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Informed Consent, Shared-Decision Making and a Reasonable Patient's Wishes Based on a National Survey in the United States

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Informed Consent, Shared-Decision Making and a Reasonable Patient's Wishes Based on a National Survey in the United States

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Abstract

Objective: In approximately half the states in the U.S., and more recently in the U.K., informed consent has been legally defined as what a reasonable patient would wish to know. Our objective was to discern the information needs of a hospitalized, "reasonable patient" during the informed-consent process.

Design: Survey the intensity using a 5-point scale (4 indicates "probably yes," and 5 indicates "definitely yes") by which individuals wish to know specific information if placed in a hypothetical scenario where an invasive procedure may be an option.

Setting: A 10-question survey was administered to three groups: nursing students (n=76), health professions educators (n=63), and a U.S. national population (n=1067).

Primary and secondary outcome measures: The primary outcome measure was the average intensity, on a 5-point scale, by which survey groups wished to have each of 10 questions answered. The secondary outcome was to discern relationships between survey demographics and the intensity by which participants wanted an answer.

Results: Despite substantial demographic differences in the nursing-student group and healthprofessions-educator group, the average intensity scores were within 0.2 units on 9 of 10 questions. The national survey revealed a strong desire to have an answer to each question (range 3.98 to 4.60 units). It showed that women desired answers more than men and older adults desired answers more than younger adults.

Conclusions: Based on responses to 10 survey questions regarding wishes of people in a situation where an invasive procedure may be necessary, the vast majority want an answer to each question. They wanted to know about all treatment options, risky drugs, decision aids, who

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will perform the procedure, and the cost. They wanted their advocate present, periodic review of their medical record, a full day to review documents, and expected outcomes and restrictions after the procedure.

Key Words: Informed consent, shared-decision making, reasonable patient, overuse of procedures

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Strengths and limitations of this study:

- Based on two targeted surveys and a national survey, findings are consistent across demographic groups and across the United States, making our conclusions robust.
- The findings form a template that could be used by clinicians when engaged in shareddecision making to elicit truly informed consent from the patient.
- The survey questions had to be limited to be practical, so in any specific, real-life situation additional questions may be asked by a reasonable patient.
- Findings about the out-of-pocket costs of a procedure probably apply only to patients in the United States where out-of-pocket costs may be enormous.

Funding statement: The study was supported by Patient Safety America, Houston, TX USA

Competing interests: none

Author's contribution: JTJ conceived the study and developed the questions. DJE formed the survey instrument to suit each of the situations where questions were to be presented to a survey audience. JTJ analyzed the data and wrote most of the paper in close consultation with DJE. Both authors agreed to be accountable for accuracy of the work.

Data sharing statement: National survey data are available at:

http://patientsafetyamerica.com/survey-data/.

Health-Professions-Educator survey data available at:

https://www.surveymonkey.com/results/SM-DQJDBBQ7L/

Nursing-student survey available at:

https://www.surveymonkey.com/analyze/jmYrcXlIAMk17hFhaVo4UpuCTnh4_2BlXkVDe_2FdYMHiZMUZ

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Introduction

While the idea of shared-decision making between patient and clinician has been around many decades, based on PubMed citations, the concept has gained momentum since 2012.¹ The culmination of shared-decision making is that the patient consents to the mutually-agreed procedures to be performed or not performed. The old standard calling for information that "reasonable clinicians" feel their patients need to know is giving way to the new standard defined by what a reasonable patient wishes to know. However, a study of recorded conversations between clinicians and a patients that may need percutaneous coronary intervention (PCI) found that only 3% of the patients received all 8 elements necessary for informed decision making.² A recent court ruling in the U.K has upheld the patient-centered, informed-consent standard and about half of the United States use "reasonable patient" as the basis for administering informed consent.³

The question then becomes, "What does a reasonable patient wish to know?" Typically, that is answered after the fact in specific cases where a patient may allege that he was not given sufficient information to make an informed decision.⁴ One example involved a case where a man's family was not given enough information about his defibrillator replacement to make an informed decision.⁵ Patient preferences were not elicited by the clinician. A court in the U.K. decided that a woman was not given sufficient information on the 1% risk of shoulder dystocia from a vaginal vs. a Caesarian delivery to make an informed decision.⁶ To our knowledge, no investigators have attempted to define the information needs of a reasonable patient in a general way that applies to care during hospitalization. To some extent the survey was driven by stories of patient advocates who have experienced harm and, in retrospect, wish they had known more

about the risks of their treatment, device, or medication. We hypothesized that such wishes could be generalized into information a "reasonable patient' would want to know.

Goal

 Our primary goal was to establish the descriptive intensity (scale of 1 to 5, with 1 being "definitely no" and 5 being "definitely yes") by which answers to general questions are desired by a reasonable patient before giving consent for an invasive procedure, prescription drugs, or medical devices that could pose a risk of avoidable harm. Our secondary goal was to characterize heterogeneity, such as gender and age, in the survey groups that may be associated with intensity variations in what a reasonable patient wishes to know.

Methods

Our survey study was approved by the Galveston College Institutional Review Board. Our search of PubMed using "reasonable patient survey" (15 November 2018) discovered only 2 partially relevant articles. One involved wishes of patients about anesthesia risks in a Singapore hospital.⁷ Another surveyed patients' opinions about pre-surgical informed-consent in a Jamaica teaching hospital.⁸ We created a statement of a generic situation in which a hospitalized patient must make choices about their care after being stabilized upon entry via the emergency department: *You are hospitalized in a large, urban, teaching hospital after being brought into its emergency room last night. The condition that brought you to the ER has been stabilized, but additional procedures may be necessary. The following 10 questions determine what you would like to know as a reasonable patient.* We developed a 10-question survey based on adverse experiences reported by members of the Patient Safety Action Network (formerly members of the Safe

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Patient Project of Consumers Union) and our knowledge of shortcomings with current informed consent practices as reflected in medical literature.

The survey was developed in two forms. The first employed demographics to include age, gender, education level, race or ethnicity, and whether the survey taker has worked in a hospital. This survey was administered via cell phone to nursing students (and a few faculty) on April 19, 2018 at Galveston College, Galveston Texas during a presentation by Dr. James. It was also administered to participants in the Health Professions Educators Summer Symposium (HPESS) Community via email request on June 8, 2018. The latter included primarily mature academics involved in educating physicians, nurses, and health-care administrators.

The second form of the survey, which was used for the U.S. national survey, employed an identical scenario and questions, but the demographics were adapted to those offered by SurveyMonkey[®] (SM) for a national survey. These included age, gender, household income level, and region of the United States. The national platform included survey takers across the U.S. that had been previously recruited by SM. The vast majority of the national survey takers used cell phones to answer the questions. The third survey was administered to the national audience on October 22, 2018.

Each of the 10 questions could be answered at one of 5 intensity levels indicating the degree to which an answer is desired by the person taking the survey. The responses were as follows: definitely no (1.0), probably no (2.0), neutral (3.0), probably yes (4.0), and definitely yes (5.0). Formal statistical analyses were deemed unsuited to the qualitative nature of our study design. Final conclusions are word descriptions of the intensity of desire of a reasonable patient to have answers such as "probably yes" or "definitely yes." Obvious trends in the data were captured graphically.

Patient and Public Involvement

The research development of the present study was a direct result of patient advocates' experiences with failed informed consent or lack of provider solicitation of patient preferences. These led to formulation of many of the questions posed in our survey. The study leaders are patient safety advocates. The outcome measures were a direct result of the reactions of putative patients as "reasonable patients" to the survey questions. We intentionally involved providers by surveying the HPESS community that consists of clinicians, nurses, and hospital administrators dedicated to educating the next generation of leaders in their respective disciplines. They were asked to assume the role of a patient as they completed our survey.

Our results will be disseminated to the HPESS community once the study has been published, and we will ask that our findings be presented during the summer symposium in July, 2019. The theme of that symposium is how to best educate millennials. Our national survey data provided a category specifically for responses by millennials. Results will be disseminated to nursing students at Galveston College through a presentation this spring. Our findings and suggested actions from our findings will be disseminated to patient advocates whose shared ideas and experiences powered this study. Those groups include the following: Patient Council of the Right Care Alliance, Patient Safety Action Network, and members of Patient Safety America. We expect to widely share our findings with the general public (represented by our national survey) through media outlets such as ProPublica, with physicians through KevinMD and Veritas Health Care, and with nurses through Quality and Safety Education for Nurses (QSEN).

Results

We targeted two groups from which to obtain responses because of the access we had to them and the expectation that their demographics would be different. The response rate from the nursing students was 99% (76/77) because it was taken during a lecture in which support was available if anyone had difficulty. Only one did. The response rate of the HPESS Community to the email request was 63/146 = 43%. The low response is likely due to busy professionals not having time to read and respond to all emails sent to them. Combined, the response rate of the two targeted studies was 62%. Table 1 shows the diversity of demographics in the two groups that took initial surveys. The primary differences were in age, education level, race or ethnic origin, and hospital work experience.

Demographic measure	Nursing students	HPESS Community
	(n = 76)	(n = 63)
Under 35 years of age	77%	3%
Female	78%	70%
High school graduate	34%	2%
College graduate	65%	5%
Advanced degree	1%	93%
White or Caucasian	51%	84%
Black or African American	16%	3%
Hispanic or Latino	26%	2%
Asian	4%	6%
Have worked in a hospital	35%	86%

Table 1.	Comparative	demographics	of targ	geted	groups

The national survey included 1211 persons who entered the survey and 1067 who completed it for a response rate of 88%. Nine participants did not answer location questions. The combined results of our three surveys consistently showed that a "reasonable patient" would want to know an answer to each of the 10 questions presented in our survey (table 2). **Table 2.** Average response levels in three surveys. 4.0 indicates the person "probably" wants an answer, and 5.0 indicates the person "definitely" wants an answer. The percentage of the 5.0 responses are shown in bold red. In the national survey, 71 % of the reported income levels were from \$10,000 to \$99,000. Of the 9 geographic regions of the U.S., 54% of responses were from 3 of those – east north central, south Atlantic, and Pacific. Footnotes: an=75, bn=62

Number and description of survey question	Nursing	HPESS	National	National	National
. , , ,	students	Group	Group	ranges	ranges
	(n = 76)	(n = 63)	(n =	over 10	over 9
	[% 5.0]	[% 5.0]	1067)	income	regions
			[%5.0]	Groups	of the
<u>^</u>					U.S.
 Would you like to know all your treatment choices, 	4.92	4.94	4.58	4.33-	4.51-
including alternatives and risks and benefits of each choice				4.97	4.65
for a patient like you. Your choices may include invasive	[92%]	[95%]	[75%]		
procedures (surgery, endoscopic procedures, insertion of a					
medical device), non-invasive treatments, and what happens					
if you do nothing?		4.54	4.40	4.07	1.20
2. Drugs that have not been approved by the Food and Drug	4.89 ^a	4.51	4.40	4.07-	4.26-
Administration for your condition are off-label for you. Drugs		[(70/]	[670/]	4.71	4.57
side-effects as drugs prescribed on-label. Would you like to	[89%]	[0/%]	[07%]		
know if any drugs prescribed to you are off-label and what					
their side effects may be?					
3. Drugs assigned a "black box" warning by the FDA pose an	4.83	4.67	4.57	4.27-	4.43-
especially serious risk of harm. If you are prescribed such a		_	-	4.92	4.69
drug, would you want to know the reasons for the black box	[83%]	[79%]	[78%]		
warning and if there are alternatives before you take it?					
 Decision aids are created to assist patients with complex 	4.66	4.65	4.41	4.07-	4.28-
medical decisions and to help them understand the risks and				4.69	4.57
benefits of treatment options. If there is a decision-aid	[73%]	[70%]	[61%]		
available for your illness, would you like to review it?					
5. If you are considering an invasive procedure, would you	4.83	4.78	4.49	4.34-	4.41-
like to know who will be performing it, their skill level, and	[84%]	[84%]	[68%]	4.82	4.63
how trainee doctors, if any, will be involved?					
6. Assuming you have decided on a procedure or treatment,	4.71	4.60 ^b	4.48	4.21-	4.41-
would you like to know what your total, out-of-pocket costs	[79%]	[68%]	[69%]	4.76	4.52
WIII be?		4 5 4	4.24	4.00	4.20
7. You have a trusted family member that is willing to act as	4.65 ^a	4.54	4.31	4.09-	4.20-
during shared decision making about your modical care?	[73%]	[62%]	[54%]	4.09	4.45
8 If you are well enough, would you like to be offered a	4.07	4.06	3 08	2 /1_	3 80-
chance to review and make entries in your medical records	[47%]	[<u>48%</u>]	[38%]	4 23	5.85 ⁻ 4 11
each day while you are hospitalized?	[47,0]	[40/0]	[30/0]		
9. Before signing any documents permitting invasive, non-	4.29	4.19	4.18	3.91-	3.87-
emergency procedures would you like to review these at	[49%]	[52%]	[47%]	4.41	4.34
least one full day in advance of the procedure?		[/-]	1		
10. If you are considering an invasive procedure, would you	4.84	4.89	4.60	4.32-	4.49-
like to know your expected difficulties, recovery times, pain	[86%]	[90%]	[76%]	4.85	4.70
management, and restrictions after the procedure while	· ·		•		
hospitalized and after discharge from the hospital? This					
includes the risk of infection from the invasive procedure.					

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Discussion

The three distinct surveys compare well regarding the wishes of patients. The highest intensity of desire to have an answer was to question 1 (know all treatment choices) in all three surveys (range 4.58-4.94). In all three surveys, the lowest intensity of desire to have an answer was to question 8 (medical record access) (range 3.98-4.07), and the second lowest intensity was to question 9 (advanced review of documents) (range 4.18-4.29). Even the lowest intensity desire for an answer was near 4.0, which implies that on weighted-average basis, the putative reasonable patient would *probably* want to have access to his medical record and be able to make entries.

Despite the different demographics in the two targeted surveys (table 1), especially in age, education level and hospital work experience, the responses were comparable in the two groups (table 2). Only one of the 10 questions (number 2) had a response level that differed by more than 0.20 units. This was the question of whether a reasonable patient would want to know about any off-label drugs prescribed. The difference was 0.38 units. The higher education level and more hospital experience of the HPESS Community may have made this group slightly less concerned about the additional risk that may be associated with off-label prescriptions.

The results of the national survey regarding demographics of gender (figure 1) and age (figure 2) demonstrated distinct trends for all 10 questions. Without exception, women wanted more information than men, and older adults wanted more information than younger adults. The former may be due to women being higher users of hospital care and hospitals tending to offer many more services targeted to women than to men.⁹ Older adults may be more likely to be cautious compared to younger adults because of more lifetime hospital experiences.

Our survey provides insight into some patient concerns that are not typically part of informed consent. In the wake of the opioid epidemic, the public is more aware of the potential dangers of prescription drugs. Thus, it should not be surprising that patients would want to know if the drugs prescribed to them are off-label or have a black-box warning. The U.S. Food and Drug Administration assigned "black box" warnings to immediate-release opioids in 2016.¹⁰ There is also growing attention to surprise medical bills in the U.S., so a reasonable patient would likely to want an estimate of his out-of-pocket costs. Inordinate out-of-pocket costs, especially those that lead to bankruptcy, may have an adverse effect on clinical outcomes.¹¹ Hospital administration staff could assist with providing cost information. The opportunity to review and make entries in one's medical record, while not part of the informed consent process, may relate. Many patients want to ensure that the data being recorded are accurate and complete; moreover, many desire access to their data as a means of gaining a better understanding of their condition and engaging with their providers. Encouraging this access can convey strong support for the view that the patient is an integral part of his care team.

There is an important connection between informed consent and the overuse of medical procedures. The overuse of PCI in the U.S. is a prime example. Patients that may need PCI were less likely to choose this invasive option when they were better informed about their care options during hospitalization.¹² A study of patients in Northern England that may need PCI concluded that there is "a mismatch between legal and ethical principles of informed consent and current practice. The variation in patients' experiences of the current place of informed consent in service delivery represents a missed opportunity for cardiologists to work in decision-making partnerships with patients. In light of recent changes in the law [to the reasonable patient standard], a new approach to informed consent is required."¹³

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Limitations

In order to respect the time of responders to our survey, we limited it to 10 questions applicable to an informed consent discussion in a hypothetical situation. In real clinical settings, it is likely that our "template" will need to be augmented with questions specific to the situation the patient faces. These should be designed to elicit the patient's preferences. We also recognize that some of the answers are out of the clinician's hands; for example, clinicians in the U.S. are seldom going to know the patient's out-of-pocket costs. We also recognize that clinicians may need the assistance of pharmacists in conveying the benefits, risks, and alternatives to off-label or black-OPP. box-warning drugs.

Conclusions

Through two targeted surveys and a U.S. national survey, we have affirmed that a reasonable patient will want to know far more information than is generally conveyed during typical shareddecision making that leads to no more than a partly informed decision by the patient. Survey respondents wanted to know risks and benefits of all treatment options, the risks and benefits of off-label and box-warning drugs. They wished to view decision aids, know precisely who will perform the procedure, and their anticipated out-of-pocket costs. Their desire was for an advocate to be present during shared-decision making, have periodic opportunities to review their medical record, have a full day to review informed-consent documents, and to be made aware of expected outcomes and restrictions after the procedure. We expect our findings to have implications for what defines a reasonable patient standard for informed consent.

Figure 1. National intensity scores above 4.0 vs. question number for gender differences in the national survey. Responses came from 497 males and 570 females.

Figure 2. National intensity scores above 4.0 vs. question number for age differences in the national survey. Responses came from 297, 230, 343, and 197 people in the four respective age groups.

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Figure 1. Effect of gender on survey responses



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Abstract

Objective: In approximately half the states in the U.S., and more recently in the U.K., informed consent is legally defined as what a reasonable patient would wish to know. Our objective was to discern the information needs of a hospitalized, "reasonable patient" during the informed-consent process.

Design: Survey the intensity using a 5-point scale (4 indicates "probably yes," and 5 indicates "definitely yes") by which individuals wish to know specific information if placed in a hypothetical scenario where an invasive procedure may be an option.

Setting: A 10-question survey was administered from April 19 through October 22, 2018 to three groups: student nurses (n=76), health professions educators (n=63), and a U.S. national population (n=1067).

Primary and secondary outcome measures: The primary outcome measure was the average intensity, on a 5-point scale, by which survey groups wished to have each of 10 questions answered. The secondary outcome was to discern relationships between survey demographics and the intensity by which participants wanted an answer.

Results: Despite substantial demographic differences in the nursing-student group and healthprofessions-educator group, the average intensity scores were within 0.2 units on 9 of 10 questions. The national survey revealed a strong desire to have an answer to each question (range 3.98 to 4.60 units). It showed that women desired answers more than men and older adults desired answers more than younger adults.

Conclusions: Based on responses to 10 survey questions regarding wishes of people in a situation where an invasive procedure may be necessary, the vast majority want an answer to

each question. They wanted to know about all treatment options, risky drugs, decision aids, who will perform the procedure, and the cost. They wanted their advocate present, periodic review of their medical record, a full day to review documents, and expected outcomes and restrictions after the procedure.

Key Words: Informed consent, shared-decision making, reasonable patient, overuse of

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Strengths and limitations of this study:

- Based on two targeted surveys and a national survey, findings are consistent across demographic groups and across the United States, making our conclusions robust.
- The findings form a template that could be used by clinicians when engaged in shareddecision making to elicit truly informed consent from the patient.
- The survey questions had to be limited to be practical, so in any specific, real-life situation additional questions may be asked by a reasonable patient.
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Competing interests: none

Author's contribution: JTJ conceived the study and developed the questions. DJE formed the survey instrument to suit each of the situations where questions were to be presented to a survey audience. JTJ and RRS analyzed the data. JTJ wrote most of the paper in close consultation with coauthors. All authors agreed to be accountable for accuracy of the work.

Data sharing statement: National survey data are available at:

http://patientsafetyamerica.com/survey-data/.

Health-Professions-Educator survey data available at:

https://www.surveymonkey.com/results/SM-DQJDBBQ7L/

Nursing-student survey available at:

https://www.surveymonkey.com/results/SM-5F2SX9W3V/

Introduction

The human right to self-determination in healthcare is a hallmark of instruments promulgated by the United Nations. Rights are specifically described for children, persons with disabilities and older persons. These call for the highest standards attainable for children's health,¹ for treatment of illness or rehabilitation of the disabled,² and for maintenance of optimum health as people age.³ The patient's right to know certainly extends to knowing the risks and benefits of prescription medications. For example, based on a recent court decision in the U.K. involving off label and unlicensed medication prescribing, consent laws now call for patients to receive all information that a patient deems important, and not just what the physician thinks is important.⁴ However, unless the patient is harmed by denial of sufficient information to exercise their rights to make an informed decision about off-label prescriptions, there is no legal standing for compensation. In our opinion, the human rights of patients to self-determination in healthcare can only be attained through a balanced process of shared-decision making between patient and clinician.

While the idea of shared-decision making between patient and clinician has been around many decades, based on PubMed citations, the concept has gained momentum since 2012.⁵ The culmination of shared-decision making is that the patient consents to the mutually-agreed procedures to be performed or not performed. The old standard calling for information that "reasonable clinicians" feel their patients need to know is giving way to the new standard defined by what a reasonable patient wishes to know. However, a study of recorded conversations between clinicians and a patients that may need percutaneous coronary intervention (PCI) found that only 3% of the patients received all 8 elements necessary for

informed decision making.⁶ A recent court ruling in the U.K has upheld the patient-centered, informed-consent standard and about half of the United States use "reasonable patient" as the basis for administering informed consent.⁷ In the past, the "reasonable patient" standard has been ill-defined and abstract; our intent is to better-define the information wishes of a reasonable person when facing the possibility of an invasive procedure.⁸ There is a natural conflict between respect for patient autonomy in making an informed decision and the practical aspects of how a clinician delivers information to a "reasonable patient" to fulfill the ethical principle of autonomy.

The question then becomes, "What does a reasonable patient wish to know?" Typically, that is answered after the fact in specific cases where a patient may allege that he was not given sufficient information to make an informed decision.⁹ One example involved a case where a man's family was not given enough information about his defibrillator replacement to make an informed decision.¹⁰ Patient preferences were not elicited by the clinician. A court in the U.K. decided that a woman was not given sufficient information on the 1% risk of shoulder dystocia from a vaginal vs. a Caesarian delivery to make an informed decision.¹¹ To our knowledge, no investigators have attempted to define the information needs of a reasonable patient in a general way that applies to care during hospitalization. To some extent the survey was driven by stories of patient advocates who have experienced harm and, in retrospect, wish they had known more about the risks of their treatment, device, or medication. We hypothesized that such wishes could be generalized into information a "reasonable patient" would want to know.

Goal

Our primary goal was to establish the descriptive intensity (scale of 1 to 5, with 1 being "definitely no" and 5 being "definitely yes") by which answers to general questions are desired

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by a reasonable patient before giving consent for an invasive procedure, prescription drugs, or medical devices that could pose a risk of avoidable harm. Our secondary goal was to characterize heterogeneity, such as gender and age, in the survey groups that may be associated with intensity variations in what a reasonable patient wishes to know.

Methods

Our survey study was approved by the Galveston College Institutional Review Board. Our search of PubMed using "reasonable patient survey" (15 November 2018) discovered only 2 partially relevant articles. One involved wishes of patients about anesthesia risks in a Singapore hospital.¹² Another surveyed patients' opinions about pre-surgical informed-consent in a Jamaica teaching hospital.¹³ In the latter study, 67% of the surveyed patients described their consent process as 'unsatisfactory.' We created a statement of a generic situation in which a hospitalized patient must make choices about their care after being stabilized upon entry via the emergency department: *You are hospitalized in a large, urban, teaching hospital after being brought into its emergency room last night. The condition that brought you to the ER has been stabilized, but additional procedures may be necessary. The following 10 questions determine what you would like to know as a reasonable patient.* We developed a 10-question survey based on adverse experiences reported by members of the Patient Safety Action Network (formerly members of the Safe Patient Project of Consumers Union) and our knowledge of shortcomings with current informed consent practices as reflected in medical literature.

The survey was developed in two forms. The first employed demographics to include age, gender, education level, race or ethnicity, and whether the survey taker has worked in a hospital. This survey was administered via cell phone to student nurses (and a few faculty) on April 19, 2018 at Galveston College, Galveston Texas during a presentation by Dr. James. It was

also administered to participants in the Health Professions Educators Summer Symposium (HPESS) Community via email request on June 8, 2018. The latter included primarily mature academics involved in educating physicians, nurses, and health-care administrators.

The second form of the survey, which was used for the U.S. national survey, employed an identical scenario and questions, but the demographics were adapted to those offered by SurveyMonkey[®] (SM) for a national survey. These included age, gender, household income level, and region of the United States. The national platform included survey takers across the U.S. that had been previously recruited by SM. The vast majority of the national survey takers used cell phones to answer the questions. The third survey was administered to the national audience on October 22, 2018.

Each of the 10 questions could be answered at one of 5 intensity levels indicating the degree to which an answer is desired by the person taking the survey. The responses were as follows: definitely no (1.0), probably no (2.0), neutral (3.0), probably yes (4.0), and definitely yes (5.0). Formal statistical analyses were deemed unsuited to the qualitative nature of our study design. Final conclusions are word descriptions of the intensity of desire of a reasonable patient to have answers such as "probably yes" or "definitely yes." Obvious trends in the data were captured graphically.

Statistics and Factor Analyses

The data subjected to analyses were collected in three surveys (student nurses, HPESS, and the national survey). For each survey, descriptive statistics were obtained and analyses of the results were performed using Stata (version 14.0; Stata Corp., College Station, TX). The means of the responses of the various groups for each subject category (e.g., age, gender, etc.)

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were tested for differences using methods that are appropriate for these categorical variables, which are not normally distributed. The nonparametric Kruskal–Wallis one-way analysis of variance by ranks was performed to test for differences between means and the Dunn test was used to identify pairs that differed significantly. Statistical significance, adjusted for false discovery, was established with p < 0.025.

Factor analysis with principal component factoring was utilized in all surveys to determine components that can explain the greatest portions of the total variance in responses among the questions. The goal of a factor analysis is to reduce the number of variables to explain and to interpret the results. Factor loadings was achieved by regression of scoring coefficients obtained with varimax rotation. The loaded factors (principal components) generated were analyzed as described above for other variables.

Patient and Public Involvement

The research development of the present study was a direct result of patient advocates' experiences with failed informed consent or lack of provider solicitation of patient preferences. These led to formulation of many of the questions posed in our survey. The study leaders are patient safety advocates. The outcome measures were a direct result of the reactions of putative patients as "reasonable patients" to the survey questions. We intentionally involved providers by surveying the HPESS community that consists of clinicians, nurses, and hospital administrators dedicated to educating the next generation of leaders in their respective disciplines. They were asked to assume the role of a patient as they completed our survey.

Our results will be disseminated to the HPESS community once the study has been published, and we will ask that our findings be presented during the summer symposium in July,

2019. The theme of that symposium is how to best educate millennials. Our national survey data provided a category specifically for responses by millennials. Results will be disseminated to student nurses at Galveston College through a presentation this spring. Our findings and suggested actions from our findings will be disseminated to patient advocates whose shared ideas and experiences powered this study. Those groups include the following: Patient Council of the Right Care Alliance, Patient Safety Action Network, and members of Patient Safety America. We expect to widely share our findings with the general public (represented by our national survey) through media outlets such as ProPublica, with physicians through KevinMD and Veritas Health Care, and with nurses through Quality and Safety Education for Nurses (QSEN).

Results

We targeted two groups from which to obtain responses because of the access we had to them and the expectation that their demographics would be different. The response rate from the student nurses was 99% (76/77) because it was taken during a lecture in which support was available if anyone had difficulty. Only one did. The response rate of the HPESS Community to the email request was 63/146 = 43%. The low response is likely due to busy professionals not having time to read and respond to all emails sent to them. Combined, the response rate of the two targeted studies was 62%. Table 1 shows the diversity of demographics in the two groups that took initial surveys. The primary differences were in age, education level, race or ethnic origin, and hospital work experience.

Demographic measure	Student Nurses	HPESS Community	P values
	(n = 76)	(n = 63)	
Under 35 years of age	77%	3%	< 0.0001
Female	78%	70%	0.2755
High school graduate	34%	2%	< 0.0001
College graduate	65%	5%	< 0.0001
Advanced degree	1%	93%	< 0.0001
White or Caucasian	51%	84%	< 0.0001
Black or African American	16%	3%	0.0151
Hispanic or Latino	26%	2%	0.0001
Asian	4%	6%	0.5161
Have worked in a hospital	35%	86%	< 0.0001

 Table 1. Comparative demographics of targeted groups (2 sample test of proportions)

The national survey included 1211 persons who entered the survey and 1067 who completed it for a response rate of 88%. Nine participants did not answer location questions. The combined results of our three surveys consistently showed that a "reasonable patient" would want to know an answer to each of the 10 questions presented in our survey (table 2).

Table 2 allows the reader to view the results in two ways for each of the 10 questions. The first, shown in bracketed, red highlight, is the fraction of responders that indicated that they definitely wanted to know information (5.0 response) or have a certain right to access (e.g. medical record access). The second way to view results, in black lettering, indicates the numerical mean of all responses in each of the 3 surveys and the ranges of the means sorted by income groups and regions of the U.S. in the national survey. We used ranges as a measure of dispersion around the national means because it is likely lay readers will understand this more readily than the results of our formal statistical analysis. The three distinct surveys compare well regarding the wishes of patients. The highest intensity of desire to have an answer was to question 1 (know all treatment choices) in all three surveys (range 4.58-4.94). In all three surveys, the lowest intensity of desire to have an answer was to question 8 (medical record access) (range 3.98-4.07), and the second lowest intensity was to question 9 (advanced review of documents) (range 4.18-4.29). Even the lowest intensity desire for an answer was near 4.0, which implies that on weighted-average basis, the putative reasonable patient would *probably* want to have access to his medical record and be able to make entries.

Table 2. Average response levels in three surveys. 4.0 indicates the person "probably" wants an answer, and 5.0 indicates the person "definitely" wants an answer. The percentage of the 5.0 responses are shown in bold red. In the national survey, 71 % of the reported income levels were from \$10,000 to \$99,000. Of the 9 geographic regions of the U.S., 54% of responses were from 3 of those – east north central, south Atlantic, and Pacific. Footnotes: an=75, bn=62

Number and description of survey question	Student	HPESS	National	National	National
	Nurses	Group	Group	ranges	ranges
The percentages of individuals that 'definitely' (5.0)	(n = 76)	(n = 63)	(n =	over 10	over 9
wanted an answer to each question below is shown in	[% 5.0]	[% 5.0]	1067)	income	regions
hold red in the columns.			[%5.0]	Groups	of the
					U.S.
1. Would you like to know all your treatment choices,	4.92	4.94	4.58	4.33-	4.51-
ncluding alternatives and risks and benefits of each choice				4.97	4.65
for a patient like you. Your choices may include invasive	[92%]	[95%]	[75%]		
procedures (surgery, endoscopic procedures, insertion of a					
if you do nothing?					
2. Drugs that have not been approved by the Food and Drug	4.003	4.51	4.40	4.07-	4.26-
Administration for your condition are off-label for you. Drugs	4.89*			4.71	4.57
prescribed off-label are about twice as likely to cause serious	[000/]	[67%]	[67%]		
side-effects as drugs prescribed on-label. Would you like to	[89%]				
know if any drugs prescribed to you are off-label, and what					
their side effects may be?					
3. Drugs assigned a "black box" warning by the FDA pose an	4.83	4.67	4.57	4.27-	4.43-
especially serious risk of harm. If you are prescribed such a				4.92	4.69
drug, would you want to know the reasons for the black box	[83%]	[79%]	[78%]		
Warning and if there are alternatives before you take it?	1.00	4.05	4 4 1	4.07	4.20
4. Decision and are created to assist patients with complex w	4.00	4.65	4.41	4.07-	4.28-
henefits of treatment ontions. If there is a decision-aid	[720/]	[70%]	[61%]	4.09	4.57
available for your illness, would you like to review it?	[/3/0]	[/0/0]	[01/0]		
5. If you are considering an invasive procedure, would you	4.83	4 78	4 4 9	4 34-	4 41-
like to know who will be performing it, their skill level, and	[84%]	[84%]	[68%]	4.82	4.63
how trainee doctors, if any, will be involved?					
6. Assuming you have decided on a procedure or treatment,	4.71	4 60 ^b	4.48	4.21-	4.41-
would you like to know what your total, out-of-pocket costs	[79%]	[68%]	[69%]	4.76	4.52
will be?		[00/0]			
7. You have a trusted family member that is willing to act as	4.65 ^a	4.54	4.31	4.09-	4.20-
your advocate. Would you like for that person to be present	[73%]	[62%]	[54%]	4.69	4.43
during shared-decision-making about your medical care?				0.44	
8. If you are well enough, would you like to be offered a	4.07	4.06	3.98	3.41-	3.89-
chance to review and make entries in your medical records	[4/%]	[48%]	[38%]	4.23	4.11
9 Before signing any documents permitting invasive non-	1 29	/ 10	/ 18	3 91-	3 87-
emergency procedures would you like to review these at	4.29 [/10%]	[52%]	4.10 [/7%]	2.91- 4.41	4 34
least one full day in advance of the procedure?	[43/0]	[32/0]	[47,0]		
10. If you are considering an invasive procedure, would you	4.84	4.89	4.60	4.32-	4.49-
like to know your expected difficulties, recovery times, pain	[86%]	[90%]	[76%]	4.85	4.70
management, and restrictions after the procedure while	.				
hospitalized and after discharge from the hospital? This					
includes the risk of infection from the invasive procedure.					

Below we provide brief descriptions of the statistical analyses and factor analyses for each of the 3 surveys. The details of these analyses are in 'additional files.' Question numbers are found in table 2. Statistical analysis of the responses to survey questions obtained from student nurses revealed no significant differences among age groups, level of education, experience working in a hospital, or between genders, in their responses to any of the 10 questions. Not considering 'another race' as a response suitable for comparisons, the only differences in pairs were for question 1. 'White or Caucasian' was different from 'Black or African American' (p = 0.011) and 'Black or African American' was different from 'Asian or Asian American' (p = 0.020).

Factor analysis with principal component factoring identified 3 factors each with Eigenvalues greater than 1, which cumulatively accounted for 64% of total variance among responses provided by the student nurses. Varimax factor loading of 3 factor variables labeled as "knowledge", "participation", and "total cost" were generated and analyzed as above for differences in responses among groups. No significant differences were found among age groups, levels of education, or between genders, in their responses to any of the factor variables. The only significant differences, again disregarding comparisons to 'Another race,' existed among races and ethnicities in their responses associated with "knowledge" (p = 0.0091) where 'White or Caucasian' differed from 'Black or African American' (p = 0.0211).

The responses of the HPESS survey did not differ significantly between genders, or among various ethnicities for any of the ten questions. Responses differed significantly among age groups only for questions 1 (p = 0.0171) and 2 (p = 0.0024). Responses differed significantly by education level for questions 1 (p = 0.0015), 2 (p = 0.0139), 3 (p = 0.0170) and 10 (p = 0.0347). Among respondents to the HPESS survey, significant differences in responses

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to questions 1 (p = 0.003), 2 (p = 0.0024), and 5 (p = 0.0002) were provided by respondents who differed according to their employment as hospital workers.

Factor analysis of the HPESS data with principal component factoring identified no statistically significant differences for either of two factor variables "knowledge" and "participation" when responses were compared by age, gender, or level of education. A significant difference among ethnic groups was found for "knowledge" (p = 0.0394) but post hoc analysis with Dunn's test failed to identify any pairs of groups that differed significantly.

In the national survey responses differed significantly for all questions among age groups (p = 0.001 for questions 1 - 7 and 10; p = 0.0041 and 0.0052 for questions 8 and 9 respectively), between genders (p = 0.001 for questions 1, 2, 4, 7, 8 and 10; p = 0.0043, 0.0002, 0.0030 and 0.0014 for questions 3, 5, 6 and 9, respectively). Significant differences for questions 1 (p = 0.0001), 2 (p = 0.0384), 3 (p = 0.0047), 4 (p = 0.0037), and 6 (p = 0.0190) were found among groups that differed by income level. Question 9 (p = 0.0473) was the only question for which responses differed significantly among regions of the U.S. Several salient generalizations from these comparisons are apparent. When comparing responses among various age groups, differences were found among all ages groups for most questions. When significant differences were found among all ages proups of differing income levels the differences, most often, were between group 1 and the other groups. Differences between regions, in response to question 9, were most often between regions 1 and 2 and the other regions.

Factor analysis of the national data with principal component factoring demonstrated significant differences among the age categories for both factor variables ("knowledge", and "other", p = 0.0001 for both variables). All groups differed significantly from each other, with the exception of group 4 vs group 5 for the factor variable "other". For both factor variables the

differences in responses of the genders are very highly significantly different (p < 0.0001). When considering responses from groups of differing income levels, significant differences were found for the variable "knowledge" (p = 0.0005). Most of the differences among pairs are between group 1 and other groups and between group 3 and other groups. There were no significant differences in responses to factor variables among regions.

Discussion

Despite the different demographics in the two targeted surveys (table 1), especially in age, education level and hospital work experience, the responses were comparable in the two groups (table 2). Only one of the 10 questions (number 2) had a response level that differed by more than 0.20 units. This was the question of whether a reasonable patient would want to know about any off-label drugs prescribed. The difference was 0.38 units. The higher education level and more hospital experience of the HPESS Community may have made this group slightly less concerned about the additional risk that may be associated with off-label prescriptions. Statistical analysis of the nurse-student survey revealed two paired demographic differences. Two race/ethnic pairs (white vs. black and black vs. Asian) were associated with differences in intensity of response to question 1, which is about knowing all choices for treatment including risks and benefits. Statistical analysis of the HPESS community survey disclosed differences between pairs in the age, education-level and hospital-work-experience groups. While these statistical findings may be interesting, the reality is that the core message remains unchanged: patients of all types studied wish to know many details about their care choices when facing the possibility of an invasive procedure.
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The results of the national survey regarding demographics of gender (figure 1) and age (figure 2) demonstrated distinct trends for all 10 questions. Without exception, women wanted more information than men, and older adults wanted more information than younger adults. Similarly, statistical analysis supported associations between age and gender on the intensity of responses to most questions, and it revealed an effect of income for some of the survey questions. The gender associations may be due to women being higher users of hospital care and hospitals tending to offer many more services targeted to women than to men.¹⁴ Older adults may be more likely to be cautious compared to younger adults because of more lifetime hospital experiences.

Our survey provides insight into some patient concerns that are not typically part of informed consent. In the wake of the opioid epidemic, the public is more aware of the potential dangers of prescription drugs. Thus, it should not be surprising that patients would want to know if the drugs prescribed to them are off-label or have a black-box warning. The U.S. Food and Drug Administration assigned "black box" warnings to immediate-release opioids in 2016.¹⁵ There is also growing attention to surprise medical bills in the U.S., so a reasonable patient would likely to want an estimate of his out-of-pocket costs. Inordinate out-of-pocket costs, especially those that lead to bankruptcy, may have an adverse effect on clinical outcomes.¹⁶ Hospital administration staff could assist with providing cost information. The opportunity to review and make entries in one's medical record, while not part of the informed consent process, may relate. Many patients want to ensure that the data being recorded are accurate and complete; moreover, many desire access to their data as a means of gaining a better understanding of their condition and engaging with their providers. Encouraging this access can convey strong support for the view that the patient is an integral part of his care team.

There is an important connection between informed consent and the overuse of medical procedures. The overuse of PCI in the U.S. is a prime example. Patients that may need PCI were less likely to choose this invasive option when they were better informed about their care options during hospitalization.¹⁷ A study of patients in Northern England that may need PCI concluded that there is "a mismatch between legal and ethical principles of informed consent and current practice. The variation in patients' experiences of the current place of informed consent in service delivery represents a missed opportunity for cardiologists to work in decision-making partnerships with patients. In light of recent changes in the law [to the reasonable patient standard], a new approach to informed consent is required."¹⁸

The history of legally-defined informed consent for invasive procedures has evolved from a totally physician-centered concept (before the Era of Enlightenment) in which deception of the patient was deemed necessary, to the point where the process has now become patientcentered, in principle. A brief summary of some of the court decisions pertinent to involvement of the patient points to the next step in informed consent, which we feel we have defined with our survey.¹⁹ As early as 1914, a New York court established that an "adult in sound mind has the right to determine what shall be done with his own body." This was reinforced in 1960 by the decision of a court in Kansas that the patient, not the physician, must make the final decision about any operation. Of course, the patient's decision may be biased by receiving limited information from the physician. Two court decisions in 1972, one in California and the other in Washington, D.C., determined that the patient must be informed of pertinent risks of surgery and have the alternatives revealed to him or her. In 1983, a New Jersey court ruled that if a surgeon, other than the one the patient selected, performs the surgery, then the surgeon that obtained consent, but did not perform the surgery is liable for malpractice. The surgeon performing the

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surgery is liable for battery. The importance of the side effects of a drug (prednisone) came to a Massachusetts court's attention in 1986 when a patient suffered serious adverse effects of this drug used after eye surgery. It seems there was controversy about whether the physician should have known about the possible side effects, and then disclosed this potential complication of the drug to the patient.

While our survey questions originated primarily from adverse experiences of patients, it is clear that court decisions have pointed the way to a new era of the patient's voice being heard in the context of shared-decision making and informed consent. That voice says to clinicians who would perform an invasive procedure, "We patients want to know more than you have been telling us." We want to know all of our choices and their risks and benefits, we want to know the risks and benefits of drugs prescribed to us and devices placed in us, we want to view decision aids when available, we want to know the skill level of the physician(s) performing our procedure, and we want to know our costs. Moreover, we want an advocate present during shared-decision making, we want full access to our medical records, we want to review consent documents at least 24 hours before signing them, and we want to know the expected outcomes of the invasive procedure to include recovery times, pain management, and infection risks.

Limitations

In order to respect the time of responders to our survey, we limited it to 10 questions applicable to an informed consent discussion in a hypothetical situation. In real clinical settings, it is likely that our "template" will need to be augmented with questions specific to the situation the patient faces. These should be designed to elicit the patient's preferences. We also recognize that some of the answers are out of the clinician's hands; for example, clinicians in the U.S. are seldom going to know the patient's out-of-pocket costs. We also recognize that clinicians may need the

assistance of pharmacists in conveying the benefits, risks, and alternatives to off-label or blackbox-warning drugs. Surveys like ours involving a hypothetical scenario may be limited because in a real and stressful situation a patient may simply want to trust doctors' recommendations or may be afraid to ask too many questions. In a sense, our hypothetical "reasonable patient" has become a "frightened patient" when placed in a real situation, but that does not mean that he or she does not want to know answers to the all the questions in our survey.

Conclusions

Through two targeted surveys and a U.S. national survey, we have affirmed that a reasonable patient will want to know far more information than is generally conveyed during typical shared-decision making that leads to no more than a partly informed decision by the patient. Survey respondents wanted to know risks and benefits of all treatment options, the risks and benefits of off-label and box-warning drugs. They wished to view decision aids, know precisely who will perform the procedure, and their anticipated out-of-pocket costs. Their desire was for an advocate to be present during shared-decision making, have periodic opportunities to review their medical record, have a full day to review informed-consent documents, and to be made aware of expected outcomes and restrictions after the procedure. We expect our findings to have implications for what defines a reasonable patient standard for informed consent.

Figure 1. National intensity scores above 4.0 vs. question number for gender differences in the national survey. Responses came from 497 males and 570 females.

Figure 2. National intensity scores above 4.0 vs. question number for age differences in the national survey. Responses came from 297, 230, 343, and 197 people in the four respective age groups.

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Figure 1. Effect of gender on survey responses



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Informed Consent, Shared-Decision Making and a Reasonable Patient's Wishes Based on a National Survey in the United States Using a Hypothetical Scenario

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Informed Consent, Shared-Decision Making and a Reasonable Patient's Wishes Based on a National Survey in the United States Using a Hypothetical Scenario

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Abstract

Objective: In approximately half the states in the U.S., and more recently in the U.K., informed consent is legally defined as what a reasonable patient would wish to know. Our objective was to discern the information needs of a hospitalized, "reasonable patient" during the informed-consent process.

Design: Survey the intensity using a 5-point scale (4 indicates "probably yes," and 5 indicates "definitely yes") by which individuals wish to know specific information if placed in a hypothetical scenario where an invasive procedure may be an option.

Setting: A 10-question survey was administered from April 19 through October 22, 2018 to three groups: student nurses (n=76), health professions educators (n=63), and a U.S. national population (n=1067).

Primary and secondary outcome measures: The primary outcome measure was the average intensity, on a 5-point scale, by which survey groups wished to have each of 10 questions answered. The secondary outcome was to discern relationships between survey demographics and the intensity by which participants wanted an answer.

Results: Despite substantial demographic differences in the nursing-student group and healthprofessions-educator group, the average intensity scores were within 0.2 units on 9 of 10 questions. The national survey revealed a strong desire to have an answer to each question (range 3.98 to 4.60 units). It showed that women desired answers more than men and older adults desired answers more than younger adults.

Conclusions: Based on responses to 10 survey questions regarding wishes of people in a situation where an invasive procedure may be necessary, the vast majority want an answer to

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each question. They wanted to know about all treatment options, risky drugs, decision aids, who will perform the procedure, and the cost. They wanted their advocate present, periodic review of their medical record, a full day to review documents, and expected outcomes and restrictions after the procedure.

Key Words: Informed consent, shared-decision making, reasonable patient, overuse of

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Strengths and limitations of this study:

- Based on two targeted surveys and a national survey, findings are consistent across demographic groups and across the United States, making our conclusions robust.
- The findings form a template that could be used by clinicians when engaged in shareddecision making to elicit truly informed consent from the patient.
- The survey questions had to be limited to be practical, so in any specific, real-life situation additional questions may be asked by a reasonable patient.
- Findings about the out-of-pocket costs of a procedure probably apply only to patients in the United States where out-of-pocket costs may be enormous.

Funding statement: The study was supported by Patient Safety America, Houston, TX USA. A donation (\$1,400) from Dr. James to support the SurveyMonkey® platform provided the funds required. His roles are given below in the "Author's contribution" section.

Competing interests: Dr. James founded Patient Safety America as a no-budget organization dedicated to educating people about problems in the U.S. healthcare industry. He serves as its unpaid CEO and leader. He has no conflicts of interest, advocating only for improved care.

Author's contribution: JTJ conceived the study and developed the questions. DJE formed the survey instrument to suit each of the situations where questions were to be presented to a survey audience. JTJ and RRS analyzed the data. JTJ wrote most of the paper in close consultation with coauthors. All authors agreed to be accountable for accuracy of the work.

Data sharing statement: National survey data at: http://patientsafetyamerica.com/survey-data/.

Health-Professions-Educator survey at: https://www.surveymonkey.com/results/SM-DQJDBBQ7L/

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Nursing-student survey available at: <u>https://www.surveymonkey.com/results/SM-5F2SX9W3V/</u> Available 'Supplementary files' include the research proposal, 2 forms of the survey, and 6 statistical analysis files.

Introduction

The human right to self-determination in healthcare is a hallmark of instruments promulgated by the United Nations. Rights are specifically described for children, persons with disabilities and older persons. These call for the highest standards attainable for children's health,¹ for treatment of illness or rehabilitation of the disabled,² and for maintenance of optimum health as people age.³ The patient's right to know certainly extends to knowing the risks and benefits of prescription medications. For example, based on a recent court decision in the U.K. involving off label and unlicensed medication prescribing, consent laws now call for patients to receive all information that a patient deems important, and not just what the physician thinks is important.⁴ However, unless the patient is harmed by denial of sufficient information to exercise their rights to make an informed decision about off-label prescriptions, there is no legal standing for compensation. In our opinion, the human rights of patients to self-determination in healthcare can only be attained through a balanced process of shared-decision making between patient and clinician.

While the idea of shared-decision making between patient and clinician has been around many decades, based on peer-reviewed citations, the concept has gained momentum since 2012.⁵ The culmination of shared-decision making is that the patient consents to the mutually-agreed procedures to be performed or not performed. The old standard calling for information that "reasonable clinicians" feel their patients need to know is giving way to the new standard defined by what a reasonable patient wishes to know. However, a study of recorded

conversations between clinicians and a patients that may need percutaneous coronary intervention (PCI) found that only 3% of the patients received all 8 elements necessary for informed decision making.⁶ A recent court ruling in the U.K has upheld the patient-centered, informed-consent standard and about half of the United States use "reasonable patient" as the basis for administering informed consent.⁷ In the past, the "reasonable patient" standard has been ill-defined and abstract; our intent is to better-define the information wishes of a reasonable person when facing the possibility of an invasive procedure.⁸ There is a natural conflict between respect for patient autonomy in making an informed decision and the practical aspects of how a clinician delivers information to a "reasonable patient" to fulfill the ethical principle of autonomy.

The question then becomes, "What does a reasonable patient wish to know?" Typically, that is answered after the fact in specific cases where a patient may allege that he was not given sufficient information to make an informed decision.⁹ One example involved a case where a man's family was not given enough information about his defibrillator replacement to make an informed decision.¹⁰ Patient preferences were not elicited by the clinician. A court in the U.K. decided that a woman was not given sufficient information on the 1% risk of shoulder dystocia from a vaginal vs. a Caesarian delivery to make an informed decision.¹¹ To our knowledge, no investigators have attempted to define the information needs of a reasonable patient in a general way that applies to care during hospitalization. To some extent the survey was driven by stories of patient advocates who have experienced harm and, in retrospect, wish they had known more about the risks of their treatment, device, or medication. We hypothesized that such wishes could be generalized into information a "reasonable patient" would want to know.

Goal

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Our primary goal was to establish the descriptive intensity (scale of 1 to 5, with 1 being "definitely no" and 5 being "definitely yes") by which answers to general questions are desired by a reasonable patient before giving consent for an invasive procedure, prescription drugs, or medical devices that could pose a risk of avoidable harm. Our secondary goal was to characterize heterogeneity, such as gender and age, in the survey groups that may be associated with intensity variations in what a reasonable patient wishes to know.

Methods

Our survey-study proposal (Supplementary file 1) was approved by the Galveston College Institutional Review Board. Our search of peer-reviewed literature using "reasonable patient survey" (15 November 2018) discovered only 2 partially relevant articles. One involved wishes of patients about anesthesia risks in a Singapore hospital.¹² Another surveyed patients' opinions about pre-surgical informed-consent in a Jamaica teaching hospital.¹³ In the latter study, 67% of the surveyed patients described their consent process as 'unsatisfactory.' We created a statement of a generic situation in which a hospitalized patient must make choices about their care after being stabilized upon entry via the emergency department: You are hospitalized in a large, urban, teaching hospital after being brought into its emergency room last night. The condition that brought you to the ER has been stabilized, but additional procedures may be necessary. The following 10 questions determine what you would like to know as a reasonable patient. We developed a 10-question survey based on adverse experiences reported by members of the Patient Safety Action Network (formerly members of the Safe Patient Project of Consumers Union) and our knowledge of shortcomings with current informed consent practices as reflected in medical literature.

The survey was developed in two forms. The first employed demographics to include age, gender, education level, race or ethnicity, and whether the survey taker has worked in a hospital (Supplementary file 2). This survey was administered via cell phone, without any means of coercion, to student nurses (and a few faculty) on April 19, 2018 at Galveston College, Galveston Texas during a presentation by Dr. James. It was also administered to participants in the Health Professions Educators Summer Symposium (HPESS) Community via email request on June 8, 2018. The latter included primarily mature academics involved in educating physicians, nurses, and health-care administrators.

The second form of the survey, which was used for the U.S. national survey, employed an identical scenario and questions, but the demographics were adapted to those offered by SurveyMonkey[®] (SM) for a national survey (Supplementary file 3). These included age, gender, household income level, and region of the United States. The national platform included survey takers across the U.S. that had been previously recruited by SM. The vast majority of the national survey takers used cell phones to answer the questions. The third survey was administered to the national audience on October 22, 2018.

Each of the 10 questions could be answered at one of 5 intensity levels indicating the degree to which an answer is desired by the person taking the survey. The responses were as follows: definitely no (1.0), probably no (2.0), neutral (3.0), probably yes (4.0), and definitely yes (5.0). Formal statistical analyses were deemed unsuited to the qualitative nature of our study design. Final conclusions are word descriptions of the intensity of desire of a reasonable patient to have answers such as "probably yes" or "definitely yes." Obvious trends in the data were captured graphically.

Statistics and Factor Analyses

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The data subjected to analyses were collected in three surveys (student nurses, HPESS, and the national survey). For each survey, descriptive statistics were obtained and analyses of the results were performed using Stata (version 14.0; Stata Corp., College Station, TX). The means of the responses of the various groups for each subject category (e.g., age, gender, etc.) were tested for differences using methods that are appropriate for these categorical variables, which are not normally distributed. The nonparametric Kruskal–Wallis one-way analysis of variance by ranks was performed to test for differences between means and the Dunn test was used to identify pairs that differed significantly. Statistical significance, adjusted for false discovery, was established with p < 0.025.

Factor analysis with principal component factoring was utilized in all surveys to determine components that can explain the greatest portions of the total variance in responses among the questions. The goal of a factor analysis is to reduce the number of variables to explain and to interpret the results. Factor loadings was achieved by regression of scoring coefficients obtained with varimax rotation. The loaded factors (principal components) generated were analyzed as described above for other variables.

Patient, Public, and Provider Involvement

The research development of the present study was a direct result of patient advocates' experiences with failed informed consent or lack of provider solicitation of patient preferences. These led to formulation of many of the questions posed in our survey. The study leaders are patient safety advocates. The outcome measures were a direct result of the reactions of putative patients as "reasonable patients" to the survey questions. We intentionally involved providers by surveying the HPESS community that consists of clinicians, nurses, and hospital administrators

dedicated to educating the next generation of leaders in their respective disciplines. They were asked to assume the role of a patient as they completed our survey.

Our results will be disseminated to the HPESS community once the study has been published, and we will ask that our findings be presented during the summer symposium in July, 2019. The theme of that symposium is how to best educate millennials. Our national survey data provided a category specifically for responses by millennials. Results will be disseminated to student nurses at Galveston College through a presentation this spring. Our findings and suggested actions from our findings will be disseminated to patient advocates whose shared ideas and experiences powered this study. Those groups include the following: Patient Council of the Right Care Alliance, Patient Safety Action Network, and members of Patient Safety America. We expect to widely share our findings with the general public (represented by our national survey) through media outlets such as ProPublica, with physicians through KevinMD and Veritas Health Care, and with nurses through Quality and Safety Education for Nurses (QSEN).

Results

We targeted two groups from which to obtain responses because of the access we had to them and the expectation that their demographics would be different. The response rate from the student nurses was 99% (76/77) because it was taken during a lecture in which support was available if anyone had difficulty. Only one did. The response rate of the HPESS Community to the email request was 63/146 = 43%. The low response is likely due to busy professionals not having time to read and respond to all emails sent to them. Combined, the response rate of the two targeted studies was 62%. Table 1 shows the diversity of demographics in the two groups that took initial surveys. The primary differences were in age, education level, race or ethnic origin, and hospital work experience (Supplemental file 4).

Demographic measure	Student Nurses	HPESS Community	P values
	(n = 76)	(n = 63)	
Under 35 years of age	77%	3%	< 0.0001
Female	78%	70%	0.2755
High school graduate	34%	2%	< 0.0001
College graduate	65%	5%	< 0.0001
Advanced degree	1%	93%	< 0.0001
White or Caucasian	51%	84%	< 0.0001
Black or African American	16%	3%	0.0151
Hispanic or Latino	26%	2%	0.0001
Asian	4%	6%	0.5161
Have worked in a hospital	35%	86%	< 0.0001

 Table 1. Comparative demographics of targeted groups (2 sample test of proportions)

The national survey included 1211 persons who entered the survey and 1067 who completed it for a response rate of 88%. Nine participants did not answer location questions. The combined results of our three surveys consistently showed that a "reasonable patient" would want to know an answer to each of the 10 questions presented in our survey (table 2).

Table 2 allows the reader to view the results in two ways for each of the 10 questions. The first, shown in bracketed, red highlight, is the fraction of responders that indicated that they definitely wanted to know information (5.0 response) or have a certain right to access (e.g. medical record access). The second way to view results, in black lettering, indicates the numerical mean of all responses in each of the 3 surveys and the ranges of the means sorted by income groups and regions of the U.S. in the national survey. We used ranges as a measure of dispersion around the national means because it is likely lay readers will understand this more readily than the results of our formal statistical analysis. The three distinct surveys compare well regarding the wishes of patients. The highest intensity of desire to have an answer was to question 1 (know all treatment choices) in all three surveys (range 4.58-4.94). In all three surveys, the lowest intensity of desire to have an answer was to question 8 (medical record access) (range 3.98-4.07), and the second lowest intensity was to question 9 (advanced review of documents) (range 4.18-4.29). Even the lowest intensity desire for an answer was near 4.0, which implies that on weighted-average basis, the putative reasonable patient would *probably* want to have access to his medical record and be able to make entries.

Table 2. Average response levels in three surveys. 4.0 indicates the person "probably" wants an answer, and 5.0 indicates the person "definitely" wants an answer. The percentage of the 5.0 responses are shown in bold red. In the national survey, 71 % of the reported income levels were from \$10,000 to \$99,000. Of the 9 geographic regions of the U.S., 54% of responses were from 3 of those – east north central, south Atlantic, and Pacific. Footnotes: an=75, bn=62

Number and description of survey question	Student	HPESS	National	National	National
	Nurses	Group	Group	ranges	ranges
The percentages of individuals that 'definitely' (5.0)	(n = 76)	(n = 63)	(n =	over 10	over 9
wanted an answer to each question below is shown in	[% 5.0]	[% 5.0]	1067)	income	regions
hold red in the columns			[%5.0]	Groups	of the
					U.S.
1. Would you like to know all your treatment choices,	4.92	4.94	4.58	4.33-	4.51-
including alternatives and risks and benefits of each choice				4.97	4.65
for a patient like you. Your choices may include invasive	[92%]	[95%]	[75%]		
procedures (surgery, endoscopic procedures, insertion of a					
medical device), non-invasive treatments, and what happens					
if you do nothing?			-		
2. Drugs that have not been approved by the Food and Drug	4.89 ^a	4.51	4.40	4.07-	4.26-
Administration for your condition are off-label for you. Drugs			_	4.71	4.57
prescribed off-label are about twice as likely to cause serious	[89%]	[67%]	[67%]		
side-effects as drugs prescribed on-label. Would you like to	1				
know if any drugs prescribed to you are off-label, and what					
2. Drugs assigned a "black boy" warning by the EDA page an	4.02	4.67	4 5 7	4.27	1.12
3. Drugs assigned a black box warning by the FDA pose an	4.85	4.07	4.57	4.27-	4.43-
drug, would you want to know the reasons for the black how	[020/]	[709/]	[700/]	4.92	4.09
warning and if there are alternatives before you take it?	[05%]	[79%]	[/070]		
4 Decision aids are created to assist natients with complex	4.66	4 65	A A1	4 07-	4 28-
medical decisions and to help them understand the risks and	4.00	4.05	7.71	4.69	4.57
benefits of treatment options. If there is a decision-aid	[73%]	[70%]	[61%]		
available for vour illness, would vou like to review it?	[/3/0]	[10/0]	[01/0]		
5. If you are considering an invasive procedure, would you	4.83	4.78	4.49	4.34-	4.41-
like to know who will be performing it, their skill level, and	[84%]	[84%]	[68%]	4.82	4.63
how trainee doctors, if any, will be involved?		[0.00]	[00/0]		
6. Assuming you have decided on a procedure or treatment,	4.71	1 60 ^b	4.48	4.21-	4.41-
would you like to know what your total, out-of-pocket costs	[79%]	4.00	[69%]	4.76	4.52
will be?	••••	[68%]			
7. You have a trusted family member that is willing to act as	4.65 ^a	4.54	4.31	4.09-	4.20-
your advocate. Would you like for that person to be present	[72%]	[62%]	[54%]	4.69	4.43
during shared-decision-making about your medical care?	[/3/0]				
8. If you are well enough, would you like to be offered a	4.07	4.06	3.98	3.41-	3.89-
chance to review and make entries in your medical records	[47%]	[48%]	[38%]	4.23	4.11
each day while you are hospitalized?					
9. Before signing any documents permitting invasive, non-	4.29	4.19	4.18	3.91-	3.87-
emergency procedures would you like to review these at	[49%]	[52%]	[47%]	4.41	4.34
least one full day in advance of the procedure?					
10. If you are considering an invasive procedure, would you	4.84	4.89	4.60	4.32-	4.49-
like to know your expected difficulties, recovery times, pain	[86%]	[90%]	[76%]	4.85	4.70
management, and restrictions after the procedure while					
hospitalized and after discharge from the hospital? This					
includes the risk of infection from the invasive procedure.					

Below we provide brief descriptions of the statistical analyses and factor analyses for each of the 3 surveys. The details of these analyses are in supplementary files. Question numbers are found in table 2. Statistical analysis of the responses to survey questions obtained from student nurses (Supplementary file 5) revealed no significant differences among age groups, level of education, experience working in a hospital, or between genders, in their responses to any of the 10 questions. Not considering 'another race' as a response suitable for comparisons, the only differences in pairs were for question 1. 'White or Caucasian' was different from 'Black or African American' (p = 0.011) and 'Black or African American' was different from 'Asian or Asian American' (p = 0.020).

Factor analysis with principal component factoring identified 3 factors each with Eigenvalues greater than 1, which cumulatively accounted for 64% of total variance among responses provided by the student nurses. Varimax factor loading of 3 factor variables labeled as "knowledge", "participation", and "total cost" were generated and analyzed as above for differences in responses among groups (Supplementary file 6). No significant differences were found among age groups, levels of education, or between genders, in their responses to any of the factor variables. The only significant differences, again disregarding comparisons to 'Another race,' existed among races and ethnicities in their responses associated with "knowledge" (p = 0.0091) where 'White or Caucasian' differed from 'Black or African American' (p = 0.0211).

The responses of the HPESS survey did not differ significantly between genders, or among various ethnicities for any of the ten questions (Supplementary file 7). Responses differed significantly among age groups only for questions 1 (p = 0.0171) and 2 (p = 0.0024). Responses differed significantly by education level for questions 1 (p = 0.0015), 2 (p = 0.0139),

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3 (p = 0.0170) and 10 (p = 0.0347). Among respondents to the HPESS survey, significant differences in responses to questions 1 (p = 0.003), 2 (p = 0.0024), and 5 (p = 0.0002) were provided by respondents who differed according to their employment as hospital workers.

Factor analysis of the HPESS data with principal component factoring identified no statistically significant differences for either of two factor variables "knowledge" and "participation" when responses were compared by age, gender, or level of education (Supplementary file 8). A significant difference among ethnic groups was found for "knowledge" (p = 0.0394) but post hoc analysis with Dunn's test failed to identify any pairs of groups that differed significantly.

In the national survey, responses differed significantly for all questions among age groups (p = 0.001 for questions 1 - 7 and 10; p = 0.0041 and 0.0052 for questions 8 and 9 respectively), between genders (p = 0.001 for questions 1, 2, 4, 7, 8 and 10; p = 0.0043, 0.0002, 0.0030 and 0.0014 for questions 3, 5, 6 and 9, respectively) (Supplementary file 9). Significant differences for questions 1 (p = 0.0001), 2 (p = 0.0384), 3 (p = 0.0047), 4 (p = 0.0037), and 6 (p = 0.0190) were found among groups that differed by income level. Question 9 (p = 0.0473) was the only question for which responses differed significantly among regions of the U.S. Several salient generalizations from these comparisons are apparent. When comparing responses among various age groups, differences were found among all ages groups for most questions. When significant differences were found among response of groups of differing income levels the differences, most often, were between group 1 and the other groups. Differences between regions, in response to question 9, were most often between regions 1 and 2 and the other regions.

Factor analysis of the national data with principal component factoring demonstrated significant differences among the age categories for both factor variables ("knowledge", and "other", p = 0.0001 for both variables) (Supplementary file 10). All groups differed significantly from each other, with the exception of group 4 vs group 5 for the factor variable "other". For both factor variables the differences in responses of the genders are very highly significantly different (p <0.0001). When considering responses from groups of differing income levels, significant differences were found for the variable "knowledge" (p = 0.0005). Most of the differences among pairs are between group 1 and other groups and between group 3 and other groups. There were no significant differences in responses to factor variables among regions.

Discussion

Despite the different demographics in the two targeted surveys (table 1), especially in age, education level and hospital work experience, the responses were comparable in the two groups (table 2). Only one of the 10 questions (number 2) had a response level that differed by more than 0.20 units. This was the question of whether a reasonable patient would want to know about any off-label drugs prescribed. The difference was 0.38 units. The higher education level and more hospital experience of the HPESS Community may have made this group slightly less concerned about the additional risk that may be associated with off-label prescriptions. Statistical analysis of the nurse-student survey revealed two paired demographic differences. Two race/ethnic pairs (white vs. black and black vs. Asian) were associated with differences in intensity of response to question 1, which is about knowing all choices for treatment including risks and benefits. Statistical analysis of the HPESS community survey disclosed differences between pairs in the age, education-level and hospital-work-experience groups. While these

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statistical findings may be interesting, the reality is that the core message remains unchanged: patients of all types studied wish to know many details about their care choices when facing the possibility of an invasive procedure.

The results of the national survey regarding demographics of gender (figure 1) and age (figure 2) demonstrated distinct trends for all 10 questions. Without exception, women wanted more information than men, and older adults wanted more information than younger adults. Similarly, statistical analysis supported associations between age and gender on the intensity of responses to most questions, and it revealed an effect of income for some of the survey questions. The gender associations may be due to women being higher users of hospital care and hospitals tending to offer many more services targeted to women than to men.¹⁴ Older adults may be more likely to be cautious compared to younger adults because of more lifetime hospital experiences.

Our survey provides insight into some patient concerns that are not typically part of informed consent. In the wake of the opioid epidemic, the public is more aware of the potential dangers of prescription drugs. Thus, it should not be surprising that patients would want to know if the drugs prescribed to them are off-label or have a black-box warning. The U.S. Food and Drug Administration assigned "black box" warnings to immediate-release opioids in 2016.¹⁵ There is also growing attention to surprise medical bills in the U.S., so a reasonable patient would likely to want an estimate of his out-of-pocket costs. Inordinate out-of-pocket costs, especially those that lead to bankruptcy, may have an adverse effect on clinical outcomes.¹⁶ Hospital administration staff could assist with providing cost information. The opportunity to review and make entries in one's medical record, while not part of the informed consent process, may relate. Many patients want to ensure that the data being recorded are accurate and complete;

moreover, many desire access to their data as a means of gaining a better understanding of their condition and engaging with their providers. Encouraging this access can convey strong support for the view that the patient is an integral part of his care team.

There is an important connection between informed consent and the overuse of medical procedures. The overuse of PCI in the U.S. is a prime example. Patients that may need PCI were less likely to choose this invasive option when they were better informed about their care options during hospitalization.¹⁷ A study of patients in Northern England that may need PCI concluded that there is "a mismatch between legal and ethical principles of informed consent and current practice. The variation in patients' experiences of the current place of informed consent in service delivery represents a missed opportunity for cardiologists to work in decision-making partnerships with patients. In light of recent changes in the law [to the reasonable patient standard], a new approach to informed consent is required."¹⁸

The history of legally-defined informed consent for invasive procedures has evolved from a totally physician-centered concept (before the Era of Enlightenment) in which deception of the patient was deemed necessary, to the point where the process has now become patientcentered, in principle. A brief summary of some of the court decisions pertinent to involvement of the patient points to the next step in informed consent, which we feel we have defined with our survey.¹⁹ As early as 1914, a New York court established that an "adult in sound mind has the right to determine what shall be done with his own body." This was reinforced in 1960 by the decision of a court in Kansas that the patient, not the physician, must make the final decision about any operation. Of course, the patient's decision may be biased by receiving limited information from the physician. Two court decisions in 1972, one in California and the other in

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Washington, D.C., determined that the patient must be informed of pertinent risks of surgery and have the alternatives revealed to him or her. In 1983, a New Jersey court ruled that if a surgeon, other than the one the patient selected, performs the surgery, then the surgeon that obtained consent, but did not perform the surgery is liable for malpractice. The surgeon performing the surgery is liable for battery. The importance of the side effects of a drug (prednisone) came to a Massachusetts court's attention in 1986 when a patient suffered serious adverse effects of this drug used after eye surgery. It seems there was controversy about whether the physician should have known about the possible side effects, and then disclosed this potential complication of the drug to the patient.

While our survey questions originated primarily from adverse experiences of patients, it is clear that court decisions have pointed the way to a new era of the patient's voice being heard in the context of shared-decision making and informed consent. That voice says to clinicians who would perform an invasive procedure, "We patients want to know more than you have been telling us." We want to know all of our choices and their risks and benefits, we want to know the risks and benefits of drugs prescribed to us and devices placed in us, we want to view decision aids when available, we want to know the skill level of the physician(s) performing our procedure, and we want to know our costs. Moreover, we want an advocate present during shared-decision making, we want full access to our medical records, we want to review consent documents at least 24 hours before signing them, and we want to know the expected outcomes of the invasive procedure to include recovery times, pain management, and infection risks.

Limitations

In order to respect the time of responders to our survey, we limited it to 10 questions applicable to an informed consent discussion in a hypothetical situation. In real clinical settings, it is likely

that our "template" will need to be augmented with questions specific to the situation the patient faces. These should be designed to elicit the patient's preferences. We also recognize that some of the answers are out of the clinician's hands; for example, clinicians in the U.S. are seldom going to know the patient's out-of-pocket costs. We also recognize that clinicians may need the assistance of pharmacists in conveying the benefits, risks, and alternatives to off-label or black-box-warning drugs. Surveys like ours involving a hypothetical scenario may be limited because in a real and stressful situation a patient may simply want to trust doctors' recommendations or may be afraid to ask too many questions. In a sense, our hypothetical "reasonable patient" has become a "frightened patient" when placed in a real situation, but that does not mean that he or she does not want to know answers to the all the questions in our survey.

Conclusions

Through two targeted surveys and a U.S. national survey, we have affirmed that a reasonable patient will want to know far more information than is generally conveyed during typical shared-decision making that leads to no more than a partly informed decision by the patient. Survey respondents wanted to know risks and benefits of all treatment options, the risks and benefits of off-label and box-warning drugs. They wished to view decision aids, know precisely who will perform the procedure, and their anticipated out-of-pocket costs. Their desire was for an advocate to be present during shared-decision making, have periodic opportunities to review their medical record, have a full day to review informed-consent documents, and to be made aware of expected outcomes and restrictions after the procedure. We expect our findings to have implications for what defines a reasonable patient standard for informed consent.

Figure 1. National intensity scores above 4.0 vs. question number for gender differences in the national survey. Responses came from 497 males and 570 females.

Figure 2. National intensity scores above 4.0 vs. question number for age differences in the national survey. Responses came from 297, 230, 343, and 197 people in the four respective age groups.

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¹⁹ Murray PM. The history of informed consent. *Iowa Orthop J* 1990;10:104-109.



Figure 1. Effect of gender on survey responses



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A Baseline for the "Reasonable Patient Standard"

Investigators: John T. James, PhD, Patient Safety America, Houston, TX (retired NASA Chief Toxicologist) and Darwin J. Eakins, MS, (retired statistical expert, University of Kansas), Survey Consultant, Lawrence, KS

Background: Recent changes in the law on informed consent in the U.K. to favor a "reasonable patient standard" over a "reasonable clinicians' standard" prompted experts on informed consent to survey the situation in the U.S. Laws defining informed consent vary from state to state. Laws in half the states favor the reasonable-patient-standard (RPS) and others favor the reasonable-clinicians-standard.¹ A debate ensued about the problems with the RPS because it is going to vary from patient to patient. As part of the debate, an opponent of the RPS stated that perhaps a baseline RPS could be formulated.ⁱⁱ It is our intent to begin to define a general baseline for the RPS. This is essential if patient-centered-care and shared-decision making are to become a reality. Texas is a RPS state.ⁱⁱⁱ Please note that for our purposes a "reasonable person" and a "reasonable patient" are identical.

Methods: We will use the Survey Monkey Platform to capture the demographics of each survey participant, and then they will answer 10 questions related to what they would like to know when facing the possibility of an invasive procedure while hospitalized. There are two identical versions of the survey, one intended to be taken simultaneously by an audience, and the other to be taken by individuals to whom the survey-link is sent via email. The survey platform prevents individuals from taking the survey more than once from their electronic device or computer. A link to the beta-version of the survey is given here: https://www.surveymonkey.com/r/8Y5Q3MF. Those taking the survey have 5 choices to express the degree to which they would like to know an answer to the question posed in the survey. Those responses range in 5 levels from "Definitely no" to "Definitely yes."

Recruitment: Our plan is to survey up to 1,000 adults in a variety of categories. These have not been fully fixed at this point, but our target groups are as follows: students of nursing, mature and retired nurses, health professions educators, retired individuals, people with knowledge of patient safety issues, and a nationally representative group of adults. Subjects will be recruited vis email or at presentations to groups, such as nursing students (see below). Our **primary hypothesis** is that across the survey groups and for most of the questions the participants will answer either "probably yes" or "definitely yes" to the questions. Our secondary goal is to discover groups that differ significantly from the overall average. We will use t-tests to determine statistical (P<0.05) differences between groups for selected questions that seem worth exploring.

Results: At this point the survey has been administered to nursing students attending a lecture on informed consent at Galveston College (April 19, 2018). There were 77 respondents to the survey, which was taken early in the lecture. Later in the lecture, the results of the survey were presented to the group of students. The data were readily available in graphical and numerical form to the audience. This was done to prove-out our ability to capture data in near-real time.

Funding: The research is being funding by Patient Safety America, Houston, TX. This will be less than \$1,000 for the survey platform and additional costs if we choose to survey a nationally representative group to which we purchase access.
ⁱ https://jamanetwork.com/journals/jama/fullarticle/2516469

" CIVIL PRACTICE AND REMEDIES CODE

TITLE 4. LIABILITY IN TORT

CHAPTER 74. MEDICAL LIABILITY

SUBCHAPTER C. INFORMED CONSENT

r Sec. 74.101. THEORY OF RECOVERY. In a suit against a physician or health care provider involving a health care liability claim that is based on the failure of the physician or health care provider to disclose or adequately disclose the risks and hazards involved in the medical care or surgical procedure rendered by the physician or health care provider, the only theory on which recovery may be obtained is that of negligence in failing to disclose the risks or hazards that could have influenced a reasonable person in making a decision to give or withhold consent.

ⁱⁱ https://jamanetwork.com/journals/jama/article-abstract/2547748?redirect=true

Reasonable Patient Care - Phone

You are hospitalized in a large, urban, teaching hospital after being brought into its emergency room last night. The condition that brought you to the ER has been stabilized, but additional procedures may be necessary. The following 10 questions determine what you would like to know as a reasonable patient. The survey should take no more than 5 minutes. There are only sixteen (16) items.

Reasonable Patient Care - Phone	
Age	
Page 1 of 16	
1. Age	
Under 18	45-54
18-24	55-64
25-34	65+
35-44	
Reasonable Patient Care - Phone	
Gender	
Page 2 of 16	
2. Gender	
Male	
Female	
Reasonable Patient Care - Phone	
Education	
Page 3 of 16	

HS Grad		Advance Degree
College Grad		
Reasonable Patient Care	- Phone	
Race/Ethnicity		
Page 4 of 16		
4. Race/Ethnicity		
White or Caucasian		American Indian or Alaska Native
Black or African American		Native Hawaiian or other Pacific Islander
Hispanic or Latino		Another race
Asian or Asian American		
Reasonable Patient Care	- Phone	
Reasonable Patient Care Worked in Hospital	- Phone	
Reasonable Patient Care Worked in Hospital Page 5 of 16	- Phone	
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Reasonable Patient Care Worked in Hospital Page 5 of 16 5. Have you worked in a h Yes If Yes, your job was: Reasonable Patient Care Alternatives/Risks/Benefit Page 6 of 16	- Phone ospital? - Phone S	

6. Would you l choice for a pa procedures, in	ike to know all your treatment choices, atient like you. Your choices may incluc sertion of a medical device), non-invas	including alternatives and risks and benefits of each de invasive procedures (surgery, endoscopic sive treatments, and what happens if you do nothing?	
Definitely no	I	Probably yes	
Probably no		Definitely yes	
Neutral			
Reasonable Pa	tient Care - Phone		
Drugs			
Page 7 of 16			
7. Drugs that h for you. Drugs prescribed on- effects may be	nave not been approved by the Food a prescribed off-label are about twice as label. Would you like to know if any dr ?	nd Drug Administration for your condition are off-label s likely to cause serious side-effects as drugs ugs prescribed to you are off-label, and what their side	
Definitely no	1	Probably yes	
Probably no		Definitely yes	
O Neutral			
Reasonable Pa	tient Care - Phone		
Drugs Assigned	I "Black Box" Warning		
Page 8 of 16			
8. Drugs assig prescribed suc alternatives be	ned a "black box" warning by the FDA ch a drug, would you want to know the efore you take it?	pose an especially serious risk of harm. If you are reasons for the black box warning and if there are	
Definitely no	I Contraction of the second	Probably yes	
Probably no		Definitely yes	
Neutral			
Reasonable Pa	tient Care - Phone		
Decisions Aids			
	For peer review only - http://bmjopen.k	omj.com/site/about/guidelines.xhtml	3

9. Decision aids are created to ass the risks and benefits of treatment like to review it?	sist patients with complex medical decisions and to help them underst t options. If there is a decision-aid available for your illness, would you
Definitely no	Probably yes
Probably no	Definitely yes
Neutral	
Reasonable Patient Care - Phon	e
Considering Invasive Procedure	
Page 10 of 16	
10. If you are considering an invas level, and how trainee doctors, if a	sive procedure, would you like to know who will be performing it, their s any, will be involved?
O Definitely no	Probably yes
Probably no	O Definitely yes
Neutral	
Reasonable Patient Care - Phon	e
Out-Of-Pocket Costs	
Page 11 of 16	
11. Assuming you have decided o of-pocket costs will be?	n a procedure or treatment, would you like to know what your total, ou
O Definitely no	Probably yes
Probably no	Definitely yes
Neutral	
_	e
Reasonable Patient Care - Phon	

Family Member as Advicate

Page 12 of 16					
12. You have a trusted family member that is will to be present during shared-decision-making abo	ing to act as your advocate. Would you like for that person but your medical care?				
Definitely no	Definitely no Probably yes				
Probably no	O Definitely yes				
Neutral					
Reasonable Patient Care - Phone					
Make Entries In Medical Records					
Page 13 of 16					
13. If you are well enough, would you like to be o medical records each day while you are hospitali	ffered a chance to review and make entries in your zed?				
Definitely no	Probably yes				
Probably no	O Definitely yes				
Neutral					
Reasonable Patient Care - Phone					
Documents Permitting Invasive Procedures					
Page 14 of 16					
14. Before signing any documents permitting inva these at least one full day in advance of the proc	asive, non-emergency procedures would you like to review edure?				
Definitely no	Probably yes				
Probably no	Definitely yes				
Neutral					
Reasonable Patient Care - Phone					

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Page 15 of 16	
15. If you are considering a recovery times, pain mana discharge from the hospita	In invasive procedure, would you like to know your expected difficulties, gement options, and restrictions after the procedure while hospitalized and I? This includes the risk of infection from the invasive procedure.
Definitely no	Probably yes
Probably no	Definitely yes
Neutral	
Reasonable Patient Care -	Phone
Other Comments	
Page 16 of 16	
Page 16 of 16 16. What else would you lil	ke to know as a reasonable patient?
Page 16 of 16 16. What else would you lil	e to know as a reasonable patient?
Page 16 of 16 16. What else would you lil	ke to know as a reasonable patient?
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Reasonable Patient 3	

Reasonable Patient Care Survey

You are hospitalized in a large, urban, teaching hospital after being brought into its emergency room last night. The condition that brought you to the ER has been stabilized, but additional procedures may be necessary. The following 10 questions determine what you would like to know as a reasonable patient. The survey should take no more than 5 minutes.

* 1. Would you like to know all your treatment choices, including alternatives and risks and benefits of each choice for a patient like you. Your choices may include invasive procedures (surgery, endoscopic procedures, insertion of a medical device), non-invasive treatments, and what happens if you do nothing?

1=definitely no	2=probably no	3=neutral	4=probably yes	5=definitely yes
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* 2. Drugs that have not been approved by the Food and Drug Administration for your condition are off-label for you. Drugs prescribed off-label are about twice as likely to cause serious side-effects as drugs prescribed on-label. Would you like to know if any drugs prescribed to you are off-label, and what their side effects may be?

1-definitely no	2-probably no	3-neutral	4-probably yes	5-definitely yes
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* 3. Drugs assigned a "black box" warning by the FDA pose an especially serious risk of harm. If you are prescribed such a drug, would you want to know the reasons for the black box warning and if there are alternatives before you take it?

1-definitely no	2-probably no	3-neutral	4-probably yes	5-definitely yes
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* 4. Decision aids are created to assist patients with complex medical decisions and to help them understand the risks and benefits of treatment options. If there is a decision-aid available for your illness, would you like to review it?

1-definitely no	2-probably no	3-neutral	4-probably yes	5-definitely yes
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* 5. If you are considering an invasive procedure, would you like to know who will be performing it, their skill level, and how trainee doctors, if any, will be involved?

1-definitely no	2-probably no	3-neutral	4-probably yes	5-definitely yes
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* 6. Assuming you have pocket costs will be?	decided on a procedu	re or treatment, wo	uld you like to know wh	at your total, ou
1-definitely no	2-probably no	3-neutral	4-probably yes	5-definitely y
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* 7. You have a trusted to be present during s	family member that is v hared-decision-making	villing to act as you about your medica	r advocate. Would you l care?	like for that per
1-definitely no	2-probably no	3-neutral	4-probably yes	5-definitely y
\bigcirc	\bigcirc	\bigcirc	\bigcirc	\bigcirc
* 8. If you are well enou records each day whil	gh, would you like to b e you are hospitalized?	e offered a chance	to review and make en	tries in your me
1-definitely no	2-probably no	3-neutral	4-probably yes	5-definitely y
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1-definitely no	2-probably no	3-neutral	4-probably yes	5-definitely y
recovery times, pain n discharge from the ho	nanagement, and restri spital? This includes th	ctions after the pro- e risk of infection fr	cedure while hospitalize om the invasive proced	ed and after lure.
1-definitely no	2-probably no	3-neutral	4-probably yes	5-definitely y
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Table 1. Comparative demographics of targeted groups

Demographic measure	Student Nurses	HPESS Community	p-Value
	(n = 77)	(n = 63)	
Under 35 years of age	76.7%	3.2%	0.0000
Female	77.9%	69.8%	0.2755
High school graduate	33.8%	1.6%	0.0000
College graduate	64.9%	4.8%	0.0000
Advanced degree	1.3%	90.5%	0.0000
White or Caucasian	50.6%	84.1%	0.0000
Black or African American	15.6%	3.2%	0.0151
Hispanic or Latino	26.0%	1.6%	0.0001
Asian	3.9%	6.3%	0.5161
Have worked in a hospital	35.1%	85.7%	0.0000

Under 35 years of age

. prtesti 77	.767 63 .032					
Two-sample te	st of proport	ions	Ň.	х: У:	Number of obs = Number of obs =	63
Variable	Mean	Std. Err.	Z	P> z	[95% Conf.	Interval]
х У	.767 .032	.0481759			.6725769 0114601	.8614231
diff	.735 under Ho:	.053034	8.72	0.000	.6310553	.8389447
diff Ho: diff	= prop(x) - p = 0	rop(y)			z =	8.7242
Ha: diff Pr(Z < z) =	< 0 1.0000	Ha: Pr(Z >	diff != 0 z) = 0.0	0000	Ha: di Pr(Z > z)	ff > 0 = 0.0000

Female.

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. prtesti 77 .	.779 63 .698					
Two-sample tes	st of proporti	ons		х: У:	Number of obs Number of obs	= 77 = 63
Variable	Mean	Std. Err.	z	P> z	[95% Conf.	. Interval]
х У	.779 .698	.0472846 .0578443			.6863239 .5846272	.8716761 .8113728
diff	.081 under Ho:	.0747114 .0742776	1.09	0.275	0654317	.2274317
diff = Ho: diff =	= prop(x) - pr = 0	ор (у)			Z	= 1.0905
Ha: diff < Pr(Z < z) = (< 0 0.8623	Ha: di Pr(Z > z	ff != 0) = 0.2	2755	Ha: c Pr(Z > z	diff > 0 z) = 0.1377

High scho . prtesti 7	ol graduate 7 .338 63 .016					
Two-sample	lest of proport	ions		х: у:	Number of obs = Number of obs =	= 77 = 63
Variabl	e Mean	Std. Err.	Z	P> z	[95% Conf.	Interval]
	x .338 Z .016	.0539066 .0158084			.232345 0149838	.443655
dif	E .322 under Ho:	.0561767 .0670578	4.80	0.000	.2118956	.4321044
dif Ho: dif	f = prop(x) - p f = 0	rop(y)			Z =	= 4.8018
Ha: dif Pr(Z < z)	E < 0 = 1.0000	Ha: d Pr(Z >	iff != 0 z) = 0.(0000	Ha: d: Pr(Z > z)	iff > 0) = 0.0000
. College	g raduate 7 .649 63 .048					
Two-sample	test of proport	ions		х: у:	Number of obs = Number of obs =	= 77 = 63
Variabl	e Mean -+	Std. Err.	Z	P> z	[95% Conf.	Interval
	x .649 y .048	.0543914 .026932			.5423947 0047858	.7556053
dif	E .601 under Ho:	.060694 .0823973	7.29	0.000	.4820419	.7199583
dif Ho: dif	f = prop(x) - p f = 0	гор(у)		4	z =	= 7.2939
Ha: dif Pr(Z < z)	E < 0 = 1.0000	Ha: d Pr(Z >	iff != 0 z) = 0.0	0000	Ha: d: Pr(Z > z)	iff > 0) = 0.0000
: . Advance . prtesti 7	d degree 7 .013 63 .905					
Two-sample	cest of proport	ions		х: У:	Number of obs = Number of obs =	= 71 = 63
Variabl	e Mean	Std. Err.	Z	P> z	[95% Conf.	Interval
	x .013 y .905	.0129088 .0369416			0123007 .8325958	.038300 .9774042
dif	f 892 under Ho:	.0391321 .0836872	-10.66	0.000	9686974	8153020
dif Ho: dif	f = prop(x) - p f = 0	rop(y)			Z =	= -10.658
Ha: dif Pr(Z < z)	E < 0 = 0.0000	Ha: d Pr(Z >	iff != 0 z) = 0.0	0000	Ha: d: Pr($Z > z$)	iff > 0) = 1.0000
• • • •						

. White or C	Caucasian 7 .506 63 .841	L				
Two-sample tes	st of proporti	ions		х: y:	Number of obs Number of obs	= 77 = 63
Variable	Mean	Std. Err.	Z	₽> z	[95% Conf.	Interval]
х У	.506 .841	.0569762 .0460709			.3943287 .7507028	.6176713 .9312972
diff	335 under Ho:	.0732722 .0806592	-4.15	0.000	4786108	1913892
diff = Ho: diff =	= prop(x) - pi = 0	rop (y)			Z	= -4.1533
Ha: diff < Pr(Z < z) = (< 0	Ha: Pr(Z >	diff != 0 z) = 0.0	0000	Ha: d Pr(Z > z	liff > 0 () = 1.0000
Black or . prtesti 77	African Am .156 63 .032	erican				
Two-sample tes	st of proporti	lons		x:	Number of obs	= 77

Two-sample tes	t of proport:	ions	0	х: У:	Number of obs Number of obs	= 77 = 63
Variable	Mean	Std. Err.	Z	₽> z	[95% Conf.	Interval]
x y	.156	.0413512 .0221739			.0749531 0114601	.2370469 .0754601
diff 	.124 under Ho:	.0469213 .05101	2.43	0.015	.032036	.215964
diff = Ho: diff =	prop(x) - pi 0	rop(y)		Z	Z	= 2.4309
Ha: diff < Pr(Z < z) = 0	0 .9925	Ha: Pr(Z >	diff != 0 z) = 0.0)151	Ha: c Pr(Z > z	diff > 0 :) = 0.0075

. Hispanic or Latino

esti 77 .2	260 63 .016					
sample test	of proport:	ions		х: У:	Number of obs Number of obs	= 77 = 63
/ariable	Mean	Std. Err.	Z	P> z	[95% Conf.	Interval]
х У	.26 .016	.049987			.1620273 0149838	.3579727
diff 	.244 under Ho:	.0524272 .0606934	4.02	0.000	.1412447	.3467553
diff = Ho: diff =	prop(x) - p: 0	rop(y)			Z	= 4.0202
Ha: diff < Z < z) = 1.	0 .0000	Ha: Pr(Z >	diff != 0 z) = 0.	0001	Ha: d Pr(Z > z	liff > 0 () = 0.0000

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1 2							
3 . 4 . Asian 5 . prtesti	77 .0	39 63 .063					
6 7 Two-sample	test	of proport:	ions		x: y:	Number of obs : Number of obs :	= 77 = 63
89 Variak	 le	Mean	Std. Err.	Z	P> z	[95% Conf.	Interval]
10 11	+- х у	.039 .063	.0220622 .0306105			0042411 .0030046	.0822411 .1229954
12di 13	+- ff 	024 under Ho:	.0377325 .0369548	-0.65	0.516	0979543	.0499543
15 di Ho: di	ff = ff =	prop(x) - pi 0	rop (y)			Z	= -0.6494
Ha: di Ha: di Pr(Z < z)	ff < = 0.	0 2580	Ha: d Pr(Z >	iff != 0 z) = 0.5	5161	Ha: d Pr(Z > z	iff > 0) = 0.7420
19 20 . Have w 21 . prtesti	orke	d in a hosp 51 63 .857	ital				
22 23 Two-sample 24	test	of proport:	ions		x: y:	Number of obs : Number of obs :	= 77 = 63
25 Variak	le	Mean	Std. Err.	Z	P> z	[95% Conf.	Interval]
26 27	х У	.351 .857	.0543914 .044105			.2443947 .7705557	.4576053 .9434443
0 di	ff 	506 under Ho:	.0700263 .0838824	-6.03	0.000	643249	368751
31 di 32 Ho: di	ff = ff =	prop(x) - pi 0	rop (y)			Z	= -6.0323
33 Ha: di 34 Pr(Z < z) 35	ff < = 0.	0 0000	Ha: d Pr(Z >	iff != 0 z) = 0.0	0000	Ha: d. Pr(Z > z	iff > 0) = 1.0000
36 37							
38 39 40							
41 42							
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49 50							
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52 53							
54							
56							
56 57 58							

questions.

2 3	Nurse-St	udent Statis	tics Report	t		
4 5 6	Summar	у				
0 7 8	Quest	ion – For eacł	n of the ques	tions, 1-10,	is there a dif	ference in the average response <u>by age</u> ?
9 10 11	Answe	er – NO, there	e are no sign	ificant diffe	rences amon	g age groups in their responses to any of the 10 questions.
12 13 14	• Quest	ion – For eacł	n of the ques	tions, 1-10,	is there a dif	ference in the average response by gender?
15 16 17	Answe	er – NO, there	are no signi	ficant differ	ences betwe	en the genders in their responses to any of the 10 questior
18 19	Quest	ion – For eacł	n of the ques	tions, 1-10,	is there a dif	ference in the average response by level of education
20 21 22	Answe questi	er – NO, there ons.	are no signi	ficant differ	ences among	the education levels in their responses to any of the 10
23 24						
25 26	Quest	ion: For each	of the quest	ions, is there	e a difference	e in the average response <u>based upon racer or ethnicity</u>
27 28	Answe	er – YES, for q	uestions 1, 5	, and 6,		
29 30 31	. dunntest K-Wallis p	t iql, by(iet probability =	h) ma(bh) wi 0.0038	rap	of ig1 by io	+ b
32 33 34	Col Mean- Row Mean	1	Benja 2	amini-Hochbo 3	erg) 4	
35 36	2	3.061273 <mark>0.0110</mark>				
37 38 30	3	 -0.085671 0.5176	-1.871072 0.0613			
40 41	4	-0.166771 0.5422	-2.646096 <mark>0.0204</mark>	0.000000 0.5000		
42 43	7	2.553091 0.0178	-0.755791 0.3213	1.387066 0.1379	2.097047 0.0450	
44 45	False Disc <mark>Reject Ho</mark>	covery Rate = if p = P(Z <	= 0.05 = z) <= FI	<mark>DR/2</mark> with s	topping rule	
40 47 48 49	. dunntes K-Wallis p Dunn's Pa:	t iq5, by(iet probability = irwise Compar	h) ma(bh) w • <mark>0.0001</mark> ison of iq5 (Benja	rap by ieth amini-Hochbo	erg)	
50 51	Col Mean- Row Mean	1	2	3	4	
52 53	2	1.713447 0.0866				
54 55	3	2.264929 0.0294	0.858920 0.2440			
50 57 58	4	-0.476526 0.3521	-1.710491 0.0726	-2.265841 0.0391		
59 60	7	4.334614	1.465931 For peer rev	0.247897 view only - ht	3.691637 tp://bmjopen	.bmj.com/site/about/guidelines.xhtml

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I								
False Discov <mark>Reject Ho i</mark> :	very Rate = = p = P(Z <=	0.05 z) <= FD	<mark>R/2</mark> with st	opping rule				
. dunntest :	q6, by(ieth)	ma(bh) wr	ар					
Kwallis prob	ability =	0.0245 Pairwise C	omparison o	fig6 by jeth				
Col Mean-	Dunii 5	(Benja	mini-Hochbe	rg)				
Row Mean +	1	2	3	4				
2	0.459251 0.3589							
3	-0.624727 - 0.3326	-0.785168 0.3088						
4	-1.215526 - 0.2242	-1.110396 0.2224	0.000000 0.5000					
 7 	2.934536 0.0084	1.546239	2.055206	3.107180 0.0094				
False Disco	very Rate =	0.05						
Reject Ho if	E p = P(Z <=	z) <= FD	R/2 with st	opping rule				
 Question bospital 	n – For each o worker?	of the quest	tions, 1-10, i	s there a differ	ence in the	average re	esponse <u>if i</u>	respondent is
nospital	WORKET:							
Answer	– NO there a	are no signi	ficant differ	ences among g	roups, base	d upon ho	spital work	k experience,
	100, cherce c	<u> </u>						
response	es to any of th	ne 10 quest	ions.					
response	es to any of th	ne 10 quest	ions.					
response	es to any of th	ne 10 quest	ions.	6				
response	es to any of th	ne 10 quest	ions.	6				
response Statistics	es to any of th	ne 10 quest	ions.	6				
statistics	es to any of th	ne 10 quest	ions.	s there a differ	ence in the	average re	esponse by	v age among t
statistics • Question identifie	n – For each o d their age gr	ne 10 quest	ions. ions, 1-10, i	s there a differ	ence in the	average re	esponse by	v age among t
Statistics Question identifie	n – For each o d their age gr	ne 10 quest of the quest roup?	ions. ions, 1-10, i	s there a differ	ence in the	average re	esponse by	v age among t
Statistics Question identifie dunntest	n – For each o d their age gr	of the quest of the quest oup?	:ions. :ions, 1-10, i	s there a differ	ence in the	average re	esponse by	r age among t
Statistics Cuestion identifie dunntest	n – For each c d their age gr	of the quest oup? ma(bh) wr	ions. :ions, 1-10, i	s there a differ	ence in the	average re	esponse by	v age among t
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response Statistics • Question identifie . dunntest i Warning: by	n – For each o d their age gr .q1, by(iage) () values are	ne 10 quest	tions.	s there a differ	ence in the	average re	esponse by	r age among t
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respons Statistics • Question identifie . dunntest i Warning: by Kruskal-Wall +	n – For each of their age group of their age gro	of the quest of the quest roup? ma(bh) wr e unlabeled of-populat	t ions. t ions, 1-10, i ap , option no ions rank t	s there a differ label implicit	ence in the	average re	esponse by	⁷ age among t
respons Statistics • Question identifie . dunntest i Warning: by Kruskal-Wall +	n – For each of their age gr .q1, by(iage) () values are .is equalitybbs Rank Su	of the quest oup? ma(bh) wr e unlabeled of-populat	ions. tions, 1-10, i ap , option no ions rank t	s there a differ	ence in the	average re	esponse by	v age among t
responsi Statistics • Question identifie . dunntest i Warning: by Kruskal-Wall +	n – For each o d their age gr () values are is equality-	ne 10 quest of the quest roup? ma(bh) wr e unlabeled of-populat + im 	ions. cions, 1-10, i ap , option no ions rank t	s there a differ	ence in the	average re	esponse by	⁷ age among t
responsi Statistics • Question identifie . dunntest i Warning: by Kruskal-Wall +	n – For each of their age gr .q1, by (iage) () values are .is equalitybs Rank Su .2 67.0 12 402.0 14 405.5	ne 10 quest	i ons. t ions, 1-10, i ap , option no ions rank t	s there a differ label implicit	ence in the	average re	esponse by	r age among t
responsi Statistics • Question identifie . dunntest : Warning: by Kruskal-Wall +	a – For each of their age group of their age g	ne 10 quest	tions. tions, 1-10, i ap , option no ions rank t	s there a differ label implicit	ence in the	average re	esponse by	r age among t
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response Statistics Question identifie dunntest : Warning: by Kruskal-Wall t	n – For each o d their age gr () values are is equality- bbs Rank Su 2 67.0 12 402.0 14 405.5 25 806.5 10 335.0	ne 10 quest of the quest roup? ma(bh) wr e unlabeled of-populat + im 	ions. tions, 1-10, i ap , option no ions rank t	s there a differ label implicit est	ence in the	average re	esponse by	' age among t
response Statistics Question identifie dunntest : Warning: by Kruskal-Wall t	<pre>n - For each of d their age gr .q1, by(iage) () values are .is equality- </pre>	<pre>ne 10 quest of the quest roup? ma(bh) wr e unlabeled of-populat+ imm 00 00 00 00 + with 4 d.f</pre>	ions.	s there a differ label implicit est	ence in the	average re	esponse by	r age among t
response Statistics • Question identifie . dunntest : Warning: by Kruskal-Wall +	n – For each o d their age gr .q1, by(iage) () values are .is equality- 	ne 10 quest	tions.	s there a differ	ence in the	average re	esponse by	r age among t
response Statistics Question identifie dunntest : Warning: by Kruskal-Wall t	n – For each o d their age gr () values are is equality- bbs Rank Su 2 67.0 12 402.0 14 405.5 25 806.5 10 335.0 = 0.550 = 0.9685 with ties = = 0.4010	ne 10 quest	tions. tions, 1-10, i ap , option no ions rank t with 4 d.f.	s there a differ label implicit est	ence in the	average re	esponse by	r age among t
response Statistics Question identifie dunntest : Warning: by Kruskal-Wall trus	<pre>n - For each c d their age gr .q1, by(iage) () values are .is equality- </pre>	ne 10 quest of the quest roup? ma(bh) wr e unlabeled cof-populat + imm i i 00 i 00 i 00 i 00 i 00 i 00 i	tions. tions, 1-10, i ap , option no ions rank t with 4 d.f.	s there a differ label implicit est	ence in the	average re	esponse by	r age among t
response Statistics • Question identifie . dunntest : Warning: by Kruskal-Wall +	n - For each o d their age gr .q1, by (iage) () values are is equality- 	ne 10 quest of the quest roup? ma(bh) wr e unlabeled of-populat + im 1 + with 4 d.f 4.037 Pairwise C	tions. tions, 1-10, i ap , option no ions rank t with 4 d.f.	s there a differ label implicit est	ence in the	average re	esponse by	r age among t
response Statistics Question identifie dunntest : Warning: by Kruskal-Wal: +	n – For each o d their age gr () values are () values are () values are 2 67.0 12 402.0 14 405.5 25 806.5 10 335.0 = 0.550 = 0.9685 with ties = = 0.4010 Dunn's	of the quest of the quest roup? ma(bh) wr e unlabeled of-populat + im + im 00 Pairwise C (Benja	tions. tions, 1-10, i ap , option no dions rank t dions rank t with 4 d.f.	s there a differ label implicit est f iql by iage rg)	ence in the	average re	esponse by	r age among t
response Statistics Question identifie dunntest : Warning: by Kruskal-Wal: Harning: by Kruskal-Wal: Harning: by Kruskal-Wal: Harning: by Col Mean- Row Mean	n - For each of d their age gr .q1, by(iage) () values are .is equality- 	ne 10 quest of the quest roup? ma(bh) wr e unlabeled of-populat + imm + with 4 d.f 4.037 Pairwise C (Benja	tions. tions, 1-10, i ap , option no ions rank t ions rank t with 4 d.f. comparison o mini-Hochbe 4	s there a differ label implicit est f iql by iage rg) 5	ence in the	average re	esponse by	r age among t

```
0.6250
             1
                          1.704583
           5
                 0.887093
2
                   0.4688
                             0.4414
3
                          0.522019 -1.459674
           6 |
                 0.249476
4
                   0.5736
                            0.6017
                                      0.2406
             5
6
           7
                 0.000000 0.000000 -1.619603 -0.489962
                  0.5556
                           0.5000 0.2633 0.5201
7
             8
     False Discovery Rate = 0.05
9
     Reject Ho if p = P(Z <= |z|) <= FDR/2 with stopping rule
10
11
     . dunntest iq2, by(iage) ma(bh) wrap
12
13
     Warning: by() values are unlabeled, option nolabel implicit
14
15
     Kruskal-Wallis equality-of-populations rank test
16
       +----+
17
       | iage | Obs | Rank Sum |
18
         _____+
19
           3 |
               2 |
                       57.00 |
           4 | 12 |
                     320.50
20
           5 |
                14 |
                       396.50
21
                25 |
           6 |
                       857.50
22
           7 | 10 | 384.50 |
           ------
23
24
                     3.269 with 4 d.f.
     chi-squared =
25
     probability =
                     0.5139
26
     chi-squared with ties =
                               4.720 with 4 d.f
27
     probability =
                     0.3173
28
29
                     Dunn's Pairwise Comparison of iq2 by iage
30
                               (Benjamini-Hochberg)
31
     Col Mean-|
                                                    5
     Row Mean |
                          3
                                       4
32
33
                 0.153782
           4 1
34
             0.4877
35
           5 |
                 0.015486 -0.268804
36
                   0.4938
                           0.4926
             37
                -0.517415 -1.417114 -1.174105
           6 |
38
                                      0.3004
             0.4320
                          0.2607
39
40
           7 |
                -0.842084 -1.797699 -1.603668 -0.727096
                   0.3997
                             0.3611
                                      0.2720
                                                 0.3893
41
             42
     False Discovery Rate = 0.05
43
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
44
45
     . dunntest iq3, by(iage) ma(bh) wrap
46
47
     Warning: by() values are unlabeled, option nolabel implicit
48
49
     Kruskal-Wallis equality-of-populations rank test
50
       +----+
51
       | iage | Obs | Rank Sum |
52
        ------
53
           3 | 2 |
                       20.00
           4 | 12 |
                     428.00
54
           5 | 14 | 405.50
55
           6 |
                25 |
                       806.00
           7 | 10 | 356.50 |
56
                   ____+
         _____
57
58
                      4.146 with 4 d.f.
     chi-squared =
59
     probability =
                      0.3866
                           For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml
60
```

chi-squared with ties = 8.316 with 4 d.f. 1 probability = 0.0807 2 3 4 Dunn's Pairwise Comparison of iq3 by iage (Benjamini-Hochberg) 5 Col Mean-L 6 Row Mean | 3 4 5 6 7 4 | -2.596467 8 0.0471 9 5 | -1.938328 1.316342 10 0.1881 0.0657 11 12 -2.338350 0.753882 -0.758192 6 | 13 0.0323 0.2818 0.3202 14 7 | -2.558488 0.003007 -1.247607 -0.704145 15 0.0263 0.4988 0.1768 0.2674 16 False Discovery Rate = 0.05 17 Reject Ho if $p = P(Z \le |z|) \le FDR/2$ with stopping rule 18 19 . dunntest iq4, by(iage) ma(bh) wrap 20 21 Warning: by() values are unlabeled, option nolabel implicit 22 23 Kruskal-Wallis equality-of-populations rank test 24 25 +----+ | iage | Obs | Rank Sum | 26 |-----| 27 3 2 52.50 4 | 12 | 305.00 | 28 5 | 14 | 419.50 | 6 | 25 | 854.50 | 5 | 29 30 | 7 | 10 | 384.50 | 31 32 chi-squared = 3.509 with 4 d.f. 33 probability = 0.4765 34 chi-squared with ties = 5.484 with 4 d.f. 35 probability = 0.2411 36 37 Dunn's Pairwise Comparison of iq4 by iage 38 (Benjamini-Hochberg) 39 Col Mean-| 40 Row Mean | 3 4 5 6 _____ 41 4 | 0.074414 42 0.4703 43 5 | -0.335113 -0.788405 44 0.4097 0.3587 45 46 6 | -0.735992 -1.701869 -0.861331 47 0.2886 0.2219 0.3891 48 -1.074190 -2.076021 -1.397796 -0.778325 7 | 49 0.3534 0.1895 0.2703 0.3117 50 False Discovery Rate = 0.05 51 Reject Ho if $p = P(Z \le |z|) \le FDR/2$ with stopping rule 52 53 . dunntest iq5, by(iage) ma(bh) wrap 54 55 Warning: by() values are unlabeled, option nolabel implicit 56 57 Kruskal-Wallis equality-of-populations rank test 58 59 +----+ For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml 60

3	++	+	_ i				
1 1	2	39.50	Ì				
I 14	12	326.00 419.50					
6	25	861.00	Ì				
7 +	10	370.00	 _+				
		2 007		£			
robabili	ed = ty =	0.5433	itn 4 a.	• 1 •			
chi-squar	ed witł	n ties =	7.650) with 4 d.f	•		
probabili	ty =	0.1053					
		Dupple D	aimriaa	Companian	of ige by ing	-	
_		Dunn's P	allwise (Benj	jamini-Hochk	erg)	2	
Col Mean- Row Mean		3		4	5	6	
 Д	+						
T		0.2527					
5	 _1.1	160351 -0	.610687				
	(0.2049	0.3008				
6	 -1.7	716672 -1	.778507	-1.151401			
-	(0.1075	0.1255	0.1783			
7	-1.9	912387 -1	.972161	-1.459248	-0.587541		
	(0.1396	0.2430	0.1445	0.2784		
ruskal-W	allis e	equality-o	f-popula	ations rank	test		
+		Donle Cum					
iage	adu	Kalik Sull 					
iage 3	005 ++ 2	83.00	-				
iage 3 4	0.05 + 2 12	Kalik Sum + 83.00 402.50	-				
iage 3 4 5 6	005 +	Rank Sum 83.00 402.50 380.00 742.50	- 				
iage 3 4 5 6 7	005 2 12 14 25 9	Rank Sum 83.00 402.50 380.00 742.50 345.00	- 				
iage 3 4 5 6 7	005 2 12 14 25 9	83.00 402.50 380.00 742.50 345.00	- -+				
iage 3 4 5 6 7 +	++ 2 12 14 25 9 ed = tv =	83.00 402.50 380.00 742.50 345.00 3.125 w 0.5372	-1 -+	.f.			
iage 3 4 5 6 7 + chi-squar probabili	++ 2 12 14 25 9 ed = ty =	83.00 402.50 380.00 742.50 345.00 3.125 w 0.5372	-1 -+	.f.			
iage 3 4 5 6 7 + chi-squar crobabili	++ 2 12 12 25 9 ed = ty = ed with ty =	<pre>83.00 83.00 402.50 83.00 742.50 345.00 3.125 w 0.5372 1 ties = 0.3272</pre>		.f. 2 with 4 d.f	÷.		
iage 3 4 5 6 7 + chi-squar probabili	++ 2 12 12 25 9 ed = ty = ed with ty =	<pre>83.00 83.00 402.50 380.00 742.50 345.00 3.125 w 0.5372 1 ties = 0.3272</pre>		.f. 2 with 4 d.f	·.		
iage 3 4 5 6 7 + probabili chi-squar probabili	++ 2 12 14 25 9 ed = ty = ed with ty =	<pre>83.00 83.00 402.50 83.00 742.50 345.00 3.125 w 0.5372 1 ties = 0.3272 Dunn's P</pre>		.f. 2 with 4 d.f Comparison	of iq6 by iage	e	
iage 3 4 5 6 7 + probabili chi-squar probabili	055 ++ 2 12 12 25 25 9 ed = ty = ed with ty =	<pre>83.00 83.00 402.50 380.00 742.50 345.00 3.125 w 0.5372 1 ties = 0.3272 Dunn's P</pre>		.f. 2 with 4 d.f Comparison jamini-Hochk	of iq6 by iage erg)	e	
iage 3 4 5 6 7 + chi-squar probabili chi-squar probabili	005 ++ 2 12 14 25 9 ed = ty = ed with ty =	<pre>83.00 83.00 402.50 380.00 742.50 345.00 3.125 w 0.5372 1 ties = 0.3272 Dunn's P 3</pre>		.f. 2 with 4 d.f Comparison jamini-Hochk 4	of iq6 by iage berg) 5	e 6	
iage 3 4 5 6 7 + probabili chi-squar probabili chi-squar probabili	0.55 + 2 12 12 14 25 9 ed = ty = ed with ty = + 0.5	<pre>83.00 83.00 402.50 380.00 742.50 345.00 3.125 w 0.5372 ties = 0.3272 Dunn's P 3 703165</pre>		.f. 2 with 4 d.f Comparison jamini-Hochk 4	of iq6 by iage erg) 5	e 6	
iage 3 4 5 6 7 + probabili chi-squar probabili chi-squar probabili	0.05 +	<pre>83.00 83.00 402.50 380.00 742.50 345.00 3.125 w 0.5372 1 ties = 0.3272 Dunn's P 3 703165 0.3012</pre>		.f. 2 with 4 d.f Comparison jamini-Hochk 4	of iq6 by iage berg) 5	e 6	
iage 3 4 5 6 7 + probabili chi-squar probabili chi-squar probabili	0.55 + 2 12 14 25 9 ed = ty = ed with ty = 0.7 0.7 0.7 0.7	<pre>83.00 83.00 402.50 380.00 742.50 345.00 3.125 w 0.5372 ties = 0.3272 Dunn's P 3 703165 0.3012 281683 1</pre>		.f. 2 with 4 d.f Comparison jamini-Hochk 4	of iq6 by iage erg) 5	e 6	
iage 3 4 5 6 7 + probabili chi-squar probabili Col Mean- Row Mean 4	0.55 2 12 12 14 25 9 	A A A A A A A A A A A A A A A A A A A		.f. 2 with 4 d.f Comparison jamini-Hochk 4	of iq6 by iage erg) 5	e 6	
iage 3 4 5 6 7 + probabili chi-squar probabili chi-squar probabili Col Mean- Row Mean 4 5	0.05 + 2 12 12 25 25 25 2 25 9 ed = ty = ed with ty = 0.7 0.7	<pre>A content of the second content of the</pre>		.f. 2 with 4 d.f Comparison jamini-Hochk 4 -0.516952	of iq6 by iage berg) 5	e 6	
iage 3 4 5 6 7 + probabili chi-squar probabili Col Mean- Row Mean 4 5	005 + 2 12 12 14 25 9 ed = ty = ed with ty = 0.7 0.7 0.7 1.2 1.2 1.2 1.2 1.2	<pre>A content of the second content of the</pre>		.f. 2 with 4 d.f Comparison jamini-Hochk 4 -0.516952 0.3362	of iq6 by iage erg) 5	e 6	
iage 3 4 5 6 7 + probabili chi-squar probabili chi-squar probabili chi-squar 5 6 7	0.55 + 2 12 12 14 25 9 ed = ty = ed with ty = 0.7 0.7 1.2 1.2	Aank sum 83.00 402.50 380.00 742.50 345.00 345.00 345.00 0.5372 ties = 0.3272 Dunn's P 3 703165 0.3012 281683 0.3333 083624 0 0.2785 273361 -0		.f. 2 with 4 d.f Comparison jamini-Hochk 4 	of iq6 by iage berg) 5 	e 6	
iage 3 4 5 6 7 + probabili chi-squar probabili Col Mean- Row Mean 4 5 6 7	0.05 +	Raik sum 83.00 402.50 380.00 742.50 345.00 345.00 0.5372 1 ties = 0.3272 Dunn's P 3 703165 0.3012 281683 0.3333 083624 0 0.2785 273361 -0 0.3923		.f. 2 with 4 d.f Comparison jamini-Hochk 4 -0.516952 0.3362 -1.767517 0.3857	-1.498732 0.3349	e 6	
iage 3 4 5 6 7 + chi-squar probabili chi-squar probabili chi-squar 5 0 Mean- cow Mean 6 7	0.05 2 12 12 12 14 25 9 	<pre>A A A A A A A A A A A A A A A A A A A</pre>		.f. 2 with 4 d.f Comparison jamini-Hochk 4 -0.516952 0.3362 -1.767517 0.3857	-1.498732 0.3349	e 6	

Reject Ho if $p = P(Z \le |z|) \le FDR/2$ with stopping rule 1 2 . dunntest iq7, by(iage) ma(bh) wrap 3 4 Warning: by() values are unlabeled, option nolabel implicit 5 6 Kruskal-Wallis equality-of-populations rank test 7 +----+ 8 | iage | Obs | Rank Sum | 9 |-----3 | 2 | 18.00 | 4 | 12 | 342.00 | 10 11 5 | 14 | 476.00 12 6 | 25 | 827.00 7 | 10 | 353.00 13 14 15 4.164 with 4 d.f. chi-squared = 0.3843 16 probability = 17 chi-squared with ties = 5.665 with 4 d.f. 18 probability = 0.2256 19 20 Dunn's Pairwise Comparison of iq7 by iage 21 (Benjamini-Hochberg) 22 Col Mean-| 4 3 Row Mean | 5 6 23 ------24 4 | -1.624636 25 0.1303 26 -2.104451 -0.889632 5 1 27 0.0883 0.3114 28 6 | -2.085160 -0.829861 0.175376 29 0.0618 0.2904 0.4304 30 31 7 | -2.160529 -1.010574 -0.199794 -0.3775450.1537 0.3122 0.4676 0.4411 32 33 False Discovery Rate = 0.05 34 Reject Ho if $p = P(Z \le |z|) \le FDR/2$ with stopping rule 35 36 . dunntest iq8, by(iage) ma(bh) wrap 37 38 Warning: by() values are unlabeled, option nolabel implicit 39 40 Kruskal-Wallis equality-of-populations rank test 41 ----+ 42 | iage | Obs | Rank Sum | 43 |-----3 | 2 | 62.00 | 4 | 12 | 319.50 | 5 | 14 | 441.00 | 44 45 46 6 | 25 | 806.50 47 7 | 10 | 387.00 | 1 +----+ 48 2.389 with 4 d.f. 49 chi-squared = probability = 0.6646 50 51 chi-squared with ties = 2.751 with 4 d.f. 52 probability = 0.6003 53 54 Dunn's Pairwise Comparison of iq8 by iage 55 (Benjamini-Hochberg) 56 Col Mean-Row Mean | 3 5 6 4 57 _____ ____+ 58 4 | 0.335334 59 0.5267 For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml 60

```
5
                -0.038721 -0.725439
1
                  0.4846 0.4682
             2
3
                -0.100377 -0.939317 -0.133283
           6
             0.4345 0.5587
                   0.5111
4
             5
                -0.581934 -1.650916 -1.018004 -1.007582
           7 1
6
                  0.4672
                           0.4938 0.7717
                                                0.5228
7
     False Discovery Rate = 0.05
8
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
9
10
     . dunntest iq9, by(iage) ma(bh) wrap
11
12
     Warning: by() values are unlabeled, option nolabel implicit
13
14
     Kruskal-Wallis equality-of-populations rank test
15
16
       +----+
       | iage | Obs | Rank Sum |
17
       |-----|
18
           3 | 2 | 58.00 |
           4 | 12 |
                     289.50 |
19
           5 | 14 | 451.00 |
20
           6 | 25 | 843.50 |
7 | 10 | 374.00 |
21
22
         _____
23
     chi-squared =
                     3.363 with 4 d.f.
24
     probability =
                    0.4989
25
                               4.008 with 4 d.f
     chi-squared with ties =
26
     probability =
                      0.4049
27
28
                     Dunn's Pairwise Comparison of iq9 by iage
29
                               (Benjamini-Hochberg)
30
     Col Mean-|
31
     Row Mean |
                          3
                                       4
                                                    5
     ------
32
                          _ _ _ _
           4 | 0.380111
33
                 0.4399
             34
           5 | -0.253220 -1.224538
35
                  0.4000
                           0.3679
             36
             37
                -0.384128 -1.630434 -0.272188
           6 |
                 0.5006
                           0.2575
                                     0.4364
38
             39
           7 |
                -0.645800 -1.846324 -0.745866 -0.582520
40
                  0.5184
                           0.3242
                                     0.5697
                                                0.4668
             41
     False Discovery Rate = 0.05
42
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
43
44
     . dunntest iq10, by(iage) ma(bh) wrap
45
46
     Warning: by() values are unlabeled, option nolabel implicit
47
48
     Kruskal-Wallis equality-of-populations rank test
49
50
       | iage | Obs | Rank Sum |
51
        _____+
52
           3 | 2 |
4 | 12 |
           3 |
                       70.00
                     389.00
53
           5 | 14 | 394.00
54
           6 | 25 | 813.00
55
           7 | 10 | 350.00 |
       56
                ----+
           ____
57
                    0.968 with 4 d.f.
     chi-squared =
58
     probability =
                     0.9147
59
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60
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	Dunn's Pairw (vise Comparison of (Benjamini-Hochberg	iq10 by iage g)				
Col Mean- Row Mean	3	4	5	6			
4	0.362629 0.5121						
5	0.972529 1.164 0.4135 0.4	1725 1069					
6 	0.361822 -0.031 0.4484 0.5	546 -1.405830 5416 0.3994					
 7 	0.000000 -0.646 0.5000 0.4	5845 -1.775587 - 1314 0.3790	0.710605 0.4773				
False Disc Reject Ho	overy Rate = 0.05 if p = P(Z <= z)	<= FDR/2 with stop	pping rule				
_							
Question	on – For each of the	questions, 1-10, is	there a differe	nce in the av	verage resp	onse <u>by ger</u>	nder?
. dunntest	iq1, by(igender)						
Warning, h	v() values are unla	abeled, option nol	abel implicit				
	,,, .araco are unid						
Kruskal-Wa	llis equality-of-po	pulations rank te	st				
ni donai na	iiio oqualioj ol po	paraorono rann oo					
+		-+					
	r Ohs Rank Sum						
	r Obs Rank Sum ++	- -					
	r Obs Rank Sum ++	 - 					
 +	r Obs Rank Sum L 19 636.50 2 44 1379.50	 					
	r Obs Rank Sum 	 ++					
chi-square	r Obs Rank Sum +	 + 1 d.f.					
chi-square probabilit	r Obs Rank Sum 1 19 636.50 2 44 1379.50 d = 0.182 with y = 0.6695	 + 1 d.f.					
chi-square probabilit	$\begin{array}{r rrrrr} r & & Obs & & Rank & Sum \\ \hline r & & 19 & & 636.50 \\ \hline r & & 19 & & 636.50 \\ \hline r & & 19 & & 636.50 \\ \hline r & & 1379.50 \\ \hline r & & 1379.50 \\ \hline r & & 0.182 & with \\ \hline r & & 0.182 & with \\ \hline r & & 0.6695 \\ \hline r & & 0.2474 \\ \hline \end{array}$	 1 d.f. 338 with 1 d.f.					
chi-square probabilit chi-square	$\begin{array}{c c c c c c c c c c c c c c c c c c c $.+ 1 d.f. 338 with 1 d.f.					
chi-square probabilit; chi-square	c Obs Rank Sum 1 19 636.50 2 44 1379.50 d = 0.182 with y = 0.6695 d with ties = 1 y = 0.2474 Dupp's Pairwi	1 1 1 d.f. 338 with 1 d.f.	igl by igender				
chi-square probabilit chi-square	r Obs Rank Sum 1 19 636.50 2 44 1379.50 d = 0.182 with y = 0.6695 d with ties = 1 y = 0.2474 Dunn's Pairwi	<pre>1 1 d.f338 with 1 d.fse Comparison of (No adjustment)</pre>	iq1 by igender				
chi-square probabilit chi-square probabilit	r Obs Rank Sum +	l l l d.f. 338 with 1 d.f. .se Comparison of (No adjustment)	iq1 by igender				
chi-square probabilit chi-square probabilit Col Mean- Row Mean	r Obs Rank Sum 1 19 636.50 2 44 1379.50 d = 0.182 with y = 0.6695 d with ties = 1 y = 0.2474 Dunn's Pairwi 1	<pre>1 1 d.f338 with 1 d.fse Comparison of (No adjustment)</pre>	iq1 by igender				
chi-squared probability chi-squared probability Col Mean- Row Mean + 2	r Obs Rank Sum 1 19 636.50 2 44 1379.50 d = 0.182 with y = 0.6695 d with ties = 1 y = 0.2474 Dunn's Pairwi 1 1.156689 0.1227	l l l 338 with 1 d.f. .se Comparison of (No adjustment)	iq1 by igender				
chi-square probability chi-square probability Col Mean- Row Mean + 2	r Obs Rank Sum 1 19 636.50 2 44 1379.50 d = 0.182 with y = 0.6695 d with ties = 1 y = 0.2474 Dunn's Pairwi 1 1.156689 0.1237	l l l 338 with 1 d.f. .se Comparison of (No adjustment)	iq1 by igender				
chi-square probabilit chi-square probabilit Col Mean- Row Mean + 2 l alpha =	r Obs Rank Sum 1 19 636.50 2 44 1379.50 d = 0.182 with y = 0.6695 d with ties = 1 y = 0.2474 Dunn's Pairwi 1.156689 0.1237 0.05	<pre>1 d.f. 1 d.f</pre>	iq1 by igender				
<pre>chi-square probabilit; chi-square probabilit; Col Mean- Row Mean + 2 alpha = Reject Ho</pre>	r Obs Rank Sum 1 19 636.50 2 44 1379.50 d = 0.182 with y = 0.6695 d with ties = 1 y = 0.2474 Dunn's Pairwi 1 1.156689 0.1237 0.05 if p = P(Z <= z)	<pre> - 1 d.f. 338 with 1 d.f. .se Comparison of (No adjustment) <= alpha/2</pre>	iql by igender				
<pre>chi-square probabilit; chi-square probabilit; Col Mean- Row Mean + 2 alpha = Reject Ho .</pre>	r Obs Rank Sum 1 19 636.50 2 44 1379.50 d = 0.182 with y = 0.6695 d with ties = 1 y = 0.2474 Dunn's Pairwi 1.156689 0.1237 0.05 if p = P(Z <= z)	<pre> - 1 d.f. 338 with 1 d.f. .se Comparison of (No adjustment) <= alpha/2</pre>	iq1 by igender				
chi-square probability chi-square probability chi-square probability Col Mean- Row Mean + 2 alpha = Reject Ho	r Obs Rank Sum 1 19 636.50 2 44 1379.50 d = 0.182 with y = 0.6695 d with ties = 1 y = 0.2474 Dunn's Pairwi 1 1.156689 0.1237 0.05 if p = P(Z <= z) iq2, by(igender)	<pre> 1 d.f. 338 with 1 d.f. .se Comparison of (No adjustment) <= alpha/2</pre>	iq1 by igender				
chi-square probabilit chi-square probabilit Col Mean- Row Mean + 2 alpha = Reject Ho dunntest Warning: b	r Obs Rank Sum 1 19 636.50 2 44 1379.50 d = 0.182 with y = 0.6695 d with ties = 1 y = 0.2474 Dunn's Pairwi 1.156689 0.1237 0.05 if p = P(Z <= z) iq2, by(igender) y() values are unla	<pre>d d.f. d.f. d.f. d.f. d.f. d.se Comparison of (No adjustment) <= alpha/2 abeled, option nol-</pre>	iq1 by igender				
<pre>chi-square probabilit; chi-square probabilit; chi-square probabilit; Col Mean- Row Mean + 2 alpha = Reject Ho dunntest Warning: b;</pre>	r Obs Rank Sum 1 19 636.50 2 44 1379.50 d = 0.182 with y = 0.6695 d with ties = 1 y = 0.2474 Dunn's Pairwi 1.156689 0.1237 0.05 if p = P(Z <= z) iq2, by(igender) y() values are unla	<pre>d d.f. l d.f. l d.f338 with 1 d.fse Comparison of (No adjustment) <= alpha/2 abeled, option nol.</pre>	iq1 by igender				
<pre>chi-square probabilit; chi-square probabilit; chi-square probabilit; Col Mean- Row Mean + 2 alpha = Reject Ho dunntest Warning: b; Kruskal-Wa.</pre>	r Obs Rank Sum 1 19 636.50 2 44 1379.50 d = 0.182 with y = 0.6695 d with ties = 1 y = 0.2474 Dunn's Pairwi 1 1.156689 0.1237 0.05 if p = P(Z <= z) iq2, by(igender) y() values are unla llis equality-of-po	<pre> </pre>	iql by igender abel implicit				
chi-square probability chi-square probability chi-square probability Col Mean- Row Mean 2 alpha = Reject Ho dunntest Warning: by Kruskal-Wa	r Obs Rank Sum 1 19 636.50 2 44 1379.50 d = 0.182 with y = 0.6695 d with ties = 1 y = 0.2474 Dunn's Pairwi 1 1.156689 0.1237 0.05 if p = P(Z <= z) iq2, by(igender) y() values are unla llis equality-of-po	<pre> </pre>	iq1 by igender abel implicit st				
<pre>chi-square probabilit; chi-square probabilit; chi-square probabilit; Col Mean- Row Mean </pre>	<pre>r Obs Rank Sum r Obs Rank Sum r 19 636.50 2 44 1379.50 d = 0.182 with y = 0.6695 d with ties = 1 y = 0.2474 Dunn's Pairwi 1 1.156689 0.1237 0.05 if p = P(Z <= z) iq2, by(igender) y() values are unla llis equality-of-po r Obs Rank Sum</pre>	<pre> </pre>	iq1 by igender abel implicit st				
<pre>chi-square probabilit; chi-square probabilit; chi-square probabilit; Col Mean- Row Mean + 2 alpha = Reject Ho dunntest Warning: b; Kruskal-Wa</pre>	<pre>r Obs Rank Sum 1 19 636.50 2 44 1379.50 d = 0.182 with 7 = 0.6695 d with ties = 1 7 = 0.2474 Dunn's Pairwi 1 1.156689 0.1237 0.05 if p = P(Z <= z) iq2, by(igender) 7() values are unla llis equality-of-po r Obs Rank Sum </pre>	<pre> -+ 1 d.f. 338 with 1 d.f. 338 with 1 d.f. se Comparison of (No adjustment) (No adjustment) <= alpha/2 abeled, option nol- opulations rank te </pre>	iq1 by igender abel implicit st				
chi-squaree probability chi-squaree chi-sq	r Obs Rank Sum 1 19 636.50 2 44 1379.50 d = 0.182 with y = 0.6695 d with ties = 1 y = 0.2474 Dunn's Pairwi 1 1.156689 0.1237 0.05 if p = P(Z <= z) iq2, by(igender) y() values are unla llis equality-of-po r Obs Rank Sum 1 19 565.00 2 44 1451.00	<pre> </pre>	iql by igender abel implicit st				
chi-squaree probability chi-squaree probability chi-squaree probability Col Mean- Row Mean + 2 alpha = Reject Ho dunntest Warning: by Kruskal-Wa + igendes 	r Obs Rank Sum 1 19 636.50 2 44 1379.50 d = 0.182 with y = 0.6695 d with ties = 1 y = 0.2474 Dunn's Pairwi 1 1.156689 0.1237 0.05 if p = P(Z <= z) iq2, by(igender) y() values are unla llis equality-of-po r Obs Rank Sum +	<pre>d d.f. l d.f. 338 with 1 d.f. se Comparison of (No adjustment) <= alpha/2 abeled, option nol. opulations rank ter l l l +</pre>	iql by igender abel implicit st				
chi-square probabilit chi-square probabilit chi-square probabilit Col Mean- Row Mean 2 alpha = Reject Ho dunntest Warning: b Kruskal-Wa + igende: 	r Obs Rank Sum 1 19 636.50 2 44 1379.50 d = 0.182 with y = 0.6695 d with ties = 1 y = 0.2474 Dunn's Pairwi 1 1.156689 0.1237 0.05 if p = P(Z <= z) iq2, by(igender) y() values are unla llis equality-of-po r Obs Rank Sum 1 19 565.00 2 44 1451.00	<pre>d d.f. l d.f. 338 with 1 d.f. se Comparison of (No adjustment) <= alpha/2 abeled, option nol. opulations rank ter l l l l l l l l l l l l l l l l l l l</pre>	iql by igender abel implicit st				

```
chi-squared with ties =
                            0.599 with 1 d.f.
     probability =
                   0.4390
1
2
3
                   Dunn's Pairwise Comparison of iq2 by igender
                               (No adjustment)
4
     Col Mean-|
5
     Row Mean |
                         1
6
     2 | -0.773826
7
            0.2195
8
9
     alpha = 0.05
     Reject Ho if p = P(Z \le |z|) \le alpha/2
10
11
12
     . dunntest iq3, by(igender)
13
     Warning: by() values are unlabeled, option nolabel implicit
14
15
     Kruskal-Wallis equality-of-populations rank test
16
17
       +----+
18
       | igender | Obs | Rank Sum |
19
       |-----|
       | 1 | 19 | 629.00 |
20
             2 | 44 | 1387.00 |
21
       +----+
22
     chi-squared = 0.099 with 1 d.f.
probability = 0.7531
23
24
25
     chi-squared with ties =
                            0.198 with 1 d.f
     probability = 0.6560
26
27
                                                        28
                  Dunn's Pairwise Comparison of iq3 by igender
                               (No adjustment)
29
     Col Mean-L
30
     Row Mean |
                         1
31
      -----
          2 | 0.445408
32
           0.3280
33
34
     alpha = 0.05
     Reject Ho if p = P(Z \le |z|) \le alpha/2
35
36
37
     . dunntest iq4, by(igender)
38
     Warning: by() values are unlabeled, option nolabel implicit
39
40
     Kruskal-Wallis equality-of-populations rank test
41
42
       +----+
43
      | igender | Obs | Rank Sum |
       |-----|
44
           1 | 19 | 534.50 |
45
            2 | 44 | 1481.50 |
       46
       +----+
47
                   1.212 with 1 d.f.
     chi-squared =
48
     probability = 0.2710
49
     chi-squared with ties =
                            1.894 with 1 d.f.
50
     probability =
                   0.1688
51
52
                   Dunn's Pairwise Comparison of iq4 by igender
53
                               (No adjustment)
54
     Col Mean-|
55
     Row Mean |
                         1
56
               _____
     ----+-
         2 | -1.376105
57
           | 0.0844
58
59
     alpha = 0.05
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```
Reject Ho if p = P(Z \le |z|) \le alpha/2
1
2
     . dunntest iq5, by(igender)
3
     Warning: by() values are unlabeled, option nolabel implicit
4
5
6
     Kruskal-Wallis equality-of-populations rank test
7
       +----+
8
       | igender | Obs | Rank Sum |
9
       |-----|
             1 | 19 | 614.50 |
2 | 44 | 1401.50 |
10
11
         _____
12
    chi-squared = 0.009 with 1 d.f.
probability = 0.9225
13
14
15
     chi-squared with ties =
                             0.023 with 1 d.f.
     probability = 0.8782
16
17
18
                   Dunn's Pairwise Comparison of iq5 by igender
19
                                (No adjustment)
     Col Mean-|
20
     Row Mean |
                         1
21
     _____+
22
          2 | 0.153230
                0.4391
            23
24
     alpha = 0.05
     Reject Ho if p = P(Z \le |z|) \le alpha/2
25
26
27
     . dunntest iq6, by(igender)
28
     Warning: by() values are unlabeled, option nolabel implicit
29
30
31
     Kruskal-Wallis equality-of-populations rank test
                                                        32
         _____
33
       | igender | Obs | Rank Sum |
34
        -----|
             1 | 19 | 587.50 |
35
      2 | 43 | 1365.50 |
36
       +----+
37
     chi-squared =
                   0.028 with 1 d.f.
38
     probability =
                    0.8666
39
40
     chi-squared with ties =
                              0.042 with 1 d.f.
     probability =
                     0.8380
41
42
43
                   Dunn's Pairwise Comparison of iq6 by igender
                                (No adjustment)
44
     Col Mean-|
45
                         1
     Row Mean |
46
     _____
47
          2 | -0.204490
            0.4190
48
49
     alpha = 0.05
     Reject Ho if p = P(Z \le |z|) \le alpha/2
50
51
52
     . dunntest iq7, by(igender)
53
     Warning: by() values are unlabeled, option nolabel implicit
54
55
56
     Kruskal-Wallis equality-of-populations rank test
57
          -----+
58
       | igender | Obs | Rank Sum |
59
       |-----|
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60
```

```
1 | 19 | 551.00 |
              2 | 44 | 1465.00 |
1
2
3
     chi-squared = 0.729 with 1 d.f.
4
     probability =
                    0.3933
5
     chi-squared with ties =
                              0.991 with 1 d.f.
6
     probability = 0.3194
7
8
                    Dunn's Pairwise Comparison of ig7 by igender
9
                                (No adjustment)
10
     Col Mean-|
     Row Mean |
                          1
11
        ____+
12
          2 | -0.995685
13
             0.1597
14
     alpha = 0.05
15
     Reject Ho if p = P(Z \le |z|) \le alpha/2
16
17
     . dunntest iq8, by(igender)
18
     Warning: by() values are unlabeled, option nolabel implicit
19
20
21
     Kruskal-Wallis equality-of-populations rank test
22
       +-----+
23
       | igender | Obs | Rank Sum |
24
       |-----|
25
       | 1 | 19 | 561.00 |
             2 | 44 | 1455.00 |
26
       +----+
27
28
                   0.495 with 1 d.f.
0.4815
     chi-squared =
     probability =
29
30
                             0.570 with 1 d.f.
     chi-squared with ties =
31
     probability = 0.4501
32
33
                    Dunn's Pairwise Comparison of iq8 by igender
34
                                (No adjustment)
     Col Mean-I
35
     Row Mean |
                          1
36
     37
          2 | -0.755307
                 0.2250
38
            39
     alpha = 0.05
40
     Reject Ho if p = P(Z \le |z|) \le alpha/2
41
42
     . dunntest iq9, by(igender)
43
     Warning: by() values are unlabeled, option nolabel implicit
44
45
46
     Kruskal-Wallis equality-of-populations rank test
47
       +-----+
48
       | igender | Obs | Rank Sum |
49
       |-----|
            1 | 19 | 491.00 |
2 | 44 | 1525.00 |
50
51
       +----+
52
53
     chi-squared =
                    3.070 with 1 d.f.
     probability =
                    0.0797
54
55
     chi-squared with ties =
                             3.658 with 1 d.f.
56
     probability =
                     0.0558
57
58
                    Dunn's Pairwise Comparison of iq9 by igender
59
                                 (No adjustment)
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60
```

```
Col Mean-I
     Row Mean |
1
      ____+
2
          2 | -1.912701
3
           | 0.0279
4
     alpha = 0.05
5
     Reject Ho if p = P(Z \le |z|) \le alpha/2
6
7
     . dunntest iq10, by(igender)
8
9
     Warning: by() values are unlabeled, option nolabel implicit
10
11
     Kruskal-Wallis equality-of-populations rank test
12
13
       +----+
       | igender | Obs | Rank Sum |
14
       |-----|
15
          1 | 19 | 603.00 |
             2 | 44 | 1413.00 |
16
       +-----+
17
18
    chi-squared = 0.006 with 1 d.f.
probability = 0.9403
19
20
                           0.022 with 1_d.f.
     chi-squared with ties =
21
                     0.8830
     probability =
22
23
                  Dunn's Pairwise Comparison of iq10 by igender
24
                                (No adjustment)
25
     Col Mean-|
     Row Mean |
                         1
26
     _____
27
          2 | -0.147156
28
            | 0.4415
29
     alpha = 0.05
30
     Reject Ho if p = P(Z \le |z|) \le alpha/2
31
     _____
32
33
      Question – For each of the questions, 1-10, is there a difference in the average response by level of education
34
35
     . dunntest iq1, by(ied) ma(bh) wrap
36
     Warning: by() values are unlabeled, option nolabel implicit
37
38
39
     Kruskal-Wallis equality-of-populations rank test
40
         -----+
41
       | ied | Obs | Rank Sum |
42
       |-----|
         1 | 1 | 32.50 |
2 | 3 | 97.50 |
43
44
       | 3 | 57 | 1761.00 |
45
       +-----+
46
                   0.031 with 2 d.f.
0.9848
     chi-squared =
47
     probability =
48
     chi-squared with ties =
                              0.218 with 2 d.f.
49
                     0.8969
     probability =
50
51
52
                     Dunn's Pairwise Comparison of iq1 by ied
                             (Benjamini-Hochberg)
53
    Col Mean-|
54
     Row Mean |
                        1
                                      2
     -----+------
55
           2 | 0.000000
56
                  0.5000
            57
           3 |
               0.239229
                          0.407392
58
                           1.0000
                  0.6082
             59
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60
```

```
False Discovery Rate = 0.05
1
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
2
3
     . dunntest iq2, by(ied) ma(bh) wrap
4
5
     Warning: by() values are unlabeled, option nolabel implicit
6
7
     Kruskal-Wallis equality-of-populations rank test
8
9
       +----+
10
       | ied | Obs | Rank Sum |
       |----|
11
         1 | 1 | 40.50 |
2 | 3 | 121.50 |
3 | 57 | 1729.00 |
12
       13
14
15
                      1.226 with 2 d.f.
     chi-squared =
                    ⊥.2_
0.5418
16
     probability =
17
     chi-squared with ties =
                              1.853 with 2 d.f.
18
     probability =
                      0.3959
19
20
                      Dunn's Pairwise Comparison of iq2 by ied
21
                               (Benjamini-Hochberg)
22
     Col Mean-|
                    1
                                        2
     Row Mean |
23
     ____+
                _____
24
           2 | 0.000000
25
             0.5000
              26
                0.698004 1.188657
            3 |
27
                  0.3639
                           0.3519
             28
     False Discovery Rate = 0.05
29
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
30
31
     . dunntest iq3, by(ied) ma(bh) wrap
32
33
     Warning: by() values are unlabeled, option nolabel implicit
34
35
     Kruskal-Wallis equality-of-populations rank test
36
37
       +----+
       | ied | Obs | Rank Sum |
38
       |----|
39
         1 | 1 | 36.50 |
2 | 3 | 109.50 |
40
       | 3 | 57 | 1745.00 |
41
       +-----+
42
43
     chi-squared =
                     0.411 with 2 d.f.
     probability =
                     0.8143
44
45
     chi-squared with ties =
                              0.917 with 2 d.f.
46
     probability =
                      0.6323
47
48
                      Dunn's Pairwise Comparison of iq3 by ied
49
                               (Benjamini-Hochberg)
     Col Mean-|
50
                    1
                                        2
     Row Mean |
51
     _____
52
           2 | 0.000000
53
                   0.5000
             54
            3 |
                0.490961 0.836076
55
                  0.4676
                           0.6047
             56
     False Discovery Rate = 0.05
57
     Reject Ho if p = P(Z <= \mid z \mid) <= FDR/2 with stopping rule
58
59
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60
```

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```
. dunntest iq4, by(ied) ma(bh) wrap
1
    Warning: by() values are unlabeled, option nolabel implicit
2
3
    Kruskal-Wallis equality-of-populations rank test
4
5
      +----+
6
      | ied | Obs | Rank Sum |
       |-----|
7
        1 | 1 | 40.00 |
8
        2 3 120.00
9
      | 3 | 57 | 1731.00 |
10
        _____+
11
     chi-squared =
                   1.100 with 2 d.f.
12
    probability =
                   0.5769
13
     chi-squared with ties =
                            1.741 with 2 d.f.
14
    probability =
                    0.4187
15
16
                    Dunn's Pairwise Comparison of iq4 by ied
17
                           (Benjamini-Hochberg)
18
    Col Mean-|
                  1
19
    Row Mean |
                                     2
     20
          2 | 0.000000
21
            0.5000
22
           3 | 0.676626 1.152253
23
                         0.3738
                0.3740
            24
25
    False Discovery Rate = 0.05
    Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
26
27
28
     . dunntest iq5, by(ied) ma(bh) wrap
29
    Warning: by() values are unlabeled, option nolabel implicit
30
                                                      iez oni
31
    Kruskal-Wallis equality-of-populations rank test
32
33
      +----+
34
      | ied | Obs | Rank Sum |
      |-----|
35
       36
      | 2 | 3 | ...
| 3 | 57 | 1782.00 |
_----+
         2 |
37
38
39
    chi-squared = 0.479 with 2 d.f.
probability = 0.7870
40
41
     chi-squared with ties =
                            1.261 with 2 d.f.
42
     probability =
                    0.5323
43
44
                    Dunn's Pairwise Comparison of iq5 by ied
45
                            (Benjamini-Hochberg)
46
    Col Mean-|
47
    Row Mean |
                        1
                                     2
     48
          2 | 0.870715
49
            0.2879
50
            3 |
               0.383900 -1.043578
51
                 0.3505
                         0.4450
            52
     False Discovery Rate = 0.05
53
    Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
54
55
56
     . dunntest iq6, by(ied) ma(bh) wrap
57
     Warning: by() values are unlabeled, option nolabel implicit
58
59
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60
```

```
Kruskal-Wallis equality-of-populations rank test
       +----+
       | ied | Obs | Rank Sum |
       |----+----+-----
       | 1 | 1 | 40.50 |
               3 |
                     94.00 |
          2 |
       3 | 56 | 1695.50 |
       +----+
    chi-squared = 0.344 with 2 d.f.
probability = 0.8420
                            0.500 with 2 d.f.
10
     chi-squared with ties =
     probability =
                     0.7788
11
12
13
                     Dunn's Pairwise Comparison of iq6 by ied
                            (Benjamini-Hochberg)
14
     Col Mean-|
15
     Row Mean |
                        1
     ------
16
          2 | 0.548145
17
               0.4377
           18
               0.699677 0.123104
19
           3 |
                 0.7262
                         0.4510
            20
21
     False Discovery Rate = 0.05
22
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
23
24
     . dunntest iq7, by(ied) ma(bh) wrap
25
                                                .t
     Warning: by() values are unlabeled, option nolabel implicit
26
27
28
     Kruskal-Wallis equality-of-populations rank test
29
       +----+
30
      | ied | Obs | Rank Sum |
31
       |-----|
       | 1 | 1 | 42.50 |
| 2 | 3 | 99.50 |
32
33
       | 3 | 57 | 1749.00 |
34
       +----+
35
                  0.482 with 2 d.f.
     chi-squared =
36
     probability =
                    0.7857
37
     chi-squared with ties =
                            0.659 with 2 d.f.
38
     probability =
                    0.7194
39
40
                     Dunn's Pairwise Comparison of iq7 by ied
41
                            (Benjamini-Hochberg)
42
     Col Mean-I
43
     Row Mean |
                        1
                                     2
     _____
44
          2 | 0.532085
45
                0.4460
            46
           3 | 0.771080 0.275878
47
                 0.6610
                         0.3913
            48
49
     False Discovery Rate = 0.05
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
50
51
52
     . dunntest iq8, by(ied) ma(bh) wrap
53
     Warning: by() values are unlabeled, option nolabel implicit
54
55
56
     Kruskal-Wallis equality-of-populations rank test
57
```

59 60

58

+----+

| ied | Obs | Rank Sum |

1

2

3

4

5

6

7

8 9

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probabilit	d = 1.717 with y = 0.4237	h 2 d.f.			
chi-square probabilit	d with ties = y = <mark>0.3713</mark>	1.981 with 2 d.	f.		
	Dunn's Pai	irwise Comparisc (Benjamini-Hoch	on of iq8 by i bberg)	ed	
Col Mean- Row Mean	1	2			
2	0.358033 0.3602				
3	1.005400 1.01 0.2360 0.	14200 .4657			
False Disc Reject Ho	overy Rate = 0.0 if p = P(Z <= z)	05) <= FDR/2 with	stopping rule		
. dunntest	iq9, by(ied) ma(k	bh) wrap			
Warning: b	y() values are un!	labeled, option	nolabel impli	cit	
5. ~					
Kruskal-Wa	llis equality-of-r	populations rank	test		
+	+				
+					
1	1 1 15 50 1				
2	3 136.50				
2 3	3 136.50 57 1709.00				
2 3 +	3 136.50 57 1709.00				
2 3 +	d = 2.856 with $d = 0.2398$	h 2 d.f.			
2 3 + chi-square probabilit	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	h 2 d.f.	Č		
2 3 + probabilit chi-square probabilit	d = 2.856 with $d = 2.856 with$ $d = 0.2398$ $d with ties = y = 0.1819$	h 2 d.f. 3.409 with 2 d.	f.		
2 3 + probabilit chi-square probabilit	d = 2.856 with $d = 2.856 with$ $y = 0.2398$ $d with ties =$ $y = 0.1819$	h 2 d.f. 3.409 with 2 d.	f.		
2 3 + probabilit chi-square probabilit	d = 2.856 with y = 0.2398 d with ties = y = 0.1819 Dunn's Pai	h 2 d.f. 3.409 with 2 d. irwise Comparisc (Benjamini-Hoch	f. on of iq9 by i uberg)	ed	
2 3 + probabilit chi-square probabilit Col Mean- Pow Mean	d = 2.856 with $d = 2.856 with$ $y = 0.2398$ $d with ties = y$ $y = 0.1819$ Dunn's Pai	h 2 d.f. 3.409 with 2 d. irwise Comparisc (Benjamini-Hoch 2	f. on of iq9 by i uberg)	ed	
2 3 + probabilit chi-square probabilit Col Mean- Row Mean +	d = 2.856 with y = 0.2398 d with ties = y = 0.1819 Dunn's Pai	h 2 d.f. 3.409 with 2 d. irwise Comparisc (Benjamini-Hoch 2	f. m of iq9 by i iberg)	ed	
2 3 + probabilit chi-square probabilit Col Mean- Row Mean + 2	d = 2.856 with y = 0.2398 d with ties = y = 0.1819 Dunn's Pai	h 2 d.f. 3.409 with 2 d. irwise Comparisc (Benjamini-Hoch 2	f. on of iq9 by i uberg)	ed	
2 3 + chi-square probabilit chi-square probabilit Col Mean- Row Mean + 2 	d = 2.856 with y = 0.2398 d with ties = y = 0.1819 Dunn's Pai 1 0.000000 0.5000	h 2 d.f. 3.409 with 2 d. irwise Comparisc (Benjamini-Hoch 2 	f. on of iq9 by i iberg)	ed	
2 3 + probabilit chi-square probabilit Col Mean- Row Mean 2 3	d = 2.856 with y = 0.2398 d with ties = y = 0.1819 Dunn's Pai 0.000000 0.5000 0.946695 1.61 0.2578 0.	h 2 d.f. 3.409 with 2 d. irwise Comparisc (Benjamini-Hoch 2 12164 .1604	f. on of iq9 by i uberg)	ed	
2 3 + probabilit chi-square probabilit Col Mean- Row Mean + 2 3 False Disc	<pre>d = 0.300 57 1709.00 57 1709.00 d = 2.856 with y = 0.2398 d with ties = y = 0.1819 Dunn's Pai 1 0.000000 0.5000 0.946695 1.61 0.2578 0. overy Rate = 0.0</pre>	h 2 d.f. 3.409 with 2 d. irwise Comparisc (Benjamini-Hoch 2 12164 .1604 05	f. on of iq9 by i uberg)	ed	
2 3 + probabilit chi-square probabilit Col Mean- Row Mean + 2 3 False Disc Reject Ho	<pre>d = 0.856 with 3 136.50 57 1709.00 d = 2.856 with y = 0.2398 d with ties = y = 0.1819 Dunn's Pai 0.000000 0.5000 0.946695 1.61 0.2578 0. overy Rate = 0.0 if p = P(Z <= z)</pre>	h 2 d.f. 3.409 with 2 d. irwise Compariso (Benjamini-Hoch 2 12164 .1604 05) <= FDR/2 with	f. on of iq9 by i uberg) stopping rule	ed	
2 3 + chi-square probabilit chi-square probabilit Col Mean- Row Mean + 2 3 False Disc Reject Ho	<pre>d = 0.856 with 3 136.50 57 1709.00 d = 2.856 with y = 0.2398 d with ties = y = 0.1819 Dunn's Pai 1 0.000000 0.5000 0.946695 1.61 0.2578 0.0 overy Rate = 0.0 if p = P(Z <= z)</pre>	h 2 d.f. 3.409 with 2 d. irwise Compariso (Benjamini-Hock 2 12164 .1604 05) <= FDR/2 with	f. on of iq9 by i uberg) stopping rule	ed	
2 3 + probabilit chi-square probabilit Col Mean- Row Mean + 2 3 False Disc Reject Ho . dunntest	<pre>d = 0.856 with 3 136.50 57 1709.00 d = 0.2398 d with ties = y = 0.1819 Dunn's Pai 0.000000 0.5000 0.946695 1.61 0.2578 0. overy Rate = 0.0 if p = P(Z <= z) iq10, by(ied) mate</pre>	h 2 d.f. 3.409 with 2 d. irwise Compariso (Benjamini-Hoch 2 12164 .1604 05) <= FDR/2 with (bh) wrap	f. on of iq9 by i uberg) stopping rule	ed	
<pre> 2 3 + chi-square probabilit chi-square probabilit Col Mean- Row Mean + 2 3 + 2 5 alse Disc Reject Ho dunntest Warning: b</pre>	<pre>1 1 1 43.30 1 3 136.50 57 1709.00 + d = 2.856 with y = 0.2398 d with ties = y = 0.1819 Dunn's Pai</pre>	h 2 d.f. 3.409 with 2 d. irwise Compariso (Benjamini-Hock 2 12164 .1604 05) <= FDR/2 with (bh) wrap labeled, option	f. on of iq9 by i uberg) stopping rule nolabel impli	ed	
<pre> 2 3 + chi-square probabilit chi-square probabilit Col Mean- Row Mean + 2 3 5 Alse Disc Reject Ho dunntest Warning: b Kruskal-Ma</pre>	<pre>1 1 13.30 3 136.50 57 1709.00 57 1709.00 </pre>	h 2 d.f. 3.409 with 2 d. irwise Compariso (Benjamini-Hoch 2 12164 .1604 05) <= FDR/2 with (bh) wrap labeled, option	f. on of iq9 by i uberg) stopping rule nolabel impli	ed	
2 3 + chi-square probabilit chi-square probabilit Col Mean- Row Mean + 2 3 False Disc Reject Ho dunntest Warning: k Kruskal-Wa	<pre>1 1 1 3.30 1 3 1 136.50 1 57 1 1709.00 1 </pre>	h 2 d.f. 3.409 with 2 d. irwise Compariso (Benjamini-Hock 2 12164 .1604 05) <= FDR/2 with (bh) wrap labeled, option populations rank	<pre>f. f. on of iq9 by i berg) stopping rule nolabel impli t test</pre>	ed	
<pre> 2 3 + probabilit chi-square probabilit Col Mean Probabilit Col Mean 2 3 Balse Disc Reject Ho . dunntest Warning: b Kruskal-Wa + ied </pre>	<pre>1 1 13.30 3 136.50 57 1709.00 + d = 2.856 with y = 0.2398 d with ties = y = 0.1819 Dunn's Pai 0.000000 0.5000 0.946695 1.61 0.2578 0. overy Rate = 0.0 if p = P(Z <= z) iq10, by(ied) mai y() values are unl llis equality-of-p+ Obs Rank Sum </pre>	h 2 d.f. 3.409 with 2 d. irwise Compariso (Benjamini-Hoch 2 12164 .1604 05) <= FDR/2 with (bh) wrap labeled, option populations rank	f. on of iq9 by i uberg) stopping rule nolabel impli	ed	
<pre> 2 3 +</pre>	<pre>1 1 1 3.30 3 1 136.50 57 1709.00 57 1709.00 </pre>	h 2 d.f. 3.409 with 2 d. irwise Compariso (Benjamini-Hock 2 12164 .1604 05) <= FDR/2 with (bh) wrap labeled, option populations rank	<pre>f. f. m of iq9 by i berg) stopping rule nolabel impli t test</pre>	ed	

```
chi-squared =
                   0.085 with 2 d.f.
    probability =
                  0.9584
1
2
    chi-squared with ties = 0.375 with 2 d.f.
3
    probability = 0.8288
4
5
                   Dunn's Pairwise Comparison of iq10 by ied
6
                     (Benjamini-Hochberg)
7
    Col Mean-|
                 1
    Row Mean |
                                    2
8
       ----+
              _____
9
          2 | 0.000000
10
                0.5000
          11
           3 |
              0.314214 0.535088
12
                0.5650 0.8889
            13
    False Discovery Rate = 0.05
14
    Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
15
     16
17

    Question: For each of the questions, is there a difference in the average response based upon racer or ethnicity

18
19
     . dunntest iq1, by(ieth) ma(bh) wrap
20
21
    Warning: by() values are unlabeled, option nolabel implicit
22
23
    Kruskal-Wallis equality-of-populations rank test
24
25
      +----+
      | ieth | Obs | Rank Sum |
26
       |-----|
27
         1 | 53 | 1744.50 |
         2 | 2 | 36.00 |
3 | 1 | 33.50 |
4 | 4 | 134.00 |
28
29
30
      | 7 | 3 | 68.00 |
31
         -----+
32
    chi-squared =
                  2.110 with 4 d.f.
33
                  0.7155
    probability =
34
                          15.496 with 4 d.f.
    chi-squared with ties =
35
    probability =
                   0.0038
36
37
                   Dunn's Pairwise Comparison of iq1 by ieth
38
                            (Benjamini-Hochberg)
39
    Col Mean-|
40
                                   2
                                               3
                                                             Δ
    Row Mean |
                       1
     _____+____
41
          2 | 3.061273
42
                 <mark>0.0110</mark>
            43
            3 | -0.085671 -1.871072
44
                0.5176 0.0613
            45
            46
           4 | -0.166771 -2.646096 0.000000
                0.5422 <mark>0.0204</mark> 0.5000
47
            48
               2.553091 -0.755791 1.387066 2.097047
           7 |
49
            0.0178 0.3213 0.1379 0.0450
50
    False Discovery Rate = 0.05
51
    Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
52
53
     . dunntest iq2, by(ieth) ma(bh) wrap
54
55
    Warning: by() values are unlabeled, option nolabel implicit
56
57
    Kruskal-Wallis equality-of-populations rank test
58
59
      +----+
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```

1	, 1 53	. 1700						
	55	1/98.	50					
2	2 1	48. 2.	00					
4	4	1 77.	00					
+	3 	90.	+					
1.1	1	F (1)		c				
probabili	ea = ty =	0.229	98 WILN 4 G	• ± •				
- bi-equar	ad wit	h tios -	- 8.10	7 with 4 d f				
probabili	ty =	0.087	7 7	/ with 4 d.i	•			
		Dunn's	B Pairwise	Comparison	of iq2 by iet	h		
Col Mean-	I		(Ben	jamini-Hochb	erg)			
low Mean	ĺ		1	2	3		4	
2	+ 0.	904070						
		0.2614						
3	2.	073966	1.177565					
		0.1904	0.2987					
4	, 1.	856443	0.359560	-1.011444				
		0.1585	0.3596	0.3118				
7	0.	416143	-0.442842	-1.599094	-0.937000			
		0.3763	0.4112	0.1830	0.2906			
alse Dis	covery	Rate =	0.05					
Reject Ho	if p	= P(Z <=	= z) <=]	FDR/2 with s	topping rule			
dunntes	t ia3.	hv(ieth) ma(bb) t	wrap				
dunntes	t iq3,	by(ieth	n) ma(bh) t	wrap				
dunntes Marning: 1	t iq3, >v() v	by(ieth alues ar	n) ma(bh) wa	wrap ed, option n	olabel implic	cit		
dunntes Warning: 1	t iq3, oy() v	by(ieth alues ar	n) ma(bh) n ne unlabele	wrap ed, option n	olabel implic	pit.		
dunntes Warning: 1	t iq3, by() v	by(ieth alues ar	n) ma(bh) t te unlabele	wrap ed, option n	olabel implic	șit.		
dunntes Warning: 1 Kruskal-Wa	t iq3, oy() v allis	by(ieth alues ar equality	n) ma(bh) wa(bh) wa wa unlabele wa of-popula	wrap ed, option n ations rank	olabel implic test	bit		
dunntes Warning: : Kruskal-W +	t iq3, oy() v allis	by(ieth alues ar equality	n) ma(bh) w re unlabele v-of-popula	wrap ed, option n ations rank	olabel implic test	sit		
dunntes Narning: : Kruskal-W + ieth 	t iq3, by() v allis Obs +	by(ieth alues ar equality 	n) ma(bh) w re unlabele y-of-popula + Sum 	wrap ed, option n ations rank	olabel implic	nit.		
dunntes Warning: 1 Kruskal-W + ieth 1	t iq3, by() v allis Obs 53	by(ieth alues ar equality Rank S +	n) ma(bh) w re unlabele r-of-popula + Sum 50	wrap ed, option n ations rank	olabel implic	ait.		
dunntes Warning: 1 Kruskal-W + ieth 1 2 3	t iq3, by() v allis Obs + 53 2 1	by(ieth alues ar equality Rank S + 1761. 14. 38.	n) ma(bh) w re unlabele r-of-popula + Sum 50 50 50	wrap ed, option n ations rank	olabel implic	vit.		
dunntes Warning: Kruskal-W + ieth 1 2 3 4	t iq3, by() v allis Obs 53 2 1 4	by(ieth alues ar equality Rank S + 1761. 14. 38. 120.	n) ma(bh) w re unlabelo r-of-popula + Sum 50 50 50 50	wrap ed, option n ations rank	olabel implic	bit		
dunntes Narning: (ruskal-W + ieth 1 2 3 4 7 +	t iq3, by() v allis Obs + 53 2 1 4 3	by(ieth alues ar equality Rank S + 1761. 14. 38. 120. 81.	n) ma(bh) w re unlabele r-of-popula + Sum 50 50 50 50 50 50 50	wrap ed, option n ations rank	olabel implic	yit (
dunntes Narning: : Kruskal-W + ieth 1 2 3 4 7 +	t iq3, by() v allis Obs 53 2 1 4 3 	by(ieth alues ar equality Rank S + 1761. 14. 38. 120. 81.	n) ma(bh) w re unlabele r-of-popula + Sum 50 50 50 50 50 50 50 50	wrap ed, option n ations rank	olabel implic	2it		
dunntes Varning: : (ruskal-W + ieth 1 2 3 4 7 + chi-squar	t iq3, by() v allis Obs 53 2 1 4 3 ed =	by(ieth alues ar equality Rank S + 1761. 14. 38. 120. 81. 4.269	<pre>n) ma(bh) v re unlabele y-of-popula + Sum 50 50 50 + 50 +</pre>	wrap ed, option n ations rank .f.	olabel implic	vit.		
dunntes Varning: (ruskal-W + ieth 1 2 3 4 7 + chi-squar	t iq3, py() v allis Obs 53 2 1 4 3 ed = ty =	by(ieth alues ar equality Rank S + 1761. 14. 38. 120. 81. 	<pre>n) ma(bh) v re unlabele r-of-popula + Sum 50 50 50 50 50 50 50 50</pre>	wrap ed, option n ations rank .f.	olabel implic	yit.		
dunntes Narning: (ruskal-W + ieth 1 2 3 4 7 + chi-squar chi-squar	t iq3, by() v allis Obs 53 2 1 4 3 ed = ty = ed witt	by(ieth alues ar equality Rank S + 1761. 14. 38. 120. 81. (370 h ties =	<pre>n) ma(bh) v re unlabele v-of-popula + Sum + 50 50 50 50 50 50 50 50 </pre>	wrap ed, option n ations rank .f. 3 with 4 d.f	olabel implic test	yit.		
dunntes Warning: Gruskal-W + ieth 1 2 3 4 7 + chi-squar probabili	t iq3, by() v allis 	by(ieth alues ar equality Rank S + 1761. 14. 38. 120. 81. (0.370) h ties = 0.073	<pre>h) ma(bh) v re unlabele v-of-popula + Sum + 50 50 50 50 50 50 + e with 4 d 28 = 8.563</pre>	wrap ed, option n ations rank .f. 3 with 4 d.f	olabel implic test	21t		
dunntes Warning: Gruskal-W + ieth 1 2 3 4 7 + chi-squar probabili	t iq3, py() v allis Obs + 53 2 1 4 3 ed = ty = ed witt ty =	by(ieth alues ar equality Rank S + 1761. 14. 38. 120. 81. 0.370 h ties = 0.073	<pre>n) ma(bh) v re unlabele y-of-popula + Sum + 50 50 50 .50 .50 .50 + 9 with 4 d 08 = 8.563</pre>	wrap ed, option n ations rank .f. 3 with 4 d.f	olabel implic test	rit.		
dunntes Varning: (ruskal-W + ieth 1 2 3 4 7 + chi-squar probabili	t iq3, py() v allis Obs 53 2 1 4 3 ed = ty = ed witt ty =	by(ieth alues ar equality Rank S + 1761. 14. 38. 120. 81. 0.370 h ties = 0.073 Dunn's	<pre>h) ma(bh) v ce unlabele v-of-popula + Sum 50 50 50 50 50 50 50 50</pre>	wrap ed, option n ations rank .f. 3 with 4 d.f Comparison	olabel implic test of iq3 by iet	h		
dunntes Narning: Kruskal-W + ieth 1 2 3 4 7 + chi-squar probabili chi-squar	t iq3, by() v allis Obs + 53 2 1 4 3 ed = ty = ed witt ty =	by(ieth alues ar equality Rank S + 1761. 14. 38. 120. 81. 0.370 h ties = 0.073 Dunn's	<pre>h) ma(bh) v re unlabelo v-of-popula + Sum + 50 50 50 50 50 50 50 50 </pre>	wrap ed, option n ations rank .f. 3 with 4 d.f Comparison jamini-Hochb	olabel implic test of iq3 by iet erg)	h		
dunntes Warning: Kruskal-W + ieth 1 2 3 4 7 + chi-squar probabili chi-squar probabili	t iq3, by() v allis Obs + 53 2 1 4 3 ed = ty = ed witt ty =	by(ieth alues an equality Rank S + 1761. 14. 38. 120. 81. 81. 20. 0.370 h ties = 0.073 Dunn's	<pre>h) ma(bh) v re unlabele y-of-popula + Sum 50 50 50 50 50 50 50 50</pre>	wrap ed, option n ations rank .f. 3 with 4 d.f Comparison jamini-Hochb 2	olabel implic test of iq3 by iet erg) 3	ch	4	
dunntes Varning: (ruskal-W + ieth 1 2 3 4 7 + cobabili chi-squar probabili chi-squar probabili	t iq3, py() v allis Obs 53 2 1 4 3 ed = ty = ed wit ty = + 2.	by(ieth alues ar equality Rank S + 1761. 14. 38. 120. 81. 0.073 Dunn's Dunn's	<pre>n) ma(bh) v re unlabele y-of-popula sum + 50 50 50 50 50 50 50 50 </pre>	wrap ed, option n ations rank .f. 3 with 4 d.f Comparison jamini-Hochb 2	olabel implic test of iq3 by iet erg) 3	ch	4	
dunntes Varning: (ruskal-W + ieth 2 3 4 7 + chi-squar probabili chi-squar probabili	t iq3, py() v allis Obs 53 2 1 4 3 ed = ty = ed wit ty = 2.	by(ieth alues ar equality Rank S + 1761. 14. 38. 120. 81. 0.073 Dunn's 	<pre>h) ma(bh) v re unlabelo y-of-populo + Sum 50 50 50 50 50 50 50 50</pre>	wrap ed, option n ations rank .f. 3 with 4 d.f Comparison jamini-Hochb 2	olabel implie test of iq3 by iet erg) 3	ch	4	
dunntes Narning: (ruskal-W + ieth 1 2 3 4 4 7 + chi-squar probabili chi-squar probabili chi-squar 2 Col Mean- Nean	t iq3, by() v allis 	by(ieth alues ar equality Rank S + 1761. 14. 38. 120. 81. 0.370 h ties = 0.073 Dunn's 787277 0.0266 402941	<pre>h) ma(bh) v re unlabelo v-of-popula + Sum 50 50 50 50 50 50 50 50</pre>	wrap ed, option n ations rank .f. 3 with 4 d.f Comparison jamini-Hochb 2	olabel implic test of iq3 by iet erg) 3	ht.	4	
dunntes Narning: Kruskal-W + ieth 1 2 3 4 7 + chi-squar probabili chi-squar probabili chi-squar 2 Col Mean- Xow Mean	t iq3, by() v allis Obs + 53 2 1 4 3 ed = ty = ed witt ty = 2. -0.	by(ieth alues ar equality Rank S + 1761. 14. 38. 120. 81. 4.269 0.370 h ties = 0.073 Dunn's 	<pre>h) ma(bh) v re unlabele v-of-popula 50 50 50 50 50 50 50 50 </pre>	wrap ed, option n ations rank .f. 3 with 4 d.f Comparison jamini-Hochb 2	olabel implic test of iq3 by iet erg) 3	ch	4	
dunntes Warning: Kruskal-W + ieth 1 2 3 4 7 + chi-squar probabili chi-squar probabili chi-squar 2 Col Mean- Cow Mean 2 3	t iq3, py() v allis Obs 53 2 1 4 3 ed = ty = ed wit ty = 2. -0.	by(ieth alues ar equality Rank S + 1761. 14. 38. 120. 81. 4.269 0.370 h ties = 0.073 Dunn's 787277 0.0266 402941 0.3817	<pre>h) ma(bh) w re unlabele y-of-popula 50 50 50 50 50 50 50 50 </pre>	wrap ed, option n ations rank .f. 3 with 4 d.f Comparison jamini-Hochb 2	olabel implic test of iq3 by iet erg) 3	ch	4	
dunntes Warning: Kruskal-W + ieth 1 2 3 4 7 + chi-squar probabili chi-squar brobabili chi-squar 2 Col Mean 2 3 4	t iq3, py() v allis Obs + 53 2 1 4 3 ed = ty = ed wit ty = -0.	by(ieth alues ar equality Rank S + 1761. 14. 38. 120. 81. 0.370 h ties = 0.073 Dunn's 	<pre>h) ma(bh) w re unlabelo y-of-populo 50 50 50 50 50 50 50 50 </pre>	wrap ed, option n ations rank .f. 3 with 4 d.f Comparison jamini-Hochb 2 0.587402 0.3978	olabel implie test of iq3 by iet erg) 3	ch	4	
dunntes Narning: Kruskal-W + ieth 1 2 3 4 4 7 + chi-squar probabili chi-squar probabili chi-squar 2 3 4	t iq3, by() v allis Obs + 53 2 1 4 3 ed = ty = ed witt ty = 2. -0. 0. 0. 1 1 2 1 1 2 1 1 2 1 1 2 1 1 1 2 1 1 2 1 1 1 1 1 1 1 1	by(ieth alues ar equality Rank S + 1761. 14. 38. 120. 81. 0.370 h ties = 0.073 Dunn's 	<pre>h) ma(bh) w re unlabelo + Sum + 50 50 50 50 50 50 50 50 </pre>	wrap ed, option n ations rank .f. 3 with 4 d.f Comparison jamini-Hochb 2 0.587402 0.3978	olabel implic test of iq3 by iet erg) 3	ch	4	
dunntes Narning: Kruskal-W + ieth 1 2 3 4 4 7 chi-squar probabili chi-squar probabili chi-squar probabili chi-squar 2 3 4 7	t iq3, by() v allis Obs 53 2 1 4 3 ed = ty = ed wit ty = -0. 0. 0. 0.	by(ieth alues ar equality Rank S + 1761. 14. 38. 120. 81. 4.269 0.370 h ties = 0.073 Dunn's 787277 0.0266 402941 0.3817 482159 0.3936 790144 0.4294	<pre>h) ma(bh) v re unlabelo y-of-popula + Sum 50 50 50 50 50 50 50 50</pre>	wrap ed, option n ations rank .f. 3 with 4 d.f Comparison jamini-Hochb 2 0.587402 0.3978 0.758333 0 3735	<pre>olabel implic test of iq3 by iet erg) </pre>	ch	4	
dunntes Narning: Kruskal-W + ieth 1 2 3 4 7 + chi-squar probabili chi-squar probabili chi-squar probabili Col Mean- 2 3 4 7	t iq3, by() v allis 	by(ieth alues an equality Rank S +	<pre>h) ma(bh) w re unlabels y-of-populs 50 50 50 50 50 50 50 50 </pre>	wrap ed, option n ations rank .f. 3 with 4 d.f Comparison jamini-Hochb 2 0.587402 0.3978 0.758333 0.3735	olabel implic test of iq3 by iet erg) 3 0.286623 0.3872	ch	4	

```
Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
1
2
     . dunntest iq4, by(ieth) ma(bh) wrap
3
4
     Warning: by() values are unlabeled, option nolabel implicit
5
6
     Kruskal-Wallis equality-of-populations rank test
7
       +----+
8
       | ieth | Obs | Rank Sum |
9
       |-----
10
           1 | 53 | 1803.00 |
           2 |
                2 |
                      22.00
11
           3 | 1 | 41.50
12
           4 | 4 | 95.00 |
7 | 3 | 54.50 |
13
           ------
14
15
     chi-squared = 6.055 with
probability = 0.1951
                     6.055 with 4 d.f.
16
17
     chi-squared with ties =
                              9.464 with 4 d.f.
18
     probability =
                      0.0505
19
20
                     Dunn's Pairwise Comparison of iq4 by ieth
21
                               (Benjamini-Hochberg)
22
     Col Mean-|
                                       2
                                                                  4
     Row Mean |
                         1
                                                    3
23
     ----+-
                _____
24
           2 | 2.179479
25
             0.1465
             26
                -0.505482 -1.698444
           3 |
27
                 0.3407
                           0.1490
             28
             4 |
                 1.350673 -1.004099 1.082780
29
                  0.1768
                          0.2252
                                     0.2324
             30
31
           7 |
                 1.821760 -0.535433 1.378175
                                                0.498577
                  0.1712
                           0.3702
                                      0.2102
                                                  0.3090
32
             33
     False Discovery Rate = 0.05
34
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
35
36
     . dunntest iq5, by(ieth) ma(bh) wrap
37
38
     Warning: by() values are unlabeled, option nolabel implicit
39
40
     Kruskal-Wallis equality-of-populations rank test
41
          -----+
42
       | ieth | Obs | Rank Sum |
43
       1 | 53 | 1808.50
44
          2 | 2 | 39.50
3 | 1 | 7.50
       45
                       7.50
46
           4 | 4 | 148.00
47
           7 | 3 | 12.50 |
       +----+
48
     chi-squared = 10.605 with 4 d.f.
probability = 0.0314
49
50
51
     chi-squared with ties =
                              26.277 with 4 d.f.
52
     probability = 0.0001
53
54
                     Dunn's Pairwise Comparison of iq5 by ieth
55
                              (Benjamini-Hochberg)
56
     Col Mean-
     Row Mean |
                                       2
                                                    3
                          1
                                                                  4
57
                              -----
        ____+
58
           2 | 1.713447
59
                 0.0866
             For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml
60
```

$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	 3 	2.264929 0.858920 0.0294 0.2440
7 4.334614 1.465931 0.247897 3.691637 Biget Ho if $p = P(2 < (z) < FDR/2 with stopping rule dunntest iq6, by(ieth) ma(bh) wrap arning: by() values are unlabeled, option nolabel implicit ruskal-Wallis equality-of-populations rank test i ieth Obs Rank Sum i ieth Obs Rank Sum i i + 52 1672.00 2 2 54.50 3 1 41.50 4 4 1 166.00 7 3 1 41.50 4 4 1 166.00 7 3 3 0.1094 Dunn's Pairwise Comparison of iq6 by ieth (Renjamini-Mochberg) Dunn's Pairwise Comparison of iq6 by ieth (Renjamini-Mochberg) J 0.459251 0.3326 0.3089 3 -0.624727 - 0.785168 0.3266 0.3089 4 -1.215526 - 1.110396 0.000000 (0.2242 0.2224 0.50506 3.107180 0.3262 0.5626 0.05526 3.107180 0.0564 0.0564 0.0566 1.0566 1.05526 3.107180 0.0264 0.05526 3.107180 1 0.326 0.526 0.05526 3.107180 1 0.326 0.526 0.05526 3.107180 1 0.326 0.1526 0.05526 3.107180 1 0.058 0.1526 0.05526 3.107180 1 0.058 0.1526 0.05526 3.107180 1 0.0564 0.0566 0.0$	4	-0.476526 -1.710491 -2.265841 0.3521 0.0726 0.0391
also Discovery Nate = 0.05 eject Ho if $p = P(2 \ll z) \ll FDR/2$ with stopping rule dunntest iq6, by(ieth) ma(bh) wrap arning: by() values are unlabeled, option nolabel implicit ruskal-Wallis equality-of-populations rank test +	 7 	4.334614 1.465931 0.247897 3.691637 0.0001 0.1019 0.4021 0.0006
<pre>dunntest 1q6, by(ieth) ma(bh) wrap arning: by() values are unlabeled, option nolabel implicit ruskal-Wallis equality-of-populations rank test +</pre>	False Disc Reject Ho	vovery Rate = 0.05 if $p = P(Z \le z) \le FDR/2$ with stopping rule
<pre>duminest 195, By(leth) ma(bh) Wap arning: by() values are unlabeled, option nolabel implicit ruskal-Wallis equality-of-populations rank test +</pre>		
<pre>http://www.setup.org/operations/operation/operations/operatio</pre>	Warning h	Ido, by (leth) ma(bh) wiap
<pre>ruskal-Wallis equality-of-populations rank test +</pre>	warning. D	y() values are unlabeled, operon notabel implicit
<pre>ideth Obs Rank Sum ieth Obs Rank Sum 2 2 54.50 3 1 41.50 4 4 166.00 7 3 19.00 7 2.93389 1 2 3 0.0245 Dunn's Pairwise Comparison of iq6 by ieth (Henjamini-Hochberg) Mean 1 2 3 0.3889 3 -0.624727 -0.735168 0.3326 0.3088 1 -1.215526 -1.110396 0.000000 0.2242 0.2224 0.5000 0.0094 0.1526 0.0664 0.0094 alse Discovery Rate = 0.05 aject Ho if p = P(Z <= z) <= FDR/2 with stopping rule dunntest iq7, by(ieth) ma(bh) wrap arning: by() values are unlabeled, option nolabel implicit ruskal-Wallis equality-of-populations rank test +</pre>	Kruskal-Wa	llis equality-of-populations rank test
<pre></pre>	+ ieth	Obs Rank Sum
<pre> 2 2 54.50 3 1 41.50 4 4 166.00 7 3 19.00 +</pre>	+	
<pre>1 4 4 1 4 1 66.00 1 4 4 1 66.00 1 7 3 1 9.00 hi-squared = 7.553 with 4 d.f. robability = 0.1094 hi-squared with ties = 11.196 with 4 d.f. robability = 0.0245 Dunn's Pairwise Comparison of iq6 by ieth (Benjamini-Hochberg) bl Mean-1 2 0.459251 1 0.3589 3 -0.624727 -0.785168 0 0.3266 0.3088 4 -1.215526 -1.110396 0.000000 1 0.2242 0.2224 0.5000 7 2 .934536 1.546239 2.055206 3.107180 0 0.0084 0.1526 0.0664 0.0094 alse Discovery Rate = 0.05 eject Ho if p = P(2 <= z) <= FDR/2 with stopping rule dunntest iq7, by(ieth) ma(bh) wrap arning: by() values are unlabeled, option nolabel implicit ruskal-Wallis equality-of-populations rank test +</pre>		2 54.50
<pre>1 7 1 3 19.00 +</pre>	3	4 166.00
hi-squared = 7.553 with 4 d.f. robability = 0.1094 hi-squared with ties = 11.196 with 4 d.f. robability = 0.0245 Dunn's Pairwise Comparison of iq6 by leth (Benjamini-Rochberg) ol Mean-1 0 Mean-1 2 0.459251 1 0.3589 3 -0.624727 -0.785168 0 0.3326 0.3088 4 -1.215526 -1.110396 0.000000 1 0.2242 0.2224 0.5000 7 2.934536 1.546239 2.055206 3.107180 0 0.0084 0.1526 0.0664 0.0094 alse Discovery Rate = 0.05 eject Ho if p = P(2 <= z) <= FDR/2 with stopping rule dunntest iq7, by(ieth) ma(bh) wrap arning: by() values are unlabeled, option nolabel implicit ruskal-Wallis equality-of-populations rank test +	7 +	3 19.00
<pre>robability = 0.1094 hi-squared with ties = 11.196 with 4 d.f. robability = 0.0245 Dunn's Pairwise Comparison of iq6 by ieth (Benjamini-Hochberg) of Mean- ww Mean 1 2 3 4 2 0.459251 0.3589 3 -0.624727 -0.785168 0.3326 0.3088 4 -1.215526 -1.110396 0.000000 0.2242 0.5200 3.107180 0.0084 0.1526 0.0664 0.0094 alse Discovery Rate = 0.05 eject Ho if p = P(Z <= z) <= FDR/2 with stopping rule dunntest iq7, by(ieth) ma(bh) wrap arning: by() values are unlabeled, option nolabel implicit ruskal-Wallis equality-of-populations rank test +</pre>	chi-square	d = 7.553 with 4 d.f.
hi-squared with ties = 11.196 with 4 d.f. robability = 0.0245 Dunn's Pairwise Comparison of iq6 by ieth (Benjamini-Hochberg) ol Mean- ow Mean 1 2 3 4 2 0.459251 0.3589 3 -0.624727 -0.785168 0.3326 0.3088 4 -1.215526 -1.110396 0.000000 0.2242 0.2224 0.5000 7 2.934536 1.546239 2.055206 3.107180 0.0084 0.1526 0.0664 0.0094 alse Discovery Rate = 0.05 eject Ho if p = P(Z <= z) <= FDR/2 with stopping rule dunntest iq7, by(ieth) ma(bh) wrap arning: by() values are unlabeled, option nolabel implicit ruskal-Wallis equality-of-populations rank test +	probabilit	y = 0.1094
Dunn's Pairwise Comparison of iq6 by ieth (Benjamini-Hochberg) of Mean- ow Mean 1 2 3 4 2 0.459251 0.3589 3 -0.624727 -0.785168 0.3326 0.3088 4 -1.215526 -1.110396 0.000000 0.2242 0.2224 0.5000 7 2.934536 1.546239 2.055206 3.107180 0.0084 0.1526 0.0664 0.0094 alse Discovery Rate = 0.05 aject Ho if p = P(2 <= z) <= FDR/2 with stopping rule dunntest iq7, by(ieth) ma(bh) wrap arning: by() values are unlabeled, option nolabel implicit ruskal-Wallis equality-of-populations rank test +	chi-square probabilit	d with ties = 11.196 with 4 d.f.
Dunn's Pairwise Comparison of iq6 by ieth (Benjamini-Hochberg) ow Mean 1 2 3 4 2 0.459251 0.3589 3 -0.624727 -0.785168 0.3326 0.3088 4 -1.215526 -1.110396 0.000000 0.2242 0.2224 0.5000 7 2.934536 1.546239 2.055206 3.107180 0.0084 0.1526 0.0664 0.0094 alse Discovery Rate = 0.05 aject Ho if p = P(Z <= z) <= FDR/2 with stopping rule dunntest iq7, by(ieth) ma(bh) wrap arning: by() values are unlabeled, option nolabel implicit ruskal-Wallis equality-of-populations rank test +	probabilit	
bl Mean-1 ow Mean 1 2 3 4 2 0.459251 0.3589 3 -0.624727 -0.785168 0.3326 0.3088 4 -1.215526 -1.110396 0.000000 0.2242 0.2224 0.5000 7 2.934536 1.546239 2.055206 3.107180 0.0084 0.1526 0.0664 0.0094 alse Discovery Rate = 0.05 eject Ho if p = P(Z <= z) <= FDR/2 with stopping rule dunntest iq7, by(ieth) ma(bh) wrap arning: by() values are unlabeled, option nolabel implicit ruskal-Wallis equality-of-populations rank test ++ ieth Obs Rank Sum + 1 53 1815.00 2 2 47.00 3 1 15.00 4 4 4 77.00 + hi-squared = 5.167 with 4 d.f. cobability = 0.2705		Dunn's Pairwise Comparison of iq6 by ieth
<pre>ow Mean 1 2 3 4</pre>	Col Mean-	(Benjamini-Hochberg)
<pre>2 0.459251</pre>	Row Mean +	1 2 3 4
<pre>3 -0.624727 -0.785168 0.3326 0.3088 4 -1.215526 -1.110396 0.000000 0.2242 0.2224 0.5000 7 2.934536 1.546239 2.055206 3.107180 0.0084 0.1526 0.0664 0.0094 alse Discovery Rate = 0.05 aject Ho if p = P(2 <= z) <= FDR/2 with stopping rule dunntest iq7, by(ieth) ma(bh) wrap arning: by() values are unlabeled, option nolabel implicit ruskal-Wallis equality-of-populations rank test ++ ieth Obs Rank Sum + 1 53 1815.00 2 2 47.00 3 1 15.00 4 4 77.00 7 3 62.00 7 3 62.00 +</pre>	2	0.459251
<pre>3 0.02472 -0.78308 0.3326 0.3088 4 -1.215526 -1.110396 0.000000 1 0.2242 0.2224 0.5000 7 2.934536 1.546239 2.055206 3.107180 0.0084 0.1526 0.0664 0.0094 alse Discovery Rate = 0.05 aject Ho if p = P(Z <= z) <= FDR/2 with stopping rule dunntest iq7, by(ieth) ma(bh) wrap arning: by() values are unlabeled, option nolabel implicit ruskal-Wallis equality-of-populations rank test ++ ieth Obs Rank Sum + 1</pre>	2	0.024707 0.705169
<pre>4 -1.215526 -1.110396 0.00000 0.2242 0.2224 0.5000 7 2.934536 1.546239 2.055206 3.107180 0.0084 0.1526 0.0664 0.0094 alse Discovery Rate = 0.05 eject Ho if p = P(Z <= z) <= FDR/2 with stopping rule dunntest iq7, by(ieth) ma(bh) wrap arning: by() values are unlabeled, option nolabel implicit ruskal-Wallis equality-of-populations rank test ++ ieth Obs Rank Sum +</pre>	5	0.3326 0.3088
<pre> 0.2242 0.2224 0.5000 7 2.934536 1.546239 2.055206 3.107180 0.0084 0.1526 0.0664 0.0094 alse Discovery Rate = 0.05 eject Ho if p = P(Z <= z) <= FDR/2 with stopping rule dunntest iq7, by(ieth) ma(bh) wrap arning: by() values are unlabeled, option nolabel implicit ruskal-Wallis equality-of-populations rank test ++ ieth Obs Rank Sum ++ ieth Obs Rank Sum ++ i 1 53 1815.00 1 2 2 47.00 1 3 1 15.00 1 4 4 77.00 1 7 3 62.00 ++ ni-squared = 5.167 with 4 d.f. robability = 0.2705</pre>	4	-1.215526 -1.110396 0.000000
<pre>7 2.934536 1.546239 2.055206 3.107180 0.0084 0.1526 0.0664 0.0094 alse Discovery Rate = 0.05 eject Ho if p = P(Z <= z) <= FDR/2 with stopping rule dunntest iq7, by(ieth) ma(bh) wrap arning: by() values are unlabeled, option nolabel implicit ruskal-Wallis equality-of-populations rank test ++ ieth Obs Rank Sum + 1 53 1815.00 2 2 47.00 3 1 15.00 4 4 77.00 7 3 62.00 ++ ni-squared = 5.167 with 4 d.f. robability = 0.2705</pre>		0.2242 0.2224 0.5000
<pre>alse Discovery Rate = 0.05 eject Ho if p = P(Z <= z) <= FDR/2 with stopping rule dunntest iq7, by(ieth) ma(bh) wrap arning: by() values are unlabeled, option nolabel implicit ruskal-Wallis equality-of-populations rank test ++ ieth Obs Rank Sum ++ ieth Obs Rank Sum ++ 1 53 1815.00 2 2 47.00 3 1 15.00 4 4 77.00 7 3 62.00 ++ ni-squared = 5.167 with 4 d.f. robability = 0.2705</pre>	7	2.934536 1.546239 2.055206 3.107180 0.0084 0.1526 0.0664 0.0094
<pre>eject Ho if p = P(Z <= z) <= FDR/2 with stopping rule dunntest iq7, by(ieth) ma(bh) wrap arning: by() values are unlabeled, option nolabel implicit ruskal-Wallis equality-of-populations rank test ++ ieth Obs Rank Sum ++</pre>	False Disc	covery Rate = 0.05
<pre>dunntest iq7, by(ieth) ma(bh) wrap arning: by() values are unlabeled, option nolabel implicit ruskal-Wallis equality-of-populations rank test ++ ieth Obs Rank Sum ++</pre>	Reject Ho	if $p = P(Z \le z) \le FDR/2$ with stopping rule
<pre>arning: by() values are unlabeled, option nolabel implicit ruskal-Wallis equality-of-populations rank test ++ i ieth Obs Rank Sum +</pre>	. dunntest	. iq7, by(ieth) ma(bh) wrap
<pre>ruskal-Wallis equality-of-populations rank test ++ ieth Obs Rank Sum +</pre>	Warning: b	y() values are unlabeled, option nolabel implicit
<pre>ruskal-Wallis equality-of-populations rank test ++ ieth Obs Rank Sum + 1 53 1815.00 2 2 47.00 3 1 15.00 4 4 77.00 7 3 62.00 ++ ni-squared = 5.167 with 4 d.f. robability = 0.2705</pre>	-	
<pre>++ ieth Obs Rank Sum + 1 53 1815.00 2 2 47.00 3 1 15.00 4 4 77.00 7 3 62.00 ++ ni-squared = 5.167 with 4 d.f. robability = 0.2705</pre>	Kruskal-Wa	llis equality-of-populations rank test
<pre> + 1 53 1815.00 2 2 47.00 3 1 15.00 4 4 77.00 7 3 62.00 ++ ni-squared = 5.167 with 4 d.f. robability = 0.2705</pre>	+ ieth	Obs Rank Sum
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	+	
3 1 15.00 4 4 77.00 7 3 62.00 ++ hi-squared = 5.167 with 4 d.f. robability = 0.2705		2 47.00
hi-squared = 5.167 with 4 d.f. robability = 0.2705	3	
++ hi-squared = 5.167 with 4 d.f. robability = 0.2705		3 62.00
hi-squared = 5.167 with 4 d.f. robability = 0.2705	+	
robability = 0.2705	chi-emiara	+
	cur square	d = 5.167 with 4 d.f.

		Dunn's	Pairwise (Benj	Comparison amini-Hochk	of iq7 by erg)	ieth		
Col Mea: Row Mea:	n- n		1	2	3		4	
	2 0.	949225 0.4281				-		
	3 1. 	213236 0.3751	0.441625 0.6588					
	4 1. 	840200 0.3287	0.312276 0.5392	-0.241888 0.5055				
	7 1. 	455928 0.3635	0.197500 0.4686	-0.312276 0.6290	-0.118029 0.4530))		
False D. Reject 1	iscovery Ho if p	7 Rate = = P(Z <=	0.05	DR/2 with s	stopping ru	ıle		
•	-							
. dunnt	est iq8,	by(ieth) ma(bh) w	vrap				
Warning	: by() v	values ar	e unlabele	ed, option r	olabel imp	olicit		
Kruskal	-Wallis	equality	-of-popula	tions rank	test			
+			+					
iet	h Obs +	Rank S	um 					
	1 53	1804.	00					
	2 2 3 1	48.	50					
	4 4	1 92	EO 1					
i '	7 3	44.	00					
 +	7 3	44.	00 +					
 +	7 3 ared =	7.123	00 + with 4 d.	f.				
 + chi-squ probabi	7 3 ared = lity =	7.123 0.129	00 + with 4 d. 5	f.				
chi-squ probabi	7 3 ared = lity = ared wit	7.123 0.129	with 4 d. 5 8.202	f. 2 with 4 d.f				
chi-squ probabi chi-squ probabi	7 3 ared = lity = ared wit lity =	7.123 0.129	with 4 d. 5 8.202	f. 2 with 4 d.f	·.			
chi-squ probabi chi-squ probabi	7 3 lity = ared wit lity =	7.123 0.129 Ch ties = 0.084	00 + with 4 d. 5 8.202 5 Pairwise (Benj	f. 2 with 4 d.f Comparison amini-Hochk	of iq8 by berg)	ieth		
chi-squ probabi chi-squ probabi Col Mea: Row Mea:	7 3 lity = ared wit lity = n- n	7.123 0.129 Ch ties = 0.084	<pre>>00 + with 4 d. 5 8.202 5 Pairwise (Benj 1</pre>	f. 2 with 4 d.f Comparison amini-Hochk 2	of iq8 by berg) 3	ieth	4	
chi-squ probabi chi-squ probabi Col Mea Row Mea	7 3 ared = lity = ared wit lity = n 2 1.	7.123 0.129 Ch ties = 0.084 Dunn's 669101 0.1189	00 + with 4 d. 5 8.202 5 Pairwise (Benj 1	f. 2 with 4 d.f Comparison amini-Hochk 2	of iq8 by berg) 3	ieth	4	
chi-squ probabi chi-squ probabi Col Mea Row Mea	7 3 ared = lity = ared wit lity = n- n -+ l 3 -0.	7.123 0.129 Ch ties = 0.084 Dunn's 669101 0.1189 838757 0.2869	<pre>30 00 + with 4 d. 5 8.202 9airwise (Benj 11.672942 0.1572</pre>	f. 2 with 4 d.f Comparison amini-Hochk 2	of iq8 by berg) 3	ieth -	4	
l + probabi chi-squ probabi Col Mea: Row Mea:	7 3 ared = lity = ared wit lity = n 2 1. 3 -0. 4 1.	7.123 0.129 Ch ties = 0.084 Dunn's 669101 0.1189 838757 0.2869 232034 0.1816	<pre>30 00 + with 4 d. 5 8.202 Pairwise (Benj 11.672942 0.1572 -0.650622 0.3221</pre>	f. 2 with 4 d.f Comparison amini-Hochk 2 1.328647 0.1840	of iq8 by berg) 3	ieth	4	
 + probabi chi-squ probabi Col Mea Row Mea	7 3 ared = lity = ared wit lity = 1 2 1. 3 -0. 4 1. 7 1.	7.123 0.129 ch ties = 0.084 Dunn's 669101 0.1189 838757 0.2869 232034 0.1816 910806 0.2801	<pre>>30 00 + with 4 d. 5</pre>	f. 2 with 4 d.f Comparison amini-Hochk 2 1.328647 0.1840 1.715276 0.2157	of iq8 by berg) 3 0.648313 0.2871	ieth -	4	
chi-squ probabi chi-squ probabi Col Mea Row Mea 	7 3 ared = lity = ared wit lity = 1 1 1 1 3 -0. 4 1. 7 1. iscovery Ho if p	7.123 0.129 ch ties = 0.084 Dunn's Dunn's 838757 0.2869 232034 0.1816 910806 0.2801 7 Rate = = P(Z <=	<pre>30 00 + with 4 d. 5 8.202 Pairwise (Benj 1 -1.672942 0.1572 -0.650622 0.3221 -0.074816 0.4702 0.05 z) <= F</pre>	f. 2 with 4 d.f Comparison amini-Hochk 2 1.328647 0.1840 1.715276 0.2157 CDR/2 with s	<pre>c. c. of iq8 by perg)</pre>	ieth -	4	
chi-squ probabi chi-squ probabi Col Mea Row Mea 	7 3 ared = lity = ared wit lity = 1 2 1. 3 -0. 4 1. 1 7 1. iscovery Ho if p	7.123 0.129 ch ties = 0.084 Dunn's 0.1189 838757 0.2869 232034 0.1816 910806 0.2801 7 Rate = = P(Z <= by(jeth)	<pre>>00 + with 4 d. 5</pre>	f. 2 with 4 d.f Comparison amini-Hochk 2 1.328647 0.1840 1.715276 0.2157 FDR/2 with s	of iq8 by berg) 3 0.648313 0.2871 stopping ru	ieth	4	
chi-squ probabi chi-squ probabi Col Mea Row Mea 	7 3 ared = lity = ared wit lity = ared wit 1 1 3 -0. 4 1. 1 7 1. iscovery Ho if p est iq9, . by() .	<pre>7</pre>	<pre>30 00 + with 4 d. 5 8.202 Pairwise (Benj 11.672942 0.1572 -0.650622 0.3221 -0.074816 0.4702 0.05 z) <= F) ma(bh) w e unlabelo</pre>	f. 2 with 4 d.f Comparison amini-Hochk 2 1.328647 0.1840 1.715276 0.2157 FDR/2 with s	of iq8 by berg) 3 0.648313 0.2871 stopping ru	ieth 	4	
chi-squ probabi chi-squ probabi Col Mea Row Mea 	7 3 ared = lity = ared with lity = 1	<pre>7</pre>	<pre>30 00 + with 4 d. 5 8.202 Pairwise (Benj 11.672942 0.1572 -0.650622 0.3221 -0.074816 0.4702 0.05 z) <= F) ma(bh) w e unlabele</pre>	f. 2 with 4 d.f Comparison amini-Hochk 2 1.328647 0.1840 1.715276 0.2157 CDR/2 with s Vrap ed, option r	of iq8 by berg) 3 0.648313 0.2871 stopping ru	ieth - Bl hle	4	

+	3	61.50	 -+					
chi-square probabilit	ed = cy =	2.026 w 0.7310	ith 4 d.	f.				
chi-square probabilit	ed with t ty =	ies = <mark>0.6601</mark>	2.414	with 4 d.f	•			
	D	unn's P	airwise (Benj	Comparison amini-Hochb	of iq9 by erg)	ieth		
Col Mean- Row Mean		1		2	3		4	
2	0.355	651 018				-		
3	0.607	788 0 055	.291742 0.5503					
4	0.709	405 0 000	.128933 0.4986	-0.219717 0.5163				
7	1.284 0.9	614 0 946	.554503 0.7240	0.128933 0.4487	0.516563	5		
False Disc Reject Ho	covery Ra if p = P	te = (Z <=	0.05 z) <= F	DR/2 with s	topping ru	ıle		
•			(1.1.)					
				1.722 2 22				
. dunntest	: iq10, b	y(ieth)	ma (pn)	wrap				
. dunntest Warning: k	: iq10, b >y() valu	y(ieth) es are	unlabele	d, option n	olabel imp	olicit		
. dunntest Warning: k	t iq10, b	y(ieth) es are	unlabele	d, option n	olabel imp	olicit		
. dunntest Warning: k Kruskal-Wa	z iq10, b by() valu Allis equ	y(ieth) es are ality-o	na(bh) unlabele f-popula	d, option n tions rank	olabel imp test	olicit		
. dunntest Warning: k Kruskal-Wa +	iq10, b by() valu illis equ	y(ieth) es are ality-o	na(bn) unlabele f-popula -+	d, option n tions rank	dolabel imp	olicit		
. dunntest Warning: k Kruskal-Wa + ieth 	z iq10, b py() valu allis equ 	y(ieth) es are ality-o ank Sum	na(Bh) unlabele f-popula -+	d, option n tions rank	olabel imp	olicit		
. dunntest Warning: k Kruskal-Wa + ieth 1 2	z iq10, b by() valu allis equ Obs R 	y(ieth) es are ality-o ank Sum 1700.00 70 00	<pre>ma(bh) unlabele f-popula -+ a - </pre>	d, option n tions rank	olabel imp	olicit		
. dunntest Warning: k Kruskal-Wa + ieth 1 2 3	<pre>c iq10, b cy() valu allis equ</pre>	y(ieth) es are ality-o ank Sum 1700.00 70.00 35.00	<pre>ma(bh) unlabele f-popula -+ a </pre>	d, option n tions rank	olabel img	olicit		
. dunntest Warning: k Kruskal-Wa + ieth 1 2 3 4 4	<pre>c iq10, b cy() valu allis equ</pre>	y(ieth) es are ality-o ank Sum 1700.00 70.00 35.00 140.00	<pre>ma(bh) unlabele f-popula -+ - </pre>	d, option n tions rank	olabel imp	olicit		
. dunntest Warning: k Kruskal-Wa + ieth 1 2 3 4 7 +	c iq10, b by() valu allis equ Obs R 53 2 1 4 3	y(ieth) es are ality-o ank Sum 1700.00 70.00 35.00 140.00 71.00	<pre>ma(bh) unlabele f-popula -+ a - -+</pre>	d, option n tions rank	lolabel img test	olicit		
. dunntest Warning: k Kruskal-Wa + ieth 1 2 3 4 7 7 +	<pre>c iq10, b cy() valu allis equ</pre>	y(ieth) es are ality-o 1700.00 70.00 35.00 140.00 71.00 	<pre>ma(bh) unlabele f-popula -+ - -+ -+</pre>	d, option n tions rank	olabel img	olicit		
Aunntest Warning: k Kruskal-Wa ieth 1 2 3 4 7 4 7 + chi-square probabilit	<pre>c iq10, b cy() valu allis equ</pre>	<pre>y(ieth) es are ality-oank Sum1700.00 70.00 35.00 140.00 71.000 0.808 w 0.9373</pre>	<pre>ma(bh) unlabele f-popula -+ - -+ -+ -+ -+ -+ -+ -+ -+ -+ -+ -+ -+ -+</pre>	d, option n tions rank f.	dolabel imp	olicit		
<pre>Advantest Warning: k Kruskal-Wa t i ieth i i 1 i 2 i 3 i 4 i 7 t chi-square probabilit</pre>	<pre>c iq10, b cy() valu allis equ</pre>	y(ieth) es are ality-o ank Sum 1700.00 70.00 35.00 140.00 71.00 0.808 w 0.9373 ies =	<pre>ma(bh) unlabele f-popula -+ -+</pre>	<pre>d, option n tions rank f. with 4 d f</pre>	olabel img test	olicit		
<pre>Aunntest Warning: k Kruskal-Wa + ieth 1 2 3 4 7 + chi-square probabilit</pre>	<pre>c iq10, b cy() valu allis equ allis equ</pre>	<pre>y(ieth) es are ality-o ank Sum 1700.00</pre>	<pre>ma(bh) unlabele f-popula -+ - + ith 4 d. 3.122</pre>	d, option n tions rank f. with 4 d.f	test	olicit		
Varning: k Varning: k Kruskal-Wa + ieth 2 3 4 7 + chi-square probabilit	<pre>c iq10, b cy() valu allis equ allis equ</pre>	<pre>y(ieth) es are ality-oank Sum 1700.00 70.00 140.00 71.000.808 w 0.9373 ies = 0.5376 unn's P</pre>	<pre>ma(bh) unlabele f-popula -+ i </pre>	d, option n tions rank f. with 4 d.f Comparison amini-Hochb	of iq10 by verg)	plicit y ieth		
Aunntest Warning: k Kruskal-Wa i eth i eth i 1 2 3 4 7 	<pre>c iq10, b cy() valu allis equ allis equ</pre>	<pre>y(ieth) es are ality-oank Sum 1700.00 70.00 35.00 140.00 71.00 0.808 w 0.9373 ies = 0.5376 unn's P1</pre>	<pre>ma(bh) unlabele f-popula -+ - - - - -+ -+ -+ -+ -+ -+ -+ -+ -+ -+ -+ -+ -+</pre>	d, option n tions rank f. with 4 d.f Comparison amini-Hochb 2	olabel imp test of iq10 by berg) 3	plicit y ieth	4	
Aunntest Warning: k Kruskal-Wa ieth l i ieth l i 2 i 3 i 4 i 7 t chi-square probabilit chi-square probabilit	<pre>c iq10, b cy() valu allis equ allis equ</pre>	<pre>y(ieth) es are ality-oank Sum1700.00 70.00 140.00 71.000.808 w 0.9373 ies = 0.5376 unn's P1 279 528</pre>	<pre>ma(bh) unlabele f-popula -+ -+</pre>	d, option n tions rank f. with 4 d.f Comparison amini-Hochb 2	olabel imp test of iq10 by berg) 3	y ieth	4	
Aunntest Warning: k Kruskal-Wa i eth i eth i 2 i 3 i 4 j 7 t chi-square probabilit chi-square probabilit Col Mean	<pre>c iq10, b cy() valu allis equ allis equ</pre>	<pre>y(ieth) es are ality-oank Sum 1700.00 70.00 70.00 71.00 71.00 0.808 w 0.9373 ies = 0.5376 unn's P 1 279 528 626 0 401</pre>	<pre>ma(bh) unlabele f-popula -+ - - - - -+ -+++</pre>	d, option n tions rank f. with 4 d.f Comparison amini-Hochk 2	olabel imp test of iq10 by 	y ieth	4	
Aunntest Warning: k Kruskal-Wa ieth i ieth i 2 3 4 7 + chi-square probabilit Col Mean- Row Mean 2 3 4	<pre>c iq10, b cy() valu allis equ allis equ</pre>	<pre>y(ieth) es are ality-oank Sum 1700.00 70.00 140.00 71.00 0.808 w 0.9373 ies = 0.5376 unn's P 1 279 528 626 0 401 682 0 454</pre>	<pre>ma(bh) unlabele f-popula -+ i </pre>	d, option n tions rank f. with 4 d.f Comparison amini-Hochk 2 0.000000 0.5000	olabel imp test of iq10 by werg) 3	y ieth	4	

1

2 Question – For each of the questions, 1-10, is there a difference in the average response if respondent is or was a 3 . 4 hospital worker? 5 6 . dunntest iq1, by(ihwork) ma(bh) wrap 7 8 Warning: by() values are unlabeled, option nolabel implicit 9 10 Kruskal-Wallis equality-of-populations rank test 11 +----+ 12 | ihwork | Obs | Rank Sum | 13 14 0 | 38 | 1211.00 | 1 | 16 | 503.50 | 2 | 9 | 301.50 | 15 16 -----+ 17 chi-squared = 0.076 with 2 d.f. 18 probability = 0.9629 19 20 chi-squared with ties = 0.556 with 2 d.f. probability = 0.7574 21 22 23 Dunn's Pairwise Comparison of iq1 by ihwork (Benjamini-Hochberg) 24 Col Mean-I 25 Row Mean | 0 1 26 ____+ _____ 27 1 | 0.198272 1 0.4214 28 29 2 | -0.650694 -0.720741 0.3864 0.7066 30 31 False Discovery Rate = 0.05 32 Reject Ho if $p = P(Z \le |z|) \le FDR/2$ with stopping rule 33 34 . dunntest iq2, by(ihwork) ma(bh) wrap 35 36 Warning: by() values are unlabeled, option nolabel implicit 37 38 Kruskal-Wallis equality-of-populations rank test 39 +-----40 | ihwork | Obs | Rank Sum | 41 |-----| 42 0 | 38 | 1229.50 1 | 16 | 432.00 43 2 | 9 | 354.50 | 44 -----+ 45 2.667 with 2 d.f. chi-squared = 46 probability = 0.2635 47 48 3.851 with 2 d.f. chi-squared with ties = probability = 0.1458 49 50 51 Dunn's Pairwise Comparison of ig2 by ihwork (Benjamini-Hochberg) 52 Col Mean-| 53 Row Mean | 0 1 54 _____ 1 | 1.177995 55 0.1194 56 57 2 | -1.243802 -1.949178 0.1602 0.0769 58 59 For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml 60
```
False Discovery Rate = 0.05
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
1
2
3
     . dunntest iq3, by(ihwork) ma(bh) wrap
4
     Warning: by() values are unlabeled, option nolabel implicit
5
6
     Kruskal-Wallis equality-of-populations rank test
7
8
       +----+
9
       | ihwork | Obs | Rank Sum |
10
        0 | 38 | 1187.00 |
11
            1 | 16 | 482.50 |
2 | 9 | 346.50 |
12
       +----+
13
14
     chi-squared = 1.359 with 2 d.f.
probability = 0.5068
15
16
     chi-squared with ties = 2.727 with 2 d.f.
17
     probability = 0.2558
18
19
                    Dunn's Pairwise Comparison of iq3 by ihwork
20
                              (Benjamini-Hochberg)
21
     Col Mean-|
22
                         0
     Row Mean |
                                      1
      ____+
23
           1 | 0.280149
24
                 0.3897
             25
           2 | -1.513775 -1.547192
26
                 0.0976
                           0.1827
             27
     False Discovery Rate = 0.05
28
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
29
30
31
     . dunntest iq4, by(ihwork) ma(bh) wrap
32
     Warning: by() values are unlabeled, option nolabel implicit
33
34
     Kruskal-Wallis equality-of-populations rank test
35
36
       +----+
37
       | ihwork | Obs | Rank Sum |
       |-----|
38
            0 | 38 | 1109.50 |
39
           1 | 16 | 533.00 |
2 | 9 | 373.50 |
40
       +----+
41
42
     chi-squared =
                    3.388 with 2 d.f.
43
     probability =
                    0.1838
44
     chi-squared with ties =
                              5.295 with 2 d.f.
45
     probability =
                    0.0708
46
47
                    Dunn's Pairwise Comparison of iq4 by ihwork
48
                             (Benjamini-Hochberg)
49
     Col Mean-|
50
     Row Mean |
                         0
                                       1
     _____
51
          1 | -0.941750
52
                  0.1732
            - 1
53
             2 | -2.263389 -1.340169
54
                 0.0354 0.1351
             55
     False Discovery Rate = 0.05
56
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
57
58
59
     . dunntest iq5, by(ihwork) ma(bh) wrap
                           For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml
60
```

```
Warning: by() values are unlabeled, option nolabel implicit
1
2
3
     Kruskal-Wallis equality-of-populations rank test
4
                ____+
5
       | ihwork | Obs | Rank Sum |
6
        0 | 38 | 1219.00 |
1 | 16 | 464.00 |
7
            1 | 16 | 464.00 |
2 | 9 | 333.00 |
8
9
       +----+
10
                    1.099 with 2 d.f.
     chi-squared =
11
     probability = 0.5773
12
13
     chi-squared with ties =
                               2.723 with 2 d.f.
                    0.2563
     probability =
14
15
                    Dunn's Pairwise Comparison of iq5 by ihwork
16
                     (Benjamini-Hochberg)
17
     Col Mean-|
18
     Row Mean |
                          0
19
          1 | 0.887196
20
                0.1875
            21
             22
           2 |
                -1.139947 -1.648784
                 0.1907 0.1488
             23
24
     False Discovery Rate = 0.05
25
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
26
27
     . dunntest iq6, by(ihwork) ma(bh) wrap
28
     Warning: by() values are unlabeled, option nolabel implicit
29
30
                                                         Kruskal-Wallis equality-of-populations rank test
31
32
        _____+
33
       | ihwork | Obs | Rank Sum |
34
        -----|
            0 | 38 | 1081.00 |
35
            1 | 16 | 540.00 |
2 | 8 | 332.00 |
36
37
       +----+
38
     chi-squared = 3.794 with 2 d.f.
probability = 0.1500
39
40
     chi-squared with ties =
                              5.625 with 2 d.f.
41
     probability = 0.0601
42
43
                    Dunn's Pairwise Comparison of iq6 by ihwork
44
                             (Benjamini-Hochberg)
45
     Col Mean-I
46
     Row Mean |
                          0
                                       1
                _____
47
       ____+
           1 | -1.200715
48
                 0.1149
             49
           2 |
                -2.264381 -1.207799
50
                  0.0353
                           0.1703
             51
52
     False Discovery Rate = 0.05
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
53
54
55
     . dunntest iq7, by(ihwork) ma(bh) wrap
56
     Warning: by() values are unlabeled, option nolabel implicit
57
58
59
     Kruskal-Wallis equality-of-populations rank test
                           For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml
60
```

```
_____
1
       | ihwork | Obs | Rank Sum |
2
        -----
3
           0 | 38 | 1189.00 |
       1 | 16 | 460.00 |
2 | 9 | 367.00 |
4
5
       +----+
6
     chi-squared = 2.624 with 2 d.f.
probability = 0.2693
7
8
9
     chi-squared with ties =
                             3.570 with 2 d.f.
10
     probability = 0.1678
11
12
                   Dunn's Pairwise Comparison of iq7 by ihwork
13
                             (Benjamini-Hochberg)
     Col Mean-|
14
     Row Mean |
                        0
                                      1
15
      ----+
           1 0.542224
16
                0.2938
           _____
17
             18
           2 |
                -1.628668 -1.836862
19
                 0.0775 0.0993
             20
     False Discovery Rate = 0.05
21
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
22
23
     . dunntest iq8, by(ihwork) ma(bh) wrap
24
25
     Warning: by() values are unlabeled, option nolabel implicit
                                                 26
27
     Kruskal-Wallis equality-of-populations rank test
28
         29
       | ihwork | Obs | Rank Sum |
30
       |-----|
           0 | 38 | 1080.00 |
1 | 16 | 576.50 |
2 | 9 | 359.50 |
31
32
33
       +----+
34
     chi-squared = 3.913 with 2 d.f.
probability = 0.1413
35
36
37
                              4.506 with 2 d.f.
     chi-squared with ties =
38
     probability = 0.1051
39
40
                   Dunn's Pairwise Comparison of iq8 by ihwork
                              (Benjamini-Hochberg)
41
     Col Mean-I
42
     Row Mean |
                        0
                                      1
43
        ----+-------
           1 | -1,494891
44
                0.1012
            45
46
           2 | -1.819713 -0.549796
47
                  0.1032 0.2912
            48
     False Discovery Rate = 0.05
49
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
50
51
     . dunntest iq9, by(ihwork) ma(bh) wrap
52
53
     Warning: by() values are unlabeled, option nolabel implicit
54
55
     Kruskal-Wallis equality-of-populations rank test
56
       +----+
57
       | ihwork | Obs | Rank Sum |
58
        -----|
59
           0 | 38 | 1096.00 |
                          For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml
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```

chi-squared	d = 3.833 with 2 d f
probability	y = 0.1471
chi-squared probability	d with ties = 4.568 with 2 d.f. y = 0.1019
Col Mean-1	Dunn's Pairwise Comparison of iq9 by ihwork (Benjamini-Hochberg)
Row Mean	0 1
1 	-1.043163 0.1484
2	-2.060159 -1.086818 0.0591 0.2078
False Disco Reject Ho i	overy Rate = 0.05 if p = P(Z <= z) <= FDR/2 with stopping rule
. dunntest	iq10, by(ihwork) ma(bh) wrap
Warning: by	y() values are unlabeled, option nolabel implicit
Kruskal-Wal	llis equality-of-populations rank test
+	
ihwork 	Obs Rank Sum -++
	38 1206.00
i 2	i 9 i 315.00 i
chi-squared	d = 0.303 with 2 d f.
probability	y = 0.8596
chi-squared probability	d with ties = 1.169 with 2 d.f.
	Dunn's Pairwise Comparison of iq10 by ihwork
Col Mean-	(Benjamini-Hochberg)
Row Mean +-	0 1
1	0.287560 0.3868
	-0.943719 -1.045310
 2 	0.2590 0.4438
 2 False Disco	0.2590 0.4438 overy Rate = 0.05
2 2 False Disco Reject Ho i	0.2590 0.4438 overy Rate = 0.05 if p = P(Z <= z) <= FDR/2 with stopping rule
 2 False Disco Reject Ho	0.2590 0.4438 overy Rate = 0.05 if p = P(Z <= z) <= FDR/2 with stopping rule
 2 False Disco Reject Ho	0.2590 0.4438 overy Rate = 0.05 if p = P(Z <= z) <= FDR/2 with stopping rule
 2 False Disco Reject Ho	0.2590 0.4438 overy Rate = 0.05 if p = P(Z <= z) <= FDR/2 with stopping rule
 2 False Disco Reject Ho i	0.2590 0.4438 overy Rate = 0.05 if p = P(Z <= z) <= FDR/2 with stopping rule
 2 False Disco Reject Ho i	0.2590 0.4438 overy Rate = 0.05 if p = P(Z <= z) <= FDR/2 with stopping rule
 2 False Disco Reject Ho	0.2590 0.4438 overy Rate = 0.05 if p = P(Z <= z) <= FDR/2 with stopping rule
 2 False Disco Reject Ho	0.2590 0.4438 overy Rate = 0.05 if p = P(Z <= z) <= FDR/2 with stopping rule

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•	
	Question – For each of the factor variables (knowledge, participation, and total cost), are there differences in average response by age?
	Answer – NO, there are no significant differences among the age categories for any of the three factor variable
•	Question – For each of the factor variables (knowledge, participation, and total cost), are there differences in a average response <u>by gender</u> ?
	Answer – NO, there are no significant differences between genders for any of the three factor variables.
•	Question – For each of the factor variables (knowledge, participation, and total cost), are there differences in t average response by level of education?
	Answer – NO, there are no significant differences among the levels of education for any of the three factor var
•	Question: For each of the factor variables (knowledge, participation, and total cost), are there differences in the average response based upon racer or ethnicity?
	Answer – YES, for the factor variable knowledge there is a significant difference between groups 1 and 2 and between groups 1 and 7, and for the factor variable total cost there are significant differences between the pagroups 1 and 7, 3 and 7, and 4 and 7
•	Question: For each of the factor variables (knowledge, participation, and total cost), are there differences in the average response based experience working in a hospital?
	Answer – YES, for the factor variable "participation" there is a significant difference between group 0 and grou
S1	TATISTICS
•	Question – For each of the factor variables (knowledge, participation, and total cost), are there differences in t
	average response by age?
. (dunntest iknowledge, by(iage)
Krı	iskal-Wallis equality-of-populations rank test
Krı +	iskal-Wallis equality-of-populations rank test ++ iage Obs Rank Sum
Kri + 	<pre>uskal-Wallis equality-of-populations rank test ++ iage Obs Rank Sum +</pre>
Krı - 	<pre>uskal-Wallis equality-of-populations rank test i iage Obs Rank Sum + 3 2 27.50 4 12 309.00 5 14 417.50 </pre>
Kri - 	<pre>uskal-Wallis equality-of-populations rank test i iage Obs Rank Sum + 3 2 27.50 4 12 309.00 5 14 417.50 6 25 850.00 7 10 412.00 </pre>
Kru 	<pre>uskal-Wallis equality-of-populations rank test </pre>
Kru 	<pre>uskal-Wallis equality-of-populations rank test ++ iage Obs Rank Sum + 3 2 27.50 4 12 309.00 5 14 417.50 6 25 850.00 7 10 412.00 ++ i-squared = 6.392 with 4 d.f. obability = 0.1717 l-squared with ties = 8.092 with 4 d.f. obability = 0.0883</pre>

Col Mean- Now Mean						
		3	4	5	e	5
4	-0.964413					
	0.1674					
5	-1.305010	-0.635265				
6	_1 601/06	_1 //1063	-0 769360			
0	-1.091486 0.0454	-1.441963 0.0747	0.2211			
 7	-2.175239	-2.214869	-1.686889	-1.181160		
I	0.0148	0.0134	0.0458	0.1188		
ilpha =	0.05					
Reject Ho	if p = P(Z <	<= z) <= a	lpha/2			
. dunntest	: iparticipa	ce, by(iage)				
Kruskal-Wa	llis emuali		tions rank	tost		
VIUSKAI WO	uiis equaii	cy or popule		lest		
+ iage	Obs Rank	+ Sum				
+	2 3	 7 00				
3	12 28:	1.00				
5	14 458	3.00				
1 6 7	20 834	±.00 5.00				
chi-square probabilit chi-square probabilit	y = 0.1 ed with ties y = 0.1	935 = 6.276 795	5 with 4 d.f		0	
chi-square probabilit chi-square probabilit Col Mean-	y = 0.1 d with ties y = 0.1 Dunn's Pa	935 = 6.276 <mark>795</mark> airwise Comp (No	5 with 4 d.f parison of 5 adjustment	participate	e by iage	
chi-square probabilit chi-square probabilit Col Mean- Now Mean	y = 0.19 ed with ties y = 0.1 Dunn's Pa	935 = 6.276 795 airwise Comp (No 3	5 with 4 d.f parison of i p adjustment 4	participate	by iage	5
chi-square probabilit chi-square probabilit col Mean- low Mean 4	y = 0.19 ed with ties y = 0.1 Dunn's Pa -0.356920	935 = 6.276 795 airwise Comp (No 3	o with 4 d.f parison of i adjustment 4	participate	e by iage	5
chi-square probabilit chi-square probabilit Col Mean- Row Mean 	y = 0.19 ed with ties y = 0.1 Dunn's Pa -0.356920 0.3606	935 = 6.276 795 airwise Comp (No 3	5 with 4 d.f parison of i p adjustment 4	participate	e by iage	2
chi-square probabilit chi-square probabilit Col Mean- Row Mean + 4 	<pre>cy = 0.19 ed with ties cy = 0.1 Dunn's Pa Dunn's Pa -0.356920 0.3606 -1.042565 0.1405</pre>	935 = 6.276 795 airwise Comp (No 3 -1.310385	5 with 4 d.f parison of i adjustment 4	participate	e by iage	2
chi-square probabilit chi-square probabilit Col Mean 	-0.356920 0.3606 -1.042565 0.1486	935 = 6.276 795 airwise Comp (No 3 -1.310385 0.0950	o with 4 d.f parison of i adjustment 4	participate	e by iage	2
chi-square probabilit chi-square probabilit Col Mean- Row Mean 4 4 5 5 6	<pre>2y = 0.19 2d with ties 2y = 0.1 2 Dunn's Pa -0.356920 0.3606 -1.042565 0.1486 -1.121195 0 1311</pre>	935 = 6.276 795 airwise Comp (No 3 -1.310385 0.0950 -1.569823 0 0582	-0.107251	participate	e by iage	
chi-square probabilit chi-square probabilit Col Mean Now Mean 4 4 5 5 6 1	<pre>curve curve c</pre>	<pre>935 = 6.276 795 airwise Comp (No 3 -1.310385 0.0950 -1.569823 0.0582</pre>	-0.107251 0.4573	participate	e by iage	
chi-square probabilit chi-square probabilit Col Mean- Row Mean 	y = 0.19 ed with ties y = 0.11 Dunn's Pa -0.356920 0.3606 -1.042565 0.1486 -1.121195 0.1311 -1.581888 0.0568	<pre>935 = 6.276 795 airwise Comp (No 3 -1.310385 0.0950 -1.569823 0.0582 -2.225081 0.0130</pre>	-0.107251 0.455987 0.1455	-1.072837 0.1417	e by iage	
chi-square probabilit chi-square probabilit Col Mean- Row Mean 	<pre>xy = 0.19 xy = 0.19 xy = 0.19 xy = 0.19 Dunn's Pa Dunn's Pa -0.356920 0.3606 -1.042565 0.1486 -1.121195 0.1311 -1.581888 0.0568</pre>	<pre>935 = 6.276 795 airwise Comp (No 3 -1.310385 0.0950 -1.569823 0.0582 -2.225081 0.0130</pre>	-0.107251 0.455987 0.1455	-1.072837 0.1417	e by iage	20
chi-square probabilit chi-square probabilit col Mean- cow Mean 	<pre>xy = 0.19 xy = 0.19 xy = 0.19 xy = 0.19 Dunn's Pa Dunn's Pa -0.356920 0.3606 -1.042565 0.1486 -1.121195 0.1311 -1.581888 0.0568 0.05 if p = P(Z </pre>	<pre>935 = 6.276 795 airwise Comp (No 3 -1.310385 0.0950 -1.569823 0.0582 -2.225081 0.0130 <<= z) <= a</pre>	-0.107251 -0.107251 -1.055987 0.1455	-1.072837 0.1417	e by iage	
chi-square probabilit chi-square probabilit Col Mean- Now Mean 	<pre>xy = 0.19 xy = 0.19 xy = 0.19 Dunn's Pa Dunn's Pa -0.356920 0.3606 -1.042565 0.1486 -1.121195 0.1311 -1.581888 0.0568 0.05 if p = P(Z </pre>	<pre>935 = 6.276 795 airwise Comp (No 3 -1.310385 0.0950 -1.569823 0.0582 -2.225081 0.0130 <<= z) <= a</pre>	-0.107251 0.4573 -1.055987 0.1455	-1.072837 0.1417	e by iage	
chi-square probabilit chi-square probabilit Col Mean- Now Mean Now Mean 1 5 5 6 7 1 1 1 1 2 1 2 1 1 1 1 1 1 1 1 1 1 1 1	<pre>xy = 0.19 xy = 0.19 xy = 0.19 Dunn's Pa D</pre>	<pre>935 = 6.276 795 airwise Comp (No 3 -1.310385 0.0950 -1.569823 0.0582 -2.225081 0.0130 <<= z) <= a by(iage)</pre>	-0.107251 0.455 -1.055987 0.1455	-1.072837 0.1417	e by iage	
chi-square probabilit chi-square probabilit Col Mean- Now Mean 	<pre>curve content of the second seco</pre>	<pre>935 = 6.276 795 airwise Comp (No 3 -1.310385 0.0950 -1.569823 0.0582 -2.225081 0.0130 <<= z) <= a by(iage)</pre>	-0.107251 0.4573 -1.055987 0.1455	-1.072837 0.1417	e by iage	
chi-square probabilit chi-square probabilit Col Mean- Now Mean 4 Now Mean 4 Now Mean 4 Now Mean 4 Now Mean 4 Now Mean 4 Norther	<pre>Xy = 0.19 Xy = 0.19 Xy = 0.19 Xy = 0.19 Dunn's Pa Dunn's Pa -0.356920 0.3606 -1.042565 0.1486 -1.121195 0.1311 -1.581888 0.0568 0.05 if p = P(Z - c itotcost, P by() values a</pre>	<pre>935 = 6.276 795 airwise Comp (No 3 -1.310385 0.0950 -1.569823 0.0582 -2.225081 0.0130 <<= z) <= a py(iage) are unlabele</pre>	-0.107251 0.4573 -1.055987 0.1455 alpha/2	-1.072837 0.1417	e by iage	
chi-square probabilit chi-square probabilit Col Mean- Now Mean Now Mean 4 5 5 6 7 1 1 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1	<pre>Sty = 0.19 Sty = 0.19 Sty = 0.19 Dunn's Pa Dunn's Pa Dunn's Pa -0.356920 0.3606 -1.042565 0.1486 -1.042565 0.1486 -1.121195 0.1311 -1.581888 0.0568 0.05 if p = P(Z - stotcost, P sty() values a Dy() values a</pre>	<pre>935 = 6.276 795 airwise Comp (No 3 -1.310385 0.0950 -1.569823 0.0582 -2.225081 0.0130 <= z) <= a py(iage) are unlabele </pre>	 with 4 d.f parison of i adjustment 4 -0.107251 0.4573 -1.055987 0.1455 alpha/2 ed, option r 	-1.072837 0.1417	e by iage	
chi-square probabilit chi-square probabilit Col Mean Now Mean 4 4 5 6 7 8 1pha = Reject Ho Narning: k (ruskal-Wa	<pre>Xy = 0.19 Xy = 0.19 Xy = 0.19 Dunn's Pa Dunn's Pa -0.356920 0.3606 -1.042565 0.1486 -1.042565 0.1486 -1.121195 0.1311 -1.581888 0.0568 0.05 if p = P(Z <</pre>	<pre>935 = 6.276 795 airwise Comp (No 3 -1.310385 0.0950 -1.569823 0.0582 -2.225081 0.0130 <<= z) <= a by(iage) are unlabele cy-of-popula </pre>	<pre>o with 4 d.f parison of i o adjustment 4 -0.107251 0.4573 -1.055987 0.1455 alpha/2 ed, option r ations rank</pre>	-1.072837 0.1417	e by iage	
chi-square probabilit chi-square probabilit Col Mean- Now Mean Now Mean 	<pre>cd with ties cy = 0.1 d with ties cy = 0.1 Dunn's Pa Dunn's Pa -0.356920 0.3606 -1.042565 0.1486 -1.042565 0.1486 -1.121195 0.1311 -1.581888 0.0568 0.05 if p = P(Z - c itotcost, Paper cost Pape</pre>	<pre>935 = 6.276 795 airwise Comp (No 3 -1.310385 0.0950 -1.569823 0.0582 -2.225081 0.0130 <= z) <= a by(iage) are unlabele cy-of-popula+ Sum </pre>	<pre>-0.107251 0.4573 -1.055987 0.1455 alpha/2 ed, option r ations rank</pre>	-1.072837 0.1417	e by iage	
chi-square probabilit chi-square probabilit Col Mean- Row Mean 4 5 6 7 1 1 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1	<pre>Sig = 0.19 Sig = 0.19 Sig = 0.19 Sig = 0.19 Dunn's Pa Dunn's Pa Dunn's Pa -0.356920 0.3606 -1.042565 0.1486 -1.042565 0.1486 -1.121195 0.1311 -1.581888 0.0568 0.05 if p = P(Z < sitotcost, Pa si</pre>	<pre>935 = 6.276 795 airwise Comp (No 3 -1.310385 0.0950 -1.569823 0.0582 -2.225081 0.0130 <= z) <= a by(iage) are unlabele cy-of-popula+ Sum </pre>	<pre>o with 4 d.f parison of i o adjustment 4 -0.107251 0.4573 -1.055987 0.1455 alpha/2 ed, option r ations rank</pre>	-1.072837 0.1417	e by iage	
chi-square probabilit chi-square probabilit Col Mean- Now Mean 	<pre>Sig = 0.19 Sig = 0.19 Sig = 0.19 Sig = 0.19 Dunn's Pa Dunn's Pa -0.356920 0.3606 -1.042565 0.1486 -1.042565 0.1486 -1.121195 0.1311 -1.581888 0.0568 0.05 if p = P(Z </pre>	<pre>935 = 6.276 795 airwise Comp (No 3 -1.310385 0.0950 -1.569823 0.0582 -2.225081 0.0130 <<= z) <= a by(iage) are unlabele cy-of-popula+ Sum 3.00 2.50 </pre>	<pre>o with 4 d.f parison of i o adjustment 4 -0.107251 0.4573 -1.055987 0.1455 alpha/2 ed, option r ations rank</pre>	-1.072837 0.1417	e by iage	
chi-square probabilit chi-square probabilit Col Mean- Row Mean 4 4 5 6 7 6 7 6 7 8 1pha = Reject Ho dunntest Varning: k (ruskal-Wa +4 iage 1 3 4 5 5	<pre>2 81 2 40 2 82 2 40 2 82 2 40 2 83 2 40 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3</pre>	<pre>935 = 6.276 795 airwise Comp (No 3 -1.310385 0.0950 -1.569823 0.0582 -2.225081 0.0130 <= z) <= a by(iage) are unlabele cy-of-popula+ Sum 3.00 2.50 0.00 </pre>	-0.107251 0.4573 -1.055987 0.1455 alpha/2 ed, option r	-1.072837 0.1417	e by iage	
chi-square probabilit chi-square probabilit Col Mean- Row Mean 4 4 5 6 7 8 1pha = Reject Ho dunntest Varning: k (ruskal-Wa +4 iage 4 3 4 5 6 6 7	<pre>Xy = 0.19 Xy = 0.19 Xy = 0.19 Xy = 0.19 Dunn's Pa D</pre>	<pre>935 = 6.276 795 airwise Comp (No 3 -1.310385 0.0950 -1.569823 0.0582 -2.225081 0.0130 <<= z) <= a oy(iage) are unlabele cy-of-popula+ Sum 3.00 2.50 0.00 2.50 </pre>	<pre>-0.107251 0.4573 -1.055987 0.1455 alpha/2 ed, option r ations rank</pre>	-1.072837 0.1417	e by iage	

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```
chi-squared =
                  3.125 with 4 d.f.
    probability =
                 0.5372
1
2
    chi-squared with ties =
                          4.632 with 4 d.f.
3
    probability = 0.3272
4
5
                Dunn's Pairwise Comparison of itotcost by iage
6
                     (No adjustment)
7
    Col Mean-|
                     3
                                             5
    Row Mean |
                                  4
                                                         6
8
      ____+
             _____
9
         4 | 0.703165
10
               0.2410
           11
          5 |
             1.281683 1.097642
12
                       0.1362
               0.1000
           13
              1.083624 0.738198 -0.516952
          6 |
14
               0.1393 0.2302
                                 0.3026
           15
            0.273361 -0.733301 -1.767517 -1.498732
          7 1
16
               0.3923 0.2317 0.0386 0.0670
            17
18
    alpha = 0.05
    Reject Ho if p = P(Z \le |z|) \le alpha/2
19
20
    _____
21
22
    Question – For each of the factor variables (knowledge, participation, and total cost), are there differences in the
23
    average response by gender?
24
25
    . dunntest iknowledge, by(igender)
26
    Warning: by() values are unlabeled, option nolabel implicit
27
                                              28
    Kruskal-Wallis equality-of-populations rank test
29
30
      +----+
31
      | igender | Obs | Rank Sum |
      |-----|
32
          1 | 19 | 598.00 |
33
           2 | 44 | 1418.00 |
      1
34
      +----+
35
    chi-squared = 0.022 with 1 d.f.
probability = 0.8810
36
37
    chi-squared with ties = 0.028 with 1 d.f.
38
    probability = 0.8662
39
40
              Dunn's Pairwise Comparison of iknowledge by igender
41
                            (No adjustment)
42
    Col Mean-L
43
    Row Mean |
                       1
     ____+
44
         2 | -0.168503
45
                0.4331
          46
47
    alpha = 0.05
    Reject Ho if p = P(Z \le |z|) \le alpha/2
48
49
    . dunntest iparticipate, by(igender)
50
51
    Warning: by() values are unlabeled, option nolabel implicit
52
53
    Kruskal-Wallis equality-of-populations rank test
54
55
      +----+
56
      | igender | Obs | Rank Sum |
      57
          1 | 19 | 502.00 |
      58
           2 | 44 | 1514.00 |
59
        ----+
                       For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml
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```

```
chi-squared =
                    2.520 with 1 d.f.
1
     probability =
                    0.1124
2
3
     chi-squared with ties =
                             2.603 with 1 d.f.
                     0.1067
     probability =
4
5
6
               Dunn's Pairwise Comparison of iparticipate by igender
7
                                (No adjustment)
     Col Mean-|
8
     Row Mean |
                          1
9
     _____
           2 | -1.613363
10
                  0.0533
             11
12
     alpha = 0.05
13
     Reject Ho if p = P(Z \le |z|) \le alpha/2
14
15
     . dunntest itotcost, by(igender)
16
     Warning: by() values are unlabeled, option nolabel implicit
17
18
19
     Kruskal-Wallis equality-of-populations rank test
20
       21
       | igender | Obs | Rank Sum |
22
          ------
              1 | 19 | 587.50 |
23
             2 | 43 | 1365.50 |
24
            -----+
25
                     0.028 with 1 d.f.
     chi-squared =
26
                   0.8666
     probability =
27
28
     chi-squared with ties = 0.042 with 1 d.f.
     probability =
                     0.8380
29
30
31
                 Dunn's Pairwise Comparison of itotcost by igender
                                (No adjustment)
32
     Col Mean-|
33
     Row Mean |
                          1
34
     _____
          2 | -0.204490
35
                  0.4190
            36
37
     alpha = 0.05
     Reject Ho if p = P(Z \le |z|) \le alpha/2
38
39
     _____
40
41
        Question – For each of the factor variables (knowledge, participation, and total cost), are there differences in the
42
        average response by level of education?
43
44
     . dunntest iknowledge, by(ied)
45
     Warning: by() values are unlabeled, option nolabel implicit
46
47
     Kruskal-Wallis equality-of-populations rank test
48
49
       +----+
       | ied | Obs | Rank Sum |
50
       |-----|
51
         1 | 1 | 43.00 |
52
         2 | 3 | 96.50 |
3 | 57 | 1751.50 |
                     96.50 I
53
         -----+
54
55
     chi-squared =
                    0.483 with 2 d.f.
                    0.7854
56
     probability =
57
                              0.629 with 2 d.f.
     chi-squared with ties =
58
     probability =
                     0.7303
59
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60
```

Dunn's Pairwise Comparison of iknowledge by ied 1 (No adjustment) 2 Col Mean-| 3 Row Mean | 1 2 4 2 | 0.602700 5 0.2734 6 3 | 0.781528 0.156016 7 0.4380 0.2172 8 9 alpha = 0.05 Reject Ho if $p = P(Z \le |z|) \le alpha/2$ 10 11 12 . dunntest iparticipate, by(ied) 13 Warning: by() values are unlabeled, option nolabel implicit 14 15 Kruskal-Wallis equality-of-populations rank test 16 17 +----+ 18 | ied | Obs | Rank Sum | 19 |-----| 1 | 1 | 53.00 | 20 2 | 3 | 137.00 | 21 3 | 57 | 1701.00 | 22 ----+ 23 3.826 with 2 d.f. 0.1477 chi-squared = 24 probability = 25 chi-squared with ties = 3.948 with 2 d.f 26 probability = 0.1389 27 28 Dunn's Pairwise Comparison of iparticipate by ied 29 (No adjustment) 30 Col Mean-| 31 Row Mean | 1 2 32 2 | 0.363420 33 0.3581 34 3 | 1.313711 1.528732 35 0.0945 0.0632 36 37 alpha = 0.05 Reject Ho if $p = P(Z \le |z|) \le alpha/2$ 38 39 40 . dunntest itotcost, by(ied) 41 Warning: by() values are unlabeled, option nolabel implicit 42 43 Kruskal-Wallis equality-of-populations rank test 44 45 +----+ 46 | ied | Obs | Rank Sum | |-----| 47 1 | 1 | 40.50 | 2 | 3 | 94.00 | 48 49 | 3 | 56 | 1695.50 | 50 ----+ 51 chi-squared = 0.344 with 2 d.f. 52 probability = 0.8420 53 chi-squared with ties = 0.500 with 2 d.f. 54 probability = 0.7788 55 56 Dunn's Pairwise Comparison of itotcost by ied 57 (No adjustment) 58 Col Mean-| 59 Row Mean | 2 1 For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml 60

1

```
2 | 0.548145
                0.2918
            2
3
                0.699677 0.123104
           3 |
                  0.2421
                           0.4510
4
            5
     alpha = 0.05
6
     Reject Ho if p = P(Z \le |z|) \le alpha/2
7
     _____
                                    _____
8
        Question: For each of the factor variables (knowledge, participation, and total cost), are there differences in the
     9
        average response based upon racer or ethnicity?
10
11
     . dunntest iknowledge, by(ieth)
12
13
     Warning: by() values are unlabeled, option nolabel implicit
14
15
     Kruskal-Wallis equality-of-populations rank test
16
       +-----+
17
       | ieth | Obs | Rank Sum |
18
        ------
19
          1 | 53 | 1859.50 |
                    22.50 |
          2 | 2 |
20
          3 | 1 |
4 | 4 |
                       7.00 |
21
                      93.00 |
22
           7 | 3 |
                     34.00 |
       +----+
23
24
    chi-squared = 10.649 with 4 d.f.
25
    probability =
                   0.0308
26
                            13.481 with 4 d.f
     chi-squared with ties =
27
    probability = 0.0091
28
29
                 Dunn's Pairwise Comparison of iknowledge by ieth
30
                               (No adjustment)
31
    Col Mean-I
                                                 3
    Row Mean |
                        1
                                     2
32
       ____+
33
          2 | 2.031072
            0.0211
34
35
           3 |
                1.707868 0.213002
36
                 0.0438
                         0.4157
            37
               1.400992 -0.850533 -0.892152
           4 |
38
             0.0806 0.1975 0.1862
39
40
           7 |
                2.456616 -0.005603 -0.230353
                                            0.957716
                 <mark>0.0070</mark>
                           0.4978 0.4089
                                             0.1691
41
            42
     alpha = 0.05
43
    Reject Ho if p = P(Z \le |z|) \le alpha/2
44
45
     . dunntest iparticipate, by(ieth)
46
47
    Warning: by() values are unlabeled, option nolabel implicit
48
49
    Kruskal-Wallis equality-of-populations rank test
50
       +----+
51
       | ieth | Obs | Rank Sum |
52
       -----
53
          1 | 53 | 1836.00
          2 |
              2 |
                    24.00
54
          3 | 1 |
                     32.00
55
          4 | 4 | 84.50 |
7 | 3 | 39.50 |
56
       -----+
57
58
     chi-squared =
                    8.056 with 4 d.f.
59
    probability =
                    0.0895
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60
```

chi-squared with ties = 8.321 with 4 d.f. 1 probability = 0.0805 2 3 Dunn's Pairwise Comparison of iparticipate by ieth 4 (No adjustment) 5 Col Mean-L 2 6 Row Mean | 1 3 4 ____+ _____ 7 2 | 1.742754 8 0.0407 9 0.145095 -0.905406 10 3 | 0.4423 0.1826 11 12 4 | 1.445287 -0.584200 0.539304 0.0742 13 0.2795 0.2948 14 2.006289 -0.070859 0.904309 0.577727 7 | 15 0.0224 0.4718 0.1829 0.2817 16 alpha = 0.0517 Reject Ho if $p = P(Z \le |z|) \le alpha/2$ 18 19 . dunntest itotcost, by(ieth) 20 21 Warning: by() values are unlabeled, option nolabel implicit 22 23 Kruskal-Wallis equality-of-populations rank test 24 25 +----+ | ieth | Obs | Rank Sum | 26 |-----| 27 1 | 52 | 1672.00 | 2 | 2 | 54.50 | 3 | 1 | 41.50 | 4 | 4 | 166.00 | 28 29 30 | 7 | 3 | 19.00 | 31 +----+ 32 chi-squared = 7.553 with 4 d.f. 33 probability = 0.1094 34 chi-squared with ties = 11.196 with 4 d.f. 35 0.0245 probability = 36 37 38 Dunn's Pairwise Comparison of itotcost by ieth (No adjustment) 39 Col Mean-| 40 Row Mean | 1 2 3 4 41 2 | 0.459251 42 0.3230 43 3 | -0.624727 -0.785168 44 0.2162 0.2661 45 46 4 | -1.215526 -1.110396 0.000000 47 0.1121 0.1334 0.5000 48 2.934536 1.546239 2.055206 3.107180 7 | 49 <mark>0.0017</mark> 0.0610 <mark>0.019</mark>9 <mark>0.0009</mark> 50 alpha = 0.05 51 Reject Ho if $p = P(Z \le |z|) \le alpha/2$ 52 53 54 Question: For each of the factor variables (knowledge, participation, and total cost), are there differences in the 55 average response based experience working in a hospital? 56 57 . dunntest iknowledge, by(ihwork) 58 59 Warning: by() values are unlabeled, option nolabel implicit For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml 60

```
1
     Kruskal-Wallis equality-of-populations rank test
2
3
       +----+
4
       | ihwork | Obs | Rank Sum |
          ------
5
            0 | 38 | 1196.50 |
6
            1 | 16 | 439.00 |
2 | 9 | 380.50 |
7
       +----+
8
9
                  3.850 with 2 d.f.
     chi-squared =
     probability =
10
                    0.1458
11
     chi-squared with ties =
                              4.875 with 2 d.f.
12
     probability =
                  0.0874
13
14
                Dunn's Pairwise Comparison of iknowledge by ihwork
15
                                (No adjustment)
16
     Col Mean-I
     Row Mean |
                        0
                                      1
17
      ----+--
18
           1 |
               0.834026
19
                  0.2021
            - 1
20
               -1.786749 -2.186219
           2 |
21
             0.0370 0.0144
22
     alpha = 0.05
23
     Reject Ho if p = P(Z \le |z|) \le alpha/2
24
25
     . dunntest iparticipate, by(ihwork)
26
27
     Warning: by() values are unlabeled, option nolabel implicit
                                                   28
29
     Kruskal-Wallis equality-of-populations rank test
30
31
       +----+
       | ihwork | Obs | Rank Sum |
32
         33
            0 | 38 | 1060.00 |
            1 | 16 | 540.00 |
2 | 9 | 416.00 |
34
35
       +----+
36
37
                    7.470 with 2 d.f.
     chi-squared =
                  0.0239
38
     probability =
39
     chi-squared with ties =
                              7.716 with 2 d.f.
40
     probability =
                   0.0211
41
42
                Dunn's Pairwise Comparison of iparticipate by ihwork
43
                               (No adjustment)
44
     Col Mean-|
     Row Mean |
                         0
                                      1
45
                 _____
     ____+
46
          1 | -1.089332
47
                  0.1380
            48
               -2.741107 -1.659641
           2 |
49
                  0.0031 0.0485
             50
     alpha = 0.05
51
     Reject Ho if p = P(Z \le |z|) \le alpha/2
52
53
     . dunntest itotcost, by(ihwork)
54
55
     Warning: by() values are unlabeled, option nolabel implicit
56
57
     Kruskal-Wallis equality-of-populations rank test
58
59
       +----+
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60
```

	ihwork Obs Rank Sum
1 2	++ 0 38 1081.00
2	1 16 540.00 2 8 332.00
4	++
6	chi-squared = 3.794 with 2 d.f. probability = 0.1500
7	chi-squared with ties = 5.625 with 2 d.f.
8 9	probability = 0.0601
10 11	Dunn's Pairwise Comparison of itotcost by ihwork
12	(No adjustment) Col Mean-
13 14	Row Mean 0 1
14	1 -1.200715 0.1149
16 17	2 -2.264381 -1.207799
18	0.0118 0.1136
19 20	alpha = 0.05 Reject Ho if p = P(Z <= z) <= alpha/2
20	
22 23	
23 24	
25 26	
27	
28 29	
30	
31 32	
33	
34 35	
36	
37 38	
39 40	
40 41	
42 42	
43 44	
45 46	
40 47	
48 40	
49 50	
51 52	
52	
54	
55 56	
57	
58 59	
60	For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

1

-	Question – For each of the questions 1-10, is there a difference in the average response by age?
	Answer – YES, but for only two questions:
	Q1: age group 1 differed from all of the other groups.
	Q2: age groups 1 and 5 differed from groups 2,3,4, but did not differ from each other.
•	Question – For each of the questions, 1-10, is there a difference in the average response by gender?
	Answer – NO – there are no significant differences in responses between genders for any of the 10 questions.
•	Question – For each of the questions, 1-10, is there a difference in the average response by level of education
	Answer – YES, for questions 1, 2, 3, and 10
	Q1: 1 v. 3 2 v. 3
	Q2: 1 v. 3 2 v. 3
	Q3: 1 v.2 1 v.3 2 v.3
	Q10: 1 v. 3 2 v. 3
•	Question: For each of the questions, is there a difference in the average response <u>based upon racer or ethnicity</u>
	Answer - NO – there are no significant difference in responses among races or ethnicities for any of the 10
	questions.
•	Question – For each of the questions, 1-10, is there a difference in the average response if respondent is or was a
	hospital worker?
	Answer – VES – for questions 1, 2, and 5. For all three questions, group 1 is significantly different from both group (
	and group 2.
•	Question – For each of the questions, 1-10, is there a difference in the average response by age among those who
	identified their age group?
. c	dunntest iq1, by(iage) ma(bh) wrap
. c Kru	dunntest iq1, by(iage) ma(bh) wrap ıskal-Wallis equality-of-populations rank test
. c Kru + 	dunntest iq1, by(iage) ma(bh) wrap uskal-Wallis equality-of-populations rank test ++ iage Obs Rank Sum
. c Kru + 	dunntest iq1, by(iage) ma(bh) wrap uskal-Wallis equality-of-populations rank test ++ iage Obs Rank Sum +
. c Kru 	dunntest iq1, by(iage) ma(bh) wrap iskal-Wallis equality-of-populations rank test + iage Obs Rank Sum +
. c Kru 	<pre>dunntest iq1, by(iage) ma(bh) wrap uskal-Wallis equality-of-populations rank test ++ iage Obs Rank Sum +</pre>
. (Kru 	dunntest iq1, by(iage) ma(bh) wrap iskal-Wallis equality-of-populations rank test
. C Kru 	<pre>dunntest iq1, by(iage) ma(bh) wrap uskal-Wallis equality-of-populations rank test ++ iage Obs Rank Sum +</pre>
. (Kru 	dunntest iql, by(iage) ma(bh) wrap iskal-Wallis equality-of-populations rank test
. (Kru 	<pre>dunntest iq1, by(iage) ma(bh) wrap uskal-Wallis equality-of-populations rank test ++ i iage Obs Rank Sum ++ i 1 1 3.50 i 2 23 878.50 i 3 35 1376.50 i 3 35 1376.50 i 4 11 456.50 i 5 5 169.50 +</pre>

chi-squared with ties = 13.768 with 5 d.f. 1 probability = 0.0171 2 3 4 Dunn's Pairwise Comparison of iq1 by iage (Benjamini-Hochberg) 5 Col Mean-L 6 Row Mean | 1 2 3 4 5 -----7 ____+ 2 | -3.292779 8 0.0025 9 -3.424849 -0.409178 10 3 | <mark>0.0023</mark> 0.4265 11 12 4 | -3.527106 -0.873848 -0.609012 13 0.0032 0.3583 0.3699 14 -2.690371 1.366042 5 I 0.843972 1.100788 15 0.0134 0.3322 0.2903 0.2149 16 -2.604940 -0.313598 -0.207567 0.000000 -0.672593 6 | 17 0.5000 0.3759 <mark>0.013</mark>8 0.4349 0.4476 18 19 False Discovery Rate = 0.05 Reject Ho if $p = P(Z \le |z|) \le FDR/2$ with stopping rule 20 21 22 . dunntest iq2, by(iage) ma(bh) wrap 23 Kruskal-Wallis equality-of-populations rank test 24 5 25 +----+ | iage | Obs | Rank Sum | 26 |-----| 27 1 | 1 | 4.50 | 28 2 | 22 | 849.00 | 35 | 1357.50 | 3 | 29 4 | 11 | 462.00 | 30 5 | 5 | 172.50 | 31 ---+----| 6 | 1 | 4.50 | 32 -----+ 33 34 chi-squared = 5.286 with 5 d.f. probability = 0.3819 35 36 chi-squared with ties = 18.489 with 5 d.f. 37 0<mark>.0024</mark> probability = 38 39 Dunn's Pairwise Comparison of iq2 by iage 40 (Benjamini-Hochberg) Col Mean-| 41 2 Row Mean | 1 42 _____+____ 43 2 | -2.861006 <mark>0.0063</mark> 44 45 3 | -2.900874 -0.061439 46 <mark>0.0070</mark> 0.5095 47 -3.080845 -0.792177 -0.797937 4 | 48 <mark>0.0155</mark> 0.2920 0.3187 49 5 | -2.349976 0.708544 0.769210 1.193206 50 <mark>0.0201</mark> 0.2761 0.2761 0.1940 51 52 0.000000 6 | 2.861006 2.900874 3.080845 2.349976 <mark>0.0093</mark> 53 0.5000 <mark>0.0053</mark> <mark>0.0077</mark> <mark>0.0176</mark> 54 False Discovery Rate = 0.05 55 Reject Ho if $p = P(Z \le |z|) \le FDR/2$ with stopping rule 56 57 . dunntest iq3, by(iage) ma(bh) wrap 58 59 Kruskal-Wallis equality-of-populations rank test For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml 60

chi-square probabilit	ed with ti cy = <mark>(</mark>	ies = <mark>0.3817</mark>	5.288	with 5 d.f			
	Du	unn's P	Pairwise (Benj	Comparison amini-Hochb	of iq3 by iage erg)	e	
Col Mean- Row Mean	 	1	,	2	3	4	5
2	-2.2457	722 854					
3	 -2.1553 0.11	302 0 168	0.402900				
4	 -2.0665 0.09	574 0 969	0.369776 0.4851	0.079295 0.4684			
5	 -1.9266 0.10	615 0 013	0.371927 0.5325	0.157658 0.5046	0.088931 0.4978		
6	 -1.8654	437 -0 932	0.336858	-0.445925	-0.459239 -	0.481654	
False Disc	0.09	te =	0.05	U.614/	topping rule	0.7876	
False Disc Reject Ho	0.09 covery Rat if p = P(te = (Z <=	0.05 z) <= F	0.614/ DR/2 with s	topping rule	0.7876	
False Disc Reject Ho . dunntest Kruskal-Wa	<pre>0.09 covery Rat if p = P(c iq4, by(allis equal </pre>	te = (Z <= (iage) ality-c	0.05 z) <= F ma(bh) w	DR/2 with s rap tions rank	topping rule	0.7876	
False Disc Reject Ho . dunntest Kruskal-Wa + iage	0.09 covery Rat if p = P(c iq4, by(allis equa Obs Ra	te = (Z <= (iage) ality-c ank Sum	0.05 z) <= F ma(bh) w pf-popula + n	DR/2 with s Trap tions rank	topping rule	0.7876	
False Disc Reject Ho . dunntest Kruskal-Wa + iage 1 2	0.09 covery Rat if p = P : iq4, by(allis equa 	te = (Z <= (iage) ality-c ank Sum 13.00 934.00	0.05 z) <= F ma(bh) w of-popula + n 0 0	DR/2 with s rap tions rank	topping rule	0.7876	
False Disc Reject Ho . dunntest Kruskal-Wa iage 1 2 3 4	0.09 covery Rat if p = P allis equa Obs Ra 	te = (Z <= (iage) ality-c 13.00 934.00 1433.50 362.00	0.05 z) <= F ma(bh) w of-popula + n 0 0 0	DR/2 with s Trap tions rank	topping rule	0.7876	
False Disc Reject Ho . dunntest Kruskal-Wa + iage 1 2 3 4 5 6	<pre>0.09 0.09 0.09 0.09 0.09 0.09 0.09 0.09</pre>	<pre>te = (Z <= (iage) ality-c ank Sum 13.00 934.00 1433.50 362.00 211.00 49.50</pre>	0.05 z) <= F ma(bh) w of-popula + n 0 0 0 0 0 0 0	DR/2 with s rap tions rank	topping rule	0.7876	
False Disc Reject Ho . dunntest Kruskal-Wa iage 1 2 3 4 5 6 +	<pre>0.09 0.09 1 0.09 0 0.09 1 0 0.09 0</pre>	<pre>te = (Z <= (iage) ality-c ank Sum 13.00 934.00 1433.50 362.00 211.00 49.50</pre>	0.05 z) <= F ma(bh) w of-popula + n 0 0 0 0 0 0 0 0 +	DR/2 with s rap tions rank	topping rule	0.7876	
False Disc Reject Ho . dunntest Kruskal-Wa + iage 1 2 3 4 4 5 6 + Chi-square probabilit	<pre>0.09 0.09 0.09 0.09 0.09 0.09 0.09 0.09</pre>	te = (Z <= (iage) ality-c ank Sum 13.00 934.00 243.50 362.00 211.00 49.50 2.656 w 0.7529	0.05 z) <= F ma(bh) w of-popula + n 0 0 0 0 0 0 0 0 0	DR/2 with s rap tions rank	topping rule	0.7876	
False Disc Reject Ho . dunntest Kruskal-Wa . iage 	<pre>0.09 0.09 1 0.09 0 0.09 1 1 0 1 0 0 0 0 0 0 1 0 0 0 0 0 0 1 0 0 0 0</pre>	<pre>te = (Z <= (iage) ality-c ank Sum 13.00 934.00 1433.50 362.00 211.00 211.00 2.656 w 0.7529 ies = 0.4944</pre>	0.05 z) <= F ma(bh) w of-popula + n 0 0 0 0 0 0 + vith 5 d. 4.393	DR/2 with s rap tions rank f. with 5 d.f	topping rule test	0.7876	
False Disc Reject Ho . dunntest Kruskal-Wa + iage 1 2 3 4 5 6 + chi-square probabilit	<pre>0.09 0.09 1</pre>	<pre>te = (Z <= (iage) ality-c ank Sum 13.00 934.00 1433.50 211.00 2.656 w 0.7529 ies = 0.4944 unn's F</pre>	0.05 z) <= F ma(bh) w of-popula + m 	DR/2 with s rap tions rank f. with 5 d.f Comparison	topping rule test	0.7876	

$ \begin{array}{c} 5 & -1.532336 & -0.185389 & -0.286737 & -0.90242 \\ 0.4704 & 0.4569 & 0.4466 & 0.3019 \\ 6 & -1.483678 & -0.500383 & -0.548924 & -0.913141 & -0.383084 \\ 0.2866 & 0.4206 & 0.4373 & 0.3010 & 0.4385 \\ \end{array}{} \\ $	<pre>b -1.532336 -0.185389 -0.286737 -0.990242 0.4764 0.485678 -0.3019 6 -1.483678 -0.300363 -0.548924 -0.913141 -0.383084 0.2886 0.4206 0.4373 0.3010 0.4385 False Discovery Mate = 0.05 Reject Ho if p = P(2 <= [x]) <= FDR/2 with stopping rule . dunntest iq5, by(iage) ma(b)) wrp Kruskal-Wallis equality-of-populations rank test i = 1 1 1 1 7.00 1 2 1 23 1 836.00 1 3 1 35 1 1476.50 1 4 1 11 2 377.00 1 5 1 5 1 125.00 1 4 1 11 377.00 1 5 1 5 1 125.00 1 4 1 11 377.00 1 5 1 5 1 125.00 1 4 1 12 1 377.00 1 5 1 5 1 1 4 44.50 1 1 0.487 3 1 -2.484639 -1.537480 Col Mean-1 Row Mean 1 2 3 4 5 2 1 -2.057391 0 0.487 3 1 -2.484639 -1.537480 0 0.027 0.1279 4 1 -1.860894 0.403301 1.633501 0 0.0227 0.4623 0.1264 5 1 -1.961161 -0.694649 0.776748 -0.362103 6 1 0.1287 0.4263 0.1264 5 1 -1.961161 -0.694649 0.776748 -0.362103 6 1 0.1287 0.4267 0.4263 0.4200 0.4338 False Discovery Rate = 0.05 Reject No if p = P(Z <= [z]) <= FUR/2 with stopping rule . dunntest iq6, by(iage) ma(b)) wrp Kruskal-Wallis equality-of-populations rank test i = 1 1 1 1 1 10.00 1 2 1 2 3 841.50 1 3 1 5 1 1 466.50 1 1 1 466.50 1 5 1 5 1 1 1 1 466.50 1 5 1 5 1 1 1 1 466.50 1 5 1 5 1</pre>	4	-1.095769 1.207400 1.153083 0.2927 0.3409 0.3111
<pre> 0.4704 0.4369 0.4467 0.3019 6</pre>	<pre></pre>	 5	-1.532336 -0.185389 -0.286737 -0.990242
<pre>b -1.4836/8 -0.50088 -0.34892 -0.31341 -0.383084 b -1.4836/8 -0.3208 0.4206 0.4273 0.3010 0.4385 False Discovery Rate = 0.05 Reject No If p = P1Z <= Iz1) <= FDR/2 with stopping rule . dunntest iq5, by(iage) ma(bh) wrap Kruskal-Wallis equality-of-populations rank test +</pre>	<pre>b -1.4336Y8 -0.500048 -0.9338 -0.9338 -0.93385 File Discovery Rate = 0.03 Reject Bo if p = 2(2 <= r) <= FDR/2 with stopping rule . dunntest iq5, by(iage) ma(bh) wrap Kruskal-Wallis equality-of-populations rank test i iage ODS Rank Sum i 1 1 7.00 2 2 2 5 450.00 3 2 2 1 4 5 0 chi-squared = 3.728 with 5 d.f. probability = 0.5892 chi-squared = 3.728 with 5 d.f. probability = 0.0578</pre>		0.4704 0.4569 0.4467 0.3019
<pre>False Discovery Rate = 0.05 Reject Ho if p = P(2 <= x) <= FDR/2 with stopping rule . dunntest iq5, by(iage) ma(bh) wrap Rruskal-Wallis equality-of-populations rank test</pre>	<pre>False Discovery Rate = 0.05 Neject Ho If p = P(2 <= z) <= PDR/2 with stopping rule . dunntest iq3, by(iage) ma(bh) wrap Kruskal-Mallis equality-of-populations rank test</pre>	6 	-1.483678 -0.500363 -0.548924 -0.913141 -0.383084 0.2586 0.4206 0.4373 0.3010 0.4385
<pre>keject No 11 p = P(2 <= [21] <= PKX & With suppling the . dunntest iq5, by(lage) ma(bh) wrap Kruskal-Wallis equality-of-populations rank test</pre>	<pre>kejet wo if p = P(z <= [x]) <= P(x) with subpring fulle . dunntest iq5, by(iage) ma(bh) wrap Kruskal-Wallis equality-of-populations rank test</pre>	False Disc	:overy Rate = 0.05
<pre>. dunntest 1q5, by(iage) ma(bh) wrap Kruskal-Wallis equality-of-populations rank test</pre>	<pre>. dunntest iq5, by(iage) ma(bh) wrap Kruskal-Wallis equality-of-populations rank test</pre>	кејест но	II p = r(2 < - 2) < rDR/2 with stopping fulle
<pre>Kruskal-Wallis equality-of-populations rank test</pre>	<pre>Kruskal-Wallis equality-of-populations rank test i iage [Obs Rank Sum i 1 1 1 77.00 2 2 23 836.00 3 35 1376.50 4 4 11 377.00 6 1 44.130 chi-squared with ties - 9.323 with 5 d.f. probability = 0.3892 chi-squared with ties - 9.323 with 5 d.f. probability = 0.3892 chi-squared with ties - 9.323 with 5 d.f. probability = 0.1487 3 -2.484459 -1.557480 4 -1.869894 0.405361 1.639361 4 0.1247 0.4623 0.1264 5 -1.869894 0.405361 1.639361 6 0.1247 0.4623 0.1264 5 -1.869894 0.405361 1.639361 6 0.1247 0.4623 0.1264 5 -1.89886 -0.571498 -0.163411 -0.701210 -0.490290 0.1080 0.4257 -0.4662 0.4026 0.4254 False Discovery Rate = 0.05 Reject Ro if p = F(2 <= z) <= FDR/2 with stopping rule . dunntest iq6, by(iage) ma(bh) wrap Kruskal-Wallis equality-of-populations rank test i iage Obe Rank Sum i 1 1 1 4 66.50 i 1 1 4 465.50 i 1 1 1 4 465.50 i 1 1 1 1 4 465.50 i 1 1 1 1 1 1 1 1.00 i 2 1 2 7 7 0 with 5 d.f. probability = 0.7354 Korpeer review only - http://bmjopen.bmj.com/site/about/guidelin Korpear review only - http://bmjopen.bmj.com/site/about/guideli</pre>	. dunntest	iq5, by(iage) ma(bh) wrap
<pre>tiage (Dbs Rank Sum </pre>	<pre>iage Obs Rank Sum i iage Obs Rank Sum 1 1 1 7.00 2 2 3 836.00 3 3 5 1 476.50 4 1 11 377.00 5 5 1 185.00 chi-squared = 3.728 with 5 d.f. probability = 0.5992 Chi-squared with ties = 9.323 with 5 d.f. probability = 0.0965 Dunn's Pairwise Comparison of iq5 by lage (Benjamini-Hochberg) Col Mean-1 Row Mean 1 2 3 4 5 2 1 -2.057331 0 .0973 0.1279 4 1 -1.869894 0.405361 1.639361 0 .0972 0.4283 0.1264 5 1 -1.941161 -0.094449 0.776748 -0.362103 0 .1080 0.4257 0.4662 0.4026 0.4254 False Discovery Rate = 0.05 Reject Ho If p = P(Z <= 2) <= FDR/2 with stopping rule . dunntest iq6, by (lage) ma(hb) wrap Kruskal-Wallis equality-of-populations rank test +</pre>	Kruskal-Wa	llis equality-of-populations rank test
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<pre> 1 2 23 836.00 3 3 1476.50 4 11 377.00 </pre>	<pre>1 2 23 836.00 3 3 176.50 4 11 377.00 </pre>	+	1 7.00
<pre> A 01 377.00 S 5 185.00 A 11 44.50 A 11 44.50 A 11 44.50 A 11 44.50 A 10 11 44.50 A 12 11 44.50 A 12 11 44.50 A 12 12 11 11 A 12 11 11 A 12 11 11 A 12 11 11 11 11 A 12 12 12 12 12 12 12</pre>	<pre> A 13 377.00 A 14 14 377.00 A 14 14 150.00 A 1 44.50 A 14.50 A</pre>	2	23 836.00 35 1476 50
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<pre>chi-squared = 3.728 with 5 d.f. probability = 0.5892 chi-squared with ties = 9.323 with 5 d.f. probability = 0.0966 Dunn's Pairwise Comparison of 1q5 by lage (Benjamini-Hochberg) Col Mean- Row Mean 1 2 3 4 5 2 -2.057391 0.1487 3 -2.484459 -1.557480 0 0.0973 0.1279 4 -1.869894 0.405361 1.639361 0.0922 0.4283 0.1264 5 -1.961161 -0.094649 0.776748 -0.362103 0.1247 0.4623 0.4100 0.4138 6 -1.898886 -0.571498 -0.163411 -0.701210 -0.490290 0 0.0080 0.4257 0.4662 0.4026 0.4254 False Discovery Rate = 0.05 Reject Ho if p = P(Z <= 121) <= FDR/2 with stopping rule . dunntest iq6, by(iage) ma(bh) wrap Kruskal-Wallis equality-of-populations rank test i age Obs Rank Sum </pre>	<pre>chi-squared = 3.728 with 5 d.f. probability = 0.5892 chi-squared with ties = 9.323 with 5 d.f. probability = 0.0066 Dunn's Pairwise Comparison of iq5 by iage (Benjamini-Hochberg) Col Mean-I Row Mean 1 2 3 4 5 2 -2.057391 0.1487 3 -2.484459 -1.557480 0.0973 0.1279 4 -1.869894 0.405361 1.639361 0.0922 0.4283 0.1264 5 -1.961161 -0.094649 0.776748 -0.362103 0.1247 0.4623 0.4100 0.4138 0.1247 0.4623 0.4100 0.4138 0.1080 0.4257 0.4662 0.4026 0.4254 False Discovery Rate = 0.05 Reject Ro if p = P(Z <= z) <= FDR/2 with stopping rule . dunntest iq6, by(iage) ma(bh) wrap Kruskal-Wallis equality-of-populations rank test i=get Obs Rank Sum i=re-t-re-t-re-t-re-t-t-t-t-t-t-t-t-t-t-t-</pre>	5	5 185.00
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<pre>. dunntest iq6, by(iage) ma(bh) wrap Kruskal-Wallis equality-of-populations rank test ++ iage Obs Rank Sum +</pre>	<pre>. dunntest iq6, by(iage) ma(bh) wrap Kruskal-Wallis equality-of-populations rank test ++ iage Obs Rank Sum +++ 1 1 1.00 2 23 841.50 3 35 1397.00 4 11 468.50 5 5 161.50 ++</pre>	Reject Ho	if $p = P(Z \le z) \le FDR/2$ with stopping rule
<pre>. dunntest iq6, by(iage) ma(bh) wrap Kruskal-Wallis equality-of-populations rank test ++ i age Obs Rank Sum ++</pre>	<pre>. dunntest iq6, by(iage) ma(bh) wrap Kruskal-Wallis equality-of-populations rank test ++ iage Obs Rank Sum +</pre>		
<pre>Kruskal-Wallis equality-of-populations rank test ++ iage Obs Rank Sum +</pre>	<pre>Kruskal-Wallis equality-of-populations rank test ++ iage Obs Rank Sum +</pre>	. dunntest	. iq6, by(iage) ma(bh) wrap
<pre>++ iage Obs Rank Sum +</pre>	<pre>++ iage Obs Rank Sum + 1 1 11.00 2 23 841.50 3 35 1397.00 4 11 468.50 5 5 161.50 +</pre>	Kruskal-Wa	llis equality-of-populations rank test
<pre> +</pre>	<pre>+</pre>	+ iage	Obs Rank Sum
chi-squared = 2.770 with 5 d.f.	<pre>chi-squared = 2.770 with 5 d.f. probability = 0.7354</pre>	+	
<pre> 3 35 1397.00 4 11 468.50 5 5 161.50 +</pre>	<pre> 3 35 1397.00 4 11 468.50 5 5 161.50 +</pre>	2	23 841.50
chi-squared = 2.770 with 5 d.f.	chi-squared = 2.770 with 5 d.f. probability = 0.7354 For peer review only - http://bmjopen.bmj.com/site/about/guidelin	3 4	35 1397.00 11 468.50
<pre> + 6 1 46.50 ++ chi-squared = 2.770 with 5 d.f. probability = 0.7354</pre>	<pre> + 6 1 46.50 ++ chi-squared = 2.770 with 5 d.f. probability = 0.7354 For peer review only - http://bmjopen.bmj.com/site/about/guidelin</pre>	5	5 161.50
++ chi-squared = 2.770 with 5 d.f. probability = 0.7354	<pre>chi-squared = 2.770 with 5 d.f. probability = 0.7354 For peer review only - http://bmjopen.bmj.com/site/about/guidelin</pre>	+	1 46.50
chi-squared = 2.770 with 5 d.f. probability = 0.7354	chi-squared = 2.770 with 5 d.f. probability = 0.7354 For peer review only - http://bmjopen.bmj.com/site/about/guidelin	+	+
probability = 0.7354	probability = 0.7354 For peer review only - http://bmjopen.bmj.com/site/about/guidelin	chi-square	ed = 2.770 with 5 d.f.
	For peer review only - http://bmjopen.bmj.com/site/about/guidelin	probabilit	.y = 0.7354

	1	Duini	(Benj	jamini-Hochk	of 1q6 by 1 perg)	age		
Col Mean- Row Mean			1	2	3		4	5
2	+	 596368						
	(0.2070						
3	-1.8	816984	-0.790016					
		0.2390	0.3221					
4	-1.9	927631 0.4043	-1.043792 0.3178	-0.493509 0.3586				
5	 -1.2	239210	0.553701	1.015019	1.215993			
	(0.3229	0.3624	0.2907	0.2800			
6	-1.5	599813	-0.618474	-0.413849	-0.238527	-0.826140		
	1 (0.2/41	0.3656	0.3637	0.4057	0.3406		
'alse Dis Reject Ho	covery if p =	Rate = = P(Z <	= 0.05 = z) <= H	TDR/2 with s	topping rul	e		
dunntes	t iq7,	by(iag	e) ma(bh) v	vrap				
ruskal-W	allis e	equalit	y-of-popula	ations rank	test			
+			+					
iage 	Obs +	Rank +	Sum					
		13 819	.50					
3	35	1270	.50					
4	11	493 205	50					
	++	+						
6 +	1	48	.00					
hi-squar probabili hi-squar	ed = ty = ed with	2.90 0.71 h ties	7 with 5 d. 43 = 4.855	.f. 5 with 5 d.f	·			
hi-squar probabili hi-squar probabili	ed = ty = ed with ty =	2.90 0.71 h ties <mark>0.43</mark>	7 with 5 d. 43 = 4.855 38	f. 5 with 5 d.f	:.			
hi-squar probabili hi-squar probabili	ed = ty = ed with ty =	2.90 0.71 h ties 0.43 Dunn'	7 with 5 d. 43 = 4.855 38 s Pairwise (Ben	f. 5 with 5 d.f Comparison jamini-Hochk	of iq7 by i berg)	age		
hi-squar robabili hi-squar robabili ol Mean- ow Mean	ed = ty = ed with ty = 	2.90 0.71 h ties 0.43 Dunn'	7 with 5 d. 43 = 4.855 38 s Pairwise (Benj 1	f. 5 with 5 d.f Comparison jamini-Hochk 2	of iq7 by i perg) 3	age	4	5
hi-squar robabili hi-squar robabili ol Mean ow Mean 2	ed = ty = ed with ty = +	2.90 0.71 h ties Dunn' 376058	7 with 5 d. 43 = 4.855 38 s Pairwise (Benj 1	f. 5 with 5 d.f Comparison jamini-Hochk 2	of iq7 by i berg) 3	age	4	5
hi-squar robabili hi-squar robabili ol Mean- ow Mean 2	ed = ty = ed with ty = + -1.3	2.90 0.71 h ties Dunn' 376058 0.2532	7 with 5 d. 43 = 4.855 38 s Pairwise (Benj 1	f. 5 with 5 d.f Comparison jamini-Hochk 2	of iq7 by i perg) 3	age	4	5
hi-squar robabili hi-squar robabili ol Mean 2 2 3	ed = ty = ed with ty = -1.3	2.90 0.71 h ties Dunn' 376058 0.2532	7 with 5 d. 43 = 4.855 38 s Pairwise (Benj 1 0.2020966	f. 5 with 5 d.f Comparison jamini-Hochk 2	of iq7 by i berg) 3	age	4	5
hi-squar robabili hi-squar robabili ol Mean- ow Mean 2 3	ed = ty = ed with ty = -1.3 (-1.3 (2.90 0.71 h ties Dunn' 376058 0.2532 333089 0.2281	7 with 5 d. 43 = 4.855 38 s Pairwise (Benj 1 0.202096 0.4499	f. 5 with 5 d.f Comparison jamini-Hochk 2	of iq7 by i perg) 3	.age	4	5
hi-squar robabili hi-squar robabili ol Mean ow Mean 2 3 3	ed = ty = ed with ty = -1.3 -1.3 -1.5	2.90 0.71 h ties Dunn' 376058 0.2532 333089 0.2281 780629 0.5623	7 with 5 d. 43 = 4.855 38 s Pairwise (Ben] 1 0.202096 0.4499 -1.226249 0.2358	.f. 5 with 5 d.f Comparison jamini-Hochk 2 -1.469099 0.3545	of iq7 by i berg) 3	age	4	5
hi-squar robabili hi-squar robabili ol Mean- ow Mean 2 3 4	ed = ty = ed with ty = -1.3 (-1.3 (-1.3 (-1.3	2.90 0.71 h ties Dunn' 376058 0.2532 333089 0.2281 780629 0.5623	7 with 5 d. 43 = 4.855 38 s Pairwise (Benj 1 0.202096 0.4499 -1.226249 0.2358 -0.462525	.f. 5 with 5 d.f Comparison jamini-Hochk 2 -1.469099 0.3545	of iq7 by i berg) 3	age	4	5
hi-squar robabili hi-squar robabili ol Mean ow Mean 2 3 3 4 5	ed = ty = ed with ty = -1.3 -1.5 -1.7 -1.4 -1.4	2.90 0.71 h ties Dunn' 376058 0.2532 333089 0.2281 780629 0.5623 494032 0.5069	7 with 5 d. 43 = 4.855 38 s Pairwise (Ben] 1 0.202096 0.4499 -1.226249 0.2358 -0.463525 0.4384	.f. 5 with 5 d.f Comparison jamini-Hochk 2 	of iq7 by i berg) 3 	age	4	5
hi-squar probabili hi-squar probabili col Mean- cow Mean 2 3 4 5 5	ed = ty = ed with ty = -1.3 (-1.3 (-1.4 (-1.4 (-1.4	2.90 0.71 h ties Dunn' 376058 0.2532 333089 0.2281 780629 0.5623 494032 0.5069 446590	7 with 5 d. 43 = 4.855 38 s Pairwise (Ben] 1 0.202096 0.4499 -1.226249 0.2358 -0.463525 0.4384 -0.624762	.f. 5 with 5 d.f Comparison jamini-Hochk 2 -1.469099 0.3545 -0.595349 0.4137 -0.684085	<pre>of iq7 by i perg) 3 </pre>	age 	4	5
hi-squar robabili hi-squar robabili ol Mean ow Mean 2 3 3 4 5 5	ed = ty = ed with ty = -1.3 -1.5 -1.4 -1.4	2.90 0.71 h ties Dunn' 376058 0.2532 333089 0.2281 780629 0.5623 494032 0.5669 446590 0.2775	7 with 5 d. 43 = 4.855 38 s Pairwise (Ben] 1 0.202096 0.4499 -1.226249 0.2358 -0.463525 0.4384 -0.624762 0.4434	.f. 5 with 5 d.f Comparison jamini-Hochk 2 -1.469099 0.3545 -0.595349 0.4137 -0.684085 0.4631	<pre>0.413781 0.4244 -0.178063 0.4293</pre>	age -0.373508 0.4089	4	5
hi-squar robabili hi-squar robabili ol Mean ow Mean 2 3 4 5 6 calse Dis eject Ho	ed = ty = ed with ty = -1.3 -1.3 -1.3 -1.4 -1.4 -1.4 -1.4 -1.4	2.90 0.71 h ties Dunn' 376058 0.2532 333089 0.2281 780629 0.5623 494032 0.5069 446590 0.2775 Rate = = P(Z <	7 with 5 d. 43 = 4.855 38 s Pairwise (Ben] 1 0.202096 0.4499 -1.226249 0.2358 -0.463525 0.4384 -0.624762 0.4434 = 0.05 = z) <= F	.f. 5 with 5 d.f Comparison jamini-Hochk 2 -1.469099 0.3545 -0.595349 0.4137 -0.684085 0.4631 FDR/2 with s	of iq7 by i berg) 3 0.413781 0.4244 -0.178063 0.4293 stopping rul	age -0.373508 0.4089 e	4	5
hi-squar robabili hi-squar robabili ol Mean- ow Mean 2 3 4 5 6 alse Dis eject Ho	ed = ty = ed with ty = -1.3 -1.4 -1.4 -1.4 -1.4 -1.4 -1.4 -1.4	2.90 0.71 h ties Dunn' 376058 0.2532 333089 0.2281 780629 0.5623 494032 0.5069 446590 0.2775 Rate = = P(Z <	7 with 5 d. 43 = 4.855 38 s Pairwise (Ben] 1 0.202096 0.4499 -1.226249 0.2358 -0.463525 0.4384 -0.624762 0.4434 = 0.05 = z) <= H	.f. 5 with 5 d.f Comparison jamini-Hochk 2 -1.469099 0.3545 -0.595349 0.4137 -0.684085 0.4631 FDR/2 with s	<pre>0.413781 0.4244 -0.178063 0.4293 stopping rul</pre>	age -0.373508 0.4089 e	4	5

	,							
1	+	+	 00					
2	23	896.0	00					
3	35	1360.	00					
1 4 1 5	11 5	1 356.0 1 239 1	00 50					
	+	+						
6 +	1	58.	50 +					
chi-squar probabili chi-squar	ed = ty = ed wit]	3.633 0.603 h ties =	with 5 d 4 4.15	d.f. 57 with 5 d.1	Ŧ.			
probabili	ty =	0.527	<u>o</u>					
		Dunn's	Pairwise	e Comparison	of iq8 by	iage		
Col Mean-	I		(Bel	гјаштит-носи	Jerg)			
Row Mean	l		1	2	3		4	5
2	-1.	088658	(
		0.3454						
3	-1.	091772	0.017935	5				
		0.4124	0.4928					
4	 -0.	758949	0.871211	0.910035				
		0.2584	0.2398	0.2721				
5	-1.	410676 ·	-0.878018	-0.916267	-1.395398			
-		0.5938	0.2590	0.2996	0.4072			
6	 -1	455798 ·	-0.926803	-0.938242	-1.212211	-0.46875	51	
Ŭ		1.0000	0.3319	0 3730	0 4227	0.342	25	
False Dis Reject Ho	covery if p :	Rate = = P(Z <=	0.05 z) <=	FDR/2 with s	stopping ru	le		
False Dis Reject Ho . dunntes	covery if p t iq9,	Rate = = P(Z <= by(iage)	0.05 z) <=) ma(bh)	FDR/2 with s wrap	stopping ru	le		
False Dis Reject Ho . dunntes Kruskal-W	covery if p t iq9, allis	Rate = = P(Z <= by(iage)	0.05 z) <=) ma(bh) -of-popul	FDR/2 with s wrap ations rank	stopping ru	le		
False Dis Reject Ho . dunntes Kruskal-W + iage 	covery if p t iq9, allis Obs +	Rate = = P(Z <= by(iage) equality Rank Sn +	0.05 z) <=) ma(bh) -of-popul + um 	FDR/2 with s wrap .ations rank	stopping ru	le		
False Dis Reject Ho . dunntes Kruskal-W + iage 1	covery if p : t iq9, allis (Obs + 1	Rate = = P(Z <= by(iage) equality Rank St +	0.05 z) <=) ma(bh) -of-popul + um 50	FDR/2 with s wrap .ations rank	stopping ru	le		
False Dis Reject Ho . dunntes Kruskal-W + iage 1 2 3	covery if p : t iq9, allis d Obs + 1 23 35	Rate = = P(Z <= by(iage) equality Rank St +	0.05 z) <=) ma(bh) -of-popul + um 50 00	FDR/2 with s wrap .ations rank	test	le		
False Dis Reject Ho . dunntes Kruskal-W + iage 1 2 3 4	covery if p = t iq9, allis (0bs + 1 23 35 11	Rate = = P(Z <= by(iage equality Rank St + 26.1 844.1 1377.1 443.1	0.05 z) <=) ma(bh) -of-popul + um 50 00 50 	FDR/2 with s wrap .ations rank	test	le		
False Dis Reject Ho . dunntes Kruskal-W + iage 1 2 3 4 4 5	covery if p : allis (Obs + 1 23 35 11 5 +	Rate = = P(Z <= by(iage) equality Rank St + 26.] 844. 1377. 443. 208.	0.05 z) <=) ma(bh) -of-popul + um 50 00 50 50 	FDR/2 with s wrap .ations rank	stopping ru	le		
False Dis Reject Ho . dunntes Kruskal-W + iage 1 2 3 4 5 6	covery if p allis 0bs + 1 23 11 5 + 1	Rate = = P(Z <= by(iage) equality Rank St + 26.1 844.0 1377.0 443.1 208.1 + 26.1	0.05 z) <=) ma(bh) -of-popul + um 50 00 50 50 50 50	FDR/2 with s wrap .ations rank	test	le		
False Dis Reject Ho . dunntes Kruskal-W + iage 1 2 3 1 4 5 6 +	covery if p : t iq9, allis (0bs + 1 23 35 11 5 + 1 	Rate = = P(Z <= by(iage) equality Rank Si 26. 844. 1377. 443. 208. 26. 26.	0.05 z) <=) ma(bh) -of-popul + um 50 00 50 50 50 50 50 50	FDR/2 with s wrap .ations rank	test	le		
False Dis Reject Ho . dunntes Kruskal-W + 1 2 3 4 5 6 + chi-squar	covery if p t iq9, allis o 0bs 1 23 35 11 5 + 1 ed =	Rate = = P(Z <= by(iage equality Rank St 26.1 844.1 1377.1 443.2 208.3 2	0.05 z) <=) ma(bh) -of-popul + um 50 00 50 50 50 50 + with 5 c	FDR/2 with s wrap .ations rank	test	le		
False Dis Reject Ho . dunntes Kruskal-W + iage 1 2 3 4 5 6 + chi-squar probabili	covery if p allis 0bs + 1 23 11 5 + 1 ed = ty =	Rate = = P(Z <= by(iage) equality Rank St 	0.05 z) <=) ma(bh) -of-popul + um 50 00 50 50 50 + with 5 c 6	FDR/2 with s wrap .ations rank	test	le		
False Dis Reject Ho . dunntes Kruskal-W + iage 1 2 3 4 4 5 0 6 + chi-squar chi-squar	covery if p = t iq9, allis (Obs + 1 23 35 11 5 + ed = ty = ed with	Rate = = P(Z <= by(iage) equality Rank Sr 26. 844. 1377. 443. 208. 26. 26. 844. 0.975 0.964 h ties =	0.05 z) <=) ma(bh) -of-popul + um 50 00 50 50 50 50 + with 5 c 6 1.15	FDR/2 with s wrap ations rank 4.f. 58 with 5 d.1	test	le		
False Dis Reject Ho . dunntes Kruskal-W + 1 2 3 4 5 chi-squar probabili	covery if p = t iq9, allis (0bs + 1 23 35 11 5 + ed = ty = ed wit1 ty =	Rate = = P(Z <= by(iage) equality Rank St 26.1 844.1 1377.1 443.2 208.2 	0.05 z) <=) ma(bh) -of-popul + um 50 00 50 50 50 + with 5 c 6 1.15	FDR/2 with s wrap .ations rank d.f.	test	le		
False Dis Reject Ho . dunntes Kruskal-W + iage 1 2 3 4 5 6 + chi-squar probabili chi-squar	covery if p t iq9, allis 0bs + 1 23 11 5 + ed = ty = ed wit1 ty =	Rate = = P(Z <= by(iage) equality Rank St 	0.05 z) <=) ma(bh) -of-popul + um 50 00 50 50 50 + with 5 c 6 1.15	FDR/2 with s wrap .ations rank A.f. 58 with 5 d.1	test	le		
False Dis Reject Ho . dunntes Kruskal-W + iage 1 2 3 4 5 6 + chi-squar probabili chi-squar	covery if p : t iq9, allis d Obs + 1 23 35 11 5 + ed = ty = ed wit] ty =	Rate = = P(Z <= by(iage) equality Rank St 	0.05 z) <=) ma(bh) -of-popul + um 50 00 50 50 50 50 50 50	FDR/2 with s wrap .ations rank d.f. 58 with 5 d.f	test	le		
False Dis Reject Ho . dunntes Kruskal-W + iage 1 2 3 4 5 6 + chi-squar probabili chi-squar	covery if p = t iq9, allis (Obs + 1 23 35 11 5 + ed = ty = ed with ty = 	Rate = = P(Z <= by(iage) equality Rank Sr 26. 26. 344. 1377. 443. 208. 26. 844. 1377. 26. 844. 1377. 26. 844. 1377. 26. 0.975 0.964 h ties = 0.948 Dunn's	0.05 z) <=) ma(bh) -of-popul + um 50 00 50 50 50 50 50 + with 5 c 6 1.15 8 Pairwise (Ber	FDR/2 with s wrap ations rank ations rank f.f. 88 with 5 d.f e Comparison njamini-Hoch	test of iq9 by perg)	le		
False Dis Reject Ho . dunntes Kruskal-W + 1 2 3 4 5 chi-squar probabili chi-squar probabili	covery if p = t iq9, allis (0bs + 1 23 35 11 5 + ed = ty = ed wit! ty = 	Rate = = P(Z <= by(iage) equality Rank Si +	0.05 z) <=) ma(bh) -of-popul + um 50 00 50 50 50 50 50 50	FDR/2 with s wrap .ations rank d.f. 58 with 5 d.f e Comparison njamini-Hochł 2	test topping ru test	le	4	5
False Dis Reject Ho . dunntes Kruskal-W + 1 2 3 4 5 6 + chi-squar probabili chi-squar probabili	covery if p : t iq9, allis (0bs + 1 23 35 11 5 + 1 ed = ty = ed with ty = +	Rate = = P(Z <= by(iage equality- Rank Sr 26.1 844.1 1377.1 443.2 208.3 208.3	0.05 z) <=) ma(bh) -of-popul + um 50 00 50 50 50 + with 5 c 6 1.15 8 Pairwise (Ber 1	FDR/2 with s wrap .ations rank a.f. 58 with 5 d.f comparison njamini-Hochk 2	test of iq9 by berg) 3	le	_4	5
False Dis Reject Ho . dunntes Kruskal-W + iage 1 2 3 4 4 5 0 6 + chi-squar probabili chi-squar probabili Col Mean Row Mean	covery if p : t iq9, allis d Obs + 1 23 35 11 23 35 11 5 + ed = ty = ed witl ty = 	Rate = = P(Z <= by(iage) equality Rank St 	0.05 z) <=) ma(bh) -of-popul + um 50 00 50 50 50 50 50 50	FDR/2 with s wrap ations rank d.f. 68 with 5 d.f comparison njamini-Hochł 2	test test c. of iq9 by berg) 3	le	4	5
False Dis Reject Ho . dunntes Kruskal-W + 1 1 2 3 4 4 5 chi-squar probabili chi-squar probabili chi-squar probabili	covery if p = t iq9, allis (0bs + 1 23 35 11 5 + ed = ty = ed with ty = + -0. -0.	Rate = = P(Z <= by(iage) equality Rank Si 26. 	0.05 z) <=) ma(bh) -of-popul + um 50 00 50 50 50 50 50 50	FDR/2 with s wrap ations rank ations rank d.f. 8 with 5 d.f comparison njamini-Hochk 2	test test of iq9 by berg) 3	le	_4	5
False Dis Reject Ho . dunntes Kruskal-W + 1 2 3 4 5 chi-squar probabili chi-squar probabili	covery if p = t iq9, allis (0bs + 1 23 35 11 5 + ed = ty = ed wit! ty = -0.1 -0.1 -0.1 -0.1	Rate = = P(Z <= by(iage) equality Rank Si +	0.05 z) <=) ma(bh) -of-popul + um 50 00 50 50 50 50 50 50	FDR/2 with s wrap ations rank ations rank f.f. 8 with 5 d.f comparison njamini-Hoch 2	test test of iq9 by berg) 3	le	_4	5

```
0.9633 0.4693 0.5130
             1
           5
               -0.684890 -0.500594 -0.243357 -0.126456
            - 1
2
                  1.0000
                          0.6607
                                   0.5048
                                               0.4818
3
                        0.492653 0.625047
           6 |
                0.000000
                                             0.653017
                                                       0.684890
4
                  0.5000
                                   0.6649
                                             1.0000
                          0.5185
                                                       1.0000
             5
6
     False Discovery Rate = 0.05
    Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
7
8
9
     . dunntest iq10, by(iage) ma(bh) wrap
10
     Kruskal-Wallis equality-of-populations rank test
11
12
      +----+
       | iage | Obs | Rank Sum |
13
           --+----+-----
14
          1 | 1 | 6.50 |
15
               23 |
           2 |
                     856.50
           3 | 35 | 1427.50 |
16
           4 | 11 |
                    409.00 |
17
           5 | 5 |
                    182.50 I
18
19
           6 | 1 | 44.00 |
       1
         -----+
20
21
     chi-squared =
                   2.692 with 5 d.f.
22
    probability =
                   0.7473
23
     chi-squared with ties =
                             7.233 with 5 d.f.
24
                    0.2039
    probability =
25
26
                    Dunn's Pairwise Comparison of iq10 by iage
27
                            (Benjamini-Hochberg)
28
    Col Mean-|
     Row Mean |
                         1
                                     2
                                                  3
                                                              4
                                                                           5
29
                _____
     ----+
30
          2 | -2.233632
31
                 0.0957
            32
             3 |
               -2.509329 -0.980744
33
                0.0907
                         0.4084
            34
               -2.180462 0.011605 0.773901
           4 |
35
                 0.0731
                          0.4954
                                    0.4703
36
             37
               -2.032789
                        0.111187 0.665386
           5 |
                                             0.093832
                0.0789
                         0.5258
                                   0.4742
                                              0.4957
38
             39
           6
               -1.968240 -0.491273 -0.235250 -0.484547
                                                      -0.508197
40
                  0.0736
                          0.4674
                                    0.5088
                                             0.4282
                                                         0.5094
             41
     False Discovery Rate = 0.05
42
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
43
     _____
44
45
        Question – For each of the questions, 1-10, is there a difference in the average response by gender?
46
47
48
     . ranksum iq1, by(igender)
49
    Two-sample Wilcoxon rank-sum (Mann-Whitney) test
50
51
         igender |
                      obs
                            rank sum
                                       expected
52
         ____+
                      ------
              1 |
                       17
                              629.5
                                        654.5
53
              2 |
                       59
                              2296.5
                                        2271.5
54
             ---+-
                       ____
                                         ____
                      76 2926
                                         2926
55
        combined |
56
     unadjusted variance
                        6435.92
57
                       -5031.72
     adjustment for ties
58
                         1404.20
     adjusted variance
59
                         For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml
60
```

. ranksum iq2, by	y(igender))			
Gwo-sample Wilcox	xon rank-s	sum (Mann-Wh	itney) test		
igender	obs	rank sum	expected		
1 2	17 58	564 2286	646 2204		
combined	75	2850	2850		
unadjusted variar adjustment for ti	nce 62 ies -44	244.67 459.21			
adjusted variance	e 17	785.46			
Ho: iq2(igender== z =	=1) = iq2 - <u>1.941</u>	(igender==2)			
Prob > z =	0.0523				
. ranksum iq3, b <u>y</u>	y(igender))			
Swo-sample Wilcoz	xon rank-s	sum (Mann-Wh	itney) test		
igender	obs	rank sum	expected		
1 2	17 59	613 2313	654.5 2271.5		
combined	76	2926	2926		
djusted variance	e 27	738.19			
adjusted variance Ho: iq3(igender== z = Prob > z =	e 27 =1) = iq3 -0.793 0.4277	 738.19 (igender==2)			
Adjusted variance Io: iq3(igender== z = Prob > z = ranksum iq4, by	= 2 ⁷ =1) = iq3 -0.793 0.4277 y(igender)	 738.19 (igender==2)	itrov) tost		
Adjusted variance Ho: iq3(igender== z = Prob > z =	= 27 =1) = iq3 -0.793 0.4277 y(igender) xon rank-s	(igender==2) (sum (Mann-Wh	itney) test		
<pre>idjusted variance lo: iq3(igender==</pre>	e 27 =1) = iq3 -0.793 0.4277 y(igender) xon rank-s obs	 738.19 (igender==2) sum (Mann-Wh rank sum	itney) test expected 		
<pre>adjusted variance Io: iq3(igender==</pre>	<pre> = 27 =1) = iq3 -0.793 0.4277 y(igender) xon rank-s obs 17 60</pre>	738.19 (igender==2)) sum (Mann-Wh rank sum 659 2344	itney) test expected 		
<pre>djusted variance lo: iq3(igender==</pre>	e 27 =1) = iq3 -0.793 0.4277 y(igender) kon rank-s obs 17 60 77	738.19 (igender==2) sum (Mann-Wh rank sum 659 2344 3003	itney) test expected 663 2340 3003		
<pre>djusted variance lo: iq3(igender==</pre>	e 27 =1) = iq3 -0.793 0.4277 y(igender) kon rank-s obs 17 60 	738.19 (igender==2) sum (Mann-Wh rank sum 659 2344 	itney) test <u>expected</u> 663 2340 3003		
Adjusted variance Ho: iq3(igender== z = Prob > z =	e 27 =1) = iq3 -0.793 0.4277 y(igender) xon rank-s obs 17 60 77 nce 66 ies -26 e 40	738.19 (igender==2) sum (Mann-Wh rank sum 659 2344 3003 630.00 621.46 008.54	itney) test expected 		
Adjusted variance Io: iq3(igender== z = Prob > z = . ranksum iq4, by . wo-sample Wilcos igender . 1 2 . combined . adjusted variance . djusted variance . djusted variance	e 27 =1) = iq3 -0.793 0.4277 y(igender) kon rank-s obs 17 60 77 nce 66 ies -26 e 40 =1) = iq4	738.19 (igender==2)) sum (Mann-Wh rank sum 659 2344 3003 630.00 621.46 008.54 (igender==2)	itney) test expected 		
Adjusted variance Io: iq3(igender== 2 = Prob > z = . ranksum iq4, by Cwo-sample Wilcos igender 1 2 . combined anadjusted variance Adjusted variance Io: iq4(igender== 2 = Prob > z =	<pre>= 27 =1) = iq3 -0.793 0.4277 y(igender) xon rank-s obs 17 60 -0.063 0.9496</pre>	738.19 (igender==2) sum (Mann-Wh rank sum 	itney) test <u>expected</u> 663 2340 3003		
Adjusted variance Io: iq3(igender== z = Prob > z = . ranksum iq4, by Ewo-sample Wilcos igender 1 2 . combined anadjusted variar adjusted variance Ho: iq4(igender== z = Prob > z = . ranksum iq5, by	<pre>= 27 =1) = iq3 -0.793 0.4277 y(igender) xon rank-s obs 17 60 77 nce 66 ies -26 =1) = iq4 -0.063 0.9496 y(igender)</pre>	738.19 (igender==2)) sum (Mann-Wh rank sum 659 2344 3003 630.00 621.46 008.54 (igender==2)	itney) test <u>expected</u> <u>663</u> 2340 <u>3003</u>		
Adjusted variance Io: iq3(igender== Z = Prob > z = . ranksum iq4, by Cwo-sample Wilcos igender 1 2 . combined anadjusted variance Adjusted variance Io: iq4(igender== Z = Prob > z = . ranksum iq5, by Cwo-sample Wilcos	<pre>= 27 =1) = iq3 -0.793 0.4277 y(igender) xon rank-s obs 17 60</pre>	738.19 (igender==2)) sum (Mann-Wh rank sum 	itney) test		
Adjusted variance Io: iq3(igender== 2 = Prob > z = . ranksum iq4, by Cwo-sample Wilcos igender 1 2 . combined anadjusted variance Adjusted variance Io: iq4(igender== 2 = Prob > z = . ranksum iq5, by Cwo-sample Wilcos igender 	<pre>= 27 =1) = iq3 -0.793 0.4277 y(igender) kon rank-s obs 17 60 -0.063 -26 =1) = iq4 -0.063 0.9496 y(igender) kon rank-s obs</pre>	<pre> 738.19 (igender==2)) sum (Mann-Wh rank sum 659 2344 659 2344 659 2344 659 2344 659 2344 (igender==2)) sum (Mann-Wh rank sum</pre>	itney) test expected 		
adjusted variance Fo: iq3(igender== 2 = Prob > z = . ranksum iq4, by Two-sample Wilcos igender . l . combined unadjusted variance do: iq4(igender== Prob > z = . ranksum iq5, by Two-sample Wilcos igender . l . l . l . l . l . l . l . l	<pre>= 27 =1) = iq3 -0.793 0.4277 y(igender) kon rank-s obs 17 60 -0.063 -26 =1) = iq4 -0.063 0.9496 y(igender) kon rank-s obs -17 59</pre>	<pre>//38.19 (igender==2)) sum (Mann-Wh rank sum</pre>	itney) test <u>expected</u> <u>663</u> 2340 <u>3003</u> itney) test <u>expected</u> <u>654.5</u> 2271.5		

ladjusted varianc ljustment for tie	ce 64 es -38	35.92 62.43	
ljusted variance	25	73.49	
p: iq5(igender==1	L) = iq5(igender==2)	
z = Prob > z =	0.2871		
ranksum iq6, by((igender)		
vo-sample Wilcoxo	on rank-s	um (Mann-Wh	itney) test
igender	obs	rank sum	expected
1 2	17 59	684 2242	654.5 2271.5
combined	76	2926	2926
nadjusted varianc djustment for tie	ce 64 es -31	35.92 86.72	
ljusted variance	32	49.19	
: iq6(igender==1	L) = iq6(igender==2)	
Prob > z =	0.6048		
ranksum iq7, by((igender)	<i>w</i> -	\mathbf{N}^{*}
<i>i</i> o-sample Wilcoxo	on rank-s	um (Mann-Wh	itney) test
igender +	obs	rank sum	expected
1 2	17 58	599 2251	646 2204
combined	 75	2850	2850
nadjusted varianc	ce 62	44.67	
ljustment for tie	es -25	05.86	
ljusted variance	37	38.81	
: iq7(igender==1	L) = iq7(igender==2)	
z = Prob > z =	-0.769 <mark>0.4421</mark>		
ranksum iq8, by((igender)		
vo-sample Wilcoxo	on rank-s	um (Mann-Wh	itney) test
igender	obs	rank sum	expected
1 2	17 59	610.5 2315.5	654.5 2271.5
combined	76	2926	2926
ladjusted varianc ljustment for tie	ce 64 es -8	35.92 12.08	
ljusted variance		23.84	
: iq8(igender==1	L) = iq8(igender==2)	
z = Prob > z =	-0.587 <mark>0.5574</mark>		
ranksum iq9, by((igender)		
ranksum iq9, by(vo-sample Wilcoxo	(igender) on rank-s	um (Mann-Wh	itney) test

----+ ------1 | 17 597 654.5 2 | 59 2329 2271.5 1 2 ____+ _____ _____ _____ 3 combined | 76 2926 2926 4 unadjusted variance 6435.92 adjustment for ties -1019.01 5 6 _____ adjusted variance 5416.90 7 8 Ho: iq9(igender==1) = iq9(igender==2) 9 z = -0.781Prob > |z| = 0.434710 11 12 . ranksum iq10, by(igender) 13 Two-sample Wilcoxon rank-sum (Mann-Whitney) test 14 15 igender | obs rank sum expected 16
 1
 17
 635.5
 654.5

 2
 59
 2290.5
 2271.5
 17 18 ----+-_____ combined | 76 2926 19 2926 20 unadjusted variance 6435.92 adjustment for ties -4040.59 21 adjustment for ties 22 _____ adjusted variance 2395.32 23 24 Ho: iq10(igender==1) = iq10(igender==2) 25 z = -0.388Prob > |z| = 0.697926 27 _____ _____ 28 29 Question – For each of the questions, 1-10, is there a difference in the average response by level of education 30 . dunntest iq1, by(ied) ma(bh) wrap 31 32 Warning: by() values are unlabeled, option nolabel implicit 33 34 Kruskal-Wallis equality-of-populations rank test 35 36 +----+ | ied | Obs | Rank Sum | 37 |-----| 38 | 1 | 26 | 965.00 | 39 | 2 | 49 | 1957.50 | 3 | 1 | 3.50 | 40 +----+ 41 chi-squared = 2.825 with 2 d.f. probability = 0.2435 42 43 44 12.949 with 2 d.f. chi-squared with ties = 45 probability = 0.0015 46 47 Dunn's Pairwise Comparison of iq1 by ied 48 (Benjamini-Hochberg) Col Mean-| 49 Row Mean 1 2 50 ____+ 51 2 | -1.132195 52 0.1288 53 3.197953 3.498063 3 1 54 0.0010 0.0007 55 False Discovery Rate = 0.05 56 Reject Ho if $p = P(Z \le |z|) \le FDR/2$ with stopping rule 57 58 . dunntest iq2, by(ied) ma(bh) wrap 59 For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml 60

```
Warning: by() values are unlabeled, option nolabel implicit
1
2
3
     Kruskal-Wallis equality-of-populations rank test
4
5
       | ied | Obs | Rank Sum |
6
       |-----|
          1 | 26 | 979.50 |
7
       2 | 48 | 1866.00 |
3 | 1 | 4.50 |
8
9
       +----+
10
     chi-squared =
                     2.446 with 2 d.f.
11
     probability =
                     0.2944
12
13
     chi-squared with ties =
                                8.554 with 2 d.f.
     probability =
                     <mark>0.0139</mark>
14
15
                       Dunn's Pairwise Comparison of iq2 by ied
16
                         (Benjamini-Hochberg)
17
     Col Mean-I
18
     Row Mean |
                           1
                                         2
19
     ----+
          2 | -0.423546
20
                 0.3359
            - I
21
              1
22
            3 |
                  2.793337 2.919430
                           <mark>0.005</mark>3
                  <mark>0.0039</mark>
             23
24
     False Discovery Rate = 0.05
25
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
26
27
     . dunntest iq3, by(ied) ma(bh) wrap
28
     Warning: by() values are unlabeled, option nolabel implicit
29
30
                                                            Kruskal-Wallis equality-of-populations rank test
31
32
        _____+
33
       | ied | Obs | Rank Sum |
34
       |-----|
         1 | 26 | 904.00 |
35
       2 | 49 | 2015.00 |
36
       | 3 | 1 | 7.00 |
37
38
     chi-squared = 3.468 with 2 d.f.
probability = 0.1766
39
40
     chi-squared with ties =
                               8.151 with 2 d.f.
41
     probability = 0.0170
42
43
                      Dunn's Pairwise Comparison of iq3 by ied
44
                               (Benjamini-Hochberg)
45
     Col Mean-I
46
     Row Mean |
                          1
                                         2
47
      ----+-
                 _____
            2 | -1.817857
48
                  <mark>0.0345</mark>
             49
              3 |
                  1.891823
                           2.345120
50
                   <mark>0.0439</mark>
                             <mark>0.0285</mark>
              51
52
     False Discovery Rate = 0.05
     Reject Ho if p = P(Z <= |z|) <= FDR/2 with stopping rule
53
54
55
     . dunntest iq4, by(ied) ma(bh) wrap
56
     Warning: by() values are unlabeled, option nolabel implicit
57
58
59
     Kruskal-Wallis equality-of-populations rank test
                            For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml
60
```

____+ 1 | ied | Obs | Rank Sum | 2 |-----| 3 1 | 26 | 1021.50 | | 2 | 50 | 1968.50 | 4 3 | 1 | 13.00 | 5 +----+ 6 chi-squared = 1.369 with 2 d.f. probability = 0.5044 7 8 9 chi-squared with ties = 2.264 with 2 d.f. 10 probability = 0.3224 11 12 Dunn's Pairwise Comparison of iq4 by ied (Benjamini-Hochberg) 13 Col Mean-| 14 Row Mean | 1 2 15 ----+--2 | -0.019386 16 0.4923 _____ 17 18 3 | 1.482968 1.500969 19 0.1036 0.2000 20 False Discovery Rate = 0.05 21 Reject Ho if $p = P(Z \le |z|) \le FDR/2$ with stopping rule 22 23 . dunntest iq5, by(ied) ma(bh) wrap 24 25 Warning: by() values are unlabeled, option nolabel implicit t 26 27 Kruskal-Wallis equality-of-populations rank test 28 29 | ied | Obs | Rank Sum | 30 |-----| | 1 | 26 | 1044.50 | | 2 | 49 | 1874.50 | 31 32 | 3 | 1 | 7.00 | 33 +----+ 34 chi-squared = 2.190 with 2 d.f. 35 probability = 0.3345 36 37 5.477 with 2 d.f. chi-squared with ties = 38 probability = 0.0647 39 40 Dunn's Pairwise Comparison of iq5 by ied (Benjamini-Hochberg) 41 Col Mean-I 42 Row Mean | 1 2 43 ----+-------2 | 0.566082 44 0.2857 1 45 46 3 | 2.331166 2.215729 47 0.0296 0.0200 48 False Discovery Rate = 0.05 49 Reject Ho if $p = P(Z \le |z|) \le FDR/2$ with stopping rule 50 51 . dunntest iq6, by(ied) ma(bh) wrap 52 Warning: by() values are unlabeled, option nolabel implicit 53 54 55 Kruskal-Wallis equality-of-populations rank test 56 +----+ 57 | ied | Obs | Rank Sum | 58 -----| 59 | 1 | 26 | 1024.00 | For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml 60

ahd annan		1 502				
probabilit	ed =	1.593 wit 0.4508	n 2 d.t.			
chi-square probabilit	ed with t zy =	ies = <mark>0.2064</mark>	3.156 with	2 d.f.		
	:	Dunn's Pa	irwise Comp (Benjamini	arison of i -Hochberg)	q6 by ied.	
Col Mean- Row Mean		1	2			
2	0.208	239 175				
3	1.775	186 1.7 138 0	40803 .0613			
False Disc Reject Ho	covery Ra if p = P	te = 0. (Z <= z	05) <= FDR/2	with stoppi	.ng rule	
. dunntest	iq7, by	(ied) ma(bh) wrap			
Warning: k	oy() valu	es are un	labeled, op	tion nolabe	el implicit	
Kruskal-Wa	allis equ	ality-of-	populations	rank test		
+	Obs Ra	+ nk Sum !				
+-	+	 065 50				
1	48 1	771.00				
		13.50				
3 +		+				
3 +	ed =	+ 1.873 wit	h 2 d.f.			
3 + chi-square probabilit	ed = 2y =	+ 1.873 wit 0.3920	h 2 d.f.			
chi-square probabilit chi-square probabilit	ed = $ed = $ $ed with t$ $ey =$	+ 1.873 wit 0.3920 ies = <mark>0.2092</mark>	h 2 d.f. 3.129 with	2 d.f.		
3 + probabilit chi-square probabilit	ed = cy = ed with t cy =	+ 1.873 wit 0.3920 ies = 0.2092 Dupp's Pa	h 2 d.f. 3.129 with	2 d.f.	g7 by jed	
chi-square probabilit chi-square probabilit	ed = y = ed with t. y =	+ 1.873 wit 0.3920 ies = 0.2092 Dunn's Pa	h 2 d.f. 3.129 with irwise Comp (Benjamini	2 d.f. arison of i -Hochberg)	.q7 by ied	
3 + probabilit chi-square probabilit Col Mean- Row Mean	ed = y = ed with t y =	+ 1.873 wit 0.3920 ies = 0.2092 Dunn's Pa 1	h 2 d.f. 3.129 with irwise Comp (Benjamini 2	2 d.f. arison of i -Hochberg)	.q7 by ied	
chi-square probabilit chi-square probabilit Col Mean- Row Mean 2	2d = 2y = 2y = 2y = 0.994	+ 1.873 wit 0.3920 ies = 0.2092 Dunn's Pa 1 759 500	h 2 d.f. 3.129 with irwise Comp (Benjamini 2	2 d.f. arison of i -Hochberg)	.q7 by ied	
chi-square probabilit chi-square probabilit Col Mean- Row Mean 2	2d = 2y = 2d with t 2y = 0.994 0.1	+ 1.873 wit 0.3920 ies = 0.2092 Dunn's Pa 1 759 599	h 2 d.f. 3.129 with irwise Comp (Benjamini 2	2 d.f. arison of i -Hochberg)	.q7 by ied	
chi-square probabilit chi-square probabilit Col Mean- Row Mean 2 3	1 + ed = ed with t. ey = 0.994 0.1 1.599 0.1	+ 1.873 wit 0.3920 ies = 0.2092 Dunn's Pa 1 759 599 098 1.3 647 0	h 2 d.f. 3.129 with irwise Comp (Benjamini 2 73101 .1273	2 d.f. arison of i -Hochberg)	.q7 by ied	
chi-square probabilit chi-square probabilit Col Mean- Row Mean 	2d = 2y = 2y = 0.994 0.1 1.599 0.1 20very Ra	+ 1.873 wit 0.3920 ies = 0.2092 Dunn's Pa 1 759 599 098 1.3 647 0 te = 0.	h 2 d.f. 3.129 with irwise Comp (Benjamini 2 73101 .1273 05	2 d.f. arison of i -Hochberg)	.q7 by ied	
<pre>chi-square probabilit chi-square probabilit Col Mean- Row Mean 2 3 False Disc Reject Ho</pre>	2d = 2y = 2d with t 2y = 0.994 0.1 1.599 0.1 20very Ra if p = P	+ 1.873 wit 0.3920 ies = 0.2092 Dunn's Pa 1 759 599 098 1.3 647 0 te = 0. (Z <= z	h 2 d.f. 3.129 with irwise Comp (Benjamini 2 73101 .1273 05) <= FDR/2	2 d.f. arison of i -Hochberg) with stoppi	.q7 by ied ng rule	
<pre>chi-square probabilit chi-square probabilit Col Mean- Row Mean 2 3 False Disc Reject Ho dunntest</pre>	2d = 2y = 2d with t 2y = 0.994 0.1 1.599 0.1 20very Ra if p = P 2 iq8, by	+ 1.873 wit 0.3920 ies = 0.2092 Dunn's Pa 1 759 599 098 1.3 647 0 te = 0. (Z <= z (ied) ma(h 2 d.f. 3.129 with irwise Comp (Benjamini 2 73101 .1273 05) <= FDR/2 bh) wrap	2 d.f. arison of i -Hochberg) with stoppi	.q7 by ied	
<pre>chi-square probabilit chi-square probabilit Col Mean- Row Mean 2 3 False Disc Reject Ho dunntest Warning: h</pre>	2d = 2y = 2d with t 2y = 0.994 0.1 1.599 0.1 20very Ra if p = P 2 iq8, by 0y() value	+ 1.873 wit 0.3920 ies = 0.2092 Dunn's Pa 1 759 599 098 1.3 647 0 te = 0. (Z <= z (ied) ma(es are un	h 2 d.f. 3.129 with irwise Comp (Benjamini 2 73101 .1273 05) <= FDR/2 bh) wrap labeled, op	2 d.f. arison of i -Hochberg) with stoppi tion nolabe	.q7 by ied .ng rule el implicit	
<pre>chi-square probabilit chi-square probabilit Col Mean- Row Mean</pre>	<pre>1 1 2d = 2y = 2d with t 2y = 0.994 0.1 1.599 0.1 2covery Ra if p = P 2 iq8, by 2cy() value</pre>	+ 1.873 wit 0.3920 ies = 0.2092 Dunn's Pa 1 759 599 098 1.3 647 0 te = 0. (Z <= z (ied) ma(es are un	h 2 d.f. 3.129 with irwise Comp (Benjamini 2 73101 .1273 05) <= FDR/2 bh) wrap labeled, op	2 d.f. arison of i -Hochberg) with stoppi tion nolabe	.q7 by ied .ng rule el implicit	
<pre>chi-square probabilit chi-square probabilit chi-square probabilit Col Mean- Row Mean 2 3 False Disc Reject Ho dunntest Warning: k Kruskal-Wa</pre>	<pre>1 1 2d = 2y = 2d with t 2y = 0.994 0.1 1.599 0.1 20very Ra if p = P 2 iq8, by 2y() value allis equal</pre>	+ 1.873 wit 0.3920 ies = 0.2092 Dunn's Pa 1 759 599 098 1.3 647 0 te = 0. (Z <= z (ied) ma(es are un ality-of-	h 2 d.f. 3.129 with irwise Comp (Benjamini 2 73101 .1273 05) <= FDR/2 bh) wrap labeled, op populations	2 d.f. arison of i -Hochberg) with stoppi tion nolabe rank test	.q7 by ied .ng rule el implicit	
<pre>chi-square probabilit chi-square probabilit Col Mean- Row Mean 2 3 False Disc Reject Ho dunntest Warning: k Kruskal-Wa + ied </pre>	<pre>1 2d = 2y = 2d with t 2y = 0.994 0.1 1.599 0.1 1.599 0.1 20very Ra if p = P 2 iq8, by 20y() value allis equa Obs Ra:</pre>	+ 1.873 wit 0.3920 ies = 0.2092 Dunn's Pa 1 759 599 098 1.3 647 0 te = 0. (Z <= z (ied) ma(es are un ality-of- + nk Sum	h 2 d.f. 3.129 with irwise Comp (Benjamini 2 73101 .1273 05) <= FDR/2 bh) wrap labeled, op populations	2 d.f. arison of i -Hochberg) with stoppi tion nolabe rank test	.q7 by ied .ng rule el implicit	
<pre>chi-square probabilit chi-square probabilit chi-square probabilit Col Mean- Row Mean 2 3 False Disc Reject Ho dunntest Warning: k Kruskal-Wa</pre>	<pre>1 2d = 2y = 2d with t 2y = 0.994 0.1 1.599 0.1 20very Ra if p = P 2 iq8, by 2y() value allis eque obs Ra 26 1</pre>	+ 1.873 wit 0.3920 ies = 0.2092 Dunn's Pa 1 759 599 098 1.3 647 0 te = 0. (Z <= Z (ied) ma(es are un ality-of- + nk Sum 025.50	h 2 d.f. 3.129 with irwise Comp (Benjamini 2 73101 .1273 05) <= FDR/2 bh) wrap labeled, op populations	2 d.f. arison of i -Hochberg) with stoppi tion nolabe rank test	.q7 by ied	
<pre>chi-square probabilit chi-square probabilit chi-square probabilit Col Mean- Row Mean</pre>	<pre>1 2d = 2y = 2d with t 2y = 0.994 0.1 1.599 0.1 20very Ra if p = P 2 iq8, by 20y() value allis equa allis equa 26 1 49 1 1 </pre>	+ 1.873 wit 0.3920 ies = 0.2092 Dunn's Pa 1 759 599 098 1.3 647 0 te = 0. (Z <= Z (ied) ma(es are un ality-of- + nk Sum + 025.50 868.50 32.00	h 2 d.f. 3.129 with irwise Comp (Benjamini 2 73101 .1273 05) <= FDR/2 bh) wrap labeled, op populations	2 d.f. arison of i -Hochberg) with stoppi tion nolabe rank test	.q7 by ied .ng rule el implicit	

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```
probability =
                    0.9289
1
                             0.169 with 2 d.f.
     chi-squared with ties =
2
     probability =
                     0.9190
3
4
                     Dunn's Pairwise Comparison of iq8 by ied
5
                             (Benjamini-Hochberg)
6
     Col Mean-|
                   1
                                      2
7
     Row Mean |
     _____
8
           2 | 0.261480
9
                  0.3969
            10
             3 |
                0.353785
                         0.294096
11
                 1.0000
                         0.5765
             12
     False Discovery Rate = 0.05
13
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
14
15
     . dunntest iq9, by(ied) ma(bh) wrap
16
17
     Warning: by() values are unlabeled, option nolabel implicit
18
19
     Kruskal-Wallis equality-of-populations rank test
20
21
       +----+
22
       | ied | Obs | Rank Sum |
       |-----|
23
         1 | 26 | 1086.50 |
24
         2 | 49 | 1813.00 |
       25
       | 3 | 1 | 26.50 |
       +----+
26
27
     chi-squared =
                   1.098 with 2 d.f.
     probability =
28
                    0.5776
29
     chi-squared with ties =
                             1.304 with 2 d.f.
30
     probability =
                     0.5209
31
32
                     Dunn's Pairwise Comparison of iq9 by ied
33
                             (Benjamini-Hochberg)
34
     Col Mean-|
                   1
                                      2
     Row Mean |
35
     _____
36
           2 | 0.974133
37
                  0.4950
             38
             3 | 0.740520 0.513063
39
                          0.3040
                  0.3442
             40
     False Discovery Rate = 0.05
41
     Reject Ho if p = P(Z <= |z|) <= FDR/2 with stopping rule
42
43
     . dunntest iq10, by(ied) ma(bh) wrap
44
45
     Warning: by() values are unlabeled, option nolabel implicit
46
47
     Kruskal-Wallis equality-of-populations rank test
48
49
       +----+
       | ied | Obs | Rank Sum |
50
       |-----|
51
        1 | 26 | 956.50 |
52
          2 | 49 | 1963.00 |
3 | 1 | 6.50 |
       53
       1
       +----+
54
55
                   2.501 with 2 d.f.
0.2864
     chi-squared =
56
     probability =
57
                             6.720 with 2 d.f.
     chi-squared with ties =
58
     probability = 0.0347
59
                          For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml
60
```

	(Beniamini-Hochberg)
Col Mean-	
Row Mean +	1 2
2	-1.001222
3	2.206194 2.466110 0.0205 0.0205
False Disc	overv Rate = 0.05
Reject Ho	if $p = P(Z \le Z) \le FDR/2$ with stopping rule
• Ouesti	any For each of the questions, is there a difference in the overage response based upon recer or other
• Questi	on. For each of the questions, is there a difference in the average response <u>based upon racer of ethnic</u>
dunntest	ial by (ieth) ma (bb) wran
. uunneese	
Warning: b	y() values are unlabeled, option nolabel implicit
Kruckal W-	llis equality-of-populations rank test
n⊥uska⊥-Wā	IIIS Equality-OI-populations lank test
+ ieth	+ Obs Rank Sum
+	
	12 460.00
3	
7	2 83.00
+	
chi-square probabilit chi-square probabilit	a = 0.480 with 4 d.f. y = 0.9754 d with ties = 2.201 with 4 d.f. y = 0.6988
chi-square probabilit chi-square probabilit	<pre>a = 0.480 with 4 d.f. y = 0.9754 d with ties = 2.201 with 4 d.f. y = 0.6988 Dunn's Pairwise Comparison of iq1 by ieth</pre>
chi-square probabilit chi-square probabilit Col Mean-L	<pre>a = 0.480 with 4 d.f. y = 0.9754 d with ties = 2.201 with 4 d.f. y = 0.6988 Dunn's Pairwise Comparison of iq1 by ieth (Benjamini-Hochberg)</pre>
chi-square probabilit chi-square probabilit Col Mean- Row Mean	<pre>d = 0.480 with 4 d.f. y = 0.9754 d with ties = 2.201 with 4 d.f. y = 0.6988 Dunn's Pairwise Comparison of iql by ieth (Benjamini-Hochberg) 1 2 3 4</pre>
chi-square probabilit chi-square probabilit Col Mean- Row Mean + 2	<pre>d = 0.480 with 4 d.f. y = 0.9754 d with ties = 2.201 with 4 d.f. y = 0.6988 Dunn's Pairwise Comparison of iq1 by ieth (Benjamini-Hochberg) 1 2 3 4 0.357681</pre>
chi-square probabilit chi-square probabilit Col Mean- Row Mean 2 	<pre>d = 0.480 with 4 d.f. y = 0.9754 d with ties = 2.201 with 4 d.f. y = 0.6988 Dunn's Pairwise Comparison of iq1 by ieth (Benjamini-Hochberg) 1 2 3 4 0.357681 0.5147</pre>
chi-square probabilit chi-square probabilit Col Mean- Row Mean 2 3	<pre>d = 0.480 with 4 d.f. y = 0.9754 d with ties = 2.201 with 4 d.f. y = 0.6988 Dunn's Pairwise Comparison of iq1 by ieth (Benjamini-Hochberg) 1 2 3 4 0.357681 0.5147 1.322301 0.672593 </pre>
chi-square probabilit chi-square probabilit Col Mean- Row Mean + 2 3 3	<pre>d = 0.480 with 4 d.f. y = 0.9754 d with ties = 2.201 with 4 d.f. y = 0.6988 Dunn's Pairwise Comparison of iq1 by ieth (Benjamini-Hochberg) 1 2 3 4 0.357681 0.5147 1.322301 0.672593 0.9303 0.6265</pre>
chi-square probabilit chi-square probabilit Col Mean- Row Mean 2 3 3 4 4	<pre>d = 0.480 with 4 d.f. y = 0.9754 d with ties = 2.201 with 4 d.f. y = 0.6988 Dunn's Pairwise Comparison of iq1 by ieth (Benjamini-Hochberg) 1 2 3 4 0.357681 0.5147 1.322301 0.672593 0.9303 0.6265 -0.315316 -0.475595 -0.892515 0.4703 0.6344 0.9303</pre>
chi-square probabilit chi-square probabilit Col Mean- Row Mean + 2 3 3 4 1 7	<pre>d = 0.480 with 4 d.f. y = 0.9754 d with ties = 2.201 with 4 d.f. y = 0.6988 Dunn's Pairwise Comparison of iq1 by ieth (Benjamini-Hochberg) 1 2 3 4 0.357681 0.5147 1.322301 0.672593 0.9303 0.6265 -0.315316 -0.475595 -0.892515 0.4703 0.6344 0.9303 -0.260575 -0.401951 -0.745114 0.000000 0.4413 0.5731 0.7603 0.5000</pre>
chi-square probabilit chi-square probabilit Col Mean- Row Mean 2 3 4 7 False Dist	<pre>d = 0.480 with 4 d.f. y = 0.9754 d with ties = 2.201 with 4 d.f. y = 0.6988 Dunn's Pairwise Comparison of iql by ieth (Benjamini-Hochberg) 1 2 3 4 0.357681 0.5147 1.322301 0.672593 0.9303 0.6265 -0.315316 -0.475595 -0.892515 0.4703 0.6344 0.9303 -0.260575 -0.401951 -0.745114 0.000000 0.4413 0.5731 0.7603 0.5000</pre>
chi-square probabilit chi-square probabilit Col Mean- Row Mean + 2 3 3 4 7 False Disc Reject Ho	<pre>d = 0.480 with 4 d.f. y = 0.9754 d with ties = 2.201 with 4 d.f. y = 0.6988 Dunn's Pairwise Comparison of iq1 by ieth (Benjamini-Hochberg) 1 2 3 4 0.357681 0.5147 1.322301 0.672593 0.9303 0.6265 -0.315316 -0.475595 -0.892515 0.4703 0.6344 0.9303 -0.260575 -0.401951 -0.745114 0.000000 0.4413 0.5731 0.7603 0.5000 Svery Rate = 0.05 if p = P(Z <= z) <= FDR/2 with stopping rule</pre>
chi-square probabilit chi-square probabilit Col Mean- Row Mean 2 3 4 7 False Disc Reject Ho	<pre>d = 0.480 with 4 d.f. y = 0.9754 d with ties = 2.201 with 4 d.f. y = 0.6988 Dunn's Pairwise Comparison of iql by ieth (Benjamini-Hochberg) 1 2 3 4 0.357681 0.5147 1.322301 0.672593 0.9303 0.6265 -0.315316 -0.475595 -0.892515 0.4703 0.6344 0.9303 -0.260575 -0.401951 -0.745114 0.000000 0.4413 0.5731 0.7603 0.5000 Dvery Rate = 0.05 if p = P(Z <= z) <= FDR/2 with stopping rule</pre>
chi-square probabilit chi-square probabilit Col Mean- Row Mean + 2 3 4 7 False Disc Reject Ho dunntest	<pre>d = 0.480 with 4 d.f. y = 0.9754 d with ties = 2.201 with 4 d.f. y = 0.6968 Dunn's Pairwise Comparison of iql by ieth (Benjamini-Hochberg) 1 2 3 4 0.357681 0.5147 1.322301 0.672593 0.9303 0.6265 -0.315316 -0.475595 -0.892515 0.4703 0.6344 0.9303 -0.260575 -0.401951 -0.745114 0.000000 0.4413 0.5731 0.7603 0.5000 Dovery Rate = 0.05 if p = P(Z <= z) <= FDR/2 with stopping rule iq2, by(ieth) ma(bh) wrap</pre>
chi-square probabilit chi-square probabilit Col Mean- Row Mean + 2 3 4 7 False Disc Reject Ho dunntest Warning: b	<pre>d = 0.480 with 4 d.f. y = 0.9754 d with ties = 2.201 with 4 d.f. y = 0.6988 Dunn's Pairwise Comparison of iq1 by ieth (Benjamini-Hochberg) 1 2 3 4 0.357681 0.5147 1.322301 0.672593 0.9303 0.6265 -0.315316 -0.475595 -0.892515 0.4703 0.6344 0.9303 -0.260575 -0.401951 -0.745114 0.000000 0.4413 0.5731 0.7603 0.5000 Dvery Rate = 0.05 if p = P(Z <= z) <= FDR/2 with stopping rule iq2, by(ieth) ma(bh) wrap y() values are unlabeled, option nolabel implicit</pre>
chi-square probabilit chi-square probabilit Col Mean- Row Mean + 2 3 4 7 False Disc Reject Ho . dunntest Warning: b	$ \begin{array}{llllllllllllllllllllllllllllllllllll$
chi-square probabilit chi-square probabilit Col Mean- Row Mean + 2 3 3 4 7 False Disc Reject Ho dunntest Warning: b Kruskal-Wa	<pre>d = 0.480 with 4 d.f. y = 0.9754 d with ties = 2.201 with 4 d.f. y = 0.6988 Dunn's Pairwise Comparison of iql by ieth (Benjamini-Hochberg) 1 2 3 4 0.357681 0.5147 1.322301 0.672593 0.9303 0.6265 -0.315316 -0.475595 -0.892515 0.4703 0.6344 0.9303 -0.260575 -0.401951 -0.745114 0.000000 0.4413 0.5731 0.7603 0.5000 Swery Rate = 0.05 if p = P(2 <= z) <= FDR/2 with stopping rule iq2, by(ieth) ma(bh) wrap y() values are unlabeled, option nolabel implicit llis equality-of-populations rank test</pre>
chi-square probabilit chi-square probabilit Col Mean- Row Mean 2 3 4 7 False Disc Reject Ho . dunntest Warning: b Kruskal-Wa + ieth	<pre>d = 0.480 with 4 d.f. y = 0.3754 d with ties = 2.201 with 4 d.f. y = 0.6988 Dunn's Pairwise Comparison of iql by ieth (Benjamini-Hochberg) 1 2 3 4 0.357681 0.5147 1.322301 0.672593 0.9303 0.6265 -0.315316 -0.475595 -0.892515 0.4703 0.6344 0.9303 -0.260575 -0.401951 -0.745114 0.000000 0.4413 0.5731 0.7603 0.5000 overy Rate = 0.05 if p = F(Z <= z) <= FDR/2 with stopping rule iq2, by(ieth) ma(bh) wrap y() values are unlabeled, option nolabel implicit lis equality-of-populations rank test </pre>
chi-square probabilit chi-square probabilit Col Mean- Row Mean + 2 3 4 7 False Disc Reject Ho dunntest Warning: b Kruskal-Wa + ieth + 1	$ \begin{array}{llllllllllllllllllllllllllllllllllll$
chi-square probabilit chi-square probabilit Col Mean- Row Mean + 2 3 4 7 7 False Disc Reject Ho dunntest Warning: b Kruskal-Wa + ieth ++ 1 2	<pre>d = 0.480 with 4 d.f. y = 0.9754 Dunn's Pairwise Comparison of iql by ieth (Benjamini-Hochberg) 1 2 3 4 0.357681 0.5147 1.322301 0.672593 0.9303 0.6265 -0.315316 -0.475595 -0.892515 0.4703 0.6344 0.9303 -0.260575 -0.401951 -0.745114 0.000000 0.4413 0.5731 0.7603 0.5000 overy Rate = 0.05 if p = P(2 <= z) <= FDR/2 with stopping rule iq2, by(ieth) ma(bh) wrap y() values are unlabeled, option nolabel implicit lis equality-of-populations rank test </pre>

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	4 7	3 12 2 8	26.00 34.00					
chi-sq probab	quare pilit	d = 0.4 $y = 0.9$	+ 194 with 4 9741	d.f.				
chi-sq probab	quare pilit	d with ties y = 0.7	s = 1.7 <mark>7857</mark>	28 with 4 d.f				
		Duni	n's Pairwis (Be	e Comparison njamini-Hochb	of iq2 by ie erg)	eth		
Col Me Row Me	ean- ean		1	2	3		4	
	2	0.852420	5)					
	3	0.827632 0.6798	2 -0.14687 3 0.490	4 7				
	4 	-0.423600	6 -0.83084 9 1.000	2 -0.779591 0 0.5445				
	 7 	-0.350170	0 -0.70219 9 0.482	0 -0.650840 6 0.4293	0.000000 0.5000			
False Reject	Disc t Ho	overy Rate if p = P(Z	= 0.05 <= z) <=	FDR/2 with s	topping rule	9		
dunn	ntost	ia3 by(ia	ath) ma(bh)	wrap				
. dunn Warnin	na: p	v() values	are unlabe	led, option n	olabel impl	icit		
	- 5	1 ()		, <u>_</u>	r -			
Kruska	al-Wa	llis equal:	ity-of-popu	lations rank	test			
+			+					
1e 	eth +	Obs Ranl	< Sum 					
	1 2	39 164 12 35	41.00 50.00					
	3	20 72	10.00					
	7	2 9	90.00					
+			+					
chi-sq probab	quare bilit	d = 3.9 y = 0.4	969 with 4 4102	d.f.				
chi-sq probab	quare pilit	d with ties y = <mark>0.0</mark>	s = 9.3 <mark>)534</mark>	29 with 4 d.f				
		Duni	n's Pairwis	e Comparison	of iq3 by ie	eth		
Col Me	ean-		(Be	njamini-Hochb	erg)			
Row Me	ean +		1	2	3		4	
	2	2.715092 0.0333	2 L					
	3	1.660183 0.1615	3 -1.20413 5 0.228	4 5				
	4	-0.338704 0.4593	4 -1.70290 3 0.221	3 -1.065239 5 0.2390				
	7 	-0.279903 0.4333	3 -1.43921 1 0.187	6 -0.889312 6 0.2670	0.000000 0.5000			
False Reject	Disc t Ho	overy Rate if p = P(Z	= 0.05 <= z) <=	FDR/2 with s	topping rule	e		
. dunn	ntest	iq4, by(ie	eth) ma(bh)	wrap				
			For peer	review only - h	ttp://bmjopei	n.bmj.com	n/site/abou	ıt/guidelines.xht

Warning: by() values are unlabeled, option nolabel implicit 1 2 Kruskal-Wallis equality-of-populations rank test 3 +----+ 4 | ieth | Obs | Rank Sum | 5 |-----6 1 | 39 | 1584.50 2 | 12 | 474.00 3 | 20 | 733.00 7 8 37.50 4 | 3 | 9 7 | 2 | 97.00 | 1 -----+ 10 11 chi-squared = 5.096 with 4 d.f. 12 probability = 0.2776 13 chi-squared with ties = 8.628 with 4 d.f. 14 probability = 0.0711 15 16 Dunn's Pairwise Comparison of iq4 by ieth 17 (Benjamini-Hochberg) 18 Col Mean-| 19 3 Row Mean | 1 2 4 ------20 2 | 0.201372 21 0.4202 22 0.852280 0.459885 3 | 23 0.3284 0.3587 24 2.298277 25 2.766202 2.464580 4 | 0.0284 0.0343 0.0269 26 27 -0.639739 -0.694317 -0.941479 -2.323629 7 | 28 0.3265 0.3482 0.3465 0.0336 29 False Discovery Rate = 0.05 30 Reject Ho if $p = P(Z \le |z|) \le FDR/2$ with stopping rule 31 32 . dunntest iq5, by(ieth) ma(bh) wrap 33 34 Warning: by() values are unlabeled, option nolabel implicit 35 36 Kruskal-Wallis equality-of-populations rank test 37 +----+ 38 | ieth | Obs | Rank Sum | 39 _____+ 40 1 | 39 | 1585.50 | 2 | 12 | 384.00 41 3 | 20 | 771.50 42 4 | 3 | 96.00 43 7 | 2 | 89.00 | +----+ 44 45 chi-squared = 1.818 with 4 d.f. 46 probability = 0.7691 47 chi-squared with ties = 4.548 with 4 d.f. 48 probability = 0.3369 49 50 Dunn's Pairwise Comparison of iq5 by ieth 51 (Benjamini-Hochberg) 52 Col Mean-| 2 53 Row Mean | 1 3 4 _____+ 54 2 | 1.877283 55 0.3024 56 3 | 0.541285 -1.289464 57 0.3677 0.4931 58 59 4 | 1.034332 0.000000 0.760484 For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml 60

0.3762 0.5000 0.3725 1 7 | -0.379896 -1.172018 -0.572123 -0.980581 2 0.3911 0.4020 0.4052 0.3268 3 4 False Discovery Rate = 0.05 Reject Ho if $p = P(Z \le |z|) \le FDR/2$ with stopping rule 5 6 . dunntest iq6, by(ieth) ma(bh) wrap 7 8 Warning: by() values are unlabeled, option nolabel implicit 9 10 Kruskal-Wallis equality-of-populations rank test 11 12 +----+ | ieth | Obs | Rank Sum | 13 --+---+--14 1 | 39 | 1547.50 | 15 2 | 12 | 479.50 | 3 | 20 | 666.50 | 16 4 | 3 | 139.50 | 17 7 | 2 | 93.00 | 18 _____+ 19 chi-squared = 1.918 with 4 d.f. 20 probability = 0.7508 21 22 chi-squared with ties = 3.799 with 4 d.f. probability = 0.4338 23 24 25 Dunn's Pairwise Comparison of iq6 by ieth (Benjamini-Hochberg) 26 Col Mean-| 27 Row Mean | 1 2 3 28 2 | -0.053834 29 0.5317 30 31 3 | 1.472508 1.157760 0.7044 0.4116 32 33 4 | -0.725506 -0.645877 -1.356183 34 0.4681 0.4320 0.4376 35 -0.599554 -0.545866 -1.132205 7 | 0.000000 36 0.3920 0.3657 0.3219 0.5000 37 38 False Discovery Rate = 0.05 Reject Ho if $p = P(Z \le |z|) \le FDR/2$ with stopping rule 39 40 . dunntest iq7, by(ieth) ma(bh) wrap 41 42 Warning: by() values are unlabeled, option nolabel implicit 43 44 Kruskal-Wallis equality-of-populations rank test 45 46 +----+ | ieth | Obs | Rank Sum | 47 ------48 1 | 38 | 1459.00 | 49 2 | 12 | 507.00 644.00 144.00 3 | 20 | 50 4 | 3 | 51 7 | 2 | 96.00 | 52 -----+ 53 2.938 with 4 d.f. chi-squared = 54 probability = 0.5683 55 4.907 with 4 d.f. 56 chi-squared with ties = 0.2970 probability = 57 58 59 Dunn's Pairwise Comparison of iq7 by ieth For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml 60

		(Benj	amini-Hochb	erg)	
Col Mean- Row Mean		1	2	3	4
+					
	0.3500				
3	1.329710	1.632067			
	0.3060	0.5133			
4	-0.949754	-0.528220	-1.513248		
	0.3422	0.0700	0.0200		
7	-0.785104 0.3603	-0.44642/ 0.3640	-1.263331 0.2581	0.5000	
False Disc	overy Rate =	0.05			
Reject Ho	if p = P(Z <	= z) <= F	DR/2 with s	topping rule	
. dunntest	ig8, bv(iet	h) ma(bh) w	rap		
Marning, h	u() waluog a	ro unlabolo	d option n	alabol implicit	
warning. D	y() vaiues a	Te unrabere		JIADEL IMPIICIC	
Kruskal-Wa	llis equalit	y-of-popula	tions rank .	test	
+		+			
ieth	Obs Rank	Sum			
1	39 1519	.00			
2 3	12 510 20 673	.00			
	3 106	.50			
+		+			
Col Mean-	Dunn'	s Pairwise (Benj	Comparison amini-Hochbo	of iq8 by ieth erg)	
Row Mean		1	2	3	4
2	-0.521135				
	0.3764				
3	0.928892 0.2941	0.3021			
4	0.278839	0.525328	-0.142791		
	0.4335	0.4281	0.4432		
7	-1.306345	-1.014820	-1.621568	-1.220522	
	0.4786	0.3102	0.5245	0.3704	
False Disc Reject Ho	overy Rate =	0 05			
	if p = P(7, <	= z) <= F	DR/2 with s	topping rule	
. dunntest	if p = P(Z <	= z) <= F	'DR/2 with s	topping rule	
	if p = P(Z < iq9, by(iet	<pre>b:00 F z) <= F h) ma(bh) w</pre>	DR/2 with s	topping rule	
Warning: b	<pre>if p = P(Z < iq9, by(iet y() values a</pre>	z < F h) ma(bh) w re unlabele	DR/2 with s rap d, option no	topping rule plabel implicit	
Warning: b	if p = P(Z < iq9, by(iet y() values a	= z) <= F h) ma(bh) w re unlabele	DR/2 with s rap d, option no	topping rule blabel implicit	
Warning: b Kruskal-Wa	if p = P(Z < iq9, by(iet y() values a llis equalit	<pre>> z) <= F h) ma(bh) w re unlabele y-of-popula</pre>	DR/2 with s rap d, option no tions rank	topping rule blabel implicit test	
Warning: b Kruskal-Wa +	<pre>if p = P(Z < iq9, by(iet y() values a llis equalit</pre>	<pre>= z) <= F h) ma(bh) w re unlabele y-of-popula+</pre>	DR/2 with s rap d, option no tions rank	topping rule blabel implicit test	
Warning: b Kruskal-Wa + ieth +	<pre>if p = P(Z < iq9, by(iet y() values a llis equalit Obs Rank</pre>	<pre>b) of log = z) <= F h) ma(bh) w re unlabele y-of-popula+ Sum </pre>	DR/2 with s rap d, option no tions rank	topping rule blabel implicit test	
Warning: b Kruskal-Wa + ieth + 1	<pre>if p = P(Z < iq9, by(iet y() values a llis equalit Obs Rank+ 39 1358 12 400</pre>	<pre>= z) <= F h) ma(bh) w re unlabele y-of-popula+ Sum .00 50 </pre>	DR/2 with s rap d, option no tions rank	topping rule blabel implicit test	
Warning: b Kruskal-Wa + ieth + 1 2 3	<pre>if p = P(Z < iq9, by(iet y() values a llis equalit Obs Rank 39 1358 12 488 20 821</pre>	<pre>> z) <= F h) ma(bh) w re unlabele y-of-popula+ Sum .00 .50 .00 </pre>	DR/2 with s rap d, option no tions rank	topping rule blabel implicit test	
Warning: b Kruskal-Wa + ieth + 1 2 3 4	<pre>if p = P(Z < iq9, by(iet y() values a llis equalit Obs Rank 39 1358 12 488 20 821 3 142</pre>	<pre>= z) <= F h) ma(bh) w re unlabele y-of-popula+ Sum .00 .50 .50 For peer rec</pre>	'DR/2 with s rap d, option no tions rank view only - bt	topping rule plabel implicit test	ni com/site/about/quidelines yb

probabilit	:y = 0.3808				
	Dunn's Pairwise Comparison of iq9 by ieth (Benjamini-Hochberg)				
Col Mean- Row Mean	1 2 3 4				
2					
3	-1.118000 -0.046185 0.4393 0.4816				
4	-1.044571 -0.519338 -0.514209 0.2962 0.3772 0.3373				
7 -1.578074 -1.117498 -1.128123 -0.567738 0.5727 0.3297 0.6482 0.4073					
False Disc Reject Ho	:overy Rate = 0.05 if p = P(Z <= z) <= FDR/2 with stopping rule				
. dunntest	: iq10, by(ieth) ma(bh) wrap				
Warning: k	by() values are unlabeled, option nolabel implicit				
Kruskal-Wa					
	llis equality-of-populations rank test				
+	allis equality-of-populations rank test				
+ ieth	allis equality-of-populations rank test Obs Rank Sum				
+ ieth + 1	Allis equality-of-populations rank test Obs Rank Sum 				
++ ieth + 1 2 3	Allis equality-of-populations rank test + Obs Rank Sum 				
++ ieth + 1 2 3 4 7	Allis equality-of-populations rank test Obs Rank Sum 				
++ ieth + 1 2 3 4 7 +	Allis equality-of-populations rank test Obs Rank Sum 				
++ ieth 1 2 3 4 7 +	Allis equality-of-populations rank test Obs Rank Sum 				
++ ieth + 1 2 3 4 7 + chi-square probabilit	Allis equality-of-populations rank test Obs Rank Sum 				
+ ieth + 1 2 3 4 7 + chi-square probabilit	Allis equality-of-populations rank test Obs Rank Sum 				
+ ieth 1 2 3 4 7 + chi-square probabilit	Allis equality-of-populations rank test Obs Rank Sum 				
+ ieth + 1 2 3 4 7 + chi-square probabilit	Allis equality-of-populations rank test Obs Rank Sum 				
+ ieth + 1 2 3 4 7 + chi-square probabilit chi-square probabilit	Allis equality-of-populations rank test Obs Rank Sum 39 1603.50 12 415.50 20 687.00 3 132.00 2 88.00 				
++ ieth 2 3 4 7 + probabilit chi-square probabilit Col Mean Row Mean + 2	Allis equality-of-populations rank test Obs Rank Sum 39 1603.50 12 415.50 20 687.00 3 132.00 2 88.00 ed = 1.933 with 4 d.f. y = 0.7481 rd with ties = 5.194 with 4 d.f. y = 0.7481 Dunn's Pairwise Comparison of iq10 by ieth (Benjamini-Hochberg) 1 2 3 4 1.459385 0.3611				
+ ieth + 1 2 3 4 7 + probabilit chi-square probabilit Col Mean- Row Mean 2 3	Allis equality-of-populations rank test Obs Rank Sum 39 1603.50 12 415.50 20 687.00 3 132.00 2 88.00 				
+ ieth 1 2 3 4 7 + chi-square probabilit chi-square probabilit Col Mean- Row Mean 2 3 4 	Allis equality-of-populations rank test 				
+ ieth 1 2 3 4 7 + probabilit chi-square probabilit Col Mean- Row Mean 	Allis equality-of-populations rank test 				

Warning: by() values are unlabeled, option nolabel implicit 1 2 Kruskal-Wallis equality-of-populations rank test 3 +----+ 4 | ihwork | Obs | Rank Sum | 5 |-----| 6 0 | 16 | 664.00 | 1 | 10 | 263.00 | 2 | 50 | 1999.00 | 7 8 _____ 9 chi-squared = 3.572 with 2 d.f. probability = 0.1676 10 11 12 16.371 with 2 d.f. chi-squared with ties = 13 probability = 0.0003 14 15 Dunn's Pairwise Comparison of iq1 by ihwork (Benjamini-Hochberg) 16 Col Mean-| 17 Row Mean | 0 1 18 ----+ 19 1 3,655494 <mark>0.0002</mark> 20 21 0.513034 -3.828465 2 | 22 0.3040 <mark>0.0002</mark> 23 False Discovery Rate = 0.05 24 Reject Ho if $p = P(Z \le |z|) \le FDR/2$ with stopping rule 25 26 . dunntest iq2, by(ihwork) ma(bh) wrap 27 28 Warning: by() values are unlabeled, option nolabel implicit 29 30 Kruskal-Wallis equality-of-populations rank test 31 +----+ 32 | ihwork | Obs | Rank Sum | 33 |-----| 0 | 16 | 634.50 | 1 | 9 | 228.00 | 34 35 2 | 50 | 1987.50 | 36 +----+ 37 chi-squared = 3.455 with 2 d.f. 38 probability = 0.1777 39 40 chi-squared with ties = 12.083 with 2 d.f. probability = 0.0024 41 42 43 Dunn's Pairwise Comparison of iq2 by ihwork (Benjamini-Hochberg) 44 Col Mean-| 45 0 1 Row Mean | 46 _____ 1 | 2.949684 47 <mark>0.0024</mark> 48 49 2 | -0.028008 -3.416473 0.4888 <mark>0.0010</mark> 50 51 False Discovery Rate = 0.05 52 Reject Ho if p = P(Z <= |z|) <= FDR/2 with stopping rule 53 54 . dunntest iq3, by(ihwork) ma(bh) wrap 55 56 Warning: by() values are unlabeled, option nolabel implicit 57 58 Kruskal-Wallis equality-of-populations rank test 59 For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml 60

+	+
ihworl	k Obs Rank Sum ++
(
	2 50 1984.00
+	+
chi-square probabili	ed = 1.795 with 2 d.f. ty = 0.4075
chi-square probabili	ed with ties = 4.220 with 2 d.f. ty = 0.1213
	Dunn's Pairwise Comparison of iq3 by ihwork (Benjamini-Hochberg)
Col Mean- Row Mean	
	+
1	0.0539
2	0.137772 -1.980059
Talaa Dia	
Reject Ho	if $p = P(Z \le z) \le FDR/2$ with stopping rule
. dunntest	t iq4, by(ihwork) ma(bh) wrap
Warning. 1	by() values are unlabeled option polabel implicit
Warning, 3	Sy() values are uniabeted, option notabet implicit
Kruskal-Wa	allis equality-of-populations rank test
nituonai m	
+	+ k Obs Bank Sum
	-+
i i	2 50 2017.00
+	
chi-square	ed = 1.839 with 2 d.f.
probabili	Lý – 0.3987
chi-square	ed with ties = 3.042 with 2 d.f.
probabilit	
	Dunn's Pairwise Comparison of ig4 by ihwork
	(Benjamini-Hochberg)
Col Mean- Row Mean	
1	1.481917 0.1038
2	-0.003372 -1.707601 0.4987 0.1316
False Diso Reject Ho	covery Rate = 0.05 if p = P(7 <= z) <= FDR/2 with stopping rule
1.05000 1.0	
dunntesi	t iq5. by(ihwork) ma(bh) wrap
	· · · · · · · · · · · · · · · · · · ·
Warning: 1	by() values are unlabeled, option nolabel implicit
Kruskal-Wa	allis equality-of-populations rank test
+	
ihwor]	k Obs Rank Sum ++
	0 16 712.00
:	1 10 220.00 For peer review only - http://bmionen.hmi.com/site/about/quidelines.yhtml
	r or peer review only - netp.//binjopen.binj.com/site/about/guidelines.xhtml

```
2 | 50 | 1994.00 |
                 ----+
1
2
     chi-squared = 6.959 with 2 d.f.
probability = 0.0308
3
4
     chi-squared with ties =
                            17.404 with 2 d.f.
5
     probability = 0.0002
6
7
                    Dunn's Pairwise Comparison of iq5 by ihwork
8
                              (Benjamini-Hochberg)
9
     Col Mean-I
10
     Row Mean |
                          0
                                       1
     11
          1 | 3.997040
12
                 <mark>0.0001</mark>
            13
               1.151855 -3.696235
           2 |
14
             0.1247
                           <mark>0.0002</mark>
15
     False Discovery Rate = 0.05
16
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
17
18
19
     . dunntest iq6, by(ihwork) ma(bh) wrap
20
     Warning: by() values are unlabeled, option nolabel implicit
21
22
     Kruskal-Wallis equality-of-populations rank test
23
                                                 24
       +----+
25
       | ihwork | Obs | Rank Sum |
       |-----|
26
           0 | 16 | 559.00 |
1 | 10 | 308.00 |
27
            2 | 50 | 2059.00 |
28
       +----+
29
30
     chi-squared = 2.369 with 2 d.f.
probability = 0.3060
31
     probability =
32
     chi-squared with ties = 4.692 with 2 d.f.
33
     probability = 0.0958
34
35
                    Dunn's Pairwise Comparison of iq6 by ihwork
36
                              (Benjamini-Hochberg)
37
     Col Mean-|
     Row Mean |
                         0
                                       1
38
     39
           1 | 0.654135
40
                  0.2565
             - 1
41
           2 | -1.385120 -1.909689
42
                  0.1245
                           0.0843
             43
     False Discovery Rate = 0.05
44
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
45
46
47
     . dunntest iq7, by(ihwork) ma(bh) wrap
48
     Warning: by() values are unlabeled, option nolabel implicit
49
50
     Kruskal-Wallis equality-of-populations rank test
51
52
          -----+
       | ihwork | Obs | Rank Sum |
53
       |-----|
54
            0 | 16 | 644.50 |
1 | 9 | 353.00 |
55
            1 | 9 | 353.00 |
2 | 50 | 1852.50 |
56
       +----+
57
58
                    0.299 with 2 d.f.
     chi-squared =
59
     probability =
                     0.8613
                           For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml
60
```
For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

60

```
chi-squared with ties =
                            0.499 with 2 d.f.
1
     probability = 0.7793
2
3
4
                   Dunn's Pairwise Comparison of iq7 by ihwork
                    (Benjamini-Hochberg)
5
     Col Mean-I
6
     Row Mean |
                       0
                                    1
7
     1 | 0.150716
8
                0.4401
            9
               0.667091 0.355734
10
           2 |
            0.7571
                          0.5415
11
12
     False Discovery Rate = 0.05
13
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
14
15
     . dunntest iq8, by(ihwork) ma(bh) wrap
16
     Warning: by() values are unlabeled, option nolabel implicit
17
18
19
     Kruskal-Wallis equality-of-populations rank test
20
       +----+
21
      | ihwork | Obs | Rank Sum |
22
       |-----|
            0 | 16 | 521.00 |
1 | 10 | 393.00 |
23
24
           2 | 50 | 2012.00 |
      25
      +----+
26
     chi-squared = 1.480 with 2 d.f.
27
     probability = 0.4771
28
     chi-squared with ties =
                            1.694 with 2 d.f.
29
                   0.4287
     probability =
30
31
                   Dunn's Pairwise Comparison of iq8 by ihwork
32
                    (Benjamini-Hochberg)
33
     Col Mean-|
34
     Row Mean |
                       0
                                     1
     35
         1 | -0.809654
36
           | 0.3136
37
            2 | -1.294852 -0.131451
38
                0.2931 0.4477
            39
40
     False Discovery Rate = 0.05
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
41
42
43
     . dunntest iq9, by(ihwork) ma(bh) wrap
44
     Warning: by() values are unlabeled, option nolabel implicit
45
46
47
     Kruskal-Wallis equality-of-populations rank test
48
       +----+
49
      | ihwork | Obs | Rank Sum |
50
        0 | 16 | 639.00 |
51
           1 | 10 | 379.00 |
52
           2 | 50 | 1908.00 |
53
      +----+
54
     chi-squared = 0.087 with 2 d.f.
probability = 0.9574
55
     probability =
56
     chi-squared with ties =
                             0.103 with 2 d.f.
57
     probability =
                    0.9496
58
59
```

```
Dunn's Pairwise Comparison of iq9 by ihwork
                             (Benjamini-Hochberg)
1
     Col Mean-L
2
     Row Mean |
                        0
                                      1
3
                _____
           1 | 0.249482
4
                  0.6022
            5
             1
6
                0.305457 -0.037047
           2 |
                 1.0000 0.4852
7
             8
     False Discovery Rate = 0.05
9
     Reject Ho if p = P(Z <= |z|) <= FDR/2 with stopping rule
10
11
     . dunntest iq10, by(ihwork) ma(bh) wrap
12
13
     Warning: by() values are unlabeled, option nolabel implicit
14
15
     Kruskal-Wallis equality-of-populations rank test
16
       17
       | ihwork | Obs | Rank Sum |
18
        -----|
            0 | 16 | 666.50 |
19
            1 | 10 | 322.00 |
20
            2 | 50 | 1937.50 |
21
       +----+
22
     chi-squared = 1.147 with 2 d.f.
probability = 0.5635
23
24
25
     chi-squared with ties =
                              3.082 with 2 d.f
     probability = 0.2141
26
27
                                                         28
                   Dunn's Pairwise Comparison of iq10 by ihwork
                             (Benjamini-Hochberg)
29
     Col Mean-L
30
     Row Mean |
                        0
                                      1
31
                _____
                1.741221
           1 |
32
                 0.1225
            33
34
           2 |
                 0.751048 -1.403500
                  0.2263 0.1204
35
             36
     False Discovery Rate = 0.05
37
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
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57
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```

•	Quest by age	ion – I ?	For ea	ch of t	he facto	or variab	les (kn	owledge,	partici	pation), is	s there	a diffei	ence in	the aver	age resp
	Answe	er – No	D, not	for eit	her var	iable									
•	Quest <u>by ger</u>	ion – I <u>nder</u> ?	⁻ or ea	ch of t	he facto	or variab	les (kn	owledge,	partici	bation), is	s there	a differ	ence in	the aver	age resp
	Answe	er – N(D, not	for eit	her var	iable									
•	Quest <u>by lev</u>	ion – I <u>el of e</u>	⁻ or ea ducat	ch of t i <u>on</u>	he facto	or variab	les (kn	owledge,	partici	pation), is	s there	a diffei	ence in	the aver	age resp
	Answe	er – No	D, not	for eit	her var	iable									
•	Quest <u>based</u>	ion: Fo upon	or eac racer	h of th <u>or eth</u>	e facto nicity	^r variable	es (kno	wledge, p	articip	ation), is	there a	a differe	nce in tl	he avera	ge respo
	Answe signifi	er – K- cant d	Wallis ifferei	(nonp nce am	aramet	ric ANO ^v e pairs te	VA repo ested.	orts a sigr No signifi	nificant cant di	p value f ference	or "kno was foi	owledge und for	e" but th "particip	e Dunn t oate"	test find
-	0														
•	Quest	ion – I	or ea	ch of t	he facto	or variab	les (kn	owledge,	partici	pation), is	s there	a differ	ence in	the aver	age resp
•	by age	ion – I ?	For ea	ch of t	he facto	or variab	les (kn	owledge,	partici	pation), is	s there	a differ	ence in	the aver	age resp
•	by age	ion – I ??	For ea	ch of t	he facto	or variab	les (kn	owledge,	partici	pation), is	s there	a differ	ence in	the aver	age resp
• • c	by age	ion — I ?? t ikno	For ea	ch of t	he facto iage) m	or variab a(bh) wr	les (kn	owledge,	partici	bation), is	s there	a differ	ence in	the aver	age resp
• • c Kru	Quest by age	ion — ? t ikno allis	For each wledge	ch of t e, by(ity-of	he facto iage) m -popula	or variab a(bh) wr tions ra	les (kn ap .nk tes	owledge,	partici	pation), is	s there	a differ	ence in	the aver	age resp
• Kru +	dunntes uskal-Wa	ion — ? allis 	wledge equal: Ranl	ch of t e, by(ity-of c Sum	he facto iage) m -popula +	or variab a(bh) wr tions ra	les (kn ap .nk tes	owledge,	partici	pation), is	s there	a differ	ence in	the aver	age resp
• C Kru + 	dunntes uskal-Wa i iage	ion — ?? allis Obs 1	For ear wledge equal: Ranl +	ch of t e, by(ity-of c Sum 3.50	he facto iage) m -popula + 	or variab a(bh) wr tions ra	les (kn ap nk tes	owledge,	partici	pation), is	s there	a differ	ence in	the aver	age resp
• C Kru 	dunntes uskal-Wa iskal-Wa i iage i 2 3	ion — ?? allis Obs 1 22 35	For ea wledge equal: Rani + Rani + Rani + Rani + Rani Rani Rani Rani Rani	ch of t , by(lty-of 	he facto iage) m -popula + 	or variab a(bh) wr tions ra	les (kn ap nk tes	owledge,	partici	pation), is	s there	a differ	ence in	the aver	age resp
• C Kru 	dunntest iskal-Wa iage 1 2 3 4	ion — ?? allis Obs 1 22 35 11	For ea wledge equal:	ch of t e, by(ity-of sum 3.50 76.00 15.50 24.50	he facto iage) m -popula + 	or variab a(bh) wr tions ra	les (kn rap nk tes	owledge,	partici	pation), is	s there	a differ	ence in	the aver	age resp
• c Kru 	Quest by age dunntes uskal-Wa iage 1 2 2 3 4 5	ion — ?? allis Obs 1 22 35 11 5	For ea wledge equal:	ch of t , by(ity-of 	he facto iage) m -popula + 	or variab a(bh) wr tions ra	les (kn ap nk tes	owledge,	partici	bation), is	s there	a differ	ence in	the aver	age resp
• C Kru 	dunntest iskal-Wa iage 1 2 3 4 5 5	ion — ?? allis 0bs 1 22 35 11 5 + 1	For ea wledge equal: Ranl + Ranl + 142 142 20 + 2	ch of t a, by(ity-of Sum 3.50 76.00 15.50 24.50 09.50 21.00	he facto iage) m -popula + 	a(bh) wr tions ra	les (kn ap nk tes	owledge,	partici	pation), is	s there	a differ	ence in	the aver	age resp
. cc Kruu 	Quest by age	ion — ?? allis allis Obs 12 35 11 5 1 1	For ea wledge equal:	ch of t , by(ity-of 	he facto iage) m -popula + +	a(bh) wr tions ra	les (kn map nk tes	owledge,	partici	bation), is	s there	a differ	ence in	the aver	age resp
• C Kru 	dunntes dunntes iskal-Wa iage 1 2 3 4 5 iage iage iage iage iage iage 	ion — ?? allis allis Obs 1 22 35 11 5 1 1 5 1 1 5 1 2 35	For ea wledge equal:	ch of t e, by(ity-of c Sum 3.50 76.00 15.50 24.50 24.50 24.50 24.50 24.50 24.50 24.50	he facto iage) m -popula + + + th 5 d.	f.	les (kn ap nk tes	owledge,	partici	bation), is	s there	a differ	ence in	the aver	age resp
<pre>. cd Kru </pre>	dunntes dunntes iskal-Wa iage 1 2 3 4 5 i-square i-square	ion — ?? allis allis 1 22 35 11 22 35 11 11 35 35 11 11 35 35 11 11 35 35 35 35 35 35 35 35	For ea wledge equal: Rani + 8° 142 32 20 (+ 2 5.2 0.3 h ties	ch of t e, by(ity-of c Sum 3.50 76.00 15.50 24.50 24.50 21.00 540 wi 3535 s =	he facto iage) m -popula + + th 5 d. 7.568	f.	les (kn ap nk tes d.f.	owledge,	partici	pation), is	s there	a differ	ence in	the aver	age resp
 d Kru H H	dunntes dunntes uskal-Wa iage 1 2 3 4 5 i-square babili	ion — ?? allis allis Obs + 1 22 35 11 5 + 1 1 5 + 1 2 2 35 11 5 + 2 2 2 2 2 2 2 2 2 2	For ea wledge equal: Ranl + 8 14: 32 20 + 2 5.: 0.: h ties 0.:	ch of t e, by(ity-of 3.50 76.00 15.50 24.50 29.50 21.00 21.00 21.00 21.00 21.00	he facto iage) m -popula + + th 5 d. 7.568	f. with 5	les (kn rap nk tes d.f.	owledge,	partici	bation), is	s there	a differ	ence in	the aver	age resp
<pre>. cc Kru + </pre>	dunntes dunntes uskal-Wa iage 1 2 1 2 1 3 4 4 5 	ion — I ?? allis allis 1 22 35 11 5 + 1 1 = 5 + 1 = 5 + 1 22 35 11 5 + 1 22 35 11 5 5 5 5 5 5 5 5 5 5	<pre>For ea wledge equal: equal: Rani Ra</pre>	ch of t a, by(ity-of 3.50 76.00 15.50 24.50	he facto iage) m -popula + + th 5 d. 7.568	f. parison	les (kn ap nk tes d.f.	owledge,	partici	pation), is	s there	a differ	ence in	the aver	age resp
<pre>. cd Kruu + </pre>	dunntes lunntes uskal-Wa iskal-Wa iskal-Wa iskal-Wa iskal-Wa iskal-Wa iskal-Wa	ion - 1 ?? allis allis 1 22 35 11 5 + 1 1 1 1 2 2 2 2 2 2 2 2 2 2	<pre>For ea wledge equal:</pre>	ch of t e, by(ity-of 3.50 76.00 24.50 24.50 24.50 24.00 24.50 25.50 24.60 25.50 24.60 25.50 24.60 25.50 24.60 25.50 24.60 25.50 24.60 25.50 24.60 25.50 24.60 25.50 24.60 25.50 24.60 25.50 24.60 25.50 24.60 25.50 24.60 25.50 24.60 25.50 24.60 25.50 24.60 25.50 24.60 25.50 24.60 25.50 24.60 25.50 25.	he facto iage) m -popula + th 5 d. 7.568 ise Com (Benj	f. with 5 parison amini-Ho	les (kn ap nk tes d.f. of ikn chberg	owledge k	partici	pation), is	s there	a differ	ence in	the aver	age resp
<pre>. cc Kru + </pre>	dunntes dunntes uskal-Wa iskal-Wa iage 1 2 1 2 3 4 5 	ion - ?? allis allis Obs 1 22 35 11 5 + 1 1 5 + 1 22 35 11 5 + 1 22 35 11 5 + 1 22 35 11 5 22 35 11 5 22 35 11 5 5 5 5 5 5 5 5 5 5	<pre>For ea wledge equal:</pre>	ch of t a, by(ity-of c Sum 3.50 76.00 15.50 24.50	he facto iage) m -popula + + th 5 d. 7.568 ise Com (Benj	f. with 5 parison amini-Hc 2	les (kn ap nk tes d.f. of ikn chberg	owledge k	partici	pation), is	s there	a differ	ence in	the aver	age resp
<pre>. cd Kru + + </pre>	Quest by age	ion - ?? allis allis 1 22 35 11 22 35 11 22 35 11 5 + 1 = = = = = wit = = = = = = = = = = = = = = = = = = =	<pre>For ea wledge equal: equal: Rani + Rani + 8 1 42 1 32 1 20 + 5.5 0.2 n ties 0.2 0.2 130</pre>	ch of t , by (ity-of 	he facto iage) m -popula + th 5 d. 7.568 ise Com (Benj	f. parison amini-Hc	les (kn ap nk tes d.f. of ikn chberg	owledge k	partici	pation), is	s there	a differ	ence in	the aver	age resp
<pre>. cd Kru + </pre>	dunntes dunntes uskal-Wa iage 1 2 3 4 5 i-square babili i-square babili L Mean- V Mean 2 3	ion - ?? allis allis Obs 1 22 35 11 5 1 ed = cy = ed wit cy = D p 	<pre>wledge equal: equal: equal: l</pre>	ch of t c, by(ity-of c. Sum 2	he facto iage) m -popula + + th 5 d. 7.568 ise Com (Benj 123125 0.4510	f. parison a(bh) wr tions ra f. yarison amini-Hc 2	les (kn ap nk tes d.f. of ikn chberg	owledge k	partici	pation), is	s there	a differ	ence in	the aver	age resp
. cc Kru 	Quest by age	ion - 1 ?? allis allis l 0bs l 22 35 l 1 ed = ed = 	<pre>For ea wledge equal: equal: I Rani I 8 I 42 I 20 I 2</pre>	ch of t c, by(ity-of c, Sum 3.50 76.00 15.50 24.50	he facto iage) m -popula + 	f. parison a(bh) wr tions ra f. with 5 parison amini-Ho 2 1,6977	les (kn ap nk tes d.f. of ikn chberg	owledge k	partici	pation), is	s there	a differ	ence in	the aver	age resp

	0.2274 0.2010 0.1679
5	-1.879853 -0.225341 -0.163446 -1.232896 0.1503 0.4741 0.4662 0.2332
6	 -0.663600 0.986980 1.028078 0.436423 1.023149
	0.3456 0.2427 0.2849 0.4141 0.2552
False Diso Reject Ho	covery Rate = 0.05 if p = P(Z <= z) <= FDR/2 with stopping rule
. dunntes	z iparticipate, by(iage) ma(bh) wrap
Kruskal-Wa	allis equality-of-populations rank test
+ iage	+ Obs Rank Sum
	+ 1 10.00
2	
4	
	+
6 +	+ 46.00
chi-square	ed = 2.326 with 5 d.f.
probabili	ty = 0.8024
chi-square	ed with ties = 2.448 with 5 d.f.
probabili	zy = 0.7843
	Dunn's Pairwise Comparison of iparticipate by jage
Col Moor	(Benjamini-Hochberg)
Row Mean	1 2 3 4 5
2	↓ _1.234590
	0.5425
3	-1.332682 -0.328032 0.6849 0.4643
Л	
1	0.4179 0.4884 0.4732
5	-1.473837 -0.710833 -0.549938 -0.633107
	1.0000 0.5965 0.5460 0.5643
6	-1.198211 -0.422690 -0.338143 -0.403548 -0.073047 0.3463 0.5604 0.5013 0.5149 0.5045
False Dis	covery Bate = 0.05
Reject Ho	if $p = P(Z \le z) \le FDR/2$ with stopping rule
Question -	- For each of the factor variables (knowledge narticination) is there a difference in the average response
gender?	
. ranksum	iknowledge, by(igender)
Tuo ormal	Wilcowon rank-sum (Mann-Whitney) test
1w0-samp10	s willowon lank-sum (mann-willing) test
igeno	ler obs rank sum expected
	1 17 579 646 2 58 2271 2204
	+
COMULI	
unadjusted adjustment	t for ties -1673.27
adjusted .	variance 4571.40
	For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

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```
Ho: iknowl~e(igender==1) = iknowl~e(igender==2)
1
        z = -0.991
Prob > |z| = 0.3217
2
3
4
    . ranksum iparticipate, by(igender)
5
6
    Two-sample Wilcoxon rank-sum (Mann-Whitney) test
7
         igender | obs rank sum expected
8
            9
            1 | 17 599.5
2 | 58 2250.5
                                        646
10
                                        2204
     11
      combined | 75 2850
                                       2850
12
    unadjusted variance 6244.67
adjustment for ties -310.99
13
14
                      _____
15
                       5933.68
     adjusted variance
16
     Ho: iparti~e(igender==1) = iparti~e(igender==2)
17
        z = -0.604
Prob > |z| = 0.5461
18
19
     _____
                                        _____
20
21

    Question – For each of the factor variables (knowledge, participation), is there a difference in the average response

22
        by level of education
23
24
25
     . dunntest iknowledge, by(ied) ma(bh) wrap
26
     Kruskal-Wallis equality-of-populations rank test
27
                                                 28
      +----+
      | ied | Obs | Rank Sum |
29
      |-----|
30
      | 1 | 26 | 952.00 |
      | 2 | 48 | 1894.50 |
| 3 | 1 | 3.50 |
31
32
      +----+
33
    chi-squared = 2.829 with 2 d.f.
probability = 0.2431
34
35
36
                           3.864 with 2 d.f.
     chi-squared with ties =
37
     probability =
                   0.1449
38
39
                Dunn's Pairwise Comparison of iknowledge by ied
40
                           (Benjamini-Hochberg)
    Col Mean-|
41
    Row Mean |
                       1
                                    2
42
     ------
43
          2 | -0.628394
44
               0.2649
            45
          3 | 1.742681 1.909111
46
                 0.0610
                        0.0844
           1
47
     False Discovery Rate = 0.05
48
    Reject Ho if p = P(Z <= |z|) <= FDR/2 with stopping rule
49
50
     . dunntest iparticipate, by(ied) ma(bh) wrap
51
52
    Kruskal-Wallis equality-of-populations rank test
53
      +----+
54
      | ied | Obs | Rank Sum |
55
      |-----+
56
      | 1 | 26 | 1051.50 |
      | 2 | 48 | 1784.00 |
57
      | 3 | 1 | 14.50 |
58
      +-----+
59
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60
```

```
chi-squared =
                   1.559 with 2 d.f.
     probability =
                   0.4586
1
2
     chi-squared with ties =
                            1.641 with 2 d.f.
3
     probability = 0.4402
4
5
                Dunn's Pairwise Comparison of iparticipate by ied
6
                    (Benjamini-Hochberg)
7
     Col Mean-|
                 1
     Row Mean |
                                     2
8
       ____+
              _____
9
          2 | 0.633189
10
                0.2633
           11
           3 |
               1.198283 1.055981
12
                0.3462 0.2182
            13
     False Discovery Rate = 0.05
14
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
15
     _____
16
17

    Question: For each of the factor variables (knowledge, participation), is there a difference in the average response

18
        based upon racer or ethnicity
19
20
     . dunntest iknowledge, by(ieth) ma(bh) wrap
21
22
     Warning: by() values are unlabeled, option nolabel implicit
23
24
     Kruskal-Wallis equality-of-populations rank test
25
26
       | ieth | Obs | Rank Sum |
27
      |-----|
                                                  ė.
Lez
28
         1 | 38 | 1601.50 |
         2 | 12 | 333.00 |
3 | 20 | 759.00 |
      29
      30
         4 | 3 | 53.50 |
7 | 2 | 103.00 |
31
      +----+
32
33
     chi-squared = 7.365 with 4 d.f.
probability = 0.1178
34
     probability =
35
     chi-squared with ties =
                           10.060 with 4 d.f.
36
     probability = 0.0394
37
38
                 Dunn's Pairwise Comparison of iknowledge by ieth
39
                    (Benjamini-Hochberg)
40
    Col Mean-L
     Row Mean |
                        1
                                    2
                                                3
                                                              4
41
     ____+
                 _____
42
          2 | 2.331226
43
                0.0987
            44
           3 |
               0.814293 -1.498008
45
                 0.2308
                         0.1118
             46
               2.173971
                        0.823862 1.742413
47
           4 |
                 0.0743
                         0.2563
                                    0.1018
            48
49
           7 | -0.691538 -1.667587 -0.979809 -1.977762
                         0.0954 0.2337
50
                 0.2446
                                            0.0799
            51
     False Discovery Rate = 0.05
52
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
53
54
     . dunntest iparticipate, by(ieth) ma(bh) wrap
55
56
     Warning: by() values are unlabeled, option nolabel implicit
57
58
     Kruskal-Wallis equality-of-populations rank test
59
                         For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml
60
```

+----+

ieth	Obs Rai ++	nk Sum 				
1 2 3 4	38 14 12 5 20 6 3 5	430.50 507.00 659.50 128.00				
7 +	2	125.00				
chi-squar	ed = 4	.195 with 4	d.f.			
probabili 	ty = 0	.3803		-		
chi-squar probabili	ed with tie ty = 0	es = 4.4 .3528	14 with 4 d.	İ.		
	Dunn's	Pairwise Co	mparison of	iparticipate	by ieth	
Col Mean-		(Be	njamini-Hoch	berg)		
Row Mean	 +	1 	2		4	
2	0.320	34				
3	0.7956	67 1.19561 52 0.289	2 8			
4	 -0.3941	64 -0.03038	4 -0.736811			
7		53 0.487	9 0.3295	1 000000		
1	0.26	70 0.353	4 -1.873935 4 0.3047	0.3065		
≀eject Ho	if p = P(2)	Z <= z) <=	FDR/2 with	stopping rule	2	

1 2	
3	National Survey Statistics Report
5	Summary
7 8	• Question – For each of the questio
9 10 11	Answer – YES, for ALL questions the
12 13 14	• Question – For each of the questio
15 16 17	Answer – YES, for ALL questions the
18 19 20	• Question – For each of the questio
20 21 22 23	Answer – YES, for questions 1, 2, 3,
23 24 25	• Question: For each of the question
26 27 28	Answer – YES, but only for question
29 30 31 32 33	 Question – For each of the questio Answer – Yes, for all questions, exc used.
34 35	Statistics
36 37 38	• Question – For each of the questio identified their age group?
39 40	. dunntest iq1, by(iage) ma(bh) wrap
41 42	Warning: by() values are unlabeled,
43 44	Kruskal-Wallis equality-of-populatio
45 46	++ iage Obs Rank Sum ++
47 48 49 50	2 297 136808.00 3 230 120095.00 4 343 193579.00 5 197 119296.00
51 52	chi-squared = 31.130 with 3 d.f. probability = 0.0001
53 54 55 56	chi-squared with ties = 53.379 wi probability = <mark>0.0001</mark>
57 58 59	Dunn's Pairwise Com (Benjami Col Mean-
60	Row Mean 2 For peer review

Su	mmary
•	Question – For each of the questions, 1-10, are there differences in the average response by age?
	Answer – YES, for ALL questions there are significant differences among the responses of the various age groups
•	Question – For each of the questions, 1-10, are there differences in the average response by gender?
	Answer – YES, for ALL questions there are significant differences between the responses of the genders.
•	Question – For each of the questions, 1-10, are there differences in the average response by income level?
	Answer – YES, for questions 1, 2, 3, 4, and 6 there are differences in responses among income levels.
•	Question: For each of the questions, are there differences in the average responses among <u>regions</u> ?
	Answer – YES, but only for question 9.
•	Question – For each of the questions, 1-10, are there differences in the average responses among the <u>devices</u> used? Answer – Yes, for all questions, except 2, 8 and 9, there are differences in the average responses among the devices used.
	\sim
Sta	ntistics
Sta •	Atistics Question – For each of the questions, 1-10, are there differences in the average response by age among those who identified their age group?
Sta •	Atistics Question – For each of the questions, 1-10, are there differences in the average response by age among those who identified their age group?
Sta • • d	Atistics Question – For each of the questions, 1-10, are there differences in the average response by age among those who identified their age group? unntest iq1, by(iage) ma(bh) wrap ning: by() values are unlabeled, option nolabel implicit
• • War Kru	Atistics Question – For each of the questions, 1-10, are there differences in the average response by age among those who identified their age group? unntest iq1, by(iage) ma(bh) wrap ning: by() values are unlabeled, option nolabel implicit skal-Wallis equality-of-populations rank test
• • War Kru +	Atistics Question – For each of the questions, 1-10, are there differences in the average response by age among those who identified their age group? unntest iq1, by(iage) ma(bh) wrap ning: by() values are unlabeled, option nolabel implicit skal-Wallis equality-of-populations rank test
• • War Kru + 	Atistics Question – For each of the questions, 1-10, are there differences in the average response by age among those who identified their age group? unntest iq1, by(iage) ma(bh) wrap ning: by() values are unlabeled, option nolabel implicit skal-Wallis equality-of-populations rank test
Sta • • • • • • • • • • • • • • • • • • •	<pre>stistics Question - For each of the questions, 1-10, are there differences in the average response by age among those who identified their age group? unntest iq1, by(iage) ma(bh) wrap ning: by() values are unlabeled, option nolabel implicit skal-Wallis equality-of-populations rank test </pre>
Sta • • • • • • • • • • • • • • • • • • •	Atistics Question - For each of the questions, 1-10, are there differences in the average response by age among those who identified their age group? unntest iql, by(iage) ma(bh) wrap ning: by() values are unlabeled, option nolabel implicit skal-Wallis equality-of-populations rank test
Sta • • • • • • • • • • • • •	tistics Question - For each of the questions, 1-10, are there differences in the average response by age among those who identified their age group? unntest iql, by(iage) ma(bh) wrap ning: by() values are unlabeled, option nolabel implicit skal-Wallis equality-of-populations rank test

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3	-2.976209 0.0022
4	-5.561425 -2.104981 0.0000 0.0212
 5 	-6.702295 -3.651101 -1.958054 0.0000 0.0003 0.0251
False Disc Reject Ho	overy Rate = 0.05 if p = P(Z <= z) <= FDR/2 with stopping rule
. dunntest	iq2, by(iage) ma(bh) wrap
Warning: b	y() values are unlabeled, option nolabel implicit
Kruskal-Wa	llis equality-of-populations rank test
++ iage 2 3 4 5 +	Obs Rank Sum
chi-square probabilit	d = 33.059 with 3 d.f. y = 0.0001
chi-square probabilit	d with ties = 47.662 with 3 d.f.
Col Mean- Row Mean	Dunn's Pairwise Comparison of iq2 by iage (Benjamini-Hochberg) 2 3 4
3	-2.210640 0.0162
4	-5.005456 -2.376918 0.0000 0.0131
 5 	-6.338529 -3.999461 -2.077098 0.0000 0.0001 0.0189
False Disc Reject Ho	overy Rate = 0.05 if p = P(Z <= z) <= FDR/2 with stopping rule
. dunntest	iq3, by(iage) ma(bh) wrap
Warning: b	y() values are unlabeled, option nolabel implicit
Kruskal-Wa	llis equality-of-populations rank test
+ iage +	+ Obs Rank Sum +
2 3 4 5	297 139770.50 230 117843.00 343 191441.00 197 120723.50
chi-square probabilit	d = 28.691 with 3 d.f. y = 0.0001
chi-square probabilit	d with ties = 53.833 with 3 d.f. y = 0.0001
	Dunn's Pairwise Comparison of iq3 by iage

		(Benjamini-Hochberg	3)	
Col Mean- Row Mean	2	3	4	
3	-2.113003 0.0173			
4	-4.908660 -2.38	37522 0102		
5	-6.879036 -4.59	99409 -2.718488		
	0.0000 0.	0000 0.0049		
Reject Ho	overy Rate = 0.0 if p = P(Z <= z)	<= FDR/2 with stop	oping rule	
. dunntest	iq4, by(iage) ma((bh) wrap		
Warning: b	y() values are unl	abeled, option nola	abel implicit	
Kruskal-Wa	llis equality-of-p	oopulations rank tes	st	
+	+			
lage +	ODS Rank Sum			
	230 116810.50			
4	197 124903.50			
+	+			
chi-square probabilit	d = 53.252 with $y = 0.0001$	1 3 d.f.		
chi-square	d with t <mark>ies = 7</mark>	0.467 with 3 d.f.		
probabilit	y = 0.0001			
	Dunn's Pair	wise Comparison of	iq4 by iage	
Col Mean-		(Benjamini-Hochberg	y) ¹ ¹ ⁽ t	
Row Mean	2	3	4	
3	-2.730052 0.0038			
4	-6.060387 -2.82	2725		
-	0.0000 0.	0036		
5	-7.734777 -4.85 <mark>0.000</mark> 0 <mark>0.</mark>	51098 -2.576905 000 <mark>0 0.0050</mark>		
False Disc Reject Ho	overy Rate = 0.0 if p = P(Z <= z))5 <= FDR/2 with stop	oping rule	
	-			
. dunntest	iq5, by(iage) ma(bh) wrap		
Warning: b	y() values are unl	abeled, option nola	abel implicit	
Kruskal-Wa	llis equality-of-p	oopulations rank tes	st	
+	+			
iage +	Obs Rank Sum 			
	297 130735.50 230 118988 50			
	343 197372.50			
J +	05.180551 157	-		
chi-square	d = 50.736 with	a 3 d.f.		
propapilit	Y = 0.0001			
chi-square probabilit	a with ties = 7 y = <mark>0.0001</mark>	4.894 with 3 d.f.		
	For p	eer review only - http	://bmjopen.bmj.com/	/site/about/guidelines.xhtml

Row Mean	2	3	4
	.463252		
	0.0004		
4 -6	.727241 -2.687273 0.0000 0.0043		
 5 -7	833291 -4 280955	-2 086904	
5 7	0.0000 0.0000	0.0184	
False Discover	y Rate = 0.05	(0	
Reject Ho if p	$P(Z \le Z) \le$	FDR/2 with sto	opping rule
. dunntest iq6	, by(iage) ma(bh)	wrap	
Warning: by()	values are unlabel	ed, option nol	abel implicit
Kruskal-Wallis	equality-of-popul	ations rank te	est
+	+ Rank Sum		
ODS	-+		
2 297	139523.00 121315.50		
4 343 5 197	196979.50 111960.00		
+	+		
chi-squared =	21.310 with 3 d	l.f.	
probability =	0.0001		
chi-squared wi	th ties = 31.68	4 with 3 d.f.	
probability -	0.0001		
	Dunn's Pairwise	e Comparison of	iq6 by iage
Col Mean-	(Ber	jamini-Hochber	.ā)
Row Mean 	2	3	4
3 -2	.598612		
	0.0094		
4 -5 	.217225 -2.174021 0.0000 0.0223		
 5 -4	.243787 -1.665690	0.263774	
i	0.0000 0.0575	0.3960	
False Discover	y Rate = 0.05		
Reject Ho if p	$P = P(Z \le z) \le$	FDR/2 with sto	opping rule
. dunntest ia7	, by(iage) ma(bh)	wrap	
Warning, by/	$\frac{1}{2}$	ed option rol	abel implicit
warning. by()	values ale unitabel	ed, option noi	aber implicit
Kruskal-Wallis	equality-of-popul	ations rank te	est
+	+		
iage Obs	Rank Sum		
2 297	134994.00		
3 230	118404.00 195415 00		
4 343	1 100110.000 1		
4 343 5 197 +	120965.00		

chi-squared with ties = 47.396 with 3 d.f. 1 probability = 0.0001 2 3 4 Dunn's Pairwise Comparison of iq7 by iage (Benjamini-Hochberg) 5 Col Mean-I 3 6 Row Mean | 2 4 7 3 | -2.469339 8 0.0102 9 4 | -5.229834 -2.318978 10 <mark>0.0000</mark> <mark>0.0122</mark> 11 12 5 I -6.246620 -3.678399 -1.783685 13 <mark>0.000</mark>0 0.0002 0.0372 14 False Discovery Rate = 0.05 15 Reject Ho if $p = P(Z \le |z|) \le FDR/2$ with stopping rule 16 17 . dunntest iq8, by(iage) ma(bh) wrap 18 Warning: by() values are unlabeled, option nolabel implicit 19 20 21 Kruskal-Wallis equality-of-populations rank test 22 +----+ 23 | iage | Obs | Rank Sum | 24 |-----| 25 | 2 | 297 | 144264.00 | 3 | 230 | 123659.00 | 26 eziez 4 | 343 | 195323.50 | 27 5 | 197 | 106531.50 | 28 +----+ 29 chi-squared = 11.953 with 3 d.f. 30 probability = 0.0075 31 13.243 with 3 d.f. chi-squared with ties = 32 probability = 0.0041 33 34 Dunn's Pairwise Comparison of iq8 by iage 35 (Benjamini-Hochberg) 36 Col Mean-| 37 2 Row Mean | 3 4 38 3 | -2.018706 39 0.0435 40 4 | -3.607781 -1.274845 41 0.0009 0.1518 42 43 -2.045700 -0.109821 1.096108 5 I 0.0612 0.4563 0.1638 44 45 False Discovery Rate = 0.05 46 Reject Ho if $p = P(Z \le |z|) \le FDR/2$ with stopping rule 47 48 . dunntest iq9, by(iage) ma(bh) wrap 49 Warning: by() values are unlabeled, option nolabel implicit 50 51 52 Kruskal-Wallis equality-of-populations rank test 53 +-----+ 54 | iage | Obs | Rank Sum | 55 |-----2 | 297 | 145982.00 | 56 | 3 | 230 | 123673.00 57 4 | 343 | 185055.00 58 5 | 197 | 115068.00 | 59 For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml 60

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```
chi-squared = 10.994 with 3 d.f.
1
    probability =
                  0.0118
2
3
    chi-squared with ties =
                           12.738 with 3 d.f.
                   0.0052
4
    probability =
5
6
                   Dunn's Pairwise Comparison of iq9 by iage
                            (Benjamini-Hochberg)
7
    Col Mean-|
8
                               3
    Row Mean |
                       2
                                                 4
9
     10
          3 | -1.836776
                 0.0662
            11
12
           4 | -2.115200 -0.074195
13
                0.0516
                         0.4704
            14
           5 |
              -3.519369 -1.669304 -1.742007
15
                         0.0570 0.0611
                 <mark>0.001</mark>3
            16
     False Discovery Rate = 0.05
17
    Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
18
19
     . dunntest iq10, by(iage) ma(bh) wrap
20
21
     Warning: by() values are unlabeled, option nolabel implicit
22
                                             23
    Kruskal-Wallis equality-of-populations rank test
24
25
      +----+
      | iage | Obs | Rank Sum |
26
      |-----|
27
         2 | 297 | 134627.00 |
         3 | 230 | 122540.00 |
28
      4 | 343 | 194647.50 |
29
      | 5 | 197 | 117963.50 |
30
      +----+
31
     chi-squared = 33.137 with 3 d.f.
32
    probability =
                   0.0001
33
34
     chi-squared with ties = 60.194 with 3 d.f.
    probability = 0.0001
35
36
37
                   Dunn's Pairwise Comparison of iq10 by iage
                     (Benjamini-Hochberg)
38
    Col Mean-|
39
                                    3
    Row Mean |
                        2
40
     3 | -3.958265
41
                0.0001
           42
            43
           4 | -6.301218 -1.780890
            | <mark>0.0000</mark> 0.0450
44
45
           5 | -6.925950 -2.974246 -1.532010
46
                 <mark>0.0000</mark>
                        0.0022 0.0628
            47
     False Discovery Rate = 0.05
48
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
49
50
51

    Question – For each of the questions, 1-10, are there differences in the average response by gender?

52
53
     . dunntest iq1, by(igender)
54
    Warning: by() values are unlabeled, option nolabel implicit
55
56
57
    Kruskal-Wallis equality-of-populations rank test
58
      +----+
59
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60
```

```
| igender | Obs | Rank Sum |
        ------|
1
              1 | 497 | 248163.00 |
2
             2 | 570 | 321615.00 |
3
            _____+
4
     chi-squared = 11.781 with 1 d.f.
probability = 0.0006
5
6
     chi-squared with ties =
                             20.202 with 1 d.f.
7
     probability =
                    <mark>0.0001</mark>
8
9
10
                   Dunn's Pairwise Comparison of iq1 by igender
                                (No adjustment)
11
     Col Mean-|
12
     Row Mean |
                         1
13
     _____
          2 | -4.494629
14
            | 0.0000
15
     alpha = 0.05
16
     Reject Ho if p = P(Z \le |z|) \le alpha/2
17
18
19
     . dunntest iq2, by(igender)
20
     Warning: by() values are unlabeled, option nolabel implicit
21
22
     Kruskal-Wallis equality-of-populations rank test
23
24
       +----+
25
       | igender | Obs | Rank Sum |
                                                     .2.2.
       |-----|
26
           1 | 497 | 245930.00 |
27
             2 | 570 | 323848.00 |
       1
28
       +----+
29
     chi-squared = 15.032 with 1 d.f.
30
     probability = 0.0001
31
                             21.672 with 1 d.f.
     chi-squared with ties =
32
     probability = 0.0001
33
34
                   Dunn's Pairwise Comparison of iq2 by igender
35
                                (No adjustment)
36
     Col Mean-|
37
     Row Mean |
                          1
      -----
38
         2 | -4.655324
39
           | 0.0000
40
     alpha = 0.05
41
     Reject Ho if p = P(Z \le |z|) \le alpha/2
42
43
     . dunntest iq3, by(igender)
44
45
     Warning: by() values are unlabeled, option nolabel implicit
46
47
     Kruskal-Wallis equality-of-populations rank test
48
49
       +----+
       | igender | Obs | Rank Sum |
50
       |-----|
51
       | 1 | 497 | 254937.00 |
52
             2 | 570 | 314841.00 |
       53
       +----+
54
     chi-squared = 4.340 with 1 d.f.
probability = 0.0372
55
     probability =
56
     chi-squared with ties =
                              8.144 with 1 d.f.
57
     probability = 0.0043
58
59
                          For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml
60
```

```
Dunn's Pairwise Comparison of iq3 by igender
                               (No adjustment)
1
     Col Mean-L
2
     Row Mean |
                         1
3
           2 | -2.853738
4
           | 0.0022
5
6
     alpha = 0.05
     Reject Ho if p = P(Z \le |z|) \le alpha/2
7
8
9
     . dunntest iq4, by(igender)
10
     Warning: by() values are unlabeled, option nolabel implicit
11
12
13
     Kruskal-Wallis equality-of-populations rank test
14
       +----+
15
       | igender | Obs | Rank Sum |
16
       |-----|
          1 | 497 | 245219.00 |
17
            2 | 570 | 324559.00 |
      18
       +----+
19
    chi-squared = 16.150 with 1 d.f.
probability = 0.0001
20
21
22
     chi-squared with ties = 21.371 with 1 d.f.
     probability = 0.0001
23
24
25
                   Dunn's Pairwise Comparison of iq4 by igender
                                (No adjustment)
26
                                                    eler
     Col Mean-|
27
     Row Mean |
                         1
28
     _____
          2 | -4.622902
29
           | 0.0000
30
31
     alpha = 0.05
     Reject Ho if p = P(Z \le |z|) \le alpha/2
32
33
34
     . dunntest iq5, by(igender)
35
     Warning: by() values are unlabeled, option nolabel implicit
36
37
38
     Kruskal-Wallis equality-of-populations rank test
39
40
      | igender | Obs | Rank Sum |
       |-----|
41
      | 1 | 497 | 250255.00 |
42
             2 | 570 | 319523.00 |
43
       +-----+
44
    chi-squared = 9.095 with 1 d.f.
probability = 0.0026
45
46
                            13.426 with 1 d.f.
47
     chi-squared with ties =
     probability = 0.0002
48
49
                   Dunn's Pairwise Comparison of iq5 by igender
50
                                (No adjustment)
51
     Col Mean-|
52
     Row Mean |
                          1
     _____+
53
          2 | -3.664079
54
            0.0001
55
     alpha = 0.05
56
     Reject Ho if p = P(Z \le |z|) \le alpha/2
57
58
59
     . dunntest iq6, by(igender)
                          For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml
60
```

```
Warning: by() values are unlabeled, option nolabel implicit
1
2
3
     Kruskal-Wallis equality-of-populations rank test
4
5
       | igender | Obs | Rank Sum |
6
       |-----|
             1 | 497 | 253170.50 |
7
       2 | 570 | 316607.50 |
8
         -----+
9
     chi-squared = 5.930 with 1 d.f.
probability = 0.0149
10
11
12
                            8.817 with 1 d.f.
     chi-squared with ties =
13
     probability =
                  0.0030
14
15
                   Dunn's Pairwise Comparison of iq6 by igender
16
                              (No adjustment)
     Col Mean-|
17
     Row Mean |
                         1
18
     ----+-
19
          2 | -2.969281
           0.0015
20
21
     alpha = 0.05
22
     Reject Ho if p = P(Z \le |z|) \le alpha/2
23
24
     . dunntest iq7, by(igender)
25
     Warning: by() values are unlabeled, option nolabel implicit
26
27
                                                   28
     Kruskal-Wallis equality-of-populations rank test
29
       +----+
30
      | igender | Obs | Rank Sum |
31
          -----|
             1 | 497 | 242886.00 |
32
            2 | 570 | 326892.00 |
       33
       +----+
34
     chi-squared = 20.100 with 1 d.f.
probability = 0.0001
35
36
37
                            24.716 with 1 d.f.
     chi-squared with ties =
     probability = 0.0001
38
39
40
                   Dunn's Pairwise Comparison of iq7 by igender
                               (No adjustment)
41
     Col Mean-|
42
     Row Mean |
                         1
43
     -----
         2 | -4.971520
44
           | 0.0000
45
46
     alpha = 0.05
47
     Reject Ho if p = P(Z \le |z|) \le alpha/2
48
49
     . dunntest iq8, by(igender)
50
     Warning: by() values are unlabeled, option nolabel implicit
51
52
53
     Kruskal-Wallis equality-of-populations rank test
54
       +-----+
55
       | igender | Obs | Rank Sum |
56
       |-----|
       | 1 | 497 | 243180.50 |
57
            2 | 570 | 326597.50 |
58
       +----+
59
```

60

```
chi-squared = 19.578 with 1 d.f.
     probability =
                    <mark>0.0001</mark>
1
2
                             21.691 with 1 d.f.
     chi-squared with ties =
3
     probability = 0.0001
4
5
                    Dunn's Pairwise Comparison of iq8 by igender
6
                                (No adjustment)
7
     Col Mean-|
     Row Mean |
                          1
8
      -----
9
        2 | -4.657396
10
           | 0.0000
11
     alpha = 0.05
12
     Reject Ho if p = P(Z \le |z|) \le alpha/2
13
14
     . dunntest iq9, by(igender)
15
     Warning: by() values are unlabeled, option nolabel implicit
16
17
18
     Kruskal-Wallis equality-of-populations rank test
19
       +----+
20
       | igender | Obs | Rank Sum |
21
       |-----|
             1 | 497 | 250477.00 |
22
             2 | 570 | 319301.00 |
23
       +----+
24
     chi-squared = 8.830 with 1 d.f.
probability = 0.0030
25
26
27
     chi-squared with ties = 10.231 with 1 d.f.
28
     probability = 0.0014
29
30
                    Dunn's Pairwise Comparison of iq9 by igender
31
                                (No adjustment)
     Col Mean-|
32
     Row Mean |
                          1
33
     ------
34
          2 | -3.198645
            1
                  0.0007
35
36
     alpha = 0.05
37
     Reject Ho if p = P(Z \le |z|) \le alpha/2
38
39
     . dunntest iq10, by(igender)
40
     Warning: by() values are unlabeled, option nolabel implicit
41
42
43
     Kruskal-Wallis equality-of-populations rank test
44
       +-----+
45
       | igender | Obs | Rank Sum |
46
        ------
47
              1 | 497 | 246943.50 |
              2 | 570 | 322834.50 |
48
        -----+
49
     chi-squared = 13.508 with 1 d.f.
probability = 0.0002
50
51
52
     chi-squared with ties =
                             24.537 with 1 d.f.
     probability =
                    0.0001
53
54
55
                   Dunn's Pairwise Comparison of iq10 by igender
56
                                 (No adjustment)
     Col Mean-|
57
     Row Mean |
                          1
58
     -----
59
           2 | -4.953449
                           For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml
60
```

Questi	ion – For ea	ach of the que	stions, 1-10,	are there d	ifferences ir	the average	e response <u>by inco</u>	ome level?
dunntest	iq1, by(income)						
Marning: b	oy() values	s are unlabele	ed, option r	olabel impl	icit			
(ruskal-Wa	allis equa.	lity-of-popula	tions rank	test				
iincom	ne Obs	Rank Sum						
	1 85	39647.00						
	2 124 3 220	109906.00						
	4 194 5 138	109253.00 73959.00						
	++- 6 81	47674.00						
i	7 45	26205.00						
	o 29 9 13	18958.00 7766.00						
1	0 22	13681.00 						
1	1 116	61730.00						
hi-square robabilit	ed with tig	es = 36.441 .0001	with 10 d.	f.				
hi-square robabilit	ed with tie ty = 0 Dunn	25 = 36.441 0001 1's Pairwise C	. with 10 d.	f. of iql by ii	ncome			
hi-square robabilit ol Mean- .ow Mean	ed with tie cy = <mark>0</mark> Dunn 1	25 = 36.441 0001 n's Pairwise C (Nc	. with 10 d. Comparison c adjustment 3	f. of iq1 by ii	.ncome 5	6		
hi-square robabilit ol Mean- .ow Mean + 2	ed with tig y = 0 Dunn 1 -0.76923 0.220	25 = 36.441 0001 N'S Pairwise C (No 2 33 09	with 10 d. Comparison co adjustment 3	f. fiql by ii	.ncome 5	6		
col Mean- cow Mean 2 3 3	ed with tie y = 0 Dunn -0.76925 0.220 -1.10256 0.135	2 36.441 .0001 1's Pairwise C (No 2 	with 10 d. Comparison co adjustment 3	f. f iq1 by ii) 4	ncome 5	6		
col Mean- cow Mean- cow Mean cow Mean cow 1 cow 1	ed with tie y = 0 Dunn -0.76925 0.220 -1.10256 0.133 -3.15980 0.000	2 36.441 0001 1's Pairwise C (No 2 33 39 59 -0.289304 51 0.3862 08 -2.632641 08 0.0042	-2.743449 0.0030	f. of iql by ii .) 4	.ncome 5	6		
col Mean- col Mean- cow Mean + 2 3 3 4 5	ed with tie y = 0 Dunn 1 -0.76925 0.220 -1.10256 0.133 -3.15980 0.000 -2.1418 0.016	2 36.441 0001 1's Pairwise C (No 2 3 3 9 -0.289304 5 0.3862 0 8 -2.632641 0.0042 75 -1.511267 0.0654	-2.743449 0.0030 -1.422898 0.0774	f. f iql by ii 4 1.038856 0.1494	.ncome 5	6		
col Mean- cow Mean 2 3 3 4 5 5 6	ed with tig y = 0 Dunn 1 -0.76925 0.220 -1.10256 0.133 -3.15980 0.000 -2.1418 0.016 -3.34230 0.000	2 25 = 36.441 .0001 1's Pairwise C (No 2 	-2.743449 0.0030 -1.422898 0.0774 -2.909733 0.0018	f. f iql by ii 4 1.038856 0.1494 -0.816141 0.2072	.ncome 5 -1.597847 0.0550	6		
hi-square robabilit ol Mean- ow Mean 2 3 3 4 5 6 1 7	<pre>ed with tie y = 0 Dunn 1 -0.76929 0.220 -1.10256 0.133 -3.15980 0.000 -2.1418 0.010 -3.34230 0.000 -2.67138 0.000</pre>	2 36.441 0001 36.441 0001 36.441 36.441 36.441 36.441 37.5 39.9 39.9 39.9 39.9 30.	-2.743449 0.0030 -1.422898 0.0774 -2.909733 0.0018 -2.149485 0.0158	f. f iql by ii 4 1.038856 0.1494 -0.816141 0.2072 -0.492410 0.3112	-1.597847 0.0550 -1.148526 0.1254	6 0.142490 0.4433		
hi-square robabilit ol Mean- .ow Mean 2 3 4 5 5 6 6 7 8 8	<pre>ed with tie y = 0 Dunn 1 -0.76922 0.220 -1.10256 0.133 -3.15980 0.000 -2.1418 0.016 -3.34230 0.000 -2.67138 0.000 -3.70070 0.000</pre>	<pre>36.441 .0001 2</pre>	-2.743449 0.0030 -1.422898 0.0774 -2.909733 0.0018 -2.149485 0.0158 -3.315692 0.0005	f. f iq1 by ii 4 1.038856 0.1494 -0.816141 0.2072 -0.492410 0.3112 -1.932950 0.0266	-1.597847 0.0550 -1.148526 0.1254 -2.450205 0.0071	6 0.142490 0.4433 -1.279432 0.1004		
col Mean- cow Mean cow Mean 2 3 3 4 5 6 7 8 9	<pre>ed with tie y = 0 Dunn 1 -0.76925 0.220 -1.10256 0.133 -3.15980 0.000 -2.1418° 0.000 -2.1418° 0.000 -3.34230 0.000 -3.34230 0.000 -3.34230 0.000 -1.8684° 0.030</pre>	<pre>36.441 30001 31's Pairwise C (Nc 2 33 39 59 -0.289304 0.3862 35 69 -2.632641 0.3862 35 -2.632641 0.0042 35 -1.511267 0.0654 31 -2.874429 0.0020 33 -2.207428 38 0.0136 33 -2.207428 38 0.0136 31 -3.333112 0.0004 35 -1.537144 0.0621 36 36 37 36 37 37 37 37 37 37 37 37 37 37 37 37 37</pre>	-2.743449 0.0030 -2.743449 0.0030 -1.422898 0.0774 -2.909733 0.0018 -2.149485 0.0158 -3.315692 0.0005 -1.456172 0.0727	f. fiq1 by ii 4 1.038856 0.1494 -0.816141 0.2072 -0.492410 0.3112 -1.932950 0.0266 -0.507627 0.3059	-1.597847 0.0550 -1.148526 0.1254 -2.450205 0.0071 -0.900035 0.1841	6 0.142490 0.4433 -1.279432 0.1004 -0.125393 0.4501		
Col Mean- Col Mean- Cow Mean 2 3 4 5 6 7 8 9 10	<pre>ed with tie zy = 0 Dunn 1 -0.76925 0.220 -1.10256 0.133 -3.15980 0.000 -2.1418 0.010 -3.34230 0.000 -2.67138 0.000 -3.70070 0.000 -1.8684 0.030 -2.76105 0.000</pre>	1 36.441 .0001 2 .1 2 .0 2 .0 2 .0 2 .0 2 .0 2 .0 3862 .0 -2.632641 .0 .0.0654 .0 -2.632641 .0 .0.0654 .0 .0.0654 .0 -2.874429 .0 .0020 .2 .207428 .0 .0136 .1 -3.333112 .0 .00004 .1 .537144 .0 .0621 .2 -2.386668 .0.0085	-2.743449 0.0030 -2.743449 0.0030 -1.422898 0.0774 -2.909733 0.0018 -2.149485 0.0158 -3.315692 0.0005 -1.456172 0.0727 -2.323942 0.0101	f. fiq1 by ii 4 1.038856 0.1494 -0.816141 0.2072 -0.492410 0.3112 -1.932950 0.0266 -0.507627 0.3059 -1.108837 0.1338	-1.597847 0.0550 -1.148526 0.1254 -2.450205 0.0071 -0.900035 0.1841 -1.590545 0.0559	6 0.142490 0.4433 -1.279432 0.1004 -0.125393 0.4501 -0.588491 0.2781		
col Mean- col Mean- cow Mean 	<pre>2d with tie 2y = 0 Dunn 1 -0.76925 0.220 -1.10256 0.133 -3.15980 0.000 -2.1418* 0.016 -3.34230 0.000 -2.67138 0.000 -3.70070 0.000 -1.8684* 0.030 -2.76103 0.000 -1.95593 0.025</pre>	$\begin{array}{c} 36.441\\ 0.0001\\ \hline 35 = 36.441\\ 0.0001\\ \hline 36 = 36.441\\ 0.001\\ \hline 36 = 36.441\\ 0.001\\ \hline 36 = 2.632641\\ 0.3862\\ \hline 36 = -2.632641\\ 0.3862\\ \hline 36 = -2.632641\\ 0.3862\\ \hline 36 = -2.632641\\ 0.0042\\ \hline 36 = -2.632641\\ 0.0042\\ \hline 36 = -2.874429\\ 0.0020\\ \hline 36 = -2.874429\\ 0.0020\\ \hline 36 = -2.207428\\ 0.0020\\ \hline 36 = -2.38668\\ 0.0042\\ \hline 36 = -2.386668\\ 0.0085\\ \hline 36 = -1.323354\\ 0.0929\\ \hline \end{array}$	-2.743449 o.adjustment 3 -2.743449 0.0030 -1.422898 0.0774 -2.909733 0.0018 -2.149485 0.0158 -3.315692 0.0005 -1.456172 0.0727 -2.323942 0.0101 -1.206620 0.1138	<pre>f. f. f. fi iq1 by ii } 4 1.038856 0.1494 -0.816141 0.2072 -0.492410 0.3112 -1.932950 0.0266 -0.507627 0.3059 -1.108837 0.1338 1.122513 0.1308</pre>	-1.597847 0.0550 -1.148526 0.1254 -2.450205 0.0071 -0.900035 0.1841 -1.590545 0.0559 0.127501 0.4493	6 0.142490 0.4433 -1.279432 0.1004 -0.125393 0.4501 -0.588491 0.2781 1.655509 0.0489		

<pre>8 -1.273936 0.1013 9 -0.20120 0.717258 0.4195 0.2366 10 -0.645693 0.478844 -0.297344 0.6259 0.3160 0.3831 11 1.214096 2.488185 0.947688 1.639269 pha = 0.05 pha = 0.05 1 0.124 0.0064 0.1716 0.0506 pha = 0.05 pha = 0.05 1 1 85 39413.00 2 124 0.2004 1 1 85 39413.00 2 124 0.2004 1 1 16 1 46268.50 1 2 124 0.2004 1 1 16 1 46268.50 1 2 124 0.2004 1 3 202 11221.000 4 194 104957.00 1 4 194 104957.00 1 5 130 77734.00 1 6 81 46268.50 1 7 45 2714.00 1 6 81 46268.50 1 1 1 16 63359.50 1 1 1 16 63359.50 1 1 1 16 63359.50 1 -0.1237 3 -1.554296 -0.317118 0.0601 0.31756 4 -2.316395 -1.204085 -1.044061 0.0123 .0024 0.0464 0.3179 6 -2.69338 -1.792626 -1.686535 -0.889411 -0.220641 0.0035 0.0346 0.0464 0.3179 6 -2.69338 -1.792626 -0.88741 -0.220641 0.0035 0.0346 0.0464 0.3179 6 -2.69338 -1.792626 -1.686535 -0.889411 -0.220641 0.0035 0.0365 0.0444 0.1869 0.4127 7 -2.697391 -2.86668 -2.10830 -1.46228 -0.904860 -0.669331 0.0217 0.0224 0.0325 0.0444 0.01641 -0.27355 0.2319 6 -2.69338 -1.792626 -1.686535 -0.889411 -0.220641 0.0035 0.0346 0.03756 4 -2.316393 -1.792626 -1.686535 -0.889411 -0.220641 0.0377 0.2284 0.0325 0.0344 0.0404 0.1869 0.4127 7 -2.697391 -2.86668 -2.10830 -1.46228 -0.904860 -0.669331 0.0217 0.2235 0.0244 0.0335 0.0344 0.0375 1.04632 0.0375 0.0474 0.0394 0.0464 0.1373 0.0898 0.773 9 -2.074410 -1.56239 -1.47004 -1.06612 -0.774637 0.2358 9 -2.074410 -1.56239 -1.47004 -1.06612 -0.774637 0.0348 9 -2.074410 -1.56239 -1.47004 -1.06612 -0.774637 0.0348 1 -1.39265 -1.147028 -1.027451 -0.54161 -0.774637 0.2358 1 -1.39</pre>		+					
<pre>9 -0.203120 0.717258 0.4195 0.2386 10 -0.645693 0.478644 -0.297344 0.02592 0.3160 0.3931 11 1.214096 2.488185 0.947688 1.639269 pha = 0.05 pha /pre>	8	-1.273936 0.1013					
<pre>10 -0.645693 0.478844 -0.297344 0.2592 0.3160 0.3831 11 1.214096 2.488185 0.947688 1.639269 0.1716 0.0506 pha = 0.05 ject Ho if p = P(2 <= z) <= alpha/2 dunntest iq2, by(iincome) rning: by() values are unlabeled, option nolabel implicit uskal-Wallis equality-of-populations rank test +</pre>	9	 -0.203120 0.4195	0.717258 0.2366				
<pre>11 1.214096 2.488185 0.947688 1.639269 0.1716 0.0506 pha = 0.05 ject Ho If P = P(Z <= 121) <= alpha/2 dunntest iq2, by(iincome) rning: by() values are unlabeled, option nolabel implicit uskal-Wallis equality-of-populations rank test</pre>	10	-0.645693 0.2592	0.478844 0.3160	-0.297344 0.3831			
<pre>pha = 0.05 ject Ho if p = P(Z <= z) <= alpha/2 dunntest iq2, by(iincome) rning: by() values are unlabeled, option nolabel implicit uskal-Wallis equality-of-populations rank test </pre>	11	 1.214096 0.1124	2.488185 <mark>0.0064</mark>	0.947688 0.1716	1.639269 0.0506		
<pre>uskal=Wallis equality-of-populations rank test i.income Obs Rank Sum 2 124 62680.50 2 124 62680.50 3 220 113218.00 4 1 194 104957.50 5 1 38 77734.00 </pre>	lpha = eject Ho dunntes arning: 1	0.05 if p = P(Z < t iq2, by(iir by() values a	<= z) <= a ncome) are unlabele	lpha/2 d, option n	olabel impl	icit	
<pre>increase 0bs Rank Sum </pre>	ruskal-W	allis equalit	y-of-popula	tions rank	test		
<pre> </pre>	+	 me Obs I	Rank Sum				
<pre>1 2 124 62680.50 3 220 113218.00 4 194 104957.50 5 138 77734.00 6 81 46268.50 7 45 27142.00 8 29 14295.00 9 13 8091.00 1 0 22 12619.00 1 1 116 63359.50 1</pre>		++ 1 85 3	 39413.00				
<pre> A 194 104957.50 5 138 77734.00 5 138 77734.00 7 45 27142.00 8 29 14295.00 9 13 8091.00 10 22 12619.00 10 22 12619.00 10 22 12619.00 10 22 12619.00 10 22 12619.00 10 22 12619.00 10 22 12619.00 10 22 12619.00 10 22 12619.00 10 22 12619.00 10 22 12619.00 10 22 12619.00 10 22 12619.00 10 22 12619.00 10 22 12619.00 10 22 12619.00 10 22 12619.00 10 22 12619.00 10 22 12619.00 10 22 23 4 5 10 0.0384 Dunn's Pairwise Comparison of iq2 by iincome</pre>	Ì	2 124 6	52680.50 3218 00				
<pre></pre>		4 194 10)4957.50				
<pre>1 6 81 46268.50 1 7 45 27142.00 9 13 8091.00 1 0 22 12619.00 </pre>	 	++					
<pre>1 8 29 14295.00 9 13 8091.00 10 22 12619.00 </pre>		6 81 4 7 45 2	16268.50 27142.00				
<pre>1</pre>	Ì	8 29 1	4295.00				
<pre></pre>		10 22 1	2619.00				
<pre>++ i-squared = 13.281 with 10 d.f. obability = 0.2084 i-squared with ties = 19.148 with 10 d.f. obability = 0.0384 Dunn's Pairwise Comparison of iq2 by iincome</pre>		++ 11 116 6	 53359.50				
<pre>i-squared = 13.281 with 10 d.f. obability = 0.2084 i-squared with ties = 19.148 with 10 d.f. obability = 0.0384 Dunn's Pairwise Comparison of iq2 by iincome (No adjustment) 1 Mean- w Mean 1 2 3 4 5 6 2 -1.156759 0.1237 3 -1.554296 -0.317118 0.0601 0.3756 4 -2.316595 -1.204085 -1.044061 0.0103 0.1143 0.1482 5 -2.814820 -1.820137 -1.746089 -0.779272 0.0024 0.0344 0.0404 0.2179 6 -2.698388 -1.792626 -1.696535 -0.889441 -0.220641 0.0035 0.0365 0.0449 0.1869 0.4127 7 -2.947791 -2.186686 -2.108330 -1.463268 -0.904860 -0.6669351 0.0016 0.0144 0.0175 0.0717 0.1828 0.2516 8 -0.529937 0.237196 0.427915 0.941103 1.342026 1.409567 0.2981 0.4063 0.3344 0.1733 0.0898 0.0793 9 -2.076410 -1.562379 -1.471004 -1.106612 -0.793658 -0.667291 0.0189 0.0591 0.0706 0.1342 0.2137 0.2523 10 -1.790286 -1.147028 -1.027451 -0.564161 -0.174837 -0.038489 For peer review only - http://hmiopen.htm.com/.ite/about/ou For peer review only - http://htm.pr/miopen.htm.com/.ite/about/ou For peer review only - http://htm.com/.ite/about/ou For peer review only - http://miopen.htm.com/.ite/about/ou For peer</pre>	+		+				
Dunn's Pairwise Comparison of iq2 by iincome (No adjustment) Dunn's Pairwise Comparison of iq2 by iincome (No adjustment) Mean Mean 1 2 3 4 5 6 2 -1.156759 0.1237 3 -1.554296 -0.317118 0.0601 0.3756 4 -2.316595 -1.204085 -1.044061 0.0103 0.1143 0.1482 5 -2.814820 -1.820137 -1.746089 -0.779272 0.0024 0.0344 0.0404 0.2179 6 -2.698388 -1.792626 -1.696535 -0.889441 -0.220641 0.0035 0.0365 0.0449 0.1869 0.4127 7 -2.947791 -2.186686 -2.108330 -1.463268 -0.904860 -0.669351 0.0016 0.0144 0.0175 0.0717 0.1828 0.2516 8 -0.529937 0.237196 0.427915 0.941103 1.342026 1.409567 0.2881 0.4063 0.3344 0.1733 0.0898 0.0793 9 -2.076410 -1.562379 -1.471004 -1.106612 -0.793658 -0.667291 0.0189 0.0591 0.0174 -0.034489 For peer review only - http://hmiopen.htm.com/site/about/ou	hi-squar	ed = 13.28	31 with 10 d	l.f.			
Dunn's Pairwise Comparison of iq2 by iincome (No adjustment) 1 Mean-I w Mean 1 2 3 4 5 6 2 -1.156759 0.1237 3 -1.554296 -0.317118 0.0601 0.3756 4 -2.316595 -1.204085 -1.044061 0.0103 0.1143 0.1482 5 -2.814820 -1.820137 -1.746089 -0.779272 0.0024 0.0344 0.0404 0.2179 6 -2.698388 -1.792626 -1.696535 -0.889441 -0.220641 0.0035 0.0365 0.0449 0.1869 0.4127 7 -2.947791 -2.186686 -2.108330 -1.463268 -0.904860 -0.669351 0.0016 0.0144 0.0175 0.0717 0.1828 0.2516 8 -0.529937 0.237196 0.427915 0.941103 1.342026 1.409567 0.2981 0.4063 0.3344 0.1733 0.0898 0.0793 9 -2.076410 -1.562379 -1.471004 -1.106612 -0.793658 -0.667291	hi amaa		- 10 140		£		
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Varning: b	y() value	s are unlabel	ed, option r	olabel impl	icit	
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al Re	pha = ject Ho	0.05 if p = P(Z <= z) <=	alpha/2				
_	-	-						
	dunntest	iq4, by(iincome)					
Wa	rning: k	y() value	s are unlabe	led, option n	nolabel impl	icit		
Kr	uskal-Wa	llis equa	lity-of-popu	lations rank	test			
	+		+					
	iincom	ne Obs	Rank Sum					
		1 85	37107.00					
		2 124 3 220	65210.00 110440.00					
		4 194	111545.50 75994 50					
		++						
		6 81 7 45	42547.50 27401.50					
		8 29	15829.50					
	 1	9 13 .0 22	13522.00					
		++ 1 116	62378 50 L					
	+		+					
ch	i-square	ed = 19	.683 with 10	d.f.				
pr	obabilit	y = 0	.0324					
ch	i-square	ed with ti	.es = 26.0	46 with 10 d	.f.			
pr	obabilit	.y = 0	.0037					
		D	nle Dairwice	Companicon	of igd by it	ncome		
		Dun	mis rairwise (1	No adjustment	נו עמ 4µי בו נ)	come		
Co Ro	l Mean- w Mean	1	2	3	4	5	6	
	+							
	2	-2.3681 <mark>0.00</mark>	. / 1 1 <mark>89</mark>					
	 או	-1.9129	0.79406	3				
		0.02	.79 0.213	6				
	4	-3. <u>972</u> 5	34 -1.59381	2 -2. <u>76595</u> 6				
		0.00	0.055	5 <mark>0.0028</mark>				
	5	-3.0899	-0.74809	9 -1.673598	0.814298			
		0.00	0.227	2 0.0471	0.2077			
	6	-2.1330	0.01592	1 -0.668591 review oply - h	1.402405	0.677582	ite/ahout/aui	delines vhtm
			i oi heel	cview only "I			,, ubbut/ yuli	actines.Attull

	<mark>0.0165</mark>	0.4936	0.2519	0.0804	0.2490			
7	-3.490216 <mark>0.0002</mark>	-1.781082 0.0374	-2.439558 <mark>0.0074</mark>	-0.765840 0.2219	-1.266400 0.1027	-1.679380 0.0465		
8	-1.897109 0.0289	-0.361180 0.3590	-0.828471 0.2037	0.546218 0.2925	0.088444 0.4648	-0.354785 0.3614		
9	-2.050700 <mark>0.0201</mark>) -0.950966 0.1708	-1.283692 0.0996	-0.328050 0.3714	-0.636509 0.2622	-0.935496 0.1748		
10	-2.779079 0.0027	-1.432053 0.0761	-1.880365 0.0300	-0.658084 0.2552	-1.039898 0.1492	-1.387458 0.0827		
11	-2.645686 <mark>0.0041</mark>	0.342701 0.3659	-1.162901 0.1224	1.184141 0.1182	0.383446 0.3507	-0.321426 0.3739		
Col Mean- Row Mean	7	8	9	10				
8	0.988807 0.1614	· / !						
9	0.103952 0.4586	2 -0.607388 0.2718						
10	-0.081994 0.4673	-0.908257 0.1819	-0.154540 0.4386					
11	1.512891 0.0652	0.145623	0.796518	1.234306 0.1085				
+	ne Obs ++	+ Rank Sum 	CIONS FAIR	lest				
	1 85 2 124 3 220 1 4 194 1 5 138	43091.50 66453.50 .09374.50 .06261.50 75463.00						
	6 81 7 45 8 29 9 13 10 22	44934.00 24609.50 17201.00 8082.00 13958.00						
1	1 116	60349.50						
chi-square probabilit chi-square probabilit	d = 9.5 $y = 0.4$ $d with ties$ $y = 0.1$ Dunn'	64 with 10 d 796 = 14.118 .677 S Pairwise C	l.f. 9 with 10 d. Comparison o	f. 9f iq5 by ii	ncome			
Col Mean-		(No	adjustment	.)				
Row Mean	· 	1	2	3	4		5	
2	-0.810736	; a						
	0.2000	<u>,</u>						
3	0.302602 0.3811	2 1.360806 0.0868						

	0.100					
5	-1.14019 0.127	3 -0.347880 1 0.3640	-1.803628 0.0356	0.032089 0.4872		
6	-1.21324 0.112	3 -0.519526 5 0.3017	-1.746860 0.0403	-0.208654 0.4174	-0.222731 0.4119	
7	-0.85370 0.196	8 -0.248352 6 0.4019	-1.198176 0.1154	0.020538 0.4918	-0.001021 0.4996	0.166739 0.4338
8	-1.57995 0.057	4 -1.093750 1 0.1370	-1.915503 0.0277	-0.899027 0.1843	-0.893698 0.1857	-0.699570 0.2421
9	-1.51895 0.064	4 -1.160057 4 0.1230	-1.720222 0.0427	-1.017718 0.1544	-1.017309 0.1545	-0.883481 0.1885
10	-2.10141 0.017	0 -1.679350 8 0.0465	-2.420832 0.0077	-1.519726 0.0643	-1.504827 0.0662	-1.307239 0.0956
11	-0.36713 0.356	9 0.478014 8 0.3163	-0.793637 0.2137	0.923288 0.1779	0.831911 0.2027	0.939016 0.1739
ol Mean- ow Mean		7	8	9	10	
8	-0.76591 0.221	9 9	7			
9	-0.93677 0.174	7 -0.337291 4 0.3679				
10	-1.32725 0.092	8 -0.576151 2 0.2823	-0.143834 0.4428			
11	0.59768	6 1.384077 0 0.0832	1.367391	1.936218		
lpha = eject Ho dunntest arning: k	0.275 0.05 if p = P(Z iq6, by(i by() values	<= z) <= a income) are unlabele	lpha/2 d, option n	olabel impl	icit	
lpha = eject Ho dunntest arning: k ruskal-Wa	0.275 0.05 if p = P(Z iq6, by(i by() values allis equal	<= z) <= a income) are unlabele ity-of-popula	lpha/2 d, option n tions rank	olabel impl	icit	
lpha = eject Ho dunntest arning: k ruskal-Wa + iincom	0.275 0.05 if p = P(Z iq6, by(i by() values allis equal 	<pre><= z) <= a income) are unlabele ity-of-popula + Rank Sum </pre>	lpha/2 d, option n tions rank	olabel impl	icit	
lpha = eject Ho dunntest arning: k ruskal-Wa + iincom 	0.275 0.05 if p = P(Z iq6, by(i by() values allis equal de Obs 	<pre><= z) <= a income) are unlabele ity-of-popula+ Rank Sum 39943.00 65934.00 112644.00 111196.50 76173.50 </pre>	lpha/2 d, option n tions rank	olabel impl	icit	
lpha = dunntest arning: k ruskal-Wa + iincon 	0.275 0.05 if p = P(Z c iq6, by(i by() values allis equal 	<pre><= z) <= a income) are unlabele ity-of-popula+ Rank Sum 39943.00 12644.00 11196.50 76173.50 42432.00 27899.50 16523.00 7017.00 </pre>	lpha/2 d, option n tions rank	olabel impl	icit	
lpha = eject Ho dunntest arning: k ruskal-Wa iincon 	0.275 0.05 if p = P(Z c iq6, by(i by() values allis equal de Obs 1 85 2 124 3 220 4 194 5 138 	<pre><= z) <= a income) are unlabele ity-of-popula+ Rank Sum 39943.00 12644.00 11196.50 76173.50 42432.00 27899.50 16523.00 7017.00 12425.00 </pre>	lpha/2 d, option n tions rank	olabel impl	licit	
lpha = dunntest dunntest arning: k ruskal-Wa + iincon 	0.275 0.05 if p = P(Z if g, by(i by() values allis equal t 0bs t 85 2 124 3 220 4 194 5 138 6 81 7 45 8 29 9 13 .0 22 1 116 	<pre><= z) <= a income) are unlabele ity-of-popula+ Rank Sum 39943.00 12644.00 11196.50 76173.50 42432.00 27899.50 16523.00 7017.00 12425.00 57590.50 +</pre>	lpha/2 d, option n tions rank	olabel impl	icit	
lpha = eject Ho dunntest arning: k ruskal-Wa + iincon 	0.275 0.05 if p = P(Z if g = P(Z if p = P(Z) P(Z if p = P(Z) P(Z	<pre><= z) <= a income) are unlabele ity-of-popula+ Rank Sum 39943.00 65934.00 112644.00 111196.50 76173.50 42432.00 27899.50 16523.00 7017.00 12425.00 334 with 10 d 1583</pre>	lpha/2 d, option n tions rank	olabel impl test	icit	
Alpha = Reject Ho dunntest Warning: k Kruskal-Wa i incom i incom i i i incom i chi-square probabilit	0.275 0.05 if p = P(Z if g = P(Z) P(Z	<pre><= z) <= a income) are unlabele ity-of-popula+ Rank Sum 39943.00 112644.00 11196.50 76173.50 42432.00 27899.50 16523.00 12425.00 57590.50 + 334 with 10 d 1583 s = 21.312 0190</pre>	lpha/2 d, option n tions rank .f. with 10 d.	f.	icit	
Alpha = Reject Ho dunntest Warning: k Gruskal-Wa incon	0.275 0.05 if p = P(Z if g = P(Z if p	<pre><= z) <= a income) are unlabele ity-of-popula+ Rank Sum 39943.00 65934.00 112644.00 111196.50 76173.50 42432.00 27899.50 16523.00 7017.00 12425.00 334 with 10 d 1583 s = 21.312 0190 's Pairwise C (No</pre>	lpha/2 d, option n tions rank .f. with 10 d. comparison o	f. f iq6 by ii	icit	

<pre>3 -1.304384 0.694423 0.0961 0.2437 4 -3.141146 -1.426563 -2.457107 0.0076 0.0777 0.2257 5 -2.355036 -0.647742 -1.456224 0.753132 0.0998 0.2586 0.0777 0.2257 6 -1.374388 0.218080 -0.360277 1.475366 0.795202 0.0847 0.4137 0.3593 0.0701 0.2132 7 -3.220994 -2.006780 -2.611245 -1.119447 -1.567548 -2.04597 0.0006 0.0222 0.01237 0.4729 0.3653 0.2004 9 -0.928093 -0.109172 -0.384708 0.461416 0.166563 -0.2004 9 -0.928093 -0.109172 -0.384708 0.461416 0.166563 -0.2204 0.01767 0.4565 0.3502 0.3223 0.4323 0.4165 10 -1.569049 -0.565228 -0.933516 0.147834 -0.220464 -0.673484 0.0583 0.2660 0.1753 0.4412 0.4128 0.2505 11 -0.735847 1.079976 0.536170 2.586049 1.743757 0.748255 0.2004 0.0406 0.2275 11 -0.735847 1.079976 0.586170 2.586049 1.743757 0.748255 0.2007 0.1567 0.3611 10 0.1567 0.3611 10 0.839834 0.069777 -0.282811 0.2005 0.4722 0.3887 11 2.782937 1.396782 0.585780 1.162216 0.0406 0.2275 0.0406 0.2279 0.1226 upha = 0.05 elegect Ho if p = P(2 <= 1z1) <= alpha/2 dunntest iq7, by(income) Narning: by() values are unlabeled, option nolabel implicit truskal-Wallis equality-of-populations rank test +</pre>	I	0.0412					
<pre>4 -3.141146 -1.426563 -2.457107 0.0008 0.0776 0.00770 5 -2.355036 -0.647742 -1.456204 0.753132 0.00847 0.4137 0.3593 0.0701 0.2132 7 -3.220984 -2.006780 -2.611245 -1.119447 -1.567548 -2.04597 0.0006 0.0224 0.0045 0.1315 0.0585 0.200 8 -1.837011 -0.72574 -1.156479 0.667955 -0.344334 -0.83940 0.0331 0.2328 0.1237 0.4729 0.3653 -0.210795 0.1767 0.4565 0.3502 0.3223 0.4339 0.4166 10 -1.569049 -0.565228 -0.933516 0.147834 -0.220464 -0.673464 0.0383 0.2860 0.1735 0.44120 0.4126 10 -1.569049 -0.565228 -0.933516 0.147834 -0.220464 -0.673464 0.0585 0.2309 0.1401 0.2959 0.0049 0.0406 0.2272 11 -0.735847 1.079976 0.536170 2.586049 1.743757 0.748257 0.2309 0.1401 0.2959 0.0049 0.0406 0.2272 11 -0.735847 1.079976 0.536170 2.586049 1.743757 0.748257 0.2309 0.1401 0.2959 0.0049 0.0406 0.2272 11 -0.735847 1.079976 0.536170 2.586049 1.743757 0.748257 0.2309 0.1401 0.2959 0.0049 0.0406 0.2272 11 -0.735847 1.079976 0.536170 2.586049 1.743757 0.748257 0.2309 0.1401 0.2959 0.0049 0.0406 0.2272 11 -0.735847 1.079976 0.536170 2.586049 1.743757 0.748257 0.0182 0.01812 0.2790 0.1226 11 0 0.639834 0.069777 -0.282811 0.2005 0.4722 0.3887 11 2.782937 1.396782 0.585780 1.162216 12 0.0182 0.2790 0.1226 13 0.01812 0.2179 0.1226 14 0.2005 0.4722 0.3887 15 2.782937 1.396782 0.585780 1.162216 16 0.0027 0.35517 0.1627 0.13617 0.3511 10 1 0.639834 0.069777 -0.282811 0.2015 0.4722 0.3887 11 2.782937 1.396782 0.585780 1.162216 12 1.220 0.012 0.2790 0.1226 13 1 2.782937 1.396782 0.585780 1.162216 14 1.92140 6.63730.00 15 1.38 1.76798.00 14 1.94 1105789.00 15 1.138 1.76798.00 15 1.138 1.76798.00 16 1.94 1.942100 17 1.45 2.4842.00 18 2.25 1.12270.00 14 1.94 1.94210.058 15 1.93 1.76798.00 15 1.138 1.76798.00 15</pre>	3	 -1.304384 0.0961	0.694423 0.2437				
<pre>5 -2.355036 -0.647742 -1.456204 0.753132 0.2257 6 -1.374388 0.218080 -0.360277 1.475366 0.795202 0.0847 0.4137 0.3593 0.0701 0.2132 7 -3.22094 -2.006760 -2.611245 -1.119447 -1.567548 -2.045975 0.0006 0.0224 0.0045 0.1315 0.0585 2.00204 8 -1.837011 -0.729574 -1.156479 0.067955 -0.344334 -0.839400 0.0331 0.2328 0.1237 0.4729 0.3653 0.2004 9 -0.928093 -0.109172 -0.384708 0.461416 0.166563 -0.210795 0.1767 0.4565 0.3502 0.3223 0.4339 0.4161 10 -1.569049 -0.565228 -0.933516 0.147834 -0.220464 -0.673484 0.0583 0.2660 0.1753 0.4412 0.4128 0.2503 11 -0.735847 1.079976 0.536170 2.586049 1.743757 0.748257 0.2309 0.1401 0.2959 0.0049 0.0406 0.2272 11 0.2309 0.1401 0.2959 0.0049 0.0406 0.2272 11 0.2005 0.4722 0.585780 1.162216 0.0200 9 1.008073 0.355517 0.1567 0.3611 10 0.839834 0.069777 -0.282811 11 0.2005 0.4722 0.585780 1.162216 0.0022 0.0012 0.2790 0.1226 11 2.782937 1.396782 0.585780 1.162216 0.0022 0.0012 0.2790 0.1226 11 2.782937 1.396782 0.585780 1.162216 0.0022 0.0012 0.2790 0.1226 12 4.008073 0.355517 11 2.782937 1.396782 0.585780 1.162216 0.0022 0.0012 0.2790 0.1226 13 0.839834 0.069777 -0.282811 14 2.782937 1.396782 0.585780 1.162216 0.0022 0.0012 0.2790 0.1226 14 0.2005 0.4722 0.3887 15 0.1567 0.3611 10 0.839834 0.069777 -0.282811 11 2.782937 1.396782 0.585780 1.162216 0.0022 0.0012 0.2790 0.1226 14 1.0579.0.01 13 2.0200 0 1.00812 0.2790 0.1226 14 1.0579.0.01 14 1.85 40655.00 15 1.38 76798.00 15 1.38 76798.00 16 41 41257.00 17 45 22482.00 18 40270.00 18 41225.00 19 41 4105799.00 19 41 4105799.00 10 5 1.38 76798.00 10 6 81 41225.00 10 7 45 22482.00 10 8 22 182970.00 11 100709 12 1.00709 13 220 112270.00 14 1.00779 100709 15 1.38 76798.00 15 1.38 76798.00 16 81 41225.00 17 45 22482.00 18 4200 4200 4200 4200 18 4200 4200 4200 4200 4200 18 4200 4200 4200 4200 18 4200 4200 4200 4200 18 4200 </pre>	4	-3.141146	-1.426563 0.0769	-2.457107 <mark>0.0070</mark>			
<pre>6 -1.374388 0.218080 -0.360277 1.475366 0.795202 0.00847 0.4137 0.3553 0.0701 0.2132 7 -3.220984 -2.006780 -2.611245 -1.119447 -1.567548 -2.045975 0.0006 0.0224 0.0045 0.1315 0.0585 -0.344334 -0.83940 0.0311 0.229574 -1.156479 0.067955 -0.344334 -0.83940 0.0353 0.2009 9 -0.928093 -0.109172 -0.384708 0.461416 0.166563 -0.210795 0.1767 0.4565 0.3502 0.3223 0.4339 0.4161 10 -1.569049 -0.565228 -0.93516 0.147834 -0.220464 -0.673484 0.0583 0.2860 0.1753 0.4412 0.4128 0.2503 11 -0.735847 1.079976 0.536170 2.586049 1.743757 0.748257 0.2309 0.1401 0.2959 0.0049 0.0406 0.2272 tol Mean-1 tow Mean 7 8 9 10 8 0.834645 0.2020 9 1.008073 0.355517 0.1567 0.0611 10 0.839834 0.069777 -0.282811 0.2005 0.4722 0.3887 11 2.782937 1.396782 0.585780 1.162216 0.1226 upha = 0.05 teject Ho if p = P(z <= z) <= alpha/2 dunntest iq7, by(iincome) Marning: by() values are unlabeled, option nolabel implicit truskal-Wallis equality-of-populations rank test +</pre>	5	 -2.355036 <mark>0.0093</mark>	-0.647742 0.2586	-1.456204 0.0727	0.753132 0.2257		
<pre>7 -3.220984 -2.006780 -2.611245 -1.119447 -1.567548 -2.045975 0.02045 0.1315 0.0585 0.0294 8 -1.837011 -0.729574 -1.156479 0.067955 -0.344334 -0.83400 0.0331 0.2228 0.1237 0.4729 0.3653 0.2004 9 -0.928093 -0.109172 -0.384708 0.461416 0.166563 -0.21079 9 0.1767 0.4565 0.3502 0.3223 0.4339 0.4161 10 -1.569049 -0.565228 -0.933516 0.147834 -0.220464 -0.673464 0.0583 0.2860 0.1753 0.4412 0.4128 0.2503 11 -0.735847 1.079976 0.536170 2.586049 1.743757 0.74825 0.2309 0.1401 0.2959 0.0049 0.0406 0.2272 11 -0.735847 1.079976 0.536170 2.586049 1.743757 0.74825 0.2309 0.1401 0.2959 0.0049 0.0406 0.2272 11 0.839844 0.069777 -0.282811 0.2005 0.4722 0.3887 11 2.782937 1.396782 0.585780 1.162216 0.0027 0.0812 0.2790 0.1226 11 2.782937 1.396782 0.585780 1.162216 0.0126 11 2.782937 1.396782 0.585780 1.162216 0.0216 12 24 6373.00 3 220 112270.00 4 3 220 112270.00 5 138 76798.00 5 220 182990.00 5 220 2</pre>	6	 -1.374388 0.0847	0.218080 0.4137	-0.360277 0.3593	1.475366 0.0701	0.795202 0.2132	
<pre>8 -1.837011 -0.729574 -1.156479 0.067955 -0.344334 -0.839400 0.0331 0.2328 0.1237 0.4729 0.3653 0.2004 9 -0.928093 -0.109172 -0.384708 0.461416 0.166563 -0.210795 0.1767 0.4565 0.3502 0.3223 0.4339 0.4165 10 -1.569049 -0.565228 -0.933516 0.147834 -0.220464 -0.67348 0.0583 0.2860 0.1753 0.4412 0.4128 0.2503 11 -0.735847 1.079976 0.536170 2.586049 1.743757 0.74825 0.2309 0.1401 0.2959 0.0048 0.0406 0.2272 11 -0.735847 1.079976 0.536170 2.586049 1.743757 0.74825 0.2009 0.1401 0.2959 0.0048 0.0406 0.2272 10 Mean-1 7 8 9 10 8 0.834645 0.2020 9 1.008073 0.355517 0.1567 0.3611 10 0.839834 0.069777 -0.282811 0.2005 0.4722 0.3887 11 2.782937 1.396782 0.585780 1.162216 0.1226 11 0.0007 0.0812 0.2790 0.1226 11 2.782937 1.396782 0.585780 1.162216 1 0.0027 0.0812 0.2790 0.1226 11 2.782937 1.396782 0.585780 1.162216 1 0.0027 0.0812 0.2790 0.1226 11 2.782937 1.396782 0.585780 1.162216 1 0.4067 0.0812 0.2790 0.1226 12 12 4 63730.00 1.401 0.101</pre>	7	 -3.220984 <mark>0.0006</mark>	-2.006780 <mark>0.0224</mark>	-2.611245 <mark>0.0045</mark>	-1.119447 0.1315	-1.567548 0.0585	-2.045979 <mark>0.0204</mark>
<pre>9 -0.928093 -0.109172 -0.384708 0.461416 0.166563 -0.210799 0.1767 0.4565 0.3502 0.3223 0.4339 0.4165 10 -1.569049 -0.565228 -0.933516 0.147834 -0.220464 -0.673484 0.0583 0.2860 0.1753 0.4412 0.4128 0.2503 11 -0.735847 1.079976 0.536170 2.586049 1.743757 0.74825 0.2309 0.1401 0.2959 0.0049 0.0406 0.2272 501 Mean- 300 Mean 7 8 9 10 300 Mean 9 0.355517 300 Mean 9 0.355517 300 Mean 9 0.3611 300 0.839834 0.069777 -0.282811 300 0.839834 0.069777 -0.282811 300 0.2005 0.4722 0.3887 31 2.782937 1.396782 0.585780 1.162216 300 0.270 0.0812 0.2790 0.1226 31 0.0027 0.0812 0.2790 0.1226 32 0.0027 0.0812 0.2790 0.1226 32 0.0027 0.0812 0.2790 0.1226 32 0.0027 0.0812 0.2790 0.1226 33 0.0027 0.0812 0.2790 0.1226 34 0.0027 0.0812 0.2790 0.1226 35 0.138 0.76798.00 30 220 11227.00 30 220 220 220 220 220 220 220 220 220 2</pre>	8	 -1.837011 0.0331	-0.729574 0.2328	-1.156479 0.1237	0.067955 0.4729	-0.344334 0.3653	-0.839400 0.2006
<pre>10 -1.569049 -0.565228 -0.933516 0.147834 -0.220464 -0.673484 0.0583 0.2860 0.1753 0.4412 0.4128 0.2503 11 -0.735847 1.079976 0.536170 2.586049 1.743757 0.74825 0.2309 0.1401 0.2959 0.0049 0.0406 0.2272 Now Mean 7 8 9 10 8 0.834645 0.2020 9 1.008073 0.355517 1 0.1567 0.3611 10 0.839834 0.069777 -0.282811 0.2005 0.4722 0.3887 11 2.782937 1.396782 0.585780 1.162216 0.0027 0.0812 0.2790 0.1226 Nupha = 0.05 Neject Ho if p = P(Z <= z) <= alpha/2 dunntest iq7, by(iincome) Narning: by() values are unlabeled, option nolabel implicit Cruskal-Wallis equality-of-populations rank test +</pre>	9	 -0.928093 0.1767	-0.109172 0.4565	-0.384708 0.3502	0.461416 0.3223	0.166563 0.4339	-0.210799 0.4165
<pre>11 -0.735847 1.079976 0.536170 2.586049 1.743757 0.748257 0.2309 0.1401 0.2959 0.0049 0.0406 0.2272 Not Mean 7 8 9 10 8 0.833645 0.2020 9 1.008073 0.355517 0.1567 0.3611 10 0.839834 0.069777 -0.282811 0.2005 0.4722 0.3887 11 2.782937 1.396782 0.585780 1.162216 0.0027 0.0812 0.2790 0.1226 Nlpha = 0.05 Weject Ho if p = P(Z <= z) <= alpha/2 dunntest iq7, by(iincome) Narning: by() values are unlabeled, option nolabel implicit truskal-Wallis equality-of-populations rank test +</pre>	10	 -1.569049 0.0583	-0.565228	-0.933516	0.147834 0.4412	-0.220464 0.4128	-0.673484 0.2503
<pre>Col Mean- Kow Mean 7 8 9 10 8 0.834645</pre>	11	 -0.735847 0.2309	1.079976 0.1401	0.536170 0.2959	2.586049 <mark>0.0049</mark>	1.743757 0.0406	0.748257 0.2272
<pre>8 0.834645 0.2020 9 1.008073 0.355517 0.1567 0.3611 10 0.839834 0.069777 -0.282811 0.2005 0.4722 0.3887 11 2.782937 1.396782 0.585780 1.162216 0.0027 0.0812 0.2790 0.1226 alpha = 0.05 beject Ho if p = P(Z <= z) <= alpha/2 dunntest iq7, by(iincome) Narning: by() values are unlabeled, option nolabel implicit cruskal-Wallis equality-of-populations rank test +</pre>	ol Mean- ow Mean	- 7	8	9	10		
<pre>9 1.008073 0.355517 0.1567 0.3611 10 0.839834 0.069777 -0.282811 0.2005 0.4722 0.3887 11 2.782937 1.396782 0.585780 1.162216 0.0027 0.0812 0.2790 0.1226 alpha = 0.05 Weject Ho if p = P(Z <= z) <= alpha/2 dunntest iq7, by(iincome) Narning: by() values are unlabeled, option nolabel implicit Cruskal-Wallis equality-of-populations rank test +</pre>	8	0.834645 0.2020		(
<pre>10 0.839834 0.069777 -0.282811 0.2005 0.4722 0.3887 11 2.782937 1.396782 0.585780 1.162216 0.0027 0.0812 0.2790 0.1226 alpha = 0.05 Reject Ho if p = P(Z <= z) <= alpha/2 dunntest iq7, by(iincome) Warning: by() values are unlabeled, option nolabel implicit (ruskal-Wallis equality-of-populations rank test ++ iincome Obs Rank Sum + 1 85 40655.00 2 124 63730.00 3 220 112270.00 4 194 105789.00 5 138 76798.00 6 81 41235.00 7 45 24842.00 8 29 18999.00 </pre>	9	 1.008073 0.1567	0.355517 0.3611				
<pre>11 2.782937 1.396782 0.585780 1.162216 0.0027 0.0812 0.2790 0.1226 alpha = 0.05 Reject Ho if p = P(Z <= z) <= alpha/2 dunntest iq7, by(iincome) Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test +</pre>	10	 0.839834 0.2005	0.069777 0.4722	-0.282811 0.3887			
<pre>Alpha = 0.05 Reject Ho if p = P(Z <= z) <= alpha/2 dunntest iq7, by(iincome) Marning: by() values are unlabeled, option nolabel implicit Gruskal-Wallis equality-of-populations rank test +</pre>	11	 2.782937 <mark>0.0027</mark>	1.396782 0.0812	0.585780	1.162216		
<pre>truskal-Wallis equality-of-populations rank test ++ iincome Obs Rank Sum ++</pre>	.pha = ≥ject Ho dunntest arning: k	0.05 if p = P(Z <= st iq7, by(iind by() values a:	= z) <= a come) re unlabele	llpha/2 ed, option n	olabel impl	icit	
<pre>++ iincome Obs Rank Sum ++</pre>	ruskal-Wa	Vallis equality	y-of-popula	tions rank	test		
1 85 40655.00 2 124 63730.00 3 220 112270.00 4 194 105789.00 5 138 76798.00	+	ome Obs Ra	+ ank Sum				
 6 81 41235.00 7 45 24842.00 8 29 18999.00		1 85 40 2 124 63 3 220 113 4 194 109 5 138 7	0655.00 3730.00 2270.00 5789.00 6798.00				
	 	6 81 42 7 45 2 8 29 1	 1235.00 4842.00 8999.00				
9 13 6325.00 10 22 13773.00 	 1 	3 13 1 10 22 1	3773.00 3773.00 				
11 110 03302.00 ++	+	(TTO (0.	+				
chi-squared = 14.459 with 10 d.f. probability = 0.1531	ni-square robabilit	red = 14.459 ity = 0.153	9 with 10 d 31	l.f.			
chi-squared with ties = 17.779 with 10 d.f. probability = <mark>0.0588</mark>	ii-square cobabilit	red with ties = ity = 0.05;	= 17.779 <mark>88</mark>) with 10 d.	f.		

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o⊥ Mean- ow Mean		1	2	.3	4	5
2	-0.9111	185				
	0.10	011				
3	-0.9023	310 0.1164	31			
	0.18	834 0.45	37			
4	-1 8531	772 -0 9812	48 -1 278245			
	0.03	319 0.16	32 0.1006			
5	-2.0411	196 -1.2375	57 -1.530584	-0.362009		
	0.02	206 0.10	19 0.0629	0.3587		
6	-0.7133	304 0.1228	53 0.034446	0.985495	1.219413	
	0.23	378 0.45	11 0.4863	0.1622	0.1113	
7	-1.4395	516 -0.7876	36 -0.917725	-0.146588	0.093548	-0.831651
	0.0	750 0.21	55 0.1794	0.4417	0.4627	0.2028
_	o			1 00511	1 808.11	0 400005
8	-2.9590	064 -2.4630		-1.985144	-1.737404	-2.428826
	0.00	0.00	0.0042	0.0230	0.0412	0.0070
9	-1.9585	548 -1.5605	99 -1.639754	-1.194228	-1.040342	-1.581461
	0.02	251 0.05	93 0.0505	0.1162	0.1491	0.0569
10	-2.2226	639 -1.7435	56 -1.862341	-1.291486	-1.089991	-1.750747
	0.01	131 0.04	06 0.0313	0.0983	0.1379	0.0400
	1 710/	0.0.7 0.0000	22 1 10/010	0 000007	0 000755	0 000000
11	-1./120	u∠i −u.8990 434 0.18	43 0,1301	-0.028207	0.293/55	-u.923223 0.1779
ol Mean-	0.01			0.1007	0.0010	0.1770
ow Mean		7	8	9	10)
8	-1.5578	863				
l	0.05	596				
	1 0001					
9	-1.0095	557 U.1590 564 0.43	54 68			
i						
10	-1.0235	591 0.3702	67 0.147496			
	0.15	530 0.35	56 0.4414			
11	0.1192	255 1.8877	10 1.158465	1.235174		
I	0.45	525 0.02	95 0.1233	0.1084		
loho -	0.05					
eiect Ho	if p = P	(Z <= z) <	= alpha/2			
2	-		1			
الم م الم مر الم		(;;;,,,,,,)				
aunniesi	. τάς, αλ	(IIIncome)				
arning: k	oy() value	es are unlab	eled, option m	nolabel impl	icit	
-				-		
กมระว่า-พา	llie emi	ality-of-pop	ulations rank	test		
- active - WC	cquc	or bob	actono tank			
			+			
+	ie Ubs	। капк Sum +	1			
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+ iincon 	1 85 2 124 3 220 4 194 5 138 6 81	44396.00 67446.50 114674.50 109552.50 77545.00 + 39286.00				
+ iincom 	1 85 2 124 3 220 4 194 5 138 6 81 7 45 8 20	44396.00 67446.50 114674.50 109552.50 77545.00 +				
+ iincom 	1 85 2 124 3 220 4 194 5 138 6 81 7 45 8 29 9 13	44396.00 67446.50 114674.50 109552.50 77545.00 77545.00 27072.00 11459.50 7777.00				
+ iincon 	1 85 2 124 3 220 4 194 5 138 6 81 7 45 8 29 9 13 .0 22	44398.00 67446.50 114674.50 109552.50 77545.00 + 39286.00 27072.00 11459.50 7777.00 11179.00				
+	1 85 2 124 3 220 4 194 5 138 6 81 7 45 8 29 9 13 0 22	44398.00 67446.50 114674.50 109552.50 77545.00 39286.00 27072.00 11459.50 7777.00 11179.00				

15.098 with 10 d.f. For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml chi-squared =

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	Dunn's	s Pairwise C	Comparison o	f iq8 by ii	ncome		
Col Mean- Row Mean		1	2	3	4	ł	5
2	-0.523795 0.3002						
3	 0.028930 0.4885	0.689738 0.2452					
4	 -1.112733 0.1329	-0.617347 0.2685	-1.507100 0.0659				
5	-0.980783 0.1633	-0.496797 0.3097	-1.279359 0.1004	0.085372 0.4660			
6	0.820893 0.2059	1.408492 0.0795	0.952324 0.1705	2.057639 0.0198	1.876777 0.0303		
7	-1.468715 0.0710	-1.132022 0.1288	-1.677545 0.0467	-0.761682 0.2231	-0.789533 0.2149	-2.141891 0.0161	
8	2.019931 0.0217	2.463517 0.0069	2.180125 0.0146	2.908858	2.788476 0.0026	1.418337 0.0780	
9	-0.870561 0.1920	-0.636301 0.2623	-0.921258 0.1785	-0.399729 0.3447	-0.427500 0.3345	-1.294341 0.0978	
10	0.202668 0.4197	0.528388 0.2986	0.200283 0.4206	0.858878 0.1952	0.800248 0.2118	-0.328534 0.3713	
11	0.247939 0.4021	0.845071 0.1990	0.276314 0.3912	1.534811 0.0624	1.354597 0.0878	-0.635813 0.2624	
Col Mean- Row Mean	 +	7	8	9	10)	
8	2.961248 0.0015						
9	0.036549	-2.078189 0.0188					
10	1.227169 0.1099	-1.364937 0.0861	0.879687 0.1895				
11	1.743327 0.0406	-1.921793 0.0273	1.007449 0.1569	-0.056245 0.4776			
alpha = Reject Hc	0.05 if p = P(Z <	<= z) <= a	lpha/2				
		ncome)					
. dunntes	t iq9, by(iir						
. dunntes Warning:	t iq9, by(iir by() values a	are unlabele	ed, option n	olabel impl	icit		
. dunntes Warning: Kruskal-W	t iq9, by(iir by() values a Allis equalit	are unlabele	ed, option n utions rank	olabel impl test	icit		
. dunntes Warning: Kruskal-W + iinco	t iq9, by(iir by() values a allis equalit 	are unlabele cy-of-popula + Rank Sum	ed, option n tions rank	olabel impl test	icit		
. dunntes Warning: Kruskal-W + iinco 	t iq9, by(iir by() values a allis equalit me Obs F 1 85 4	are unlabele cy-of-popula + Rank Sum 12614.00	ed, option n tions rank	olabel impl test	licit		
. dunntes Warning: Kruskal-W + iinco 	t iq9, by(iir by() values a allis equalit 	are unlabele cy-of-popula + Rank Sum 12614.00 71402.00	ed, option n utions rank	olabel impl	licit		
. dunntes Warning: Kruskal-W + iinco 	t iq9, by(iir by() values a allis equalit 	are unlabele + Rank Sum 12614.00 71402.00 15021.00 07204.00	ed, option n	olabel impl	icit		
. dunntes Warning: Kruskal-W + iinco 	t iq9, by(iir by() values a allis equalit 	are unlabele + Rank Sum 12614.00 71402.00 15021.00 07204.00 73164.00	ed, option n	olabel impl	icit		
. dunntes Warning: Kruskal-W + iinco 	t iq9, by(iir by() values a allis equalit 	are unlabele + Rank Sum 42614.00 71402.00 5021.00 7204.00 73164.00 36234.00	ed, option n	olabel impl	licit		
. dunntes Warning: Kruskal-W + iinco 	t iq9, by(iir by() values a allis equalit 	are unlabele + Rank Sum 	ed, option n	olabel impl	icit		

	Dunn's	Pairwise ((No	Comparison c adjustment	of iq9 by ii :)	ncome		
Col Mean- Row Mean	 	1	2	3	4		5
2	-1.847551 0.0323						
3	-0.587541 0.2784	1.648615 0.0496					
4	-1.376451 0.0843	0.705584 0.2402	-1.056011 0.1455				
5	-0.730439 0.2326	1.288633 0.0988	-0.236466 0.4065	0.703374 0.2409			
6	1.214944 0.1122	3.141555 0.0008	2.028888 0.0212	2.779463	2.067305 0.0194		
7	-1.360262 0.0869	0.053977 0.4785	-1.074127 0.1414	-0.433524 0.3323	-0.874138 0.1910	-2.363446 0.0091	
8	-1.939659 0.0262	-0.760958 0.2233	-1.731626 0.0417	-1.195867 0.1159	-1.548947 0.0607	-2.799362 0.0026	
9	0.350465 0.3630 	1.250438 0.1056	0.628553 0.2648	0.989247 0.1613	0.706893 0.2398	-0.282083 0.3889	
10	-0.739751 0.2297	0.359696 0.3595	-0.455786 0.3243	0.009284 0.4963	-0.332100 0.3699	-1.520705 0.0642	
11 Col Mean-	-0.826199 0.2043 	1.100886 0.1355	-0.374111 0.3542	0.520401 0.3014	-0.136936 0.4455	-2.117528 0.0171	
Row Mean	 +	7	8	9	10		
8	-0.698600 0.2424						
9	1.127888 0.1297	1.562424 0.0591					
10	0.283759 0.3883	0.849481 0.1978	-0.804181 0.2106				
11	0.756224 0.2248	1.440971 0.0748	-0.760168 0.2236	0.253676 0.3999			
alpha = Reject Ho	0.05 if p = P(Z <	= z) <= a	alpha/2				
. dunntes	t iq10, bv(ii	ncome)					
Warning:	by() values a	re unlabele	ed, option r	nolabel impl	icit		

chi-square probabilit	ed = 8.75 cy = 0.55	54 with 10 d	.f.						
chi-square probabilit	ed with ties cy = <mark>0.10</mark>	= 15.902	with 10 d.	f.					
	Dunn's	Pairwise Co (No	mparison of adjustment	iq10 by ii	income				
Col Mean- Row Mean		1	2	3	4		5	6	
2	-1.510986 0.0654								
3	-1.740758 0.0409	-0.084983 0.4661							
4	-2.349653 0.0094	-0.807641 0.2096	-0.845934 0.1988						
5	-2.428329 0.0076	-0.986350 0.1620	-1.036053 0.1501	-0.262123 0.3966					
6 	-1.709198 0.0437	-0.368355 0.3563	-0.331484 0.3701	0.304134 0.3805	0.495983 0.3100				
 7 	-3.098024	-2.059211 0.0197	-2.132063 0.0165	-1.604670 0.0543	-1.376629 0.0843	-1.644439 0.0500			
 8 	-2.614557 0.0045	-1.694358 0.0451	-1.720791 0.0426	-1.289040 0.0987	-1.113423 0.1328	-1.371867 0.0851			
 9 	-1.674775 0.0470	-0.980992 0.1633	-0.968521 0.1664	-0.674109 0.2501	-0.565066	-0.781047 0.2174			
10 	-1.709276 0.0437	-0.847650 0.1983	-0.834294 0.2021	-0.458910 0.3231	-0.322558 0.3735	-0.596764 0.2753			
 11 	-1.524450 0.0637	-0.037823 0.4849	0.040590 0.4838	0.749543 0.2268	0.930124 0.1762	0.329695			
Col Mean- Row Mean		7	8	9	10				
8	0.037254 0.4851								
9	0.229874 0.4091	0.190278 0.4245							
10	0.623759 0.2664	0.542557 0.2937	0.256952 0.3986						
 11 	2.012741 0.0221	1.659858 0.0485	0.961094 0.1683	0.822269 0.2055					
alpha = Reject Ho	0.05 if p = P(Z <	<= z) <= a	lpha/2						

iregio	n Obs R	ank Sum				
	1 47 2 2 123 6 3 190 10 4 60 3 5 196 9	5801.50 7314.50 2363.00 0521.00 9988.50				
 +	6 74 3 7 102 5 8 77 4 9 189 10	9154.50 3159.00 0078.50 1830.50				
hi-square robabilit	d = 2.16 y = 0.97	3 with 8 d. 56	f.			
hi-square brobabilit	d with ties y = <mark>0.88</mark>	= 3.726 09	5 with 8 d.f	·		
	Dunn's	Pairwise C (No	Comparison c adjustment	of iq1 by in .)	region	
ol Mean- .ow Mean	1	2	3	4	5	6
2	0.042474 0.4831					
3 	0.269342 0.3938	0.316211 0.3759				
4	0.888316 0.1872	1.052593 0.1463	0.872168 0.1916	0.0405.64		
5 	0.1523	0.0828	0.1137	-0.042564	0 507100	
0 7	0.437191 0.3238	0.2980	0.3813	-0.305166	-0.387744	0 223575
8	0.2491	0.2012	0.2692	-0.294747	0.3491	0.4115
9	0.2544	0.2144	0.2808	0.3841 -0.872573	0.3704 -1.206703	0.4101
 ol Mean- 	0.3942 7	0.3765 8	0.4994	0.1914	0.1138	0.3810
++ 8 !	0.018968 0.4924					
9 	-0.615972 0.2690	-0.580954 0.2806				
lpha = .eject Ho dunntest	0.05 if p = P(Z < iq2, by(ire	= z) <= a gion)	lpha/2			
Marning: b	y() values a	re unlabele	ed, option n	olabel impl	icit	
ruskal-Wa	llis equalit	y-of-popula	tions rank	test		
iregio	n Obs R	ank Sum				

	4 60	3101	2.00					
	5 196	10060	9.50					
	6 74 7 102	5488	5.00 1.50					
	8 77 9 189	4428 9961	3.00 4.50					
+			+	-				
chi-squan probabili	red = .ty =	4.999 w. 0.7577	ith 8 d.	f.				
chi-squar	ed with t	ies =	7.247	with 8 d.:	E.			
probabili	.ty =	0.5102						
	Du	inn's Pa	irwise (Comparison o	of iq2 by ir	egion		
Col Mean-	•		(NC	adjustment		_	ć	
Row Mean	1 +		2	3	4	5	6	
2	-1.401 0.0	.196)806						
3	 -0.673	3408 1	.128301					
	0.2	2503	0.1296					
4	-0.333	3024 1 3696	.113944	0.302762				
5	 _0 313	3209 1	646623	0 577895	0 094889			
0	0.3	3771	0.0498	0.2817	0.4622			
6	0.044	227 1	.689339	0.860804	0.420891	0.433300		
7		EDE 0	0.0430	0.1947	0.5309	0.3324	1 005504	
/	0.2	2000	0.2462	0.3764	0.3039	0.2123	0.1525	
8	-1.590)200 -0	.372086	-1.366818	-1.332635	-1.810343	-1.858851	
	0.0)559	0.3549	0.0858	0.0913	0.0351	0.0315	
9	-0.644 0.2	1434 1 2596	.167399 0.1215	0.045410 0.4819	-0.271087 0.3932	-0.531360 0.2976	-0.826147 0.2044	
Col Mean- Row Mean	· 7	1	8					
8	+ -0.967	7067						
	0.1 	668						
9	0.352 0.3	2577 1 8622	.400283 0.0807					
alpha =	0.05							
Reject Ho	o if p = P	P(Z <=	z) <= a	lpha/2				
dunntes	st iq3, by	/(iregio	n)					
Varning:	by() valu	les are :	unlabele	ed, option ,	nolabel impl	icit		
, C	<u> </u>			· <u> </u>	1			
Kruskal-W	Mallis equ	ality-o	f-popula	tions rank	test			
+	on I Ohe	Rank	+ Sum					
	+	-+	 3 50 1					
	2 123	6857	1.50					
	4 60	2928	2.00					
	5 196 +	+	6.UU 					
	· · · · ·		o o = ·					
 	6 74 7 102	3698 5180	8.00 7.00					

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chi-square probabilit	d with ties = y = 0.322	9.241	with 8 d.f			
	Dunn's	Pairwise C (Nc	comparison c adiustment	of iq3 by ir	region	
Col Mean- Row Mean	1	2	3	4	5	6
2	-0.861221 0.1946					
3	-0.571695 0.2838	0.471363 0.3187				
4	0.850479 0.1975	1.989908 0.0233	1.747619 0.0403			
 5 	0.254530 0.3995	1.643252 0.0502	1.320843	-0.842644 0.1997		
 6 	0.602672 0.2734	1.767949 0.0385	1.500029 0.0668	-0.306543 0.3796	0.520904 0.3012	
 7 	0.431017 0.3332	1.670219 0.0474	1.377797 0.0841	-0.551195 0.2908	0.283785 0.3883	-0.238533 0.4057
 8 	-0.682835 0.2474	0.146504 0.4418	-0.246206 0.4028	-1.696032	-1.247144 0.1062	-1.466964 0.0712
 9 	-0.362407 0.3585	0.764912 0.2222	0.331578 0.3701	-1.516629 0.0647	-0.984934 0.1623	-1.250510 0.1056
Col Mean- Row Mean	7	8				
8	-1.340578 0.0900					
 9 	-1.099269 0.1358	0.497979 0.3092				
alpha = Reject Ho	0.05 if p = P(Z <=	= z) <= a	lpha/2			
•			-			
Warning: b	oy() values an	re unlabele	d, option r	olabel impl	icit	
Kruskal-Wa	llis equality	-of-popula	tions rank	test		
+	n Obs Rar	+ ik Sum				
	1 47 238	 98.00				
	2 123 703 3 190 998	871.00 803.00				
I	4 60 295	74.00 27.50				
	6 74 396	 668.00				
Ì	7 102 560	00.00				
 +	9 189 984	82.00				
chi-square probabilit	d = 5.937 y = 0.654	/ with 8 d. 3	f.			
chi-square	d with ties =	7.884	with 8 d.f			

Col Mean- Row Mean	1	2	3	4	5	6
2	-1.399868	 } }				
3	-0.389159 0.3486	1.526466 0.0634				
4	0.301407	1.897289 0.0289	0.824575 0.2048			
5	0.039361 0.4843	2.142444 0.0161	0.685502 0.2465	-0.354599 0.3614		
6	-0.557758	0.924573 0.1776	-0.296550 0.3834	-0.936798 0.1744	-0.809347 0.2092	
7	-0.867458 0.1928	0.650583 0.2577	-0.729396 0.2329	-1.300823 0.0967	-1.304961 0.0960	-0.320211 0.3744
8	-1.041294 0.1489	0.325541 0.3724	-0.957487 0.1692	-1.460253 0.0721	-1.480649 0.0694	-0.544963 0.2929
9 ol Mean-	-0.291544 0.3853	1.661935 0.0483	0.154551 0.4386	-0.716903 0.2367	-0.528838 0.2985	0.412115 0.3401
ow Mean	7	8				
8	-0.263754 0.3960	 [)				
9	0.857955 0.1955	5 1.074198 0.1414				
lpha = eject Ho dunntest farning: k	0.05 if p = P(Z iq5, by(ir by() values	<= z) <= a region) are unlabele	alpha/2 ed, option r	nolabel impl	icit	
lpha = weject Ho dunntest Warning: k ruskal-Wa	0.05 if p = P(Z iq5, by(ir by() values allis equali	<= z) <= a region) are unlabele ty-of-popula	alpha/2 ed, option r ations rank	nolabel impl test	icit	
Alpha = Reject Ho dunntest Warning: k Cruskal-Wa + iregio	0.05 if p = P(Z iq5, by(ir oy() values allis equali	<= z) <= a region) are unlabele ty-of-popula cank Sum	alpha/2 ed, option r ations rank	nolabel impl test	icit	
<pre>Alpha = Alpha = A</pre>	0.05 if p = P(Z iq5, by(ir by() values allis equali on Obs F ++- 1 47 2	<= z) <= a region) are unlabele ty-of-popula 	alpha/2 ed, option r ations rank	nolabel impl test	icit	
Alpha = Reject Ho dunntest Warning: k Kruskal-Wa + iregio 	0.05 if p = P(Z c iq5, by(ir by() values allis equali on Obs F 	<= z) <= a region) are unlabele .ty-of-popula + Rank Sum 	alpha/2 ed, option r ations rank	nolabel impl test	icit	
<pre>llpha = leject Ho dunntest larning: k ruskal-Wa + iregio </pre>	0.05 if p = P(Z iq5, by(ir by() values allis equali on Obs F 1 47 2 2 123 7 3 190 9 4 60 3	<= z) <= a region) are unlabele ty-of-popula 	alpha/2 ed, option r ations rank	nolabel impl test	icit	
llpha = keject Ho dunntest Varning: k Cruskal-Wa + iregio 	0.05 if p = P(Z iq5, by(ir by() values allis equali 	<= z) <= a region) are unlabele ty-of-popula + Rank Sum 20157.00 27806.00 21315.00 29921.50 	alpha/2 ed, option r ations rank	nolabel impl test	icit	
<pre>llpha = leject Ho dunntest larning: k ruskal-Wa + iregio </pre>	0.05 if p = P(Z iq5, by(ir by() values allis equali con Obs F 1 47 2 2 123 7 3 190 9 4 60 3 5 196 9 6 74 4 7 42	<pre><= z) <= a region) are unlabele ty-of-popula</pre>	alpha/2 ed, option r	nolabel impl test	icit	
Alpha = Reject Ho dunntest Warning: k Gruskal-Wa t i iregio t i t t t t t t t t t t t t t t t	0.05 if p = P(Z iq5, by(ir by() values allis equali on Obs F 	<pre><= z) <= a region) are unlabele ty-of-popula</pre>	alpha/2 ed, option r ations rank	nolabel impl test	icit	
<pre>llpha = keject Ho dunntest Jarning: k Gruskal-Wa + iregio </pre>	0.05 if p = P(Z iq5, by(ir by() values allis equali 	<= z) <= a region) are unlabele ty-of-popula + Rank Sum 25000.00 20157.00 20157	alpha/2 ed, option r ations rank	holabel impl	icit	
Alpha = Reject Ho dunntest Warning: k Gruskal-Wa t i iregio t i i i i t i i t t t	0.05 if p = P(Z iq5, by(ir by() values allis equali on Obs F 	<pre><= z) <= a region) are unlabele ty-of-popula</pre>	alpha/2 ed, option r ations rank	nolabel impl test	icit	
<pre>lpha = .eject Ho dunntest arning: h aruskal-Wa + i iregio i</pre>	0.05 if $p = P(Z)$ iq5, by(in by() values allis equali on Obs F 1 47 2 2 123 7 3 190 9 4 60 3 5 196 9 4 60 3 5 196 9 4 60 3 5 196 9 4 60 3 5 196 9 6 74 4 7 102 5 8 77 4 9 189 9 ed = 4.3 cy = 0.8 ed with ties cy = 0.5	<pre><= z) <= a cegion) are unlabele .ty-of-popula .ty-of-popula</pre>	alpha/2 ed, option r ations rank .f. 5 with 8 d.f	nolabel impl test	icit	
Alpha = Aeject Ho dunntest Warning: k (ruskal-Wa + iregio 	0.05 if p = P(Z iq5, by(ir by() values allis equali on Obs F 1 47 2 2 123 7 3 190 9 4 60 3 5 196 9 6 74 4 7 102 5 8 77 4 9 189 9 ed = 4.3 by = 0.8 cy = 0.5 Dunn'	<pre><= z) <= a segion) are unlabele .ty-of-popula</pre>	alpha/2 ed, option r ations rank .f. 5 with 8 d.f Comparison co adjustment	nolabel impl test :. of iq5 by ir	icit	
Alpha = Aeject Ho dunntest Warning: k Gruskal-Wa t iregio t iregio t iregio t iregio t iregio t iregio t iregio t iregio t	0.05 if p = P(Z iq5, by(ir by() values allis equali 	<pre><= z) <= a region) are unlabele ty-of-popula</pre>	alpha/2 ed, option r ations rank .f. 5 with 8 d.f Comparison c b adjustment 3	nolabel impl test of iq5 by ir) 4	icit egion	6
Alpha = Reject Ho dunntest Warning: k (ruskal-Wa t iregic t iregic t iregic t iregic t t t t t t t t t t t t t t t t	0.05 if p = P(Z iq5, by(ir by() values allis equali on Obs F 1 47 2 2 123 7 3 190 9 4 60 3 5 196 9 6 74 4 7 102 5 8 77 4 9 189 9 ed = 4.3 cy = 0.8 ed with ties cy = 0.5 Dunn' 1 -0.894537 0.1855	<pre><= z) <= a region) are unlabele .ty-of-popula</pre>	alpha/2 ed, option r ations rank 5 with 8 d.f Comparison c b adjustment 3	test fiq5 by in 4	icit egion 5	6
Alpha = Reject Ho dunntest Warning: k (ruskal-Wa iregio iregio i i iregio i i i i i i i i i i i i i i i i	0.05 if p = P(Z iq5, by(ir by() values allis equali 	<pre><= z) <= a region) are unlabele ty-of-popula+ Rank Sum </pre>	alpha/2 ed, option r ations rank .f. 5 with 8 d.f Comparison c b adjustment 3	test test of iq5 by in 4	icit egion 5	6

	1							
	4	0.204685	1.227342 0.1098	-0.192492 0.4237				
	5 	0.542899 0.2936	2.100075 0.0179	0.194468 0.4229	0.327393 0.3717			
	6 	-0.610565 0.2707	0.268597 0.3941	-1.330089 0.0917	-0.885045 0.1881	-1.480943 0.0693		
	 7 	-0.075772 0.4698	1.045718 0.1478	-0.665873 0.2527	-0.327165 0.3718	-0.831627 0.2028	0.658314 0.2552	
	8 	0.033979 0.4864	1.098894 0.1359	-0.459584 0.3229	-0.195009 0.4227	-0.608833 0.2713	0.738209 0.2302	
	9 	0.184904 0.4267	1.584274 0.0566	-0.372203 0.3549	-0.065677 0.4738	-0.569284 0.2846	1.050261 0.1468	
Col N Row N	1ean- 1ean	7	8					
	++ 8 	0.130148 0.4482						
	9 	0.354032 0.3617	0.176403 0.4300					
alpha Rejec	a = ct Ho	0.05 if p = P(Z <=	z) <= a	lpha/2				
. dur	nntest	iq6, by(ireg	ion)					
Warni	ing: b	y() values ar	e unlabele	d, option r	olabel impl	icit		
Krusł	ka⊥-Wa	llis equality	-of-popula	tions rank	test			
+ i	 Lregio	n Obs Ra	+ nk Sum					
		+ 1 47 24	 290.50					
İ		2 123 67	846.50 167.00					
		4 60 31	261.00					
		5 196 103	413.00 					
		6 74 36 7 102 52	430.00 408.00					
		8 77 40	753.50 641 50					
+			+					
chi-s	square	d = 2.535	with 8 d.	f.				
proba	abilit	y = 0.960	Ţ					
chi-s proba	square abilit	d with ties = y = 0.876	3.778 <mark>6</mark>	with 8 d.f				
		Dunn's	Pairwise C	omparison c	of iq6 by ir	egion		
Col N	1ean-		(110	aujustment	.)	-	ć	
Row M	1ean +	I			4	5	6	
	2 	-0.810245 0.2089						
	3 	-0.383515 0.3507	0.660725 0.2544					
	4	-0.086090 0.4657	0.775858 0.2189	0.308663 0.3788				
	5	-0.265616 0.3953	0.832852 0.2025	0.189948 0.4247	-0.178732 0.4291			
	6 	0.525236 0.2997	1.610354 0.0537	1.170901 0.1208	0.660455 0.2545	1.034219 0.1505	to /ab aut / *	dolinesubtur
			ror peer re	view only - h	ττp://bmJope	n.pmj.com/si	te/apout/gui	aeiines.xhtm

	0 068329	1 127482	0 607136	0 177112	0 452013	-0 562680
/ 	0.4728	0.1298	0.2719	0.4297	0.3256	0.2868
8	-0.268646 0.3941	0.613941 0.2696	0.094387 0.4624	-0.191391 0.4241	-0.048979 0.4805	-0.907275 0.1821
 9 	-0.643588 0.2599	0.293845 0.3844	-0.412947 0.3398	-0.594761 0.2760	-0.605829 0.2723	-1.479401 0.0695
Col Mean- Row Mean	7	8				
8	-0.409188 0.3412					
 9 	-0.951871 0.1706	-0.408107 0.3416				
alpha = Reject Ho	0.05 if p = P(Z <	= z) <= a	lpha/2			
•	1					
. dunntest	iq7, by(ire	gion) re unlabele	d option n	olabel impl	icit	
warning. b	y() vaiues a	re unrabere		отарет тшрт	ICIC	
Kruskal-Wa	llis equalit	y-of-popula	tions rank	test		
iregio	n Obs R ++	ank Sum 				
i I	1 47 2 2 123 6	5775.50 9441.50				
	3 190 9 4 60 2	6261.50 9885.00				
 	5 196 10	4560.50				
	6 74 3	6689.50 5909 00				
	8 77 4	1935.00				
+		+				
chi-square probabilit	d = 5.00 y = 0.75	4 with 8 d. 72	f.			
chi-square	d with ties	= 6.168	with 8 d.f			
probabilit	y = 0.62	84				
	Dunn's	Pairwise C (Nc	comparison o adjustment	f iq7 by ir)	egion	
Col Mean- Row Mean	1	2	3	4	5	6
 2 	-0.342213 0.3661					
 3 	0.931783 0.1757	1.818737 0.0345				
4	0.938892	1.534078	0.209944			
 5	0.334313	0.982182	-0.957666	-0.871545		
 	0.3691	0.1630	0.1691	0.1917	1.003173	
0	1 02/020	1 698300	0.201323	0.01/0/4	±.003±/3	
	1.024920 0.1527	1.698322 0.0447	0.3869	0.4810	0.1079	
 7 	1.024920 0.1527 0.005924 0.4976	1.698322 0.0447 0.446007 0.3278	0.3869 -1.228147 0.1097	0.4810 -1.117670 0.1319	-0.436178 0.3314	-1.245082 0.1066
 	1.024920 0.1527 0.005924 0.4976 0.074683 0.4702	1.698322 0.0447 0.446007 0.3278 0.498964 0.3089	0.3869 -1.228147 0.1097 -1.021316 0.1536	0.4810 -1.117670 0.1319 -0.981768 0.1631	-0.436178 0.3314 -0.300926 0.3817	-1.245082 0.1066 -1.089410 0.1380
 	1.024920 0.1527 0.005924 0.4976 0.074683 0.4702 0.459648	1.698322 0.0447 0.446007 0.3278 0.498964 0.3089 1.153261	0.3869 -1.228147 0.1097 -1.021316 0.1536 -0.748309	0.4810 -1.117670 0.1319 -0.981768 0.1631 -0.728610 0.2221	-0.436178 0.3314 -0.300926 0.3817 0.202295	-1.245082 0.1066 -1.089410 0.1380 -0.847727

Row Mean	7 +	8					
8	0.084653 0.4663						
9	0.601297 0.2738	0.451909 0.3257					
alpha = Reject Ho	0.05 if p = P(Z <	<= z) <= a	lpha/2				
. dunntest	t iq8, by(ire	egion)					
Warning: k	oy() values a	ire unlabele	d, option n	olabel impl	icit		
Kruskal-Wa	allis equalit	y-of-popula	tions rank	test			
+ iregio	on Obs R	ank Sum					
 	1 47 2 2 123 6 3 190 9 4 60 3 5 196 10	24173.50 53543.50 99851.00 80860.50 96283.50					
 	6 74 3 7 102 5 8 77 3 9 189 10	37277.50 38555.00 38886.50 00780.00					
chi-square probabilit chi-square probabilit	ed = 4.07 ty = 0.85 ed with ties ty = 0.80	24 with 8 d. 504 = 4.516 078	f. With 8 d.f				
chi-square probabilit chi-square probabilit	ed = 4.07 ty = 0.85 ed with ties ty = 0.80 Dunn's	74 with 8 d. 004 = 4.516 778 9 Pairwise C (No	f. with 8 d.f comparison c adjustment	f iq8 by in	region		
chi-square probabilit chi-square probabilit Col Mean- Row Mean	ed = 4.07 ty = 0.85 ed with ties ty = 0.80 Dunn's	24 with 8 d. 504 = 4.516 778 9 Pairwise C (No	f. with 8 d.f comparison c adjustment 3	f iq8 by in) 4	region 5	6	_
chi-square probabilit chi-square probabilit Col Mean- Row Mean 2	ed = 4.07 ty = 0.85 ed with ties ty = 0.80 Dunn's 1 -0.045892 0.4817	24 with 8 d. 504 = 4.516 778 9 Pairwise C (No 2	f. 6 with 8 d.f Comparison c adjustment 3	f iq8 by ir) 4	region 5	6	-
chi-square probabilit chi-square probabilit Col Mean- Row Mean 2 3	ed = 4.07 ty = 0.85 ed with ties ty = 0.80 Dunn's 1 +	<pre>/4 with 8 d. 004 = 4.516 778 3 Pairwise C (No 2 -0.265506 0.3953</pre>	f. with 8 d.f comparison c adjustment 3	f iq8 by in) 4	region 5	6	<u>.</u>
chi-square probabilit chi-square probabilit Col Mean- Row Mean 2 3 4	ed = 4.07 ty = 0.85 ed with ties ty = 0.80 Dunn's 1 -0.045892 0.4817 -0.236920 0.4064 -0.000210 0.4999	<pre>24 with 8 d. 504 = 4.516 778 9 Pairwise C (No 2 -0.265506 0.3953 0.049717 0.4802</pre>	f. 5 with 8 d.f Comparison co adjustment 3 0.260358 0.3973	f iq8 by in) 4	region 5	6	
chi-square probabilit chi-square probabilit Col Mean- Row Mean 2 3 4 5	ed = 4.07 ty = 0.85 ed with ties ty = 0.80 Dunn's 1 1 1 -0.045892 0.4817 1 -0.236920 0.4064 1 -0.000210 0.4999 1 -0.592588 0.2767	<pre>24 with 8 d. 504 = 4.516 778 3 Pairwise C (No 2 -0.265506 0.3953 0.049717 0.4802 -0.768275 0.2212</pre>	f. 5 with 8 d.f 5 omparison co 6 adjustment 3 0.260358 0.3973 -0.566239 0.2856	-0.652046 0.2572	region 5	6	2
chi-square probabilit chi-square probabilit Col Mean- Row Mean 2 3 4 5 6	ed = 4.07 ty = 0.85 ed with ties ty = 0.80 Dunn's 1 1 1 -0.045892 0.4817 1 -0.236920 0.4064 1 -0.000210 0.4999 1 -0.592588 0.2767 1 0.195439 0.4225	<pre>24 with 8 d. 504 = 4.516 778 3 Pairwise C (No 2 -0.265506 0.3953 0.049717 0.4802 -0.768275 0.2212 0.301278 0.3816</pre>	f. with 8 d.f comparison co adjustment 3 0.260358 0.3973 -0.566239 0.2856 0.547699 0.2919	<pre>f iq8 by ir)</pre>	0.972587 0.1654	6	2
chi-square probabilit chi-square probabilit Col Mean- Row Mean 2 3 4 5 6 7	ed = 4.07 ty = 0.85 ed with ties ty = 0.80 Dunn's 1 1 -0.045892 0.4817 -0.236920 0.4064 -0.000210 0.4999 -0.592588 0.2767 0.195439 0.4225 -1.167548 0.1215	<pre>24 with 8 d. 504 = 4.516 78 Pairwise C (No 2 -0.265506 0.3953 0.049717 0.4802 -0.768275 0.2212 0.301278 0.3816 -1.478256 0.0697</pre>	f. with 8 d.f comparison co adjustment 3 0.260358 0.3973 -0.566239 0.2856 0.547699 0.2919 -1.362451 0.0865	-0.652046 0.2572 0.210071 0.4168 -1.264884 0.1030	0.972587 0.1654 -0.897613 0.1847	6 -1.586690 0.0563	2
chi-square probabilit chi-square probabilit Col Mean- Row Mean 2 3 4 5 6 7 8	ed = 4.07 ty = 0.85 ed with ties ty = 0.80 Dunn's 1 1 1 -0.045892 0.4817 1 -0.236920 0.4064 1 -0.000210 0.4999 1 -0.592588 0.2767 1 0.195439 0.4225 1 -1.167548 0.1215 1 0.173304 0.4312	<pre>24 with 8 d. 504 = 4.516 78 3 Pairwise C (No 2 -0.265506 0.3953 0.049717 0.4802 -0.768275 0.2212 0.301278 0.3816 -1.478256 0.0697 0.274910 0.3917</pre>	<pre>f. with 8 d.f model f. model f. model f. f. f. f. f. f. f. f. f. f. f. f. f.</pre>	<pre>-0.652046</pre>	0.972587 0.1654 -0.897613 0.1847 0.954118 0.1700	6 -1.586690 0.0563 -0.026870 0.4893	
chi-square probabilit chi-square probabilit Col Mean- Row Mean 2 3 4 5 6 7 8 8 9	ed = 4.07 ty = 0.85 ed with ties ty = 0.80 Dunn's 1 1 -0.045892 0.4817 1 -0.236920 0.4064 1 -0.236920 0.4064 1 -0.000210 0.4999 1 -0.592588 0.2767 1 0.195439 0.4225 1 -1.167548 0.1215 1 0.173304 0.4312 1 -0.399480 0.3448	<pre>24 with 8 d. 504 = 4.516 78 Pairwise C (No 2 -0.265506 0.3953 0.049717 0.4802 -0.768275 0.2212 0.301278 0.3816 -1.478256 0.0697 0.274910 0.3917 -0.494122 0.3106</pre>	<pre>f. with 8 d.f mith pre>	<pre>-0.652046 0.2572 0.210071 0.4168 -1.264884 0.1030 0.186526 0.4260 -0.439142 0.3303</pre>	0.972587 0.1654 -0.897613 0.1847 0.954118 0.1700 0.305373 0.3800	6 -1.586690 0.0563 -0.026870 0.4893 -0.740665 0.2294	
chi-square probabilit chi-square probabilit Col Mean- Row Mean 2 3 4 5 6 7 8 9 Col Mean- Row Mean	ed = 4.07 ty = 0.85 ed with ties ty = 0.80 Dunn's 1 -0.045892 0.4817 -0.236920 0.4064 -0.000210 0.4999 -0.592588 0.2767 0.195439 0.4225 -1.167548 0.1215 0.173304 0.4312 -0.399480 0.3448 7	<pre>24 with 8 d. 504 = 4.516 78 3 Pairwise C (No 2 -0.265506 0.3953 0.049717 0.4802 -0.768275 0.2212 0.301278 0.3816 -1.478256 0.0697 0.274910 0.3917 -0.494122 0.3106 8</pre>	<pre>f. with 8 d.f mith pre>	<pre>f iq8 by ir</pre>	0.972587 0.1654 -0.897613 0.1847 0.954118 0.1700 0.305373 0.3800	6 -1.586690 0.0563 -0.026870 0.4893 -0.740665 0.2294	
chi-square probabilit chi-square probabilit Col Mean- Row Mean 2 3 4 5 6 7 8 9 Col Mean- Row Mean 8	ed = 4.07 ty = 0.85 ed with ties ty = 0.80 Dunn's 1 1 -0.045892 0.4817 -0.236920 0.4064 -0.000210 0.4999 -0.592588 0.2767 0.195439 0.4225 -1.167548 0.1215 0.173304 0.4312 -0.399480 0.3448 7 1.575938 0.0575	<pre>24 with 8 d. 504 = 4.516 78 Pairwise C (No 2 -0.265506 0.3953 0.049717 0.4802 -0.768275 0.2212 0.301278 0.3816 -1.478256 0.0697 0.274910 0.3917 -0.494122 0.3106 8</pre>	<pre>f. with 8 d.f omparison c adjustment</pre>	<pre>-0.652046 0.2572 0.210071 0.4168 -1.264884 0.1030 0.186526 0.4260 -0.439142 0.3303</pre>	0.972587 0.1654 -0.897613 0.1847 0.954118 0.1700 0.305373 0.3800	6 -1.586690 0.0563 -0.026870 0.4893 -0.740665 0.2294	

Warning: b	y() values a:	re unlabele	d, option r	olabel impl	icit	
2				-		
Kruskal-Wa	llis equality	y-of-popula	tions rank	test		
+ iregio	n Obs Ra	+ ank Sum				
	$1 \mid 47 \mid 20$ $2 \mid 123 \mid 7$	2186.50				
	3 190 102 4 60 28	2587.00 8965.00				
 	5 196 99	9733.50				
	6 74 42 7 102 55 8 77 4	2108.50 5248.00 2429 00				
' +	9 189 9	6276.50				
chi-square	d = 13.49	7 with 8 d.	f.			
probabilit	y = 0.095	58				
probabilit	y = 0.04	= 15.870 <mark>73</mark>	with 8 d.1	Ó		
	Dunn's	Pairwise C	comparison c	of iq9 by in	egion	
Col Mean-		(Nc	adjustment	.)		
Row Mean +	1	2	3	4	5	6
2 	-3.021718 0.0013					
3	-2.164465 <mark>0.0152</mark>	1.430595 0.0763				
4	-0.775061	2.331881	1.361625			
 5	-1.496111	2.392263	1.076742	-0.623663		
	0.0673	0.0084	0.1408	0.2664		
6	-2.440672 <mark>0.0073</mark>	0.427811 0.3344	-0.748920 0.2270	-1.751408 0.0399	-1.555611 0.0599	
7	-2.034428	1.191120	-0.049282	-1.276529	-0.947432	0.632439
	-2.116297	0.870093	-0.289594	-1.398130	-1.105946	0.390079
0	0.0172	0.1921	0.3861	0.0810	0.1344	0.3482
	-1.502790 0.0664	2.358466 <mark>0.0092</mark>	1.048006 0.1473	-0.634183 0.2630	-0.019200 0.4923	1.533501 0.0626
0 9 20] Moan-		0				
0 9 Col Mean- Row Mean	7	×				
o 9 Col Mean- Row Mean + 8	7 -0.219074 0.4133	8 				
o 9 201 Mean Row Mean 8 9 9	7 -0.219074 0.4133 0.925552 0.1773	1.085736 0.1388				
0 9 201 Mean- 200 Mean 300 Mean 8 9 9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	7 -0.219074 0.4133 0.925552 0.1773 0.05 if p = P(Z <=	8 1.085736 0.1388 = z) <= a	lpha/2			
Kruskal-Wallis equality-of-populations rank test

+			+							
ire <u>c</u> 	gion +	Obs 1	Rank Sum 							
	1	47 2	24342.50 68159 50							
I	3	190 10	03335.00							
	4 5	60 2 196 10	29614.00 00986.00							
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į	7	102 5	54254.00							
	8 9	189 10	40915.50 02381.50							
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chi-squa	ared =	= 4.12	23 with 8 d.	f.						
probabil										
chi-squa probabil	ared w Lity =	e <mark>0.4</mark>	= 7.555 781	with 8 d.f	•					
		- ·								
		Dunn's	Pairwise Co (No	omparison of adjustment))	region				
Col Mear Row Mear	1- 1	1	2	3	4	5	6			
2	+ 2 -	0.935595								
		0.1747								
(7)	3 -	-0.705458	0.393271							
		0.2403	0.54/1	1 = 0 / = = /						
4	± 	0.2898 0.2898	1.704126 0.0442	1.504759 0.0662						
ŗ	 5	0.073394	1.498376	1.245921	-0.650586					
		0.4707	0.0670	0.1064	0.2577					
e	5	0.675122	1.946495	1.757676	0.103700	0.835569				
		0.2498	0.0258	0.0394	0.4587	0.2017				
7	7 -	0.351199	0.735705	0.431870 0 3329	-1.043803	-0.604764	-1.230118			
		0.001760	0.2010	0.0004	0.1100	0.501461	1 1 2 2 4 2 5			
8	3 - 	-0.321760 0.3738	0.694206 0.2438	0.409844 0.3410	-0.972509 0.1654	-0.531464 0.2975	-1.139406 0.1273			
c	 -	0.646183	0.475741	0.093459	-1.439010	-1.150070	-1.686357			
Col Mar		0.2591	0.3171	0.4628	0.0751	0.1251	0.0459			
Row Mear	1 1	7	8							
 {	+ 3	0.015606								
		0.4938								
ç) -	0.353323	-0.338514							
	I	0.3019	0.30/5							
alpha = Reject F	0.0 Ho if)5 p = P(Z <	<= z) <= a	alpha/2						
-			, -	-						
• <u>Oue</u>	stion	– For eac	h of the que	stions 1-10	are there d	ifferences in	the average	resnonse	among the	e devices u
- Que	30011	i ui eau	n or the que	500115, 1-10,	are there u		i the avel dg	e response	among tilt	
. dunnte	est ic	1, bv(ide	evice) ma(bł	n) wrap						
	- hu	valuos -	are unlabolo	- d ontion n	olabel imri	icit				
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Warning:										
Warning: Kruskal-	-Walli	.s equalit	ty-of-popula	ations rank	test					

1	1 455	23538	35.00					
	2 464 4 117	24313 7249	30.00 96.00					
	5 22 6 9	1379 497	96.00 71.00					
+			+					
chi-square	ed = 1	L2.894 v	with 4 d.	f.				
probabili	-y =							
chi-square probabilit	ed with t ty =	0.0002	22.109	with 4 d.f				
	_							
_	. Du	inn's Pa	airwise C (Benj	omparison o amini-Hochb	t iql by i erg)	device		
Col Mean- Row Mean		1	2	4	5			
2	+ -0.428	 3773						
	0.4 	1176						
4	-4.193 <mark>0.0</mark>	3416 -3 <mark>)001</mark>	3.928305 0.0002					
5	 -2.136	6598 -2	2.007905	-0.136539				
-	0.0)544	0.0558	0.4457				
6	-0.441	L873 -(0.357900	0.826607	0.802829	I		
	0.1	1/01	0.4002	0.4005	0.3317			
dalse Disc Reject Ho	if n = F	ate = 2(7 <= 1	0.05 기) <= 표	'DR/2 with s	topping ru	10		
Veject IIO	т р – т	(2 <-	2) <- 1	DI(/2 WICH S	copping in	.16		
•								
. dunntest	t iq2, by	/idevio	ce) ma(bh) wrap				
. dunntest Warning: k	t iq2, by	y(idevio les are	ce) ma(bh unlabele) wrap d, option n	olabel imp	licit		
. dunntes† Warning: ł	t iq2, by by() valu	y(idevio les are	ce) ma(bh unlabele	n) wrap ed, option n	olabel imp	licit		
. dunntes† Warning: k Kruskal-Wa	t iq2, by by() valu allis equ	y(idevio les are lality-o	ce) ma(bh unlabele of-popula) wrap d, option n tions rank	olabel imp test	licit		
dunntes Warning: M Kruskal-Wa +	t iq2, by by() valu allis equ	y(idevio ues are uality-c	ce) ma(bh unlabele of-popula +	a) wrap ad, option n tions rank	olabel imp test	licit		
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. dunntest Warning: } Kruskal-Wa + idevic 	z iq2, by by() valu allis equ ce Obs 1 455 2 464	y(idevic ues are uality-c Ranh + 23873	<pre>ce) ma(bh unlabele of-popula</pre>	n) wrap	olabel imp test	licit		
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dunntest Warning: } Kruskal-Wa + idevic 	t iq2, by by() valu allis equ ce Obs 1 455 2 464 4 117 5 22	<pre>v(idevid ues are uality-c Ran + 23873 24380 6949 1304 470</pre>	ce) ma(bh unlabele of-popula csum csum ds.50 ds.00 d2.00 d4.00	a) wrap	olabel imp test	licit		
dunntest Warning: } Kruskal-Wa + idevic 	z iq2, by by() valu allis equ ce Obs 1 455 2 464 4 117 5 22 6 9	y(idevic nes are nality-c Ran 23873 24380 24380 6949 1304 470	ce) ma(bh unlabele of-popula + (31.50 31.50 33.00 07.50 12.00 04.00 +	n) wrap	olabel imp test	licit		
dunntest Warning: P Kruskal-Wa + idevic 	c iq2, by py() valu allis equ ce Obs 1 455 2 464 4 117 5 22 6 9 	<pre>(idevic ues are uality-c Ranh + 23873 24380 6949 1304 470 6.023 w</pre>	<pre>ce) ma(bh unlabele of-popula c Sum c Sum c Sum d 1.50 03.00 07.50 12.00 04.00 c+ vith 4 d.</pre>) wrap d, option n tions rank f.	olabel imp test	licit		
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. dunntest Warning: H Kruskal-Wa + idevid 	t iq2, by by() valu allis equ ce Obs 1 455 2 464 4 117 5 22 6 9 ced = cy = ed with t	<pre>v(idevid ues are uality-c Ran 23873 24380 6949 1304 470 </pre>	<pre>ce) ma(bh unlabele of-popula c Sum </pre>	<pre>d) wrap d, option n tions rank f. with 4 d.f</pre>	olabel imp test	licit		
dunntest Varning: A Kruskal-Wa idevic idevic 	<pre>z iq2, by py() valu allis equ ce Obs 1 455 2 464 4 117 5 22 6 9 ced = cy = ed = cy = ed with t cy =</pre>	<pre>v(idevid ues are uality-c Ranh + 23873 24380 6949 1304 470 0.1975 cies = 0.0695</pre>	ce) ma(bh unlabele of-popula c Sum c Sum d.50 31.50 31.50 32.00 42.00 42.00 04.00 vith 4 d. 8.683	d, option notions rank f.	olabel imp test	licit		
dunntest Warning: H Kruskal-Wa + idevic 	<pre>c iq2, by oy() valu allis equ ce Obs 2 464 4 117 5 22 6 9 ed = cy = ed with t cy =</pre>	<pre>(idevic ues are uality-c Ran 23873 24380 6949 1304 470 0.1975 cies = 0.0695</pre>	<pre>ce) ma(bh unlabele of-popula c Sum </pre>	<pre>d) wrap d, option n tions rank f. with 4 d.f</pre>	olabel imp test	device		
. dunntest Warning: H Kruskal-Wa idevic idevic 	t iq2, by by() valu allis equ ce Obs 1 455 2 464 4 117 5 22 6 9 ced = ty = ed with t ty = Du	<pre>v(idevia ues are uality-c Ran 23873 24380 6949 1304 470 0.1975 cies = 0.0695 unn's Pa</pre>	<pre>ce) ma(bh unlabele of-popula c+ c Sum 31.50 32.00 37.50 42.00 42.00 + vith 4 d. 8.683 airwise C (Benj</pre>	<pre>c) wrap cd, option n ctions rank f. f. comparison o amini-Hochb</pre>	olabel imp test f iq2 by i erg)	device		
dunntest Varning: k Kruskal-Wa + idevic chi-square probabilit chi-square probabilit	<pre>z iq2, by oy() valu allis equ ce Obs +</pre>	<pre>v(idevia ues are uality-c Ranl 23873 24380 6949 1304 470 0.1975 cies = 0.0695 unn's Pa 1</pre>	<pre>ce) ma(bh unlabele of-popula c Sum </pre>	<pre>d, option n d, option n tions rank f. f. with 4 d.f comparison o amini-Hochb 4</pre>	olabel imp test f iq2 by i erg) 5	device		
. dunntest Warning: H Kruskal-Wa idevid idevid 	<pre>c iq2, by py() valu allis equ ce Obs 1 455 2 464 4 117 5 22 6 9 ed = cy = ed with t cy = Du</pre>	<pre>y(idevic ues are uality-c Ran + 23873 24380 6949 1304 470 6.023 T 0.1975 ties = 0.0695 unn's Pa 1 1</pre>	<pre>ce) ma(bh unlabele of-popula content c Sum content c Su</pre>	d, option n d, option n tions rank f. with 4 d.f Comparison o amini-Hochb	olabel imp test f iq2 by i erg) 5	device		
. dunntest Warning: H Kruskal-Wa idevic idevic 	<pre>c iq2, by py() valu allis equ ce Obs 1 455 2 464 4 117 5 22 6 9 cd = cy = cy = cy = cy = cy = cy = cy = cy</pre>	<pre>v(idevia ues are uality-c Ran 23873 24380 304 470 0.1975 cies = 0.0695 unn's Pa 1 4463 5890</pre>	<pre>ce) ma(bh unlabele of-popula c Sum </pre>	f. comparison o amini-Hochb	olabel imp test f iq2 by i erg) 5	device		
. dunntest Warning: H Kruskal-Wa idevid idevid 	<pre>c iq2, by py() valu allis equ ce Obs ce Obs 2 464 4 117 5 22 6 9 cd = cy = cd with t cy = Du l </pre>	<pre>y(idevic ues are uality-c Ranl + 23873 24380 6949 1304 470 </pre>	<pre>ce) ma(bh unlabele of-popula c Sum </pre>	d) wrap d, option n tions rank f. with 4 d.f comparison o amini-Hochb 4	olabel imp test f iq2 by i erg) 5	device		
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dunntest Warning: H Kruskal-Wa + idevid 	<pre>z iq2, by py() valu allis equ ce Obs </pre>	<pre>y(idevia ues are uality-c Ranl + 23873 24380 6949 1304 470 </pre>	<pre>ce) ma(bh unlabele of-popula content con</pre>	<pre>d, option n d, option n tions rank f. f. with 4 d.f comparison o amini-Hochb 4 0.019744</pre>	olabel imp test f iq2 by i erg) 5	device		
. dunntest Warning: H Kruskal-Wa + idevid 	<pre>t iq2, by py() valu allis equ ce Obs 1 455 2 464 4 117 5 22 6 9 ced = cy = ced with t cy = Du -0.044 0.6 -2.605 0.0 -1.216 0.3</pre>	<pre>v(idevia ues are uality-c Ran + 23873 24380 1304 470 6.023 v 0.1975 ties = 0.0695 unn's Pa 1 4463 5890 5346 -2 0459 5133 -1 3732</pre>	<pre>ce) ma(bh unlabele of-popula c+ c Sum 31.50 32.00 97.50 12.00 97.50 12.00 04.00 + with 4 d.</pre>	<pre>c) wrap cd, option n ctions rank f. f. comparison o amini-Hochb 4 0.019744 0.4921</pre>	olabel imp test f iq2 by i erg) 5	device		
. dunntest Warning: H Kruskal-Wa + idevic 	<pre>c iq2, by py() valu allis equ ce Obs 1 455 2 464 4 117 5 22 6 9 ed = cy = ed with t cy = Du -0.044 -2.605 0.023 0.023</pre>	<pre>v(idevia ues are uality-c l Ranl l 23873 l 24380 l 6949 l 1304 l 470 c.023 v 0.1975 cies = 0.0695 unn's Pa 1 </pre>	<pre>ce) ma(bh unlabele of-popula c Sum </pre>	<pre>d, option n d, option n tions rank f. f. with 4 d.f comparison o amini-Hochb 4 0.019744 0.4921 0.803447</pre>	olabel imp test f iq2 by i erg) 5 0.690797	device		

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Page 137 of 153
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Reject Ho if $p = P(Z \le |z|) \le FDR/2$ with stopping rule 1 2 . dunntest iq3, by(idevice) ma(bh) wrap 3 4 Warning: by() values are unlabeled, option nolabel implicit 5 6 Kruskal-Wallis equality-of-populations rank test 7 +-----+ 8 | idevice | Obs | Rank Sum | 9 -----| 10 1 | 455 | 231099.50 | 2 | 464 | 249881.00 | 11 4 | 117 | 70070.00 12 5 | 22 | 13920.00 13 6 | 9 | 4807.50 ----+ 14 15 chi-squared = 10.808 with 4 d.f. probability = 0.0288 16 17 chi-squared with ties = 20.278 with 4 d.f. 18 probability = 0.0004 19 20 Dunn's Pairwise Comparison of iq3 by idevice 21 (Benjamini-Hochberg) 22 Col Mean-| 4 2 Row Mean | 1 5 23 ------24 2 | -2.063320 25 0.0489 26 -3.901314 -2.593174 4 | 27 0.0005 <mark>0.0238</mark> 28 5 | -2.541578 -1.918820 -0.647263 29 <mark>0.0184</mark> 0.0550 0.3234 30 0.831681 31 6 | -0.346709 0.057717 1.107209 0.4049 0.4770 0.2897 0.2235 32 33 False Discovery Rate = 0.05 34 Reject Ho if $p = P(Z \le |z|) \le FDR/2$ with stopping rule 35 36 . dunntest iq4, by(idevice) ma(bh) wrap 37 38 Warning: by() values are unlabeled, option nolabel implicit 39 40 Kruskal-Wallis equality-of-populations rank test 41 _____ 42 | idevice | Obs | Rank Sum | 43 |-----| 1 | 455 | 233917.50 | 44 2 | 464 | 245190.00 45 4 | 117 | 71356.50 46 5 | 22 | 13558.00 6 | 9 | 5756.00 | 47 +----+ 48 49 chi-squared = 11.767 with 4 d.f. probability = 0.0192 50 51 chi-squared with ties = 15.571 with 4 d.f. 52 probability = 0.0037 53 54 Dunn's Pairwise Comparison of iq4 by idevice 55 (Benjamini-Hochberg) 56 Col Mean-Row Mean | 1 2 4 5 57 _____ ____+ 58 2 | -0.810343 59 0.2984 For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml 60

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4
               -3.449252 -2.939310
1
             0.0028 0.0082
             2
3
               -1.747119 -1.502874 -0.102617
           5
             0.1344 0.1661
                                     0.4591
4
             5
               -1.391205 -1.232608 -0.320191 -0.219652
           6 |
6
                  0.1642 0.1814 0.4680 0.4590
7
     False Discovery Rate = 0.05
8
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
9
10
     . dunntest iq5, by(idevice) ma(bh) wrap
11
12
     Warning: by() values are unlabeled, option nolabel implicit
13
14
     Kruskal-Wallis equality-of-populations rank test
15
16
       +-----4
       | idevice | Obs | Rank Sum |
17
       |-----|
18
             1 | 455 | 233689.00 |
19
             2 | 464 | 246682.00
              4 | 117 | 72399.00 |
20
              5 | 22 | 13029.00
21
                  9 | 3979.00 |
              6 |
22
            -----+
23
     chi-squared = 12.465 with 4 d.f.
24
     probability = 0.0142
25
                             18.400 with 4 d.f.
     chi-squared with ties =
26
     probability = 0.0010
27
28
                   Dunn's Pairwise Comparison of iq5 by idevice
29
                              (Benjamini-Hochberg)
30
     Col Mean-|
31
     Row Mean |
                              2
                                       4
                                                   5
                    1
     32
           2 | -1.078030
33
                  0.2007
            34
           4 | -4.001036 -3.321473
35
                 <mark>0.0003</mark>
                          <mark>0.0022</mark>
             36
             37
                                   0.450750
               -1.420055 -1.094722
           5 |
                 0.1556
                           0.2280
                                    0.3261
38
             39
           6 |
                0.837348 1.048842
                                    2.013779
                                             1.495773
40
                  0.2236
                           0.1839
                                     0.0734
                                               0.1684
             41
     False Discovery Rate = 0.05
42
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
43
44
     . dunntest iq6, by(idevice) ma(bh) wrap
45
46
     Warning: by() values are unlabeled, option nolabel implicit
47
48
     Kruskal-Wallis equality-of-populations rank test
49
50
       | idevice | Obs | Rank Sum |
51
        _____
52
              1 | 455 | 232150.00 |
53
              2 | 464 | 249498.50
             4 | 117 | 70802.00 |
54
             5 | 22 | 12735.50 |
55
             6 | 9 | 4592.00 |
56
          -----+
57
                   9.534 with 4 d.f.
0.0491
     chi-squared =
58
     probability =
59
                          For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml
60
```

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chi-squared with ties =

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probability = 0.0068 1 2 3 Dunn's Pairwise Comparison of iq6 by idevice 4 (Benjamini-Hochberg) Col Mean-| 5 2 Row Mean | 1 4 5 6 2 | -1.648801 7 0.1653 8 9 4 | -3.623520 -2.579191 10 0.0015 0.0248 11 5 | -1.244659 -0.746660 0.447117 12 0.2666 0.3794 0.4092 13 -0.000029 0.323201 1.085795 0.686639 6 | 14 0.5000 0.4147 0.2776 0.3516 15 False Discovery Rate = 0.05 16 Reject Ho if $p = P(Z \le |z|) \le FDR/2$ with stopping rule 17 18 19 . dunntest iq7, by(idevice) ma(bh) wrap 20 Warning: by() values are unlabeled, option nolabel implicit 21 22 Kruskal-Wallis equality-of-populations rank test 23 24 +-----+ 25 | idevice | Obs | Rank Sum | |-----| 26 1 | 455 | 241171.00 | 27 2 | 464 | 241784.00 | 28 4 | 117 | 70870.00 | 5 | 22 | 12133.00 | 6 | 9 | 3820.00 | 29 30 +----+ 31 8.437 with 4 d.f. chi-squared = 32 probability = 0.0768 33 34 chi-squared with ties = 10.374 with 4 d.f. probability = 0.0346 35 36 37 Dunn's Pairwise Comparison of iq7 by idevice (Benjamini-Hochberg) 38 Col Mean-| 39 Row Mean | 1 2 4 5 -----40 2 | 0.488676 41 0.3473 42 1 43 4 | -2.627194 -2.944079 0.0215 0.0162 44 45 -0.353648 -0.501570 0.839686 5 | 46 0.3618 0.3850 0.2865 47 1.128879 1.033292 1.885785 1.155457 6 | 48 0.2589 0.2512 0.0989 0.3099 49 False Discovery Rate = 0.05 50 Reject Ho if $p = P(Z \le |z|) \le FDR/2$ with stopping rule 51 52 . dunntest iq8, by(idevice) ma(bh) wrap 53 54 Warning: by() values are unlabeled, option nolabel implicit 55 56 Kruskal-Wallis equality-of-populations rank test 57 58 +----+ 59 | idevice | Obs | Rank Sum | For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml 60

14.174 with 4 d.f.

 +	1 455 236191.50 2 464 255170.50 4 117 60562.50 5 22 13139.50 6 9 4714.00
chi-square probabilit	d = 3.571 with 4 d.f. y = 0.4671
chi-square probabilit	d with ties = 3.957 with 4 d.f. y = 0.4119
	Dunn's Pairwise Comparison of iq8 by idevice
Col Mean- Row Mean	(Benjamini-Hochberg) 1 2 4 5
+ 2 	-1.596325 0.5521
 4 	0.048571 1.066739 0.5340 0.3576
 5 	-1.222802 -0.740661 -1.170335 0.5535 0.4589 0.4031
 6 	-0.047444 0.265489 -0.060723 0.634244 0.4811 0.5647 0.5947 0.4383
False Disc Reject Ho	overy Rate = 0.05 if $p = P(Z \le Z) \le EDR/2$ with stopping rule
+	<pre>+ e Obs Rank Sum ++ 1 455 233402.00 2 464 251754.00 4 117 69053.00 5 22 11048.00 6 9 4521.00 +</pre>
chi-square probabilit	d = 6.698 with 4 d.f. y = 0.1527
chi-square probabilit	d with ties = 7.761 with 4 d.f. y = 0.1007
	Dunn's Pairwise Comparison of iq9 by idevice
Col Mean- Row Mean	Dunn's Pairwise Comparison of iq9 by idevice (Benjamini-Hochberg) 1 2 4 5
Col Mean- Row Mean + 2	Dunn's Pairwise Comparison of iq9 by idevice (Benjamini-Hochberg) 1 2 4 5
Col Mean- Row Mean 2 4	Dunn's Pairwise Comparison of iq9 by idevice (Benjamini-Hochberg) 1 2 4 5 -1.567210 0.1951 -2.602321 -1.607996 0.0463 0.2696
Col Mean- Row Mean 2 4 5	Dunn's Pairwise Comparison of iq9 by idevice (Benjamini-Hochberg) 1 2 4 5 -1.567210 0.1951 -2.602321 -1.607996 0.0463 0.2696 0.172649 0.646611 1.322982 0.5393 0.4316 0.2323
Col Mean- Row Mean 2 4 5 6	Dunn's Pairwise Comparison of iq9 by idevice (Benjamini-Hochberg) <u>1</u> <u>2</u> <u>4</u> <u>5</u> -1.567210 0.1951 -2.602321 -1.607996 0.0463 0.2696 0.172649 0.646611 1.322982 0.5393 0.4316 0.2323 0.110391 0.417646 0.887233 -0.001338 0.5067 0.4830 0.3750 0.4995

laevice	e Obs I	+ Rank Sum			
	. 455 23	 30212.00			
2	2 464 25 117 5	51454.50 70292.50			
5	5 22 1 5 9	13460.00 4359.00			
+		+	f		
probability	r = 0.02	243			
chi-squarec probability	l with ties y = <mark>0.00</mark>	= 20.35 ⁻	7 with 4 d.f		
	Dunn's	Pairwise Co (Ben	omparison of jamini-Hochb	iq10 by idevi erg)	ce
Col Mean- Row Mean	1	2	4	5	
2	-2.384264		(
 	-4.001160	-2.488534			
I I	<mark>0.0003</mark>	0.0321			
5 	-2.120896 0.0424	-1.400904 0.1152	-0.207547 0.4178		
6	0.280999	0.748461	1.472429	1.409124	
I False Disco	verv Rate =	= 0.05	0.1409	0.1323	
Reject Ho i	f p = P(Z <	<= z) <= 1	FDR/2 with s	topping rule	

•	Questi age?	on – For e	ach of t	the facto	or variab	oles (kno	owledge a	nd othe	r), are th	ere diff	erences	in the av	erage resp	onse b
	Answe except Differe	r – YES, tł ion of gro nce	iere are up 4 vs	e signific group 5	cant diffe	erences factor v	among th variable "c	ne age ca other" all	ategories I groups	s for bot differed	h factor significa	variable antly froi	s, and with n each oth	the er.
. d Kru	lunntest Iskal-Wa	iknowled llis prob	ge, by(ability	(iage) / =	<mark>0.0001</mark>									
Dun	ın's Pai	rwise Com	parison	n of ikn	owledge	by iage	e							
Col	Mean-	2		3	aujusti 1	lienc)								
	3	-3.0470	 39											
	4	-6.6478	54 -3.	.042354										
	l	0.00	00	0.0012										
	5 	-8.5405 <mark>0.00</mark>	06 -5. <mark>00</mark>	.326895 <mark>0.0000</mark>	-2.8842 <mark>0.00</mark>	203 <mark>)20</mark>								
		0.05												
alp <mark>Rei</mark>	ha = ect.Ho	0.05 if $p = P($	7 <= 17		lpha/2									
alp <mark>Rej</mark> . d Kru	ha = ect Ho lunntest skal-Wa	if p = P(iother, 1 llis prob	Z <= z py(iage ability n's Pai	2) <= a 2) 7 = 1rwise C	lpha/2 0.0001 ompariso	on of id	other by	iage						
alp <mark>Rej</mark> . d Kru Col Row 	ha = ect Ho lunntest skal-Wa . Mean- 7 Mean	if p = P(iother, 1 llis prob Dun 2	Z <= z by(iage ability n's Pai	2)) <= a 2) 2 = irwise C (No 3	lpha/2 0.0001 ompariso adjustr 4	on of id ment)	other by	iage						
alp <mark>Rej</mark> . d Kru Col Row	ha = ect Ho lunntest skal-Wa . Mean- 7 Mean + 3	0.05 if p = P(iother, 1 llis prob Dun 2 -3.6876 0.00	Z <= z by(iage ability h's Pai 58 0 <mark>1</mark>	2) <= a 2) 7 = 1rwise C (No 3 	lpha/2 0.0001 ompariso adjustr 4	on of id ment)	other by	iage						
alp Rej . d Kru Col Row	ha = ect Ho lunntest skal-Wa . Mean- 7 Mean + 3 4	<pre>iother, # iother, # llis prob Dun 2 -3.6876 0.00 -6.4094 0.00</pre>	Z <= z by(iage ability h's Pai 58 01 32 -2. 00	2) <= a 2) 7 = irwise C (No 3 .160471 0.0154	lpha/2 0.0001 ompariso adjustr 4	on of ionent)	other by	iage						
alp <mark>Rej</mark> . d Kru Col Row	ha = ect Ho lunntest skal-Wa Mean Mean 3 4 1 5 5	0.05 if p = P(iother, 1 llis prob Dun 2 -3.6876 0.00 -6.4094 0.00 -5.9958 0.00	2 <= z py(iage ability 1's Pai 32 -2. 32 -2. 32 -2. 30	z) <= a ⇒) / = irwise C (No 3 .160471 0.0154 .338749 0.0097	<pre>lpha/2 0.0001 ompariso adjustr</pre>	on of id ment) 	other by	iage						
alp Rej . d Kru Col Row 	<pre>bha = ect Ho lunntest skal-Wa . Mean- 7 Mean 3 4 4 5 5 9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</pre>	<pre>iother, i iother, i llis prob Dun 2</pre>	<pre>2 <= z by(iage bbility n's Pai 32 -2. 30 32 -2. 30 ach of t</pre>	2) <= a 2) 7 = 1rwise C (No 3 .160471 0.0154 .338749 0.0097 the factor	<pre>lpha/2 0.0001 ompariso adjustr</pre>	on of io ment) 036 156 bles (kno	other by	iage nd other	r), are th	ere diffe	erences	in the av	erage resp	onse <u>b</u>
alp Rej . d Kru Col Row	ect Ho lunntest skal-Wa Mean- Mean 3 4 5 5 0 Questi gende highly	<pre>ions if p = P(iother, f llis prob Dun 2 -3.6876 0.00 -6.4094 0.00 -5.9958 0.00 on - For e ? r - YES, fo significant</pre>	<pre>2 <= z by(iage bbility h's Pai </pre>	(1) <= a (2) <= a (No) (160471) (0.0154) (338749) (0.0097) (1he factor value of the factor val	lpha/2 0.0001 ompariso adjustr 4 -0.4800 0.31 or variab ariables <0.0001	Dn of ic ment) D36 156 Dles (knowle)	other by owledge a edge and o	iage nd other other) th	r), are th	ere diffe	erences respons	in the av	erage resp genders a	onse <u>b</u> re very
alp <mark>Rej</mark> . d Kru Col Row	ect Ho ect Ho lunntest skal-Wa Mean- Mean 3 4 5 4 5 0 Questi gende highly Questi incom	<pre>ions if p = P(iother, f llis prob Dun 2 -3.6876 0.00 -6.4094 0.00 -6.4094 0.00 -5.9958 0.00 on - For e ? r - YES, fo significant on - For e e?</pre>	<pre>2 <= z by(iage bbility h's Pai 32 -2. 32 -2.</pre>	(1) <= a (No 160471 0.0154 .338749 0.0097 the factor value the factor valu	lpha/2 0.0001 ompariso adjustr 4 -0.4800 0.31 or variab ariables <0.0001 or variab	on of id ment) 036 156 oles (knowle) oles (knowle	other by owledge a edge and o owledge a	iage nd other other) th nd other	r), are the difference of the the the the the the the the the the	ere diffe ences in	erences respons erences	in the av es of the in the av	erage resp genders a erage resp	onse <u>b</u> re very onse <u>b</u>

Row Mean	1	2	3	4	5	6	
2	-2.497470 0.0063						
3	-1.980782 <mark>0.0238</mark>	0.879087 0.1897					
4	-3.815271 0.0001	-1.257535 0.1043	-2.470334 <mark>0.0067</mark>				
5	-3.893000 <mark>0.0000</mark>	-1.495793 0.0674	-2.613509 <mark>0.0045</mark>	-0.363691 0.3580			
6	-3.353408 <mark>0.000</mark> 4	-1.183058 0.1184	-2.060025 <mark>0.0197</mark>	-0.184688 0.4267	0.114798 0.4543		
7	-3.552889 <mark>0.0002</mark>	-1.742852 0.0407	-2.457248 <mark>0.0070</mark>	-0.959300 0.1687	-0.688698 0.2455	-0.722300 0.2351	
8	-1.760408 0.0392	-0.130388 0.4481	-0.635829 0.2624	0.591132 0.2772	0.774389 0.2194	0.656758 0.2557	
9	-2.347848 <mark>0.0094</mark>	-1.192059 0.1166	-1.563387 0.0590	-0.708333 0.2394	-0.559877 0.2878	-0.597431 0.2751	
10	-3.169354 <mark>0.0008</mark>	-1.756891 0.0395	-2.259138 <mark>0.0119</mark>	-1.163994 0.1222	-0.964239 0.1675	-0.987559 0.1617	
11 Col Mean-	-3.282179 <mark>0.0005</mark>	-0.905285 0.1827	-1.879430 0.0301	0.235565 0.4069	0.541013 0.2942	0.359674 0.3595	
Row Mean	7	8	9	10			
8	1.160782 0.1229			(
9	-0.140395 0.4442	-0.960591 0.1684					
10	-0.396438 0.3459	-1.342428 0.0897	-0.168444 0.4331				
11	1.061221 0.1443	-0.433697 0.3323	0.788364 0.2152	1.244967 0.1066			
alpha = <mark>Reject Ho</mark>	0.05 if p = P(Z <	<= z) <= a	lpha/2				
Quest among	ion: For each g <u>regions?</u>	of the facto	r variables (knowledge a	and other), a	re there differences in the avera	ge res
Answe	er – NO, for b	oth factor v	ariables, the	ere are no si	gnificant dif	ferences in responses among reg	ions.
Quest	ion: For each	of the facto	r variables (knowledge a	and other), a	re there differences in the avera	ge res
based	upon type of	device used	1?				
Answe	er – YES, for b	ooth factor v	variables the	ere are signif	icant differe	nces in response provided on va	rious
. dunntest Kruskal-Wa	: iknowledge, allis probabi	by(idevice lity =	e) <mark>0.0002</mark>				
Dunn's Pai	irwise Compar	rison of ikr (No	owledge by adjustment	idevice			
		(1.0		,			

I	0.1998								
4	-4.104772 0.0000	-3.575691 0.0002							
5	-2.253612	-1.999900	-0.286000						
 6	-1.116132	-0.951199	0.3874	0.293782					
lpha -	0.1322	0.1708	0.4428	0.3845					
eject Ho	if p = P(Z <=	= z) <= a	<mark>lpha/2</mark>						
dunntest Truskal-Wa	. iother, by(: llis probabi	idevice) lity =	0.0423						
unn's Pai	rwise Compar.	ison of iot	her by idev	ice					
ol Mean- ow Mean	1	2	4	5					
+ 2 	-1.392887 0.0818								
4	-3.084003	-2.201813							
5	-0.728643	-0.307796	0.691191						
 6	0.005101	0.278162	0.2447	0.406324					
- 1	0.000101		0 1701	0 3423					
lpha = eject Ho TATIST	0.4980 0.05 if p = P(Z <	0.3904 = z) <= a	lpha/2		othor) are		fforonce	os in the	
lpha = eject Ho STATIST Questi age? dunntest	0.4980 0.05 if p = P(Z < FICS on - For each iknowledge, vy() values a:	0.3904 = z) <= a. of the factor by(iage) re unlabele	0.1764 lpha/2 pr variables d, option r	(knowledge and	other), are	there di	fference	es in the	e average i
STATIS Ouesti age? dunntest	0.4980 0.05 if p = P(Z < FICS on - For each iknowledge, y() values a: llis equality	0.3904 = z) <= a of the factor by(iage) re unlabeled v-of-popula	0.1764 lpha/2 or variables d, option r	(knowledge and	other), are	e there di	fference	es in the	e average i
lpha = eject Ho TATIST Questi age? dunntest arning: k ruskal-Wa	0.4980 0.05 if p = P(Z < FICS on - For each iknowledge, by() values and llis equality	0.3904 = z) <= a of the factor by(iage) re unlabeled y-of-popula	0.1764 lpha/2 or variables d, option r tions rank	(knowledge and olabel implicit	other), are	e there di	fference	es in the	e average i
<pre>lpha = eject Ho STATIST Questi age? dunntest arning: k ruskal-Wa + iage 4</pre>	0.4980 0.4980 0.05 if p = P(Z < FICS on - For each iknowledge, y() values a: .1lis equality 	0.3904 = z) <= a. of the facto by(iage) re unlabeled y-of-popula + Sum + 7.00	0.1764 lpha/2 or variables d, option r tions rank	(knowledge and olabel implicit	other), are	there di	fference	es in the	e average i
<pre>lpha = eject Ho STATIST Questi age? dunntest arning: k ruskal-Wa + iage + 2 3 4 </pre>	0.4980 0.05 if p = P(Z < FICS on - For each iknowledge, y() values a: .1lis equality Obs Rank 	0.3904 = z) <= a. a of the factor by(iage) re unlabeled y-of-popula + Sum + Sum + 7.00 7.50 6.00	0.1764 lpha/2 or variables d, option r tions rank	(knowledge and olabel implicit	other), are	e there di	fference	es in the	e average i
<pre>lpha = eject Ho STATIST Questi age? dunntest arning: k ruskal-Wa + iage + 2 3 4 5 +</pre>	0.4980 0.05 if p = P(Z < FICS on - For each : iknowledge, y() values a: .11is equalit; 	0.3904 = z) <= a of the factor by(iage) re unlabeled y-of-populat + Sum 1 7.00 7.50 6.00 7.50 +	0.1764 lpha/2 or variables d, option r tions rank	(knowledge and olabel implicit test	other), are	e there di	fference	es in the	e average i
<pre>lpha = eject Ho STATIST Questi age? dunntest arning: k ruskal-Wa iage + iage ++ iage +++ iage +++ iage +++ iage +++++ iage ++++++++++++++++++++++++++++++++</pre>	0.4980 0.4980 0.05 if p = P(Z < FICS on - For each : iknowledge, by() values a: .11is equality 	0.3904 = z) <= a of the factor by(iage) re unlabeled y-of-populat + Sum + Sum + 7.50 6.00 7.50 + 1 with 3 d. 01	0.1764 lpha/2 or variables d, option r tions rank f.	(knowledge and olabel implicit test	other), are	e there di	fference	es in the	e average i
<pre>lpha = eject Ho STATIST Questi age? dunntest arning: k fruskal-Wa iage l 2 l 3 l 4 l 5 i</pre>	0.4980 0.4980 0.05 if p = P(Z < FICS on - For each : iknowledge, by() values a: .1lis equality 	0.3904 = z) <= a of the factor by(iage) re unlabeled y-of-popula + Sum + Sum + 1.50 6.00 7.50 + 1 with 3 d. 01 = 85.400 01	0.1764 lpha/2 or variables d, option r tions rank f. with 3 d.f	(knowledge and olabel implicit test	other), are	e there di	fference	es in the	e average i
<pre>clpha = ceject Ho Control Contro Control Control Control Control Control Control</pre>	0.4980 0.05 if p = P(Z < FICS on - For each : iknowledge, by() values a: .11is equality 	0.3904 = z) <= a of the factor by(iage) re unlabeled y-of-popula + Sum + Sum + Sum + 1 with 3 d. 01 = 85.400 01	0.1764 lpha/2 or variables d, option r tions rank f. with 3 d.f	(knowledge and olabel implicit test	other), are	e there di	fference	es in the	e average i
<pre>clpha = cject Ho CTATIST Questi age? dunntest arning: k cruskal-Wa i age </pre>	0.4980 0.4980 0.05 if p = P(Z < FICS on - For each : iknowledge, by() values a: (11is equality) Obs Rank 	0.3904 = z) <= a of the factor by(iage) re unlabeled y-of-popula + Sum + Sum + Sum + 1 with 3 d. 01 = 85.400 01 airwise Comp (No	0.1764 lpha/2 or variables d, option r tions rank f. with 3 d.f parison of adjustment	<pre>(knowledge and olabel implicit test iknowledge by i)</pre>	other), are	e there di	fference	es in the	e average i
<pre>STATIST STATIST Questi age? dunntest Jarning: k Gruskal-Wa + iage + 2 3 4 5 + chi-square probabilit chi-square probabilit col Mean- .ow Mean +</pre>	0.4980 0.05 if p = P(Z < FICS on - For each : iknowledge, by() values a: (11is equality) Obs Rank 	0.3904 = z) <= a of the factor by(iage) re unlabeled y-of-popula + Sum + Sum + Sum + 1 with 3 d. 01 airwise Comp (No 3	0.1764 lpha/2 or variables d, option r tions rank f. with 3 d.f parison of adjustment 4	<pre>(knowledge and olabel implicit test iknowledge by i)</pre>	other), are	e there di	fference	es in the	e average i
<pre>alpha = Reject Ho STATIST Questi age? dunntest Jarning: k (ruskal-Wa liage l 2 l 3 l 4 l 5 liage liag</pre>	0.4980 0.4980 0.05 if p = P(Z < FICS on - For each : iknowledge, by() values a. (11is equality) Obs Rank 	0.3904 = z) <= a of the factor by(iage) re unlabeled y-of-popular + Sum + Sum + 7.00 7.50 + 1 with 3 d. 01 airwise Comp (No 3	0.1764 lpha/2 or variables d, option r tions rank f. with 3 d.f parison of adjustment 4	<pre>(knowledge and olabel implicit test iknowledge by i)</pre>	other), are	e there di	fference	es in the	e average i

```
5
                -8.540506 -5.326895 -2.884203
1
                  0.0000 0.0000 0.0020
2
3
     alpha = 0.05
     Reject Ho if p = P(Z \le |z|) \le alpha/2
4
5
6
     . dunntest iother, by(iage)
7
     Warning: by() values are unlabeled, option nolabel implicit
8
9
     Kruskal-Wallis equality-of-populations rank test
10
11
                    ____+
12
       | iage | Obs | Rank Sum |
        -----
13
           2 | 297 | 128210.00 |
14
           3 | 230 | 122050.50 |
15
           4 | 343 | 201312.00
           5 | 197 | 118205.50 |
16
       +-----+
17
18
    chi-squared = 51.926 with 3 d.f.
probability = 0.0001
19
20
     chi-squared with ties =
                             52.814 with 3 d.f.
21
     probability = 0.0001
22
23
                   Dunn's Pairwise Comparison of iother by iage
24
                                (No adjustment)
25
     Col Mean-|
                    2
                              3
     Row Mean |
                                       4
26
     _____
27
           3 | -3.687658
28
                 <mark>0.0001</mark>
            29
           4 | -6.409482 -2.160471
30
             0.0000
                          0.0154
31
               -5.995882 -2.338749 -0.480036
           5 I
32
                  <mark>0.0000</mark>
                          <mark>0.009</mark>7
                                     0.3156
             33
34
     alpha = 0.05
     Reject Ho if p = P(Z \le |z|) \le alpha/2
35
36
37
      _____
                                                                                   _____
38
        Question – For each of the factor variables (knowledge and other), are there differences in the average response by
39
        gender?
40
41
     . dunntest iknowledge, by(igender)
42
43
     Warning: by() values are unlabeled, option nolabel implicit
44
45
     Kruskal-Wallis equality-of-populations rank test
46
47
            -----+
       | igender | Obs | Rank Sum |
48
        -----|
49
             1 | 497 | 240985.50 |
             2 | 570 | 328792.50
50
           -----+
51
    probability = 0.0001
52
53
54
     chi-squared with ties =
                             26.585 with 1 d.f.
55
     probability =
                   0.0001
56
57
                Dunn's Pairwise Comparison of iknowledge by igender
58
                                (No adjustment)
59
     Col Mean-|
                          For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml
60
```

Rc	w Mean	1	
	2 -5.	156095	
	I	0.0000	
al	pha = 0.05		
Re	ject Ho if p	= P(Z <= z) <	= alpha/2
•	dunntest ioth	er, by(igender)	
Wa	rning: by() v	alues are unlab	eled, option nolabel implicit
Kr	ruskal-Wallis	equality-of-pop	ulations rank test
	+		+
	igender O	bs Rank Sum	
		97 238686.50	
	2 5	70 331091.50	+
ch pr	ii-squared =	28.299 with 1 0.0001	d.f.
÷.,			
ch pr	i-squared wit obability =	h ties = 28. 0.0001	783 with 1 d.f.
1	-		
	D	unn's Pairwise	Comparison of iother by igender
~	7		(No adjustment)
Cc Rc	o⊥ Mean- ow Mean	1	
	2 -5.	365020 0.0000	
al	pha = 0.05	- /	
Re	eject Ho if p	$= P(Z \le z) \le$	= alpha/2
==			
•	Question – I	-or each of the f	actor variables (knowledge and other), are there differences in the average response
	income?		
	dunntest ikno	wledge, by(iinc	come)
Ma	rning, by() y	alues are unlah	weled ontion nolabel implicit
Kr	websl-Wallie	equality_of_por	wlations rank test
I/T	uskai-waiiis	equaricy-or-pop	
	+	ha l Dank Gum	+
	+	+	
		85 35381.50	
	2 1 3 2	24 64287.00 20 107747.00	
	4 1	94 108728.50	
	5 1	38 78967.00	
	6	81 45972.00	I
		45 27296.00	
		29 15261.50 13 8052 50	
	10	22 14004.00	
	+	16 64001 00	
	L L +	10 04081.00 	+
ch	i-squared =	28.138 with 1	0 d.f.
Ρt		0.001/	
ch	i-squared wit	h ties = 31.	647 with 10 d.f.
pr	obability =	0.0005	
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6

Dunn's Pairwise Comparison of iknowledge by iincome (No adjustment)

(1	1		2	3	4	
+	+						
2	-2.497	470 063					
	0.0	000					
3	-1.980	782 C	.879087				
	0.02	238	0.1897				
4	-3.815	271 -1	.257535	-2.470334			
į	0.0	001	0.1043	0.0067			
_				0 01 0 5 0 0	0 0 0 0 0 0 1		
5	-3.8930	000 -1 000	.495793	-2.613509	-0.363691		
	1 0.00	000	0.00/4	0.0045	0.5500		
6	-3.353	408 -1	.183058	-2.060025	-0.184688	0.114798	
	0.0	004	0.1184	0.0197	0.4267	0.4543	
7	 _3 552;	889 -1	742852	-2 457248	-0 959300	-0 688698	-0 722300
,	0.0	002	0.0407	0.0070	0.1687	0.2455	0.2351
ļ	Ì						
8	-1.760	408 -C	.130388	-0.635829	0.591132	0.774389	0.656758
	I 0.03	392	0.4481	0.2624	0.2772	0.2194	0.2557
9	-2.347	848 -1	.192059	-1.563387	-0.708333	-0.559877	-0.597431
į	0.0	094	0.1166	0.0590	0.2394	0.2878	0.2751
10		2E4 1	75 60 01	0.050100	1 1 6 9 9 9 6	0 064000	0 007550
10	-3.1693 0.01	ა⊃4 −1 008	0.0395	-2.259138 0 0119	-1.163994	-U.964239 0 1675	-U.98/559 0 1617
	0.00		0.0000	0.0119	V	0.10/3	0.101/
11	-3.282	179 -0	.905285	-1.879430	0.235565	0.541013	0.359674
-]	0.0	005	0.1827	0.0301	0.4069	0.2942	0.3595
ol Mean- ow Mean		7		8	9	10	
+	, +					10	
8	1.160	782					
	0.1	229					
9	I -0.1403	395 -0	.960591				
-	0.4	442	0.1684				
10	-0.396	438 -1 450	.342428	-0.168444			
	0.34 	439	0.0897	0.4331			
11	, 1.061:	221 -0	.433697	0.788364	1.244967		
	0.1	443	0.3323	0.2152	0.1066		
loba -	0 05						
eject Ho	if p = P	(Z <=	z) <= a	alpha/2			
2	Ŧ			± .			
		1					
1	t lother,	by(iin	.come)				
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dunntest arning: k	oy() vaiue						
dunntest arning: k	oy() vaiue	-14+··	f	tions1	toot		
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dunntest arning: k ruskal-Wa +	allis equ	ality-c	f-popula	ations rank	test		
dunntest arning: k ruskal-Wa + iincom	allis equa me Obs	ality-c 	f-popula + Sum	ations rank	test		
dunntest arning: k ruskal-Wa + iincom	allis equa 	ality-c	f-popula	ations rank	test		
dunntest rning: k uskal-Wa + iincon 	allis equa me Obs + 1 85 2 124	ality-c Rank + 4055 6889	f-popula Sum 7.50 1.50	ations rank	test		
dunntest urning: k ruskal-Wa iincom 	allis equa me Obs 	ality-c Rank + 4055 6888 11115	of-popula Sum 7.50 1.50 2.50	ations rank	test		
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dunntest ruskal-Wa + iincom 	allis equa me Obs 	ality-c Rank + 4055 6888 11115 10925 7656	f-popula Sum 7.50 1.50 2.50 3.00 6.00	ations rank	test		
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dunntest arning: k cuskal-Wa iincon 	allis equa me Obs 	ality-c	of-popula Sum + Sum 7.50 1.50 2.50 3.00 6.00 6.50 3.00	ations rank	test		
dunntest arning: k ruskal-Wa iincon 	allis equa me Obs 	ality-c	of-popula Sum 	ations rank	test		
dunntest arning: k ruskal-Wa + iincon 	allis equa me Obs 	ality-c	of-popula Sum 	ations rank	test		
dunntest arning: k ruskal-Wa + iincon 	allis equa me Obs 	ality-c	of-popula Sum 	ations rank	test		
dunntest arning: k cuskal-Wa + iincon 	allis equa me Obs 1 85 2 124 3 220 4 194 5 138 + 6 81 7 45 8 29 9 13 10 22 + 11 116	ality-c	of-popula Sum 	ations rank	test		
dunntest rning: k uskal-Wa + iincon 	allis equa me Obs 1 85 2 124 3 220 4 194 5 138 + 6 81 7 45 8 29 9 13 10 22 11 116	ality-c	of-popula Sum 	ations rank	test		

	Dunn's E	airwise Com	parison of	iother by i	income				
Col Mean- Row Mean		1	2	3	4		5	6	
2	-1.820902 0.0343								
3	-0.719869 0.2358	1.464701 0.0715							
4	-2.164101 0.0152	-0.218148 0.4137	-1.924668 0.0271						
5	-1.843770 0.0326	0.017718 0.4929	-1.494472 0.0675	0.244915 0.4033					
6	-0.080037 0.4681	1.707810 0.0438	0.611758	2.033932 0.0210	1.727440 0.0420				
7	-2.166306 0.0151	-0.821450 0.2057	-1.879091 0.0301	-0.712417 0.2381	-0.845545 0.1989	-2.081181 0.0187			
8	-1.116035 0.1322	0.079540 0.4683	-0.749513 0.2268	0.208387	0.069584 0.4723	-1.051661 0.1465			
9	-1.009833 0.1563	-0.152029 0.4396	-0.731528 0.2322	-0.067154 0.4732	-0.160323 0.4363	-0.964946 0.1673			
10	-1.199166 0.1152	-0.131556 0.4477	-0.871672 0.1917	-0.023795 0.4905	-0.142123 0.4435	-1.141432 0.1268			
11	-1.247245 0.1062	0.606437 0.2721	-0.750743 0.2264	0.881120 0.1891	0.604470	-1.144015 0.1263			
Col Mean- Row Mean		7	8	9	10				
8	0.669238 0.2517								
9	0.313259 0.3770	-0.181941 0.4278							
10	0.432536 0.3327	-0.165674 0.4342	0.039694 0.4842						
11	1.260049 0.1038	0.298282 0.3827	0.419363 0.3375	0.467740 0.3200					
alpha = Reject Ho	0.05 if p = P(Z <	<= z) <= a	lpha/2						
Quest	ion: For each	of the facto	r variables (knowledge a	and other), a	are there dif	ferences in	the average res	
. dunntest	iknowledge,	by(iregion	.)						
Warning: k	oy() values a	re unlabele	d, option r	olabel impl	icit				
Kruskal-Wa	allis equalit	y-of-popula	tions rank	test					
+	on Obs F	+ Rank Sum							

Page 149 of 153

robabilit	y = 0	.7065		_			
hi-square robabilit	d with ti y = 0	es = 6.16 .6291	2 with 8 d.1	•			
	Dunn's	Pairwise Comp	arison of ik adjustment	nowledge by	y iregion		
ol Mean- .ow Mean		1	2	3	4		5
+ 2 	-1.0716	 09 19					
3	-0.1722	51 1.345399 16 0.0892					
4	0.3901	49 1.649590 82 0.0495	0.702685				
5	0.4147	02 2.183041 92 0.0145	0.937194	-0.058582			
6	0.1631 0.43	90 1.455991 52 0.0727	0.426919 0.3347	-0.262248	-0.270564 0.3934		
 7 	-0.1863 0.42	28 1.126918 61 0.1299	-0.039002 0.4844	-0.669008	-0.820729 0.2059	-0.414454 0.3393	
 8 	-0.5781 0.28	86 0.528077 16 0.2987	-0.584510 0.2794	-1.062830 0.1439	-1.296538	-0.844421 0.1992	
 9 	-0.1356 0.44	99 1.395304 60 0.0815	0.057851 0.4769	-0.662132 0.2539	-0.877640 0.1901	-0.383263 0.3508	
ol Mean- .ow Mean 		7	8				
8	-0.4913 0.31	39 16					
9 	0.0873 0.46	40 0.628024 52 0.2650					
lpha = eject Ho	0.05 if p = P(Z <= z) <= ;	alpha/2				
dunntest	iother.	hy(iregion)					
arning: b	y() value	s are unlabel	ed, option r	olabel impl	licit		
ruskal-Wa	llis equa	litv-of-popul	ations rank	test			
+		+					
1regio	n Obs ++	Rank Sum					
	1 4/ 2 123 2 100	69595.50					
	3 190 4 60	90283.50 29825.50					
 	5 196 ++	103603.00					
	6 74 7 102	38500.50 56208.00					
	8 I 77 I	10265 50 i					

Col Moon-	Dunn's P	airwise Com (Nc	parison of adjustment	iother by i	region			
Row Mean		1	2	3	4	l	5	6
2	+ -1.651264 0.0493							
3	 -0.754747 0.2252	1.384344 0.0831						
4	-0.289090 0.3863	1.440613 0.0748	0.450033 0.3263					
5	-0.986810 0.1619	1.068340 0.1427	-0.366535 0.3570	-0.704618 0.2405				
6	-0.712218 0.2382	1.021777 0.1534	-0.072157 0.4712	-0.440535 0.3298	0.201037 0.4203			
7	-1.329861 0.0918	0.363767 0.3580	-0.908316 0.1819	-1.094902 0.1368	-0.607562 0.2717	-0.665397 0.2529		
8	-0.764952 0.2221	0.974207 0.1650	-0.137978 0.4451	-0.495255 0.3102	0.138866 0.4448	-0.053765 0.4786		
9 Col Mean-	-1.140280 0.1271	0.839921 0.2005	-0.612310 0.2702	-0.874259 0.1910	-0.250994 0.4009	-0.386621 0.3495		
Row Mean	 +	7	8					
8	0.615064 0.2693							
9	0.395481 0.3462	-0.327411 0.3717						
alpha = Reject Ho	if p = P(Z <	Ξ= z) <= a	lpha/2					
alpha = Reject Ho • Quest based . dunntest Warning: k Kruskal-Wa	<pre>if p = P(Z < ion: For each upon type of t iknowledge, oy() values a allis equalit</pre>	<pre>if (idevice) if (idevice)</pre>	<pre>lpha/2</pre>	knowledge and holabel implatest	and other), a	are there dif	ferences ir	n the average respo
<pre>alpha = Reject Ho Quest</pre>	<pre>if p = P(Z < ion: For each upon type of t iknowledge, oy() values a allis equalit ce Obs R</pre>	<pre>i z) <= a i of the facto i device used by(idevice ure unlabele cy-of-popula cank Sum </pre>	lpha/2 r variables (?) d, option r tions rank	knowledge a nolabel impl test	and other), a	are there dif	ferences ir	n the average respo
alpha = Reject Ho Quest based . dunntest Warning: k Kruskal-Wa + idevic 	<pre>if p = P(Z < ion: For each upon type of t iknowledge, oy() values a allis equalit ce Obs R 1 455 23 2 464 24 4 117 7 5 22 1 6 9 </pre>	<pre>cof the facto device used by(idevice ure unlabele cy-of-popula cank Sum cank Sum</pre>	lpha/2 r variables (?) d, option r tions rank	knowledge a nolabel impl test	and other), a	are there dif	ferences ir	n the average respo
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		(No	adjustment)	
Row Mean	1	2	4	5	
2	-0.842399 0.1998				
4	-4.104772 <mark>0.0000</mark>	-3.575691 <mark>0.0002</mark>			
5 	-2.253612 <mark>0.0121</mark>	-1.999900 <mark>0.022</mark> 8	-0.286000 0.3874		
6	-1.116132 0.1322	-0.951199 0.1708	0.143918 0.4428	0.293782 0.3845	
alpha = Reject Ho	0.05 if p = P(Z <	= z) <= a.	lpha/2		
dunntest	iother, by(idevice)			
Warning: b	oy() values a	re unlabele	d, option n	olabel implio	cit
Kruskal-Wa	llis equalit	y-of-popula	tions rank	test	
+	e Ohe D	+ ank Sum !			
	++ 1 455 23	 2086.50			
Ì	2 464 24 4 117 7	9706.50 1108.00			
l I	5 22 1 6 9	2291.00 4586.00			
	d = 9.72	7 with 4 d.	f.		
probabilit	y = 0.04	53			
chi-square probabilit	ed with ties zy = 0.04	= 9.893 <mark>23</mark>	with 4 d.f		
					evice
	Dunn's P	airwise Com	narison of	iother by ide	
Col Mean-	Dunn's P	airwise Comj (No	parison of adjustment	iother by ide	
Col Mean- Row Mean +	Dunn's P 1	airwise Comj (No 2	parison of adjustment 4	iother by ide 5	
Col Mean- Row Mean 2 2	Dunn's P 1 -1.392887 0.0818	airwise Comj (No 2	parison of adjustment 4	iother by ide) 	
Col Mean- Row Mean 2 4 	Dunn's P 1 -1.392887 0.0818 -3.084003 0.0010	airwise Comy (No 2 	parison of adjustment 4	iother by ide) 	
Col Mean- Row Mean 2 4 4 5	Dunn's P 1 -1.392887 0.0818 -3.084003 0.0010 -0.728643 0.2331	airwise Comy (No -2.201813 0.0138 -0.307796 0.3791	parison of adjustment 4 0.691191 0.2447	iother by idd	
Col Mean- Row Mean 2 4 5 5 6	Dunn's P 1 -1.392887 0.0818 -3.084003 0.0010 -0.728643 0.2331 0.005101 0.4980	airwise Comy (No -2.201813 0.0138 -0.307796 0.3791 0.278162 0.3904	0.691191 0.2447 0.929115 0.1764	0.406324 0.3423	
Col Mean- Row Mean 2 4 4 5 6 1	Dunn's P 1 -1.392887 0.0818 -3.084003 0.0010 -0.728643 0.2331 0.005101 0.4980 0.05	airwise Comy (No 2 -2.201813 0.0138 -0.307796 0.3791 0.278162 0.3904	0.691191 0.22447 0.929115 0.1764	0.406324 0.3423	

STROBE Statement—Checklist of items that should be included in reports of *cross-sectional studies*, ADAPTED FOR A SURVEY STUDY: Informed consent, shared-decision making and a reasonable patient's wished based on a national survey in the United States using a hypothetical scenario. An (X) indicates that the checklist item is included in the manuscript if applicable for a survey study.

	Item No	Recommendation
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract \mathbf{x}
		(b) Provide in the abstract an informative and balanced summary of what was done
		and what was found X
Introduction		
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported \mathbf{x}
Objectives	3	State specific objectives, including any prespecified hypotheses X
Methods		
Study design	4	Present key elements of study design early in the paper X
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment,
C		exposure, follow-up, and data collection X
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of
1		participants X
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect
		modifiers. Give diagnostic criteria, if applicable X
Data sources/	8*	For each variable of interest, give sources of data and details of methods of
measurement		assessment (measurement). Describe comparability of assessment methods if there is
		more than one group X
Bias	9	Describe any efforts to address potential sources of bias X
Study size	10	Explain how the study size was arrived at X
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable,
		describe which groupings were chosen and why X
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding
		X
		(b) Describe any methods used to examine subgroups and interactions X
		(c) Explain how missing data were addressed NOT APPLICABLE
		(<i>d</i>) If applicable, describe analytical methods taking account of sampling strategy X
		(<u>e</u>) Describe any sensitivity analyses NOT APPLICABLE
Results		
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially
		eligible, examined for eligibility, confirmed eligible, included in the study.
		completing follow-up, and analysed NOT APPLICABLE
		(b) Give reasons for non-participation at each stage NOT APPLICABLE
		(c) Consider use of a flow diagram NOT USEFUL
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and
r r		information on exposures and potential confounders \mathbf{X}
		(b) Indicate number of participants with missing data for each variable of interest X
Outcome data	15*	Report numbers of outcome events or summary measures X
Main results	16	(a) Give unadjusted estimates and if applicable confounder-adjusted estimates and
	10	their precision (eg. 95% confidence interval). Make clear which confounders were
		_ their precision (eg, 95% confidence interval). Make clear which confounders we

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		adjusted for and why they were included NOT APPLICABLE
		(<i>b</i>) Report category boundaries when continuous variables were categorized NOT APPLICABLE
		(<i>c</i>) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period <i>NOT RELEVANT</i>
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses X
Discussion		
Key results	18	Summarise key results with reference to study objectives X
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias X
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence X
Generalisability	21	Discuss the generalisability (external validity) of the study results X
Other information		
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based X

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

BMJ Open

Informed Consent, Shared-Decision Making and a Reasonable Patient's Wishes Based on a Cross-sectional, National Survey in the United States Using a Hypothetical Scenario

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Secondary Subject Heading:	Medical management
Keywords:	informed consent, shared-decision making, reasonable patient, overuse of procedures, coproduction, patient autonomy



1 2	
2 3 4 5 6 7	Informed Consent, Shared-Decision Making and a Reasonable Patient's Wishes Based on a Cross-sectional, National Survey in the United States Using a Hypothetical Scenario
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16 17 18	³ Private consultant on statistical methods and interpretation
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Abstract

Objective: In approximately half the states in the U.S., and more recently in the U.K., informed consent is legally defined as what a reasonable patient would wish to know. Our objective was to discern the information needs of a hospitalized, "reasonable patient" during the informed-consent process.

Design: We performed a cross-sectional study to develop a survey instrument and better define "reasonable person" in relation to informed consent in a hypothetical scenario where an invasive procedure may be an option.

Setting: A 10-question survey was administered from April 19 through October 22, 2018 to three groups: student nurses (n=76), health professions educators (n=63), and a U.S. national population (n=1067).

Primary and secondary outcome measures: The primary outcome measure was the average intensity, on a 5-point scale, by which survey groups wished to have each of 10 questions answered. The secondary outcome was to discern relationships between survey demographics and the intensity by which participants wanted an answer.

Results: Despite substantial demographic differences in the nursing-student group and healthprofessions-educator group, the average intensity scores were within 0.2 units on 9 of 10 questions. The national survey revealed a strong desire to have an answer to each question (range 3.98 to 4.60 units). It showed that women desired answers more than men and older adults desired answers more than younger adults.

Conclusions: Based on responses to 10 survey questions regarding wishes of people in a situation where an invasive procedure may be necessary, the vast majority want an answer to

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each question. They wanted to know about all treatment options, risky drugs, decision aids, who will perform the procedure, and the cost. They wanted their advocate present, periodic review of their medical record, a full day to review documents, and expected outcomes and restrictions after the procedure.

Key Words: Informed consent, shared-decision making, reasonable patient, overuse of

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Strengths and limitations of this study:

- Based on two targeted surveys and a national survey, findings are consistent across demographic groups and across the United States, making our conclusions robust.
- The findings form a template that could be used by clinicians when engaged in shareddecision making to elicit truly informed consent from the patient.
- The survey questions had to be limited to be practical, so in any specific, real-life situation additional questions may be asked by a reasonable patient.
- Findings about the out-of-pocket costs of a procedure probably apply only to patients in the United States where out-of-pocket costs may be enormous.
- Our survey was limited by requirements to read English and have electronic access.

Funding statement: The study was supported by Patient Safety America, Houston, TX USA. A donation (\$1,400) from Dr. James to support the SurveyMonkey® platform provided the funds required. His roles are given below in the "Author's contribution" section.

Competing interests: Dr. James founded Patient Safety America as a no-budget organization dedicated to educating people about problems in the U.S. healthcare industry. He serves as its unpaid CEO and leader. He has no conflicts of interest, advocating only for improved care.

Author's contribution: JTJ conceived the study and developed the questions. DJE formed the survey instrument to suit each of the situations where questions were to be presented to a survey audience. JTJ and RRS analyzed the data. JTJ wrote most of the paper in close consultation with coauthors. All authors agreed to be accountable for accuracy of the work.

Data sharing statement: National survey data at: http://patientsafetyamerica.com/survey-data/.

Health-Professions-Educator survey at: https://www.surveymonkey.com/results/SM-DQJDBBQ7L/

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Nursing-student survey available at: <u>https://www.surveymonkey.com/results/SM-5F2SX9W3V/</u> Available 'Supplementary files' include the research proposal, 2 forms of the survey, and 6 statistical analysis files.

Introduction

The human right to self-determination in healthcare is a hallmark of instruments promulgated by the United Nations. Rights are specifically described for children, persons with disabilities and older persons. These call for the highest standards attainable for children's health,¹ for treatment of illness or rehabilitation of the disabled,² and for maintenance of optimum health as people age.³ The patient's right to know certainly extends to knowing the risks and benefits of prescription medications. For example, based on a recent court decision in the U.K. involving off label and unlicensed medication prescribing, consent laws now call for patients to receive all information that a patient deems important, and not just what the physician thinks is important.⁴ However, unless the patient is harmed by denial of sufficient information to exercise their rights to make an informed decision about off-label prescriptions, there is no legal standing for compensation. In our opinion, the human rights of patients to self-determination in healthcare can only be attained through a balanced process of shared-decision making between patient and clinician.

While the idea of shared-decision making between patient and clinician has been around many decades, based on peer-reviewed citations, the concept has gained momentum since 2012.⁵ The culmination of shared-decision making is that the patient consents to the mutually-agreed procedures to be performed or not performed. The old standard calling for information that "reasonable clinicians" feel their patients need to know is giving way to the new standard defined by what a reasonable patient wishes to know. However, a study of recorded

conversations between clinicians and a patients that may need percutaneous coronary intervention (PCI) found that only 3% of the patients received all 8 elements necessary for informed decision making.⁶ A recent court ruling in the U.K has upheld the patient-centered, informed-consent standard and about half of the United States use "reasonable patient" as the basis for administering informed consent.⁷ In the past, the "reasonable patient" standard has been ill-defined and abstract; our intent is to better-define the information wishes of a reasonable person when facing the possibility of an invasive procedure.⁸ There is a natural conflict between respect for patient autonomy in making an informed decision and the practical aspects of how a clinician delivers information to a "reasonable patient" to fulfill the ethical principle of autonomy.

The question then becomes, "What does a reasonable patient wish to know?" Typically, that is answered after the fact in specific cases where a patient may allege that he was not given sufficient information to make an informed decision.⁹ One example involved a case where a man's family was not given enough information about his defibrillator replacement to make an informed decision.¹⁰ Patient preferences were not elicited by the clinician. A court in the U.K. decided that a woman was not given sufficient information on the 1% risk of shoulder dystocia from a vaginal vs. a Caesarian delivery to make an informed decision.¹¹ To our knowledge, no investigators have attempted to define the information needs of a reasonable patient in a general way that applies to care during hospitalization. To some extent the survey was driven by stories of patient advocates who have experienced harm and, in retrospect, wish they had known more about the risks of their treatment, device, or medication. We hypothesized that such wishes could be generalized into information a "reasonable patient" would want to know.

Goal

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Our primary goal was to establish the descriptive intensity (scale of 1 to 5, with 1 being "definitely no" and 5 being "definitely yes") by which answers to general questions are desired by a reasonable patient before giving consent for an invasive procedure, prescription drugs, or medical devices that could pose a risk of avoidable harm. Our secondary goal was to characterize heterogeneity, such as gender and age, in the survey groups that may be associated with intensity variations in what a reasonable patient wishes to know.

Methods

Our survey-study proposal (Supplementary file 1) was approved by the Galveston College Institutional Review Board. Our search of peer-reviewed literature using "reasonable patient survey" (15 November 2018) discovered only 2 partially relevant articles. One involved wishes of patients about anesthesia risks in a Singapore hospital.¹² Another surveyed patients' opinions about pre-surgical informed-consent in a Jamaica teaching hospital.¹³ In the latter study, 67% of the surveyed patients described their consent process as 'unsatisfactory.' We created a statement of a generic situation in which a hospitalized patient must make choices about their care after being stabilized upon entry via the emergency department: You are hospitalized in a large, urban, teaching hospital after being brought into its emergency room last night. The condition that brought you to the ER has been stabilized, but additional procedures may be necessary. The following 10 questions determine what you would like to know as a reasonable patient. We developed a 10-question survey based on adverse experiences reported by members of the Patient Safety Action Network (formerly members of the Safe Patient Project of Consumers Union) and our knowledge of shortcomings with current informed consent practices as reflected in medical literature.

The survey was developed in two forms. The first employed demographics to include age, gender, education level, race or ethnicity, and whether the survey taker has worked in a hospital (Supplementary file 2). This survey was administered via cell phone, without any means of coercion, to student nurses (and a few faculty) on April 19, 2018 at Galveston College, Galveston Texas during a presentation by Dr. James. All present in the lecture hall were verbally recruited to take the survey at the start of the presentation, and then the survey results were shared at the conclusion of the talk. It was also administered to participants in the Health Professions Educators Summer Symposium (HPESS) Community via email request on June 8, 2018. The master-list of past participants in summer symposia was used as the recruitment tool. The latter included primarily mature academics involved in educating physicians, nurses, and health-care administrators.

The second form of the survey, which was used for the U.S. national survey, employed an identical scenario and questions, but the demographics were adapted to those offered by SurveyMonkey[®] (SM) for a national survey (Supplementary file 3). These included age, gender, household income level, and region of the United States. The national platform included survey takers across the U.S. that had been previously recruited by SM as part of their nationally representative database. The vast majority of the national survey takers used cell phones to answer the questions. The third survey was administered to the national audience on October 22, 2018.

Each of the 10 questions could be answered at one of 5 intensity levels indicating the degree to which an answer is desired by the person taking the survey. The responses were as follows: definitely no (1.0), probably no (2.0), neutral (3.0), probably yes (4.0), and definitely yes (5.0). Formal statistical analyses were deemed unsuited to the qualitative nature of our study

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design. Final conclusions are word descriptions of the intensity of desire of a reasonable patient to have answers such as "probably yes" or "definitely yes." Obvious trends in the data were captured graphically.

Statistics and Factor Analyses

The data subjected to analyses were collected in three surveys (student nurses, HPESS, and the national survey). For each survey, descriptive statistics were obtained and analyses of the results were performed using Stata (version 14.0; Stata Corp., College Station, TX). The means of the responses of the various groups for each subject category (e.g., age, gender, etc.) were tested for differences using methods that are appropriate for these categorical variables, which are not normally distributed. The nonparametric Kruskal–Wallis one-way analysis of variance by ranks was performed to test for differences between means and the Dunn test was used to identify pairs that differed significantly. Statistical significance, adjusted for false discovery, was established with p < 0.025.

Factor analysis with principal component factoring was utilized in all surveys to determine components that can explain the greatest portions of the total variance in responses among the questions. The goal of a factor analysis is to reduce the number of variables to explain and to interpret the results. Factor loadings was achieved by regression of scoring coefficients obtained with varimax rotation. The loaded factors (principal components) generated were analyzed as described above for other variables.

Patient and Public Involvement

The development of our research plan was a direct result of patient advocates' experiences with failed informed consent. These experiences led to formulation of many of the questions posed in

our survey. Our results will be disseminated to the HPESS community once the study has been published. Results will be disseminated to student nurses at Galveston College through a presentation this spring. Our findings and suggested actions from our findings will be disseminated to patient advocates whose shared ideas and experiences powered this study. Those groups include the following: Patient Council of the Right Care Alliance, Patient Safety Action Network, and members of Patient Safety America. We expect to widely share our findings with the general public (represented by our national survey) through media outlets such as ProPublica, with physicians through KevinMD and Veritas Health Care, and with nurses through Quality and Safety Education for Nurses (QSEN).

Results

We targeted two groups from which to obtain responses because of the access we had to them and the expectation that their demographics would be different. The response rate from the student nurses was 99% (76/77) because it was taken during a lecture in which support was available if anyone had difficulty. Only one did. The response rate of the HPESS Community to the email request was 63/146 = 43%. The low response is likely due to busy professionals not having time to read and respond to all emails sent to them. Combined, the response rate of the two targeted studies was 62%. Table 1 shows the diversity of demographics in the two groups that took initial surveys. The primary differences were in age, education level, race or ethnic origin, and hospital work experience (Supplemental file 4).

Demographic measure	Student Nurses	HPESS Community	P values
	(n = 76)	(n = 63)	
Under 35 years of age	77%	3%	< 0.0001
Female	78%	70%	0.2755
High school graduate	34%	2%	< 0.0001
College graduate	65%	5%	< 0.0001
Advanced degree	1%	93%	< 0.0001
White or Caucasian	51%	84%	< 0.0001
Black or African American	16%	3%	0.0151
Hispanic or Latino	26%	2%	0.0001
Asian	4%	6%	0.5161
Have worked in a hospital	35%	86%	< 0.0001

 Table 1. Comparative demographics of targeted groups (2 sample test of proportions)

The national survey included 1211 persons who entered the survey and 1067 who completed it for a response rate of 88%. Nine participants did not answer location questions. The combined results of our three surveys consistently showed that a "reasonable patient" would want to know an answer to each of the 10 questions presented in our survey (table 2).

Table 2 allows the reader to view the results in two ways for each of the 10 questions. The first, shown in bracketed, red highlight, is the fraction of responders that indicated that they definitely wanted to know information (5.0 response) or have a certain right to access (e.g. medical record access). The second way to view results, in black lettering, indicates the numerical mean of all responses in each of the 3 surveys and the ranges of the means sorted by income groups and regions of the U.S. in the national survey. We used ranges as a measure of dispersion around the national means because it is likely lay readers will understand this more readily than the results of our formal statistical analysis. The three distinct surveys compare well regarding the wishes of patients. The highest intensity of desire to have an answer was to question 1 (know all treatment choices) in all three surveys (range 4.58-4.94). In all three surveys, the lowest intensity of desire to have an answer was to question 8 (medical record access) (range 3.98-4.07), and the second lowest intensity was to question 9 (advanced review of documents) (range 4.18-4.29). Even the lowest intensity desire for an answer was near 4.0, which implies that on weighted-average basis, the putative reasonable patient would *probably* want to have access to his medical record and be able to make entries.

Table 2. Average response levels in three surveys. 4.0 indicates the person "probably" wants an answer, and 5.0 indicates the person "definitely" wants an answer. The percentage of the 5.0 responses are shown in bold red. In the national survey, 71 % of the reported income levels were from \$10,000 to \$99,000. Of the 9 geographic regions of the U.S., 54% of responses were from 3 of those – east north central, south Atlantic, and Pacific. Footnotes: an=75, bn=62

Number and description of survey question	Student	HPESS	National	National	National
	Nurses	Group	Group	ranges	ranges
The percentages of individuals that 'definitely' (5.0)	(n = 76)	(n = 63)	(n =	over 10	over 9
wanted an answer to each question below is shown in	[% 5.0]	[% 5.0]	1067)	income	regions
hold red in the columns			[%5.0]	Groups	of the
					U.S.
1. Would you like to know all your treatment choices,	4.92	4.94	4.58	4.33-	4.51-
including alternatives and risks and benefits of each choice				4.97	4.65
for a patient like you. Your choices may include invasive	[92%]	[95%]	[75%]		
procedures (surgery, endoscopic procedures, insertion of a					
medical device), non-invasive treatments, and what happens					
if you do nothing?					
2. Drugs that have not been approved by the Food and Drug	4.89 ^a	4.51	4.40	4.07-	4.26-
Administration for your condition are off-label for you. Drugs		[(70/]	[(70/]	4.71	4.57
side effects as drugs prescribed on label. Would you like to	[89%]	[6/%]	[67%]		
know if any drugs prescribed to you are off-label, and what					
their side effects may be?					
3. Drugs assigned a "black box" warning by the FDA pose an	4.83	4.67	4.57	4.27-	4.43-
especially serious risk of harm. If you are prescribed such a				4.92	4.69
drug, would you want to know the reasons for the black box	[83%]	[79%]	[78%]	-	
warning and if there are alternatives before you take it?					
4. Decision aids are created to assist patients with complex	4.66	4.65	4.41	4.07-	4.28-
medical decisions and to help them understand the risks and				4.69	4.57
benefits of treatment options. If there is a decision-aid	[73%]	[70%]	[61%]		
available for your illness, would you like to review it?					
5. If you are considering an invasive procedure, would you	4.83	4.78	4.49	4.34-	4.41-
like to know who will be performing it, their skill level, and	[84%]	[84%]	[68%]	4.82	4.63
how trainee doctors, if any, will be involved?					
6. Assuming you have decided on a procedure or treatment,	4.71	4.60 ^b	4.48	4.21-	4.41-
would you like to know what your total, out-of-pocket costs	[79%]	[68%]	[69%]	4.76	4.52
will be?					
7. You have a trusted family member that is willing to act as	4.65 ^a	4.54	4.31	4.09-	4.20-
your advocate. Would you like for that person to be present	[73%]	[62%]	[54%]	4.69	4.43
during shared-decision-making about your medical care?	4.07	4.00	2.00	2.44	2.00
8. If you are well enough, would you like to be offered a	4.07	4.06	3.98	3.41-	3.89-
chance to review and make entries in your medical records	[47%]	[48%]	[38%]	4.23	4.11
Perfore signing any documents permitting invasive non	1 20	1 10	1 10	2 01	2 07
amergency procedures would you like to review these at	4.29	4.19	4.10	5.91- 1 11	5.07- 1.31
least one full day in advance of the procedure?	[49/0]	[52/0]	[47/0]	4.41	4.54
10. If you are considering an invasive procedure, would you	4 84	4 89	4 60	4 32-	4 49-
like to know your expected difficulties, recovery times, pain	[86%]	[90%]	[76%]	4.85	4.70
management, and restrictions after the procedure while	[00/0]	[30/0]	[10/0]		
hospitalized and after discharge from the hospital? This					
includes the risk of infection from the invasive procedure.					
	1	1		1	1

Below we provide brief descriptions of the statistical analyses and factor analyses for each of the 3 surveys. The details of these analyses are in supplementary files. Question numbers are found in table 2. Statistical analysis of the responses to survey questions obtained from student nurses (Supplementary file 5) revealed no significant differences among age groups, level of education, experience working in a hospital, or between genders, in their responses to any of the 10 questions. Not considering 'another race' as a response suitable for comparisons, the only differences in pairs were for question 1. 'White or Caucasian' was different from 'Black or African American' (p = 0.011) and 'Black or African American' was different from 'Asian or Asian American' (p = 0.020).

Factor analysis with principal component factoring identified 3 factors each with Eigenvalues greater than 1, which cumulatively accounted for 64% of total variance among responses provided by the student nurses. Varimax factor loading of 3 factor variables labeled as "knowledge", "participation", and "total cost" were generated and analyzed as above for differences in responses among groups (Supplementary file 6). No significant differences were found among age groups, levels of education, or between genders, in their responses to any of the factor variables. The only significant differences, again disregarding comparisons to 'Another race,' existed among races and ethnicities in their responses associated with "knowledge" (p = 0.0091) where 'White or Caucasian' differed from 'Black or African American' (p = 0.0211).

The responses of the HPESS survey did not differ significantly between genders, or among various ethnicities for any of the ten questions (Supplementary file 7). Responses differed significantly among age groups only for questions 1 (p = 0.0171) and 2 (p = 0.0024). Responses differed significantly by education level for questions 1 (p = 0.0015), 2 (p = 0.0139),

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3 (p = 0.0170) and 10 (p = 0.0347). Among respondents to the HPESS survey, significant differences in responses to questions 1 (p = 0.003), 2 (p = 0.0024), and 5 (p = 0.0002) were provided by respondents who differed according to their employment as hospital workers.

Factor analysis of the HPESS data with principal component factoring identified no statistically significant differences for either of two factor variables "knowledge" and "participation" when responses were compared by age, gender, or level of education (Supplementary file 8). A significant difference among ethnic groups was found for "knowledge" (p = 0.0394) but post hoc analysis with Dunn's test failed to identify any pairs of groups that differed significantly.

In the national survey, responses differed significantly for all questions among age groups (p = 0.001 for questions 1 - 7 and 10; p = 0.0041 and 0.0052 for questions 8 and 9 respectively), between genders (p = 0.001 for questions 1, 2, 4, 7, 8 and 10; p = 0.0043, 0.0002, 0.0030 and 0.0014 for questions 3, 5, 6 and 9, respectively) (Supplementary file 9). Significant differences for questions 1 (p = 0.0001), 2 (p = 0.0384), 3 (p = 0.0047), 4 (p = 0.0037), and 6 (p = 0.0190) were found among groups that differed by income level. Question 9 (p = 0.0473) was the only question for which responses differed significantly among regions of the U.S. Several salient generalizations from these comparisons are apparent. When comparing responses among various age groups, differences were found among all ages groups for most questions. When significant differences were found among response of groups of differing income levels the differences, most often, were between group 1 and the other groups. Differences between regions, in response to question 9, were most often between regions 1 and 2 and the other regions.

Factor analysis of the national data with principal component factoring demonstrated significant differences among the age categories for both factor variables ("knowledge", and "other", p = 0.0001 for both variables) (Supplementary file 10). All groups differed significantly from each other, with the exception of group 4 vs group 5 for the factor variable "other". For both factor variables the differences in responses of the genders are very highly significantly different (p <0.0001). When considering responses from groups of differing income levels, significant differences were found for the variable "knowledge" (p = 0.0005). Most of the differences among pairs are between group 1 and other groups and between group 3 and other groups. There were no significant differences in responses to factor variables among regions.

Discussion

Despite the different demographics in the two targeted surveys (table 1), especially in age, education level and hospital work experience, the responses were comparable in the two groups (table 2). Only one of the 10 questions (number 2) had a response level that differed by more than 0.20 units. This was the question of whether a reasonable patient would want to know about any off-label drugs prescribed. The difference was 0.38 units. The higher education level and more hospital experience of the HPESS Community may have made this group slightly less concerned about the additional risk that may be associated with off-label prescriptions. Statistical analysis of the nurse-student survey revealed two paired demographic differences. Two race/ethnic pairs (white vs. black and black vs. Asian) were associated with differences in intensity of response to question 1, which is about knowing all choices for treatment including risks and benefits. Statistical analysis of the HPESS community survey disclosed differences between pairs in the age, education-level and hospital-work-experience groups. While these
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statistical findings may be interesting, the reality is that the core message remains unchanged: patients of all types studied wish to know many details about their care choices when facing the possibility of an invasive procedure.

The results of the national survey regarding demographics of gender (figure 1) and age (figure 2) demonstrated distinct trends for all 10 questions. Without exception, women wanted more information than men, and older adults wanted more information than younger adults. Similarly, statistical analysis supported associations between age and gender on the intensity of responses to most questions, and it revealed an effect of income for some of the survey questions. The gender associations may be due to women being higher users of hospital care and hospitals tending to offer many more services targeted to women than to men.¹⁴ Older adults may be more likely to be cautious compared to younger adults because of more lifetime hospital experiences.

Our survey provides insight into some patient concerns that are not typically part of informed consent. In the wake of the opioid epidemic, the public is more aware of the potential dangers of prescription drugs. Thus, it should not be surprising that patients would want to know if the drugs prescribed to them are off-label or have a black-box warning. The U.S. Food and Drug Administration assigned "black box" warnings to immediate-release opioids in 2016.¹⁵ There is also growing attention to surprise medical bills in the U.S., so a reasonable patient would likely to want an estimate of his out-of-pocket costs. Inordinate out-of-pocket costs, especially those that lead to bankruptcy, may have an adverse effect on clinical outcomes.¹⁶ Hospital administration staff could assist with providing cost information. The opportunity to review and make entries in one's medical record, while not part of the informed consent process, may relate. Many patients want to ensure that the data being recorded are accurate and complete;

moreover, many desire access to their data as a means of gaining a better understanding of their condition and engaging with their providers. Encouraging this access can convey strong support for the view that the patient is an integral part of his care team.

There is an important connection between informed consent and the overuse of medical procedures. The overuse of PCI in the U.S. is a prime example. Patients that may need PCI were less likely to choose this invasive option when they were better informed about their care options during hospitalization.¹⁷ A study of patients in Northern England that may need PCI concluded that there is "a mismatch between legal and ethical principles of informed consent and current practice. The variation in patients' experiences of the current place of informed consent in service delivery represents a missed opportunity for cardiologists to work in decision-making partnerships with patients. In light of recent changes in the law [to the reasonable patient standard], a new approach to informed consent is required."¹⁸

The history of legally-defined informed consent for invasive procedures has evolved from a totally physician-centered concept (before the Era of Enlightenment) in which deception of the patient was deemed necessary, to the point where the process has now become patientcentered, in principle. A brief summary of some of the court decisions pertinent to involvement of the patient points to the next step in informed consent, which we feel we have defined with our survey.¹⁹ As early as 1914, a New York court established that an "adult in sound mind has the right to determine what shall be done with his own body." This was reinforced in 1960 by the decision of a court in Kansas that the patient, not the physician, must make the final decision about any operation. Of course, the patient's decision may be biased by receiving limited information from the physician. Two court decisions in 1972, one in California and the other in

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Washington, D.C., determined that the patient must be informed of pertinent risks of surgery and have the alternatives revealed to him or her. In 1983, a New Jersey court ruled that if a surgeon, other than the one the patient selected, performs the surgery, then the surgeon that obtained consent, but did not perform the surgery is liable for malpractice. The surgeon performing the surgery is liable for battery. The importance of the side effects of a drug (prednisone) came to a Massachusetts court's attention in 1986 when a patient suffered serious adverse effects of this drug used after eye surgery. It seems there was controversy about whether the physician should have known about the possible side effects, and then disclosed this potential complication of the drug to the patient.

While our survey questions originated primarily from adverse experiences of patients, it is clear that court decisions have pointed the way to a new era of the patient's voice being heard in the context of shared-decision making and informed consent. That voice says to clinicians who would perform an invasive procedure, "We patients want to know more than you have been telling us." We want to know all of our choices and their risks and benefits, we want to know the risks and benefits of drugs prescribed to us and devices placed in us, we want to view decision aids when available, we want to know the skill level of the physician(s) performing our procedure, and we want to know our costs. Moreover, we want an advocate present during shared-decision making, we want full access to our medical records, we want to review consent documents at least 24 hours before signing them, and we want to know the expected outcomes of the invasive procedure to include recovery times, pain management, and infection risks.

Limitations

In order to respect the time of responders to our survey, we limited it to 10 questions applicable to an informed consent discussion in a hypothetical situation. In real clinical settings, it is likely

that our "template" will need to be augmented with questions specific to the situation the patient faces. These should be designed to elicit the patient's preferences. We also recognize that some of the answers are out of the clinician's hands; for example, clinicians in the U.S. are seldom going to know the patient's out-of-pocket costs. We also recognize that clinicians may need the assistance of pharmacists in conveying the benefits, risks, and alternatives to off-label or black-box-warning drugs. Surveys like ours involving a hypothetical scenario may be limited because in a real and stressful situation a patient may simply want to trust doctors' recommendations or may be afraid to ask too many questions. In a sense, our hypothetical "reasonable patient" has become a "frightened patient" when placed in a real situation, but that does not mean that he or she does not want to know answers to the all the questions in our survey.

Selection bias is always a possibility in surveys such as ours. Survey takers were recruited from the 3 different groups to which we had access. One clear bias is that the survey platform was electronic and written in English, eliminating any potential responses from people that do not have electronic access or do not read English well enough to participate in the survey. The number of adult Americans who cannot read has been estimated at about 32 million.²⁰ Our results do not apply to populations outside the U.S. where there may be higher or lower trust of the healthcare delivery system, or where people are desperate to get any medical care. Despite large demographic differences in the smaller survey populations (table 1) and the different methods of recruitment in all 3 surveys, the consistency of the results across the 3 surveys suggests that the data in table 2 are representative of the majority of people living in the U.S.

Conclusions

Through two targeted surveys and a U.S. national survey, we have affirmed that a reasonable patient will want to know far more information than is generally conveyed during typical shared-

decision making that leads to no more than a partly informed decision by the patient. Survey respondents wanted to know risks and benefits of all treatment options, the risks and benefits of off-label and box-warning drugs. They wished to view decision aids, know precisely who will perform the procedure, and their anticipated out-of-pocket costs. Their desire was for an advocate to be present during shared-decision making, have periodic opportunities to review their medical record, have a full day to review informed-consent documents, and to be made aware of expected outcomes and restrictions after the procedure. We expect our findings to have implications for what defines a reasonable patient standard for informed consent. ore trien only

Figure 1. National intensity scores above 4.0 vs. question number for gender differences in the national survey. Responses came from 497 males and 570 females.

Figure 2. National intensity scores above 4.0 vs. question number for age differences in the national survey. Responses came from 297, 230, 343, and 197 people in the four respective age groups.

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Figure 1. Effect of gender on survey responses



A Baseline for the "Reasonable Patient Standard"

Investigators: John T. James, PhD, Patient Safety America, Houston, TX (retired NASA Chief Toxicologist) and Darwin J. Eakins, MS, (retired statistical expert, University of Kansas), Survey Consultant, Lawrence, KS

Background: Recent changes in the law on informed consent in the U.K. to favor a "reasonable patient standard" over a "reasonable clinicians' standard" prompted experts on informed consent to survey the situation in the U.S. Laws defining informed consent vary from state to state. Laws in half the states favor the reasonable-patient-standard (RPS) and others favor the reasonable-clinicians-standard.¹ A debate ensued about the problems with the RPS because it is going to vary from patient to patient. As part of the debate, an opponent of the RPS stated that perhaps a baseline RPS could be formulated.ⁱⁱ It is our intent to begin to define a general baseline for the RPS. This is essential if patient-centered-care and shared-decision making are to become a reality. Texas is a RPS state.ⁱⁱⁱ Please note that for our purposes a "reasonable person" and a "reasonable patient" are identical.

Methods: We will use the Survey Monkey Platform to capture the demographics of each survey participant, and then they will answer 10 questions related to what they would like to know when facing the possibility of an invasive procedure while hospitalized. There are two identical versions of the survey, one intended to be taken simultaneously by an audience, and the other to be taken by individuals to whom the survey-link is sent via email. The survey platform prevents individuals from taking the survey more than once from their electronic device or computer. A link to the beta-version of the survey is given here: https://www.surveymonkey.com/r/8Y5Q3MF. Those taking the survey have 5 choices to express the degree to which they would like to know an answer to the question posed in the survey. Those responses range in 5 levels from "Definitely no" to "Definitely yes."

Recruitment: Our plan is to survey up to 1,000 adults in a variety of categories. These have not been fully fixed at this point, but our target groups are as follows: students of nursing, mature and retired nurses, health professions educators, retired individuals, people with knowledge of patient safety issues, and a nationally representative group of adults. Subjects will be recruited vis email or at presentations to groups, such as nursing students (see below). Our **primary hypothesis** is that across the survey groups and for most of the questions the participants will answer either "probably yes" or "definitely yes" to the questions. Our secondary goal is to discover groups that differ significantly from the overall average. We will use t-tests to determine statistical (P<0.05) differences between groups for selected questions that seem worth exploring.

Results: At this point the survey has been administered to nursing students attending a lecture on informed consent at Galveston College (April 19, 2018). There were 77 respondents to the survey, which was taken early in the lecture. Later in the lecture, the results of the survey were presented to the group of students. The data were readily available in graphical and numerical form to the audience. This was done to prove-out our ability to capture data in near-real time.

Funding: The research is being funding by Patient Safety America, Houston, TX. This will be less than \$1,000 for the survey platform and additional costs if we choose to survey a nationally representative group to which we purchase access.

ⁱ https://jamanetwork.com/journals/jama/fullarticle/2516469

" CIVIL PRACTICE AND REMEDIES CODE

TITLE 4. LIABILITY IN TORT

CHAPTER 74. MEDICAL LIABILITY

SUBCHAPTER C. INFORMED CONSENT

r Sec. 74.101. THEORY OF RECOVERY. In a suit against a physician or health care provider involving a health care liability claim that is based on the failure of the physician or health care provider to disclose or adequately disclose the risks and hazards involved in the medical care or surgical procedure rendered by the physician or health care provider, the only theory on which recovery may be obtained is that of negligence in failing to disclose the risks or hazards that could have influenced a reasonable person in making a decision to give or withhold consent.

ⁱⁱ https://jamanetwork.com/journals/jama/article-abstract/2547748?redirect=true

Reasonable Patient Care - Phone

You are hospitalized in a large, urban, teaching hospital after being brought into its emergency room last night. The condition that brought you to the ER has been stabilized, but additional procedures may be necessary. The following 10 questions determine what you would like to know as a reasonable patient. The survey should take no more than 5 minutes. There are only sixteen (16) items.

Reasonable Patient Care - Phone	
Age	
Page 1 of 16	
1. Age	
Under 18	45-54
18-24	55-64
25-34	65+
35-44	
Reasonable Patient Care - Phone	
Gender	
Page 2 of 16	
2. Gender	
Male	
Female	
Reasonable Patient Care - Phone	

Education

Page 3 of 16

3. Education	
HS Grad	Advance Degree
College Grad	
Reasonable Patient Care - Phone	
Race/Ethnicity	
Page 4 of 16	
4. Race/Ethnicity	
White or Caucasian	American Indian or Alaska Native
Black or African American	Native Hawaiian or other Pacific Islander
Hispanic or Latino	Another race
Asian or Asian American	
Reasonable Patient Care - Phone	
Worked in Hospital	
Page 5 of 16	
5. Have you worked in a hospital?	
Yes	No
If Yes, your job was:	
Reasonable Patient Care - Phone	
Alternatives/Risks/Benefits	
Page 6 of 16	
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procedures, insertion of a medical	
Definitely no	Probably yes
Probably no	Definitely yes
Neutral	
Reasonable Patient Care - Phone	
Drugs	
Page 7 of 16	
7. Drugs that have not been appro- for you. Drugs prescribed off-label prescribed on-label. Would you like effects may be?	ved by the Food and Drug Administration for your condition are off-lab are about twice as likely to cause serious side-effects as drugs e to know if any drugs prescribed to you are off-label, and what their s
Definitely no	Probably yes
Probably no	Definitely yes
Neutral	
Reasonable Patient Care - Phone	2
Drugs Assigned "Black Box" Warr	ning
Page 8 of 16	
8. Drugs assigned a "black box" wa prescribed such a drug, would you alternatives before you take it?	arning by the FDA pose an especially serious risk of harm. If you are want to know the reasons for the black box warning and if there are
O Definitely no	Probably yes
Probably no	O Definitely yes
Neutral	
Reasonable Patient Care - Phone	2

Page 9 of 16

9. Decision aids are created to assist patients with complex medical decisions and to help them understand the risks and benefits of treatment options. If there is a decision-aid available for your illness, would you like to review it?

\bigcirc	Definitely no	\bigcirc	Probably yes
\bigcirc	Probably no	\bigcirc	Definitely yes
\bigcirc	Neutral		

Reasonable Patient Care - Phone

Considering	Invasive	Procedure
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Page 10 of 16

10. If you are considering an invasive procedure, would you like to know who will be performing it, their skill level, and how trainee doctors, if any, will be involved?

O Definitely no	Probably yes
Probably no	O Definitely yes
Neutral	

Reasonable Patient Care - Phone

Out-Of-Pocket Costs

Page 11 of 16

11. Assuming you have decided on a procedure or treatment, would you like to know what your total, outof-pocket costs will be?

Definitely no	Probably yes
Probably no	O Definitely yes
Neutral	

Reasonable Patient Care - Phone

Family Member a	s Advicate
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Page 12 of 16

12. You have a trusted family member that is willing to act as your advocate. Would you like for that person to be present during shared-decision-making about your medical care?

O Definitely no	Probably yes
Probably no	O Definitely yes

Neutral

Reasonable Patient Care - Phone

Make Entries In Medical Records

Page 13 of 16

13. If you are well enough, would you like to be offered a chance to review and make entries in your medical records each day while you are hospitalized?

Definitely no	Probably yes
Probably no	Definitely yes
Neutral	

Reasonable Patient Care - Phone

Documents Permitting Invasive Procedures

Page 14 of 16

14. Before signing any documents permitting invasive, non-emergency procedures would you like to review these at least one full day in advance of the procedure?

O Definitely no	Probably yes
Probably no	O Definitely yes
Neutral	

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2

Expected Difficulties /Recovery Times/Restrictions Page 15 of 16 15. If you are considering an invasive procedure, would you like to know your expected difficulties, recovery times, pain management options, and restrictions after the procedure while hospitalized and after discharge from the hospital? This includes the risk of infection from the invasive procedure. Definitely no Probably yes Probably no Definitely yes Neutral Page 16 of 16 16. What else would you like to know as a reasonable patient?

Reasonable Patient 3

Reasonable Patient Care Survey

You are hospitalized in a large, urban, teaching hospital after being brought into its emergency room last night. The condition that brought you to the ER has been stabilized, but additional procedures may be necessary. The following 10 questions determine what you would like to know as a reasonable patient. The survey should take no more than 5 minutes.

* 1. Would you like to know all your treatment choices, including alternatives and risks and benefits of each choice for a patient like you. Your choices may include invasive procedures (surgery, endoscopic procedures, insertion of a medical device), non-invasive treatments, and what happens if you do nothing?

1=definitely no	2=probably no	3=neutral	4=probably yes	5=definitely yes
\bigcirc	\bigcirc	\bigcirc	\bigcirc	\bigcirc

* 2. Drugs that have not been approved by the Food and Drug Administration for your condition are off-label for you. Drugs prescribed off-label are about twice as likely to cause serious side-effects as drugs prescribed on-label. Would you like to know if any drugs prescribed to you are off-label, and what their side effects may be?

1-definitely no	2-probably no	3-neutral	4-probably yes	5-definitely yes
\bigcirc	\bigcirc	\bigcirc	\bigcirc	\bigcirc

* 3. Drugs assigned a "black box" warning by the FDA pose an especially serious risk of harm. If you are prescribed such a drug, would you want to know the reasons for the black box warning and if there are alternatives before you take it?

1-definitely no	2-probably no	3-neutral	4-probably yes	5-definitely yes
\bigcirc	\bigcirc	\bigcirc	\bigcirc	\bigcirc

* 4. Decision aids are created to assist patients with complex medical decisions and to help them understand the risks and benefits of treatment options. If there is a decision-aid available for your illness, would you like to review it?

1-definitely no	2-probably no	3-neutral	4-probably yes	5-definitely yes
\bigcirc	\bigcirc	\bigcirc	\bigcirc	\bigcirc

* 5. If you are considering an invasive procedure, would you like to know who will be performing it, their skill level, and how trainee doctors, if any, will be involved?

1-definitely no	2-probably no	3-neutral	4-probably yes	5-definitely yes
\bigcirc	\bigcirc	\bigcirc	\bigcirc	\bigcirc

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1-definitely no	2-probably no	3-neutral	4-probably yes	5-definitely y
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* 7. You have a trusted	family member that is v	willing to act as you	advocate. Would you	like for that per
to be present during s	hared-decision-making	about your medica	l care?	
1-definitely no	2-probably no	3-neutral	4-probably yes	5-definitely y
\bigcirc	\bigcirc	\bigcirc	\bigcirc	\bigcirc
* 8. If you are well enou records each day whil	igh, would you like to b e you are hospitalized?	e offered a chance	to review and make en	tries in your me
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* 10. If you are consider recovery times, pain r	ring an invasive proced nanagement, and restri	lure, would you like	to know your expected	I difficulties, ed and after
* 10. If you are consider recovery times, pain r discharge from the ho 1-definitely no	ring an invasive proced nanagement, and restri spital? This includes th 2-probably no	lure, would you like ictions after the prod le risk of infection fro 3-neutral	to know your expected cedure while hospitalize om the invasive proced 4-probably yes	l difficulties, ed and after lure. 5-definitely y
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Demographic measure	Student Nurses	HPESS Community	p-Value
	(n = 77)	(n = 63)	
Under 35 years of age	76.7%	3.2%	0.0000
Female	77.9%	69.8%	0.2755
High school graduate	33.8%	1.6%	0.0000
College graduate	64.9%	4.8%	0.0000
Advanced degree	1.3%	90.5%	0.0000
White or Caucasian	50.6%	84.1%	0.0000
Black or African American	15.6%	3.2%	0.0151
Hispanic or Latino	26.0%	1.6%	0.0001
Asian	3.9%	6.3%	0.5161
Have worked in a hospital	35.1%	85.7%	0.0000

Under 35 years of age

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diff Ho: diff	= prop(x) - p = 0	rop(y)			Z	= 8.7242
Ha: diff Pr(Z < z) =	< 0 1.0000	Ha: Pr(Z >	diff != 0 z) = 0.	0000	Ha: d Pr(Z > z	iff > 0) = 0.0000

Female.

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х У	.779 .698	.0472846 .0578443			.6863239 .5846272	.8716761 .8113728
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diff 	.601 under Ho:	.060694 .0823973	7.29	0.000	.4820419	.719958
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$\begin{array}{c} \text{diff} = \operatorname{prop}(x) - \operatorname{prop}(y) & z = -4.15 \\ \text{Ho: diff} = 0 & \text{Ha: diff} = 0 & \text{Ha: diff} > 0 \\ \text{Pr}(z < z) = 0.0000 & \operatorname{Pr}(z > z) = 0.0000 & \operatorname{Pr}(z > z) = 1.00 \\ \end{array}$ $\begin{array}{c} \textbf{.} \textbf{Black or African American} \\ \textbf{.} \textbf{prtesti 77 .156 63 .032} \\ \textbf{Two-sample test of proportions} & x: Number of obs = \\ y: Number of obs = \\ \hline variable & Mean & Std. Err, & z & P> z & [95% Conf. Interva \\ x & .156 & .0413512 & .0749531 & .23704 \\ y & .032 & .0221739 &0114601 & .07546 \\ \hline diff & .124 & .0469213 & .032036 & .2159 \\ \hline diff = prop(x) - prop(y) & z = 2.43 \\ Ho: diff = 0 & Ha: diff != 0 \\ Pr(z < z) = 0.9925 & \operatorname{Pr}(z > z) = 0.0151 & \operatorname{Pr}(z > z) = 0.000 \\ \hline \end{array}$	d	iff	+ 335 under Ho:	.0732722 .0806592		0.000	4786108	19138
Ha: diff < 0 Pr(2 < z) = 0.0000 Pr(z > z) = 0.0000 Pr(z > z) = 1.00 Pr(z > z) = 1.00 Pr(z > z) = 1.00 Pr(z > z) = 0.000 Pr(z > z) = 0.000	d d Ho: d	iff iff	= prop(x) - p: = 0	rop (y)			Z	= -4.15
Black or African American prtesti 77 .156 63 .032 Two-sample test of proportions x : Number of obs = y: Number of obs = Variable Mean Std. Err. z P> z [95% Conf. Interva x .156 .0413512 .0749531 .23704 y .032 .0221739 .0114601 .07546 diff .124 .0469213 .032036 .2159 under Ho: .05101 2.43 0.015 diff = prop(x) - prop(y) z = 2.43 Ho: diff = 0 Ha: diff < 0 Ha: diff != 0 Ha: diff > 0 Pr(Z < z) = 0.9925 Pr(Z > z) = 0.0151 Pr(Z > z) = 0.00 Ha: diff < 0 Ha: diff != 0 presti 77 .260 63 .016 Two-sample test of proportions x : Number of obs = y: Number of obs = Variable Mean Std. Err. z P> z [95% Conf. Interva x .26 .049987 .1620273 .35797 y .016 .0158084 .010 Mai diff = 0 Ha: diff < 0 Ha: diff != 0 Ha: diff > 0 fiff = prop(x) - prop(y) z = 4.02 diff = prop(x) - prop(y) z = 4.02 Ha: diff < 0 Ha: diff != 0 Ha: diff > 0 Pr(Z < z) = 1.0000 Pr(Z > z) = 0.0001 Pr(Z > z) = 0.00	Ha: d Pr(Z < z	iff) =	< 0 0.0000	Ha: Pr(Z >	diff != z) = (0.0000	Ha: c Pr(Z > z	liff > 0 () = 1.000
Two-sample test of proportions x: Number of obs = Variable Mean Std. Err. z P> z [95% Conf. Intervalian of the state of	Blac l . prtesti	k or	African Am .156 63 .032	erican				
Variable Mean Std. Err. z $P > z $ $[95\%$ Conf. Interva x .156 .0413512 .0749531 .23704 y .032 .0221739 0114601 .07546 diff .124 .0469213 .032036 .2159 diff = prop(x) - prop(y) $z = 2.43$ 0.015 main diff = 0 Ha: diff != 0 Ha: diff > 0 Pr(Z < z) = 0.9925	[wo-sampl	e te	st of proport:	ions		х: у:	Number of obs Number of obs	= -
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Varia	ble	Mean	Std. Err.	z	₽> z	[95% Conf.	Interval
diff .124 .0469213 .032036 .2159 diff prop(x) - prop(y) z = 2.43 Ho: diff = 0 Latiff < 0		x y	.156 .032	.0413512 .0221739			.0749531 0114601	.237046
$\begin{array}{c} \text{diff} = \text{prop}(x) - \text{prop}(y) & z = 2.43 \\ \text{Ho: diff} = 0 & \text{Ha: diff} != 0 & \text{Ha: diff} > 0 \\ \text{Pr}(Z < z) = 0.9925 & \text{Pr}(Z > z) = 0.0151 & \text{Pr}(Z > z) = 0.00 \\ \end{array}$	d	iff	+ .124 under Ho:	.0469213 .05101	2.43	0.015	.032036	.21596
Ha: diff < 0	d Ho: d	iff iff	= prop(x) - p: = 0	гор (у)		Z	z	= 2.430
Hispanic or Latino prtesti 77 .260 63 .016 Ywo-sample test of proportions x: Number of obs = Variable Mean Std. Err. z $P > z $ [95% Conf. Interva x .26 .049987 .1620273 .35797 y .016 .0158084 0149838 .04698 diff .244 .0524272 .1412447 .34675 under Ho: .0606934 4.02 0.000 diff = prop(x) - prop(y) $z = 4.02$ Ha: diff < 0	Ha: d Pr(Z < z	iff) =	< 0 0.9925	Ha: Pr(Z >	diff != z) = (0.0151	Ha: c Pr(Z > z	liff > 0 () = 0.007
Fwo-sample test of proportions x: Number of obs = Variable Mean Std. Err. z $P > z $ [95% Conf. Interva x .26 .049987 .1620273 .35797 y .016 .0158084 0149838 .04698 diff .244 .0524272 .1412447 .34675 under Ho: .0606934 4.02 0.000 diff = prop(x) - prop(y) $z = 4.02$ Ho: diff = 0 Ha: diff > 0 Ha: diff < 0	. Hispar . prtesti	nic o 77	r Latino .260 63 .016					
Variable Mean Std. Err. z $P > z $ [95% Conf. Intervalue x .26 .049987 .1620273 .35797 y .016 .0158084 0149838 .04698 diff .244 .0524272 .1412447 .34675 under Ho: .0606934 4.02 0.000 diff = prop(x) - prop(y) $z = 4.02$ Ho: diff = 0 Ha: diff != 0 Ha: diff < 0	Two-sampl	e te	st of proport:	ions		х: У:	Number of obs Number of obs	= 7
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Varia	ble	Mean	Std. Err.	z	P> z	[95% Conf.	Interval
<pre>diff .244 .0524272 .1412447 .34675 under Ho: .0606934 4.02 0.000 diff = prop(x) - prop(y) z = 4.02 Ho: diff = 0 Ha: diff < 0 Ha: diff != 0 Ha: diff > 0 Pr(Z < z) = 1.0000 Pr(Z > z) = 0.0001 Pr(Z > z) = 0.00 .</pre>		x Y	.26 .016	.049987 .0158084			.1620273 0149838	.357972
diff = prop(x) - prop(y) Ho: diff = 0 Ha: diff < 0 Pr(Z < z) = 1.0000	d	iff	+ .244 under Ho:	.0524272 .0606934	4.02	0.000	.1412447	.346755
Ha: diff < 0 Ha: diff != 0 Ha: diff > 0 Pr(Z < z) = 1.0000 Pr(Z > z) = 0.0001 Pr(Z > z) = 0.00	d Ho: d	iff iff	= prop(x) - p: = 0	гор (у)			Z	= 4.020
	Ha: d Pr(Z < z	iff) =	< 0 1.0000	Ha: Pr(Z >	diff != z) = (0.0001	Ha: c Pr(Z > z	liff > 0 () = 0.000

. Asian . prtesti 77	.039 63 .063				
Iwo-sample te	st of proport	ions		х: У:	Number of obs = Number of obs =
Variable	Mean	Std. Err.	Z	P> z	[95% Conf.
х У	.039 .063	.0220622 .0306105			0042411 .0030046
diff	+ 024 under Ho:	 .0377325 .0369548	-0.65	0.516	0979543
diff	= prop(x) - p	 rop(y)			Z =
Ha: diff Pr(Z < z) =	< 0 0.2580	Ha: d Pr(Z >	iff != 0 z) = 0.5	161	Ha: di Pr(Z > z)
. Have worl . prtesti 77	ked in a hosp .351 63 .857	oital			
Two-sample te	st of proport	ions		х: у:	Number of obs = Number of obs =
Variable	Mean	Std. Err.	Z	P> z	[95% Conf.
х У	.351 .857	.0543914 .044105			.2443947 .7705557
diff	506 under Ho:	.0700263 .0838824	-6.03	0.000	643249
diff Ho: diff	= prop(x) - p = 0	rop(y)		Z	Z =
Ha: diff $Pr(Z < z) =$	< 0	Ha: d	iff != 0 zl) = 0.0	000	Ha: di $Pr(7 \ge 7)$
(_ * _)					

Nurs	se-Stu	dent Statis	stics Report	t						
Sum	mary									
• 0	uestic	on – For eacl	n of the ques	tions, 1-10,	is there a diff	erence in the	e average re	esponse <u>b</u>	<u>y age</u> ?	
А	nswer	– NO, ther	e are no sign	ificant diffe	rences among	age groups i	in their res	ponses to	any of the 10 qu	uestion
• 0	uestic	on – For eacl	n of the ques	tions, 1-10,	is there a diff	erence in the	e average ro	esponse <u>b</u>	y gender?	
A	nswer	– NO, there	e are no signi	ficant differ	rences betwee	n the gender	rs in their r	esponses	to any of the 10	questic
• 0	uestic	on – For eacl	n of the ques	tions, 1-10,	is there a diff	erence in the	e average ro	esponse <u>b</u>	y level of educa	<u>tion</u>
A q	nswer uestio	– NO, there ons.	e are no signi	ficant differ	rences among	the education	n levels in	their respo	onses to any of	the 10
• 0	uestic	on: For each	of the quest	ions, is ther	e a difference	in the avera	ge respons	e <u>based u</u>	oon racer or eth	<u>nicity</u>
А	nswer	– YES. for a	uestions 1.5	. and 6.						
. dun	ntest	iq1, by(iet	ch) ma(bh) wi	rap						
K-Wal	lis pı	robability =	= <mark>0.0038</mark>			4.				
		Dunn'	s Pairwise ((Benja	Comparison amini-Hochb	of iq1 by iet erg)	h				
Col M Row M	ean- ean	1	2	3	4					
	2	3.061273 <mark>0.0110</mark>								
	3 	-0.085671 0.5176	-1.871072 0.0613							
	4	-0.166771 0.5422	-2.646096 <mark>0.0204</mark>	0.000000 0.5000						
	7 	2.553091 <mark>0.0178</mark>	-0.755791 0.3213	1.387066 0.1379	2.097047 0.0450					
False <mark>Rejec</mark>	Disco t Ho i	overy Rate =	= 0.05 <= z) <= FI	<mark>DR/2</mark> with s	topping rule					
. dun K-Wal Dunn'	ntest lis pi s Pain	iq5, by(iet cobability = cwise Compar	ch) ma(bh) wi = <mark>0.0001</mark> rison of iq5 (Benja	rap by ieth amini-Hochb	erg)					
Row M	ean +-	1	2	3	4					
	2 	1.713447 0.0866								
	3 	2.264929 0.0294	0.858920 0.2440							
	4	-0.476526 0.3521	-1.710491 0.0726	-2.265841 0.0391						

_

False Discover								
Reject Ho if p	ry Rate = p = P(Z <=	0.05 z) <= FD	<mark>R/2</mark> with s	topping rule				
dunata ta day	C beeld at b)						
Kwallis probab	oility =	0.0245	ap					
	Dunn's	Pairwise C	omparison (of iq6 by ieth				
Col Mean-		(Benja:	mini-Hocho	erg)				
Row Mean		2		4				
2 (0.459251 0.3589							
3 -(0.624727	-0.785168						
	0.3326	0.3088						
4 -	0.2242	-1.110396 0.2224	0.000000					
7 2	2.934536 <mark>0.0084</mark>	1.546239 0.1526	2.055206	3.107180 0.0094				
False Discove:	ry Rate =	0.05						
Reject Ho if p	p = P(Z <=	z) <= FD	R/2 with s [†]	topping rule				
Question -	- For each o	of the quest	ions, 1-10,	is there a differ	ence in the	average resp	onse <u>if responden</u>	t is or
<u>hospital w</u>	orker?							
Answer –	NO there	are no signi	ficant differ	rences among g	rouns hase	l unon hosnit	tal work experienc	o in t
responses	to any of t	he 10 quest	ions.	rences anong g	oups, based	i upon nospi		.e, iii t
responses	to any or t	ine io quest	10113.					
Statistics								
Statistics				L	~			
Statistics Question -	- For each (of the quest	ions, 1-10,	is there a differ	ence in the	average respo	onse by age amon	g thos
Statistics Question – identified 	- For each o their age g	of the quest roup?	ions, 1-10,	is there a differ	ence in the	average resp	onse by age amon	g thos
Statistics Question - identified	- For each o their age g	of the quest roup?) ma(bh) wr	ions, 1-10,	is there a differ	ence in the	average resp	onse by age amon	g thos
Statistics Question - identified dunntest iq: Warning: by()	- For each of their age g	of the quest roup?) ma(bh) wr e unlabeled	ions, 1-10, ap , option no	is there a differ	ence in the	average resp	onse by age amon	g thos
Statistics • Question - identified . dunntest iq: Warning: by()	- For each o their age g 1, by(iage values are	of the quest roup?) ma(bh) wr e unlabeled	ions, 1-10, ap , option no	is there a differ	ence in the	average resp	onse by age amon	g thos
Statistics • Question - identified . dunntest iq: Warning: by() Kruskal-Wallis	- For each of their age g 1, by(iage values are s equality	of the quest roup?) ma(bh) wr e unlabeled -of-populat	ions, 1-10, ap , option no ions rank f	is there a differ olabel implicit	ence in the	average resp	onse by age amon	g thos
Statistics Question - identified dunntest iq: Warning: by() Kruskal-Wallis	- For each of their age g 1, by(iage values are s equality	of the quest roup?) ma(bh) wr e unlabeled -of-populat	ions, 1-10, ap , option no ions rank f	is there a differ olabel implicit test	ence in the	average resp	onse by age amon	g thos
Statistics Question - identified dunntest iq: Warning: by() Kruskal-Wallis	- For each of their age g 1, by(iage values ard s equality s Rank St	of the quest roup?) ma(bh) wr e unlabeled -of-populat + um 	ions, 1-10, ap , option no ions rank ;	is there a differ olabel implicit	ence in the	average resp	onse by age amon	g thos
Statistics • Question - identified . dunntest iq: Warning: by() Kruskal-Wallis +	- For each of their age g 1, by(iage values ard s equality s Rank St 	of the quest roup?) ma(bh) wr e unlabeled -of-populat + um 00 00	ions, 1-10, ap , option no ions rank ;	is there a differ olabel implicit test	ence in the	average resp	onse by age amon	g thos
Statistics Question - identified dunntest iq: Warning: by() Kruskal-Wallis	- For each of their age g	of the quest roup?) ma(bh) wr e unlabeled -of-populat + um 00 50 50	ions, 1-10, ap , option no ions rank f	is there a differ olabel implicit	ence in the	average resp	onse by age amon	g thos
Statistics • Question - identified . dunntest iq: Warning: by() Kruskal-Wallis +	- For each (their age g 1, by(iage values are s equality s Rank Sp 	of the quest roup?) ma(bh) wr e unlabeled -of-populat + um 00 00 50 50 50	ions, 1-10, ap , option no ions rank f	is there a differ olabel implicit test	ence in the	average resp	onse by age amon	g thos
Statistics • Question - identified . dunntest iq: Warning: by() Kruskal-Wallis +	- For each (their age g 1, by (iage values ard s equality s Rank St 2 67. 2 402. 4 405. 5 806. 0 335.	of the quest roup?) ma(bh) wr e unlabeled -of-populat + um 00 50 50 50 00 +	ions, 1-10, ap , option no ions rank f	is there a differ olabel implicit	ence in the	average resp	onse by age amon	g thos
Statistics • Question identified . dunntest iq: Warning: by() Kruskal-Wallis +	- For each (their age g 1, by(iage values are s equality s Rank Si 2 67. 2 402. 4 405. 5 806. 0 335. 0.550 0.968	of the quest roup?) ma(bh) wr e unlabeled -of-populat + um 00 00 50 50 50 50 50 50	ions, 1-10, ap , option no ions rank f	is there a differ olabel implicit test	ence in the	average resp	onse by age amon	g thos
Statistics Question - identified dunntest iq: Warning: by() Kruskal-Wallis H	- For each of their age g 1, by (iage) values are s equality s Rank St 2 67. 2 402. 4 405. 5 806. 0 335. 0.550 0.968 ith ties =	of the quest roup?) ma(bh) wr e unlabeled -of-populat + um 00 00 50 50 50 50 50 50	ions, 1-10, ap , option no ions rank f	is there a differ olabel implicit test	ence in the	average resp	onse by age amon	g thos
Statistics • Question - identified . dunntest iq: Warning: by() Kruskal-Wallis +	- For each (their age g 1, by (iage) values are s equality s Rank Sp 2 67. 2 67. 2 402. 4 405. 5 806. 0 335. 0.550 0.968 ith ties = 0.401	of the quest roup?) ma(bh) wr e unlabeled -of-populat + um 00 00 50 50 50 50 50 50	ions, 1-10, ap , option no ions rank f	is there a differ olabel implicit test	ence in the	average resp	onse by age amon	g thos
Statistics • Question - identified . dunntest iq: Warning: by() Kruskal-Wallis +	- For each (their age g 1, by(iage) values ard s equality s Rank St 2 67.1 2 402.1 4 405.2 5 806.2 0 335.1 0.550 0.9682 ith ties = 0.4010 Dunn's	of the quest roup?) ma(bh) wr e unlabeled -of-populat + um + 00 00 50 50 50 50 50 50	ions, 1-10, ap , option no ions rank f with 4 d.f omparison o mini-Hochbo	is there a differ olabel implicit test of iql by iage erg)	ence in the	average resp	onse by age amon	g thos
Statistics • Question - identified . dunntest iq: Warning: by() Kruskal-Wallis +	- For each (their age g 1, by (iage values are s equality s Rank Si 	of the quest roup?) ma(bh) wr e unlabeled -of-populat + um 1 1 00 1 00 1 50 1 50 1 50 1 50 1 50 1 50	ions, 1-10, ap , option no ions rank f ions rank f with 4 d.f omparison of mini-Hochbo	is there a differ olabel implicit test of iq1 by iage erg) 5	ence in the	average resp	onse by age amon	g thos

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```
0.6250
             1
                          1.704583
            5 |
                 0.887093
2
                   0.4688
                             0.4414
3
                          0.522019 -1.459674
            6 |
                 0.249476
4
                   0.5736
                             0.6017
                                      0.2406
             5
6
            7
                 0.000000 0.000000 -1.619603 -0.489962
                  0.5556
                           0.5000 0.2633 0.5201
7
             8
     False Discovery Rate = 0.05
9
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
10
11
     . dunntest iq2, by(iage) ma(bh) wrap
12
13
     Warning: by() values are unlabeled, option nolabel implicit
14
15
     Kruskal-Wallis equality-of-populations rank test
16
       +----+
17
       | iage | Obs | Rank Sum |
18
         _____
19
           3 |
               2 |
                       57.00 |
            4 | 12 |
                     320.50
20
            5 |
                14 |
                       396.50
21
                25 |
            6 |
                       857.50
22
            7 | 10 | 384.50 |
           ------
23
24
                      3.269 with 4 d.f.
     chi-squared =
25
     probability =
                     0.5139
26
     chi-squared with ties =
                               4.720 with 4 d.f
27
     probability =
                      0.3173
28
29
                     Dunn's Pairwise Comparison of iq2 by iage
30
                               (Benjamini-Hochberg)
31
     Col Mean-|
                                                     5
     Row Mean |
                          3
                                        4
32
33
                 0.153782
            4 1
34
             0.4877
35
            5 |
                 0.015486 -0.268804
36
                   0.4938
                           0.4926
             37
                -0.517415 -1.417114 -1.174105
            6 |
38
                                      0.3004
             0.4320
                          0.2607
39
40
            7 |
                -0.842084 -1.797699 -1.603668 -0.727096
                   0.3997
                             0.3611
                                      0.2720
                                                  0.3893
41
             42
     False Discovery Rate = 0.05
43
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
44
45
     . dunntest iq3, by(iage) ma(bh) wrap
46
47
     Warning: by() values are unlabeled, option nolabel implicit
48
49
     Kruskal-Wallis equality-of-populations rank test
50
       +----+
51
       | iage | Obs | Rank Sum |
52
        ------
53
           3 | 2 |
                       20.00
           4 | 12 |
                      428.00
54
           5 | 14 |
                     405.50
55
            6 |
                25 |
                       806.00
           7 | 10 | 356.50 |
56
                   ____+
          _____
57
58
                      4.146 with 4 d.f.
     chi-squared =
59
     probability =
                      0.3866
                           For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml
60
```

Col 1			Dunn	s Pairwi (B	se Co enjam	omparison nini-Hochk	of iq3 1 perg)	oy iage		
Row 1	Mean- Mean			3		4		5	6	
	4	-2.	596467 0.0471							
	5	-1.	938328 0.0657	1.3163 0.18	42 81					
	6	-2.	338350 0.0323	0.7538 0.28	82 - 18	-0.758192 0.3202				
	7	-2.	558488 0.0263	0.0030 0.49	07 - 88	-1.247607 0.1768	-0.704 0.2	145 674		
False Reje	e Disc ct Ho	covery if p	Rate = = P(Z <	= 0.05 <= z) <	= FDF	R/2 with s	stopping	rule		
. dui	nntest	: iq4,	by(iag	ye) ma(bh) wra	ap ontion r		implicit		
Nafii.	IIIG: L	ο <u>γ</u> () ν	aiues a	ire uniad	erea,	operon		Impiicit		
Krusl	kal-Wa	allis	equalit	y-of-pop	ulati	lons rank	test			
+	iage	Obs	Rank	+ Sum						
 	+ ا 3	2	+ 52	 2.50						
	4	12 14	305	5.00 2.50						
İ	6	25	854	50 1						
			1 00	i.JU						
+	7	10	384	1.50 +						
chi-: proba chi-: proba	7 square abilit square abilit	10 ed = cy = ed wit cy =	3.50 3.50 0.47 h ties 0.24	1.50 1.50 + 09 with 4 765 = 5.	d.f. 484 w	vith 4 d.1	. .			
chi-: proba chi-: proba	7 square abilit square abilit	10 ed = cy = ed wit cy =	3.50 0.47 h ties 0.24	1.50 1.50 1.50 9 with 4 765 = 5. 111 (B	d.f. 484 w se Cc enjam	with 4 d.f omparison nini-Hochk	of iq4 1	oy iage		
chi-: proba chi-: proba Col I Row I	7 square abilit square abilit Mean- Mean-	10 ed = ey = ed wit ey =	3.50 0.42 h ties 0.24	1.50 1.50 1.50 9 with 4 765 = 5. 111 (B 3	d.f. 484 w se Cc enjan	with 4 d.f omparison nini-Hochk 4	of iq4 1 berg)	by iage	6	
chi-s proba chi-s proba	7 square abilit square abilit Mean + 4	10 ed = ey = ed wit ey = 0.	3.50 0.47 h ties 0.24 Dunn' 074414 0.4703	1.50 1.50 9 with 4 765 = 5. 111 s Pairwi (B 3	d.f. 484 w se Cc enjan	with 4 d.f omparison nini-Hochk 4	of iq4 1 berg)	oy iage 5	6	
+ chi proba Col 1 Col 1 Row 1	7 square abilit square abilit Mean + 4 1 5	10 ed = ey = ed wit ey = 0.	3.50 0.47 h ties 0.24 Dunn ¹ 074414 0.4703 335113 0.4097	-0.7884 0.35	d.f. 484 w se Cc enjan 05 87	with 4 d.1 comparison nini-Hochk 4	of iq4 i berg)	by iage	6	
+ chi proba chi proba Col 11 Row 1	7 square abilit square abilit Mean 	10 ed = ey = ed wit ey = 0. -0.	3.50 0.47 h ties Dunn 0.4703 335113 0.4097 735992 0.2886	-0.7884 0.22	d.f. 484 w se Cc enjan 05 87 69 - 19	vith 4 d.1 omparison nini-Hochk 4 -0.861331 0.3891	of iq4 perg)	by iage	6	
+ bhi-: proba chi-: proba	7 square abilit square abilit Mean + 4 1 5 6 1 6 1 7	10 ed = ey = ed wit ey = 0. -0. -0. -1.	3.50 0.47 h ties Dunn 074414 0.4703 335113 0.4097 735992 0.2886 074190 0.3534	-0.7884 0.35 -0.7884 0.35 -1.7018 0.22 -2.0760 0.18	d.f. 484 w se Cc enjan 05 87 69 - 19 21 - 95	vith 4 d.f omparison nini-Hochk 4 	-0.778 0.3	oy iage 5 325 117	6	
False	7 square abilit square abilit Mean + 4 5 1 5 1 6 7 7 1 6 7 1 7	10 ed = ey = ed wit ey = 0. -0. -1. covery if p	3.5(0.42 h ties Dunn 0.24 Dunn 0.24 0.24 0.400 335113 0.4097 735992 0.2886 074190 0.2886 074190 0.3534 Rate = P(Z <	-0.7884 0.35 + 09 with 4 265 = 5. 111 3 -0.7884 0.35 -1.7018 0.22 -2.0760 0.18 = 0.05 (= z) <	d.f. 484 w se Cc enjan 05 87 69 - 19 21 - 95 = FDF	vith 4 d.1 omparison nini-Hochk 4 	-0.778 0.3 stopping	by iage 5 325 117 rule	6	
+ chi: proba chi: proba Col 11 Row 1 False Rejee . dun	7 square abilit square abilit Mean + 4 5 6 7 6 7 1 6 7 1 6 1 7 1 7	10 ed = ey = ed wit y = 0. -0. -0. -1. covery if p = iq5,	3.5(0.42 h ties Dunn 0.42 Dunn 0.424 Dunn 0.403 335113 0.4097 735992 0.2886 074190 0.2886 074190 0.3534 Rate = P(Z <	-0.7884 0.35 	d.f. 484 w se Cc enjan 05 87 69 - 19 21 - 95 = FDF) wra	<pre>vith 4 d.f omparison nini-Hochk</pre>	-0.778 0.3 stopping	by iage 5 325 117 rule	6	

iage											
3	2	39	.50								
4	12	326	.00								
5	14 25	419 861	.50								
7	10	370	.00								
+			+								
chi-squar(ed =	3.08	7 with	4 d.:	f.						
probabilit	су =	0.54	33								
chi-square	ed with	ties	= 7	.650	with 4 d.						
JIODADIII	-y -	0.10	<mark></mark>								
		Dunn'	s Pairw	vise (Comparison	of iq5	by iage				
Col Moon				(Benja	amini-Hochl	perg)	1 2				
Row Mean			3		4		5		6		
 1	+										
4	-0.8 C	.2527									
F	11	C02E1	0 (1)	0.07							
5	L T T	.2049	0.010	3008							
c	1 -	1 6 6 7 0	1 770		1 151401						
6		16672	-1.//8	255	0.1783						
_			1 0 7 6								
1	-1.9 C	12387	-1.972	2161 2430	-1.459248	-0.58	2784 2784				
False Disc	covery	Rate =	0.05	5							
Reject Ho	if p =	• P(Z <=	= z)	<= FI	DR/2 with	stopping	rule				
. dunntest	: iq6,	by(iag	e) ma(b	oh) wi	rap						
. dunntesi	: iq6,	by(iag	e) ma(b	oh) wi	rap)			
. dunntes† Warning: k	iq6, by() va	by(iago lues a:	e) ma(b re unla	oh) wi abeleo	rap d, option :	nolabel	implici	t			
. dunntes: Warning: k	z iq6, oy() va	by(iag	e) ma(k re unla	oh) wi abeleo	rap d, option :	nolabel	implici	t			
. dunntes Warning: W Kruskal-Wa	t iq6, by() va allis e	by(iag lues a qualit	e) ma(k re unla y-of-po	oh) wi abeleo opulat	rap d, option : tions rank	nolabel test	implici	t			
dunntes: Warning: } Kruskal-Wa	iq6, by() va allis e	by(iag	e) ma(k re unla y-of-pc	oh) wi abeleo opulat	rap d, option m tions rank	nolabel test	implici	t			
dunntes Warning: } Kruskal-Wa + iage	iq6, by() va allis e Obs	by(iago lues a equality Rank	e) ma(k re unla y-of-po + Sum 	oh) wi abeleo opulat	rap d, option : tions rank	nolabel test	implici	t			
dunntes: Warning: } Xruskal-Wa + iage 3	z iq6, by() va allis e Obs ++ 2	by(iago lues a equalit Rank a 83	e) ma(k re unla y-of-po + Sum .00	bh) wi abeled opulat	rap d, option : tions rank	nolabel test	implici	t			
. dunntes Warning: } Kruskal-Wa + iage 3 4	z iq6, by() va allis e Obs + 2 12	by(iageneric by) equality Rank a 83 402	e) ma(k re unla y-of-po + Sum .00 .50	bh) wi abeleo opulat	rap d, option : tions rank	nolabel test	implici	t			
dunntes Warning: } Xruskal-Wa + iage 3 4 5	: iq6, py() va allis e Obs 2 12 14	by(iag lues a equalit: Rank 83 402 380	e) ma(k re unla y-of-po + Sum .00 .50 .00	bh) wi abeleo opulat	rap d, option : tions rank	test	implici	t			
dunntes Warning: } Kruskal-Wa + iage 3 4 5 6 7	z iq6, py() va allis e + Obs + 2 12 14 25 9	by(iag lues a equalit; Rank 3 402 380 742 345	<pre>>) ma(k re unla y-of-po + Sum .00 .50 .00 </pre>	bh) wi abeleo opulat	rap d, option : tions rank	test	implici	t			
dunntes Warning: } Kruskal-Wa + iage 3 4 5 6 7 +	z iq6, py() va allis e Obs - 2 1 2 1 2 1 4 25 9	by(iag llues a equalit Rank : 83 402 3800 742 345	<pre>>) ma(k re unla y-of-pc + Sum .00 .50 .00 .50 .00 +</pre>	bh) wi	rap d, option : tions rank	nolabel test	implici	t			
. dunntes Warning: } Kruskal-Wa iage 3 4 5 6 7 +	<pre>c iq6, by() va allis e Obs 0bs 2 12 14 25 9 </pre>	by(iag qualit Rank 83 402 380 742 345	<pre>e) ma(k re unla y-of-pc + Sum .00 .50 .00 .50 .00 + 5 with</pre>	24 d	rap d, option : tions rank	test	implici	t			
. dunntes Warning: } Kruskal-Wa + iage 3 4 5 6 7 + chi-square probabilit	<pre>c iq6, py() va allis e Obs 2 12 14 25 9 </pre>	by(iag lues a equality Rank 3 402 380 742 345 3.12 0.53	<pre>e) ma(k re unla y-of-po + Sum .00 .50 .00 .50 .00 + 5 with 72</pre>	oh) wi abeled opulat 4 d.:	rap d, option : tions rank f.	test	implici	t			
. dunntes Warning: } Kruskal-Wa + iage 3 4 5 6 7 + chi-square probabilit	<pre>c iq6, py() va allis e l Obs l 2 l 12 l 12 l 25 l 25 g g ed = cy =</pre>	by(iag lues a equality Rank 33 402 380 742 345 	<pre>>) ma(k re unla y-of-po + Sum .00 .50 .00 </pre>	9h) wi abeleo opulat 4 d.:	rap d, option : tions rank f.	test	implici	t			
. dunntes Warning: } Kruskal-Wa + iage 3 4 5 6 7 + chi-square probabilit	<pre>c iq6, by() va allis e l Obs + l Obs + l 12 l 12 l 14 25 l 25 l 25 l 22 l</pre>	by(iag llues a equalit Rank : 83 402 3800 742 345 3.12 0.53 1 ties : 0.32	<pre>>) ma(k re unla y-of-pc + Sum .00 .50 .00 .50 .00 + 5 with 72 = 4</pre>	9h) wi abeled ppulat 4 d.: 4.632	rap d, option : tions rank f. with 4 d.	test	implici	t			
. dunntes Warning: 1 Kruskal-Wa + iage 3 4 5 6 7 + chi-square probabilit	<pre>c iq6, by() va allis e l Obs l</pre>	by(iag llues a equalit Rank 33 402 380 742 345 3.12 0.53 1 ties 0.32	<pre>a) ma(k re unla y-of-pc Sum + Sum .00 .50 </pre>	9h) wi abeleo ppulat 4 d.: 4.632	rap d, option ; tions rank f. with 4 d.	test	implici	t			
. dunntes Warning: 1 Kruskal-Wa + iage 3 4 5 6 7 + chi-square probabilit	<pre>c iq6, py() va allis e</pre>	by(iag lues a equality Rank 3 402 380 742 345 3.12 0.53 1 ties 5 0.32	<pre>e) ma(k re unla y-of-po+ Sum .00 .50 .00 .50 .00 + 5 with 72 = 4 72</pre>	4 d.:	rap d, option : tions rank f. with 4 d.	test	implici	t			
. dunntes Warning:] Kruskal-Wa + iage 3 4 5 6 7 + chi-square probabilit	<pre>c iq6, py() va allis e Obs 2 12 14 25 9 </pre>	by(iag llues a equality Rank 3 402 380 742 345 	<pre>a) ma(k re unla y-of-po + Sum .00 .50 .00 + 5 with 72 = 4 72 s Pairw</pre>	4 d.: 4 d.: 4.632 vise ((Benja	rap d, option : tions rank f. with 4 d. Comparison amini-Hochl	of iq6	implici by iage	t			
. dunntes Warning: 1 Kruskal-Wa + iage 3 4 5 6 7 + chi-square probabilit chi-square	<pre>c iq6, py() va allis e l Obs l+ l 12 l 12 l 14 25 l 9 l 25 l 9 ed = cy = ed with cy =</pre>	by(iag llues a equalit Rank : 83 402 3800 742 3.12 0.53 1 ties : 0.32 Dunn'	<pre>e) ma(k re unla y-of-po + Sum .00 .50 .00 .50 .00 + 5 with 72 = 4 72 s Pairv</pre>	4 d.: 4 d.: 4.632 7 jse (Benja	rap d, option : tions rank f. with 4 d. Comparison amini-Hochl	of iq6	implici by iage	t			
. dunntes Warning: 1 Kruskal-Wa + iage 3 4 5 6 7 + chi-square probabilit chi-square probabilit	<pre>c iq6, by() va allis e Obs 2 12 12 25 9 25 9 25 9 25 9 25 9 25 9 25 9 25 9 2 2</pre>	by(iag llues a equalit Rank : 83 402 3800 742 345 3.12 0.53 1 ties : 0.32 Dunn'	<pre>e) ma(k re unla y-of-po+ Sum Sum + Sum + Sum + 5 with 72 = 4 72 s Pairw 3</pre>	A d.: 4 d.: 4 d.: 4.632 7 ise (Benja	rap d, option : tions rank f. with 4 d. Comparison amini-Hochl 4	of iq6	implici by iage	t	6		
. dunntes Warning: 1 Kruskal-Wa iage iage 3 4 5 6 7 + chi-square probabilit chi-square probabilit	<pre>c iq6, by() va allis e l Obs l 2</pre>	by(iag llues a equalit; Rank : 83 402 380 742 345 3.12 0.53 1 ties : 0.32 Dunn';	<pre>e) ma(k re unla y-of-pc Sum + Sum .00 .50 </pre>	4 d.: 4 d.: 4 d.: (Benja	rap d, option r tions rank f. with 4 d. Comparison amini-Hochl 4	of iq6 berg)	implici by iage	t	6		
. dunntes Warning: 1 Kruskal-Wa iage iage 3 4 5 6 7 + chi-square probabilit chi-square probabilit	<pre>c iq6, py() va allis e Obs 2 12 12 14 25 9 25 9 25 9 25 9 25 9 25 27 = 29 = 29 = 29 = 20 with 29 = 20 vith 20 /pre>	by(iag) llues a equalit; Rank : 83 402 380 742 345 3.12 0.53 1 ties : 0.32 Dunn': 03165 0.3012	<pre>e) ma(k re unla y-of-pc Sum + Sum .00 .50 </pre>	4 d.: 4 d.: 1.632 vise ((Benja	rap d, option r tions rank f. with 4 d. Comparison amini-Hochl 4	of iq6	implici by iage	t	6		
. dunntes Warning: 1 Kruskal-Wa iage 3 4 5 6 7 + chi-square probabilit chi-square probabilit Col Mean- Row Mean	<pre>c iq6, py() va allis e</pre>	by(iag) lues a equality Rank 3 402 380 742 345 3.12 0.53 1 ties 3 0.32 Dunn' 03165 0.3012 81683	<pre>e) ma(k re unla y-of-pc Sum + Sum .00 .50 </pre>	A d.: 4 d.: 4 d.: 4.632 7 ise ((Benja 	rap d, option : tions rank f. with 4 d. Comparison amini-Hochl 4	of iq6 berg)	implici by iage 5	t	6		
. dunntes Warning:] Kruskal-Wa iage iage 3 4 5 6 7 + chi-square probabilit chi-square probabilit Col Mean- Row Mean 	<pre>c iq6, py() va allis e Obs 2 12 14 25 9 14 25 9 14 25 9 1.2 0.7 0.7</pre>	by(iag) lues a equality Rank 3 402 380 742 345 3.12 0.53 1 ties 3 0.32 Dunn 1 03165 .3012 81683 0.333	<pre>a) ma(k re unla y-of-po + Sum .00 .50 .00 .50 .00 + 5 with 72 = 4 72 3 3 3 </pre>	4 d.: 4 d.: 4 d.: 4 d.: 4 d.: 4 .632 7 ise ((Benja 7 642 3 4 0 5	rap d, option : tions rank f. with 4 d. Comparison amini-Hochl	of iq6 berg)	implici by iage	t	6		
. dunntes Warning:] Kruskal-Wa iage iage 3 4 5 6 7 + probabilit chi-square probabilit Col Mean- Row Mean 	<pre>c iq6, py() va allis e l Obs l 2 l 12 l 14 l 25 l 9 l 24 l 26 l 9 l 27 l 12 l 14 l 25 g l 0.7 c l br/>l 0.7 c c l 0.7 c c l 0.7 c c c c c c c c c c c c c c c c c c c</pre>	by(iag) llues a equality Rank 3 402 380 742 3405 3.12 0.53 1 ties 3 0.32 Dunn' 03165 0.3012 81683 0.3333	<pre>a) ma(k re unla y-of-po + Sum .00 .50 </pre>	4 d.: 4 d.: 4 d.: 4 d.: 4 d.: 4 d.: 4 d.: 4 d.: 4 d.: 4 d.: 4 d.: 4 d.: 4 d.: 4 d.: 4 d.: 4 d.: 5	rap d, option : tions rank f. with 4 d. Comparison amini-Hochl 4	of iq6 berg)	implici by iage 5	t	6		
. dunntes Warning:] Kruskal-Wa + iage 3 4 5 6 7 + chi-square probabilit chi-square probabilit Col Mean- Row Mean 4 5 5	<pre>c iq6, py() va allis e allis e l Obs l 2 l 12 l 14 l 25 g 9 ed = cy = ed with cy = l l 0.7 c l 1.2 c l 1.2 l 0.7 c l 1.2 l 0.7 c l 1.2 l 0.7 c l 1.2 l 0.7 c l 1.2 l 0.7 c l 1.2 c 1.</pre>	by(iag) llues a equalit Rank : 83 402 3800 742 3.12 0.53 1 ties : 0.32 Dunn' 03165 .3012 81683 .3333 183624 2705	<pre>e) ma(k re unla y-of-pc + Sum .00 .50 .00 .50 .00 + 5 with 72 = 4 72 s Pairw 3 3 1.097 0.3 0.738</pre>	<pre>bh) wi abeled opulat 4 d.: 4.632 dise (Benja (Benja 7642 3405 3198 2827</pre>	<pre>rap d, option : tions rank f. with 4 d. Comparison amini-Hochl</pre>	of iq6 berg)	implici by iage	t	6		
. dunntes Warning: 1 Kruskal-Wa + iage 3 4 5 6 7 + chi-square probabilit chi-square probabilit Col Mean- Row Mean 4 5 5	<pre>c iq6, by() va allis e l Obs l 2</pre>	by(iag) llues a equalit Rank : 83 402 3800 742 345 3.12 0.53 3.12 0.53 1 ties : 0.32 Dunn ' 03165 .3012 81683 .3333 83624 0.2785	<pre>e) ma(k re unla y-of-pc + Sum .00 .50 .00 .50 .00 .50 .00 + 5 with 72 = 4 72 s Pairw 3 1.097 0.3 0.738 0.738</pre>	<pre>>h) wi abeled >ppulat 4 d.: 4.632 /ise (Benja /642 3405 3198 3837</pre>	rap d, option r tions rank f. with 4 d. Comparison amini-Hochl 4 -0.516952 0.3362	of iq6 berg)	implici by iage	t	6		
. dunntes Warning: 1 Kruskal-Wa iage iage 3 4 5 6 7 + chi-square probabilit chi-square probabilit Col Mean- Row Mean 4 5 6 7	<pre>c iq6, by() va allis e l Obs l 2</pre>	by(iag) llues a equalit; Rank : 83 402 3800 742 345 3.12 0.53 3.12 0.53 3.12 0.53 3.12 0.53 1 ties : 0.32 Dunn' 03165 0.3012 81683 0.3333 83624 0.2785 73361	<pre>e) ma(k re unla y-of-pc + Sum + Sum .00 .50 .00 .00 .50 .00 .00 .50 .00 </pre>	<pre>>h) wi abeled >ppulat 4 d.: 4.632 (Benja (Benja 7642 3405 3198 3837 3301</pre>	rap d, option : tions rank f. with 4 d. Comparison amini-Hochl 4 -0.516952 0.3362 -1.767517	of iq6 berg) -1.498	implici by iage 5	t	6		
. dunntes Warning: 1 Kruskal-Wa iage iage 3 4 5 6 7 + chi-square probabilit chi-square probabilit Col Mean- Row Mean 	<pre>c iq6, py() va allis e Obs 2 12 12 14 25 9 25 9 26d = cy = ed with cy = 0.7 c 1.2 1.2 1.2 0.7 /pre>	by(iag) llues a equalit; Rank : 83 402 380 742 345 3.12 0.53 3.12 0.53 3.12 0.53 1 ties : 0.32 Dunn': 03165 0.3012 81683 0.333 83624 0.2785 73361 0.3923	<pre>a) ma(k re unla y-of-pc Sum + Sum + Sum .00 .50 .00 .00 .00 .50 .00 </pre>	<pre>>h) wi abeled >ppulat 4 d.: 4.632 (Benja (Benja 642 3405 3198 3301 3310</pre>	rap d, option r tions rank f. with 4 d. Comparison amini-Hochl 4 	-1.498	implici by iage 5	t	6		
. dunntes Warning: 1 Kruskal-Wa iage iage 3 4 5 6 7 + chi-square probabilit chi-square probabilit Col Mean- Row Mean 	<pre>c iq6, py() va allis e Obs 2 12 12 14 25 9 25 9 26 = cy = cy = cy = cy = cod with cy = l 1.2 cod cod cod cod cod cod cod cod cod cod</pre>	by(iag) llues a equalit; Rank : 83 402 380 742 345 3.12 0.53 1 ties : 0.32 Dunn': 03165 0.3012 81683 0.3333 83624 0.2785 73361 0.3923 Rate -	<pre>e) ma(k re unla y-of-pc Sum + Sum + Son .00 .50 .00 .00 .50 .00 .00 .50 .00 </pre>	<pre>>h) w: abeled >ppulat 4 d.: 4.632 vise ((Benja 2642 3405 3198 3301 3310 5</pre>	rap d, option r tions rank f. with 4 d. Comparison amini-Hochl 4 	of iq6 berg) -1.498 0.3	implici by iage 5 3732 3349	t	6		

```
Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
1
2
     . dunntest iq7, by(iage) ma(bh) wrap
3
4
     Warning: by() values are unlabeled, option nolabel implicit
5
6
     Kruskal-Wallis equality-of-populations rank test
7
       +----+
8
       | iage | Obs | Rank Sum |
9
       |-----
          3 | 2 | 18.00 |
4 | 12 | 342.00 |
10
11
           5 | 14 | 476.00
12
           6 | 25 | 827.00 |
7 | 10 | 353.00 |
13
       14
15
                     4.164 with 4 d.f.
     chi-squared =
                    0.3843
16
     probability =
17
     chi-squared with ties =
                              5.665 with 4 d.f.
18
     probability =
                      0.2256
19
20
                     Dunn's Pairwise Comparison of iq7 by iage
21
                               (Benjamini-Hochberg)
22
     Col Mean-|
                                        4
                          3
     Row Mean |
                                                     5
                                                                  6
23
     -----
24
            4 | -1.624636
25
             0.1303
              26
                -2.104451 -0.889632
            5 1
27
                 0.0883 0.3114
              28
              6 |
                -2.085160 -0.829861 0.175376
29
                   0.0618
                          0.2904
                                     0.4304
              30
31
            7 |
                -2.160529 -1.010574 -0.199794
                                               -0.377545
                  0.1537
                            0.3122
                                     0.4676
                                                0.4411
32
             33
     False Discovery Rate = 0.05
34
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
35
36
     . dunntest iq8, by(iage) ma(bh) wrap
37
38
     Warning: by() values are unlabeled, option nolabel implicit
39
40
     Kruskal-Wallis equality-of-populations rank test
41
          ----+
42
       | iage | Obs | Rank Sum |
43
       |-----
          3 | 2 | 62.00 |
4 | 12 | 319.50 |
5 | 14 | 441.00 |
44
       45
       46
           6 | 25 | 806.50
47
           7 | 10 | 387.00 |
       1
       +----+
48
49
     chi-squared = 2.389 with 4 d.f.
     probability =
                     0.6646
50
51
     chi-squared with ties =
                               2.751 with 4 d.f.
52
     probability =
                      0.6003
53
54
                     Dunn's Pairwise Comparison of iq8 by iage
55
                              (Benjamini-Hochberg)
56
     Col Mean-
     Row Mean |
                          3
                                                     5
                                                                   6
                                        4
57
                               _____
        ____+
58
            4 | 0.335334
59
                  0.5267
             For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml
60
```

```
5
                -0.038721 -0.725439
1
                  0.4846 0.4682
             2
3
                -0.100377 -0.939317 -0.133283
           6
             0.4345
                   0.5111
                                       0.5587
4
             5
                -0.581934 -1.650916 -1.018004 -1.007582
           7 1
6
                  0.4672
                           0.4938 0.7717
                                                0.5228
             7
     False Discovery Rate = 0.05
8
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
9
10
     . dunntest iq9, by(iage) ma(bh) wrap
11
12
     Warning: by() values are unlabeled, option nolabel implicit
13
14
     Kruskal-Wallis equality-of-populations rank test
15
16
       +----+
       | iage | Obs | Rank Sum |
17
       |-----|
18
           3 | 2 | 58.00 |
           4 | 12 |
                     289.50 |
19
           5 | 14 | 451.00 |
20
           6 | 25 | 843.50 |
7 | 10 | 374.00 |
21
22
         _____
23
     chi-squared =
                     3.363 with 4 d.f.
24
     probability =
                    0.4989
25
                               4.008 with 4 d.f
     chi-squared with ties =
26
     probability =
                      0.4049
27
28
                     Dunn's Pairwise Comparison of iq9 by iage
29
                               (Benjamini-Hochberg)
30
     Col Mean-|
31
     Row Mean |
                          3
                                       4
                                                    5
     ------
32
           4 | 0.380111
33
                 0.4399
             34
           5 | -0.253220 -1.224538
35
                  0.4000
                           0.3679
36
             37
                -0.384128 -1.630434 -0.272188
           6 |
                 0.5006
                           0.2575
                                     0.4364
38
             39
           7 |
                -0.645800 -1.846324 -0.745866 -0.582520
40
                  0.5184
                           0.3242
                                     0.5697
                                                0.4668
             41
     False Discovery Rate = 0.05
42
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
43
44
     . dunntest iq10, by(iage) ma(bh) wrap
45
46
     Warning: by() values are unlabeled, option nolabel implicit
47
48
     Kruskal-Wallis equality-of-populations rank test
49
50
       | iage | Obs | Rank Sum |
51
        _____+
52
           3 | 2 |
4 | 12 |
           3 |
                       70.00
                     389.00
53
           5 | 14 | 394.00
54
           6 | 25 | 813.00
55
           7 | 10 | 350.00 |
       56
                ----+
           ____
57
                    0.968 with 4 d.f.
     chi-squared =
58
     probability =
                     0.9147
59
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60
```

```
chi-squared with ties =
                          3.737 with 4 d.f.
    probability =
                  0.4428
1
2
3
                  Dunn's Pairwise Comparison of iq10 by iage
                           (Benjamini-Hochberg)
4
    Col Mean-|
5
                      3
                                  4
                                             5
                                                         6
    Row Mean |
6
    4 | 0.362629
7
               0.5121
           8
9
          5 0.972529 1.164725
10
               0.4135 0.4069
           11
          6 |
             0.361822 -0.031546 -1.405830
12
               0.4484 0.5416 0.3994
           13
             0.000000 -0.646845 -1.775587 -0.710605
          7 |
14
           0.5000 0.4314 0.3790 0.4773
15
    False Discovery Rate = 0.05
16
    Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
17
18
                                    _____
     _____
19

    Question – For each of the questions, 1-10, is there a difference in the average response by gender?

20
21
    . dunntest iq1, by(igender)
22
23
    Warning: by() values are unlabeled, option nolabel implicit
24
25
    Kruskal-Wallis equality-of-populations rank test
26
                                              +-----+
27
      | igender | Obs | Rank Sum |
28
      |-----|
29
        1 | 19 | 636.50 |
           2 | 44 | 1379.50 |
30
      +----+
31
32
    chi-squared = 0.182 with 1 d.f.
probability = 0.6695
33
34
    chi-squared with ties = 1.338 with 1 d.f.
35
    probability = 0.2474
36
37
                 Dunn's Pairwise Comparison of iq1 by igender
38
                            (No adjustment)
39
    Col Mean-I
    Row Mean |
                       1
40
     _____+
41
        2 | 1.156689
42
           | 0.1237
43
    alpha = 0.05
44
    Reject Ho if p = P(Z \le |z|) \le alpha/2
45
46
     . dunntest iq2, by(igender)
47
48
    Warning: by() values are unlabeled, option nolabel implicit
49
50
    Kruskal-Wallis equality-of-populations rank test
51
52
      +----+
      | igender | Obs | Rank Sum |
53
      |-----|
54
      | 1 | 19 | 565.00 |
           2 | 44 | 1451.00 |
55
      +----+
56
57
                 0.415 with 1 d.f.
0.5196
    chi-squared =
    probability =
58
59
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60
```

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```
chi-squared with ties =
                            0.599 with 1 d.f.
     probability =
                   0.4390
1
2
3
                   Dunn's Pairwise Comparison of iq2 by igender
                               (No adjustment)
4
     Col Mean-|
5
    Row Mean |
                        1
6
     2 | -0.773826
7
            0.2195
8
9
     alpha = 0.05
    Reject Ho if p = P(Z \le |z|) \le alpha/2
10
11
12
     . dunntest iq3, by(igender)
13
    Warning: by() values are unlabeled, option nolabel implicit
14
15
    Kruskal-Wallis equality-of-populations rank test
16
17
      +----+
18
      | igender | Obs | Rank Sum |
19
      |-----|
      | 1 | 19 | 629.00 |
20
             2 | 44 | 1387.00 |
21
      +----+
22
    chi-squared = 0.099 with 1 d.f.
probability = 0.7531
23
24
25
     chi-squared with ties =
                            0.198 with 1 d.f
     probability = 0.6560
26
27
28
                  Dunn's Pairwise Comparison of iq3 by igender
                               (No adjustment)
29
                                                      Col Mean-L
30
    Row Mean |
                         1
31
      -----
         2 | 0.445408
32
           1
                0.3280
33
34
     alpha = 0.05
    Reject Ho if p = P(Z \le |z|) \le alpha/2
35
36
37
     . dunntest iq4, by(igender)
38
    Warning: by() values are unlabeled, option nolabel implicit
39
40
    Kruskal-Wallis equality-of-populations rank test
41
42
       +----+
43
      | igender | Obs | Rank Sum |
       |-----|
44
           1 | 19 | 534.50 |
45
            2 | 44 | 1481.50 |
      46
      +----+
47
                   1.212 with 1 d.f.
     chi-squared =
48
    probability = 0.2710
49
     chi-squared with ties =
                            1.894 with 1 d.f.
50
    probability =
                   0.1688
51
52
                   Dunn's Pairwise Comparison of iq4 by igender
53
                               (No adjustment)
54
    Col Mean-|
55
    Row Mean |
                        1
56
               _____
     ----+-
         2 | -1.376105
57
                 0.0844
           58
59
    alpha = 0.05
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60
```

```
Reject Ho if p = P(Z \le |z|) \le alpha/2
1
2
     . dunntest iq5, by(igender)
3
     Warning: by() values are unlabeled, option nolabel implicit
4
5
6
     Kruskal-Wallis equality-of-populations rank test
7
       +----+
8
       | igender | Obs | Rank Sum |
9
       |-----|
             1 | 19 | 614.50 |
2 | 44 | 1401.50 |
10
11
         _____
12
    chi-squared = 0.009 with 1 d.f.
probability = 0.9225
13
14
15
     chi-squared with ties =
                             0.023 with 1 d.f.
     probability = 0.8782
16
17
18
                   Dunn's Pairwise Comparison of iq5 by igender
19
                                (No adjustment)
     Col Mean-|
20
     Row Mean |
                          1
21
     _____+
22
          2 | 0.153230
            0.4391
23
24
     alpha = 0.05
     Reject Ho if p = P(Z \le |z|) \le alpha/2
25
26
27
     . dunntest iq6, by(igender)
28
     Warning: by() values are unlabeled, option nolabel implicit
29
30
31
     Kruskal-Wallis equality-of-populations rank test
                                                        iez oni
32
         _____
33
       | igender | Obs | Rank Sum |
        -------
34
             1 | 19 | 587.50 |
35
      2 | 43 | 1365.50 |
36
       +----+
37
     chi-squared =
                   0.028 with 1 d.f.
38
     probability =
                    0.8666
39
40
     chi-squared with ties =
                             0.042 with 1 d.f.
     probability =
                     0.8380
41
42
43
                   Dunn's Pairwise Comparison of iq6 by igender
                                (No adjustment)
44
     Col Mean-|
45
                         1
     Row Mean |
46
     _____
47
          2 | -0.204490
            0.4190
48
49
     alpha = 0.05
     Reject Ho if p = P(Z \le |z|) \le alpha/2
50
51
52
     . dunntest iq7, by(igender)
53
     Warning: by() values are unlabeled, option nolabel implicit
54
55
56
     Kruskal-Wallis equality-of-populations rank test
57
         ----+
58
       | igender | Obs | Rank Sum |
59
       |-----|
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60
```

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<pre>-squared with ties = 0.991 with 1 d.f. bability = 0.0196 Dunn's Pairwise Comparison of iq7 by igender (No adjustment) Mean Mean 1 2 -0.995685 0.1597 ha = 0.05 ect Ho if p = P(Z <= z) <= alpha/2 unntest iq8, by(igender) ning: by() values are unlabeled, option nolabel implicit skal-Wallis equality-of-populations rank test </pre>	. 4	h 1 d.f.
Dunn's Pairwise Comparison of iq7 by igender Nean-1 Mean 1 1 2 -0.995685 1 0.1597 ha = 0.05 ect Ho if p = P(2 <= z) <= alpha/2 unntest iq8, by(igender) ning: by() values are unlabeled, option nolabel implicit skal-Wallis equality-of-populations rank test 	chi-squared with ties = probability = <mark>0.3194</mark>	0.991 with 1 d.f.
Mean 1 $2 \mid -0.995685$ 0.1597 ha = 0.05 ect Ho if p = P(Z <= z) <= alpha/2 unntest iq8, by(igender) ning: by() values are unlabeled, option nolabel implicit skal-Wallis equality-of-populations rank test 	Dunn's Pairv	wise Comparison of iq7 by igender (No adjustment)
<pre>2 -0.995685</pre>	COI Mean- Row Mean 1 	
<pre>ha = 0.05 ect Ho if p = P(Z <= z) <= alpha/2 unntest iq8, by(igender) ning: by() values are unlabeled, option nolabel implicit skal-Wallis equality-of-populations rank test </pre>	2 -0.995685 0.1597	
<pre>unntest iq8, by(igender) ning: by() values are unlabeled, option nolabel implicit skal-Wallis equality-of-populations rank test </pre>	alpha = 0.05 Reject Ho if p = P(Z <= z)) <= alpha/2
<pre>unntest iq8, by(igender) ning: by() values are unlabeled, option nolabel implicit skal-Wallis equality-of-populations rank test</pre>		
<pre>ning: by() values are unlabeled, option nolabel implicit skal-Wallis equality-of-populations rank test </pre>	. dunntest iq8, by(igender)	
<pre>skal-Wallis equality-of-populations rank test </pre>	Warning: by() values are unl	labeled, option nolabel implicit
<pre>igender Obs Rank Sum </pre>	Kruskal-Wallis equality-of-p	populations rank test
<pre>1 yendel 005 Kank Suk 1 19 561.00 2 44 1455.00 </pre>	+	+
<pre>2 44 1455.00 </pre>		
<pre>-squared = 0.495 with 1 d.f. bability = 0.4815 -squared with ties = 0.570 with 1 d.f. bability = 0.4501 Dunn's Pairwise Comparison of iq8 by igender (No adjustment) Mean 1 </pre>		
Dunn's Pairwise Comparison of iq8 by igender (No adjustment) Mean 1 2 -0.755307 0.2250 ha = 0.05 ect Ho if p = P(Z <= z) <= alpha/2 unntest iq9, by(igender) ning: by() values are unlabeled, option nolabel implicit	probability = 0.4815 chi-squared with ties = probability = <mark>0.4501</mark>	0.570 with 1 d.f.
<pre>Mean- Mean 1 </pre>	Dunn's Pairv	wise Comparison of iq8 by igender
<pre>2 -0.755307 0.2250 ha = 0.05 ect Ho if p = P(Z <= z) <= alpha/2 unntest iq9, by(igender) ning: by() values are unlabeled, option nolabel implicit</pre>	Col Mean- Row Mean 1	
<pre>ha = 0.05 ect Ho if p = P(Z <= z) <= alpha/2 unntest iq9, by(igender) ning: by() values are unlabeled, option nolabel implicit</pre>	2 -0.755307	
<pre>ha = 0.05 ect Ho if p = P(Z <= z) <= alpha/2 unntest iq9, by(igender) ning: by() values are unlabeled, option nolabel implicit</pre>	0.2250	
unntest iq9, by(igender) ning: by() values are unlabeled, option nolabel implicit	alpha = 0.05 Reject Ho if p = P(Z <= z)) <= alpha/2
ning: by() values are unlabeled, option nolabel implicit	dunntest igg by (igender)	
	Warning, br() list and	labeled, option polabel implicit
	warning: DVU Values are un	
skal-Wallis equality-of-populations rank test	warning: אַשְׁ() values are un.	populations rank test
igender Obs Rank Sum	warning: by() varues are un. Kruskal-Wallis equality-of-r	
1 19 491.00	Kruskal-Wallis equality-of-r + igender Obs Rank Sum	——— m
2 44 1525.00 +	Kruskal-Wallis equality-of-r + igender Obs Rank Sum 	+ m 0
-squared = 3.070 with 1 d.f. bability = 0.0797	<pre>warning: by() values are un. Kruskal-Wallis equality-of-y +</pre>	+ 0 +
-squared with ties = 3.658 with 1 d.f. bability = 0.0558	<pre>Kruskal-Wallis equality-of-y</pre>	+ m 0 0 +

```
Col Mean-I
     Row Mean |
1
       ____+
2
          2 | -1.912701
3
           | 0.0279
4
     alpha = 0.05
5
     Reject Ho if p = P(Z \le |z|) \le alpha/2
6
7
     . dunntest iq10, by(igender)
8
9
     Warning: by() values are unlabeled, option nolabel implicit
10
11
     Kruskal-Wallis equality-of-populations rank test
12
13
       +----+
       | igender | Obs | Rank Sum |
14
       |-----|
15
          1 | 19 | 603.00 |
             2 | 44 | 1413.00 |
16
       +-----+
17
18
    chi-squared = 0.006 with 1 d.f.
probability = 0.9403
19
20
     chi-squared with ties = 0.022 with 1 d.f.
21
                     0.8830
     probability =
22
23
                  Dunn's Pairwise Comparison of iq10 by igender
24
                                (No adjustment)
25
     Col Mean-|
     Row Mean |
                         1
26
     _____
27
          2 | -0.147156
28
            | 0.4415
29
     alpha = 0.05
30
     Reject Ho if p = P(Z \le |z|) \le alpha/2
31
     _____
32
33

    Question – For each of the questions, 1-10, is there a difference in the average response by level of education.

34
35
     . dunntest iq1, by(ied) ma(bh) wrap
36
     Warning: by() values are unlabeled, option nolabel implicit
37
38
39
     Kruskal-Wallis equality-of-populations rank test
40
         -----+
41
       | ied | Obs | Rank Sum |
42
       |-----|
         1 | 1 | 32.50 |
2 | 3 | 97.50 |
43
44
       | 3 | 57 | 1761.00 |
45
       +-----+
46
                   0.031 with 2 d.f.
0.9848
     chi-squared =
47
     probability =
48
     chi-squared with ties =
                             0.218 with 2 d.f.
49
                     0.8969
     probability =
50
51
52
                     Dunn's Pairwise Comparison of iq1 by ied
                       (Benjamini-Hochberg)
53
    Col Mean-|
54
     Row Mean |
                        1
                                      2
     -----+------
55
          2 | 0.000000
56
                 0.5000
            57
           3 |
               0.239229
                          0.407392
58
                           1.0000
                  0.6082
             59
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60
```
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```
False Discovery Rate = 0.05
1
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
2
3
     . dunntest iq2, by(ied) ma(bh) wrap
4
5
     Warning: by() values are unlabeled, option nolabel implicit
6
7
     Kruskal-Wallis equality-of-populations rank test
8
9
       +----+
10
       | ied | Obs | Rank Sum |
       |-----|
11
        1 | 1 | 40.50 |
2 | 3 | 121.50 |
3 | 57 | 1729.00 |
12
       13
14
15
                     1.226 with 2 d.f.
     chi-squared =
                    1.22
0.5418
16
     probability =
17
     chi-squared with ties =
                              1.853 with 2 d.f.
18
     probability =
                      0.3959
19
20
                      Dunn's Pairwise Comparison of iq2 by ied
21
                               (Benjamini-Hochberg)
22
     Col Mean-|
                    1
                                        2
     Row Mean |
23
     ____+
                _____
24
           2 | 0.000000
25
             0.5000
              26
                0.698004 1.188657
            3 |
27
                  0.3639
                           0.3519
             28
     False Discovery Rate = 0.05
29
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
30
31
     . dunntest iq3, by(ied) ma(bh) wrap
32
33
     Warning: by() values are unlabeled, option nolabel implicit
34
35
     Kruskal-Wallis equality-of-populations rank test
36
37
       +----+
       | ied | Obs | Rank Sum |
38
       |----|
39
         1 | 1 | 36.50 |
2 | 3 | 109.50 |
40
       | 3 | 57 | 1745.00 |
41
       +-----+
42
43
     chi-squared =
                     0.411 with 2 d.f.
     probability =
                     0.8143
44
45
     chi-squared with ties =
                              0.917 with 2 d.f.
46
     probability =
                      0.6323
47
48
                      Dunn's Pairwise Comparison of iq3 by ied
49
                               (Benjamini-Hochberg)
     Col Mean-|
50
                     1
                                        2
     Row Mean |
51
     _____
52
           2 | 0.000000
53
                   0.5000
             54
            3 |
                0.490961 0.836076
55
                  0.4676
                           0.6047
             56
     False Discovery Rate = 0.05
57
     Reject Ho if p = P(Z <= \mid z \mid) <= FDR/2 with stopping rule
58
59
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60
```

```
. dunntest iq4, by(ied) ma(bh) wrap
1
     Warning: by() values are unlabeled, option nolabel implicit
2
3
     Kruskal-Wallis equality-of-populations rank test
4
5
       +----+
6
       | ied | Obs | Rank Sum |
       |-----|
7
         1 | 1 | 40.00 |
8
         2 3 120.00
9
       | 3 | 57 | 1731.00 |
10
         ____
             ----+
11
     chi-squared =
                   1.100 with 2 d.f.
12
     probability =
                   0.5769
13
     chi-squared with ties =
                            1.741 with 2 d.f.
14
     probability =
                     0.4187
15
16
                     Dunn's Pairwise Comparison of iq4 by ied
17
                      (Benjamini-Hochberg)
18
     Col Mean-|
                 1
19
                                     2
     Row Mean |
     20
          2 | 0.000000
21
            0.5000
22
           3 | 0.676626 1.152253
23
                         0.3738
                0.3740
            24
25
     False Discovery Rate = 0.05
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
26
27
28
     . dunntest iq5, by(ied) ma(bh) wrap
29
     Warning: by() values are unlabeled, option nolabel implicit
30
                                                      31
     Kruskal-Wallis equality-of-populations rank test
32
33
       +----+
34
       | ied | Obs | Rank Sum |
       |-----|
35
       36
      | 2 | 3 | ...
| 3 | 57 | 1782.00 |
_----+
         2 |
37
38
39
    chi-squared = 0.479 with 2 d.f.
probability = 0.7870
40
41
     chi-squared with ties =
                            1.261 with 2 d.f.
42
     probability =
                     0.5323
43
44
                     Dunn's Pairwise Comparison of iq5 by ied
45
                            (Benjamini-Hochberg)
46
     Col Mean-|
47
     Row Mean |
                        1
                                     2
     48
          2 | 0.870715
49
            0.2879
50
             3 |
               0.383900 -1.043578
51
                 0.3505
                         0.4450
            52
     False Discovery Rate = 0.05
53
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
54
55
56
     . dunntest iq6, by(ied) ma(bh) wrap
57
     Warning: by() values are unlabeled, option nolabel implicit
58
59
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60
```

1

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Kruskal-Wallis equality-of-populations rank test

```
+----+
2
      | ied | Obs | Rank Sum |
3
      |----+----+----
      4
               3 |
                    94.00 |
         2 |
      5
        3 | 56 | 1695.50 |
      6
      +----+
7
    chi-squared = 0.344 with 2 d.f.
probability = 0.8420
8
9
                           0.500 with 2 d.f.
10
     chi-squared with ties =
    probability =
                    0.7788
11
12
13
                    Dunn's Pairwise Comparison of iq6 by ied
                            (Benjamini-Hochberg)
14
    Col Mean-|
15
     Row Mean |
                        1
     _____
16
          2 | 0.548145
17
               0.4377
           18
              0.699677 0.123104
19
          3 |
                 0.7262
                        0.4510
            20
21
     False Discovery Rate = 0.05
22
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
23
24
     . dunntest iq7, by(ied) ma(bh) wrap
25
                                               .t
     Warning: by() values are unlabeled, option nolabel implicit
26
27
28
    Kruskal-Wallis equality-of-populations rank test
29
      +----+
30
      | ied | Obs | Rank Sum |
31
      |-----|
      | 1 | 1 | 42.50 |
| 2 | 3 | 99.50 |
32
33
      | 3 | 57 | 1749.00 |
34
      +----+
35
                  0.482 with 2 d.f.
     chi-squared =
36
    probability =
                   0.7857
37
     chi-squared with ties =
                           0.659 with 2 d.f.
38
    probability =
                    0.7194
39
40
                    Dunn's Pairwise Comparison of iq7 by ied
41
                           (Benjamini-Hochberg)
42
    Col Mean-I
43
     Row Mean |
                       1
                                    2
     _____
44
          2 | 0.532085
45
                0.4460
            46
          3 | 0.771080 0.275878
47
                0.6610
                         0.3913
            48
49
     False Discovery Rate = 0.05
    Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
50
51
52
     . dunntest iq8, by(ied) ma(bh) wrap
53
     Warning: by() values are unlabeled, option nolabel implicit
54
55
56
    Kruskal-Wallis equality-of-populations rank test
57
      +----+
58
      | ied | Obs | Rank Sum |
59
      |-----|
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```

3 +	3 120.50 57 1723.50	-+
chi-squared probability	d = 1.717 v r = 0.4237	with 2 d.f.
chi-squared probability	With ties = 7 = <mark>0.3713</mark>	1.981 with 2 d.f.
Col Moon-L	Dunn's	Pairwise Comparison of iq8 by ied (Benjamini-Hochberg)
Row Mean	1	2
2	0.358033 0.3602	
3	1.005400 1 0.2360	1.014200 0.4657
False Disco Reject Ho i	overy Rate = .f p = P(Z <=	0.05 z) <= FDR/2 with stopping rule
. dunntest	iq9, by(ied) m	ma(bh) wrap
Warning: by	v() values are	unlabeled, option nolabel implicit
Kruskal-Wal	lis equality-c	of-populations rank test
+ ied C)bs Rank Sum	-+
+	+ 1 45.50	-1
2	3 136.50	
	5/ 1 1/05.00	
+		-+
+	l = 2.856 v	-+ with 2 d.f.
+ chi-squarec probability	A = 2.856 v v = 0.2398	-+ with 2 d.f.
+ chi-squarec probability chi-squarec probability	d = 2.856 v v = 0.2398 d with ties = v = 0.1819	-+ with 2 d.f. 3.409 with 2 d.f.
+ chi-squarec probability chi-squarec probability	<pre>d = 2.856 v z = 0.2398 d with ties = z = 0.1819 Dunn's</pre>	-+ with 2 d.f. 3.409 with 2 d.f. Pairwise Comparison of iq9 by ied
<pre>chi-squarec probability chi-squarec probability Col Mean- </pre>	A = 2.856 v v = 0.2398 A with ties = v = 0.1819 Dunn's	-+ with 2 d.f. 3.409 with 2 d.f. Pairwise Comparison of iq9 by ied (Benjamini-Hochberg)
<pre>chi-squarec probability chi-squarec probability Col Mean- Row Mean +</pre>	A = 2.856 v v = 0.2398 A with ties = v = 0.1819 Dunn's	-+ with 2 d.f. 3.409 with 2 d.f. Pairwise Comparison of iq9 by ied (Benjamini-Hochberg) 2
+ chi-squarec probability chi-squarec probability Col Mean- Row Mean 	A = 2.856 v v = 0.2398 A with ties = v = 0.1819 Dunn's 1 0.000000 0.5000	-+ with 2 d.f. 3.409 with 2 d.f. Pairwise Comparison of iq9 by ied (Benjamini-Hochberg) 2
+ chi-squarec probability chi-squarec probability Col Mean- Row Mean 	A = 2.856 v v = 0.2398 A with ties = v v = 0.1819 Dunn's 1 0.000000 0.5000 0.946695 1 0.2578	<pre>-+ with 2 d.f. 3.409 with 2 d.f. Pairwise Comparison of iq9 by ied (Benjamini-Hochberg) 2 1.612164 0.1604</pre>
<pre>chi-squarec probability chi-squarec probability Col Mean- Row Mean </pre>	A = 2.856 v v = 0.2398 A with ties = v Dunn's 1 0.000000 0.5000 0.946695 0.2578 Dvery Rate = f p = P(Z <= 1)	<pre>-+ with 2 d.f. 3.409 with 2 d.f. Pairwise Comparison of iq9 by ied (Benjamini-Hochberg) 2 1.612164 0.1604 0.05 z) <= FDR/2 with stopping rule</pre>
<pre>chi-squarec probability chi-squarec probability Col Mean- Row Mean </pre>	<pre>A = 2.856 v v = 0.2398 A with ties = v v = 0.1819 Dunn's 1 0.000000 0.5000 0.946695 1 0.2578 overy Rate = f p = P(Z <= 1 iq10, by(ied)</pre>	<pre>-+ with 2 d.f. 3.409 with 2 d.f. Pairwise Comparison of iq9 by ied (Benjamini-Hochberg) 2 1.612164 0.1604 0.05 z) <= FDR/2 with stopping rule ma(bh) wrap</pre>
<pre>chi-squarec probability chi-squarec probability Col Mean- Row Mean </pre>	<pre>A = 2.856 v y = 0.2398 A with ties = y = 0.1819 Dunn's 1 0.000000 0.5000 0.946695 1 0.2578 Dvery Rate = f p = P(Z <= 1) iq10, by(ied) y() values are</pre>	<pre>-+ with 2 d.f. 3.409 with 2 d.f. Pairwise Comparison of iq9 by ied (Benjamini-Hochberg) 2 1.612164 0.1604 0.05 z) <= FDR/2 with stopping rule ma(bh) wrap unlabeled, option nolabel implicit</pre>
<pre>chi-squarec probability chi-squarec probability Col Mean- Row Mean 2 </pre>	<pre>d = 2.856 v v = 0.2398 d with ties = v p = 0.1819 Dunn's 1 0.000000 0.5000 0.946695 1 0.2578 Dvery Rate = f p = P(Z <= 1) iq10, by(ied) v() values are lis equality-c</pre>	<pre>-+ with 2 d.f. 3.409 with 2 d.f. Pairwise Comparison of iq9 by ied (Benjamini-Hochberg) 2 1.612164 0.1604 0.05 z) <= FDR/2 with stopping rule ma(bh) wrap unlabeled, option nolabel implicit of-populations rank test</pre>
<pre>chi-squarec probability chi-squarec probability Col Mean- Row Mean </pre>	<pre>A = 2.856 v v = 0.2398 A with ties = v Dunn's Dunn's 0.000000 0.5000 0.946695 1 0.2578 Overy Rate = 0.1819 0.2578 Dvery Rate = 0.2578 Dvery Rate = 0.25788 Dvery Rate = 0.2578 Dvery Rate = 0.25788 Dvery Rate = 0.257888 Dvery Rate = 0.257888888888888888888888888888888888888</pre>	<pre>-+ with 2 d.f. 3.409 with 2 d.f. Pairwise Comparison of iq9 by ied (Benjamini-Hochberg) 2 1.612164 0.1604 0.05 z) <= FDR/2 with stopping rule ma(bh) wrap unlabeled, option nolabel implicit of-populations rank test -+ -+</pre>
<pre>chi-squarec probability chi-squarec probability Col Mean- Row Mean </pre>	<pre>A = 2.856 v v = 0.2398 A with ties = v Dunn's 1 0.000000 0.5000 0.946695 1 0.2578 Dvery Rate = f p = P(Z <= 1) iq10, by(ied) v() values are lis equality-of Dbs Rank Sum</pre>	<pre>-+ with 2 d.f. 3.409 with 2 d.f. Pairwise Comparison of iq9 by ied (Benjamini-Hochberg) 2 1.612164 0.1604 0.05 z) <= FDR/2 with stopping rule ma(bh) wrap unlabeled, option nolabel implicit of-populations rank test -+ -1 -1</pre>
<pre>chi-squarec probability chi-squarec probability Col Mean- Row Mean </pre>	<pre>A = 2.856 v v = 0.2398 A with ties = v v = 0.1819 Dunn's 1 0.000000 0.5000 0.946695 1 0.2578 Overy Rate = of p = P(Z <= 1) iq10, by(ied) v() values are lis equality-out 0.000 v 0.000 v 0.000000 0.5000 0.946695 1 0.2578 Dvery Rate = overy Rate = f p = P(Z <= 1) iq10, by(ied) v() values are lis equality-out 0.000 v 0.000 v 0.000 v 0.000 v 0.000 v 0.000 v 0.000 v 0.000 v 0.000</pre>	<pre>-+ with 2 d.f.</pre>

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```
chi-squared =
                   0.085 with 2 d.f.
    probability =
                   0.9584
1
2
    chi-squared with ties = 0.375 with 2 d.f.
3
    probability =
                   0.8288
4
5
                   Dunn's Pairwise Comparison of iq10 by ied
6
                     (Benjamini-Hochberg)
7
    Col Mean-|
                  1
     Row Mean |
                                     2
8
       ----+
              _____
9
          2 | 0.000000
10
                0.5000
           11
           3 |
              0.314214 0.535088
12
                0.5650 0.8889
            13
     False Discovery Rate = 0.05
14
    Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
15
                                                   _____
16
     _____
17

    Question: For each of the questions, is there a difference in the average response based upon racer or ethnicity

18
19
     . dunntest iq1, by(ieth) ma(bh) wrap
20
21
    Warning: by() values are unlabeled, option nolabel implicit
22
23
    Kruskal-Wallis equality-of-populations rank test
24
25
      +----+
      | ieth | Obs | Rank Sum |
26
       |-----|
27
          1 | 53 | 1744.50 |
          2 | 2 | 36.00 |
3 | 1 | 33.50 |
4 | 4 | 134.00 |
28
29
30
      | 7 | 3 | 68.00 |
31
         -----+
32
     chi-squared =
                   2.110 with 4 d.f.
33
                   0.7155
    probability =
34
                          15.496 with 4 d.f.
    chi-squared with ties =
35
    probability =
                   0.0038
36
37
                   Dunn's Pairwise Comparison of iq1 by ieth
38
                            (Benjamini-Hochberg)
39
     Col Mean-|
40
                                   2
                                               3
                                                             Δ
    Row Mean |
                       1
     _____+____
41
          2 | 3.061273
42
                 <mark>0.0110</mark>
            43
            3 | -0.085671 -1.871072
44
                0.5176 0.0613
            45
            46
           4 |
              -0.166771 -2.646096 0.000000
47
                0.5422 <mark>0.0204</mark> 0.5000
            48
               2.553091 -0.755791 1.387066 2.097047
           7 |
49
            0.0178 0.3213 0.1379 0.0450
50
     False Discovery Rate = 0.05
51
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
52
53
     . dunntest iq2, by(ieth) ma(bh) wrap
54
55
     Warning: by() values are unlabeled, option nolabel implicit
56
57
    Kruskal-Wallis equality-of-populations rank test
58
59
      +----+
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	1 0.000	1					
1 -	53	1798.5	0				
2	2	48.0	0				
3		2.0	0				
4	4	1 //.0					
+	ן ג 		·+				
hi-squar	ed =	5.615	with 4 d.	f.			
robabili	ty =	0.2298					
hi-squar	ed with	a ties =	8.107	with 4 d.f			
robabili	ty =	0.0877	1				
		- ·		~ ·			
		Dunn's	Pairwise (Benj	amini-Hochbe	erg)		
ol Mean-	1	1		2	3	4	
	+					-	
2	0.9	904070 0.2614					
3	2.0	J73966 0.1904	1.177565				
			5.2907				
4	1.8	356443 0 1585	0.359560	-1.011444			
	, (0.3390	0.3118			
7	0.4	416143 -	0.442842	-1.599094	-0.937000		
	1 (1.3/63	0.4112	0.1830	0.2906		
alse Dis	coverv	Rate =	0.05				
eject Ho	if p =	= P(Z <=	z) <= ₽	DR/2 with st	copping rule		
dunntoo	+ 2	hrr(iath)	ma (bb)				
uuiiiteS	с ±43,	Sy(Letii)	1110 (DII) W	ταΡ			
larning:	by() va	alues are	unlabele	d, option no	olabel implicit		
					<u> </u>		
uskal-W	αιιις θ	squarrty-	от-рорита	CIOUS LAUK 1			
+		Dank C.	+				
	++	, манк эц +	·				
1	53	1761.5	0				
2	2	14.5	0				
3	1	38.5	0				
1 1	4		0				
4	1 3 1	120.0	0				
4 7 +	3	120.0 81.5	0				
4 7 +	3	120.0 81.5	0 +	-			
hi-squar	3 ed = t.v =	120.0 81.5 	00 + with 4 d.	f.			
4 7 +	3 ed = ty =	120.0 81.5 4.269 0.3708	00 + with 4 d.	f.			
hi-squar chi-squar	3 ed = ty = ed with	120.0 81.5 4.269 0.3708	0 + with 4 d. 8.563	f. with 4 d.f			
4 7 + chi-squar probabili chi-squar	3 ed = ty = ed with ty =	120.0 81.5 4.269 0.3708 n ties = 0.0730	0 + with 4 d. 8.563	f. with 4 d.f			
4 7 + probabili chi-squar probabili	3 ed = ty = ed with ty =	120.0 81.5 	0 + with 4 d. 8.563	f. with 4 d.f			
4 7 + probabili chi-squar probabili	3 ed = ty = ed with ty =	120.0 81.5 4.269 0.3708 h ties = 0.0730 Dunn's	0 + with 4 d. 8.563 Pairwise (Benj	f. with 4 d.f. Comparison of amini-Hochbe	of iq3 by ieth erα)		
4 7 + probabili chi-squar probabili	3 ed = ty = ed with ty = 	120.0 81.5 4.269 0.3708 n ties = 0.0730 Dunn's	0 + with 4 d. 8.563 Pairwise (Benj	f. with 4 d.f Comparison of amini-Hochbe	of iq3 by ieth erg)		
4 7 + chi-squar probabili chi-squar probabili	3 ed = ty = ed with ty =	120.0 81.5 4.269 0.3708 h ties = 0.0730 Dunn's	0 + with 4 d. 8.563 Pairwise (Benj	f. with 4 d.f Comparison o amini-Hochbe 2	of iq3 by ieth erg) 3	4	
1 4 7 + chi-squar probabili chi-squar probabili Col Mean	3 ed = ty = ed with ty =	120.0 81.5 	0 + with 4 d. 8.563 Pairwise (Benj	f. with 4 d.f Comparison o amini-Hochbe 2	of iq3 by ieth erg) 3 	4	
ti 4 7 + probabili chi-squar probabili col Mean	3 ed = ty = ed with ty = 2.7	120.0 81.5 4.269 0.3708 h ties = 0.0730 Dunn's 1 787277).0266	0 + with 4 d. 8.563 Pairwise (Benj	f. with 4 d.f Comparison of amini-Hochbe 2	of iq3 by ieth erg) 3	4	
ti 4 7 + chi-squar probabili chi-squar probabili Col Mean	3 ed = ty = ed with ty = 2.7	120.0 81.5 4.269 0.3708 h ties = 0.0730 Dunn's 1 787277).0266	0 + with 4 d. 8.563 Pairwise (Benj	f. with 4 d.f. Comparison of amini-Hochbe 2	of iq3 by ieth erg) 3	4	
ti 4 7 + chi-squar probabili chi-squar probabili Col Mean	3 ed = ty = ed with ty = 2.7 2.7	120.0 81.5 	0 + with 4 d. 8.563 Pairwise (Benj 1.971406 0.0811	f. with 4 d.f. Comparison of amini-Hochbe 2	of iq3 by ieth erg) 3	4	
ti 4 7 + chi-squar probabili chi-squar probabili Col Mean	3 ed = ty = ed with ty = 2.7 2.7 0.4	120.0 81.5 	0 + with 4 d. 8.563 Pairwise (Benj 1.971406 0.0811	f. with 4 d.f. Comparison of amini-Hochbe 2	of iq3 by ieth erg) 3	4	
1 4 1 7 + chi-squar probabili chi-squar probabili Col Mean	3 ed = ty = ed with ty = 2.7 0.4	120.0 81.5 4.269 0.3708 h ties = 0.0730 Dunn's 1 	0 + with 4 d. 8.563 Pairwise (Benj 1.971406 0.0811 2.029656	f. with 4 d.f Comparison of amini-Hochbe 2 0.587402	of iq3 by ieth erg) 3	4	
i 4 i 7 + chi-squar probabili chi-squar probabili Col Mean	3 ed = ty = ed with ty = 2.7 2.7 0.4 0.4	120.0 81.5 	<pre>id id=+ with 4 d. 8.563 Pairwise (Benj 1.971406 0.0811 2.029656 0.1060</pre>	f. with 4 d.f Comparison o amini-Hochbe 2 0.587402 0.3978	of iq3 by ieth erg) 3	4	
i 4 i 7 + chi-squar probabili chi-squar probabili col Mean	<pre>ed = ty = ed with ty = l l l l l l l l l l l l l l l l l l</pre>	120.0 81.5 	<pre>id id=+ with 4 d. 8.563 Pairwise (Benj 1.971406 0.0811 2.029656 0.1060 1.685695</pre>	<pre>f. with 4 d.f Comparison o amini-Hochbe 2 0.587402 0.3978 0.758333</pre>	of iq3 by ieth erg) 3 	4	
i 4 i 7 + chi-squar probabili chi-squar probabili col Mean	<pre>ed = ty = ed with ty = l l l l l l l l l l l l l l l l l l</pre>	120.0 81.5 4.269 0.3708 h ties = 0.0730 Dunn's 1 	<pre>id id=-+ with 4 d. 8.563 Pairwise (Benj 1.971406 0.0811 2.029656 0.1060 1.685695 0.1148</pre>	<pre>f. with 4 d.f Comparison c amini-Hochbe 2 0.587402 0.3978 0.758333 0.3735</pre>	<pre> 0.286623 0.3872 </pre>	4	
<pre></pre>	3 ed = ty = ed with ty = 2.7 2.7 0.4 0.4 0.7	120.0 81.5 	<pre>intermediate 2 ***********************************</pre>	f. with 4 d.f Comparison of amini-Hochbe 2 0.587402 0.3978 0.758333 0.3735	<pre> 0.286623 0.3872 </pre>	4	
<pre></pre>	<pre> 3 ed = ty = ed with ty = </pre>	120.0 81.5 4.269 0.3708 h ties = 0.0730 Dunn's 1 	<pre>intermediate 20</pre>	f. with 4 d.f. Comparison of amini-Hochbe 2 0.587402 0.3978 0.758333 0.3735	of iq3 by ieth erg) 3 0.286623 0.3872	4	
<pre>1 4 1 7 1 7 + hi-squar robabili hi-squar robabili ol Mean- ow Mean 2 3 4 7 alse Dis</pre>	<pre>ed = ty = ed with ty = l l l l l l l l l l l l l l l l l l</pre>	120.0 81.5 	<pre>image content is a second</pre>	f. with 4 d.f. Comparison of amini-Hochbe 2 0.587402 0.3978 0.758333 0.3735 view only - ht	• • • • • • • • • • • • • •	4 nj.com/site/about/g	uidel

Reject Ho if $p = P(Z \le |z|) \le FDR/2$ with stopping rule 1 2 . dunntest iq4, by(ieth) ma(bh) wrap 3 4 Warning: by() values are unlabeled, option nolabel implicit 5 6 Kruskal-Wallis equality-of-populations rank test 7 +----+ 8 | ieth | Obs | Rank Sum | 9 |-----10 1 | 53 | 1803.00 | 2 | 2 | 22.00 11 3 | 1 | 41.50 12 4 | 4 | 95.00 | 7 | 3 | 54.50 | 13 ------14 15 6.055 with 4 d.f. chi-squared = probability = 0.1951 16 17 chi-squared with ties = 9.464 with 4 d.f. 18 probability = 0.0505 19 20 Dunn's Pairwise Comparison of iq4 by ieth 21 (Benjamini-Hochberg) 22 Col Mean-| 2 4 Row Mean | 1 3 23 ----+ _____ 24 2 | 2.179479 25 0.1465 26 -0.505482 -1.698444 3 | 27 0.3407 0.1490 28 4 | 1.350673 -1.004099 1.082780 29 0.1768 0.2252 0.2324 30 31 7 | 1.821760 -0.535433 1.378175 0.498577 0.1712 0.3702 0.2102 0.3090 32 33 False Discovery Rate = 0.05 34 Reject Ho if $p = P(Z \le |z|) \le FDR/2$ with stopping rule 35 36 . dunntest iq5, by(ieth) ma(bh) wrap 37 38 Warning: by() values are unlabeled, option nolabel implicit 39 40 Kruskal-Wallis equality-of-populations rank test 41 -----+ 42 | ieth | Obs | Rank Sum | 43 1 | 53 | 1808.50 44 2 | 2 | 39.50 3 | 1 | 7.50 45 7.50 46 4 | 4 | 148.00 47 7 | 3 | 12.50 | +----+ 48 chi-squared = 10.605 with 4 d.f. probability = 0.0314 49 50 51 chi-squared with ties = 26.277 with 4 d.f. 52 probability = 0.0001 53 54 Dunn's Pairwise Comparison of iq5 by ieth 55 (Benjamini-Hochberg) 56 Col Mean-Row Mean | 2 3 1 4 57 ------____+ 58 2 | 1.713447 59 0.0866 For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml 60

```
3 |
                 2.264929 0.858920
1
                          0.2440
                  0.0294
             2
3
                -0.476526 -1.710491 -2.265841
           4
             0.0726
                   0.3521
                                       0.0391
4
             5
           7 1
                          1.465931 0.247897
                 4.334614
                                               3.691637
6
                   0.0001
                           0.1019
                                     0.4021
                                                <mark>0.0006</mark>
7
     False Discovery Rate = 0.05
8
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
9
10
     . dunntest iq6, by(ieth) ma(bh) wrap
11
12
     Warning: by() values are unlabeled, option nolabel implicit
13
14
     Kruskal-Wallis equality-of-populations rank test
15
16
       +----+
       | ieth | Obs | Rank Sum |
17
        -----|
18
           1 | 52 | 1672.00 |
19
                2 |
                      54.50 I
           2 |
           3 | 1 |
                       41.50 |
20
           4 | 4 .
- 3 |
                 4 | 166.00 |
21
                      19.00 |
22
23
     chi-squared =
                     7.553 with 4 d.f.
24
     probability =
                    0.1094
25
                              11.196 with 4 d.f
     chi-squared with ties =
26
                    <mark>0.0245</mark>
     probability =
27
28
                     Dunn's Pairwise Comparison of iq6 by ieth
29
                               (Benjamini-Hochberg)
30
     Col Mean-|
31
     Row Mean |
                                       2
                                                    3
                          1
     ------
32
                          ____
                             _____
           2 | 0.459251
33
                 0.3589
             34
           3 | -0.624727 -0.785168
35
                  0.3326 0.3088
             36
             37
                -1.215526 -1.110396 0.000000
           4 |
                 0.2242
                           0.2224
                                     0.5000
38
             39
           7 |
                 2.934536
                          1.546239
                                     2.055206
                                                3.107180
40
                   0.0084
                           0.1526
                                      0.0664
                                                 0.0094
             41
     False Discovery Rate = 0.05
42
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
43
44
     . dunntest iq7, by(ieth) ma(bh) wrap
45
46
     Warning: by() values are unlabeled, option nolabel implicit
47
48
     Kruskal-Wallis equality-of-populations rank test
49
50
       | ieth | Obs | Rank Sum |
51
        _____+
52
           1 | 53 | 1815.00 |
53
           2 |
                2 |
                       47.00
           3 1
                     15.00
54
           4 | 4 | 77.00
55
           7 | 3 | 62.00 |
       56
           -----+
57
                    5.167 with 4 d.f.
     chi-squared =
58
     probability =
                     0.2705
59
                           For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml
60
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	Dunn's 1	Pairwise ((Benja	Comparison amini-Hochb	of iq7 by ie erg)	eth	
Col Mean- Row Mean	1		2	3		4
+						
2	0.949225					
3	1.213236	0.441625				
	0.3751	0.6588				
4	1.840200	0.312276	-0.241888			
	0.3287	0.5392	0.5055			
7	1.455928	0.197500	-0.312276	-0.118029		
	0.3035	0.4000	0.0290	0.4000		
False Disc Reject Ho	covery Rate = if p = P(Z <=	0.05 z) <= FI	DR/2 with s	topping rule	9	
. dunntest	iq8, by(ieth)	ma(bh) wr	rap			
Warning: k	oy() values are	unlabeled	d, option n	olabel impl:	cit	
Kruskal-Wa	allis equality-o	of-populat	ions rank	test		
+		+				
ieth	Obs Rank Sur	n 				
1	53 1804.00					
2	2 27.00))				
4	4 92.50) C				
· · · · · · · · · · · · · · · · · · ·	3 1 11 01	Ω I				
/ + chi-square probabilit	$3 \mid 44.00$ ed = 7.123 r zy = 0.1295) + with 4 d.f	Ē.			
/ + probabilit chi-square probabilit	3 44.00 d = 7.123 m d = 0.1295 d = 0.1295 d = 0.0845	0 + with 4 d.f 8.202	with 4 d.f			
/ + probabilit chi-square probabilit	3 44.00 ed = 7.123 m cy = 0.1295 ed with ties = cy = 0.0845 Dunn's D	0 + 8.202 Pairwise ((Benja	with 4 d.f Comparison Amini-Hochb	of iq8 by ie berg)	eth	
/ + probabilit chi-square probabilit Col Mean- Row Mean	3 44.00 ed = 7.123 r cy = 0.1295 ed with ties = cy = 0.0845 Dunn's 1 1	D + 8.202 Pairwise ((Benja	with 4 d.f Comparison amini-Hochb 2	of iq8 by iderg) 3	eth	4
/ + chi-square probabilit chi-square probabilit Col Mean- Row Mean 	3 44.00 ed = 7.123 m zy = 0.1295 ed with ties = zy = 0.0845 Dunn's 1 1 669101	D + with 4 d.f 8.202 Pairwise C (Benja	E. with 4 d.f Comparison amini-Hochk 2	of iq8 by id berg) 3	eth	4
/ + chi-square probabilit chi-square probabilit Col Mean Row Mean 	3 44.00 ed = 7.123 r zy = 0.1295 ed with ties = zy = 0.0845 Dunn's 1 1.669101 0.1189	0 + with 4 d.f 8.202 Pairwise C (Benja	with 4 d.f Comparison amini-Hochk 2	of iq8 by is berg) 3	eth	4
/ + probabilit chi-square probabilit Col Mean- Row Mean 2 3	3 44.00 ed = 7.123 m cy = 0.1295 ed with ties = cy = 0.0845 Dunn's 1 1.669101 0.1189 -0.838757 - 5	0 + with 4 d.f 8.202 Pairwise C (Benja 1.672942	with 4 d.f Comparison amini-Hochk 2	of iq8 by ie berg) 3	eth	4
/ + probabilit chi-square probabilit Col Mean Row Mean 	3 44.00 ed = 7.123 m zy = 0.1295 ed with ties = zy = 0.0845 Dunn's 1 1.669101 0.1189 -0.838757 -: 0.2869	0 + with 4 d.f 8.202 Pairwise C (Benja 1.672942 0.1572	with 4 d.f Comparison amini-Hochk 2	of iq8 by i erg) 3	eth	4
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<pre>• Question - For each of the questions, 1-10, is there a difference in the average response <u>if respondent is or was hospital worker?</u> • durinest iq1, by('twork) we(bb) wrup Xerning: by() values are unlabeled, option nolabel implicit Kriskel-Railis equality-of-populations cant text • • • • • • • • • • • • • • • • • • •</pre>		
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<pre>Kruskal-Wallis equality-of-populations rank test</pre>	warning.	by () values are unlabeled, opeion notabel implicit
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<pre>l 1 1 6 3 303.00</pre>		0 38 1211.00
<pre>chi-aquared = 0.076 with 2.d.f. probability = 0.565 % 1ch 2.d.f. probability = 0.556 % 1ch 2.d.f. probability = 0.000 (Benjamini-Hochberg) Col Mean- Rew Mean 0 1 1 0.198272 0.3664 -0.720741 2 0.3664 -0.720741 2 0.3664 -0.720741 3 0.3666 False Discovery Mate = 0.05 Reject Ho if p = F(Z <= [2]) <= FDF/2 with stopping rule 0.3664 -0.7066 False Discovery Mate = 0.05 Reject Ho if p = F(Z <= [2]) <= FDF/2 with stopping rule 0.3684 -0.7066 False Discovery Mate = 0.05 Reject Ho if p = F(Z <= [2]) <= FDF/2 with stopping rule 0.3684 -0.7066 False Discovery Mate = 0.05 Reject Ho if p = F(Z <= [2]) <= FDF/2 with stopping rule 0.3684 -0.7066 False Discovery Mate = 0.05 Reject Ho if p = F(Z <= [2]) <= FDF/2 with stopping rule 0.3684 -0.7066 False Discovery Mate = 0.05 Reject Ho if p = F(Z <= [2]) <= FDF/2 with stopping rule 0.3884 -0.7066 False Discovery Mate = 0.05 Reject Ho if p = F(Z <= [2]) <= FDF/2 with stopping rule 0.3884 -0.7066 False Discovery Mate = 0.65 Reject Ho if p = F(Z <= [2]) <= FDF/2 with stopping rule 0.3884 -0.7066 False Discovery Mate = 0.65 Reject Ho if p = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z <= [2]) = F(Z</pre>		
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Dunn's Pairwise Comparison of iql by inwork (Benjamini-Hochberg) Col Mean-1 Rew Mean 0 1 1 0.198272 0.4214 2 -0.650634 -0.720741 2 0.3864 -0.720741 2 0.3864 -0.700766 False Discovery Rate = 0.05 Reject Ho if p = P(2 <= 12)) <= FDR/2 with stopping rule . dunntest iq2, by(ihwork) ma(bh) wrap Narning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test +		
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<pre>chi-squared = 2.667 with 2 d.f. probability = 0.2635 chi-squared with ties = 3.851 with 2 d.f. probability = 0.1458 Dunn's Pairwise Comparison of iq2 by ihwork (Benjamini-Hochberg) Col Mean- Row Mean 0 1 </pre>		2 9 354.50
chi-squared = 2.667 with 2 d.f. probability = 0.2635 chi-squared with ties = 3.851 with 2 d.f. probability = 0.1458 Dunn's Pairwise Comparison of iq2 by ihwork (Benjamini-Hochberg) Col Mean- Row Mean 0 1 1 1.177995 0.1194 2 -1.243802 -1.949178 0.1602 0.0769	+	+
probability = 0.2635 chi-squared with ties = 3.851 with 2 d.f. probability = 0.1458 Dunn's Pairwise Comparison of iq2 by ihwork (Benjamini-Hochberg) Col Mean- Row Mean 0 1 	chi-squa	ared = 2.667 with 2 d.f.
chi-squared with ties = 3.851 with 2 d.f. probability = 0.1458 Dunn's Pairwise Comparison of iq2 by ihwork (Benjamini-Hochberg) Col Mean- Row Mean 0 1 	probabil	uty = 0.2635
probability = 0.1458 Dunn's Pairwise Comparison of iq2 by ihwork (Benjamini-Hochberg) Col Mean- Row Mean 0 1 	chi-squa	ared with ties = 3.851 with 2 d.f.
Dunn's Pairwise Comparison of iq2 by ihwork (Benjamini-Hochberg) Col Mean- Row Mean 0 1 	probabil	ity = 0.1458
Dunn's Pairwise Comparison of iq2 by ihwork (Benjamini-Hochberg) Col Mean- Row Mean 0 1 		
Col Mean- Row Mean 0 1 		Dunn's Pairwise Comparison of iq2 by ihwork
Row Mean 0 1 1 1.177995 1 0.1194 1 1 2 -1.243802 -1.949178 0.1602 0.0769	Col Mear	(Benjamini-Hochberg)
1 1.177995 0.1194 2 -1.243802 -1.949178 0.1602 0.0769	Row Mear	. 0 1
2 -1.243802 -1.949178 0.1602 0.0769		-+
2 -1.243802 -1.949178 0.1602 0.0769	Ţ	0.1194
2 -1.243802 -1.949178 0.1602 0.0769		
	2	-1.243802 -1.949178 0.1602 0.0769

```
False Discovery Rate = 0.05
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
1
2
3
     . dunntest iq3, by(ihwork) ma(bh) wrap
4
     Warning: by() values are unlabeled, option nolabel implicit
5
6
     Kruskal-Wallis equality-of-populations rank test
7
8
       +----+
9
       | ihwork | Obs | Rank Sum |
10
        0 | 38 | 1187.00 |
11
            1 | 16 | 482.50 |
2 | 9 | 346.50 |
12
13
       +----+
14
     chi-squared = 1.359 with 2 d.f.
probability = 0.5068
15
16
     chi-squared with ties = 2.727 with 2 d.f.
17
     probability = 0.2558
18
19
                    Dunn's Pairwise Comparison of iq3 by ihwork
20
                              (Benjamini-Hochberg)
21
     Col Mean-|
22
                         0
     Row Mean |
                                      1
      ____+
23
           1 | 0.280149
24
                 0.3897
             25
           2 | -1.513775 -1.547192
26
                 0.0976
                           0.1827
             27
     False Discovery Rate = 0.05
28
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
29
30
31
     . dunntest iq4, by(ihwork) ma(bh) wrap
32
     Warning: by() values are unlabeled, option nolabel implicit
33
34
     Kruskal-Wallis equality-of-populations rank test
35
36
       +----+
37
       | ihwork | Obs | Rank Sum |
       |-----|
38
            0 | 38 | 1109.50 |
39
           1 | 16 | 533.00 |
2 | 9 | 373.50 |
40
       +----+
41
42
     chi-squared =
                    3.388 with 2 d.f.
43
     probability =
                    0.1838
44
     chi-squared with ties =
                              5.295 with 2 d.f.
45
     probability =
                    0.0708
46
47
                    Dunn's Pairwise Comparison of iq4 by ihwork
48
                             (Benjamini-Hochberg)
49
     Col Mean-|
50
     Row Mean |
                         0
                                       1
     _____
51
          1 | -0.941750
52
                  0.1732
            1
53
             1
           2 |
               -2.263389 -1.340169
54
                 0.0354 0.1351
             55
     False Discovery Rate = 0.05
56
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
57
58
59
     . dunntest iq5, by(ihwork) ma(bh) wrap
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60
```

```
Warning: by() values are unlabeled, option nolabel implicit
1
2
3
     Kruskal-Wallis equality-of-populations rank test
4
           _____+
5
       | ihwork | Obs | Rank Sum |
6
        ------
            0 | 38 | 1219.00 |
1 | 16 | 464.00 |
7
            1 | 16 | 464.00 |
2 | 9 | 333.00 |
8
9
       +----+
10
                    1.099 with 2 d.f.
     chi-squared =
11
     probability = 0.5773
12
                               2.723 with 2 d.f.
13
     chi-squared with ties =
     probability = 0.2563
14
15
                    Dunn's Pairwise Comparison of iq5 by ihwork
16
                      (Benjamini-Hochberg)
17
     Col Mean-I
18
     Row Mean |
                          0
19
     ----+
          1 | 0.887196
20
                0.1875
           |
21
             1
22
           2 |
                -1.139947 -1.648784
               0.1907 0.1488
             23
24
     False Discovery Rate = 0.05
25
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
26
27
     . dunntest iq6, by(ihwork) ma(bh) wrap
28
     Warning: by() values are unlabeled, option nolabel implicit
29
30
                                                         Kruskal-Wallis equality-of-populations rank test
31
32
         _____+
33
       | ihwork | Obs | Rank Sum |
34
        -----|
            0 | 38 | 1081.00 |
35
       1 | 16 | 540.00 |
2 | 8 | 332.00 |
36
37
       +----+
38
     chi-squared = 3.794 with 2 d.f.
probability = 0.1500
39
40
     chi-squared with ties =
                              5.625 with 2 d.f.
41
     probability = 0.0601
42
43
                    Dunn's Pairwise Comparison of iq6 by ihwork
44
                             (Benjamini-Hochberg)
45
     Col Mean-I
46
     Row Mean |
                          0
                                       1
47
       ----+-
                _____
           1 | -1.200715
48
                 0.1149
             49
             2 |
                -2.264381 -1.207799
50
                  0.0353
                           0.1703
             51
52
     False Discovery Rate = 0.05
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
53
54
55
     . dunntest iq7, by(ihwork) ma(bh) wrap
56
     Warning: by() values are unlabeled, option nolabel implicit
57
58
59
     Kruskal-Wallis equality-of-populations rank test
                           For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml
60
```

_____ 1 | ihwork | Obs | Rank Sum | 2 -----3 0 | 38 | 1189.00 | 1 | 16 | 460.00 | 2 | 9 | 367.00 | 4 5 +----+ 6 chi-squared = 2.624 with 2 d.f. probability = 0.2693 7 8 9 chi-squared with ties = 3.570 with 2 d.f. 10 probability = 0.1678 11 12 Dunn's Pairwise Comparison of iq7 by ihwork 13 (Benjamini-Hochberg) Col Mean-| 14 Row Mean | 0 1 15 ----+ 0.542224 16 1 1 0.2938 _____ 17 18 2 | -1.628668 -1.836862 19 0.0775 0.0993 20 False Discovery Rate = 0.05 21 Reject Ho if $p = P(Z \le |z|) \le FDR/2$ with stopping rule 22 23 . dunntest iq8, by(ihwork) ma(bh) wrap 24 25 Warning: by() values are unlabeled, option nolabel implicit 26 27 Kruskal-Wallis equality-of-populations rank test 28 29 | ihwork | Obs | Rank Sum | 30 -----| 0 | 38 | 1080.00 | 1 | 16 | 576.50 | 2 | 9 | 359.50 | 31 32 33 +----+ 34 chi-squared = 3.913 with 2 d.f. 35 0.1413 probability = 36 37 4.506 with 2 d.f. chi-squared with ties = 38 probability = 0.1051 39 40 Dunn's Pairwise Comparison of iq8 by ihwork (Benjamini-Hochberg) 41 Col Mean-| 42 Row Mean | 0 1 43 ----+-------1 | -1.494891 44 0.1012 45 46 2 | -1.819713 -0.549796 47 0.1032 0.2912 48 False Discovery Rate = 0.05 49 Reject Ho if $p = P(Z \le |z|) \le FDR/2$ with stopping rule 50 51 . dunntest iq9, by(ihwork) ma(bh) wrap 52 53 Warning: by() values are unlabeled, option nolabel implicit 54 55 Kruskal-Wallis equality-of-populations rank test 56 +----+ 57 | ihwork | Obs | Rank Sum | 58 -----| 59 0 | 38 | 1096.00 | For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml 60

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chi-squared = 3.833 with 2 d.f. probability = 0.1471 chi-squared with ties = 4.568 with 2 d.f. probability = 0.1019 Dunn's Pairwise Comparison of iq9 by ihwork (Benjamini-Hochberg) Col Mean-1 Row Mean 1 0 1 	<pre>chi-squared =</pre>	1 2 +	16 545.00 9 375.00
chi-squared with ties = 4.568 with 2 d.f. probability = 0.1019 Dunn's Pairwise Comparison of iq9 by ihwork (Benjamini-Hochberg) Col Mean- Row Mean 0 1 	<pre>chi-squared with ties = 1.668 with 2 d.f. probability = 0.003 Col Mean-1 0 0 1 1 - 1.043163 2 - 2.060155 - 1.086818 0.0591 0.2079 False Discovery Rate = 0.05 Reject Ho if p = F(Z <= z) <= FDR/2 with stopping rule . dunntest iq10, by(ihwork) ma(bh) wrap Marning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test 1 - 0 - 1 38 1206.00 1 - 1 - 1 - 1 - 0.8396 chi-squared = 0.303 with 2 d.f. probability = 0.8596 chi-squared with ties = 1.169 with 2 d.f. probability = 0.8596 chi-squared with ties = 1.169 with 2 d.f. probability = 0.8596 chi-squared = 0.303 with 2 d.f. probability = 0.4339 col Mean-1 0 1 - 0.287560 2 - 0.943719 - 0.04380 False Discovery Rate = 0.05 Reject Ho if p = F(Z <= z) <= FDR/2 with stopping rule Exceedence with stopping rule False Discovery Rate = 0.05 Reject Ho if p = F(Z <= z) <= FDR/2 with stopping rule Exceedence works, bttp://bningen.bmicgon/disc/</pre>	chi-square probabilit	ed = 3.833 with 2 d.f. ey = 0.1471
Dunn's Pairwise Comparison of iq9 by ihwork (Benjamini-Hochberg) Col Mean- Row Mean 0 1 	Dunn's Pairwise Comparison of ig9 by ihwork (Benjamini-Hochberg) Col Mean- 1 -1.043163 2 -2.060159 -1.086818 0.0591 -0.2078 False Discovery Rate = 0.05 Reject Ho If P = F(Z <= z) <= FDR/2 with stopping rule	chi-square probabilit	ed with ties = 4.568 with 2 d.f. y = 0.1019
<pre>Row Mean 0 1</pre>	<pre>Now Mean 0 1 1 -1.043163 2 -2.060159 -1.086618 0.05070 False Discovery Rate = 0.05 Reject Ho if p = P(Z <= z) <= FDR/2 with stopping rule</pre>	Col Mean-I	Dunn's Pairwise Comparison of iq9 by ihwork (Benjamini-Hochberg)
<pre>1 -1.043163</pre>	<pre>1 -1.043163 2 -2.060159 -1.086818 2 -2.060159 -0.2078 False Discovery Rate = 0.05 Reject Ho If p = P(2 <= z) <= PDP/2 with stopping rule dunntest iql0, by(ihwork) ma(bh) wrap Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test +</pre>	Row Mean	0 1
<pre>2 -2.060159 -1.086818 0.0591 0.2078 False Discovery Rate = 0.05 Reject Ho if p = P(Z <= z) <= FDR/2 with stopping rule . dunntest iq10, by(ihwork) ma(bh) wrap Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test +</pre>	<pre>2 -2.060159 -1.086818 0.0591 0.2078 False Discovery Rate = 0.05 Reject Ho if p = P(2 <= z) <= FDR/2 with stopping rule . dunntest iq10, by(ihwork) ma(bh) wrap Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test</pre>	1 	-1.043163 0.1484
<pre>False Discovery Rate = 0.05 Reject Ho if p = P(Z <= z) <= FDR/2 with stopping rule . dunntest iq10, by(ihwork) ma(bh) wrap Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test +</pre>	<pre>False Discovery Rate = 0.05 Reject H0 if p = P(Z <= z) <= EDR/2 with stopping rule dunntest iq10, by(ihwork) ma(bh) wrap Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test +</pre>	2	-2.060159 -1.086818 0.0591 0.2078
<pre> . dunntest iq10, by(ihwork) ma(bh) wrap Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test ++ ihwork Obs Rank Sum + 0 38 1206.00 1 16 495.00 2 9 315.00 ++ chi-squared = 0.303 with 2 d.f. probability = 0.8596 chi-squared with ties = 1.169 with 2 d.f. probability = 0.5574 Dunn's Pairwise Comparison of iq10 by ihwork (Benjamini-Hochberg) Col Mean- Row Mean 0 1 </pre>	. dunntest iq10, by(ihwork) ma(bh) wrap Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test +	False Disc Reject Ho	:overy Rate = 0.05 if p = P(Z <= z) <= FDR/2 with stopping rule
<pre>Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test ++ ihwork Obs Rank Sum +</pre>	<pre>Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test +</pre>	. dunntest	: iq10, by(ihwork) ma(bh) wrap
<pre>Kruskal-Wallis equality-of-populations rank test ++ i hwork Obs Rank Sum + i hwork Obs Rank Sum + i hwork Obs Rank Sum </pre>	<pre>Kruskal-Wallis equality-of-populations rank test</pre>	Warning: b	py() values are unlabeled, option nolabel implicit
<pre>https://www.initeconvertex.com/</pre>	<pre>https://without.com/diality/of/populations/function</pre>	Kruskal-Wa	allis equality-of-populations rank test
<pre>i ihwork Obs Rank Sum </pre>	<pre>i ihwork Obs Rank Sum 0 38 1206.00 1 16 495.00 2 9 315.00 chi-squared = 0.303 with 2 d.f. probability = 0.8596 chi-squared with ties = 1.169 with 2 d.f. probability = 0.5574 Dunn's Pairwise Comparison of iq10 by ihwork (Benjamini-Hochberg) Col Mean- Row Mean 0 1 </pre>	+Wa	
<pre></pre>	<pre></pre>	ihwork	: Obs Rank Sum
<pre> 1 10 495.00 2 9 315.00 ++ chi-squared = 0.303 with 2 d.f. probability = 0.8596 chi-squared with ties = 1.169 with 2 d.f. probability = 0.5574 Dunn's Pairwise Comparison of iq10 by ihwork</pre>	<pre> 1 1 0 493.00 2 9 315.00 ++ chi-squared = 0.303 with 2 d.f. probability = 0.8596 chi-squared with ties = 1.169 with 2 d.f. probability = 0.5574 Dunn's Pairwise Comparison of iq10 by ihwork</pre>		
<pre>++ chi-squared = 0.303 with 2 d.f. probability = 0.8596 chi-squared with ties = 1.169 with 2 d.f. probability = 0.5574</pre>	<pre>tt chi-squared = 0.303 with 2 d.f. probability = 0.8596 chi-squared with ties = 1.169 with 2 d.f. probability = 0.5574</pre>	1	2 9 315.00
chi-squared = 0.303 with 2 d.f. probability = 0.8596 chi-squared with ties = 1.169 with 2 d.f. probability = 0.5574 Dunn's Pairwise Comparison of iq10 by ihwork (Benjamini-Hochberg) Col Mean- Row Mean 0 1 	<pre>chi-squared = 0.303 with 2 d.f. probability = 0.8596 chi-squared with ties = 1.169 with 2 d.f. probability = 0.5574 Dunn's Pairwise Comparison of iq10 by ihwork (Benjamini-Hochberg) Col Mean- Row Mean 0 1 </pre>	+	+
chi-squared with ties = 1.169 with 2 d.f. probability = 0.5574 Dunn's Pairwise Comparison of iq10 by ihwork (Benjamini-Hochberg) Col Mean- Row Mean 0 1 	chi-squared with ties = 1.169 with 2 d.f. probability = 0.5574 Dunn's Pairwise Comparison of iq10 by ihwork (Benjamini-Hochberg) Col Mean- Row Mean 0 1 	chi-square probabilit	ed = 0.303 with 2 d.f.
Dunn's Pairwise Comparison of iq10 by ihwork (Benjamini-Hochberg) Col Mean- Row Mean 0 1 	Expression of iq10 by inwork (Benjamini-Hochberg) Col Mean- Row Mean 0 1 	chi-square	$rac{1}{2}$
Dunn's Pairwise Comparison of iq10 by ihwork (Benjamini-Hochberg) Col Mean- Row Mean 0 1 	Dunn's Pairwise Comparison of iq10 by ihwork (Benjamini-Hochberg) Col Mean- Row Mean 0 1 1 0.287560 0.3868 2 -0.943719 -1.045310 0.2590 0.4438 False Discovery Rate = 0.05 Reject Ho if p = P(Z <= z) <= FDR/2 with stopping rule Ecr peer review only - http://bmionen.hmi.com/site/al	probabilit	y = 0.5574
Col Mean- Row Mean 0 1 	Col Mean- Row Mean 0 1 		Dupple Bairwise Comparison of ig10 by ibyork
Col Mean 0 1 Row Mean 0 1 1 0.287560 0.3868 2 -0.943719 -1.045310 0.2590 0.4438 False Discovery Rate = 0.05	Col Mean- Row Mean 0 1 		(Benjamini-Hochberg)
1 0.287560 0.3868 2 -0.943719 -1.045310 0.2590 0.4438 False Discovery Rate = 0.05	<pre> 1 0.287560 0.3868 2 -0.943719 -1.045310 0.2590 0.4438 False Discovery Rate = 0.05 Reject Ho if p = P(Z <= z) <= FDR/2 with stopping rule Eor peer review only - http://bmiopen.hmi.com/site/al </pre>	Col Mean- Row Mean	0 1
0.3868 2 -0.943719 -1.045310 0.2590 0.4438 False Discovery Rate = 0.05	<pre>For peer review only - http://hmiopen.hmi.com/site/all</pre>	+	0.287560
2 -0.943719 -1.045310 0.2590 0.4438 False Discovery Rate = 0.05	<pre>2 -0.943719 -1.045310 0.2590 0.4438 False Discovery Rate = 0.05 Reject Ho if p = P(Z <= z) <= FDR/2 with stopping rule</pre>		0.3868
False Discovery Rate = 0.05	<pre>False Discovery Rate = 0.05 Reject Ho if p = P(Z <= z) <= FDR/2 with stopping rule </pre>	2	-0.943719 -1.045310 0.2590 0.4438
raise Discovery Nace = 0.000	Reject Ho if p = P(Z <= z) <= FDR/2 with stopping rule	False Diec	rowery Pate = 0.05
	For peer review only - http://bmiopen.hmi.com/site/al		
	For peer review only - http://bmiopen.hmi.com/site/al		
	For peer review only - http://bmionen.hmi.com/site/a		
	For peer review only - http://bmiopen.hmi.com/site/al		
	For neer review only - http://bmionen.hmi.com/site/al		
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Nurse Student Statistics on Factor Analysis Produced Variables

1 2

3

4 5 6

7 8 9

Question - For each of the factor variables (knowledge, participation, and total cost), are there differences in the average response by age? Answer – NO, there are no significant differences among the age categories for any of the three factor variables. Question – For each of the factor variables (knowledge, participation, and total cost), are there differences in the 10 average response by gender? 11 12 Answer – NO, there are no significant differences between genders for any of the three factor variables. 13 14 15 16 Question – For each of the factor variables (knowledge, participation, and total cost), are there differences in the 17 average response by level of education? 18 19 Answer – NO, there are no significant differences among the levels of education for any of the three factor variables. 20 21 22 23 Question: For each of the factor variables (knowledge, participation, and total cost), are there differences in the 24 average response based upon racer or ethnicity? 25 26 Answer – YES, for the factor variable knowledge there is a significant difference between groups 1 and 2 and 27 between groups 1 and 7, and for the factor variable total cost there are significant differences between the pairs of 28 groups 1 and 7, 3 and 7, and 4 and 7 29 30 Question: For each of the factor variables (knowledge, participation, and total cost), are there differences in the 31 32 average response based experience working in a hospital? 33 34 Answer – YES, for the factor variable "participation" there is a significant difference between group 0 and group 2 35 36 37 **STATISTICS** 38 39 Question – For each of the factor variables (knowledge, participation, and total cost), are there differences in the 40 average response by age? 41 42 . dunntest iknowledge, by(iage) 43 44 Kruskal-Wallis equality-of-populations rank test 45 46 | iage | Obs | Rank Sum | 47 -----48 3 | 2 | 27.50 49 12 | 4 | 309.00 5 | 14 | 417.50 50 6 | 25 | 850.00 51 7 | 10 | 412.00 | 52 _____+ 53 6.392 with 4 d.f. chi-squared = 54 probability = 0.1717 55 8.092 with 4 d.f. chi-squared with ties = 56 probability = 0.0883 57 58 Dunn's Pairwise Comparison of iknowledge by iage 59 For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml 60

Col Mean-						
Row Mean	 	3	3	4	5	6
	+	61113				
4	-0.9	.1674				
5	 _1 3	05010 -	0 635265			
-	0	.0959	0.2626			
6	 -1.6	91486 -	1.441963	-0.768369		
	0	.0454	0.0747	0.2211		
7	-2.1	75239 -	2.214869	-1.686889	-1.181160	
	0	.0148	0.0134	0.0458	0.1188	
alpha = Reject Ho	0.05	P(7 <=	7) <= a	lpha/2		
	тър	1 (2) <	1217 5 6	11012		
• . dunntest	t ipart	icipate,	by(iage)			
Kruckal-W	-	- ouality-	of-popula	tione rank	+0.0+	
NIUSKAI-W	alling e	quarrey-	.or-bobars		LESL	
+	 Obs	Rank Su	+ ım			
	++					
3 4	2 12	37.0 281.0	10 10			
1 5	14	458.0	00			
6	25 10	834.0 406.0				
+			+			
chi-square	ed =	6.076	with 4 d.	f.		
probabili	су =	0.1935	5			
probabili	ty =	0.1795	0.270	5 WICH 4 0.1		
	Dun	n's Pair	wise Com <u>r</u>	oarison of i	participate by	iage
Col Mean-	I		(No	o adjustment	.)	
Row Mean	l	З	3	4	5	6
4	-0.3	56920				
	0	.3606				
5	1					
5	-1.0	42565 -	1.310385			
5	-1.0 0	42565 - .1486	0.0950			
6	-1.0 0 -1.1	42565 - .1486 21195 -	·1.310385 0.0950 ·1.569823	-0.107251		
6	-1.0 0 -1.1 0	42565 - .1486 21195 - .1311	·1.310385 0.0950 ·1.569823 0.0582	-0.107251 0.4573		
6 7	-1.0 0 -1.1 0 -1.5	42565 - .1486 21195 - .1311 81888 -	-1.310385 0.0950 -1.569823 0.0582 -2.225081	-0.107251 0.4573 -1.055987	-1.072837	
6 7	-1.0 0 -1.1 0 -1.5 0	42565 - .1486 21195 - .1311 81888 - .0568	-1.310385 0.0950 -1.569823 0.0582 -2.225081 0.0130	-0.107251 0.4573 -1.055987 0.1455	-1.072837 0.1417	
6 7 alpha =	-1.0 0 -1.1 -1.5 0.05	42565 - .1486 21195 - .1311 81888 - .0568	-1.310385 0.0950 -1.569823 0.0582 -2.225081 0.0130	-0.107251 0.4573 -1.055987 0.1455	-1.072837 0.1417	
6 7 Reject Ho	-1.0 0 -1.1 -1.5 0.05 if p =	42565 - .1486 21195 - .1311 81888 - .0568 = P(Z <=	<pre>-1.310385 0.0950 -1.569823 0.0582 -2.225081 0.0130 z) <= a</pre>	-0.107251 0.4573 -1.055987 0.1455 alpha/2	-1.072837 0.1417	
6 7 alpha = Reject Ho	-1.0 0 -1.1 -1.5 0.05 if p =	42565 - .1486 21195 - .1311 81888 - .0568 P(Z <=	<pre>-1.310385 0.0950 -1.569823 0.0582 -2.225081 0.0130 z) <= a</pre>	-0.107251 0.4573 -1.055987 0.1455 alpha/2	-1.072837 0.1417	
6 7 alpha = Reject Ho . dunntes	-1.0 0 -1.1 -1.5 0.05 if p =	42565 - .1486 21195 - .1311 81888 - .0568 = P(Z <=	<pre>-1.310385 0.0950 -1.569823 0.0582 -2.225081 0.0130 z) <= a fiage)</pre>	-0.107251 0.4573 -1.055987 0.1455 alpha/2	-1.072837 0.1417	
6 7 alpha = Reject Ho . dunntest Warning: }	<pre> -1.0 0 -1.1 -1.5 -1.5 0 0.05 if p = z itotc py() va</pre>	42565 - .1486 21195 - .1311 81888 - .0568 • P(Z <= cost, by(lues are	<pre>1.310385 0.0950 1.569823 0.0582 2.225081 0.0130 z) <= a fiage) e unlabele</pre>	-0.107251 0.4573 -1.055987 0.1455 alpha/2 ed, option m	-1.072837 0.1417 nolabel implici	t
6 7 alpha = Reject Ho . dunntest Warning: }	<pre> -1.0 0 -1.1 -1.5 0 0.05 if p = t itotc py() va</pre>	42565 - .1486 21195 - .1311 81888 - .0568 = P(Z <= rost, by(lues are	<pre>-1.310385 0.0950 -1.569823 0.0582 -2.225081 0.0130 z) <= a fiage) e unlabele</pre>	-0.107251 0.4573 -1.055987 0.1455 alpha/2 ed, option m	-1.072837 0.1417 nolabel implici	t
6 7 Reject Ho . dunntes Warning: } Kruskal-Wa	<pre> -1.0 0 -1.1 -1.5 0 0.05 if p = t itotc py() va allis e</pre>	42565 - .1486 21195 - .1311 81888 - .0568 = P(Z <= cost, by(lues are	<pre>-1.310385 0.0950 -1.569823 0.0582 -2.225081 0.0130 z) <= a fiage) e unlabele</pre>	-0.107251 0.4573 -1.055987 0.1455 alpha/2 ed, option m	-1.072837 0.1417 Nolabel implici	t
6 7 alpha = Reject Ho dunntest Warning: } Kruskal-Wa +	<pre> -1.0 0 -1.1 -1.5 0 0.05 if p = t itotc cy() va allis e </pre>	42565 - .1486 21195 - .1311 81888 - .0568 P(Z <= cost, by(lues are equality-	<pre>-1.310385 0.0950 -1.569823 0.0582 -2.225081 0.0130 z) <= a fiage) e unlabele +</pre>	-0.107251 0.4573 -1.055987 0.1455 alpha/2 ed, option m	-1.072837 0.1417 Nolabel implici	t
6 7 alpha = Reject Ho dunntes Marning: J Kruskal-Wa + iage	<pre> -1.0 0 -1.1 -1.5 0 0.05 if p = t itotc cy() va allis e Obs ++</pre>	42565 - .1486 21195 - .1311 81888 - .0568 • P(Z <= rost, by(lues are equality- 	<pre>-1.310385 0.0950 -1.569823 0.0582 -2.225081 0.0130 z) <= a :iage) e unlabele + m +</pre>	-0.107251 0.4573 -1.055987 0.1455 alpha/2 ed, option m	-1.072837 0.1417 Molabel implici	t
6 7 alpha = Reject Ho dunntes Marning: 1 Kruskal-Wa t iage 3	<pre> -1.0 0 -1.1 -1.5 0 0.05 if p = t itotc oy() va allis e Obs ++ 2 </pre>	42565 - .1486 21195 - .1311 81888 - .0568 P(Z <= cost, by(lues are equality- Rank Su 83.0	<pre>-1.310385 0.0950 -1.569823 0.0582 -2.225081 0.0130 z) <= a :iage) e unlabele + im 00 </pre>	-0.107251 0.4573 -1.055987 0.1455 alpha/2 ed, option m ations rank	-1.072837 0.1417 holabel implici	t
6 7 alpha = Reject Ho dunntest Warning: J Kruskal-Wa t iage 3 4 4	<pre> -1.0 0 -1.1 -1.5 0 0.05 if p = t itotc oy() va allis e + 0bs ++ 2 12 </pre>	42565 - .1486 21195 - .1311 81888 - .0568 • P(Z <= cost, by(lues are equality- Rank Su 83.0 402.5	<pre>-1.310385 0.0950 -1.569823 0.0582 -2.225081 0.0130 z) <= a (iage) e unlabele + m 00 00 00 </pre>	-0.107251 0.4573 -1.055987 0.1455 alpha/2 ed, option m ations rank	-1.072837 0.1417 Nolabel implici	t
6 7 alpha = Reject Ho . dunntest Warning: J Kruskal-Wa + iage 3 4 5 6	<pre> -1.0 0 -1.1 -1.5 0 0.05 if p = t itotc cy() va allis e + Obs ++ 2 12 14 25 </pre>	42565 - .1486 21195 - .1311 81888 - .0568 P(Z <= cost, by(lues are equality- Rank Su 83.0 402.5 380.0 742.5	<pre>-1.310385 0.0950 -1.569823 0.0582 -2.225081 0.0130 z) <= a (iage) e unlabele </pre>	-0.107251 0.4573 -1.055987 0.1455 alpha/2 ed, option m ations rank	-1.072837 0.1417 Wolabel implici	t
6 7 alpha = Reject Ho dunntest Warning: J Kruskal-Wa + iage 3 4 5 6 7	<pre> -1.0 0 -1.1 -1.5 0 0.05 if p = t itotc oy() va allis e Obs + 2 12 14 14 25 9 </pre>	42565 - .1486 21195 - .1311 81888 - .0568 = P(Z <= cost, by(lues are equality- Rank Su 	<pre>-1.310385 0.0950 -1.569823 0.0582 -2.225081 0.0130 z) <= a fiage) e unlabele + m + m + 00 00 00 00 </pre>	-0.107251 0.4573 -1.055987 0.1455 alpha/2 ed, option m	-1.072837 0.1417 Holabel implici	t
6 7 alpha = Reject Ho . dunntes Warning: J Kruskal-Wa t iage 3 4 4 5 6 7 +	<pre> -1.0 0 -1.1 -1.5 0 0.05 if p = t itotc cy() va allis e + Obs +++ 2 1 12 14 25 9 </pre>	42565 - .1486 21195 - .1311 81888 - .0568 • P(Z <= cost, by(lues are equality- Rank Su 83.0 402.5 380.0 742.5 345.0	<pre>-1.310385 0.0950 -1.569823 0.0582 -2.225081 0.0130 z) <= a (iage) e unlabele + mm 00 00 00 00 +</pre>	-0.107251 0.4573 -1.055987 0.1455 alpha/2 ed, option m ations rank	-1.072837 0.1417 holabel implici	t
6 7 alpha = Reject Ho dunntes Warning: J Kruskal-Wa t i age 1 i 3 4 4 5 6 7 	<pre> -1.0 0 -1.1 -1.5 0 0.05 if p = t itotc oy() va allis e Obs ++ 2 12 14 25 9 </pre>	42565 - .1486 21195 - .1311 81888 - .0568 P(Z <= cost, by(lues are equality- Rank Su 83.0 402.5 380.0 742.5 345.0	<pre>-1.310385 0.0950 -1.569823 0.0582 -2.225081 0.0130 z) <= a :iage) e unlabele + un + un + un + Eo + For peer ref</pre>	-0.107251 0.4573 -1.055987 0.1455 alpha/2 ed, option m ations rank	-1.072837 0.1417 holabel implici test ttp://bmjopen.b	.t

```
chi-squared =
                  3.125 with 4 d.f.
    probability =
                  0.5372
1
2
    chi-squared with ties =
                          4.632 with 4 d.f.
3
    probability = 0.3272
4
5
                 Dunn's Pairwise Comparison of itotcost by iage
6
                     (No adjustment)
7
    Col Mean-|
                     3
                                            5
    Row Mean |
                                  4
                                                         6
8
      ____+
             _____
9
         4 | 0.703165
10
               0.2410
          11
          5 |
             1.281683 1.097642
12
               0.1000
                       0.1362
           13
             1.083624 0.738198 -0.516952
          6 |
14
               0.1393 0.2302
                                0.3026
           15
            0.273361 -0.733301 -1.767517 -1.498732
          7 1
16
               0.3923 0.2317 0.0386 0.0670
            17
18
    alpha = 0.05
    Reject Ho if p = P(Z \le |z|) \le alpha/2
19
20
    _____
21
22
    Question – For each of the factor variables (knowledge, participation, and total cost), are there differences in the
23
    average response by gender?
24
25
     . dunntest iknowledge, by(igender)
26
    Warning: by() values are unlabeled, option nolabel implicit
27
                                              28
    Kruskal-Wallis equality-of-populations rank test
29
30
      +----+
31
      | igender | Obs | Rank Sum |
      |-----|
32
           1 | 19 | 598.00 |
33
           2 | 44 | 1418.00 |
      1
34
      +----+
35
    chi-squared = 0.022 with 1 d.f.
probability = 0.8810
36
37
    chi-squared with ties = 0.028 with 1 d.f.
38
    probability = 0.8662
39
40
              Dunn's Pairwise Comparison of iknowledge by igender
41
                            (No adjustment)
42
    Col Mean-L
43
    Row Mean |
                      1
     -----
44
         2 | -0.168503
45
          0.4331
46
47
    alpha = 0.05
    Reject Ho if p = P(Z \le |z|) \le alpha/2
48
49
    . dunntest iparticipate, by(igender)
50
51
    Warning: by() values are unlabeled, option nolabel implicit
52
53
    Kruskal-Wallis equality-of-populations rank test
54
55
      +----+
56
      | igender | Obs | Rank Sum |
      57
          1 | 19 | 502.00 |
      58
            2 | 44 | 1514.00 |
59
        _____
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60
```

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```
chi-squared =
                    2.520 with 1 d.f.
1
     probability =
                    0.1124
2
3
    chi-squared with ties =
                             2.603 with 1 d.f.
                     0.1067
     probability =
4
5
6
               Dunn's Pairwise Comparison of iparticipate by igender
7
                                (No adjustment)
     Col Mean-|
8
     Row Mean |
                          1
9
     _____
          2 | -1.613363
10
                  0.0533
            11
12
     alpha = 0.05
13
     Reject Ho if p = P(Z \le |z|) \le alpha/2
14
15
     . dunntest itotcost, by(igender)
16
     Warning: by() values are unlabeled, option nolabel implicit
17
18
19
     Kruskal-Wallis equality-of-populations rank test
20
       21
       | igender | Obs | Rank Sum |
22
          ------
             1 | 19 | 587.50 |
23
             2 | 43 | 1365.50 |
24
            -----+
25
                     0.028 with 1 d.f.
     chi-squared =
26
                   0.8666
     probability =
27
28
     chi-squared with ties = 0.042 with 1 d.f.
     probability =
                  0.8380
29
30
31
                 Dunn's Pairwise Comparison of itotcost by igender
                                (No adjustment)
32
     Col Mean-|
33
     Row Mean |
                         1
34
     _____
          2 | -0.204490
35
                  0.4190
            36
37
     alpha = 0.05
     Reject Ho if p = P(Z \le |z|) \le alpha/2
38
39
     _____
40
41
       Question – For each of the factor variables (knowledge, participation, and total cost), are there differences in the
42
        average response by level of education?
43
44
     . dunntest iknowledge, by(ied)
45
     Warning: by() values are unlabeled, option nolabel implicit
46
47
     Kruskal-Wallis equality-of-populations rank test
48
49
       +----+
       | ied | Obs | Rank Sum |
50
       |-----|
51
         1 | 1 | 43.00 |
52
         2 | 3 | 96.50 |
3 | 57 | 1751.50 |
                     96.50 I
53
         -----+
54
55
     chi-squared =
                    0.483 with 2 d.f.
                    0.7854
56
     probability =
57
     chi-squared with ties =
                              0.629 with 2 d.f.
58
     probability =
                     0.7303
59
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60
```

Dunn's Pairwise Comparison of iknowledge by ied 1 (No adjustment) 2 Col Mean-| 3 Row Mean | 1 2 4 2 | 0.602700 5 0.2734 6 3 | 0.781528 0.156016 7 0.4380 0.2172 8 9 alpha = 0.05 Reject Ho if $p = P(Z \le |z|) \le alpha/2$ 10 11 12 . dunntest iparticipate, by(ied) 13 Warning: by() values are unlabeled, option nolabel implicit 14 15 Kruskal-Wallis equality-of-populations rank test 16 17 +----+ 18 | ied | Obs | Rank Sum | 19 |-----| 1 | 1 | 53.00 | 20 2 | 3 | 137.00 | 21 3 | 57 | 1701.00 | 22 ----+ 23 chi-squared = 3.826 with 2 d.f. 24 0.1477 probability = 25 chi-squared with ties = 3.948 with 2 d.f 26 probability = 0.1389 27 28 Dunn's Pairwise Comparison of iparticipate by ied 29 (No adjustment) 30 Col Mean-| 31 Row Mean | 1 2 32 2 | 0.363420 33 0.3581 34 3 | 1.313711 1.528732 35 0.0945 0.0632 36 37 alpha = 0.05 Reject Ho if $p = P(Z \le |z|) \le alpha/2$ 38 39 40 . dunntest itotcost, by(ied) 41 Warning: by() values are unlabeled, option nolabel implicit 42 43 Kruskal-Wallis equality-of-populations rank test 44 45 +----+ 46 | ied | Obs | Rank Sum | |-----| 47 1 | 1 | 40.50 | 2 | 3 | 94.00 | 48 49 | 3 | 56 | 1695.50 | 50 ----+ 51 chi-squared = 0.344 with 2 d.f. 52 probability = 0.8420 53 chi-squared with ties = 0.500 with 2 d.f. 54 probability = 0.7788 55 56 Dunn's Pairwise Comparison of itotcost by ied 57 (No adjustment) 58 Col Mean-| 59 Row Mean | 2 1 For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml 60

2 3	0.548145 0.2918 0.699677 0.123104
alpha = 0.(Reject Ho if	0.2421 0.4510 $p = P(Z \le z) \le alpha/2$
 Question average r 	: For each of the factor variables (knowledge, participation, and total cost), are there differences in the response based upon racer or ethnicity?
. dunntest il	knowledge, by(ieth)
Warning: by()) values are unlabeled, option nolabel implicit
Kruskal-Wall:	is equality-of-populations rank test
+	
chi-squared =	= 10.649 with 4 d.f.
chi-squared i	- 0.0000
probability =	= 0.0091
	Dunn's Pairwise Comparison of iknowledge by ieth (No adjustment)
Col Mean- Row Mean	1 2 3 4
2 	2.031072 0.0211
3 	1.707868 0.213002 0.0438 0.4157
4	1.400992 -0.850533 -0.892152 0.0806 0.1975 0.1862
7	2.456616 -0.005603 -0.230353 0.957716 0.0070 0.4978 0.4089 0.1691
alpha = 0.0 Reject Ho if	$p = P(Z \le z) \le alpha/2$
. dunntest ig	participate, by(ieth)
Warning: by()) values are unlabeled, option nolabel implicit
Kruskal-Wall:	is equality-of-populations rank test
+ ieth Oł +	
1 5 2 3 4 7	53 1836.00 2 24.00 1 32.00 4 84.50 3 39.50
T= ====	

Col Mean-	Dunn's Pairwise C	omparison of i (No adjustment	participate by :)	eth		
Row Mean	1	2	3	4		
2	1.742754 0.0407					
3	0.145095 -0.9054 0.4423 0.18	06 26				
4	1.445287 -0.5842 0.0742 0.27	00 0.539304 95 0.2948				
7	2.006289 -0.0708 0.0224 0.47	59 0.904309 18 0.1829	0.577727 0.2817			
alpha = Reject Ho	0.05 if p = P(Z <= z) <	= alpha/2				
• . dunntes	t itotcost, by(ieth)					
Warning: 1	oy() values are unlab	eled, option n	olabel implicit			
Kruskal-Wa	allis equality-of-pop	ulations rank	test			
+	+					
ieth	Obs Rank Sum					
1	52 1672.00					
2	2 54.50					
3	4 166.00					
7	3 19.00					
+	+					
chi-square	d = 7.553 with 4	df				
probabili	xy = 0.1094					
alad a anna a sa						
chi-square probabili	ed with ties = 11. :v = 0.0245	196 with 4 d.f	•			
chi-square probabili	ed with ties = 11. cy = <mark>0.0245</mark>	196 with 4 d.f				
chi-square probabilit	ed with ties = 11. Ey = <mark>0.0245</mark> Dunn's Pairwise	Comparison of (No adjustment	· itotcost by ief	h O		
chi-square probabili Col Mean- Row Mean	ed with ties = 11. Ey = 0.0245 Dunn's Pairwise 1 2	L96 with 4 d.f Comparison of (No adjustment 3	· itotcost by iet) 4	h		
chi-square probabili Col Mean- Row Mean 2	ed with ties = 11. Ey = 0.0245 Dunn's Pairwise 1 2 0.459251 0.3230	Comparison of (No adjustment 3	• itotcost by iet) 4 	h		
chi-square probabili Col Mean- Row Mean 2 3	ed with ties = 11. Ey = 0.0245 Dunn's Pairwise 1 2 0.459251 0.3230 -0.624727 -0.7851 0.2661 0.21	Comparison of (No adjustment 3 	itotcost by ien	h		
chi-square probabili Col Mean- Row Mean 2 3 3	ed with ties = 11. Ey = 0.0245 Dunn's Pairwise 1 2 0.459251 0.3230 -0.624727 -0.7851 0.2661 0.21 -1.215526 -1.1103 0.1121 0.13	Comparison of (No adjustment 3 68 62 96 0.000000 34 0.5000	itotcost by iet) 4 	h		
chi-square probabilit Col Mean- Row Mean 2 3 4 4	ed with ties = 11. y = 0.0245 Dunn's Pairwise 1 2 0.459251 0.3230 -0.624727 -0.7851 0.2661 0.21 -1.215526 -1.1103 0.1121 0.13 2.934536 1.5462 0.0017 0.06	196 with 4 d.f Comparison of (No adjustment 3 68 62 96 0.000000 34 0.5000 39 2.055206 10 0.019	itotcost by iet) 4 3.107180 0.0009	h		
chi-square probabilit Col Mean- Row Mean 2 3 4 7 alpha = Reject Ho	<pre>ed with ties = 11. y = 0.0245 Dunn's Pairwise 1 2 0.459251 0.3230 -0.624727 -0.7851 0.2661 0.21 -1.215526 -1.1103 0.1121 0.13 2.934536 1.5462 0.0017 0.06 0.05 if p = P(Z <= z) <</pre>	Comparison of (No adjustment 3 		h		
chi-square probabilit Col Mean- Row Mean 2 3 4 7 alpha = Reject Ho	<pre>ed with ties = 11. zy = 0.0245 Dunn's Pairwise 1 2 0.459251 0.3230 -0.624727 -0.7851 0.2661 0.21 -1.215526 -1.1103 0.1121 0.13 2.934536 1.5462 0.0017 0.06 0.05 if p = P(Z <= z) <</pre>	Comparison of (No adjustment 3 68 62 96 0.000000 34 0.5000 39 2.055206 10 0.019 9 = alpha/2		h		
chi-square probabilit Col Mean- Row Mean 2 3 4 7 alpha = Reject Ho ====================================	<pre>ed with ties = 11. y = 0.0245 Dunn's Pairwise 1 2 0.459251 0.3230 -0.624727 -0.7851 0.2661 0.21 -1.215526 -1.1103 0.1121 0.13 2.934536 1.5462 0.0017 0.06 if p = P(Z <= z) < con: For each of the factorial contents of the factorial co</pre>	Comparison of (No adjustment 3 68 62 96 0.000000 34 0.5000 39 2.055206 10 0.019 9 = alpha/2 ctor variables (I erience workin	 itotcost by ief 4 3.107180 0.0009 knowledge, partigg in a hospital? 	h ipation, and total	cost), are there difference	ces in 1

1

```
Kruskal-Wallis equality-of-populations rank test
2
3
      +----+
      | ihwork | Obs | Rank Sum |
4
         ----+----+------
5
            0 | 38 | 1196.50 |
6
            1 | 16 | 439.00 |
2 | 9 | 380.50 |
7
      +----+
8
9
                  3.850 with 2 d.f.
     chi-squared =
     probability =
10
                   0.1458
11
     chi-squared with ties =
                             4.875 with 2 d.f.
12
     probability = 0.0874
13
14
                Dunn's Pairwise Comparison of iknowledge by ihwork
15
                               (No adjustment)
16
     Col Mean-I
                        0
     Row Mean |
                                     1
17
     -------
18
           1 |
               0.834026
19
                 0.2021
            20
               -1.786749 -2.186219
           2 |
21
            0.0370 0.0144
22
     alpha = 0.05
23
     Reject Ho if p = P(Z \le |z|) \le alpha/2
24
25
     . dunntest iparticipate, by(ihwork)
26
27
     Warning: by() values are unlabeled, option nolabel implicit
                                                  28
29
     Kruskal-Wallis equality-of-populations rank test
30
31
       +----+
       | ihwork | Obs | Rank Sum |
32
        33
            0 | 38 | 1060.00 |
            1 | 16 | 540.00 |
2 | 9 | 416.00 |
34
35
       +----+
36
37
                   7.470 with 2 d.f.
     chi-squared =
     probability = 0.0239
38
39
     chi-squared with ties =
                              7.716 with 2 d.f.
40
     probability =
                   0.0211
41
42
               Dunn's Pairwise Comparison of iparticipate by ihwork
43
                               (No adjustment)
44
     Col Mean-|
     Row Mean |
                        0
                                      1
45
                _____
     ____+
46
          1 | -1.089332
47
                 0.1380
            48
               -2.741107 -1.659641
           2 |
49
                  0.0031 0.0485
            50
     alpha = 0.05
51
     Reject Ho if p = P(Z \le |z|) \le alpha/2
52
53
     . dunntest itotcost, by(ihwork)
54
55
     Warning: by() values are unlabeled, option nolabel implicit
56
57
     Kruskal-Wallis equality-of-populations rank test
58
59
       +----+
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```

	ihwork Obs Rank Sum
1	
2	1 16 540.00
3	
4 5	
6	chi-squared = 3.794 with 2 d.f.
7	
8	chi-squared with ties = 5.625 with 2 d.f.
9	
10	Dunn's Pairwise Comparison of itotcost by inwork
11	(No adjustment)
12	COI Mean- Row Mean 0 1
14	
15	0.1149
16	2 -2 264381 -1 207799
1/ 10	0.0118 0.1136
10	alpha = 0.05
20	Reject Ho if $p = P(Z \le z) \le alpha/2$
21	
22	
23	
24 25	
26	
27	
28	
29 30	
31	
32	
33	
34 25	
36	
37	
38	
39	
40 41	
42	
43	
44	
45 46	
40 47	
48	
49	
50	
51 52	
53	
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55	
50 57	
58	
59	
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	Question – For each of the questions, 1-10, is there a difference in the average response by age?
	Answer – YES, but for only two questions:
	Q1: age group 1 differed from all of the other groups.
	Q2: age groups 1 and 5 differed from groups 2,3,4, but did not differ from each other.
•	Question – For each of the questions, 1-10, is there a difference in the average response by gender?
	Answer – NO – there are no significant differences in responses between genders for any of the 10 questions.
	Question – For each of the questions, 1-10, is there a difference in the average response by level of education
	Answer – YES for questions 1, 2, 3, and 10.
	01: 1 v. 3 2 v. 3
	Q2: 1 v. 3 2 v. 3
	Q3: 1 v.2 1 v.3 2 v.3
	Q10: 1 v. 3 2 v. 3
	Question: For each of the questions, is there a difference in the average response based upon racer or ethnicity
	Answer - NO – there are no significant difference in responses among races or ethnicities for any of the 10
	questions.
	Question For each of the questions, 1,10, is there a difference in the average response if respondent is or was a
	hospital worker?
	Answer – YES – for questions 1, 2, and 5. For all three questions, group 1 is significantly different from both group (
	and group 2.
•	Question – For each of the questions, 1-10, is there a difference in the average response by age among those who
	identified their age group?
. d	lunntest iq1, by(iage) ma(bh) wrap
Kru	skal-Wallis equality-of-populations rank test
+	iage Obs Rank Sum
į	
	3 35 1376.50 4 11 456.50
	5 5 169.50
	6 1 41.50

		Dunn'	's Pairwis (Be:	e Comparison njamini-Hochb	of iql by i erg)	age	
Col Mea Now Mea	.n- .n +		1	2	3	4	5
	2 -3	3.292779 0.0025					
	3 -3 	8.424849 <mark>0.0023</mark>	-0.40917	8 5			
	4 -3 	3.527106 0.0032	-0.87384 0.358	8 -0.609012 3 0.3699			
	5 -2 	2.690371 <mark>0.0134</mark>	0.84397	2 1.100788 2 0.2903	1.366042 0.2149		
	6 -2	2.604940 <mark>0.013</mark> 8	-0.31359 0.434	8 -0.207567 9 0.4476	0.000000 0.5000	-0.672593 0.3759	
Talse D	iscover	y Rate =	= 0.05	U,			
Reject	Ho if p	o = P(Z <	<= z) <=	FDR/2 with s	topping rul	e	
dunnt	est iq2	2, by(iac	ge) ma(bh)	wrap			
Kruskal	-Wallis	equalit	ty-of-popu	lations rank	test		
+	e l Obs		+ Sum				
	+	-+	 1 50				
	2 22	2 849	9.00				
	3 35	5 1357	7.50				
	5 5	5 172	2.50				
	6 1 1	-+	 4 50				
+			+				
:hi-squ	ared =	5.28	36 with 5 -	d.f.			
robabi	lity =	0.38	819				
chi-squ	ared wi	th ties. 0 <mark>.00</mark>	= 18.4 <mark>024</mark>	89 with 5 d.f			
robabi	iity -						
probabi	.iity -	Dunn	's Pairwis (Be:	e Comparison njamini-Hochb	of iq2 by i erg)	age	
orobabi Col Mea Now Mea	n- n	Dunn	's Pairwis (Be: 1	e Comparison njamini-Hochb 2	of iq2 by i erg) 3	age 4	5
orobabi Col Mea Row Mea	n- n + 2 -2	Dunn'	's Pairwis (Be 1	e Comparison njamini-Hochb 2	of iq2 by i erg) 3	age 4	5
orobabi Col Mea Cow Mea	n- n 2 -2	Dunn' 2.861006 0.0063	's Pairwis (Be: 1	e Comparison njamini-Hochb 2	of iq2 by i erg) 3	age 4	5
orobabi Col Mea Now Mea	n- n 2 -2 3 -2	Dunn 2.861006 0.0063 2.900874 0.0070	's Pairwis (Be: 1 -0.06143 0.509	e Comparison njamini-Hochb 2 9 5	of iq2 by i erg) 3	age 4	5
orobabi Col Mea Low Mea	n- n 2 -2 3 -2 4 -3	Dunn 2.861006 0.0063 2.900874 0.0070 8.080845 0.0155	's Pairwis (Be: 1 -0.06143 0.509 -0.79217 0.292	e Comparison njamini-Hochb 2 9 5 7 -0.797937 0 0.3187	of iq2 by i erg) 3	age 4	5
orobabi	n- n 2 -2 3 -2 4 -3 5 -2	Dunn 2.861006 0.0063 2.900874 0.0070 8.080845 0.0155 2.349976 0.0201	's Pairwis (Be: 1 -0.06143 0.509 -0.79217 0.292 0.70854 0.276	e Comparison njamini-Hochb 2 9 5 7 -0.797937 0 0.3187 4 0.769210 1 0.2761	of iq2 by i erg) 3 1.193206 0.1940	age 4	5
orobabi	n- n + 2 -2 3 -2 4 -3 5 -2 6 0	Dunn 2. 861006 0.0063 2. 900874 0.0070 3. 080845 0.0155 2. 349976 0.0201 0.00000 0.5000	's Pairwis (Be: 1 -0.06143 0.509 -0.79217 0.292 0.70854 0.276 2.86100 0.005	e Comparison njamini-Hochb 2 9 5 7 -0.797937 0 0.3187 4 0.769210 1 0.2761 6 2.900874 3 0.0093	of iq2 by i erg) 1.193206 0.1940 3.080845 0.0077	age 4 4 2.349976 0.0176	5
Col Mea Cow Mea Cow Mea Cow Lead	n- n 2 -2 3 -2 4 -3 5 -2 6 0 Viscover Ho if p	Dunn 2.861006 0.0063 2.900874 0.0070 3.080845 0.0155 2.349976 0.0201 0.000000 0.5000 Cy Rate = D = P(Z <	's Pairwis (Be: 1 -0.06143 0.509 -0.79217 0.292 0.70854 0.276 2.86100 0.005 <= 0.05 <= z) <=	e Comparison njamini-Hochb 2 9 5 7 -0.797937 0 0.3187 4 0.769210 1 0.2761 6 2.900874 3 0.0093 FDR/2 with s	of iq2 by i erg) 3 1.193206 0.1940 3.080845 0.0077 topping rul	age 4 4 2.349976 0.0176 e	5

2	23 35	921 1347	.00 .00							
4	11 5	419 187	.00							
	1	+ 45	.00							
+			+							
chi-square probabilit	ed = tv =	2.25 0.81	0 with 36	5 d.	f.					
chi-square	ed wit	n ties	= 5	.288	with 5 d.f					
probabilit	су =	0.38	17							
		Dunn'	s Pairw	ise	Comparison	of iq3 b	y iage			
Col Mean-	l		(Benj	amini-Hochb	erg)				
Row Mean	 		1		2	3			4	5
2	-2.	245722 D.1854								
3	-2.	155302	0.402	900						
		0.1168	0.5	725						
4	-2.	0.0969	0.369	851	0.079295					
5	-1.	926615	0.371	927	0.157658	0.0889	31			
		J.1013	0.5	323	0.5046	0.49	/8	401.65		
6	 _1	265137	-0 336	050	_0 //5025	_0 /502	20 -1	19165	/	
6	-1.	865437 0.0932	-0.336 0.4	858 601	-0.445925 0.6147	-0.4592 0.69	22 22	0.787	4 6	
6 False Disc	-1.	865437 D.0932 Rate =	-0.336 0.4 0.05	858 601	-0.445925 0.6147	-0.4592 0.692	22	0.787	6	
6 False Disc Reject Ho	-1. covery if p	865437).0932 Rate = = P(Z <	-0.336 0.4 0.05 = z)	858 601 <= F	-0.445925 0.6147 DR/2 with s	-0.4592 0.692	rule	0.787	4 6	
6 False Disc Reject Ho	-1. covery if p	865437 D.0932 Rate = = P(Z <	-0.336 0.4 0.05 = z)	858 601 <= F	-0.445925 0.6147 DR/2 with s	-0.4592 0.692	rule	0.787	4	
6 False Disc Reject Ho . dunntest	-1. covery if p	865437 0.0932 Rate = = P(Z < by(iag	-0.336 0.4 0.05 = z) e) ma(b	858 601 <= F h) w	-0.445925 0.6147 DR/2 with s rap	-0.4592 0.69	rule	0.787	4	
6 False Disc Reject Ho . dunntest Kruskal-Wa	-1. covery if p if q4,	865437 0.0932 Rate = = P(Z < by(iag	-0.336 0.4 0.05 = z) e) ma(b y-of-po	858 601 <= F h) w pula	-0.445925 0.6147 DR/2 with s rap tions rank	-0.4592 0.692	rule	0.787	6	
6 False Disc Reject Ho . dunntest Kruskal-Wa + iage	-1. covery if p iq4, allis	865437 D.0932 Rate = P(Z < by(iag equalit Rank	-0.336 0.4 0.05 = z) e) ma(b y-of-po + Sum	858 601 <= F h) w pula	-0.445925 0.6147 DR/2 with s rap tions rank	-0.4592 0.69 topping : test	rule	0.787	6	
False Disc Reject Ho . dunntest Kruskal-Wa iage i	-1. covery if p if q4, allis	865437 D.0932 Rate = P(Z < by(iag equalit Rank Rank Rank	-0.336 0.4 0.05 = z) e) ma(b y-of-po + Sum .00	858 601 <= F h) w pula	-0.445925 0.6147 DR/2 with s rap tions rank	-0.4592 0.69 topping t	rule	0.787	4	
False Disc Reject Ho . dunntest Kruskal-Wa iage 1 2 3 3	-1.	B65437 D.0932 Rate = P(Z < by(iag equalit Rank H N 13 934 1433	-0.336 0.4 0.05 = z) e) ma(b y-of-pc + Sum .00 .50	858 601 <= F h) w pula	-0.445925 0.6147 DR/2 with s rap tions rank	-0.4592 0.69 topping : test	rule	0.787	4	
False Disc Reject Ho . dunntest Kruskal-Wa iage 1 2 3 4 5	-1. covery if p if q4, allis Obs 1 23 36 11 5	B65437 D.0932 Rate = P(Z < by(iag equalit Rank 1 33 934 1433 1 362	-0.336 0.4 0.05 = z) e) ma(b y-of-po + Sum .00 .00 .00 .00	858 601 <= F h) w pula	-0.445925 0.6147 DR/2 with s rap tions rank	-0.4592 0.69 topping :	rule	0.787	4	
6 False Disc Reject Ho . dunntest Kruskal-Wa iage i age 2 3 4 5 6	-1.	865437 D.0932 Rate = = P(Z < by(iag) equalit Rank + 13 934 1433 362 211 + 49	-0.336 0.4 0.05 = z) e) ma(b y-of-po + Sum .00 .00 .00 .00 .00 .50	858 601 <= F h) w pula	-0.445925 0.6147 DR/2 with s rap tions rank	-0.4592 0.69 topping : test	rule	0.787	4	
6 False Disc Reject Ho . dunntest Kruskal-Wa ! iage iage 3 4 5 6 	-1.	B65437 D.0932 Rate = P(Z < by(iag equalit Rank + 13 934 1433 362 211 + 49	-0.336 0.4 0.05 = z) e) ma(b y-of-po + Sum .00 .00 .50 .00 .50 .50 +	858 601 <= F h) w pula	-0.445925 0.6147 DR/2 with s rap tions rank	-0.4592 0.69 topping test	rule	.48165	46	
<pre>6 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7</pre>	-1. covery if p allis 	B65437 D.0932 Rate = = P(Z < by(iag equalit Rank 13 934 1432 211 + 49 2.65 0.75	-0.336 0.4 0.05 = z) e) ma(b y-of-po + Sum .00 .00 .50 .00 .50 + 6 with 29	858 601 <= F h) w pula	-0.445925 0.6147 DR/2 with s rap tions rank	-0.4592 0.69 topping : test	rule	0.787	46	
<pre>6 6 7 False Disc Reject Ho . dunntest Kruskal-Wa</pre>	-1. covery if p if p	B65437 D.0932 Rate = P(Z < by(iag) equalit Rank 1 Rank 1 1433 1 934 1 1433 1 362 2 211 + 1 49 2.65 0.75 h ties	-0.336 0.4 0.05 = z) e) ma(b y-of-po + Sum .00 .00 .50 .00 .50 + 6 with 29 = 4	858 601 <= F h) w pula 5 d.	-0.445925 0.6147 DR/2 with s rap tions rank f. with 5 d.f	-0.4592 0.69 topping test	rule	0.787	46	
<pre>6 False Disc Reject Ho . dunntest Kruskal-Wa . iage </pre>	-1. covery if p if p allis -1. -1. -1. -1. -1. -1. -1. -1.	B65437 D.0932 Rate = = P(Z < by(iag equalit Rank 133 934 1433 362 211 + 49 2.65 0.75 h ties 0.49	-0.336 0.4 0.05 = z) e) ma(b y-of-po + Sum + Sum + 00 .00 .50 .00 .50 + 6 with 29 = 4	858 601 <= F h) w pula 5 d. .393	-0.445925 0.6147 DR/2 with s rap tions rank f. with 5 d.f	-0.4592 0.69 topping : test	rule	.48165	46	
<pre>6 False Disc Reject Ho . dunntest Kruskal-Wa . iage</pre>	-1. covery if p allis 	B65437 D.0932 Rate = P(Z < by(iag equalit Rank B B B B B B B B B B B B B B B B B B B	-0.336 0.4 0.05 = z) e) ma(b y-of-po + Sum .00 .00 .50 .00 .50 .50 + 6 with 29 = 4 44 s Pairw	858 601 <= F h) w pula 5 d. .393	-0.445925 0.6147 DR/2 with s rap tions rank f. with 5 d.f	-0.4592 0.69 topping test	y iage	.48165	46	
<pre>6 False Disc Reject Ho . dunntest Kruskal-Wa . iage </pre>	-1. covery if p allis -1. -1. -1. -1. -1. -1. -1. -1.	B65437 D.0932 Rate = P(Z < by(iag equalit Rank Rank Rank A 13 B 34 A 1433 A 362 C 211 A 1433 A 362 C 211 A 1433 A 362 C 211 C 65 O.75 A 149 Dunn'	-0.336 0.4 0.05 = z) e) ma(b y-of-po + Sum .00 .00 .50 .00 .50 .00 .50 + 6 with 29 = 4 44 s Pairw (858 601 <= F h) w pula 5 d. .393 .ise Benj	-0.445925 0.6147 DR/2 with s rap tions rank f. with 5 d.f Comparison amini-Hochk	-0.4592 0.69 topping test test	y iage	.48165	4	5
<pre>6 False Disc Reject Ho . dunntest Kruskal-Wa . iage </pre>	-1. covery if p if p allis -1. -1. -1. -1. -1. -1. -1. -1.	B65437 D.0932 Rate = = P(Z < by(iag) equalit Rank 133 934 1433 362 211 + 49 2.65 0.75 h ties Dunn'	-0.336 0.4 0.05 = z) e) ma(b y-of-po + Sum + Sum .00 .00 .00 .50 + 6 with 29 = 4 44 s Pairww(1	858 601 <= F h) w pula 5 d. .393 .393 	-0.445925 0.6147 DR/2 with s rap tions rank f. with 5 d.f Comparison amini-Hochb 2	-0.4592 0.69 topping : test test of iq4 by berg) 3	y iage	.48165	46	5
<pre>6 False Disc Reject Ho . dunntest Kruskal-Wa . iage </pre>	-1. covery if p if p allis 0bs 1 23 36 11 5 -1 ed = cy = ed wit: cy =	B65437 D.0932 Rate = = P(Z < by(iag) equalit Rank 13 934 1433 362 211 2.65 0.75 n ties Dunn' 553696 D.9019	-0.336 0.4 0.05 = z) e) ma(b y-of-po + Sum .00 .00 .00 .50 .00 .50 + 6 with 29 = 4 44 s Pairw (1	858 601 <= F h) w pula 5 d. .393 .ise Benj	-0.445925 0.6147 DR/2 with s rap tions rank f. with 5 d.f Comparison amini-Hochk 2	-0.4592 0.69 topping : test test of iq4 by verg) 3	y iage	.48165	4 6 -	5

5	(0.2927	0.3409	0.3111			
-	-1.5 (532336 - 0.4704	0.185389 0.4569	-0.286737 0.4467	-0.990242 0.3019		
6	-1.4	483678 - 0.2586	0.500363 0.4206	-0.548924 0.4373	-0.913141 0.3010	-0.383084 0.4385	
False Disc Reject Ho	covery if p =	Rate = = P(Z <=	0.05 z) <= F	'DR/2 with s	stopping rul	Le	
dunntes	t ia5.	by(jage)	ma(bb) w	Iran			
Kruskal-Wa	allis e	equality-	of-popula	tions rank	test		
+	Obs	Rank Su	+ m				
	+	7.0	 0				
2 3	23 35	836.0 1476.5					
4 5	11 5	377.0 185.0					
	+	+					
+	<u>1</u>		+				
chi-square	ed =	3.728	with 5 d.	f.			
probabili	ty =	0.5892					
chi-square	ed with	n ties =	9.323	with 5 d.f			
probabili	ty =	0.0968					
		Dunn's	Pairwise	Comparison	of ig5 by i	age	
		Dunn D	(Benj	amini-Hochk	perg)	lage	
Col Mean- Row Mean		1		2	3		4 5
2	+	 057391					
	(0.1487					
3	-2.4	484459 -	1.557480				
	(J.0973	0.1279				
4	-1.8	369894 0.0922	0.405361	1.639361 0.1264			
-	1 1 0	2 C 1 1 C 1	0 001610	0 336340	0 0 0 0 1 0 0		
5	-1.9	961161 -).1247	0.094649 0.4623	0.776748 0.4100	-0.362103 0.4138		
5	-1.9 (-1.8	961161 - 0.1247 398886 -	0.094649 0.4623 0.571498	0.776748 0.4100	-0.362103 0.4138	-0.490290	3
5	-1.9 () -1.8	961161 - 0.1247 398886 - 0.1080	0.094649 0.4623 0.571498 0.4257	0.776748 0.4100 -0.163411 0.4662	-0.362103 0.4138 -0.701210 0.4026	-0.490290 0.4254	2
5 6 False Disc	-1.9 () -1.8 () covery	961161 - 0.1247 898886 - 0.1080 Rate =	0.094649 0.4623 0.571498 0.4257 0.05	0.776748 0.4100 -0.163411 0.4662	-0.362103 0.4138 -0.701210 0.4026	-0.490290 0.4254	2
5 6 False Disc Reject Ho	-1.9 (-1.8 -1.8 (covery if p =	961161 - 0.1247 898886 - 0.1080 Rate = = P(Z <=	0.094649 0.4623 0.571498 0.4257 0.05 z) <= F	0.776748 0.4100 -0.163411 0.4662	-0.362103 0.4138 -0.701210 0.4026	-0.490290 0.4254 Le	2
5 6 False Disc Reject Ho	-1.9 () -1.8 () covery if p =	961161 - 0.1247 898886 - 0.1080 Rate = = P(Z <=	0.094649 0.4623 0.571498 0.4257 0.05 z) <= F	0.776748 0.4100 -0.163411 0.4662 'DR/2 with s	-0.362103 0.4138 -0.701210 0.4026	-0.490290 0.4254	2
5 6 False Disc Reject Ho . dunntest	<pre> -1.9 () -1.8 () covery if p = t iq6,</pre>	961161 - 0.1247 898886 - 0.1080 Rate = = P(Z <= by(iage)	0.094649 0.4623 0.571498 0.4257 0.05 z) <= F ma(bh) w	0.776748 0.4100 -0.163411 0.4662 DR/2 with s	-0.362103 0.4138 -0.701210 0.4026	-0.490290 0.4254 Le	
5 False Disc Reject Ho . dunntest Kruskal-Wa	-1.9 () -1.8 -1.8 () covery if p = t iq6, allis e	961161 - 0.1247 898886 - 0.1080 Rate = = P(Z <= by(iage) equality-	0.094649 0.4623 0.571498 0.4257 0.05 z) <= F ma(bh) w of-popula	0.776748 0.4100 -0.163411 0.4662 'DR/2 with s Trap tions rank	-0.362103 0.4138 -0.701210 0.4026 stopping rul	-0.490290 0.4254	
5 6 False Disc Reject Ho . dunntes Kruskal-Wa +	-1.9 () -1.8 -1.8 () covery if p = t iq6, allis e	961161 - 0.1247 898886 - 0.1080 Rate = = P(Z <= by(iage) equality- Rank Su	0.094649 0.4623 0.571498 0.4257 0.05 z) <= F ma(bh) w of-popula + m	0.776748 0.4100 -0.163411 0.4662 'DR/2 with s 'rap tions rank	-0.362103 0.4138 -0.701210 0.4026 stopping rul	-0.490290 0.4254	
5 False Disc Reject Ho . dunntest Kruskal-Wa + iage 	-1.9 () -1.8 () covery if p = t iq6, allis e Obs +	961161 - 0.1247 898886 - 0.1080 Rate = = P(Z <= by(iage) equality- 	0.094649 0.4623 0.571498 0.4257 0.05 z) <= F ma(bh) w of-popula + m 1	0.776748 0.4100 -0.163411 0.4662 DR/2 with s Trap	-0.362103 0.4138 -0.701210 0.4026	-0.490290 0.4254	
5 False Disc Reject Ho . dunntest Kruskal-Wa + iage 1 2	-1.9 -1.8 961161 - 0.1247 898886 - 0.1080 Rate = = P(Z <= by(iage) equality- 	0.094649 0.4623 0.571498 0.4257 0.05 z) <= F ma(bh) w of-popula + m 0 0	0.776748 0.4100 -0.163411 0.4662 'DR/2 with s 'rap tions rank	-0.362103 0.4138 -0.701210 0.4026 stopping rul	-0.490290 0.4254 Le		
5 False Disc Reject Ho . dunntes Kruskal-Wa . iage i ige . 2 . 3 . 4	-1.9 () -1.8 -1.8 () covery if p = t iq6, allis e 0bs + 0bs + 1 23 35 1	961161 - 0.1247 898886 - 0.1080 Rate = = P(Z <= by(iage) equality- Rank Sut + 11.0 841.5 1397.0 468 5	0.094649 0.4623 0.571498 0.4257 0.05 z) <= F ma(bh) w of-popula + m 1 0 0 0 0	0.776748 0.4100 -0.163411 0.4662 DR/2 with s Trap	-0.362103 0.4138 -0.701210 0.4026 stopping rul	-0.490290 0.4254	
5 False Disc Reject Ho . dunntest Kruskal-Wa iage iage 2 3 4 5	-1.9 () -1.8 -1.8 () covery if p = t iq6, allis e 0bs 0bs 1 23 35 11 5	961161 - 0.1247 898886 - 0.1080 Rate = = P(Z <= by(iage) equality- Rank Sut + 11.0 841.5 1397.0 468.5 161.5	0.094649 0.4623 0.571498 0.4257 0.05 z) <= F ma(bh) w of-popula + m 0 0 0 0 0	0.776748 0.4100 -0.163411 0.4662 'DR/2 with s 'rap tions rank	-0.362103 0.4138 -0.701210 0.4026 stopping rul	-0.490290 0.4254	
5 False Disc Reject Ho . dunntes: Kruskal-Wa 	-1.9 -1.6 -1.6 -1.8 961161 - 0.1247 898886 - 0.1080 Rate = = P(Z <= by(iage) equality- Rank Sur + 11.0 841.5 1397.0 468.5 161.5 + 46.5	0.094649 0.4623 0.571498 0.4257 0.05 z) <= F ma(bh) w of-popula + m 1 0 0 0 0 0 0 0 0 0 0	0.776748 0.4100 -0.163411 0.4662 DR/2 with s Trap	-0.362103 0.4138 -0.701210 0.4026 stopping rul	-0.490290 0.4254		
5 False Disc Reject Ho . dunntest Kruskal-Wa ! iage ! ! i 2 . 3 . 4 . 5 . 6 +	-1.9 -1.8 961161 - 0.1247 898886 - 0.1080 Rate = = P(Z <= by(iage) equality- Rank Su + 11.0 841.5 1397.0 468.5 161.5 +	0.094649 0.4623 0.571498 0.4257 0.05 z) <= F ma(bh) w of-popula + m 0 0 0 0 0 0 0 +	0.776748 0.4100 -0.163411 0.4662 'DR/2 with s rrap tions rank	-0.362103 0.4138 -0.701210 0.4026 stopping rul	-0.490290 0.4254		

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	Dunn	's Pairwise	Comparison	of iq6 by i	age	
ol Mean-		(Benj	amını-Hochb	erg)		
ow Mean		1	2	3	4	5
2	-1.596368					
	0.2070					
3	-1.816984	-0.790016				
	0.2390	0.3221				
4	-1.927631 0.4043	-1.043792 0.3178	-0.493509 0.3586			
5	-1 239210	0 553701	1 015019	1 215003		
	0.3229	0.3624	0.2907	0.2800		
 6	-1.599813	-0.618474	-0.413849	-0.238527	-0.826140	
İ	0.2741	0.3656	0.3637	0.4057	0.3406	
alse Disc	overy Rate =	= 0.05				
eject Ho	if p = P(Z <	<= z) <= F	'DR/2 with s	topping rul	e	
		, <u>, , , , , , , , , , , , , , , , , , </u>				
dunntest	iq', by(iac	ge) ma(bh) w	rap			
ruskal-Wa	illis equalit	y-of-popula	tions rank	test		
+		+				
iage +	Obs Rank	Sum 				
	1 13	3.50				
	35 1270	9.00).50				
4	11 493	3.50				
5	5 205					
6	1 48	3.00				
		·				
chi-square probabilit	d = 2.90 v = 0.71)7 with 5 d. L43	f.			
	-	4 055				
hi-square brobabilit	ed with ties y = 0.43	= 4.855	with 5 d.f			
hi-square probabilit	ed with ties y = 0.43	= 4.855 338	with 5 d.f			
hi-square robabilit	ed with ties Ey = 0.43 Dunn	= 4.855 338 's Pairwise	with 5 d.f Comparison	of iq7 by i	age	
hi-square probabilit col Mean-1	d with ties y = 0.43 Dunn'	= 4.855 338 's Pairwise (Benj	with 5 d.f Comparison amini-Hochk	• of iq7 by i erg)	age	
hi-square probabilit col Mean- cow Mean	ed with ties Ey = 0.43 Dunn	= 4.855 338 's Pairwise (Benj 1	with 5 d.f Comparison amini-Hochb 2	• of iq7 by i erg) 3	age 4	5
hi-square robabilit ol Mean- ow Mean + 2	ed with ties y = 0.43 Dunn -1.376058	= 4.855 338 's Pairwise (Benj 1	Comparison amini-Hochb	• of iq7 by i erg) 3	age4	5
col Mean- col Mean- cow Mean + 2	ed with ties y = 0.43 Dunn' -1.376058 0.2532	= 4.855 338 's Pairwise (Benj 1	with 5 d.f Comparison amini-Hochb 2	of iq7 by i erg) 3 	age4	5
col Mean- col Mean- cow Mean + 2 3	ed with ties y = 0.43 Dunn ¹ -1.376058 0.2532 -1.333089	= 4.855 338 's Pairwise (Benj 1 0.202096	Comparison amini-Hochb 2	• of iq7 by i erg) 3	age4	5
col Mean- col Mean- cow Mean 2 3	ed with ties y = 0.43 Dunn' -1.376058 0.2532 -1.333089 0.2281	= 4.855 338 's Pairwise (Benj 1 0.202096 0.4499	Comparison amini-Hochb 2	of iq7 by i erg) 3	age4	5
col Mean- col Mean- cow Mean + 2 3 3 4	<pre>d with ties y = 0.43 Dunn' -1.376058 0.2532 -1.333089 0.2281 -1.780629</pre>	= 4.855 338 's Pairwise (Benj 1 0.202096 0.4499 -1.226249	with 5 d.f Comparison amini-Hochb 2 -1.469099	of iq7 by i erg) 3 	age4	5
col Mean- col Mean- cow Mean 2 3 3 4 4	ed with ties y = 0.43 Dunn ¹ -1.376058 0.2532 -1.333089 0.2281 -1.780629 0.5623	= 4.855 338 2s Pairwise (Benj 1 0.202096 0.4499 -1.226249 0.2358	-1.469099 0.3545	• of iq7 by i erg) 3	age 4	5
col Mean- col Mean- cow Mean 2 3 3 4 5	ed with ties y = 0.43 Dunn' -1.376058 0.2532 -1.333089 0.2281 -1.780629 0.5623 -1.494032	= 4.855 338 's Pairwise (Benj 1 0.202096 0.4499 -1.226249 0.2358 -0.463525	<pre>with 5 d.f Comparison amini-Hochk 2 -1.469099 0.3545 -0.595349</pre>	of iq7 by i erg) 3 	age4	5
col Mean- col Mean- cow Mean 2 3 3 4 5	ed with ties y = 0.42 Dunn' -1.376058 0.2532 -1.333089 0.2281 -1.780629 0.5623 -1.494032 0.5069	= 4.855 338 's Pairwise (Benj 1 0.202096 0.4499 -1.226249 0.2358 -0.463525 0.4384	-1.469099 0.3545 -0.595349 0.4137	of iq7 by i erg) 3 0.413781 0.4244	age4	5
col Mean- col Mean- cow Mean + 2 3 3 4 5 5 6	ed with ties y = 0.43 Dunn ¹ -1.376058 0.2532 -1.333089 0.2281 -1.780629 0.5623 -1.494032 0.5069 -1.446590	= 4.855 338 2s Pairwise (Benj 1 0.202096 0.4499 -1.226249 0.2358 -0.463525 0.4384 -0.624762	-1.469099 0.3545 -0.595349 0.4137 -0.684085	of iq7 by i erg) 3 0.413781 0.4244 -0.178063	age 4 4	5
col Mean- col Mean- cow Mean cow Mean cov Mean co	ed with ties y = 0.43 Dunn' -1.376058 0.2532 -1.333089 0.2281 -1.780629 0.5623 -1.494032 0.5069 -1.446590 0.2775	= 4.855 338 2s Pairwise (Benj 1 0.202096 0.4499 -1.226249 0.2358 -0.463525 0.4384 -0.624762 0.4434	<pre>with 5 d.f Comparison amini-Hochk 2 -1.469099 0.3545 -0.595349 0.4137 -0.684085 0.4631</pre>	of iq7 by i erg) 3 0.413781 0.4244 -0.178063 0.4293	age 4 4 4	5
col Mean- col Mean- cow Mean 2 3 3 4 5 6 1 2 1 3 1 3 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1 1 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	ed with ties y = 0.42 Dunn' -1.376058 0.2532 -1.333089 0.2281 -1.780629 0.5623 -1.494032 0.5069 -1.446590 0.2775 covery Rate =	<pre>4.855 338 2 s Pairwise (Benj 1 0.202096 0.4499 -1.226249 0.2358 -0.463525 0.4384 -0.624762 0.4434 = 0.05</pre>	-1.469099 0.3545 -0.595349 0.4137 -0.684085 0.4631	of iq7 by i erg) 3 0.413781 0.4244 -0.178063 0.4293	age 4 4 4	5
Col Mean- Col Mean- Cow Mean 2 3 3 4 5 6 2alse Disc	ed with ties Ey = 0.43 Dunn ¹ -1.376058 0.2532 -1.333089 0.2281 -1.780629 0.5623 -1.494032 0.5069 -1.446590 0.2775 covery Rate = if p = P(Z <	= 4.855 338 2s Pairwise (Benj 1 0.202096 0.4499 -1.226249 0.2358 -0.463525 0.4384 -0.624762 0.4434 = 0.05 (= z) <= F	-1.469099 0.3545 -0.595349 0.4137 -0.684085 0.4631	of iq7 by i erg) 3 0.413781 0.4244 -0.178063 0.4293 topping rul	age 4 -0.373508 0.4089 e	5
col Mean- col Mean- cow Mean 2 3 4 5 6 1 2 2 3 1 3 1 3 1 5 1 5 1 5 1 5 1 6 1 1 5 1 5 r>5 1 1 5 1 1 1 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	ed with ties y = 0.43 Dunn ¹ -1.376058 0.2532 -1.333089 0.2281 -1.780629 0.5623 -1.494032 0.5069 -1.446590 0.2775 covery Rate = if p = P(Z <	= 4.855 338 2s Pairwise (Benj 1 0.202096 0.4499 -1.226249 0.2358 -0.463525 0.4384 -0.624762 0.4434 = 0.05 <= z) <= F	<pre>with 5 d.f Comparison amini-Hochb 2 -1.469099 0.3545 -0.595349 0.4137 -0.684085 0.4631 'DR/2 with s</pre>	of iq7 by i erg) 3 0.413781 0.4244 -0.178063 0.4293 topping rul	age 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	5
hi-square robabilit ol Mean- ow Mean + 2 3 3 4 5 6 1 alse Disc eject Ho dunntest	<pre>2d with ties 2y = 0.42 Dunn' -1.376058 0.2532 -1.333089 0.2281 -1.780629 0.5623 -1.494032 0.5069 -1.446590 0.2775 covery Rate = if p = P(Z < ciq8, by(iac</pre>	<pre>= 4.855 338 's Pairwise (Benj 1 0.202096 0.4499 -1.226249 0.2358 -0.463525 0.4384 -0.624762 0.4384 = 0.05 (= z) <= F ge) ma(bh) w</pre>	-1.469099 0.3545 -0.595349 0.4137 -0.684085 0.4631	of iq7 by i erg) 3 0.413781 0.4244 -0.178063 0.4293 topping rul	age 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	5

	+ 1	+	I 00 I				
2	23	896.0					
	1 35	356.0					
5 	5 +	239.5 +	50 				
6 +	1	58.5	50 +				
chi-square probabilit	ed = ty =	3.633 0.6034	with 5 d 4	l.f.			
chi-square probabilit	ed wit] ty =	h ties = <mark>0.5270</mark>	4.15)	7 with 5 d.:	Ē.		
		Dunn's	Pairwise	Comparison	of iq8 by iac	je	
Col Mean-	I		(Ben	jamini-Hochł	perg)		
Row Mean	 +	1	1	2	3	4	5
2	-1.0	088658 0.3454					
3	-1.0	091772 0.4124	0.017935 0.4928				
4	-0. -0.	758949 0.2584	0.871211 0.2398	0.910035 0.2721			
5	-1.4 (410676 - 0.5938	0.878018- 0.2590	-0.916267 0.2996	-1.395398 0.4072		
6	-1.	455798 - 1.0000	-0.926803 0.3319	-0.938242 0.3730	-1.212211 - 0.4227	-0.468751 0.3425	
		. .					
False Disc	covery	Rate =	0.05				
False Diso Reject Ho	covery if p =	Rate = = P(Z <=	0.05 z) <=	FDR/2 with s	stopping rule		
False Disc Reject Ho	if p =	Rate = = P(Z <=	0.05 z) <=	FDR/2 with s	stopping rule		
False Disc Reject Ho . dunntest	covery if p = t iq9,	Rate = = P(Z <= by(iage)	0.05 z) <=	FDR/2 with s wrap	stopping rule		
False Diso Reject Ho . dunntest Kruskal-Wa	if p = t iq9, allis (Rate = = P(Z <= by(iage) equality-	0.05 z) <=) ma(bh) -of-popul	FDR/2 with s wrap ations rank	stopping rule test		
False Disc Reject Ho . dunntest Kruskal-Wa +	t iq9, allis d	<pre>Rate = P(Z <= by(iage) equality</pre>	0.05 z) <=) ma(bh) -of-popul	FDR/2 with s wrap ations rank	stopping rule test		
False Disc Reject Ho . dunntest (ruskal-Wa + iage 	t iq9, allis (Obs	Rate = = P(Z <= by(iage) equality- Rank St +	0.05 z) <=) ma(bh) -of-popul + im 	FDR/2 with s wrap ations rank	stopping rule		
False Disc Reject Ho Kruskal-Wa + iage 1 2	covery if p = t iq9, allis e Obs + 1 23	Rate = = P(Z <= by(iage) equality- Rank Su +	0.05 z) <=) ma(bh) -of-popul + im 50 20	FDR/2 with s wrap ations rank	stopping rule		
False Disc Reject Ho . dunntest Kruskal-Wa + iage 1 2 3 4 4	covery if p : t iq9, allis (0bs + 1 23 35 11	Rate = = P(Z <= by(iage) equality- Rank Su +	0.05 z) <=) ma(bh) -of-popul + im 50 20 50	FDR/2 with s wrap ations rank	stopping rule		
False Disc Reject Ho (ruskal-Wa iage 1 2 3 4 5	covery if p : t iq9, allis d 	Rate = = P(Z <= by(iage) equality- Rank St 	0.05 z) <= 0 ma(bh) -of-popul + im + 50 00 50 50	FDR/2 with s wrap ations rank	stopping rule		
False Disc Reject Ho Aunntest Kruskal-Wa + iage 2 3 4 5 6	t iq9, allis () Obs 	Rate = = P(Z <= by(iage) equality- Rank Su 	0.05 z) <=) ma(bh) -of-popul + im 50 50 50 50 50 50	FDR/2 with s wrap ations rank	stopping rule		
False Disc Reject Ho (ruskal-Wa iage 1 2 3 4 5 6 +	covery if p : t iq9, allis e Obs + 1 23 35 11 5 + 1	Rate = = P(Z <= by(iage) equality- Rank Su +	0.05 z) <=) ma(bh) -of-popul + im 50 50 50 50 50 +	FDR/2 with s wrap ations rank	stopping rule		
False Disc Reject Ho dunntest (ruskal-Wa tru	covery if p : t iq9, allis (0bs 1 23 35 11 5 + 1 ed = ty =	Rate = = P(Z <= by(iage) equality- Rank Su 26.5 844.0 1377.0 443.5 208.5 	0.05 z) <=) ma(bh) -of-popul + im 50 50 50 50 50 50 50 50	FDR/2 with s wrap ations rank	stopping rule		
False Disc Reject Ho dunntest (ruskal-Wa iage 1 2 3 4 5 6 + chi-square	covery if p : t iq9, allis (0bs 1 23 35 11 5 + 1 ed = ty =	Rate = = P(Z <= by(iage) equality- Rank Su 26.5 844.0 1377.0 443.5 208.5 + 26.5 0.975 0.9646	0.05 z) <=) ma(bh) -of-popul + im 50 50 50 50 50 50 + with 5 d	FDR/2 with s wrap ations rank	stopping rule test		
False Disc Reject Ho Aunntest Kruskal-Wa Liage L Jiage	covery if p : t iq9, allis (Obs 1 23 35 11 5 + ed = ty = ed with ty =	Rate = = P(Z <= by(iage) equality- Rank Su 26.5 844.0 1377.0 443.5 208.5 + 0.975 0.9646 h ties = 0.9486	0.05 z) <=) ma(bh) -of-popul + im + 50 50 50 50 50 50 50 50	FDR/2 with s wrap ations rank l.f. 8 with 5 d.:	stopping rule test f.		
False Disc Reject Ho Aunntest Kruskal-Wa t iage 1 1 2 3 4 5 1 i 6 t chi-square brobabilit	covery if p : t iq9, allis e Obs + 1 23 35 11 5 + 1 ed = ty = ed with ty =	Rate = = P(Z <= by(iage) equality- Rank Su +	0.05 z) <=) ma(bh) -of-popul + im 50 20 50 50 + with 5 d 6 1.15 Pairwise (Ben	FDR/2 with s wrap ations rank .f. 8 with 5 d.: Comparison jamini-Hoch	stopping rule test f. of iq9 by iac berg)	Je	
False Disc Reject Ho Aunntest Kruskal-Wa I age I 1 I 2 I 3 I 4 J 5 I Chi-square Drobabilit Col Mean- Row Mean	covery if p : t iq9, allis (Obs 1 23 35 11 5 + ed = ty = ed with ty = 	Rate = = P(Z <= by(iage) equality- Rank Su +	0.05 z) <=) ma(bh) -of-popul + m 50	FDR/2 with s wrap ations rank 1.f. 8 with 5 d.: Comparison jamini-Hoch 2	test f. of iq9 by iaq berg) 3	ge	5
False Disc Reject Ho Aunntest Kruskal-Wa iage i i 1 2 3 4 4 5 chi-square probabilit chi-square probabilit	<pre>covery if p : t iq9, allis c Obs + 1 23 35 11 5 + 1 2 1 5 + 1 2 35 11 5 + 1 2 35 1 1 5 + 0 2 3 1 5 1 1 1 5 1 1 1 1 5 1 1 1 1 1 1 1 1 1 1</pre>	Rate = = P(Z <= by(iage) equality- Rank Su + 26.5 844.0 1377.0 443.5 208.5 0.975 0.9640 h ties = 0.9480 Dunn's 492653 0.5834	0.05 z) <= 0 ma(bh) -of-popul + im 50 + with 5 d 6 1.15 Pairwise (Ben 1	FDR/2 with s wrap ations rank .f. 8 with 5 d.: Comparison jamini-Hochl 2	test f. of iq9 by iac berg) 3	ge4	5
False Disc Reject Ho Aunntest Kruskal-Wa Lange Lange Lange Lange Lange Lange Lange Lange Col Mean- Col Mea	<pre>covery if p : t iq9, allis d Obs 1 23 35 11 23 35 11 5 + 1 23 35 11 5 + 0 0 0 0 0 0 0 0 0 0</pre>	Rate = = P(Z <= by(iage) equality- Rank Su + 26.5 844.0 1377.0 443.5 208.5 + 0.975 0.9646 h ties = 0.9486 Dunn's 492653 0.5834 625047 - 0.7979	0.05 z) <=) ma(bh) -of-popul + im + 50 20 50	FDR/2 with s wrap ations rank 1.f. 8 with 5 d.: Comparison jamini-Hoch 2	test f. of iq9 by iac berg) 3	ge4	5

5 6	-0.684890 1.0000 0.000000	-0.500	594 -0. 607	.243357	-0.126456						
6	0.000000	0 100			0.4818						
	0.5000	0.492	653 0. 185	.625047 0.6649	0.653017 1.0000	0.684890 1.0000					
False Discc Reject Ho i	very Rate = f p = P(Z <	= 0.05 <= z)	<= FDR/2	2 with s	stopping ru	le					
. dunntest	iq10, by(ia	age) ma(bh) wrag	þ							
Kruskal-Wal	lis equalit	zy-of-po	pulatior	ns rank	test						
+		+									
iage +-	Obs Rank	Sum									
	1 6	5.50 j									
2	35 142	7.50									
4	11 409	9.00 <									
+-	+										
6 +	⊥ 44	±.UU +									
chi-squared	= 2.69	92 with	5 d.f.								
probability	= 0.74	173									
chi-squared	with ties	= 7	.233 wit	ch 5 d.1	E.						
probability	= 0.20	<mark>)39</mark>									
	Dunn	's Pairw (ise Comp Benjamir	oarison ni-Hochk	of iq10 by berg)	iage					
Col Mean-		1	2	2	3		Л	5			
+-					د 		+	J			
2	-2.233632 0.0957										
3	-2 500320	_0 000	7 / /								
	0.0907	0.980	084								
4	-2.180462	0.011	605 0.	.773901							
	0.0731	0.4	954	0.4703							
5	-2.032789	0.111	187 0.	.665386	0.093832						
	0.0789	0.5	258	0.4742	0.4957						
6	-1.968240	-0.491	273 -0.	235250	-0.484547	-0.508197					
I	0.0736	0.4	6/4	0.5088	0.4282	0.5094					
False Disco Reject Ho i	very Rate = $f p = P(7 < $	= 0.05	<= FDR/2	with s	stopping ru	le					
	1 P 1(8	1217	1 1 1010/ 2	. wron .	copping in						
Questic	n – For eacl	h of the	questior	ns, 1-10	, is there a c	lifference in	the avera	ge respo	onse <u>by </u>	<u>ender</u> ?	
. ranksum i	ql, by(iger	nder)									
Two-sample	Wilcoxon ra	ank-sum	(Mann-Wł	nitney)	test						
iconde	r l al		nk eum	- <u>- '</u>	rted						
	+			expec							
	1 1 2 5	L7 59	629.5 2296.5	65 22	54.5 71.5						
	+										
	.1		1476	2	147h						
combine	d 5	/ 6	2920		2920						
combine unadjusted	d . variance	6435. -5031	2920 92 72								
combine unadjusted adjustment	d variance for ties	6435. -5031.	92 72 								

Z	==1) = 1q1	(igender==2)			
Prob > z	= -0.667 = <mark>0.5047</mark>				
. ranksum iq2, !	by(igender)			
Two-sample Wilc	oxon rank-	sum (Mann-Wh	itney) test		
igender	obe	rank sum	expected		
+-					
1 2	17 58	564 2286	646 2204		
combined	/5	2850	2850		
unadjusted varia adjustment for	ance 6 ties -4	244.67 459.21			
adjusted varian	ce 1	/85.46			
Ho: iq2(igender	==1) = iq2 = -1 941	(igender==2)			
Prob > z	= 0.0523				
. ranksum iq3, !	by(igender)			
Two-sample Wilc	oxon rank-	sum (Mann-Wh	itney) test		
igender	obe	rank sum	expected		
+-					
1 2	17 59	613 2313	654.5 2271.5		
+-					
combined	76	2926	2926		
adjustment for adjusted varian	ties -3 ce 2	435.92 697.73 738.19			
adjustment for adjusted varian Ho: iq3(igender z = Prob > z =	ties -3 ce 2 ==1) = iq3 = -0.793 = <mark>0.4277</mark>	(igender==2)			
adjustment for adjusted varian Ho: iq3(igender Prob > z =	ties -3 ce 2 ==1) = iq3 = -0.793 = 0.4277	<pre>435.92 697.73 738.19 (igender==2)</pre>			
adjustment for adjusted varian Ho: iq3(igender Prob > z = . ranksum iq4, 1	ties -3 ce 2 ==1) = iq3 = -0.793 = 0.4277 by(igender	<pre>435.92 697.73 738.19 (igender==2))</pre>			
adjustment for adjusted varian do: iq3(igender Prob > z . ranksum iq4, 1 Two-sample Wilco	ties -3 ce 2 ==1) = iq3 = -0.793 = 0.4277 by(igender oxon rank-	<pre>435.92 697.73 738.19 (igender==2)) sum (Mann-Wh</pre>	itney) test		
adjustment for adjusted varian Ho: iq3(igender Prob > z . ranksum iq4, 1 Two-sample Wilco igender	ties -3 ce 2 ==1) = iq3 = -0.793 = 0.4277 by(igender oxon rank- obs	<pre>435.92 697.73 738.19 (igender==2)) sum (Mann-Wh rank sum</pre>	itney) test expected		
adjustment for adjusted varian Ho: iq3(igender Prob > z ranksum iq4, 1 Cwo-sample Wilco igender 	ties -3 ce 2 ==1) = iq3 = -0.793 = 0.4277 by(igender oxon rank- obs 	<pre>435.92 697.73 738.19 (igender==2)) sum (Mann-Wh rank sum 659</pre>	itney) test expected 		
adjustment for adjusted varian Ho: iq3(igender Prob > z	ties -3 ce 2 ==1) = iq3 = -0.793 = 0.4277 by(igender oxon rank- obs 17 60	<pre>435.92 697.73 738.19 (igender==2)) sum (Mann-Wh rank sum </pre>	itney) test expected 		
adjustment for adjusted varian Ho: iq3(igender Prob > z ranksum iq4, 5 Iwo-sample Wilco igender 1 2	ties -3 ce 2 ==1) = iq3 = -0.793 = 0.4277 by(igender oxon rank- obs 17 60 77	<pre>435.92 697.73 738.19 (igender==2)) sum (Mann-Wh rank sum 659 2344 3003</pre>	itney) test expected 663 2340 3003		
adjustment for adjusted varian Ho: iq3(igender Prob > z . ranksum iq4, 1 Iwo-sample Wilco igender 1 2 combined unadjusted varia	ties -3 ce 2 ==1) = iq3 = -0.793 = 0.4277 by(igender oxon rank- obs 17 60 77 ance 6	<pre>435.92 697.73 738.19 (igender==2)) sum (Mann-Wh rank sum 659 2344 3003 630.00</pre>	itney) test expected 663 2340 3003		
adjustment for adjusted varian Ho: iq3(igender Prob > z . ranksum iq4, : Iwo-sample Wilco igender 1 2 . combined unadjusted varia	ties -3 ce -2 ==1) = iq3 = -0.793 = 0.4277 by(igender oxon rank- obs 	<pre>435.92 697.73 738.19 (igender==2)) sum (Mann-Wh rank sum 659 2344 3003 630.00 621.46</pre>	itney) test expected 		
adjustment for adjusted varian Ho: iq3(igender Prob > z ranksum iq4, 1 Iwo-sample Wilco igender 1 2 combined unadjusted varian	ties -3 ce 2 ==1) = iq3 = -0.793 = 0.4277 by(igender oxon rank- obs ce 4	<pre>435.92 697.73 738.19 (igender==2)) sum (Mann-Wh rank sum 659 2344 659 2344 659 2344 659 2344 008.54</pre>	itney) test expected 663 2340 3003		
adjustment for adjusted varian Ho: iq3(igender Prob > z . ranksum iq4, : Iwo-sample Wilco- igender 2 . combined unadjusted varian adjusted varian Ho: ig4(igender)	ties -3 ce -2 ==1) = iq3 = -0.793 = 0.4277 by(igender oxon rank- obs 17 60 77 ance 6 ties -2 ce 4 ==1) = iq4	<pre>435.92 697.73 738.19 (igender==2)) sum (Mann-Wh rank sum 659 2344 3003 630.00 621.46 008.54 (igender==2)</pre>	itney) test expected 		
adjustment for adjusted varian Ho: iq3(igender Prob > z . ranksum iq4, 1 Two-sample Wilco- igender 1 2 . combined unadjusted variand adjusted variand Ho: iq4(igender: z :	ties -3 ce 2 ==1) = iq3 = -0.793 = 0.4277 by(igender oxon rank- obs n ance 6 ties -2 ce 4 ==1) = iq4 = -0.063	<pre>435.92 697.73 738.19 (igender==2)) sum (Mann-Wh rank sum 659 2344 659 2344 659 2344 008.54 (igender==2)</pre>	itney) test expected 663 2340 3003		
adjustment for adjusted varian Ho: iq3(igender Prob > z . ranksum iq4, 2 Iwo-sample Wilco igender	ties -3 ce 2 ==1) = iq3 = -0.793 = 0.4277 by(igender oxon rank- obs cobs 77 ance 6 ties -2 ce 4 ==1) = iq4 = -0.063 = 0.9496	<pre>435.92 697.73 738.19 (igender==2)) sum (Mann-Wh rank sum 659 2344 3003 630.00 621.46 008.54 (igender==2)</pre>	itney) test expected 663 2340 3003		
adjustment for adjusted varian Ho: iq3(igender Prob > z . ranksum iq4, : Two-sample Wilco- igender 1 2 . combined unadjusted variand adjusted variand Ho: iq4(igender: Prob > z :	ties -3 ce -2 ==1) = iq3 = -0.793 = 0.4277 by(igender oxon rank- obs obs ce 4 ==1) = iq4 = -0.063 = 0.9496 bu(igender	<pre>435.92 697.73 738.19 (igender==2)) sum (Mann-Wh rank sum 659 2344 3003 630.00 621.46 008.54 (igender==2))</pre>	itney) test expected 		
adjustment for adjusted varian Ho: iq3(igender Prob > z . ranksum iq4, : Two-sample Wilco- igender 1 2 . combined unadjusted variand adjusted variand Ho: iq4(igender: Prob > z . ranksum iq5, 1	ties -3 ce -2 ==1) = iq3 = -0.793 = 0.4277 by(igender oxon rank- obs obs ce 4 ==1) = iq4 = -0.063 = 0.9496 by(igender	<pre>435.92 697.73 738.19 (igender==2)) sum (Mann-Wh rank sum 659 2344 659 2344 659 2344 008.54 (igender==2))</pre>	itney) test expected 663 2340 3003		
adjustment for adjusted varian Ho: iq3(igender Prob > z . ranksum iq4, : Iwo-sample Wilco- igender 1 2 . combined unadjusted varian djusted varian Ho: iq4(igender: Prob > z : . ranksum iq5, 1 Iwo-sample Wilco	ties -3 ce -2 ==1) = iq3 = -0.793 = 0.4277 by(igender oxon rank- obs obs ce 4 ==1) = iq4 = -0.063 = 0.9496 by(igender oxon rank-	<pre>435.92 697.73 738.19 (igender==2)) sum (Mann-Wh rank sum 659 2344 3003 630.00 621.46 008.54 (igender==2)) sum (Mann-Wh</pre>	itney) test expected 663 2340 3003		
adjustment for adjusted varian Ho: iq3(igender Prob > z . ranksum iq4, 2 Iwo-sample Wilco- igender 2 . combined unadjusted variand Ho: iq4(igender: Prob > z . ranksum iq5, 1 Iwo-sample Wilco- igender	ties -3 ce -2 ==1) = iq3 = -0.793 = 0.4277 by(igender oxon rank- obs obs ties -2 ce 4 ==1) = iq4 = -0.063 = 0.9496 by(igender oxon rank- obs	<pre>435.92 697.73 738.19 (igender==2)) sum (Mann-Wh rank sum 659 2344 3003 630.00 621.46 008.54 (igender==2)) sum (Mann-Wh rank sum</pre>	itney) test expected 		
adjustment for adjusted varian Ho: iq3(igender Prob > z = . ranksum iq4, : Two-sample Wilco- igender 1 2 . combined unadjusted varian adjusted varian Ho: iq4(igender Prob > z = . ranksum iq5, I Iwo-sample Wilco- igender . ranksum iq5, I	ties -3 ce -3 ce 2 ==1) = iq3 = -0.793 = 0.4277 by(igender oxon rank- obs 	<pre>435.92 697.73 738.19 (igender==2)) sum (Mann-Wh rank sum 659 2344 3003 630.00 621.46 008.54 (igender==2)) sum (Mann-Wh rank sum 600 5</pre>	<pre>itney) test expected</pre>		
adjustment for adjusted varian Ho: iq3(igender Prob > z . ranksum iq4, : Two-sample Wilco- igender 1 2 . combined unadjusted varian djusted varian Ho: iq4(igender: Prob > z . ranksum iq5, 1 Fwo-sample Wilco- igender . ranksum iq5, 1 Fwo-sample Wilco- 1 2 . ranksum iq5, 1 . ranksum iq5, 1	ties -3 ce -2 ==1) = iq3 = -0.793 = 0.4277 by(igender oxon rank- obs obs r7 ance 6 ties -2 ce 4 ==1) = iq4 = -0.063 = 0.9496 by(igender oxon rank- obs ce 17 59	<pre>435.92 697.73 738.19 (igender==2)) sum (Mann-Wh rank sum 659 2344 3003 630.00 621.46 008.54 (igender==2)) sum (Mann-Wh rank sum 600.5 2325.5</pre>	itney) test expected 663 2340 3003 itney) test expected 654.5 2271.5		
adjustment for adjusted varian Ho: iq3(igender Prob > z ranksum iq4, : 'wo-sample Wilco- igender 1 2 combined adjusted varian do: iq4(igender: Prob > z ranksum iq5, 1 'wo-sample Wilco- igender ranksum iq5, 1 'wo-sample Wilco- igender combined	ties -3 ce -2 ==1) = iq3 = -0.793 = 0.4277 by(igender oxon rank- obs obs ce 4 ==1) = iq4 = -0.063 = 0.9496 by(igender oxon rank- obs ce -4 =-1) = iq4 = -0.063 = 0.9496 by(igender oxon rank- ce -4 by(igender 	<pre>435.92 697.73 738.19 (igender==2)) sum (Mann-Wh rank sum 659 2344 3003 630.00 621.46 008.54 (igender==2)) sum (Mann-Wh rank sum 600.5 2325.5 </pre>	itney) test expected 663 2340 3003 itney) test expected 654.5 2271.5 		

unadjusted variance adjustment for ties	≥ 6435.92 ≤ −3862.43		
adjusted variance	2573.49		
Ho: iq5(igender==1)	= iq5(igender==2)		
z = - Prob > z =	-1.064 0.2871		
1100 / 121	0.2071		
. ranksum iq6, by(i	igender)		
Two-sample Wilcoxor	n rank-sum (Mann-Wh	itney) test	
igender	obs rank sum	expected	
+	17 684	654.5	
2	59 2242	2271.5	
combined	76 2926	2926	
unadjusted variance	e 6435.92		
adjustment for ties	3 -3186.72		
adjusted variance	3249.19		
Ho: iq6(igender==1)	= iq6(igender==2)		
z = Prob > z =	0.6048		
. ranksum iq7, by(i	igender)		
Two-sample Wilcoxor	ı rank-sum (Mann-Wh	itney) test	
igender	obs rank sum	expected	
+		646	
2	58 2251	2204	
combined	75 2850	2850	
unadjusted variance	6244.67		
adjustment for ties	₃		
adjusted variance	3738.81		
Ho: iq7(igender==1)	= iq7(igender==2)		
z = - Prob > z =	0.4421		
. ranksum iq8, by(i	igender)		
Two-sample Wilcoxor	ı rank-sum (Mann-Wh	itney) test	
igender	obs rank sum	expected	
1	17 610.5	654.5	
2	59 2315.5	2271.5	
combined	76 2926	2926	
unadjusted variance	e 6435.92		
adjustment for ties	-812.08		
adjusted variance	5623.84		
Ho: iq8(igender==1)	= iq8(igender==2)		
z = - Prob > z =	-0.587 0.5574		
. ranksum iq9, by(i	igender)		
Two-sample Wilcoxor	n rank-sum (Mann-Wh	itney) test	
igender	obs rank sum	expected	

```
1 | 17 597 654.5
2 | 59 2329 2271.5
1
2
        ----+--
                        _____
                                  _____
                                            _____
3
         combined | 76 2926 2926
4
                           6435.92
     unadjusted variance
5
                        -1019.01
     adjustment for ties
6
                         _____
     adjusted variance 5416.90
7
8
     Ho: iq9(igender==1) = iq9(igender==2)
9
                z = -0.781
         Prob > |z| = 0.4347
10
11
12
     . ranksum iq10, by(igender)
13
     Two-sample Wilcoxon rank-sum (Mann-Whitney) test
14
15
         igender |
                      obs rank sum
                                        expected
16

        1
        17
        635.5
        654.5

        2
        59
        2290.5
        2271.5

17
18
             ----+-
                        _____
                                 combined | 76 2926
19
                                             2926
20
     unadjusted variance 6435.92
adjustment for ties -4040.59
21
     adjustment for ties
22
                         _____
     adjusted variance 2395.32
23
24
     Ho: iq10(igender==1) = iq10(igender==2)
25
                z = -0.388
         Prob > |z| = 0.6979
26
27
     _____
                                                           _____
28
29

    Question – For each of the questions, 1-10, is there a difference in the average response by level of education

30
     . dunntest iq1, by(ied) ma(bh) wrap
31
32
     Warning: by() values are unlabeled, option nolabel implicit
33
34
     Kruskal-Wallis equality-of-populations rank test
35
36
       +----+
       | ied | Obs | Rank Sum |
37
       |-----|
38
       | 1 | 26 | 965.00 |
          2 | 49 | 1957.50 |
39
       .
          3 | 1 | 3.50 |
40
         -----+
41
     chi-squared = 2.825 with 2 d.f.
probability = 0.2435
42
43
44
                              12.949 with 2 d.f.
     chi-squared with ties =
45
     probability =
                      0.0015
46
47
                      Dunn's Pairwise Comparison of iq1 by ied
48
                              (Benjamini-Hochberg)
     Col Mean-|
49
     Row Mean
                          1
                                        2
50
      ____+
51
            2 | -1.132195
52
             0.1288
              53
                 3.197953 3.498063
            3 1
54
                   <mark>0.0010</mark>
                           <mark>0.0007</mark>
             55
     False Discovery Rate = 0.05
56
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
57
58
     . dunntest iq2, by(ied) ma(bh) wrap
59
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```

```
Warning: by() values are unlabeled, option nolabel implicit
1
2
3
     Kruskal-Wallis equality-of-populations rank test
4
5
       | ied | Obs | Rank Sum |
6
       |-----|
          1 | 26 | 979.50 |
7
       2 | 48 | 1866.00 |
3 | 1 | 4.50 |
8
9
       +----+
10
     chi-squared =
                     2.446 with 2 d.f.
11
     probability =
                    0.2944
12
13
     chi-squared with ties =
                               8.554 with 2 d.f.
     probability =
                     0.0139
14
15
                      Dunn's Pairwise Comparison of iq2 by ied
16
                        (Benjamini-Hochberg)
17
     Col Mean-I
18
     Row Mean |
                           1
                                         2
                 _____
19
     ____+
          2 | -0.423546
20
                 0.3359
            - I
21
              1
22
            3 |
                 2.793337 2.919430
                           <mark>0.005</mark>3
                  <mark>0.0039</mark>
             23
24
     False Discovery Rate = 0.05
25
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
26
27
     . dunntest iq3, by(ied) ma(bh) wrap
28
     Warning: by() values are unlabeled, option nolabel implicit
29
30
                                                           Kruskal-Wallis equality-of-populations rank test
31
32
         _____
33
       | ied | Obs | Rank Sum |
34
       |-----|
         1 | 26 | 904.00 |
35
       2 | 49 | 2015.00 |
36
       | 3 | 1 | 7.00 |
37
38
     chi-squared = 3.468 with 2 d.f.
probability = 0.1766
39
40
     chi-squared with ties =
                               8.151 with 2 d.f.
41
     probability = 0.0170
42
43
                      Dunn's Pairwise Comparison of iq3 by ied
44
                              (Benjamini-Hochberg)
45
     Col Mean-I
46
     Row Mean |
                          1
                                         2
47
      ----+-
                 _____
            2 | -1.817857
48
                  <mark>0.0345</mark>
             49
              3 |
                 1.891823
                           2.345120
50
                   <mark>0.0439</mark>
                            <mark>0.0285</mark>
              51
52
     False Discovery Rate = 0.05
     Reject Ho if p = P(Z <= |z|) <= FDR/2 with stopping rule
53
54
55
     . dunntest iq4, by(ied) ma(bh) wrap
56
     Warning: by() values are unlabeled, option nolabel implicit
57
58
59
     Kruskal-Wallis equality-of-populations rank test
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```

_____ 1 | ied | Obs | Rank Sum | 2 |-----| 3 1 | 26 | 1021.50 | 2 | 50 | 1968.50 | 4 1 3 | 1 | 13.00 | 5 +----+ 6 1.369 with 2 d.f. 0.5044 7 chi-squared = probability = 8 9 chi-squared with ties = 2.264 with 2 d.f. 10 probability = 0.3224 11 12 Dunn's Pairwise Comparison of iq4 by ied 13 (Benjamini-Hochberg) Col Mean-| 14 Row Mean | 1 2 15 ----+-2 | -0.019386 16 0.4923 _____ 17 18 3 | 1.482968 1.500969 19 0.1036 0.2000 20 False Discovery Rate = 0.05 21 Reject Ho if $p = P(Z \le |z|) \le FDR/2$ with stopping rule 22 23 . dunntest iq5, by(ied) ma(bh) wrap 24 25 Warning: by() values are unlabeled, option nolabel implicit t 26 27 Kruskal-Wallis equality-of-populations rank test 28 29 | ied | Obs | Rank Sum | 30 |-----| 1 | 26 | 1044.50 | 2 | 49 | 1874.50 | 31 32 | 3 | 1 | 7.00 | 33 +----+ 34 2.190 with 2 d.f. chi-squared = 35 probability = 0.3345 36 37 5.477 with 2 d.f. chi-squared with ties = 38 probability = 0.0647 39 40 Dunn's Pairwise Comparison of iq5 by ied (Benjamini-Hochberg) 41 Col Mean-I 42 Row Mean | 1 2 43 2 | 0.566082 44 0.2857 1 45 46 3 | 2.331166 2.215729 47 0.0296 0.0200 48 False Discovery Rate = 0.05 49 Reject Ho if $p = P(Z \le |z|) \le FDR/2$ with stopping rule 50 51 . dunntest iq6, by(ied) ma(bh) wrap 52 Warning: by() values are unlabeled, option nolabel implicit 53 54 55 Kruskal-Wallis equality-of-populations rank test 56 +----+ 57 | ied | Obs | Rank Sum | 58 -----| 59 1 | 26 | 1024.00 | For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml 60
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chi-square probabilit	d = 1.593 with 2 d.f. v = 0.4508
chi-square probabilit	d with ties = 3.156 with 2 d.f. y = 0.2064
	Dunn's Pairwise Comparison of igh by jed
Col Mean-	(Benjamini-Hochberg)
Row Mean	1 2
2	0.208239 0.4175
3	1.775186 1.740803 0.1138 0.0613
False Disc Reject Ho	overy Rate = 0.05 if p = P(Z <= z) <= FDR/2 with stopping rule
dunntest	ig7. by(ied) ma(bb) wrap
Warning: k	y() values are unlabeled, option nolabel implicit
Kruskal-Wa	llis equality-of-populations rank test
+	
+ +-	
3	48 1//1.00 1 13.50
3 +	48 1//1.00 1 13.50 +
3 + chi-square probabilit	48 1//1.00 1 13.50
3 + probabilit chi-square probabilit	$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$
3 + chi-square probabilit chi-square probabilit	$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$
3 + chi-square probabilit chi-square probabilit	48 1//1.00 1 13.50
3 + chi-square probabilit chi-square probabilit Col Mean- Row Mean	48 1/71.00 1 13.50
3 + chi-square probabilit chi-square probabilit Col Mean- Row Mean 	48 1/71.00 1 13.50 + d = 1.873 with 2 d.f. y = 0.3920 d with ties = 3.129 with 2 d.f. y = 0.2092 Dunn's Pairwise Comparison of iq7 by ied (Benjamini-Hochberg) 1 2 0.994759 0.1599
3 + probabilit chi-square probabilit Col Mean- Row Mean 2 	48 1/71.00 1 13.50
3 + probabilit chi-square probabilit Col Mean- Row Mean 	<pre>48 1/71.00 1 13.50 </pre>
3 +	<pre>48 1//1.00 1 13.50 </pre>
3 +	<pre>48 1//1.00 1 13.50 </pre>
3 +	<pre>48 1/1.00 1 13.50 </pre>
3 + probabilit chi-square probabilit Col Mean- Row Mean 	<pre>48 1//1.00 1 13.50 </pre>
<pre> 3 + chi-square probabilit chi-square probabilit Col Mean- Row Mean 2 3 False Disc Reject Ho Marning: k Kruskal-Wa + ied </pre>	<pre>48 177.00 1 13.50 </pre>
<pre> 3 + chi-square probabilit chi-square probabilit Col Mean- Row Mean 2 3 2 3 False Disc Reject Ho Kruskal-Wa + ied +- 1 </pre>	<pre>48 1/1.00 1 13.50 </pre>

```
probability =
                    0.9289
1
     chi-squared with ties =
                            0.169 with 2 d.f.
2
     probability =
                     0.9190
3
4
                     Dunn's Pairwise Comparison of iq8 by ied
5
                             (Benjamini-Hochberg)
6
     Col Mean-|
                   1
                                      2
7
     Row Mean |
     _____
8
           2 | 0.261480
9
                  0.3969
            10
             0.294096
           3 |
                0.353785
11
                 1.0000
                         0.5765
             12
     False Discovery Rate = 0.05
13
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
14
15
     . dunntest iq9, by(ied) ma(bh) wrap
16
17
     Warning: by() values are unlabeled, option nolabel implicit
18
19
     Kruskal-Wallis equality-of-populations rank test
20
21
       +----+
22
       | ied | Obs | Rank Sum |
       |-----|
23
         1 | 26 | 1086.50 |
24
         2 | 49 | 1813.00 |
       25
       | 3 | 1 | 26.50 |
       +----+
26
27
     chi-squared =
                   1.098 with 2 d.f.
     probability =
28
                    0.5776
29
     chi-squared with ties =
                             1.304 with 2 d.f.
30
     probability =
                     0.5209
31
32
                     Dunn's Pairwise Comparison of iq9 by ied
33
                            (Benjamini-Hochberg)
34
     Col Mean-|
                  1
                                      2
     Row Mean |
35
     _____
36
           2 | 0.974133
37
                  0.4950
             38
             3 | 0.740520 0.513063
39
                          0.3040
                  0.3442
             40
     False Discovery Rate = 0.05
41
     Reject Ho if p = P(Z <= |z|) <= FDR/2 with stopping rule
42
43
     . dunntest iq10, by(ied) ma(bh) wrap
44
45
     Warning: by() values are unlabeled, option nolabel implicit
46
47
     Kruskal-Wallis equality-of-populations rank test
48
49
       +----+
       | ied | Obs | Rank Sum |
50
       |-----|
51
        1 | 26 | 956.50 |
52
          2 | 49 | 1963.00 |
3 | 1 | 6.50 |
       53
       1
       +----+
54
55
                   2.501 with 2 d.f.
0.2864
     chi-squared =
56
     probability =
57
     chi-squared with ties =
                             6.720 with 2 d.f.
58
     probability = 0.0347
59
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	Dunn's Pairwise Comparison of iq10 by ied
Col Mean-	(Benjamini-Rochberg)
Row Mean	1 2
2	-1.001222
	0.1584
3	2.206194 2.466110
	0.0205 0.0205
False Disc	covery Rate = 0.05
Reject Ho	if $p = P(Z \le z) \le FDR/2$ with stopping rule
 Questi 	on: For each of the questions, is there a difference in the average response based upon racer or ethnicity
. dunntest	: iql, by(ieth) ma(bh) wrap
Warning, h	() values are unlabeled option polabel implicit
warning, t	Y() values are unrabeled, option notabel implicit
Vruchol M.	allie equality-of-populations rank test
ı∖⊥uskal-W∂	TITS Eduality-or-bobulations rank rest
+	
leth +	
	39 1542.50
2	
4	3 124.50
7	2 83.00
	Dunn's Pairwise Comparison of idl by jeth
	(Benjamini-Hochberg)
Row Mean	1 2 3 4
+	0.357691
2	0.5147
3	1 322301 0 672593
	0.9303 0.6265
4	
·	0.4703 0.6344 0.9303
7	
, i 	0.4413 0.5731 0.7603 0.5000
Folgo Digo	Antonia Data - 0.05
Reject Ho	if $p = P(Z \le z) \le FDR/2$ with stopping rule
. dunntest	; iq2, by(ieth) ma(bh) wrap
Monriel	w() welves are unlabeled, ention noticel implicit
warning: b	Y() values are unlabeled, option notabel implicit
72	llie emelity of negulations work toot
kruskal-Wa	LIIS equality-of-populations rank test
+	
ieth +	UDS Rank Sum
1	38 1483.50
2	12 429.00 20 727.50
1 9	For poor rouiou only http://breichen.html.com/site/sk-ut/wid-line-uktur
	For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

4 7 +	3 126.00 2 84.00
chi-square probabilit	ed = 0.494 with 4 d.f. y = 0.9741
chi-square probabilit	ad with ties = 1.728 with 4 d.f. $x_y = 0.7857$
	Dunn's Pairwise Comparison of iq2 by ieth (Benjamini-Hochberg)
) Col Mean- Row Mean	1 2 3 4
2 2	0.852426 1.0000
3	0.827632 -0.146874 0.6798 0.4907
 4 	-0.423606 -0.830842 -0.779591 0.4799 1.0000 0.5445
 7 1	-0.350170 -0.702190 -0.650840 $0.0000000.4539$ 0.4826 0.4293 0.5000
False Disc Reject Ho	covery Rate = 0.05 if $p = P(7 \le z) \le EDR/2$ with stopping rule
. dunntest	: iq3, by(ieth) ma(bh) wrap
Warning: k	y() values are unlabeled, option nolabel implicit
Kruskal-Wa	llis equality-of-populations rank test
+	
ieth	Obs Rank Sum
+	39 1641.00
2	
	3 135.00
7 +	2 90.00
chi-square	d = 3.969 with 4 d.f.
chi-square	ed with ties = 9.329 with 4 d.f.
probabilit	y = 0.0534
	Dunn's Pairwise Comparison of iq3 by ieth (Benjamini-Hochberg)
Col Mean- Bow Mean	
2	2.715092
 3	0.0331 1.660183 -1.204134
	0.1615 0.2285
4	0.4593 0.2215 0.2390
7	-0.279903 -1.439216 -0.889312 0.000000 0.4331 0.1876 0.2670 0.5000
False Disc Reject Ho	covery Rate = 0.05 if p = P(Z <= z) <= FDR/2 with stopping rule
. dunntest	iq4, by(ieth) ma(bh) wrap
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Warning: by() values are unlabeled, option nolabel implicit 1 2 Kruskal-Wallis equality-of-populations rank test 3 +----+ 4 | ieth | Obs | Rank Sum | 5 |-----6 1 | 39 | 1584.50 2 | 12 | 474.00 3 | 20 | 733.00 7 8 37.50 4 | 3 | 9 7 | 2 | 97.00 | -----+ 10 11 chi-squared = 5.096 with 4 d.f. 12 probability = 0.2776 13 chi-squared with ties = 8.628 with 4 d.f. 14 probability = 0.0711 15 16 Dunn's Pairwise Comparison of iq4 by ieth 17 (Benjamini-Hochberg) 18 Col Mean-| 19 3 Row Mean | 1 2 4 _____ 20 2 | 0.201372 21 0.4202 22 0.852280 0.459885 3 | 23 0.3284 0.3587 24 2.298277 25 2.766202 2.464580 4 | 0.0284 0.0343 0.0269 26 27 -0.639739 -0.694317 -0.941479 -2.323629 7 | 0.0336 28 0.3265 0.3482 0.3465 29 False Discovery Rate = 0.05 30 Reject Ho if $p = P(Z \le |z|) \le FDR/2$ with stopping rule 31 32 . dunntest iq5, by(ieth) ma(bh) wrap 33 34 Warning: by() values are unlabeled, option nolabel implicit 35 36 Kruskal-Wallis equality-of-populations rank test 37 +----+ 38 | ieth | Obs | Rank Sum | 39 40 1 | 39 | 1585.50 | 2 | 12 | 384.00 41 3 | 20 | 771.50 42 4 | 3 | 96.00 43 7 | 2 | 89.00 | +----+ 44 45 chi-squared = 1.818 with 4 d.f. 46 probability = 0.7691 47 chi-squared with ties = 4.548 with 4 d.f. 48 probability = 0.3369 49 50 Dunn's Pairwise Comparison of iq5 by ieth 51 (Benjamini-Hochberg) 52 Col Mean-I 2 53 Row Mean | 1 3 4 _____+ 54 2 | 1.877283 55 0.3024 56 3 | 0.541285 -1.289464 57 0.3677 0.4931 58 59 4 | 1.034332 0.000000 0.760484 For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

```
0.3762 0.5000
                                   0.3725
             1
           7 |
                -0.379896 -1.172018 -0.572123 -0.980581
2
                  0.3911
                          0.4020
                                   0.4052
                                              0.3268
             3
4
     False Discovery Rate = 0.05
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
5
6
     . dunntest iq6, by(ieth) ma(bh) wrap
7
8
     Warning: by() values are unlabeled, option nolabel implicit
9
10
     Kruskal-Wallis equality-of-populations rank test
11
12
       +----+
       | ieth | Obs | Rank Sum |
13
           --+---+--
14
          1 | 39 | 1547.50 |
15
          2 | 12 | 479.50 |
3 | 20 | 666.50 |
16
           4 | 3 | 139.50 |
17
           7 | 2 | 93.00 |
18
          _____+
19
     chi-squared = 1.918 with 4 d.f.
20
     probability =
                    0.7508
21
22
     chi-squared with ties =
                              3.799 with 4 d.f.
     probability =
                   0.4338
23
24
25
                    Dunn's Pairwise Comparison of iq6 by ieth
                             (Benjamini-Hochberg)
26
     Col Mean-|
27
     Row Mean |
                        1
                                     2
                                                   3
28
     2 | -0.053834
29
                  0.5317
             30
31
           3 |
               1.472508 1.157760
                  0.7044
                           0.4116
32
             33
           4 | -0.725506 -0.645877 -1.356183
34
             0.4681
                          0.4320
                                   0.4376
35
           7 |
               -0.599554 -0.545866 -1.132205
                                             0.000000
36
                  0.3920
                          0.3657
                                   0.3219
                                              0.5000
             37
38
     False Discovery Rate = 0.05
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
39
40
     . dunntest iq7, by(ieth) ma(bh) wrap
41
42
     Warning: by() values are unlabeled, option nolabel implicit
43
44
     Kruskal-Wallis equality-of-populations rank test
45
46
       +----+
       | ieth | Obs | Rank Sum |
47
        ------
48
           1 | 38 | 1459.00 |
49
           2 | 12 | 507.00
                     644.00
           3 | 20 |
50
                    144.00
               3 |
           4 |
51
           7 | 2 | 96.00 |
52
          -----+
53
                    2.938 with 4 d.f.
     chi-squared =
54
     probability =
                    0.5683
55
                              4.907 with 4 d.f.
56
     chi-squared with ties =
                     0.2970
     probability =
57
58
59
                    Dunn's Pairwise Comparison of iq7 by ieth
                          For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml
60
```

Col Mean- Row Mean	 	1		2	3	4	
	+	0387					
2	0.09	3500					
3	 1.32	9710 1	.632067				
Ū.	0.	3060	0.5133				
4	 -0.94	9754 -0	.528220	-1.513248			
_	0.	3422	0.3733	0.3255			
7	 -0.78	5104 -0	.446427	-1.263331	0.00000		
	0.	3603	0.3640	0.2581	0.5000		
False Disc	covery R	ate =	0.05				
Reject Ho	if p =	P(Z <=	z) <= F	DR/2 with s	copping rule		
. dunntest	t iq8, b	y(ieth)	ma(bh) w	rap			
Warning: }	by() val	ues are	unlabele	d, option n	olabel implicit	t	
Kruskal-Wa	allis eq	uality-o	f-popula	tions rank	test		
+			-+				
ieth	Obs	Rank Sum	Ì				
	++- 39	1519 00	-				
2	12	510.00	Ì				
3 4	20	673.50 106 50					
7		117.00					
probabili chi-square probabili	ty = ed with ty =	0.3478 ties = <mark>0.4775</mark>	3.502	with 4 d.f	2		
probabili chi-square probabili	ty = ed with ty =	0.5478 ties = 0.4775 Dunn's P	3.502 airwise (Benj	with 4 d.f Comparison amini-Hochbo	of iq8 by ieth		
probabili chi-square probabili Col Mean- Row Mean	ty = ed with ty = 	0.3478 ties = 0.4775 Dunn's P.	3.502 airwise (Benj	with 4 d.f Comparison o amini-Hochbo 2	of iq8 by ieth erg) 3	4	
probabili chi-square probabili Col Mean- Row Mean 2	ty = ed with ty = +	0.5478 ties = 0.4775 Dunn's P. 1 1135	3.502 airwise (Benj	with 4 d.f Comparison amini-Hochbo 2	of iq8 by ieth erg) 3	4	
probabili chi-square probabili Col Mean- Row Mean 2	ty = ed with ty = + -0.52 0.	0.3478 ties = 0.4775 Dunn's P. 1 1135 3764	3.502 airwise (Benj	with 4 d.f Comparison amini-Hochbo 2	of iq8 by ieth erg) 3	4	
probabili chi-square probabili Col Mean- Row Mean 2 2 3	ty = ed with ty = -0.52 0. 0.92	0.3478 ties = 0.4775 Dunn's P. 1 1135 3764 8892 1	3.502 airwise (Benj 	with 4 d.f Comparison amini-Hochbo 2	of iq8 by ieth erg) 3	4	
probabili chi-square probabili Col Mean- Row Mean 2 3	ty = ed with ty = -0.52 0.92 0.92	ties = 0.4775 Dunn's P. 1 1135 3764 8892 1 2941	3.502 airwise (Benj .170773 0.3021	with 4 d.f Comparison amini-Hochbo 2	of iq8 by ieth erg) 3	4	
probabili chi-square probabili Col Mean- Row Mean 2 3 3	ty = ed with ty = -0.52 0.92 0.92 0.27	0.3478 ties = 0.4775 Dunn's P. 1 1135 3764 8892 1 2941 8839 0	3.502 airwise (Benj .170773 0.3021 .525328	with 4 d.f Comparison amini-Hochbo 2 	of iq8 by ieth erg) 3	4	
probabili chi-square probabili Col Mean- Row Mean 2 3 4	ty = ed with ty = -0.52 0. 0.92 0.27 0.27	ties = 0.4775 Dunn's P. 1 1135 3764 8892 1 2941 8839 0 4335	3.502 airwise (Benj .170773 0.3021 .525328 0.4281	with 4 d.f Comparison amini-Hochbo 2 -0.142791 0.4432	of iq8 by ieth erg) 3	4	
probabili chi-square probabili Col Mean- Row Mean 2 3 3 4 7	ty = ed with ty = -0.52 0. 0.92 0.27 0. 0.27 0. -1.30	ties = 0.4775 Dunn's P. 1 1135 3764 8892 1 2941 8839 0 4335 6345 -1	3.502 airwise (Benj .170773 0.3021 .525328 0.4281 .014820	<pre>with 4 d.f Comparison 0 amini-Hochbo 2 </pre>	-1.220522	4	
probabili chi-square probabili Col Mean- Row Mean 2 3 4 7	ty = ed with ty = -0.52 0.92 0.92 0.27 0.27 0.1 -1.30 0.2	<pre>ties = 0.4775 Dunn's P. 1 1135 3764 8892 1 2941 8839 0 4335 6345 -1 4786</pre>	3.502 airwise (Benj .170773 0.3021 .525328 0.4281 .014820 0.3102	<pre>with 4 d.f Comparison 0 amini-Hochbo 2 -0.142791 0.4432 -1.621568 0.5245</pre>	-1.220522 0.3704	4	
probabili chi-square probabili Col Mean- Row Mean 	ty = ed with ty = -0.52 0. 0.92 0.27 0. -1.30 0. covery R	ties = 0.4775 Dunn's P. 1 1135 3764 8892 1 2941 8839 0 4335 6345 -1 4786 ate =	3.502 airwise (Benj .170773 0.3021 .525328 0.4281 .014820 0.3102 0.05	with 4 d.f Comparison of amini-Hochbo 2 	-1.220522 0.3704	4	
probabili chi-square probabili Col Mean- Row Mean 2 3 4 7 False Disc Reject Ho	ty = ed with ty = -0.52 0. 0.92 0.27 0. 0.27 0.27 0. 0.27 0.27 0. 0.27 0. 0.27 0. 0.27 0. 0.52 0.55	<pre>ties = 0.4775 Dunn's P 1 1135 3764 8892 1 2941 8839 0 4335 6345 -1 4786 ate = P(Z <= </pre>	3.502 airwise (Benj .170773 0.3021 .525328 0.4281 .014820 0.3102 0.05 z) <= F	with 4 d.f Comparison 6 amini-Hochbo 2 	-1.220522 0.3704	4	
probabili chi-square probabili Col Mean- Row Mean 2 3 4 7 False Disc Reject Ho	ty = ed with ty = -0.52 0.92 0.92 0.92 0.1 0.27 0. -1.30 -1.30 0. 0. 0. 0. 0. 0. 0. 0	<pre>ties = 0.4775 Dunn's P. 1 135 3764 8892 1 2941 8839 0 4335 6345 -1 4786 ate = P(Z <= </pre>	3.502 airwise (Benj .170773 0.3021 .525328 0.4281 .014820 0.3102 0.015 z) <= F	with 4 d.f Comparison of amini-Hochbo 2 	-1.220522 0.3704	4	
probabili chi-square probabili Col Mean- Row Mean 2 3 4 7 False Disc Reject Ho . dunntest	<pre>ty = ed with ty =</pre>	<pre>ties = 0.4775 Dunn's P. 1 1.35 3764 8892 1 2941 8839 0 4335 6345 -1 4786 ate = P(Z <= y(ieth) 1</pre>	3.502 airwise (Benj .170773 0.3021 .525328 0.4281 .014820 0.3102 0.05 z) <= F ma(bh) w	with 4 d.f Comparison of amini-Hochbo 2 	-1.220522 0.3704	4	
probabili chi-square probabili Col Mean- Row Mean 	<pre>ty = ed with ty = -0.52 0. 0.92 0. 0.27 0.27 0. 0.27 0.27 0. 0.27 0. 0.27 0. 0.27 0. 0.27 0. 0.27 0. 0.27 0. 0.27 0. 0.27 0. 0.27</pre>	<pre>ties = 0.4775 Dunn's P 1 1135 3764 8892 1 2941 8839 0 4335 6345 -1 4786 ate = P(Z <= y(ieth) r ues are</pre>	3.502 airwise (Benj .170773 0.3021 .525328 0.4281 .014820 0.3102 0.05 z) <= F ma(bh) w unlabele	with 4 d.f Comparison of amini-Hochbo 2 	-1.220522 0.3704	Ł	
probabili chi-square probabili Col Mean- Row Mean 2 3 4 7 False Disc Reject Ho . dunntest Warning: B	<pre>ty = ed with ty =</pre>	<pre>ties = 0.4775 Dunn's P 1 1135 3764 8892 1 2941 8839 0 4335 6345 -1 4786 ate = P(Z <= y(ieth)) ues are</pre>	3.502 airwise (Benj .170773 0.3021 .525328 0.4281 .014820 0.3102 0.05 z) <= F ma(bh) w unlabele	with 4 d.f Comparison of amini-Hochbo 2 	-1.220522 0.3704	ł	
probabili chi-square probabili Col Mean- Row Mean 2 3 4 7 False Disc Reject Ho dunntest Warning: H	<pre>ty = ed with ty = + -0.52 0.92 0.92 0.92 0.27 0.1 -1.30 -1.30 0.covery R if p = t iq9, b by() val allis eq</pre>	<pre>ties = 0.4775 Dunn's P 1 1135 3764 8892 1 2941 8839 0 4335 6345 -1 4786 ate = P(Z <= y(ieth) n ues are uality-0</pre>	3.502 airwise (Benj .170773 0.3021 .525328 0.4281 .014820 0.3102 0.05 z) <= F ma(bh) w unlabele f-popula	with 4 d.f Comparison of amini-Hochbo 2 -0.142791 0.4432 -1.621568 0.5245 DR/2 with so rap d, option no tions rank	-1.220522 0.3704 copping rule	ł	
probabili chi-square probabili Col Mean- Row Mean 2 3 4 7 False Disc Reject Ho dunntest Warning: H Kruskal-Wa	<pre>ty = ed with ty = -0.52 0. 0.92</pre>	<pre>ties = 0.4775 ties = 0.4775 Dunn's P 1 1135 3764 8892 1 2941 8839 0 4335 6345 -1 4786 ate = P(Z <= y(ieth) = ues are uality-o</pre>	3.502 airwise (Benj .170773 0.3021 .525328 0.4281 .014820 0.3102 0.05 z) <= F ma(bh) w unlabele f-popula	with 4 d.f Comparison of amini-Hochbo 2 	-1.220522 0.3704 copping rule	ł	
probabili chi-square probabili Col Mean- Row Mean 2 3 4 7 False Disc Reject Ho	<pre>ty = ed with ty = + -0.52 0.92 0.92 0.92 0.1 0.27 0.1 0.27 0.1 -1.30 0.1 covery R if p = t iq9, b by() val allis eq Obs </pre>	<pre>ties = 0.4775 Dunn's P 1 1135 3764 8892 1 2941 8839 0 4335 6345 -1 4786 ate = P(Z <= y(ieth) r ues are uality-o Rank Sum </pre>	3.502 airwise (Benj .170773 0.3021 .525328 0.4281 .014820 0.3102 0.05 z) <= F ma(bh) w unlabele f-popula -+ 	with 4 d.f Comparison of amini-Hochbo 2 -0.142791 0.4432 -1.621568 0.5245 DR/2 with so trap d, option no tions rank	-1.220522 0.3704 copping rule	ł	
probabili chi-square probabili Col Mean- Row Mean 2 3 4 7 False Disc Reject Ho dunntest Warning: H Kruskal-Wa + ieth	<pre>ty = ed with ty = 0.52 0.92</pre>	<pre>0.3478 ties = 0.4775 Dunn's P 1 1135 3764 8892 1 2941 8839 0 4335 6345 -1 4786 ate = P(Z <= y(ieth) 1 ues are uality-0 Rank Sum</pre>	3.502 airwise (Benj .170773 0.3021 .525328 0.4281 .014820 0.3102 0.05 z) <= F ma(bh) w unlabele f-popula -+ -	with 4 d.f Comparison of amini-Hochbo 2 -0.142791 0.4432 -1.621568 0.5245 DR/2 with so rap d, option no tions rank	-1.220522 0.3704 copping rule	ł	
probabili chi-square probabili Col Mean- Row Mean 2 3 4 7 False Disc Reject Ho dunntest Warning: H Kruskal-Wa + ieth 1 2	<pre>ty = ed with ty = -0.52 0.92 0.92 0.92 0.27 0.92 0.1 0.27 0.1 0.27 0.1 0.27 0.1 0.27 0.2</pre>	<pre>ties = 0.4775 ties = 0.4775 Dunn's P 1 135 3764 8892 1 2941 8839 0 4335 6345 -1 4786 ate = P(Z <= y(ieth) ; ues are uality-o Rank Sum 1358.00 488.50</pre>	3.502 airwise (Benj .170773 0.3021 .525328 0.4281 .014820 0.3102 0.05 z) <= F ma(bh) w unlabele f-popula -+ - 	with 4 d.f Comparison of amini-Hochbo 2 	-1.220522 0.3704 copping rule	t	
probabili chi-square probabili Col Mean- Row Mean 	<pre>ty = ed with ty =</pre>	<pre>ties = 0.4775 Dunn's P 1 1135 3764 8892 1 2941 8839 0 4335 6345 -1 4786 ate = P(Z <= y(ieth) 1 ues are uality-o 1358.00 488.50 821.00 142.50 </pre>	3.502 airwise (Benj .170773 0.3021 .525328 0.4281 .014820 0.3102 0.05 z) <= F ma(bh) w unlabele f-popula -+ -1 	with 4 d.f Comparison of amini-Hochbo 2 	-1.220522 0.3704 copping rule	t	

probabilit	y = 0.3808					
	Dunn's Pairwise Co	omparison o	of iq9 by ieth			
Col Mean- Row Mean	(Benjam) 1	nini-Hochbe 2	erg) 3	4		
+ 2 	-0.880360 0.3156					
 3 	-1.118000 -0.046185 0.4393 0.4816					
 4 	-1.044571 -0.519338 - 0.2962 0.3772	0.514209				
 7 	-1.578074 -1.117498 - 0.5727 0.3297 -	-1.128123 0.6482	-0.567738 0.4073			
False Disc Reject Ho	overy Rate = 0.05 if p = P(Z <= z) <= FDF	R/2 with st	opping rule			
. dunntest	iq10, by(ieth) ma(bh) wr	rap				
Warning: b	y() values are unlabeled,	, option no	label implici	t		
Kruskal-Wa	llis equality-of-populati					
	iiis equalicy of populaci	ions rank t	est			
+	Obs Rank Sum	ions rank t	lest			
+ ieth + 1	+ Obs Rank Sum + 39 1603.50	ions rank t	est			
++ ieth + 1 2 3	+ Obs Rank Sum + 39 1603.50 12 415.50 20 687.00 2 132.00	lons rank t	est			
++ ieth + 1 2 3 4 7 +	Obs Rank Sum 	lons rank t	est			
++ ieth + 1 2 3 4 7 + chi-square	Dbs Rank Sum + Obs Rank Sum + 39 1603.50 12 415.50 20 687.00 3 132.00 2 88.00 + d = 1.933 with 4 d.f. y = 0.7481	ions rank t	est			
+ ieth + 1 2 3 4 7 + chi-square probabilit	Dbs Rank Sum 	vith 4 d.f.	est			
+ ieth + 1 2 3 4 7 + chi-square probabilit	Dbs Rank Sum 	vith 4 d.f.	est			
+ ieth + 1 2 3 4 7 + chi-square probabilit	Dunn's Pairwise Co Obs Rank Sum 	vith 4 d.f. pmparison o nini-Hochbe	f iq10 by iet	h		
+ ieth + 1 2 3 4 7 + chi-square probabilit chi-square probabilit	Dunn's Pairwise Co (Benjan 113 equality of population Dbs Rank Sum 	vith 4 d.f. pmparison o nini-Hochbe 2	est of iq10 by iet org) 3	h 4		
+ ieth + 1 2 3 4 7 + probabilit chi-square probabilit Col Mean + Row Mean + 2	Dunn's Pairwise Co (Benjan 1.459385 0.3611	with 4 d.f. mparison o nini-Hochbe 2	f iq10 by iet rg) 3	h 4		
+ ieth + 1 2 3 4 7 + chi-square probabilit chi-square probabilit Col Mean- Row Mean + 2 3 3	Dunn's Pairwise Co (Benjan 1.459385 0.3611 1.825894 0.5308 0.5308 0.132 0.132 0.145 0.145 0.145 0.145 0.145 0.145 0.145 0.145 0.145 0.145 0.145 0.145 0.145 0.155	with 4 d.f. mparison o nini-Hochbe	est of iq10 by iet rg) 3	h 4		
+ ieth + 1 2 3 4 7 + chi-square probabilit chi-square probabilit Col Mean + 2 3 4 4 4 3 4 4 4 3 4 4 4 1 1 1 1 1 1 1 1	Dunn's Pairwise Co (Benjan) 1.459385 0.3611 1.825894 0.5149 0.5149 0.107801 0.1078049 0.5149 0.107100 0.107100 0.107100 0.10710000000000	with 4 d.f. pomparison o nini-Hochbe 2 -1.156913 0.4122	f iq10 by iet rg) 3	h 4		
+ ieth + 1 2 3 4 7 + chi-square probabilit chi-square probabilit Col Mean- Row Mean + 2 3 4 7 + 7 3 4 7 + 7 + 2 + + + + + + + + + + + + + + + 	Dunn's Pairwise Co (Benjan) 1.459385 0.3611 1.459385 0.3511 1.459328 0.3513 0.295328 -0.911118 - 0.4798 0.3019	<pre>vith 4 d.f. omparison o nini-Hochbe</pre>	est f iq10 by iet rg) 3 0.000000 0.5000	h 4		

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Warning: by() values are unlabeled, option nolabel implicit 1 2 Kruskal-Wallis equality-of-populations rank test 3 +----+ 4 | ihwork | Obs | Rank Sum | 5 |-----| 6 0 | 16 | 664.00 | 1 | 10 | 263.00 | 2 | 50 | 1999.00 | 7 8 _____ 9 chi-squared = 3.572 with 2 d.f. probability = 0.1676 10 11 12 16.371 with 2 d.f. chi-squared with ties = 13 probability = 0.0003 14 15 Dunn's Pairwise Comparison of iq1 by ihwork (Benjamini-Hochberg) 16 Col Mean-| 17 Row Mean | 0 1 18 1 19 1 3,655494 0.0002 20 21 0.513034 -3.828465 2 | 22 0.3040 <mark>0.0002</mark> 23 False Discovery Rate = 0.05 24 Reject Ho if $p = P(Z \le |z|) \le FDR/2$ with stopping rule 25 26 . dunntest iq2, by(ihwork) ma(bh) wrap 27 28 Warning: by() values are unlabeled, option nolabel implicit 29 30 Kruskal-Wallis equality-of-populations rank test 31 +----+ 32 | ihwork | Obs | Rank Sum | 33 |-----| 0 | 16 | 634.50 | 1 | 9 | 228.00 | 34 35 2 | 50 | 1987.50 | 36 +----+ 37 chi-squared = 3.455 with 2 d.f. 38 probability = 0.1777 39 40 chi-squared with ties = 12.083 with 2 d.f. probability = 0.0024 41 42 43 Dunn's Pairwise Comparison of iq2 by ihwork (Benjamini-Hochberg) 44 Col Mean-| 45 0 1 Row Mean | 46 _____ 1 | 2.949684 47 <mark>0.0024</mark> 48 49 2 | -0.028008 -3.416473 0.4888 <mark>0.0010</mark> 50 51 False Discovery Rate = 0.05 52 Reject Ho if p = P(Z <= |z|) <= FDR/2 with stopping rule 53 54 . dunntest iq3, by(ihwork) ma(bh) wrap 55 56 Warning: by() values are unlabeled, option nolabel implicit 57 58 Kruskal-Wallis equality-of-populations rank test 59 For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml 60

<pre>introck 0se Rank Sum </pre>	+	+
<pre>chi-squared = 1.755 with 2 d.f. probability = 0.40% hi-squared = 1.755 with 2 d.f. probability = 0.40% Durn's Pairwise Comparison of 1q3 by inwork (Benjamini-tochberg) Col Mean-1 0 1 T 1 1.799706 1 0.4552 0.0715 Pairse Discovery Rate = 0.05 Reject Ro if p = 2(Z < z) < FDR/2 with stopping rule . durntest iq4, by ilwork) ma(bh) wrap Warning: by() values are unlabeled, option nolabel implicit Fruskal-Wallis equality-of-populations rank test impobability = 0.3897 chi-squared = 1.839 with 2 d.f. probability = 0.3987 chi-squared = 1.839 with 2 d.f. probability = 0.3987 chi-squared = 0.18397 chi-squared = 0.18397 chi-squared = 0.18397 chi-squared = 0.19372 -1.707601 1 1.1.481919 Col Mean-1 kew Mean 1 0 1 i</pre>	ihworl	k Obs Rank Sum
<pre>chi-squared = 1.735 with 2 d.f. probability = 0.4075 chi-squared with ties = 4.220 with 2 d.f. probability = 0.215 Dunn's Dairwise Comparison of idd by inwork (Benjamini-Kochberg) Col Mean 0 1 1 1.7.99706 0.0539 2 1 0.137772 -1.980053 2 1 0.4452 0.0715 False Discovery Rate = 0.05 Reject Ho if p = P.12 <- [x]) <- PDR/2 with stopping rule . dunntest iqd, by(itwork) ma(bh) wap Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test immore 1 0 1 1 0.0339 chi-squared = 1.838 with 2 d.f. probability = 0.315 chi-squared = 1.838 with 2 d.f. probability = 0.315 chi-squared with ties = 3.042 with 2 d.f. probability = 0.315 chi-squared with ties = 3.042 with 2 d.f. probability = 0.315 chi-squared with ties = 0.05 Reject Ho if p = P.12 <- [x]) <= FDR/2 with stopping rule . dunntest iqd, by(itwork) ma(bh) wap Marning: by() values are unlabeled, option nolabel implicit Flase Mean 0 1 1 </pre>		
<pre>i</pre>		
<pre>chi-squared = 1.795 with 2 d.f. probability = 0.4075 chi-squared with time = 4.220 with 2 d.f. probability = 0.405 Col Mean-1 work Mean-1 i = 1.799706 1 = 0.0339 2 = 0.4352 = 0.05 False Discovery Mate = 0.05 Meglect No if P = P(2 <= 2) <= FER/2 with stopping rule . dunntest iq4, by(ihwork) ms(bh) wrap Warning: by() values are unlabeled, option molabel implicit Kruskal-Wallis equality-of-populations rank test i = 1.000 = 1 chi-squared = 1.839 with 2 d.f. probability = 0.0387 chi-squared = 1.839 with 2 d.f. probability = 0.0387 chi-squared with time = 3.042 with 2 d.f. probability = 0.0387 chi-squared with time = 3.042 with 2 d.f. probability = 0.0387 chi-squared with time = 3.042 with 2 d.f. probability = 0.0387 chi-squared with time = 0 = 1 i = 1.48197 0.1316 False Discovery Mate = 0.05 Meglect No if P = P(2 <= 2) (<= FER/2 with stopping rule . dunntest lqb, by(ihwork) ms(bh) wrap Warning: by() values are unlabeled, option molabel implicit Kruskal-Wallis equality-of-populations rank test i = 0.0337 = 1.707601 i = 0.0337 = 0.1316 False Discovery Mate = 0.05 Meglect No if P = P(2 <= 2) (<= FER/2 with stopping rule . dunntest lqb, by(ihwork) ms(bh) wrap Warning: by() values are unlabeled, option molabel implicit Kruskal-Wallis equality-of-populations rank test i = 1.100 = 100 = 10000000000000000000000</pre>	2	2 50 1984.00
<pre>chi-squared = 1.795 with 2 d.f. probability = 0.4075 Chi-squared with ties = 4.220 with 2 d.f. Dunn's Pairwise Comparison of iq3 by inwork (Beeginnin-Hochberg) Col Mean- Row Mean 0 1 1 1.799706 1 0.0539 2 0.137772 -1.980059 2 0.4532 0.0715 False Discovery Rate = 0.05 Reject No if p = P(Z <= x) << FDR/2 with stopping rule . dunntest iq4, by(ihwork) ma(bb) wrap Warning: by() values are unlabeled, option molabel implicit Kruskal-Wallis equality-of-populations rank test i thwork 1 Obs Rank Num 1 0 17 665.50 1 1 10 300.50 1 1 10 300.50 1 1 10 300.50 1 1 1.00 300.50 1 0.1038 Chi-squared with ties = 3.042 with 2 d.f. probability = 0.1387 Chi-squared with ties = 0.05 Reject No if p = P(Z <= z) <= FDR/2 with stopping rule . dunntest iq5, by(ihwork) ma(bb) wrap Warning: by() values are unlabeled, option molabel implicit Kruskal-Wallis equality-of-populations rank test . dunntest iq5, by(ihwork) ma(bb) wrap Warning: by() values are unlabeled, option molabel implicit Kruskal-Wallis equality-of-populations rank test itervise loss are unlabeled, option molabel implicit Kruskal-Wallis equality-of-populations rank test itervise loss are unlabeled, option molabel implicit Kruskal-Wallis equality-of-populations rank test itervise loss are unlabeled, option molabel implicit Kruskal-Wallis equality-of-populations rank test itervise loss are unlabeled, option molabel implicit Kruskal-Wallis equality-of-populations rank test itervise loss are unlabeled, option molabel implicit i 1 10 i 230.00 . To reper review only - http://bmiopen.bmi.com/site/about/guidelines.html </pre>	+	+
<pre>probability = 0.4075 chi-squared with ties = 4.220 with 2 d.f. probability = 0.113</pre>	chi-square	d = 1.795 with 2 d f
<pre>chi-squared with ties -</pre>	probabilit	ty = 0.4075
<pre>chilegiprid Wilf (light = 0.12)</pre>	ala i a anno m	
<pre>bunn's Pairwise Comparison of iq3 by ihwork (Benjamini-Bochberg) Col Mean-1 Wew Mean 0 0 1 1 1.799706 1 0.0539 2 1 0.13772 -1.980055 3 0.4452 0.0715 False Discovery Rate = 0.05 Reject Ho if p = P(2 <= z) <= FDR/2 with stopping rule . dunntest iq4, by(ihwork) ma(bh) wrp Warning: by() values are unlabeled, option noiabel implicit Kruskal-Wallis equality-of-populations rank test 1 10 1 17 1 685.50 1 2 1 50 1 2017.00 1 1 1 10 1 300.50 1 2 1 5 0 1 2017.00 1 1 1 1 0 300.50 1 2 1 - 50 1 2017.00 1 2 1 - 50 1 2017.00 1 1 1 1 0 300.50 1 2 1 - 0.03372 -1.707601 0 1 1 1 0 0 1 1 1 1.481917 1 0.1038 2 1 - 0.03372 -1.707601 0 .4987 0.1316 False Discovery Rate = 0.05 Reject Ho if p = P(2 <= z) <= FDR/2 with stopping rule . dunntest iq5, by(ihwork) ma(bh) wrp Warning: by() values are unlabeled, option noiabel implicit Kruskal-Wallis equality-of-populations rank test 1 0.0108 2 1 - 0.03372 -1.707601 0 .4987 0.1316 False Discovery Rate = 0.05 Reject Ho if p = P(2 <= z) <= FDR/2 with stopping rule . dunntest iq5, by(ihwork) ma(bh) wrp Warning: by() values are unlabeled, option noiabel implicit Kruskal-Wallis equality-of-populations rank test 1 1 1 1 0 1 220.00 1 1 1 1 0 1 220.00 1 0 1 1 1 0 1 220.00 1 0 0 1 1 1 0 1 220.00 1 0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0</pre>	probabilit	4.220 with 2 d.1.
Dunn's Pairwise Comparison of iq3 by inwork (Benjamini-Bochberg) Col Mean- Row Mean 0 1 1 1.799706 0.0339 2 0.13772 -1.980039 2 0.4452 0.0715 False Discovery Rate = 0.05 Reject Bo if p = F(2 <= z) <= FDR/2 with stopping rule	F	
Col Mean-1 (Berjamini-Rochberg) Col Mean-1 (Derivation		
Col Mean-1 Rew Mean 1 1 1.799706 1 0.0339 2 0.0339 2 0.04352 0.0715 False Discovery Rate = 0.05 Reject Ho if P = P(2 <= z) <= FDR/2 with stopping rule		(Benjamini-Hochberg)
<pre>Rew Mean 0 1</pre>	Col Mean-	
$\frac{1}{1} \frac{1.799706}{0.0539}$ $\frac{2}{2} \frac{0.137772}{0.4452} \frac{-1.980059}{0.0715}$ False Discovery Rate = 0.05 Reject Ho if p = P(Z <= z) <= rDR/2 with stopping rule dunntest iq4, by(ihwork) ma(bh) wrap Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test $\frac{1}{1} \frac{1.0}{1} \frac{1.655.50}{1.2017.004}$ chi-squared = 1.839 with 2 d.f. probability = 0.3987 chi-squared = 1.839 with 2 d.f. probability = 0.3987 chi-squared with ties = 3.042 with 2 d.f. probability = 0.3987 chi-squared with ties = 1.000 molecular (Benjamin-Hochberg) Boum's Pairwise Comparison of igd by inwork (Benjamin-Hochberg) Col Mean-1 Sow Mean 0 1 1 1 1.48197 0.0387 2 1 -0.003872 -1.707601 1 0.4987 0.1316 False Discovery Rate = 0.05 Reject Ho if p = P(Z <= z) <= FDR/2 with stopping rule dunntest iq5, by(ihwork) ma(bh) wrap Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test $\frac{1}{1} \frac{1.0}{1.0} \frac{1.2000}{1.0}$ For peer review only - http://bmjopen.bmj.com/site/about/quidelines.ktml	Row Mean	0 1
<pre> 1 0.0539 2 0.0452 -0.0715 False Discovery Rate = 0.05 Reject Ho if p = P(2 <= z) <= FDR/2 with stopping rule . . . dunntest iq4, by(ihwork) ma(bh) wrap Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test timvork Obs Rank Sum i</pre>	1	1.799706
<pre>2 0.137772 -1.980059 0.4452 0.0715 False Discovery Rate = 0.05 Reject Ho If p = P(Z <= z) <= FDR/2 with stopping rule . dunntest iq4, by(ihwork) ma(bh) wrap Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test +</pre>		0.0539
<pre>2 0.13772 -1.950039 0.4452 0.0715 False Discovery Rate = 0.05 Reject Ho if p = P(2 <= z) <= FDR/2 with stopping rule . dunntest iq4, by(ihwork) ma(bh) wrap Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test +</pre>	^	
<pre>raise Discovery Rate = 0.05 Reject Ho if p = P(2 <= z) <= FDR/2 with stopping rule . dunntest iq4, by(ihwork) ma(bh) wrap Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test +</pre>	2	0.13///2 -1.980039
<pre>False Discovery Rate = 0.05 Reject Ho if p = P(2 <= z) <= FDR/2 with stopping rule</pre>		
<pre>Keject Ho if p = P(Z <= z) <= FDR/2 with stopping rule dunntest iq4, by(ihwork) ma(bh) wrap Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test +</pre>	False Disc	covery Rate = 0.05
<pre>. dunntest iq4, by(ihwork) ma(bh) wrap Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test +</pre>	Keject Ho	If $p = P(Z \le z) \le FDR/2$ with stopping rule
<pre>. dunntest iq4, by(ihwork) ma(bh) wrap Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test +</pre>		
<pre>Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test +</pre>	. dunntest	t iq4, by(ihwork) ma(bh) wrap
<pre>Waining. by() values are unladeled, option morabel implicit Kruskal-Wallis equality-of-populations rank test +</pre>	Warning	au() waluog are unlabeled ention malabel implicit
<pre>Kruskal-Wallis equality-of-populations rank test ++ ihwork Obs Rank Sum + i</pre>	warnind: 1	Jy() values are unitabeled, option notabel implicit
<pre>Kruskal-Wallis equality-of-populations rank test +</pre>		
<pre>++ i+ i+ i+ i+ i+ i</pre>	Kruskal-Wa	allis equality-of-populations rank test
<pre>i ihwork Obs Rank Sum 0 17 685.50 1 10 300.50 2 50 2017.00 +</pre>	+	/
<pre> </pre>	ihworl	k Obs Rank Sum
<pre> 0 17 685.50 2 50 2017.00 +</pre>		++
<pre> 1 1 1 1 2 301.30 2 50 2017.00 chi-squared = 1.839 with 2 d.f. probability = 0.3987 chi-squared with ties = 3.042 with 2 d.f. probability = 0.2185</pre>	(
<pre>chi-squared = 1.839 with 2 d.f. probability = 0.3987 chi-squared with ties = 3.042 with 2 d.f. probability = 0.2185 Dunn's Pairwise Comparison of iq4 by ihwork (Benjamini-Hochberg) Col Mean- Row Mean 0 1 </pre>		
<pre>chi-squared = 1.839 with 2 d.f. probability = 0.3987 chi-squared with ties = 3.042 with 2 d.f. probability = 0.2185 Dunn's Pairwise Comparison of iq4 by ihwork (Benjamini-Hochberg) Col Mean- Row Mean 0 1 </pre>	+	
<pre>chi-squared = 1.839 with 2 d.f. probability = 0.3987 chi-squared with ties = 3.042 with 2 d.f. probability = 0.2185 Dunn's Pairwise Comparison of iq4 by ihwork (Benjamini-Hochberg) Col Mean- Row Mean 0 1 </pre>	, ,	
chi-squared with ties = 3.042 with 2 d.f. probability = 0.2185 Dunn's Pairwise Comparison of iq4 by ihwork (Benjamini-Hochberg) Col Mean- Row Mean 0 1 	chi-square	d = 1.839 with 2 d.f.
chi-squared with ties = 3.042 with 2 d.f. probability = 0.2185 Dunn's Pairwise Comparison of iq4 by ihwork (Benjamini-Hochberg) Col Mean- Row Mean 0 1 	p10202111	
<pre>probability = 0.2185</pre>	chi-square	ed with ties = 3.042 with 2 d.f.
Dunn's Pairwise Comparison of iq4 by ihwork (Benjamini-Hochberg) Col Mean- Row Mean 0 1 	probabilit	ty = 0.2185
Dunn's Pairwise Comparison of iq4 by ihwork (Benjamini-Hochberg) Col Mean 0 1 		
<pre>(Benjamini-Hochberg) Col Mean- Row Mean 0 1 </pre>		Dunn's Pairwise Comparison of iq4 by ihwork
<pre>Col Hean </pre>	Col Moor	(Benjamini-Hochberg)
<pre>1 1.481917</pre>	COI Mean- Row Mean	
<pre>1 1.481917</pre>		
<pre></pre>	1	1.481917
<pre>2 -0.003372 -1.707601 0.4987 0.1316 False Discovery Rate = 0.05 Reject Ho if p = P(Z <= z) <= FDR/2 with stopping rule . dunntest iq5, by(ihwork) ma(bh) wrap Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test ++ ihwork Obs Rank Sum ++</pre>		0.1038
<pre>i 0.4987 0.1316 False Discovery Rate = 0.05 Reject Ho if p = P(Z <= z) <= FDR/2 with stopping rule dunntest iq5, by(ihwork) ma(bh) wrap Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test ++ ihwork Obs Rank Sum ++</pre>	2	-0.003372 -1.707601
<pre>False Discovery Rate = 0.05 Reject Ho if p = P(Z <= z) <= FDR/2 with stopping rule dunntest iq5, by(ihwork) ma(bh) wrap Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test ++ ihwork Obs Rank Sum + 0 16 712.00 1 10 220.00 For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml</pre>	2	0.4987 0.1316
<pre>False Discovery Rate = 0.05 Reject Ho if p = P(Z <= z) <= FDR/2 with stopping rule . dunntest iq5, by(ihwork) ma(bh) wrap Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test ++ ihwork Obs Rank Sum + 0 16 712.00 1 10 220.00 For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml</pre>	_	
<pre> dunntest iq5, by(ihwork) ma(bh) wrap Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test ++ ihwork Obs Rank Sum ++</pre>	False Disc	covery Rate = 0.05
. dunntest iq5, by(ihwork) ma(bh) wrap Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test ++ ihwork Obs Rank Sum + 0 16 712.00 1 10 220.00 For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml	Neject HO	TT P = 1/2 /- 1211 /- FDK/2 WITH SCODDING THE
<pre>. dunntest iq5, by(ihwork) ma(bh) wrap Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test ++ ihwork Obs Rank Sum +++</pre>		
<pre>Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test ++ ihwork Obs Rank Sum ++ 0 16 712.00 1 10 220.00 For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml</pre>	. dunntest	t iq5, by(ihwork) ma(bh) wrap
<pre>Kruskal-Wallis equality-of-populations rank test ++ ihwork Obs Rank Sum + 0 16 712.00 1 10 220.00 For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml</pre>	Warning. 4	nu() values are unlabeled ontion nolabel implicit
<pre>Kruskal-Wallis equality-of-populations rank test ++ ihwork Obs Rank Sum +++ 0 16 712.00 1 10 220.00 For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml</pre>	warnind: 1	yy() values are unitabeted, option notabel implicit
<pre>Kruskal-Wallis equality-of-populations rank test ++ ihwork Obs Rank Sum +-+</pre>		
++ ihwork Obs Rank Sum 	Kruskal-Wa	allis equality-of-populations rank test
ihwork Obs Rank Sum 	+	
 0 16 712.00 1 10 220.00 For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml	ihworl	k Obs Rank Sum
0 16 712.00 1 10 220.00 For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml		++
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```
2 | 50 | 1994.00 |
                 ----+
1
2
     chi-squared = 6.959 with 2 d.f.
probability = 0.0308
3
4
     chi-squared with ties =
                             17.404 with 2 d.f.
5
     probability = 0.0002
6
7
                    Dunn's Pairwise Comparison of iq5 by ihwork
8
                               (Benjamini-Hochberg)
9
     Col Mean-I
10
     Row Mean |
                          0
                                       1
     11
          1 | 3.997040
12
                 <mark>0.0001</mark>
             13
                1.151855 -3.696235
            2 |
14
             0.1247
                           <mark>0.0002</mark>
15
     False Discovery Rate = 0.05
16
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
17
18
19
     . dunntest iq6, by(ihwork) ma(bh) wrap
20
     Warning: by() values are unlabeled, option nolabel implicit
21
22
     Kruskal-Wallis equality-of-populations rank test
23
24
                                                  +----+
25
       | ihwork | Obs | Rank Sum |
       |-----|
26
           0 | 16 | 559.00 |
1 | 10 | 308.00 |
2 | 50 | 2059.00 |
27
28
       -----+
29
30
     chi-squared = 2.369 with 2 d.f.
probability = 0.3060
31
     probability =
32
     chi-squared with ties = 4.692 with 2 d.f.
33
     probability = 0.0958
34
35
                    Dunn's Pairwise Comparison of iq6 by ihwork
36
                              (Benjamini-Hochberg)
37
     Col Mean-|
     Row Mean |
                         0
                                        1
38
     39
           1 | 0.654135
40
                  0.2565
             - 1
41
            2 | -1.385120 -1.909689
42
                  0.1245
                            0.0843
             43
     False Discovery Rate = 0.05
44
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
45
46
47
     . dunntest iq7, by(ihwork) ma(bh) wrap
48
     Warning: by() values are unlabeled, option nolabel implicit
49
50
     Kruskal-Wallis equality-of-populations rank test
51
52
          -----+
       | ihwork | Obs | Rank Sum |
53
       |-----|
54
            0 | 16 | 644.50 |
1 | 9 | 353.00 |
55
            1 | 9 | 353.00 |
2 | 50 | 1852.50 |
56
       +----+
57
58
                    0.299 with 2 d.f.
     chi-squared =
59
     probability =
                      0.8613
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60
```

```
chi-squared with ties =
                            0.499 with 2 d.f.
1
     probability = 0.7793
2
3
                   Dunn's Pairwise Comparison of iq7 by ihwork
4
                     (Benjamini-Hochberg)
5
     Col Mean-I
6
     Row Mean |
                        0
                                     1
7
     1 | 0.150716
8
                0.4401
            9
               0.667091 0.355734
10
           2 |
             0.7571
                          0.5415
11
12
     False Discovery Rate = 0.05
13
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
14
15
     . dunntest iq8, by(ihwork) ma(bh) wrap
16
     Warning: by() values are unlabeled, option nolabel implicit
17
18
19
     Kruskal-Wallis equality-of-populations rank test
20
       +----+
21
       | ihwork | Obs | Rank Sum |
22
        -----|
            0 | 16 | 521.00 |
1 | 10 | 393.00 |
23
24
           2 | 50 | 2012.00 |
       25
       +----+
26
     chi-squared = 1.480 with 2 d.f.
27
     probability = 0.4771
28
     chi-squared with ties =
                            1.694 with 2 d.f.
29
                  0.4287
     probability =
30
31
                   Dunn's Pairwise Comparison of iq8 by ihwork
32
                    (Benjamini-Hochberg)
33
     Col Mean-|
34
     Row Mean |
                        0
                                     1
               -----
     ____+
35
         1 | -0.809654
36
           | 0.3136
37
             2 | -1.294852 -0.131451
38
                0.2931 0.4477
            39
40
     False Discovery Rate = 0.05
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
41
42
43
     . dunntest iq9, by(ihwork) ma(bh) wrap
44
     Warning: by() values are unlabeled, option nolabel implicit
45
46
47
     Kruskal-Wallis equality-of-populations rank test
48
       +----+
49
       | ihwork | Obs | Rank Sum |
50
         0 | 16 | 639.00 |
51
            1 | 10 | 379.00 |
52
           2 | 50 | 1908.00 |
53
       +----+
54
     chi-squared = 0.087 with 2 d.f.
probability = 0.9574
55
     probability =
56
     chi-squared with ties =
                             0.103 with 2 d.f.
57
     probability =
                    0.9496
58
59
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```
Dunn's Pairwise Comparison of iq9 by ihwork
                             (Benjamini-Hochberg)
1
     Col Mean-L
2
     Row Mean |
                         0
                                      1
3
                _____
           1 | 0.249482
4
                  0.6022
            5
             1
6
                 0.305457 -0.037047
           2 |
                 1.0000 0.4852
7
             8
     False Discovery Rate = 0.05
9
     Reject Ho if p = P(Z <= |z|) <= FDR/2 with stopping rule
10
11
     . dunntest iq10, by(ihwork) ma(bh) wrap
12
13
     Warning: by() values are unlabeled, option nolabel implicit
14
15
     Kruskal-Wallis equality-of-populations rank test
16
       17
       | ihwork | Obs | Rank Sum |
18
        -----|
            0 | 16 | 666.50 |
19
            1 | 10 | 322.00 |
20
            2 | 50 | 1937.50 |
21
       +----+
22
     chi-squared = 1.147 with 2 d.f.
probability = 0.5635
23
24
25
     chi-squared with ties =
                              3.082 with 2 d.f
     probability = 0.2141
26
27
28
                   Dunn's Pairwise Comparison of iq10 by ihwork
                             (Benjamini-Hochberg)
29
                                                       Col Mean-L
30
     Row Mean |
                         0
                                      1
31
                _____
                1.741221
           1 |
32
                 0.1225
            33
34
           2 |
                 0.751048 -1.403500
                  0.2263 0.1204
35
             36
     False Discovery Rate = 0.05
37
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
38
39
40
41
42
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                          For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml
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•	Questi by age	on – Fo ?	r each	of th	e facto	or variabl	es (kno	wledge, p	articipat	ion), is tl	here a	a differe	ence in	the ave	rage res	po
	Answe	er – NO,	not fo	or eitl	ner var	iable										
•	Questi <u>by ger</u>	ion – Fo i <u>der</u> ?	r each	of th	ie facto	or variabl	es (kno	owledge, p	articipat	ion), is tl	here a	a differe	ence in ⁻	the ave	rage res	po
	Answe	er – NO,	not fo	or eitl	ner var	iable										
•	Quest by leve	ion – Fo el of edu	r each Icatior	of th n	ie facto	or variabl	es (knc	owledge, p	oarticipat	ion), is tl	here a	a differe	ence in ⁻	the ave	rage res	pc
	Answe	er – NO,	not fo	or eitl	ner var	iable										
•	Quest based	ion: For upon ra	each o cer or	of the <u>ethr</u>	e factoi iicity	variable	s (knov	wledge, pa	irticipatio	on), is th	ere a	differer	nce in tl	he avera	age resp	or
	Answe signific	er – K-W cant diff	allis (r erence	nonpa e am	aramet ong the	ric ANOV e pairs te	A repo sted. N	orts a signi No significa	ficant p v ant diffe	value for rence wa	"knov as fou	wledge' nd for "	' but th particip	e Dunn bate"	test find	s
•	Questi	on – Fo	r each	oftł	ne facto	or variabl	es (kno	owledge, p	articipat	ion), is tl	here a	a differe	ence in	the ave	rage res	ро
•	Quest by age	ion — Fo ?	r each	ofth	ie facto	or variabl	es (kno	owledge, p	participat	ion), is tl	here a	a differe	ence in	the ave	rage res	рс
• . c Kru	Questi by age dunntest	on — Fo ? : iknowl	reach edge, uality	by(i y-of-	age) m	or variable a (bh) wra tions rar	es (knc up uk test	owledge, p	participat	ion), is tl	here a	a differe	ence in [.]	the ave	rage res	pc
• . c Kru +	Questi by age	on — Fo ? iknowl allis eq Obs	edge, uality Rank S	by(i y-of- Sum	age) m	or variable a(bh) wra tions rar	es (knc ^{ap} ak test	owledge, p	participat	ion), is th	here a	a differe	ence in [•]	the ave	rage res	pc
• . c Kru + 	Questi by age	on - Fo ? : iknowl allis eq Obs 	edge, uality Rank S	by(i y-of- Sum .50	age) m	or variable a(bh) wra tions rar	ap Ik test	owledge, p	participat	ion), is th	here a	a differe	ence in ⁻	the ave	rage res	pc
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<pre>5 -1.87833 -0.25331 -0.2628 0.2332 5 -0.65800 0.96680 1.02007 0.4862 0.2332 781a Discovery Rate = 0.05 Megnet Ho ff p = M(X < [21] <= NM/2 with stopping rule . dunted iparticipate, sylidegi malbdi wrap Krasal-Kalls equality-of-populations rank test . dunted iparticipate, sylidegi malbdi wrap Krasal-Kalls equality-of-populations rank test . dunted iparticipate and the stopping rule . during and all time - 2.468 with 5 d.f. probability - cores . during and all time - 2.468 with 5 d.f. probability - cores . during and all time - 2.468 with 5 d.f. probability - cores . during and all time - 2.468 with 5 d.f. probability - cores . during and all time - 2.468 with 5 d.f. probability - cores . during and all time - 2.468 with 5 d.f. probability - cores . during and all time - 2.468 with 5 d.f. probability - cores . during and all time - 2.468 with 5 d.f. probability - cores . during and all time - 2.468 with 5 d.f. probability - cores . during and all time - 2.468 with 5 d.f. . during and all time - 2.468 with 5 d.f. . during and all time - 2.468 with 5 d.f. . during and all time - 2.468 with 5 d.f. . during and all time - 2.468 with 5 d.f. . during and all time - 2.468 with 5 d.f. . during all time - 2.468 with 5 d.f. . during all time - 2.468 with 5 d.f. . during all time - 2.468 with - 2.058 with 0.3648 - 0.033047 . during all time - 2.058 with - 2.0313 with experime - 2.058 . during all time - 2.058 with - 2.058</pre>		0.2274 0.2010 0.1679
<pre>e -0.88580 0.98680 0.128078 0.38482 1.023140 2.3252 ***********************************</pre>	 5 	-1.879853 -0.225341 -0.163446 -1.232896 0.1503 0.4741 0.4662 0.2332
rijes utscorery Kone = 0.05 Reject Ko 16 p = P(2 < z) <= FTR/2 With stopping rule . durntset tparticipate, by(tage) em (bh) wran Kruskal-Wallie squality-of-populations rank test . durntset (be) Remains Sum . during (DB Remains Sum . duri	6 	-0.663600 0.986980 1.028078 0.436423 1.023149 0.3456 0.2427 0.2849 0.4141 0.2552
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An use of the second se	Kruele Ma	llie emplity of normations much toot
<pre>i isge Obs Rank Sum</pre>	Kruskai-Wa	ills equality-of-populations rank test
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<pre></pre>	+	 1 10 00
$\begin{bmatrix} 1 & 3 & 1 & 35 & 1 & 1355.00 \\ 1 & 4 & 1 & 11 & 407.05 \\ 1 & 5 & 1 & 5 & 1 & 221.50 \\ \hline & & & & & & & & & & & & & & & & & &$		22 810.00
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Col Mean-1 Row Mean 1 2 3 4 5 2 -1.234590 0.5425 3 -1.332682 -0.328032 0.06849 0.4643 4 -1.218838 -0.028970 0.227253 0.4179 0.4884 0.4732 5 -1.473837 -0.710833 -0.549938 -0.633107 1.0000 0.5965 0.5460 0.5643 6 -1.198211 -0.422690 -0.338143 -0.403548 -0.073047 0.3463 0.5604 0.5013 0.5149 0.5045 False Discovery Rate = 0.05 Reject Ho if p = P(Z <= z) <= FDR/2 with stopping rule 		(Benjamini-Hochberg)
Now Ream 1 2 5 1 5 2 -1.234590 0.5425 -1.332682 -0.328032 3 -0.6849 0.4643 -0.4732 -0.4179 0.4884 0.4732 5 -1.473837 -0.710833 -0.549938 -0.633107 -0.073047 1 1.0000 0.5965 0.5460 0.5643 -0.073047 6 -1.198211 -0.422690 -0.338143 -0.403548 -0.073047 0.3463 0.5004 0.5013 0.5149 0.5045 False Discovery Rate = 0.05 Reject Ho if p = P(2 <= z) <= FDR/2 with stopping rule	Col Mean-	1 2 3 4 5
2 -1.234590 0.5425 3 -1.332682 -0.328032 0.6649 0.4643 4 -1.218838 -0.028970 0.227253 0.4179 0.4884 0.4732 5 -1.473837 -0.710833 -0.549938 -0.633107 1 0.0000 0.5965 0.5460 0.5643 6 -1.198211 -0.422690 -0.338143 -0.403548 -0.073047 0.3463 0.5604 0.5013 0.5149 0.5045 False Discovery Rate = 0.05 Reject Ho if p = P(2 <= z) <= FDR/2 with stopping rule 	+	Y
0.5423 1 -1.332682 -0.328032 0.6849 0.4643 4 -1.218838 -0.028970 0.227253 0.4179 0.4884 0.4732 5 1 -1.473837 -0.710833 -0.633107 1 1.0000 0.5965 0.5460 0.5643 6 1 -1.198211 -0.422690 -0.338143 -0.403548 -0.073047 0.3463 0.5604 0.5013 0.5149 0.5045 False Discovery Rate = 0.05 Reject Ho if p = P(2 <= z) <= FDR/2 with stopping rule	2	-1.234590
3 -1.332682 -0.328032 4 -1.218838 -0.028970 0.227253 0 0.4179 0.4884 0.4732 5 -1.473837 -0.710833 -0.549938 -0.633107 1 1.0000 0.5965 0.5460 0.5643 6 -1.198211 -0.422690 -0.338143 -0.403548 -0.073047 0.3463 0.5604 0.5013 0.5149 0.5045 False Discovery Rate = 0.05 Reject Ho if p = P(Z <= z) <= FDR/2 with stopping rule		0.3425
1 0.8839 0.4843 4 -1.218838 -0.028970 0.227253 5 -1.473837 -0.710833 -0.549938 -0.633107 1 0000 0.5965 0.5640 0.5643 6 -1.198211 -0.422690 -0.338143 -0.403548 -0.073047 0.3463 0.5604 0.5013 0.5149 0.5045 False Discovery Rate = 0.05 Reject Ho if p = P(Z <= z) <= FDR/2 with stopping rule	3	-1.332682 -0.328032
<pre>4 -1.218838 -0.028970 0.227253 0.4179 0.4884 0.4732 5 -1.473837 -0.710833 -0.549938 -0.633107 1.0000 0.5965 0.5460 0.5643 6 -1.198211 -0.422690 -0.338143 -0.403548 -0.073047 0.3463 0.5604 0.5013 0.5149 0.5045 False Discovery Rate = 0.05 Reject Ho if p = P(Z <= z) <= FDR/2 with stopping rule </pre>		0.0849 0.4643
i 0.4179 0.4884 0.4732 5 -1.473837 -0.710833 -0.549938 -0.633107 6 -1.198211 -0.422690 -0.338143 -0.403548 -0.073047 6 -1.198211 -0.422690 -0.338143 -0.403548 -0.073047 7 0.3463 0.5604 0.5013 0.5149 0.5045 False Discovery Rate = 0.05 Reject Ho if p = P(Z <= z) <= FDR/2 with stopping rule	4	-1.218838 -0.028970 0.227253
<pre>5 -1.473837 -0.710833 -0.549938 -0.633107 1 0.000 0.5965 0.5460 0.5643 6 -1.198211 -0.422690 -0.338143 -0.403548 -0.073047 0.3463 0.5604 0.5013 0.5149 0.5045 False Discovery Rate = 0.05 Reject Ho if p = P(Z <= z) <= FDR/2 with stopping rule </pre>		0.41/9 0.4884 0.4732
<pre> 1.0000 0.3963 0.3460 0.3643 6 -1.198211 -0.422690 -0.338143 -0.403548 -0.073047 0.3463 0.5604 0.5013 0.5149 0.5045 False Discovery Rate = 0.05 Reject Ho if p = P(Z <= z) <= FDR/2 with stopping rule Question - For each of the factor variables (knowledge, participation), is there a difference in the average response gender? . ranksum iknowledge, by(igender) Two-sample Wilcoxon rank-sum (Mann-Whitney) test</pre>	5	
<pre>6 -1.198211 -0.422690 -0.338143 -0.403548 -0.073047</pre>		1.0000 0.5965 0.5460 0.5643
<pre>False Discovery Rate = 0.05 Reject Ho if p = P(Z <= z) <= FDR/2 with stopping rule </pre>	6	-1.198211 -0.422690 -0.338143 -0.403548 -0.073047
<pre>False Discovery Rate = 0.05 Reject Ho if p = P(Z <= z) <= FDR/2 with stopping rule</pre>	I	0.3463 0.3604 0.3013 0.3149 0.3043
Reject Ho if p = P(2 <= 2) <= FDR/2 with stopping rule	False Disc	overy Rate = 0.05
Question – For each of the factor variables (knowledge, participation), is there a difference in the average response gender? . ranksum iknowledge, by(igender) Two-sample Wilcoxon rank-sum (Mann-Whitney) test	keject Ho	$II p = r(2 \le z) \le r_{DK/2} \text{ with stopping rule}$
Question – For each of the factor variables (knowledge, participation), is there a difference in the average response gender? . ranksum iknowledge, by(igender) Two-sample Wilcoxon rank-sum (Mann-Whitney) test		
<pre>Guestion - For each of the factor variables (knowledge, participation), is there a difference in the average response gender? . ranksum iknowledge, by(igender) Two-sample Wilcoxon rank-sum (Mann-Whitney) test</pre>	Ouestien	For each of the factor verichlas (knowledge, participation) is there a difference in the average response
<pre>genuer; . ranksum iknowledge, by(igender) Two-sample Wilcoxon rank-sum (Mann-Whitney) test </pre>	Question -	For each of the factor variables (knowledge, participation), is there a difference in the average response
<pre>. ranksum iknowledge, by(igender) Two-sample Wilcoxon rank-sum (Mann-Whitney) test</pre>	genuel !	
Two-sample Wilcoxon rank-sum (Mann-Whitney) test <u>igender obs rank sum expected</u> <u>1 17 579 646</u> <u>2 58 2271 2204</u> <u>combined 75 2850 2850</u> unadjusted variance 6244.67 adjusted variance 4571.40	. ranksum	iknowledge, by(igender)
igender obs rank sum expected 1 17 579 646 2 58 2271 2204 	Two-samole	: Wilcoxon rank-sum (Mann-Whitney) test
igender obs rank sum expected 1 17 579 646 2 58 2271 2204 	THE PUMPIC	
1 17 579 646 2 58 2271 2204 combined 75 2850 2850 unadjusted variance adjustment for ties 6244.67 -1673.27 adjusted variance 4571.40	igend	er obs rank sum expected
2 58 2271 2204 		1 17 579 646
combined 75 2850 2850 unadjusted variance 6244.67 adjustment for ties -1673.27 		2 58 2271 2204
unadjusted variance 6244.67 adjustment for ties -1673.27 	combir	 ued 75 2850 2850
unadjusted variance 6244.67 adjustment for ties -1673.27 		
adjusted variance 4571.40	adjustment	. variance 6244.67 / for ties -1673.27
adjusted variance 4571.40		
	adjusted v	ariance 4571.40

```
Ho: iknowl~e(igender==1) = iknowl~e(igender==2)
1
        z = -0.991
Prob > |z| = 0.3217
2
3
4
     . ranksum iparticipate, by(igender)
5
6
    Two-sample Wilcoxon rank-sum (Mann-Whitney) test
7
         igender | obs rank sum expected
8
            ----+----
                    _____
9
            1 | 17 599.5
2 | 58 2250.5
                                         646
10
                                         2204
      11
      combined | 75 2850
                                        2850
12
    unadjusted variance 6244.67
adjustment for ties -310.99
13
14
                      _____
15
                        5933.68
     adjusted variance
16
     Ho: iparti~e(igender==1) = iparti~e(igender==2)
17
        z = -0.604
Prob > |z| = 0.5461
18
19
      _____
                                                   _____
20
21

    Question – For each of the factor variables (knowledge, participation), is there a difference in the average response

22
        by level of education
23
24
25
     . dunntest iknowledge, by(ied) ma(bh) wrap
26
     Kruskal-Wallis equality-of-populations rank test
27
                                                  28
      +----+
      | ied | Obs | Rank Sum |
29
      |-----|
30
      | 1 | 26 | 952.00 |
      | 2 | 48 | 1894.50 |
| 3 | 1 | 3.50 |
31
32
      +----+
33
    chi-squared = 2.829 with 2 d.f.
probability = 0.2431
34
35
36
                           3.864 with 2 d.f.
     chi-squared with ties =
37
     probability =
                    0.1449
38
39
                 Dunn's Pairwise Comparison of iknowledge by ied
40
                            (Benjamini-Hochberg)
    Col Mean-|
41
    Row Mean |
                        1
                                    2
42
     ------
43
          2 | -0.628394
44
                0.2649
            45
          3 | 1.742681 1.909111
46
                 0.0610
                         0.0844
            47
     False Discovery Rate = 0.05
48
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
49
50
     . dunntest iparticipate, by(ied) ma(bh) wrap
51
52
    Kruskal-Wallis equality-of-populations rank test
53
       +----+
54
      | ied | Obs | Rank Sum |
55
      |-----+
56
      | 1 | 26 | 1051.50 |
      | 2 | 48 | 1784.00 |
57
      | 3 | 1 | 14.50 |
58
       +-----+
59
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60
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```
chi-squared =
                   1.559 with 2 d.f.
    probability =
                   0.4586
1
2
    chi-squared with ties =
                            1.641 with 2 d.f.
3
    probability = 0.4402
4
5
                Dunn's Pairwise Comparison of iparticipate by ied
6
                    (Benjamini-Hochberg)
7
    Col Mean-|
                       1
     Row Mean |
                                     2
8
       ____+
              _____
9
          2 | 0.633189
10
                0.2633
           11
           3 |
              1.198283 1.055981
12
                0.3462 0.2182
            13
     False Discovery Rate = 0.05
14
    Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
15
                                16
     _____
17

    Question: For each of the factor variables (knowledge, participation), is there a difference in the average response

18
        based upon racer or ethnicity
19
20
     . dunntest iknowledge, by(ieth) ma(bh) wrap
21
22
     Warning: by() values are unlabeled, option nolabel implicit
23
24
    Kruskal-Wallis equality-of-populations rank test
25
26
      | ieth | Obs | Rank Sum |
27
      |-----
                                                  ė.
28
         1 | 38 | 1601.50 |
         2 | 12 | 333.00 |
3 | 20 | 759.00 |
      29
      30
          4 | 3 | 53.50 |
7 | 2 | 103.00 |
31
      +----+
32
33
     chi-squared = 7.365 with 4 d.f.
34
    probability =
                   0.1178
35
     chi-squared with ties =
                           10.060 with 4 d.f.
36
    probability = 0.0394
37
38
                Dunn's Pairwise Comparison of iknowledge by ieth
39
                   (Benjamini-Hochberg)
40
    Col Mean-L
    Row Mean |
                       1
                                   2
                                                3
                                                             4
41
     ----+-
                 _____
42
          2 | 2.331226
43
                0.0987
            44
           3 |
              0.814293 -1.498008
45
                 0.2308
                         0.1118
            46
              2.173971
                        0.823862 1.742413
47
           4 |
                 0.0743
                         0.2563
                                   0.1018
            48
49
           7 | -0.691538 -1.667587 -0.979809 -1.977762
                        0.0954 0.2337
                                           0.0799
50
                 0.2446
            51
     False Discovery Rate = 0.05
52
    Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
53
54
     . dunntest iparticipate, by(ieth) ma(bh) wrap
55
56
    Warning: by() values are unlabeled, option nolabel implicit
57
58
     Kruskal-Wallis equality-of-populations rank test
59
                         For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml
60
```

+		+		
	++			
1	12 507.00			
3	20 659.50			
4	2 128.00			
+		+		
chi-squa: probabil:	ed = 4.195 wi ty = 0.3803	th 4 d.f.		
chi-squa:	ed with ties =	4.414 with 4 d.	f.	
probabili	ty = 0.3528			
	Dunn la Daimi		incuticingto has i	- + h
	Dunn's Pairwi	(Benjamini-Hoch	berg)	eth
Col Mean- Bow Mean		2	З	Д
	+			1
2	-0.654633 0.3204			
3	0.795667 1.	195612		
		0.2000		
4	-0.394164 -0.	030384 -0.736811		
	0.3855	0.4879 0.3295		
7	-1.612653 -1.	247994 -1.873935	-1.022662	
	1 0.20/0	0.3034 0.3047	0.3065	
False Dis	covery Rate = 0	.05		
keject Ho	ττ b = ⊾(ς <= z) <= FDR/2 with	scopping rule	
	For	r peer review only - ł	nttp://bmiopen.bmi	.com/site/about/quide
	. 01			

1

	Na	tional Survey Statistics Report	
	Su	nmary	
	•	Question – For each of the questions, 1-10, are there differences in the average response by age?	
0 1		Answer – YES, for ALL questions there are significant differences among the responses of the various age groups	i.
2 3 4	•	Question – For each of the questions, 1-10, are there differences in the average response by gender?	
5 6 7		Answer – YES, for ALL questions there are significant differences between the responses of the genders.	
8 9	•	Question – For each of the questions, 1-10, are there differences in the average response by income level?	
0 1 2		Answer – YES, for questions 1, 2, 3, 4, and 6 there are differences in responses among income levels.	
3 4 5	•	Question: For each of the questions, are there differences in the average responses among <u>regions</u> ?	
5 7 3		Answer – YES, but only for question 9.	
)) <u>)</u>	•	Question – For each of the questions, 1-10, are there differences in the average responses among the <u>devices</u> us Answer – Yes, for all questions, except 2, 8 and 9, there are differences in the average responses among the dev used.	ed? ices
1 5	Sta	tistics	
) 7 }	•	Question – For each of the questions, 1-10, are there differences in the average response by age among those w identified their age group?	'no
)	. d	unntest iq1, by(iage) ma(bh) wrap	
 <u>2</u>	War	ning: by() values are unlabeled, option nolabel implicit	
• -	Kru	skal-Wallis equality-of-populations rank test	
	+	 iage Obs Rank Sum ++	
		2 297 136808.00 3 230 120095.00 4 343 193579.00 5 197 119296.00	
	chi pro		
	chi pro	-squared with ties = 53.379 with 3 d.f. pability = 0.0001	
		Dunn's Pairwise Comparison of ig1 by iage	
1	Col	(Benjamini-Hochberg) Mean-	

3	-2.976209
4	
5	-6.702295 -3.651101 -1.958054
False Disc Reject Ho	covery Rate = 0.05 if p = P(Z <= z) <= FDR/2 with stopping rule
. dunntest	; iq2, by(iage) ma(bh) wrap
Warning: k	y() values are unlabeled, option nolabel implicit
Kruskal-Wa	allis equality-of-populations rank test
+ iage	Obs Rank Sum
	297 137489.50
3	230 117935.00
4	197 120644.00
+	
chi-square	ed = 33.059 with 3 d.f.
chi-square probabilit	$\frac{1}{2} = \frac{1}{0.0001}$
	Dunn's Pairwise Comparison of iq2 by iage
Col Mean-	(Benjamini-Hochberg)
Row Mean	2 3 4
3	-2.210640
	0.0162
4	-5.005456 -2.376918
	0.0000
5	-6.338529 -3.999461 -2.077098 0.0000 0.0001 0.0189
Folco Dicc	
Reject Ho	if $p = P(Z \le z) \le FDR/2$ with stopping rule
. dunntest	; iq3, by(iage) ma(bh) wrap
Warning: k	by() values are unlabeled, option nolabel implicit
Kruskal-Wa	allis equality-of-populations rank test
+	+
iage	Obs Rank Sum
	297 139770.50
3	230 117843.00
4	197 120723.50
+	+
chi-square	ed = 28.691 with 3 d.f.
probabilit	$x_{Y} = 0.0001$
chi-square probabilit	d with ties = 53.833 with 3 d.f. y = 0.0001
	Dunnia Dainuica Companican of ig2 bu issu
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		(Benjamini-Hochberg)
1	Col Mean-	I
2	Row Mean	2 3 4
- २		
4	5	
4		
5	4	-4.908660 -2.387522
6		0.0000 0.0102
7	-	
8	S	
9		
10	False Disc	covery Rate = 0.05
11	Reject Ho	if $p = P(Z \le z) \le FDR/2$ with stopping rule
12		
12	dunntest	ial by (iago) ma (bb) wran
13	· duffices	idi, by(idge) md(bh) widp
14	Warning: k	by() values are unlabeled, option nolabel implicit
15		
16	Kruchol W	allie emplity of populations work test
17	KLUSKAL-Wa	aills equality-of-populations fank test
18	+	+
19	iage	Obs Rank Sum
20		
21	2	
22	4	343 196304.50
23	5	197 124903.50
24	+	+
25	chi-square	Pd = 53.252 with 3 d.f.
26	probabilit	cy = 0.0001
20		
27	chi-square	ed with ties = 70.467 with 3 d.f.
20	probabilit	
29		
30		Dunn's Pairwise Comparison of iq4 by iage
31	Col Moon	(Benjamini-Hochberg)
32	Row Mean	2 3 4
33		
34	3	-2.730052
35		0.0038
36	4	-6.060387 -2.822725
37		0.0000 0.0036
38	_	
39	5	
40		
41	False Disc	covery Rate = 0.05
42	Reject Ho	if $p = P(Z \le z) \le FDR/2$ with stopping rule
43		
44	dunntest	z iq5, by(iage) ma(bh) wrap
45		
45 46	Warning: k	py() values are unlabeled, option nolabel implicit
47	Kruskal-Wa	allis equality-of-populations rank test
4ð		
49	+	
50	lage	
51	2	297 130735.50
52	3	230 118988.50
53	4	343 197372.50
54	1 5	+
55	r 	
56	chi-square	ed = 50.736 with 3 d.f.
57	probabilit	cy = 0.0001
58	abi ama	d with tion - 74 804 with 2 d f
59	probabilit	zu = 0.0001
60	PICCUDITI	For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml
00		

<pre>Rev Mean 2 3 4 3 -3.463352</pre>	Col Mean-I	(Ber	ıjamini-Hochberg)	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Row Mean	2	3	4	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	3	-3.463252			
<pre>4 -6.727241 -2.687273 5 -7.83229 -4.28095 -2.186804 5 -7.83291 -4.28095 -2.186804 False Discovery Rate = 0.05 Reject Ho if p = P(2 < [1]) <= FDR/2 with stopping rule dunntest iq6, by(lage) ma(bh) wrap Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test +</pre>		0.0004			
<pre>5 -7.33221 -4.28025 -2.086904</pre>	4		3		
<pre>> -/.03241 -4.26393 -2.08304</pre>		7 022001 4 000055	-		
<pre>False Discovery Rate = 0.05 Reject Ho if p = F(Z <= z) <= FDR/2 with stopping rule dunntest iq6, by(iage) ma(bh) wrap Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test i age Obs Rank Sum i 2 297 139523.00 1 3 20 12113.50 1 4 343 196373.50 1 5 197 11160.00 chi-squared = 21.310 with 3 d.f. probability = 0.0001 chi-squared with ties = 31.684 with 3 d.f. probability = 0.0001 chi-squared with ties = 31.684 with 3 d.f. probability = 0.0001 chi-squared with ties = 31.684 with 3 d.f. probability = 0.0001 chi-squared vith ties = 31.684 with 3 d.f. probability = 0.0001 chi-squared vith ties = 31.684 with 3 d.f. probability = 0.0001 chi-squared = 2.174021</pre>	ן כ 	-7.833291 -4.280955 0.0000 0.0000	0.0184		
<pre>Reject Ho if p = P(Z <= z) <= FDR/2 with stopping rule . dunntest iq6, by(iage) ma(bh) wrap Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test +</pre>	False Disc	covery Rate = 0.05			
<pre>. dunntest iq6, by(iage) ma(bh) wrap Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test +</pre>	Reject Ho	if p = P(Z <= z) <=	FDR/2 with stop	ping rule	
<pre>. duminest 1q0, y(1age) ma(bn) viep Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test +</pre>		igh by (ingo) mo (bb)			
<pre>Marning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test</pre>	. uunnest	. iqu, by(iage) ma(bh)	мтар		
<pre>Kruskal-Wallis equality-of-populations rank test</pre>	Warning: k	y() values are unlabel	led, option nola	bel implicit	
<pre>+</pre>	Kruskal-Wa	allis equality-of-popul	lations rank tes	t	
<pre>iage Obs Rank Sum </pre>	+				
<pre></pre>	iage	Obs Rank Sum			
<pre>1 3 230 121315.50 1 4 331 136979.50 + 5 197 111960.00 +</pre>	+	297 139523.00			
<pre>chi-squared = 21.310 with 3 d.f. probability = 0.0001 Chi-squared with ties = 31.664 with 3 d.f. probability = 0.0001 Dunn's Pairwise Comparison of iq6 by iage (Benjamini-Hochberg) Col Mean- Row Mean 2 3 4 </pre>	3	230 121315.50 343 196979.50			
<pre>tt chi-squared = 21.310 with 3 d.f. probability = 0.0001 chi-squared with ties = 31.684 with 3 d.f. probability = 0.0001 Dunn's Pairwise Comparison of iq6 by iage</pre>	5	197 111960.00			
chi-squared = 21.310 with 3 d.f. probability = 0.0001 chi-squared with ties = 31.684 with 3 d.f. probability = 0.0001 Dunn's Pairwise Comparison of iq6 by iage (Benjamini-Hochberg) Col Mean- Row Mean 2 3 4 	+	+			
Col Mean 2 3 4 		Dunn's Pairwise (Ber	e Comparison of njamini-Hochberc	iq6 by iage	
<pre>3 -2.598612 0.0094 4 -5.217225 -2.174021 0.0000 0.0223 5 -4.243787 -1.665690 0.263774 0.0000 0.0575 0.3960 False Discovery Rate = 0.05 Reject Ho if p = P(Z <= z) <= FDR/2 with stopping rule . dunntest iq7, by(iage) ma(bh) wrap Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test +</pre>	Col Mean- Row Mean	2	3	4	
<pre></pre>	+	-2.598612			
<pre>4 -5.217225 -2.174021 0.0000 0.0223 5 -4.243787 -1.665690 0.263774 0.0000 0.0575 0.3960 False Discovery Rate = 0.05 Reject Ho if p = P(Z <= z) <= FDR/2 with stopping rule . dunntest iq7, by(iage) ma(bh) wrap Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test +</pre>	l	0.0094			
<pre>b 0.0000 0.0223 5 -4.243787 -1.665690 0.263774 0.0000 0.0575 0.3960 False Discovery Rate = 0.05 Reject Ho if p = P(Z <= z) <= FDR/2 with stopping rule . dunntest iq7, by(iage) ma(bh) wrap Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test +</pre>	4	-5.217225 -2.174021	1		
<pre>5 -4.243787 -1.665690 0.263774 0.0000 0.0575 0.3960 False Discovery Rate = 0.05 Reject Ho if p = P(Z <= z) <= FDR/2 with stopping rule dunntest iq7, by(iage) ma(bh) wrap Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test +</pre>		0.0000 0.0223	<u>s</u>		
<pre>False Discovery Rate = 0.05 Reject Ho if p = P(Z <= z) <= FDR/2 with stopping rule . dunntest iq7, by(iage) ma(bh) wrap Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test ++ iage Obs Rank Sum ++</pre>	5	-4.243787 -1.665690 0.0000 0.0575) 0.263774 5 0.3960		
<pre>raise Discovery Rate = 0.05 Reject Ho if p = P(Z <= z) <= FDR/2 with stopping rule . dunntest iq7, by(iage) ma(bh) wrap Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test ++ iage Obs Rank Sum ++</pre>	Folco Dicc	anneru Data = 0.05			
. dunntest iq7, by(iage) ma(bh) wrap Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test +	Reject Ho	if $p = P(Z \le z) \le$	FDR/2 with stop	ping rule	
<pre>. dunntest iq7, by(iage) ma(bh) wrap Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test ++ iage Obs Rank Sum +++</pre>					
<pre>Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test ++ iage Obs Rank Sum ++</pre>	. dunntest	iq7, by(iage) ma(bh)	wrap		
<pre>Kruskal-Wallis equality-of-populations rank test ++ iage Obs Rank Sum ++</pre>	Warning: b	y() values are unlabel	led, option nola	bel implicit	
<pre>Kruskal-Wallis equality-of-populations rank test ++ iage Obs Rank Sum ++ 2 297 134994.00 3 230 118404.00 4 343 195415.00 5 197 120965.00 ++ chi-squared = 38.545 with 3 d.f. probability = 0.0001 For peer review only - http://bmjopen.bmj.com/site/about/guidelines.</pre>					
<pre>++ iage Obs Rank Sum + 2 297 134994.00 3 230 118404.00 4 343 195415.00 5 197 120965.00 ++ chi-squared = 38.545 with 3 d.f. probability = 0.0001 For peer review only - http://bmjopen.bmj.com/site/about/guidelines.</pre>	Kruskal-Wa	llís equality-of-popul	lations rank tes	t	
chi-squared = 38.545 with 3 d.f. probability = 0.0001 For peer review only - http://bmjopen.bmj.com/site/about/quidelines.	+	Ohs Pank Sum			
<pre> 2 297 134994.00 3 230 118404.00 4 343 195415.00 5 197 120965.00 +</pre>	1 dama 1	UDS KAIIK SUM			
chi-squared = 38.545 with 3 d.f. probability = 0.0001 For peer review only - http://bmjopen.bmj.com/site/about/quidelines.	iage +				
<pre>chi-squared = 38.545 with 3 d.f. probability = 0.0001 For peer review only - http://bmjopen.bmj.com/site/about/quidelines.</pre>	iage + 2 3	297 134994.00 230 118404.00			
chi-squared = 38.545 with 3 d.f. probability = 0.0001 For peer review only - http://bmjopen.bmj.com/site/about/quidelines.	iage + 2 3 4	297 134994.00 230 118404.00 343 195415.00			
probability = 0.0001 For peer review only - http://bmjopen.bmj.com/site/about/guidelines.	iage + 2 3 4 5	297 134994.00 230 118404.00 343 195415.00 197 120965.00			
For peer review only - http://bmjopen.bmi.com/site/about/quidelines.	iage + 2 3 4 5 +	297 134994.00 230 118404.00 343 195415.00 197 120965.00 +	۱f		
	iage + 2 3 4 5 + chi-square probabilit	297 134994.00 230 118404.00 343 195415.00 197 120965.00 	l.f.		

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chi-squared with ties = 47.396 with 3 d.f. 1 probability = 0.0001 2 3 4 Dunn's Pairwise Comparison of iq7 by iage (Benjamini-Hochberg) 5 Col Mean-I 6 Row Mean | 2 3 4 7 3 | -2.469339 8 0.0102 9 4 | -5.229834 -2.318978 10 <mark>0.0000</mark> <mark>0.0122</mark> 11 12 5 I -6.246620 -3.678399 -1.783685 13 <mark>0.000</mark>0 0.0002 0.0372 14 False Discovery Rate = 0.05 15 Reject Ho if $p = P(Z \le |z|) \le FDR/2$ with stopping rule 16 17 . dunntest iq8, by(iage) ma(bh) wrap 18 19 Warning: by() values are unlabeled, option nolabel implicit 20 21 Kruskal-Wallis equality-of-populations rank test 22 +----+ 23 | iage | Obs | Rank Sum | 24 |-----| 25 | 2 | 297 | 144264.00 | 3 | 230 | 123659.00 | 26 eziez 4 | 343 | 195323.50 | 27 5 | 197 | 106531.50 | 28 +----+ 29 chi-squared = 11.953 with 3 d.f. 30 probability = 0.0075 31 chi-squared with ties = 13.243 with 3 d.f. 32 probability = 0.0041 33 34 Dunn's Pairwise Comparison of iq8 by iage 35 (Benjamini-Hochberg) 36 Col Mean-| 37 2 Row Mean | 3 4 38 3 | -2.018706 39 0.0435 40 4 | -3.607781 -1.274845 41 0.0009 0.1518 42 43 -2.045700 -0.109821 1.096108 5 I 0.0612 0.4563 0.1638 44 45 False Discovery Rate = 0.05 46 Reject Ho if $p = P(Z \le |z|) \le FDR/2$ with stopping rule 47 48 . dunntest iq9, by(iage) ma(bh) wrap 49 Warning: by() values are unlabeled, option nolabel implicit 50 51 52 Kruskal-Wallis equality-of-populations rank test 53 +-----+ 54 | iage | Obs | Rank Sum | 55 |-----2 | 297 | 145982.00 | 56 | 3 | 230 | 123673.00 57 4 | 343 | 185055.00 58 5 | 197 | 115068.00 | 59 For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml 60

```
chi-squared = 10.994 with 3 d.f.
1
    probability =
                   0.0118
2
3
    chi-squared with ties =
                          12.738 with 3 d.f.
                   <mark>0.0052</mark>
    probability =
4
5
6
                   Dunn's Pairwise Comparison of iq9 by iage
                           (Benjamini-Hochberg)
7
    Col Mean-|
8
                              3
    Row Mean |
                       2
                                                 4
9
     10
          3 | -1.836776
            0.0662
11
12
           4 | -2.115200 -0.074195
13
                0.0516
                         0.4704
            14
           5 |
              -3.519369 -1.669304 -1.742007
15
                        0.0570 0.0611
                <mark>0.001</mark>3
            16
     False Discovery Rate = 0.05
17
    Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
18
19
     . dunntest iq10, by(iage) ma(bh) wrap
20
21
     Warning: by() values are unlabeled, option nolabel implicit
22
                                              23
    Kruskal-Wallis equality-of-populations rank test
24
25
      +----+
      | iage | Obs | Rank Sum |
26
      |-----|
27
         2 | 297 | 134627.00 |
         3 | 230 | 122540.00 |
28
      4 | 343 | 194647.50 |
29
      5 | 197 | 117963.50 |
30
      +----+
31
     chi-squared = 33.137 with 3 d.f.
32
    probability =
                   0.0001
33
34
     chi-squared with ties = 60.194 with 3 d.f.
    probability = 0.0001
35
36
37
                   Dunn's Pairwise Comparison of iq10 by iage
                    (Benjamini-Hochberg)
38
    Col Mean-|
39
                                    3
    Row Mean |
                        2
40
     _____
                _____
         3 | -3.958265
41
                <mark>0.0001</mark>
           42
            43
           4 | -6.301218 -1.780890
            | <mark>0.0000</mark> 0.0450
44
45
           5 | -6.925950 -2.974246 -1.532010
46
                0.0000 0.0022 0.0628
            47
     False Discovery Rate = 0.05
48
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
49
50
51

    Question – For each of the questions, 1-10, are there differences in the average response by gender?

52
53
     . dunntest iq1, by(igender)
54
    Warning: by() values are unlabeled, option nolabel implicit
55
56
57
    Kruskal-Wallis equality-of-populations rank test
58
      +----+
59
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60
```

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| igender | Obs | Rank Sum |

```
-----|
1
             1 | 497 | 248163.00 |
2
             2 | 570 | 321615.00 |
3
            _____+
4
     chi-squared = 11.781 with 1 d.f.
probability = 0.0006
5
6
     chi-squared with ties =
                             20.202 with 1 d.f.
7
     probability =
                    <mark>0.0001</mark>
8
9
10
                   Dunn's Pairwise Comparison of iq1 by igender
                                (No adjustment)
11
     Col Mean-|
12
     Row Mean |
                         1
13
     _____
          2 | -4.494629
14
            | 0.0000
15
     alpha = 0.05
16
     Reject Ho if p = P(Z \le |z|) \le alpha/2
17
18
19
     . dunntest iq2, by(igender)
20
     Warning: by() values are unlabeled, option nolabel implicit
21
22
     Kruskal-Wallis equality-of-populations rank test
23
                                                  r
24
       +-----+
25
      | igender | Obs | Rank Sum |
       |-----|
26
           1 | 497 | 245930.00 |
       27
       1
             2 | 570 | 323848.00 |
28
       +----+
29
     chi-squared = 15.032 with 1 d.f.
30
     probability = 0.0001
31
                             21.672 with 1 d.f.
     chi-squared with ties =
32
     probability = 0.0001
33
34
                   Dunn's Pairwise Comparison of iq2 by igender
35
                                (No adjustment)
36
     Col Mean-|
37
     Row Mean |
                         1
      -----
38
         2 | -4.655324
39
           | 0.0000
40
     alpha = 0.05
41
     Reject Ho if p = P(Z \le |z|) \le alpha/2
42
43
     . dunntest iq3, by(igender)
44
45
     Warning: by() values are unlabeled, option nolabel implicit
46
47
     Kruskal-Wallis equality-of-populations rank test
48
49
       +----+
       | igender | Obs | Rank Sum |
50
       |-----|
51
       | 1 | 497 | 254937.00 |
52
            2 | 570 | 314841.00 |
       53
       +----+
54
     chi-squared = 4.340 with 1 d.f.
probability = 0.0372
55
     probability =
56
     chi-squared with ties =
                              8.144 with 1 d.f.
57
     probability = 0.0043
58
59
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60
```

```
Dunn's Pairwise Comparison of iq3 by igender
                               (No adjustment)
1
     Col Mean-L
2
     Row Mean |
                          1
3
           2 | -2.853738
4
            | 0.0022
5
6
     alpha = 0.05
     Reject Ho if p = P(Z \le |z|) \le alpha/2
7
8
9
     . dunntest iq4, by(igender)
10
     Warning: by() values are unlabeled, option nolabel implicit
11
12
13
     Kruskal-Wallis equality-of-populations rank test
14
       +----+
15
       | igender | Obs | Rank Sum |
16
       |-----|
          1 | 497 | 245219.00 |
17
            2 | 570 | 324559.00 |
       18
       +----+
19
     chi-squared = 16.150 with 1 d.f.
probability = 0.0001
20
21
22
     chi-squared with ties = 21.371 with 1 d.f.
     probability = 0.0001
23
24
25
                   Dunn's Pairwise Comparison of iq4 by igender
                                (No adjustment)
26
                                                    PL.
     Col Mean-|
27
     Row Mean |
                          1
28
     _____
          2 | -4.622902
29
           | 0.0000
30
31
     alpha = 0.05
     Reject Ho if p = P(Z \le |z|) \le alpha/2
32
33
34
     . dunntest iq5, by(igender)
35
     Warning: by() values are unlabeled, option nolabel implicit
36
37
38
     Kruskal-Wallis equality-of-populations rank test
39
40
       | igender | Obs | Rank Sum |
       |-----|
41
       | 1 | 497 | 250255.00 |
42
             2 | 570 | 319523.00 |
43
       +-----+
44
     chi-squared = 9.095 with 1 d.f.
probability = 0.0026
45
46
                            13.426 with 1 d.f.
47
     chi-squared with ties =
     probability = 0.0002
48
49
                   Dunn's Pairwise Comparison of iq5 by igender
50
                                (No adjustment)
51
     Col Mean-|
52
     Row Mean |
                          1
     _____+
53
          2 | -3.664079
54
            0.0001
55
     alpha = 0.05
56
     Reject Ho if p = P(Z \le |z|) \le alpha/2
57
58
59
     . dunntest iq6, by(igender)
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60
```

```
Warning: by() values are unlabeled, option nolabel implicit
1
2
3
     Kruskal-Wallis equality-of-populations rank test
4
5
      | igender | Obs | Rank Sum |
6
       |-----|
             1 | 497 | 253170.50 |
7
      2 | 570 | 316607.50 |
8
         -----+
9
     chi-squared = 5.930 with 1 d.f.
probability = 0.0149
10
11
12
                            8.817 with 1 d.f.
     chi-squared with ties =
13
     probability =
                  0.0030
14
15
                   Dunn's Pairwise Comparison of iq6 by igender
16
                              (No adjustment)
     Col Mean-|
17
     Row Mean |
                         1
18
     ----+-
19
          2 | -2.969281
           1
                 0.0015
20
21
     alpha = 0.05
22
     Reject Ho if p = P(Z \le |z|) \le alpha/2
23
24
     . dunntest iq7, by(igender)
25
     Warning: by() values are unlabeled, option nolabel implicit
26
27
                                                   28
     Kruskal-Wallis equality-of-populations rank test
29
      +----+
30
      | igender | Obs | Rank Sum |
31
      |--
          -----|
             1 | 497 | 242886.00 |
32
      2 | 570 | 326892.00 |
      33
      +----+
34
    chi-squared = 20.100 with 1 d.f.
probability = 0.0001
35
36
37
                            24.716 with 1 d.f.
     chi-squared with ties =
     probability = 0.0001
38
39
40
                   Dunn's Pairwise Comparison of iq7 by igender
                               (No adjustment)
41
     Col Mean-|
42
     Row Mean |
                         1
43
     -----
         2 | -4.971520
44
           | 0.0000
45
46
     alpha = 0.05
47
     Reject Ho if p = P(Z \le |z|) \le alpha/2
48
49
     . dunntest iq8, by(igender)
50
     Warning: by() values are unlabeled, option nolabel implicit
51
52
53
     Kruskal-Wallis equality-of-populations rank test
54
      +-----+
55
      | igender | Obs | Rank Sum |
56
       |-----|
      | 1 | 497 | 243180.50 |
57
            2 | 570 | 326597.50 |
58
       +----+
59
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60
```

```
chi-squared = 19.578 with 1 d.f.
     probability =
                    0.0001
1
2
                             21.691 with 1 d.f.
     chi-squared with ties =
3
     probability = 0.0001
4
5
                   Dunn's Pairwise Comparison of iq8 by igender
6
                                (No adjustment)
7
     Col Mean-I
     Row Mean |
                          1
8
      -----
9
        2 | -4.657396
10
           | 0.0000
11
     alpha = 0.05
12
     Reject Ho if p = P(Z \le |z|) \le alpha/2
13
14
     . dunntest iq9, by(igender)
15
     Warning: by() values are unlabeled, option nolabel implicit
16
17
18
     Kruskal-Wallis equality-of-populations rank test
19
       +----+
20
       | igender | Obs | Rank Sum |
21
       |-----|
             1 | 497 | 250477.00 |
22
             2 | 570 | 319301.00 |
23
       +----+
24
     chi-squared = 8.830 with 1 d.f.
probability = 0.0030
25
26
27
     chi-squared with ties = 10.231 with 1 d.f.
28
     probability = 0.0014
29
30
                   Dunn's Pairwise Comparison of iq9 by igender
31
                               (No adjustment)
     Col Mean-|
32
     Row Mean |
                          1
33
     _____
34
          2 | -3.198645
           0.0007
35
36
     alpha = 0.05
37
     Reject Ho if p = P(Z \le |z|) \le alpha/2
38
39
     . dunntest iq10, by(igender)
40
     Warning: by() values are unlabeled, option nolabel implicit
41
42
43
     Kruskal-Wallis equality-of-populations rank test
44
       +-----+
45
       | igender | Obs | Rank Sum |
46
        ------
47
             1 | 497 | 246943.50 |
             2 | 570 | 322834.50 |
48
        -----+
49
     chi-squared = 13.508 with 1 d.f.
probability = 0.0002
50
51
52
     chi-squared with ties =
                             24.537 with 1 d.f.
     probability =
                   0.0001
53
54
55
                   Dunn's Pairwise Comparison of iq10 by igender
56
                                (No adjustment)
     Col Mean-|
57
     Row Mean |
                          1
58
     -----
59
           2 | -4.953449
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60
```

Questi	on – For eac	h of the ques	stions, 1-10,	are there d	ifferences ir	the averag	e response <u>by inco</u>	me level?
. dunntest	iq1, by(iir	ncome)						
Varning: b	y() values a	are unlabele	d, option n	olabel impl	icit			
Kruskal-Wa	llis equalit	tv-of-popula	tions rank	test				
+		+						
iincom 	e Obs I	Rank Sum 						
	1 85 3 2 124 6	39647.00 60999.00						
	3 220 10 4 194 10	09906.00 09253.00						
 	5 138	73959.00						
	6 81 4 7 45 2	47674.00 26205.00						
	8 29 1 9 13	18958.00 7766.00						
1 	0 22 1	13681.00 						
1 +	1 116 0	61730.00 +						
hi-square	d = 21.25	52 with 10 d	.f.					
robabilit								
	y = 0.01	194						
chi-square	y = 0.01 ed with ties y = 0.00	194 = 36.441 001	with 10 d.	f.				
chi-square probabilit	y = 0.01 ad with ties y = 0.00	194 = 36.441 <mark>001</mark>	with 10 d.	f.				
hi-square probabilit	y = 0.01 d with ties y = 0.00 Dunn's	194 = 36.441 001 s Pairwise C (No	with 10 d. omparison o adjustment	f. f iq1 by ii	ncome			
col Mean- cow Mean	y = 0.01 d with ties y = 0.00 Dunn's	194 = 36.441 001 s Pairwise C (No 2	with 10 d. omparison o adjustment 3	f. f iq1 by ii) 4	ncome 5	6		
col Mean- col Mean- cow Mean cou Mean cou Mean	y = 0.01 d with ties y = 0.00 Dunn's 1 -0.769253	194 = 36.441 001 s Pairwise C (No 2	with 10 d. omparison o adjustment 3	f. f iq1 by ii) 4	ncome 5	6		
col Mean- Row Mean 2 2 2	y = 0.01 d with ties y = 0.00 Dunn's 1 -0.769253 0.2209	194 = 36.441 001 s Pairwise C (No 2	with 10 d. omparison o adjustment 3	f. f iql by ii) 4	ncome 5	6		
col Mean- col Mean- cow Mean 2 3 3	y = 0.01 d with ties y = 0.00 Dunn's -0.769253 0.2209 -1.102569 0.1351	194 = 36.441 001 s Pairwise C (No 2 -0.289304 0.3862	with 10 d. omparison o adjustment 3	f. f iq1 by ii) 4	ncome 5	6		
col Mean- cow Mean- cow Mean 2 3 3 4	y = 0.01 d with ties y = 0.00 Dunn's -0.769253 0.2209 -1.102569 0.1351 -3.159808	194 = 36.441 001 s Pairwise C (No 2 -0.289304 0.3862 -2.632641	with 10 d. omparison o adjustment -2.743449	f. f iq1 by ii) 4	ncome 5	6		
col Mean- col Mean- cow Mean 2 3 3 4 1	y = 0.01 d with ties y = 0.00 Dunn's -0.769253 0.2209 -1.102569 0.1351 -3.159808 0.0008	194 = 36.441 001 s Pairwise C (No 2 -0.289304 0.3862 -2.632641 0.0042 1 511055	with 10 d. omparison o adjustment 3 	f. f iq1 by ii) 4	ncome 5	6		
col Mean- col Mean- cow Mean 2 3 4 5 5	y = 0.01 d with ties y = 0.00 Dunn's -0.769253 0.2209 -1.102569 0.1351 -3.159808 0.0008 -2.141875 0.0161	194 = 36.441 001 s Pairwise C (No 2 -0.289304 0.3862 -2.632641 0.0042 -1.511267 0.0654	with 10 d. omparison o adjustment 3 2.743449 0.0030 -1.422898 0.0774	f. f iq1 by ii) 4 1.038856 0.1494	ncome 5	6		
col Mean- col Mean- cow Mean 2 3 4 4 5 6	y = 0.01 d with ties y = 0.00 Dunn's -0.769253 0.2209 -1.102569 0.1351 -3.159808 0.0008 -2.141875 0.0161 -3.342301	194 = 36.441 001 s Pairwise C (No 2 -0.289304 0.3862 -2.632641 0.0042 -1.511267 0.0654 -2.874429	<pre>with 10 d. omparison o adjustment</pre>	<pre>f. f. f iq1 by ii } 4 1.038856 0.1494 -0.816141</pre>	ncome 5	6		
col Mean- col Mean- cow Mean 2 3 3 4 5 6 1	y = 0.01 d with ties y = 0.00 Dunn's -0.769253 0.2209 -1.102569 0.1351 -3.159808 0.0008 -2.141875 0.0161 -3.342301 0.0004	194 = 36.441 001 s Pairwise C (No 2 -0.289304 0.3862 -2.632641 0.0042 -1.511267 0.0654 -2.874429 0.0020	<pre>with 10 d. omparison o adjustment</pre>	<pre>f. f. f iq1 by ii</pre>	ncome 5 -1.597847 0.0550	6		
col Mean- col Mean- cow Mean 2 2 3 4 4 5 6 1 7	y = 0.01 d with ties y = 0.00 Dunn's -0.769253 0.2209 -1.102569 0.1351 -3.159808 0.0008 -2.141875 0.0161 -3.342301 0.0004 -2.671383 0.0038	194 = 36.441 001 s Pairwise C (No 2 -0.289304 0.3862 -2.632641 0.0042 -1.511267 0.0654 -2.874429 0.0020 -2.207428 0.0136	<pre>with 10 d. omparison o adjustment</pre>	<pre>f. f. f iq1 by ii</pre>	-1.597847 0.0550 -1.148526 0.1254	6 0.142490 0.4433		
col Mean- col Mean- cow Mean 2 3 4 5 5 6 7 8	y = 0.01 d with ties y = 0.00 Dunn's -0.769253 0.2209 -1.102569 0.1351 -3.159808 0.0008 -2.141875 0.0161 -3.342301 0.0004 -2.671383 0.0038 -3.700701	194 = 36.441 001 s Pairwise C (No 2 -0.289304 0.3862 -2.632641 0.0042 -1.511267 0.0654 -2.874429 0.0020 -2.207428 0.0136 -3.333112	<pre>with 10 d. omparison o adjustment</pre>	<pre>f. f. f iq1 by ii</pre>	-1.597847 0.0550 -1.148526 0.1254 -2.450205	6 0.142490 0.4433 -1.279432		
Col Mean- Col Mean- Cow Mean 2 3 3 4 5 6 7 8 8	y = 0.01 d with ties y = 0.00 Dunn's -0.769253 0.2209 -1.102569 0.1351 -3.159808 0.0008 -2.141875 0.0161 -3.342301 0.0004 -2.671383 0.0038 -3.700701 0.0001	<pre>194 = 36.441 201 s Pairwise C (No 2 -0.289304 0.3862 -2.632641 0.0042 -1.511267 0.0654 -2.874429 0.0020 -2.207428 0.0136 -3.333112 0.0004</pre>	<pre>with 10 d. omparison o adjustment</pre>	<pre>f. f. f iq1 by ii } 4 1.038856 0.1494 -0.816141 0.2072 -0.492410 0.3112 -1.932950 0.0266</pre>	ncome 5 -1.597847 0.0550 -1.148526 0.1254 -2.450205 0.0071	6 0.142490 0.4433 -1.279432 0.1004		
Col Mean- col Mean- cow Mean 2 3 3 4 5 6 1 7 8 8 9	y = 0.01 d with ties y = 0.00 Dunn's -0.769253 0.2209 -1.102569 0.1351 -3.159808 0.0008 -2.141875 0.0161 -3.342301 0.0004 -2.671383 0.0038 -3.700701 0.0001 -1.868475 0.0308	194 = 36.441 DO1 s Pairwise C (No 2 -0.289304 0.3862 -2.632641 0.0042 -1.511267 0.0654 -2.874429 0.0020 -2.207428 0.0136 -3.333112 0.0004 -1.537144 0.0621	<pre>with 10 d. omparison o adjustment</pre>	<pre>f. f. f iq1 by ii</pre>	ncome 5 -1.597847 0.0550 -1.148526 0.1254 -2.450205 0.0071 -0.900035 0.1841	6 0.142490 0.4433 -1.279432 0.1004 -0.125393 0.4501		
Col Mean- Col Mean- Col Mean Cow Mean 2 3 4 5 6 7 8 9 10	y = 0.01 d with ties y = 0.01 Dunn's -0.769253 0.2209 -1.102569 0.1351 -3.159808 0.0008 -2.141875 0.0161 -3.342301 0.0004 -2.671383 0.0038 -3.700701 0.0001 -1.868475 0.0308 -2.761056	194 = 36.441 001 s Pairwise C (No 2 -0.289304 0.3862 -2.632641 0.0042 -1.511267 0.0654 -2.874429 0.0020 -2.207428 0.0136 -3.333112 0.0004 -1.537144 0.0621 -2.386668	<pre>with 10 d. omparison o adjustment</pre>	<pre>f. f. f iq1 by ii</pre>	ncome 5 -1.597847 0.0550 -1.148526 0.1254 -2.450205 0.0071 -0.900035 0.1841 -1.590545	6 0.142490 0.4433 -1.279432 0.1004 -0.125393 0.4501 -0.588491		
col Mean- col Mean- cow Mean 2 3 3 4 5 6 7 8 9 9 10 10	y = 0.01 d with ties y = 0.01 Dunn's 1 -0.769253 0.2209 -1.102569 0.1351 -3.159808 0.0008 -2.141875 0.0161 -3.342301 0.0004 -2.671383 0.0038 -3.700701 0.0001 -1.868475 0.0308 -2.761056 0.0029	<pre>194 = 36.441 201 s Pairwise C (No 2 -0.289304 0.3862 -2.632641 0.0042 -1.511267 0.0654 -2.874429 0.0020 -2.207428 0.0136 -3.333112 0.0004 -1.537144 0.0621 -2.386668 0.0085</pre>	<pre>with 10 d. omparison of adjustment 3 2.743449 0.0030 -1.422898 0.0774 -2.909733 0.0018 -2.149485 0.0158 -3.315692 0.0005 -1.456172 0.0727 -2.323942 0.0101</pre>	<pre>f. f. f iq1 by ii</pre>	-1.597847 0.0550 -1.148526 0.1254 -2.450205 0.0071 -0.900035 0.1841 -1.590545 0.0559	6 0.142490 0.4433 -1.279432 0.1004 -0.125393 0.4501 -0.588491 0.2781		
col Mean- col Mean- cow Mean cow Mean 2 3 4 5 6 7 8 7 8 9 10 11	y = 0.01 d with ties y = 0.00 Dunn's -0.769253 0.2209 -1.102569 0.1351 -3.159808 0.0008 -2.141875 0.0161 -3.342301 0.0004 -2.671383 0.0008 -3.700701 0.0001 -1.868475 0.0308 -2.761056 0.0029 -1.955930 0.0252	194 = 36.441 DOI s Pairwise C (No 2 -0.289304 0.3862 -2.632641 0.0042 -1.511267 0.0654 -2.874429 0.0020 -2.207428 0.0136 -3.333112 0.0004 -1.537144 0.0621 -2.386668 0.0085 -1.323354 0.0929	<pre>with 10 d. omparison o adjustment</pre>	<pre>f. f. f iq1 by ii</pre>	ncome 5 -1.597847 0.0550 -1.148526 0.1254 -2.450205 0.0071 -0.900035 0.1841 -1.590545 0.0559 0.127501 0.4493	6 0.142490 0.4433 -1.279432 0.1004 -0.125393 0.4501 -0.588491 0.2781 1.655509 0.0489		

	+					
8	-1.273936 0.1013					
9	-0.203120 0.4195	0.717258 0.2366				
10	 -0.645693 0.2592	0.478844 0.3160	-0.297344 0.3831			
11	 1.214096 0.1124	2.488185 0.0064	0.947688 0.1716	1.639269 0.0506		
alpha =	0.05					
eject Ho	if p = P(Z <	<= z) <= a	lpha/2			
dunntest	t iq2, by(iin	icome)				
Marning: h	oy() values a	re unlabele	d, option n	olabel impl	icit	
ruskal-Wa	allis equalit	y-of-popula	tions rank	test		
+	me Obs R	ank Sum I				
I	2 124 6	52680.50				
	3 220 11 4 194 10	.3218.00)4957.50				
	5 138 7	7734.00				
	6 81 4	6268.50				
	7 45 2 8 29 1	4295.00				
	9 13 10 22 1	8091.00 .2619.00				
	++ 11 116 6					
+		+				
hi-square	ed = 13.28	31 with 10 d	.f.			
probabilit	ty = 0.20	84				
hi-square	ed with ties $v = 0.03$	= 19.148	with 10 d.	f.		
	0,00	· · · ·				
	Dunn's	Pairwise C	omparison o	f iq2 by ii	ncome	
col Mean-		(No	adjustment)		
.ow Mean	<u>1</u> +	2	3	4	5	6
2	-1.156759 0.1237					
З	 _1 554296	-0 317110				
J	0.0601	0.3756				
4	 -2.316595	-1.204085	-1.044061			
	<mark>0.0103</mark> 	0.1143	0.1482			
5	-2.814820	-1.820137	-1.746089	-0.779272		
-		1 000000	1 000505	0.21/9	0.000000	
6	-2.698388 0.0035	-1./92626 0.0365	-1.696535 0.0449	-0.889441 0.1869	-0.220641 0.4127	
7	I		0 100000	1 462260	-0.904860	-0.669351
	-2.947791	-2.186686	-2.108330	-1.463268		
	-2.947791 <mark>0.0016</mark>	-2.186686 <mark>0.0144</mark>	-2.108330 0.0175	-1.463268 0.0717	0.1828	0.2516
8	-2.947791 0.0016 -0.529937	-2.186686 0.0144	-2.108330 0.0175	-1.463268 0.0717 0.941103	0.1828	0.2516
8	-2.947791 0.0016 -0.529937 0.2981	-2.186686 0.0144 0.237196 0.4063	-2.108330 0.0175 0.427915 0.3344	-1.463268 0.0717 0.941103 0.1733	0.1828 1.342026 0.0898	0.2516 1.409567 0.0793
8 9	-2.947791 0.0016 -0.529937 0.2981 -2.076410 0.0189	-2.186686 0.0144 0.237196 0.4063 -1.562379 0.0591	-2.108330 0.0175 0.427915 0.3344 -1.471004 0.0706	-1.463268 0.0717 0.941103 0.1733 -1.106612 0.1342	0.1828 1.342026 0.0898 -0.793658 0.2137	0.2516 1.409567 0.0793 -0.667291 0.2523
8	-2.947791 0.0016 -0.529937 0.2981 -2.076410 0.0189	-2.186686 0.0144 0.237196 0.4063 -1.562379 0.0591	-2.108330 0.0175 0.427915 0.3344 -1.471004 0.0706	-1.463268 0.0717 0.941103 0.1733 -1.106612 0.1342	0.1828 1.342026 0.0898 -0.793658 0.2137	0.2516 1.409567 0.0793 -0.667291 0.2523 -0.038489

l	0.036	7 0.1257	0.1521	0.2863	0.4306	0.4846
11	-2.25197 0.012	1 -1.228138 2 0.1097	-1.072211 0.1418	-0.172116 0.4317	0.528550 0.2986	0.673092 0.2504
Col Mean- Row Mean	7	8	9	10		
+ 8	1.80355	 6 .7				
 9	-0.23794	9 -1.511200				
 10	0.406	0 0.0654 -1.111590	0.543469			
	0.329	0 0.1332	0.2934			
11	1.26357 0.103	4 -0.999773 2 0.1587	1.014893 0.1551	0.458911 0.3231		
alpha = Reject Ho	0.05 if p = P(Z	<= z) <= a	lpha/2			
•	ia? bu(i	incomo)				
. dunntest		Income)				
Warning: b	y() values	are unlabele	d, option r	nolabel impl	icit	
Kruskal-Wa	allis equal	itv-of-popula	tions rank	test		
,	iiio cquui	rey or popura				
iincom	ne Obs	Rank Sum				
	++- 1 85	 38988.50				
ĺ	2 124	65318.50				
	3 220 4 194	111481.50				
l	5 138	75233.00				
	6 1 91 1					
	7 45	26126.00				
	8 29	16689.00				
1	9 13 .0 22	8034.00 13280.50				
	++-					
1 +	.1 116	59965.00				
		501 11 10 1				
chi-square probabilit	d = 13. v = 0.	531 with 10 d 1955	f.			
				_		
chi-square probabilit	d with tie v = 0.	s = 25.388 0047	with 10 d.	t.		
<u> </u>	1					
	Dunn	's Pairwise C	comparison c	of iq3 by ii	ncome	
a 1 M		(No	adjustment	2)		
Row Mean	1	2	3	4	5	6
+						
2	-2.14882 0.015	9 . <mark>8</mark>				
3	-1.67225 0.047	0.792784 0.2140				
	0.01/	_ 0.2110				
4	-3.38752	3 -1.200612	-2.305484			
	0.000	- U.IIDU	0.0100			
5	-2.78791	0 -0.661150	-1.573197	0.504950		
	0.002	0.2543	0.0578	U.3068		
6	-3.28386	2 -1.451113	-2.280115	-0.523645	-0.896635	
	0.000	D 0.0734	<mark>0.0113</mark>	0.3003	0.1850	
7	-2.93890	0 -1.374539	-2.006238	-0.611462	-0.916926	-0.171575
	<mark>0.001</mark>	<mark>6</mark> 0.0846	0.0224	0.2704	0.1796	0.4319
_						
8 1	-2.41408	7 -1.049909	-1.546854	-0.394415	-0.659672	-0.042756

	I	<mark>0.0079</mark>	0.1469	0.0609	0.3466	0.2547	0.4829	
	9 	-2.377882 <mark>0.0087</mark>	-1.391143 0.0821	-1.732772 0.0416	-0.933760 0.1752	-1.115905 0.1322	-0.663510 0.2535	
	10	-2.693915 <mark>0.0035</mark>	-1.477507 0.0698	-1.926749 0.0270	-0.905783 0.1825	-1.132569 0.1287	-0.559433 0.2879	
	11 	-1.813516 0.0349	0.338009 0.3677	-0.395350 0.3463	1.548125 0.0608	0.996072 0.1596	1.733268 0.0415	
Col Me Row Me	ean- ean	7	8	9	10			
)	8	0.095106 0.4621						
- 6	9	-0.528284 0.2987	-0.566220 0.2856					
	10 	-0.394380 0.3467	-0.442980 0.3289	0.182222 0.4277				
	 11 	1.610698 0.0536	1.253413 0.1050	1.535893	1.657645 0.0487			
alpha Reject	= 0. t. Ho if	.05 = P(7. <	(= z) <= a	lpha/2				
	0 110 11	- 10 - 10	(121) (u	ipila, 2				
. dunn	ntest i	lq4, by(iin	ncome)					
Warnin	ng: by	() values a	are unlabele	d, option n	olabel impl	icit		
Kruska	al-Wall	lis equalit	y-of-popula	tions rank	test			
+			+					
ii 	income	Obs F -++	Rank Sum 					
	1	85 3	37107.00					
	3	220 11	.0440.00					
	4 5	194 11 138 7	1545.50 75994.50					
		-++ 81 4	 12547_50_1					
	7	45 2	27401.50					
	8 9	29 1	.5829.50 7802.00					
İ	10	22 1	3522.00					
	11	116 6	52378.50					
+			+					
chi-sc probat	quared	= 19.68	33 with 10 d 324	.f.				
problem	orrey		00.040		c			
probak	oility	= 0.00	= 26.046) <mark>37</mark>	with it a.	1.			
		Dunn's	s Pairwise C	omparison o	f iq4 by ii	ncome		
Col Me	ean-		(No	adjustment)			
Row Me	ean +	1	2	3	4	5	6	
	2	-2.368171 0.0089						
	3	-1.912976 <mark>0.0279</mark>	0.794063 0.2136					
	4	-3.972534 <mark>0.0000</mark>	-1.593812 0.0555	-2.765956 <mark>0.0028</mark>				
	5 	-3.089953 0.0010	-0.748099 0.2272	-1.673598 0.0471	0.814298 0.2077			

	I	<mark>0.01</mark>	. <mark>65</mark>	0.4936	0.2519	0.0804	0.2490			
	7	-3.4902 <mark>0.00</mark>	16 -1 02	.781082 0.0374	-2.439558 <mark>0.0074</mark>	-0.765840 0.2219	-1.266400 0.1027	-1.679380 0.0465		
	8	-1.8971 <mark>0.02</mark>	.09 -0 <mark>.89</mark>	.361180 0.3590	-0.828471 0.2037	0.546218 0.2925	0.088444 0.4648	-0.354785 0.3614		
	9 	-2.0507 <mark>0.02</mark>	00 -0 01	.950966 0.1708	-1.283692 0.0996	-0.328050 0.3714	-0.636509 0.2622	-0.935496 0.1748		
	10 	-2.7790 <mark>0.00</mark>	79 -1 27	.432053 0.0761	-1.880365 0.0300	-0.658084 0.2552	-1.039898 0.1492	-1.387458 0.0827		
	 11 	-2.6456 <mark>0.00</mark>	86 -0 41	.342701 0.3659	-1.162901 0.1224	1.184141 0.1182	0.383446 0.3507	-0.321426 0.3739		
Col M Row M	Mean- Mean	7		8	9	10				
	8	0.9888 0.16	07 14							
	9 	0.1039 0.45	52 -0 86	.607388 0.2718						
	10 	-0.0819 0.46	94 -0 73	.908257 0.1819	-0.154540 0.4386					
	 11 	1.5128 0.06	91 0 52	.145623 0.4421	0.796518 0.2129	1.234306 0.1085				
Warni Krusk	ing: by kal-Wal	y() value llis equa	s are	unlabele	ed, option r	nolabel impl	icit			
Warni Krusk + i	ing: by kal-Wal 	y() value llis equa e Obs	s are lity-o Rank	unlabele f-popula + Sum	ed, option r	nolabel impl test	icit			
Warni Krusk + i 	ing: by kal-Wal iincome	y() value llis equa e Obs 	lity-o Rank 4309 6645 10937 10626 7546	unlabele of-popula Sum 1.50 3.50 4.50 1.50 3.00	ed, option r	holabel impl	icit			
Warni Krusł + i 	ing: by kal-Wal iincome	Y() value llis equa 	lity-o Rank 4309 6645 10937 10626 7546 7546 7546 1720 808 1395 6034	unlabele of-popula Sum 1.50 3.50 4.50 1.50 3.00 4.00 9.50 1.00 2.00 8.00 9.50	ed, option r	holabel impl	icit			
Warni Krusł + i -Wal	y() value llis equa 	<pre>s are llity-o Rank A309 6645 10937 10626 7546 7546 4493 2460 1720 808 1395 6034 6034 5.564 w .4796 es = .1677</pre>	unlabele of-popula Sum + Sum 1.50 3.50 4.50 1.50 3.00 4.00 9.50 1.00 2.00 8.00 + 9.50 + ith 10 d 14.118	ed, option r ations rank d.f. 3 with 10 d.	f.	icit				
Warni Krusł + j -Wal	<pre>y() value llis equa e Obs </pre>	llity-o Rank 4309 6645 10937 10937 10937 10937 10937 10937 2460 1720 808 1395 6034 6034 6034 6034 6034 6034 6034 6034 6034 	unlabele of-popula Sum + Sum 1.50 3.50 4.50 1.50 3.00 4.00 9.50 1.00 2.00 8.00 9.50 + ith 10 c 14.118 irwise C (Nc	ed, option r ations rank d.f. 8 with 10 d. Comparison c o adjustment	f.	ncome				
Warni Krusł + j -Wal	<pre>y() value llis equa e Obs e Obs </pre>	lity-o Rank 4309 6645 10937 10626 7546 7546 7546 1720 808 1395 6034 .564 w .4796 es = .1677 n's Pa	unlabele of-popula Sum + Sum 1.50 3.50 4.50 1.50 3.50 4.50 1.50 3.00 4.00 9.50 1.00 2.00 8.00 9.50 9.50 14.118 irwise C (No	ed, option r ations rank d.f. 3 with 10 d. Comparison c b adjustment 2	f. of iq5 by ii	ncome		5		
Warni Krusł + i i i i i i i i i i i i i i i	<pre>kal-Wal kal-Wal iincome iincome fincome</pre>	<pre>y() value llis equa e Obs -++ l 85 2 124 3 220 4 194 5 138 -++ 6 81 7 45 8 29 9 13 0 22 -++ l 116 0 22 -++ l 116 0 22 -++ l 116 0 22 0 0 22 -++ l 0 0 0 0 0 0 0 0 0 0 </pre>	s are llity-o Rank Rank 4309 6645 10937 10626 7546 7546 7546 7546 808 1395 6034 6034 6034 564 w .1677 m's Pa 1 36 88	unlabele of-popula Sum + Sum 	ed, option r ations rank d.f. 3 with 10 d. Comparison c o adjustment 2	f. of iq5 by ii 3	ncome		5	
Warni Krusł + j e>kal-Wal kal-Wal iincome iincome fincome</pre>	<pre>y() value llis equa e Obs </pre>	<pre>s are llity-o Rank A309 6645 10937 10626 7546 7546 7546 1720 808 1395 6034 .1395 .564 w .4796 es = .1677 n's Pa 1 36 88 502 1 11</pre>	unlabele of-popula Sum + Sum 1.50 3.50 4.50 1.50 3.00 4.00 9.50 9.50 9.50 + 'ith 10 d 14.118 irwise C (No	ed, option r ations rank d.f. 8 with 10 d. Comparison co adjustment 2	f. of iq5 by ii 3	ncome		5		

1			2.2420	0.0217			
5	-1.140	193 ·	-0.347880	-1.803628	0.032089		
-	0.1	271	0.3640	0.0356	0.4872		
6	-1.213 0.1	243 · 125	-0.519526 0.3017	-1.746860 0.0403	-0.208654 0.4174	-0.222731 0.4119	
7	-0.853 0.1	708 · 966	-0.248352 0.4019	-1.198176 0.1154	0.020538 0.4918	-0.001021 0.4996	0.166739 0.4338
 8 1	-1.579	954 · 571	-1.093750	-1.915503	-0.899027	-0.893698	-0.699570
9	-1.518	954	-1.160057	-1.720222	-1.017718	-1.017309	-0.883481
 10	-2.101	410 ·	-1.679350	-2.420832	-1.519726	-1.504827	-1.307239
 11	0.0	178 139	0.0465	0.0077	0.0643	0.0662	0.0956
 Col Mean-	0.3	568	0.3163	0.2137	0.1779	0.2027	0.1739
+			·		پ 	10	
8 	-0.765 0.2	919 219					
9	-0.936 0.1	777 · 744	-0.337291 0.3679				
10 	-1.327 0.0	258 · 922	-0.576151 0.2823	-0.143834 0.4428			
1					1 02 02 1 0		
alpha = Reject Ho . dunntest Warning: k	0.597 0.2 0.05 if p = P iq6, by	686 750 (Z <= (iinco es are	1.384077 0.0832 z) <= ome) e unlabel	1.367391 0.0858 alpha/2 ed, option r	0.0264	icit	
11 alpha = Reject Ho . dunntest Warning: k Kruskal-Wa	0.597 0.2 0.05 if p = P c iq6, by by() valu	686 750 (Z <= (iinco es aro ality:	1.384077 0.0832 z) <= ome) e unlabel -of-popul	1.367391 0.0858 alpha/2 ed, option r ations rank	nolabel impl	icit	
11 alpha = Reject Ho . dunntest Warning: k Kruskal-Wa +	0.597 0.2 if p = P if q6, by by() valu allis equ	686 750 (Z <= (iinco es aro ality:	1.384077 0.0832 z) <= ome) e unlabel -of-popul	1.367391 0.0858 alpha/2 ed, option r ations rank	nolabel impl	icit	
11 alpha = Reject Ho . dunntest Warning: k Kruskal-Wa + iincom	0.597 0.2 if p = P id6, by by() valu allis equ ne Obs	686 750 (Z <= (iinco es arc ality Ran +	1.384077 0.0832 z) <= ome) e unlabel -of-popul + nk Sum	1.367391 0.0858 alpha/2 ed, option r ations rank	nolabel impl	icit	
<pre>11 11 alpha = Reject Ho Warning: k Kruskal-Wa + iincom </pre>	0.597 0.2 0.05 if p = P c iq6, by by() valu allis equ 	686 750 (Z <= es are ality Rai + 39! 65:	1.384077 0.0832 z) <= ome) e unlabel -of-popul + nk Sum 943.00 934.00	1.367391 0.0858 alpha/2 ed, option r ations rank	nolabel impl	icit	
<pre>11 11 Reject Ho . dunntest Warning: k Kruskal-Wa + iincom </pre>	0.597 0.2 if p = P c iq6, by py() valu allis equ allis equ 	686 750 (Z <= (iinco es arc ality Ran + 399 659 112 111	1.384077 0.0832 z) <= ome) e unlabel -of-popul + nk Sum 943.00 934.00 934.00 196.50	1.367391 0.0858 alpha/2 ed, option r ations rank	nolabel impl	icit	
<pre>11 11 alpha = Reject Ho dunntest Warning: k Kruskal-Wa + iincom </pre>	0.597 0.2 0.05 if p = P c iq6, by allis equ allis equ 	686 750 (Z <= (iinco es arc ality Ran + 399 559 112 1112 1112 1112	1.384077 0.0832 z) <= ome) e unlabel -of-popul + nk Sum 943.00 934.00 644.00 196.50 173.50 	1.367391 0.0858 alpha/2 ed, option r ations rank	nolabel impl	icit	
<pre>11 11 11 11 11 11 11 12 14 14 14 14 14 14 14 14</pre>	0.597 0.2 0.05 if p = P iq6, by by() valu allis equ allis equ allis equ 1 85 2 124 3 220 4 194 5 138 6 81 7 45	686 750 (Z <= (iinco es arc ality: Rai + 39: 112: 112: 111: 76: + 42: 27:	1.384077 0.0832 z) <= ome) e unlabel -of-popul 943.00 934.00 934.00 196.50 173.50 432.00 899.50	1.367391 0.0858 alpha/2 ed, option r ations rank	nolabel impl	icit	
<pre>11 11 Reject Ho . dunntest Warning: k Kruskal-Wa + iincom </pre>	0.597 0.2 0.05 if p = P c iq6, by by() valu allis equ allis equ allis equ allis equ allis equ bs 2 124 3 220 4 194 5 138 6 81 7 45 8 29 9 13	686 750 (Z <= (iinco es are ality Rai + 39 65 112 112 111 76 + 42 27 16 70	1.384077 0.0832 z) <= ome) e unlabel -of-popul + nk Sum + 943.00 934.00 934.00 644.00 173.50 432.00 899.50 523.00 017.00	1.367391 0.0858 alpha/2 ed, option r ations rank	nolabel impl	icit	
<pre>11 11 11 Reject Ho . dunntest Warning: k Warning: k Kruskal-Wa + iincom 	0.597 0.2 0.05 if p = P c iq6, by py() valu allis equ allis equ 	686 750 (Z <= (iinco es arc ality Ran + 399 112 111 111 76: + 422 277 163 70 123	1.384077 0.0832 z) <= ome) e unlabel -of-popul 	1.367391 0.0858 alpha/2 ed, option r ations rank	nolabel impl	icit	
<pre>11 11 alpha = Reject Ho dunntest Warning: k Kruskal-Wa</pre>	0.597 0.2 0.05 if p = P iq6, by by() valu allis equ allis equ allis equ allis equ allis equ by () valu allis equ allis	686 750 (Z <= (iinco es arc ality Rai + 39: 112; 112; 111; 76; + 42; 16; 12; 12; 77; 12; +; 57;	1.384077 0.0832 z) <= ome) e unlabel -of-popul 943.00 934.00 196.50 173.50 173.50 432.00 899.50 523.00 017.00 425.00 590.50 	1.367391 0.0858 alpha/2 ed, option r ations rank	nolabel impl	icit	
<pre>alpha = Reject Ho dunntest Warning: k Kruskal-Wa + iincom </pre>	0.597 0.2 0.05 if p = P c iq6, by by() valu allis equ allis equ allis equ 1 85 2 124 3 220 4 194 5 138 6 81 7 45 8 29 9 13 0 22 1 116 	686 750 (Z <= (iinco es arc ality Ran + 399 655 1122 1122 1112 1612 127 162 77 127 162 77 127 127 127	1.384077 0.0832 z) <= ome) e unlabel -of-popul + nk Sum + 943.00 934.00 644.00 196.50 173.50 899.50 523.00 017.00 425.00 590.50 + with 10	1.367391 0.0858 alpha/2 ed, option r ations rank	nolabel impl	icit	
<pre>11 11 11 11 11 12 13 14 14 14 14 14 14 14 14</pre>	0.597 0.2 0.05 if p = P c iq6, by allis equ allis equ allis equ 	686 750 (Z <= (iinco es arc ality Ran + 8 1 112 1112 1112 112 122 + 57 57 4.334 0.158	1.384077 0.0832 z) <= ome) e unlabel -of-popul + nk Sum 943.00 934.00 644.00 196.50 173.50 432.00 899.50 523.00 017.00 425.00 + with 10 3	1.367391 0.0858 alpha/2 ed, option r ations rank d.f.	nolabel impl	icit	
<pre>11 11 11 11 11 12 13 14 14 14 14 14 14 14 14</pre>	0.597 0.2 0.05 if p = P i q6, by by() valu allis equ allis	686 750 (Z <= (iinco es arc ality Ray + 39 112 111 76 122 162 112 127 127 16 77 57 57 57 57 57 57 57	1.384077 0.0832 z) <= ome) e unlabel -of-popul + nk Sum + 943.00 934.00 934.00 934.00 173.50 432.00 899.50 523.00 017.00 425.00 + with 10 3 21.31	<pre>1.367391 0.0858 alpha/2 ed, option r ations rank d.f. 2 with 10 d.</pre>	nolabel impl test	icit	
<pre>11 11 11 11 11 1 Reject Ho dunntest Warning: k Kruskal-Wa Kruskal-Wa</pre>	0.597 0.2 0.05 if p = P i q6, by py() valu allis equ allis equ 1 85 2 124 3 220 4 194 5 138 6 81 7 45 8 29 9 13 0 22 1 116 ed = 1 Equ = 1 Equ = 2 Du	686 750 (Z <= (iinco es arc ality Ran + 8 1 112; 111; 111; 111; 112; 12; +; 4.334 0.158; ies = 0.019;	1.384077 0.0832 z) <= ome) e unlabel -of-popul 	<pre>1.367391 0.0858 alpha/2 ed, option r ations rank d.f. 2 with 10 d. Comparison content</pre>	nolabel impl test	icit	
<pre>alpha = Reject Ho dunntest Warning: k Kruskal-Wa Kruskal-Wa</pre>	0.597 0.2 0.05 if p = P i q6, by by() valu allis equ allis	686 750 (Z <= (iinco es arc ality Ran + 399 112 111 76 122 + 42 273 16 70 122 + 57 57 122 16 15 16 16 15 16 16 15 16 16 16 16 16 16 16 16	1.384077 0.0832 z) <= ome) e unlabel -of-popul 	<pre>1.367391 0.0858 alpha/2 ed, option r ations rank d.f. 2 with 10 d. Comparison co o adjustment</pre>	.f. of iq6 by ii	.icit	

3	1					
	-1.3043 0.09	0.694423 061 0.2437	3			
4	 -3.1411 0.00	.46 -1.426563	-2.457107			
5	-2.3550	036 -0.647742	2 -1.456204	0.753132		
6		888 0.218080 847 0.4135	-0.360277	1.475366	0.795202	
7	-3.2209	-2.006780	-2.611245	-1.119447	-1.567548	-2.045979
8		011 -0.729574	-1.156479	0.067955	-0.344334	-0.839400
9	-0.9280	0.109172 093 -0.109172	-0.384708	0.461416	0.166563	-0.210799
10	-1.5690	049 -0.565228	-0.933516	0.147834	-0.220464	-0.673484
11	 -0.7358 0.23	1.079976 0.1401	5 0.536170 0.2959	2.586049	1.743757	0.748257
Col Mean- Row Mean	 7	8	9	10	0.0100	0.2272
8	+ 0.8346 0.20	545 920	0			
9	 1.0080 0.15	073 0.355517 667 0.3611	1			
10	 0.8398 0.20	0.069777 05 0.4722	-0.282811 0.3887			
11	2.7829 0.00	937 1.396782 9 <mark>27</mark> 0.0812	0.585780 0.2790	1.162216 0.1226		
11 Alpha = Reject Ho dunntes: Varning: N	2.7829 0.05 if p = P(t iq7, by(by() value allis equa	<pre>037 1.396782 127 0.0812 23 <= z) <= 24 25 iincome) 25 are unlabel 31 iincome)</pre>	2 0.585780 2 0.2790 alpha/2 .ed, option r .ations rank	1.162216 0.1226 holabel impl	licit	
11 Alpha = Reject Ho dunntes Narning: 1 Kruskal-Wa + iinco	2.7829 0.00 if p = P(t iq7, by(by() value allis equa me Obs	<pre>237 1.396782 227 0.0812 22 <= z) <= 32 (iincome) 33 are unlabel 34 ulity-of-popul 34 ulity-of-popul 35 are unlabel 36 are unlabel 37 (iincome) 38 are unlabel 39 (iincome) 39 (iincome) 30 (iinco</pre>	2 0.585780 0.2790 alpha/2 .ed, option r .ations rank	1.162216 0.1226 nolabel impl test	licit	
11 Alpha = Reject Ho dunntes Warning: 1 Kruskal-W. + iincon 	<pre> 2.7829 0.00 if p = P(t iq7, by(by() value allis equa</pre>	<pre>237 1.396782 227 0.0812 22 <= z) <= 32 (iincome) 25 are unlabel 26 ulity-of-popul 27 ulity-of-popul 28 are unlabel 29 ulity-of-popul 20 ulity-of-popu</pre>	2 0.585780 2 0.2790 alpha/2 .ed, option r .ations rank	1.162216 0.1226 holabel impl test	licit	
11 alpha = Reject Ho . dunntes Warning: 1 Kruskal-Wa tincon I	<pre> 2.7829 0.00 0.05 if p = P(t iq7, by(by() value allis equa allis equa me Obs </pre>	<pre>237 1.396782 227 0.0812 22 <= z) <= 32 (iincome) 33 are unlabel 34 ulity-of-popul 35 are unlabel 36 ulity-of-popul 36 ulity-of-popul 37 ulity-of-popu</pre>	2 0.585780 0.2790 alpha/2 .ed, option r .ations rank	1.162216 0.1226	licit	
11 alpha = Reject Ho . dunntes Warning: 1 Kruskal-Wa t i iincon 	<pre> 2.7829 0.05 if p = P(t iq7, by(by() value allis equa allis equa me Obs ++++ 1 85 2 124 3 220 4 194 5 138 +++++ 6 81 7 45 8 29 9 13 10 22 +++++++++++++++++++++++++++++++++++</pre>	<pre>237 1.396782 227 0.0812 22 <= z) <= 3000000000000000000000000000000000000</pre>	2 0.585780 0.2790 alpha/2 .ed, option r .ations rank	1.162216 0.1226	licit	
<pre>11 alpha = Reject Ho dunntes Warning: D Kruskal-Wa</pre>	<pre> 2.7829 0.00 0.05 if p = P(t iq7, by(by() value allis equa allis equa allis equa</pre>	<pre>237 1.396782 227 0.0812 22 <= z) <= 31 income) 32 are unlabel 33 are unlabel 34 ulity-of-popul 35 are unlabel 36 are unlabel 36 are unlabel 37 0.00 37 0.00 37 0.00 37 0.00 38 25 0.0 38 25 0.0 38 25 0.0 38 25 0.0 38 36 2.00 38 36 2.00 38 36 2.00 38 36 2.00 37 31 0 39 36 2.00 39 36 2.00 30 36 2.00 31 37 30 0 31 37 30 0 33 36 2.00 31 37 30 0 31 37 30 0 33 36 2.00 31 37 30 0 31 37 30 0 31 37 30 0 31 37 30 0 31 36 2.00 31 36 2.00 31 36 2.00 31 37 30 0 31 36 2.00 31 36 2</pre>	<pre>2 0.585780 0.2790 alpha/2 .ed, option r .ations rank d.f.</pre>	1.162216 0.1226	licit	

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Dunn's	Pairwise	Comparison	of	iq7	by	iincome	
	(N	No adjustme	nt)				

ol Moon	1		(Nc	adjustment	.)			
Now Mean	 	1		2	3	4	Ł	5
2	+ -0.911 0.1	185 811						
3	 -0.902 0.1	310 0. 834	116431 0.4537					
4	 -1.853 0.0	772 -0. 319	981248 0.1632	-1.278245 0.1006				
5	 -2.041 0.0	196 -1. 206	237557 0.1079	-1.530584 0.0629	-0.362009 0.3587			
6	-0.713 0.2	304 0. 378	122853 0.4511	0.034446 0.4863	0.985495 0.1622	1.219413 0.1113		
7	-1.439 0.0	516 -0. 750	787636 0.2155	-0.917725 0.1794	-0.146588 0.4417	0.093548 0.4627	-0.831651 0.2028	
8	-2.959 0.0	064 -2. 015	463005 0.0069	-2.637831 0.0042	-1.985144 0.0236	-1.737404 0.0412	-2.428826 0.0076	
9	-1.958 0.0	548 -1. 251	560599 0.0593	-1.639754 0.0505	-1.194228 0.1162	-1.040342 0.1491	-1.581461 0.0569	
10	-2.222 0.0	639 -1. 131	743556 0.0406	-1.862341 0.0313	-1.291486	-1.089991 0.1379	-1.750747 0.0400	
11 ol Mean-	-1.712 0.0	027 -0. 434	899033 0.1843	-1.126019 0.1301	-0.028207 0.4887	0.293755 0.3845	-0.923223 0.1779	
ow Mean	 +	7		8	9	10)	
8	-1.557 0.0	863 596						
9	-1.009 0.1	557 0. 564	159054 0.4368					
10	-1.023 0.1	591 0. 530	370267 0.3556	0.147496 0.4414				
11	0.119 0.4	255 1. 525	887710 0.0295	1.158465 0.1233	1.235174 0.1084			
lpha = eject Ho dunntes arning:] ruskal-Wa	0.05 if p = F t iq8, by cy() valu allis equ	?(Z <= z ?(iincome les are u ality-of) <= a) nlabele -popula	alpha/2 ed, option n ations rank	olabel impl test	icit		
+	ne Obs	Rank	+ Sum					
 	1 85 2 124 3 220 4 194 5 138	44398 67446 114674 109552 77545	 .00 .50 .50 .50 .00					
' 	/							
	6 81 7 45 8 29 9 13 10 22	39286 27072 11459 7777 11179	.00 .00 .50 .00 .00					

15.098 with 10 d.f. For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

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Col Mea Row Mea	n- n 2 1 3 4 1	-0.523795 0.3002 0.028930 0.4885 -1.112733	1 0.689738 0.2452	2	3	4		5	
	+ 2 3 4 	-0.523795 0.3002 0.028930 0.4885 -1.112733	0.689738 0.2452						
	3 4 	0.028930 0.4885 -1.112733	0.689738 0.2452						
	4	-1.112733							
	_ !	0.1329	-0.617347 0.2685	-1.507100 0.0659					
	5	-0.980783 0.1633	-0.496797 0.3097	-1.279359 0.1004	0.085372 0.4660				
	6 	0.820893 0.2059	1.408492 0.0795	0.952324 0.1705	2.057639 0.0198	1.876777 0.0303			
	7	-1.468715 0.0710	-1.132022 0.1288	-1.677545 0.0467	-0.761682 0.2231	-0.789533 0.2149	-2.141891 0.0161		
	8 	2.019931 0.0217	2.463517 0.0069	2.180125 0.0146	2.908858	2.788476 0.0026	1.418337 0.0780		
	9	-0.870561 0.1920	-0.636301 0.2623	-0.921258 0.1785	-0.399729 0.3447	-0.427500 0.3345	-1.294341 0.0978		
1	0	0.202668 0.4197	0.528388 0.2986	0.200283 0.4206	0.858878 0.1952	0.800248 0.2118	-0.328534 0.3713		
1 Col Mea	1 n-	0.247939 0.4021	0.845071 0.1990	0.276314 0.3912	1.534811 0.0624	1.354597 0.0878	-0.635813 0.2624		
Row Mea	n +		7	8	9	10			
	8 	2.961248 0.0015							
	9 	0.036549 0.4854	-2.078189 0.0188						
1	0	1.227169 0.1099	-1.364937 0.0861	0.879687 0.1895					
1	1 	1.743327 0.0406	-1.921793 0.0273	1.007449 0.1569	-0.056245 0.4776				
alpha = Reject	0. Ho if	05 p = P(Z <	<= z) <= a	lpha/2					
dunnt	est i	a9. by(iir	come)						
Warning	: bv() values a	are unlabele	d, option n	olabel impl	icit			
5	-				-				
Kruskal	-Wall	is equalit.	cy-of-popula	tions rank	test				
+ iin	 come	Obs 1	+ Rank Sum						
		++							
	1 2	85 4	12614.00 71402.00						
1	3	220 11	15021.00 j						
	4	194 10)/204.00 73164 00						
		++							
	6	81 3	36234.00						
	8	29 2	18002.00						

Row Mean 2 	-1.847551	1 	Z		//		_
							5
	0.0323						
3 	-0.587541 0.2784	1.648615 0.0496					
4	-1.376451 0.0843	0.705584 0.2402	-1.056011 0.1455				
5	-0.730439 0.2326	1.288633 0.0988	-0.236466 0.4065	0.703374 0.2409			
6	1.214944	3.141555	2.028888	2.779463	2.067305		
7	-1.360262	0.053977	-1.074127	-0.433524	-0.874138	-2.363446	
8	-1.939659	-0.760958	-1.731626	-1.195867	-1.548947	-2.799362	
9	0.350465	1.250438	0.628553	0.989247	0.706893	-0.282083	
10	-0.739751	0.359696	-0.455786	0.009284	-0.332100	-1.520705	
11	-0.826199	1.100886	-0.374111	0.520401	-0.136936	-2.117528	
Col Mean- Row Mean	0.2043	0.1355	0.3542 8	9	0.4455	0.01/1	
8	-0.698600						
9	1.127888	1.562424					
10	0.283759	0.849481	-0.804181				
11	0.756224	1.440971	-0.760168	0.253676			
alpha = (0.2248	0.0/40	0.2230	0.3333			
Reject Ho i	fp = P(Z <	= z) <= a	lpha/2				

		+							
chi-squar probabili	ed = 8.75 ty = 0.55	54 with 10 d 556	.f.						
chi-squar probabili	ed with ties ty = <mark>0.10</mark>	= 15.902	with 10 d.	f.					
	Dunn's	Pairwise Co	mparison of	iq10 by ii	Income				
Col Mean- Row Mean		(No 1	adjustment 2	3	4		5	6	
2	+ -1.510986								
3	0.0654 -1.740758	-0.084983							
	0.0409	0.4661	0.045024						
4	-2.349653 0.0094 	-0.807641 0.2096	-0.845934 0.1988						
5	-2.428329 0.0076	-0.986350 0.1620	-1.036053 0.1501	-0.262123 0.3966					
6	-1.709198 0.0437	-0.368355 0.3563	-0.331484 0.3701	0.304134 0.3805	0.495983 0.3100				
7	 -3.098024 0.0010	-2.059211 0.0197	-2.132063 0.0165	-1.604670 0.0543	-1.376629	-1.644439 0.0500			
8	 -2.614557 0.0045	-1.694358 0.0451	-1.720791 0.0426	-1.289040 0.0987	-1.113423 0.1328	-1.371867 0.0851			
9	 -1.674775 0.0470	-0.980992 0.1633	-0.968521 0.1664	-0.674109 0.2501	-0.565066 0.2860	-0.781047 0.2174			
10	 -1.709276 0.0437	-0.847650 0.1983	-0.834294 0.2021	-0.458910 0.3231	-0.322558 0.3735	-0.596764 0.2753			
11	 -1.524450 0.0637	-0.037823 0.4849	0.040590 0.4838	0.749543 0.2268	0.930124 0.1762	0.329695			
Col Mean- Row Mean		7	8	9	10				
8	0.037254 0.4851								
9	 0.229874 0.4091	0.190278 0.4245							
10	 0.623759 0.2664	0.542557 0.2937	0.256952 0.3986						
11	 2.012741 0.0221	1.659858 0.0485	0.961094 0.1683	0.822269 0.2055					
alpha = Reject Ho	0.05 if p = P(Z <	<= z) <= a	lpha/2						

iregic	n Obs R	ank Sum				
	1 47 2	 5801.50				
	2 123 6	7314.50				
	4 60 3	0521.00				
	5 196 9	9988.50 				
	6 74 3	9154.50				
	7 102 5 8 77 4	3159.00 0078.50				
 +	9 189 10	1830.50				
hi-square	d = 2.16 v = 0.97	3 with 8 d	.f.			
hi-square	d with ties	- 3.72	6 with 8 d f	=		
robabilit	y = 0.88	09				
	Dunn's	Pairwise (Comparison c	of ial by in	region	
ol Moor '	241111 0	(No	o adjustment	~y ;)		
ol Mean- ow Mean	1	2	3	4	5	6
2	0.042474		(
	0.4831					
3	0.269342	0.316211				
	0.3938	0.3759				
4	0.888316	1.052593	0.872168			
	0.1872	0.1463	0.1910			
5	1.026723	1.386337	1.206927	-0.042564		
	0.1020	0.0020	0.1107	0.4050		
6	0.457191 0.3238	0.530134	0.302107	-0.505166 0.3067	-0.597188 0.2752	
	0 677356	0 837319	0 615384	-0 329566	-0 387744	0 223575
,	0.2491	0.2012	0.2692	0.3709	0.3491	0.4115
8	0.660596	0.791341	0.580345	-0.294747	-0.330689	0.227308
	0.2544	0.2144	0.2808	0.3841	0.3704	0.4101
9	0.268329	0.314656	-0.001383	-0.872573	-1.206703	-0.302920
ol Mean-l	0.3942	0.3765	0.4994	0.1914	0.1138	0.3810
ow Mean	7	8				
+ 8	0.018968					
	0.4924					
9	-0.615972	-0.580954				
	0.2000	0.2000				
⊥pha = eject Ho	0.05 if p = P(Z <	= z) <= a	alpha/2			
dunntest	iq2, by(ire	gion)				
arning: h	v() values a	re unlabele	ed, option r	nolabel impl	licit	
	,,, , , , , , , , , , , , , , , , , ,		, operon i			
ruskal-Wa	llis equalit	y-of-popula	ations rank	test		
+	-	+				
iregic	n Obs R	ank Sum				

Col Mean 1 2 3 4 5 Row Mean 1 2 3 4 5 2 -1.401196 0.0806 3 -0.673408 1.128301 0.2503 0.1296 4 -0.333024 1.113944 0.302762 0.3696 0.1327 0.3810 5 -0.313209 1.646623 0.577895 0.094889 0.3771 0.0498 0.2817 0.4622 6 0.044227 1.689339 0.860804 0.420891 0.433300 0.4824 0.0456 0.1947 0.3369 0.3324 7 -0.841525 0.686424 -0.314897 -0.513148 -0.798495 -1.022 0.2000 0.2462 0.3764 0.3039 0.2123 0.2 8 -1.590200 -0.372086 -1.366818 -1.332635 -1.810343 -1.858 0.0559 0.3549 0.0658 0.0913 0.0351 0.0 9 -0.644434 1.167399 0.045410 -0.271087 -0.531360 -0.824 0.2596 0.1215 0.4819 0.3932 0.2976 0.2 Col Mean 7 8 8 -0.967067 0.2606 0.1215 0.4819 0.3932 0.2976 0.2 Col Mean 7 8 8 -0.967067 0.3622 0.0807 alpha = 0.05 Reject Ho if p = P(Z <= z) <= alpha/2	<i>.</i>		egion	of iq2 by ir	Comparison o adjustment	s Pairwise ((No	Dunn':	
2 -1.401196 0.0806 3 -0.673408 1.128301 0.2503 0.1296 4 -0.333024 1.113944 0.302762 0.3696 0.1327 0.3810 5 -0.313209 1.646623 0.577895 0.094889 0.3771 0.0498 0.2817 0.4622 6 0.044227 1.689339 0.860804 0.420891 0.433300 0.4824 0.0456 0.1947 0.3369 0.3324 7 -0.841525 0.686424 -0.314897 -0.513148 -0.798495 -1.023 0.2000 0.2462 0.3764 0.3039 0.2123 0.3 8 -1.590200 -0.372086 -1.366818 -1.332635 -1.810343 -1.856 0.0559 0.3549 0.0858 0.0913 0.0351 0.0 9 -0.644434 1.167399 0.045410 -0.271087 -0.531360 -0.824 0.2596 0.1215 0.4819 0.3932 0.2976 0.2 Col Mean-I Row Mean 7 8 8 -0.967067 0.1668 9 0.352577 1.400283 0.3622 0.0807 alpha = 0.05 Reject Ho if p = P(Z <= z) <= alpha/2	6	6	5	4	3	2	1	Col Mean- Row Mean
3 -0.673408 1.128301 0.2503 0.1296 4 -0.333024 1.113944 0.302762 0.3696 0.1327 0.3810 5 -0.313209 1.646623 0.577895 0.094889 0.3771 0.0498 0.2817 0.4622 6 0.044227 1.689339 0.860804 0.420891 0.433300 0.4824 0.0456 0.1947 0.3369 0.3324 7 -0.841525 0.686424 -0.314897 -0.513148 -0.798495 -1.023 0.2000 0.2462 0.3764 0.3039 0.2123 0.3 8 -1.590200 -0.372086 -1.366818 -1.332635 -1.610343 -1.855 0.0559 0.3549 0.0858 0.0913 0.0351 0.0 9 -0.644434 1.167399 0.045410 -0.271087 -0.531360 -0.824 0.2596 0.1215 0.4819 0.3932 0.2976 0.2 Col Mean- Row Mean 7 8 							-1.401196	2
<pre>4 -0.333024 1.113944 0.302762 0.3696 0.1327 0.3810 5 -0.313209 1.646623 0.577895 0.094889 0.3771 0.0498 0.2817 0.4622 6 0.044227 1.689339 0.860804 0.420891 0.433300 0.4824 0.0456 0.1947 0.3369 0.3324 7 -0.841525 0.686424 -0.314897 -0.513148 -0.798495 -1.029 0.2000 0.2462 0.3764 0.3039 0.2123 0.3 8 -1.590200 -0.372086 -1.366818 -1.332635 -1.810343 -1.856 0.0559 0.3549 0.0858 0.0913 0.0351 0.0 9 -0.644434 1.167399 0.045410 -0.271087 -0.531360 -0.826 0.2596 0.1215 0.4819 0.3932 0.2976 0.2 Col Mean 7 8 </pre>						1.128301 0.1296	-0.673408	3
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$					0.302762	1.113944 0.1327	-0.333024 0.3696	4
6 0.044227 1.689339 0.860804 0.420891 0.433300 0.4824 0.0456 0.1947 0.3369 0.3324 7 -0.841525 0.686424 -0.314897 -0.513148 -0.798495 -1.025 0.2000 0.2462 0.3764 0.3039 0.2123 0.3 8 -1.590200 -0.372086 -1.366818 -1.332635 -1.810343 -1.858 0.0559 0.3549 0.0858 0.0913 0.0351 0.0 9 -0.644434 1.167399 0.045410 -0.271087 -0.531360 -0.826 0.2596 0.1215 0.4819 0.3932 0.2976 0.2 Col Mean- Row Mean 7 8 -0.967067 0.1668 9 0.352577 1.400283 0.3622 0.0807 alpha = 0.05 Reject Ho if p = P(Z <= z) <= alpha/2				0.094889	0.577895 0.2817	1.646623 0.0498	-0.313209 0.3771	5
7 -0.841525 0.686424 -0.314897 -0.513148 -0.798495 -1.025 0.2000 0.2462 0.3764 0.3039 0.2123 0.3 8 -1.590200 -0.372086 -1.366818 -1.332635 -1.810343 -1.858 0.0559 0.3549 0.0858 0.0913 0.0351 0.0 9 -0.644434 1.167399 0.045410 -0.271087 -0.531360 -0.824 0.2596 0.1215 0.4819 0.3932 0.2976 0.2 Col Mean- Row Mean 7 8 			0.433300 0.3324	0.420891 0.3369	0.860804 0.1947	1.689339 0.0456	0.044227 0.4824	6
8 -1.590200 -0.372086 -1.366818 -1.332635 -1.810343 -1.858 0.0559 0.3549 0.0858 0.0913 0.0351 0.0 9 -0.644434 1.167399 0.045410 -0.271087 -0.531360 -0.826 0.2596 0.1215 0.4819 0.3932 0.2976 0.2 Col Mean- Now Mean 7 8 	25584 .1525	-1.025584 0.1525	-0.798495 - 0.2123	-0.513148 0.3039	-0.314897 0.3764	0.686424 0.2462	-0.841525 0.2000	7
9 -0.644434 1.167399 0.045410 -0.271087 -0.531360 -0.826 0.2596 0.1215 0.4819 0.3932 0.2976 0.2 Col Mean- Row Mean 7 8 	38851 .0315	-1.858851 0.0315	-1.810343 - 0.0351	-1.332635 0.0913	-1.366818 0.0858	-0.372086 0.3549	-1.590200 0.0559	8
Sol Mean 7 8 Row Mean 7 8	26147 .2044	-0.826147 0.2044	-0.531360 - 0.2976	-0.271087 0.3932	0.045410 0.4819	1.167399 0.1215	-0.644434 0.2596	9 Sol Moon-
<pre>8 -0.967067 0.1668 9 0.352577 1.400283 0.3622 0.0807 alpha = 0.05 Reject Ho if p = P(Z <= z) <= alpha/2</pre>						8	7	Row Mean
9 0.352577 1.400283 0.3622 0.0807 alpha = 0.05 Reject Ho if $p = P(Z \le z) \le alpha/2$							-0.967067 0.1668	8
alpha = 0.05 Reject Ho if p = P(Z <= z) <= alpha/2						1.400283 0.0807	0.352577 0.3622	9
					alpha/2	<= z) <= a	0.05 if p = P(Z <	alpha = Reject Ho
. dunntest iq3, by(iregion)						egion)	: iq3, by(ire	. dunntest
Narning: by() values are unlabeled, option nolabel implicit			icit	olabel impl	ed, option n	are unlabele	oy() values a	∛arning: k
Kruskal-Wallis equality-of-populations rank test				test	ations rank	y-of-popula	allis equalit	Kruskal-Wa
++ iregion Obs Rank Sum						+ Rank Sum	on Obs I	+ iregio
 1 47 24663.50							++	
1 47 24663.50 2 123 68571.50						1	1 47 1 3	1

probabilit	y = 0.322	4	. wich o U.I	•		
	Dunn's	Pairwise ((No	Comparison c o adjustment	of iq3 by ir :)	egion	
Col Mean- Row Mean	1	2	3	4	5	6
2	-0.861221 0.1946					
3	-0.571695 0.2838	0.471363 0.3187				
4	0.850479 0.1975	1.989908 0.0233	1.747619 0.0403			
5	0.254530 0.3995	1.643252 0.0502	1.320843 0.0933	-0.842644 0.1997		
6 	0.602672 0.2734	1.767949 0.0385	1.500029 0.0668	-0.306543 0.3796	0.520904 0.3012	
7	0.431017 0.3332	1.670219 0.0474	1.377797 0.0841	-0.551195 0.2908	0.283785 0.3883	-0.238533 0.4057
8 	-0.682835 0.2474	0.146504 0.4418	-0.246206 0.4028	-1.696032	-1.247144 0.1062	-1.466964 0.0712
9 Col Mean-	-0.362407 0.3585	0.764912 0.2222	0.331578 0.3701	-1.516629 0.0647	-0.984934 0.1623	-1.250510 0.1056
Row Mean +	7	8				
8 	-1.340578 0.0900					
 9 	-1.099269 0.1358	0.497979 0.3092				
alpha = Reject Ho	0.05 if p = P(Z <=	z) <= a	alpha/2			
. dunntest	iq4, by(ireg	ion)				
warning: c	oy() values ar	e uniadeie	ed, option r	lolabel impi	lClt	
Kruskal-Wa	allis equality	-of-popula	ations rank	test		
+ iregio	on Obs Ran	+ k Sum				
	1 47 238	 98.00				
	2 123 703 3 190 998	71.00 03.00				
	4 60 295	74.00 27.50				
	++ 2 130 332					
	6 74 396 7 102 560	68.00 00.00				
	8 77 430	87.50 82.00				
1	984 צאב ש 	02.00				
+	d - 5 937	with 8 d.	f.			
+ chi-square probabilit	xy = 0.654	3				

Col Mean- Row Mean	1	2	3	4	5	6
2	-1.39986	 68 08				
3	-0.38915 0.348	1.526466 0.0634				
4	0.30140 0.381	1.897289 .6 0.0289	0.824575 0.2048			
5	0.03936 0.484	51 2.142444 3 0.0161	0.685502 0.2465	-0.354599 0.3614		
6	-0.55775 0.288	0.924573 0.1776	-0.296550 0.3834	-0.936798 0.1744	-0.809347 0.2092	
7	-0.86745 0.192	0.650583 0.2577	-0.729396 0.2329	-1.300823 0.0967	-1.304961 0.0960	-0.320211 0.3744
8	-1.04129 0.148	0.325541 0.3724	-0.957487 0.1692	-1.460253 0.0721	-1.480649 0.0694	-0.544963 0.2929
9 Nean-1	-0.29154 0.385	1.661935 0.0483	0.154551 0.4386	-0.716903 0.2367	-0.528838 0.2985	0.412115 0.3401
low Mean	7	8				
8	-0.26375 0.396	64 60				
9	0.85795 0.195	1.074198 0.1414				
alpha = Reject Ho dunntest Warning: k	0.05 if p = P(Z iq5, by(i by() values	z <= z) <= a region) are unlabele	alpha/2 ed, option n	olabel impl	icit	
Alpha = Reject Ho dunntest Warning: k Kruskal-Wa	0.05 if p = P(Z : iq5, by(i by() values allis equal	z <= z) <= a region) s are unlabele ity-of-popula	alpha/2 ed, option n ations rank	olabel impl test	icit	
Alpha = Reject Ho dunntest Warning: k Kruskal-Wa + iregic	0.05 if p = P(Z c iq5, by(i by() values allis equal	<pre>c <= z) <= a .region) are unlabele .ity-of-popula </pre>	alpha/2 ed, option n ations rank	olabel impl	icit	
Alpha = Reject Ho dunntest Warning: k Kruskal-Wa + iregic 	0.05 if p = P(Z c iq5, by(i py() values allis equal on Obs 	<pre>c <= z) <= a .region) c are unlabele .ity-of-popula</pre>	alpha/2 ed, option n ations rank	olabel impl	icit	
Alpha = Reject Ho dunntest Marning: k Kruskal-Wa + iregic 	0.05 if p = P(Z c iq5, by(i by() values allis equal on Obs 	<pre>c <= z) <= a .region) a are unlabele .ity-of-popula</pre>	alpha/2 ed, option n ations rank	olabel impl	icit	
Alpha = Reject Ho dunntest Jarning: k Gruskal-Wa + i iregic 	0.05 if p = P(Z c iq5, by(i by() values allis equal on Obs 	<pre>c <= z) <= a .region) a are unlabele .ity-of-popula</pre>	alpha/2 ed, option n ations rank	olabel impl	icit	
Alpha = Reject Ho dunntest Jarning: k Kruskal-Wa + iregic 	0.05 if p = P(Z a iq5, by(i by() values allis equal on Obs 	<pre>c <= z) <= a .region) a are unlabele .ity-of-popula</pre>	alpha/2 ed, option n ations rank	olabel impl test	icit	
Alpha = Reject Ho Marning: k Gruskal-Wa t i iregic i i i i i i i i i i i i i i i i	0.05 if p = P(Z a iq5, by(i by() values allis equal on Obs 	<pre>c <= z) <= a .region) a are unlabele .ity-of-popula</pre>	alpha/2 ed, option n ations rank .f. 5 with 8 d.f	olabel impl test	icit	
Alpha = Reject Ho dunntest Warning: k Gruskal-Wa t i iregic i i iregic i chi-square brobabilit chi-square	0.05 if p = P(Z iq5, by(i by() values allis equal on Obs 1 47 2 123 3 190 4 60 5 196 	<pre>c <= z) <= a .region) c are unlabele .ity-of-popula</pre>	alpha/2 ed, option m ations rank .f. 5 with 8 d.f	olabel impl test	icit	
Alpha = Reject Ho . dunntest Warning: k (ruskal-Wa + iregic : 	0.05 if p = P(Z iq5, by(i by() values allis equal on Obs 	<pre>2 <= z) <= a aregion) a are unlabele ity-of-popula </pre>	alpha/2 ed, option m ations rank .f. 5 with 8 d.f Comparison c b adjustment 3	olabel impl test : of iq5 by ir	icit region	6
Alpha = Reject Ho . dunntest Varning: k (ruskal-Wa + iregic 	0.05 if p = P(Z a iq5, by(i by() values allis equal on Obs 	<pre>3 <= z) <= a aregion) 5 are unlabele ity-of-popula</pre>	alpha/2 ed, option m ations rank 5 with 8 d.f Comparison c o adjustment 3	olabel impl test f iq5 by ir) 4	icit region	6

0.204685 0.4189	1.227342 0.1098	-0.192492 0.4237				
0.542899 0.2936	2.100075 0.0179	0.194468 0.4229	0.327393 0.3717			
-0.610565 0.2707	0.268597 0.3941	-1.330089 0.0917	-0.885045 0.1881	-1.480943 0.0693		
-0.075772 0.4698	1.045718 0.1478	-0.665873 0.2527	-0.327165 0.3718	-0.831627 0.2028	0.658314 0.2552	
0.033979 0.4864	1.098894 0.1359	-0.459584 0.3229	-0.195009 0.4227	-0.608833 0.2713	0.738209 0.2302	
0.184904 0.4267	1.584274 0.0566	-0.372203 0.3549	-0.065677 0.4738	-0.569284 0.2846	1.050261 0.1468	
7	8					
0.130148 0.4482						
0.354032 0.3617	0.176403 0.4300					
0.05 if p = P(Z <	= z) <= a	lpha/2				
in (her (her						
. iqo, by(ire	gion)					
y() values a	re uniabele	α, οριτοή ή		LICIL		
allis equalit	y-of-popula	tions rank	test			
	+					
n Obs R	ank Sum 					
1 47 2	4290.50 7846 50					
3 190 10	1167.00					
4 60 3 5 196 10	1261.00 3413.00					
6 74 3	 6430.00					
7 102 5	2408.00 0753 50					
9 189 10	2641.50					
	+					
d = 2.53 y = 0.96	5 with 8 d. 01	f.				
ed with ties	= 3.778	with 8 d.f	· .			
y = 0.87	<mark>66</mark>					
Dunn's	Pairwise C	omparison c	f iq6 by ir	region		
1	2	3	4	5	6	
-0.810245 0.2089						
-0.810245 0.2089 -0.383515 0.3507	0.660725 0.2544					
-0.810245 0.2089 -0.383515 0.3507 -0.086090 0.4657	0.660725 0.2544 0.775858 0.2189	0.308663 0.3788				
-0.810245 0.2089 -0.383515 0.3507 -0.086090 0.4657 -0.265616 0.3953	0.660725 0.2544 0.775858 0.2189 0.832852 0.2025	0.308663 0.3788 0.189948 0.4247	-0.178732 0.4291			
-0.810245 0.2089 -0.383515 0.3507 -0.086090 0.4657 -0.265616 0.3953 0.525236	0.660725 0.2544 0.775858 0.2189 0.832852 0.2025 1.610354	0.308663 0.3788 0.189948 0.4247 1.170901	-0.178732 0.4291 0.660455	1.034219		
	<pre>0.4189 0.542899 0.2936 0.2936 0.2936 0.2707 0.610565 0.2707 0.4698 0.033979 0.4864 0.04864 0.184904 0.4267 0.130148 0.4482 0.354032 0.3617 0.05 if p = P(Z < c iq6, by(ire oy() values a allis equalit on Obs R allis equalit on O</pre>	<pre>0.4189 0.1098 0.542899 2.100075 0.2936 0.0179 0.2707 0.3941 0.0075772 1.045718 0.4698 0.1478 0.4698 0.1478 0.033979 1.098894 0.4864 0.1359 0.184904 1.584274 0.4267 0.0566 0 7 8 0.130148 0.4482 0.4482 0.354032 0.176403 0.3617 0.4300 0.05 if p = P(Z <= z) <= a c iq6, by(iregion) by() values are unlabele allis equality-of-popula c.1005 Rank Sum 0.123 67846.50 3 190 101167.00 4 60 31261.00 5 196 103413.00 0.05 if p = 102 41.50 2 123 67846.50 3 190 102 41.50 0.01 0.02 0.03 0.04 0.04 0.04 0.04 0.04 0.04 0.04</pre>	<pre>0.4189 0.1098 0.4237 0.542899 2.100075 0.194468 0.2936 0.0179 0.4229 0.2707 0.3941 0.0917 -0.610565 0.268597 -1.330089 0.2707 0.3941 0.0917 -0.075772 1.045718 -0.665873 0.4698 0.1478 0.2527 0.033979 1.098894 -0.459584 0.4864 0.1359 0.3229 0.184904 1.584274 -0.372203 0.4267 0.0566 0.3549 7 8 </pre>	<pre>0.4189 0.1098 0.4237 0.542899 2.100075 0.194468 0.327393 0.2936 0.0179 0.4229 0.3717 -0.610565 0.268597 -1.330089 -0.885045 0.2707 0.3941 0.0917 0.1881 -0.075772 1.045718 -0.665873 -0.327165 0.4698 0.1478 0.2527 0.3718 0.033979 1.098894 -0.459584 -0.195009 0.4864 0.1359 0.3229 0.4227 0.184904 1.584274 -0.372203 -0.065677 0.4267 0.0566 0.3549 0.4738 0.3617 0.4300 0.05 if p = P(Z <= z) <= alpha/2 c iq6, by(iregion) oy() values are unlabeled, option nolabel impl allis equality-of-populations rank test </pre>	<pre>0.4189 0.1098 0.4237 0.542899 2.100075 0.194468 0.327393 0.2936 0.0179 0.4229 0.3717 -0.610565 0.268597 -1.330089 -0.885045 -1.480943 0.2707 0.3941 0.0917 0.1881 0.0693 -0.075772 1.045718 -0.665873 -0.327165 -0.831627 0.4698 0.1478 0.2527 0.3718 0.2028 0.033979 1.098894 -0.459584 -0.195009 -0.608833 0.4864 0.1359 0.3229 0.4227 0.2713 0.184904 1.584274 -0.372203 -0.065677 -0.569284 0.4267 0.0566 0.3549 0.4738 0.2846 1 7 8 </pre>	0.4199 0.1098 0.4237 0.542899 2.100075 0.194468 0.327393 0.2936 0.0179 0.4229 0.3717 1 -0.610555 0.268597 -1.330689 -0.885045 -1.480943 0.2707 0.3941 0.0917 0.1881 0.0693 -0.075772 1.045718 -0.665873 -0.327165 -0.831627 0.658314 0.4698 0.1478 0.2527 0.3718 0.2028 0.2552 0.033979 1.098894 -0.459584 -0.195009 -0.608833 0.738209 0.4864 0.1359 0.3229 0.4227 0.2713 0.2302 0.184904 1.584274 -0.37203 -0.65677 -0.569284 1.050261 0.4267 0.0566 0.3549 0.4738 0.2846 0.1468 7 8

Ι

7	0.068329 0.4728	0.1298	0.607136 0.2719	0.177112 0.4297	0.452013 0.3256	-0.562680 0.2868
 8 	-0.268646 0.3941	0.613941 0.2696	0.094387 0.4624	-0.191391 0.4241	-0.048979 0.4805	-0.907275 0.1821
 9	-0.643588	0.293845	-0.412947	-0.594761	-0.605829	-1.479401
 Col Mean Row Mean	0.2599	0.3844 8	0.3398	0.2760	0.2723	0.0695
++ 8	-0.409188					
9	-0.951871	-0.408107				
 alpha =	0.1706	0.3416				
Reject Ho	if p = P(Z <	= z) <= a	lpha/2			
. dunntest	iq7, by(ire	gion)				
Warning: b	y() values a	re unlabele	d, option n	olabel impl	icit	
Kruskal-Wa	llis equalit	y-of-popula	tions rank	test		
+		+				
	++ 1 47 2	 5775.50				
i	2 123 6 3 190 9	9441.50 6261.50				
l l	4 60 2 5 196 10	9885.00 4560.50				
	6 74 3 7 102 5	6689.50				
	9 189 9	1935.00 9753.50				
+		+				
chi-square probabilit	d = 5.00 y = 0.75	4 with 8 d. 72	f.			
chi-square	d with ties $v = 0.62$	= 6.168	with 8 d.f			
5105051110	<u>y</u> 0.02					
0.1 Mara 1	Dunn's	Pairwise C (No	omparison o adjustment	f iq7 by ir)	egion	
Row Mean	1	2	3	4	5	6
2 1						
2	-0.342213 0.3661					
2 	-0.342213 0.3661 0.931783	1.818737				
2 3 4	-0.342213 0.3661 0.931783 0.1757 0.938892	1.818737 0.0345 1.534078	0 209944			
2 3 4 	-0.342213 0.3661 0.931783 0.1757 0.938892 0.1739	1.818737 0.0345 1.534078 0.0625	0.209944 0.4169			
2 3 4 5	-0.342213 0.3661 0.931783 0.1757 0.938892 0.1739 0.334313 0.3691	1.818737 0.0345 1.534078 0.0625 0.982182 0.1630	0.209944 0.4169 -0.957666 0.1691	-0.871545 0.1917		
2 3 4 5 5 6	-0.342213 0.3661 0.931783 0.1757 0.938892 0.1739 0.334313 0.3691 1.024920 0.1527	1.818737 0.0345 1.534078 0.0625 0.982182 0.1630 1.698322 0.0447	0.209944 0.4169 -0.957666 0.1691 0.287329 0.3869	-0.871545 0.1917 0.047674 0.4810	1.003173 0.1579	
2 3 4 5 5 6 7	-0.342213 0.3661 0.931783 0.1757 0.938892 0.1739 0.334313 0.3691 1.024920 0.1527 0.005924 0.4976	1.818737 0.0345 1.534078 0.0625 0.982182 0.1630 1.698322 0.0447 0.446007 0.3278	0.209944 0.4169 -0.957666 0.1691 0.287329 0.3869 -1.228147 0.1097	-0.871545 0.1917 0.047674 0.4810 -1.117670 0.1319	1.003173 0.1579 -0.436178 0.3314	-1.245082 0.1066
2 3 4 5 5 6 7 7 8 8	-0.342213 0.3661 0.931783 0.1757 0.938892 0.1739 0.334313 0.3691 1.024920 0.1527 0.005924 0.4976 0.074683 0.4702	1.818737 0.0345 1.534078 0.0625 0.982182 0.1630 1.698322 0.0447 0.446007 0.3278 0.498964 0.3089	0.209944 0.4169 -0.957666 0.1691 0.287329 0.3869 -1.228147 0.1097 -1.021316 0.1536	-0.871545 0.1917 0.047674 0.4810 -1.117670 0.1319 -0.981768 0.1631	1.003173 0.1579 -0.436178 0.3314 -0.300926 0.3817	-1.245082 0.1066 -1.089410 0.1380
2 3 4 5 5 6 7 8 8 9	-0.342213 0.3661 0.931783 0.1757 0.938892 0.1739 0.334313 0.3691 1.024920 0.1527 0.005924 0.4976 0.074683 0.4702 0.459648	1.818737 0.0345 1.534078 0.0625 0.982182 0.1630 1.698322 0.0447 0.446007 0.3278 0.498964 0.3089 1.153261	0.209944 0.4169 -0.957666 0.1691 0.287329 0.3869 -1.228147 0.1097 -1.021316 0.1536 -0.748309	-0.871545 0.1917 0.047674 0.4810 -1.117670 0.1319 -0.981768 0.1631 -0.728610	1.003173 0.1579 -0.436178 0.3314 -0.300926 0.3817 0.202295	-1.245082 0.1066 -1.089410 0.1380 -0.847727

+	+ 0.084653	·					
0	0.4663						
9	0.601297 0.2738	0.451909 0.3257					
alpha =	0.05						
Reject Ho	if p = P(Z <	<= z) <= a	alpha/2				
. dunntest	t iq8, by(ire	egion)					
Warning: k	oy() values a	re unlabele	ed, option n	olabel impl	icit		
Kruskal-Wa	allis equalit	y-of-popula	ations rank	test			
+ iregic	on Obs R	Aank Sum					
	++ 1 47 2	 24173.50					
	2 123 6	3543.50					
	4 60 3	80860.50					
	+						
	6 74 3 7 102 5	87277.50 85555.00					
	8 77 3	88886.50 0780 00					
+		+					
chi-square probabilit chi-square probabilit	ed = 4.07 ty = 0.85 ed with ties ty = 0.80	= 4.516	5 with 8 d.f		2.		
chi-square probabilit chi-square probabilit	ed = 4.07 ty = 0.85 ed with ties ty = 0.80 Dunn's	= 4.516 778 9 Pairwise C	5 with 8 d.f Comparison c adjustment	f iq8 by in	region		
chi-square probabilit chi-square probabilit Col Mean- Row Mean	ed = 4.07 ty = 0.85 ed with ties ty = 0.80 Dunn's	<pre>4 with 0 d. 504 = 4.516 778 9 Pairwise C (No 2</pre>	5 with 8 d.f Comparison c adjustment 3	f iq8 by in	region 5	6	
chi-square probabilit chi-square probabilit Col Mean- Row Mean + 2	ed = 4.07 ty = 0.85 ed with ties ty = 0.80 Dunn's 1 + -0.045892 0.4817	<pre>4 with 0 d. 504 = 4.516 778 5 Pairwise C (No 2</pre>	5 with 8 d.f Comparison c adjustment 3	f iq8 by in	region 5	6	
chi-square probabilit chi-square probabilit Col Mean- Row Mean 2 3	ed = 4.07 ty = 0.85 ed with ties ty = 0.80 Dunn's 1 +	-0.265506 0.3953	5 with 8 d.f Comparison c adjustment 3	f iq8 by ir) 4	region 5	6	5
chi-square probabilit chi-square probabilit Col Mean- Row Mean 2 3 3 4	ed = 4.07 ty = 0.85 ed with ties ty = 0.80 Dunn's 1 -0.045892 0.4817 -0.236920 0.4064 -0.000210	<pre>4 with 0 d. 504 = 4.516 778 3 Pairwise C (No 2 -0.265506 0.3953 0.0497177</pre>	5 with 8 d.f Comparison c o adjustment 3 0.260358	f iq8 by ir) 4	region 5	6	5
chi-square probabilit chi-square probabilit Col Mean- Row Mean 2 3 3 4 4	ed = 4.07 ty = 0.85 ed with ties ty = 0.80 Dunn's 1 -0.045892 0.4817 -0.236920 0.4064 -0.000210 0.4999	-0.265506 0.3953 0.049717 0.4802	5 with 8 d.f Comparison c o adjustment 3 0.260358 0.3973	f iq8 by in	egion 5	6	2
chi-square probabilit chi-square probabilit Col Mean- Row Mean 2 3 4 4 5	ed = 4.07 ty = 0.85 ed with ties ty = 0.80 Dunn's 1 1 1 -0.045892 0.4817 1 -0.236920 0.4064 1 -0.000210 0.4999 1 -0.592588 0.2767	-0.265506 0.3953 0.049717 0.4802 -0.768275 0.2212	5 with 8 d.f Comparison c o adjustment 3 0.260358 0.3973 -0.566239 0.2856	f iq8 by in) 4 -0.652046 0.2572	region 5	6	2
chi-square probabilit chi-square probabilit Col Mean- Row Mean 2 3 4 5 5 6	ed = 4.07 ty = 0.85 ed with ties ty = 0.80 Dunn's 1 1 1 -0.045892 0.4817 1 -0.236920 0.4064 1 -0.236920 0.4064 1 -0.000210 0.4999 1 -0.592588 0.2767 1 0.195439	-0.265506 0.3953 0.049717 0.4802 -0.768275 0.2212 0.301278	5 with 8 d.f Comparison c adjustment 3 0.260358 0.3973 -0.566239 0.2856 0.547699	<pre>-0.652046 0.2572 0.210071</pre>	egion 5	6	3
chi-square probabilit chi-square probabilit Col Mean- Row Mean 2 2 3 4 5 5 6	ed = 4.07 ty = 0.85 ed with ties ty = 0.80 Dunn's 1 1 1 -0.045892 0.4817 1 -0.236920 0.4064 1 -0.000210 0.4999 1 -0.592588 0.2767 1 0.195439 1 0.4225	-0.265506 0.3953 0.049717 0.4802 -0.768275 0.2212 0.301278 0.301278 0.301278	5 with 8 d.f Comparison c o adjustment 3 0.260358 0.3973 -0.566239 0.2856 0.547699 0.2919	f iq8 by in) -0.652046 0.2572 0.210071 0.4168	0.972587 0.1654	6	3
chi-square probabilit chi-square probabilit Col Mean- Row Mean 	ed = 4.07 ty = 0.85 ed with ties ty = 0.80 Dunn's 1 1 -0.045892 0.4817 1 -0.236920 0.4064 1 -0.00210 0.4999 1 -0.592588 0.2767 1 0.195439 0.4225 1 -1.167548 0 1215	-0.265506 0.3953 0.049717 0.4802 -0.768275 0.2212 0.301278 0.3816 -1.478256	5 with 8 d.f Comparison c b adjustment 3 0.260358 0.3973 -0.566239 0.2856 0.547699 0.2919 -1.362451 0.0055	-0.652046 0.2572 0.210071 0.4168 -1.264884	0.972587 0.1654 -0.897613 0.1847	-1.586690	
chi-square probabilit chi-square probabilit Col Mean- Row Mean 2 3 4 4 5 6 1 7 7 2	ed = 4.07 ty = 0.85 ed with ties ty = 0.80 Dunn's 1 1 -0.045892 0.4817 1 -0.236920 0.4064 1 -0.236920 0.4064 1 -0.000210 0.4999 1 -0.592588 0.2767 1 0.195439 0.4225 1 -1.167548 0.1215	-0.265506 0.3953 0.049717 0.4802 -0.768275 0.2212 0.301278 0.3816 -1.478256 0.0697	5 with 8 d.f 5 with 8 d.f Comparison c 0 adjustment 3 0.260358 0.3973 -0.566239 0.2856 0.547699 0.2919 -1.362451 0.0865 0.502155	-0.652046 0.2572 0.210071 0.4168 -1.264884 0.1030	0.972587 0.1654 -0.897613 0.1847	6 -1.586690 0.0563	
chi-square probabilit chi-square probabilit Col Mean- Row Mean 	ed = 4.07 ty = 0.85 ed with ties ty = 0.80 Dunn's I 1 -0.045892 0.4817 I -0.236920 0.4064 I -0.000210 0.4064 I -0.000210 0.4999 I -0.592588 0.2767 I 0.195439 0.4225 I -1.167548 0.1215 I 0.173304 0.4312	<pre>4 with 0 d. 504 = 4.516 78 Pairwise C (No 2 -0.265506 0.3953 0.049717 0.4802 -0.768275 0.2212 0.301278 0.3816 -1.478256 0.0697 0.274910 0.3917</pre>	5 with 8 d.f Comparison co adjustment 3 0.260358 0.3973 -0.566239 0.2856 0.547699 0.2919 -1.362451 0.0865 0.523165 0.3004	-0.652046 0.2572 0.210071 0.4168 -1.264884 0.1030 0.186526 0.4260	0.972587 0.1654 -0.897613 0.1847 0.954118 0.1700	6 -1.586690 0.0563 -0.026870 0.4893	
chi-square probabilit chi-square probabilit Col Mean- Row Mean 2 3 4 4 5 6 6 7 8 8 8 9	ed = 4.07 ty = 0.85 ed with ties ty = 0.80 Dunn's 1 1 -0.045892 0.4817 -0.236920 0.4064 -0.236920 0.4064 -0.000210 0.4999 -0.592588 0.2767 0.195439 0.4225 -1.167548 0.1215 0.173304 0.4312 -0.399480	<pre>4 with 0 d. 504 = 4.516 78 5 Pairwise C (No 2 -0.265506 0.3953 0.049717 0.4802 -0.768275 0.2212 0.301278 0.3816 -1.478256 0.0697 0.274910 0.3917 -0.494122</pre>	5 with 8 d.f 5 with 8 d.f Comparison co adjustment 3 0.260358 0.3973 -0.566239 0.2856 0.547699 0.2919 -1.362451 0.0865 0.523165 0.3004 -0.258114	-0.652046 0.2572 0.210071 0.4168 -1.264884 0.1030 0.186526 0.4260 -0.439142	0.972587 0.1654 -0.897613 0.1847 0.954118 0.1700 0.305373	6 -1.586690 0.0563 -0.026870 0.4893 -0.740665	
chi-square probabilit chi-square probabilit Col Mean- Row Mean 2 3 4 5 6 6 7 8 8 9 9 2 2 3 4 1 5 5 6 1 5 6 1 7 1 1 1 1 1 1 1 1 1 1	ed = 4.07 ty = 0.85 ed with ties ty = 0.80 Dunn's 1 1 -0.045892 0.4817 -0.236920 0.4064 -0.000210 0.4999 -0.592588 0.2767 0.195439 0.4225 -1.167548 0.1215 0.173304 0.4312 -0.399480 0.3448	<pre>4 with 0 d. 504 = 4.516 78 Pairwise C (No 2 -0.265506 0.3953 0.049717 0.4802 -0.768275 0.2212 0.301278 0.3816 -1.478256 0.0697 0.274910 0.3917 -0.494122 0.3106</pre>	5 with 8 d.f 5 with 8 d.f Comparison co adjustment 3 0.260358 0.3973 -0.566239 0.2856 0.547699 0.2919 -1.362451 0.0865 0.523165 0.3004 -0.258114 0.3982	<pre>-0.652046</pre>	0.972587 0.1654 -0.897613 0.1847 0.954118 0.1700 0.305373 0.3800	6 -1.586690 0.0563 -0.026870 0.4893 -0.740665 0.2294	
chi-square probabilit chi-square probabilit Col Mean- Row Mean 	ed = 4.07 ty = 0.85 ed with ties ty = 0.80 Dunn's 1 1 -0.045892 0.4817 -0.236920 0.4064 -0.000210 0.4064 -0.000210 0.4999 -0.592588 0.2767 0.195439 0.4225 -1.167548 0.1215 0.173304 0.4312 -0.399480 0.3448 7	<pre>4 with 0 d. 504 = 4.516 78 5 Pairwise C (No 2 -0.265506 0.3953 0.049717 0.4802 -0.768275 0.2212 0.301278 0.3816 -1.478256 0.0697 0.274910 0.3917 -0.494122 0.3106 8 </pre>	5 with 8 d.f 5 with 8 d.f Comparison co adjustment 3 0.260358 0.3973 -0.566239 0.2856 0.547699 0.2919 -1.362451 0.0865 0.523165 0.3004 -0.258114 0.3982	<pre>-0.652046</pre>	0.972587 0.1654 -0.897613 0.1847 0.954118 0.1700 0.305373 0.3800	6 -1.586690 0.0563 -0.026870 0.4893 -0.740665 0.2294	
chi-square probabilit chi-square probabilit Col Mean- Row Mean 2 3 4 5 6 7 8 9 9 Col Mean- Row Mean 	ed = 4.07 ty = 0.85 ed with ties ty = 0.80 Dunn's 1 1 -0.045892 0.4817 -0.236920 0.4064 -0.000210 0.4999 -0.592588 0.2767 0.195439 0.4225 -1.167548 0.1215 0.173304 0.4312 -0.399480 0.3448 7 1.575938 0.0575	<pre>4 with 0 d. 504 = 4.516 78 5 Pairwise C (No 2 -0.265506 0.3953 0.049717 0.4802 -0.768275 0.2212 0.301278 0.3816 -1.478256 0.0697 0.274910 0.3917 -0.494122 0.3106 8</pre>	5 with 8 d.f 5 with 8 d.f Comparison co adjustment 3 0.260358 0.3973 -0.566239 0.2856 0.547699 0.2919 -1.362451 0.0865 0.523165 0.3004 -0.258114 0.3982	<pre>-0.652046</pre>	egion 5 0.972587 0.1654 -0.897613 0.1847 0.954118 0.1700 0.305373 0.3800	6 -1.586690 0.0563 -0.026870 0.4893 -0.740665 0.2294	

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Jarning, h	v() values a	re unlabele	d. option r	olabel imrl	icit	
arning, c	y() varues a	re unrabere	a, operon i	ютарет тшрі		
Cruskal-Wa	llis equality	y-of-popula	tions rank	test		
+ iregic	n Obs Ra	+ ank Sum				
	1 47 20	 0677.00				
	2 123 72 3 190 102	2186.50 2587.00				
	4 60 28 5 196 99	8965.00 9733.50				
 	6 74 42	 2108.50				
	7 102 55 8 77 42	5248.00 2429.00				
 +	9 189 90	6276.50				
hi-square	d = 13.49	7 with 8 d.	f.			
orobabilit	y = 0.095	58				
hi-square probabilit	d with ties = y = <mark>0.04</mark>	= 15.670 <mark>73</mark>	with 8 d.f			
	Dunn's	Pairwise C (Nc	omparison c adjustment	of iq9 by in :)	region	
Col Mean- Now Mean	1	2	3	4	5	6
2	-3.021716			(0	
3 	-2 164465	1 130505				
5	0.0152	0.0763				
4	-0.775061	2.331881 0.0099	1.361625			
 5	-1.496111	2.392263	1.076742	-0.623663		
	0.0673	<mark>0.0084</mark>	0.1408	0.2664		
6 	-2.440672 <mark>0.0073</mark>	0.427811 0.3344	-0.748920 0.2270	-1.751408 0.0399	-1.555611 0.0599	
 7	-2.034428	1.191120	-0.049282	-1.276529	-0.947432	0.632439
	<mark>0.0210</mark>	0.1168	0.4803	0.1009	0.1717	0.2635
8 	-2.116297 <mark>0.0172</mark>	0.870093 0.1921	-0.289594 0.3861	-1.398130 0.0810	-1.105946 0.1344	0.390079 0.3482
 9	-1.502790	2.358466	1.048006	-0.634183	-0.019200	1.533501
 - Col Mean	0.0664	0.0092	0.1473	0.2630	0.4923	0.0626
low Mean	7	8				
	-0.219074 0.4133					
8		1.085736				
 9	0.925552	0 1 2 0 0				
8 9 	0.925552 0.1773	0.1388				
8 9 llpha = Reject Ho	0.925552 0.1773 0.05 if p = P(Z <=	0.1388 = z) <= a	lpha/2			
8 9 llpha = Reject Ho	0.925552 0.1773 0.05 if p = P(Z <=	U.1388 = z) <= a	lpha/2			

Kruskal-Wallis equality-of-populations rank test

+			+							
-	iregion	n Obs 1	Rank Sum 							
	-	1 47 2 123	24342.50 68159.50							
I		3 190 1 4 60	03335.00 29614 00							
		5 196 1 -++	00986.00							
İ		6 74	36223.00 54254.00							
	1	8 77	40915.50							
 +			+							
chi- prob	square abilit	d = 4.1 y = 0.8	23 with 8 d.: 458	f.						
chi- prob	square abilit	d with ties y = <mark>0.4</mark>	= 7.555 781	with 8 d.f						
		Dunn's	Pairwise Con (No	mparison of adjustment	iq10 by in 2)	region				
Col I Row I	Mean- Mean	1	2	3	4	5	6			
	2	-0.935595 0.1747		2	0					
	3	-0.705458 0.2403	0.393271 0.3471							
	4	0.553976 0.2898	1.704126 0.0442	1.504759 0.0662						
	5 	0.073394 0.4707	1.498376 0.0670	1.245921 0.1064	-0.650586 0.2577					
	6	0.675122 0.2498	1.946495 0.0258	1.757676 0.0394	0.103700 0.4587	0.835569 0.2017				
	7	-0.351199 0.3627	0.735705 0.2310	0.431870 0.3329	-1.043803 0.1483	-0.604764 0.2727	-1.230118 0.1093			
	8	-0.321760 0.3738	0.694206 0.2438	0.409844 0.3410	-0.972509 0.1654	-0.531464 0.2975	-1.139406 0.1273			
Col I	9 Mean-l	-0.646183 0.2591	0.475741 0.3171	0.093459 0.4628	-1.439010 0.0751	-1.150070 0.1251	-1.686357 0.0459			
Row I	Mean	7	8							
	8	0.015606 0.4938								
	9	-0.353323 0.3619	-0.338514 0.3675							
alph Reje	a = (ct Ho :	0.05 if p = P(Z	<= z) <= a	lpha/2						
• (Questio	on – For eac	h of the ques	tions, 1-10,	are there d	ifferences ir	n the average	e response a	imong the <u>devi</u>	<u>ces</u> ι
. du	nntest	iq1, by(id	evice) ma(bh) wrap						
Warn	ing: b	y() values	are unlabele	d, option r	olabel impl	icit				
Krus	kal-Wa	llis equali	ty-of-popula	tions rank	test					
+			+ For peer rev	view only - h	ttp://bmjope	en.bmj.com/s	ite/about/gu	idelines.xhtm	nl	

			00 1					
	1 455 2 464	235385 243130	.00					
	4 117 5 22	72496 13796	.00 .00					
 +	6 9	4971	.00					
chiegouar	ad – 1	2 894 111	+b / d	f				
probabili†	ty =	0.0118	un - u.	±•				
chi-squar	ed with t	ies =	22.109	with 4 d.f				
probabilii	ty =	0.0002						
	Du	nn's Pai:	rwise C	omparison o	f iq1 by	idevice		
Col Mean-	I		(Benja	amini-Hochb	erg)			
Row Mean	 +	1 	2	4	5	-		
2	-0.428 0.4	773 176						
4	 -4.193	416 -3.9	928305					
	<mark>0.0</mark> 	001 (<mark>0.0002</mark>					
5	-2.136	598 -2.0	007905	-0.136539				
6		873 -0 '	357900	0.826607	0.80282	9		
0	0.4	704 (0.4002	0.4085	0.351	7		
False Dis	covery Ra	te = 0	.05			_		
Paiact UA	if p = P	(Z <= Z) <= F	DR/2 with s	topping r	ule		
мајест по	Ŧ							
·	tion bu	(idouido)) ma(bb) uran				
. dunntest	t iq2, by	(idevice)) ma(bh) wrap				
. dunntest Warning: h	t iq2, by by() valu	(idevice) es are un) ma(bh nlabele) wrap d, option n	olabel imj	plicit		
. dunntes Warning: }	t iq2, by	(idevice) es are un) ma(bh nlabele) wrap d, option n	olabel imp	plicit		
. dunntes Warning: } Kruskal-Wa	t iq2, by by() valu allis equ	(idevice) es are un ality-of) ma(bh nlabele -popula) wrap d, option n tions rank	olabel imp test	plicit		
. dunntes Warning: } Kruskal-Wa + idevid	t iq2, by by() valu allis equ ce Obs	(idevice, es are un ality-of Rank () ma(bh nlabeled -popula + Sum) wrap d, option n tions rank	olabel imj test	plicit		
. dunntes Warning: } Kruskal-Wa + idevic	t iq2, by by() valu allis equ ce Obs 	(idevice) es are un ality-of- Rank : +) ma(bh nlabeled -popula + Sum .50) wrap d, option n tions rank	olabel imj test	plicit		
. dunntes Warning: } Kruskal-Wa + idevic 	t iq2, by by() valu allis equ ce Obs + 1 455 2 464	(idevice) es are un ality-of- Rank (+ 238731 243803) ma(bh nlabeled -popula + Sum .50 .00 50) wrap d, option n tions rank	olabel imj test	plicit		
. dunntes Warning: } Kruskal-Wa + idevio 	t iq2, by by() valu allis equ ce Obs 	(idevice) es are un ality-of- Rank 3 + 238731 243803 69497 13042) ma(bh nlabeled -popula + Sum .50 .00 .50 .00) wrap d, option n tions rank	olabel imj test	plicit		
dunntes Warning: } Xruskal-Wa + idevio 	t iq2, by by() valu allis equ ce Obs 1 455 2 464 4 117 5 22 6 9	(idevice) es are un ality-of- Rank 9 + 238731 243803 69497 13042 4704) ma(bh nlabele -popula + Sum .50 .00 .50 .00 .00) wrap d, option n tions rank	olabel imm test	plicit		
<pre>dunntes Marning: } Xruskal-Wa findevid find</pre>	t iq2, by by() valu allis equ ce Obs 1 455 2 464 4 117 5 22 6 9 ed =	(idevice) es are un ality-of- Rank (+) ma(bh nlabele -popula + Sum .50 .00 .00 .00 + th 4 d.) wrap d, option n tions rank f.	olabel imj test	plicit		
dunntes Warning: } Kruskal-Wa idevio idevio idevio i chi-square probabilit	t iq2, by by() valu allis equ ce Obs 1 455 2 464 4 117 5 22 6 9 ed = ty =	(idevice) es are un ality-of- Rank 9 238731 243803 243803 69497 13042 4704 6.023 wit 0.1975) ma(bh nlabeled -popula + Sum .50 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00) wrap d, option n tions rank f.	olabel imj test	plicit		
<pre>August August re>	t iq2, by by() valu allis equ ce Obs 1 455 2 464 4 117 5 22 6 9 ed = ty = ed with t	(idevice) es are un ality-of- Rank 9 + 238731 243803 69497 13042 4704 6.023 wit 0.1975 ies = 0.0695) ma(bh nlabeled -popula + Sum .50 .00) wrap d, option n tions rank f. with 4 d.f	olabel imy test	plicit		
<pre>August and august</pre>	t iq2, by py() value allis equ ce Obs 	(idevice) es are un ality-of- Rank 3 + 238731 243803 69497 13042 4704 6.023 wit 0.1975 ies = 0.0695) ma(bh nlabeled -popula + Sum .50 .00) wrap d, option n tions rank f. with 4 d.f	olabel imm test	plicit		
<pre> dunntes varning: varning: varning: varning: varning: varning: varning: varni</pre>	t iq2, by by() valu allis equ ce Obs 1 455 2 464 4 117 5 22 6 9 ced = ty = ed with t ty =	(idevice) es are un ality-of- Rank s + 238731 243803 13042 4704 6.023 wit 0.1975 ies = 0.0695 nn's Pai:) ma(bh nlabeled -popula + Sum .50 .00 .00 .00 .00 th 4 d. 8.683 rwise Co) wrap d, option n tions rank f. with 4 d.f omparison c	olabel imy test f iq2 by .	plicit		
<pre>dunntes dunntes Warning: } Kruskal-Wa idevia idevia idevia idevia chi-square probabilit chi-square probabilit chi-square probabilit</pre>	t iq2, by by() value allis eque ce Obs 1 455 2 464 4 117 5 22 6 9 ed = ty = ed with t ty = Du	(idevice) es are un ality-of- Rank 9 + 238731 243803 69497 13042 4704 6.023 wit 0.1975 ies = 0.0695 nn's Pai:) ma(bh nlabeled -popula + Sum 1 .50 .00 .00 .00 .00 .00 th 4 d. 8.683 rwise C((Benj,) wrap d, option n tions rank f. with 4 d.f omparison o amini-Hochb	olabel imj test f iq2 by f erg)	plicit		
dunntes Warning: 1 Kruskal-Wa idevia idevia idevia chi-square probabilit chi-square probabilit	t iq2, by by() valu allis equ ce Obs 1 455 2 464 4 117 5 22 6 9 ed = ty = ed with t ty = Du	(idevice) es are un ality-of- Rank { + 238731 243803 243803 243803 243803 243803 243803 243803 4704) ma(bh nlabeled -popula + Sum .50 .00) wrap d, option n tions rank f. with 4 d.f omparison o amini-Hochb 4	olabel im test f iq2 by erg) 5	plicit idevice		
<pre>dunntes dunntes Warning:) Kruskal-Wa idevid idevid i idevid idevid chi-square probabilit chi-square probabilit Col Mean- Row Mean</pre>	t iq2, by by() valu allis equ ce Obs 1 455 2 464 4 117 5 22 6 9 ed = ty = ed with t ty = Du Du	(idevice) es are un ality-of- Rank 9 + 238731 243803 243803 69497 13042 4704 6.023 wit 0.1975 ies = 0.0695 nn's Pai: 1) ma(bh nlabeled -popula + Sum .50 .00) wrap d, option n tions rank f. with 4 d.f omparison o amini-Hochb 4	olabel imp test f iq2 by f erg) 5	plicit idevice		
. dunntes Warning: 1 Kruskal-Wa + idevia chi-square probabilit Col Mean- Row Mean	t iq2, by by() value allis equ ce Obs 1 455 2 464 4 117 5 22 6 9 ed = ty = bd with t ty = Due 1	(idevice) es are un ality-of- Rank 3 + 238731 243803 243803 69497 13042 4704) ma(bh nlabeled -popula + Sum .50 .00) wrap d, option n tions rank f. with 4 d.f omparison o amini-Hochb 4	olabel imp test f iq2 by erg) 5	plicit idevice		
. dunntes Warning:] Kruskal-Wa + idevid chi-square probabilit chi-square probabilit Col Mean- Row Mean 2 4	t iq2, by by() valu allis equ ce Obs 1 455 2 464 4 117 5 22 6 9 ed = ty = bd with t ty = Du 1 -0.044 0.6 1 -2.605 0.0	(idevice) es are un ality-of- Rank s + 238731 243803 243803 243803 243803 243803 243803 243803 4704 6.023 wit 0.1975 ies = 0.0695 ies = 0.0695 nn's Pai: 1 463 890 346 -2.9) ma(bh nlabeled -popula + Sum .50 .00 .00 .00 + th 4 d. 8.683 rwise Co (Benj) 2 582173 0.0245) wrap d, option n tions rank f. with 4 d.f omparison o amini-Hochb 4	olabel imp test f iq2 by erg) 5	plicit idevice		
. dunntes Warning: 1 Kruskal-Wa + idevid chi-square probabilit Col Mean- Row Mean 2 4	t iq2, by by() value allis eque ce Obs 1 455 2 464 4 117 5 22 6 9 ed = ty = ed with t ty = Du 1 - 0.044 0.6 1 - 2.605 0.0 	(idevice) es are un ality-of- Rank 3 + 238731 243803 69497 13042 4704 6.023 win 0.1975 ies = 0.0695 nn's Pai: 1 463 890 346 -2.9 459 (1)) ma(bh nlabeled -popula + Sum 1 .50 .00) wrap d, option n tions rank f. with 4 d.f omparison o amini-Hochb 4 0.019744	olabel im test f iq2 by erg) 5	plicit idevice		
. dunntes Warning: 1 Kruskal-Wa + idevid chi-square probabilit chi-square probabilit Col Mean- Row Mean 2 4	t iq2, by by() value allis equ ce Obs 1 455 2 464 4 117 5 22 6 9 ced = ty = ed with t ty = Du 1 -0.044 0.6 1 -2.605 0.0 1 -1.216 0.3	(idevice) es are un ality-of- Rank 3 + 238731 243803 69497 13042 4704 6.023 wit 0.1975 ies = 0.0695 nn's Pai: 1) ma(bh nlabeled -popula + Sum .50 .00) wrap d, option n tions rank f. with 4 d.f omparison c amini-Hochb 4 0.019744 0.4921	olabel imp test f iq2 by erg) 5	plicit idevice		
. dunntes Warning:] Kruskal-Wa + idevid chi-square probabilit chi-square probabilit Col Mean- Row Mean 2 4 5 6	t iq2, by by() valu allis equ ce Obs 1 455 2 464 4 117 5 22 6 9 ed = ty = ed with t ty = Du -0.044 -0.044 0.6 -1.216 0.023 0.023 0.023 0.023 0.023	(idevice) es are un ality-of- Rank 3 + 238731 243803 69497 13042 4704 6.023 win 0.1975 ies = 0.0695 nn's Pai: 1 463 890 346 -2.1 459 (1) 133 -1.2 732 (1) 358 0.0) ma(bh nlabeled -popula + Sum .50 .00) wrap d, option n tions rank f. with 4 d.f omparison o amini-Hochb 4 4 0.019744 0.4921 0.803447 0.4217	olabel imj test f iq2 by erg) 5 5	plicit idevice - 7		

```
Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
1
2
     . dunntest iq3, by(idevice) ma(bh) wrap
3
4
     Warning: by() values are unlabeled, option nolabel implicit
5
6
     Kruskal-Wallis equality-of-populations rank test
7
       +-----+
8
       | idevice | Obs | Rank Sum |
9
        -----|
10
              1 | 455 | 231099.50 |
              2 | 464 | 249881.00 |
11
              4 | 117 | 70070.00
12
              5 | 22 | 13920.00
13
              6 |
                   9 | 4807.50
                       ----+
14
15
     chi-squared = 10.808 with 4 d.f.
probability = 0.0288
16
17
     chi-squared with ties =
                              20.278 with 4 d.f.
18
     probability =
                    0.0004
19
20
                    Dunn's Pairwise Comparison of iq3 by idevice
21
                               (Benjamini-Hochberg)
22
     Col Mean-|
                                          4
                                2
     Row Mean |
                     1
                                                     5
23
     ------
24
           2 | -2.063320
25
             0.0489
              26
                -3.901314 -2.593174
            4 |
27
                 0.0005
                           <mark>0.0238</mark>
              28
              5 |
                -2.541578 -1.918820 -0.647263
29
                   <mark>0.0184</mark>
                           0.0550
                                     0.3234
30
31
            6 |
                -0.346709
                          0.057717
                                     0.831681
                                                1.107209
                   0.4049
                            0.4770
                                     0.2897
                                                  0.2235
32
              33
     False Discovery Rate = 0.05
34
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
35
36
     . dunntest iq4, by(idevice) ma(bh) wrap
37
38
     Warning: by() values are unlabeled, option nolabel implicit
39
40
     Kruskal-Wallis equality-of-populations rank test
41
          _____
42
       | idevice | Obs | Rank Sum |
43
       |-----|
              1 | 455 | 233917.50 |
44
              2 | 464 | 245190.00
45
              4 | 117 | 71356.50
46
              5 | 22 | 13558.00
              6 | 9 | 5756.00 |
47
       +-----+
48
49
     chi-squared = 11.767 with 4 d.f.
probability = 0.0192
50
51
     chi-squared with ties =
                              15.571 with 4 d.f.
52
     probability = 0.0037
53
54
                    Dunn's Pairwise Comparison of iq4 by idevice
55
                               (Benjamini-Hochberg)
56
     Col Mean-
     Row Mean |
                    1
                               2
                                         4
                                                    5
57
                             _____
        ____+
58
            2 | -0.810343
59
                   0.2984
             For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml
60
```

```
-3.449252 -2.939310
           4
1
                 0.0028 0.0082
             2
3
                -1.747119 -1.502874 -0.102617
           5
             0.1344
                           0.1661
                                     0.4591
4
             5
                -1.391205 -1.232608 -0.320191 -0.219652
           6 |
6
                  0.1642
                           0.1814 0.4680 0.4590
             7
     False Discovery Rate = 0.05
8
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
9
10
     . dunntest iq5, by(idevice) ma(bh) wrap
11
12
     Warning: by() values are unlabeled, option nolabel implicit
13
14
     Kruskal-Wallis equality-of-populations rank test
15
       +-----4
16
       | idevice | Obs | Rank Sum |
17
       |-----|
18
             1 | 455 | 233689.00 |
19
             2 | 464 | 246682.00
              4 | 117 | 72399.00 |
20
              5 | 22 | 13029.00 |
6 | 9 | 3979.00 |
21
22
            -----+
23
     chi-squared = 12.465 with 4 d.f.
24
     probability = 0.0142
25
     chi-squared with ties =
                             18.400 with 4 d.f
26
     probability = 0.0010
27
28
                    Dunn's Pairwise Comparison of iq5 by idevice
29
                               (Benjamini-Hochberg)
30
     Col Mean-|
31
     Row Mean |
                               2
                                        4
                                                    5
                    1
     32
           2 | -1.078030
33
                  0.2007
            34
           4 | -4.001036 -3.321473
35
                 <mark>0.0003</mark>
                          <mark>0.0022</mark>
             36
             37
                                    0.450750
                -1.420055 -1.094722
           5 |
                 0.1556
                           0.2280
                                     0.3261
38
             39
           6 |
                 0.837348 1.048842
                                     2.013779 1.495773
40
                  0.2236
                           0.1839
                                     0.0734
                                               0.1684
             41
     False Discovery Rate = 0.05
42
     Reject Ho if p = P(Z \le |z|) \le FDR/2 with stopping rule
43
44
     . dunntest iq6, by(idevice) ma(bh) wrap
45
46
     Warning: by() values are unlabeled, option nolabel implicit
47
48
     Kruskal-Wallis equality-of-populations rank test
49
50
       | idevice | Obs | Rank Sum |
51
        ------
52
              1 | 455 | 232150.00 |
53
              2 | 464 | 249498.50
             4 | 117 | 70802.00 |
54
             5 | 22 | 12735.50 |
55
             6 | 9 | 4592.00 |
56
          -----+
57
                    9.534 with 4 d.f.
0.0491
     chi-squared =
58
     probability =
59
                           For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml
60
```

	Dunn's	Pairwise Co (Benja	omparison o amini-Hochb	f iq6 by idev. erg)	ice	
ol Mean- .ow Mean	1	2	4	5		
2	-1.648801 0.1653					
4	-3.623520 0.0015	-2.579191 <mark>0.0248</mark>				
5	-1.244659 0.2666	-0.746660 0.3794	0.447117 0.4092			
6	-0.000029 0.5000	0.323201 0.4147	1.085795 0.2776	0.686639 0.3516		
alse Disc eject Ho dunntest	<pre>overy Rate = if p = P(Z <= iq7, by(idev.</pre>	0.05 z) <= FD	DR/2 with s	topping rule		
arning: b	y() values are	e unlabeled	l, option n	olabel implic.	it	
ruskal-Wa	llis equality	-of-populat	ions rank	test		
+	e Obs Ra:	+ nk Sum '				
	1 455 241 2 464 241 4 117 70 5 22 12 6 9 3	171.00 784.00 870.00 133.00 820.00				
hi-square robabilit	d = 8.437 v = 0.076	with 4 d.f 8	: .			
hi-square robabilit hi-square robabilit	d = 8.437 y = 0.076 d with ties = y = 0.034	with 4 d.f 8 10.374 <mark>6</mark>	with 4 d.f			
hi-square robabilit hi-square robabilit	<pre>d = 8.437 y = 0.076 d with ties = y = 0.034 Dunn's #</pre>	with 4 d.f 8 10.374 6 Pairwise Cc	with 4 d.f	f iq7 by idev	ice	
hi-square robabilit hi-square robabilit ol Mean- ow Mean	<pre>d = 8.437 y = 0.076 d with ties = y = 0.034 Dunn's 1</pre>	with 4 d.f 8 10.374 6 Pairwise Co (Benja 2	with 4 d.f omparison o umini-Hochb 4	• f iq7 by idev erg) 5	ice	
hi-square robabilit hi-square robabilit ol Mean- ow Mean + 2	d = 8.437 y = 0.076 d with ties = y = 0.034 Dunn's 1 1 0.488676 0.3473	with 4 d.f 8 10.374 6 Pairwise Co (Benja 2	with 4 d.f omparison o amini-Hochb 4	• f iq7 by idev. erg) 5 	ice	
hi-square robabilit hi-square robabilit ow Mean + 2 4	d = 8.437 y = 0.076 d with ties = y = 0.034 Dunn's 1 	with 4 d.f 8 10.374 6 Pairwise Cc (Benja 2 	with 4 d.f omparison o amini-Hochb 4	f iq7 by idev. erg) 5 	ice	
hi-square robabilit hi-square robabilit ow Mean 2 2 4 5 	<pre>d = 8.437 y = 0.076 d with ties = y = 0.034 Dunn's 1 0.488676 0.3473 -2.627194 0.0215 -0.353648 0.3618</pre>	with 4 d.f 10.374 Pairwise Cc (Benja 2 -2.944079 0.0162 -0.501570 0.3850	with 4 d.f mparison o mini-Hochb 4 0.839686 0.2865	• f iq7 by idev. erg) 5 	ice	
hi-square robabilit hi-square robabilit ou Mean + 2 4 4 5 6 1	d = 8.437 y = 0.076 d with ties = y = 0.034 Dunn's 1 0.488676 0.3473 -2.627194 0.0215 -0.353648 0.3618 1.128879 0.2589	with 4 d.f 8 10.374 6 Pairwise Cc (Benja 2 -2.944079 0.0162 -0.501570 0.3850 1.033292 0.2512	<pre>with 4 d.f mparison o mini-Hochb</pre>	• erg) 5 1.155457 0.3099	ice	
hi-square robabilit hi-square robabilit ol Mean- ow Mean + 2 4 5 6 1 6 1 alse Disc eject Ho	<pre>d = 8.437 y = 0.076 d with ties = y = 0.034 Dunn's 1 0.488676 0.3473 -2.627194 0.0215 -0.353648 0.3618 1.128879 0.2589 overy Rate = if p = P(Z <=</pre>	<pre>with 4 d.f 8</pre>	<pre>with 4 d.f mparison o mini-Hochb</pre>	• f iq7 by idev. erg) 5 1.155457 0.3099 topping rule	ice	
hi-square robabilit hi-square robabilit ol Mean- ow Mean + 2 4 5 6 1 alse Disc eject Ho dunntest	<pre>d = 8.437 y = 0.076 d with ties = y = 0.034 Dunn's 1 0.488676 0.3473 -2.627194 0.0215 -0.353648 0.3618 1.128879 0.2589 overy Rate = if p = P(Z <= iq8, by(idev</pre>	<pre>with 4 d.f 8</pre>	<pre>with 4 d.f omparison o umini-Hochb</pre>	• f iq7 by idev. erg) 5 1.155457 0.3099 topping rule	ice	
hi-square robabilit hi-square robabilit ol Mean- ow Mean + 2 4 4 5 6 1 alse Disc eject Ho dunntest arning: b	<pre>d = 8.437 y = 0.076 d with ties = y = 0.034 Dunn's 1 0.488676 0.3473 -2.627194 0.0215 -0.353648 0.3618 1.128879 0.2589 overy Rate = if p = P(Z <= iq8, by(idev y() values are</pre>	<pre>with 4 d.f 8</pre>	<pre>with 4 d.f mparison o mini-Hochb</pre>	<pre>f iq7 by idev. erg) 5 1.155457 0.3099 topping rule olabel implic.</pre>	ice	

 +	5 22 6 9	4714.0	50 20 +					
chi-square probabilit	ed = 3 y = 0	8.571 with 0.4671	n 4 d.f					
chi-square probabilit	d with ti y = <mark>0</mark>	es = .4119	3.957	with 4 d.f				
	Dun	nn's Pairw	wise Co (Benja	mparison c mini-Hochb	f iq8 erg)	by idev	vice	
Col Mean- Row Mean	1		2	4		5		
2	-1.5963 0.55	325 521						
4	0.0485 0.53	671 1.06 840 0.	66739 .3576					
5	-1.2228 0.55	802 -0.74 535 0.	40661 .4589	-1.170335 0.4031				
6	-0.0474 0.48	144 0.26 11 0.	65489 .5647	-0.060723 0.5947	0.63	4244 4383		
alse Disc	overy Rat	e = 0.0)5 \	P/2 with c	toppin	a rulo		
dunntest Warning: k Kruskal-Wa	iq9, by(y() value llis equa	idevice) es are unl lity-of-p	ma(bh) labeled populat	wrap , option r ions rank	olabel test	implic	it	
dunntest Warning: k Kruskal-Wa + idevic 	<pre>iq9, by(py() value</pre>	idevice) es are unl ulity-of-p Rank Su 233402.0 251754.0 69053.0 11048.0 4521.0	<pre>ma(bh) labeled copulat</pre>	wrap , option r ions rank	olabel test	implic	it	
dunntest Warning: k Kruskal-Wa + idevic 	<pre>iq9, by(py() value .11is equa</pre>	(idevice) es are unl lity-of-p Rank Su 233402.0 251754.0 69053.0 11048.0 4521.0 5.698 with 0.1527 es = 0.1007	<pre>ma(bh) labeled coopulat+</pre>	wrap , option r ions rank with 4 d.f	olabel test	implic	it	
dunntest Warning: k Kruskal-Wa + idevic 	<pre>iq9, by(py() value ullis equa ullis eq</pre>	(idevice) es are unl ulity-of-p Rank Su 233402.0 251754.0 69053.0 11048.0 4521.0 5.698 with 0.1527 es = 0.1007	<pre>ma(bh) labeled copulat+ im </pre>	wrap , option r ions rank with 4 d.f mparison c	olabel test f iq9	implic by idex	rice	
<pre>dunntest Varning: k (ruskal-Wa + idevic idevic + chi-square probabilit chi-square probabilit col Mean- tow Mean </pre>	<pre>iq9, by(py() value ullis equa ullis equa ue Obs 1 + 455 2 + 464 4 + 117 5 + 22 + 6 + 9 + ud = 6 y = 0 ud with ti y = 0 Dun 1</pre>	<pre>idevice) es are unl lity-of-p Rank Su 233402.0 251754.0 69053.0 11048.0 4521.0 6.698 with 0.1527 es = 0.1007 an's Pairw</pre>	<pre>ma(bh) labeled copulat+ im 00 00 00 n 4 d.f 7.761 vise Co (Benja 2</pre>	<pre>wrap , option r ions rank . with 4 d.f mparison c mini-Hochk 4</pre>	olabel test f iq9 erg)	implic by idea	rice	
dunntest Warning: k (ruskal-Wa idevic 	<pre>iq9, by(py() value ullis equa</pre>	<pre>didevice) es are unl lity-of-p Rank Su 233402.0 233402.0 251754.0 69053.0 11048.0 4521.0 5.698 with 0.1527 ess = 0.1007 an's Pairw 210 251</pre>	<pre>ma(bh) labeled populat+ im 00 00 00 00 00 + n 4 d.f 7.761 wise Co (Benja 2</pre>	<pre>wrap , option r ions rank . with 4 d.f mparison c mini-Hochk4</pre>	olabel test f iq9 erg)	implic by idex 5	rice	
dunntest Varning: k Kruskal-Wa idevic chi-square probabilit chi-square probabilit chi-square probabilit	<pre>iq9, by(py() value ullis equa</pre>	<pre>didevice) es are unl ulity-of-p Rank Su 233402.0 233402.0 233402.0 233402.0 (09053.0 1048.0 4521.0 6.698 with .1527</pre>	<pre>ma(bh) labeled copulat+ im 00 00 00 00 00 00 + n 4 d.f 7.761 wise Co (Benja 2 07996 .2696</pre>	wrap , option r ions rank with 4 d.f mparison c mini-Hochk 4	olabel test f iq9 erg)	implic by idev 5	rice	
dunntest Warning: k Kruskal-Wa + idevic + chi-square probabilit Col Mean- Row Mean + 2 	<pre>iq9, by() y() value ullis equa</pre>	(idevice) es are unl lity-of-p Rank Su 233402.0 251754.0 69053.0 11048.0 4521.0 5.698 with 0.1527 es = 0.1007 an's Pairw 210 251 221 -1.60 63 0.64 93 0.64 93 0.64	<pre>ma(bh) labeled coopulat+ im 00 00 00 00 00 00 00</pre>	<pre>wrap , option r ions rank . with 4 d.f mparison c mini-Hochk</pre>	olabel test f iq9 erg)	implic by idex 5	rice	

NIUSKAI-WAI	lis equality	y-of-popula	tions rank	test		
+ idevice	: Obs Ra	+ ank Sum 				
	455 230	0212.00 1454.50				
4 5	117 70 22 13	0292.50 3460.00				
6 +	9 4	4359.00 +				
chi-squared probability	l = 11.207 v = 0.024	7 with 4 d. 43	f.			
chi-squared	l with ties =	= 20.357	with 4 d.f			
propagiiicy	<mark>0.00(</mark>					
	Dunn's 1	Pairwise Co (Benj	mparison of amini-Hochb	iq10 by id erg)	evice	
Col Mean- Row Mean +-	1	2	4	5		
2	-2.384264 0.0285					
4	-4.001160	-2.488534				
 5	-2.120896	-1.400904	-0.207547			
 6	0.0424	0.1152	0.4178	1.409124		
-						
Ì	0.4326	0.2839	0.1409	0.1323		
False Disco Reject Ho i	0.4326 overy Rate = f p = P(Z <=	0.2839 0.05 = z) <= F	0.1409 DR/2 with s	0.1323 topping rul	e	
 False Disco Reject Ho i	0.4326 vvery Rate = f p = P(Z <=	0.2839 0.05 = z) <= F	0.1409 DR/2 with s	0.1323 topping rul	e	
 False Disco Reject Ho i	0.4326 very Rate = f p = P(Z <=	0.2839 0.05 = z) <= F	0.1409 DR/2 with s	0.1323	e	
l False Disco Reject Ho i	0.4326 vvery Rate = f p = P(Z <=	0.2839 0.05 = z) <= F	0.1409 DR/2 with s	0.1323	e	
 False Disco Reject Ho i	0.4326 vvery Rate = f p = P(Z <=	0.2839 0.05 = z) <= F	0.1409 DR/2 with s	0.1323	e	
 False Disco Reject Ho i	0.4326 vvery Rate = f p = P(Z <=	0.2839 0.05 = z) <= F	0.1409 DR/2 with s	0.1323	e	
 False Disco Reject Ho i	0.4326 vvery Rate = f p = P(Z <=	0.2839 0.05 = z) <= F	0.1409 DR/2 with s	0.1323	e	
 Reject Ho i	0.4326 vvery Rate = f p = P(Z <=	0.2839 0.05 = z) <= F	0.1409 DR/2 with s	0.1323	e	
 False Disco Reject Ho i	0.4326 vvery Rate = f p = P(Z <=	0.2839 0.05 = z) <= F	0.1409 DR/2 with s	0.1323	e	
 False Disco Reject Ho i	0.4326 vvery Rate = f p = P(Z <=	0.2839 0.05 = z) <= F	0.1409 DR/2 with s	0.1323	e	
 False Disco Reject Ho i	0.4326 vvery Rate = f p = P(Z <=	0.2839 0.05 = z) <= F	0.1409 DR/2 with s	0.1323	e	
 False Disco Reject Ho i	0.4326 vvery Rate = f p = P(Z <=	0.2839 0.05 = z) <= F	0.1409 DR/2 with s	0.1323	e	
 False Disco Reject Ho i	0.4326 vvery Rate = f p = P(Z <=	0.2839 0.05 = z) <= F	0.1409 DR/2 with s	0.1323	e	

Nat	tional Survey Statistics on Factor Analysis Produced Variables
•	Question – For each of the factor variables (knowledge and other), are there differences in the average response by age?
	Answer – YES, there are significant differences among the age categories for both factor variables, and with the exception of group 4 vs group 5 for the factor variable "other" all groups differed significantly from each other. Difference
. d Kru	unntest iknowledge, by(iage) skal-Wallis probability = 0.0001
Dun	n's Pairwise Comparison of iknowledge by iage
Col Row	Mean- Mean 2 3 4
	3 -3.047089 0.0012
	4 -6.647864 -3.042354 0.0000 0.0012
	5 -8.540506 -5.326895 -2.884203 0.0000 0.0000 0.0020
alpi <mark>Rej</mark>	ha = 0.05 ect Ho if p = P(Z <= z) <= alpha/2
. d	unntest iother, by(iage)
Kru	skal-Wallis probability = 0.0001
G - 1	(No adjustment)
Row	Mean- Mean 2 3 4
	3 -3.687658 0.0001
	4 -6.409482 -2.160471 - 0.000 - 0.0154
	5 -5.995882 -2.338749 -0.480036
	0.0000 0.0097 0.3156
•	Question – For each of the factor variables (knowledge and other), are there differences in the average response <u>by</u> <u>gender</u> ?
	Answer – YES, for both factor variables (knowledge and other) the differences in responses of the genders are very highly significantly different (p <0.0001)
•	Question – For each of the factor variables (knowledge and other), are there differences in the average response by income?
	Answer – YES, but only for the factor variable knowledge. Most of the differences among pairs are between group 1 and other groups and between group 3 and other groups.
. d Kru	unntest iknowledge, by(iincome) skal-Wallis probability = 0.0005
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devices.

Col Mean-	 1	2	З	4	5	6
2	-2.497470					
3	0.0063 -1.980782	0.879087				
4	-3.815271	-1.257535	-2.470334			
5	-3.893000 0.0000	-1.495793 0.0674	-2.613509 0.0045	-0.363691 0.3580		
6	 -3.353408 <mark>0.000</mark> 4	-1.183058 0.1184	-2.060025 <mark>0.0197</mark>	-0.184688 0.4267	0.114798 0.4543	
7	 -3.552889 <mark>0.0002</mark>	-1.742852 0.0407	-2.457248 0.0070	-0.959300 0.1687	-0.688698 0.2455	-0.722300 0.2351
8	-1.760408 0.0392	-0.130388 0.4481	-0.635829 0.2624	0.591132 0.2772	0.774389 0.2194	0.656758 0.2557
9	 -2.347848 <mark>0.0094</mark>	-1.192059 0.1166	-1.563387 0.0590	-0.708333 0.2394	-0.559877 0.2878	-0.597431 0.2751
10	-3.169354 0.0008	-1.756891 0.0395	-2.259138 0.0119	-1.163994 0.1222	-0.964239 0.1675	-0.987559 0.1617
11	-3.282179 0.0005	-0.905285 0.1827	-1.879430 0.0301	0.235565 0.4069	0.541013 0.2942	0.359674 0.3595
ow Mean	7	8	9	10		
8	1.160782 0.1229					
9	-0.140395 0.4442	-0.960591 0.1684				
10	-0.396438 0.3459	-1.342428 0.0897	-0.168444 0.4331			
11	1.061221 0.1443	-0.433697 0.3323	0.788364 0.2152	1.244967 0.1066		
alpha = Reject Ho	0.05 if p = P(Z <	<= z) <= a	lpha/2			
• Ouest	ion: For each	of the facto	r variables (knowledge a	and other). a	are there differences in the avera
among	g <u>regions?</u>			0	,,	
Answe	er – NO, for b	oth factor v	ariables, the	ere are no si	gnificant dif	ferences in responses among reg
Ouert	ion: For oach	of the facto	r variables (knowladza	and other)	are there differences in the avera
based	upon type of	device used	1 variables (]?	viiowiedge (anu ouner), à	are there unreferices in the average
Answe	er – YES, for l	both factor v	variables the	ere are signif	ficant differe	ences in response provided on vai
dunntest Cruskal-Wa	: iknowledge, allis probabi	by(idevice lity =	e) <mark>0.0002</mark>			
	irwise Compar	rison of ikr	nowledge by	idevice		
)unn's Pai		(No	adjustment	:)		

	0.1350
4	-4.104772 -3.575691 0.0000 0.0002
5	-2.253612 -1.999900 -0.286000 0.0121 0.022 ⁸ 0.3874
6	-1.116132 -0.951199 0.143918 0.293782 0.1322 0.1708 0.4428 0.3845
alpha = <mark>Reject H</mark>	0.05 10 if p = P(Z <= z) <= alpha/2
. dunnte Kruskal-	st iother, by(idevice) Wallis probability = 0.0423
Dunn's P	airwise Comparison of iother by idevice
Col Mean Row Mean	$\begin{array}{c} 1 \\ 1 \\ 2 \\ 4 \\ 5 \end{array}$
2	-1.392887 0.0818
4	-3.084003 -2.201813 0.0010 0.0138
5	$ \begin{bmatrix} -0.728643 & -0.307796 & 0.691191 \\ 0.2331 & 0.3791 & 0.2447 \end{bmatrix} $
6	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
.] .] .	
alpha = <mark>Reject H</mark>	0.05 to if p = P(Z <= z) <= alpha/2
STATI	STICS
0.00	ation . For each of the factor verichles (Incomediate and other) are there differences in the evenes response by
age?	stion – For each of the factor variables (knowledge and other), are there differences in the average response by
. dunnte	est iknowledge, by(iage)
Warning:	by() values are unlabeled, option nolabel implicit
Kruskal-	Wallis equality-of-populations rank test
++	
3	
4	
	197 128827.50
+	5 197 128827.50 +
+ chi-squa probabil	<pre>ired = 75.931 with 3 d.f. ity = 0.0001</pre>
chi-squa probabil chi-squa probabil	<pre>ired = 75.931 with 3 d.f. ired with ties = 85.400 with 3 d.f. ity = 0.0001</pre>
+ chi-squa probabil chi-squa probabil	<pre>ared = 75.931 with 3 d.f. .ity = 0.0001 ared with ties = 85.400 with 3 d.f. .ity = 0.0001</pre>
+ chi-squa probabil chi-squa probabil	<pre>a 343 136000.00 b 197 128827.50 </pre>
+ chi-squa probabil chi-squa probabil Col Mean Row Mean	<pre>a 343 136000.00 b 197 128827.50 </pre>
chi-squa probabil chi-squa probabil Col Mean Row Mean 	<pre>a 343 130000.00 b 197 128827.50 ared = 75.931 with 3 d.f. ity = 0.0001 wred with ties = 85.400 with 3 d.f. ity = 0.0001 Dunn's Pairwise Comparison of iknowledge by iage (No adjustment) </pre>
+ chi-squa probabil chi-squa probabil Col Mean Row Mean 3	<pre>a 343 19800.00 b 197 128827.50 ared = 75.931 with 3 d.f. ity = 0.0001 ared with ties = 85.400 with 3 d.f. ity = 0.0001 Dunn's Pairwise Comparison of iknowledge by iage (No adjustment) b 2 3 4 </pre>
chi-squa probabil chi-squa probabil Col Mean Row Mean 	<pre>i 197 128827.50 irred = 75.931 with 3 d.f. ity = 0.0001 irred with ties = 85.400 with 3 d.f. ity = 0.0001 Dunn's Pairwise Comparison of iknowledge by iage</pre>

```
-8.540506 -5.326895 -2.884203
           5
1
                  0.0000 0.0000 0.0020
2
3
     alpha = 0.05
     Reject Ho if p = P(Z \le |z|) \le alpha/2
4
5
6
     . dunntest iother, by(iage)
7
     Warning: by() values are unlabeled, option nolabel implicit
8
9
     Kruskal-Wallis equality-of-populations rank test
10
11
                    ____+
12
       | iage | Obs | Rank Sum |
13
        -----
           2 | 297 | 128210.00 |
14
           3 | 230 | 122050.50 |
15
           4 | 343 | 201312.00
           5 | 197 | 118205.50 |
16
       +-----+
17
                  51.926 with 3 d.f.
18
     chi-squared =
     probability =
19
                    0.0001
20
     chi-squared with ties =
                             52.814 with 3 d.f.
21
     probability = 0.0001
22
23
                   Dunn's Pairwise Comparison of iother by iage
24
                               (No adjustment)
25
     Col Mean-|
                              3
     Row Mean |
                    2
                                       4
26
     _____
27
           3 | -3.687658
28
                  0.0001
            29
           4 | -6.409482 -2.160471
30
             0.0000
                          0.0154
31
               -5.995882 -2.338749 -0.480036
           5 I
32
                  <mark>0.0000</mark>
                          <mark>0.009</mark>7
                                    0.3156
             33
34
     alpha = 0.05
     Reject Ho if p = P(Z \le |z|) \le alpha/2
35
36
37
      _____
                                                                                   _____
38
        Question – For each of the factor variables (knowledge and other), are there differences in the average response by
39
        gender?
40
41
     . dunntest iknowledge, by(igender)
42
43
     Warning: by() values are unlabeled, option nolabel implicit
44
45
     Kruskal-Wallis equality-of-populations rank test
46
47
             -----+
       | igender | Obs | Rank Sum |
48
        -----|
49
             1 | 497 | 240985.50 |
             2 | 570 | 328792.50
50
           _____+
51
52
                   23.638 with 1 d.f.
     chi-squared =
     probability =
53
                    0.0001
54
     chi-squared with ties =
                             26.585 with 1 d.f.
55
     probability =
                   0.0001
56
57
                Dunn's Pairwise Comparison of iknowledge by igender
58
                                (No adjustment)
59
     Col Mean-|
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60
```

Ro	w Mean 1
	2 -5.156095 <mark>0.0000</mark>
al Re	pha = 0.05 •ject Ho if p = P(Z <= z) <= alpha/2
	dunntest iother, by(igender)
Wa	arning: by() values are unlabeled, option nolabel implicit
Kr	ruskal-Wallis equality-of-populations rank test
	++
	1gender Obs Rank Sum +++
	1 497 238686.50 2 570 331091.50
	++
ch pr	hi-squared = 28.299 with 1 d.f. cobability = 0.0001
ch	i-squared with ties = 28.783 with 1 d.f.
pr	cobability = 0.0001
	Dunn's Pairwise Comparison of iother by igender
Co	(No adjustment)
Ro	w Mean 1
	2 -5.365020
	I 0.0000
al	pha = 0.05
Re	pject Ho if $p = P(Z \le z) \le alpha/2$
==	
_	Question For each of the factor which has the day and athere differences in the surrouter second
•	income?
•	dunntest iknowledge, by(iincome)
Wa	arning: by() values are unlabeled, option nolabel implicit
Kr	ruskal-Wallis equality-of-populations rank test
	++
	iincome Obs Rank Sum
	1 85 35381.50
	3 220 107747.00
	4 194 108728.50
	/ 45 2/296.00 8 29 15261.50
	9 13 8052.50
	10 22 14004.00
	11 116 64081.00
	++
ch	i-squared = 28.138 with 10 d.f.
pr	robability = 0.0017
ch	i-squared with ties = 31.647 with 10 d.f.
pr	robability = 0.0005
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Dunn's	Pairwise	Comparison	of	iknowledge	by	iincome	
		(No adjus	stme	ent)			

.ow Mean	 	1		2	3	4	
	+						
2	-2.497	470					
	ı 0.0	000					
3	-1.980	782 0.87	9087				
	0.0	238 0.	1897				
,		0.7.1 1 0.5	<i>(</i>				
4	-3.815	271 -1.25	7535 -2 1043	0 0067			
	0.0	001 0.	1043	0.0007			
5	-3.893	000 -1.49	5793 -2	2.613509	-0.363691		
	0.0	000 0.	0674	0.0045	0.3580		
G	1 2 252	100 1 10	2050 /	0 0 6 0 0 2 5	0 101600	0 114700	
0	0.0	004 0.	1184 -2	0.0197	0.4267	0.4543	
7	-3.552	889 -1.74	2852 -2	2.457248	-0.959300	-0.688698	-0.722300
	0.0	002 0.	0407	0.0070	0.1687	0.2455	0.2351
8	-1.760	408 -0.13	0388 -0	0.635829	0.591132	0.774389	0.656758
-	0.0	392 0.	4481	0.2624	0.2772	0.2194	0.2557
-							
9	-2.347	848 -1.19	2059 - 1	1.563387	-0.708333	-0.559877	-0.597431
	1 0.0	094 U.	ττυρ	0.0590	0.2394	0.28/8	0.2/51
10	-3.169	354 -1.75	6891 -2	2.259138	-1.163994	-0.964239	-0.987559
	0.0	008 0.	0395	0.0119	0.1222	0.1675	0.1617
1 1	2.000	170 0 00	E00E -	1 070400		0 5/1010	0 250674
11	-3.282	1/9 -0.90	5285 -1 1827	0 0301	0.235565	0.541013	0.359674
ol Mean-	0.0	000 0.	1021	0.0301	0.4005	0.2912	0.0000
w Mean		7		8	9	10	
 o	+	700					
0	0.1	702 229					
9	-0.140	395 -0.96	0591				
	0.4	442 0.	1684				
10	-0.396	438 -1.34	2428 -(0.168444			
	0.3	459 0.	0897	0.4331			
1 1		001 0.40	2607 (0 700064	1 044067		
11	0.1	443 0.	3697 (3323	0.2152	0.1066		
lpha =	0.05						
eject Ho	if p = P	$(Z \leq z)$	<= alpł	ha/2			
dunntes	t iother,	by(iincom	e)				
	h() 7		-17] .]	1.11	
rning:]	by() valu	es are unl	abeled,	option 1	no⊥abel impl	lClt	
	allis equ	ality-of-p	opulatio	ons rank	test		
ruskal-Wa							
ruskal-Wa			 m				
ruskal-W	ne Ohe	Rank Sur					
:uskal-W + iincon 	 me Obs +	Rank Su +					
ruskal-W + iincon 	me Obs + 1 85	Rank Su + 40557.5	 0				
ruskal-W + iincon 	me Obs + 1 85 2 124	Rank Su + 40557.5 68881.5					
ruskal-W + iincon 	me Obs + 1 85 2 124 3 220 4 194	Rank Su + 40557.5 68881.5 111152.5 109253 0	 0 0 0				
ruskal-W. + iincon 	me Obs 1 85 2 124 3 220 4 194 5 138	Rank Su + 40557.5 68881.5 111152.5 109253.0 76566.0					
cuskal-W. + iinco 	me Obs 1 85 2 124 3 220 4 194 5 138	Rank Su + 40557.5 68881.5 111152.5 109253.0 76566.0					
ruskal-W. iincon 	me Obs 1 85 2 124 3 220 4 194 5 138 	Rank Su + 40557.5 68881.5 11152.5 109253.0 76566.0 + 38956.5					
ruskal-W iincon 	me Obs 1 85 2 124 3 220 4 194 5 138 6 81 7 45 2 20	Rank Su +					
ruskal-W + iinco 	me Obs 1 85 2 124 3 220 4 194 5 138 6 81 7 45 8 29 9 13	Rank Su + 40557.5 68881.5 11152.5 109253.0 76566.0 + 38956.5 26963.0 15964.0 7307 5					
ruskal-W + iincon 	me Obs 1 85 2 124 3 220 4 194 5 138 	Rank Su + 40557.5 68881.5 111152.5 109253.0 76566.0 38956.5 26963.0 15964.0 7397.5 12425.5					
ruskal-W + iincon 	me Obs 1 85 2 124 3 220 4 194 5 138 6 81 7 45 8 29 9 13 10 22	Rank Su + 40557.5 68881.5 111152.5 109253.0 76566.0 + 38956.5 26963.0 15964.0 7397.5 12425.5					

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	Dunn's E	airwise Com	parison of	iother by i	income			
Col Mean- Row Mean		(No 1	adjustment 2	3	4	1	5	6
2	-1.820902 0.0343							
 3 	-0.719869 0.2358	1.464701 0.0715						
4	-2.164101 0.0152	-0.218148 0.4137	-1.924668 0.0271					
 5 	-1.843770 0.0326	0.017718 0.4929	-1.494472 0.0675	0.244915 0.4033				
 6 	-0.080037 0.4681	1.707810 0.0438	0.611758	2.033932 0.0210	1.727440 0.0420			
 7 	-2.166306 0.0151	-0.821450 0.2057	-1.879091 0.0301	-0.712417 0.2381	-0.845545 0.1989	-2.081181 0.0187		
 8 	-1.116035 0.1322	0.079540 0.4683	-0.749513 0.2268	0.208387	0.069584 0.4723	-1.051661 0.1465		
9 	-1.009833 0.1563	-0.152029 0.4396	-0.731528 0.2322	-0.067154 0.4732	-0.160323 0.4363	-0.964946 0.1673		
10 	-1.199166 0.1152	-0.131556 0.4477	-0.871672 0.1917	-0.023795 0.4905	-0.142123 0.4435	-1.141432 0.1268		
 11 Col Mean	-1.247245 0.1062	0.606437 0.2721	-0.750743 0.2264	0.881120 0.1891	0.604470 0.2728	-1.144015 0.1263		
Row Mean +		7	8	9	10)		
8 	0.669238 0.2517							
9 	0.313259 0.3770	-0.181941 0.4278						
10	0.432536 0.3327	-0.165674 0.4342	0.039694 0.4842					
11 	1.260049 0.1038	0.298282 0.3827	0.419363 0.3375	0.467740 0.3200				
alpha = Reject Ho	0.05 if p = P(Z <	<= z) <= a	lpha/2					
Questi	on: For each	of the factor	variables (knowledge a	and other), a	are there dif	ferences in t	he average respon
among	regions?							
. dunntest	iknowledge,	by(iregion)					
Warning: b	y() values a	ire unlabele	d, option n	olabel impl	icit			
Kruskal-Wa	llis equalit	y-of-popula	tions rank	test				
+ iregic	n Obs F	Rank Sum						
	++							

+		+					
chi-squar probabili	ed = 5 ty = 0	.469 with 8 .7065	d.f.				
chi-squar probabili	ed with ti ty = 0	.es = 6.1	62 with 8 d.1	Ē.			
-	-						
	Dunn's	Pairwise Com	parison of il No adjustment	nowledge by ;)	' iregion		
Col Mean- Row Mean		1	2	3	4		5
2	+	 509					
	0.14	19					
3	-0.1722 0.43	251 1.34539 816 0.089	9				
4	0.3901	49 1.64959	0.702685				
-	0.34	0.049	0.2411				
5	0.4147	202 2.18304 892 0.014	1 0.937194 5 0.1743	-0.058582 0.4766			
6	0.1631	.90 1.45599	0.426919	-0.262248	-0.270564		
	0.43	0.072	0.3347	0.3966	0.3934		
7	-0.1863	28 1.12691 61 0.129	8 -0.039002 9 0.4844	-0.669008 0.2517	-0.820729	-0.414454	
8	-0.5781	86 0.52807	7 -0.584510	-1.062830	-1.296538	-0.844421	
-	0.28	0.298	0.2794	0.1439	0.0974	0.1992	
9	-0.1356	599 1.39530	4 0.057851 5 0.4769	-0.662132	-0.877640	-0.383263	
Col Mean- Row Mean		7	8				
	+	39	-				
	0.31 	.16					
9	0.0873 0.46	0.62802 52 0.265	4				
alpha =	0.05						
Reject Ho	if p = P(Z <= z) <=	alpha/2				
. dunntes	t iother,	by(iregion)					
Warning:	by() value	s are unlabe	led, option r	nolabel impl	icit		
Kruskal-W	allis equa	lity-of-popu	lations rank	test			
+ iregi	on Obs	Rank Sum					
	++ 1 47	22561.50					
	2 123 3 190	69595.50 98283.50					
i	4 60	29825.50					
 	5 196	T03603.00					
	6 74 7 102	38500.50 56208.00					
Ì	8 77	40265.50					
1	9 189	101368.00					

	Dunn's P	airwise Com	parison of	iother by i	region				
Col Mean- Row Mean		1	2	3	4		5	6	
2	-1.651264 0.0493								
3	-0.754747 0.2252	1.384344 0.0831							
4	-0.289090 0.3863	1.440613 0.0748	0.450033 0.3263						
5	-0.986810 0.1619	1.068340 0.1427	-0.366535 0.3570	-0.704618 0.2405					
6	-0.712218 0.2382	1.021777 0.1534	-0.072157 0.4712	-0.440535 0.3298	0.201037 0.4203				
7	-1.329861 0.0918	0.363767 0.3580	-0.908316 0.1819	-1.094902 0.1368	-0.607562 0.2717	-0.665397 0.2529			
8	-0.764952 0.2221	0.974207 0.1650	-0.137978 0.4451	-0.495255 0.3102	0.138866 0.4448	-0.053765 0.4786			
9 Col Mean-	-1.140280 0.1271	0.839921 0.2005	-0.612310 0.2702	-0.874259 0.1910	-0.250994 0.4009	-0.386621 0.3495			
KOW Mean 	 0.615064 0.2693	1	8						
9 9 alpha = Reject Ho	0.395481 0.3462 0.05 if p = P(Z <	-0.327411 0.3717 = z) <= a	lpha/2						
9 alpha = Reject Ho • Quest	0.395481 0.3462 0.05 if p = P(Z <	-0.327411 0.3717 = z) <= a	llpha/2	knowledge a	and other), a	are there dif	ferences	in the aver	
9 alpha = Reject Ho • Questi based	0.395481 0.3462 0.05 if p = P(Z < ion: For each upon type of	-0.327411 0.3717 = z) <= a 	llpha/2 r variables (1?	knowledge a	and other), a	are there dif	ferences	in the aver	
9 alpha = Reject Ho • Questi based . dunntest Warning: k	<pre>0.395481 0.3462 0.05 if p = P(Z < ion: For each upon type of c iknowledge, py() values a</pre>	-0.327411 0.3717 = z) <= a of the facto <u>device</u> used by(idevice re unlabele	<pre>slpha/2 r variables (?? s) sd, option r</pre>	knowledge a	and other), a	are there dif	ferences	in the aver	
<pre>9 alpha = Reject Ho Questi based . dunntest Warning: k Kruskal-Wa</pre>	<pre>0.395481 0.3462 0.05 if p = P(Z < ion: For each upon type of c iknowledge, by() values a allis equalit</pre>	-0.327411 0.3717 = z) <= a of the facto <u>device</u> usec by(idevice re unlabele y-of-popula	<pre>slpha/2 r variables (}? s) sd, option r stions rank</pre>	knowledge a	and other), a	are there dif	ferences	in the aver	age respo
9 alpha = Reject Ho • Questi based . dunntest Warning: k Kruskal-Wa	<pre>0.395481 0.3462 0.05 if p = P(Z < ion: For each upon type of c iknowledge, by() values a allis equalit</pre>	-0.327411 0.3717 = z) <= a of the facto <u>device</u> used by(idevice re unlabele y-of-popula	<pre>slpha/2 r variables (? sd, option r stions rank</pre>	knowledge a	and other), a	are there dif	ferences	in the aver	age respo
9 alpha = Reject Ho Questi based . dunntest Warning: k Kruskal-Wa + idevic	<pre>0.395481 0.3462 0.05 if p = P(Z < ion: For each upon type of c iknowledge, by() values a allis equalit ce Obs R </pre>	-0.327411 0.3717 = z) <= a ===================================	<pre>slpha/2 style="text-align: center;"> slpha/2 style="text-align: center;" style="text-align: center;" style="text-align: center;"> style="text-align: center;" style="</pre>	knowledge a	and other), a	are there dif	ferences	in the aver	age respo
<pre>9 alpha = Reject Ho Questi based . dunntest Warning: k Kruskal-Wa . idevic</pre>	<pre>0.395481 0.3462 0.05 if p = P(Z < ion: For each upon type of c iknowledge, by() values a allis equalit ce Obs R </pre>	-0.327411 0.3717 = z) <= a ===================================	<pre>slpha/2 r variables (? s) sd, option r stions rank</pre>	knowledge a	and other), a	are there dif	ferences	in the aver	age respo
<pre>9 alpha = Reject Ho Questi based . dunntest Warning: k Kruskal-Wa + idevic +</pre>	0.395481 0.3462 0.05 if p = P(Z < ion: For each of upon type of c iknowledge, by() values a allis equalit ce Obs R 1 455 23 2 464 24 4 117 7 5 22 1 6 9	-0.327411 0.3717 = z) <= a of the facto device usec by(idevice re unlabele y-of-popula + ank Sum + 1846.00 3925.50 4083.00 4355.00 5568.50 +	<pre>slpha/2 r variables (} d, option r stions rank</pre>	knowledge a	and other), a	are there di	ferences	in the aver	age respo
9 alpha = Reject Ho • Questi based . dunntest Warning: k Kruskal-Wa +	<pre>0.395481 0.3462 0.05 if p = P(Z < ion: For each upon type of c iknowledge, by() values a allis equalit ce Obs R 1 455 23 2 464 24 4 117 7 5 22 1 6 9 cd = 19.25 cy = 0.00</pre>	-0.327411 0.3717 = z) <= a of the facto device usec by(idevice re unlabele y-of-popula + ank Sum 1846.00 3925.50 4083.00 4355.00 5568.50 + 5 with 4 d. 07	<pre>slpha/2 r variables (}? s) sd, option r stions rank f.</pre>	knowledge a	and other), a	are there di	ferences	in the aver	age respo

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Dol Mean- Now Mean- 2 -0.842399 2 -0.842399 4 -4.104772 -3.575691 0.0000 0.0002 5 -2.253612 -1.999900 -0.286000 1 0.0121 0.0228 0.3874 6 -1.116132 -0.951199 0.143918 0.293782 1 0.1322 0.1708 0.4428 0.3845 alpha = 0.05 Reject Ho if p = P(2 <= z) <= alpha/2 . dunntest iother, by(idevice) Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test +	<pre>Dol Mean- Now Mean 1 2 4 5 2 -0.842399 0.1998 4 -4.104772 -3.575691 0.0000 0.0002 5 -2.253612 -1.999900 -0.286000 0.0021 0.0228 0.3874 6 -1.116132 -0.951199 0.143918 0.293782 0.1322 0.1708 0.4428 0.3845 alpha = 0.05 Reject Ho if p = P(Z <= z) <= alpha/2 . dunntest iother, by(idevice) Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test +</pre>	Dol Mean- Now Mean- 2 -0.842399 0.1998 4 -4.104772 -3.575691 0.0000 5 -2.253612 -1.999900 -0.286000 0.00226 0.3874 6 -1.116132 -0.951199 0.143918 0.293782 0.1322 0.1708 0.4428 0.3845 alpha = 0.05 Reject Ho if p = P(Z <= z) <= alpha/2	Del Mean- 2 -0.842399 0.1998 4 -4.104772 -3.575691 0.0000 0.0002 5 -2.253612 -1.999900 -0.286000 0.0121 0.0228 0.3874 6 -1.116132 -0.951199 0.143918 0.293782 0.1322 0.1708 0.4428 0.3845 alpha = 0.05 Reject Ho if p = P(Z <= z) <= alpha/2 dunntest iother, by(idevice) Warning: by() values are unlabeled, option nolabel implicit Xruskal-Wallis equality-of-populations rank test +	Jol Mean-		(No	adjustment))
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<pre>5 -2.253612 -1.999900 -0.286000 0.0121 0.0228 0.3874 6 -1.116132 -0.951199 0.143918 0.293782 0.1322 0.1708 0.4428 0.3845 alpha = 0.05 Reject Ho if p = P(Z <= z) <= alpha/2 . dunntest iother, by(idevice) Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test +</pre>	<pre>5 -2.253612 -1.999900 -0.286000 0.0121 0.0228 0.3874 6 -1.116132 -0.951199 0.143918 0.293782 0.1322 0.1708 0.4428 0.3845 alpha = 0.05 Reject Ho if p = P(Z <= z) <= alpha/2 . dunntest iother, by(idevice) Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test +</pre>	<pre>5 -2.253612 -1.999900 -0.286000 0.0121 0.0228 0.3874 6 -1.116132 -0.951199 0.143918 0.293782 0.1322 0.1708 0.4428 0.3845 alpha = 0.05 Reject Ho if p = P(Z <= z) <= alpha/2</pre>	<pre>5 -2.253612 -1.999900 -0.286000 0.0121 0.0228 0.3874 6 -1.116132 -0.951199 0.143918 0.293782 0.1322 0.1708 0.4428 0.3845 alpha = 0.05 Reject Ho if p = P(Z <= z) <= alpha/2 . dunntest iother, by(idevice) Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test +</pre>	4	-4.104772 0.0000	-3.575691 <mark>0.0002</mark>		
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<pre>alpha = 0.05 Reject Ho if p = P(Z <= z) <= alpha/2 . dunntest iother, by(idevice) Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test +</pre>	<pre>alpha = 0.05 Reject Ho if p = P(Z <= z) <= alpha/2 . dunntest iother, by(idevice) Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test +</pre>	<pre>alpha = 0.05 Reject Ho if p = P(Z <= z) <= alpha/2 . dunntest iother, by(idevice) Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test +</pre>	<pre>alpha = 0.05 Reject Ho if p = P(Z <= z) <= alpha/2 . dunntest iother, by(idevice) Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test +</pre>	6	 -1.116132 0.1322	-0.951199 0.1708	0.143918 0.4428	0.293782 0.3845
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Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test +	<pre>Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test +</pre>	<pre>Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test +</pre>	<pre>Warning: by() values are unlabeled, option nolabel implicit Kruskal-Wallis equality-of-populations rank test +</pre>	. dunntes	t iother, by(idevice)		
<pre>Kruskal-Wallis equality-of-populations rank test +</pre>	<pre>Kruskal-Wallis equality-of-populations rank test +</pre>	<pre>Kruskal-Wallis equality-of-populations rank test +</pre>	<pre>Kruskal-Wallis equality-of-populations rank test +</pre>	Warning:)	by() values a	re unlabele.	d, option no	olabel implicit
<pre>Kruskal-Wallis equality-of-populations rank test ++ idevice Obs Rank Sum +++ 1 455 232086.50 2 464 249706.50 3 4 117 71108.00 4 117 71108.00 5 22 12291.00 4 6 9 4586.00 4</pre>	<pre>Kruskal-Wallis equality-of-populations rank test</pre>	<pre>Kruskal-Wallis equality-of-populations rank test ++</pre>	<pre>Kruskil-Wallis equality-of-populations rank test idevice Obs Rank Sum </pre>					
<pre>++ idevice Obs Rank Sum + 1 455 232086.50 2 464 249706.50 4 117 71108.00 5 22 12291.00 6 9 4586.00 ++ chi-squared = 9.727 with 4 d.f. probability = 0.0453 chi-squared with ties = 9.893 with 4 d.f. probability = 0.0423 Dunn's Pairwise Comparison of iother by idevice (No adjustment) Col Mean- Row Mean 1 2 4 5 2 -1.392887 0.0818 4 -3.084003 -2.201813 0.0010 0.0138 5 -0.728643 -0.307796 0.691191 0.2331 0.3791 0.2447 6 0.005101 0.278162 0.929115 0.406324 0.4980 0.3904 0.1764 0.3423</pre>	<pre>idevice Obs Rank Sum </pre>	<pre>++ i idevice Obs Rank Sum + i idevice Obs Zank Sum + i i 4 117 71108.00 i 5 22 12291.00 i 6 9 4586.00 ++ chi-squared = 9.727 with 4 d.f. probability = 0.0453 chi-squared with ties = 9.893 with 4 d.f. probability = 0.0423 Dunn's Pairwise Comparison of iother by idevice</pre>	<pre>++ i device Obs Rank Sum + i device Obs Rank Sum + i device Obs 20086.50 2 464 249706.50 4 117 71108.00 5 22 12291.00 6 9 4586.00 + chi-squared = 9.727 with 4 d.f. probability = 0.0453 chi-squared with ties = 9.893 with 4 d.f. probability = 0.0423 Dunn's Pairwise Comparison of iother by idevice</pre>	∧ruskal-Wa	aiis equalit	y-or-popula	LIONS TANK 1	LEST
<pre></pre>	<pre> </pre>	<pre> </pre>	<pre> </pre>	+	 ce Obs F	ank Sum		
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<pre>++ chi-squared = 9.727 with 4 d.f. probability = 0.0453 chi-squared with ties = 9.893 with 4 d.f. probability = 0.0423 Dunn's Pairwise Comparison of iother by idevice</pre>	<pre>++ chi-squared = 9.727 with 4 d.f. probability = 0.0453 chi-squared with ties = 9.893 with 4 d.f. probability = 0.0423 Dunn's Pairwise Comparison of iother by idevice</pre>	<pre>++ chi-squared = 9.727 with 4 d.f. probability = 0.0453 chi-squared with ties = 9.893 with 4 d.f. probability = 0.0423 Dunn's Pairwise Comparison of iother by idevice</pre>	<pre>++ chi-squared = 9.727 with 4 d.f. probability = 0.0453 chi-squared with ties = 9.893 with 4 d.f. probability = 0.0423</pre>		6 9	4586.00		
chi-squared = 9.727 with 4 d.f. probability = 0.0453 chi-squared with ties = 9.893 with 4 d.f. probability = 0.0423 Dunn's Pairwise Comparison of iother by idevice (No adjustment) Col Mean- Row Mean 1 2 4 5 2 -1.392887 0.0818 4 -3.084003 -2.201813 0.0010 0.0138 5 -0.728643 -0.307796 0.691191 0.2331 0.3791 0.2447 6 0.005101 0.278162 0.929115 0.406324 0.4980 0.3904 0.1764 0.3423	chi-squared = 9.727 with 4 d.f. probability = 0.0453 chi-squared with ties = 9.893 with 4 d.f. probability = 0.0423 Dunn's Pairwise Comparison of iother by idevice (No adjustment) Col Mean- Row Mean 1 2 4 5 2 -1.392887 0.0818 4 -3.084003 -2.201813 0.0010 0.0138 5 -0.728643 -0.307796 0.691191 0.2331 0.3791 0.2447 6 0.005101 0.278162 0.929115 0.406324 0.4980 0.3904 0.1764 0.3423 alpha = 0.05 Reject Ho if p = P(Z <= 171) <= alpha/2	chi-squared = 9.727 with 4 d.f. probability = 0.0453 chi-squared with ties = 9.893 with 4 d.f. probability = 0.0423 Dunn's Pairwise Comparison of iother by idevice (No adjustment) Col Mean- Row Mean 1 2 4 5 	chi-squared = 9.727 with 4 d.f. probability = 0.0453 chi-squared with ties = 9.893 with 4 d.f. probability = 0.0423 Dunn's Pairwise Comparison of iother by idevice (No adjustment) Col Mean- Row Mean 1 2 4 5 	+		+		
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6 0.005101 0.278162 0.929115 0.406324 0.4980 0.3904 0.1764 0.3423	$6 \mid 0.005101 0.278162 0.929115 0.406324 \\ \mid 0.4980 0.3904 0.1764 0.3423$ $alpha = 0.05$ $Beject Ho if p = P(7 \le z) \le alpha/2$	6 0.005101 0.278162 0.929115 0.406324 0.4980 0.3904 0.1764 0.3423 alpha = 0.05 Reject Ho if p = P(Z <= z) <= alpha/2	6 0.005101 0.278162 0.929115 0.406324 0.4980 0.3904 0.1764 0.3423 alpha = 0.05 Reject Ho if p = P(Z <= z) <= alpha/2	4	-3.084003 0.0010 -0.728643	-2.201813 0.0138	0.691191	
0.4980 0.3904 0.1764 0.3423	alpha = 0.05 Reject Ho if p = P(7 <= 7) <= alpha/2	0.4980 0.3904 0.1764 0.3423 alpha = 0.05 Reject Ho if p = P(Z <= z) <= alpha/2	0.4980 0.3904 0.1764 0.3423 alpha = 0.05 Reject Ho if p = P(Z <= z) <= alpha/2	4	-3.084003 0.0010 -0.728643 0.2331	-2.201813 0.0138 -0.307796 0.3791	0.691191 0.2447	
	alpha = 0.05 Reject Ho if $p = P(7 \le z) \le alpha/2$	alpha = 0.05 <mark>Reject Ho if p = P(Z <= z) <= alpha/2</mark>	alpha = 0.05 Reject Ho if p = P(Z <= z) <= alpha/2	4 5 6	-3.084003 0.0010 -0.728643 0.2331 0.005101	-2.201813 0.0138 -0.307796 0.3791 0.278162	0.691191 0.2447 0.929115	0.406324
alpha = 0.05	Reject Ho if $p = P(7 \le z) \le alpha/2$	Reject Ho if $p = P(Z \le z) \le alpha/2$	Reject Ho if p = P(Z <= z) <= alpha/2	4 5 6	-3.084003 0.0010 -0.728643 0.2331 0.005101 0.4980	-2.201813 0.0138 -0.307796 0.3791 0.278162 0.3904	0.691191 0.2447 0.929115 0.1764	0.406324 0.3423
	alpha = 0.05 Reject Ho if p = P(7 <= z) <= alpha/2	alpha = 0.05 <mark>Reject Ho if p = P(Z <= z) <= alpha/2</mark>	alpha = 0.05 Reject Ho if p = P(Z <= z) <= alpha/2					
кејест но 1f p = P(Z <= z) <= alpha/2				4 5 6 alpha = <mark>Reject Ho</mark>	-3.084003 0.0010 -0.728643 0.2331 0.005101 0.4980 0.05 if p = P(Z <	-2.201813 0.0138 -0.307796 0.3791 0.278162 0.3904 = z) <= a	0.691191 0.2447 0.929115 0.1764 lpha/2	0.406324 0.3423
кејест но 1f p = P(Z <= z) <= alpha/2				4 5 6 alpha = <mark>Reject Ho</mark>	-3.084003 0.0010 -0.728643 0.2331 0.005101 0.4980 0.05 if p = P(Z <	-2.201813 0.0138 -0.307796 0.3791 0.278162 0.3904 = z) <= a	0.691191 0.2447 0.929115 0.1764	0.406324 0.3423
кеject но if p = P(Z <= z) <= alpha/2				4 5 6 alpha = Reject Ho	-3.084003 0.0010 -0.728643 0.2331 0.005101 0.4980 0.05 if p = P(Z <	-2.201813 0.0138 -0.307796 0.3791 0.278162 0.3904 = z) <= a	0.691191 0.2447 0.929115 0.1764	0.406324 0.3423
кејест но if p = P(Z <= z) <= alpha/2				4 5 6 alpha = Reject Ho	-3.084003 0.0010 -0.728643 0.2331 0.005101 0.4980 0.05 if p = P(Z <	-2.201813 0.0138 -0.307796 0.3791 0.278162 0.3904 = z) <= a	0.691191 0.2447 0.929115 0.1764	0.406324 0.3423
кејест но 1Г p = P(Z <= Z) <= alpha/2				4 5 6 alpha = <u>Reject Ho</u>	-3.084003 0.0010 -0.728643 0.2331 0.005101 0.4980 0.05 if p = P(Z <	-2.201813 0.0138 -0.307796 0.3791 0.278162 0.3904 = z) <= a	0.691191 0.2447 0.929115 0.1764	0.406324 0.3423
кејест но if p = P(Z <= z) <= alpha/2				4 5 6 alpha = Reject Ho	<pre>-3.084003 -3.084003 -0.728643 0.2331 0.005101 0.4980 0.05 if p = P(Z <</pre>	-2.201813 0.0138 -0.307796 0.3791 0.278162 0.3904 = z) <= a	0.691191 0.2447 0.929115 0.1764	0.406324 0.3423
кејест но if p = P(Z <= z) <= alpha/2				4 5 6 alpha = Reject Ho	-3.084003 0.0010 -0.728643 0.2331 0.005101 0.4980 0.05 if p = P(Z <	-2.201813 0.0138 -0.307796 0.3791 0.278162 0.3904 = z) <= a	0.691191 0.2447 0.929115 0.1764	0.406324 0.3423
кејест но if p = P(Z <= z) <= alpha/2				4 5 6 alpha = Reject Ho	-3.084003 0.0010 -0.728643 0.2331 0.005101 0.4980 0.05 if p = P(Z <	-2.201813 0.0138 -0.307796 0.3791 0.278162 0.3904 = z) <= a	0.691191 0.2447 0.929115 0.1764	0.406324 0.3423
кејест но 1f p = P(Z <= z) <= alpha/2				4 5 6 alpha = Reject Ho	-3.084003 0.0010 -0.728643 0.2331 0.005101 0.4980 0.05 if p = P(Z <	-2.201813 0.0138 -0.307796 0.3791 0.278162 0.3904 = z) <= a	0.691191 0.2447 0.929115 0.1764	0.406324 0.3423

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STROBE Statement—Checklist of items that should be included in reports of *cross-sectional studies*,
ADAPTED FOR A SURVEY STUDY: Informed consent, shared-decision making and a reasonable patient's wished based on a national survey in the United States using a hypothetical scenario.
An (X) indicates that the checklist item is included in the manuscript if applicable for a survey study.

	Item No	Recommendation
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract
The and abstract	1	x
		(b) Provide in the abstract an informative and balanced summary of what was done
		and what was found X
Introduction		
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported
Buekground/futionale	-	X
Objectives	3	State specific objectives, including any prespecified hypotheses X
Methods		
Study design	4	Present key elements of study design early in the paper X
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment.
	-	exposure. follow-up, and data collection X
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of
1		participants X
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect
		modifiers. Give diagnostic criteria, if applicable X
Data sources/	8*	For each variable of interest, give sources of data and details of methods of
measurement		assessment (measurement). Describe comparability of assessment methods if there is
		more than one group X
Bias	9	Describe any efforts to address potential sources of bias X
Study size	10	Explain how the study size was arrived at X
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable,
		describe which groupings were chosen and why X
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding
		X
		(b) Describe any methods used to examine subgroups and interactions X
		(c) Explain how missing data were addressed NOT APPLICABLE
		(d) If applicable, describe analytical methods taking account of sampling strategy X
		(e) Describe any sensitivity analyses NOT APPLICABLE
Results		
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially
		eligible, examined for eligibility, confirmed eligible, included in the study,
		completing follow-up, and analysed NOT APPLICABLE
		(b) Give reasons for non-participation at each stage NOT APPLICABLE
		(c) Consider use of a flow diagram NOT USEFUL
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and
		information on exposures and potential confounders X
		(b) Indicate number of participants with missing data for each variable of interest \mathbf{X}
Outcome data	15*	Report numbers of outcome events or summary measures X
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and
		their precision (eg, 95% confidence interval). Make clear which confounders were

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		adjusted for and why they were included NOT APPLICABLE
		(<i>b</i>) Report category boundaries when continuous variables were categorized NOT APPLICABLE
		(<i>c</i>) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period <i>NOT RELEVANT</i>
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses X
Discussion		
Key results	18	Summarise key results with reference to study objectives X
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or
		imprecision. Discuss both direction and magnitude of any potential bias \mathbf{X}
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations,
		multiplicity of analyses, results from similar studies, and other relevant evidence X
Generalisability	21	Discuss the generalisability (external validity) of the study results X
Other information		
Funding	22	Give the source of funding and the role of the funders for the present study and, if
		applicable, for the original study on which the present article is based \mathbf{X}

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.