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Health Information Seeking, Source Trust, and Culture: Comparative Analysis of Health Information Trends and Needs between Guam and the U.S.

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Despite improvements in the overall health of the general population over the past decade, there are still significant health disparities across diverse populations (Angeles & Somers, 2007). Knowledge gaps related to health and challenges in information delivery have been found to contribute to health disparities (Clayman et al., 2010; Viswanath, 2006). As new media revolutionized the way information is disseminated and accessed, it was hoped that knowledge and information gaps among different population groups would be reduced (Jäntti, 2014; Leug, 2010). Compaine (1986) argued earlier that these differences will eventually disappear, with technological advances, like electricity and other utilities. However, the assumption that equalization of communication is inevitable has been questioned (Viswanath, 2006). Indeed, the sheer availability of information and the state of technology and communication has yet to reverse the growth of health disparities due to sociocultural, sociopolitical and socioeconomic factors (Hesse, 2011).

Although health information is readily accessible via diverse channels, the continuing health disparities among minority populations (AHRQ, 2013) suggest that health information is not reaching underserved and underrepresented groups, such as Pacific Islanders (Haddock et al., 2009). Viswanath (2006) argues that “inequalities in communication offer one potent explanation for inequalities in health (p. 222)” and that new technology does not necessarily improve health outcomes of minority populations, as constant upgrades place greater burdens on those in lower income groups, even as information technology costs drop. Furthermore, he points out that the allocation of money to communication services, such as Internet and mobile phones, is based on conscious choices that people make, vis-à-vis what they spend on other needs. Thus, some may perceive communication technology as a necessity, while others may see it as a luxury.

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Since effective actions to reduce health disparities start with enhanced understanding of the unique nature of health information processing among diverse population groups, this study aims to investigate health information seeking and processing patterns among Guam residents and compare them with the national health information trends reported in Health Information National Trends Survey (HINTS). Guam's multi-ethnic population offers a unique opportunity to learn about the health information needs and practices of Americans of Pacific Island ancestry, which is a largely underserved and underrepresented segment of the national population.

Health Information National Trends Survey (HINTS)

As part of its mission to facilitate the process through which cancer is communicated to the public, the National Cancer Institute developed HINTS (http://hints.cancer.gov). HINTS measures how people access and use health information, how they use information technology to manage health and health information, and the degree to which people are engaged in healthy behaviors. As such, the HINTS data is intended to provide insights about the relationship between communication constructs and cancer-relevant knowledge, attitudes, and behaviors as a means to develop more effective population based interventions. However, as HINTS became more useful as a national health surveillance system, it became more apparent that national level data was not sufficient, as sample sizes at the state level were too small for meaningful analyses. To date, only local HINTS data from Puerto Rico have been documented (Tortolero-Luna et al., 2010). Therefore, there is a need for more localized HINTS data, particularly in unique demographic and geographic subpopulations.

Health and Communication Context in Guam

Guam, the westernmost territory of the United States, located 4,000 miles west of Hawaii in the middle of the Pacific Ocean, provides a very unique cultural and communication environment to its 159,000 residents. Guam is comprised of numerous cultural groups and languages (Palafox & Hixon, 2011) including Chamorro, Filipino and other Pacific Islanders.

There is a dearth of research on health information patterns in this geographic area which is home to a significant percentage of Americans of Pacific Islander ancestry, among whom the incidence of some cancers, certain chronic conditions like diabetes and obesity, and heart disease is higher than the national average (Behavioral Risk Factors Surveillance System (BRFSS), 2013). Guam has some marked health disparities, ranking first among all U.S. states and territories in smoking prevalence and 48th in physical activity in 2011 (BRFSS, 2013). Furthermore, the incidence of certain cancers is higher among Pacific Islanders (Haddock et al., 2009) and the prevalence of preventive testing is lower than the national average.

As Palafox and Hixon (2011) suggest, improving the state of current health disparities in the region should take into account the role of social determinants of health. For one, Pacific Islander cultures have characteristically oral-aural teaching and learning traditions (Tsark, 2007). These cultures are also collectivistic, and familial ties and values such as filial piety

impact on intergenerational communication, even in the online context (Somera, Dalisay, & Forbes, 2012).

The communication environment in Guam also differs somewhat from the mainland U.S. For example, the level of Internet penetration is lower than the US averages (56.3% compared to 86.8% in early 2014, (http://www.internetlivestats.com). However, the percentage of Internet users who are on Facebook in Guam is greater (78.2%) than in the U.S. (66.7%), which could be attributed to the need to maintain communication with their social networks, given Guam's relative geographical isolation.

Key Factors Affecting Health Information Processing

While there are many factors that are related to health information processing, we will focus on three key factors that have been shown to influence how people seek and process health related information: socio-demographic factors, information source preference, and trust in information sources.

Socio demographic factors

Many socio-demographic factors (e.g., age, sex, socioeconomic status, and ethnicity) exert powerful influence over various aspects of health including health information seeking, information processing, and access to health care (AHRQ, 2013). For instance, differences have been found in the nature and extent of health information seeking among older people compared to young people, possibly due to increased concern over health issues in general. Sex also affects health information seeking patterns, given overall differences in communication patterns and social networks. Females are more likely to discuss health issues with others, seek and exchange information about health compared to males (Weaver et al., 2010). Socio-economic factors influence various health outcomes and behaviors including health information seeking and processing (AHRQ, 2013). Finally, Lee et al. (2014) indicate that culture influences the types of motivation people have for information seeking.

Communication sources

According to Do et al. (2010) and Fox and Purcell (2010), people's communication source choices are determined by factors such as topic, motivation for communication, demographic factors, and culture. Studies consistently show that health care providers are most important sources for health information (Hesse et al., 2005; Smith, 2011; Thompson, 2013). Family and friends often serve as informal resources of health information (Hesse, Moser, & Rutten, 2010) and sometimes even act as surrogates to seek information for others (Thompson, 2008). Not surprisingly, the Internet has become a major source for health information (Cohen & Adams, 2009; Hesse et al., 2005; Fox, 2011). However, some people are more likely to use Internet for health information: e.g., Non-Hispanic whites, younger, more educated, currently employed (Hesse et al., 2005).

Both mass and social media are important sources of health information, but different types of people may access media in various ways. For example, members of underserved communities trust and value ethnicity-specific media (Nguyen & Bellamy, 2006; Pickel,

Quinn, & Brown, 2002; Ramirez, 2007). Asian Americans prefer printed information sources (Nguyen & Bellamy, 2006), while ethnic newspapers are popular among African Americans and Hispanics (Caburnay et al., 2008; Ramirez, 2007).

Trust in Health Information Sources

For health information to influence behavior, individuals have to believe and process the information, and then adopt the message's recommendation. Trust in the information source plays a key role in people's responses to health-related messages (Clayman et al., 2010). Healthcare professionals consistently command the highest level of trust (Smith, 2011) although the level of trust in other information sources such as family, friends, the Internet, and television tends to be fairly high as well (Smith, 2011). Further, trust in information sources varies by demographic factors such as age, sex, race, education and income (Do et al., 2010).

Given the importance of these factors in determining, both directly and indirectly, health information seeking and processing, health decision making, and ultimately, health behaviors, a better understanding of the factors for a specific population group is a critical first step in developing effective health communication programs. Within this context, the present study focuses on the Pacific Islander population in Guam, and addresses the following research questions:

1. What are the factors which affect health information seeking patterns - socio-demographic characteristics, sources of health information, the level of trust - in Guam?
2. How are these factors which affect health information seeking patterns in Guam different from the national sample of the United States?

Methods

Data Source and Instruments

We conducted a survey of 511 residents in Guam in February and March of 2013. For this study, we compared our survey data with the 2011 HINTS data (N = 3959). The HINTS data used in this study is part of HINTS 4 (Cycle 1) data collected from October 2011 through February 2012, the most recent at the time when Guam study was conducted.[1] The Guam data was collected using the respondent driven sampling (RDS) procedure. While HINTS uses a random sampling method using random digit dialing to recruit participants, this random sampling method is not practical for sampling populations of small size, such as minorities or "hidden populations" which do not have a proper sampling frame (Heckathorn, 1997). The RDS method is a non-probability sampling procedure developed by Heckathorn (2002) which uses chain-referrals that progress through a series of recruitment waves until equilibrium (when the composition of the ultimate sample is independent of the initial

[1]The sample design for HINTS (Cycle 1) consisted of a single-mode mail survey. The sampling consisted of a two-stage stratified sample of addresses used by Marketing Systems Group (MSG), and two methods of respondent selection were used for Cycle 1: the "All Adult" method and the "Next Birthday" method. Detailed information about Cycle 1 of HINTS 4 methodology can be found in a comprehensive report by the National Cancer Institute (Westat, 2012), and a historical overview of the HINTS program can be found in Finney Rutten et al. (2012).

sample) is reached. Studies have demonstrated that the RDS procedure generates reasonable population estimates for minority and hard-to-reach populations who cannot be sampled using probability sampling methodology (Heckathorn, 2002; Salganik & Heckathorn,2004).

The survey instrument used in the Guam study was based on the 2011 HINTS Cycle 1 instrument. In addition to the HINTS items, we included additional measures that were identified in the literature as well as in focus groups with Guam residents to be important for studying the impact of culture on health outcomes. Key measures included in the survey were: fatalism (Powe, 1995) acculturation (Novotny et al., 2009), and health locus of control (Wallston et al., 1976). Additionally, social network questions were added for the respondent-driven sampling calculations and estimates.

Study Variables

We selected the following socio-demographic variables to be included in the study: gender, age, education, ethnicity, annual household income, marital status, and employment status. Health and cancer information seeking status and sources were measured by responses to the following questions: “Have you ever looked for information about health or medical topics from any source?” and “Have you ever looked for cancer information from any source?” Internet status was measured by responses to the following question: “Do you ever go on-line to access the Internet or World Wide Web, or to send and receive an email?”

Data Analysis

The data were encoded and analyzed using Statistical Package for the Social Sciences (SPSS, Version 20). A total of 511 surveys were included in the analysis (100% of the completed surveys). Data were weighted according to population estimates for sex, age, and ethnicity from the 2010 Guam Census to provide representative estimates of the adult population in Guam. Study variables were drawn from HINTS data and recoded to match Guam data codes. HINTS data also contained both final sample weights that helped obtain population-level estimates and a set of 50 replicate sampling weights to obtain the correct standard errors; both of these were included in the present analysis.[2] We used STATA (Version 13.1) to account for the complex sampling design used in HINTS and to incorporate the jackknife replicate weights needed to compute accurate standard errors. All analyses were weighted to estimate standard errors of point estimates for the complex survey data. Missing data (with responses of “refuse” or “don’t know”) were recoded as missing for all analyses.

Descriptive statistics were calculated for all variables included in the analysis. Bivariate analysis was conducted between socio-demographic characteristics and the outcomes of interest (health and cancer information seeking, and Internet use) using Pearson’s chi-square test. Finally, based on the results of the bivariate analysis, we conducted separate multivariate logistic regression models for each of the outcomes of interest (health information seeking, cancer information seeking, and health related use of the Internet) to

[2]Detailed descriptions of how the sample and replicate weights were calculated can be found in the HINTS 4 Methodology Report (Westat, 2012).

estimate the odds ratios (ORs) and their 95% CIs for the association between the socio-demographic characteristics and these behaviors. The outcomes were tested by running separate models for the Guam and national HINTS data.

Results

Sample Characteristics

The mean age of the respondents was 40.03 years (*SD*=15.27 , *range* = 18-78) for the Guam sample and 46.47 (*SD*=18.05, *range* = 18-99) for the HINTS sample. The Guam sample was markedly younger with 36.5% in the 18-34 range, compared to 30.3% in the HINTS sample. On the other hand, 32.5% of the Guam sample were over 50 years of age, while 42.4% of this age group made up the HINTS sample. Twenty-three percent of the Guam sample were high school graduates, 34% reported having some college education, and 32% were college graduates, percentages comparable with the HINTS sample. As for income, a larger proportion of Guam residents made less than $15,000 per year (20% compared to 17%), and a smaller proportion made over $75,000 (22% compared to 29%) than the HINTS sample. These income differences are consistent with data from Bureau of Labor Statistics (2013). A greater percentage of the Guam sample were single or never been married (42% versus 29%), and a smaller percentage were married (48% versus 55%) compared to the national sample. In terms of ethnicity, Chamorros, the indigenous people of Guam, were the largest group at 39.4%, followed by Filipinos (32.3%), Whites (9.3%), Micronesians (8.0%), and Asians (6.0%). No comparison with the HINTS sample was made, since the majority of the population of Guam is made up of Pacific Islanders, an underrepresented minority in the national sample.

Information Seeking and Experiences

The health information seeking behaviors of participants are presented in Table 1.

The majority of the participants in Guam (79.7%) had looked for health or medical topics at a comparable level as the national HINTS sample (79.9%). During the most recent time they looked for this type of information, the most common source was the Internet for 69.1% of the Guam participants and 69.6% of the national sample. However, the Guam sample turned to print media next (13.7%), followed by a healthcare provider (11.3%) while 5.9% percent turned to “other” sources. In contrast, HINTS respondents said that the second source of health information they would turn to after the Internet would be a healthcare provider, 13.6%, followed by printed materials, 9.8%.

If they had “a strong need to get information about health or medical topics,” Guam survey participants indicated that they would go to the Internet first (45.8%) followed by a healthcare provider, 38.2%, “other” sources, 10.4%, and printed materials, 5.6%. In contrast, 52.2% of the HINTS respondents said that they would go to a healthcare provider first, while only 39.4% would go to the Internet first. Five percent (5.4%) would consult “other” sources, while 3.0% would go to printed materials.

A higher percentage of the Guam sample (65.8% compared to 51.8% of the HINTS sample) reported having ever looked for information about cancer from any source. The percentage

that looked for health or medical information for themselves on the Internet was comparable at 79.1% and 78.0% for the Guam and HINTS samples, respectively.

Table 2 summarizes the health information seeking experiences of the survey participants.

Overall, both Guam and national HINTS participants felt it did not take a lot of effort to get the information. They were not frustrated about finding health information, were able to understand the information they found, and were confident that they could get advice or information about health or medical topics when needed. However, the Guam respondents seemed more concerned about the quality of the information they found ($M = 2.74$, $SD = 1.28$) compared to the HINTS sample ($M = 2.51$, $SD = 1.53$). The national HINTS sample indicated that they felt significantly more frustrated during their search for (health) information than the Guam sample ($p < .05$).

Trust in Health Information Sources

Survey participants indicated how much trust they had in the health or medical information from nine sources. For both the Guam and the HINTS samples, the most trusted information source for health and medical topics were health care providers ($M = 3.60$, $SD = 1.06$ and $M = 3.64$, $SD = 1.04$, respectively). The second and third ranked information sources, government health agencies and the Internet, were the same for both samples. However, ratings for the other information sources varied in the Guam and HINTS samples, as showed in Table 3.

It should be noted that the Guam sample, overall, rated the trustworthiness of the information sources more highly than the HINTS sample in all sources but the health care providers. Interestingly, religious organizations and leaders received relatively high ratings for trustworthiness in the Guam sample (M=2.53, $SD = 1.31$) while they were rated as the least trusted sources in the HINTS sample (M=2.05, $SD = 1.45$).

Factors Associated with Health and Cancer Information Seeking

Bivariate analysis of socio-demographic variables associated with health or medical information seeking was conducted. Chi-square tests of independence indicated that socio-demographic variables (sex, education, income, and employment) were significantly associated with health and cancer information seeking for both the Guam and HINTS samples.

As Table 4 shows, women are more likely than men to seek information about health and cancer. The higher the educational attainment, the greater the interest in seeking health and cancer-related information. With the exception of the first two income levels, the rest of the income brackets follow the same progression as the levels of educational attainment. Those who are employed are more likely to seek information about health and cancer, compared to those unemployed. Finally, income, marital and employment status were all significantly associated with use of the Internet for both samples.

The variables significantly associated at the bivariate level with health and cancer information seeking and Internet access were entered into separate multivariate logistic

regression models to identify independent associations. Tables 5 and 6 summarize the results for the logistic models.

As Table 5 shows, women were significantly more likely to have sought health information for both Guam and the HINTS samples. While having some college or more education significantly predicted general health and cancer information seeking for the national HINTS sample, this was not the case in Guam, although a similar trend was evident in the data. Income was a significant factor in cancer information seeking for both Guam and HINTS samples, but not for general health information seeking. Currently employed individuals and students in the Guam sample were about three times more likely to have sought health information compared to those not currently employed (OR = 3.36, 95% *CI* 1.38-8.21 for currently employed, and OR = 3.01, 95% *CI* 1.2-7.59 for students). Employment status was not a factor in the HINTS sample.

There were huge differences associated with Internet use in the Guam sample, as indicated in Table 6, particularly with the factors of age, education and income.

Respondents aged 18-34 and those with higher levels of education were more likely to use the Internet. Compared to those aged 50+, younger respondents (age 18-34) were almost thirty times more likely to use the Internet (OR = 29.87, 95% *CI* 7.99-111.55). Those between 35-49 years older were about eight times more likely to use to the Internet (OR = 8.12, 95% *CI* 2.73-24.16) compared to their older counterparts. A similar pattern was found in the national sample, though at a smaller magnitude.

Respondents with high school, some college, and college graduates had approximately seven (OR = 6.91, 95% *CI* 2.14-22.33), fifty (OR = 49.18, 95% *CI* 10.53-229.64) and fifty-three (OR = 53.14, 95% *CI* 10.87-259.75) times higher odds of using the Internet, respectively. Again, similar patterns were found for the national sample, but the magnitude of difference was smaller. Income levels played a role in predicting use of the internet: those who were in the $35,000-$49,999 bracket were eight times more likely to use the Internet (OR = 8.22, 95% *CI* 1.06-63.56), while those earning $50,000-$74,999 were almost six times more likely to use the Internet (OR = 5.86, 95% *CI* 1.19-28.78) and those who made over $75,000 year per annum were ten times more likely to use the Internet (OR = 10.31, 95% *CI* 1.74-61.04). However, for the HINTS sample, only those who make $75,000 or more were found to be different in their predicted Internet use.

Discussion

This study had two primary goals: first, to describe the health information seeking patterns among Pacific Islanders in Guam, particularly their communication and information-seeking behaviors, experiences, and needs relevant to cancer as indicated by their responses to selected sections of the HINTS; and second, to compare the health information seeking patterns in the Guam sample to the national HINTS sample to determine what factors may have an influence on these patterns. The results indicate that there are many similarities in health information seeking among those who live in Guam and the national HINTS sample.

More interestingly, however, there are some significant differences between the two populations.

First, reliance on health care providers, albeit the most trusted, as a source for health information is lower in Guam compared to the national sample, even when there is a strong need for health or medical information. While the level of information-seeking for the Guam and the national sample are almost identical (79.7% and 79.9%, respectively) and both samples would go to the Internet first for information (69.1% an 69.6% respectively), there is a marked difference when there is a strong need for health or medical information. Almost half (45.8%) of the Guam sample would turn to the Internet first, while more than half (52.2%) of the national sample would go to a healthcare provider.

The level of awareness of health issues in Guam appears to be fairly high, which could be attributed to local concerns about the burden of non-communicable diseases in the community, with the levels of diabetes, heart disease, and certain cancers being higher than the national average (BRFSS, 2013). Interestingly, while the levels of health and cancer information seeking for the Guam and HINTS samples are comparable, Internet use for the Guam sample is much higher. In addition to the socio-demographic variables, geographical isolation for the island community and relatively limited medical resources may account for the greater reliance on online information.

The Internet was the first source of information about health and medical topics, for both groups. The big gap between the information sought on the Internet (69.1%) and other information sources may be attributed to both access and cost. It is not uncommon for individuals with acute health care concerns to go to Hawaii, the Philippines, or even the U.S. for medical treatment, if they can afford it. Presumably, individuals resort to the Internet first because the information can be acquired easily. It could also be used as a filter, i.e., identify some explanations for health symptoms before going to a health care provider or not. However, it could lead to self-diagnoses, and may explain the low prevalence of preventive testing and higher instances of late stage diagnosis of certain cancers in Guam (Haddock et al., 2009).

The response to the question about where they would go first if they had a strong need for medical information bears this out – the Internet would still be the first choice for the Guam sample, but healthcare providers are a closer second choice. In contrast, the majority of the HINTS sample would go to a healthcare provider first for an urgent need for health or medical information, followed by the Internet. It appears that the Guam sample uses the Internet as a screening mechanism, i.e., to determine if the symptoms indeed warrant a visit to a healthcare provider and the assumption of expected financial burdens, particularly when the person involved may not have health insurance. Age may also be a relevant factor, i.e., the Guam sample has a greater percentage of younger people, whereas older people in the HINTS sample are more likely to be employed or retired, and have health insurance.

The higher percentage of the sample turning to the Internet for health information could be attributed to the lack of access to healthcare providers. On the other hand, the ability to seek out health and medical information on the Internet may give people a sense of

empowerment, which could be reflected in the high levels of confidence and satisfaction with their health information-seeking experience. The moderately low scores on the scale for the Guam and HINTS samples indicate that their experience in getting the health information they needed did not require a lot of effort. Similarly, they did not feel frustrated during their search for information. However, there seemed to be more concern about the quality of information, although they did not think that the information was hard to understand. The level of concern for the quality of information may suggest a reassuring level of media literacy and an awareness of the range of reliability of the health information available, particularly from online sources.

It is also noteworthy that religious organizations and leaders command significantly higher levels of trust for health information compared to the national sample. This high trust level is consistent with a focus group finding that religiosity is a key cultural factor in the Guam population. Therefore, any health-related intervention directed towards this population needs to take this finding into consideration.

Finally, logistic regression results show rather different patterns of relationships between socio-demographic factors and health information seeking behaviors in the Guam and the national HINTS samples. Females were significantly more likely to seek health information than males in both samples, perhaps reflecting the gender roles across cultures, particularly when it comes to health issues. That is, women are typically seen as the nurturers and caregivers, particularly of significant others who may have some type of illness. However, education level did not play a role in the Guam sample for both forms of health information seeking behavior, while employment level played a role only in Guam. In general, the data also shows that age, education, and income play a much more important role in predicting Internet use in the Guam sample, compared to the HINTS sample. This finding seems to be consistent with the notion that the digital divide may exist at a more substantial scale, perhaps due to the high cost of Internet access in Guam. Our data point to the impact of literacy and economic security on the degree of awareness and proactive health-related behaviors that individuals may engage in, which may result in an undesirable widening in the knowledge gap among those who have access to the Internet and those who do not.

In sum, these findings suggest that health information seeking patterns are influenced by a variety of factors, and that we will have to take these factors into account, and recognize that a “one-size fits all” approach will not be effective. Patterns of how individuals seek out health information are constantly changing, given the advent of digital communication channels. While there is an increasing likelihood that individuals will initially seek online health information , they still maintain the highest level of trust for healthcare providers. However, accessibility and affordability may constrain individual choices to seek information from them.

Individuals in various geographical locations are influenced by socio-demographic and cultural factors; there is a possibility that some people might self-medicate after they have diagnosed their own health condition based on what they’ve learned online and not see a health provider. Thus, effective actions to reduce health disparities are needed, as the problem is likely to grow as the U.S. becomes more socially and culturally diverse.

Communication interventions to affect health behaviors are an increasingly important strategy for improving the public's health. Developing such interventions and effectively influencing individuals in diverse populations to engage in healthy behaviors rely on an understanding of the social and cultural contexts that shape the behavior of individuals, families, and communities.

We want to note that there are some limitations of the present study. Most importantly, the Guam data, unlike the national HINTS survey, was collected using the RDS procedure,which resulted in a sample that is slightly younger than the overall population in Guam. Nevertheless, the analyses for weighted and unweighted samples of the Guam data resulted in pretty close estimates for health and cancer information seeking behaviors, which show that our estimates are quite stable.

In addition, given that we are relying on cross-sectional data, the relationships found in this study need to be interpreted as associations rather than causal connections. Furthermore, the nature of cross-sectional data did not allow the investigation of behavioral changes across time periods. A longitudinal study would provide insights about changes in behavior, if any, over time.

Despite these limitations, the results from this study will be beneficial in designing more effective cancer prevention and control programs with better communication strategies and messages that are data driven and tailored to the target populations we are trying to influence. Moreover, the development of the local capacity to assess cancer related communication behaviors and cancer-relevant knowledge, attitudes and behaviors has the potential to inform cancer planning in Guam and the other Pacific islands. Health promotion strategies and messages can be designed with a consideration of the culturally-relevant and population-specific communication behaviors, resources and opportunities.

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Table 1

Health Information Seeking Behavior

	Guam	US
	Weighted % (N)	**Weighted % (N)**
Have you ever looked for information on health or medical topics from any source? (n=510)		
Yes	79.7 (411)	79.9 (3181)
No	20.3 (99)	20.1 (788)
The most recent time you looked for information about health or medical topics, where did you go first?		
Internet	69.1 (261)	69.6 (1691)
Printed Materials	13.7 (34)	09.8 (372)
Healthcare Provider	11.3 (29)	13.6 (436)
Other	05.9 (26)	06.9 (200)
Imagine that you had a strong need to get information about health or medical topics. Where would you go first?		
Internet	45.8 (251)	39.4 (1391)
Printed Materials	05.6 (18)	03.0 (152)
Healthcare provider	38.2 (163)	52.2 (2023)
Other sources	10.4 (60)	05.4 (210)
Have you ever looked for information about cancer from any source?		
Yes	65.8 (341)	51.8 (2153)
No	34.2 (168)	48.2 (1773)
In the past 12 months, have you used the internet to look for health or medical information for yourself?		
Yes	79.1 (354)	78.0 (2238)
No	20.9 (91)	22.0 (662)

Table 2
Reported experience of people who sought health information

	Guam			US			
	N	**Mean**	**SD**	**N**	**Mean**	**SD**	**t-test**
It took a lot of effort to get the information you needed.	410	2.21	1.30	3103	2.19	1.70	0.30
You felt frustrated during your search for the information.	410	1.94	1.11	3087	2.08	1.98	−2.12 *
You were concerned about the quality of the information.	410	2.74	1.28	3093	2.51	1.53	3.36 ***
The information you found was hard to understand.	410	2.06	1.42	3092	2.00	1.84	0.76
Overall how confident are you that you could get advice or information about health or medical topics if you needed it?	410	3.69	1.28	3931	3.74	1.89	−0.65

* $p < .05$.

** $p < .01$.

*** $p < .001$

Table 3

Trust in sources of health information

	Guam			US			
	N	**Mean**	**SD**	**N**	**Mean**	**SD**	**t-test**
Healthcare Provider	410	3.60	1.06	3916	3.64	1.04	−0.645
Government Health Agencies	405	3.20	1.10	3776	2.93	1.40	4.590***
Internet	406	3.02	1.10	3707	2.85	1.33	2.890**
Charitable Organizations	405	2.87	1.15	3751	2.37	1.68	7.791***
Family or Friends	408	2.73	0.92	3806	2.62	1.13	2.321*
Newspapers or magazines	407	2.70	0.89	3781	2.34	1.15	7.609***
Television	408	2.69	0.99	3773	2.26	1.25	8.089***
Religious Organizations and Leaders	407	2.53	1.31	3779	2.05	1.45	6.911***
Radio	403	2.40	1.03	3731	2.07	1.51	5.781***

* $p < .05$.

** $p < .01$.

*** $p < .001$

Table 4

Bivariate analysis of sociodemographic characteristics associated with health and cancer information seeking and Internet use

	Sought Health Information		Sought Cancer Information	
	GUAM	**US**	**GUAM**	**US**
Sex				
Male	72.1	75.5	57.4	43.4
Female	87.3	85.0	74.5	60.6
	$p<.01$	$p<.001$	$p<.01$	$p<.001$
Age				
18-34	74.7	78.7	64.3	45.5
35-49	78.5	84.7	59.5	52.8
50+	86.1	77.9	73.5	55.6
	$p=0.28$	$p=.11$	$p=0.23$	$p<.01$
Education				
Less than High School	69.8	60.6	48.8	34
High School	67.0	67.6	53	39.6
Some College	75.9	85	64.4	54.2
College Graduate	93.2	91.8	80.2	64.9
	$p<.01$	$p<.001$	$p<0.01$	$p<.001$
Ethnicity				
Chamorro	82.1		62.7	
Filipino	86.1		70.7	
Asian	70.8		68.1	
Micronesian	66.7		58.1	
White	63.4		57.5	
Other	76.9		73.1	
	$p=0.28$		$p=0.82$	
Income				
<$15,000	68.7	68.6	60.6	42.9
$15,000 - $34,999	67.2	74.8	47.8	45.7
$35,000 - $49,999	86.8	80.2	85.5	49.2
$50,000 - $74,999	84.2	84.3	72.3	52.2
$75,000+	92	89.5	67	63.4
	$p<.01$	$p<.001$	$p<.01$	$p<.001$
Marital Status				
Not currently married	83.3	75.7	61.1	50.8
Married or living as married	83.5	82.4	69.2	54.4
Single, never been married	73.9	79.2	61.7	47.7
	$p=0.27$	*0.13*	$p=0.49$	$p=.16$
Employment				
Not currently employed	60.2	75.8	50.9	49.9

	Sought Health Information		Sought Cancer Information	
	GUAM	**US**	**GUAM**	**US**
Currently employed	87.7	82.7	71	50.7
Student	80.6	81.7	67.7	71.1
	$p<.001$	$p=.09$	$p<.05$	$p<.05$

Note: P-values associated with chi-square tests of independence.

Table 5

Logistic regression model predicting factors associated with health and cancer information seeking

	Sought Health Information		Sought Cancer Information	
	Guam	US	Guam	US
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Sex				
Male	1.00	1.00	1.00	1.00
Female	**3.75 (1.84, 7.64)**	**2.05 (1.52, 2.77)**	**2.27 (1.3, 3.96)**	**2.03 (1.62, 2.56)**
Education				
Less than High School	1.00	1.00	1.00	1.00
High School	0.52 (0.18, 1.49)	1.29 (.76, 2.19)	0.93 (0.29, 2.99)	1.16 (.71, 1.88)
Some College	0.71 (0.24, 2.10)	**3.43 (2.04, 5.77)**	1.4 (0.41, 4.83)	**1.75 (1.04, 2.93)**
College Graduate	2.01 (0.45, 8.99)	**5.78 (3.42, 9.75)**	3.27 (0.73, 14.65)	**2.71 (1.59, 4.64)**
Income				
<$15,000	1.00	1.00	1.00	1.00
$15,000 - $34,999	1.24 (0.53, 2.94)	1.03 (.64, 1.66)	0.63 (0.28, 1.41)	1.27 (.83, 1.93)
$35,000 - $49,999	2.66 (0.80, 8.82)	1.23 (.73, 2.04)	**3.13 (1.08, 9.08)**	1.40 (.95, 2.06)
$50,000 - $74,999	2.64 (0.87, 7.96)	1.54 (.88, 2.70)	1.34 (0.48, 3.79)	1.63 (.99, 2.69)
$75,000+	3.93 (0.86, 17.96)	1.67 (.88, 3.14)	0.79 (0.25, 2.45)	**2.10 (1.28, 3.44)**
Employment				
Not employed	1.00	1.00	1.00	1.00
Employed	**3.36 (1.38, 8.21)**	1.1 (.78, 1.56)	1.97 (0.89, 4.32)	.77 (.61, .97)
Student	**3.01 (1.2, 7.59)**	1.14 (.32, 4.1)	2.22 (0.97, 5.09)	2.54 (.96, 6.72)

Table 6
Logistic regression model predicting factors associated with Internet use

	Guam	US
	OR (95% CI)	**OR (95% CI)**
Age		
18-34	**29.87 (7.99, 111.55)**	5.69 (2.64, 12.28)
35-49	**8.12 (2.73, 24, 16)**	3.63 (2.26, 5.83)
50+	1.00	1.00
Education		
Less than High School	1.00	1.00
High School	**6.91 (2.14, 22.33)**	2.18 (1.27, 3.73)
Some College	**49.18 (10.53, 229.64)**	7.6 (4.66, 12.39)
College Graduate	**53.14 (10.87, 259.75)**	14.73 (8.36, 25.93)
Income		
<$15,000	1.00	1.00
$15,000 - $34,999	0.99 (0.35, 2.87)	1.45 (.81, 2.59)
$35,000 - $49,999	**8.22 (1.06, 63.56)**	1.73 (.95, 3.14)
$50,000 - $74,999	**5.852 (1.19, 28.78)**	2.05 (.89, 4.72)
$75,000+	**10.31 (1.74, 61.04)**	4.24 (2.18, 8.26)
Marital Status		
Not currently married	1.00	1.00
Married or living as married	1.86 (0.49, 7.01)	1.39 (.96, 2.01)
Single, never been married	4.05 (0.95, 17.23)	1.12 (.70, 1.78)
Employment		
Not employed	1.00	1.00
Employed	3.37 (0.83, 4.34)	1.34 (.89, 2.02)
Student	2.88 (0.92, 5.73)	7.33 (.36, 151.19)