

# Reliability of the Health Hazard Appraisal

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**Abstract:** As part of a controlled clinical trial of Health Hazard Appraisal's (HHA) efficacy in stimulating risk reduction, the reliability of the HHA questionnaire was evaluated. Of 203 subjects, only 30 (15 per cent) had no contradictions when comparing the responses of the follow-up with baseline questionnaire. Overall, there was an average of 1.6 contradictions per subject. Failure to control for reliability may account for apparent reduction of risk reported in previous studies of HHA. (*Am J Public Health* 1980; 70:730-732.)

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## Introduction

Health Hazard Appraisal (HHA) has been proposed as a means of outlining a preventive medicine program for comprehensive health care provided by the physician.<sup>1</sup> Given knowledge of clinical, historical, and lifestyle parameters, risk multipliers can be applied to the baseline risks for an individual to compute a chance of death and an overall measure of risk, the appraisal age. A physician can then counsel the patient accordingly. Theoretically, improvement in one's potential for survival should be achieved by reducing risk factors associated with particular causes of death.

Reported studies of HHA are few in number. These reports suggest effectiveness of the HHA in stimulating risk reduction.<sup>2-10</sup> Unfortunately, virtually all these studies lacked a control group and/or suffered from high dropout rates, non-rigorous statistical approaches, or serious self-selection biases. If the appraisal is to be used as a measurement of risk reduction as it has been, the reliability of the instrument should be known. Self-reported behaviors such as smoke intake could change over time; however, other items (e.g., height of an adult) should be constant. In their study of HHA, Best and Milsum noted "getting almost as much change in those responses which should not change as in those that might . . . they resurrected their parents, caused their rheumatic heart disease and diabetes to dis-

appear, shrunk their frames and added five years to their history of virginity."<sup>5</sup>

As part of a controlled clinical trial of the effectiveness of HHA in stimulating risk reduction, we assessed the reliability of the HHA questionnaire.

## Methods

The study population consisted of four types of respondents (Table 1). Informed consent was obtained. The subject was then randomly placed into treatment or control group after stratification by age and sex. The base-line questionnaire was taken and checked for completeness.

The responses were keypunched, verified, and then computed by the Baltimore USPHS Hospital Health Services Research Section. The treated group received their risk profile an average of 25 days after taking the baseline questionnaire. A follow-up questionnaire was obtained an average of 85 days after the baseline one. All 207 individuals who completed the baseline questionnaire completed the follow-up questionnaire, with exception of four patients. The control group received no results until after completion of the follow-up questionnaire at the end of the study period (an average of 82 days from the baseline questionnaire).

## Results

Noteworthy is the fact that only 15 per cent of all subjects had no logical inconsistency evident when comparing the two questionnaires (Table 1). The most frequently reported change was miles driven (Table 2) with 60 per cent changing the variable by an average absolute value of 4,700 miles/year. Despite the "oil shortage," treated and control groups showed an overall increase in miles driven on follow-up. Almost 10 per cent of subjects reported a different height at follow-up examination. Parental age was changed by over one in three subjects. One parent reportedly aged 20 chronological years in three months. One in five ex-smokers and ex-drinkers have apparent difficulty in reliably recalling their previous consumption pattern.

Other inconsistencies observed that were not listed on the Table due to low frequency include the disappearance of a past history of: colonic polyps (2); heart murmur (2); hypertension (2); suicidal ideation (2); ulcerative colitis (1); arrest record (1); emphysema (1); diabetes (1); and parental breast cancer (1). Also noted was one maternal resurrection, one ovarian reappearance, and one 10-year disappearance of an ovary that was present three months previously. One subject reported his age as 55 at baseline and 50 at follow-up.

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**TABLE 1—Population Groups Studied and Numbers in Each Group Whose Follow-up HHA Responses Agreed with Baseline Responses**

Population Groups	Responses Agree with Baseline Responses Total in Study Group			(%)
	Group Treated	Group Not Treated	Both Groups	
Physicians				
Male	5/23	2/20	7/43	(16)
Female	0/2	2/5	2/7	(29)
Total	5/25	4/25	9/50	(18)
Nurses				
Male	0/2	0/2	0/4	( 0)
Female	3/23	3/25	6/48	(13)
Total	3/25	3/27	6/52	(12)
Federal Employee*				
Male	2/23	3/27	5/50	(10)
Female	5/21	2/14	7/35	(20)
Total	7/44	5/41	12/85	(14)
Patients				
Male	2/8	1/6	3/14	(21)
Female	0/1	0/1	0/2	( 0)
Total	2/9	1/7	3/16	(19)
Total				
Male	9/56	6/51	15/107	(14)
Female	8/47	7/49	15/96	(16)
Total	17/103	13/100	30/203	(15)

\*Coast Guardsmen and Other

Other variables also appeared unreliably reported although they could not be considered fixed. Three subjects who reported themselves ex-smokers were seen smoking cigarettes on two or more occasions. A number of women decided to get two normal Pap smears in less than three months. Numerous individuals asked if they had changed any habits (e.g., seat belt usage) between the two surveys reported they had not despite the fact their follow-up questionnaire indicated a change.

Females appeared to be slightly more reliable reporters than males. The patient group showed slightly more reliability than physicians. Control groups tended to show less reliability

**TABLE 3—Effect of Varying Miles Driven (VL) for a 25 Year Old White Male Seat Belt Wearing, Teetotaling Freeway Driver**

Reported Miles Driven	Deaths/100,000	Appraisal Age
16,000	202	13
20,000	316	14
24,000	442	16
28,000	568	20

bility than treated groups. The average number of contradictory changes excluding mileage was 1.0 per person; including mileage changes, it was 1.6 per subject.

### Discussion

Inconsistency in responses can produce an effect on the overall measure of risk—the appraisal age. Change in height will alter the weight-table computation for risk from obesity. Change in parental age can vary the risk multiplier for heart disease by 0.1–0.2. Since heart disease is a major and frequent cause of death in older age groups, a small change in a risk multiplier can effect a great change in overall risk.

Miles driven is considered an unalterable, baseline risk for death in a motor vehicle accident. For example, no recommendation is made to reduce miles driven. The yearly mileage is divided by 10,000 to produce the risk multiplier. To demonstrate the effect of variation in the multiplier, a fictitious 25-year-old white male was created and a HHA generated (Table 3). Three other HHAs were computed with the only change between them being a 4,000 mile increment in miles driven (VL) for each subsequent appraisal. Note the variation in appraisal age. Since motor-vehicle accidents represent one of the major causes of death for many members of the study population, the variation in reported miles driven (4,700 mile average) could account for substantial variations in the appraisal age.

The reliability of the HHA questionnaire should be seriously questioned. Previously reported successes with HHA

**TABLE 2—Frequencies of Contradictory Responses by Sex and According to Item**

Item*	Contradictory Response Total in Group					
	Male	(%)	Female	(%)	Total	(%)
Miles Driven	71/107	(66)	49/96	(51)	120/203	(59)
Parental Age	38/107	(36)	28/96	(29)	66/203	(33)
Height ( $\geq 1''$ )	12/107	(11)	7/96	( 7)	19/203	( 9)
Ex-smokers, amount smoked	9/33	(27)	2/22	( 9)	11/55	(20)
Ex-smokers, years quit	6/33	(18)	5/22	(22)	11/55	(20)
Ex-drinkers amount consumed	3/10	(30)	2/5	(40)	5/15	(33)
Pap Smear History			16/96	(17)		
Age 1st Intercourse			12/96	(13)		

\*Eight out of a total of 28 for men, 34 for women. See text for other changes.

in stimulating risk reduction may simply reflect the variation in response (and therefore outcome measures) when an individual takes the questionnaire twice. Unless this reliability issue is addressed and controlled for in a study, its conclusions should be accepted with great caution. We feel that further research on the HHA, including possible modifications to increase reliability, should be done before the tool is adopted into widespread practice or accepted as a reliable longitudinal measure of risk.

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#### ACKNOWLEDGMENTS

The authors wish to acknowledge the following individuals for their invaluable help: Elliot Shefrin, Health Services Research, USPHS Hospital, Baltimore, MD; Robert Gidursky, MD, James Haskins, Edward Ottman, US Coast Guard Health Unit, San Francisco, CA; Betty Paeth, MD, Lola Blair, RN, Bridgette Bradley, RN, Federal Employee Health Unit, Federal Building, San Francisco, CA; Melvin Greberman, MD, MPH, US Public Health Service Hospital, San Francisco, CA; Nicholas Petrakis, MD, University of California Medical School, San Francisco, CA.

## Teaching and Research on Women's Health Issues In Schools of Public Health

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**Abstract:** Women have been among the students and the faculty in Schools of Public Health since the early days of academic programs in public health. This report provides data on the recent past and current proportions of students and faculty who are women, and on the current quantity and type of teaching and research on women's health issues in the 22 North American Schools of Public Health. Teaching on these subjects is more widespread than research, but one or both are found in all but three of the schools. (*Am J Public Health* 1980; 70:732-735.)

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### Introduction

Women were among the first students enrolled in the study of public health,<sup>1</sup> and were among the early public

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health faculty as well.<sup>2</sup> In view of the interest during the past decade in women as students and as faculty and the development of women's studies throughout colleges and universities,<sup>3</sup> it is appropriate and timely to determine the current status of women in Schools of Public Health and to survey the extent and nature of teaching and research on women's health issues within these schools.

### Methods

Data were collected from the 22 Schools of Public Health by means of a brief questionnaire mailed to each of the Deans at the end of calendar year 1978. The questionnaire provided information on student and faculty composition as of the beginning of the fall semester 1978-79 and on the extent and type of teaching and research on women's health issues. After follow-up, a 100 per cent return rate was obtained, although certain items were missing in a few questionnaires.

Further data on historical trends in representation of women among students and faculty were obtained from the