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## Process and Measurement Issues in Health Risk Appraisal

For those who want the bottom line early, the articles on Health Risk Appraisal (HRA) appearing in this issue of the Journal<sup>1-3</sup> do not enhance our overall confidence in the use of the technique as an educational instrument or as an assessment device for evaluating the effects of health programs. Yet, they also suggest some directions for developing risk appraisals that may be more effective in contributing to appropriate belief and behavior change. Use of the HRA has increased rapidly in the past few years, and the number of different instruments and procedures have multiplied.<sup>4</sup> In spite of the apparent simplicity of the idea behind HRA, a complex process is involved in the idealized functioning of the procedure. At the core of a justification is the idea that personalizing risk estimates based on individual characteristics and behaviors should help educators move toward that ideal of tailoring communications to individual circumstances.

Assumptions, however, are lurking all over the landscape. First, it is necessary that recipients of HRA instruments be capable of reporting the relevant information and that they do so in a reasonably accurate way. For most people, blood pressure and cholesterol levels are beyond recall capability. Other information may be sensitive (e.g., alcohol consumption in a work place HRA screening) and lead to inaccurate reporting. Second, feedback is the crucial communication step in the procedure. Information must be received and understood. Most HRAs try to convey specific risks, summary appraisals, and particular recommendations. In a small scale study, we found that very few subjects who received feedback could define "achievable" or "appraisal" age.\* Assuming comprehension, the process also requires that some alteration of psychological dispositions take place to bridge that abyss of inertia and start behavior change rolling. Such dispositions may be motive states or expectancies regarding future health problems.

To what extent are the assumptions based on information gathered from HRA research? Evidence for the assumed process has been rather sparse. Thus, it is helpful to have reports that seek to detail what happens when HRAs are given.<sup>1-3</sup> Two issues are addressed in these three articles: a more narrow one concerning the reliability of HRA assessment, and a broader one regarding the role of risk perceptions (those attributions people make about their own vulnerability), and what they signify.

In terms of the measurement properties of HRA instruments, there have been questions about the stability of responses to items, potentially affecting the accuracy of appraisal. While the paper on reliability<sup>2</sup> finds that the different instruments are acceptably consistent over time in terms of risk estimates, the authors note considerable variation by topic, with reports of "lifestyle" variables, such as "diet," least reliable. Potential remedies for low reliability are straightforward: Don't ask questions that people can't answer (blood pressure), develop better and multiple items to assess complex behaviors, and above all do not let the respondent do the calculations needed for a risk estimate.

More problematic are issues concerning risk perception. First, the different studies report a lack of correspondence between perceptions and "objective" risk, as defined by HRA estimates of mortality. Fewer than half the respondents were considered

\*Kirscht J, Trenkner L: An evaluation of health risk appraisal feedback. Unpublished manuscript, 1989.

predict perceived risk, the regression coefficients are very modest. Niknian, *et al.*,<sup>3</sup> note that overall agreement is poor and least accurate among those at higher risk. Second, the studies find strong evidence for widespread underestimation of risk, confirming the tendency toward "optimistic bias."<sup>5</sup> Rather small proportions of people will describe themselves as above average in risk relative to others of similar age and sex. In contrast to studies of specialized groups, the research reported here involved cross-sections of populations, and there must be some folks above average in risk. Third, one might argue that a cross-sectional study design<sup>3</sup> might not represent a situation in which congruence is expected between perceived and objective risk, and a better test must involve looking at changes in perception after a risk communication. Since Avis, *et al.*,<sup>1</sup> used such a design, what was the result?

Perceptions of risk changed rather little with feedback, although those at higher HRA risk did change the most. Further, changes in risk perceptions were not related to behavior change. Taken together, the findings in these studies raise questions about the role of cognitive factors in relation to actual health risks and to processes of behavior change. Literally taken, the results suggest that perceptions do not matter, at least in relation to behaviors that do matter. Those of us who tend to have cognitive convictions may be going out of the health education business. Yet before we have a fire sale on beliefs, let me suggest some modest alternative considerations about HRA.

Some of the (vague) theory surrounding HRA may not be correct, or may not be adequately implemented. It is certain that risk communications are often not understood in the ways intended by the communicator. Risk information itself is not a sufficient basis for action in many circumstances. Much more research attention is needed to the educational aspect of HRA; so much of the work has focused on the technical problems of risk estimation. Weinstein<sup>5</sup> himself has suggested a stage process through which people move before they will take "precautions." Risk perceptions may be involved in ways that change over time. Thus, the educational implications of the research findings on HRA need elaboration, and the conceptual issues in HRA are worth making explicit so that the problem areas can be specified.

To move to a simpler level, a caution is needed about the results of the studies. Changes were investigated seven to

twelve weeks after the initial intervention. When should change occur, if the procedure is theoretically generated? While there was not a lot of change in risk perception over time, there was some change. Among those receiving *no* feedback, about 30 percent gave a different response, with 17 percent moving to a higher risk category. Perception was assessed with a five-category scale of relative risk. It is at least possible that the reliability of this measure is not high and that some people misunderstand the question. I know it is suggesting further research, but a richer, psychometrically sound measure of risk perceptions is a goal to pursue. In the process, we may better understand how people see risk and relate that to education intervention designed to convey personal health information. These queries are meant to point out the value of the articles to forwarding the potential contributions of HRA.

#### REFERENCES

1. Avis N, Smith K, McKinlay J: Accuracy of perceptions of heart attack risk: What influences perceptions and can they be changed? *Am J Public Health* 1989; 79:1608-1612.
2. Smith K, McKinlay S, McKinlay J: The reliability of health risk appraisals: A field trial of four instruments. *Am J Public Health* 1989; 79:1603-1607.
3. Niknian M, McKinlay S, Rakowski W, Carleton R: A comparison of perceived and objective CVD risk in a general population. *Am J Public Health* 1989; 79:1653-1654.
4. Schoenbach V, Wagner E, Beery W: Health risk appraisal: Review of evidence for effectiveness. *Health Serv Res* 1987; 22:553-580.
5. Weinstein N: The precaution adoption process. *Health Psychol* 1988; 7:355-386.

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**NOTE:** The Journal is sorry to report the untimely death of Dr. Kirscht during the recent APHA annual meeting, Oct 22-26, 1989, in Chicago.

## Lessons from Silicosis Control in China

The history of disease prevention is an unusual mix of success and unrealized opportunity. As new understanding of infectious disease control developed, there often was little immediate interest, belief, or commitment to application of the new knowledge.<sup>1</sup> Jenner's development of smallpox vaccine was not met with widespread acceptance; Semelweiss' recognition of the importance of sterile technique in obstetrics was ridiculed; and Snow's work on cholera control was not acted on for many years. Similarly, in non-infectious disease, the seminal work of Goldberger on pellagra was commonly rejected despite the impressive observations and experimental studies carried out by this innovative health worker.<sup>2</sup> Eventually, however, each of these developments found its way into public health practice and today no one would argue with their importance.

Application of knowledge about control of environmental diseases, furthermore, has been even more tardy than was true

of infectious disease. For example, the importance of silica in causing chronic pulmonary disease and premature mortality, first mentioned by Hippocrates and Pliny, was well described by Ramazzini as a disease of stonecutters.<sup>3</sup> The term silicosis was coined in 1870 by Visconte and it may well be that specific identification by name with its causative agent was a factor in generating efforts to prevent this long-recognized disease. Financial considerations also played a role, for, by the early twentieth century, English workers received compensation for disability due to this condition. This may have helped focus the interest of authorities on prevention but it was not until well into the twentieth century that government began to play a direct role in stopping this preventable disease.

Lagging even further behind in interest in occupational diseases are the developing nations where delay has been motivated, to some extent, by fear that control measures would