

Health Policy Research Program Summary of Research Results

Title:	Public Perception and Acceptable Levels of Health Risk among Canadians
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Project Completion Date:	May 2005
Research Category:	Research
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Project Number:	6795-15-2002/4770021

Summary

Project 1.1 focused on group and individual interviews to understand the meanings individuals assign to risk and their account of their own risk assessment and decisions. Project 1.1 also explored emerging themes and dimensions of risk perception and acceptability in people's beliefs and decisions regarding: a) the risks they are most concerned about for their own health; b) the risks they believe government should manage; and c) our six risk exemplars (cancer factors, cellular telephones, motor vehicles, recreational physical activity, climate change and terrorism). Overall, the emphasis men and women placed on individual decision making and on assuming the consequences of one's decisions remained clear and constant throughout the interviews. This belief in individual responsibility for one's health underlying participant answers is connected to the importance they attach to individual choice. Risks are acceptable as long as they are voluntary. But this choice depends on awareness, the availability of knowledge and of accurate information. The perceived levels of individual control as well as the type of health risk also influence the extent to which participants want more external control of health risks.

Section 1.2.1 and 1.2.2 consist of a bibliometric analysis of the six exemplars common to the research project as well as a content analysis of the presentation of climate change in four major Canadian media. The objective of this section is to gain an overall understanding of scientific productivity and of the nature of reporting of these risks. Breast cancer is the field with the largest number of publications, followed by climate change, recreational physical activity, motor vehicles, terrorism and finally cellular telephones. Breast cancer journals have larger impact factors than of other journals. The USA and Europe are the clear leaders in publication of articles on our selected exemplars. Canada's largest contribution was in the field of climate change with 7.3% of articles and

was ranked third worldwide, followed by physical activity with 5.1% of articles, also with a rank of third.

A national survey of health risk perception of 1 503 Canadians was conducted in 2004 as a follow-up to our 1992 survey. Section 2.1 presents a description of the ratings of perceived risk of thirty specific hazards to the Canadian population, sources of information about health issues and risk, confidence in these information sources, a descriptive account of perceptions of five health hazards (motor vehicles, climate change, recreational physical activity, cellular phones, and terrorism) and five health outcomes (cancer, long-term disabilities, asthma, heart disease, and depression), word associations that highlight the public's salient thoughts surrounding health risks, and agreement with a range of risk perception belief statements including: environmental concern, social concern, genetic concern, dependence on regulators, locus of health risk control (internal, powerful others, chance), risk acceptability, and technological enthusiasm.

Of the specific hazards considered, behavioral risks such as cigarette smoking, obesity, and unprotected sex were seen to present the greatest risk to the health of Canadians. Hazards related to the social environment (e.g. homelessness, street crime, unemployment) were seen as posing moderately high health risks. Medical devices or therapies (e.g. prescription drugs, vaccines, laser eye surgery) tended to rank the lowest in terms of health risk. Women, older respondents, and those with less education reported risks as being higher than men, younger respondents, and those with more education respectively. Large geographical differences in risk perception were also observed. Participants described receiving 'a lot' of information from the news media, medical doctors, and the internet but reported the greatest amount of confidence in medical doctors, university scientists/scientific journals, and health brochures/pamphlets. Perceived risk to Canadians was greater than perceived personal risk for all exemplars evaluated. Large variation was also seen in ratings of personal control, knowledge, worry and uncertainty. Risk acceptability however, was very low for all health hazards considered. The factors most strongly related to perceived risk to Canadians and to perceived personal risk were worry and uncertainty about the hazard or health outcome. Large increases in trust and dependence on the ability of government and experts to make decisions and regulate health risks in Canada were seen from 1992. Belief statements reflecting environmental concern and social concern were found to correlate with the level of risk perceived for a variety of health hazards and outcomes, however, the strength of these correlations tended to be weak.

Benchmark risk scales are of interest to the discipline of risk perception for at least three (interrelated reasons). First, they are of interest for inclusion as potential explanatory variables when trying to explain respondent rankings of risks. Second, they can help with assessing the contention that expert perceptions of risk are somehow more accurate than lay perceptions. Third, benchmark risk scales can provide a communication device for putting unfamiliar or new risks into perspective. In section 2.2.1 we focus on the computation of benchmark scales. In particular, we point out that the benchmark risk scale that is customarily used in risk perception studies, hinges on a number of choices. First, the scale used represents just one possible type of risk measure. Second, the scale

is generally calculated to represent the prospects of people at birth (age zero). And, thirdly, the scale is generally calculated as an average across female and male outcomes in the population of interest. Our interest in this chapter is to scrutinize all three of these choices. In this chapter, we categorize risk scales and show that the one traditionally used, essentially summarizes the likelihood dimension of a risk. Notably, it neglects the consequence dimension. We then select two alternative indices from the literature. One focuses exclusively on the number of years lost per death (one dimension of consequence) while the other represents a hybrid measure of likelihood and consequence. Using a large contemporary dataset (2001) of Canadian mortality (providing mortality data for 370 causes of death), we examine the interrelationships among the alternative indices. We also use the dataset to explore the influence of age and gender on risk indices. We find that risk rankings based on the traditional risk measure (a likelihood based measure) will provide an adequate proxy for hybrid measures of risk (likelihood and consequence), but will provide a poor proxy for consequence measures of risk (life years lost per death). Our analyses also demonstrate that the indices are sensitive to age and gender. Additional analysis is required to assess just how sensitive respondent rankings would be to age and gender distinctions. In addition, this work demonstrates two unique and customized plotting styles that were developed to help depict so-called risk ladders, and their dependence upon age.

A detailed review of the concept of risk acceptability is provided in Section 2.2.2. Individuals, health policy administrators and government policy makers each must determine appropriate levels of acceptable risk for any given risk issue. Individuals rely almost entirely on an “experiential” mode to determine acceptable risks by their pre-existing mental model. Factors that influence individual choice of risk acceptability are experience, previously held ideas surrounding a risk issue, perceptions of risk, information from trusted regulatory sources, expert information, news media, social amplification of risk issues and an understanding of the risk probabilities involved. Population level risk acceptability uses an “analytical mode” with health care administrators and policy analysts making decisions based on group statistics and group outcomes. Acceptable risk at the population level stems from a probabilistic cost/benefit analysis usually in terms that either attempts to mitigate risks or compares two treatments that may improve health outcomes in a cost-effective manner. Experts, integral for credible information, possess differing ideas of risk acceptability than the layperson, a result of internalizing specialized or analytical information into their mental model. Finally, government officials setting policy guidelines for acceptable risk use the analytical mode but must also incorporate aspects of the experiential mode to set levels of acceptable risk taking into account real and perceived risks. Communicating tolerable or acceptable risk levels to the layperson requires knowledge transfer in both analytical and probabilistic terms that can be integrated into pre-existing experiential mental models, the inability to do so results in a communication gap with individuals ignoring analytical information and science-based risk analysis data.

Section 3.1 describes the establishment of an experimental paradigm to study subjective risk perception quantitatively. Using a computerized analog task, participants were exposed to five types of hazards (car transportation, cell phone emissions, climate

changes, physical recreational activities – skiing – and terrorism) according to three levels of objective risk (.75, .50 and .25) crossed with two levels of base rate (.05 and .25). They were also asked to judge risk level and acceptability separately. Results indicate that subjective risk perception is ordinal and systematically related to objective values. It is also lower when base rate is lower. Acceptability is inversely related to level of risk and base rate, and is additionally influenced by the nature of the specific risk. Here, the two hazards that were more global and social rather than individual, climate changes and terrorism, were judged less acceptable. Finally, an associative mechanism can model risk perceptions and the negative relation of acceptability with risk quite well.

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In addition to the above summary, the full report can be accessed in the following ways:

- A print version of the full report in the language of submission can be borrowed from the Departmental Library; requests may be sent to HCLibrary_BibliothequeSC@hc-sc.gc.ca.
- An electronic version of the full report in the language of submission is available upon request from Health Canada by contacting the Research Management and Dissemination Division.

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