

## RISK PERCEPTION OF PRESCRIPTION DRUGS:

## REPORT ON A SURVEY IN CANADA

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## ABSTRACT

A representative sample of the Canadian public was interviewed to determine their attitudes and perceptions of the risks and benefits from prescription drugs. In general, prescription drugs, with the exception of sleeping pills, antidepressants, and tranquilizers, were perceived to be high in benefit and low in risk. They appeared to be sharply differentiated from other chemicals and from illicit drugs. Perceptions varied somewhat according to geographic region, age, gender, education and tendency toward political activism on health issues. Despite the general acceptance of drug risks, respondents were very quick to call for withdrawal from the market of a drug suspected of causing fatal reactions in some patients. Evidence for safety and efficacy, in combination with warning information, appeared to make these concerned individuals much more tolerant of the risks from such a drug. Practical implications of these results and the need for further research on risk/benefit perception are discussed.

Key words: perceived risk, perceived benefit, informed choice, prescription drugs, attitudes, warning information, patient information.

## INTRODUCTION

Knowledge of risk perceptions has been demonstrated to be vitally important in understanding how individuals and societies manage the risks of daily life (1, 2). In medicine, perceptions of drug risks are likely to influence patients' treatment choices, their compliance with treatment regimens, their views on the acceptability of adverse reactions and the drugs that cause them, and their attitudes toward government regulation of drugs (3, 4). Understanding perceptions is a prerequisite for designing better communication materials for patients and the public.

To date, few studies have examined perceptions of the risks associated with prescription drugs. The present study was designed to meet the following objectives:

1. Describe precisely and quantitatively the Canadian public's perceptions of risk and benefit from the use of various kinds of prescription drugs.
2. Place perceptions of prescription drugs within a broader context of perceptions regarding many other activities (e.g., driving, smoking) and technologies (e.g., air travel, pesticides), including other medical technologies (X-rays, surgery).
3. Allow comparisons to be made across important personal and demographic characteristics (e.g., health status, age).
4. Provide baseline data that will allow the impact of new drug problems and controversies to be monitored and allow trends in relevant attitudes and perceptions to be followed over time.

5. Help pharmaceutical companies understand the influence of public perceptions on the sociopolitical environment in which they operate.

A prior study of this type examined the attitudes and perceptions of a representative sample of the general public in Sweden (5). This paper reports the results of a comparable study, based upon a national survey in Canada.

## DESIGN AND ADMINISTRATION OF THE SURVEY

The Canadian survey followed the basic design of the Swedish survey, with only a few modifications. The survey had three main components, as described below. The full questionnaire is available from the authors.

### Part I: General Attitudinal and Demographic Questionnaire

Part I of the survey employed a traditional format in which respondents were asked to indicate their attitudes, perceptions, and opinions in response to specific questions. These questions dealt with topics such as:

- Perceptions of risk today as compared to risks in the past
- The nature and perceived frequency of drug side effects
- The adequacy of performance by government regulators, drug manufacturers, physicians, and pharmacists in ensuring drug safety and efficacy
- The respondent's personal experiences with drug side effects
- Perceived causes of drug side effects
- Opinions in response to a scenario describing a drug crisis
- Attitudes toward receiving precaution and warning information about a drug.

In addition, Part I included a non-traditional task in which respondents were asked to read the words 'prescription drugs' which were printed six times on a card. Each time they read these words, they were instructed to write down the first association that came to

their minds. Of particular interest in this task is the frequency and nature of positive and negative associations to prescription drugs.

#### Part II: Risk/Benefit Perceptions

Each of 33 items was rated by each respondent on a scale of risk and a scale of benefit. The 33 items included 19 pharmaceutical products (e.g., vaccines, antibiotics), 5 medical devices or procedures (e.g., X-rays, heart surgery), and 9 non-medical items (e.g., automobiles, nuclear power plants). The pharmaceutical items were carefully selected according to several criteria, including importance, familiarity to the general public, and diversity. The non-medical items were included to provide a broad context against which to compare the medical and pharmaceutical items.

The risk scale asked: "To what extent would you say that people who are exposed to this item are at risk of experiencing personal harm from it?" The rating scale went from 1 (they are not at risk) to 7 (they are very much at risk). The benefit scale asked: "In general, how beneficial do you consider this item to be for society as a whole?" (1 = not at all beneficial; 7 = very beneficial). All 33 hazard items were rated on one scale before the other scale was considered. Before starting this task, respondents were asked to examine a glossary which defined each term (e.g., insulin--a drug used to treat diabetes). Respondents were allowed to refer back to this glossary as necessary during this task.

### Part III: Personal Information about Respondents

The third section of the survey elicited information pertaining to the general attitudes and personal background of the respondent. This section included questions pertaining to the patient's age, sex, education, region of residence, native language, health status, cigarette smoking, occupation, income, marital status, medicine usage, interest in news items on health and medicine, health consciousness, attitudes toward risk taking, attitudes toward fate, and attitudes toward using medicines. It also included a question asking about actions that the respondent would be likely to take in the event of an important health decision facing the government. These actions ranged from acquiring information or signing a petition to joining a consumer group that is involved in the issue. Answers to these attitudinal and background questions were examined to determine whether any of these factors were associated with perceptions and attitudes pertaining to drug risks.

### Administration of the Survey

A representative sample of the Canadian adult population was interviewed in person in their own homes by personnel from Gallup Canada. The interviews took place between February 8 and February 20, 1989. From 2874 eligible persons contacted, 1261 completed interviews were obtained, for a completion rate of 44%. Quota sampling was done to insure proper representation of males and females, regions of residence, community types, and community sizes. The sampling frame was identical to that typically used by Gallup Canada in political

polling that has been found to be quite accurate in forecasting election results.



## RESULTS

Characteristics of the Sample

The sample was about equally split between females (49.4%) and males (50.6%). About 9.5% of the respondents came from the Atlantic provinces<sup>1</sup>, 25.7% from Quebec, 36.2% from Ontario, 17.1% from the prairie provinces<sup>2</sup>, and 11.4% from British Columbia. The mother tongue was English for 62.4% of the respondents, French for 25.3%, and neither English nor French for 12.3%. The mother tongue was French for 87.0% of those residing in Quebec. Some 20.2% of the respondents were between the ages of 18 and 29; 25.1% were between the ages of 30 and 39; 16.7% were 40-49; 21.0% were 50-64; and 16.7% were 65 years of age or older.

Education levels were diverse; 11.9% had a public (elementary) school education or less, 48.1% had attended high school (about 60% of these people had graduated), 17.4% had at least some university education, 17.5% had attended a community college, and 5.0% had at least some graduate school training. Occupational backgrounds were evenly distributed across professional, technical, business, sales, homemaker, clerical, and skilled and unskilled labor.

The majority of respondents rated their health as either excellent (21.7%) or very good (52.5%). Not surprisingly, a smaller proportion

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<sup>1</sup> The Atlantic provinces include New Brunswick, Nova Scotia, Newfoundland, and Prince Edward Island.

<sup>2</sup> The prairie provinces include Manitoba, Saskatchewan, and Alberta.

(60.1%) of people older than 65 years rated their health in these two highest categories. People with University and Graduate educations rated their health as much better (88.2% excellent or very good for University; 88.9% for graduate education) than did people with only a public school education (55.3% excellent or very good). Income and occupation was also positively correlated with health status. Self-rated health status was lowest for those who gave their occupation as homemaker and was highest for professionals, persons in sales or clerical jobs, and students.

About one-fifth (20.8%) of the respondents reported seeing their physicians regularly. Heart, blood pressure, arthritis, and back problems were listed as the major reasons for consulting a physician. Some 35.0% of the sample said that they were currently taking some kind of medication (either prescription or non-prescription). When asked to describe that medication, drugs to treat high blood pressure, pain relievers, heart medicines, tranquilizers, and arthritis drugs were among those most commonly mentioned. Current use of medicines was highest in the Atlantic region (40.8%), lowest in Quebec (28.1%), highest among those 65 years of age or more (63.0%), higher for women (42.2%) than for men (27.8%), and inversely related to education and income.

When asked whether they had significantly benefited from taking a prescription drug in the last 5 years, 54.2% replied that they had. Those residing in Quebec were less likely to reply in the affirmative (42.9%) than were those living in British Columbia (76.4%) or the

Atlantic region (66.7%). The proportion of persons reporting benefits was higher among older people (66.4% in ages 65+), women (59.1%), housewives (61.2%), and health-care workers (64.3%). The categories of benefits reported were improvement in chronic conditions (39.5%), cures (25.7%), symptom relief in temporary illness (24.1%), pain relief (18.7%), and the saving of life (5.0%). Cures were reported much more frequently by the respondents between the ages of 18 and 29 (44.5%) than by those 65 years of age or older (12.1%). Improvements in chronic conditions were reported frequently among the oldest respondents (67.9%) as was the saving of life (12.1%).

When asked to rate the degree of attention they paid to news items about health and medicine on a five-point scale (1 = very little; 5 = very much), the mean response was 3.64, and most respondents rated their attention level as 3 (25.3%), 4 (31.1%) or 5 (27.8%). The highest ratings were obtained in Quebec (37.0% in Category 4 and 32.4% in Category 5). Women had higher ratings than men (35.2% in category 5 as compared to 20.5% for men). Health-care workers stood out with a mean rating of 4.15 (48.8% rated their attention level as 5). No other subgroup differences were marked.

When asked whether or not they were aware of any recent news items about prescription drug problems, 28.4% said that they were. These individuals were asked to indicate the content of those items. The most frequent responses were Thalidomide babies (27.1%), AIDS treatment

(12.8%), Halcion sleeping pills (10.9%), controversies over birth control (7.8%), and generic drug issues (4.7%).

Respondents were also asked to indicate the degree to which various statements about risk taking, health consciousness, fatalism, and medicine taking described them personally. Most of these individuals (67%) said that they were "very" or "somewhat" well described as not liking to take risks and being health conscious (93.4%). Only 46.8% said they were very well or somewhat well described as feeling comfortable about taking medicines whenever they did not feel well. There was also divergence of views regarding fate. About 40.6% said they were very well or somewhat well described by the statement that they believed most mishaps in life are predetermined by fate and unavoidable; 56.9% said that such beliefs described their personal views very poorly or not at all.

There were several subgroup differences in responses to the statement that "I feel comfortable taking medicines whenever I don't feel my best." Only 9.9% of those residing in Quebec responded that this described them very well (compared with 16.0% in the total sample). Some 50.0% of those in Quebec said this described them very poorly (as compared with 10.0% for those in the Atlantic region). People aged 65 or older reported being more comfortable taking medicines than did younger people.

#### Images of Prescription Drugs

More than 3000 associations were produced in response to the stimulus concept 'prescription drugs.' The major types of associations

are listed in Table 1 in order of their frequency. The term "doctor" headed the list, followed by associations to pharmacies and concerns about costs. Strong positive images (necessary, beneficial) accounted for 179 responses. Strong negative images were more frequent and took three general forms: one had to do with safety concerns (122 responses); the second had to do with overuse, abuse, addictiveness, and dependency (173 responses); the third had to do with lack of necessity or worth (33 responses). Of interest is the fact that there was very little association of prescription drugs with illicit drugs and few references to natural or herbal medicines. Overall, these data in Table 1 provide a baseline against which to compare responses over time in Canada and responses from other nations.

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Insert Table 1 about here

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#### Present and Past Risk

Respondents were asked to indicate whether they believed that there is more risk, less risk, or about the same risk today than there was 20 years ago for each of several types of hazards. The results, shown in Figure 1, indicate that the risks from chemicals were perceived to be greater today by 83.7% of the respondents. Other percentages for the 'more risk' response were heart disease (70.7%), cancer (74.0%), food (69.2%), quality of drinking water (61.9%), methods of travel (61.4%), climate changes (57.3%), energy sources

(54.2%), infectious diseases excluding AIDS (42.3%), and prescription drugs (37.7%). Looking at the other side of the coin, the proportion of responses in the 'less risk today' category was highest for infectious diseases (37.4%) and prescription drugs (32.7%) and lowest for chemicals (16.3%) and climate changes (7.8%).

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Insert Figure 1 about here

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We thus see a strong difference between the perceived trend in risk for prescription drugs and the perceived trends for chemicals as a whole and for other technologies. Although about one-third of the sample believes that drug risks have increased during the past 20 years, this is far smaller than the percentage perceiving increased risk from the other hazards, with the exception of infectious disease (which may be seen as closely linked to drug efficacy).

#### Drug Efficacy and Side Effects

Several questions asked about drug efficacy and the frequency, severity, and causes of side effects. When asked to rate the job that various health-care agents were doing to make sure that prescription drugs are safe and effective, pharmacists received the highest marks (75.6% excellent or good), followed at quite a distance by doctors (57.3%), government regulatory agencies (44.9%) and drug manufacturers (40.0%).

When asked how often "the drug works as it should for patients taking prescription drugs", 72.8% replied always, very often, or often; 18.5% replied occasionally, and 3.9% said rarely or never. When asked how often patients taking prescription drugs experience unwanted effects/side effects, 28.8% replied always, very often, or often; 19.8% replied rarely or never. Asked to specify the most serious side effects/unwanted effects that occur with use of prescription drugs, the combination of nausea, stomach irritation, or vomiting was mentioned by 25.5% of the respondents, dizziness or drowsiness by 20.7%, allergic reactions by 18.0%, addiction by 12.8%, rash by 9.3%, mental problems (including disorientation, forgetfulness, and hallucinations) by 8.0%, headaches by 7.2%, death by 6.2%, and heart and circulatory problems by 5.2%.

When asked whether they personally had suffered a side effect or unwanted effect from taking a prescription drug during the past five years 27.5% of the sample replied that they had (see Figure 4); of these people, 32.6% considered the side effect to have been severe. A similar proportion (32.6%) rated their personally experienced side effect as having been mild and 34.3% rated it as moderate in severity. Asked to describe the kind of side effect/unwanted effect they had suffered, the predominant responses included nausea, stomach irritation, vomiting, drowsiness, rash, headaches, and mental effects (forgetfulness, disorientation, hallucinations).

Respondents were also asked to indicate their opinions about the main cause of a drug side effect. Their spontaneous responses, shown

in Table 2, named patient sensitivity or incompatibility, improper drug prescription, incorrect examination by the doctor, and misuse by patients as the major causes. Following this question was a structured question that asked people to indicate how frequently each of eight specified factors is the cause of a side effect. The results indicated that failure of the patient to follow instructions was judged the most likely cause (55.5% rated it always, very often or often a cause), followed closely by failure to give the patient enough information (52.2% rated it always, very often, or often a cause). Patient sensitivity was again singled out as one of the most frequent causal factors (44.5% always, very often, or often), followed by improper monitoring of the patient by the doctor (33.7% always, very often, or often). Less frequent attributions of causality were assigned to inadequate testing by the drug manufacturer (21.1%), wrong prescription (16.7%), or wrong dosage prescribed (15.6%). Pharmacist's mistakes were seen as the least likely cause of a drug-induced side effect (1.9% always, very often, or often).

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Insert Table 2 about here

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#### A Drug Crisis Scenario

The following hypothetical scenario was posed to each respondent, indicating a possible link between a drug and some fatalities among its users.



'Imagine that a new prescription drug becomes available in this country for treating a serious disease. Other drugs are also available for treating this disease. A study reveals that some people may have died from taking this drug. What do you think the government should do in this case?'

- Leave the drug on the market.
- Take the drug off the market.
- Leave the drug on the market but warn the doctors and patients.
- Not sure.

In response to this scenario, 60.1% of the respondents wanted the government to take the drug off the market, 3.3% wanted the drug left on the market, 35.1% wanted it left on the market with a warning, and 1.4% were not sure what should be done.

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Insert Figure 2 about here

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Those who wanted the drug removed from the market or who were not sure (61.5% of the total sample) were asked to reconsider their answers, taking into account each of six possible extenuating circumstances. The results, shown in Figure 2, indicated that there is no circumstance that, by itself, would convince more than about 25% of these people to leave the drug on the market as it was before. However, in combination with information warning physicians and patients about the possible problem, these additional considerations

led to substantial changes in opinions. Knowledge that the risk affected only "certain types of patients, such as elderly persons with liver problems" convinced 4.3% of these respondents to leave the drug on the market and another 62.1% to leave it on the market with a warning. Changes such as this also occurred when respondents were told that the drug is more effective than other, similar drugs, or that the drug has fewer side effects for most patients than other, similar drugs. Being told that the drug has been used safely and effectively for many years in another country or that you've taken the drug for many months and are very satisfied with it produced somewhat less change of opinions. The circumstance that produced the least opinion change was the fact that the government and manufacturer are actively gathering more information about the problem.

#### Attitudes Toward Warning Information

There have been numerous surveys indicating that patients strongly desire warning information pertaining to prescription drugs (see, e.g., 6, 7, 8). When the drug-crisis scenario described above was evaluated in the Swedish survey, the results suggested that use of warning information could greatly affect the acceptability of a risky drug (5). When that vignette was repeated in the present survey, the results confirmed the Swedish findings (see Figure 2). Because of the importance of this issue, the present survey included several questions pertaining to warnings that had not been included in the Swedish survey.

One question began with the statement "Information describing the precautions and side effects/unwanted effects associated with taking prescription drugs would . . ." This statement was followed by seven different endings and, for each, the respondent was asked to indicate degree of agreement or disagreement. The results are shown in Figure 3. There was overwhelming agreement with the statement that precautions and warning information "would help me to recognize and avoid problems when taking the drug" (92.5% agreed or strongly agreed). Respondents also believed that such information would encourage them "to take the drug exactly as prescribed" (90.1% agreed or strongly agreed). They also believed that this type of information "ought to describe all possible side effects, even if some of them are extremely unlikely" (85.6% agreement) and correspondingly tended to disagree with the statement that "only the most likely side effects" ought to be included (40.0% agreement; 56.5% disagreement). In addition, 64.8% of the respondents agreed or strongly agreed that such information "indicates that the drug may be too dangerous to use," 53.9% agreed that it would "make me uneasy about taking the drug," and 47.5% agreed that such information "is generally hard to understand."

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Insert Figure 3 about here

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Two additional questions probed further into attitudes toward warnings. The first was based on a study of perceptions of the risks from household chemicals (cleansers, bleaches, etc.) conducted in the

United States by Kraus and Slovic (9). That study found that 59% of the respondents agreed and 22% strongly agreed with the statement "I feel safer when I use a (household) product that has caution/warning information on the label than I do when I use a similar product that does not have caution/warning information on the label." This question was asked in the present survey with the words "prescription drug" substituted for the words "household product." Because prescription drugs are associated at times with serious side effects, we expected that many respondents might disagree with this statement. This did not occur: 42.6% strongly agreed and another 50.0% agreed that warning information made them feel safer. Only 3.3% disagreed and 2.1% strongly disagreed with this statement.

The second question was designed to assess attitudes toward the strategy of marketing a drug or medical product to a targeted patient population coupled with extensive warnings about the risks. This strategy is currently being pursued by Alza Corporation in their marketing of the IUD, Progestasert (10) and by Hoffman-LaRoche, Inc. in their marketing of the anti-acne drug Accutane. The question asks for degree of agreement or disagreement with the statement "When drugs have a potential for serious unwanted effects/side effects, patients should be required to read warning information and to sign a form indicating that they understand the risk before being allowed to take the drug." Again there was substantial agreement with this strategy. Some 43.4%

of the respondents agreed and 33.7% strongly agreed with the statement, 15.8% disagreed, and 4.7% strongly disagreed.

#### Perceived Risks and Benefits

Ratings of each hazard item were averaged across all 1261 respondents for both the risk and benefit scales in Part II of the survey. The mean ratings for perceived risk, ordered from high to low, are shown in Figure 4. Three non-drug chemicals--cigarette smoking, pesticides, and alcohol--stood out (with nuclear power) as highest in perceived risk, followed closely by three drug items--sleeping pills, tranquilizers, and antidepressants. Vitamin pills, herbal medicines, vaccines, and acupuncture were judged lowest in risk. Prescription drugs in general and most specific drugs (e.g., antibiotics, anti-arthritics) were judged to have only low or moderate degrees of risk.

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Insert Figure 4 about here

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The prior survey in Sweden found that high perceived risk for sleeping pills and antidepressant drugs was associated with images of addiction, abuse, dependency, and overuse. To test this relationship in the present study, the responses of 294 persons who mentioned one of these problems on the image question or on the question regarding the most serious side effects from prescription drugs or on both of these questions were compared with 964 persons who never once mentioned addiction, abuse, etc. in those questions. The results, shown in Table 3 for the nine statistically significant items, again indicate

the link between addiction, abuse, dependency, and overdose and higher perceived risks for antidepressant drugs and sleeping pills. Tranquilizers and arthritis drugs also exhibited this link to a relatively great extent.

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Insert Table 3 about here

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Mean ratings of perceived benefit are shown in Figure 5. High benefits were associated with automobiles and air travel as well as pharmaceutical products such as insulin, antibiotics, vaccines, cancer drugs, and prescription drugs in general. Heart surgery and x-rays also fell in the highest range of perceived benefit. Very low benefits were attributed to smoking cigarettes and drinking alcoholic beverages as well as to non-drug chemicals such as food additives, artificial sweeteners, and pesticides.

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Insert Figure 5 about here

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The risk and benefit means are superimposed in Figure 6. Perceived risks and benefits were related in a negative way (their correlation across items was  $-.46$ ). Vaccines, insulin, appendectomy, and prescription drugs as a whole stood out as being quite high in perceived benefit and low in perceived risk. Other drug items, with the notable exception of sleeping pills, tranquilizers, and

antidepressants, showed a similar, though less extreme, pattern. Three non-drug chemical hazards--cigarettes, alcohol, and pesticides, along with nuclear power, were judged extremely high in risk and low in benefit.

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Insert Figure 6 about here

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Subgroup Differences: Part I

There were numerous differences between subgroups of the sample for the questions in Part I of the survey. Although these differences were often sizable, they rarely led to any reversal in the main trends that appeared in the overall sample.

Regional differences. Respondents in the Atlantic provinces and in Quebec consistently stood apart from each other and from the other respondents in their attitudes and perceptions. Atlantic respondents tended to be the most positively oriented toward prescription drugs and those in Quebec were least positive. Specifically, Atlantic respondents were most likely to say that:

- there is less risk from prescription drugs today than 20 years ago
- prescription drugs always or very often work as they should
- government agencies, drug manufacturers, doctors, and pharmacists do a good or excellent job of ensuring drug safety and efficacy

- patient misuse of drugs is an important cause of side effects.

Atlantic respondents were least likely to say that patients always or very often experience side effects. One exception to their generally favorable attitudes toward prescription drugs were their responses to the second part of the drug-crisis scenario. There, Atlantic residents were least likely to say that the drug in question should simply be left on the market in the light of information about its safety and effectiveness.

As noted earlier, Atlantic residents also had the highest proportion of respondents currently using prescription drugs, the highest proportion claiming not to be risk takers, and the highest proportion indicating that they feel comfortable taking medicines.

Respondents from Quebec tended to be at the other extreme from the Atlantic respondents. In addition to being least likely to say they were comfortable taking medicines, they were most likely to say that:

- drug risks are higher today than 20 years ago
- patients often experience side effects
- the side effects they personally experienced were severe
- they personally experienced nausea or stomach irritation as side effects.
- they pay close attention to news about prescription drug problems.

On the other hand, residents of Quebec were the most likely to say that the drug in question in the crisis scenario should be left on the market given evidence in favor of its safety and efficacy.



In the risk/benefit rating section of the survey, Atlantic and Quebec respondents did not differ much in their ratings of the perceived risk of the various pharmaceutical items. However, Atlantic residents had higher perceptions of benefit for 25 of the 33 items. A noticeable exception to this trend occurred with herbal medicines, which received higher ratings of benefit by residents of Quebec. Payer (11), in her book Medicine and Culture, discusses the preference for "gentler medicines" in France. The present data indicate that a similar preference exists in Quebec.

Age. Many age differences were observed. In general, the older respondents were more likely to associate "costs," "benefits," and "overdose" with the term "prescription drug." They were also more likely to say that:

- the side effects they had personally suffered were severe
- a drug that they had taken successfully should be left on the market (in the crisis scenario)
- a drug that only harmed specific types of patients such as elderly persons with liver problems should be taken off the market
- precaution/warning information would make them feel uneasy about taking the drug.

Older people were less likely to say that:

- the most serious side effects include death and addiction
- frequent causes of side effects are incorrect dosage, patient

sensitivity, patient misuse, improper monitoring by the doctor, or problems with the drug itself.

Sex. Women had generally less favorable attitudes and perceptions regarding the risks and benefits of prescription drugs. They were more likely than men to associate safety concerns with the term "prescription drug." They were also more likely to say that:

- patients always or often experience side effects
- they themselves had experienced side effects during the past 5 years
- the side effects they had experienced were severe
- they had experienced rashes and allergies as side effects
- inadequate patient information is a major cause of side effects
- the drug in the crisis vignette should be taken off the market
- warning information would make them feel uneasy about taking the drug.

On the positive side, women were more likely than men to say that a prescription drug always or often works as it should.

Education. There were many large differences in perceptions and attitudes that were associated with educational background. Overall, persons having more extensive formal education tended to have more favorable attitudes and perceptions regarding the risks and benefits from prescription drugs. Specifically, in comparison with persons having high school educations or less, those with university and post-graduate educational experience were more likely to say that:

- a prescription drug always or very often works as it should
- serious side effects include death
- the government is doing a good or excellent job in ensuring drug safety and efficacy
- important causes of side effects are inadequate information for patients and failure of patients to follow instructions.

Persons with more extensive educational backgrounds were less likely to say that:

- there is more risk today from drugs and chemicals than there was 20 years ago
- persons taking prescription drugs always or very often experience side effects
- the side effects they had personally experienced during the past five years were severe
- inadequate government regulation was a frequent cause of side effects
- the drug under suspicion in the crisis scenario should be left on the market (without special warnings) in light of evidence pertaining to its safety and efficacy
- warning information should include only the most likely side effects.

Activism. A series of five questions asked respondents to indicate on a 1-7 scale how likely they were to do each of five actions in the event of a major health decision facing Canada. The actions were a) seek more information, b) sign a petition, c) alert others, d)

write a letter, and e) join a consumer group. An activism score was obtained by summing an individual's ratings over the five questions. The scores ranged from 5 to 35 with a mean of 23.4 and standard deviation of 7.1. The distribution of scores was divided into three segments of approximately equal numbers of respondents. There were 428 persons (34.2% of total) with scores of 20 or lower. These individuals were labeled non-activists. The 390 individuals (31.2%) with the highest scores (28 or higher) were labeled activists. The activist and non-activist groups were compared on the other survey questions. The middle 34% of the distribution was not examined further.

Activists were found to differ from non-activists in many ways. Particularly striking was the fact that a higher percentage of activists reported having suffered a drug side effect (32.8% to 22.4%) and, of those with side-effect experience, 41.4% were reported to be severe by activists versus only 26.0% severe effects for non-activists. There was no difference in the percentage of individuals within each group who had reported benefiting from a prescription drug.

Activists were more likely to say that they were "very well described" as being health conscious (58.7% vs. 35.5%), fatalists (17.4% vs. 9.8%; this seems surprising); and non-risk takers (35.6% vs. 27.1%).

Activists were more likely to say that prescription drugs often, very often, or always cause a patient to experience side effects (34.3% vs. 25.8%). They were also more likely than non-activists to attribute

side effects to lack of testing by the manufacturer, inadequate government regulation, and incorrect prescription of drug or dosage by the doctor. Activists were less likely to attribute side effects to patient sensitivity to the drug.

There was little difference between activism groups with respect to initial response to the drug-crisis scenario. However, on the follow-up questions given to those who initially wanted the drug removed from the market, activists were consistently more likely to agree to leave the drug on the market given that it was accompanied by warning information. For example, if the drug was said to have fewer side effects, overall, than similar drugs, 56.2% of the activists would leave it on the market with a warning compared with 41.9% in the non-activist group (the percentages who would leave it on the market with no warning were about equal for both groups).

In response to specific questions about warnings and precautions, activists were consistently more favorable towards disclosure of risk information. Specifically, activists were more likely to strongly agree that warnings and precautions would encourage them to take the drug exactly as prescribed (37.2% vs. 30.4%) and should include all side effects (42.5% vs. 35.5%). However, activists were also more likely to agree and strongly agree that such information would make them uneasy about taking the drug (58.5% vs. 50.5%).

Activists were also more likely to strongly agree that they feel safer taking a drug that has warnings and precautions (56.2% vs. 45.8%). The largest difference between the two groups occurred with the

statement that patients should be required to read warning information and sign a statement of understanding before being allowed to take the drug; 40.5% of the activists strongly agreed with this proposal as compared to 28.3% of the non-activists.

Subgroup Differences: Part II

Regional differences were again apparent in looking at the quantitative risk and benefit ratings in Part II of the survey. Residents of the Atlantic provinces gave slightly higher ratings of perceived risk to the general category "prescription drugs" than did residents of the other provinces and residents of Quebec gave the lowest risk ratings to prescription drugs, in keeping with their responses to questions in Part I of the survey. However, differences between Atlantic residents and those in Quebec were particularly high with regard to rated benefits of prescription drugs. Atlantic residents had a mean benefit rating of 6.07 (57.5% in category 7) compared with a mean of 5.44 for residents of Quebec (31.2% in category 7). Other regions had intermediate benefit ratings. Atlantic residents also stood out as having the highest mean benefit ratings for non-prescription drugs.

Women had perceptions of risk that were equal to or greater than the perceptions of men for every one of the 33 items. The largest differences were found with nuclear power, alcohol, antibiotics, sleeping pills, tranquilizers, IUDs, air travel, laxatives, and aspirin.

Fewer sex differences were obtained with perceived benefit. However, women did perceive significantly greater benefit from birth control pills and significantly less benefit from nuclear power plants, pesticides, IUDs, food additives, and alcohol.

Activists consistently exhibited higher perceived risk than non-activists, particularly for food additives, IUDs, alcohol, birth control pills, sleeping pills, aspirin, and tranquilizers. There were no differences for AIDS drugs, vaccines, heart surgery, or appendectomy. Activists also rated perceived benefit higher than non-activists for five items--herbal medicines, vitamin pills, appendectomy, cancer drugs, and anti-hypertensive drugs. The two groups' perceptions of benefit did not differ significantly on the remaining items. In general, activists and non-activists differed more in their perceptions of risks than in their perceptions of benefits.

## DISCUSSION

The broad pattern of results from this survey is very consistent with the results from the national survey in Sweden. In both Sweden and Canada, two main results were clearly evident.

- Prescription drugs were perceived to be high in benefit and low in risk. They appeared to be sharply differentiated from other chemicals and from illicit drugs. The only exceptions to this favorable pattern of perceptions occurred with sleeping pills, antidepressants, and tranquilizers (note that tranquilizers were studied only in Canada). It is also significant, we believe, that causes for side effects tended to be attributed more to patient sensitivity or actions by the physician than to improper manufacturing, testing, or regulation of the drug.

- Despite the general acceptance of drug risks, people were very quick to call for withdrawal from the market of a drug suspected of causing fatal reactions in some patients. Evidence for safety and efficacy, in combination with warning information, appeared to make these concerned individuals much more tolerant of the risks from such a drug.

This second major finding was extended in the present survey by the addition of several new questions pertaining to precautions and warning information. Canadian respondents strongly endorsed the provision of warning information, saying that it would encourage them to use the drug exactly as prescribed, that it would help them to recognize and avoid problems, that it made them feel safer, and that it



ought to include all side effects, not only the most likely ones. For drugs with the potential for serious side effects, respondents wanted patients to be required to read the warnings and sign a form indicating that they understood the risk before being allowed to take the drug.

Carpenter (10) has argued that the provision of extensive, frank warnings and precautions is desirable because it affords the patient the opportunity for "informed choice." The concept of informed choice is a powerful idea with the potential to revolutionize the role of risk and warning information in the marketing and use of prescription drugs. The concept is currently being implemented in conjunction with several high-risk products and the success or failure of these ventures will be very informative. However, additional information will be needed to delineate the boundaries for the successful application of this approach. For which types of pharmaceutical or medical products will it be favorably received? Under what circumstances would such an approach be ill advised? The present study uncovered some potentially adverse responses to warnings in the form of uneasiness about taking drugs and concerns that the drug may be too dangerous to use. Would such concerns deter some patients from taking essential medicines? Would they lead to non-compliance with the prescription regime? We believe that new studies, focused specifically on issues raised by the concept of informed choice, are important to pursue.

Although the surveys in Sweden and Canada produced remarkably similar overall results, close examination of their findings uncovers many interesting differences.

One such difference is that the subgroup differences in Sweden were infrequent and small. In Canada they were frequent and sizable. Residents of the Atlantic region were generally the most favorable in their view of the risks and benefits of prescription drugs and residents of Quebec were generally least favorable. In view of the fact that residents of these regions did not differ significantly on any background or demographic variables except "mother tongue," these differences appear to be cultural in origin. Another subgroup effect was the fact that older respondents had substantially different views than did younger persons. Differences in educational background and gender were also associated with different attitudes and perceptions. Further efforts should be made to verify and understand the causes of these subgroup differences, which could be important in designing and marketing drug products and communicating with patients.

One important subgroup, activists, was studied in Canada but not Sweden. Canadian activists appeared to be persons who have been sensitized to drug risks through personal experience with side effects. They tended to blame government, manufacturers, and physicians for side effects, rather than patients, and they strongly favored the provision of warning and precaution information to patients.

One particularly large difference between Sweden and Canada occurred in the response to the word-association task. In Canada, "Costs" were the third most frequent category of responses to the stimulus term "prescription drug"; in Sweden, costs were infrequently

given as an association (they ranked 18th in frequency with 33 mentions). This should not be surprising given the different methods of financing health care in the two countries, but it does serve to demonstrate the sensitivity of the word-association method to differences in concerns.

In sum, the risk-perception surveys in Sweden and Canada have provided insight into fundamental attitudes and perceptions regarding prescription drugs. Further replication of these studies in other countries and with patient subgroups as well as with the general public should help pharmaceutical companies better understand patients' concerns, meet their needs for information, and facilitate wiser and safer use of prescription drugs.

## REFERENCES

1. The Royal Society. Risk assessment: report of a Royal Society study group. London, 1983. 198 p.
2. Slovic P. Perception of risk. *Science* 1987;236:280-5.
3. Horisberger B, Dinkel R, eds. The perception and management of drug safety risks. New York: Springer-Verlag, 1989:210.
4. von Wartburg WP. Drugs and the perception of risks. *Swiss Pharma* 1984;6(Nr.11a):21-3.
5. Slovic P, Kraus NN, Lappe H, Letzel, H, Malmfors, T. Risk perception of prescription drugs: report on a survey in Sweden. *Pharmaceutical Medicine* 1989;4:43-65. (Reprinted in Horisberger B., Dinkel R., eds. The perception and management of drug safety risks. Berlin: Springer-Verlag, 1989:90-111.)
6. Keown C, Slovic P, Lichtenstein S. Attitudes of physicians, pharmacists, and laypersons toward seriousness and need for disclosure of prescription drug side effects. *Health Psychology* 1984;3:1-11.
7. Malmfors T, Slovic P, Kraus N, Wiström G, Lappe H, Letzel, H. Allmänhetens uppfattning av risker och läkemedelsbehandling (The general public's conceptions of risks and treatment with drugs). *Svensk Farmaceutisk Tidskrift* 1988;92(11):31-7.
8. Fujino S. Risk perception of prescription drugs: report on surveys in Japan. In: Horisberger B, Dinkel R, eds. The perception and management of drug safety risks. New York: Springer-Verlag, 1989:112-6.

9. Kraus NN, Slovic P. Consumer risk perceptions of household chemicals (Report 89-2). Eugene, OR: Decision Research, 1988:149.
10. Carpenter PF. Responsibility, risk, and informed consent. In: Ekkelmen KB, ed. New medical devices: invention, development, and use. Washington, DC: National Academy Press, 1978. (Series on Technology and Social Priorities).
11. Payer L. Medicine and culture. New York: Holt, 1988.

Table 1  
Associations to "Prescription Drugs"

Rank	Association	Count	Percent
1	Doctor	696	55.2
2	Drugstore/Pharmacy	471	37.4
3	Cost/Expense Concerns	403	32.0
4	Drug/Pill/Medicine--Specified <sup>a</sup>	389	30.8
5	Drug/Pill/Medicine--Unspecified	345	27.4
6	Illness/Sickness	328	26.0
7	Necessary/Beneficial <sup>b</sup>	179	14.2
8	Hospital	128	10.2
9	Safety Concerns <sup>c</sup>	122	9.7
10	Medical Coverage/Health Insurance	109	8.6
11	Overuse	67	5.3
12	Tylenol	66	5.2
13	Abuse	53	4.2
14	Addictiveness/Dependency	53	4.2
15	Health	49	3.9
16	Family, Children, Baby	42	3.3
17	Need for More Information on Drugs	35	2.8
18	Unnecessary/Unworthwhile	33	2.6
19	Paraphernalia--bottles, needles, etc.	25	2.0
20	Generic	24	1.9
21	Profit	10	0.8
22	Death	6	0.5
23	Warning	5	0.4

<sup>a</sup> e.g., antibiotics, penicillin, valium, insulin

<sup>b</sup> also includes helpful, recovery, reliable

<sup>c</sup> also includes dangerous, some risk, trouble, handle with care.

Table 2  
Reasons for Side Effects: Spontaneous Mentions

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	Frequency
Chemical Incompatibility with Patient	19.7%
Patient Allergic	19.7%
Insufficient/Incorrect Examination by Doctor	15.5%
Wrong Prescription	13.6%
Wrong Strength/Dosage	13.3%
Misuse by Patient	12.8%
Not Enough Known About Drug	7.6%
Problems with Drug Itself	7.5%
Drug Interaction with Other Substance	5.7%
Overuse/Overdose	5.4%
Patient Given Wrong/Inadequate Information	3.9%
No Answer/Don't Know	4.7%

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Table 3

Effects of Concerns about Addiction, Dependency,  
Abuse or Overuse on Mean Perceived Risk

	Respondent Subgroup		t
	not concerned (N = 964)	concerned (N = 294)	
Antidepressants	4.64	5.04	3.88
Tranquilizers	4.80	5.15	3.49
Sleeping Pills	4.91	5.24	3.33
Antiarthritics	3.28	3.55	2.73
Prescription Drugs	3.48	3.74	2.57
Cigarette Smoking	5.94	6.16	2.50
Aspirin	3.07	3.35	2.47
IUDs	4.34	4.58	2.15
Food Additives	4.13	4.36	1.99

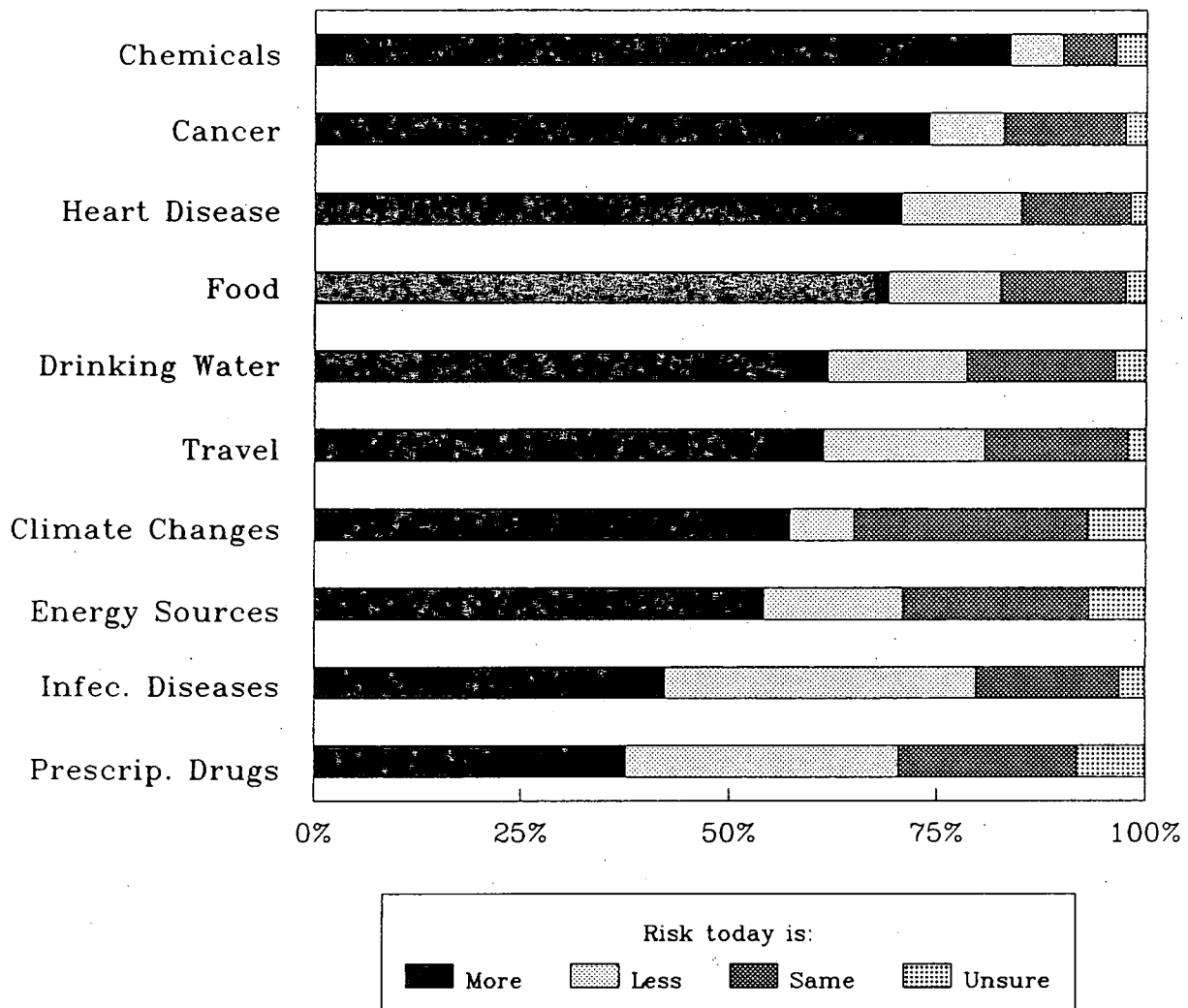
NOTE: Entries in the first two columns are mean values for perceived risk. Respondents classified as "concerned" mentioned addiction, dependency, abuse or overuse in either the imagery question or the question about the most serious side-effects of prescription drugs.



## FIGURE CAPTIONS

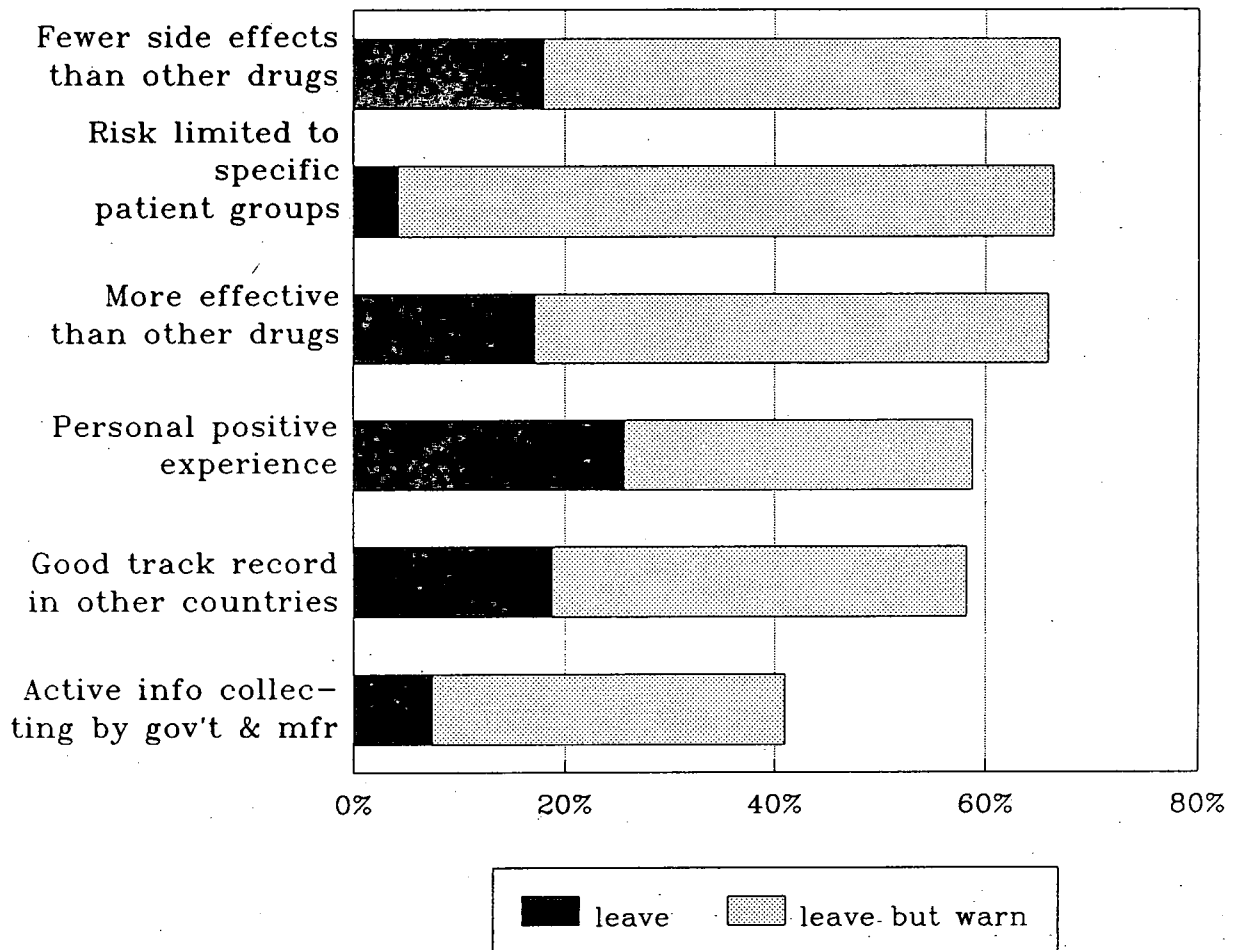
- Figure 1. Risk today versus 20 years ago.
- Figure 2. Reactions to a drug crisis scenario: Modification of opinion in view of additional evidence. Two response categories -- "take the drug off the market" and "not sure" -- are not shown in the figure.
- Figure 3. Attitudes and opinions regarding warning information.
- Figure 4. Perceived risk.
- Figure 5. Perceived benefit.
- Figure 6. Perceived risk and perceived benefit.

# RISK TODAY VERSUS 20 YEARS AGO

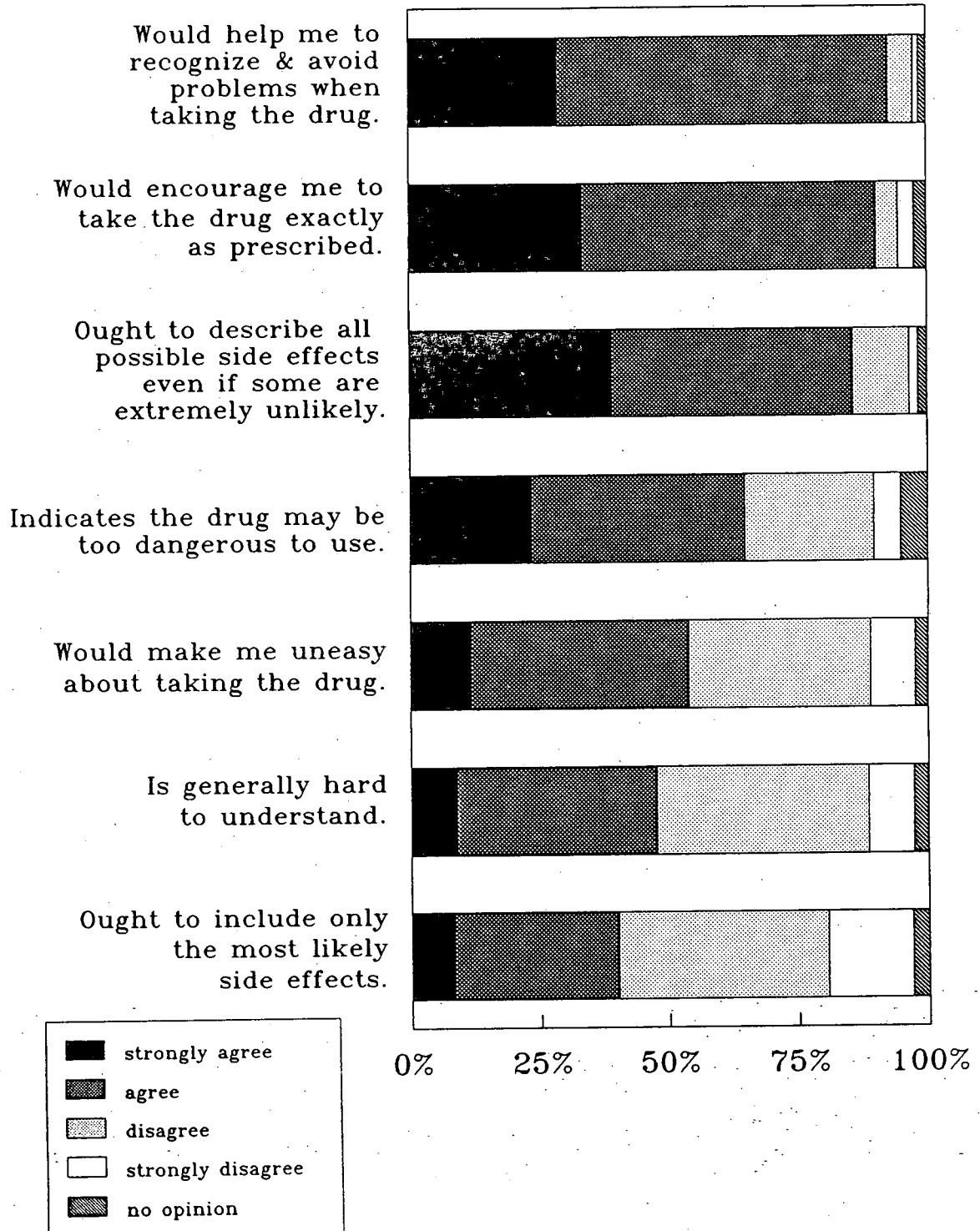


# REACTIONS TO A DRUG CRISIS SCENARIO

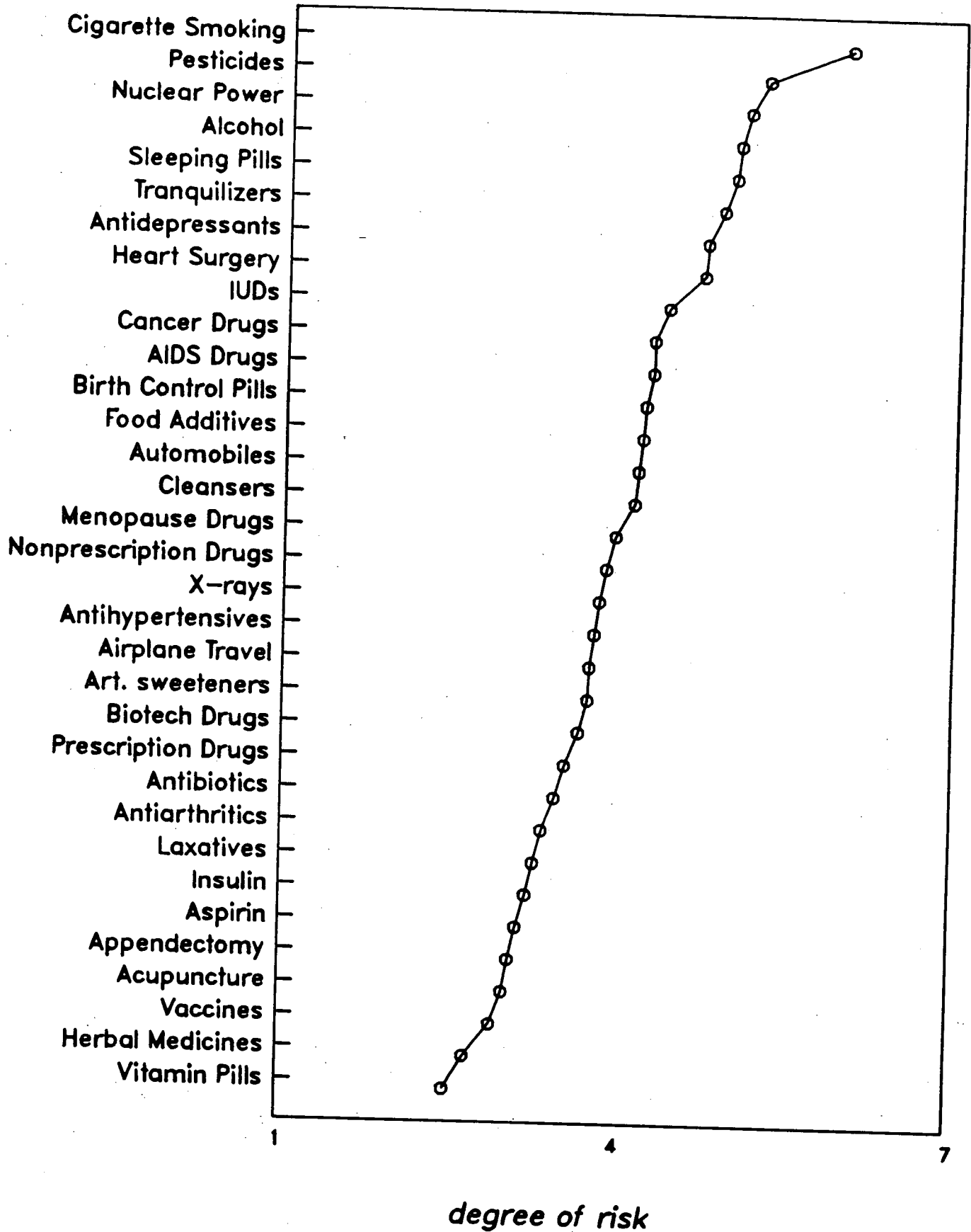
## Modification of Opinion in View of Additional Evidence



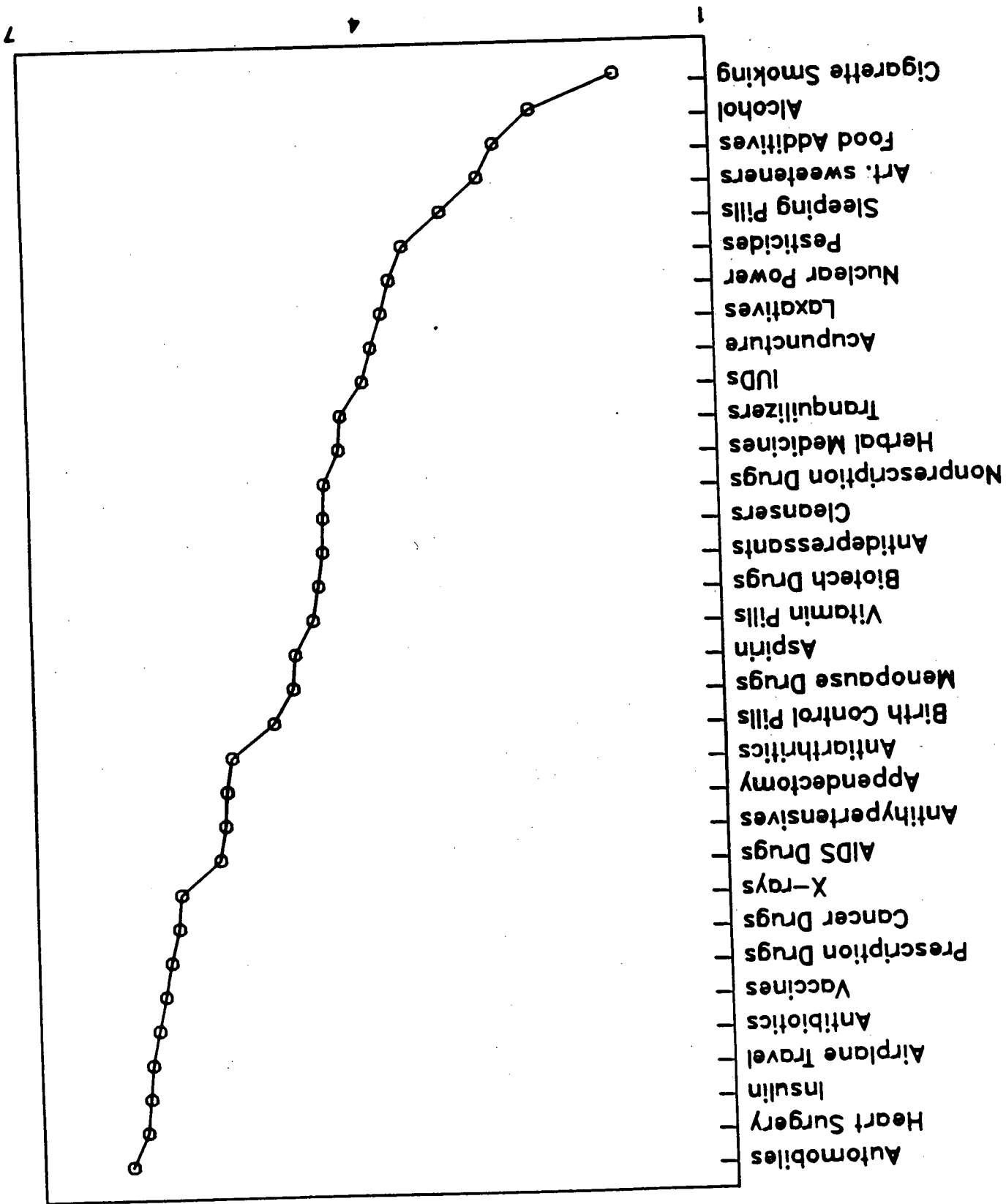
Information describing the precautions  
and side effects/unwanted effects  
associated with taking prescription drugs...



# PERCEIVED RISK



# PERCEIVED BENEFIT



degree of benefit

1

7

# RISK AND BENEFIT

