

Appendix II: Methodological Issues in the Design of the PSI

Defining personal security is a challenge. Despite its importance, attempts to capture and measure the level and changes in personal security have been few and far between. This may be because security – or insecurity – is a subjective state that varies according to each person's response to their individual situation. Everyone has a different comfort zone based on their age, health and income status. This means that any measurement of security must necessarily be somewhat arbitrary with respect to the ranking of different components.

While the concept of security has many dimensions, for our purposes it is reduced to three key elements:

- economic security in the broad sense of job and financial security;
- health security in the sense of protection against the threats of disease and injury; and
- physical safety in the sense of feeling safe from violent crime and theft.

In a broader exercise, security could also be considered to include the quality of people's social relations or the stability and future potential of their communities. However, practical considerations limit this project to the economic, health and physical safety dimensions of personal security.

The PSI has also been developed within the limitations of the data that are available. While an ideal security index would include, for example, indicators of the quality of the physical environment or the presence of life-threatening pathogens, data on such indicators are limited and do not allow for analysis of changes from year to year.

Conscious of the challenges inherent in such an exercise, we have proceeded with great care in the selection of the personal security components and the indicators. All of the key indicators were chosen with the help of an expert advisory committee. The weights given to the three major components of the PSI reflect the views of ordinary Canadians as captured in last year's survey. These weights have been fixed for each year of the PSI to date.

Creating the PSI

In order to create the PSI, it was necessary to first develop a conceptual framework, then find individual indicators that best embodied the various dimensions of our central concept of personal security. The next step involved transforming each variable into a common scale so that two scores could be calculated – one for the objective or data indicators and one for the subjective or perceptual indicators. The indicators were then weighted on the common scale to calculate the overall score of the Personal Security Index. The final step was to revise the conceptual framework, the choice of indicators, and the strategy used to transform and weight the PSI in order to keep it as relevant as possible to annual changes in the personal security of Canadians.

Indicator Selection

In order to identify the most appropriate indicators for each of the three key elements of the PSI, the CCSD submitted a list of proposed variables to experts in a variety of fields. These individuals then selected the indicators that they felt best captured the different dimensions of personal security, using the following criteria:

- Indicators should measure the personal security of adults and their family members.
- Subjective indicators should measure each individual's personal experience of security, rather than their perceptions of the general level of security in Canada.
- Indicators should be meaningful – that is, they should be descriptive of the personal security of Canadians at a given point in time. They should be compelling and relatively easy to understand on the part of the general population.
- Indicators should be valid – that is, well recognized in the research literature.
- Indicators should be responsive to changes over time and among different populations, wherever possible.
- Indicators should show a degree of variability.
- Indicators should measure things that have a high probability of influencing an individual's personal security.
- Ideally, indicators should be available on an annual basis.
- Indicators should be available at the national level and for selected demographic groups and geographic areas. Ideally, the objective indicators should be available for other selected countries as well.
- Indicators should be readily available from established data sources.

The conceptual framework for the PSI and the indicators selected were then submitted to focus groups of Canadians to test their resonance with the public. The goal was to develop indicators that were both understandable to the general public and that embodied Canadians' most essential concerns about their personal security. Thus, people were asked to assess the overall conceptual framework, as well as each individual indicator.

PSI Indicators

For the Personal Security Index, the CCSD looked at economic security and physical security (both health and physical safety) and chose indicators that threaten or enhance security.

Economic Security

Economic security refers to an assured and stable standard of living that provides individuals and families with a level of resources and benefits necessary to participate economically, politically, socially, culturally and with dignity in their community's activities. Components of economic security include the level and adequacy of income, employment security, access to a social safety net, and financial vulnerability. Under this element of the PSI, we are interested in finding out whether people have adequate resources, whether they have access to stable sources of income through their employment, and whether they have access to an adequate social safety net to deal with times of adversity.

Level and Adequacy of Income

The first component of economic security deals with the question of whether Canadians have enough income to afford the basics of life – food, shelter, clothing, education and health care. We therefore focus on changes in the earnings of paid employees in Canada and changes in their income. We also analyze Canadians’ perceptions about whether they think they have an income adequate to meet their household’s basic needs.

Employment Security

This component of employment security is central to the concept of economic security because it relates to people’s capacity to get access to jobs and earnings. Under this indicator, we examine Canadians’ employment status and their perceptions of their job security and their employability, that is, their capacity to find alternative employment if they are laid off.

Social Safety Net

The third component of economic security addresses the issue of the Canadian “social safety net.” In our society, perhaps one of the most common forms of adversity is to lose one’s job. Depending on a person’s set of skills and the state of the economy, finding a new job can take time, and whether Canadians can count on income support from programs such as Employment Insurance or social assistance is a key element in the economic security equation.

Financial Vulnerability

Another type of “safety net” is the nest egg that Canadians accumulate for their retirement or for the theoretical “rainy day.” As a proxy for this component of economic security, the PSI monitors how long Canadians think they could live on their savings if they were to lose their job. And because exposure to debt and the servicing of accumulated debts are making many Canadian households more vulnerable, we track their overall ratio of debt to disposable income.

Physical Security

Physical security refers to physical and mental well-being, the quality of natural and built environments, and the status of one’s personal safety. Components of physical security include people’s physical health and mental well-being, their access to health care services, and their personal physical safety. Under this component of the PSI, we group concerns about one’s current and long-term health, threats to physical security due to injuries or disease, and threats from crime and violence. Broadly speaking, physical security encompasses many different components, but for our purposes, we concentrate on two main questions: Is my health at risk? and, Am I safe?

Physical and Mental Well-being

Under this component, we look at the foundation of Canadians’ physical security – their health – as well as potential threats to health and the impact of such dangers in the home, workplace and the community.

Access to Health Services

Beyond a person's physical health and a sense of safety from health hazards, another important component of health security is whether or not a person has access to necessary health care services in times of need.

Physical Safety

Another component of physical security addresses public concerns about crime and violence. People are worried mainly about the incidence and types of crime that take place in their communities. This includes incidents that are reported to police, and thus included in national crime data, as well as threats to people's physical safety and their property.

Data Sources for the PSI Indicators

The intent of the PSI is to capture both the "reality" and the "perception" of personal security in the lives of Canadians. Accordingly, equal importance has been given to objective factors and to Canadians' subjective perceptions of their personal security. The PSI therefore measures changes in both the objective data trends and people's perceptions of these elements. The PSI contains two sub-indexes: a "Data Index" and a "Perception Index." Each index contains a series of indicators to track the different dimensions of our economic, health and physical safety described above.

The Data Index: Definition, Sources and Calculations

The Data Index, derived mainly from Statistics Canada databases, is designed to measure changes in "real" outcomes related to personal security, such as levels of income and debt, and rates of crime and poor health. The Data Index is composed of 11 indicators: six economic indicators and five indicators related to health and physical safety.

Economic Data Indicators

To track the adequacy of incomes, the PSI monitors changes in the level of disposable income – that is, how much money from earnings, government transfers or investments Canadians have left in their pockets after they have paid their income taxes. We calculate the personal disposable income per Canadian by taking disposable income data from the National Accounts and dividing it by the Canadian population figures established by Statistics Canada each year.

As an indicator of poverty, the PSI uses the "poverty gap" which details how far below the poverty line poor Canadians are. The total poverty gap represents the amount of money that would be required to raise every poor Canadian's income up to the poverty line. It is based on Statistics Canada's evaluation of the poverty gap published in their report and on their CD, *Incomes in Canada*.

As an indicator of employment security, the PSI measures the long-term unemployment rate, which is a better measure of the underlying strength of the labour market and of the persistence and severity of unemployment. The long-term unemployment rate is defined in the PSI as the proportion of all unemployed people who have been unemployed for more than 12 months. Data for this indicator are available in Statistics Canada's *Labour Force Survey*.

The strength of the social safety net is a major element contributing to the economic security of Canadians. And a major component of Canada's social safety net is the employment insurance system (EI) that is designed to help people make ends meet while they look for a job. For the objective measure of how well EI serves Canadians, the PSI calculates the percentage of unemployed Canadians who receive EI benefits, using Statistics Canada data from the *Labour Force Survey* and Employment Insurance program data.

For Canadians ineligible for EI benefits, provincially administered social assistance – or “welfare” – can provide some economic security. To track how well Canadians are served by social assistance benefits, the PSI provides data on the average level of assistance available and the benefit level as a percentage of Statistics Canada's pre-tax Low Income Cut-offs (LICOs), which are popularly referred to as Canada's poverty lines. Information about provincial social assistance benefits for a variety of different family types is collected and standardized by the National Council of Welfare. For simplicity, the PSI compares benefits for a lone-parent family with one child living in a large city. The national benefit figure provided is the unweighted average of the 10 provinces for this family type.

Growing levels of household debt are causing many Canadians to worry about their economic security. To measure the financial vulnerability of Canadians, the PSI tracks the ratio of total mortgage and consumer debt to total disposable income. The debt-to-income ratio is calculated by dividing total mortgage and consumer debt by the disposable income figures. Both sets of data are published by Statistics Canada in the *Canadian Economic Observer*. Debts reported in PSI are gross amounts.

Health and Crime Data Indicators

Because thousands of Canadians every year die prematurely from injuries or disease, the PSI calculates an indicator known as the “potential years of life lost” or PYLL. It is a ratio of the total years of life lost before the age of 75 and the proportion of the population under age 75. These data are published annually by Statistics Canada.

To gauge the safety of Canadians in the workplace and on the road, the PSI tracks the incidence of workplace injuries and the motor vehicle accident injury rate. The rate of workplace injuries is calculated as the number of injuries per 100,000 workers that result in time being lost from the workplace. The motor vehicle accident injury rate is calculated based on the number of people who are injured as a result of traffic accidents, as a proportion of the overall Canadian population.

The Perception Index: Definition, Sources and Questionnaire

The Perception Index of the PSI is based on responses to a national survey conducted for the CCSD this year by EKOS Research Associates. The survey asks Canadians how they would rate different issues affecting their personal security and asks them about their perceptions of their own security. For the 2002 edition of the PSI, more than 3,000 telephone interviews were conducted with Canadian residents aged 16 years and older between January 3rd and January 31st, 2002. The results are considered to be valid within a margin of error of plus or minus 1.8

percentage points, 19 times out of 20. The margin of error is larger for results from sub-groups of the Canadian population. To ensure that the sample was representative of the general public in Canada aged 16 and older, the data were weighted based on Statistics Canada data for age, gender and region. The sample sizes and margins of error were approximately the same in the 2000, 2001 and 2002 editions of PSI, but the sample was 50% smaller (1,500) in the first edition of the PSI in 1999, with a larger margin of error.

Survey Questionnaire

The following questions were asked by staff of EKOS Research Associates for the PSI project:

- How adequate would you say your household income is in meeting your family's basic needs? Please use a 7-point scale where 1 is "not adequate at all" and 7 is "extremely adequate," and the mid-point 4 is "moderately adequate."
- In general, how would you rate your health? Please use a 7-point scale where 1 is "terrible," 7 is "excellent," and the mid-point 4 is "average."
- Thinking of your family's exposure to violent crime, how safe is your neighbourhood? Please use a 7-point scale where 1 is "not at all safe," 7 is "extremely safe," and 4 is "moderately safe."
- Thinking of your household's exposure to property crime such as break-ins, how safe is your neighbourhood? Please use a 7-point scale where 1 is "not at all safe," 7 is "extremely safe," and 4 is "moderately safe."
- How stressful would you say your life is? Please use a 7-point scale where 1 is "not at all stressful," 7 is "extremely stressful," and the mid-point 4 is "moderately stressful."
- If you were seriously ill at home, is there a friend, neighbour or family member who would look after you?
- If you lost your job, or were in financial distress, is there a friend, neighbour or family member who you could count on to help you?
- Now, please rate the degree to which you agree or disagree with the following statements, using a 7-point scale where 1 means you "strongly disagree," 7 means you "strongly agree," and the mid-point 4 means you "neither agree nor disagree." The (first/next) one is (READ STATEMENT – RANDOMIZE). (IF RESPONDENT SAYS THEY DON'T HAVE A JOB OR THAT THE QUESTION DOESN'T APPLY TO THEM, THEN RECORD "99")

Statements:

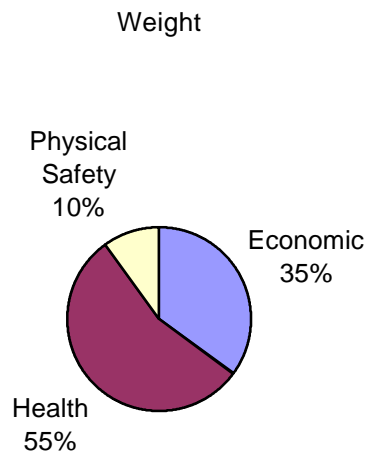
- I think there is a good chance I could lose my job over the next couple of years.
- If I lost my job, I am confident that I could find an equivalent one within six months.
- If I lost my job, I am confident I could count on government support programs to sustain me and my family adequately while I looked for a new job.
- I'm confident that if I or a member of my family were to become seriously ill, we would be able to access the necessary health care services.
- If you and your spouse lost your jobs, how many MONTHS could you sustain yourselves on your current savings (that is, bank accounts and RRSPs)? (PROBE FOR BEST ESTIMATE. OBTAIN SPECIFIC NUMBER, NOT A RANGE)
- One's own feelings of personal security can be felt a number of different ways. Which of the following three sources of security is MOST important to you personally? (READ LIST – RANDOMIZE. PROBE FOR ONE RESPONSE ONLY)
 - Economic security – for instance, having enough income or savings, feeling secure in your job

- Health security – for instance, being healthy, having adequate access to health care
- Physical security – for instance, feeling safe from violent crime and property crime
(Note: This question was not asked in 2001 or 2002.)

Weighting the Indicators

After the individual indicators were selected and calculated, the next step was to determine the relative value of each component and each indicator within the composite index. Are some indicators more important than others in the personal security considerations of Canadians? If so, how should the various indicators be weighted to account for these differences in their relative importance?

To accomplish this, Canadians were asked in a survey to tell us the relative importance they attached to the three main indicator groups: economic security, health security and physical safety. The results of the 1999 PSI survey indicated that 55% of respondents considered health to be the most important element, while 35% selected economic security, and 10% indicated physical safety. Consequently, each indicator in these three categories has this weight attached to it in the final PSI indexes. It is recognized that weighting in any one year will be influenced by circumstances prevailing at the time of the survey, therefore weights will be adjusted over time as subsequent surveys reveal different priorities. To maintain consistency, weighting of the PSI indicators will remain the same for at least three years.



Calculating the PSI Indexes

The Personal Security Index is created by transposing the raw data into common units of analysis so that changes in all indicators can be measured in order to arrive at an overall weighted score.

The transposition of the raw data into the PSI Perception Index is relatively simple. Because all indicators in the Perception Index are already based on a common 7-point scale, the mean score of that 7-point scale is calculated for each of the individual Perception indicators. For example, we calculated the mean score of all valid responses of all respondents to the question, “How adequate would you say your household income is in meeting your family’s basic needs?” The mean score was 4.74 in 1998. This means that, on average, all responses to this question are distributed between 1 and 7, with a mean of 4.74. Changes between two years are equal to the percentage change between the mean scores of those years. In order to track historical change – such as from 1998 to 1999 and 2000 – and to monitor progress each year, percentage change is measured from the base year. For example, in 1999, the mean of all responses to the sample question above was 4.67. Therefore the mean score for this indicator went down by 1.5% between 1998 and 1999.

After transposing the raw data into common units of analysis, we needed to establish the relationship between that particular indicator and the PSI, in order to know if an increase in the mean score for an indicator meant an increase or a decrease in the personal security of Canadians. For example, an increase in the mean score for the question, “I think there is a good chance I could lose my job over the next couple of years” means that Canadians are feeling less secure about their job security. If we simply applied the change directly to the Perception Index, the Index would increase, whereas Canadians were actually feeling less secure. In order to transpose a negative relationship between an indicator and the PSI, we multiplied the variation of the indicator by -1. In other words, when an indicator is negatively related to the PSI and that indicator decreases, the PSI increases; when that indicator increases, the PSI decreases. And when an indicator is positively related to the PSI, the change in the indicator is directly reflected in the PSI.

To translate the impact of changes in the Perception indicators into a PSI value, we multiplied the baseline year value of the indicator by the percentage change to arrive at the amount of the PSI change. Finally, the new values for each indicator were added up. A composite PSI score of more than 100 suggests that the level of personal security was higher in that year than in the base year; a lower score would suggest that Canadians were less personally secure.

The transposition of raw data into the PSI Data Index is somewhat more complicated. Because all the indicators are not on the same scale, we needed to standardize the changes between years in order to calculate comparable changes in the Index. To accomplish this, we used a common statistical technique of standardization (Z scores) that standardizes the changes to a mean equal to zero, where decreases compared to the mean are below zero and increases are over zero. We do not standardize the indicators, but only the changes of one year compared to the average changes that occurred in the five years before the baseline year (1998). This technique ensures that changes in the indicators are registered in such a way as to reflect historical levels of variability.

In the baseline year of 1998, the value of each individual indicator was established according to the weighting procedure described above. In order to track historical changes in the PSI Data Index from 1998 to 2000, and to monitor progress in future years, we have added the value of the standardized change to the value of the base year weight. For example, in 1998, the long-term unemployment rate was 9.6%, and in 1999, the rate was 8.0%. The standardized change was equal to 2.38 points. To calculate the variation in this indicator between 1998 and 1999, we increased the value of the indicator by 2.38 points, so that it went up from 5.83 to 8.22. We used the same statistical technique for all the indicators included in the PSI Data Index.

To translate the impact of these changes in the Data indicators into a PSI value, we added the baseline year value for the indicator to the change value to arrive at the PSI change amount. Finally, the new values for each indicator were added. A composite score of over 100 suggests that Canadians' level of personal security was higher than was recorded in the base year; a lower score would suggest that Canadians were less secure.

To build PSI regional indexes, we recalculated both the Data and Perception Indexes for each region. These regions were built to be as detailed as possible based on data accessibility and validity. For the Perception Index, all indicators were calculated based on 1998, 1999, 2000, and 2001 surveys. In the Data Index, data related to EI coverage, levels of debt, and Potential Years of Life Lost were not available by region, so they were kept constant to the national level. For most of the other data – such as workplace injuries – data were available by province. To calculate a regional score for these data, we calculated an unweighted average for each region. Finally, because we did not have historical information for all of the data indicators used in the Data Index before 1998, indicator variations between years were calculated in terms of percentage change, rather than being standardized as in the national PSI.

Testing and Reliability

The CCSD intends to periodically review the indicators and their weights in order to determine whether they still adequately reflect different dimensions of personal security and whether they are still reliable. In some cases, indicators may be modified or eliminated altogether, keeping in mind the integrity of the Index over time. Changes in the choice of indicators and the weighting will be clearly detailed in the each report of the PSI.