Public Health Agency of Canada (PHAC)

Chronic Diseases in Canada

Volume 22, No. 1 - 2001

# The Economic Burden of Mental Health Problems in Canada

*Thomas Stephens and Natacha Joubert*

[Table of Contents]

## Abstract

This study provides a comprehensive estimate of the economic burden of mental health problems in Canada in 1998. In particular, it estimates the cost of non-medical services that have not been previously published and the value of short-term disability associated with mental health problems that was previously underestimated, according to the approach used here. The costs of consultations with psychologists and social workers not covered by public health insurance was $278 million, while the value of reduced productivity associated with depression and distress over the short term was $6 billion. Several data limitations suggest that these are underestimates. The estimated total burden of $14.4 billion places mental health problems among the costliest conditions in Canada.

***Key words***: *Canada; depression; distress; economic cost; population*

## Introduction

The objective of this study is to provide a comprehensive estimate of the economic burden of mental health problems in Canada. In so doing, we seek to build on estimates published in Health Canada's *Economic Burden of Illness in Canada, 1993* (EBIC, 1993)[1] and to address some of the data issues identified in this complex analytical task. While direct and indirect economic costs are only one aspect of the burden of disease, they can provide a valuable perspective for planning programs and setting priorities.

A recent study by Health Canada's Cancer Bureau of the former Laboratory Centre for Disease Control (LCDC), estimates that the economic burden of mental disorders in Canada was $7.8 billion in 1993,[1] or $8.4 billion in 1998 dollars. Mental disorders ranked seventh among the 20 disease categories for which cost estimates were published. *Direct* costs for treating medically diagnosed mental disorders totalled $6.3 billion (1998), comprising $3.9 billion for hospital care, $887 million for other institutional care, $854 million for physician care, and $642 million for prescription medications. Additional *indirect* costs totalling $3.0 billion were made up of short-term sick days ($866 million), long-term disability ($1,707 million), and premature death ($400 million), although these latter amounts were not restricted to diagnosed disorders.

These estimates were based on a societal perspective and thus incorporated both direct (internal) and indirect (external) costs, using conventional assumptions for the calculations. For example, the value of lost productivity due to early retirement was based on the present value of the lifetime earnings of the person who retires early due to a mental disorder. While there are some limitations to the approach (for example, health care *savings* arising from early death were not considered), it is consistent across disease categories and allows for a reasonably fair comparison of the economic burden of diseases.

However, with respect to the economic burden of mental health problems in particular, there are some more serious limitations to this approach. First, it includes only *medically treated*, *diagnosed* disorders in the direct costs (ICD-9 codes 290-319). By definition, these are problems that come to the attention of the health care system and that do not include states such as distress or depression that are untreated by physicians or other health professionals providing publicly insured health services.

Large numbers of Canadians with mental health problems treated outside the medical system are missing in such medically based calculations of the direct cost of illness. According to data from the 1996/97 National Population Health Survey (NPHS),[2] only 21% of Canadians who consulted a psychologist about their mental health also consulted a family doctor or a psychiatrist in the previous year, while 29% who consulted a social worker also consulted a physician. Since 4% of Canadians were depressed and 20% were classified as distressed in 1996/97,[3] the direct costs associated with their mental health problems could be considerable, but most of these would not be included in the EBIC, which is based on publicly insured services.

A second limitation of the EBIC, which affects the *indirect* cost of mental health problems, is the method used to attribute short-term disability to specific disease categories. Unlike the direct costs, the indirect costs are not limited to diagnosed disorders in the EBIC analysis, but include any health-based reason for cutting down on normal activity. The attribution to specific disease categories is then made on the basis of data from the Quebec Health Survey.[1] Although the Quebec data are the only available basis for attributing short-term disability to disease categories, they have important shortcomings with respect to their validity and applicability. First, the validity of reports attributing activity reduction to mental health problems is questionable because a significant proportion of these attributions is based on third-party reports for other members of the household. Second, even if these reports were of unquestioned accuracy, the application of these 1992/93 Quebec data to all of the Canadian population is doubtful: in 1994/95, Quebec residents were the *least* likely to report that distress affects their life - 13% versus an average of 17% for the other provinces.[3] This low level of attribution of effects to distress in Quebec leads to underestimating the short-term disability costs of mental health problems such as distress, estimated in the EBIC, 1993 as $811 million ($866 million in 1998 dollars).

The objective of this analysis is to address these shortcomings and provide a more complete estimate of the economic burden of mental health problems in Canada. In so doing, we are building on one of the recommendations in the EBIC, 1993,[1] namely to "improve data sources and refine methods for direct and indirect cost components to provide more comprehensive information for specific diseases" (p. iv).

## Methods

### *Data source*

The source of data for the original analyses in this study was the 1996/97 NPHS "share" file. The share file is virtually identical to the public use file, but includes some detail removed from the latter for reasons of respondent confidentiality. Population estimates and dollar values were adjusted to 1998 figures.[4,5]

The NPHS is the biennial survey conducted by Statistics Canada to describe health status and health determinants; the 1996/97 sample is representative of the household population of Canada. Data collection for the mental health indicators in the present study was by personal interview of approximately 77,000 persons aged twelve and over.[2]

### *Definitions of mental health problems*

We used the NPHS questions on depression and distress as evidence of mental health problems. The distress scale includes many symptoms of anxiety (e.g., feeling nervous, restless or fidgety) and, with the depression scale, provides a reasonably comprehensive view of population mental health problems. Depression was defined according to the Statistics Canada definition[2] as a probability of 90% or greater of a major depressive episode in the previous year; the overall prevalence rate is 4%. Unlike depression, there is no independently verified definition of "high distress" for the measure used in the NPHS. We used as a definition a response of "a lot" or "some" to the question "How much do these (distressing) experiences interfere with your life or activities?" regardless of level of distress on the 24-item scale preceding the question on impact. By this definition, 15% of Canadians can be regarded as distressed.

There is a fairly high association between depression and distress: 53% of depressed persons also reported distress, and 24% of distressed persons were depressed. In order to avoid double-counting these persons, all analyses in this paper consider two groups in turn - all depressed persons, then distressed persons who are free of depression.

### *Direct costs*

The EBIC, 1993 uses a "top-down" approach to estimating the direct costs of illness. That is, estimates are based on a known total for health care costs, which is then allocated to various disease categories, according to the principal diagnosis for the care received. In contrast, this study is obliged to use a "bottom-up" approach, estimating the volume of non-medical health care associated with mental health problems, and then the associated cost.

The NPHS ascertained the number of consultations with each of psychologists, social workers, physicians, and other health professionals in the previous 12 months, for reasons of "physical, emotional or mental health." The survey also separately identified visits to psychologists, social workers, physicians and others, for reasons of one's "emotional or mental health," but did not ascertain the *number* of these mental health visits. To estimate the *number of social worker and psychologist visits for mental health reasons,* we combined data from these two separate questions. Further, to exclude publicly insured consultations with psychologists and social workers (e.g., in hospitals) already included in EBIC estimates, in the absence of survey data on the *location* of the consultation, we adjusted the total of visits to reflect the proportion provided by psychologists or social workers *in the absence of any physician consultation.* As noted above, this is 79% of those consulting a psychologist and 71% of persons seeing a social worker.[a]

The number of psychologist and social worker visits by all depressed and

distressed/not depressed persons was obtained from the NPHS, adjusted for the proportion of institutional visits and further adjusted for a population growth of 1.4% between 1996/97 and mid-1998,[4] and then multiplied by the average cost of such visits ($125).[b]

With respect to medications, there are severe limitations to the NPHS data. They are restricted to reports of any use in the previous month and there is no information that would permit an estimate of the *annual frequency* of use. Unless frequency can be obtained from some other recent and comparable source, the cost of these medications has to be limited to the cost estimated in EBIC, 1993, which is confined to prescriptions arising from medical care.

### *Indirect costs*

The indirect costs of mental health problems not fully accounted for in the EBIC, 1993 analysis are, for reasons described above, those due to short-term work loss associated with depression or distress. In the present study, short-term work loss is calculated from the NPHS using the questions on two-week disability days (cut-down days + bed-days). *Excess* time off associated with depression is obtained by comparing the disability days of depressed vs. non-depressed persons and then, similarly, distressed vs. non-distressed persons. Although the exact health reason for the time off was not ascertained and has to be assumed to be mental-health related, this is analogous to the procedure that attributes excess sick-days to smokers.[7]

Since the prevalence of depression and distress varies according to labour force status, we estimated work-loss days separately for part-time workers, full-time workers, and non-employed persons. As the NPHS does not identify on which days of the week the reduced activity occurred, the proportion that are work days was estimated by assuming that the probability is equal for any day of the week being a sick day, and multiplying the total by 5/7 (usual work days/week). Assuming two weeks of annual holidays, the two-week total was then multiplied by 25 to give an annual estimate for work-days of restricted activity. In the absence of an exact report of hours worked per week, we weighted the work-loss of part-time workers by a factor of 0.5 in estimating their contribution to the total for the worker population. The dollar value of this lost time was calculated using average employment income for full- and part-time workers as published by Statistics Canada,[8] expressed in 1998 dollars.

To maintain consistency with the approach used in EBIC, 1993, the disability-days of persons outside the work force was also calculated. A proportion of the disability days of full-time workers (two of seven days) and of part-time workers (four and a half of seven days) was added to this total, to account for their activity restriction outside of the usual working days. The value of this lost time was obtained by assuming unpaid work is worth $15,000 annually, based on an hourly wage of $7.50 and 2000 hours of work annually. This is consistent with the "generalist" approach to the value of unpaid work as used in EBIC, 1993.[9]

Next, total disability days were adjusted for the fact that most are not days of complete inactivity, but only of reduced activity. For working persons, such "cut-down" days constitute 74.1% of all two-week disability days.[2] If cut-down days are weighted as 0.5 of a bed-day, then the adjustment required to take account of the proportion of cut-down days is (74.1 x 0.5 + [1 - 74.1] x 1.0) = 0.6285.

[a] For psychologists, this corresponds reasonably well to an estimate of 69% of service hours spent in private, as distinct from institutional, settings by 1,065 respondents to a 1999 survey of the 3,240 psychologists registered with the Canadian Register of Health Service Providers in Psychology.6

[b] Provincial bodies that license psychologists and social workers were contacted for their fee schedules: six replied, representing 85% of the Canadian population. While fees range widely ($60-$180/session) among and within provinces, the weighted average is $125. This figure was confirmed as a reasonable estimate by the Canadian Register of Health Service Providers in Psychology (P. L-J. Ritchie, personal communication, October 13, 2000).

## Results

### *Direct costs - visits to non-medical mental health professionals*

In 1996/97, depressed persons age 12 and older who sought professional help for mental health reasons made almost 1.5 million visits to social workers and more than 850,000 visits to psychologists (Table 1). The 1998 equivalent is estimated at 2.38 million visits in total, after adjusting for population growth of 1.4%.[4] In addition, 1.6 million Canadians reported being distressed without being depressed. While the vast majority of them did not seek care from any mental health professional, there were approximately 280,000 visits to social workers and 328,000 visits to psychologists. These consultations are the equivalent of 616,000 visits in 1998.

For depression and distress combined, there were almost 3 million visits to psychologists and social workers in 1998. An estimated 2.2 million of these visits took place on a fee-for-service basis outside institutions (Table 1). At $125 each, the total cost for these visits exceeds $278 million.

### *Indirect costs - days off work*

In 1998, almost 678,000 employed Canadians accumulated more than 39,000 excess person-years of short-term reduced activity associated with depression and another 2 million had over 115,000 person-years of time off associated with distress (Table 2). Among unemployed Canadians, there were more than 76,000 days of reduced activity associated with depression and 224,000 associated with distress.

After adjusting for part-time work, inflation, and the preponderance of cut-down days over bed-days, the total value of lost work time was $2.16 billion. An amount equivalent to $3.86 billion in unpaid work was similarly reported by depressed and distressed persons. The total value of paid and unpaid work lost associated with these conditions was $6.02 billion in 1998 (Table 2).

**TABLE 1**
**Number of consultations with social workers and psychologists for reasons of mental health, Canada, age 12+, 1998**

| Condition | Social worker[a] | Psychologist[a] | Total[a] | 1998 |
|---|---|---|---|---|
| Depressed | 1,491,423 | 858,223 | 2,349,646 | 2,382,541 |
| Distressed (not depressed) | 279,634 | 327,604 | 607,238 | 615,739 |
| Both conditions | | | | |
| - all settings | 1,771,057 | 1,185,827 | 2,956,884 | 2,998,280 |
| - fee basis only | 1,257,450 | 936,803 | 2,194,253 | 2,224,973 |

[a] Source of unadjusted data: National Population Health Survey, 1996/97 share file

**TABLE 2**
**Indirect cost of depression and distress, Canada, age 15+, 1998**

| Condition | Population affected[a] | Excess time lost: Average days in 2 weeks[a] | Total person-years | Cost $ |
|---|---|---|---|---|
| Depressed | | | | |
| - paid work | 677,625 | 0.84 | 39,075 | 451,676,778 |
| - unpaid work[b] | 536,221 | 2.00 | 76,393 | 967,268,150 |
| Distressed/not depressed | | | | |
| - paid work | 2,043,168 | 0.82 | 115,397 | 1,711,976,531 |
| - unpaid work[b] | 2,341,064 | 1.34 | 224,126 | 2,892,781,577 |
| Both conditions | | | | |
| - paid work | 2,720,793 | 0.83 | 154,472 | 2,163,653,309 |
| - unpaid work[b] | 2,877,285 | 1.51 | 300,519 | 3,860,049,727 |
| **Total** | **5,598,078** | **1.28** | **454,991** | **6,023,703,036** |

[a] Source: National Population Health Survey, 1996/97 share file

[b] Includes the value of unpaid work of full- and part-time workers while not at work

## Summary

Table 3 summarizes the direct and indirect costs for depression and distress as estimated in the present study, and the direct costs and indirect costs for medically treated mental disorders as estimated in EBIC, 1993. Our estimate for the economic burden of mental health problems increases previously published estimates[1] by 71% - after adjustment for inflation between 1993 and 1998. The total in 1998 was $14.4 billion.

**TABLE 3**
**Summary of costs related to mental health problems, Canada, 1998**
**($ million)**

| | Cost | Source[a] |
|---|---|---|
| Treatment | | |
| - of diagnosed disorders | | |
| - medications | 642 | EBIC |
| - physicians | 854 | EBIC |
| - hospitals | 3,874 | EBIC |
| - other institutions | 887 | EBIC |
| - of depression and distress | | |
| - non-publicly insured mental health professionals | 278 | This study |
| Total | 6,257 | |
| Lost productivity | | |
| - short-term disability | 6,024 | This study |
| - long-term disability | 1,708 | EBIC |
| - early death | 400 | EBIC |
| Total | 8,132 | |
| **Total** | **14,389** | |

[a] EBIC estimates from Reference 1, adjusted for inflation of 6.68% between 1993 and 1998.[5]

## Discussion

This attempt to provide a comprehensive estimate of the economic burden of

mental health problems reveals that previous estimates[1] may be far too low, primarily due to attributing too small a proportion of lost productivity to mental health problems. However, the current study may also be an underestimate of the true value, due to several limitations. The principal ones are:

- The mental health problems newly accounted for in this analysis are limited to depression and distress. These conditions are important, but they are not exhaustive; others such as phobias could not be accounted for, although some anxiety symptoms are part of the distress scale.
- The NPHS definition of depression is conservative: it counts only those persons who report feeling "sad, blue or depressed for two weeks or more in a row" during the past 12 months *and* whose responses to a symptom checklist indicate a probability of a major depressive episode during the past year of 90% or more. This definition would exclude anyone with transient feelings of depression; such persons might well have taken time away from work or other usual activities, however.
- It was not possible to estimate the cost of over-the-counter medications possibly used in response to depression and distress. As collected by the NPHS, these would be sleeping pills, painkillers, stomach remedies and laxatives, but person-level data on frequency of use needed to calculate annual consumption are not available.
- It is not clear that the true extent of reduced productivity due to distress and depression is captured by the question used in the NPHS, "[During the last 14 days], did you stay in bed/cut down on normal activities because of illness or injury?" It seems unlikely that distress, in particular, would be universally regarded as an "illness."
- Long-term work loss was not included in this analysis due to data limitations, including the strong possibility that depression and distress are the *result* as much as the *cause* of activity restriction.
- The value of reduced productivity of non-employed persons has been set at the equivalent of $15,000 per year - a very conservative figure.
- No account has been taken of the cost of violence and early school departure that may accompany depression and distress. Nor have we included the costs of smoking, drug and alcohol abuse that may be used to cope with depression and distress, nor the cost to family and friends of providing support to persons in need. Further, no estimate has been made here of the large amounts of time devoted to personal crisis counselling by other professionals, e.g., guidance counsellors in schools, EAP staff in work settings, and clergy in the community.

All of the foregoing limitations would produce underestimates of the true economic burden. Only one limitation - co-morbidity - might inflate these estimates.

While it is possible to estimate the excess days off work associated with depression and distress (Table 2), there is no way of knowing whether mental health problems are the *primary cause* of the lost productivity, or whether a co-existing condition might be the cause, since the NPHS does not provide this detail (and, as noted, other sources such as the Quebec Health Survey are inadequate for this purpose). If conditions other than mental health problems lie behind the reduced productivity associated with depression and distress in this analysis, however, they appear to be limited: depressed persons report *half* the number of co-existing physical conditions (1.8) of persons with chronic physical conditions (3.3) (G. Torrance, personal communication, May 1, 2000). While there is an association between depression and number of physical health problems, and similarly between distress and physical health, it is modest for those with one or two physical conditions.[3]

The upshot of all these limitations is that the estimates presented in this paper are likely quite conservative. We can thus conclude with fair confidence that the

economic burden of mental health problems - both medically treated and not - is $14.4 billion annually, *at a minimum*.

### Implications

The major implications of this study are similar in many ways to those described in a recent analysis of the mental health status of the Canadian population.[3] The new element is the dollar figures.

These results strongly suggest that promoting the mental health of Canadians would be a sound investment, not only to prevent mental health problems but also to reduce the staggering economic burden associated with them. This analysis demonstrates that these are much higher than suggested by previous studies,[1] and indeed, are likely considerably higher than the available data suggests, due to the many limitations described above.

Moreover, the number of persons in distress may *increase,* in tandem with current trends in child poverty, income disparities, involuntary part-time work, single-parenting, youth unemployment, and declining expenditures on health, welfare and education.[3,10] It is striking that youth now exhibit the highest distress levels in the population, when they had the lowest levels 20 years ago.[3,10] This trend raises the possibility of lifelong problems for the current youth cohort, exacerbated by the sharp decline in the support provided by the community and the mental health system. This situation will continue to deteriorate as long as individual support networks and the broader social safety net are not repaired and maintained. Whatever benefits children and youth may get from various programs can be very difficult to sustain when there is a lack of support from the family and the community.[11] Social support can be increased by fostering the development of meaningful relationships in families and social environments - in schools, workplaces, the community and institutions.[12]

It is clear that offering only more "services" will not respond effectively to the population's mental health needs. Since approximately 60% of people with mental health problems do not receive care from a health professional, the apparent gap in services is simply too big to fill. What is evidently needed is a different kind of investment to promote the population's mental health. Generally speaking, this could take the form of developing individual and community resourcefulness, and promoting resilience among individuals of all ages.[13,14] The significant contribution of mental health problems to the global burden of disease is being addressed by a growing number of countries, including Canada, the United States, Australia, New Zealand, and the Member States of the European Union, all of which are developing national plans of action or other initiatives to promote the mental health of their populations.[11] The dollars thus invested would represent a small figure compared with the economic burden if nothing is done, judging by our analysis.

This analysis also has implications for research, especially for the collection of data in future population surveys. In order to calculate both direct and indirect costs adequately, it is essential to determine the respondent's assessment of (a) the reason for cutting down on normal activities, in a manner that can deal with co-morbidity, (b) whether any mental health services received were covered by public health insurance, and (c) the frequency and dosage of over-the-counter medications taken for mental health reasons. To enhance the validity of these reports, they should be obtained directly from the respondent; third-party reports should not be accepted. Even with these improvements in data, the economic burden of mental health problems will likely continue to be underestimated until they are reported as openly as are physical health

problems.

### Acknowledgments

This study was supported financially by the Mental Health Promotion Unit of Health Canada; George Torrance of Health Canada provided access to the NPHS 1996/97 share file. George Torrance, Doug Angus and anonymous reviewers provided constructive comments on earlier drafts.

### References

1. Moore R, Mao Y, Zhang J, Clarke K, Laboratory Centre for Disease Control. *Economic Burden of Illness in Canada, 1993.* Ottawa: Health Canada, 1997.

2. Statistics Canada. National Population Health Survey, 1996/97. Share file and public use data file documentation.

3. Stephens T, Dulberg CS, Joubert N. Mental Health of the Canadian population: A comprehensive analysis. *Chronic Dis Can* 1999;20 (3)118-126.

4. Statistics Canada. CANSIM Matrices 6367-6378 and 6408-6409.

5. Statistics Canada. Consumer price index, 1996 classification, average annual all-items indexes, Canada, historical summary. CANSIM, Matrix 9957.

6. Doody K. CRHSPP registrants speak: "Tell us more about the CRHSPP." *Rapport* 2000, 7 (1), 10.

7. Choi BK, Robson L, Single E. Estimating the economic costs of the abuse of tobacco, alcohol and illicit drugs: A review of methodologies and Canadian data sources. *Chronic Dis Can* 1997; 18(4):149-165.

8. Statistics Canada . Employment Income. Catalogue No. 13-217-X1B.

9. Statistics Canada. Unpaid Work of Households. *The Daily,* Dec 20, 1995.

10. Stephens T. *Population Mental Health in Canada.* Ottawa: Mental Health Promotion Unit, 1998.

11. Joubert N. Promoting the best of ourselves : Mental health promotion in Canada. *International Journal of Mental Health Promotion* 2001;3:35-40.

12. Cohen S, Underwood LG, Gottlieb BH. *Social Support Measurement and Intervention.* New York: Oxford University Press, 2000.

13. Pransky J. *Prevention: The Critical Need.* Springfield: Burrel Foundation and Paradigm Press, 1991

14. Durlak J & Wells AM. Primary prevention mental health programs for children and *adolescents : A meta-analysis review.* American Journal of Community Psychology 1997; 25:115-152.

### Author References

Thomas Stephens, Department of Public Health Sciences, University of Toronto; and Faculty of Administration, University of Ottawa; and Thomas Stephens & Associates.

Natacha Joubert, Mental Health Promotion Unit, Health Canada, Ottawa

Correspondence: Thomas Stephens & Associates, PO Box 837, Manotick, Ontario K4M 1A7; Fax (613) 692-1027; E-mail: tstephens@cyberus.ca

[Previous][Table of Contents] [Next]

Last Updated: 2002-10-02 Important Notices