Absent Without Leaving.

The Economic Impact of Early, Optimized Treatment for Depression

At a Glance

- Depression can affect an individual's health, well-being, and productivity—enabling access to proper treatment is important to the individual and to the employer.

- Optimal treatment can improve workplace functionality and reduce the number of hospitalizations from depression.

- Although early, optimized treatment can provide the greatest opportunity for achieving full functional recovery, individuals can experience a delay in receiving optimal treatment.

- Increasing optimal treatment provides the greatest economic impact, but increasing access to minimally adequate treatment is a most realistic outcome.
Executive Summary

With workplace mental health and wellness receiving increased attention, there has been interest in examining the effects of early treatment for patients with depression. Indeed, a body of evidence points to early, optimized treatment providing the greatest opportunity for achieving full functional recovery. However, there are many stages at which a person with depression can experience a delay in receiving optimal treatment. These begin even before encountering the health system, as many people do not seek treatment for depression at all. For individuals who seek treatment and receive a minimally adequate level, many do not achieve an adequate response and/or eventually relapse. Therefore, early, optimized treatment involves getting the patient on the proper drug or helping the individual access the appropriate therapy as quickly as possible.

From a workplace perspective, enabling access to optimal treatment is important not only to the individual, but also to the employer. Previous Conference Board of Canada research estimates that of the 1.3 million Canadians with depression, only 16.7 per cent work full time and function fully at work. Meanwhile, 40.0 per cent work full time but at a reduced level of functioning, while 20.0 per cent work part time because their illness prevents them from working full time. The remaining 23.3 per cent are unable to work.

What is more, depression severity can have an impact on workplace functionality. Certainly, fewer Canadians with mild depression are unable to work because of their conditions, while a smaller proportion of those with severe depression are fully functional at work. Workplace
Ensuring that more depressed Canadians have access to minimally adequate treatment will also lead to significant economic gains.

functionality also differs for the population that seeks treatment and the population that does not seek treatment—for the portion of the population that seeks treatment, about half (53.0 per cent) receive minimally adequate treatment. This treatment is successful (or optimal) for 70.0 per cent of patients (i.e., they achieve remission). When the minimally adequate treatment is not successful, the patient does not achieve remission and the treatment must be re-evaluated. Treatment must also be re-evaluated for those who do not receive the minimally adequate treatment.

With this in mind, the Conference Board calculated the economic activity that could be gained if the negative impacts of depression were mitigated with increased access to optimized treatment. This involved creating simulated scenarios that increase employment and workplace functionality resulting from an increase in the number of depressed workers who receive optimized treatment. The scenarios focus on increasing the number of people who seek treatment; increasing the number of people who receive the minimally adequate treatment; and increasing the number of people who receive optimal, individualized treatment that works.

All in all, the largest benefit comes from ensuring that Canadians currently seeking treatment for their depression can access optimal treatment. Although it may seem that improving access to treatment would lead to significant benefits, it is more important to focus on providing optimal treatment to current patients before implementing strategies to expand the number who seek treatment. This makes it possible for more Canadians to be fully functional at work, while at the same time helping to reduce the number of hospitalizations from depressive episodes. In reality, the economic gains of increasing treatment come from the fact that the functional breakdown of those who receive treatment is slightly better than those who do not receive treatment.

However, ensuring that Canadians can access optimal treatment is not very realistic at this point in time. A more likely goal is to ensure that more depressed Canadians have access to minimally adequate treatment, which will also lead to significant economic gains. Therefore,
further research must focus on the earlier recognition of depression, which would reduce both health care costs and work productivity losses.

Introduction

Workplace mental health and wellness has received tremendous attention in Canada over the past decade, and with good reason. Mental illnesses affect an individual's health, well-being, and productivity from both absenteeism (absence from work) and presenteeism (coming to work while sick and performing with reduced productivity). Organizations that pay attention to the mental well-being of their employees stand to reap the benefits through a healthier, more productive workforce.

The Conference Board of Canada’s Healthy Brains at Work\(^1\) research series explored the importance of addressing mental health and mental illnesses\(^2\) in Canadian workplaces. Its objectives were to:

- explore what is known, and not known, about the profile of mental health and mental illness among working Canadians (including by industry/occupation);
- understand what is being done in the workplace to address mental health and mental illness and how this compares with evidence-based guidelines, recommendations, and standards;
- estimate the potential impacts from greater uptake of effective workplace programs and benefits as they relate to mental illness.

Following on this research, there has been interest in examining the effects of early treatment for patients with depression. A scan of the literature suggests that the greatest opportunity for achieving full functional recovery from depression lies in early, optimized treatment: early diagnosis followed by rapid implementation of optimal, individualized treatment.\(^3\) Unfortunately, not everyone receives this early, optimized treatment. In fact, there are a number of stages at which

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1 Sutherland and Stonebridge, The Footprint of Mental Health Conditions and Estimating the Impact of Workplace Mental Health Benefits; and Chénier and Boyer, Employer-Sponsored Mental Health Benefits.

2 Refers to the DSM-IV classification of mental illnesses, found in the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders, 4th edition.

3 Habert and others, “Functional Recovery in Major Depressive Disorder.”
a person with depression can experience a delay in receiving optimal treatment. These begin even before encountering the health system, as many people do not seek treatment for depression at all. If a person does not seek treatment, there is no opportunity for optimal treatment to begin. Further, even if a minimally adequate level of treatment is received, many individuals fail to achieve adequate response or subsequently relapse.

From a workplace perspective, enabling access to optimal treatment is important not only to the individual, but also to the employer. The purpose of this briefing is to examine the health care and economic impact of early, optimized treatment for patients with depression, using specific ways to increase access to optimal treatment, such as:

1. increasing the number of people who seek treatment;
2. increasing the number of people who receive minimally adequate treatment;
3. increasing the number of people who achieve remission.

For the purposes of this briefing, minimally adequate treatment is defined as receiving more than four counselling or psychotherapy sessions or having antidepressant prescriptions filled with more than 84 supply days. In some cases, the minimally adequate treatment can be considered the “optimal treatment.” But as the accompanying analysis shows, minimally adequate treatment is not optimal for everyone—some individuals may receive minimally adequate treatment very early, but it may not necessarily be the optimal treatment. Others may receive minimally adequate treatment after a very long period, and the benefits of receiving it early have vanished.

The analysis presented does not factor the exact point in time when an individual receives treatment; thus, it is challenging to properly estimate “early, optimized treatment.” If the minimally adequate treatment is successful, then it is considered the “optimal treatment.” But without knowing the exact point in time when treatment begins, early optimized treatment is technically a step beyond this, and its benefits

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4 Dewa, Thompson, and Jacobs, “The Association of Treatment of Depressive Episodes.”
5 Anderson and Haddad, “CANMAT Guidelines for Depression.”
6 Puyat and others, “How Often Do Individuals With Major Depression.”
would be significantly higher. Meanwhile, if the minimally adequate treatment is not successful, the individual will relapse and begin an alternate treatment.

With that in mind, whether treatment includes pharmaceuticals or therapy, or a combination of both, we present a modelling exercise that explores the potential impact of improving outcomes for working Canadians diagnosed with depression. This was accomplished by estimating both the health care and economic costs of early, optimized treatment for depression. The health care costs in this briefing pertain to costs to the health care system for accessing and receiving care, whereas the economic costs pertain to production losses associated with reduced workplace performance from the symptoms of depression. To inform this briefing, we present a review of the literature, the modelling approach, and a presentation of the results. We conclude with some thoughts on how to improve access to this treatment.

A Short Review of the Literature

Major Depressive Disorder

Major depressive disorder (MDD) is a burdensome and stigmatized illness in Canada, with a lifetime prevalence of 11.3 per cent and past-year prevalence of 4.7 per cent of the adult population 15 years of age and over. MDD is characterized by having a depressed mood and/or substantially reduced interest in most activities for at least two weeks. MDD must also meet at least four other criteria established by the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*: significant weight loss, insomnia, loss of energy, feelings of worthlessness, agitation, diminished ability to think or concentrate, and/or recurrent thoughts of death. The severity of these major depressive episodes is categorized as mild, moderate, or severe.10

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7 While the focus of this briefing is on early treatment, it is recognized that longer-term treatment can also have an impact. See Vos and others, “The Burden of Major Depression Avoidable.”
8 Patten and others, “Descriptive Epidemiology of Major Depressive Disorder.”
9 Statistics Canada, CANSIM table 105-1101.
10 Patten and others, “Canadian Network for Mood and Anxiety Treatments (CANMAT) Clinical Guidelines.”
The Classification of Depression

The new edition of *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5®) defines and classifies mental disorders to improve diagnoses, treatment, and research. Used by clinicians and researchers, the handbook is intended to facilitate an objective assessment of symptom presentations in a variety of clinical settings—inpatient, outpatient, partial hospital, consultation-liaison, clinical, private practice, and primary care.

However, the Mental Health Profile portion of the Canadian Community Health Survey (a major source of data for this briefing) is partially based on a modified World Health Organization Composite International Diagnostic Interview (WHO CIDI). The WHO CIDI is a standardized instrument for assessing mental disorders and conditions according to an operationalization of the definitions and criteria of the DSM-IV, which predates the DSM-5 version, updated in 2013. Therefore, throughout this briefing, the Conference Board refers to the DSM-IV classification of depression.

Untreated Illness

The duration of untreated MDD is increasingly being examined as a predictor of clinical outcomes, with a recent systematic review and meta-analysis showing that a shorter duration of untreated illness had a positive effect on a patient’s response to treatment and remission, as well as prevention of worse outcomes and chronicity. In fact, the results of an individual study included in this meta-analysis found that patients who began psychotherapy after more than six months of having the first episode of depression had a 50.0 per cent reduced chance of achieving remission compared with those who were treated earlier. Similarly, a study published after this meta-analysis showed that a shorter duration of untreated depression was associated with a three-times-higher odds of response at 12 weeks and a four-times-higher odds of remission at

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*11 American Psychiatric Association, *Diagnostic and Statistical Manual of Mental Disorders, 5th Edition.*

*12 Ghio and others, "Duration of Untreated Illness and Outcomes in Unipolar Depression."

*13 Bukh and others, "The Effect of Prolonged Duration of Untreated Depression."*
24 weeks, after adjusting for relevant confounders, and generally led to better outcomes in terms of depression-related disability.\(^\text{14}\)

These results are alarming considering a recent study showing that the majority (61.6 per cent) of Canadians with a mood and/or anxiety diagnosis received their diagnosis more than one year after the onset of symptoms. After diagnosis, the majority of affected employees with mild and moderate depressive episodes did not use mental health treatment (82.6 per cent and 56.8 per cent, respectively) and two-fifths (40.0 per cent) of those with a severe depressive episode did not use mental health treatment.\(^\text{15}\) Clearly, strategies to facilitate an early diagnosis and treatment of depression are needed.\(^\text{16}\) Stigmatization of the illness does not help the situation; a recent systematic review found that stigma had a small-to-moderate significant negative effect on help-seeking, with internalized stigma (such as shame/embarrassment) and treatment stigma most often associated with reduced help-seeking. The qualitative analysis from this review identified processes underlying the relationship between stigma and help-seeking. This included dissonance between a person’s preferred self-identity or social identity and common mental health stereotypes; anticipation/experience of negative consequences; and the need/preference for non-disclosure. The research also found that sub-populations that were disproportionately deterred by stigma were often ethnic minorities, youth, men, and those in military and health professions.\(^\text{17}\) All in all, without diagnosis, there is no opportunity to begin professional treatment.

### Treatment Adherence

A study that used Canadian population-based administrative data showed that a little more than half (53.0 per cent) of people with depression received counselling/psychotherapy or antidepressant therapy that met the minimum threshold for adequacy. Other studies

\(^\text{14}\) Ghio and others, “Duration of Untreated Depression Influences Clinical Outcomes and Disability.”

\(^\text{15}\) Dewa, Thompson, and Jacobs, “The Association of Treatment of Depressive Episodes.”

\(^\text{16}\) Cheung and others, “Factors Associated With Delayed Diagnosis.”

\(^\text{17}\) Clement and others, “What Is the Impact of Mental Health-Related Stigma on Help-Seeking?”
in North America also suggest that less than half (about 48.0 per cent) of those with MDD received minimally adequate treatment, while the remainder (around 52.0 per cent) did not.\textsuperscript{18}

Similarly, research from the United States showed that two-fifths (42.4 per cent) of patients discontinued antidepressant therapy during the first month and less than one-third (28.0 per cent) of patients continued antidepressant therapy for more than three months. It was found that combining psychotherapy with pharmacotherapy and selecting an appropriate antidepressant medication may help reduce the discontinuation rate.\textsuperscript{19} Another study from the United States showed that a depressed patient has almost two times the odds of being non-adherent to medication compared with a non-depressed patient.\textsuperscript{20} Lastly, Australian research also showed that longer term maintenance of drug or psychological treatment strategies for depression can reduce half of the disability-adjusted life years after five years of a major depressive episode compared with only 13.0 per cent with current episodic treatment.\textsuperscript{21}

The main reasons for early discontinuation cited in the literature were lack of response, stigma associated with having a mental health condition, side effects,\textsuperscript{22} and patients’ belief that they can stop their antidepressants as soon as they begin to feel better and take them on a needs basis only.\textsuperscript{23} One possible solution to tackle non-adherence is to ensure that clinicians communicate information in a collaborative manner to increase the patient’s knowledge and satisfaction with the treatment.\textsuperscript{24}

Given the huge societal impact of MDD, it is important to address the gap in treatment inadequacy by exploring other potential barriers and opportunities to reduce this gap.

\textsuperscript{18} Puyat and others, “How Often to Individuals With Major Depression.”
\textsuperscript{19} Olfson and others, “Continuity of Antidepressant Treatment.”
\textsuperscript{20} Grenard and others, “Depression and Medication Adherence in the Treatment of Chronic Diseases in the United States.”
\textsuperscript{21} Vos and others, “The Burden of Major Depression Avoidable.”
\textsuperscript{22} Lam and others, “Canadian Network for Mood and Anxiety Treatments (CANMAT) Clinical Guidelines.”
\textsuperscript{23} Mitchell, “Depressed Patients and Treatment Adherence.”
\textsuperscript{24} Ibid.
Optimal/ Optimized Treatment

Receiving minimally adequate treatment is distinct from receiving optimal treatment: to receive optimal treatment, the treatment must first be adequate with treatment protocol followed. Early, optimized treatment can be defined as early diagnosis followed by rapid individualized treatment consisting of close monitoring and assessment and timely adjustment of treatment. It is essential that symptoms and function are closely monitored as soon as treatment begins to ensure that patients do not remain on ineffective or poorly tolerated treatment, which may prolong the recovery process and increase the risk of residual functional deficits. Individualized care can be utilized as early as two weeks to determine whether the treatment is working and to make decisions on whether the dose needs to be altered, the antidepressants need to be switched, or adjunctive therapy should be provided.25 For the purposes of this study, early, optimized treatment can occur in the early stages of major depressive disorder or in the early stages of a major depressive episode.

The largest study to evaluate the effectiveness of next-step therapies in real-life patients with MDD was the Sequenced Treatment Alternatives to Relieve Depression (STAR*D) trial.26 This study provided evidence that effective treatment for MDD earlier on has the greatest potential for bringing the patient to full functional recovery. Overall, after these four optimized treatments, approximately 70.0 per cent of patients achieved remission, while the remaining 30.0 per cent continued to experience significant impairment.27

The bottom line is that optimized treatment and management for depression involves a multi-step, continual process that includes screening and early diagnosis; monitoring tolerability and adherence to the treatment; and assessing symptomatic and functional improvements to adjust the treatment as necessary until the proper goals are achieved, which may enable the individual to work full time and be fully functional while at work.28

25 Habert and others, “Functional Recovery in Major Depressive Disorder.”
26 Huynh and McIntyre, “What Are the Implications of the STAR*D Trial for Primary Care?”
27 Greden, “Workplace Depression.”
28 Habert and others, “Functional Recovery in Major Depressive Disorder.”
Costs
As the literature demonstrates, a significant driver of the cost of MDD is impairment in role function. Both absenteeism and presenteeism contribute to the cost of lost production and increase significantly with depression severity. Specifically, with every 1-point increase in the Patient Health Questionnaire 9-item score used to measure depression severity, patients experienced an additional productivity loss of 1.65 per cent.29 However, there is hope; those who received treatment for their moderate or severe depressive episode were significantly more likely to be highly productive than those who did not receive some treatment.30 And if the symptoms are treated in a timely, optimal manner, the functional recovery for patients and the corresponding productivity gains are enhanced.31 Therefore, employers may benefit from investing in treatment for their employees with depression. Indeed, recent Conference Board research estimated that improved treatment of depression among employed Canadians could boost Canada’s economy by up to $32.3 billion a year.32 To our knowledge, there are limited, publicly available Canadian studies that have examined the impact of depression on the health care system. However, the total cost for drug, hospital care, and physician costs for all mood disorders in Canada was estimated to be $2.7 billion according to the 2008 Economic Burden of Illness in Canada report.33 In like manner, health care costs for MDD in the United States were estimated to be $98.9 billion in 2010, with the majority of these costs due to outpatient and inpatient medical services.34

Modelling Approach and Data Sources
Taking this literature into account, the Conference Board presents a modelling approach to estimate the impact of early, optimized treatment for depression. To inform the modelling approach in this briefing, the Conference Board made use of the methodology published in the

29 Beck and others, “Severity of Depression and Magnitude of Productivity Loss.”
30 Dewa, Thompson, and Jacobs, “The Association of Treatment of Depressive Episodes.”
31 Trivedi and others, “Increase in Work Productivity of Depressed Individuals.”
32 Sutherland and Stonebridge, Healthy Brains at Work: Estimating.
34 Greenberg and others, “The Economic Burden of Adults With Major Depressive Disorder.”
Healthy Brains at Work research series,\textsuperscript{34} which originally came from a Conference Board report entitled Mental Health Issues in the Labour Force: Reducing the Economic Impact on Canada.\textsuperscript{36} This report provides an estimate of the cost to the Canadian economy of mental illness among working-age Canadians, highlighting the overarching case for action by employers and governments in mitigating lost participation in the labour force resulting from mental illness.

For that report, the Conference Board conducted a survey of 15 mental health clinicians who assessed the degree of debilitation associated with mental illnesses in the workplace. The clinicians categorized the extent to which people with these mental disorders are unable to work; able to work part time; able to work full time, but with reduced functioning; or able to work full time and be fully functional at work. To validate the opinions of clinicians, the Conference Board contacted several major Canadian insurers that provide short- and long-term disability programs. An analysis by the Conference Board concluded that the breakdown of the claims data was consistent with clinician assessments.

To complete the analysis, the Conference Board accessed data from Statistic Canada’s 2012 Canadian Community Health Survey (CCHS)—specifically, the Mental Health Profile, which provides a detailed breakdown for major depressive episodes in Canada.\textsuperscript{37} The CCHS also publishes the approximate point in time when the episode occurred—either in the person’s lifetime or in the past 12 months. From the workplace perspective, it is helpful to focus on the population that has lived with depression in the past year. Using these data, the Conference Board applied weights to the CCHS data for each of the following categories of debilitation:

- A 100.0 per cent weight was applied to the category of people considered “unable to work.” This suggests that, should the debilitating effects of illness be fully mitigated, these individuals would make their full contribution to the labour force.

\textsuperscript{35} Sutherland and Stonebridge, Healthy Brains at Work: Estimating.
\textsuperscript{36} Conference Board of Canada, The, Mental Health Issues in the Labour Force.
\textsuperscript{37} Statistics Canada, CANSIM table 105-1101.
• A 50.0 per cent weight was applied to the category of people considered “able to work part time.” This suggests that, because of their symptoms, the population in this category is working at only half its capacity. If the effects of the illness were fully mitigated, these individuals would be able to contribute an additional 50.0 per cent.

• A 25.0 per cent weight was applied to the category of people considered “able to work but with reduced functioning.” This weighting suggests that because of its symptoms, the population in this category is working at only three-quarters of its capacity. There is the potential for an additional 25.0 per cent contribution to the labour force if the effects of the illness were fully mitigated.

• A weight of zero was applied to the category of people considered “fully functioning at work.” In effect, there is no impact as this population is at work and contributing at full capacity.

This approach allowed the Conference Board to estimate the impact of depression on the economy while accounting for the different levels of functioning that are evident among the population of Canadians living with depression. While the number of Canadians at each level of functioning differs based on the severity of depression and whether treatment is sought, the functional levels are also independent of the treatment needed.38,39 In fact, for the purposes of this briefing, it is important to point out that other limitations to the methodology exist. (See “Methodological Limitations.”)
Methodological Limitations: Classification of Depression

Despite our best efforts, it is difficult to allow for every nuance at play with mental disorders. Therefore, we outline possible shortcomings with our classification of depression.

For instance, our methodology does not factor in co-occurrence. Each mental illness is not necessarily independent of the others. Any person living with major depressive disorder, for example, may also possess symptoms of dysthymia (or persistent depressive disorder). Some sources even say that the co-occurrence of depression and anxiety is 50.0 per cent.\textsuperscript{40,41} Our methodology also presumes that there is no comorbidity with substance use, which is common in individuals with co-occurring mental disorders, and that there is no comorbidity with physical illness—depression is common for those with a chronic physical illness.\textsuperscript{42,43,44} As well, reduced functioning due to physical illness could also be related to a mental illness, contributing to depression’s growing economic impact.\textsuperscript{45}

The economic costs estimated in this briefing refer to a depressed employee’s lower level of functioning at work. They do not include premature mortality or other non-medical costs. The term “reduced functioning” is equivalent to presenteeism and generally refers to anything that affects an employee’s ability to perform regular work duties. Indeed, cognitive difficulties are a principal reason for reduced work performance from depression.\textsuperscript{46} But for patients with a major depressive disorder, an improvement in work functioning can be as important as remission.\textsuperscript{47} This functional impairment may also lead to additional symptoms of insomnia, fatigue, bodily pain, and further cognition difficulties.\textsuperscript{48}

Full-time work with reduced functioning also includes those who work full-time hours, but with accommodation or in a different role/job description. This is presumed to include those who have just recently returned to work from a

\textsuperscript{40} Hirschfeld, “The Comorbidity of Major Depression and Anxiety Disorders.”
\textsuperscript{41} Cameron, “Understanding Comorbid Depression and Anxiety.”
\textsuperscript{42} Ruttley and Reid, “Depression in Physical Illness.”
\textsuperscript{43} Olver and Hopwood, “Depression and Physical Illness.”
\textsuperscript{44} Smyth, “Depression in Physical Illness.”
\textsuperscript{45} Rubin, “Mental Disorders Linked With Chronic Diseases.”
\textsuperscript{46} McIntyre and others, “Cognitive Deficits and Functional Outcomes in Major Depressive Disorder.”
\textsuperscript{47} Lam and others, “The Effects of Desvenlafaxine on Neurocognitive.”
\textsuperscript{48} Greer, Kurian, and Trivedi, “Defining and Measuring Functional Recovery.”
disability leave. It also includes those affected by presenteeism. By the same token, being fully functional equates with returning to the same or similar pre-illness position and hours.

For the health care costs, the Conference Board obtained cost estimates and number of hospital stays by clinical group (i.e., severity) and age group for major depressive disorders in Canada for the fiscal year 2014–15 from the Canadian Institute for Health Information (CIHI). The cost of a depression stay was determined by multiplying the cost of a standard hospital stay (by province/territory)\(^49\) by the Resource Intensity Weight of the case.\(^50\) The cost estimates for the hospital stay (e.g., inpatient episode of care) includes all hospital expenses such as labour, supplies, drugs, and other expenses for nursing, pharmacy, medical imaging, laboratory, and allied health services. This also includes other costs, such as administrative and support costs that are required to run the hospital (e.g., finance, human resources, health records).\(^51\) (See “Limitations of the Hospital Data” for a further explanation of the CIHI data.)

Cases were separated into four clinical groups based on the most responsible diagnosis: mild, moderate, severe, and other major depressive disorders/episodes. Age groups were defined in five different categories: 1–7 years, 8–17 years, 18–59 years, 60–79 years, and 80+ years. To remain consistent with the breakdown by severity presented in our functionality model, cases in the “other” category were distributed to the mild, moderate, or severe category. However, the Conference Board concluded that fully functional employees are not hospitalized. As a result, the number of other hospitalizations was applied to the lesser three functional categories, based on the results of the clinician survey.

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49 Canadian Institute for Health Information, “Cost of a Standard Hospital Stay.”
50 Canadian Institute for Health Information, DAD Resource Intensity Weights and Expected Length of Stay.
51 Ibid.
Limitations of the Hospital Data

Health care costs are considered conservative for the following reasons:

• They excluded cost data from Quebec, Nunavut, and the Northwest Territories, since these regions did not have a valid Cost of a Standard Hospital Stay indicator and/or invalid Resource Intensity Weight.

• Only cases with a most responsible diagnosis of major depressive disorder were captured, and therefore, other cases with a secondary diagnosis of major depressive disorder were not captured.

• The estimate included the costs incurred by the hospital in providing services and excluded physician compensation, since physicians are normally paid directly by the jurisdiction. Cases over 80 years of age were also excluded from the analysis.

The Current Situation in Canada

Using these data, the Conference Board estimated the current situation of Canadians experiencing depression. This includes the functional breakdown of working Canadians with depression, as well as the summary of the cost of hospitalization because of depressive symptoms. Indeed, it is estimated that only 16.7 per cent of those with depression work full time and are fully functioning at work. Meanwhile, 40.0 per cent work full time but at a reduced level of functioning, while 20.0 per cent work part time because their illness prevents them from working full time. The remaining 23.3 per cent are unable to work. (See Chart 1.)

As mentioned in the previous section, the functional categories differ based on the severity of depression (i.e., mild/moderate/severe). A scan of the literature suggests that 21.0 per cent of the depressed population have mild depression, 50.9 per cent have moderate depression, and 28.1 per cent have severe depression.52 A breakdown by severity reveals that fewer Canadians with mild depression are unable to work because of their conditions. Conversely, for those with severe depression, a smaller

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52 Dewa, Thompson, and Jacobs, “The Association of Treatment of Depressive Episodes.”
proportion is fully functional at work.\textsuperscript{53} This is consistent with the literature on workplace impairment among people with depression,\textsuperscript{54} which states that those with more severe symptoms of mental illness will encounter greater degrees of reduced workplace functionality.\textsuperscript{55} (See Chart 2.)

**Chart 1**

*Clinicians’ Opinions on Capacity to Work, 2010*  
(per cent)

![Chart 1](chart1.png)

Source: The Conference Board of Canada.

**Chart 2**

*Clinicians’ Opinions on Capacity to Work, by Severity, 2010*  
(per cent)

![Chart 2](chart2.png)

Source: The Conference Board of Canada.

\textsuperscript{53} Kim and others, “A Cross-Sectional Study of Functional Disabilities.”

\textsuperscript{54} Woo and others, “Cognitive Deficits as a Mediator of Poor Occupational Function.”

\textsuperscript{55} Kim and others, “A Cross-Sectional Study of Functional Disabilities.”
Still, workplace functionality also differs for the population that seeks treatment and the population that does not seek treatment (by each level of severity). The literature indicates that 17.4 per cent of those with mild depression, 43.2 per cent of those with moderate depression, and 60 per cent of those with severe depression seek treatment. Therefore, it is possible to estimate the workplace functionality by treatment sought and by level of severity. (See Chart 3.)

**Chart 3**

**Clinicians’ Opinions on Capacity to Work, by Severity, Those Who Seek Treatment, 2010**

(percentage)

<table>
<thead>
<tr>
<th>Severity</th>
<th>Unable to work</th>
<th>Able to work part time</th>
<th>Able to work, but with reduced functioning</th>
<th>Fully functioning at work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Moderate</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Severe</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: The Conference Board of Canada.

For the portion of the population that seeks treatment, about half (53.0 per cent) receive minimally adequate treatment (defined as four optimized, well-delivered counselling/psychotherapy or antidepressant therapy sessions or antidepressant medication filled for more than 84 days). This treatment is successful (or optimal) for 70.0 per cent of patients (i.e., they achieve remission). For the purposes of this briefing, minimally adequate treatment is considered optimal treatment when it is successful. (Early, optimized treatment goes a step further in that

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56 Dewa, Thompson, and Jacobs, “The Association of Treatment of Depressive Episodes.”
57 Puyat and others, “How Often Do Individuals With Major Depression.”
58 Greden, “Workplace Depression.” An estimated 30.0 per cent continue to experience depressive symptoms even after the minimally adequate treatment. As a result, remission rates decrease with each prior treatment failure.
individuals successfully receive the proper minimally adequate treatment at the onset of their symptoms.) When the minimally adequate treatment is not successful, the patient does not achieve remission, and the treatment must be re-evaluated. Treatment must also be re-evaluated for those who do not receive the minimally adequate treatment.

To estimate the impact of depression on the economy, a level of productivity is assigned to each level of functionality. The Conference Board calculates average productivity estimates to measure each employee’s contribution to gross domestic product (the value of goods and services produced by Canadians). For the overall Canadian economy, average productivity is about $66,100.\textsuperscript{59,60} In our model, it is presumed that the productivity of fully functional employees with depression is a little higher at $67,200—the same level of productivity as those not living with depression. Meanwhile, the productivity of those at reduced functionality (75.0 per cent) is $50,400 and of those who are working part time because of their symptoms (50.0 per cent) is $33,600.

For the purposes of this briefing, at each level of severity the portion of the population that receives the optimal treatment (70.0 per cent of the 53.0 per cent who seek treatment) is assigned the highest level of productivity.\textsuperscript{61} For those who seek treatment but receive only the minimally adequate treatment, their level of productivity is at a lower functional level, determined by the model. For those not receiving the minimally adequate treatment, or who do not seek treatment, their level of productivity is also at a lower level determined by the model.\textsuperscript{62} Early, optimized treatment goes a step further in that the individual successfully receives the proper minimally adequate treatment at the onset of symptoms, which is not quantified in this model. The individual would be assigned the same level of productivity as those who receive optimal treatment, but earlier in the treatment schedule, and so the benefit would be greater.

\textsuperscript{59} Macdonald, An Examination of Public Capital’s Role in Production.

\textsuperscript{60} Calculated using Conference Board data and labour’s share of income detailed in Macdonald, An Examination of Public Capital’s Role in Production.

\textsuperscript{61} For those who seek treatment, it is presumed that the only way to be fully functional at work is to receive optimal treatment. It is presumed their functionality is reduced; that is why they seek treatment.

\textsuperscript{62} For those who do not seek treatment, it is presumed that a portion are fully functional and thus do not require treatment. As such, the population that does not seek treatment is a mixture of those who refuse help and those who do not need it.
According to the Canadian Community Health Survey, about 1.3 million Canadians lived with a depressive episode in the past year. Based on this number, our methodology suggests that around 1 million of this total are employed, sometimes experiencing depressive symptoms while at work. Indeed, only 222,000 of the 1 million employed are working full time and functioning at full capacity while at work. The others are either functioning below full capacity or are unable to work full time because of their symptoms. On top of that, roughly 310,000 are unable to work at all because of their symptoms. (See Table 1.)

Table 1
Depression and Workplace Performance, by Severity, Base Case Scenario
(number of people)

<table>
<thead>
<tr>
<th></th>
<th>Overall</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unable to work</td>
<td>310,009</td>
<td>23,183</td>
<td>137,092</td>
<td>149,734</td>
</tr>
<tr>
<td>Work part time</td>
<td>266,102</td>
<td>30,392</td>
<td>115,029</td>
<td>120,681</td>
</tr>
<tr>
<td>Work full time, but with reduced functioning</td>
<td>532,204</td>
<td>139,343</td>
<td>311,378</td>
<td>81,483</td>
</tr>
<tr>
<td>Work full time, fully functioning</td>
<td>222,195</td>
<td>86,489</td>
<td>115,061</td>
<td>20,645</td>
</tr>
<tr>
<td>Total employed with mental illness</td>
<td>1,020,501</td>
<td>256,224</td>
<td>541,468</td>
<td>222,809</td>
</tr>
<tr>
<td>Total population with a mental illness</td>
<td>1,330,510</td>
<td>279,407</td>
<td>678,560</td>
<td>372,543</td>
</tr>
</tbody>
</table>

Sources: Statistics Canada; The Conference Board of Canada.

Table 1 also outlines the number of Canadians living with depression by level of severity and their workplace functionality. Recall that about 21.0 per cent of depressed Canadians live with a mild form of depression, 50.9 per cent with a moderate form, and 28.1 per cent with severe depression. And, as was noted in the Methodology section, the functional breakdown differs by severity of depression. As a result, the ratio of fully functional employees is higher among those with mild depression than among those with severe depression. Similarly, the ratio of those unable to work because of their symptoms is highest for those living with severe depression.

Tables 2 and 3 provide a functional breakdown of the number of Canadians living with depression who seek and do not seek treatment. Remember that the likelihood of seeking treatment for depressive
symptoms differs by severity, such that those with severe depression are more inclined to seek treatment compared with those with mild or moderate depression.

Table 2
Depression and Workplace Performance, Population That Seeks Treatment, Base Case Scenario
(number of people)

<table>
<thead>
<tr>
<th></th>
<th>Overall</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unable to work</td>
<td>127,608</td>
<td>2,050</td>
<td>46,748</td>
<td>78,810</td>
</tr>
<tr>
<td>Work part time</td>
<td>113,302</td>
<td>2,499</td>
<td>37,225</td>
<td>73,578</td>
</tr>
<tr>
<td>Work full time, but with reduced functioning</td>
<td>185,342</td>
<td>20,834</td>
<td>108,179</td>
<td>56,329</td>
</tr>
<tr>
<td>Work full time, fully functioning</td>
<td>138,945</td>
<td>23,150</td>
<td>100,986</td>
<td>14,809</td>
</tr>
<tr>
<td>Total employed with mental illness</td>
<td>437,588</td>
<td>46,483</td>
<td>246,390</td>
<td>144,716</td>
</tr>
<tr>
<td>Total population with a mental illness</td>
<td>565,197</td>
<td>48,533</td>
<td>293,138</td>
<td>223,526</td>
</tr>
</tbody>
</table>

Sources: Statistics Canada; The Conference Board of Canada.

Table 3
Depression and Workplace Performance, Population That Does Not Seek Treatment, Base Case Scenario
(number of people)

<table>
<thead>
<tr>
<th></th>
<th>Overall</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unable to work</td>
<td>182,401</td>
<td>21,133</td>
<td>90,344</td>
<td>70,924</td>
</tr>
<tr>
<td>Work part time</td>
<td>152,800</td>
<td>27,893</td>
<td>77,804</td>
<td>47,103</td>
</tr>
<tr>
<td>Work full time, but with reduced functioning</td>
<td>346,862</td>
<td>118,509</td>
<td>203,199</td>
<td>25,154</td>
</tr>
<tr>
<td>Work full time, fully functioning</td>
<td>83,250</td>
<td>63,339</td>
<td>14,075</td>
<td>5,837</td>
</tr>
<tr>
<td>Total employed with mental illness</td>
<td>582,913</td>
<td>209,741</td>
<td>295,078</td>
<td>78,093</td>
</tr>
<tr>
<td>Total population with a mental illness</td>
<td>765,313</td>
<td>230,874</td>
<td>385,422</td>
<td>149,017</td>
</tr>
</tbody>
</table>

Sources: Statistics Canada; The Conference Board of Canada.

Recall that 53.0 per cent of those who seek treatment receive the minimally adequate treatment, which is consistent for each level of severity. This minimally adequate treatment ends up as the optimal treatment for 70.0 per cent of all recipients. However, the proportion of those receiving the optimal treatment differs by level of severity. Certainly, 90.0 per cent of mild patients (23,150 individuals); 65.0 per cent of moderate patients (100,986 individuals); and 12.5 per cent of severe patients (14,809 individuals) receive optimized treatment. Therefore, the model presumes that for Canadians who seek treatment, the only way
to be fully functional at work is to receive optimal treatment. Those who do not receive optimized treatment either level off at a lesser functional category or relapse back to their functional level prior to treatment. Conversely, of those who do not seek any treatment, a portion is fully functional at work—their symptoms are not affecting them enough to seek treatment.

To get a sense of the economic effects of depression in the workplace, average productivity estimates are used to measure each employee’s contribution to the gross domestic product (the value of goods and services produced by Canadians). Similarly, to get a sense of the health care costs of depression, Table 4 reveals that of a total of 12,421 hospitalizations with a primary diagnosis of major depressive disorder, 137 were for mildly depressed patients, 920 were for moderately depressed patients, and 11,364 were for severely depressed patients. Using the results of the clinician survey, these figures were distributed across the lesser levels of functioning, and the total health care costs were estimated to be about $108 million, with 92.5 per cent of this cost attributable to severe depressive episodes. (See Table 4.)

<table>
<thead>
<tr>
<th>Table 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of Inpatient Hospitalizations for Depression, by Workplace Performance and Severity, Base Case Scenario</strong> (number of people)</td>
</tr>
<tr>
<td>Overall</td>
</tr>
<tr>
<td>Unable to work</td>
</tr>
<tr>
<td>Work part time</td>
</tr>
<tr>
<td>Work full time, but with reduced functioning</td>
</tr>
<tr>
<td>Work full time, fully functioning</td>
</tr>
<tr>
<td>Total employed with mental illness</td>
</tr>
<tr>
<td>Total population with a mental illness</td>
</tr>
<tr>
<td><strong>Total cost estimate ($)</strong></td>
</tr>
</tbody>
</table>

Sources: Canadian Institute for Health Information; The Conference Board of Canada.

This is the current situation in Canada (also called the “base case” scenario). The next step calculates the economic activity that could be gained if the negative impacts of depression were somewhat mitigated with increased access to optimized treatment. This takes the existing
An economic modelling exercise explores the potential impact of improving outcomes for working Canadians living with depression.

Base case scenario and compares it with a simulated scenario that increases both employment and workplace functionality resulting from an increase in the number of depressed workers who receive optimized treatment. The difference between the base case scenario and the simulated scenarios becomes an estimate of the benefit of optimized treatment.

Results

This section shows the results of an economic modelling exercise that explores the potential impact of improving outcomes for working Canadians living with depression. Three scenarios are presented that measure the extent to which people with depression can make functional improvements from optimized treatment:

- **Scenario A**: The number of individuals who seek treatment goes from 17.3 per cent to 24.6 per cent among those with mild depression; from 43.2 per cent to 61.1 per cent among those with moderate depression; and from 60.0 per cent to 84.3 per cent among those with severe depression. The proportion of the population receiving minimally adequate treatment and optimal treatment remains the same as the base case scenario.

- **Scenario B**: The number of individuals who receive minimally adequate treatment goes from 53.0 per cent to 75.0 per cent. The proportion of the population that seeks treatment remains the same as the base case scenario, as does the proportion receiving optimal treatment.

- **Scenario C**: The number of individuals who receive optimal treatment goes from 70.0 per cent to 100.0 per cent. The proportion of the population that seeks treatment remains the same as the base case scenario, as does the proportion receiving minimally adequate treatment.

Considering this, the scenarios will capture both the economic and health care gains based on improved workplace functionality. The economic gains associated with improved functionality are twofold: the first is from improved productivity for those who are working at reduced functionality because of their symptoms; and the second is from those who were unable to work because of their symptoms entering the
workforce. This means that accessing optimized treatment will boost productivity and have an impact on both GDP and employment. The health care gains stem from lower costs due to fewer hospitalizations from depressed Canadians.

To calculate the economic activity that could be gained if the negative impacts of depression on working Canadians were fully mitigated, the Conference Board’s standard estimate of long-term economic performance contains analysis and assumptions regarding demographic realities and health trends—including the effects of poor mental health. To estimate the economic impact of optimized treatment, the Conference Board combines its own economic data with data from the Mental Health Profile published by Statistic Canada’s Canadian Community Health Survey. (For an explanation of mental disorders in the CCHS, see “The Classification of Depression” on page 7.) For each scenario, the weights associated with workplace functionality are adjusted to reflect the improvement/reduction in functionality of workers who are living with a mental disorder. This improvement in functionality is then used to determine health care costs. Only patients at lesser functional levels are hospitalized, so any scenario that improves functionality will, in turn, reduce hospital costs.

Although it is estimated that employment will increase in the scenario exercise, bear in mind that this is not a “job creation program.” It is merely an estimate of the number of Canadians who could potentially enter the workforce if their symptoms were treated optimally. The simulated scenarios assess the productivity and health care cost improvements by increasing the percentage of working-age Canadians with MDD who seek treatment, receive minimally adequate treatment, and receive optimal treatment. For the different scenarios to be comparable, the same magnitude of increase was used.

**Scenario A**

This first scenario examines the impact of increasing the number of Canadians who seek treatment for their depressive symptoms. To accomplish this, the number of mildly, moderately, and severely depressed Canadians seeking treatment is increased such that
nearly 615,000 employed Canadians are now seeking treatment for their symptoms (compared with 438,000 in the base case). (See Table 5.) At the same time, access to minimally adequate treatment remains at 53.0 per cent and its effectiveness (optimal treatment) at 70.0 per cent. With the number of Canadians seeking treatment for depression increasing, workplace productivity will rise slightly, boosting Canada’s GDP by about $1.76 billion—a gain of 0.09 per cent. Still, screening more Canadians for depression may not be the most realistic scenario, although it is interesting to establish how this compares with other scenarios.

### Table 5

**Depression and Workplace Performance, Population That Seeks Treatment, by Severity, Scenario A**

<table>
<thead>
<tr>
<th>(number of people)</th>
<th>Overall</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unable to work</td>
<td>185,131</td>
<td>3,316</td>
<td>66,149</td>
<td>115,666</td>
</tr>
<tr>
<td>Work part time</td>
<td>160,944</td>
<td>4,158</td>
<td>53,503</td>
<td>103,283</td>
</tr>
<tr>
<td>Work full time, but with reduced functioning</td>
<td>257,072</td>
<td>28,442</td>
<td>152,244</td>
<td>76,386</td>
</tr>
<tr>
<td>Work full time, fully functioning</td>
<td>196,607</td>
<td>32,758</td>
<td>142,895</td>
<td>20,954</td>
</tr>
<tr>
<td>Total employed with mental illness</td>
<td>614,623</td>
<td>65,358</td>
<td>348,642</td>
<td>200,623</td>
</tr>
<tr>
<td>Total population with a mental illness</td>
<td>799,753</td>
<td>68,674</td>
<td>414,790</td>
<td>315,289</td>
</tr>
</tbody>
</table>

Sources: Statistics Canada; The Conference Board of Canada.

Despite the economic benefits of increasing the number of depressed Canadians who seek treatment, hospital costs go up. (See Table 6.) Although this may seem surprising, Scenario A presumes that the number of depressed Canadians who do not receive optimal, or even minimally adequate, treatment also goes up. So, while the number of fully functional Canadians has increased, so has the number in less functional categories. This increases the number of hospitalizations, inevitably creating an extra burden on the health care system. Indeed, total hospitalizations would have increased to 17,635, leading to an additional $45.4 million in hospital costs (to $153.4 million total). That being said, the economic benefits ($1.76 billion) considerably outweigh the rising hospital costs.
Table 6
Number of Inpatient Hospitalizations for Depression, by Workplace Performance and Severity, Scenario A
(increase those who are seeking treatment; number of people)

<table>
<thead>
<tr>
<th>Overall</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unable to work</td>
<td>7,440</td>
<td>27</td>
<td>317</td>
</tr>
<tr>
<td>Work part time</td>
<td>5,776</td>
<td>36</td>
<td>270</td>
</tr>
<tr>
<td>Work full time, but with reduced functioning</td>
<td>4,419</td>
<td>135</td>
<td>715</td>
</tr>
<tr>
<td>Work full time, fully functioning</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total employed with mental illness</td>
<td>10,195</td>
<td>169</td>
<td>985</td>
</tr>
<tr>
<td>Total population with a mental illness</td>
<td>17,635</td>
<td>198</td>
<td>1,302</td>
</tr>
<tr>
<td>Total cost estimate ($)</td>
<td>153,422,981</td>
<td>1,519,500</td>
<td>9,968,817</td>
</tr>
</tbody>
</table>

Sources: Canadian Institute for Health Information; The Conference Board of Canada.

Scenario B

The second scenario analyzes the impact of increasing the number of Canadians receiving minimally adequate treatment. Of the three scenarios presented, this is likely to be the most realistic. It implies that the same number of Canadians will seek treatment (by severity) as in the base case, but now 75.0 per cent will receive minimally adequate treatment, up from 53.0 per cent in the base case. (The optimal portion will stay at 70.0 per cent.) Since this minimally adequate treatment will make depressed Canadians who seek treatment more productive, even more will now be fully functional at work—from 139,000 in the base case to 218,000 in this scenario. (See Table 7.) Indeed, for each level of severity, depressed Canadians will move out of the lower levels of functionality and work at the higher level of productivity. This has a significant impact on the Canadian economy. For instance, more Canadians would be working at the higher level of productivity, and Canada’s GDP would increase by about $2.6 billion—a gain of 0.16 per cent.
Similarly, more Canadians having access to minimally adequate treatment also has a significant impact on hospital costs. Certainly, around 700 fewer hospitalizations are expected in this scenario, resulting in about $5.7 million worth of hospital cost savings, making total hospital costs $102.3 million in this scenario. (See Table 8.) Most of these cost savings come from fewer hospitalizations for those living with moderate and severe depression—specifically, $2.3 million and $3.0 million in savings, respectively.

Table 7
Depression and Workplace Performance, Population That Seeks Treatment, by Severity, Scenario B
(number of people)

<table>
<thead>
<tr>
<th></th>
<th>Overall</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unable to work</td>
<td>108,291</td>
<td>895</td>
<td>31,201</td>
<td>76,194</td>
</tr>
<tr>
<td>Work part time</td>
<td>96,635</td>
<td>985</td>
<td>24,180</td>
<td>71,470</td>
</tr>
<tr>
<td>Work full time, but with reduced functioning</td>
<td>141,666</td>
<td>13,893</td>
<td>72,867</td>
<td>54,906</td>
</tr>
<tr>
<td>Work full time, fully functioning</td>
<td>218,605</td>
<td>32,760</td>
<td>164,890</td>
<td>20,956</td>
</tr>
<tr>
<td>Total employed with mental illness</td>
<td>456,906</td>
<td>47,638</td>
<td>261,937</td>
<td>147,331</td>
</tr>
<tr>
<td>Total population with a mental illness</td>
<td>565,197</td>
<td>48,533</td>
<td>293,138</td>
<td>223,526</td>
</tr>
</tbody>
</table>

Sources: Statistics Canada; The Conference Board of Canada.

Table 8
Number of Inpatient Hospitalizations for Depression, by Workplace Performance and Severity, Scenario B
(increase minimally adequate treatment; number of people)

<table>
<thead>
<tr>
<th></th>
<th>Overall</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unable to work</td>
<td>4,832</td>
<td>7</td>
<td>149</td>
<td>4,675</td>
</tr>
<tr>
<td>Work part time</td>
<td>3,916</td>
<td>9</td>
<td>122</td>
<td>3,786</td>
</tr>
<tr>
<td>Work full time, but with reduced functioning</td>
<td>2,973</td>
<td>66</td>
<td>342</td>
<td>2,565</td>
</tr>
<tr>
<td>Work full time, fully functioning</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total employed with mental illness</td>
<td>6,889</td>
<td>74</td>
<td>464</td>
<td>6,350</td>
</tr>
<tr>
<td>Total population with a mental illness</td>
<td>11,721</td>
<td>82</td>
<td>614</td>
<td>11,025</td>
</tr>
<tr>
<td>Total cost estimate ($)</td>
<td>102,310,373</td>
<td>628,018</td>
<td>4,699,310</td>
<td>96,983,044</td>
</tr>
</tbody>
</table>

Sources: Canadian Institute for Health Information; The Conference Board of Canada.
Scenario C

The third scenario considers the impact of Canadians receiving minimally adequate treatment remaining the same (at 53.0 per cent), but effectiveness (optimal treatment) going from 70.0 per cent to 100.0 per cent. As a result, the number of fully functional employees will go from 139,000 in the base case to almost 300,000 in this scenario. (See Table 9.) Similar to Scenario B, for each level of severity, depressed Canadians will move out of the lower levels of functionality and work at higher levels of productivity as they become fully functional at work. This is also the scenario where a large number of severely depressed Canadians become fully functional at work. As a result, Canada’s GDP would increase by about $6.8 billion—a gain of 0.4 per cent.

This scenario will also reduce the number of hospitalizations by about half, resulting in approximately $53 million of hospital cost savings, making total hospital costs only $55.1 million in this scenario. (See Table 10.) Once again, nearly all the savings are due to those with severe depressive episodes moving into higher functional categories and thus avoiding being admitted to hospital.

Table 9
Depression and Workplace Performance, Population That Seeks Treatment, by Severity, Scenario C

(number of people)

<table>
<thead>
<tr>
<th></th>
<th>Overall</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unable to work</td>
<td>64,030</td>
<td>843</td>
<td>33,519</td>
<td>29,669</td>
</tr>
<tr>
<td>Work part time</td>
<td>64,471</td>
<td>746</td>
<td>24,690</td>
<td>39,035</td>
</tr>
<tr>
<td>Work full time, but with reduced functioning</td>
<td>137,141</td>
<td>21,222</td>
<td>79,566</td>
<td>36,353</td>
</tr>
<tr>
<td>Work full time, fully functioning</td>
<td>299,554</td>
<td>25,722</td>
<td>155,363</td>
<td>118,469</td>
</tr>
<tr>
<td>Total employed with mental illness</td>
<td>501,167</td>
<td>47,691</td>
<td>259,619</td>
<td>193,857</td>
</tr>
<tr>
<td>Total population with a mental illness</td>
<td>565,197</td>
<td>48,533</td>
<td>293,138</td>
<td>223,526</td>
</tr>
</tbody>
</table>

Sources: Statistics Canada; The Conference Board of Canada.
Table 10
Number of Inpatient Hospitalizations for Depression, by Workplace Performance and Severity, Scenario C
(increase optimal treatment; number of people)

<table>
<thead>
<tr>
<th></th>
<th>Overall</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unable to work</td>
<td>1,988</td>
<td>7</td>
<td>160</td>
<td>1,820</td>
</tr>
<tr>
<td>Work part time</td>
<td>2,199</td>
<td>6</td>
<td>125</td>
<td>2,068</td>
</tr>
<tr>
<td>Work full time, but with reduced functioning</td>
<td>2,173</td>
<td>101</td>
<td>374</td>
<td>1,698</td>
</tr>
<tr>
<td>Work full time, fully functioning</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total employed with mental illness</td>
<td>4,372</td>
<td>124</td>
<td>498</td>
<td>3,766</td>
</tr>
<tr>
<td>Total population with a mental illness</td>
<td>6,359</td>
<td>114</td>
<td>659</td>
<td>5,586</td>
</tr>
<tr>
<td>Total cost estimate ($)</td>
<td>55,059,013</td>
<td>876,511</td>
<td>5,044,999</td>
<td>49,137,503</td>
</tr>
</tbody>
</table>

Sources: Canadian Institute for Health Information; The Conference Board of Canada.

A closer look at the results reveals that the number of employed Canadians will increase slightly, with the most substantial gains coming from those with severe depression. This is because the minimally adequate treatment works for only 12.5 per cent of severely depressed patients in the base case scenario. Ramping this figure up to 100.0 per cent is a significant jump that will lead to nearly 120,000 severely depressed Canadians being fully functional at work. Admittedly, this is a very optimistic figure. Providing optimal treatment to all those living with severe depression is ambitious and almost certainly impossible at the present time.

Conclusion and Discussion

This briefing aims to create a platform for further discussion on early, optimized treatment for depression by modelling the health care and economic costs associated with increasing the number of people who seek treatment; increasing the number of people who receive the minimally adequate treatment; and increasing the number of people who receive optimal, individualized treatment that works. All in all, the largest benefit will come from ensuring that Canadians currently seeking treatment for their depression can access optimal treatment (Scenario C). However, increasing access to minimally adequate treatment (Scenario B) might be the most realistic. Although it may seem
that improving access to treatment (Scenario A) would lead to significant benefits, it is more important to focus on providing optimal treatment to current patients before implementing strategies to expand the number who seek treatment. This way it is possible for more Canadians to be fully functional at work. At the same time, it helps reduce the number of hospitalizations from depressive episodes. In reality, the economic gains of increasing treatment come from the fact that the functional breakdown of those who receive treatment is slightly better than those who do not receive treatment. It also must be noted that while the aim of this briefing is to estimate the benefits of early, optimized treatment for depression, our model does not contain a variable describing the exact point in time when treatment begins. As a result, the benefits of early, optimized treatment would be significantly higher than the results presented above.

**Increasing Treatment**

Early, optimized treatment on the patient care pathway begins with screening and diagnosis, followed by treatment. By intercepting and optimally treating depression earlier, there is potential to reduce morbidity, mortality, functional impairment, and associated health care and economic costs.\(^6\) Indeed, our review of the literature showed that people who received treatment were more likely to be productive than those who did not receive treatment.\(^6\) Therefore, early intervention programs for depression could be aimed at ensuring prompt initial contact between the individual and the primary care team. Collaborative care programs could be implemented between mental health services and primary care services, as well as in schools and workplaces,\(^6\) which may serve to decrease the stigma associated with mental illness. In this collaborative program, repeated assessments by the primary care provider or another professional might help to avoid missed cases and improve the overall quality of care.\(^6\)

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63 Dewa, Thompson, and Jacobs, “The Association of Treatment of Depressive Episodes.”
64 Ibid.
65 Ghio and others, “Duration of Untreated Illness and Outcomes in Unipolar Depression.”
66 Mitchell, Vaze, and Rao, “Clinical Diagnosis of Depression in Primary Care.”
For employers, evidence-based management programs could yield a substantial return on investment. While primary care physicians have the first opportunity to screen, diagnose, and treat depression, employers may be able to provide the support for employees to remain fully functional at work. Employers may find it beneficial to invest in treatment for depressed employees, regardless of severity, as even employees with mild depression may have reduced work productivity.

A collaborative approach to address other key treatment barriers, such as combining anti-stigma programs with those addressing mental health literacy, is warranted. Other interventions that reduce internalized stigma, such as psycho-education and acceptance and behaviour therapy; and services that avoid unnecessary labelling, respect confidentiality, and provide destigmatizing care may also encourage help-seeking. Generally, utilization rates can be increased by continually tailoring the promotion of access to mental health to specific sub-populations.

**Increasing Minimally Adequate Treatment**

Simply increasing the numbers of those who seek treatment will not result in cost savings to the health care system. At the very least, increasing access to minimally adequate treatment will reduce health care costs. Yet, there needs to be a clearer understanding of why only half (53.0 per cent) of the individuals diagnosed with depression received minimally adequate treatment. One obstacle to minimally adequate treatment is patient adherence. At the patient level, making the individual aware of the time lag required to feel the effect of the antidepressant and the need to continue medications even when feeling better would go a long way to improving adherence. Similarly, at the physician level, reviewing the patient’s personal barriers to adherence may also be helpful in selecting the treatment. This may include poor tolerability to the drug, delayed onset of efficacy, ineffective dosage, and

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67 Beck and others, “Severity of Depression and Magnitude of Productivity Loss.”
68 Clement and others, “What Is the Impact of Mental Health-Related Stigma on Help-Seeking.”
69 Gagné, Vasiliadis, and Préville, “Gender Differences in General and Specialty.”
70 Lam and others, “Canadian Network for Mood and Anxiety Treatments (CANMAT) Clinical Guidelines.”
complicated dosing regimens. Providing psychotherapy in conjunction with pharmacotherapy may also increase adherence. But all in all, examples like these suggest that a multifactorial approach is needed to help improve access to minimally adequate treatment for depression.

### Increasing Optimal Treatment

With the goal of providing personalized treatment for the individual patient with depression, some critical factors must be considered. These include diagnosing a patient early during his or her first depressive episode, selecting an effective well-tolerated treatment based on the patient's medical history, and closely following up with the patient during the treatment to ensure full symptomatic remission and full functioning. The effectiveness of a treatment can be assessed at two weeks to ensure that the treatment is optimized. If there is a lack of improvement at two to three weeks after initiation of treatment, a change in management should be considered. Special attention must be given to earlier recognition and prevention of treatment-resistant depression among employees with depression, which would reduce both health care costs and work productivity losses. All in all, full-scale workplace programs, collaborative partnerships, individualized treatment, and prevention programs provide an overall health care and economic benefit rather than an increase in costs.

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71 Habert and others, “Functional Recovery in Major Depressive Disorder.”
72 Olfson and others, “Continuity of Antidepressant Treatment.”
73 Puyat and others, “How Often Do Individuals With Major Depression.”
74 Habert and others, “Functional Recovery in Major Depressive Disorder.”
75 Lam, “Onset, Time Course and Trajectories of Improvement.”
76 Habert and others, “Functional Recovery in Major Depressive Disorder.”
77 Greden, “Workplace Depression.”
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APPENDIX A

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