



Uncovering the impact of a depressive episode on employment earnings among Canadian workers

Kathleen Dobson, PhD
Institute for Work & Health Speakers Series
November 9, 2021

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It all started with a question.

How much does experiencing a depressive episode cost a Canadian's earning potential?

How much does experiencing a depressive episode cost a Canadian's earning potential?

Crudely, a cumulative ten-year loss in earnings of roughly \$115,000 for men and \$71,000 for women

Overview

1

Why did we ask this question?

2

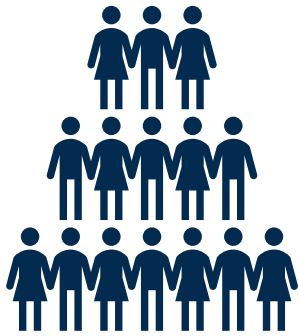
How did we come to the answer?

3

Understanding the answer in our current context

Background: Importance of Studying the Mental Health State of the Canadian Labor Force

Burden of Mental Illness: An Overview



500,000 Canadians in any given week are unable to work due to mental health problems

\$51,000,000,000

The economic burden of mental illness in Canada is \$51 billion per year



\$6 billion attributable to indirect costs

Timeline of Canadian Work-related Mental Health Initiatives



Ontario Occupational Health and Safety Act (Violence and Harassment in the Workplace, 2009)

Guarding Minds @ Work: A workplace Guide to Psychological Health and Safety (2009)



National Standard of Canada for Psychological Health & Safety in the Workplace (2013)

The Evolution of Workplace Mental Health in Canada: Research Report (2007-2017)



Understanding mental health, mental illness, and their impacts in the workplace (2018)



Stress at Work, Mental Injury and the Law in Canada: A Discussion Paper for the Mental Health Commission of Canada (2009)

2000 • • • • • 2007 • • • • • 2009 • • • • • 2013 • • • 2016 • • • 2020

Act Respective Labour Standards (QB, 2004)

Accessibility for Ontarians with Disabilities Act (2005)



Prevention, Promotion, and Organizational Practices Contributing to Health in the Workplace (La norme Entreprise en santé) in Quebec (2008)



Sexual Violence and Harassment Action Plan Act (2016)

Supporting Ontario's First Responders Act for PTSD (2016)

Federal Public Service Workplace Mental Health Strategy (2016)

Workers Compensation Amendment Act (Presumption Re PTSD) in Manitoba (2016)



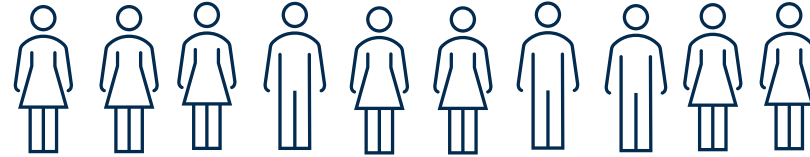
Epidemiological Research Gaps

Quantifying the labor market outcomes of those experiencing mental illness

Major Depressive Disorder (MDD)

Annual prevalence: ~5%

Lifetime prevalence: ~11%

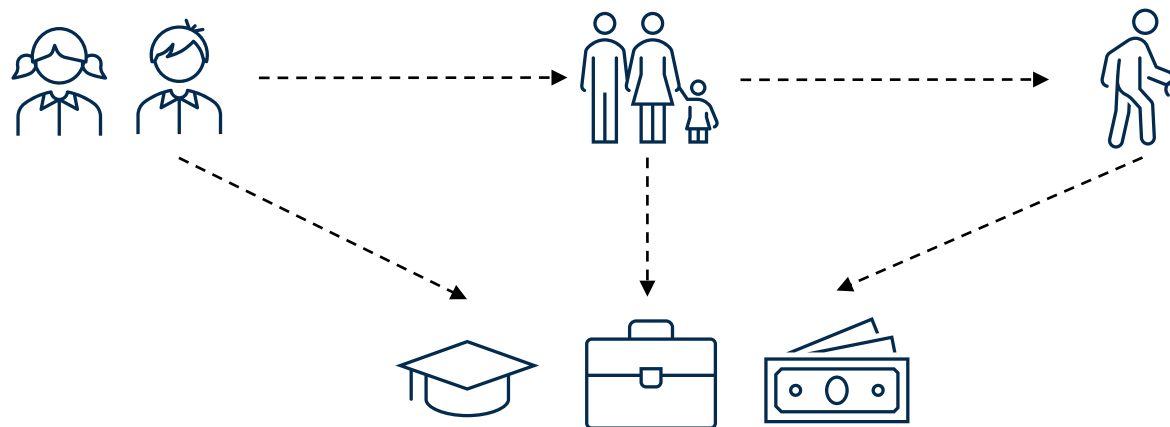


Manifests as depressive episodes (MDE)

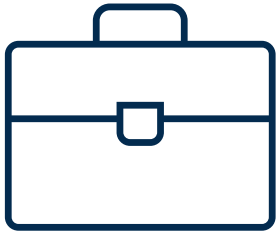
Majority of individuals experience 2+ episodes



Depression may occur at any age,
which may influence participation
in the labor force



Labor Market Outcomes among Canadians Experiencing Depression



Employment

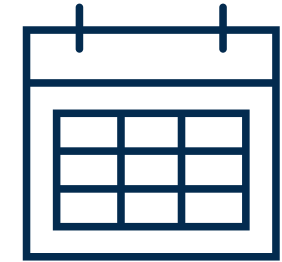
30% of MDD patients are unemployed or on a disability leave



Work-Related

White-collar workers more likely to experience a MDE vs. blue-collar workers

~32 days per year where depressive symptoms made it unfeasible or not possible to complete their work



Retirement

↑ likelihood of early retirement

Earnings



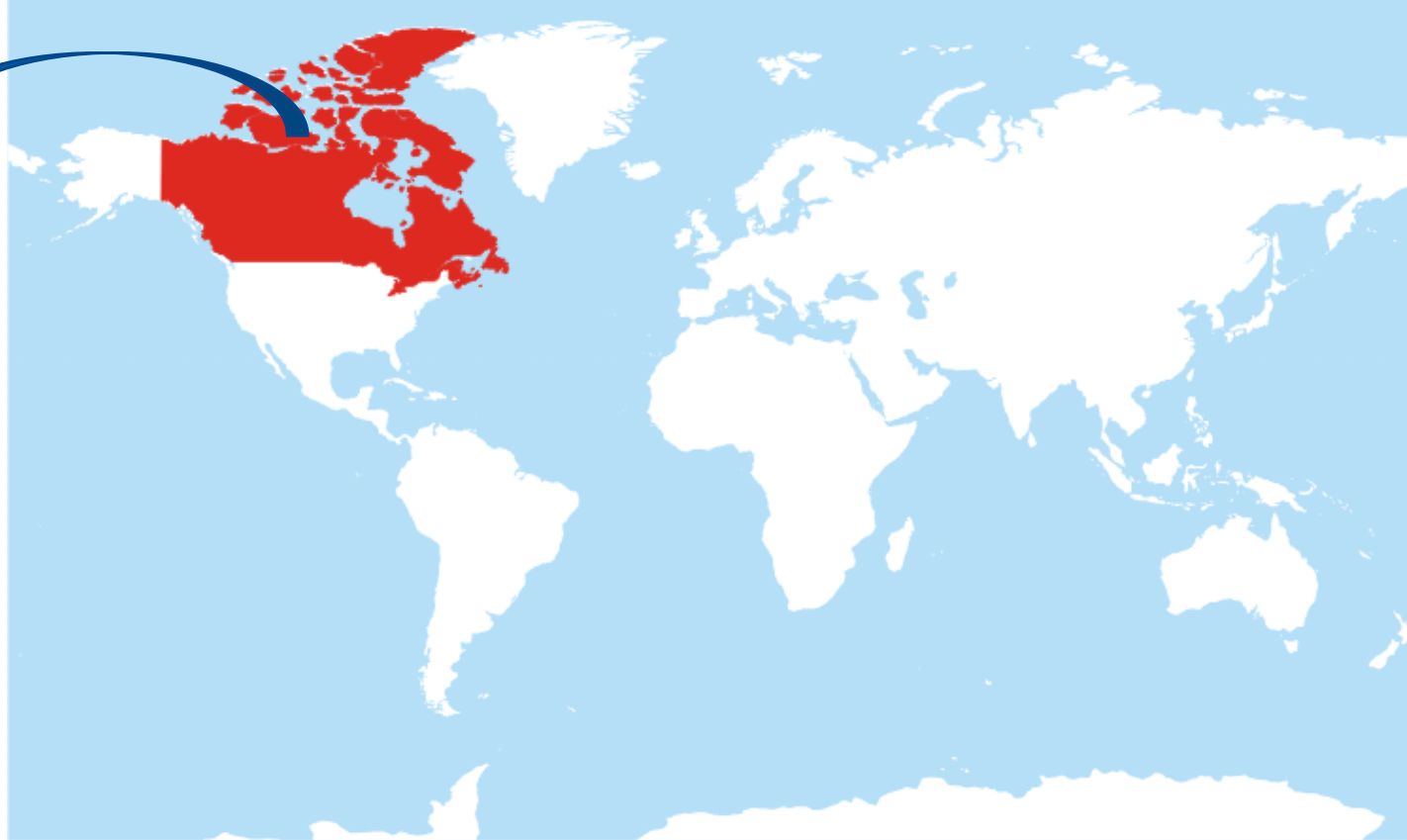
Proxy of career success

Component socioeconomic status

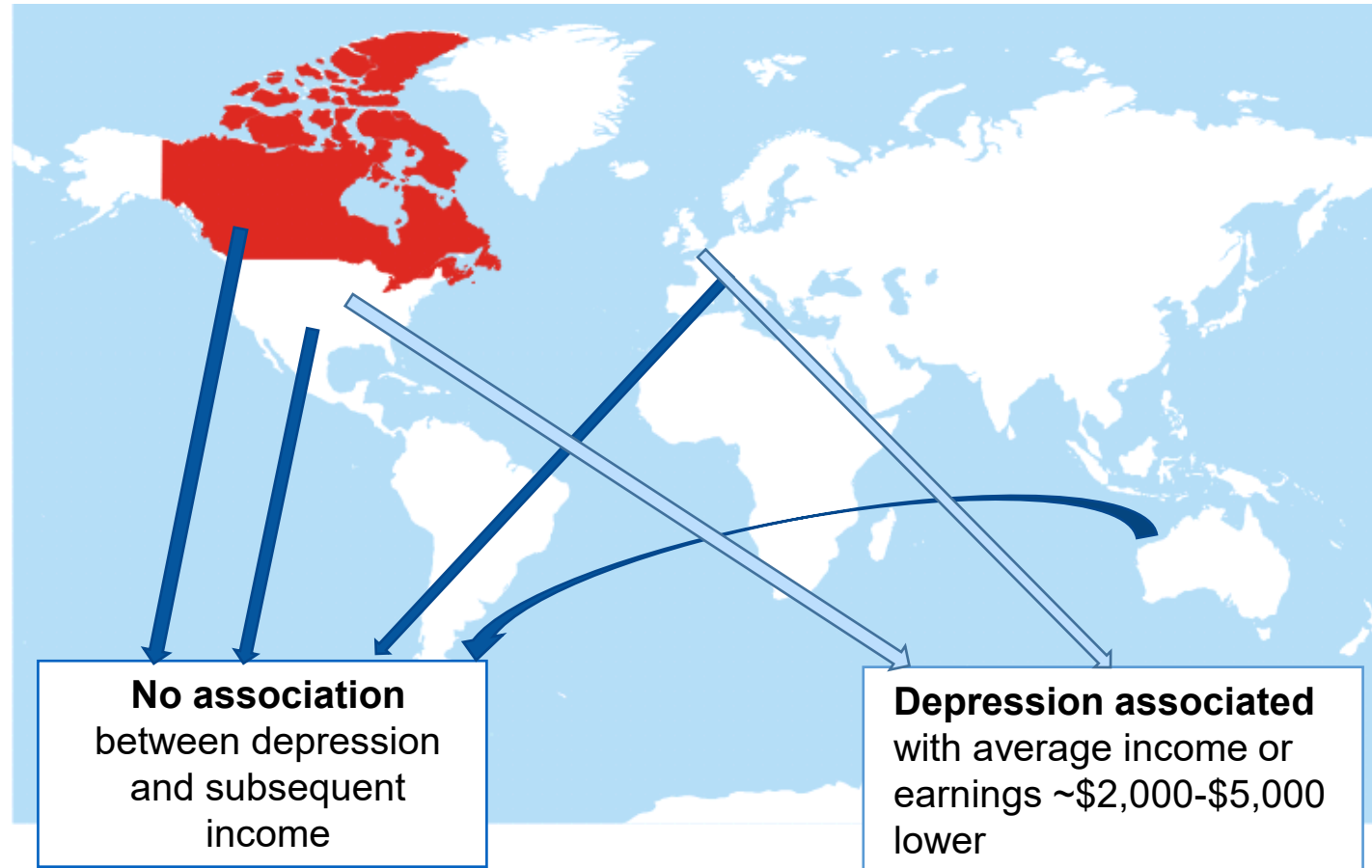
Marker of ability to access resources

Depression & Earning Attainment: *Cross-Sectional Canadian Evidence*

Working Canadians
experiencing major
depressive disorder
(MDD) earn ~\$3,500
less in annual income



Depression & Earning Attainment: *Longitudinal Evidence*



Study Objective

Quantify how experiencing a major depressive episode (MDE) impacts employment earnings over a decade among working-aged Canadian men and women



Journal of Affective Disorders

Volume 285, 15 April 2021, Pages 37-46



Research paper

Major Depressive Episodes and Employment Earnings Trajectories over the Following Decade among Working-aged Canadian Men and Women

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^d Women's College Hospital and Research Institute, Toronto, ON, Canada

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Study Data Overview

Methods: Linked Data Source

Canadian Community Health Survey (CCHS)

- Representative sample of ~97% of Canadians
- Assesses: depression, health, sociodemographic information
- Used 2003 – 2014 CCHS cycles



Administrative Tax Files

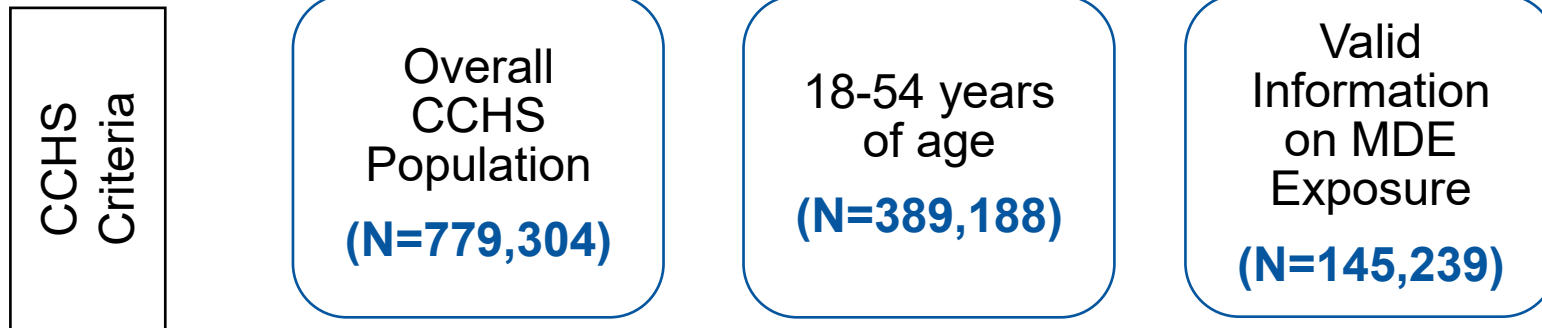
- Covers ~95% of the Canadian census population
- Assesses: income, earnings, and employment data

Linkage Information

- Overall linkage rate: ~82%
- Linked each CCHS cycle to 6 years of retrospective tax records & prospective tax records up to 2016

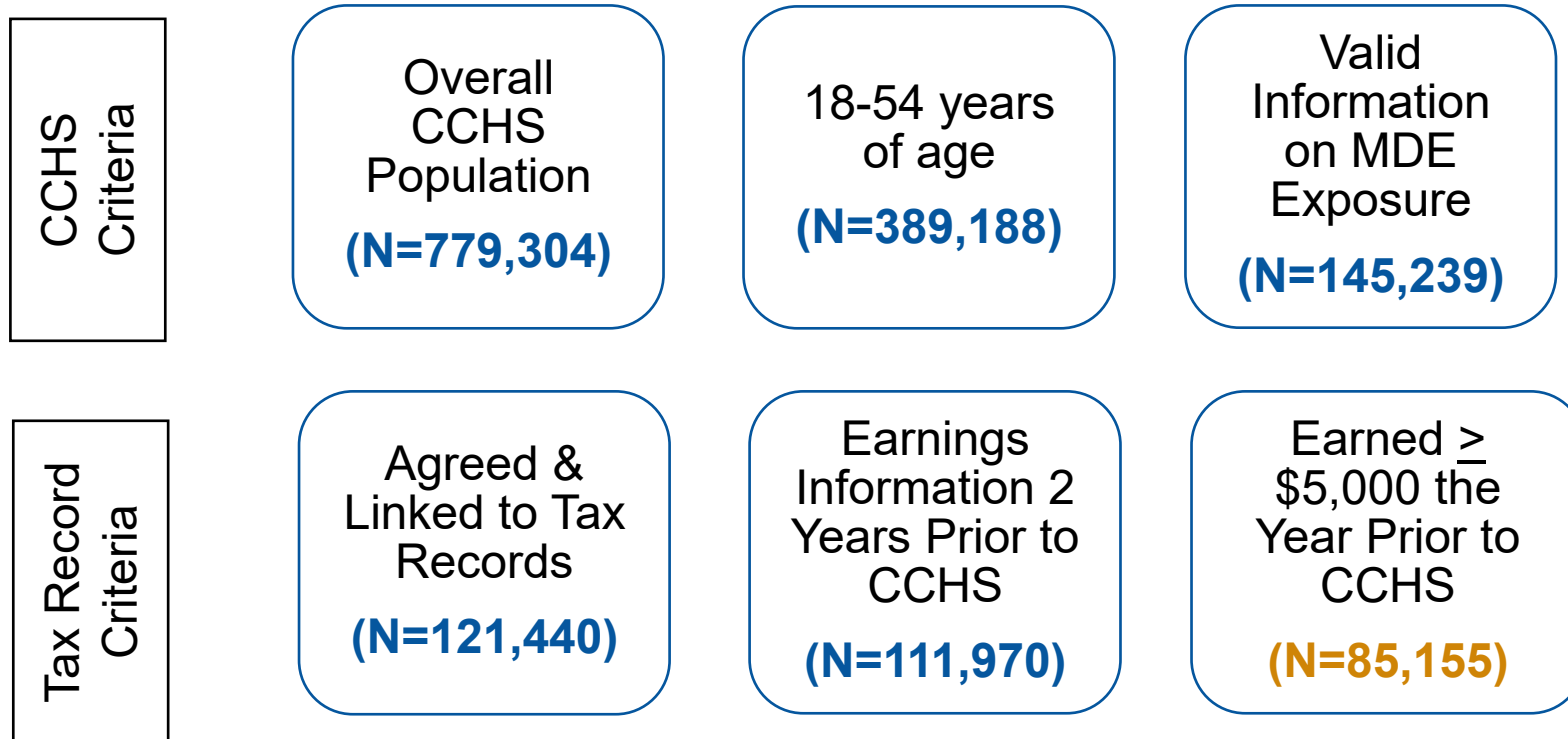
Methods: Sample

Population of interest: Working-aged Canadians participating in the labor force



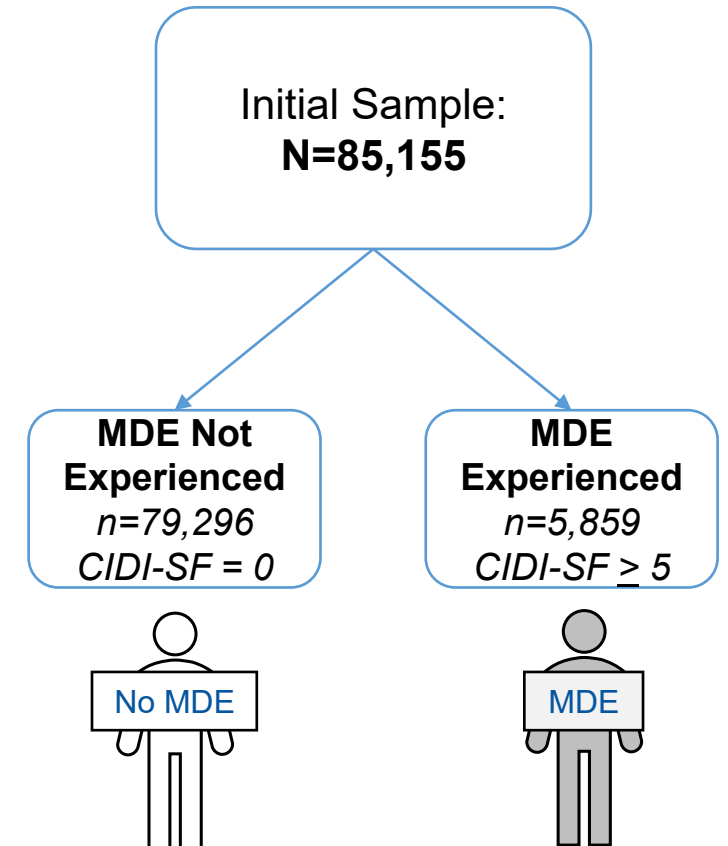
Methods: Sample

Population of interest: Working-aged Canadians participating in the labor force



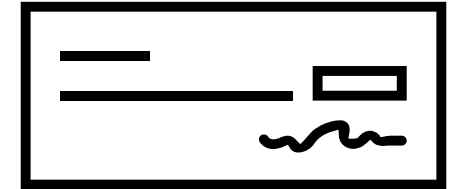
Methods: MDE Exposure

	Exposure: MDE in the Past 12 Months
Ascertained In:	CCHS
Time Period:	T
Defined As:	A high likelihood of experiencing a major depressive episode in the past twelve months
Measured By:	Composite International Diagnostic Interview Short Form (CIDI-SF)
Measurement Details:	CIDI-SF scores range from 0 – 8 Did not experience a MDE = CIDI-SF Score 0 Experienced a MDE = CIDI-SF Score ≥ 5



Methods: Employment Earnings

	Outcome: Employment Earnings
Ascertained In:	Tax Files
Time Period:	T-2 to T+10
Defined As:	Total employment income from all paid-employment income (<i>Wages, salaries, and commissions before deductions</i>)
Measured From:	T4 Slips
Measurement Details:	Treated as a continuous variable in 2016 CAD real dollars



What did we do?

Methods: Design & Analysis

Stratified data by gender

- Women (N=44,020)
- Men (N=41,135)

Created propensity score for MDE

- Logistic regression of MDE exposure on confounding factors

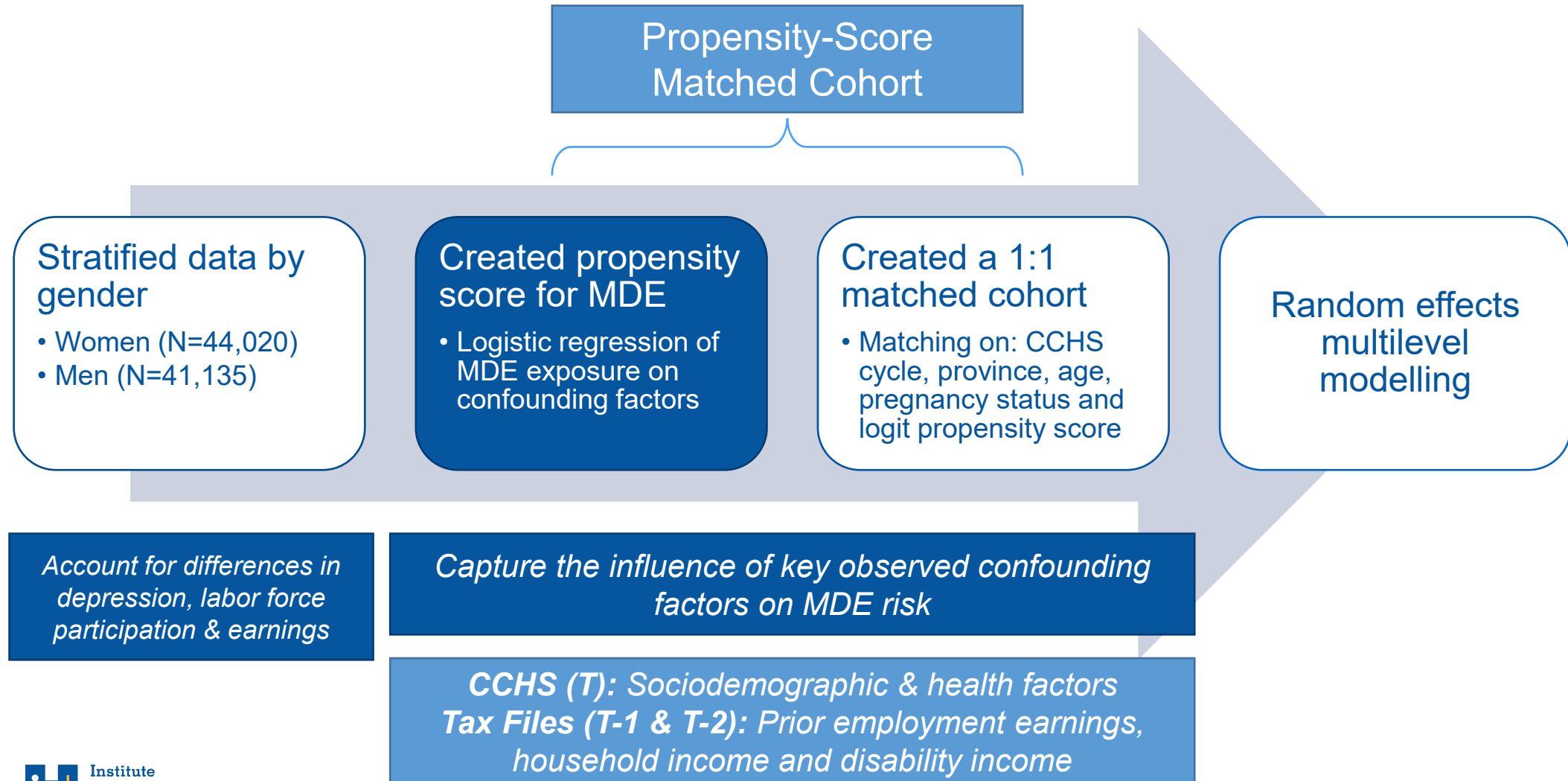
Created a 1:1 matched cohort

- Matching on: CCHS cycle, province, age, pregnancy status and logit propensity score

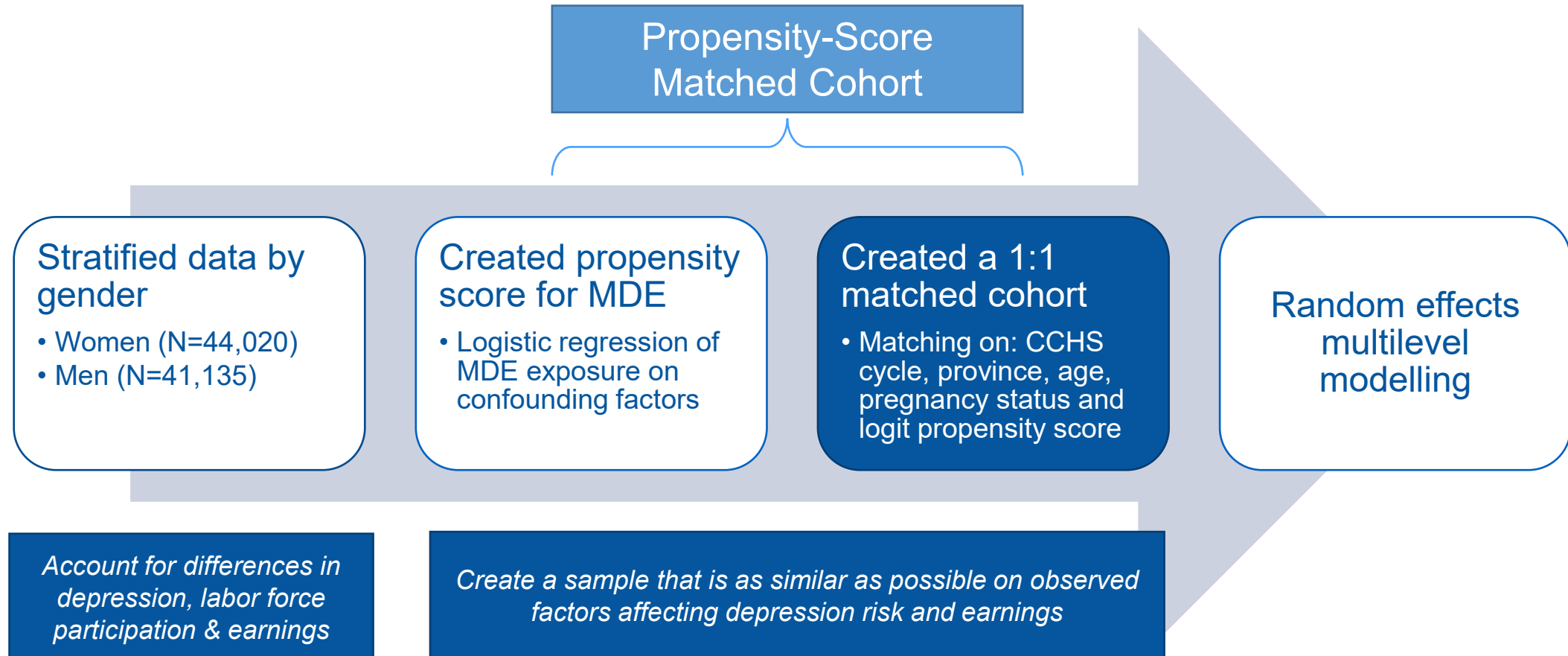
Random effects multilevel modelling

Account for differences in depression, labor force participation & earnings

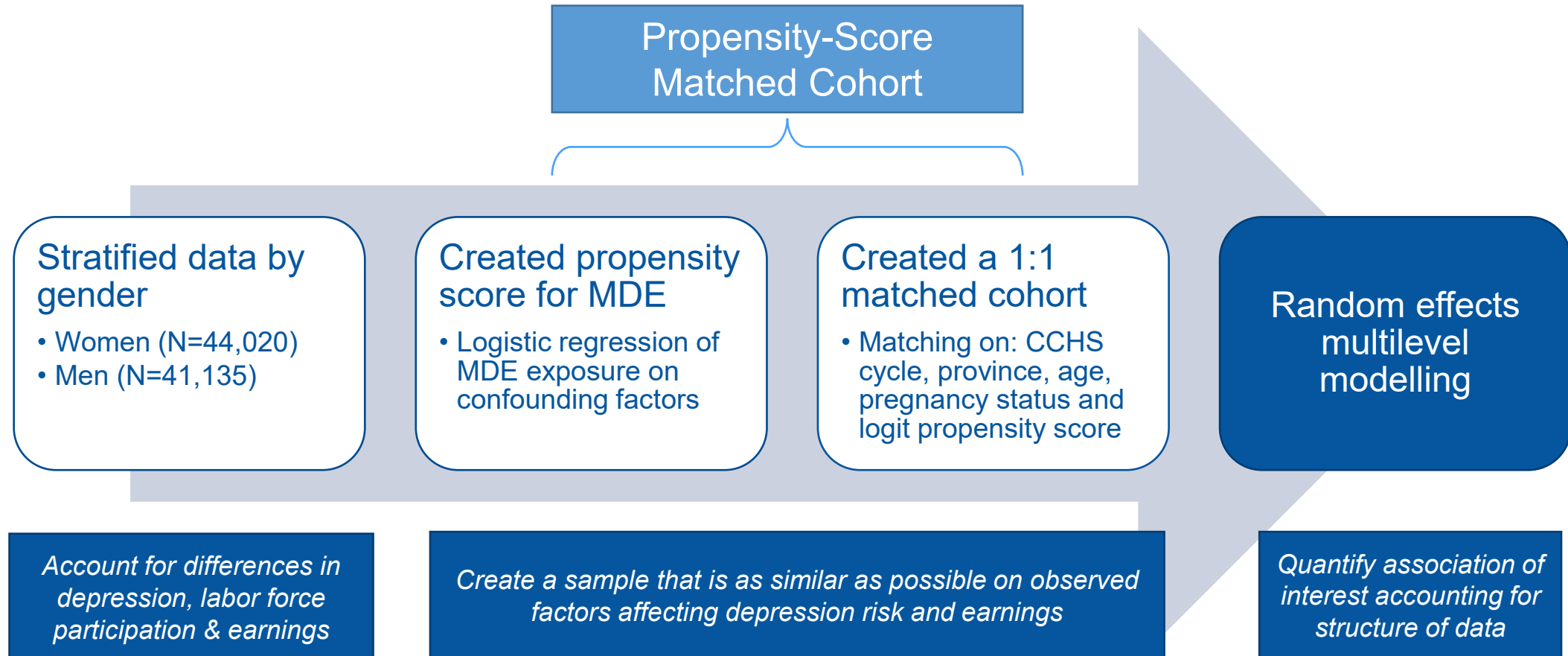
Methods: Design & Analysis



Methods: Design & Analysis



Methods: Design & Analysis



What did we find?

1: Matched Cohort Results

Matched Female Sample	
Total Sample Size	6,974
N _{MDE Cases}	3,487
N _{Controls}	3,487
% of Cases Retained	90%

Matched Male Sample	
Total Sample Size	3,620
N _{MDE Cases}	1,810
N _{Controls}	1,810
% of Cases Retained	92%

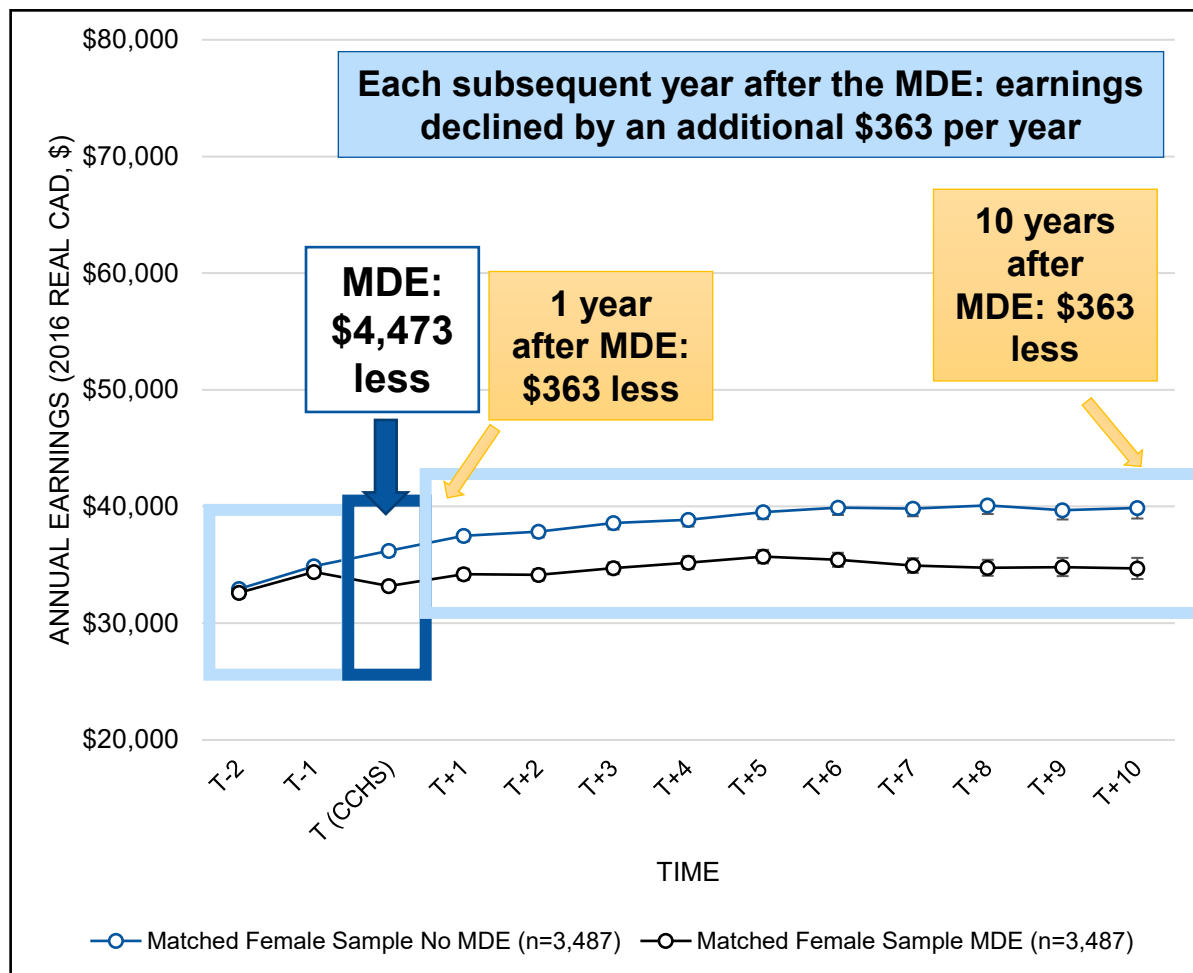
2: Who is in the matched cohort?

	Female Sample (n=6,974)	Male Sample (n=3,620)
Age, years	37	37
CCHS Cycle	2003 & 2005 (45%)	2003 & 2005 (43%)
Province	Quebec (32%)	Quebec (33%)
Urban Geography	77%	76%
Immigrant	8%	6%
Minority Race	11%	10%
Married	46%	43%
Couple with Children	32%	38%
Chronic Condition Present*	62%	52%
Employment Earnings T-1	\$34,700	\$49,000
Employment Earnings T-2	\$32,700	\$47,500

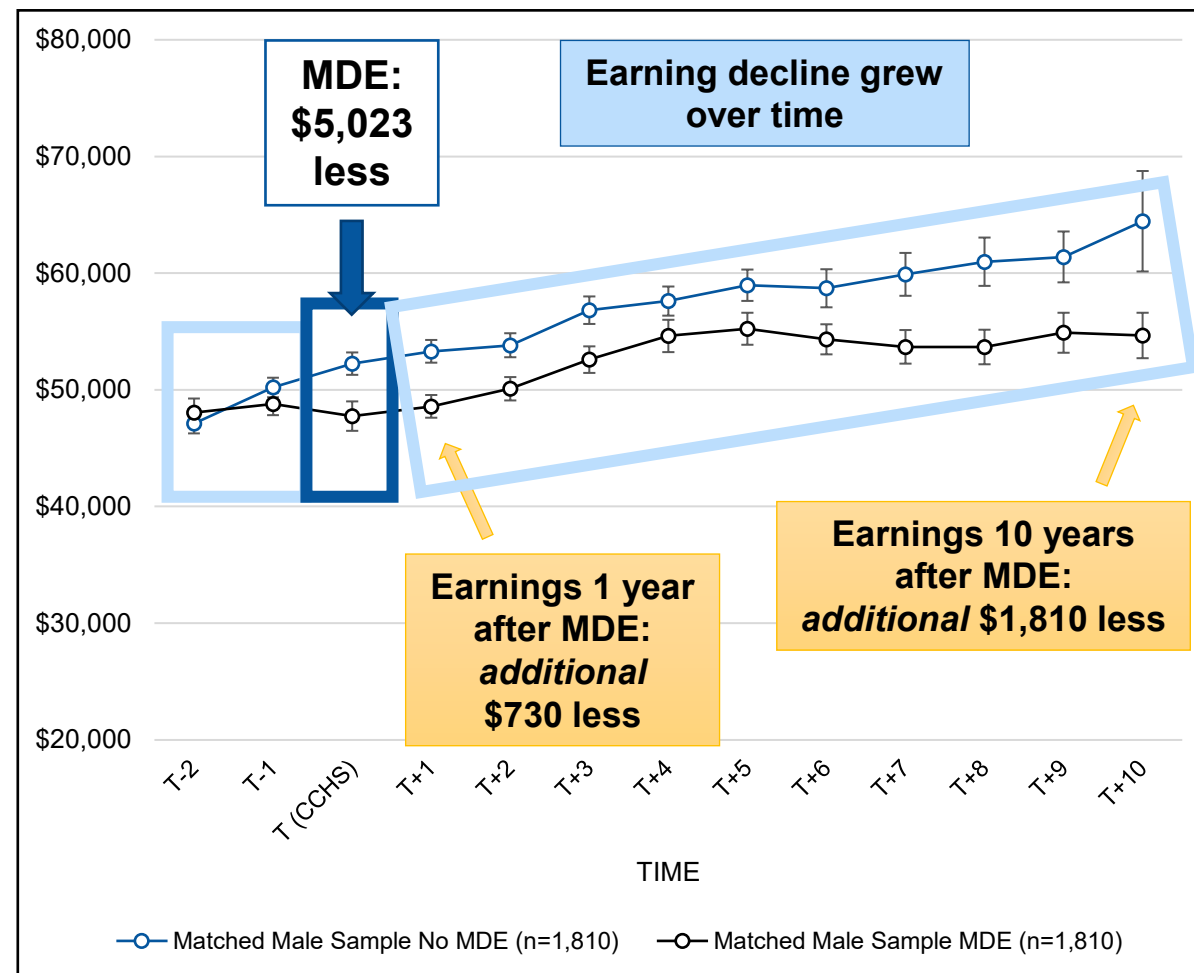
* **Chronic Conditions:** *Diabetes, Bowel Disorder, Cancer, CVD-related* (heart disease, high blood pressure), *Musculoskeletal-related* (arthritis, back pain), *Respiratory-related* (asthma, COPD, emphysema)

3: Average Annual Employment Earnings among Matched Cohort, by Depressive Episode Status

WOMEN

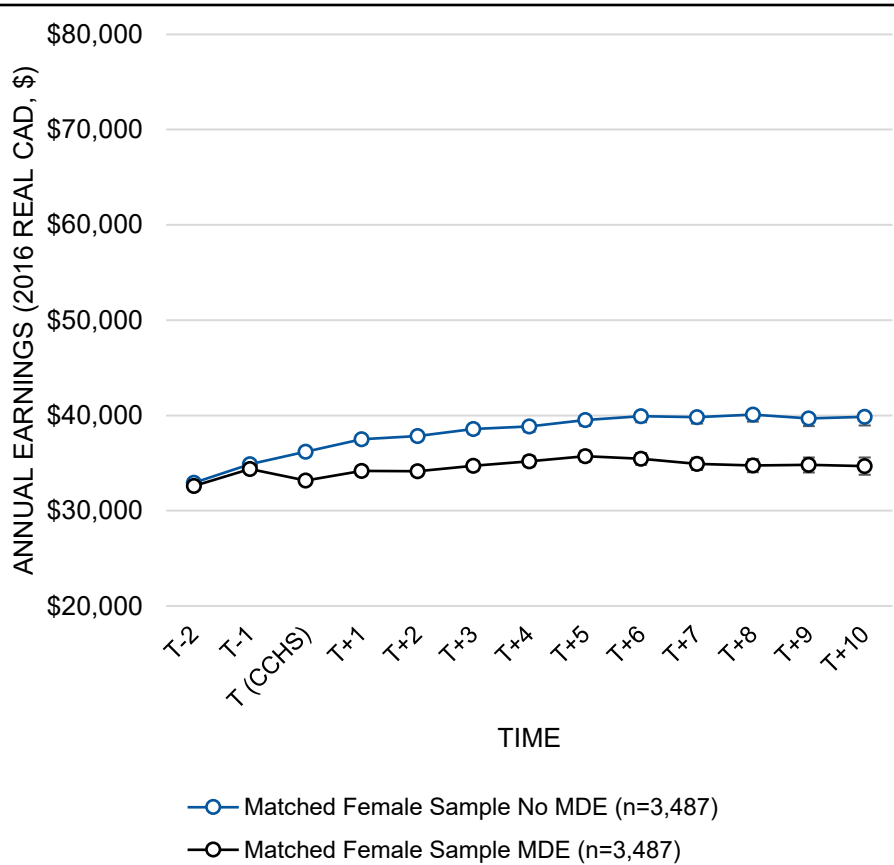


MEN



Predicted Earnings Difference between Cases & Controls

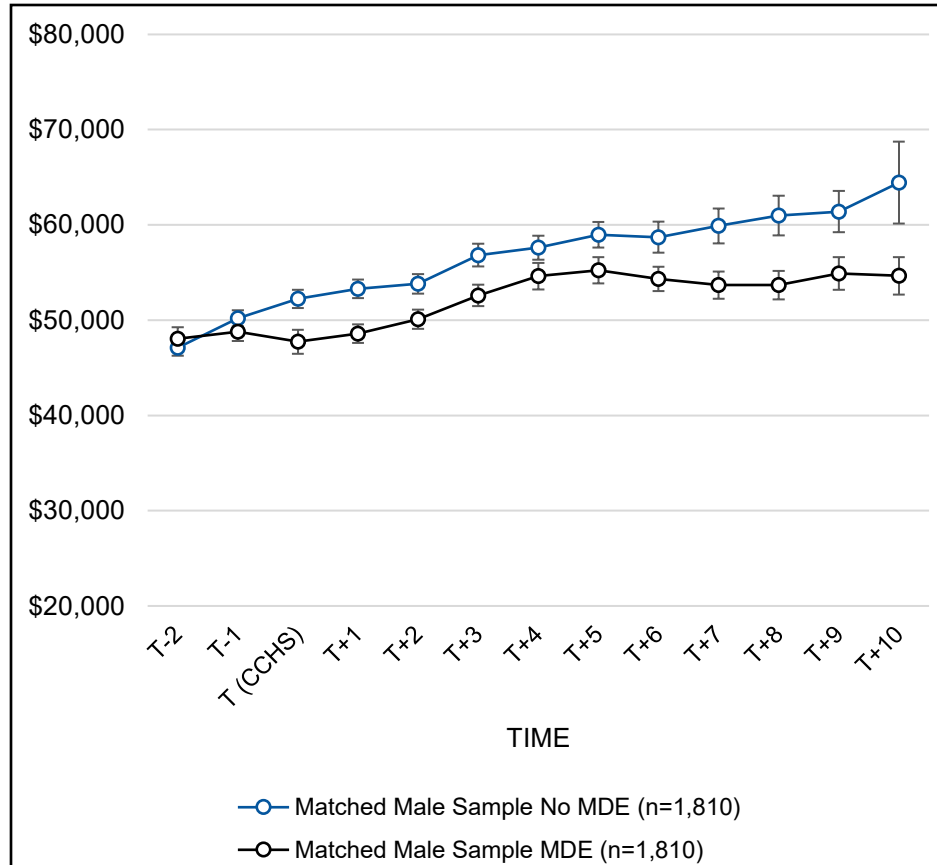
WOMEN



Difference in Annual Earnings between Controls and MDE Cases

	Women	Men
T ₀	\$4,473	\$5,023
T ₊₁	\$4,842	\$5,753
T ₊₂	\$5,223	\$6,603
T ₊₃	\$5,616	\$7,573
T ₊₄	\$6,021	\$8,663
T ₊₅	\$6,438	\$9,873
T ₊₆	\$6,867	\$11,203
T ₊₇	\$7,308	\$12,653
T ₊₈	\$7,761	\$14,223
T ₊₉	\$8,226	\$15,913
T ₊₁₀	\$8,703	\$17,723
Total	\$71,478	\$115,203

MEN



Takeaways & Considerations

Key Findings

Depressive episode associated with initial decline in earnings

Longstanding earnings consequence of a single depressive episode

Matched cohort participants had high burden of chronic conditions

Trends present in both men and women

Explanation of Earnings Difference

Immediate earnings loss due to experience or recovering from MDE:

- Reduced productivity at work

- Partaking in disability leave

- Temporarily terminating employment

Long-term earnings loss, scarring effect of the MDE:

- Interaction of depression, health & sociodemographic factors

- Selection into lower-paying work

- Pathway through reduced productivity when at work

Who has depression?

Profile of individuals experiencing depression



Gendered Differences



Study Limitations

Key Limitations

- 1) Optional depression module reduced sample size, generalizability
 - Potential impact: *results may be underestimated*
- 2) Reverse causality
 - Potential impact: *results may be overestimated*
- 3) One assessment of depression
 - Potential impact: *results may be overestimated for participants with just one MDE, but underestimated for those with more than one*

From research to real life: findings in context

Since we've completed this study...



Research

Employment and earnings trajectories before and after sickness absence due to major depressive disorder: a nationwide case–control study

Christian Hakulinen ^{1,2}, Petri Böckerman ^{3,4,5}, Laura Pulkki-Råback, ^{1,6}
Marianna Virtanen, ^{7,8} Marko Elovainio ^{1,2,9}

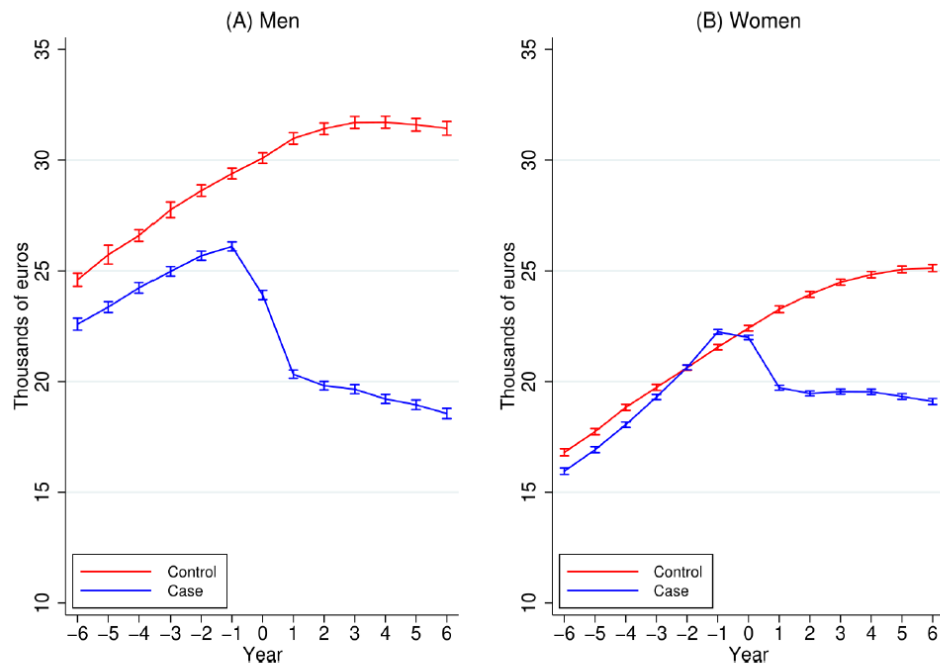
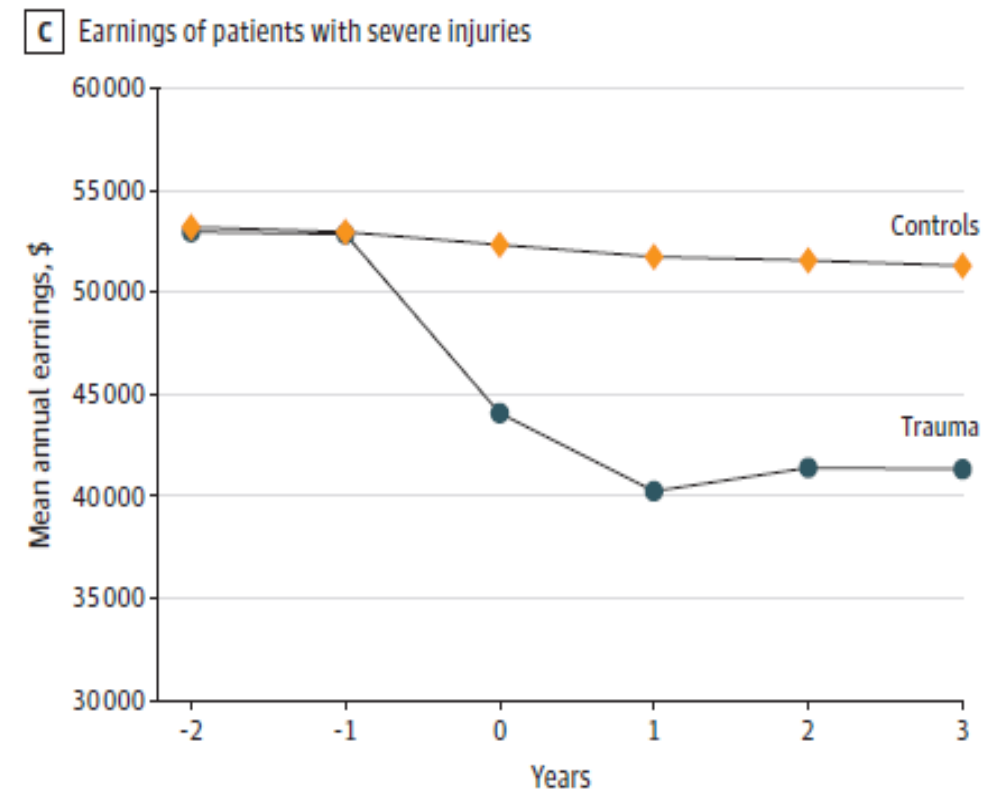


Figure 2 Predicted trajectories of personal earnings for men and women with and without sickness absence due to major depressive disorder (MDD). Year 0 depicts the year of MDD diagnosis.

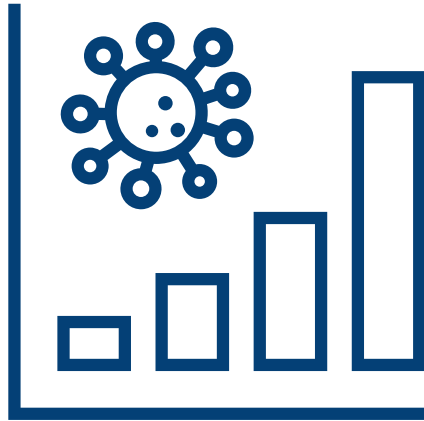
JAMA Surgery | Original Investigation

Association of Severe Trauma With Work and Earnings in a National Cohort in Canada

Barbara Haas, MD, PhD; Sung-Hee Jeon, PhD; Michelle Rotermann, MA; Michael Stepner, PhD; Randy Fransoo, PhD; Claudia Sanmartin, PhD; Hannah Wunsch, MD, MSc, MSc; Damon C. Scales, MD, PhD; Theodore J. Iwashyna, MD, PhD; Allan Garland, MD, MA



Since we've completed this study...



COVID-19 Pandemic



Labor Force Changes



Population Mental
Health

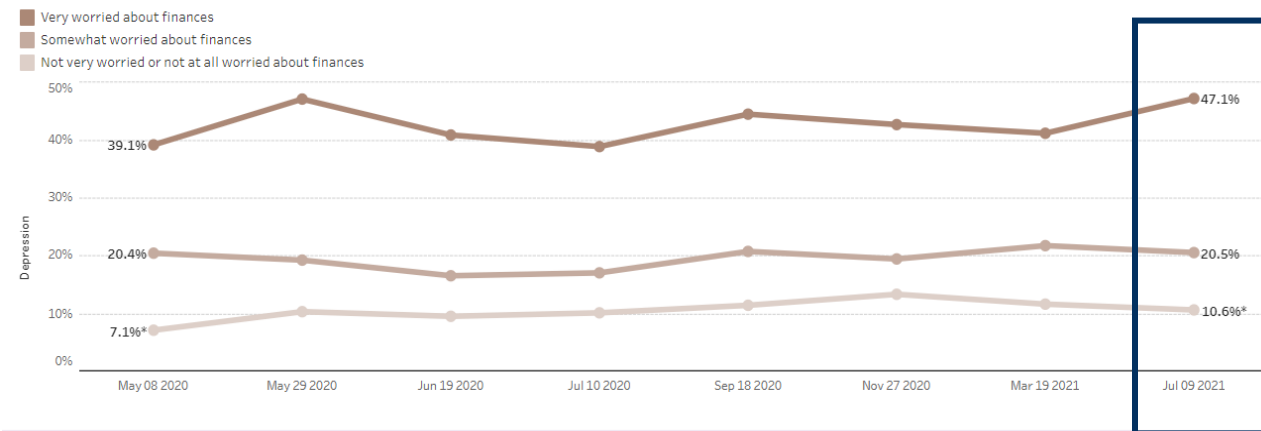
COVID-19 Pandemic & Depression Prevalence among Canadians

Increases in depression & depression symptom prevalence

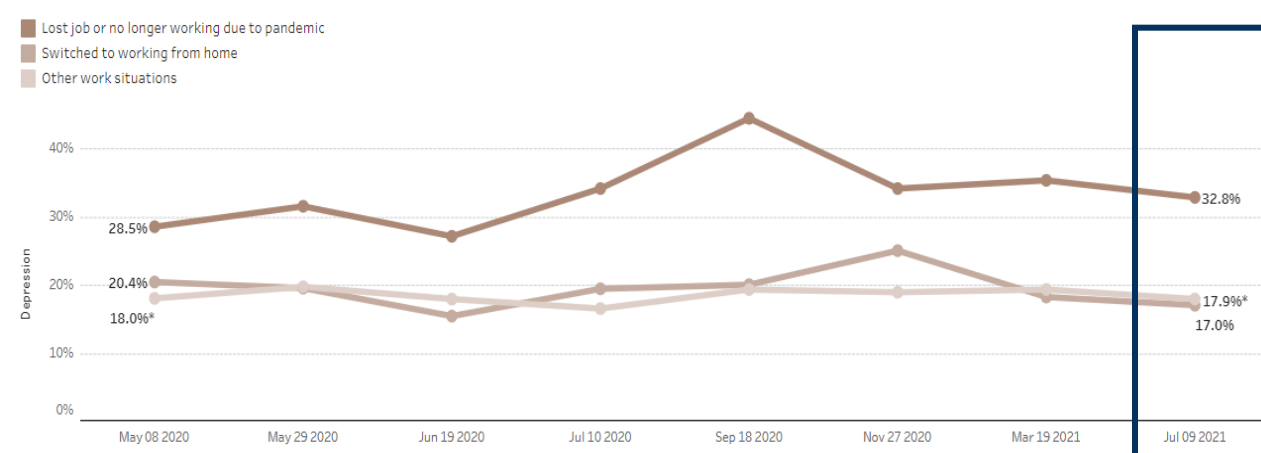


Depression reporting, by labor-related factors

Depression among those worried about impact of COVID-19 on personal financial situat..



Depression according to employment impact since physical distancing measures impos..



Canadian Mental Health Resources

Digital Interventions to Support Population Mental Health in Canada During the COVID-19 Pandemic: Rapid Review

Gillian Strudwick^{1,2}, RN, PhD, FAMIA; Sanjeev Sockalingam^{1,2,3}, MD, MHPE; Iman Kassam¹, MHI; Lydia Sequeira^{1,2}, MHI; Sarah Bonato¹, MIS; Alaa Youssef^{2,3}, BSc; Rohan Mehta¹; Nadia Green⁴, RN, MN; Branka Agic¹, PhD; Sophie Soklaridis^{1,2}, PhD; Danielle Impey⁵, PhD; David Wiljer^{1,2,3}, PhD; Allison Crawford^{1,2}, MD, PhD

Abstract

Background: The COVID-19 pandemic has resulted in a number of negative health related consequences, including impacts on mental health. More than 22% of Canadians reported that they had felt depressed in the last week, in response to a December 2020 national survey. Given the need to physically distance during the pandemic, and the increase in demand for mental health services, digital interventions that support mental health and wellness may be beneficial.

Objective: The purpose of this research was to identify digital interventions that could be used to support the mental health of the Canadian general population during the COVID-19 pandemic. The objectives were to identify (1) the populations these interventions were developed for, inclusive of exploring areas of equity such as socioeconomic status, sex/gender, race/ethnicity and culture, and relevance to Indigenous peoples and communities; (2) the effect of the interventions; and (3) any barriers or facilitators to the use of the intervention.

Methods: This study was completed using a Cochrane Rapid Review methodology. A search of Embase, PsycInfo, Medline, and Web of Science, along with Google, Million Short, and popular mobile app libraries, was conducted. Two screeners were involved in applying inclusion criteria using Covidence software. Academic articles and mobile apps identified were screened using the Standard Quality Assessment Criteria for Evaluating Primary Research Papers from a Variety of Fields resource, the American Psychiatric Association App Evaluation Framework, and the Mental Health Commission of Canada's guidance on app assessment and selection.

Results: A total of 31 mobile apps and 114 web-based resources (eg, telemedicine, virtual peer support groups, discussion forums, etc) that could be used to support the mental health of the Canadian population during the pandemic were identified. These resources have been listed on a publicly available website along with search tags that may help an individual make a suitable selection. Variability exists in the populations that the interventions were developed for, and little assessment has been done with regard to areas of equity. The effect of the interventions was not reported for all those identified in this synthesis; however, for those that did report the effect, it was shown that they were effective in the context that they were used. A number of barriers and facilitators to using these interventions were identified, such as access, cost, and connectivity.

Conclusions: A number of digital interventions that could support population mental health in Canada during the global COVID-19 pandemic were identified, indicating that individuals have several options to choose from. These interventions vary in their purpose, approach, design, cost, and targeted user group. While some research and digital interventions addressed equity-related considerations, more research and focused attention should be given to this area.

Provincial Initiatives

Ontario 1-866-531-2600 Links | Quick Facts | Careers | Accessibility | Français | Other Languages | Ontario.ca | Log In

ConnexOntario
Discover Mental Health, Addiction and Problem Gambling Services

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Find Services In Your Area

Home About Us What to Expect Our Services Products Contact Us Initiatives & Partnerships COVID 19

Free 24/7 Access
to Healthcare Services Information

Learn More Explore Directory

Canadian Mental Health Association

BounceBack®
reclaim your health

COVID-19 Adults (19+) Youth (15-18) Care Providers About CMHA

GET STARTED ADULTS 19+ YOUTH 15-18 CARE PROVIDERS

BounceBack® is a free skill-building program managed by the Canadian Mental Health Association (CMHA). It is designed to help adults and youth 15+ manage low mood, mild to moderate depression and anxiety, stress or worry. Delivered over the phone with a coach and through online videos, you will get access to tools that will support you on your path to mental wellness.

City of Toronto

COVID-19: Mental Health Resources

Call 911 if you are in an emergency, immediate danger, or medical distress. For other needs, call 211 to be connected to mental health and other social services.

To close this web page quickly press Alt+F4 or Cmd+Q (Mac). Learn how to [remove evidence of your visit to this page](#).

Click on the Translate button at the bottom of this page for information in your language. Mental health supports are also available in many languages.

It's OK not to feel OK

Many people may feel sad, stressed, anxious, confused, scared or angry during the COVID-19 pandemic. These are normal and common responses to unexpected or stressful situations.

Support is available. At the beginning of the pandemic, the City of Toronto partnered with 13 organizations to help connect residents to free telephone, text and online mental health support during the COVID-19 pandemic. On April 16, 2021 the City announced partnerships with an additional 18 organizations to ensure that residents have increased access to mental health resources.

Through this partnership, the City's Mental Health Support Strategy responds to the needs of children and youth, seniors, frontline workers, as well as those with intersectional identities, such as Indigenous, Black, persons with disabilities and LGBTQ2S, who are struggling with isolation, stress and anxiety exacerbated by COVID-19 measures.

Our partners provide free mental health supports to diverse communities across Toronto:

- [Across Boundaries](#)
- [Barbra Schlifer Clinic](#)
- [Black Coalition for AIDS Prevention \(BlackCAP\)](#)
- [Breakaway](#)
- [Caribbean African Canadian Social Services](#)
- [Centre for Young Black Professionals \(CEE\)](#)
- [Crisis Text Line](#)
- [Distress Centre of Greater Toronto](#)
- [Family Services Toronto](#)
- [Generation Chosen](#)
- [Gerstein Crisis Centre](#)
- [Harriet Tubman Community Organization](#)
- [Hong Fook](#)
- [Kids Help Phone](#)
- [La Passerelle I.D.E.](#)
- [LGBT Youthline](#)
- [LOFT Community Services](#)
- [Native Child and Family Services of Toronto](#)
- [Ontario Psychological Association](#)
- [Stolen from Africa](#)
- [Strides Toronto](#)
- [TAIBU Community Health Centre](#)
- [The Access Point](#)
- [The Canadian Mental Health Association](#)
- [Toronto Rape Crisis Centre](#)
- [Toronto Seniors Helpline](#) (WoodGreen)
- [Wanasah Regent Park](#)
- [Warm Line](#) (Progress Place)
- [WoodGreen Community Services](#)
- [Young and Potential Fathers](#)

Concluding Thoughts

It all started with a question

How much does experiencing a depressive episode cost a Canadian's earning potential?

How does experiencing a major depressive episode impact employment earnings over a decade among working-aged Canadian men and women?



Crudely, a cumulative ten-year loss in earnings of roughly \$115,000 for men and \$71,000 for women

What questions to ask next?

Research team and funding

Research team:

Kathleen Dobson, Dalla Lana School of Public Health, Institute for Work & Health

Simone Vigod, Women's College Hospital & Research Institute

Cameron Mustard, Institute for Work & Health

Peter Smith, Institute for Work & Health

Funders and Support:



Thank you

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