

The direct healthcare costs of major depression and psychological distress: A population-based cohort study in Ontario, Canada



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Background

Major depression

- Persistently low mood, accompanied by low self-esteem and loss of pleasure/interest in normally enjoyable activities
- Important public health concern that impacts ~350 million people worldwide (World Health Organization, 2012)
- 11.3% of Canadian adults will experience major depression at some point in their lives (Pearson, 2013)

Psychological distress

- Symptoms of depression and anxiety without necessarily meeting the criteria for major depression
- More prevalent in the population than major depression

Previous cost studies

- In general, depressed populations incur higher healthcare costs than non-depressed controls
- Limitations:
 - Patients in primary care settings rather than population-based samples
 - Self-reported healthcare utilization → costs
 - Limited adjustment for confounders (e.g. age, sex, income, lifestyle factors, and comorbidities)
 - Very few studies examined costs associated with psychological distress

Objectives

1. To determine the direct healthcare costs associated with major depression and psychological distress in Ontario (per-capita and population-wide costs)
2. Understand how these costs:
 - Vary by healthcare sectors (i.e. outpatient, emergency department, hospital, other)
 - Are categorized as mental health and addictions (MHA) vs. non-MHA related health services

Study design

Canadian Community Health Survey (CCHS) cycle 1.2 (2002)

Aged 15+ years living in private dwellings

Exclusions

- Unable/refused to link
- Severe mental illnesses
- OHIP ineligible ≤ 1 yr prior to index

Study cohort (2002)

- Major Depressive Disorder
- Psychological distress
- Controls

%getcost macro

~11 years follow up to death, loss of OHIP eligibility or Mar 31, 2013

Per capita costs

- By sector
- By MHA vs. nonMHA

$N_{MDD} = 361,389$
 $N_{PD} = 599,047$

Population-wide costs

- By Sector

Study groups

Major Depressive Disorder (MDD)

- WHO World Mental Health Composite International Diagnostic Interview (CIDI)
- Based on Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) criteria
- Assess symptoms (e.g. loss of interest, feelings of sadness or despair) and levels of impairments in social, occupational, and other areas of functioning

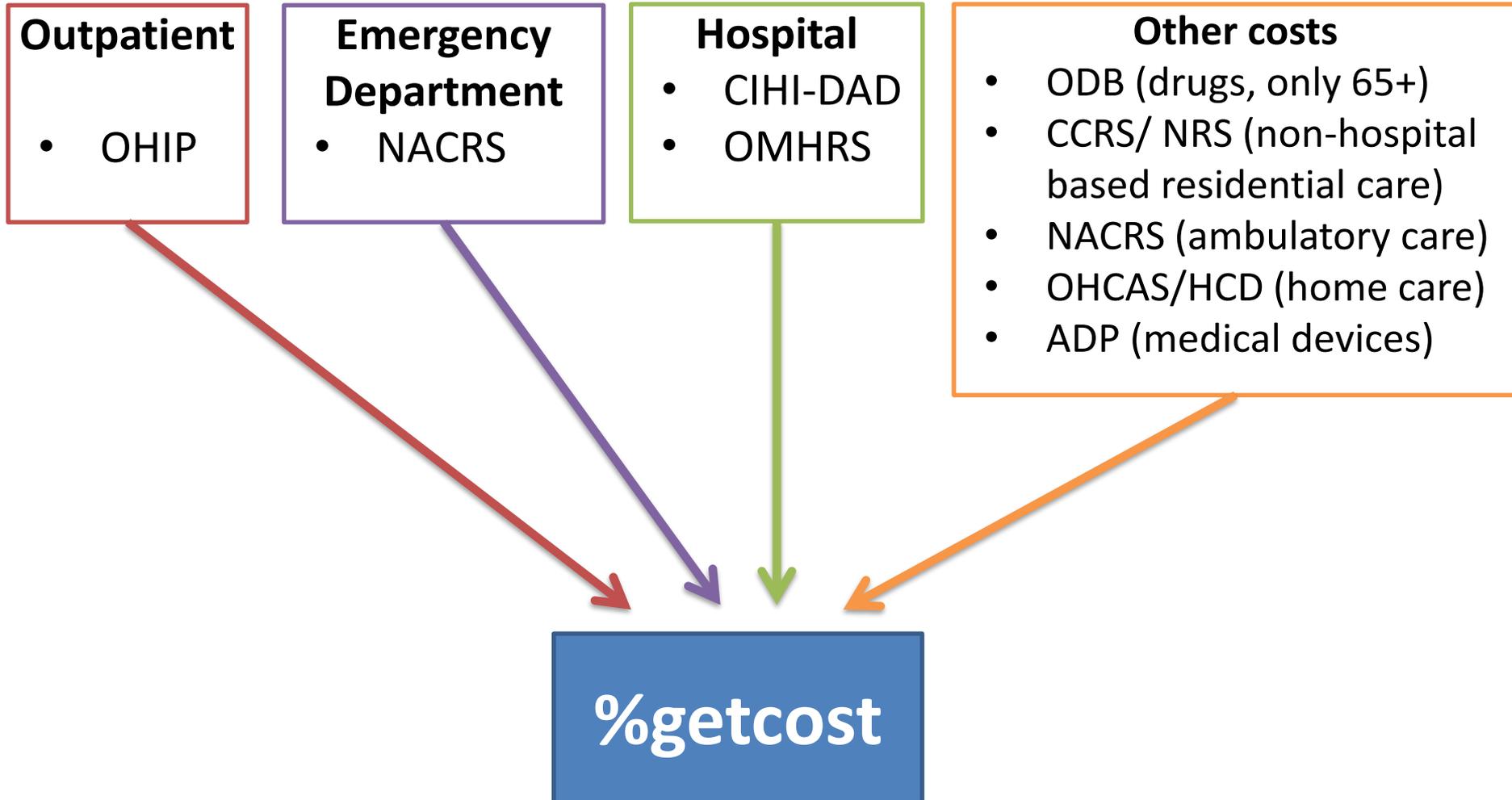
Psychological distress

- Did not meet criteria for MDD
- Kessler 6 (K6) distress scale
- Consists of questions to respondents about feeling nervous, hopeless, restless/fidgety, worthless, so depressed that nothing could cheer them up, and that everything was an effort during the past 30 days
- 8 or more out of 24 on the K6 scale

Controls

- Individuals not meeting the criteria above for MDD or psychological distress

Data sources



Per-capita costs

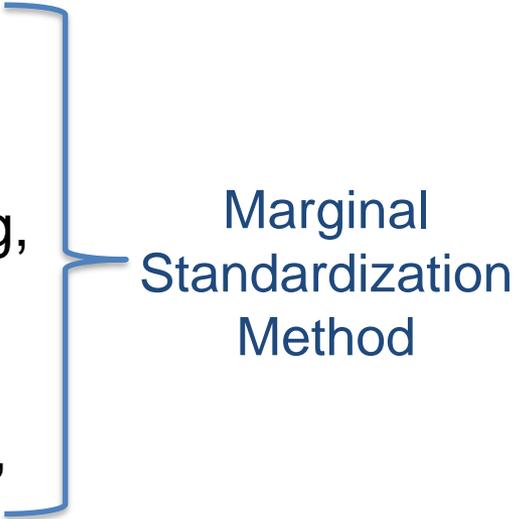
- All costs were divided by the total length of follow-up to estimate annualized costs and inflated to 2013 values
- All costs presented in 2013 CAD
- **MHA costs**
 - Family Physician/GP visits using Steele's algorithm
 - Psychiatrist visits
 - DAD/NACRS with ICD-10 codes F00-F99
 - All OMHRS admissions
- **Non-MHA costs**

References:

de Oliveira C, Cheng J, Vigod S, Rehm J, Kurdyak P. Patients With High Mental Health Costs Incur Over 30 Percent More Costs Than Other High-Cost Patients. *Health Affairs*. 2016;35(1):36-43.

Steele LS, Glazier RH, Lin E, Evans M. Using administrative data to measure ambulatory mental health service provision in primary care. *Medical care*. 2004;42(10):960-5.

Statistical analysis

- Two-part models:
 - Part 1: Probit regression modeling likelihood of incurring a cost
 - Part 2: Generalized linear model (gamma distribution) to estimate the level of costs, conditional on incurring any expenditure
 - Unadjusted costs
 - Age- and sex-adjusted costs
 - Multivariable adjusted costs
 - Age, sex, marital status, urban dwelling, low income status, non-white ethnicity, immigrant status, smoking, physical activity, overweight, cardiovascular disease, cancer, respiratory conditions, hypertension, diabetes
- 
- Marginal Standardization Method

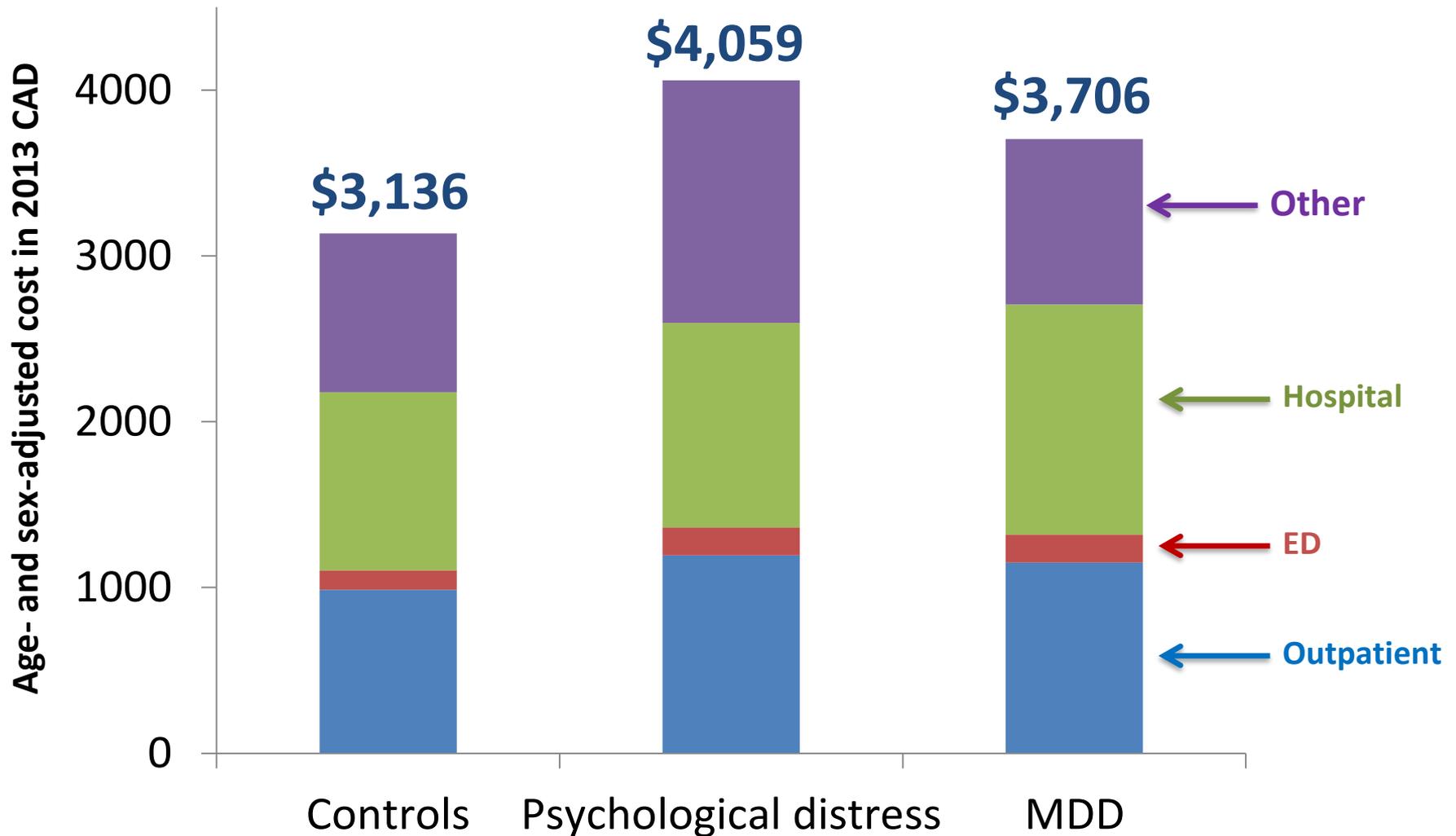
Results

Sociodemographic characteristics

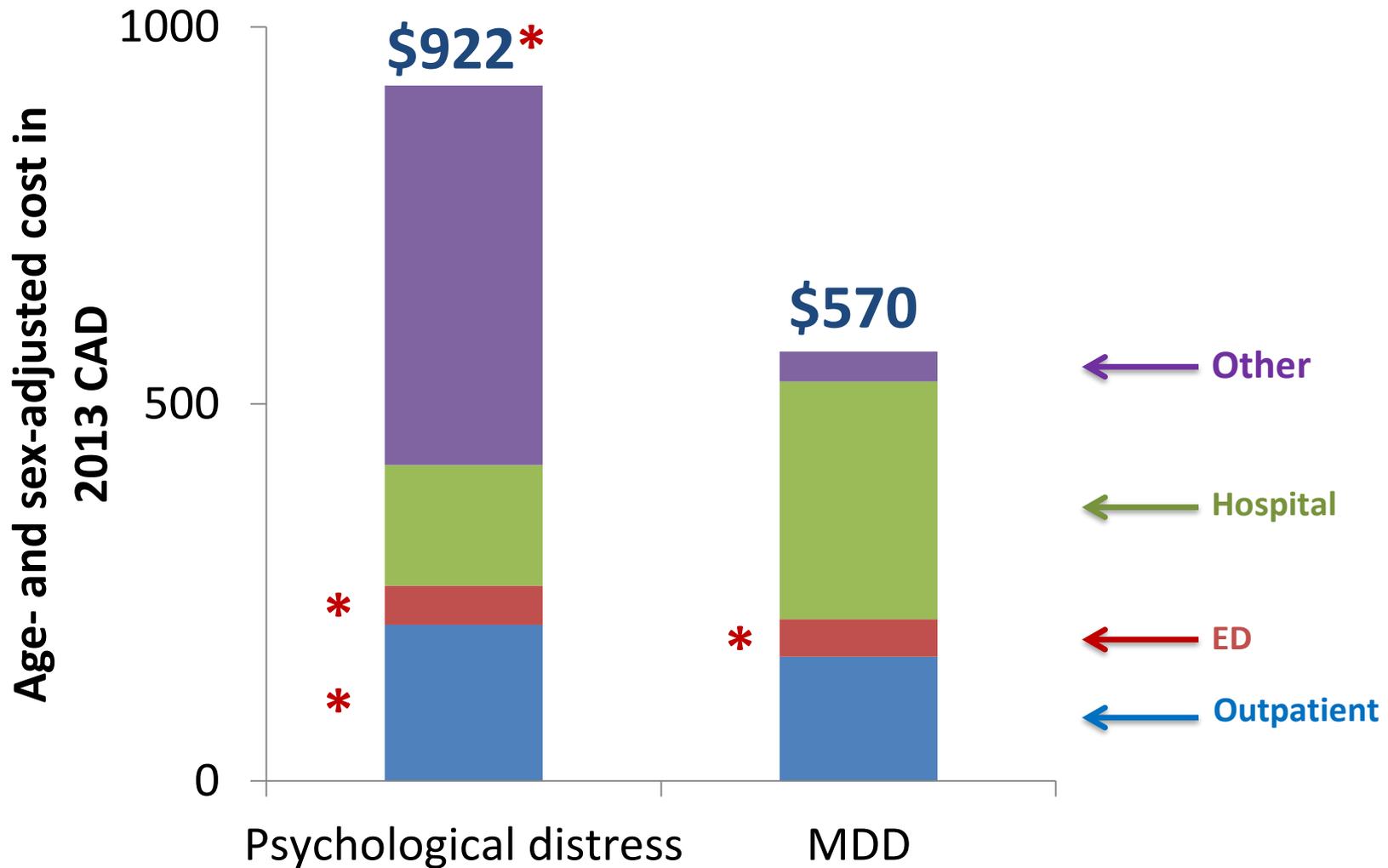
	Controls	Psychological distress	MDD
N	9078	657	420
Prevalence (%)		6.5%	3.9%
Mean age (years)	44.4	40.9*	39.4*
Male sex (%)	50.1	46.2	36.4*
Married/Common Law (%)	64.7	55.5*	49.0*
Urban residence (%)	82.7	86.7	80.8
Income quintile 1-2 (%)	40.3	47.3*	41.4
Non-white ethnicity (%)	21.5	25.9	16.0
Non-immigrant (%)	68.0	64.3	72.4

***P < 0.05**

Similar per-capita costs incurred by psychological distress and MDD groups (per year)

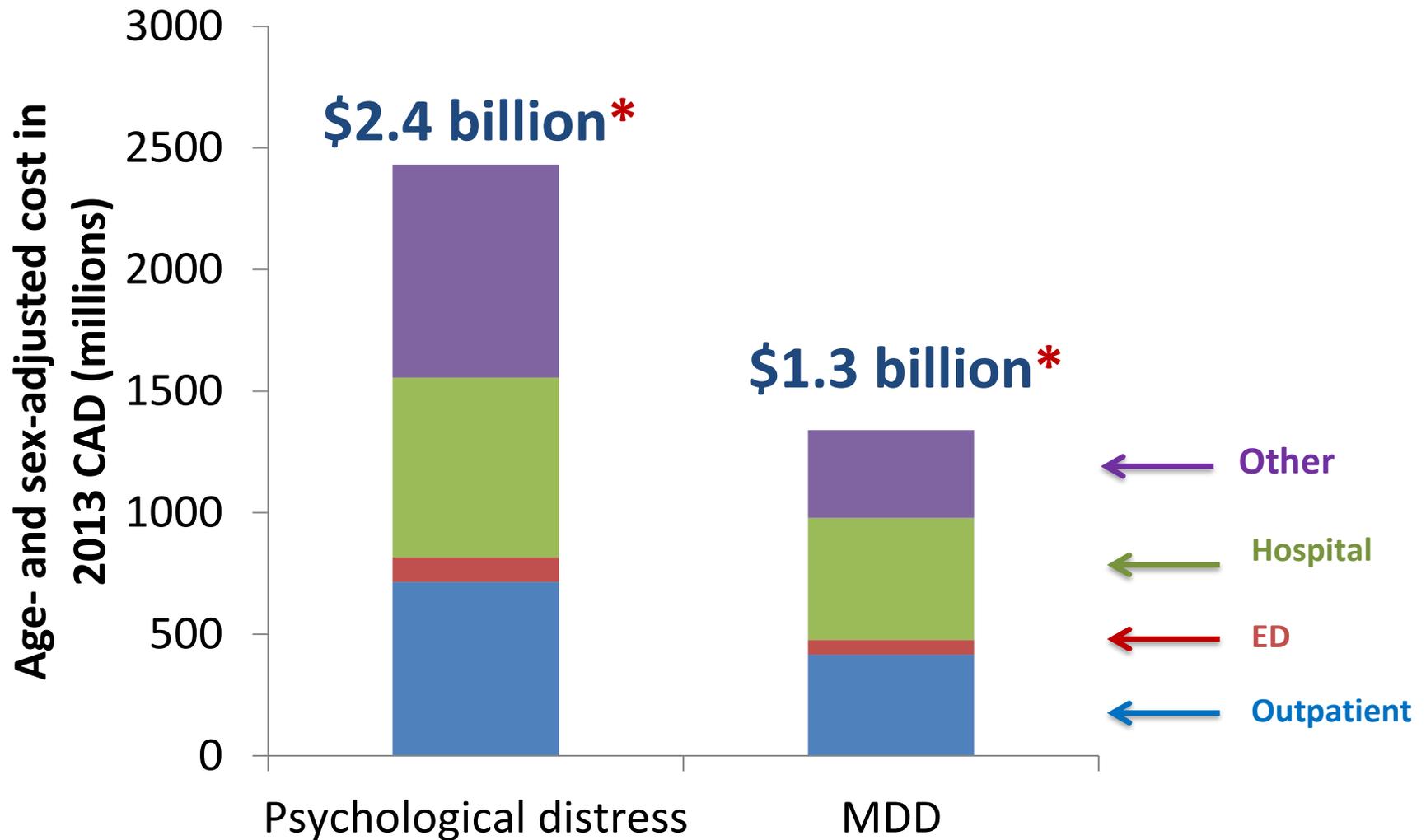


Significantly greater excess costs in the psychological distress group vs. controls



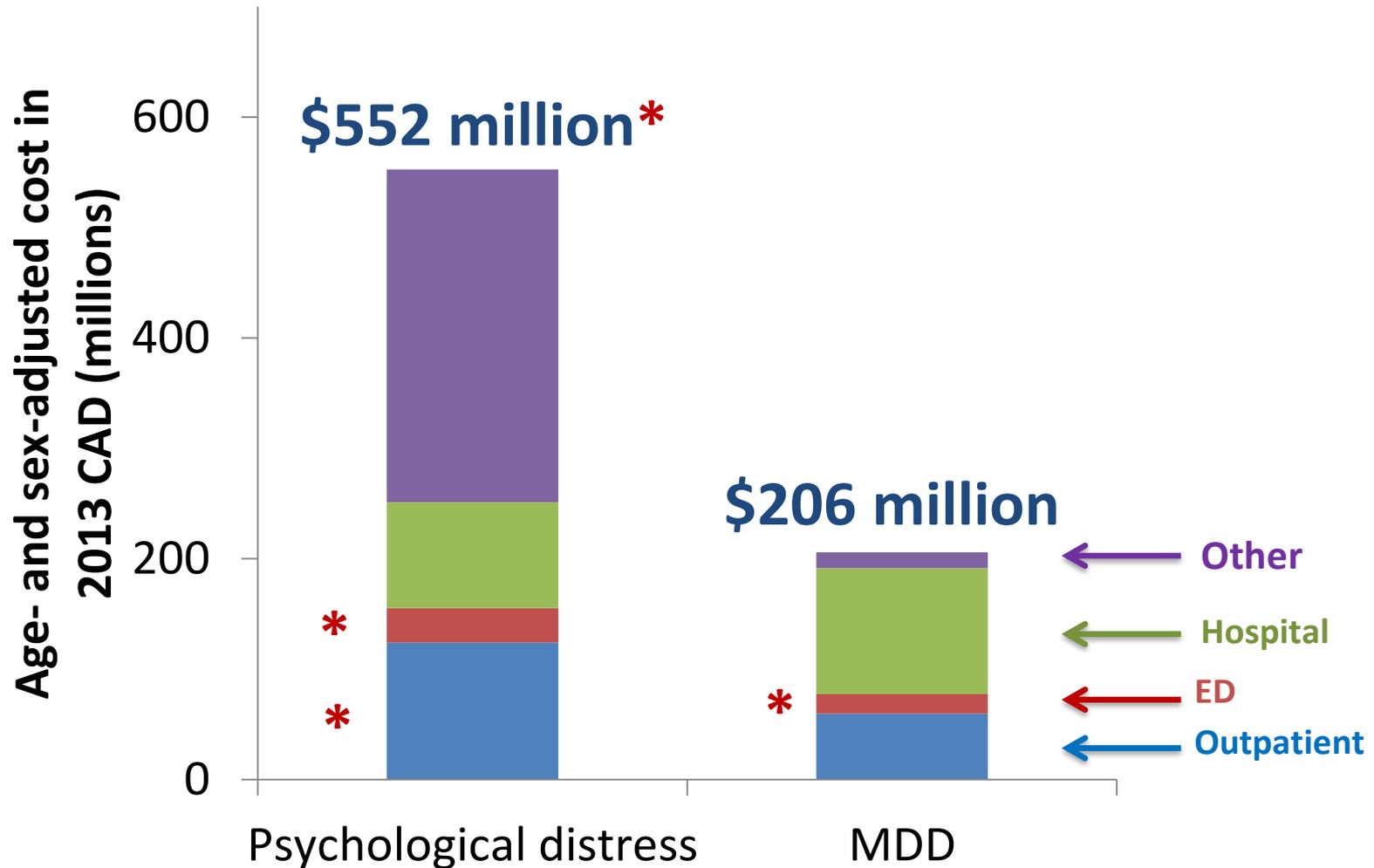
* P < 0.05 vs. controls

Greater prevalence of psychological distress in population
→ twice the population-wide cost burden vs. MDD

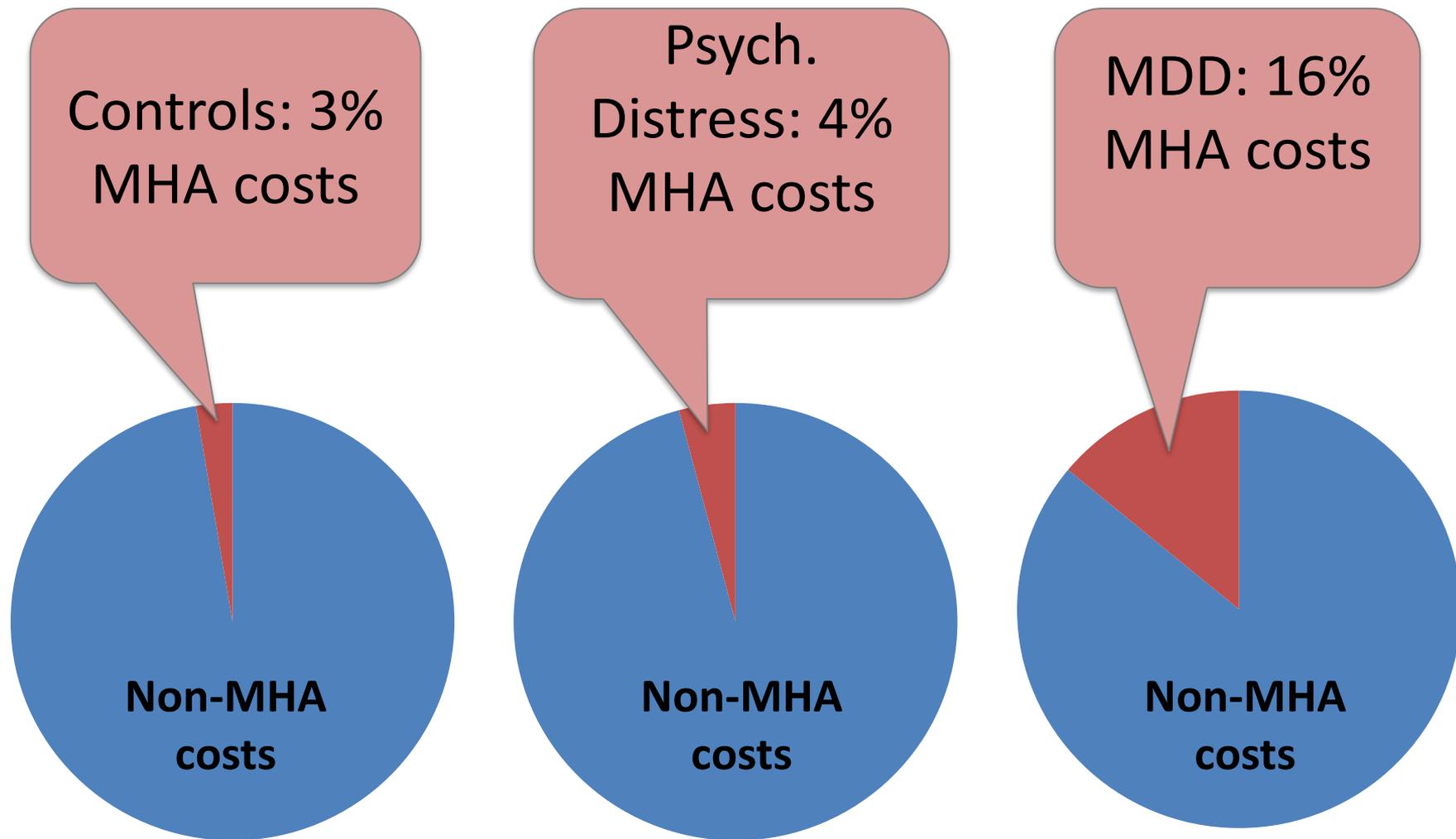


* P < 0.05 vs. controls

Psychological distress and depression, together associated with three-quarters of a billion dollars in excess healthcare costs vs. controls



Only a small proportion of total per-capita costs incurred by psychologically distressed individuals are for MHA-related services



Strengths

- Population-based sample
- Objective measures of healthcare utilization (not self-report)
- Depression was measured using CIDI DSM-IV
- Analyses weighted by CCHS sample weights → generalizable to Ontario population
- Calculated per-capita and population-wide costs

Limitations

- CCHS excluded certain populations (e.g. institutionalized, those living on Canadian Forces bases, incarcerated, homeless, those living on Indian Reserves or Crown Lands)
- Exposures and covariates only measured at baseline
- Miss certain direct costs (e.g. community-based, addictions services)

Conclusions

- Significant healthcare costs associated with both psychological distress and MDD
- Psychological distress is a more prevalent yet often undetected condition
- Future research is needed to better understand psychological distress and the elevated costs associated with both psychological distress and depression

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Questions and comments

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