

Economic Burden of Multimorbidity in Ontario's Health Care System

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OBJECTIVES

Treatment for chronic conditions are costly and account for 75% of all health care expenditure in the USA and about 80% of health care expenses in Europe. In Canada, about \$39 billion is spent each year for treating people with chronic conditions. Despite a great deal of research on costs associated with individual disease in multimorbid populations, evidence pertaining to healthcare costs attributable to multimorbidity is limited. This is particularly important as both costs and the prevalence of multimorbidity among older adults is high.

This study aims to: 1) describe pattern of health care expenditures associated with multimorbidity among 16 prevalent, costly, and disabling conditions, 2) estimate costs attributable to multimorbidity in Ontario's population.

DATA SOURCES AND STUDY POPULATION

Study design

- Cross-sectional, population-based study

Data sources

- Cost and utilization data for CIHI and MOHLTC Databases for Acute, Emergency Department, Ambulatory Care, Inpatient Rehabilitation, Complex Continuing Care, Long Term Care, Home Care, Physician and Lab Services, Drug Benefits for those aged 65 and over.
- Registered Persons Database (RPDB)
- ICES validated disease cohorts derived from administrative record

Study population

All Ontario residents who met the following criteria in 2009/10:

- aged 0 - 105 years old
- had at least one of the following conditions: cardiac arrhythmia, acute myocardial infarction, hypertension, chronic coronary syndrome, congestive heart failure, stroke, asthma, chronic obstructive pulmonary disorder, diabetes, osteoporosis, rheumatoid arthritis, osteo- and other arthritis, depression, dementia, cancer, or renal failure.

Cohort size: 6,639,089 (followed April 1, 2009 to March 31, 2010)

MEASURES AND ANALYSIS

Measures

- Outcomes: total healthcare costs and subdivided costs for hospital, physician, drug, continuing care (residential care and home care) and other costs
- Independent variable: number of health conditions: 1, 2, 3, 4 and 5+ condition (s)
- Adjustment factors: age, sex, primary care model, rurality index, neighbourhood factors in quintiles: income, deprivation index, ethnicity concentration, and dependency.

Analysis

- Descriptive statistics
 - Mean costs per person per year by service types, age groups and number of chronic conditions
- Incremental costs due to multimorbidity: differencing predicted costs for different categories of multimorbidity based on regression models using a generalized linear model (GLM) with log-link
 - Model diagnostics: assessment of kurtosis, modified Park test, and modified Hosmer-Lemeshow test

RESULTS

Figure 1: Mean costs for adults under 65 years

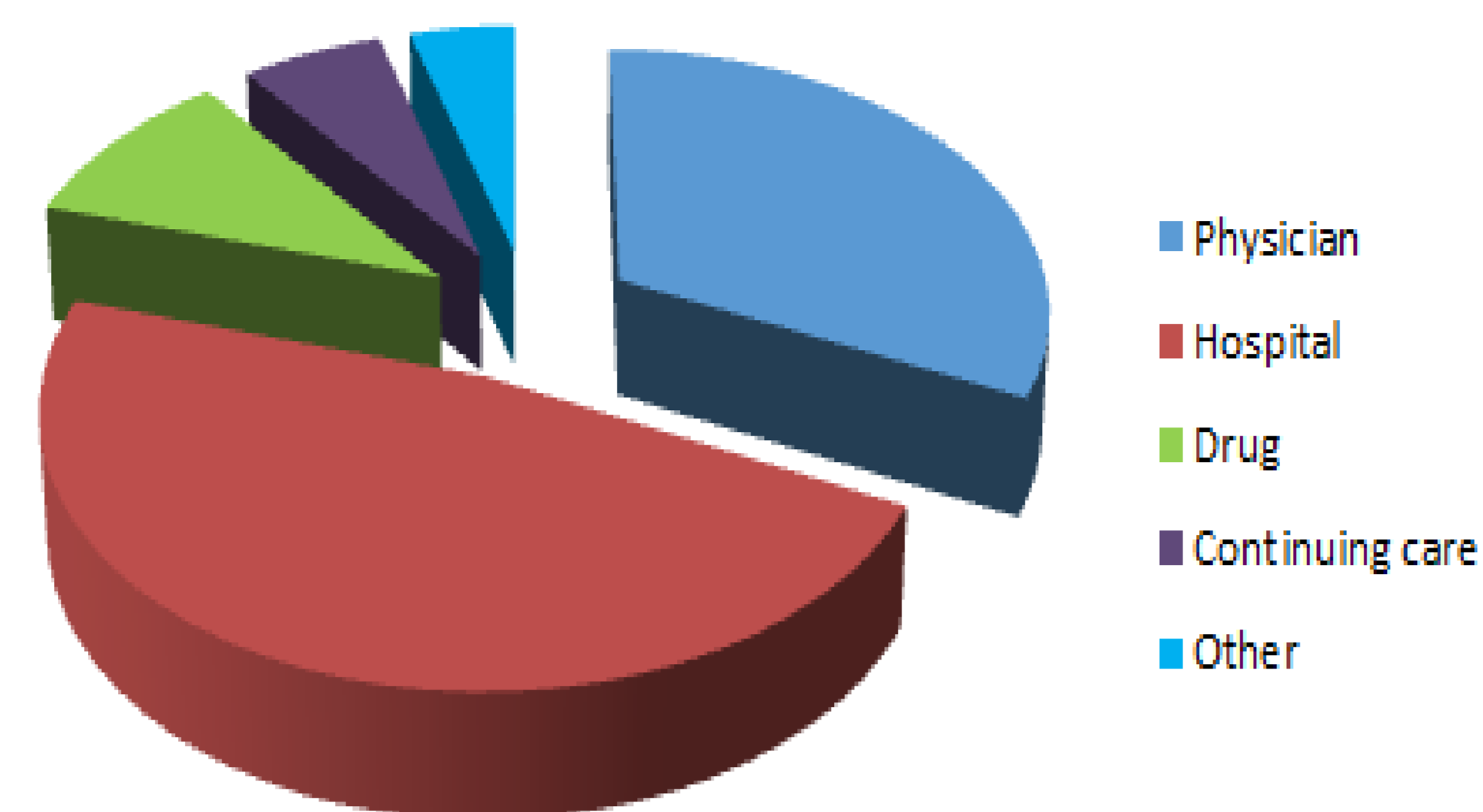


Figure 2: Mean costs for adults aged 65 years plus



Figure 3: Mean cost by service type, number of conditions and age groups

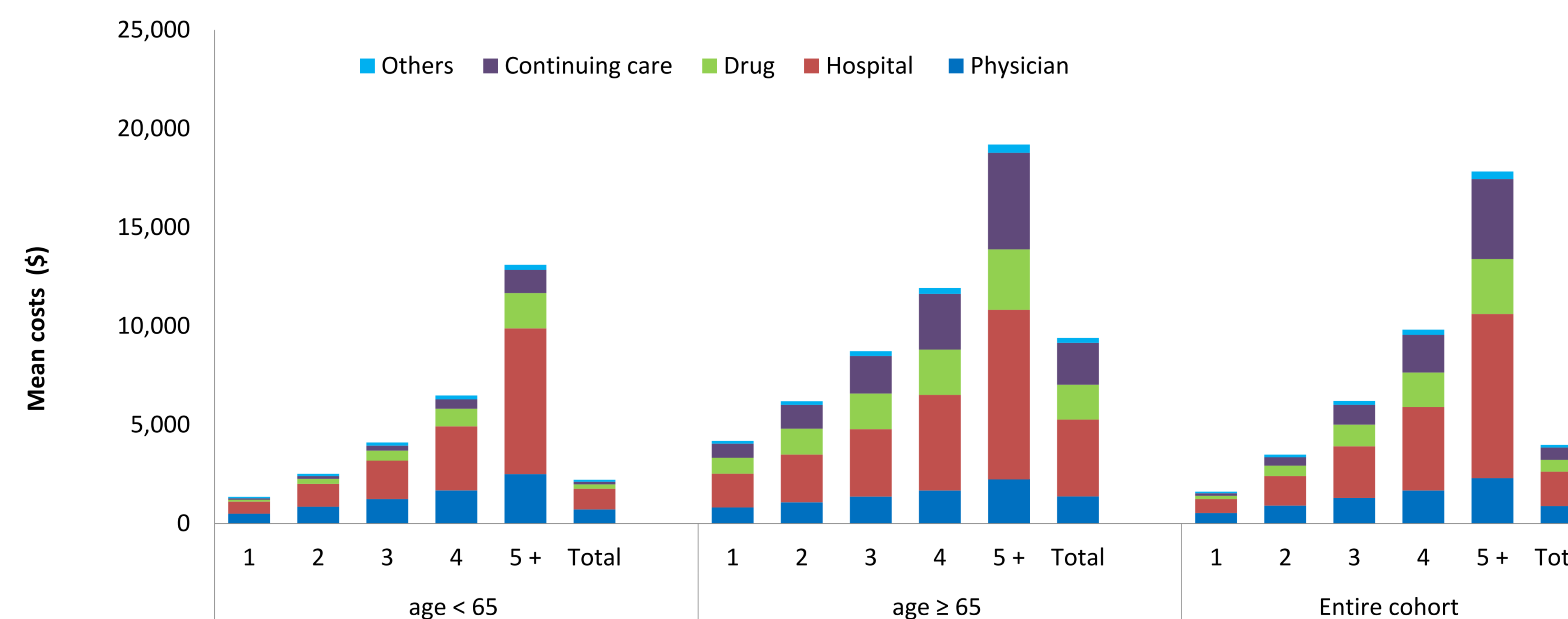


Figure 4: Adjusted incremental costs of multimorbidity*

Adults aged 65 years plus					
(In red, Each column across each row shows incremental costs compared to the far left column)					
	1 condition	2 conditions	3 conditions	4 conditions	≥5 conditions
1 condition		\$1,026	\$2,306	\$3,958	\$7,789
2 conditions	\$377		\$1,280	\$2,932	\$6,763
3 conditions	\$911	\$534		\$1,652	\$5,483
4 conditions	\$1,709	\$1,332	\$798		\$3,831
≥5 conditions	\$3,781	\$3,405	\$2,781	\$2,073	
Adults aged under 65 years					
(In Blue, Each row down each column shows incremental costs compared to the top row)					

*Adjusted model controls for individual age, sex, primary care model, rurality index, and neighborhood factors in quintiles (income, deprivation, ethnicity and dependency)

KEY FINDINGS

Multimorbidity places a high economic burden to the Ontario's health care system.

- Total cost for cohort was \$26,454,246,811 or 86% of (allocatable) provincial health care spending in 2009.

Hospitalization costs remain a primary cost driver for total health care costs, irrespective of the number of health conditions, age groups and service types.

- Physician costs were the 2nd largest cost component for those aged under 65 years.
- Physicians accounted for only 15% of costs for those aged 65+ and continuing care costs became the 2nd largest cost component.

In Ontario, health care costs per capita rise exponentially with increased number of health conditions, especially when the number of conditions increases from 4 to 5 or more conditions

- An Incremental cost of multimorbidity in adults aged <65 with 5+ conditions was 10 times higher than those with only 2 conditions.
- An Incremental cost of multimorbidity in adults aged 65 or older with 5+ conditions was approximately 7 times higher than those with only 2 conditions.

Among multimorbid individuals, dementia was associated with the highest average costs per capita (\$26,722), followed by renal failure (\$20,655) and congestive heart failure (\$18,906) (data not shown in poster).

IMPLICATIONS

A longer life expectancy is associated with the presence of several simultaneously occurring diseases. The impact of multimorbidity on health care costs is therefore highly relevant for policymakers. In the context of escalating health care expenditures, findings from this study provide a first step in understanding the economic burden of multimorbid conditions in the Ontario.

Future studies should be conducted to forecast future costs of multimorbidity and corresponding demand for health services and to identify policy intervention (s) that effectively slow the growth of health care spending attributable to multimorbidity.

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