Income-related inequalities in falls injury hospitalizations in Canada: the case of seniors living with dementia

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Objectives

- Evaluate the degree of income-related inequality among Canadian seniors admitted to hospital for fall-related injury.

- Compare income-related inequality measures in two sub-populations – seniors with and without dementia.

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Background: Seniors and falls

- Falls often result in hospitalization and surgery, increased physical dependence, long-term care admissions and death.

- The direct health care costs for fall-related injuries are $2 billion annually.

- The per capita cost is 3.7 times higher for Canadian seniors than for non-seniors.

- Seniors **with dementia** have a higher risk of falls in both long-term care and the community, compared with other seniors.

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Methods: Definition of dementia

CIHI data holding	Description	Qualifying codes
Hospital Morbidity Database, 2012-2013 to 2015-2016	Dementia in Alzheimer's disease	ICD-10-CA: F000, F001, F002, F009
	Vascular dementia	ICD-10-CA: F010, F011, F012, F013, F018, F019
	Dementia in other diseases classified elsewhere	ICD-10-CA: F020, F021, F022, F023, F024, F028
	Unspecified dementia	ICD-10-CA: F03
	Alzheimer's disease	ICD-10-CA: G300, G301, G308, G309
Ontario Mental Health Reporting System, 2012-2013 to 2015-2016	Alzheimer's disease/vascular dementia	DSM-IV: 290, 2904, 29040, 29041, 29042, 29043, 2941, 29410, 29411, 2948

Exclusions:
- Individuals younger than 65 as of April 1, 2015
- Gender reported was neither male nor female
- Invalid health card numbers or issuing province
- Health cards issued by the Government of Canada

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Methods: Fall injury hospitalizations and inequality dimension

Inclusion criteria:

- **Presence of at least one ICD-10-CA code for falls from the range W00 to W19 with a corresponding diagnosis type = 9 (external cause of injury code)**

- **Separations from all acute care institutions (analytical institution type = 1)**

- **Separations occurring between April 1, 2015 and March 31, 2016**

Statistics Canada's Postal Code Conversion File Plus (PCCF+, version 6D) was used to assign patients to 5 income quintiles.
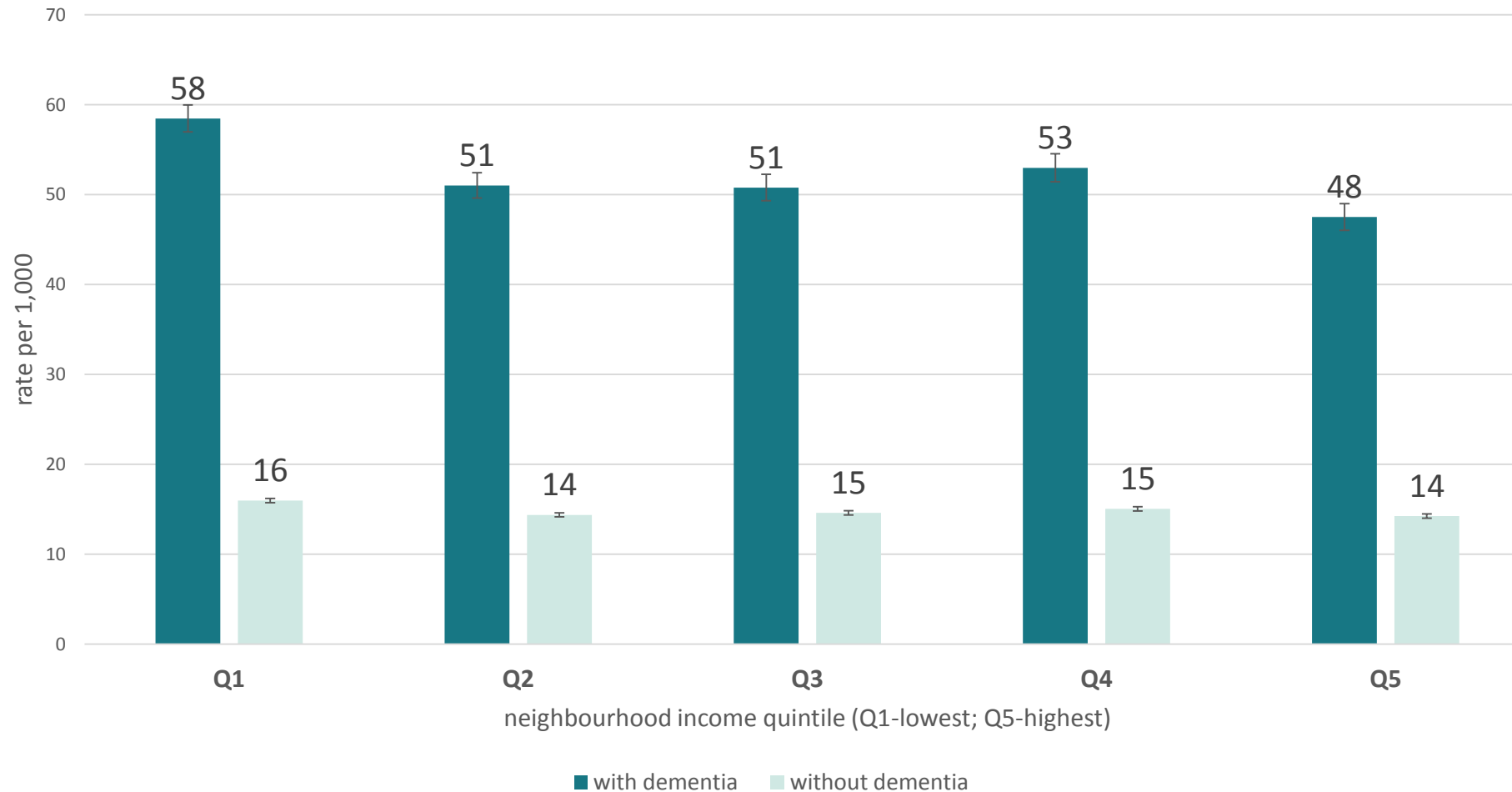
Income quintiles were determined using average neighbourhood-level income.

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Results: Cohort description

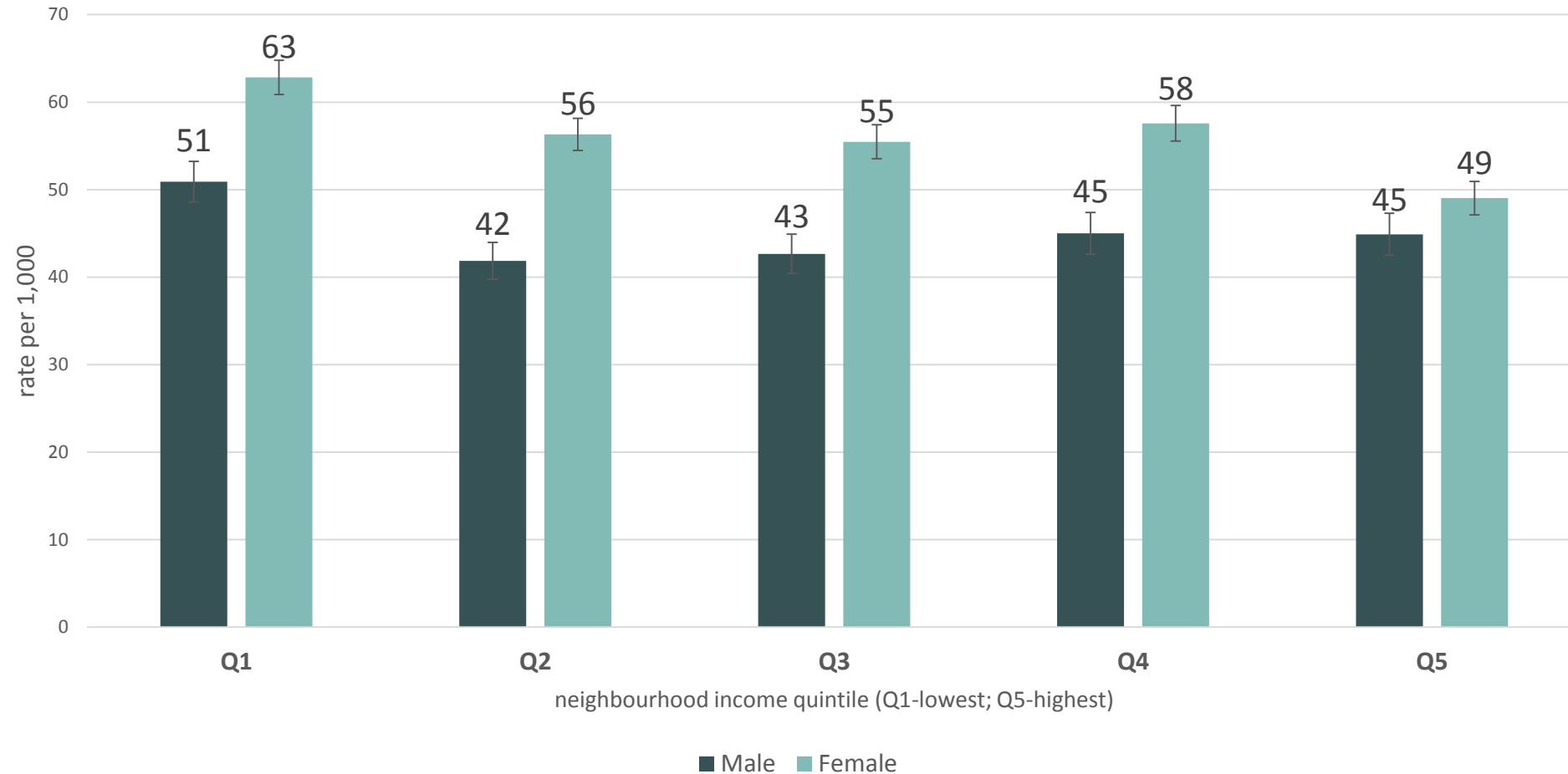|	Seniors with dementia	Seniors without dementia
Total population	431,179	5,355,728
In acute care hospitals:		
Had at least 1 hospitalization	88,305	732,858
Median age, years	85	76
Percent female	58%	51%
Total hospitalizations in 2015-16	142,813	1,090,923
- including fall-related	22,715 (15.9%)	80,227 (7.4%)
Hospitalization rate, fall-related, per 1,000	53	15

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Results: Seniors with and without dementia

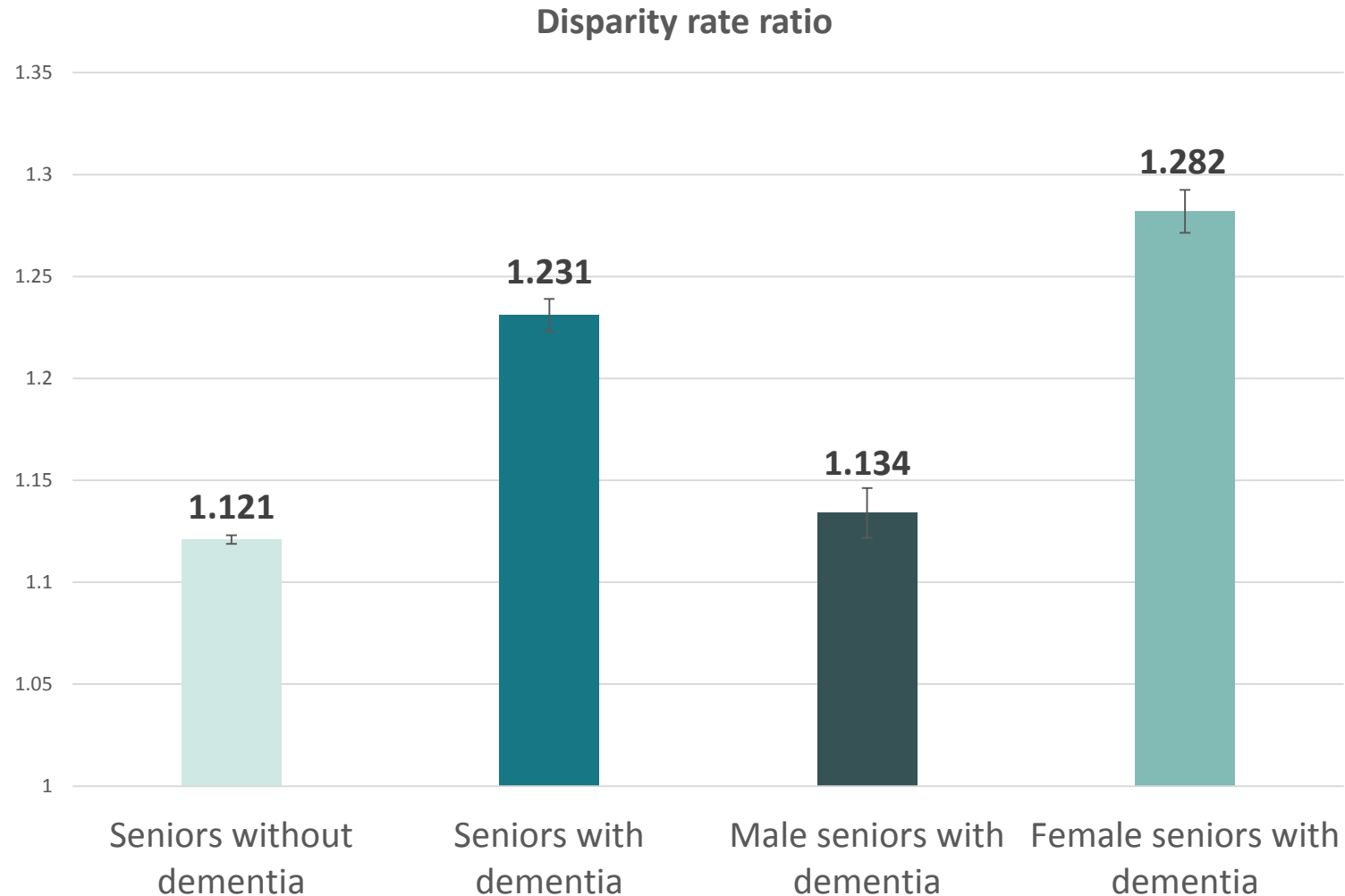Hospitalization rate for fall-related injuries, 2015-2016

■ with dementia ■ without dementia

rate per 1,000

neighbourhood income quintile (Q1-lowest; Q5-highest)

| Q1 | Q2 | Q3 | Q4 | Q5 |

with dementia: 58, 51, 51, 53, 48
without dementia: 16, 14, 15, 15, 14

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Results: Seniors with dementia by gender

Hospitalization rate for fall-related injuries, 2015-2016

Male   Female

neighbourhood income quintile (Q1-lowest; Q5-highest)

rate per 1,000

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Results: Income-related disparity measures

Disparity rate ratio

Category	DRR and 95% confidence limits
Seniors without dementia	1.121 (1.119 to 1.123)
Seniors with dementia	1.231 (1.223 to 1.239)
Male seniors with dementia	1.134 (1.122 to 1.146)
Female seniors with dementia	1.282 (1.271 to 1.292)

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Results: Potential Rate Reduction (PRR) and Population Impact Number (PIN)

- **PRR refers to the hypothetical scenario that each income group experienced the same rate as the highest income group.**

- **Actual rate = 52.7 hospitalizations per 1,000; hypothetical rate = 48.2 per 1,000**
  PRR = 8.5%

- **PIN is an absolute measure of the potential reduction in the number of cases of an outcome that would occur in the hypothetical scenario described above**
  PIN = 1,900 cases

- **Potential savings to the health care system approximately equal to $28 million (based on the estimated average cost per hospitalization $14,800)**

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Conclusion

- Seniors with dementia admitted to hospitals for fall-related injuries are **much older and predominantly female** compared to seniors without dementia admitted for the same reason.

- Differences in hospitalization rates across income quintiles are more pronounced among seniors with dementia compared to those without.

- **Female** seniors with dementia are **hospitalized for falls more often** than male and **experience greater inequality** by neighbourhood income.

- Disparity rate ratio is significantly greater among seniors with dementia. This difference is driven by disparity among female seniors.

- Tackling income-related inequalities may reduce fall-related hospitalizations and result in savings for the healthcare system.

Dementia in Canada

CIHI's digital report provides our first comprehensive look at this complex illness and its effects on seniors, caregivers and health systems.

It uses data and information from several sources, including the Public Health Agency of Canada.

The report allows users to interact with the content and includes 2 caregiver stories.

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Questions?

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