

Analysis in Brief

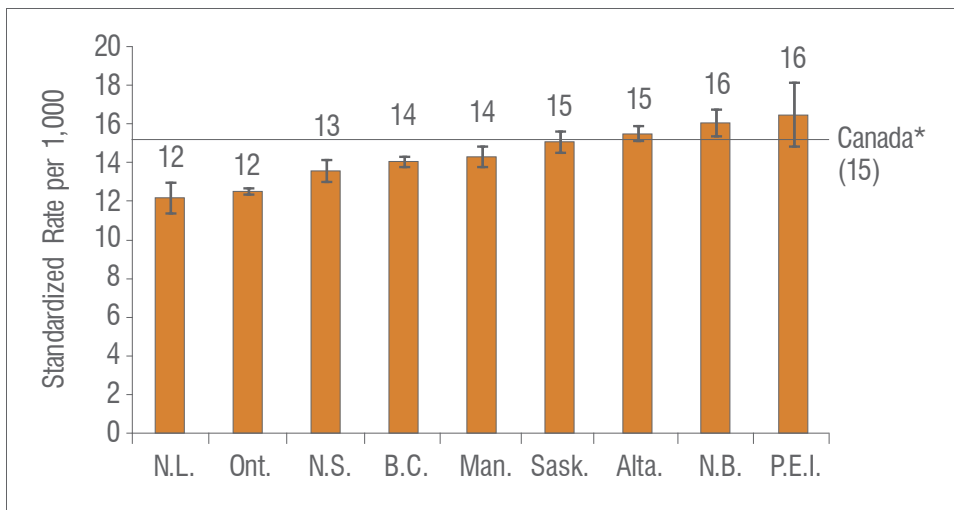
June 2010 **Types of Care**



Falls Among Seniors—Atlantic Canada

During 2007–2008, the age-standardized fall-related hospitalization rate for seniors was 12 per 1,000 for Newfoundland and Labrador, 13 per 1,000 for Nova Scotia and 16 per 1,000 for Prince Edward Island and New Brunswick.

Figure 1
Age-Standardized Fall-Related Hospitalization Rate for Seniors, 2007–2008



Notes

* Excluding Quebec residents.

Data from Nunavut, the Northwest Territories and the Yukon was suppressed due to small cell sizes.

Source

Discharge Abstract Database, 2007–2008, Canadian Institute for Health Information.

During 2007–2008 in Atlantic Canada, approximately 60% of seniors with fall-related hospitalizations fell at home, while 13% fell in a residential institution.

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Our Vision

To help improve Canada's health system and the well-being of Canadians by being a leading source of unbiased, credible and comparable information that will enable health leaders to make better-informed decisions.

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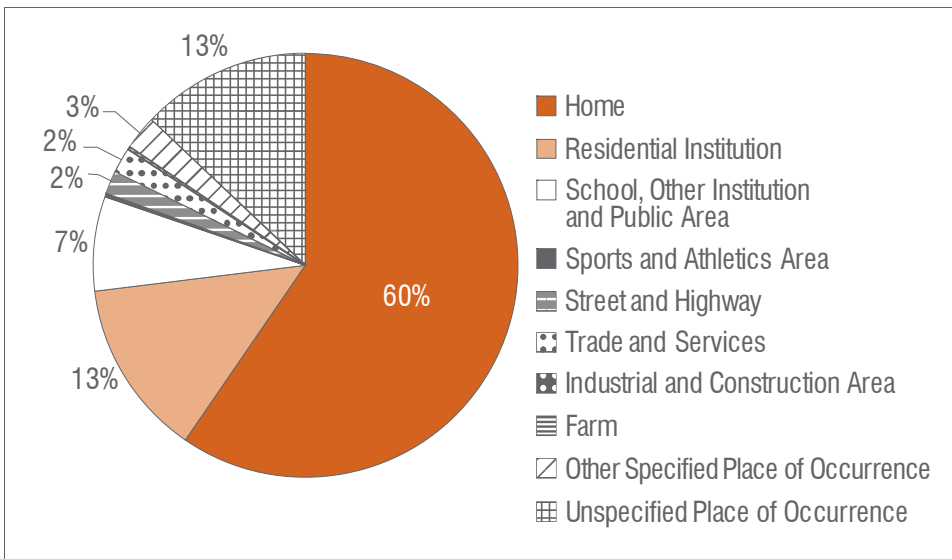
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Figure 2

Fall-Related Hospitalizations in Seniors by Injury Place,*
Atlantic Canada, 2007–2008



Note
* Excludes categories with less than 1% of data (Farm, Industrial and Construction area and Sports and Athletics area).

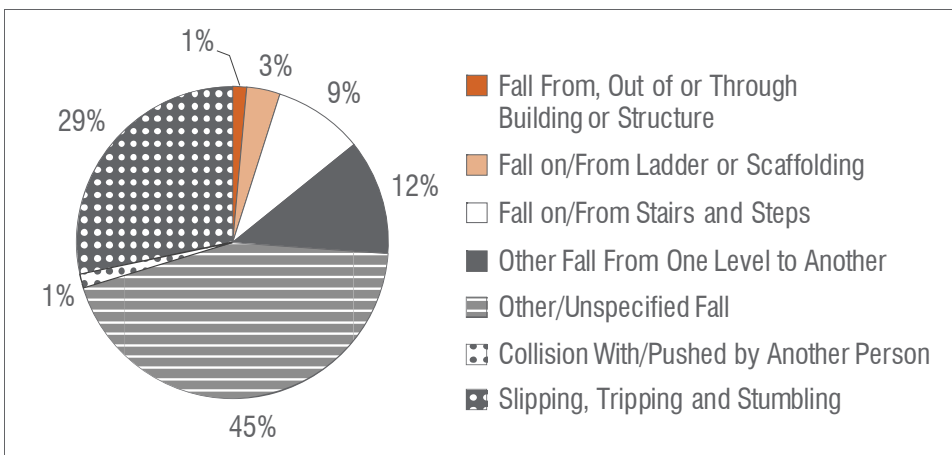
Source
Discharge Abstract Database, 2007–2008, Canadian Institute for Health Information.

The National Trauma Registry captures hospitalizations by specified types of injury, with additional subcategories further detailing types of unintentional falls. During 2007–2008 in Atlantic Canada, most hospitalizations due to unintentional falls were reported as *other/unspecified* or *slipping, tripping and stumbling*.

In New Brunswick, 74% of unintentional fall-related hospitalizations were a result of *slipping, tripping and stumbling* or were an *other/unspecified fall*. In Newfoundland and Labrador, 73% of unintentional fall-related hospitalizations were a result of an *other/unspecified fall* or *slipping, tripping and stumbling*, while Nova Scotia and P.E.I. unintentional fall-related hospitalizations were 72% and 77%, respectively.

Figure 3

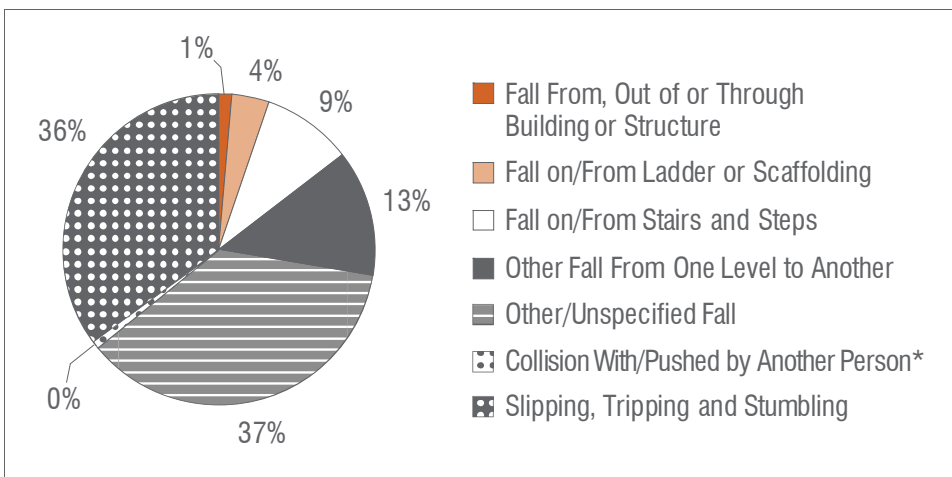
Percent of Hospitalizations Due to Unintentional Falls,
Specified Cause of Injury, New Brunswick, 2007–2008



Source
National Trauma Registry Minimum Data Set, 2007–2008, Canadian Institute for Health Information.

Figure 4

Percent of Hospitalizations Due to Unintentional Falls, Specified by Cause of Injury, Newfoundland and Labrador, 2007–2008

**Note**

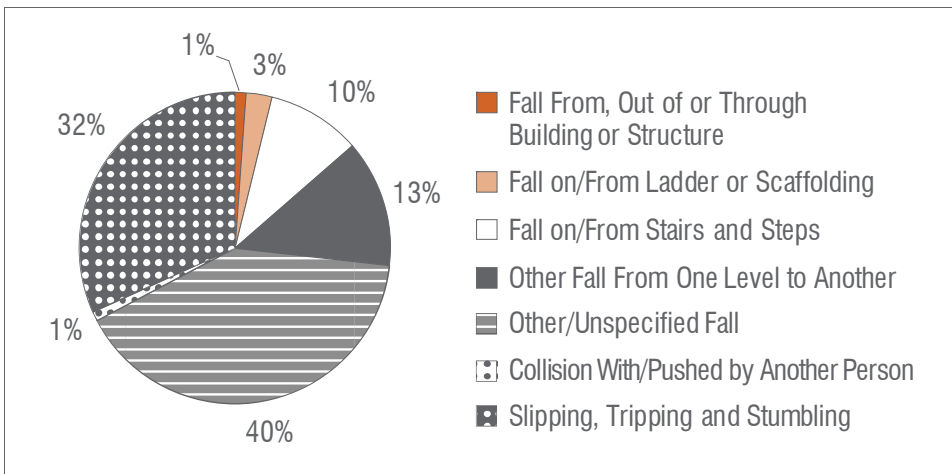
* Total excludes suppressed cells. Cell sizes less than 5 were suppressed.

Source

National Trauma Registry Minimum Data Set, 2007–2008, Canadian Institute for Health Information.

Figure 5

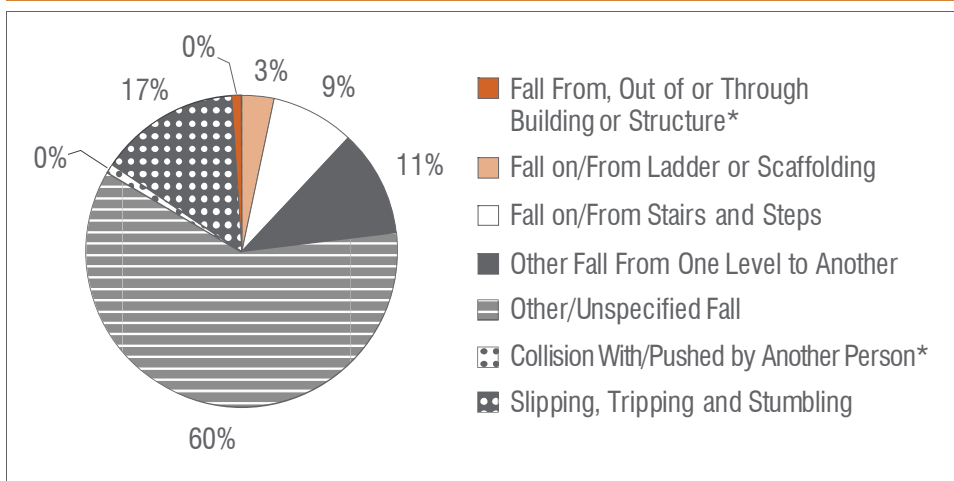
Percent of Hospitalizations Due to Unintentional Falls, Specified by Cause of Injury, Nova Scotia, 2007–2008

**Source**

National Trauma Registry Minimum Data Set, 2007–2008, Canadian Institute for Health Information.

Figure 6

Percent of Hospitalizations Due to Unintentional Falls, Specified by Cause of Injury, Prince Edward Island, 2007–2008



Note
* Total excluding suppressed cells; cell sizes less than 5 were suppressed.

Source
National Trauma Registry Minimum Data Set, 2007–2008, Canadian Institute for Health Information.

Table 1

All Hospitalizations by Unintentional Falls, 2007–2008

Cause of Injury Subgroup	N.L.	P.E.I.	N.S.	N.B.
Fall From, Out of or Through Building or Structure	23	N/R	41	51
Fall on/From Ladder or Scaffolding	68	21	100	120
Fall on/From Stairs and Steps	162	55	352	322
Other Fall From One Level to Another	230	70	484	411
Other/Unspecified Fall	642	382	1,474	1,543
Collision With/Pushed by Another Person	N/R	N/R	36	17
Slipping, Tripping and Stumbling	620	105	1,157	997
Total	1,745	633	3,644	3,461

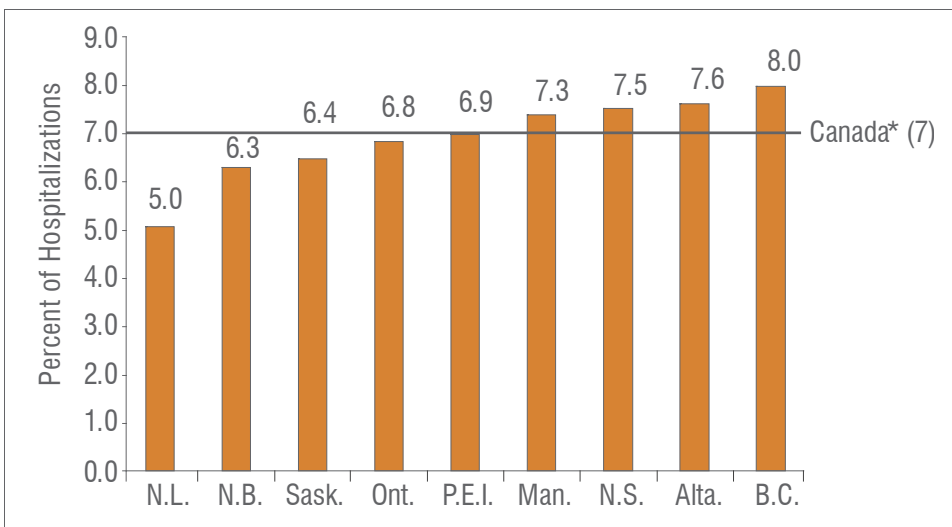
Note
N/R: not recorded due to cell size less than 5.

Source
National Trauma Registry, 2007–2008, Canadian Institute for Health Information.

In Canada, during 2007–2008, 7% of total hospitalizations for seniors were related to an unintentional fall. Results in Atlantic Canada during 2007–2008 indicated that 5% of total hospitalizations for seniors were related to an unintentional fall in Newfoundland and Labrador, 6.3% in New Brunswick, 6.9% in P.E.I. and 7.5% in Nova Scotia.

Figure 7

Percent of Total Hospitalizations for Seniors That Were Related to an Unintentional Fall, 2007–2008

**Notes**

* Excluding Quebec residents.

Data from Nunavut, the Northwest Territories and the Yukon was suppressed due to small cell sizes.

Source

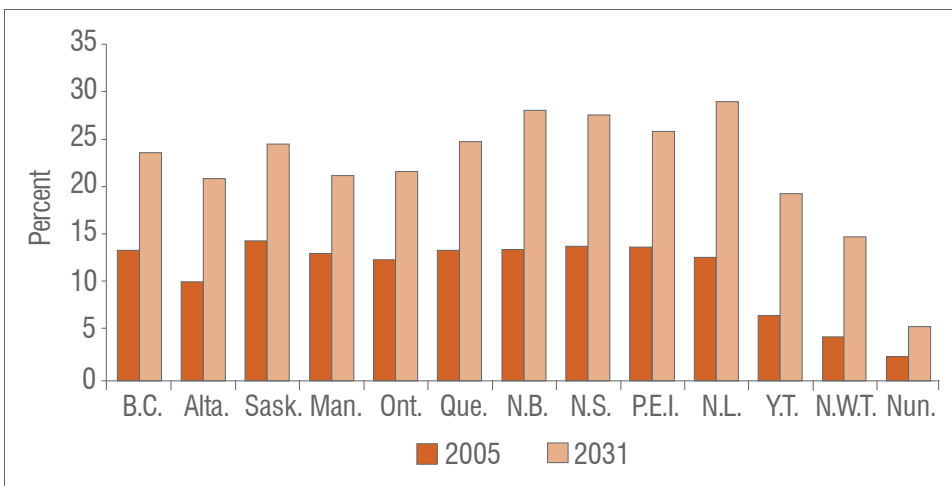
Discharge Abstract Database, 2007–2008, Canadian Institute for Health Information.

Aging Population

Approximately 13% of people currently residing in Atlantic Canada are age 65 and older. According to Statistics Canada, population projections for Canada indicate the “population share comprised of seniors will increase most within the Atlantic Provinces compared to all other regions.”¹ The share of the population comprised of seniors in Newfoundland and Labrador is projected to increase from 13% in 2005 to 29% by 2031. Similarly, the share of the population comprised of seniors in P.E.I. is projected to increase from 13% to 26%, that in Nova Scotia from 14% to 28% and that in New Brunswick from 14% to 28% over the same time frame.

Figure 8

Population Share Age 65 or Older by Province, 2005 and 2031 (Projection)

**Source**

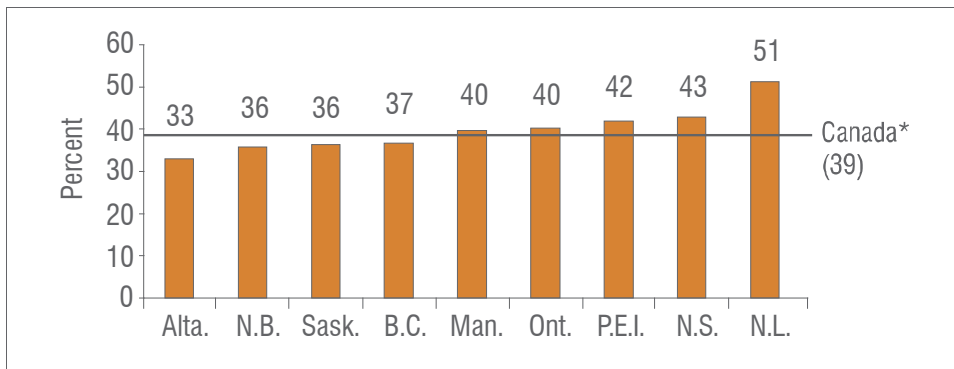
Statistics Canada, *Population Projections for Canada, Provinces and Territories, 2005–2031* (Ottawa, Ont.: Statistics Canada, 2005), catalogue no. 91-520-XIE.

Hospitalization

During 2007–2008 in Atlantic Canada, 43% of fall-related hospitalizations among seniors involved a hip fracture. Figure 9 depicts the percent of fall-related hospitalizations in seniors involving a hip fracture by province.

Figure 9

Percent of Fall-Related Hospitalizations in Seniors Involving a Hip Fracture, 2007–2008



Notes

* Excluding Quebec residents.

Data from Nunavut, the Northwest Territories and the Yukon was suppressed due to small cell sizes.

Source

Discharge Abstract Database, 2007–2008, Canadian Institute for Health Information.

Table 2

Wait Times for Hip Surgery, Risk-Adjusted Rate (Percent), 2007–2008

	N.L. (95% CI)	P.E.I. (95% CI)	N.S. (95% CI)	N.B. (95% CI)	Canada*
Proportion With Surgery Same or Next Day	62.8 (58.3–67.3)	67.1 (59.0–75.2)	62.5 (59.2–65.8)	67.7 (63.9–71.5)	62.5
Proportion With Surgery Same, Next or Day After	85.9 (82.5–89.4)	82.1 (75.9–88.2)	80.0 (77.5–82.6)	84.4 (81.5–87.3)	83.3

Note

* Rates for Quebec are not included due to differences in data collection.

Source

Canadian Institute for Health Information, *Health Indicators 2009* (Ottawa, Ont.: CIHI, 2009).

Approximately 83% of patients in Canada received surgery to repair a hip fracture within the first three days of admission, with 62% of patients receiving surgery within the first two days of admission. Most Atlantic provinces met the national average wait time for hip surgery in 2007–2008.

Using an interactive tool known as the Patient Cost Estimator, publicly available on CIHI's website, the average estimated cost per defined Case Mix Group is calculated by province for this region. Within Atlantic Canada during 2007–2008, the average estimated cost for fixation repair of hip/femur among seniors was \$12,253, while the average estimated cost for hip replacement with trauma among seniors was \$14,778.

Table 3

Estimated Average Cost (Dollars) by Case Mix Type, 2007–2008

		N.L.	P.E.I.	N.S.	N.B.	Atlantic Canada	Canada
Fixation Repair, Hip/Femur	Age 60–79	11,490	9,352	12,789	11,952	11,396	11,807
	Age 80+	13,748	11,086	14,229	13,381	13,748	13,451
Hip Replacement With Trauma	Age 60–79	13,841	11,671	13,639	17,077	14,057	14,443
	Age 80+	18,216	14,074	14,229	15,479	15,500	15,943

Source

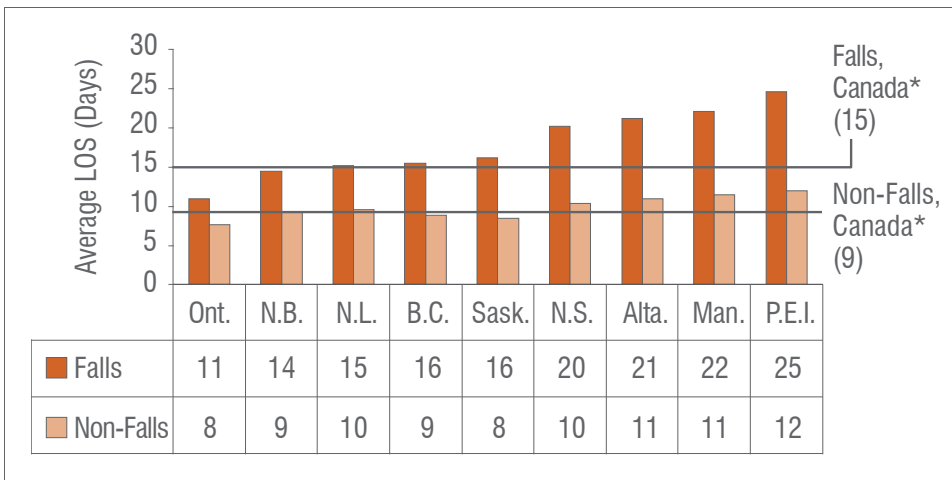
Patient Cost Estimator, 2007–2008, Canadian Institute for Health Information.

Recovery/Length of Stay

In Canada during 2007–2008, seniors admitted to hospital with a fall-related injury stayed an average of 15 days before being discharged. In Atlantic Canada during the same year, the provincial average length of stay ranged from 14 to 25 days for seniors admitted to hospital with a fall-related injury.

Figure 10

Average Senior Length of Stay for Fall-Related Hospitalizations Versus All Other Hospitalizations, 2007–2008



Notes

* Excluding Quebec residents.

Data from Nunavut, the Northwest Territories and the Yukon was suppressed due to small cell sizes.

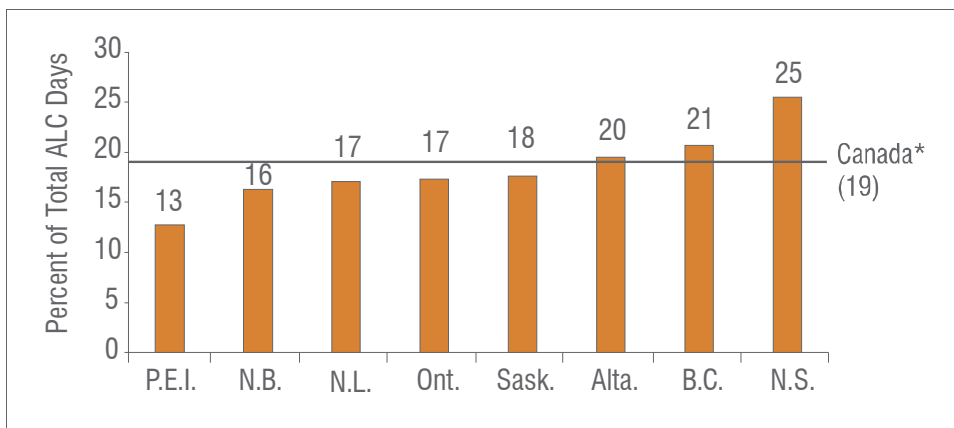
Source

Discharge Abstract Database, 2007–2008, Canadian Institute for Health Information.

“Alternate level of care,” or ALC, is a term used to describe time an inpatient spends in a hospital setting when the acute portion of stay is complete but he or she continues to occupy a hospital bed for a variety of reasons. These non-acute hospital days capture hospital beds that are being occupied by patients who no longer need acute services, using limited, expensive resources while they wait to be discharged to a more appropriate setting.²

Figure 11

Percent of Total ALC Days for Seniors With Fall-Related Hospitalizations, 2007–2008



Notes

* Excluding Quebec residents.

Data from Nunavut, the Northwest Territories and the Yukon was suppressed due to small cell sizes.

Manitoba data was excluded due to coding issues (rehabilitation beds began to be systematically coded as alternate level of care in 2006–2007).

Source

Discharge Abstract Database, 2007–2008, Canadian Institute for Health Information.

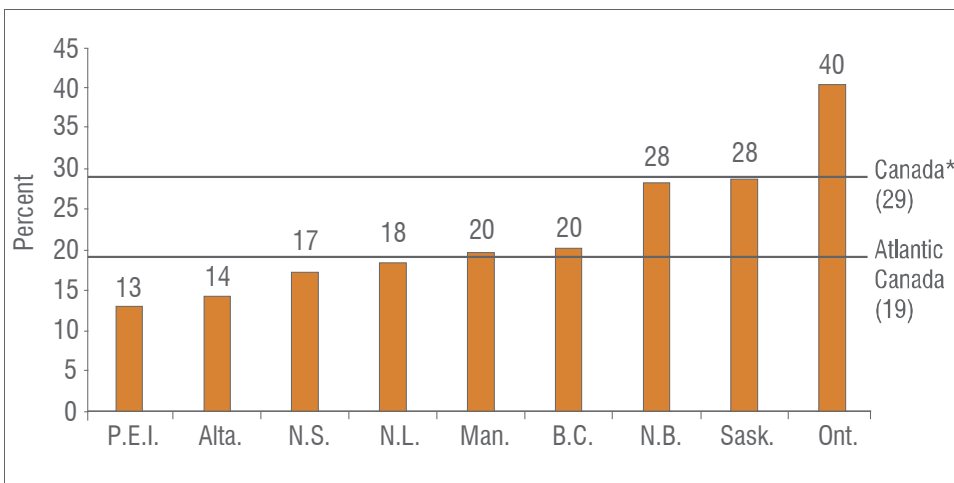
Seniors hospitalized due to a fall-related injury accounted for 19% of ALC days in Canada during 2007–2008. Within Atlantic Canada, seniors hospitalized with fall-related injuries accounted for 13% of ALC days in P.E.I., 16% and 17%, respectively, in New Brunswick and Newfoundland and Labrador, and 25% in Nova Scotia. As mentioned in the analysis *Alternate Level of Care in Canada, 2009*, produced by CIHI, “sources of variation are not well understood. Differences in funding and available system capacity for different kinds of care may account for some of the variation. However, in addition to differences in patient care, ALC variation may arise from differences in documentation and data collection.”²

Unable to Return Home

In 2007–2008, 19% of seniors living in a non-residential setting within Atlantic Canada were transferred to a residential care facility after a fall-related hospitalization (Figure 12 provides results by province). Availability of suitable home supports and access to a residential care facility could influence the time a senior occupies an acute care facility bed or where he or she might live upon discharge from hospital. Cuming et al. suggest a fall can cause a loss of confidence and decreased activity level, which can lead to a decline in health and function and contribute to future falls with more serious outcomes.³

Figure 12

Percent of Non-Residential Falls Transferred to Residential Care After a Fall-Related Hospitalization, 2007–2008



Notes

* Excluding Quebec residents.

Data from Nunavut, the Northwest Territories and the Yukon was suppressed due to small cell sizes.

Source

Discharge Abstract Database, 2007–2008, Canadian Institute for Health Information.

Discussion

Many factors are attributed to increasing the risk of falls among seniors. Recent reports by the Public Health Agency of Canada and the World Health Organization place risk factors into four main categories: biological, behavioural, environmental and socio-economic. Table 4 provides a summary of common risk factors often associated with falling among seniors. Muscle weakness and decreased physical function are found to be the most important risk factors, increasing the risk of falling by four to five times.⁴

Best practice frameworks are available in the literature that focus on prevention strategies to address falls among seniors. According to the World Health Organization, an “effective fall prevention program offered by trained health care professionals should include; education, exercise, medication review and adjustments, vision assessment and correction along with home safety assessment and modifications.”⁵ Guidelines for preventing falls in older persons released by the American Geriatrics Society support a multidimensional approach that effectively addresses commonly known risk factors associated with falling.⁴

Table 4

Common Risk Factors Associated With Falling Among Seniors

Biological	Behavioural	Environmental	Socio-Economic
<ul style="list-style-type: none"> • Muscle weakness • Impaired balance/gait • Vision changes • Chronic illness • Physical disability • Acute illness • Cognitive impairment • Depression 	<ul style="list-style-type: none"> • Previous falls • Risk-taking behaviour • Certain medications • Polypharmacy • Excessive alcohol • Footwear, clothing • Inactivity and inadequate diet • Fear of falling 	<ul style="list-style-type: none"> • Stairs • Factors in and around the home • Factors in public environments • Fall hazards in long-term care settings and hospitals • Assistive devices 	<ul style="list-style-type: none"> • Income • Education • Housing • Social connectedness

Source

Public Health Agency of Canada, Division of Aging and Seniors, *Report on Seniors' Falls in Canada* (Ottawa, Ont.: PHAC, 2005).

In 2004, Accreditation Canada introduced a required organizational practice involving falls prevention that “requires a facility to implement and evaluate a fall prevention strategy to minimize the impact of client falls.”⁶

Decision-makers in Atlantic Canada are addressing falls prevention among seniors through various means. Collectively, the Atlantic Collaborative for Injury Prevention holds a wide mandate to facilitate the coordination of injury prevention activities within Atlantic Canada.

The Nova Scotia provincial government’s Department of Health Promotion and Protection released *Preventing Falls Among Older Nova Scotians: A Strategic Framework* in 2007. It provides a comprehensive long-term plan aimed at reducing falls and fall-related injuries among the senior population of Nova Scotia. A Falls Risk Assessment Framework is also available through the government’s website. This is a comprehensive assessment based on evidence-based information gathered through a review of the literature and prepared by a Falls Assessment Working Group under the auspices of the Provincial Osteoporosis Project established in 2004. The province of Nova Scotia employs a provincial falls prevention coordinator to manage a Preventing Falls Together program. Preventing Falls Together is a province-wide program of Community Links, funded by Nova Scotia Health Promotion and Protection. The program’s goal is to reduce falls among seniors in Nova Scotia. The program involves working with individuals and organizations in their communities to promote falls awareness and to take action to reduce risks and hazards that may contribute to falls. Individual district health authorities may also employ a falls prevention or injury prevention coordinator. A Provincial Intersectoral Falls Prevention Committee is also in place in the province.

New Brunswick’s provincial seniors’ resource centre offers a falls prevention initiative incorporated into a project known as Go Ahead Seniors. Go Ahead Seniors is a provincial, bilingual, non-profit organization incorporated in 1996. Falls prevention education is part of the Healthy Active Living program sponsored by the government of New Brunswick. Individual efforts to address this issue from a prevention perspective may also exist. For example, each spring in Saint John, New Brunswick, health professionals provide education sessions during a week-long event known as the Seniors Expo.

In Newfoundland and Labrador, injury prevention, with a focus on unintentional injury, is one of the priority areas identified in *Achieving Health and Wellness: Provincial Wellness Plan for Newfoundland and Labrador*. The focus for injury prevention in Phase II of the Provincial Wellness Plan will be on building knowledge, capacity and structures to support injury prevention partners in the province to address injury issues. In the province’s regional health authorities, interdisciplinary team members incorporate health promotion measures and support related to falls prevention in their professional practice. Further, the regional health authorities, through their health promotion divisions, either employ injury prevention coordinators or have identified positions with responsibility for injury prevention in the community. Provincial wellness grants support community-based initiatives with a focus on preventing falls in seniors.

Prince Edward Island’s Network for Injury Prevention is interested in and involved with any area of injury prevention, from early childhood to late adulthood. In 2009, a Senior Research Forum sponsored by the P.E.I. Seniors’ Secretariat and the P.E.I. Population Aging Initiative enabled local stakeholders to discuss many issues, including falls among seniors.

Across Atlantic Canada, a Falls Prevention Training Curriculum is offered by various agencies. The curriculum provides those working with older adults the knowledge and skills to apply an evidence-based approach to preventing falls and fall-related injuries.⁷ The Canadian Falls Prevention Training Curriculum is an evaluated course, developed by a team of experts in falls prevention, adult education and clinical practice under the leadership of Dr. Vicky Scott and Dr. Elaine Gallagher (B.C. Injury Research and Prevention Unit), with funding provided by the Public Health Agency of Canada’s Population Health Fund.

In addition to falls prevention strategies, decision-makers are also addressing the changed care needs that often occur after a fall. During 2007–2008 in Canada, 29% of seniors living outside residential care were transferred to residential care after an admission to hospital with a fall-related injury. Seniors admitted to hospital with a fall-related injury stay in hospital on average six days longer than seniors admitted to hospital without a fall-related injury. It is estimated that seniors admitted to hospital in Canada with a fall-related injury account for 19% of total ALC days for all seniors admitted to hospital.

To address changed care needs after a senior is discharged from hospital as a result of a fall-related injury, decision-makers are reviewing bed capacity in residential care facilities along with availability of and access to home supports. Within Atlantic Canada, provinces are employing a number of strategies to address changes in the care needs of seniors after being admitted to hospital with a fall-related injury, such as increasing the number of long-term care beds in the provinces, along with creating more home care supports for seniors.

Through New Brunswick's Extra-Mural Program, persons are eligible to receive up to 30 days of home support services to enable them to return home while waiting for a long-term care assessment.

In Nova Scotia, as part of the government's 10-year continuing care strategy, the province plans to add more than 1,300 new long-term care beds across the province by 2016.

Newfoundland and Labrador offers a two-week short-term acute home care program that provides certain medication and home assistance free of charge to individuals who have undergone hip and knee surgery. The government recently introduced a new financial assessment process to determine eligibility for a home support subsidy; one of the objectives is to improve accessibility to home support services.

The Public Health Agency of Canada's division of Aging and Seniors produced an inventory of falls prevention initiatives across Canada in 2005. This document, along with additional resources, is available on its website at www.phac-aspc.gc.ca/index-eng.php.

Conclusion

Canada's population is aging. Individuals age 80 and older are the fastest-growing age group within the senior population. It is expected that individuals age 65 and older will represent 25% of the population by 2050.⁸ As reported by SMARTRISK in the report *The Economic Burden of Injury in Canada, 2009*, "falls were the leading cause of overall injury costs in Canada in 2004, accounting for \$6.2 billion or 31% of total injury costs."⁹

In 2007–2008, seniors in **Canada** (excluding Quebec) accounted for 13% of the total population.

- Seven percent of total hospitalizations among seniors were related to an unintentional fall.
- Thirty-nine percent of fall-related hospitalizations involved a hip fracture.
- On average, patients admitted with a fall-related hospitalization stayed six days longer than all other hospitalizations.
- Seniors hospitalized due to falls accounted for 19% of total ALC days.
- Twenty-nine percent of non-residential care patients transferred to residential care after a fall-related hospitalization.

In 2007–2008, seniors in **New Brunswick** accounted for 15% of the total population.

- Six percent of all hospitalizations were related to an unintentional fall.
- Sixteen percent of ALC days were related to hospitalizations for an unintentional fall.
- Twenty-eight percent of non-residential care patients transferred to a residential care facility after a fall-related hospitalization.
- Thirty-six percent of fall-related hospitalizations involved a hip fracture.

In 2007–2008, seniors in **Nova Scotia** accounted for 15% of the total population.

- Eight percent of all hospitalizations were related to an unintentional fall.
- Twenty-five percent of ALC days were related to hospitalization for an unintentional fall.
- Seventeen percent of non-residential care patients transferred to a residential care facility after a fall-related hospitalization.
- Forty-three percent of all fall-related hospitalizations involved a hip fracture.

In 2007–2008, seniors in **Prince Edward Island** accounted for 14% of the total population.

- Seven percent of all hospitalizations were related to an unintentional fall.
- Thirteen percent of ALC days were related to hospitalization for an unintentional fall.
- Thirteen percent of non-residential care patients transferred to a residential care facility after a fall-related hospitalization.
- Forty-two percent of fall-related hospitalizations involved a hip fracture.

In 2007–2008, seniors in **Newfoundland and Labrador** accounted for 14% of the total population.

- Five percent of hospitalizations were related to an unintentional fall.
- Seventeen percent of ALC days were related to hospitalization for an unintentional fall.
- Eighteen percent of non-residential care patients transferred to a residential care facility after a fall-related hospitalization.
- Fifty-one percent of fall-related hospitalizations involved a hip fracture.

About the Data

Data in this report was obtained primarily from CIHI's Discharge Abstract Database. This database captures administrative, clinical and demographic information on inpatient events from acute care hospitals in Canada. Consequently, this data captures information only on seniors hospitalized as a result of a fall. A single source containing data on all falls among the senior population in Canada is not currently available. Additional information about falls among seniors who were not hospitalized is available in the Continuing Care and Home Care reporting systems at CIHI. These data holdings are growing in depth and breadth at present. In the future, as more facilities contribute, these databases will offer opportunities to garner a better understanding of falls among seniors in residential and home care settings.

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P.E.I.: Sally Lockhart, Island Network for Injury Prevention

Nova Scotia: Julian B. Young, Coordinator, Injury Prevention and Control, Department of Health Promotion and Protection

New Brunswick: Janice Campbell, Primary Health Care Consultant, Department of Health; Heather Oakley, Facility Director, St. Joseph's Health Facility; and Jean-Claude Cormier, Program Director, Go Ahead Seniors Program

Appendix A: Technical Notes

Data Sources

Hospitalization data was obtained from CIHI's Discharge Abstract Database (DAD). This database captures administrative, clinical and demographic information on inpatient events from acute care hospitals in Canada. Hospitalizations (that is, episodes of care—see below) for all acute care discharges that occurred between April 1, 2006, and March 31, 2008, were derived; hospitalizations were selected if the discharge date associated with the final record in an episode of care was between April 1, 2007, and March 31, 2008.

Population share projection data was obtained from the Statistics Canada report *Population Projections for Canada, Provinces and Territories, 2005–2031*.¹⁰

Costing data was located using the Patient Cost Estimator, a new interactive tool developed by CIHI to estimate the average cost of various services provided in hospitals. This new tool provides information nationally, by province and by patient age group. The cost estimates represent the estimated average cost of services provided to the average patient. They include the costs incurred by the hospital in providing services and exclude all physician fees, since physicians are normally paid directly by the province and not by the hospital. The Patient Cost Estimator uses 2007–2008 data from both DAD and the Canadian MIS Database, combined using CIHI's CMG+ inpatient grouping methodology.

Wait time data was obtained from *Health Indicators 2009*.¹¹ The primary source of this data is DAD.

Data on specific types of unintentional falls was obtained from the National Trauma Registry using the Quick Stats feature available on CIHI's website. The National Trauma Registry provides national statistics on injuries in Canada. Data is provided by the Hospital Morbidity Database (HMDB), provincial trauma registries and trauma centres in Canada. The minimum data set includes demographic, diagnostic and procedural information on all admissions to acute care hospitals in Canada due to injury. The HMDB is populated by a subset of DAD data for those provinces and territories that submit discharge statistics to DAD. The HMDB is unique in that it appends data from non-DAD jurisdictions to be nationally comprehensive.

Methodology

The unit of analysis was hospitalizations. To account for transfers from one acute hospital to another, discharge records were combined to build episodes of care. A discharge record was considered a transfer if a) a transfer to or from an acute facility was indicated in the discharge record; or b) admission to an acute facility occurred within 12 hours before or after another acute care discharge.

Linkage process

The linkage process involved merging all DAD discharge records that had an exact match on a) encrypted health card number; b) province issuing health card; and c) year of birth.

Inclusion criteria

- Acute care discharges
- Age is greater than or equal to 65
- Gender is male or female

Exclusion criteria

Because we used encrypted health card numbers to link patient records, we excluded hospital records without a uniquely identifiable health card number (that is, the health card number was not submitted or patients were from out of country or under federal care).

Hospitalizations with unknown age, unknown gender and/or gender coded as *other* were excluded.

Definitions of Terms

Acute care

The portion of a hospitalization's total length of stay in which active treatment is received.

Age

Patient age, in years, at the time of admission.

Age-standardization

Age-standardized rates were calculated using the direct standardization method. Statistics Canada's 1991 population was used as the standard population.

Alternate level of care

The portion of a hospitalization's total length of stay which is non-acute. These non-acute hospital days capture hospital beds that are being occupied by patients who no longer need acute services, using limited, expensive resources while they wait to be discharged to a more appropriate setting.

Discharge disposition

A component of DAD that denotes the place where the patient went after leaving the hospital. Discharge disposition categories are as follows:

- Transferred to acute care
- Transferred to long-term care facility
- Transferred to other—palliative care
- Discharged to a home setting with support
- Discharged home
- Signed out
- Died

For this analysis, discharge disposition was determined by the final abstract in the episode of care.

Fall-related hospitalization

Hospitalizations from acute care hospitals in Canada involving an unintentional fall as defined by select ICD-10-CA codes. The variable was derived by looking across all diagnosis codes in the discharge records associated with a given episode of care. External cause of injury codes used to identify unintentional falls were ICD-10-CA codes W00 to W19.

Hip fracture

Hospitalizations from acute care hospitals in Canada involving a hip fracture as defined by select ICD-10-CA codes. The variable was derived by looking across all diagnosis codes in the discharge records associated with a given episode of care. ICD-10-CA codes used to indicate a hip fracture were S72.0, S72.1 and S72.2.

In-hospital deaths

An admitted patient who dies during his or her hospital stay, after admission but before discharge. Deaths that occur at the scene, during transport to hospital or in the emergency department before admission to hospital are not captured.

Injury hospitalizations

Hospitalizations from acute care hospitals in Canada involving an injury as defined by select ICD-10-CA codes. The variable was derived by looking across all diagnosis codes in the discharge records associated with a given episode of care. External cause of injury codes used to identify injury hospitalizations were as follows:

- V01 to V99 Transport incidents
- W00 to W19 Unintentional falls
- W20 to W45, W49 Exposure to inanimate mechanical forces
- W50 to W60, W64 Exposure to animate mechanical forces
- W65 to W70, W73, W74 Unintentional drowning and submersion
- W75 to W77, W81, W83, W84 Other unintentional threats to breathing except due to inhalation of gastric contents, food or other objects
- W85 to W94, W99 Exposure to electric current, radiation and extreme ambient air temperature and pressure
- X00 to X06, X08, X09 Exposure to smoke, fire and flames
- X10 to X19 Contact with heat and hot substances
- X30 to X39 Exposure to forces of nature
- X50 Overexertion and strenuous or repetitive movements
- X52 Prolonged stay in weightless environment
- X58, X59 Unintentional exposure to other and unspecified factors
- X70 to X84 Intentional self-harm, excluding poisoning
- X86, X91 to X99, Y00 to Y05, Y07 to Y09 Assault, excluding poisoning
- Y20 to Y34 Event of undetermined intent, excluding poisoning
- Y35, Y36 Legal intervention and operations of war

Injury place

A component of the ICD coding system that denotes the place where the injury occurred. Injury place categories are as follows:

- U98.0 Home
- U98.1 Residential institution
- U98.2 School, other institution and public area
- U98.3 Sports and athletics area
- U98.4 Street and highway
- U98.5 Trade and services
- U98.6 Industrial and construction area
- U98.7 Farm
- U98.8 Other specified place of occurrence
- U98.9 Unspecified place of occurrence

For this analysis, injury place was determined by the first abstract in the episode of care.

Population

The reference population used to calculate rates was forecast, assuming a linear increase, using Statistics Canada's census populations from 2001 and 2006.

Province

The province that issued the patient's health card.

Wait time for hip fracture surgery¹¹

Proportion with surgery same or next day: Risk-adjusted proportion of hip fracture patients age 65 and older who underwent hip fracture surgery on the day of admission or the next day.

Proportion with surgery same, next day or day after: Risk-adjusted proportion of hip fracture patients age 65 and older who underwent hip fracture surgery on the day of admission, the next day or the day after that.

Denominator

The number of hip fracture patients age 65 and older who underwent hip fracture surgery in an acute care hospital.

Inclusion criteria

1. a) Hip fracture ICD-10-CA code S72.0, S72.1 or S72.2 as the most responsible diagnosis (MRDx) and not also as diagnosis type (2); or
 - b) Another diagnosis coded as MRDx and also as type (2) and a diagnosis of hip fracture coded as diagnosis type (1), (W), (X) or (Y) and not also as diagnosis type (2); or
 - c) Convalescence or rehabilitation ICD-10-CA codes Z50.1, Z50.8, Z50.9, Z54.0, Z54.4, Z54.7, Z54.8 and Z54.9 coded as MRDx and hip fracture coded as diagnosis type (1), (W), (X) or (Y) and not also as type (2).
2. Criterion 1 (a, b or c) along with a relevant CCI procedure codeⁱ
 - a) 1.VA.74.^.^ Fixation, hip joint
 - b) 1.VA.53.^.^ Implantation of internal device, hip joint
 - c) 1.VA.73.^.^ Reduction, hip joint
 - d) 1.VC.74.^.^ Fixation, femur
 - e) 1.SQ.53.^.^ Implantation of internal device, pelvis
3. Age at admission 65 and older
4. Gender recorded as male or female
5. Admission to an acute care institution
6. Admission category recorded as emergent/urgent
7. Canadian resident

Exclusion criteria

1. Records with an invalid health card number
2. Records with an invalid date of birth
3. Records with an invalid admission date
4. Records with an invalid procedure date
5. Discharged as self sign-out
6. Records where hip fracture was coded as post-admission diagnosis—diagnosis type (2)
7. Hip fracture cases with no hip fracture surgery within the same fiscal year
8. Patients with hip fracture admission within the last two weeks of the previous fiscal year—admissions to hospital between March 16 and 31 (the last two weeks of the fiscal year) were excluded to allow for sufficient follow-up. (In 2005–2006 data, 99% of hip fracture patients who underwent hip fracture surgery had their procedure done within two weeks.)

i. Code may be recorded in any position. Procedures with status attribute A (abandoned after onset) or OOH indicator flag Y (out-of-hospital intervention) were excluded.

Numerator

A subset of the denominator according to one of two available definitions; represents the number of patients who underwent hip fracture surgery *on the same/next day* or *the same/next day/day after*.

Two separate logistic regression models were fitted with age, sex and selected pre-admission comorbid diagnoses (heart failure, ischemic heart disease, hypertension, chronic obstructive pulmonary disease, diabetes with complications and cardiac dysrhythmia) as independent variables, one modelling the probability of having hip fracture surgery *on the same/next day* and the second one modelling the probability of having hip fracture surgery *on the same/next day/day after*. Coefficients derived from the logistic models were used to calculate the probability for each case. The expected number of patients in a region was the sum of these case probabilities for that region. The risk-adjusted proportion was calculated by dividing the observed number by the expected number of cases and multiplying by the Canadian average. A 95% confidence interval was also calculated; the method used to calculate confidence intervals is available upon request. The model specifications for the list of variables entered in the model and coefficient values are available upon request.

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