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## Seniors' Use of Emergency Departments in Ontario, 2004–2005 to 2008–2009

### Introduction

One recurring theme in health care discussions in Canada and elsewhere involves the potential demand that an aging population may place on the system. Despite much research to the contrary,<sup>1–3</sup> many believe that because the aging population is growing in numbers, its demand for care will outstrip the capacity of the health care system. This concern is fuelled by the fact that many seniors suffer from chronic health conditions<sup>4</sup> and that over time these conditions are, typically, more expensive to treat.<sup>5</sup>

This Analysis in Brief adds to the discussion by reviewing the trend of emergency service use by seniors (age 65 and older) in Ontario, the only province for which CIHI has comprehensive trend information. It provides a focused look at the changes in seniors' emergency department (ED) visit volumes, triage levels and acute care admission rates through EDs from 2004–2005 to 2008–2009. It also considers changes in volumes of seniors' ED visits for ambulatory care sensitive conditions (ACSCs) and the costs of ED visits overall.

### Key Findings

- Rates of ED visits by seniors increased slightly (1.5%) between 2004–2005 and 2008–2009. Overall visit rates increased by 2%.
- The proportion of seniors triaged at the highest levels of urgency (resuscitation or emergent) increased between 2004–2005 and 2008–2009, from 19% to 22%. This change in proportion could be due to changes in coding practices and does not necessarily suggest an increase in the severity of illness being seen in EDs.
- Although the proportion of those triaged as critical (resuscitation or emergent) increased, hospital admissions through EDs decreased. The decline was most notable for seniors, decreasing from 28% in 2004–2005, to 25% in 2008–2009; an increasing proportion was either discharged home or transferred to other facilities over a similar period.

# Analysis in Brief

Taking health information further

- ACSCs accounted for 9% of seniors’ visits to EDs in 2008–2009; in 2004–2005, they accounted for 10% of visits. Overall, seniors’ visits for ACSCs were triaged at higher urgency levels and resulted in greater hospitalization rates when compared to overall visits for seniors.
- The proportion of seniors’ visits for ACSCs triaged as critical (resuscitation or emergent) increased from 39% to 44% between 2004–2005 and 2008–2009. Concurrently, hospital admissions decreased from 52% to 48% for seniors’ ACSC-related visits.
- Seniors’ rates of ED visits varied by local health integration network (LHIN); seniors’ rates of visits for ACSCs also varied.
- The average cost of an ED visit was \$260 in 2007–2008. This cost was higher for seniors, with an average visit cost of \$386.
- Costs associated with ACSCs tended to be higher than average ED costs overall.

## Methodology

Analyses were completed based on National Ambulatory Care Reporting System (NACRS) data submitted from Ontario hospitals between 2004–2005 and 2008–2009. In 2008–2009, 178 Ontario hospitals submitted ED data to NACRS. Analyses were restricted to Ontario residents who made unplanned and unscheduled visits to EDs, as defined within NACRS. All analyses were based on the fiscal year, which runs from April 1 to March 31.

The population estimates were obtained for 2004 to 2008 from Statistics Canada and were used in the per capita analyses. LHIN-level analyses used the 2004, 2007 and 2008 Statistics Canada population estimates. All rates were age–sex standardized to the 2001 Ontario census population.

## Definitions

**Age groups:** There are three age groups: adults (20 to 64), seniors (65 and older) and all ages (those younger than 20, adults and seniors).

**Triage levels:** ED visits were grouped based on the five-level Canadian Triage and Acuity Scale, which indicates patient care needs upon arrival. Scores range from level I (resuscitation) to level V (non-urgent).<sup>6</sup> In this report, levels I and II are often combined and referred to as “critical.”

Triage Level	I	II	III	IV	V
Level of Acuity	Resuscitation	Emergent	Urgent	Less Urgent	Non-Urgent

# Analysis in Brief

Taking health information further

Local health integration network (LHIN): There are 14 LHINs in Ontario. With the exception of utilization rates, all ED visits were grouped by the LHIN in which the ED visit occurred. Utilization rates were calculated by the number of ED visits made by dividing the number of patients living within a LHIN (based on the patients' postal codes) by the population of the LHIN.

Ambulatory care sensitive conditions (ACSCs): ED visits were also analyzed according to ACSCs. Rates of ACSC admissions to hospital are thought to offer insight into community care and potentially to reflect the availability of adequate care within the community setting. Seven ACSCs were examined: angina, asthma, chronic obstructive pulmonary disease (COPD), diabetes, epilepsy, heart failure and pulmonary edema, and hypertension.

See Appendix A for more detailed information on the technical methods of the report.

## Results

### Trends in Seniors' Use of Emergency Departments in Ontario

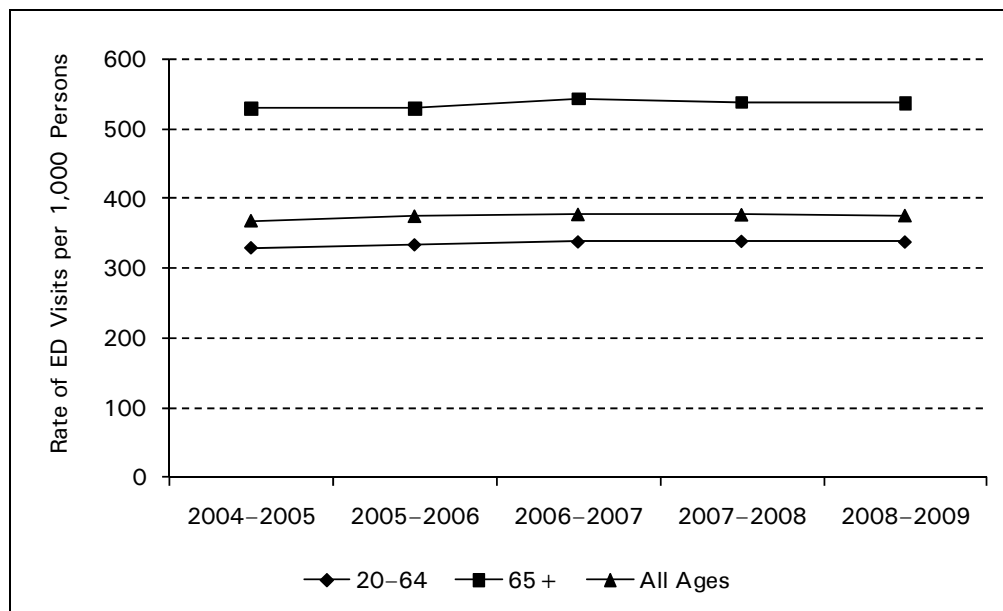
Between 2004–2005 and 2008–2009, the rate of ED visits in Ontario increased by 2%. For seniors, the rate increased by 1.5%, which compares to an increase of 2.6% among adults.

As the overall rate of visits to Ontario EDs increased, the number of annual visits rose by 6.9%. This increase reflects both increased utilization rates and population growth (Table 1).

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**Figure 1 Rate of Emergency Department Visits per 1,000 Persons, by Age Group, 2004–2005 to 2008–2009**



**Notes**

Rates for each age group were age and sex standardized to the 2001 Ontario census population. "All ages" includes those younger than 20, adults and seniors.

**Source**

National Ambulatory Care Reporting System, Canadian Institute for Health Information.

**Table 1 Comparison of Emergency Department Visits and Population Size, by Age Group, 2004–2005 and 2008–2009**

Age Group	2004–2005	2008–2009	Absolute Change	Percent Change
<b>Emergency Department Visits</b>				
20–64	2,551,779	2,737,210	185,431	+ 7.3%
65 +	853,278	960,392	107,114	+ 12.6%
All Ages	4,593,614	4,908,435	314,821	+ 6.9%
<b>Population Size</b>				
20–64	7,738,838	8,079,392	340,554	+ 4.4%
65 +	1,589,697	1,743,868	154,171	+ 9.7%
All Ages	12,454,171	12,928,996	474,825	+ 3.8%

**Note**

"All ages" includes those younger than 20, adults and seniors.

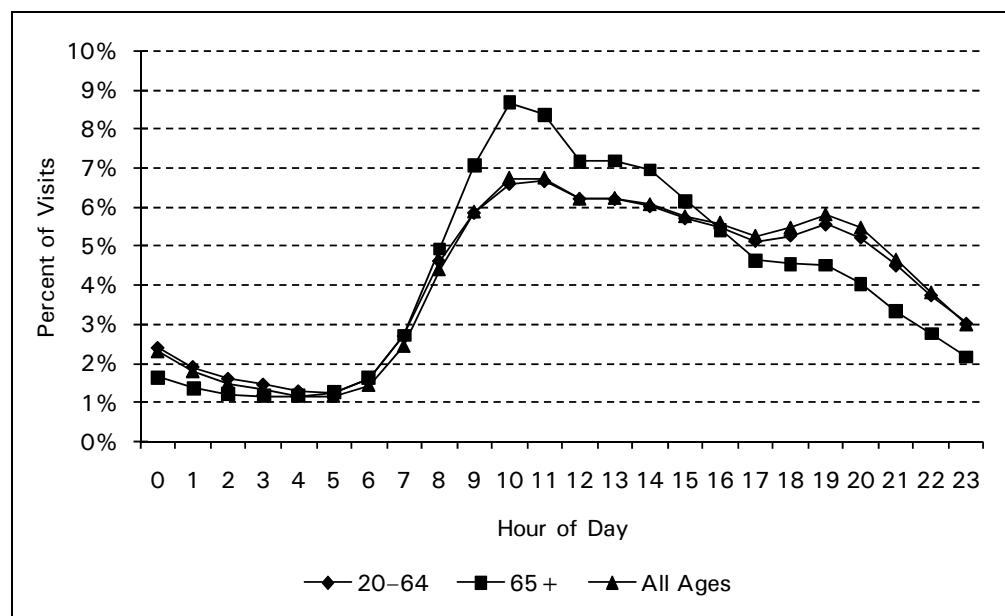
**Sources**

National Ambulatory Care Reporting System, Canadian Institute for Health Information; and Population Estimates, Statistics Canada.

## Variation in Time of Emergency Department Visits

Patients visited EDs 24 hours a day; however, visits varied by time of day. For example, the percent of visits increased from 6 a.m. until they peaked at 10 a.m. ED use also varied by age group; compared to adults, a greater percentage of seniors' visits were made between 9 a.m. and 3 p.m. (Figure 2). The distribution in the time of ED visits did not change between 2004–2005 and 2008–2009 (data not shown).

**Figure 2** Percent of Emergency Department Visits by Time of Day, by Age Group, 2008–2009



**Notes**

Visit time was based on registration time. If registration time was missing, triage time was used. "All ages" includes those younger than 20, adults and seniors.

**Source**

National Ambulatory Care Reporting System, Canadian Institute for Health Information.

## Triage Scores on the Rise

When patients enter EDs, they are first triaged by a nurse to identify how quickly they need to be seen by a physician. Ontario EDs use the five-level Canadian Triage and Acuity Scale (CTAS) to make this assessment. Patients with the highest needs are triaged as level I (resuscitation) or II (emergent) and have life-threatening or critical care needs. Conversely, patients triaged at the lowest level (level V) have non-urgent needs.

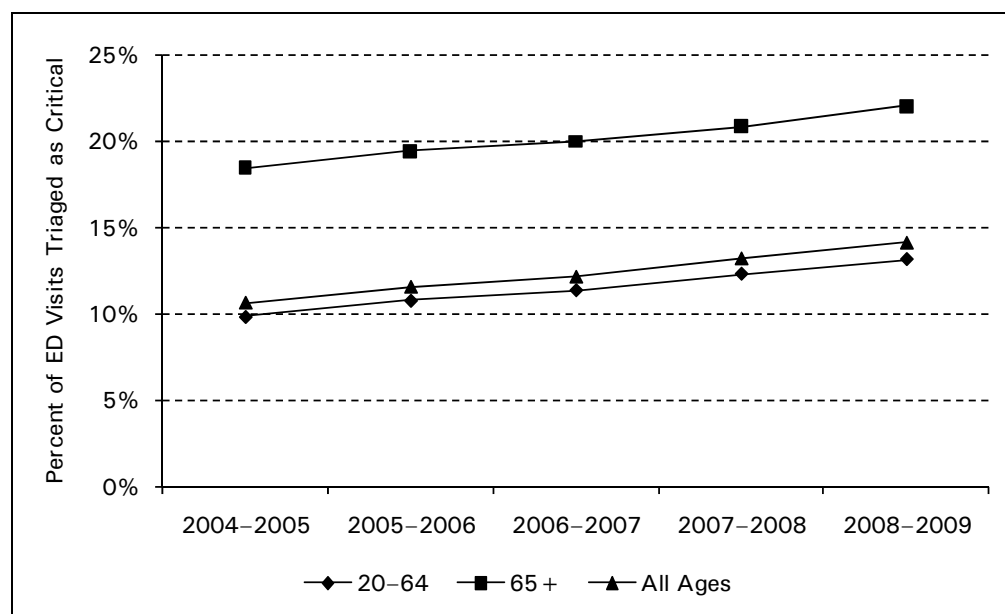
The proportion of all ED patients triaged with the most critical care needs (resuscitation or emergent) increased from 11% to 14% between 2004–2005 and 2008–2009. That of seniors increased from 19% to 22% over the five years.

# Analysis in Brief

Taking health information further

The increased percentage of patients triaged as critical was not just the result of a proportional shift of patients to more urgent levels of care. It was also the result of an increased number of patients triaged at level I or II. Between 2004–2005 and 2008–2009, more than 54,000 additional seniors were triaged as critical. A similar pattern was observed for both adults and patients of all ages. The increase in the percentage of patients triaged as critical may reflect changes in coding practices and therefore does not necessarily suggest an increase in the severity of illness being seen in emergency departments.

**Figure 3** Percent of Emergency Department Visits Triaged as Critical (Resuscitation and Emergent), by Age Group, 2004–2005 to 2008–2009



**Notes**

Critical visits were defined as those triaged as level I (resuscitation) or level II (emergent). The analysis was restricted to records with available triage levels. "All ages" includes those younger than 20, adults and seniors.

**Source**

National Ambulatory Care Reporting System, Canadian Institute for Health Information.

**Table 2 Comparison of Percent and Volume of Emergency Department Visits Triage as Critical (Resuscitation or Emergent), by Age Group, 2004–2005 and 2008–2009**

Age Group	2004–2005	2008–2009	Absolute Change	Percent Change
<b>Volume of Patients Triage as Level I or II</b>				
20–64	251,144	359,357	108,213	+43.1%
65+	157,563	211,626	54,063	+34.3%
All Ages	488,890	692,918	204,028	+41.7%
<b>Percent of Patients Triage as Level I or II</b>				
20–64	9.9%	13.1%	3.2%	+32.3%
65+	18.5%	22.0%	3.5%	+18.9%
All Ages	10.7%	14.1%	3.4%	+31.8%

**Notes**

Critical visits were defined as those triage as level I (resuscitation) or level II (emergent). The analysis was restricted to records with available triage levels. “All ages” includes those younger than 20, adults and seniors.

**Source**

National Ambulatory Care Reporting System, Canadian Institute for Health Information.

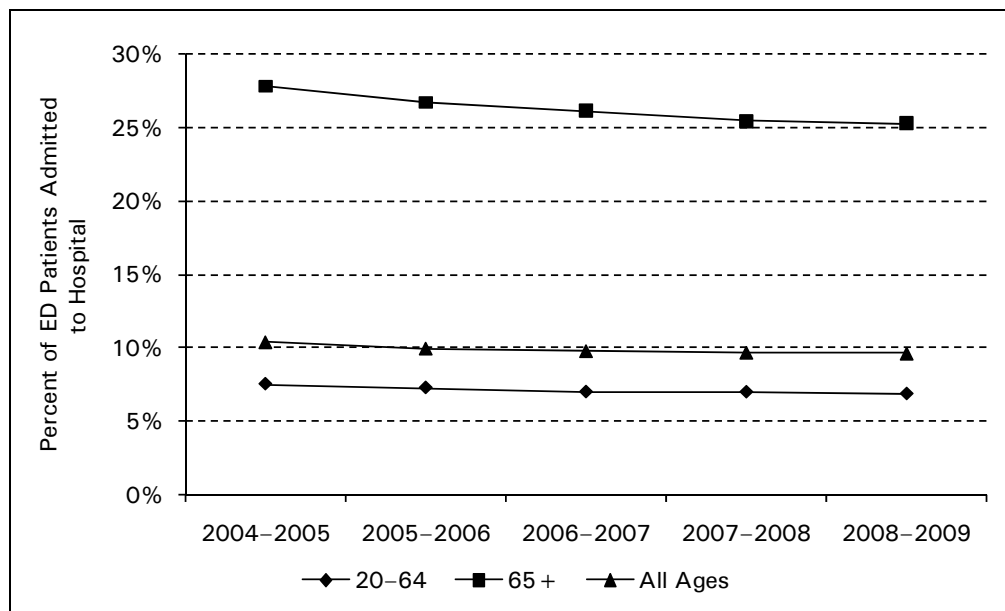
Although the percentage of patients with the most critical needs increased between 2004–2005 and 2008–2009, the percentage of ED visits that ended in hospital admissions decreased over the same period of time, resulting in more than 5,400 fewer hospitalizations through EDs.

The declining proportion of hospital admissions was observed in both adults and seniors. In 2008–2009, 25% of visits by seniors resulted in acute care admissions—down from 28% in 2004–2005. By comparison, 7% of adults’ ED visits resulted in acute care admissions—down from 8% in 2004–2005 (Figure 4).

# Analysis in Brief

Taking health information further

**Figure 4** Percent of Emergency Department Visits Resulting in Hospital Admissions, by Age Group, 2004–2005 to 2008–2009



**Note**

“All ages” includes those younger than 20, adults and seniors.

**Source**

National Ambulatory Care Reporting System, Canadian Institute for Health Information.

Hospital admission rates not only declined for patients triaged at the highest levels of urgency, but for patients triaged at all levels. For example, among seniors triaged as least urgent (less urgent or non-urgent), hospital admission rates decreased from 8.5% in 2005–2006, to 7.0% in 2008–2009 (Table 3).

(Due to changes in coding, this data is presented from 2005–2006 to 2008–2009. See Appendix A for additional information.)



**Table 3 Discharge Distribution by Triage Level for Seniors, 2005–2006 to 2008–2009**

Discharge Disposition	Percent of ED Visits			
	2005–2006	2006–2007	2007–2008	2008–2009
<b>Triage Levels I and II</b>				
Admit as Inpatient	49.8%	48.9%	47.3%	47.1%
Discharged Home	41.6%	42.4%	43.7%	43.7%
Transferred or Discharged to Place of Residence	6.0%	6.0%	6.5%	6.7%
Left Before Completion	0.7%	0.9%	1.0%	1.0%
Death	1.9%	1.8%	1.6%	1.5%
<b>Triage Level III</b>				
Admit as Inpatient	31.1%	30.0%	29.1%	27.8%
Discharged Home	59.6%	60.1%	60.6%	61.5%
Transferred or Discharged to Place of Residence	7.4%	7.7%	8.1%	8.3%
Left Before Completion	1.8%	2.2%	2.2%	2.3%
Death	0.07%	0.07%	0.06%	0.06%
<b>Triage Levels IV and V</b>				
Admit as Inpatient	8.5%	8.2%	7.5%	7.0%
Discharged Home	83.7%	83.4%	83.7%	83.8%
Transferred or Discharged to Place of Residence	5.1%	5.4%	5.7%	6.0%
Left Before Completion	2.7%	2.9%	3.1%	3.3%
Death	0.05%	0.05%	0.06%	0.05%

**Notes**

“Transferred or discharged to place of residence” includes patients transferred to another department or facility and those discharged to a place of residence, including a nursing or retirement home or chronic care; a private dwelling with home care, VON or Meals on Wheels; or jail.

The analysis was restricted to records with available triage levels.

Due to coding changes, the discharge distribution for 2004–2005 was excluded from this analysis.

**Source**

National Ambulatory Care Reporting System, Canadian Institute for Health Information.

## Time Under Care

In April 2008, the Ontario government released emergency room time targets in an effort to oversee and, ultimately, manage the total length of time that patients spend in EDs. As a result, the Emergency Department Reporting System was implemented in 128 of Ontario's hospitals. This system seeks to track how long patients spend in EDs. The targets articulated by the Ministry of Health and Long-Term Care indicate that 90% of patients with complex conditions (those requiring more time for diagnosis, treatment or hospital bed admission) should spend a maximum of eight hours (480 minutes) in the ED. The guidelines further state that 90% of patients with minor or uncomplicated conditions (requiring less time for diagnosis, treatment or observation) should spend, at most, four hours (240 minutes) in the ED.<sup>7</sup>

Ontario is not alone in these efforts. The United Kingdom implemented similar guidelines in an attempt to establish a four-hour maximum length of ED visits for 98% of patients.<sup>8</sup>

In previous reports, CIHI reported extensively on wait times for ED services.<sup>9-11</sup> Here, we measure only a portion of the amount of time patients typically spend in EDs. More precisely, time under care is defined as the time from physician assessment to visit completion. For patients admitted as inpatients or transferred, the time of completion was the time the patients left the EDs. For all other patients, visit completion was obtained from the disposition time variable.

In 2008–2009, 50% of senior patients spent less (and 50% spent more) than 155 minutes in EDs, from the time of physician assessment to the time of visit completion. By comparison, 50% of adult patients spent less (and 50% spent more) than 57 minutes in EDs, from physician assessment to visit completion. Not surprisingly, the time spent under care in EDs is related to triage level regardless of age. At the highest two triage levels, 1 in 10 patients (90th percentile) spent more than 15 hours under care in EDs before their visits were completed (Table 4).

**Table 4 Time Under Care by Age Group and Triage Level, 2008–2009**

	Time Under Care (Minutes)		
	10th Percentile	Median	90th Percentile
<b>By Age Group</b>			
20–64	10	57	350
65 +	15	155	978
All Ages	10	60	410
<b>By Triage Level (All Ages)</b>			
Level I—Resuscitation	35	245	1,126
Level II—Emergent	35	210	945
Level III—Urgent	11	95	490
Level IV—Less Urgent	6	26	143
Level V—Non-Urgent	5	15	88

**Notes**

The analysis was restricted to records with available triage levels and related time variables.

Times under care of more than 72 hours were excluded from the analysis.

“All ages” includes those younger than 20, adults and seniors.

**Source**

National Ambulatory Care Reporting System, Canadian Institute for Health Information.

## Reasons for Seniors’ Emergency Department Visits: A Focus on Ambulatory Care Sensitive Conditions

People visit EDs for many reasons. These can range from acute illness or injury to care for complications arising from chronic conditions. As a result, no single illness or condition accounted for more than 7.5% of patient visits to EDs in 2008–2009 (data not shown). However, ED visits can be grouped into 19 major ambulatory clusters based on the patient’s main clinical problem. Using this classification system, 15% of seniors’ visits to EDs in 2008–2009 were for diseases and disorders of the circulatory system. In contrast, more than one in five adult visits to EDs were the result of trauma, coma or toxic effects in 2008–2009 (Table 5).

**Table 5 Major Clinical Reasons for Emergency Department Visits, by Age Group, 2004–2005 and 2008–2009**

Major Ambulatory Cluster	Percent of ED Visits	
	2004–2005	2008–2009
<b>Adults</b>		
Trauma, Coma and Toxic Effects	23.5%	21.5%
Diseases and Disorders of the Digestive System	10.8%	11.0%
Diseases and Disorders of the Ear, Nose, Mouth and Throat	8.5%	8.5%
Diseases and Disorders of the Skin and Subcutaneous Tissue and Breast	8.2%	8.9%
Diseases and Disorders of the Musculoskeletal System and Connective Tissue	8.0%	7.8%
<b>Seniors</b>		
Diseases and Disorders of the Circulatory System	15.9%	14.9%
Trauma, Coma and Toxic Effects	14.5%	14.3%
Diseases and Disorders of the Digestive System	11.5%	11.4%
Diseases and Disorders of the Respiratory System	10.1%	9.6%
Diseases and Disorders of the Nervous System	7.9%	8.2%

**Note**

All ED visits were assigned to 1 of 19 major ambulatory clusters based on the patients' main problems.

**Source**

National Ambulatory Care Reporting System, Canadian Institute for Health Information.

Here we consider ED visits for a specific set of conditions known as ambulatory care sensitive conditions (ACSCs). Visits for ACSCs are of interest because hospital admission rates for these conditions have been used as a measure of access to adequate community care,<sup>12, 13</sup> and they may have implications for how community care is organized. As noted earlier, ACSCs include angina, asthma, chronic obstructive pulmonary disease (COPD), diabetes, epilepsy, heart failure and pulmonary edema, and hypertension.

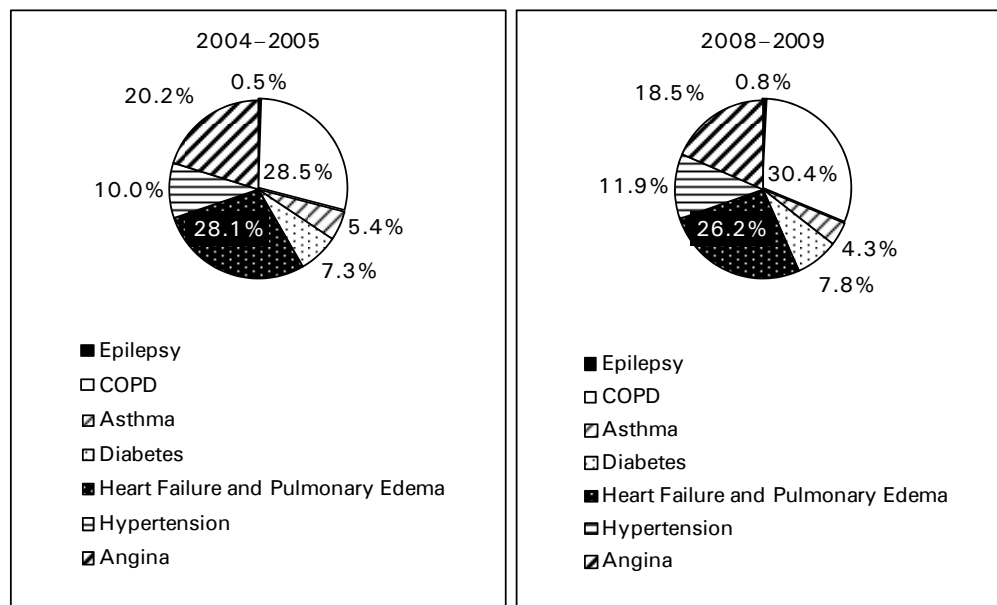
Taken together, ACSCs accounted for 9% of all ED visits by seniors in 2008–2009; in 2004–2005, they accounted for 10% of all visits. In contrast, ED visits for ACSCs accounted for just 3% of adults' visits in 2004–2005 and 2008–2009.

In both 2004–2005 and 2008–2009, the largest proportion of seniors' ACSC visits to EDs were for COPD (approximately 30%), followed closely by heart failure and pulmonary edema. Epilepsy consistently resulted in the smallest proportion of ED visits for seniors with ACSCs (Figure 5).

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**Figure 5 Percent of Conditions Comprising Seniors' Emergency Department Visits for Ambulatory Care Sensitive Conditions, 2004–2005 and 2008–2009**



**Source**

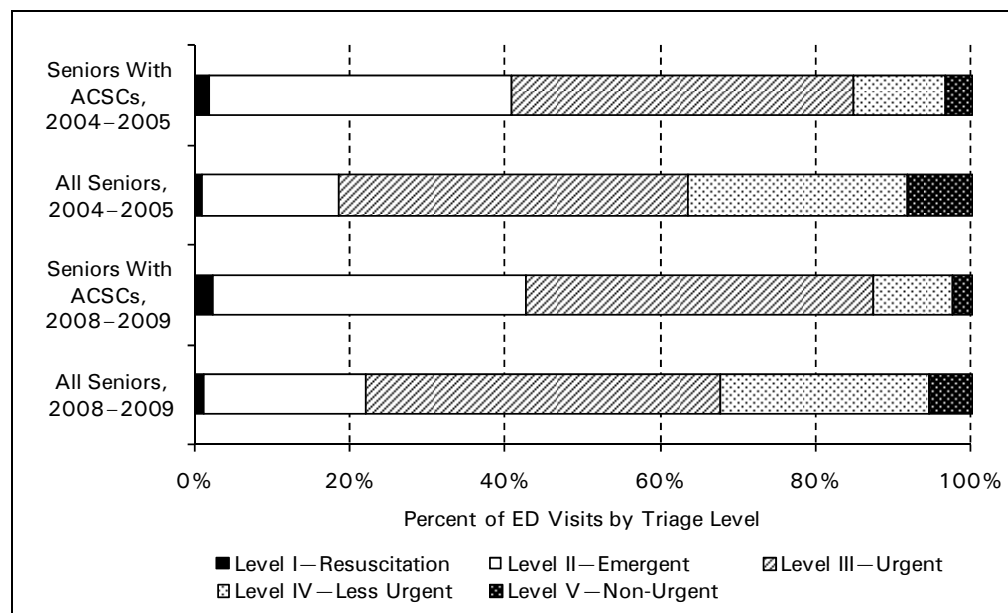
National Ambulatory Care Reporting System, Canadian Institute for Health Information.

Seniors arriving at EDs for ACSCs tended to be triaged at higher urgency levels than seniors overall. In 2008–2009, more than 40% of seniors with ACSCs were triaged as critical (resuscitation or emergent). By contrast, 22% of seniors overall were triaged at these levels in this same year. As seen with seniors' visits overall, the proportion of seniors' ACSC-related visits triaged with the most critical needs increased over time, from 39% to 44% between 2004–2005 and 2008–2009 (Figure 6). As with visits overall, the increase in the proportion of those triaged at the highest levels of care need may reflect changes in coding practices and therefore does not necessarily suggest an increase in the severity of illness being seen in emergency departments.

# Analysis in Brief

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**Figure 6 Distribution of Triage Levels for Emergency Department Visits by Seniors With and Without Ambulatory Care Sensitive Conditions, 2004–2005 and 2008–2009**



**Note**

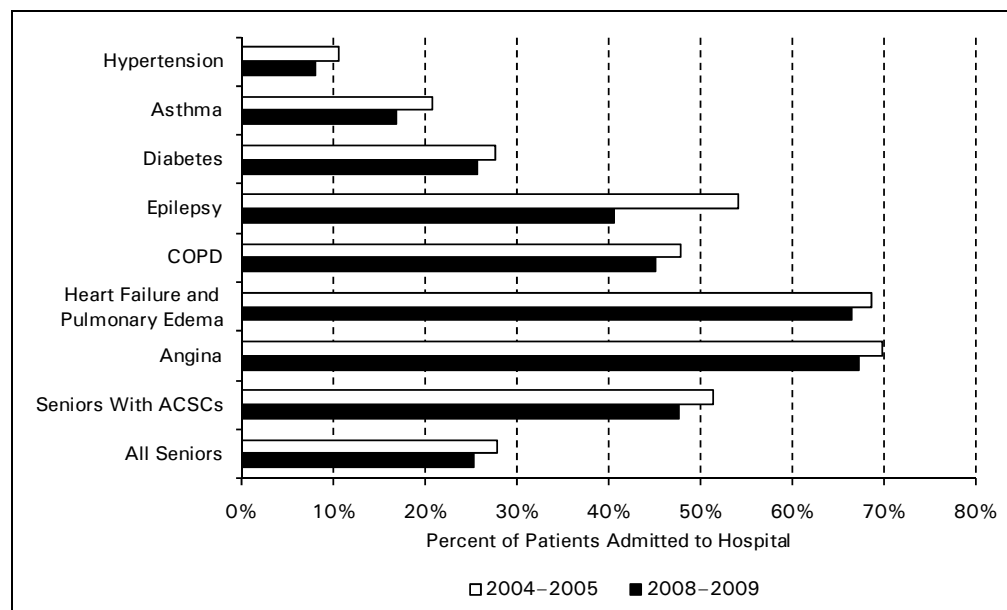
The analysis was restricted to records with available triage levels.

**Source**

National Ambulatory Care Reporting System, Canadian Institute for Health Information.

Hospitalization rates for seniors visiting for ACSCs were almost twice as high as those for the general senior population. In 2008–2009, 25% of seniors overall were hospitalized, but for those visiting EDs with ACSCs, the hospitalization rate was 48%. Of the ACSCs, angina and heart failure and pulmonary edema resulted in the greatest percentage of ED patients being hospitalized (Figure 7). Similar to overall hospitalization rates, hospital admissions for seniors visiting for ACSCs decreased between 2004–2005 and 2008–2009, from 52% to 48%.

**Figure 7** Percent of Seniors' Emergency Department Visits for Ambulatory Care Sensitive Conditions That Resulted in Hospitalization, 2004–2005 and 2008–2009



**Source**

National Ambulatory Care Reporting System, Canadian Institute for Health Information.

## Regional Variations in Emergency Department Visits by Seniors for Ambulatory Care Sensitive Conditions

As with much health care utilization, there were regional variations in ED visits among seniors in Ontario. The variation was evident with visits overall as well as with visits for ACSCs. Regional visit rates were determined by the number of ED visits made by patients living within a LHIN (based on the patients' postal codes). In 2008–2009, there was a twofold difference in seniors' rates across Ontario's LHINs (Table 6). Between 2004–2005 and 2008–2009, changes in utilization rates differed by LHIN.

It is difficult to interpret these regional variations in terms of care provision. While care is organized by health regions, patients do not always adhere to LHIN boundaries when seeking health services. For example, although a patient lives in one LHIN, he or she may travel to another LHIN to visit a specific ED. Nevertheless, it is interesting to consider the extent to which the ED is used for specific conditions and by specific populations across regions.

**Table 6 Rate of Emergency Department Visits by Local Health Integration Network, 2004–2005 and 2008–2009**

LHIN	Overall Rate of ED Visits Per 1,000 Persons			Seniors' Rate of ED Visits Per 1,000 Persons (65+)			Seniors' Rate of ED Visits for ACSCs Per 1,000 Persons (65+)		
	2004–2005	2008–2009	Percent Change	2004–2005	2008–2009	Percent Change	2004–2005	2008–2009	Percent Change
Erie St. Clair	424.1	423.0	-0.3%	564.0	577.2	2.3%	59.2	56.2	-5.1%
South West	492.4	556.5	13.0%	590.5	684.1	15.9%	52.5	59.1	12.6%
Waterloo Wellington	311.6	309.3	-0.7%	456.0	461.9	1.3%	46.0	41.4	-10.0%
Hamilton Niagara Haldimand Brant	389.9	385.7	-1.1%	506.2	498.8	-1.5%	48.2	43.9	-8.9%
Central West	260.9	255.7	-2.0%	388.7	380.8	-2.0%	40.8	38.0	-6.9%
Mississauga Halton	247.2	251.4	1.7%	442.0	437.3	-1.1%	39.7	36.3	-8.6%
Toronto Central	254.9	269.9	5.9%	402.4	415.4	3.2%	36.2	35.5	-1.9%
Central	250.4	248.3	-0.8%	443.9	430.4	-3.0%	40.6	36.3	-10.6%
Central East	338.1	334.0	-1.2%	498.4	496.3	-0.4%	48.4	46.7	-3.5%
South East	510.2	554.3	8.6%	629.4	640.8	1.8%	60.2	58.7	-2.5%
Champlain	376.1	378.0	0.5%	550.8	546.8	-0.7%	52.4	49.7	-5.2%
North Simcoe Muskoka	486.0	467.0	-3.9%	633.6	605.6	-4.4%	67.9	58.0	-14.6%
North East	687.8	729.5	6.1%	857.8	838.8	-2.2%	83.9	81.6	-2.7%
North West	666.6	744.5	11.7%	781.8	875.4	12.0%	74.1	78.9	6.5%
<b>Ontario</b>	<b>368.3</b>	<b>375.7</b>	<b>2.0%</b>	<b>529.0</b>	<b>536.7</b>	<b>1.5%</b>	<b>50.6</b>	<b>48.5</b>	<b>-4.2%</b>

**Notes**

Visit rates were determined by the number of ED visits made by patients living within a LHIN (based on the patients' postal codes) divided by the population of the LHIN. The analysis was restricted to records with available postal codes.

Rates were standardized to the 2001 Ontario census population.

**Source**

National Ambulatory Care Reporting System, Canadian Institute for Health Information.

## The Cost of Seniors' Emergency Department Care in Ontario

### Calculating the Costs

CIHI developed methods for costing ED care in Ontario using Resource Intensity Weights and a cost per weighted case measure. (For more information about these measures, see Appendix A.) These two values are then used to calculate the hospital costs associated with ED care. This is often referred to as the full-cost indicator.



# Analysis in Brief

Taking health information further

A full-cost indicator calculates ED costs by ensuring all hospital costs are included in the calculation. These expenses include portions of hospital overhead costs and diagnostic and laboratory costs, as well as portions of the direct costs of patients who have been admitted to hospital but wait in EDs until a bed is available. The indicator also includes direct costs reported in nursing units—for example, nursing salaries, medical supplies, clerical salaries and amortized equipment costs. The full-cost indicator does not include any fee-for-service physician compensation but does include physician compensation paid by the hospital, for example, compensation paid to salaried physicians.

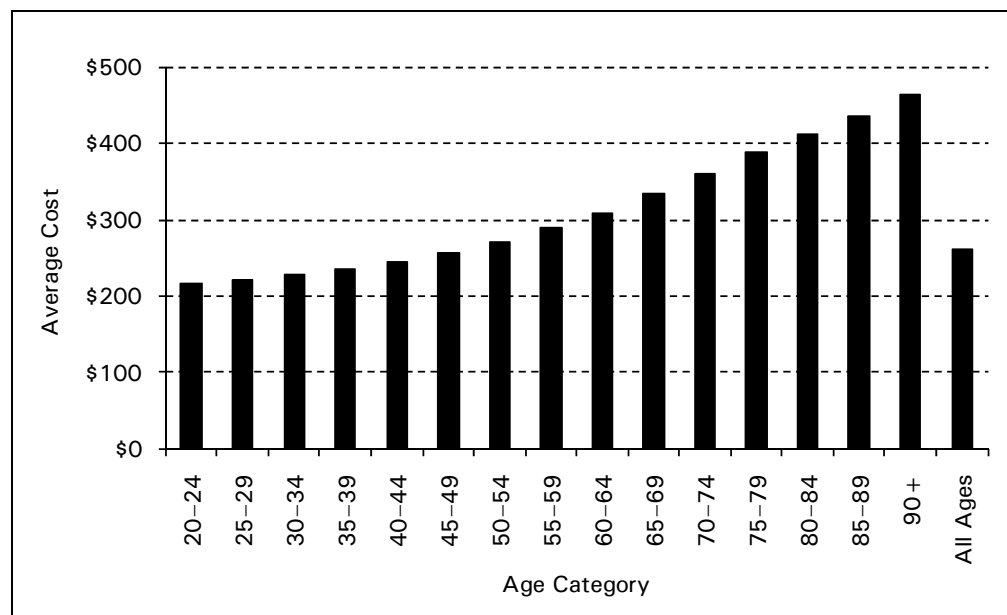
Here, the costs of Ontario ED visits are described for 2007–2008, the most recent year for which costing information is available.

## Overall Costs and Senior-Specific Costs of Emergency Department Care

Ontario hospitals spent an estimated \$1.27 billion providing and supporting ED services in 2007–2008. Based on the methodology described above, the average cost of an ED visit in Ontario was \$260.

Not surprisingly, costs for seniors were higher. For example, the average cost of a senior’s ED visit was \$386 in 2007–2008. In general, the cost of care increased with the patient’s age.

**Figure 8 Average Cost of an Emergency Department Visit by Age Group, 2007–2008**



**Notes**

Costs were determined using a full-cost indicator.  
 “All ages” includes those younger than 20, adults and seniors.

**Sources**

National Ambulatory Care Reporting System and Canadian MIS Database, Canadian Institute for Health Information.

# Analysis in Brief

Taking health information further

The cost of care for seniors in EDs was disproportional to their share of visits. In 2007–2008, seniors accounted for 19% of all ED visits but for 29% of total ED costs.

Costs per ED visit for seniors also varied with respect to LHINs and ACSCs. However, across all LHINs, the cost variations were less than twofold for seniors' visits and those for ACSCs.

Costs associated with ACSCs also varied with respect to the specific type of conditions involved. In 2007–2008, among seniors visiting EDs for ACSCs, those visiting EDs for angina were the most costly. Hypertension, on the other hand, was the least costly ACSC.

**Table 7 Average Cost of Emergency Department Visits by LHIN, 2007–2008**

LHIN	Average Cost of ED Visit	Average Cost of Seniors' ED Visit	Average Cost of Seniors' ED Visit for ACSC
Erie St. Clair	\$258	\$400	\$577
South West	\$229	\$337	\$508
Waterloo Wellington	\$234	\$353	\$480
Hamilton Niagara Haldimand Brant	\$249	\$385	\$587
Central West	\$362	\$565	\$786
Mississauga Halton	\$251	\$387	\$567
Toronto Central	\$314	\$474	\$652
Central	\$239	\$364	\$523
Central East	\$235	\$357	\$525
South East	\$224	\$335	\$528
Champlain	\$253	\$378	\$538
North Simcoe Muskoka	\$211	\$313	\$461
North East	\$218	\$324	\$471
North West	\$222	\$335	\$503
<b>Ontario</b>	<b>\$260</b>	<b>\$386</b>	<b>\$545</b>

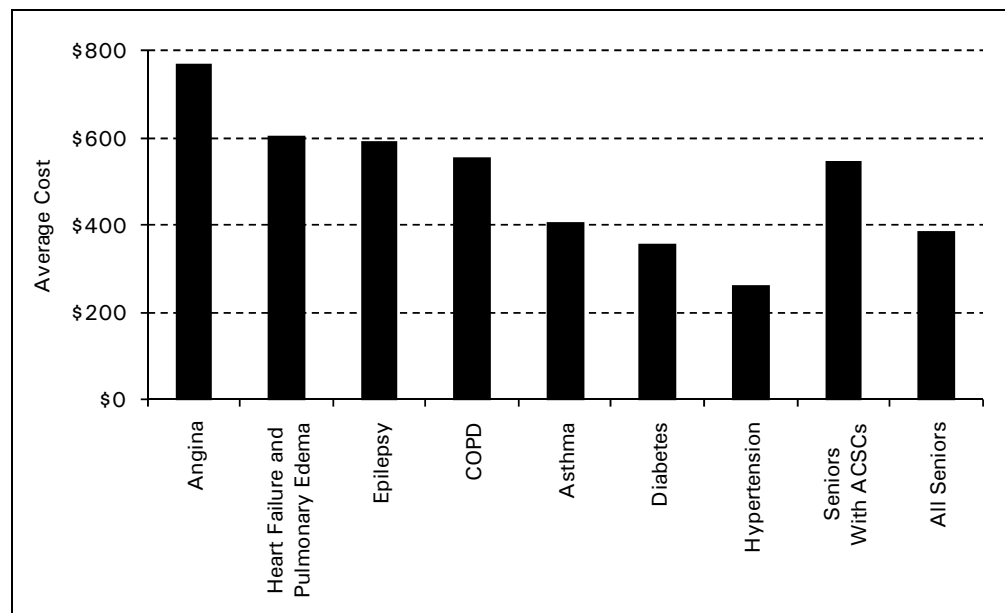
**Notes**

The average cost of an ED visit was based on all visits to EDs located within each LHIN. Ontario residents who visited EDs outside Ontario were excluded. Costs were determined using a full-cost indicator.

**Sources**

National Ambulatory Care Reporting System and Canadian MIS Database, Canadian Institute for Health Information.

**Figure 9 Average Cost of Seniors’ Emergency Department Visits for Ambulatory Care Sensitive Conditions, 2007–2008**



**Note**

Costs were determined using a full-cost indicator.

**Sources**

National Ambulatory Care Reporting System and Canadian MIS Database, Canadian Institute for Health Information.

## Summary

CIHI began collecting data on ED visits in 2001–2002 through its National Ambulatory Care Reporting System. This data was used to present a five-year analysis of ED use among Ontario’s seniors between 2004–2005 and 2008–2009. The Ontario experience may provide insights on patterns that prevail in other jurisdictions.

Overall, the volume of seniors’ ED visits increased between 2004–2005 and 2008–2009. With this increase in visit volumes there was also an increase in the proportion of those triaged at the highest levels of urgency (level I—resuscitation and level II—emergent). In 2004–2005, for example, 19% of seniors were triaged as either level I or II. In 2008–2009, five years later, these patients accounted for 22% of seniors’ ED visits. While the proportion of those triaged at both levels I and II increased over the five-year period, the increase was primarily driven by those triaged as level II (see Appendix B—Additional Table). However, this increase may reflect a change in coding practices over the five-year period and does not necessarily suggest an increase in the level of severity of illness being seen in emergency departments, especially given that there was a concurrent decrease in the proportion of seniors being hospitalized following their ED visits.

# Analysis in Brief

Taking health information further

Our ability to monitor changes in health care utilization for specific populations increased significantly over the past decade. This information can help those managing the system understand the implications of these shifts over time and perhaps plan for the future use of health care services.

## Acknowledgements

CIHI wishes to acknowledge and thank the following individual for his contribution to *Seniors' Use of Emergency Departments in Ontario, 2004–2005 to 2008–2009*:

Howard Ovens, MD, CCFP (EM), FCFP  
Director, Schwartz-Reisman Emergency Centre, Mount Sinai Hospital; Associate Professor, Department of Family and Community Medicine, University of Toronto; and Acting Co-Chair, Ontario ER/ALC Expert Panel

Please note that the analyses and conclusions in this document do not necessarily reflect those of the individual mentioned above.

## About CIHI

The Canadian Institute for Health Information (CIHI) collects and analyzes information on health and health care in Canada and makes it publicly available. Canada's federal, provincial and territorial governments created CIHI as a not-for-profit, independent organization dedicated to forging a common approach to Canadian health information. CIHI's goal: to provide timely, accurate and comparable information. CIHI's data and reports inform health policies, support the effective delivery of health services and raise awareness among Canadians of the factors that contribute to good health.

Production of this analysis is made possible by financial contributions from Health Canada and provincial and territorial governments. The views expressed herein do not necessarily represent the views of Health Canada or any provincial or territorial government.

## Appendix A—Technical Notes

ED statistics were obtained from NACRS from 2004–2005 to 2008–2009. NACRS captures administrative, clinical and demographic information.

### Population Estimates

- The Ontario population estimates from 2004 to 2008 were obtained from Statistics Canada and were used to calculate the rates of ED use and per capita ED costs. Population estimates at the LHIN level for 2004, 2007 and 2008 were used in the analysis.
- All rates were age and sex standardized to the 2001 Ontario census population.

### Inclusion/Exclusion Criteria

- All analyses were restricted to Ontario residents. Provincial health card numbers were used to identify those records. For the provincial analyses, Ontario residents who visited EDs outside Ontario who were captured in NACRS were included.
- Duplicate records were identified using the registration date, registration time, health card number, chart number and date of birth.
- Subjects with gender coded as “O” were excluded.
- Subjects with a missing health card number were excluded.

### Triage Level

- A minority of hospitals used a pediatric version of the CTAS to triage infants and children in the ED. As both versions identify patients’ urgency of need, they were not differentiated in this report.

### Discharge Disposition

- In 2004–2005, the disposition “discharged home” included patients discharged home as well as those discharged to nursing, retirement or chronic care facilities.
- From 2005–2006 onwards, “discharged home” included only those discharged to a private dwelling without support. A new variable, “discharged to place of residence,” was added to capture those discharged to a nursing or retirement home or chronic care; a private dwelling with home care, VON or Meals on Wheels, etc.; or jail.
- As a result, the analysis of discharge disposition excluded 2004–2005, when “discharged home” was examined.

# Analysis in Brief

Taking health information further

## Time Under Care

- Time under care was defined as the interval from the time of the physician's initial assessment to the time of ED visit completion. For patients who were admitted as inpatients or transferred, the time of completion was the time the patients left the EDs. For all other patients, the time of completion was obtained from the disposition time variable.
- In determining resource use, times under care of more than 72 hours were set as missing. This resulted in 0.1% of subjects with available time variables being excluded from the analyses.

## LHIN-Level Analyses

- Utilization rates were based on the number of ED visits made by patients living within a LHIN (based on the patients' postal codes), divided by the population of the LHIN.
- In calculating utilization rates, visits with missing postal codes were excluded. This resulted in about 1.6% of patients being excluded in 2004–2005 and 2008–2009. Patients with a postal code outside Ontario were also excluded from this analysis, resulting in less than 0.1% of records being excluded for 2004–2005 and 2008–2009.
- In all other LHIN-level analyses, ED visits were grouped by the LHIN in which the visit occurred, regardless of patients' places of residence.

## Costing Methodology

- The full-cost indicator used the Resource Intensity Weight (RIW) and cost per weighted case (CPWC) to determine ED costs.
- The RIW is an indicator representing the relative resources used to treat a patient. RIWs describe the resource consumption of an "average" patient within a group of patients with similar conditions. For example, an RIW of 2.0 may be assigned to a group of patients with similar clinical conditions. This means that the costs incurred by the hospital to treat this type of patient are two times more than the cost associated with treating an average acute inpatient.
- The 2008 RIW methodology was used in this report.
- The CPWC is a measure of the average financial cost a facility incurs to treat a patient. It is calculated by dividing the net total patient cost for a facility by the total weighted cases in that facility. The CPWC is calculated and updated annually by CIHI's Canadian MIS Database (CMDB). The CMDB contains financial and statistical information from hospitals and regional health authorities across Canada that can be used to evaluate the cost of services in these institutions. The latest LHIN-specific CPWC was used in this report based on data for 2007–2008.
- The full-cost indicator is calculated by multiplying the RIW value and the CPWC.

## Appendix B—Additional Table

**Table B.1 Distribution of Triage Levels for Seniors' Emergency Department Visits by Local Health Integration Network, 2004–2005 and 2008–2009**

LHIN	Triage Level														
	Level I			Level II			Level III			Level IV			Level V		
	2004–2005	2008–2009	Percent Change	2004–2005	2008–2009	Percent Change	2004–2005	2008–2009	Percent Change	2004–2005	2008–2009	Percent Change	2004–2005	2008–2009	Percent Change
Erie St. Clair	1.0	1.3	30.0%	19.3	24.6	27.5%	45.5	45.3	-0.4%	29.4	25.2	-14.3%	4.9	3.6	-26.5%
South West	1.0	0.9	-10.0%	11.5	12.6	9.6%	37.1	38.9	4.9%	38.6	39.0	1.0%	11.8	8.5	-28.0%
Waterloo Wellington	0.7	1.0	42.9%	16.2	17.5	8.0%	52.7	54.2	2.8%	26.1	23.3	-10.7%	4.4	4.0	-9.1%
Hamilton Niagara Haldimand Brant	0.9	1.3	44.4%	14.7	17.3	17.7%	45.9	49.2	7.2%	29.5	28.3	-4.1%	9.0	3.8	-57.8%
Central West	1.2	1.6	33.3%	28.7	27.6	-3.8%	51.4	55.8	8.6%	17.4	14.2	-18.4%	1.2	0.8	-33.3%
Mississauga Halton	1.4	1.8	28.6%	27.5	31.0	12.7%	48.5	48.3	-0.4%	21.2	18.0	-15.1%	1.5	0.9	-40.0%
Toronto Central	1.3	1.9	46.2%	22.5	26.5	17.8%	54.6	53.0	-2.9%	18.9	16.8	-11.1%	2.7	1.8	-33.3%
Central	1.2	1.9	58.3%	21.7	29.8	37.3%	49.9	48.1	-3.6%	23.8	19.0	-20.2%	3.5	1.2	-65.7%
Central East	0.9	1.1	22.2%	18.0	20.9	16.1%	51.3	49.1	-4.3%	25.5	25.4	-0.4%	4.4	3.5	-20.5%
South East	1.0	0.7	-30.0%	14.3	14.9	4.2%	42.2	45.3	7.3%	37.7	35.6	-5.6%	4.8	3.5	-27.1%
Champlain	1.0	1.0	0.0%	14.1	15.7	11.3%	46.3	46.8	1.1%	31.0	29.2	-5.8%	7.6	7.3	-3.9%
North Simcoe Muskoka	1.2	0.8	-33.3%	18.2	18.3	0.5%	43.9	43.3	-1.4%	31.9	32.1	0.6%	4.9	5.5	12.2%
North East	0.8	1.1	37.5%	14.3	18.2	27.3%	27.7	32.2	16.2%	31.4	32.7	4.1%	25.9	15.9	-38.6%
North West	0.9	1.4	55.6%	19.8	23.9	20.7%	35.4	35.3	-0.3%	24.1	27.5	14.1%	19.8	12.0	-39.4%
Ontario	1.0	1.3	30.0%	17.5	20.8	18.9%	45.0	45.8	1.8%	28.5	26.8	-6.0%	8.0	5.3	-33.8%

### Notes

The triage level for an ED visit was based on visits to EDs located within each LHIN.

Ontario residents who visited EDs outside Ontario were excluded.

The analysis was restricted to records with available triage levels.

### Source

National Ambulatory Care Reporting System, Canadian Institute for Health Information.

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# Analysis in Brief

Taking health information further

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