

# THE COST OF INJURY IN CANADA

**Summary Report:**  
Falls &  
Transport Injury  
Trends in Children  
2004 and 2010



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Falls & Transport Injury Trends in Children

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# INTRODUCTION

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## Defining Injury and Injury Burden

Injury is defined as “the physical damage that results when a human body is subjected to energy that exceeds the threshold of physiological tolerance or results in lack of one or more vital elements, such as oxygen”.<sup>1</sup> Injuries can be categorized as intentional and unintentional; the categorization differentiating between “whether or not an injury was meant to harm the victim”.<sup>2</sup> In Canada in 2010, preventable injuries, including both unintentional and intentional, caused:

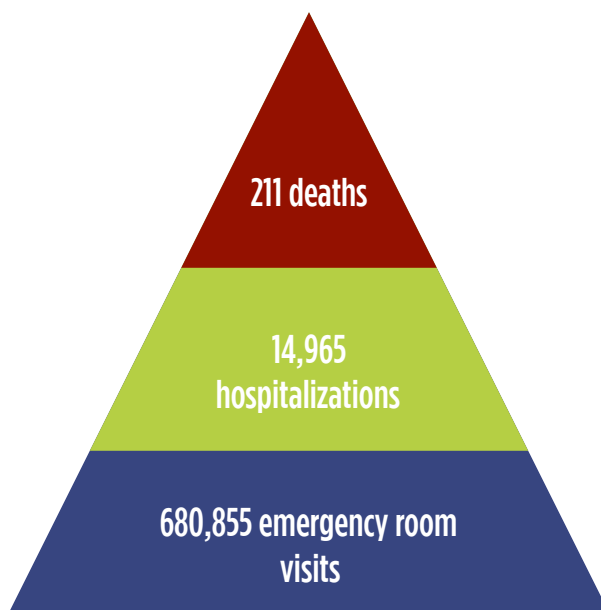
- ❖ Nearly 16,000 deaths
- ❖ Over 231,000 hospitalizations
- ❖ Approximately 3.5 million emergency room visits
- ❖ More than 60,000 disabilities

Preventable injury is the leading cause of fatality for Canadians between the ages of 1 to 44 and among the top causes of hospitalizations for Canadians of all ages.<sup>3</sup>

## Injury Burden in Canadian Children

Preventable injuries claim the lives of more children in Canada than all other causes of death, categorizing children as a highly vulnerable group.<sup>4</sup> Child and youth injury rates in Canada vary by age category and can be attributed to a number of risk factors, including child development and exposure to hazards.<sup>2</sup> In 2010, unintentional injuries, including but not limited to, incidents related to transportation, falls, drowning, and poisonings, in children between the ages of 0 to 14 resulted in 211 deaths, 14,965 hospitalizations, and 680,855 emergency department visits.<sup>3</sup>

Figure 1

**Number of injury deaths, hospitalizations, and emergency room, Ages 0 to 14, Canada, 2010**

Transport injuries were the leading cause of injury-related deaths in children, comprising 48% of all deaths due to unintentional injuries, while falls were the leading cause of hospitalizations and emergency room visits related to unintentional injuries in children. In fact, falls were attributed to 42% of all injury-related hospitalizations and 36% of all injury-related emergency department visits in children.<sup>3</sup>

The aforementioned statistics pertaining to transport and fall morbidity and mortality among children are of high relevance in injury prevention and require further study to understand root causes of the high burden. This information can in turn provide the evidence for national, provincial, and regional prevention priorities for program and policy development, given the high burden of injury on children and their families.

## Cost of Injury in Canada - Falls and Transport Injuries in Children

This compendium to the *Cost of Injury in Canada Report* (2015) provides comparisons between 2004 and 2010 injury data, focusing specifically on transport and fall injury deaths, hospitalizations and emergency room visits in children from birth to 14 years, as these are among the highest burden of injury. The data in this compendium has been obtained from the 2009 and 2015 ERAT analysis, using 2004 and 2010 data, respectively. An important aspect to understanding the cost of injury in Canada is the ability to visualize emerging trends, identify areas where the number and rates of injuries have

changed and link this to reasons why these changes have occurred. Understanding all of these components can inform priorities, allow successes to be highlighted, as well as areas that require more attention and resources.

## Summary of Findings

- ❖ The unintentional injury mortality rate in children 0 to 14 years has decreased from 4.33 per 100,000 to 3.75 per 100,00 between 2004 and 2010.
- ❖ The combination of fall and transport related mortalities comprised 52% of the total unintentional injury-related mortality rate in children in 2004 and 45% of the total unintentional injury-related mortality rate in children 2010.
- ❖ Children ages 10-14 had the highest number of transport-related fatalities in 2004 and 2010.
- ❖ The largest increase in mortality rate due to transport incidents between 2004 and 2010 was found in 0 to 4 year olds, where the percent change was 19%.
- ❖ In 2004 and 2010, the leading causes of hospitalizations and emergency room visits due to transport incidents were attributed to pedal cycle, MVC, and snowmobile/ATV incidents.
- ❖ In 2004, most fall-related hospitalizations occurred in 10 to 14 year olds, however in 2010, children between the ages of 0 to 4 years of age experienced the most falls-related hospitalizations.

## GOOD PRACTICE RECOMMENDATIONS

The findings from this compendium have revealed notable trends in child injury, specifically in terms of transport and fall incidents. The significant injury burden among children has led researchers to recommend that child injury prevention be incorporated into broader child health strategies.<sup>2</sup> Since the aforementioned may not always be feasible, the three E's of injury prevention are often prescribed as tools to establish "large scale changes in healthy public policy" and the creation of physical and social environments "which allow the safe behaviour to be the easy behaviour".<sup>6</sup> Although the traditional three E approach has been critiqued for its' simplicity and limiting terms, it is important to consider them in their broadest context (See Figure 2).

Figure 2

### Three E's of Injury Prevention



Subsequent to the fall and transport sections of the report will follow a series of good practice recommendations, for the injuries that have demonstrated the need for significant attention: motor vehicle collision and pedestrian-related fatalities, and pedal cycle and falls-related injuries. While the good practices prescribed in this compendium are general, it is important to keep in mind the developmental stages of children, which in turn denotes the type of injury risk they are exposed to. As children's abilities and skills change, so does their risk for injuries and the type of injury they may experience. It is thus imperative to identify and apply identify age-specific strategies, especially when targeting at-risk groups, such as those 0 to 4 years old, which experienced a 19 percent increase in age-specific injury-related mortality rates between 2004 and 2010.

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# Part 1: General Injury Statistics and Rates

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## Child and Youth Injury Burden Findings

To fully understand impact of the burden of fall and transport injuries in children, ages 0 to 14, it is imperative to understand the context of the general statistics and rates of deaths, hospitalizations and emergency room visits for *all* unintentional injuries.

Table 1 describes the total number of unintentional injury-related deaths, hospitalizations and emergency room visits in 2004 and 2010. While the total number of deaths and hospitalizations have decreased between 2004 and 2010, the number of emergency room visits attributed to unintentional injuries has increased, slightly. In 2010, children between the ages of 0 to 4 had the highest number of emergency room visits, followed by 10 to 14 year olds and 5 to 9 year olds, respectively. These findings are consistent with the findings from the Canadian Institute of Health Information (CIHI), where it was found that children younger than five accounted for the highest proportion of emergency room visits in 2010.<sup>5</sup>

Table 1

### Unintentional injury deaths, hospitalizations, and emergency room visits among children ages 0-14, 2004 and 2010

Year	Deaths	Hospitalizations	ER Visits
2004	247	19,783	666,325
2010	211	15,606	682,950

Table 2 below provides age-specific mortality rates for unintentional injuries among children per 100,000 population. While the age-specific mortality rate has decreased between 2004 and 2010, the differences in the size of the reference populations should be noted.



Table 2

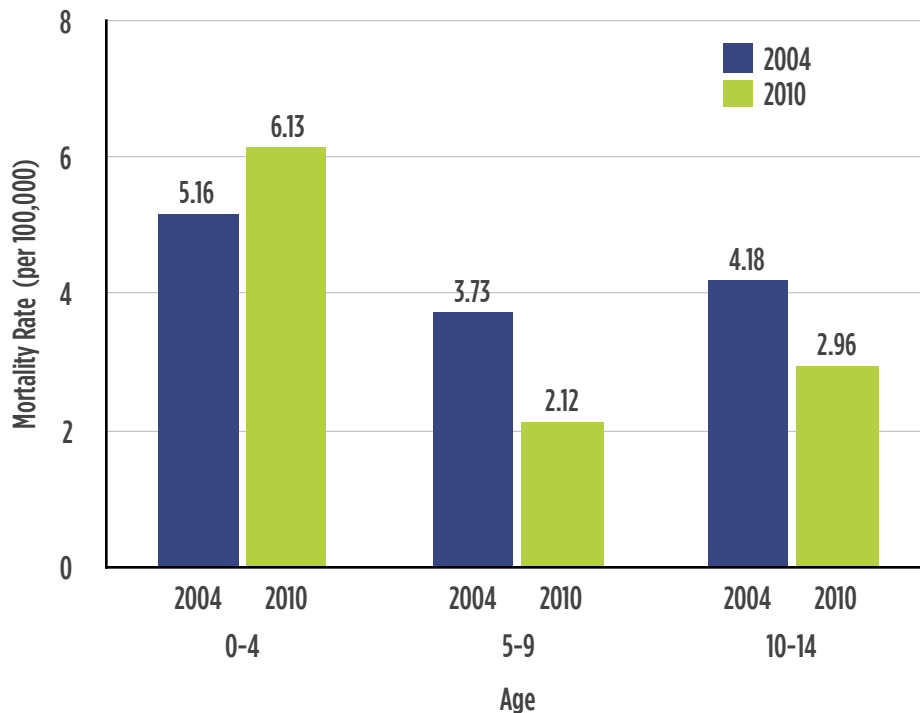
Age-specific mortality rates for unintentional injury among children ages 0-14, 2004 and 2010

Year	Deaths	Reference Population (ages 0-14)	Age-Specific Mortality Rate (per 100,000)
2004	247	5,701,187	4.33
2010	211	5,624,472	3.75

When analyzed by age category, the age-specific injury-related mortality rates in 0 to 4 year olds (Figure 3) increased by 19% between 2004 and 2010, from 5.16 per 100,000 to 6.14 per 100,000. Conversely, there was a decrease in mortality rate by 43% and 29% for 5-9 year olds and 10-14 year olds, respectively.

Figure 3

Age specific, injury-related mortality rates, 2004 and 2010, ages 0-14



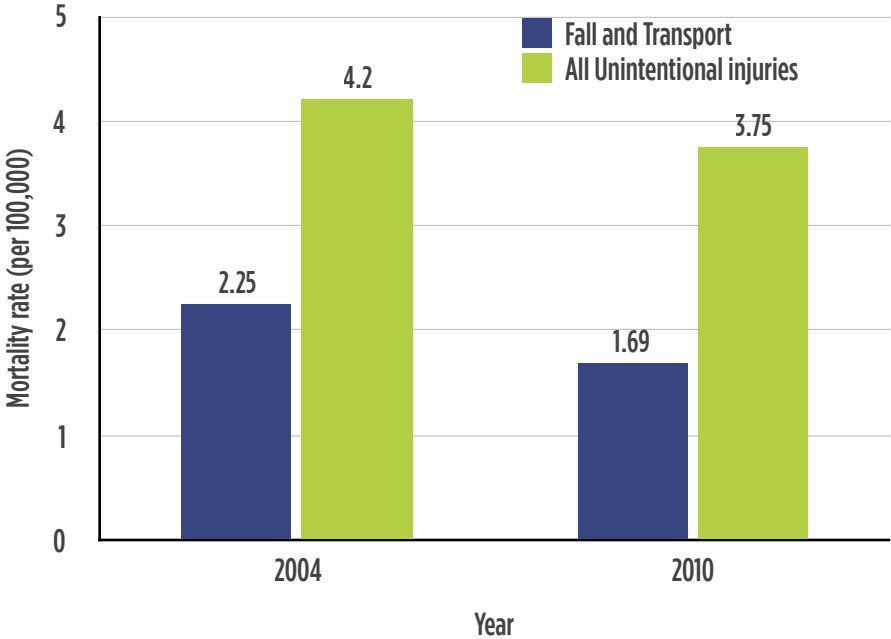
# Part 2: Transport and Fall-Specific Injury Statistics

The following section provides statistics specific to transport and fall injuries, demonstrating the changes between 2004 and 2010. When examining the age-specific mortality rates for transport and falls in Table 4 and Figure 4, it is evident that transport incidents result in a more notable mortality rate than falls, due to the severity of transport injuries compared to falls (in Canadian children).

Table 4  
**Transport, Falls and Combined Age-Specific Mortality Rate, Ages 0-14, 2004-2010**

Year	Reference Population (ages 0-14)	Transport Mortality Rate (per 100,000)	Falls Mortality Rate (per 100,000)	Combined Mortality Rate (per 100,000)
2004	5,701,187	2.00	0.25	2.25
2010	5,624,472	1.60	0.09	1.69

Figure 4  
**Fall and transport compared to unintentional injury mortality rate, 2004 and 2010, ages 0-14**



However, when combining fall and transport incidents, and comparing this to the data from Table 1, it is evident that the combination of fall and transport related mortalities comprised 52% of the total unintentional injury-related mortality rate in children in 2004 and 45% of the total unintentional injury-related mortality rate in children 2010.

### i) Transport-Related Injury Statistics

For the purpose of this report, the ERAT data categorizes transport injuries by relevant ICD-10 codes related to external mortality in terms of:

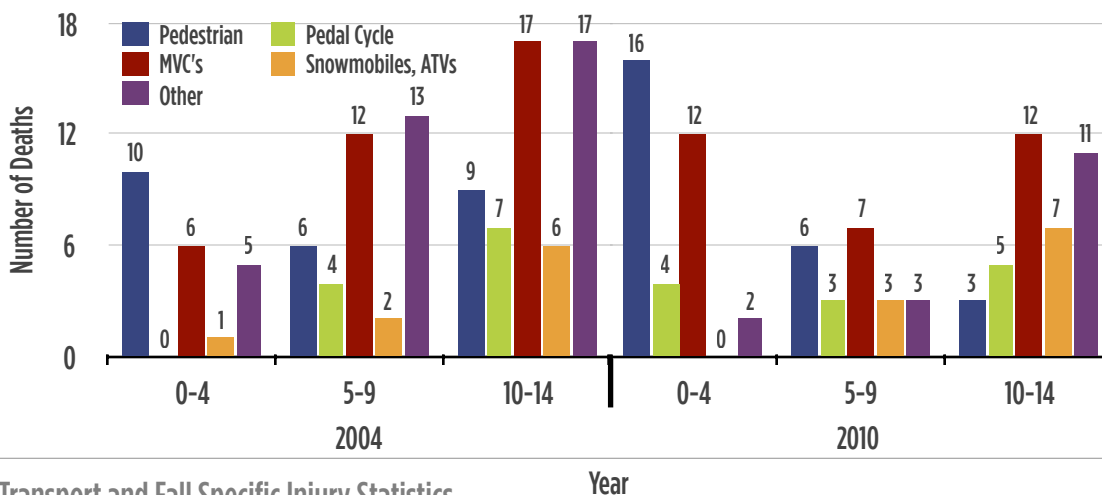
- ❖ pedestrian,
- ❖ pedal cycle,
- ❖ motor vehicle,
- ❖ snowmobile/ ATV

It is important to note that this is not an exhaustive list of classifications. The following is a summary of findings and trends related to transport-related deaths, hospitalizations and emergency room visits between 2004 and 2010. A more detailed summary of findings can be found in Appendix A, which provides data based on injury type, year and age category.

### Mortality

As evident in Figure 5 below, pedestrian, pedal cycle, and motor vehicle collision (MVC) fatalities increased in 0 to 4 year olds between 2004 and 2010, yet decreased in the other age categories.

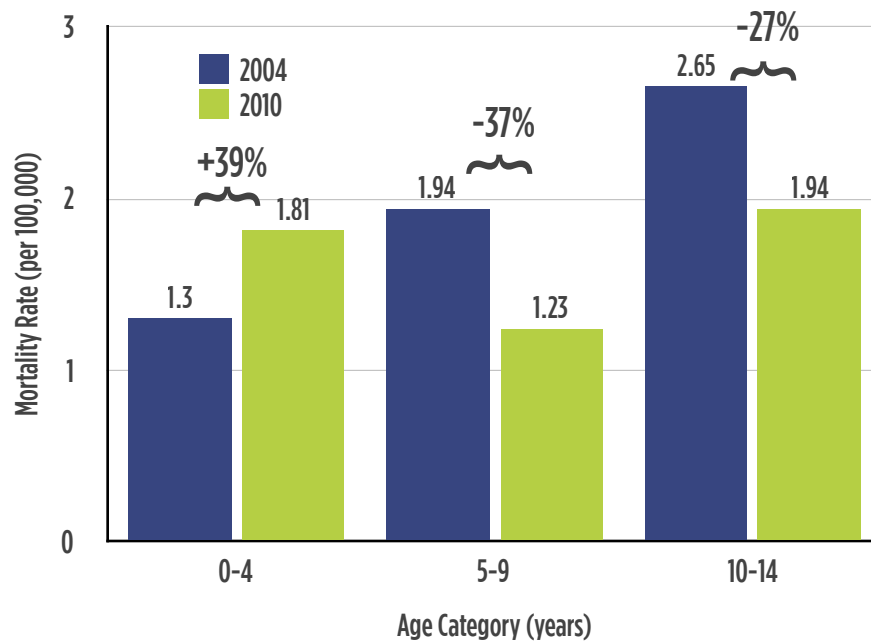
Figure 5  
**Transport-Related Mortality, 2004 and 2010, Ages 0-14**



However, snowmobile and ATV-related fatalities increased in 10 to 14 year olds. Of all age groups seen below, those ages 0 to 4 had the highest number of pedestrian fatalities in 2004 and 2010. Of the remaining categories, youth between the ages of 10 to 14 had the highest number of transport-related fatalities in 2004 and 2010, with specifically MVC-related fatalities.

Figure 6 below describes the changes in age-specific transport-related mortality rate between 2004 and 2010. The largest increase in mortality rate due to transport incidents between 2004 and 2010 was found in 0 to 4 year olds, where the percent change was 39%. In 5-9 year olds and 10-14 year olds, there was a decrease in mortality rate between 2004 and 2010 by 37% and 27% respectively.

Figure 6  
**Transport-Related Age-Specific Mortality Rate, Ages 0-14, 2004 and 2010**



## Good Practice Recommendations: MVC-Related Fatalities

As the leading cause of fatality in children, good practice recommendations for passenger safety are imperative. In addition to seatbelt and restraint use, which can lead to decreases in death and injury (24, 47-52), there are a number of practices that can be adopted to help reduce MVC fatalities.

Type of Recommendation	Evidence	Implementation
Engineering	❖ Child passenger restraints result in decreases in death and injury <sup>35-38</sup>	<ul style="list-style-type: none"> <li>❖ Keeping a child in rear-facing restraints for longer has been shown to increase protection by 3 to 5 times<sup>39,40</sup></li> <li>❖ In children ages 4 to 7, booster seats can reduce the risk of experiencing a significant injury during a crash by 59%<sup>41-45</sup></li> <li>❖ Enhancing parental knowledge and restraint availability, accessibility, cost and ease of use impacts uptake<sup>46</sup></li> </ul>
	❖ Rear seating position is the safest place for child passengers <sup>41, 48-50</sup>	<ul style="list-style-type: none"> <li>❖ By placing children in the rear row(s) of the vehicle, their risk for injury decreases by one half to two thirds<sup>50</sup></li> <li>❖ Efforts to encourage rear-seating position should target parents' experiences of pressure to allow their children to sit in front seats and provide realistic risk perception and strategies that impact decision making<sup>51,52</sup></li> </ul>
Enforcement	❖ Restraint and seatbelt legislation, alongside enforcement of child restraint legislation <sup>47, 53, 55</sup>	<ul style="list-style-type: none"> <li>❖ Level of enforcement will increase usage, thereby impacting effectiveness<sup>54</sup></li> <li>❖ Legislation is most effective when accompanied by educational efforts<sup>54</sup></li> </ul>
Education	❖ Community-wide, multi-pronged intervention combining dissemination of child passenger restraint safety information with enforcement campaigns leads to increased use of restraints <sup>46, 47, 53</sup>	<ul style="list-style-type: none"> <li>❖ Successful intervention components include long-term strategy, focused leadership, multi-agency collaboration, and selecting appropriate targeting and timing techniques<sup>14</sup></li> <li>❖ Enforcement campaigns supported by school-based promotional tactics have demonstrated increases in seat belt use<sup>46</sup></li> </ul>
	❖ Community-wide, multi-pronged intervention combining child passenger restraint distribution, loaner programs or incentives with educational programs leads to increased use <sup>46, 47,53</sup>	<ul style="list-style-type: none"> <li>❖ Successful intervention components include long-term strategy, focused leadership, multi-agency collaboration, and selecting appropriate targeting and timing techniques<sup>14</sup></li> <li>❖ Selecting a reliable, well-established and well-informed organization is required to successfully run a loaner program<sup>46</sup></li> </ul>

## Good Practice Recommendations: Pedestrian-Related Fatalities

After motor vehicle collisions, pedestrian injuries resulted in the most transport-related fatalities among children in 2004 and 2010, emphasizing the need to implement good practices to improve child pedestrian safety.

Type of Recommendation	Evidence	Implementation
Engineering	❖ Area-wide engineering solutions and traffic calming measures are a cost-effective way in which to reduce child pedestrian injuries. <sup>7 12</sup>	❖ Examples include pedestrian facilities and/or traffic calming infrastructure <sup>7 12</sup> ❖ Traffic calming has shown accident savings of 60% in 30km/h zones <sup>19</sup> ❖ Can be more effective when supported by educational and enforcement activities <sup>13</sup>
	❖ Vehicular modifications appear to reduce the risk of pedestrian fatalities. <sup>12 20</sup>	❖ Modifications to the front of vehicle design that account for children result in reduced number of child pedestrian fatalities <sup>20</sup>
Enforcement	❖ Legislation/policy that reduces vehicle speeds in residential areas can reduce injuries and changes in driver behaviour. <sup>7</sup>	❖ In the United Kingdom, by introducing 32km/h speed limit zones in residential areas, a 70% reduction in fatal child pedestrian accidents was witnessed. <sup>21</sup> ❖ Level of enforcement and pairing legislation <sup>22 23</sup> with educational activities increases effectiveness. <sup>13</sup>
Education	❖ Community-based education and/or advocacy programs to prevent pedestrian injuries in children 0-14 can reduce in a reduction of injuries. <sup>25</sup>	❖ Comprehensive programs which incorporate educational, social, and environmental strategies, community commitment and resource provision are the most successful. <sup>25</sup>
	❖ Pedestrian skills training leads to improved child pedestrian crossing skills. <sup>12</sup>	❖ Multi-faceted programs which incorporate parental involvement are the most successful. <sup>12</sup>

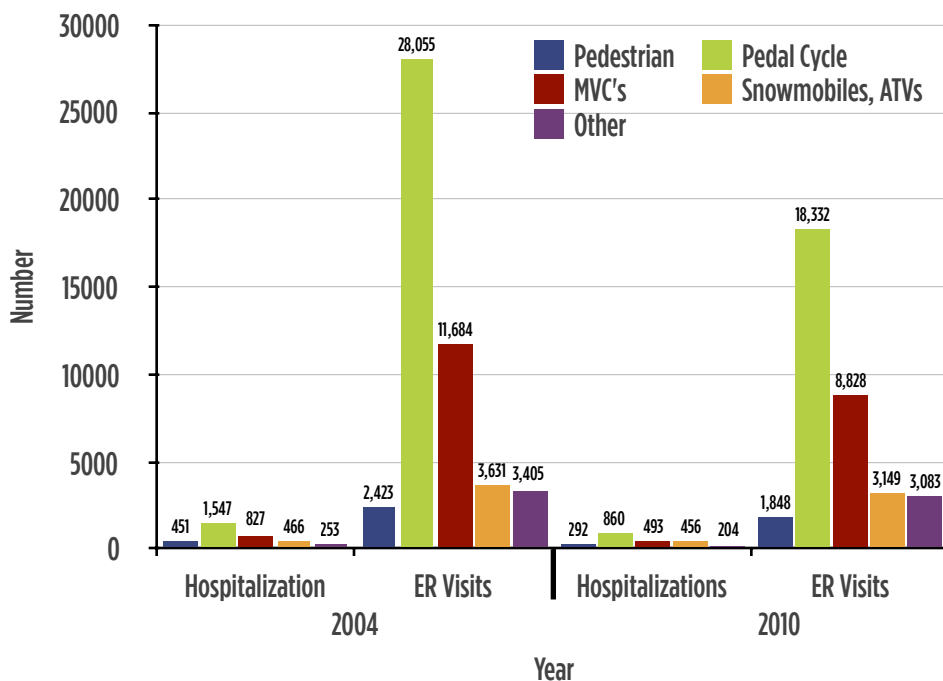
## Hospitalizations and Emergency Room (ER) Visits

In 2004 and 2010, the leading causes of hospitalization and emergency room (ER) visits due to transport incidents were attributed to pedal cycle, MVC, and snowmobile/ATV incidents. The highest number of ER visits in 2004 and 2010 were attributed to pedal cycle incidents decreasing by 34% from 28,055 in 2004 to 18,332 in 2010.

From Figure 6 below, a few general statements can be extrapolated. Overall, the number of hospitalizations and emergency room visits for transport incidents have decreased from 2004 to 2010. This shows promise in terms of transport-related prevention efforts and policy implementation. The only numbers which do not appear to have significantly decreased are number of hospitalizations and emergency room visits due to snowmobile or ATV incidents, which roughly stayed the same in 2004 and 2010.

Figure 6

Transport-Related Hospitalizations and ER Visits by Cause, Ages 0-14, 2004-2010



## Good Practice Recommendations Pedal Cycle-Related Injuries

As the leading cause of hospitalizations and emergency room (ER) visits due to transport incidents in 2004 and 2010, these numbers suggest the implementation of good practice for child cyclist safety. As evidence has repeatedly demonstrated, the use of bicycle helmets leads to a reduction in injuries – a correctly fitted bicycle helmet can reduce the risk of head and brain injury by as much as 85%.<sup>7,8,9</sup>

Type of Recommendation	Evidence	Implementation
Engineering	❖ Use of bicycle helmets leads to reduction in injuries. <sup>7,8,9</sup>	<ul style="list-style-type: none"> <li>❖ Imperative to enhance parental knowledge to ensure proper helmet use.<sup>10</sup></li> <li>❖ Address barriers such as helmet availability, accessibility and cost by reducing the costs of helmets<sup>10</sup> through give-away programs and discounts.<sup>11</sup></li> </ul>
	❖ Area-wide engineering solutions and traffic calming measures can reduce child cyclist injuries. <sup>7</sup>	<ul style="list-style-type: none"> <li>❖ Examples include speed reduction zones<sup>7</sup>, cycling lanes and pathways<sup>12</sup></li> <li>❖ Can be more effective when supported by educational and enforcement activities<sup>13</sup></li> </ul>
Education	❖ Community-based approaches, such as education and or advocacy programs around child helmet wearing can lead to increased helmet use. <sup>12,14,15,16</sup>	<ul style="list-style-type: none"> <li>❖ Develop a long-term strategy grounded in effective leadership, collaboration, grassroots and targeted approaches<sup>14</sup></li> <li>❖ Target contextual and upstream factors, including socioeconomic status (SES) through the provision of free helmets and parental participation<sup>15</sup></li> </ul>
	❖ Cycling skills training demonstrates increased knowledge and improved riding skills in children who received training. <sup>12</sup>	<ul style="list-style-type: none"> <li>❖ Children require the necessary cognitive and motor skills, knowledge about traffic rules and signs in order to ride safely<sup>17</sup></li> <li>❖ Introducing comprehensive programs which incorporate multiple elements, such as helmet education, traffic rules, safety guidelines, on-bike training<sup>12</sup>, and parental involvement show the most promise<sup>18</sup></li> </ul>



## ii) Fall-Related Injury Statistics

For the purpose of this report, the ERAT data categorizes fall injuries by relevant ICD-10 codes related to external mortality:

- ❖ on the same level, from skates/skis/boards/blades,
- ❖ from furniture,
- ❖ in playgrounds,
- ❖ on stairs,
- ❖ from ladders/scaffolding,
- ❖ from diving, and
- ❖ other.

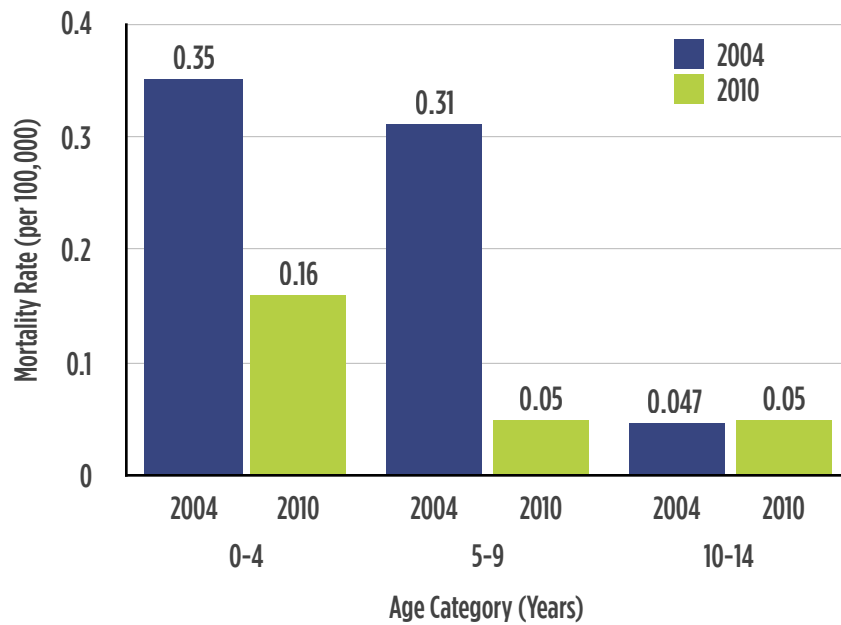
The following is a summary of findings and trends related to falls-related deaths, hospitalizations and emergency room visits between 2004 and 2010. A detailed summary of findings can be found in Appendix B, which provides data based on injury type, year, and age category.

### Mortality

Figure 8 below describes the changes in age-specific fall-related mortality rate, which should be noted as quite low to begin with. The highest mortality rate is seen in 0 to 4 year olds in both 2004 and 2010, with causes attributed to falls from stairs, same level, skis/boards/blades, ladders/scaffolding and other. The data demonstrates that the major burden with fall injuries is not associated with mortality, but rather with hospitalizations and emergency room visits. Falling is a normal part of the way a child develops and interacts with his or her environment. Most often, falls among children are non-fatal but rather pose a significant burden on health care facilities, including emergency departments. These trends are reflective on a global scale in most high-income countries, with falls comprising the leading type of injury resulting in hospitalization or emergency room visits.<sup>56</sup>

Figure 8

Falls-Related Age-Specific Mortality Rate, Ages 0-14, 2004-2010

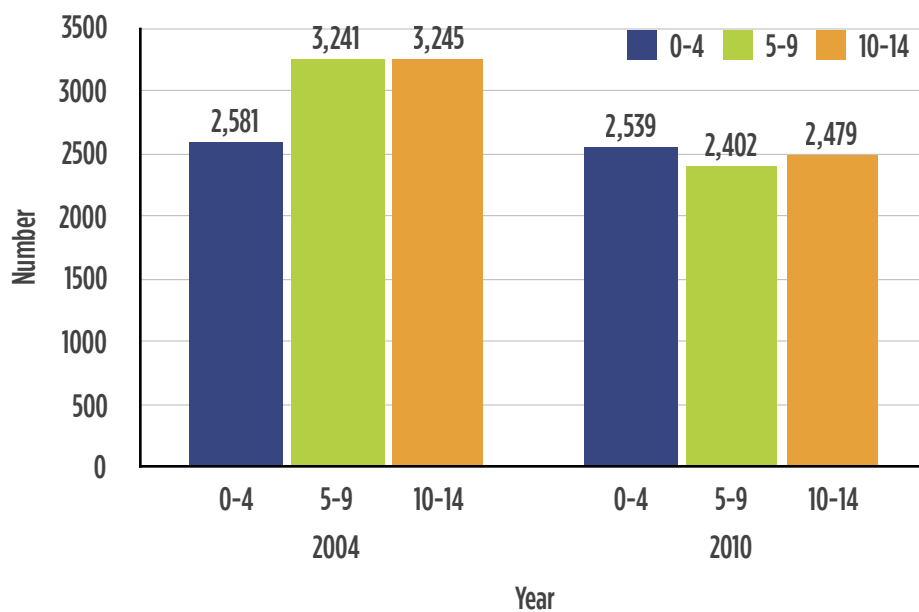


Hospitalizations

Figure 9 below describes the age distribution of fall-related hospitalizations in 2004 and 2010, in children between the ages of 0-14.

Figure 9

Fall-Related Hospitalizations, 2004-2010, Ages 0-14



In 2004, the most falls-related hospitalizations occurred in 10 to 14 year olds, totalling 3,245 hospitalizations, followed closely by 5 to 9 year olds (3,241) and 0 to 4 year olds (2,581). In 2010, children between the ages of 0 to 4 years of age experienced the most falls-related hospitalizations 2,539, followed by 10 to 14 year olds (2,479) and 5 to 9 year olds (2,402).

Table 7 and Figure 10 below depict the number of hospitalizations due to fall-related incidents by fall type between 2004 and 2010.

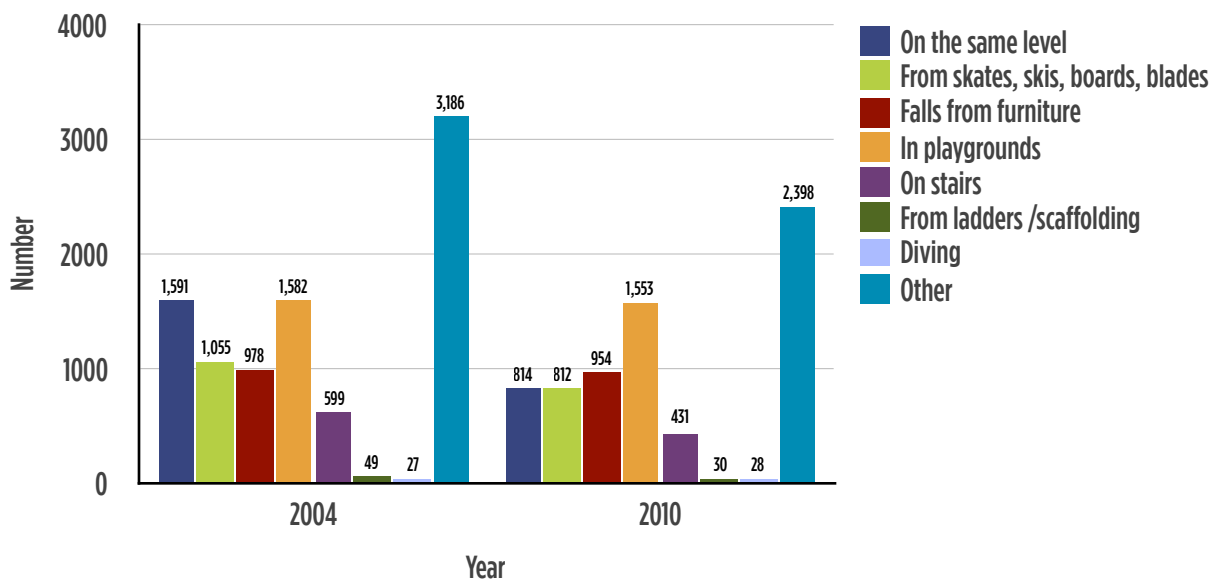
Table 7

**Number of Hospitalizations due to Falls-Related Incidents, 2004-2010, Ages 0-14**

Description	2004	2010
Falls on the same level	1,591	814
Falls from skates, skis, boards, blades	1,055	812
Falls from furniture	978	954
Falls in playgrounds	1,582	1,553
Falls on stairs	599	431
Falls from ladders / scaffolding	49	30
Diving	27	28
Other	9,067	7,020

Figure 10

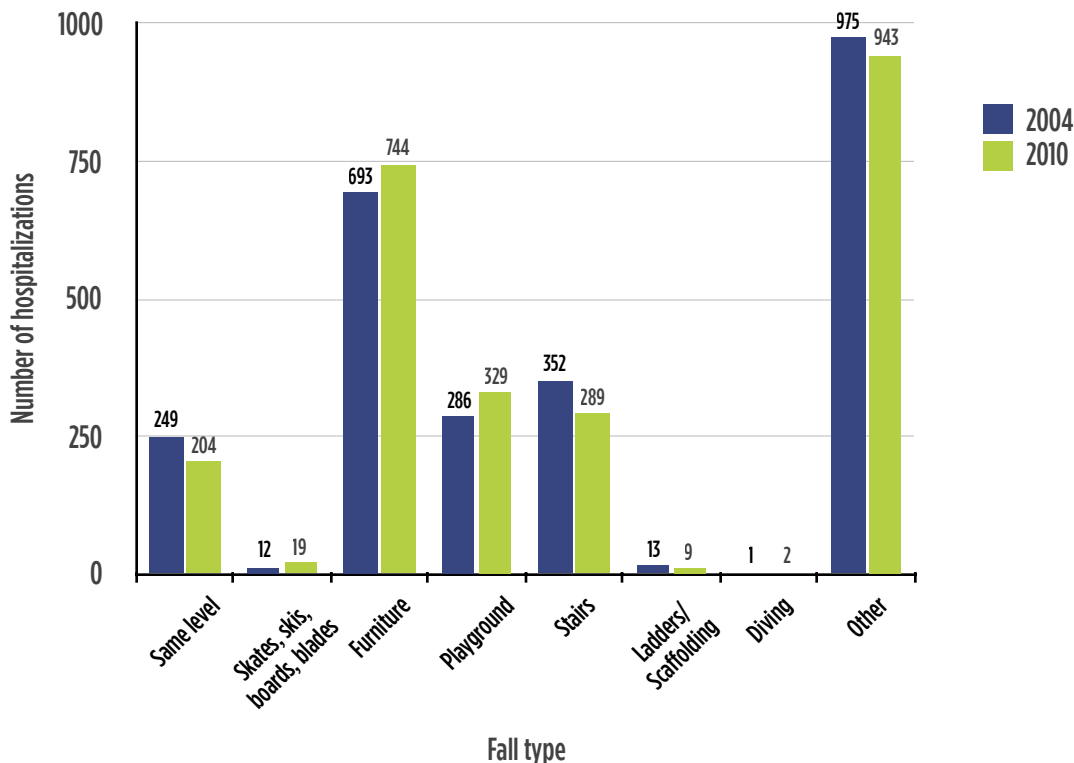
**Number of Hospitalizations due to Falls-Related Incidents, 2004-2010, Ages 0-14**



The total number of hospitalizations for all fall-incidents has decreased in all three age categories between 2004 and 2010. In 2004, the leading causes of hospitalization due to falls were falls on the same level, falls in playgrounds, and falls from skis /skates / snowboards. Conversely, the highest number of fall-related hospitalizations in 2010 was due to falls in playgrounds, followed by falls from furniture and same-level falls. Falls from ladders/scaffolding and diving appear to have the lowest burden of hospitalizations in children in 2004 and 2010.

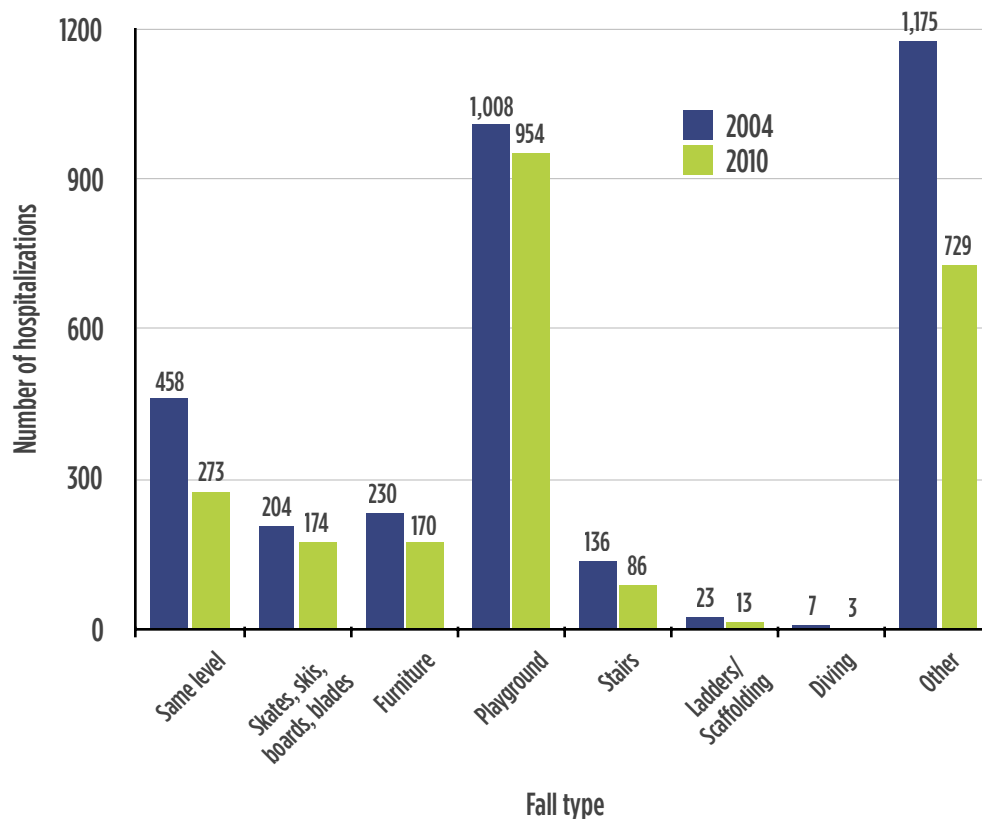
The highest number of hospitalizations due to falls in 0 to 4 year olds was due to falls from furniture, followed by falls in the playground and falls from stairs. Furthermore, of the three age categories, children between the ages of 0 and 4 experienced the highest hospitalizations due to falls from furniture and falls in from stairs. Furthermore, the numbers pertaining to falls from stairs have increased between 2004 and 2010 from 693 to 744 falls, respectively, in 0-4 year olds (Figure 11). All other fall types have experienced a decrease in 0 to 4 year olds.

Figure 11  
**Hospitalizations due to Falls, Ages 0-4, 2004 and 201**



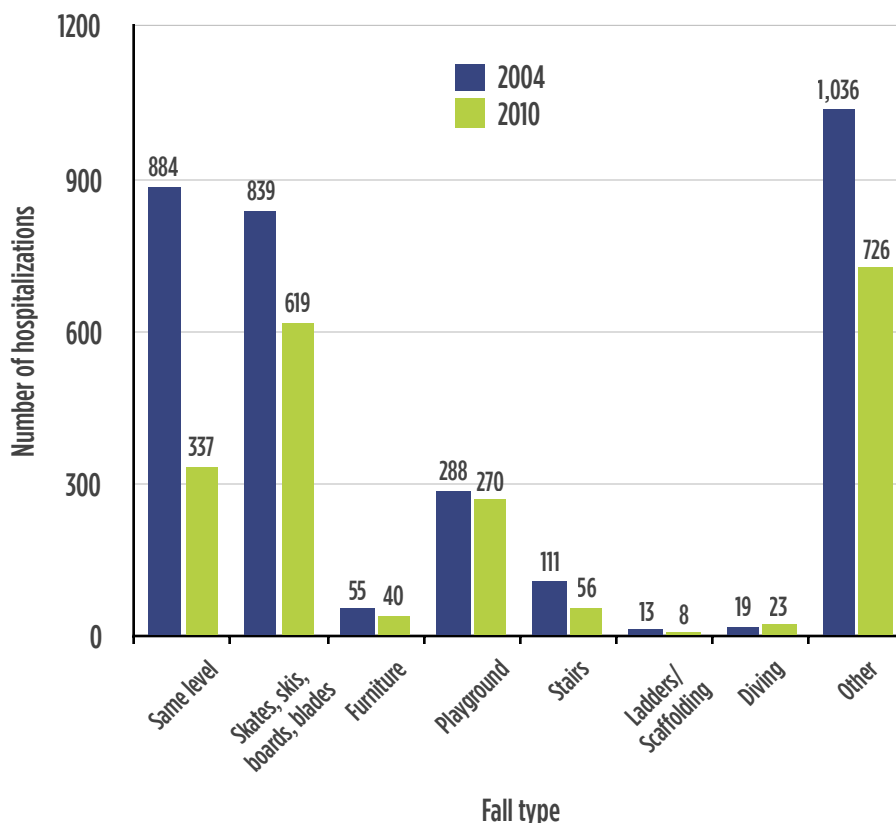
Overall, hospitalizations due to falls in 5 to 9 year olds decreased by 26% between 2004 and 2010 (Figure 12). The highest hospitalizations in the 5 to 9 year old age groups in both 2004 and 2010 was due to falls in playgrounds, followed by falls on the same level and falls from furniture. Children ages 5 to 9 were the most likely out of all three age groups to experience a fall in a playground.

Figure 12  
**Hospitalizations due to falls, ages 5 to 9, 2004 and 2010**



Children ages 10 to 14 experienced the highest hospitalization due to falls on the same level and falls from skates, skis, boards and blades in 2004 and 2010 of all three age groups (Refer to Appendix B). Furthermore, as Figure 13, demonstrates the highest hospitalizations due to falls in 10 to 14 year olds were due to falls on the same level, falls from skates, skis, boards and blades and falls in the playground.

Figure 13  
Hospitalizations due to falls, ages 10 to 14, 2004 and 2010



### Emergency Room Visits

Figure 14 below describes the age distribution of fall related emergency room visits in 2004 and 2010, in children between the ages of 0 to 14. In 2004, the highest falls-related emergency room visits occurred in 10 to 14 year olds, totalling 57,475 emergency room visits, followed by 0 to 4 year olds (50,395) and 5 to 9 year olds (41,347). In 2010, children between the ages of 0 to 4 years of age experienced the most falls-related hospitalizations 61,864, followed by 10 to 14 year olds (50,169) and 5 to 9 year olds (38,726). Furthermore, out of all age groups, only the 0 to 4 age category has experienced an increase in ER visits since 2004.

Figure 14

**Number of Emergency Room Visits due to Falls-Related Incidents, 2004 and 2010, Ages 0-14**

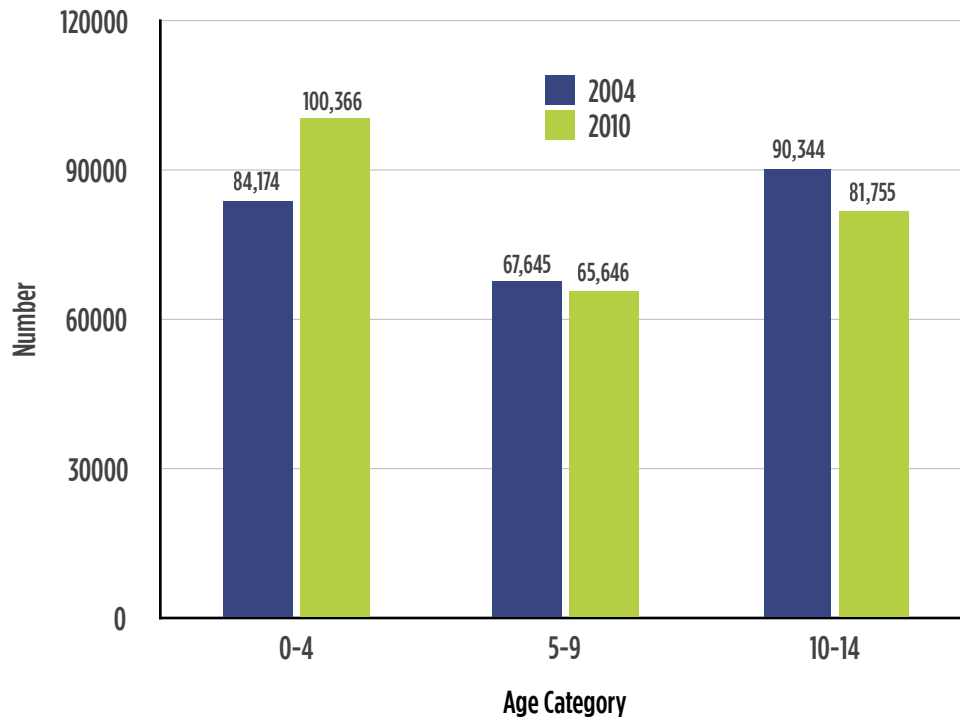


Table 8 and Figure 15 below describe the number of ER visits due to falls-related incidents in 2004 and 2010.

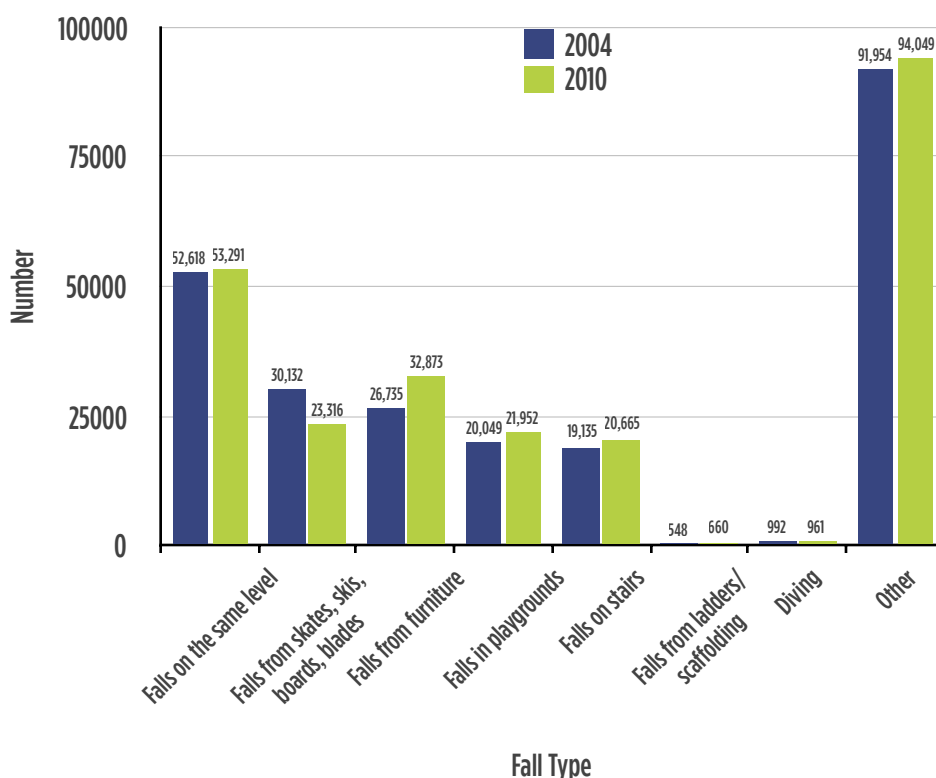
Table 8

**Number of Emergency Room Visits due to Falls-Related Incidents, 2004 and 2010, Ages 0-14**

Description	2004	2010
Falls on the same level	52,618	53,291
Falls from skates, skis, boards, blades	30,132	23,316
Falls from furniture	26,735	32,873
Falls in playgrounds	20,049	21,952
Falls on stairs	19,135	20,655
Falls from ladders / scaffolding	548	660
Diving	992	961
Other	91,594	94,049

In 2004, the leading causes of fall-related ER visits were due to falls on the same level, from skates/skis/boards/blades and from furniture. In 2010, the leading causes were due falls on the same level, falls from furniture, and falls from skates/skis/boards/blades. The number of emergency room visits due to falls on the same level, from furniture, in the playground, on stairs, and from ladders/scaffolding increased between 2004 and 2010. Also, falls from ladders/scaffolding and diving appear to have the lowest burden of ER visits in children.

Figure 15  
**Emergency Room Visits due to Fall-Incidents, 2004-2010, Ages 0-14**



Of these incidents, children between the ages of 0 to 4 experienced the highest ER visits due to falls from furniture and from stairs (these numbers have increased between 2004 and 2010). In the 5 to 9 year old age groups, the highest ER visits due to falls in playgrounds was found in. In addition, ER visits due to falls in playgrounds increased in all age groups since 2004. Lastly, children between the ages of 10-14 experienced the highest ER visits due to falls on the same level and from skates, skis, boards, and blades in 2004 and 2010.



ii) Fall Good Practice Recommendations

In 2010, falls were attributed to 42% of all injury-related hospitalizations and 36% of all injury-related emergency department visits in children (Parachute, 2015b). Typically, good practice recommendations for falls are classified under two categories: in the home and in the playground.

Type of Recommendation	Evidence	Implementation
Engineering	<ul style="list-style-type: none"> <li>❖ Safety mechanisms such as window bars / positioning devices<sup>12</sup> and stair gates are effective strategies to prevent falls.<sup>7</sup></li> </ul>	<ul style="list-style-type: none"> <li>❖ Parental knowledge, and availability, accessibility, cost, durability and ease of use impact the uptake of equipment use.<sup>7 26 27</sup></li> <li>❖ Further research on ways in which to overcome income inequalities and thus, installation barriers is required.<sup>28</sup></li> </ul>
	<ul style="list-style-type: none"> <li>❖ Surfacing materials (e.g. sand or woodchips) to a depth of 23-31cm are recommended to prevent playground equipment-related injuries. The optimal equipment height to reduce the risk of head injuries is 1.5m or 5 feet.<sup>12</sup></li> </ul>	<ul style="list-style-type: none"> <li>❖ Typical Canadian Playground Standards require 15 to 30 cm surfacing depth <sup>29 31</sup></li> <li>❖ Important to regularly maintain surfacing materials and incorporate educational activities to retain protective effect.<sup>12 30</sup></li> <li>❖ Addresses risk of head injury, not injuries to arms and legs. <sup>12 32</sup></li> </ul>
Education	<ul style="list-style-type: none"> <li>❖ Educational programs which encourage the use of fall prevention safety devices, such as window safety mechanisms or stair gates can increase the uptake of equipment use.<sup>12 27</sup></li> </ul>	<ul style="list-style-type: none"> <li>❖ Parental knowledge, and availability, accessibility, cost, durability and ease of use impact the use of equipment <sup>26 27 33</sup></li> <li>❖ Important to consider context, such as low income settings through the provision and instalment of free equipment to facilitate increased use <sup>26 27</sup></li> <li>❖ Tailor education efforts to suit target communities (i.e. low income or ethnic communities) by developing cultural-specific materials and advice <sup>34</sup></li> <li>❖ Identify barriers which could inhibit fall prevention techniques, such as rental or shared accommodation<sup>34</sup></li> </ul>

# Conclusion

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The *Cost of Injury Report* serves as a fundamental tool for comparing trends in injury over time. By analyzing the fall and transport data found in the ERAT 2004 and 2014 analysis, it is evident that fall and transport injuries comprise a significant portion of the injury burden among children under the age of 14 years of age in Canada. While overall injury trends in children have decreased between 2004 and 2010, children between the ages of 0-4 experienced an increase in overall injury mortality rates, as well as transport-specific mortality rates. Furthermore, in 2010, children under the age of 4 also experienced the most fall-related hospitalizations and emergency room visits, compared to 5-9 year and 10-14 year olds.

While this compendium provides good practice recommendations to address transport injuries and falls, further age-specific prevention research may be warranted, specifically targeting children under the age 4. For further information on the burden of injury in children, the *Cost of Injury Report (2015)* provides as a detailed account of national and provincial data by gender. In addition, the *Child Safety Good Practice Guide (2011)* outlines clear good practice recommendations as well as case examples for a variety of child injury topics.

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# Appendix A

## Transport Deaths, Hospitalizations and Emergency Room Visits among Children Ages 0-14 (2004-2010)

Transport Incidents	Age	2004			2010		
		Deaths	Hospitalizations	ER Visits	Deaths	Hospitalizations	ER Visits
Pedestrian	0-4	10	85	420	16	70	392
	5-9	6	160	668	6	101	494
	10-14	9	206	1,335	3	121	962
Pedal Cycle	0-4	0	82	1,856	4	50	1,493
	5-9	4	518	9,846	3	266	6,008
	10-14	7	947	16,353	5	544	10,831
MVCs	0-4	6	135	2,729	12	103	2,358
	5-9	12	256	3,678	7	131	2,567
	10-14	17	436	5,277	12	259	3,903
Snowmobiles, ATVs	0-4	1	23	149	0	21	163
	5-9	2	119	715	3	111	720
	10-14	6	406	2,767	7	324	2,266
Other	0-4	5	30	314	2	31	242
	5-9	13	63	814	3	59	725
	10-14	17	160	2,277	11	114	2,116
<b>Total</b>		<b>115</b>	<b>3,544</b>	<b>52,593</b>	<b>94</b>	<b>2,305</b>	<b>35,240</b>



# Appendix B

## Falls Deaths, Hospitalizations and Emergency Room visits among Children ages 0-14 (2004-2010)

Fall Type	Age	2004			2010		
		Deaths	Hospitalizations	ER Visits	Deaths	Hospitalizations	ER Visits
On the same level	0-4	1	249	14,598	0	204	16,414
	5-9	0	458	15,299	0	273	14,831
	10-14	0	884	22,721	0	337	22,046
From skates, skis, boards, blades	0-4	0	12	772	0	19	917
	5-9	1	204	5,698	0	174	5,394
	10-14	0	839	23,662	0	619	17,005
From furniture	0-4	0	693	20,038	1	744	26,303
	5-9	0	230	5,070	0	170	5,079
	10-14	0	55	1,627	0	40	1,491
In playgrounds	0-4	0	286	4,374	0	329	5,622
	5-9	0	1,008	11,312	0	954	11,609
	10-14	0	288	4,363	0	270	4,721
On stairs	0-4	2	352	10,402	0	289	12,329
	5-9	1	136	3,786	0	86	3,585
	10-14	1	111	4,947	0	56	4,751
From ladders / scaffolding	0-4	0	13	211	0	9	279
	5-9	1	23	182	0	13	226
	10-14	0	13	155	0	8	155
Diving	0-4	0	1	63	0	2	99
	5-9	0	7	350	0	3	383
	10-14	0	19	579	0	23	479
Other	0-4	3	975	33,716	2	943	38,403
	5-9	4	1,175	25,948	1	729	24,539
	10-14	0	1,036	32,290	1	726	31,107
<b>Total</b>		<b>14</b>	<b>9,067</b>	<b>242,163</b>	<b>5</b>	<b>7,420</b>	<b>247,767</b>