
The Illinois Department of Transportation (IDOT) maintains a statewide database for all motor vehicle crashes (MVCs) in Illinois that involve death, injury and/or significant vehicle or property damage. These data include records of pedestrian and pedalcyclist victims in MVCs. (“Pedalcyclist” is an inclusive term that covers persons riding bicycles, tricycles, etc.)

Using these data to analyze the records of 0-14 year olds between 2000 and 2012, considerable declines were found in the number of MVC pedestrian and pedalcyclist victims, decreasing 58.5% and 57.5%, respectively. The same decline was not found for older age groups.

To validate these numbers, a second Illinois dataset was analyzed. The Illinois Trauma Registry (ITR) was available for 2004-2012. Over this time period, the same pattern of large decline was found for 0-14 year old MVC pedestrian and pedalcyclist trauma victims relative to older age groups.

The Illinois numbers could also be compared with national data from the National Highway Traffic Safety Administration (NHTSA). Each year NHTSA publishes “Traffic Safety Facts” on selected topics, including pedestrian and pedalcyclist injuries and fatalities in MVCs. The reports showed similarly strong declines for younger age groups nationally between 2000 and 2012.

To help interpret these results, findings from two surveys examining childhood activity and travel modes were reviewed. They showed a considerable reduction over time in bicycling. However, they are less clear in accounting for the findings regarding pedestrians. Separately, technological and legislative improvements have taken place over this time period, including countdown traffic signals and distracted driving laws. Finally, safety programs for children have also been emphasized, and they may have had an effect.
Pedestrian Victims in MVCs in Illinois

In 2000 there were a total of 6,948 pedestrian victims (for all ages, including “unknown” age) in MVCs in Illinois. By 2012, this number had declined 27.1% to 5,066. To control for changes in the state’s population during this time period, population-based rates were calculated. This consisted of dividing the number of victims by the number or residents in Illinois for the appropriate year.* The population-based rate of all MVC pedestrian victims was 55.9 per 100,000 population in 2000. It declined to 39.3 per 100,000 (29.7%) in 2012.

However, as shown in Table 1 below, the decline for persons 14 years old or younger was particularly high, at 58.5% for number of victims and 55.5% for population-based rate. By contrast, for persons 15 or older, the decline was 13.9% for number and from 19.1% for rate.

Table 1. Number and Population-Based Rate of MVC Pedestrian Victims by Age Group, 2000-2012

<table>
<thead>
<tr>
<th>Year</th>
<th>Age 0-14 Years</th>
<th></th>
<th>Age 15 Years or Older</th>
<th></th>
<th>Totals‡ (All Ages, including unk age)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Rate a per 100,000</td>
<td>Number</td>
<td>Rate a per 100,000</td>
<td>Number</td>
<td>Rate per 100,000</td>
</tr>
<tr>
<td>2000</td>
<td>1,851</td>
<td>68.3</td>
<td>4,792</td>
<td>49.3</td>
<td>6,948</td>
<td>55.9</td>
</tr>
<tr>
<td>2012</td>
<td>768</td>
<td>30.4</td>
<td>4,128</td>
<td>39.9</td>
<td>5,066</td>
<td>39.3</td>
</tr>
<tr>
<td>% Change</td>
<td>-58.5%</td>
<td>-55.5%</td>
<td>-13.9%</td>
<td>-19.1%</td>
<td>-27.1%</td>
<td>-29.7%</td>
</tr>
</tbody>
</table>

Note: a Rates were calculated as the number of records divided by the statewide Illinois population for the year and age group. b Totals include 305 records with unknown ages in 2000, and 170 records with unknown ages in 2012. Data Sources: IDOT Crash Data, Centers for Disease Control and Prevention (CDC) Bridged Race Population Data

Figure 1.a indicates that, for children 14 years old or younger, the decline appeared gradually throughout the 13 year time period. By contrast, Figure 1.b shows a less consistent decline for persons who were 15 years and older.

Figure 1. Pedestrian Victims in Motor Vehicle Crashes in Illinois, 2000-2012

Notes: Rates were calculated as the number of records divided by the statewide Illinois population for the year and age group. To facilitate comparison, the scales for number and rate are the same for the two charts. Data Sources: IDOT Crash Data, Centers for Disease Control and Prevention (CDC) Bridged Race Population Data

*Source for population data: Centers for Disease Control and Prevention (CDC) Bridged Race Population Data, available online at http://wonder.cdc.gov/bridged-race-population.html
Finally, when examining the data using standard age groupings, the greatest decline over this 13 year time period took place for 5-9 year olds: 69.4% for number and 66.7% for rate. As with 0-14 year olds, the decline was also gradual for this age group over the time period. Appendix 1 shows charts with the numbers and rates of pedestrian MVC victims for 5-9 year olds and all other standard age groups in Illinois from 2000-2012.

Pedalcyclist Victims in MVCs in Illinois

In 2000 there were a total of 3,571 pedalcyclist victims (for all ages, including unknown age) in MVCs in Illinois. By 2012, this number had declined only slightly to 3,489 (2.3%). The population-based rate of all pedalcyclist victims was 28.7 per 100,000 population in 2000. It declined to 27.1 per 100,000 in 2012 (5.6% lower).

As shown in Table 2, the number of 0-14 year old victims declined by 57.5% and the rate by 54.5%. By contrast, for persons 15 or older, there was a 34.9% increase in the number of victims and a 26.8% increase in the rate.

Table 2. Number and Population-Based Rate of MVC Pedalcyclist Victims by Age Group, 2000-2012

<table>
<thead>
<tr>
<th>Year</th>
<th>Age 0-14 Years</th>
<th>Age 15 Years or Older</th>
<th>Totals b (All Ages including unk age)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Rate a per 100,000</td>
<td>Number</td>
</tr>
<tr>
<td>2000</td>
<td>1,341</td>
<td>49.5</td>
<td>2,069</td>
</tr>
<tr>
<td>2012</td>
<td>570</td>
<td>22.5</td>
<td>2,792</td>
</tr>
<tr>
<td>% Change</td>
<td>-57.5%</td>
<td>-54.5%</td>
<td>+34.9%</td>
</tr>
</tbody>
</table>

Note: a Rates were calculated as the number divided by the statewide Illinois population for the year and age group. b Totals include 161 records with unknown ages in 2000, and 127 records with unknown ages in 2012.

Data Sources: IDOT Crash Data, Centers for Disease Control and Prevention (CDC) Bridged Race Population Data

Similarly to pedestrians, the decline for 0-14 year old pedalcyclist victims appeared gradually throughout the 13 year period, as shown in Figure 2.a. Also, as with pedestrians, pedalcyclist data were analyzed using standard age groups. Particularly large declines were found for 5-9 and 10-14 year olds. Appendix 2 shows charts using standard age groups for pedalcyclists.

Figure 2. Pedalcyclist Victims in Motor Vehicle Crashes in Illinois, 2000-2012

Notes: Rates were calculated as the number of records divided by the statewide Illinois population for the year and age group. To facilitate comparison, the scales for number and rate are the same for the two charts.

Data Sources: IDOT Crash Data, Centers for Disease Control and Prevention (CDC) Bridged Race Population Data
Pedestrian and Pedalcyclist Trauma Victims in Illinois

To help validate these findings, a second Illinois data source containing MVC-related injured victims was analyzed. The Illinois Trauma Registry (ITR) captures all trauma records submitted by the Illinois Department of Public Health (IDPH) Level I or Level II Trauma Centers (67 facilities, including 7 border state hospitals that submit data for Illinois patients).* ITR data were available from 2004 through 2012.

The ITR includes records for patients who (a) sustain traumatic injuries that require treatment at a trauma center and are then admitted to a trauma center; (b) are transferred to a trauma center; or (c) are dead-on-arrival or die in the emergency department.

To identify MVC pedestrian and pedalcyclist victims in the ITR, categories available from CDC† for the mechanism of injury were applied (E-Codes). Using these categories, the statewide number of MVC pedestrian victims with traumatic injuries, for all ages, fell from 1,786 in 2004 to 1,468 in 2012 (17.8%). As shown in Table 3, for 0-14 year olds the number decreased 43.6%. For persons 15 years of age or older, it only decreased 8.0%.

<table>
<thead>
<tr>
<th>Year</th>
<th>0-14 Years</th>
<th>15 Years or Older</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>493</td>
<td>1,293</td>
<td>1,786</td>
</tr>
<tr>
<td>2012</td>
<td>278</td>
<td>1,190</td>
<td>1,468</td>
</tr>
<tr>
<td>% Change</td>
<td>-43.6%</td>
<td>-8.0%</td>
<td>-17.8%</td>
</tr>
</tbody>
</table>

Table 3. Number of MVC Pedestrian Victims in the ITR by Age Group, 2004-2012

As shown in Table 4, for MVC pedalcyclist victims, the statewide ITR number increased 18.0% from 378 in 2004 to 446 in 2012. For 0-14 year olds the number decreased 30.8%, but the number increased 47.7% for persons 15 years of age or older.

<table>
<thead>
<tr>
<th>Year</th>
<th>0-14 Yr Olds</th>
<th>15+ Yr Olds</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>143</td>
<td>235</td>
<td>378</td>
</tr>
<tr>
<td>2012</td>
<td>99</td>
<td>347</td>
<td>446</td>
</tr>
<tr>
<td>% Change</td>
<td>-30.8%</td>
<td>+47.7%</td>
<td>+18.0%</td>
</tr>
</tbody>
</table>

Table 4. Number of MVC Pedalcyclist Victims in the ITR by Age Group, 2000-2012

* An IDPH listing of Illinois trauma centers is available online at [http://www.idph.state.il.us/ems/traumaregions.htm](http://www.idph.state.il.us/ems/traumaregions.htm)
National Trends

To compare Illinois findings with national data, reports available from the National Highway Traffic Safety Administration (NHTSA) were used. Each year, NHTSA publishes Traffic Safety Facts “fact sheets” on selected topics, including pedestrians and pedalcyclists.*

In these fact sheets, NHTSA reports the number and population-based rate of injuries and fatalities by age group. Although the age groups differ slightly from those used in the Illinois data (NHTSA uses 0-15 year olds rather than 0-14 year olds), the numbers and rates of injuries showed similar patterns of large decline for younger ages.

As Tables 5 and 6 below show, the declines in fatality for 0-15 year olds were over 40% for pedestrians and over 60% for pedalcyclists. The declines in injury victims were even greater. By contrast, for persons 16 years old or older, relatively small declines were found in the population-based rates of pedestrian fatalities (9.2%) and pedalcyclist injuries (5.5%), and increases were found for all other values.

Regarding these numbers, it should be noted that NHTSA uses estimates for the number of injuries based on survey data. Fatalities are based on actual data reported to NHTSA by individual states.

Table 5. NHTSA Traffic Safety Facts Report Data for U.S. Pedestrian Victims of MVCs, 2000-2012

<table>
<thead>
<tr>
<th>Year</th>
<th>0-15 Yrs</th>
<th>16 Yrs or Older</th>
<th>0-15 Yrs</th>
<th>16 Yrs or Older</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Rate</td>
<td>Number</td>
<td>Rate</td>
</tr>
<tr>
<td>2000</td>
<td>517</td>
<td>0.82</td>
<td>4153</td>
<td>1.96</td>
</tr>
<tr>
<td>2012</td>
<td>292</td>
<td>0.45</td>
<td>4427</td>
<td>1.78</td>
</tr>
<tr>
<td>% Change</td>
<td>-43.5%</td>
<td>-45.1%</td>
<td>6.6%</td>
<td>-9.2%</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Year</th>
<th>0-15 Yrs</th>
<th>16 Yrs or Older</th>
<th>0-15 Yrs</th>
<th>16 Yrs or Older</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Rate</td>
<td>Number</td>
<td>Rate</td>
</tr>
<tr>
<td>2000</td>
<td>190</td>
<td>0.30</td>
<td>493</td>
<td>0.23</td>
</tr>
<tr>
<td>2012</td>
<td>67</td>
<td>0.10</td>
<td>653</td>
<td>0.26</td>
</tr>
<tr>
<td>% Change</td>
<td>-64.7%</td>
<td>-66.7%</td>
<td>+32.5%</td>
<td>+13.0%</td>
</tr>
</tbody>
</table>

Notes: Numbers and rates were calculated from the NHTSA reports for the year and age groups.

Discussion

This brief report provides descriptive information about declines in childhood pedestrian and pedalcyclist MVC victims in Illinois from 2000 to 2012. While it is difficult to statistically establish causes for the observed trends, a limited exploration can be made regarding potentially associated factors.

For pedalcyclists in particular, decreases in childhood bicycling as an activity have been documented. According to the National Household Travel Survey (NHTS) conducted by the Federal Highway Administration of the U.S. Department of Transportation, the percentage of 5-15 year old children bicycling for at least 30 minutes per day fell by one-third from 2.4% in 2001 to 1.6% in 2009. In a separate survey from the National Sporting Goods Association, the percentage of 7-17 year old children who bicycle at least six times per year fell one-fourth from 25.6% in 2000 to 19.7% in 2010. Both of these declines are substantial, although not to the level of the decline in childhood MVC pedalcyclist crash victims found in the Illinois data.

Declines in pedestrian activity are less clearly documented. The NHTS found only a slight decrease in the percentage of 5-15 year old children walking at least 30 minutes per day, from 7.5% to 7.1%. According to a separate set of questions from this same survey, there were considerable declines in children walking to school in 2009 relative to 2001, with more parents driving their children even short distances. To evaluate this association, the IDOT crash data were checked by calendar quarter. The third quarter (July through September), contains a smaller proportion of time when children are in school compared with the fourth, first, and second quarters (October through June). However, the third quarter actually showed a slightly greater decrease between 2000 and 2012 in MVC pedestrian victims for 0-14 year olds (64.1% in number, 61.6% in rate) compared to other quarters (57.2% in number and 54.2% in rate).

Legislative and technological improvements have taken place over this time period in Illinois. These include red light cameras, countdown signals, graduated driver license legislation, and regulations regarding cell phones/texting. Also, NHTSA has conducted studies overlapping with this period that identified improvements in roadway safety, individual behavior (e.g., restraint use), and crash-worthiness of vehicles.

Finally, it seems possible that, given the large reduction of childhood pedestrian and pedalcyclist MVC victims in Illinois, safety programs may have contributed to the decreases found, and numerous pedestrian and bicyclist safety programs were initiated or maintained in Illinois over the period of 2000-2012. Some examples include the following:

- IDOT provided funding support for pedestrian and pedalcyclist safety programs to the Chicago Department of Transportation (CDOT), Chicago Police Department, City of Elgin, League of Illinois Bicyclists, and Chicagoland Bicycle Federation. One example of efforts specifically directed to children is CDOT’s Safe Routes to School Ambassadors, an educational program available freely to elementary schools throughout the city
The Illinois Department of Public Health applied federal Community Transformation Grant funding to support programs such as Complete Streets, Joint Use Agreements, and Safe Routes to School.

Safe Kids is a global network of coalitions dedicated to reducing childhood injury. Based at health departments, hospitals, and other organizations, coalitions focus programs on local community needs. Funding is provided by private foundations, corporations, and government agencies. Ten coalitions are located throughout Illinois.
References


Number of Pedestrians and Rate per 100,000 Population By Age Group
Data Sources: IDOT Crash Data, CDC Bridged Race Population Data
Appendix 1, continued (Pedestrians in MVCs in Illinois)
Number of Pedalcyclists and Rate per 100,000 Population By Age Group
Data Sources: IDOT Crash Data, CDC Bridged Race Population Data

Age 0 Years

Age 1 to 4 Years

Age 5 to 9 Years

Age 10 to 14 Years

Age 15 to 19 Years

Age 20 to 24 Years
Appendix 2, continued (Pedalcyclists in MVCs in Illinois)

Age 25 to 34 Years

Age 35 to 44 Years

Age 45 to 54 Years

Age 55 to 64 Years

Age 65 to 74 Years

Age 75 + Years