

# Outdoor Deck and Porch Injury Study

## By Legacy Services LLC

### Abstract

This paper examines the number of injuries caused by outdoor decks and porches from 2003 to 2007. Data was collected using the Consumer Product Safety Commission's National Electronic Injury Surveillance System.<sup>1</sup> Three categories were analyzed: 1.) decks, porches, balconies and open floors, 2.) railings and 3.) stairs. The study focused on deck and porch injuries involving wood structures. Based on the statistics from the CPSC, 224,000 people were injured nationally due to a deck or porch over the study period. Nearly 15 percent of these injuries were a result of a structural failure or collapse.

### Deck Study – Injuries and Structural Failures

Since 2003, deck collapses have caused thousands of reported injuries and several deaths in the U.S.<sup>2</sup> The most tragic deck collapse occurred in June of 2003 when a porch gave way in Chicago, killing 13 people and injuring 57. This incident created a concern for deck and porch safety across the country.

Although the number of people that are injured from outdoor wood decks and porches appears to be on the rise, a detailed study has not been completed to determine the actual number of injuries.

For more than 25 years, the U.S. Consumer Product Safety Commission (CPSC) has administered the National Electronic Injury Surveillance System (NEISS) which is a national probability sample of hospitals in the U.S. The NEISS program collects patient information from hospital emergency rooms to identify the number and severity of consumer product-related injuries. The sample is then extrapolated to estimate the total number of product-related injuries treated in hospital emergency rooms nationwide. Hundreds of categories are recorded daily and the information is made available to the general public in an effort to reduce the number of injuries and fatalities associated with consumer products. Three of the NEISS categories include decks, porches and balconies, railings and stairs. The following is an analysis of that information.

### Methodology

Data from CPSC's NEISS was retrieved based on category and year. The latest five-year period available was from 2003 through 2007. The data was obtained for the following groups:

Category 1 – decks, porches, balconies and open floors

Category 2 – railings

Category 3 – stairs

Copyright © 2010 Legacy Services, LLC - 215.804.6679

---

<sup>1</sup> Consumer Product Safety Commission's National Electronic Injury Surveillance System, <http://www.cpsc.gov/LIBRARY/neiss.html>

<sup>2</sup> Based on news clippings and media reports.

<sup>3</sup> Porches were included as they are often deck-type structures with a roof.

<sup>4</sup> Kessler, E. and T. Schroeder. (1998). National Electronic Injury Surveillance System (NEISS) Estimated Generalized Relative Sampling Errors. Washington, DC: U.S. Consumer Product Safety Commission.

<sup>5</sup> National Ornamental & Miscellaneous Metals Association (NOMMA) and Whorton Marketing & Research (WM&R) *Climbability Research, Analysis, and Communications Planning* document, May 31, 2006.

<sup>6</sup> *Wood Myths Facts and Fiction*, Paul Fiset, 2005 Building Material and Wood Technology-University of Massachusetts at Amherst

Injuries caused from wood decks and porches<sup>3</sup> were included. Injuries that did not appear to be caused by a deck or wood porch were removed. In addition, balconies, stages, open floors, and cement/steel decks and porches were not included. This study focused on deck and porch injuries involving wood structures. Injuries caused by slipping on a wet or icy surface were not included. Injuries from a splinter or similar minor injuries, such as falling with minor contusions, were not counted nor were any alcohol-related injuries.

The analysis for railings included all of the exceptions listed above for wood decks and porches. Banisters, platforms, indoor related injuries and metal railings with cement porches were not included.

The yearly number of stair injuries were estimated at more than one million. A small percentage were identified to occur from wood decks and porches. Stair injuries were only included when they were identified from a wood deck or porch.

In addition, an analysis of structural failures was included. Such key words as “collapse”, “gave way”, railing or deck “failed” or “broke” were used to determine how many injuries were a result of a structural failure or collapse.

### **Sample**

The CPSC NEISS gathers data from 100 of the 5,300 hospitals that have emergency departments in the U.S. and its territories. To determine the appropriate multiplier to reflect the national average, a previous research study on guardrail safety<sup>4</sup> was referenced. This study used a straight line method (multiplying by 40) to represent all U.S. hospitals. In addition, because NEISS estimates are based on data from a sample of hospital emergency departments rather than from a census of all emergency department data, they are subject to sampling (or standard) errors. For convenience, the CPSC provides researchers with an estimated generalized sampling error of a 95 percent confidence interval.<sup>5</sup>

For the purposes of this study, a straight line multiplier of 40 was used to be consistent with the previous guardrail study and to account for sampling errors as mentioned above.

By eliminating the parameters not pertinent to this study and by using a multiplier of 40, the data provided in the following results are believed to be conservative, yet probable estimates.

Copyright © 2010 Legacy Services, LLC - 215.804.6679

---

<sup>1</sup> Consumer Product Safety Commission's National Electronic Injury Surveillance System, <http://www.cpsc.gov/LIBRARY/neiss.html>

<sup>2</sup> Based on news clippings and media reports.

<sup>3</sup> Porches were included as they are often deck-type structures with a roof.

<sup>4</sup> Kessler, E. and T. Schroeder. (1998). National Electronic Injury Surveillance System (NEISS) Estimated Generalized Relative Sampling Errors. Washington, DC: U.S. Consumer Product Safety Commission.

<sup>5</sup> National Ornamental & Miscellaneous Metals Association (NOMMA) and Whorton Marketing & Research (WM&R) *Climbability Research, Analysis, and Communications Planning* document, May 31, 2006.

<sup>6</sup> *Wood Myths Facts and Fiction*, Paul Fisette, 2005 Building Material and Wood Technology-University of Massachusetts at Amherst

## Results

**Table 1. Annual National Estimate of Injuries from a Deck or Wood Porch**

	<b>Deck &amp; Porch</b>	<b>Railing</b>	<b>Stairs</b>	<b>Total</b>
<b>2003</b>	29,400	4,880	3,480	37,760
<b>2004</b>	37,720	5,520	3,120	46,360
<b>2005</b>	31,160	4,680	3,680	39,520
<b>2006</b>	36,640	5,440	3,860	45,940
<b>2007</b>	43,880	6,120	5,160	55,160
<b>TOTAL</b>	<b>178,800</b>	<b>26,640</b>	<b>19,300</b>	<b>224,740</b>

Note: These are the estimated total number of people with injuries that went to the hospital emergency room due to falling off or becoming injured from a wood deck or porch. These numbers do not include slipping on a wet or icy surface, splinters, falling on a deck or other minor incidents, including alcohol or drug related injuries that occurred on a deck or porch.

**Table 2. Annual National Estimate of Injuries as a Result of a Structural Failure or Collapse**

	<b>Deck &amp; Porch</b>	<b>Railing</b>	<b>Stairs</b>	<b>Total</b>
<b>2003</b>	4,080	1,760	280	6,120
<b>2004</b>	3,640	2,400	320	6,360
<b>2005</b>	3,800	1,880	560	6,240
<b>2006</b>	4,080	2,080	390	6,550
<b>2007</b>	4,600	3,000	400	8,000
<b>TOTAL</b>	<b>20,200</b>	<b>11,120</b>	<b>1,950</b>	<b>33,270</b>

Note: The injuries in the previous table, Table 1, were not all a result of a structural failure. Of the 37,760 injuries occurring in 2003, 6,120 were a result of a structural failure or collapse. Table 2 provides estimated data for injuries that were a result of a deck, porch, railing or stair that collapsed, gave way, wood failed or wood that broke. Nearly 15% of all injuries are a result of a structural failure.

Copyright © 2010 Legacy Services, LLC - 215.804.6679

<sup>1</sup> Consumer Product Safety Commission's National Electronic Injury Surveillance System, <http://www.cpsc.gov/LIBRARY/neiss.html>

<sup>2</sup> Based on news clippings and media reports.

<sup>3</sup> Porches were included as they are often deck-type structures with a roof.

<sup>4</sup> Kessler, E. and T. Schroeder. (1998). National Electronic Injury Surveillance System (NEISS) Estimated Generalized Relative Sampling Errors. Washington, DC: U.S. Consumer Product Safety Commission.

<sup>5</sup> National Ornamental & Miscellaneous Metals Association (NOMMA) and Whorton Marketing & Research (WM&R) *Climbability Research, Analysis, and Communications Planning* document, May 31, 2006.

<sup>6</sup> *Wood Myths Facts and Fiction*, Paul Fiset, 2005 Building Material and Wood Technology-University of Massachusetts at Amherst

## Conclusion

Outdoor living became popular about 35 years ago and continues to grow in popularity. Estimates show there are more than 40 million existing decks in the U.S. As with any outdoor structure, porches and decks are exposed to the elements 365 days a year, seven days a week, 24 hours a day. All things have a finite life and this is especially true with any structure exposed to the weather. Most deck experts, approximate the average life of a deck to be 10-15 years.<sup>6</sup> It is estimated there are more than 20 million decks and porches in the U.S. that are older than 15 years.

Based on the statistics from the CPSC, 224,000 people were injured nationally due to a deck or porch over the study's five-year period. Of those injuries, 33,000 were a result of a structural failure or collapse.

The estimate for "serious" injuries resulting from those failures exceeds 18,000. Serious injuries included head trauma, concussion, major fractures, such as those associated with the back, and paralysis.

Legacy believes most injuries are preventable with proper deck inspection each year by a qualified professional. The obvious signs of wood decay and deterioration should be taken seriously and the structure replaced if necessary.

Given the 10-15 year lifespan, the fact that wood decks and porches naturally deteriorate over time, and the large number of structural failures and collapses that consistently occur each year, a reasoned argument can be made that unsafe decks and porches are the cause of thousands of injuries across the U.S. Legacy Services, LLC recommends the immediate inspection of the existing stock of outdoor decks and porches as well as the repair or retrofit of decks and porches in order to prevent more injuries and deaths from occurring and to ensure consumer safety.

Copyright © 2010 Legacy Services, LLC - 215.804.6679

---

<sup>1</sup> Consumer Product Safety Commission's National Electronic Injury Surveillance System, <http://www.cpsc.gov/LIBRARY/neiss.html>

<sup>2</sup> Based on news clippings and media reports.

<sup>3</sup> Porches were included as they are often deck-type structures with a roof.

<sup>4</sup> Kessler, E. and T. Schroeder. (1998). National Electronic Injury Surveillance System (NEISS) Estimated Generalized Relative Sampling Errors. Washington, DC: U.S. Consumer Product Safety Commission.

<sup>5</sup> National Ornamental & Miscellaneous Metals Association (NOMMA) and Whorton Marketing & Research (WM&R) *Climbability Research, Analysis, and Communications Planning* document, May 31, 2006.

<sup>6</sup> *Wood Myths Facts and Fiction*, Paul Fiset, 2005 Building Material and Wood Technology-University of Massachusetts at Amherst