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## **HSC Statistical Brief No. 29**

### **A Review of Accidental Falls in West Virginia**

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According to the Centers for Disease Control and Prevention (CDC) about 26,000 people die from accidental falls each year, or 8.4 per 100,000 people in the United States. The CDC also reports that most fatal and non-fatal falls tend to occur among the elderly. With an aging population, the number of falls is likely to increase in the coming years.

This report will present both morbidity and mortality data related to accidental falls among West Virginia (WV) residents.

The Health Statistics Center's Behavioral Risk Factor Surveillance System (BRFSS) collected data related to falls in 2006, 2008, and 2010. The data collected included both the number of falls experienced by WV adults within the previous three months and the number of those falls that caused an injury. A fall was defined as when a person unintentionally came to rest on the ground or another lower level. An injury was defined as when a fall caused the person to limit their regular activities for at least a day or to go see a doctor. Results presented here are restricted to adults aged 65 and older.

In 2006, 16.6% of WV adults aged 65 and older experienced at least one fall in the previous three months. Of those that experienced at least one fall, the mean number of falls that occurred in the previous three months was 2.23, or one fall every other month. The data are fairly consistent over the next few years. In 2008, 14.1% of WV adults aged 65 and older experienced at least one fall in the previous three months. Of those who fell, the mean number of falls experienced was 2.12. In 2010, 14.6% of WV adults aged 65 and older experienced at least one fall in the previous three months. Those adults averaged 2.42 falls during those 3 months. The U.S. fall prevalence for those aged 65 and older was 16.1% in 2010 and was statistically equivalent to the WV prevalence (14.6%) for that year. West Virginia ranked the 10<sup>th</sup> lowest among the 54 BRFSS participants in 2010 for the prevalence of at least one fall in the previous three months among those aged 65 and older.

Because there was no statistically significant change in the number of falls between 2006, 2008, and 2010, and to increase reliability of estimates, those three years of data were combined for further subpopulation and socio-demographic analysis.

Table 1 below presents subpopulation and socio-demographic characteristics of falls among WV adults aged 65 and older for the 2006, 2008, and 2010 combined years.

<b>Table 1. Prevalence of at least one fall in the previous three months among WV adults aged 65 and older by demographic characteristics (2006, 2008, 2010 combined)</b>			
<b>Characteristic</b>	<b>Number of Respondents</b>	<b>Prevalence Estimate (%)</b>	<b>95% Confidence Interval</b>
<i>TOTAL</i>	3,703	15.1	13.8-16.4
<i>Gender</i>			
Male	1,251	14.0	11.9-16.0
Female	2,452	15.9	14.3-17.6
<i>Age</i>			
65-74	2,060	14.6	12.9-16.3
75-84	1,296	14.4	12.3-16.5
85+	347	21.4	16.5-26.2
<i>Educational Attainment</i>			
Less than H.S.	916	18.8	16.0-21.5
H.S. or G.E.D.	1,556	14.0	12.0-15.9
Some Post-H.S.	717	14.7	11.8-17.6
College Graduate	500	12.6	9.5-15.8
<i>Yearly Household Income</i>			
Less than \$15,000	628	21.1	17.5-24.7
\$15,000- 24,999	972	16.4	13.8-19.1
\$25,000- 34,999	600	13.0	10.0-16.0
\$35,000- 49,999	416	11.8	8.4-15.1
\$50,000- 74,999	178	8.9	4.4-13.4
\$75,000+	165	10.0	4.9-15.1
<i>Marital Status</i>			
Married	1,543	13.9	12.1-15.8
Divorced	398	18.0	13.7-22.3
Widowed	1,594	16.1	14.1-18.1
Separated	32	19.5	6.0-33.1
Single	130	16.6	9.2-23.9
<i>Employment Status</i>			
Employed	265	8.6	4.9-12.2
Homemaker	411	18.6	14.3-22.9
Retired	2,694	14.7	13.2-16.2
Unable to Work	216	24.1	17.8-30.4
<i>Disability Status</i>			
Disabled	1,382	24.9	22.3-27.5
Not Disabled	2,313	9.4	8.1-10.7
<b>Data Source: WV Health Statistics Center, Behavioral Risk Factor Surveillance System</b>			

For the combined years of 2006, 2008, and 2010, 15.1% of WV adults aged 65 and older experienced at least one fall in the previous three months. This equates to approximately 43,400 WV adults aged 65 and older per year who had at least one fall in the previous three months. Of those that experienced at least one fall, the mean number of falls that occurred was 2.26.

Data analysis results show that for the combined years of 2006, 2008, and 2010, there was no gender difference in the prevalence of having a fall in the previous three months among WV adults aged 65 and older. However, the results do indicate that those aged 85 and older had a significantly higher prevalence of a fall in the previous three months than those aged 65-74 or 75-84. Socioeconomic status also appears to play a role in fall prevalence. Those with less than a high school education had a higher prevalence of a fall in the previous three months than those with a high school degree or a college degree. Additionally, those with an annual household income of less than \$15,000 had a higher prevalence of a fall in the previous three months than those making \$35,000 or more per year. Race and ethnicity could not be analyzed due to low number of respondents even with three years of data combined. There were no marital status differences in the prevalence of having a fall in the previous three months among those aged 65 and older. The results indicate that the prevalence of having a fall in the previous three months was significantly higher among homemakers, those who are retired, and those who are unable to work than among those who are employed. The results also show that those who are disabled had a higher prevalence of a fall in the previous three months than those who are not disabled. This difference was also found for each individual year (2006, 2008, and 2010).

The BRFSS data also included information about injuries sustained due to any falls in the previous three months. An injury was defined as when a fall caused the person to limit their regular activities for at least a day or to go see a doctor. Results presented here are restricted to adults aged 65 and older.

In 2006, 35.7% of WV adults aged 65 and older who fell in the previous three months experienced at least one injury from a fall. In 2008, 28.4% of WV adults aged 65 and older who fell in the previous three months experienced at least one injury from a fall. In 2010, 35.8% of WV adults aged 65 and older who fell in the previous three months experienced at least one injury from a fall. The U.S. fall injury prevalence for those aged 65 and older was 31.9% in 2010 and was statistically equivalent to the WV prevalence (35.8%) for that year. West Virginia ranked the 10<sup>th</sup> highest among the 54 BRFSS participants in 2010 for the prevalence of at least one injury from a fall in the previous three months among those aged 65 and older.

Because there was no statistically significant change in the number of injuries from falls between 2006, 2008, and 2010, and to increase reliability of estimates, those three years of data were combined for further subpopulation and socio-demographic analysis.

Table 2 presents subpopulation and socio-demographic characteristics of injuries from falls among WV adults aged 65 and older for the 2006, 2008, and 2010 combined years. Due to small number of respondents and unreliability of estimates, not all subpopulation and socio-demographic characteristics could be analyzed for this indicator. For this reason, income, race/ethnicity, and employment are not displayed in Table 2. Additionally, some groups within a characteristic are not displayed due to unreliable estimates.

For the combined years for 2006, 2008, and 2010, of the WV adults aged 65 and older who experienced at least one fall, 33.4% of those experienced at least one injury from a fall in the previous three months. This equates to approximately 14,400 WV adults aged 65 and older per year who had at least one injury from a fall in the previous three months. Of those that experienced at least one injury from a fall, the mean number of injuries that occurred was 1.27.

<b>Table 2. Prevalence of at least one injury among WV adults aged 65 and older who had at least one fall in the previous three months by demographic characteristics (2006, 2008, 2010 combined)</b>			
<b>Characteristic</b>	<b>Number of Respondents</b>	<b>Prevalence Estimate (%)</b>	<b>95% Confidence Interval</b>
<i>TOTAL</i>	552	33.4	29.2-37.7
<i>Gender</i>			
Male	181	27.1	20.0-34.0
Female	371	37.5	32.1-42.9
<i>Age</i>			
65-74	290	31.8	26.0-37.6
75-84	193	37.0	29.5-44.4
85+	69	29.4	18.1-40.7
<i>Educational Attainment</i>			
Less than H.S.	166	34.8	27.1-42.6
H.S. or G.E.D.	214	33.8	26.9-40.7
Some Post-H.S.	105	31.7	22.1-41.4
College Graduate	66	29.9	17.8-42.0
<i>Marital Status</i>			
Married	214	29.3	23.0-35.7
Divorced	68	30.1	18.7-41.4
Widowed	242	40.5	33.8-47.3
<i>Disability Status</i>			
Disabled	324	36.1	30.4-41.7
Not Disabled	227	29.5	23.0-35.9
<b>Data Source: WV Health Statistics Center, Behavioral Risk Factor Surveillance System</b>			

Data analysis results show that for the combined years of 2006, 2008, and 2010, there was no gender difference in the prevalence of having an injury from a fall in the previous three months among WV adults aged 65 and older. However, the prevalence among women appears to be slightly higher than the prevalence among males. These analyses also reveal that there were no age, educational attainment, or marital status differences in the prevalence of having an injury from a fall in the previous three months. There was also no disability status difference in the prevalence of having an injury from a fall in the previous three months. However, the prevalence was slightly higher among those who are disabled than among those who are not disabled.

The Health Statistics Center also collected mortality data related to fatal accidental falls for the 1999-2010 time period. A fatal fall can be classified by type or location of fall and include:

- fall on same level involving ice and snow
- fall on same level from slipping, tripping, and stumbling
- fall involving ice-skates, skis, roller-skates, or skateboards
- other fall on same level due to collision with, or pushing by, another person
- fall while being carried or supported by other persons
- fall involving wheelchair
- fall involving bed
- fall involving chair
- fall involving other furniture
- fall involving playground equipment
- fall on and from stairs and steps
- fall on and from ladder
- fall on and from scaffolding
- fall from, out of, or through building or structure
- fall from tree
- fall from cliff
- diving or jumping into water causing injury other than drowning or submersion
- other fall from one level to another
- other fall on same level
- unspecified fall

These 20 classifications are based on the World Health Organization's *International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10)* cause of death codes W00-W19.

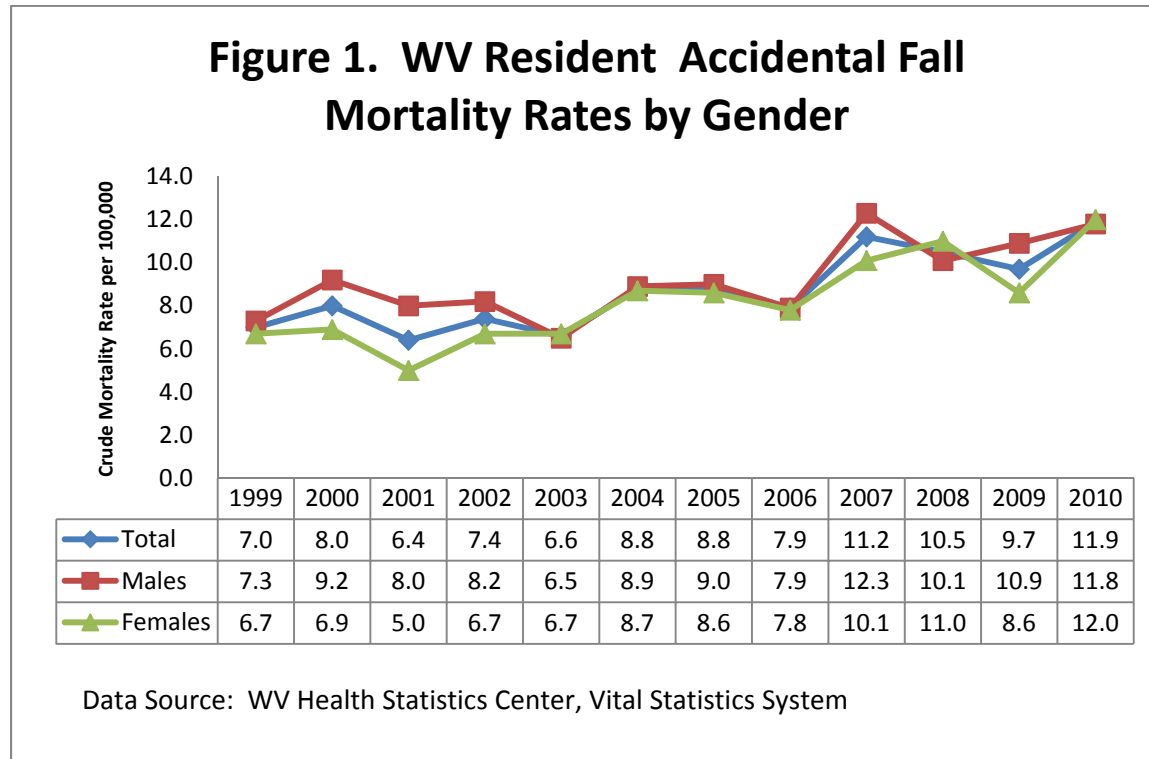
During the 1999-2010 twelve year period, a total of 1,905 WV residents died from an accidental fall. Approximately one-third or 36.1% of those fall deaths were classified as unspecified. Falls on the same level accounted for 26.6% of fall deaths, 12.3% of the total deaths occurred with falls from stairs, and 5.1% of all deaths occurred with falls from a bed. The remaining classifications each accounted for less than 5% of total deaths.

Of the 1,905 total fall-related deaths, 984 deaths (51.7%) occurred among males and 921 deaths (48.3%) occurred among females. An unspecified fall was the most common type of fall for males (32.9%), followed by falls on the same level (24.2%), fall from stairs (13.6%), and fall from a building (7.3%). An unspecified fall was also the most common type of fall for females (39.5%), followed by fall on the same level (29.2%), fall from stairs (11.0%), fall from a bed (6.1%), and fall from slipping or tripping (5.8%).

The age-adjusted accidental fall mortality rate for WV residents in 2010 was 8.6 per 100,000 and was statistically equivalent to the U.S. age-adjusted accidental fall mortality rate of 7.9 per 100,000. West Virginia ranked the 26<sup>th</sup> highest among other states in the age-adjusted accidental

fall mortality rate in 2010. The accidental fall mortality rates presented in the rest of this report are overall crude rates for West Virginia.

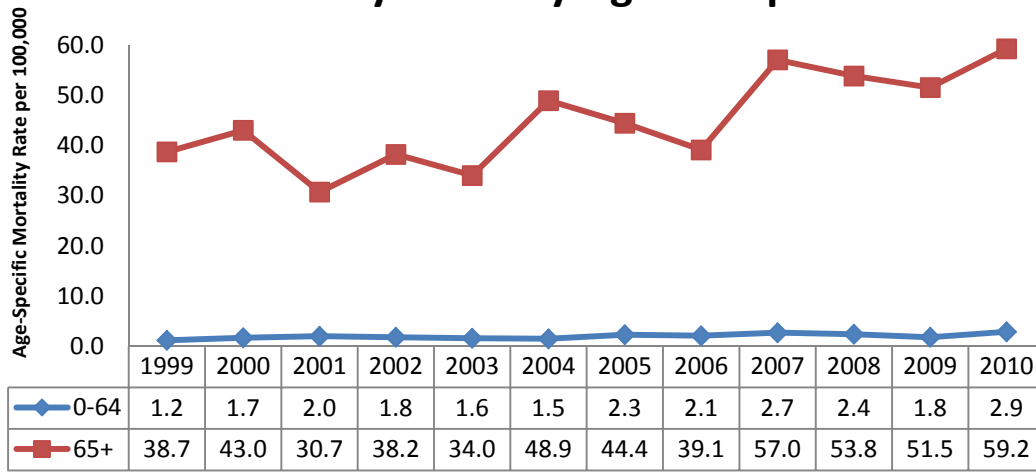
Figure 1 below displays overall accidental fall mortality rates for WV residents by gender for each year, 1999-2010.



The WV resident overall accidental fall mortality rate significantly increased from 7.0 per 100,000 in 1999 to 11.9 per 100,000 in 2010. The increase was somewhat steady with a statistically significant increase in the total mortality rate between 2006 and 2007, a 41% increase. There was no gender difference in the accidental fall mortality rate for any year during the 1999-2010 time period. The results do indicate that the WV resident accidental fall mortality rate significantly increased from 1999 to 2010 for both males and females. As with the total rate, there was a slow but steady increase in the fall mortality rate for both males and females between 1999 and 2010.

Figure 2 displays overall accidental fall mortality rates for WV residents by age group for each year, 1999-2010.

**Figure 2. WV Resident Accidental Fall Mortality Rates by Age Group**

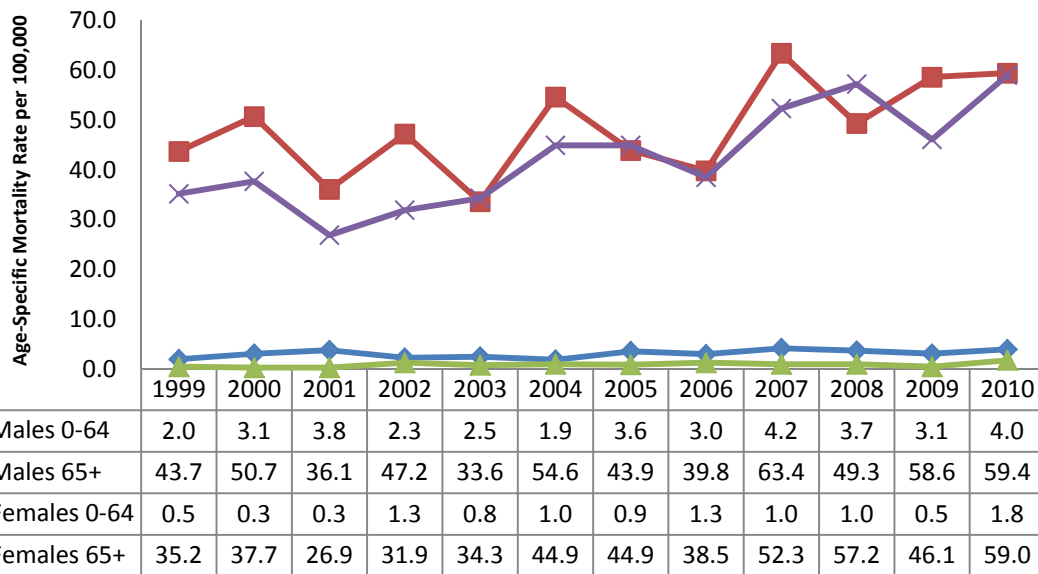


Data Source: WV Health Statistics Center, Vital Statistics System

The WV resident accidental fall mortality rate significantly increased between 1999 and 2010 for both the 0-64 and 65 and older age groups. There was a statistically significant age group difference each year, 1999-2010. The accidental fall mortality rate among WV residents aged 65 and older is significantly higher than the accidental fall mortality rate among those aged 64 and younger.

Figure 3 displays overall accidental fall mortality rates for WV residents by gender and age group for each year, 1999-2010.

**Figure 3. WV Resident Accidental Fall Mortality Rates by Gender & Age Group**



Data Source: WV Health Statistics Center, Vital Statistics System

The WV resident accidental fall mortality rate was stable between 1999 and 2010 for males aged 0-64, males aged 65 and older, and females aged 0-64. However, among females aged 65 and older the accidental fall mortality rate significantly increased between 1999 and 2010. The age group difference in accidental fall mortality observed for the total population is also evident for males and females. Data analysis results indicate that the accidental fall mortality rate was significantly higher among males aged 65 and older than among males aged 64 and younger each year, 1999-2010. The results also show that the accidental fall mortality rate was significantly higher among females aged 65 and older than among females aged 64 and younger each year, 1999-2010. There was no gender difference in accidental fall mortality for WV adults aged 65 and older. However, when looking at the 64 and younger age group, some gender differences in fall mortality are observed. In the years 2000, 2001, 2005, 2007, 2008, and 2009, the accidental fall mortality rate was significantly higher among males aged 64 and younger than among females aged 64 and younger.



Overall, the results indicate that accidental falls are an issue for the elderly in West Virginia. With an aging population, accidental falls may become more prevalent in the coming years. Because falls are largely preventable, this area can be a focus for public health prevention efforts.



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 The logo for the West Virginia Health Statistics Center. It features a stylized map of West Virginia in black. Overlaid on the map is the text "WEST VIRGINIA" in white, "Health Statistics Center" in white, and "HSC" in large white letters. The words "DEPARTMENT OF HEALTH AND HUMAN RESOURCES" are written in a semi-circle above the map, and "BUREAU FOR PUBLIC HEALTH" is written below it.	<p><b>West Virginia Health Statistics Center</b> 350 Capitol Street, Room 165 Charleston, WV 25301-3701 Phone: (304) 558-2931 Fax: (304) 558-1787 Web: <a href="http://www.wvdhhr.org/bph/hsc">http://www.wvdhhr.org/bph/hsc</a></p>	 The logo for the West Virginia Department of Health & Human Resources. It features the text "WEST VIRGINIA Department of Health & Human Resources" in blue. To the left of the text is a circular seal with a green border and a yellow center, containing a landscape scene with a building and trees.
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