

Healthy Vision Month — May 2016

May is Healthy Vision Month, a national observance devoted to encouraging persons to make vision and eye health a priority. During this month, CDC's Vision Health Initiative in the Division of Diabetes Translation partners with the National Eye Institute's National Eye Health Education Program to educate the public about vision loss prevention and eye health promotion. May is also Older Americans Month, which offers an opportunity to raise awareness about the importance of older adults' health and well-being to their independence.

In recognition of these two observances, CDC's Vision Health Initiative recently examined the state-specific annual prevalence of falls among persons aged ≥ 65 years with and without self-reported severe vision impairment. The study's findings, reported in this issue, indicate a higher prevalence of falls among older adults with severe vision impairment, as well as wide variation in that prevalence among states. These findings suggest that among the approximately 2.8 million persons aged ≥ 65 years reporting severe vision impairment in 2014 (1), an estimated 1.3 million likely experienced a fall in the previous year. The findings also underscore the importance of each state implementing effective strategies to improve vision health and reduce falls, especially among older adults with severe vision impairment.

Because many common eye diseases have no immediate symptoms, early detection and timely treatment are important, as is the use of proper eye-safety practices. Developing community-based interventions for populations at high risk might reduce identified disparities in vision health. More information about vision and eye health is available from CDC (<http://www.cdc.gov/visionhealth>) and the National Eye Institute (<https://nei.nih.gov/hvm>).

Reference

1. Census Bureau. Disability characteristics. Suitland, MD: US Department of Commerce, Census Bureau; 2016. http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_12_1YR_S1810&prodType=table

Falls Among Persons Aged ≥ 65 Years With and Without Severe Vision Impairment — United States, 2014

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In 2014, an estimated 2.8 million persons aged ≥ 65 years in the United States reported severe vision impairment* defined as being blind or having severe difficulty seeing, even with eyeglasses. Good vision is important for maintaining balance as well as for identifying low-contrast hazards, estimating distances, and discerning spatial relationships. Conversely, having poor vision increases the risk for falls (1,2). Falls among older adults are common and can cause serious injuries, disabilities, and premature death (1,3). To date, no state-level investigations have examined the annual prevalence of falls

* http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_12_1YR_S1810&prodType=table.

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among persons with and without severe vision impairment. CDC analyzed data from the 2014 Behavioral Risk Factor Surveillance System (BRFSS) to estimate the state-specific annual prevalence of falls among persons aged ≥ 65 years with and without self-reported severe vision impairment. Overall, 46.7% of persons with, and 27.7% of older adults without, self-reported severe vision impairment reported having fallen during the previous year. The state-specific annual prevalence of falls among persons aged ≥ 65 years with severe vision impairment ranged from 30.8% (Hawaii) to 59.1% (California). In contrast, the prevalence of falls among persons aged ≥ 65 years without severe vision impairment ranged from 20.4% (Hawaii) to 32.4% (Alaska). Developing fall-prevention interventions intended for persons with severe vision impairment will help states manage the impact of vision impairment and falls on health care resources, and can inform state-specific fall prevention initiatives.

The BRFSS is a state-based, cross-sectional, telephone surveillance system that examines health-related behavioral risk factors among the U.S. civilian population aged ≥ 18 years.[†] It is administered by states and territories in collaboration with CDC. The median response rate in 2014 was 47.8%; the median completion rate was 47.0%.

[†] <http://www.cdc.gov/brfss>.

The 2014 BRFSS included questions about severe vision impairment[§] and about falls.[¶] Persons who responded “don’t know” or “refused” to either question were excluded from the analyses. The study sample included 140,762 adults aged ≥ 65 years from 50 states and the District of Columbia (DC). SUDAAN statistical software version 9.3 was used for the analyses to account for the complex sampling design. Estimates were age-adjusted and weighted to account for individual selection probabilities, nonresponse, and poststratification. State and national populations and prevalences were estimated. Statistically significant differences ($p < 0.05$) were determined by a chi-square test.

Overall, 6.7% of respondents reported severe vision impairment. Among all respondents, 28.9% reported at least one fall in the previous year (Table). Among respondents who reported severe vision impairment, 46.7% reported a fall during the previous year, ranging from 30.8% in Hawaii to 59.1% in California ($p < 0.001$). Among persons who did not report vision impairment, 27.7% reported a fall during the previous year, ranging from 20.4% in Hawaii to 32.4% in Alaska ($p < 0.001$). In 30 states, 40%–49% of persons with vision impairment fell,

[§] The BRFSS vision question is, “Are you blind or do you have serious difficulty seeing, even when wearing glasses?” Severe vision impairment was defined as a positive response to this question.

[¶] In even-numbered years, the BRFSS core survey contains the question, “In the past 12 months, how many times have you fallen?” and defines a fall as “when a person unintentionally comes to rest on the ground or another lower level.” Respondents were dichotomized into either those in the last year who did or those who did not fall.

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TABLE. Age-adjusted prevalence* of falls among persons aged ≥65 years, by self-reported vision impairment† status and state — United States, 2014

State	Vision impairment		No vision impairment		Total	
	No.‡	% (95% CI)	No.‡	% (95%CI)	No.‡	% 95% CI
Alabama	24,184	43.4 (36.4–50.7)	178,857	28.7 (26.5–31.1)	203,040	29.8 (27.7–32.1)
Alaska¶	1,781	45.3 (30.3–61.3)	20,304	32.4 (28.0–37.1)	22,085	33.2 (29.0–37.6)
Arizona	24,352	39.2 (32.3–46.6)	226,772	26.8 (25.2–28.4)	251,124	27.7 (26.1–29.3)
Arkansas	20,301	58.7 (48.7–68.1)	121,766	32.1 (29.4–35.0)	142,068	34.4 (31.7–37.2)
California	169,407	59.1 (47.6–69.8)	983,556	28.4 (25.7–31.3)	1,152,963	30.9 (28.1–33.8)
Colorado	12,119	37.4 (28.8–46.9)	148,836	26.6 (24.8–28.4)	160,955	27.3 (25.6–29.1)
Connecticut	13,647	47.0 (35.4–59.0)	121,889	25.6 (23.2–28.1)	135,536	26.8 (24.4–29.2)
Delaware¶	2,614	37.3 (23.3–53.8)	36,776	28.1 (25.2–31.2)	39,390	28.4 (25.6–31.4)
District of Columbia	2,829	51.0 (36.0–65.7)	18,464	29.3 (26.0–32.8)	21,293	31.0 (27.8–34.5)
Florida	74,318	35.2 (27.6–43.5)	779,171	24.8 (23.0–26.6)	853,489	25.4 (23.7–27.3)
Georgia	43,124	48.0 (38.1–58.1)	279,281	27.4 (24.9–30.1)	322,406	29.1 (26.6–31.7)
Hawaii¶	2,530	30.8 (19.1–45.7)	40,476	20.4 (18.0–23.1)	43,005	20.9 (18.5–23.5)
Idaho¶	5,840	37.5 (25.7–51.1)	57,583	29.4 (26.6–32.4)	63,423	30.0 (27.2–32.9)
Illinois	46,609	54.9 (38.7–70.1)	411,836	26.0 (23.4–28.9)	458,444	27.5 (24.7–30.5)
Indiana	25,963	51.5 (43.7–59.2)	243,856	30.4 (28.5–32.4)	269,819	31.7 (29.8–33.6)
Iowa	9,297	46.8 (35.8–58.2)	132,301	30.8 (28.7–33.0)	141,598	31.5 (29.4–33.7)
Kansas	11,907	46.1 (39.0–53.4)	103,525	29.3 (27.7–31.0)	115,432	30.3 (28.8–31.9)
Kentucky	26,934	46.3 (35.9–57.0)	164,501	30.9 (28.4–33.5)	191,435	32.4 (29.9–35.0)
Louisiana	23,897	40.9 (33.0–49.4)	122,972	23.5 (21.2–25.9)	146,870	25.2 (23.0–27.6)
Maine	4,069	51.3 (40.2–62.3)	63,338	29.6 (27.6–31.7)	67,407	30.3 (28.3–32.4)
Maryland	10,515	35.6 (26.9–45.4)	180,676	25.1 (22.9–27.3)	191,191	25.4 (23.3–27.7)
Massachusetts	30,674	47.7 (38.3–57.3)	232,550	27.3 (25.4–29.2)	263,224	28.6 (26.8–30.6)
Michigan	48,140	53.4 (43.2–63.3)	418,074	31.1 (29.0–33.4)	466,214	32.5 (30.4–34.7)
Minnesota	16,267	43.4 (34.9–52.3)	173,790	25.7 (24.1–27.3)	190,057	26.5 (25.0–28.2)
Mississippi	13,609	42.2 (31.4–53.8)	95,772	26.3 (23.4–29.4)	109,381	27.6 (24.8–30.6)
Missouri	23,583	44.8 (34.5–55.5)	253,825	32.0 (29.4–34.7)	277,408	32.8 (30.2–35.4)
Montana	4,640	44.2 (34.9–54.0)	46,622	31.5 (29.0–34.2)	51,262	32.3 (29.9–34.9)
Nebraska	5,936	42.1 (34.5–50.1)	65,575	27.3 (25.9–28.8)	71,510	28.1 (26.7–29.6)
Nevada	14,246	44.5 (31.7–58.1)	85,860	26.1 (22.6–29.9)	100,106	27.7 (24.3–31.4)
New Hampshire	4,642	45.8 (31.6–60.7)	49,598	27.1 (24.5–29.8)	54,240	28.0 (25.5–30.7)
New Jersey	30,544	41.8 (32.4–51.8)	254,566	22.7 (20.7–24.9)	285,110	23.9 (21.9–26.0)
New Mexico	9,998	50.5 (40.8–60.1)	67,539	26.3 (23.9–28.7)	77,537	28.0 (25.7–30.4)
New York	70,967	39.9 (28.4–52.5)	656,123	26.9 (24.3–29.7)	727,090	27.7 (25.2–30.4)
North Carolina	42,971	40.2 (32.2–48.8)	338,647	27.5 (25.3–29.9)	381,617	28.5 (26.4–30.8)
North Dakota	2,560	44.9 (32.8–57.8)	24,813	26.1 (23.6–28.7)	27,373	27.2 (24.8–29.7)
Ohio	57,032	51.7 (41.4–61.7)	441,646	28.4 (26.2–30.7)	498,678	29.8 (27.7–32.1)
Oklahoma	16,450	44.5 (36.3–53.0)	142,903	29.7 (27.7–31.9)	159,353	30.8 (28.8–32.8)
Oregon	15,716	54.5 (42.9–65.7)	167,689	30.6 (28.1–33.2)	183,406	31.8 (29.4–34.4)
Pennsylvania	46,270	48.4 (39.6–57.3)	518,933	27.7 (25.8–29.8)	565,204	28.8 (26.8–30.8)
Rhode Island	3,664	44.5 (33.7–55.8)	37,037	25.7 (23.3–28.4)	40,701	26.7 (24.3–29.3)
South Carolina	26,792	47.9 (40.7–55.3)	181,227	28.2 (26.3–30.2)	208,020	29.8 (27.9–31.7)
South Dakota	5,302	57.0 (44.8–68.4)	29,074	26.1 (23.2–29.3)	34,376	28.3 (25.4–31.5)
Tennessee	37,676	49.1 (39.4–58.9)	231,815	29.6 (26.8–32.5)	269,491	31.1 (28.4–33.9)
Texas	114,897	49.1 (40.0–58.3)	742,627	30.0 (27.5–32.6)	857,524	31.5 (29.1–34.1)
Utah	8,954	52.6 (43.4–61.6)	72,355	28.4 (26.5–30.4)	81,308	29.9 (28.0–31.9)
Vermont¶	2,008	43.5 (30.7–57.3)	28,925	31.6 (28.9–34.3)	30,933	32.2 (29.6–34.9)
Virginia	30,020	42.9 (33.2–53.3)	248,024	24.7 (22.6–27.1)	278,044	25.9 (23.7–28.1)
Washington	26,753	46.4 (37.6–55.4)	255,718	29.8 (27.8–31.9)	282,470	30.9 (28.9–32.9)
West Virginia	12,740	34.1 (27.4–41.6)	70,809	25.9 (23.6–28.4)	83,548	26.9 (24.7–29.3)
Wisconsin¶	8,396	39.4 (25.6–55.2)	181,745	27.5 (24.5–30.7)	190,142	27.7 (24.8–30.9)
Wyoming	2,373	44.0 (35.4–53.0)	21,584	31.3 (28.8–34.0)	23,957	32.3 (29.9–34.9)
Total	1,290,055	46.7 (44.5–49.0)	10,572,200	27.7 (27.2–28.1)	11,864,255	28.9 (28.4–29.4)

Abbreviation: CI = confidence interval.

* Weighted estimates, age adjusted to the 2000 U.S. standard population.

† Respondents were asked, "Are you blind or do you have serious difficulty seeing, even when wearing glasses?"; "In the past 12 months, how many times have you fallen?" Respondents who refused to answer, reported "don't know," or who had other missing responses were excluded from the analyses.

‡ Weighted numbers.

¶ States without significant difference in falls between those with vision impairment and no vision impairment.

and in 11 states and DC, approximately half of older adults with severe vision impairment fell. Extrapolating these findings to the U.S. population in 2014, an estimated 1.3 million persons ≥ 65 years with severe vision impairment fell in the previous year.

Discussion

Approximately 2.8 million older adults have severe vision impairment,** a condition associated with chronic diseases, depression, and social isolation (4). During 2014, vision problems were estimated to cost \$145 billion annually (5). Vision impairment is associated with falls, which occur frequently among older adults and often cause long-term disabilities (2). In 2013, the direct medical costs of falls among persons aged ≥ 65 years were \$34 billion (6).

In this assessment, 46.7% of adults aged ≥ 65 years with severe vision impairment fell, compared with 27.7% of those without severe vision impairment. The differences were statistically significant in all but six U.S. states (Alaska, Delaware, Hawaii, Idaho, Vermont, and Wisconsin). In 11 states and DC, approximately half of older adults with severe vision impairment fell. In 2014, an estimated 1.3 million persons aged ≥ 65 years with severe vision impairment fell in the previous year.

These findings are consistent with those from previous investigations that found an association between vision impairment and falls (2). Factors associated with falls include contrast sensitivity and poor balance, as well as poor visual acuity (2). Additional reasons include multiple chronic conditions, gait problems, lower extremity muscle weakness, and the use of multiple medications, some of which might exacerbate these problems (7). Addressing these risk factors would require a range of interventions, including education, medical risk management, exercise, and home modifications (7), as well as improved access to and use of eye care. Evidence-based interventions to prevent falls among older persons have been identified (http://www.cdc.gov/homeandrecreationsafety/falls/community_preventfalls.html). In the only randomized controlled trial to date that evaluates fall-prevention interventions among older adults with vision impairment, investigators reported that, of the two interventions examined, a home safety intervention (e.g., increasing illumination, removing throw rugs, etc.), but not a strength and balance training program, significantly reduced falls among persons with vision impairment aged ≥ 75 years in New Zealand (8).

A number of evidence-based fall interventions address environmental hazards using occupational therapists ([### Summary](http://</p>
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What is already known about this topic?

Vision impairment is associated with falls among persons aged ≥ 65 years. Limited state-level data exists on the prevalence of falls among older persons with vision impairment.

What is added by this report?

A state-based, cross-sectional, telephone survey of noninstitutionalized U.S. adults aged ≥ 65 years found that 28.9% of respondents reported at least one fall in the previous year. Among the 6.7% of respondents who reported severe vision impairment, 46.7% reported a fall, ranging from 30.8% in Hawaii to 59.1% in California.

What are the implications for public health practice?

It is important to develop fall prevention interventions intended for persons with severe vision impairment and for each state to identify and implement effective strategies both to reduce falls and improve vision, especially among those with severe vision impairment.

www.cdc.gov/homeandrecreationsafety/falls/compendium.html), but these interventions are not designed for persons with vision impairment. Given the variety of visual factors associated with falls (visual acuity, visual fields, and contrast sensitivity) as well as visual barriers in educational materials (print size, poor contrast, and visual clutter) (9), randomized controlled trials of fall-prevention interventions intended for persons with severe vision impairment are needed (10).

The findings in this report are subject to at least five limitations. First, BRFSS data are self-reported and the accuracy of responses might be affected by recall, social desirability, or other factors. Second, these data are cross-sectional and do not permit causal inference. Third, although these estimates are age-adjusted, they do not account for differences such as health behaviors or chronic conditions that might be associated with vision impairment and also contribute to falls. Fourth, the median response rate was low (<50%). Finally, all of the excess falls among persons with severe vision impairments might not be caused by vision impairments.

Many state health departments are committed to reducing falls among older adults. The prevalence of falls among adults aged ≥ 65 years with severe vision impairment varies widely among states. However, the consistently high prevalence of falls among older persons with severe vision impairment suggests the need for all states to implement evidence-based fall reduction interventions specifically targeted to the needs of persons with severe vision impairment as well as to improve methods to prevent vision impairment. This approach might lead to fewer injuries, higher quality of life, and greater independence among older adults, as well as reduced health care costs.

** http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_12_1YR_S1810&prodType=table.

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