

# Self-Reported Increased Confusion or Memory Loss and Co-Occurring Conditions Among Adults Aged 60 or Older

2011 BRFSS Data Reported by 21 States

## What is known about increased confusion or memory loss?

Cognitive functioning refers to attention, memory, learning, executive function, and language capabilities, and affects a person's ability to stay socially connected, have a sense of purpose, function independently, recover from illness or injury, and cope with the functional deficits that come with ageing.<sup>1</sup> Confusion or memory loss that is happening more often or getting worse over time may indicate declines in cognitive functioning.

Cognitive decline can negatively affect quality of life, personal relationships, and the capacity for making informed decisions about health care and other matters.<sup>2</sup> In addition, people with increased confusion or memory loss may have co-occurring chronic conditions (e.g., asthma, arthritis, diabetes, heart disease) making these conditions more difficult to manage. Understanding self-reported increased confusion or memory loss and the extent to which these conditions occur among people with co-occurring chronic conditions will help guide programs, policies, and research agendas.

## Where can we get information about this topic?

The Behavioral Risk Factor Surveillance System (BRFSS) provides an opportunity to learn more about self-reported increased confusion or memory loss at the state level. The BRFSS consists of annual state-based telephone surveys of randomly selected noninstitutionalized US adults aged 18 years or older regarding health practices and risk behaviors linked to chronic diseases, injuries, and preventable infectious diseases. To estimate the prevalence of self-reported increased confusion or memory loss and associated functional difficulties among adults aged 60 years or older, BRFSS included an optional Cognitive Impairment module that asked respondents whether they had, "confusion or memory loss that is happening more frequently or getting worse over the past 12 months." CDC analyzed data from 21 states that administered an optional module in the 2011 BRFSS and reported the results in *Morbidity and Mortality Weekly Report*.<sup>3</sup>

1. Hendrie HC, Albert MS, Butters MA, et al. The NIH cognitive and emotional health project: report of the critical evaluation study committee. *Alzheimers Dement*. 2006; Jan 2(1):12-32.
2. Wagster MV, King JW, Resnick SM, Rapp PR. The 87%. *J Gerontol A Biol Sci Med*. 2012; 67:739-740.
3. CDC. Self-reported increased confusion or memory loss and associated functional difficulties among adults aged ≥60 years — 21 States. *MMWR. Morb Mortal Wkly Rep*. 2013; 62(18):347-50. Available at: <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6218a1.htm>.

Memory problems typically are one of the first warning signs of cognitive decline.

Table 1. Proportion of Self-reported Increased Confusion or Memory Loss, by State (2011 BRFSS)

State	Weighted % (95% CI)
Arkansas	20.0 (17.9-22.3)
California	17.0 (14.9-19.3)
Florida	13.8 (12.2-15.7)
Hawaii	9.2 (8.0-9.6)
Illinois	11.4 (9.7-13.4)
Iowa	9.0 (7.8-10.4)
Louisiana	7.3 (6.2-8.5)
Maryland	9.5 (7.6-11.7)
Michigan	13.9 (11.4-16.9)
Nebraska	12.0 (10.8-13.4)
New Hampshire	11.0 (9.6-12.6)
New York	10.6 (8.6-13.0)
North Carolina	8.5 (7.3-9.8)
Oklahoma	12.1 (10.5-14.0)
South Carolina	13.7 (12.1-15.4)
Tennessee	6.4 (5.2-7.7)
Texas	12.6 (10.8-14.6)
Utah	17.0 (14.4-19.9)
Washington	15.7 (14.4-17.1)
West Virginia	8.3 (7.0-9.9)
Wisconsin	11.1 (9.0-13.5)
All States	12.7 (12.1-13.3)

## What have we learned about this topic?

In 2011, 12.7% of BRFSS respondents across the nation reported increased confusion or memory loss during the preceding 12 months, ranging from 6.4% in Tennessee to 20.0% in Arkansas (Table 1). In most states, the percentage reporting increased confusion or memory loss was higher among the following: people aged 75 years or older compared with those aged 60 to 74 years; people with less than a high school education compared with those who reported more education; people with an annual household income of less than \$15,000 compared with those with an income of \$15,000 or more; people who reported being disabled compared with those who were not disabled; and veterans compared with non-veterans (Table 2). Although national data from the 2011 BRFSS also indicate that Hispanics or Latinos are more likely to report increased confusion or memory loss compared with whites, insufficient race/ethnicity data are available at the state level to explore this relationship.

## What have we learned about increased confusion and memory loss and co-occurring chronic conditions?

In each of the 21 states that included the cognitive impairment module in their BRFSS surveys, the percentage of adults aged 60 or older who reported increased confusion or memory loss in the past year was higher among those who also reported having ever been told by a health professional that they had cardiovascular disease, arthritis, asthma, chronic obstructive pulmonary disease, or diabetes (Table 3). Each of these co-occurring chronic conditions was reported more often by people who also reported increased confusion or memory loss compared with those who did not. In most of the 21 states, the percentage who reported increased confusion or memory loss was higher among people who also reported having ever been told by a health care professional that they have cancer (other than skin cancer).

*Chronic conditions are reported more often by people who also report increased confusion or memory loss.*

**Table 2. Proportion of Adults Aged 60 or Older Who Reported Increased Confusion and Memory Loss in the Past Year within Demographic Categories, Overall and by State, 2011 Behavioral Risk Factor Surveillance System**

Variable and Category	Arkansas	California	Florida	Hawaii	Illinois	Iowa	Louisiana	Maryland	Michigan	Nebraska	New Hampshire	New York	North Carolina	Oklahoma	South Carolina	Tennessee	Texas	Utah	Washington	West Virginia	Wisconsin	All States
Sample size, n	374	328	651	335	241	233	303	208	168	578	262	131	393	212	610	159	394	166	697	156	208	6,807
<b>Age, y</b>																						
60-64	19.4*	15.9	13.6	6.3*	---	---	7.4	---	---	10.5*	9.0	---	8.8	---	13.0	---	14.4	---	12.4*	---	---	12.0*
65-74	16.5	17.4	13.9	8.3†	10.5	9.5	6.5	8.1	15.5	10.3	10.8	---	7.5	11.3	13.5	7.2	10.1	15.7	14.7	8.0	9.4	11.9
75-84	24.7	18.9	13.7	13.7†	10.9	9.2	8.6	12.0	16.0†	14.9	12.3	---	7.8	12.5	14.4	---	13.6	---	19.7	---	12.3	14.0
≥85	---	---	15.2	---	---	---	---	---	---	15.5	---	---	---	---	15.1†	---	---	---	24.2†	---	---	15.6
<b>Sex</b>																						
Male	22.7*	17.3	16.6*	9.3	12.0	11.8*	7.3	9.9	14.7	13.5*	11.5	---	8.4	13.5	15.0	---	13.1	17.4	15.7	8.6	9.5	13.4*
Female	17.9	16.8	11.5	9.2	11.0	6.7	7.3	9.1	13.3	10.8	10.6	10.8	8.5	11.1	12.6	6.5	12.1	16.6	15.7	8.1	12.4	12.1
<b>Race/ ethnicity</b>																						
NH white	19.3*	15.1	12.4*	9.3	12.1	8.9	7.5	9.1	13.9	12.4	11.0	11.0	8.1	12.8	12.8	6.0	12.4	16.4	15.2	8.2	11.0	12.1*
NH black	---	---	---	---	---	---	7.5	---	---	---	---	---	10.1	---	15.2	---	---	---	---	---	---	11.8
Hispanic, any race	---	23.2†	---	---	---	---	---	---	---	---	---	---	---	---	---	---	12.0	---	---	---	---	16.9
NH other	---	---	---	9.6†	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	14.3
<b>Education</b>																						
<HS	26.4†*	---	21.7†*	---	---	---	7.8	---	---	16.3†	---	---	12.9*	---	20.2†*	---	17.0†	---	---	---	---	16.3*
HS	19.4	15.5	12.3	11.1	11.7	8.9	6.9	8.9	17.1	11.4	10.4	---	7.8	11.1	14.5	6.2	12.2	22.8†	17.1	7.1	13.3	12.5
Some college	19.0	15.8	12.7	8.1	12.4	7.7	7.5	---	12.2	12.5	9.7	---	8.3	10.9	11.5	---	12.6	---	16.3	---	---	12.1
≥College degree	14.6	16.6	11.6	9.3	8.9	---	6.8	8.3	10.2	10.3	10.0	---	4.1	10.4	8.8	---	9.5	13.2	14.0	---	11.8	10.9

**Table 2. Proportion of Adults Aged 60 or Older Who Reported Increased Confusion and Memory Loss in the Past Year within Demographic Categories, Overall and by State, 2011 Behavioral Risk Factor Surveillance System (continued)**

Variable and Category	Arkansas	California	Florida	Hawaii	Illinois	Iowa	Louisiana	Maryland	Michigan	Nebraska	New Hampshire	New York	North Carolina	Oklahoma	South Carolina	Tennessee	Texas	Utah	Washington	West Virginia	Wisconsin	All States
<b>Income, \$</b>																						
<15,000	27.0†*	23.2†*	19.9†	---	---	---	8.3*	---	---	16.1†	---	---	14.2*	---	16.8†*	---	21.5†*	---	26.6†*	---	---	19.5*
15,000-24,999	21.2	21.2†	13.5	11.3	13.6	---	11.2	---	---	13.7	---	---	11.4	13.4	20.3†	---	11.1	---	20.4	---	14.8†	14.5
25,000-49,999	19.9	14.1	14.4	8.8	10.3	7.9	4.9	---	12.9	11.0	11.2	---	5.9	---	13.8	---	11.2	19.3†	16.5	---	8.1	11.5
50,000-74,999	---	---	10.1	---	---	---	---	---	---	9.4	---	---	---	---	13.8	---	---	---	13.3	---	---	11.6
≥75,000	---	13.0	11.5	6.0	---	---	---	---	---	---	---	---	---	---	7.5	---	---	---	9.5	---	---	8.9
<b>Employment status</b>																						
Employed/SE	---	13.1*	6.0*	5.8*	---	---	---	---	---	8.3*	---	---	---	---	12.1†*	---	6.8*	---	8.8*	---	---	7.8*
Out of work	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	16.4
Home-maker	---	---	9.6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	11.8
Student	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Retired	19.6	16.8	13.1	10.0	11.8	9.5	7.1	8.6	13.3	13.0	11.8	10.3†	7.3	11.6	11.4	6.9	11.5	18.6	17.3	6.9	9.2	12.3
Unable to work	36.5†	---	39.3†	---	---	---	12.7	---	---	25.0†	---	---	22.0†	---	30.3†	---	31.8†	---	26.9†	---	---	28.3
<b>Disability status</b>																						
Yes	32.6*	25.3*	23.2*	14.3*	18.6*	15.3*	12.4*	14.4*	19.9†*	18.1*	18.5*	19.2*	13.8*	20.4*	21.2*	10.9*	18.8*	26.0†*	23.0*	13.6*	17.9*	20.2*
No	9.9	10.9	6.7	6.7	6.8	5.3	3.2	6.2	9.5	8.2	6.7	---	4.9	---	8.3	3.3	8.5	10.3	9.8	---	7.0	7.5
<b>Veteran status</b>																						
Yes	25.7†*	14.4	17.6*	11.1	10.3	12.6*	8.2	---	---	12.3	14.2*	---	8.1	15.3	15.0	---	16.3†	---	17.6	---	10.8	13.9*
No	18.4	17.7	12.7	8.7	11.7	7.9	7.0	8.4	14.4	11.9	9.9	9.9	8.6	11.1	13.2	6.3	11.5	16.2	14.9	8.7	11.1	12.3

Abbreviations: NH, non-Hispanic; HS, high school; SE, self-employed.

\* Statistically significant difference at  $P < .05$  in the prevalence of reported Increased Confusion and Memory Loss (ICML) between people in different categories of a given variable.

† 95% confidence interval for the proportion is wider than 10 percentage points.

--- <50 respondents reported the characteristic, yielding an unreliable estimate.

Data from this table should be interpreted as follows: Among 60-64 year olds in Arkansas, 19.4% reported ICML. A significant  $p$ -value indicates that people in one age group were significantly more likely to have ICML than people in another age group.

**Table 3. Proportion of Adults Aged 60 or Older With and Without Chronic Health Conditions Who Reported Increased Confusion and Memory Loss in the Past Year, Overall and by State, 2011 Behavioral Risk Factor Surveillance System**

Variable and Category	Arkansas	California	Florida	Hawaii	Illinois	Iowa	Louisiana	Maryland	Michigan	Nebraska	New Hampshire	New York	North Carolina	Oklahoma	South Carolina	Tennessee	Texas	Utah	Washington	West Virginia	Wisconsin	All States
Sample size, n	374	328	651	335	241	233	303	208	168	578	262	131	393	212	610	159	394	166	697	156	208	6,807
<b>Cardiovascular disease</b>																						
With condition	33.7†*	22.6†*	20.7*	12.4*	19.0†*	18.2*	12.5*	---	21.5†*	19.8*	16.6*	---	14.8*	18.9*	19.0*	9.9*	20.3†*	---	25.6*	12.7*	19.1†*	19.5*
Without condition	14.7	15.7	11.8	8.4	9.4	6.7	5.3	8.4	11.4	9.6	9.5	8.9	6.1	10.0	12.0	5.3	10.1	14.1	13.3	6.8	8.9	10.7
<b>Arthritis</b>																						
With condition	26.4*	22.6*	19.4*	12.7*	14.2*	11.6*	10.8*	11.3	18.1*	15.5*	14.2*	15.2*	11.2*	15.5*	18.1*	7.7	17.1*	22.8*	19.5*	10.5*	14.6*	16.9*
Without condition	13.0	11.8	7.9	7.2	8.3	6.6	3.7	7.7	8.2	8.7	7.8	---	5.8	8.7	8.5	5.2	8.0	11.7	11.9	---	7.2	8.3
<b>Asthma</b>																						
With condition	24.6†	21.6†	22.3†*	7.9	---	---	13.1†*	---	---	18.2†*	16.2†*	---	9.9	---	23.1†*	---	30.2†*	---	24.2†*	---	---	18.3*
Without condition	19.5	16.6	13.1	9.3	10.4	8.3	6.9	8.1	14.5	11.5	---	10.1	8.1	10.9	12.7	6.0	10.8	16.2	14.8	7.3	10.4	11.9
<b>Chronic obstructive pulmonary disease</b>																						
With condition	28.4†*	23.7†*	25.9†*	11.1	28.5†*	---	16.6*	---	---	---	21.6*	---	14.8*	27.3†*	27.2†*	---	27.2†*	---	23.1†*	---	---	22.3*
Without condition	18.1	16.3	12.0	---	9.3	8.0	6.2	7.6	12.7	14.5	9.6	10.0	7.5	9.4	11.6	5.5	10.8	15.8	14.9	7.2	9.7	11.4
<b>Diabetes</b>																						
With condition	26.5†*	18.9†	18.3*	10.9	16.9*	13.8*	10.4*	---	16.3†	---	16.4*	---	12.1*	16.8*	17.3*	---	18.2*	---	21.6*	---	---	16.3*
Without condition	18.1	16.6	12.7	8.6	10.0	7.9	6.3	9.4	13.3	12.7	9.7	9.6	7.4	10.8	12.6	5.8	10.8	15.4	14.4	7.1	10.6	11.7
<b>Cancer (excluding skin cancer)</b>																						
With condition	23.7†	14.4	16.4	13.9*	14.6	12.6*	9.5	---	---	16.3†	---	---	9.6	---	16.6	---	11.9	---	20.3*	---	18.2†*	14.2*
Without condition	19.4	17.5	13.3	8.4	10.9	8.4	6.9	8.4	15.4	13.3	10.6	9.6	8.2	11.6	13.2	5.6	12.7	15.2	14.7	7.6	9.6	12.4
<b>Any of the six above conditions</b>																						
With condition	23.8*	20.0*	16.6*	11.6*	14.1*	11.4*	9.0*	10.7*	15.7*	14.7*	12.9*	12.4*	10.2*	14.7*	16.1*	7.3*	15.1*	19.7*	18.4*	9.6*	13.0*	15.0*
Without condition	---	9.6	5.9	5.5	---	---	---	---	---	5.3	6.4	---	---	---	6.7	---	6.0	---	9.2	---	---	6.2

\* Statistically significant difference at  $P < .05$  in the prevalence of reported Increased Confusion and Memory Loss (ICML) between people in different categories of a given variable.

† 95% confidence interval for the proportion is wider than 10 percentage points.

--- <50 respondents reported the characteristic, yielding an unreliable estimate.

Data from this table should be interpreted as follows: % of individuals in the state with the reported condition who also report ICML. % of individuals in the state without the reported condition who report ICML. For example, 33.7% of individuals with cardiovascular disease in Arkansas report ICML. 14.7% of individuals without cardiovascular disease in Arkansas report ICML. A significant  $p$ -value indicates that people with cardiovascular disease were more likely to have ICML than people without cardiovascular disease.

## What does this mean to state and local public health?

State and local public health agencies should take action to promote cognitive health as a vital, integral, component of public health and to address issues related to cognitive impairment for people living in the community and their care partners (i.e., informal and paid caregivers and health care providers). To guide these actions, the Alzheimer's Association and the Centers for Disease Control and Prevention's (CDC's) Healthy Aging Program have developed the second in a series of Road Maps to advance cognitive health as a critical component of public health. *The Healthy Brain Initiative: The Public Health Road Map for State and National Partnerships, 2013–2018*, outlines how state and local public health agencies and their partners can promote cognitive functioning, address cognitive impairment for people living in the community, and help meet the needs of care partners. The Road Map includes 35 action items addressing four traditional domains of public health: monitor and evaluate, educate and empower the nation, develop policy and mobilize partnerships, and assure a competent workforce. In the Road Map, public health agencies and private, nonprofit, and governmental partners at the national, state, and local levels are encouraged to work together on the actions that best fit their missions, needs, interests, and capabilities.

The Road Map was informed by a concept mapping process that solicited and then organized action items into domains using input from a broad group of stakeholders. Using results from the concept mapping process, a subset of action items deemed most important and feasible to state respondents were identified and subjected to an iterative Delphi technique, a structured method of getting feedback that is designed to achieve convergence of opinion. A group of National Association of Chronic Disease Directors experts, including chronic disease directors and local representatives who had relevant expertise or experience, were invited to participate. The purpose was to identify a subset of four to six priority actions for state public health practitioners to promote cognitive health or address issues of cognitive impairment and care partners in the next 3 to 5 years. Two rounds of the Delphi process were conducted.

As a result of this input, the following six action items included in the Road Map were prioritized by chronic disease directors and local representatives:

- Promote incorporation of cognitive health and impairment into state and local public health burden reports [Develop Policy and Mobilize Partnerships (P), P-03].
- Use surveillance data to enhance awareness and action in public health programming (e.g. link Behavioral Risk Factor Surveillance System questions on cognition to health-related quality of life or falls prevention) [Monitor and Evaluate (M), M-02].
- Develop strategies to help ensure that state public health departments have expertise in cognitive health and impairment related to research and best practices [Ensure a Competent Workforce (W), W-01].
- Collaborate in the development, implementation and maintenance of state Alzheimer's disease plans [Develop Policy and Mobilize Partnerships (P), P-01].
- Engage national and state organizations and agencies to examine policies that may differentially impact persons with dementia, including Alzheimer's disease [Develop Policy and Mobilize Partnerships (P), P-05].
- Integrate cognitive health and impairment into state and local government plans (e.g., aging, coordinated chronic disease, preparedness, falls and transportation plans) [Develop Policy and Mobilize Partnerships (P), P-02].

Regardless of the specific actions taken, state and local health agencies should recognize that cognitive health is a critical component of public health and important to include in public health programs and policies. For additional information, please visit the [CDC Healthy Aging Program website](#).

*"Monitoring and evaluation are key practices of public health. The tools we traditionally have applied to physical health are equally valuable to understand the impact of cognitive impairment."*

- Jill Myers Gadelmann, BS, RN Board President, National Association of Chronic Disease Directors, Bureau Chief, Chronic Disease Prevention and Management, Iowa Department of Public Health\*

*"We must capitalize on state efforts to coordinate public health chronic disease programs and include cognitive health in that larger picture."*

- Sharon Moffatt, RN, BSN, MSN, Association of State and Territorial Health Officials\*

\* Alzheimer's Association and Centers for Disease Control and Prevention. *The Healthy Brain Initiative: The Public Health Road Map for State and National Partnerships* 2013–2018: Chicago, IL: Alzheimer's Association; 2013.