
Alzheimer's Disease Facts and Figures 2008

A Report from the Alzheimer's Association

Alzheimer's Disease Facts and Figures 2008 is a comprehensive statistical abstract of US data on Alzheimer's disease (AD), the most common type of dementia. In the second of a series on AD, *Medicare Patient Management* reprints another section of the association's report, which discusses prevalence and causes of AD. Future sections will address family caregiving, use and costs of care, mortality, and lifetime risk of AD. To review the first article in the series, see page 35 of the March/April issue of *MPM* (www.medicarepatientmanagement.com/issues/03-03/mpmMJ08-Alzheimers-0428.pdf).

Millions of Americans now have AD or other dementias. More women than men have AD and other dementias, primarily because women live longer, on average, than men, and their longer life expectancy increases the time during which they could develop AD or other dementias. The prevalence of AD and other dementias also differs for people with fewer versus more years of education and for African-Americans compared to Caucasians.

The number of Americans with AD and other dementias is increasing every year because of the steady growth in the older population. The number will continue to increase and escalate rapidly in the coming years as the baby boom

generation ages. Figures from different studies on the prevalence and characteristics of people with AD and other dementias vary, depending on how each study was conducted. Data from several studies are used here to describe the prevalence of these conditions and the proportion of people with the conditions by gender, years of education, race, and cause of dementia. For information about lifetime risk, see "Lifetime Risk of AD" on page 39."

Prevalence of AD and Other Dementias?*

An estimated 5.2 million Americans of all ages have AD in 2008. This figure includes 5 million people aged 65ⁱ and over and 200,000

individuals under age 65 who have younger-onset AD.ⁱⁱ The Alzheimer's Association estimates that there are approximately 500,000 Americans under age 65 who have AD or another dementia, and about 40% of them have AD.

- One in 8 persons aged 65 and over (13%) has AD.ⁱⁱⁱ
- Every 71 seconds, someone in America develops AD. By mid-century, someone will develop AD every 33 seconds.^{iv}

Prevalence of AD and Dementia in Women and Men

Women are more likely than men to have AD and dementia. Fourteen percent of all people aged 71 and over have dementia.¹ As shown in Figure 1, this includes 16% of women and 11% of men in that age group. This difference amounts to more than 1.4 million people aged 71 and over in 2008 (2.4 million women compared with about 1 million men).

Further analysis of these data shows that the larger proportion of older women than men who have dementia is primarily explained by the fact that women live longer, on

*In late 2007, findings on the prevalence of AD and other dementias from the Aging, Demographics, and Memory Study (ADAMS) were published.

average, than men.¹ Likewise, many studies of the age-specific incidence (new cases) of dementia have found no significant difference by gender.²⁻⁶

The same is true for AD. The larger proportion of older women than men who have AD is primarily explained by the fact that women live longer.¹ Again, many studies of the age-specific incidence of AD show no significant difference for women and men.²⁻¹⁰ Thus, it appears that female gender is not a risk factor for AD or dementia once age is taken into account. Essentially, women are more likely to have AD and other dementias because they live long enough to develop these conditions.

Prevalence of AD and Dementia by Years of Education

People with fewer years of education are more likely than people with more years of education to have AD and dementia. Studies of the prevalence of dementia show that having fewer years of education is associated with greater likelihood of having dementia,^{1,11} and incidence studies show that having fewer years of education is associated with a greater risk of developing dementia.^{4,5,12}

One study found, for example, that people with less than 12 years of education had a 15% greater risk of developing dementia than people with 12 to 15 years of education and a 35% greater risk of developing dementia than people with more than 15 years of education.⁵

The same is true for AD. Studies of the prevalence of AD show that having fewer years of education is

associated with higher likelihood of having AD,^{1,11} and incidence studies show that having fewer years of education is associated with greater risk of developing AD.^{5,8,12,13}

Some researchers believe that having more years of education may provide “cognitive reserve” that either protects a person from AD and other dementias or at least allows the person to compensate for a longer time before the symptoms of AD and dementia are observable.¹¹⁻¹⁵

Other researchers point out that years of education may be a surrogate marker for factors that affect access to education in childhood, such as socioeconomic status and where one lived as a child.^{13,16} Having fewer years of education is generally related to additional factors, such as lower levels of occupational attainment and higher prevalence of physical health conditions in adulthood, that are also associated with the development of dementia. Studies that have considered these additional factors have shown, however, that having

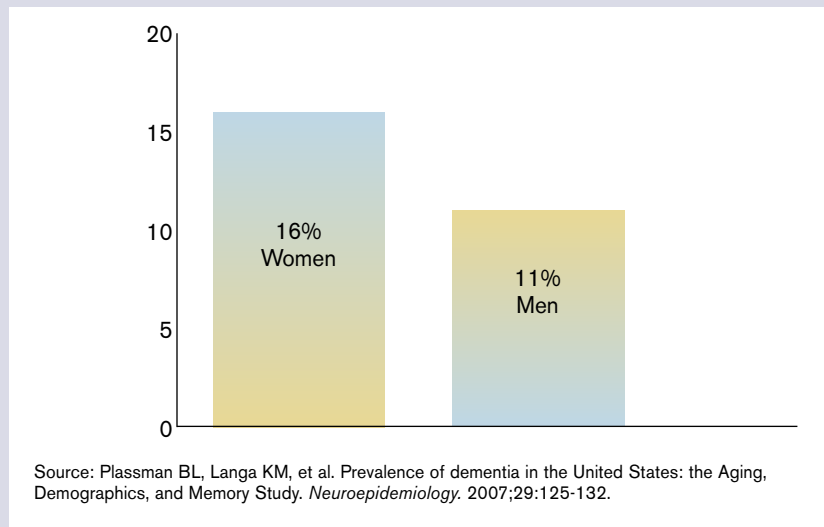
fewer years of education is a risk factor for AD and other dementias, even when these factors are taken into account.¹²⁻¹⁷

Prevalence of AD and Dementia in African-Americans and Caucasians

African-Americans are more likely than Caucasians to have AD and dementia, but further analyses of this relationship indicate that it is primarily explained by factors other than race. Most analyses that have combined age, gender, years of education, African-American compared to Caucasian race, and other factors show that African-Americans do not have a statistically significant increased risk of dementia or that their increased risk in comparison with Caucasians is greatly reduced once these factors are taken into account.^{1,3-5,11,18}

The same is true for AD. Most analyses that have combined age, gender, years of education, African-American compared to Caucasian race, and Apolipoprotein E status have found that the higher preva-

Figure 1. Percentage of People Aged 71+ with Dementia by Gender



lence of AD in African-Americans is primarily explained by these other factors or that their increased risk is greatly reduced once these factors are taken into account.^{1,3-5,8,11}

Years of education seems to be a particularly important factor in explaining why African-Americans are more likely than Caucasians to have AD and dementia. In fact, one study that included only African-Americans found that having fewer years of education was associated with increased likelihood of having AD and dementia.¹⁴ Some researchers point out that quality of education and socioeconomic factors that affect access to education are probably also important factors in explaining why African-Americans are more likely than Caucasians to have AD and dementia.^{5,14,18,19}

Prevalence of AD by State

The number of people with AD varies greatly by state (Table 1). The most important reason for the differences among states in estimated number of people with AD is differences in the number of older people. In addition, within the older population of each state, the proportion of people in the age group 80 and over that has the highest prevalence of AD also affects the estimated number of people with the disease.

The estimated number of people with AD in 2000 varies from 3400 in Alaska to 440,000 in California. The percentage change from 2000 to 2010 is greater in states that start with a lower estimated number of people with AD. In Alaska, for example, the projected change from 2000 to 2010 is 47% even though the estimated number of

Table 1. Incidence of AD in Sample States

State	2000	2010	% Change 2000–2010
Alaska	3,400	5,000	47
California	440,000	480,000	9
Florida	360,000	450,000	25
Iowa	65,000	69,000	6
Maine	25,000	25,000	0
New Mexico	27,000	31,000	15
New York	330,000	320,000	-3
Pennsylvania	280,000	280,000	0
Texas	270,000	340,000	26

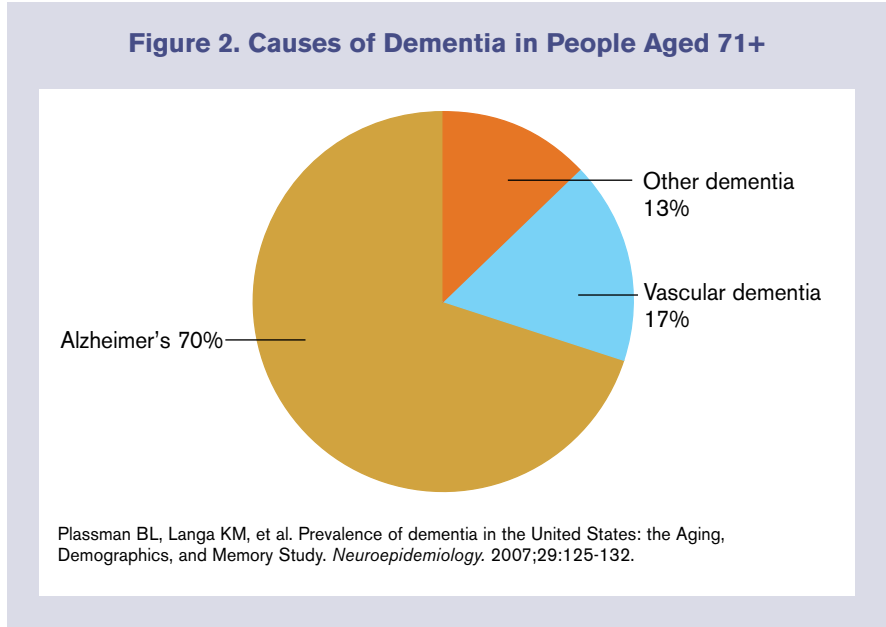
people with AD only increases from 3400 to 5000 people in that period. In contrast, the projected change from 2000 to 2010 in California is 9%, despite an estimated increase from 440,000 to 480,000 people with AD.

State-specific factors that are likely to increase the number of people with AD in the future include growth in the state's older population, especially the population aged 80 and over, and reduced mortality from other causes. States that experience an increase in average years of education in the future may see a slower increase in the to-

tal number of people with AD in the state because having more years of education is associated with decreased risk of the disease.

Causes of Dementia

AD is the most frequent cause of dementia. As shown in Figure 2, AD accounts for 70% of all cases of dementia in Americans aged 71 and over.¹ Vascular dementia accounts for 17% of cases of dementia, and other diseases and conditions, including Parkinson's disease, Lewy body disease, frontotemporal dementia, and normal-pressure hydrocephalus, account



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omen are more likely than men to have AD and other dementias, primarily because women live longer, on average, and their longer life expectancy increases the time during which they could develop these diseases.

for the remaining 13%.^v

The proportion of dementia caused by AD increases with age. In people aged 90 and over, AD accounts for 80% of all dementia, compared with 47% for people aged 71 to 79.¹

Looking to the Future

The number of Americans surviving into their 80s and 90s is expected to grow because of advances in medicine, medical technology, and social and envi-

ronmental conditions. Since the incidence and prevalence of AD and dementia increase with age,

the number of people with these conditions will also grow rapidly.

• In 2000, there were an estimated

Lifetime Risk of AD

The “lifetime risk” of a disease or condition is the likelihood that a person will develop the disease or condition at any time in his or her life. Currently, there is no information to calculate risk from birth for AD or dementia. The figures presented here pertain to the risk of developing AD or dementia for Americans who live to be at least age 55. The remaining lifetime risk of AD for women at age 55 is 17%. Thus, 1 in 6 American women who live to be at least age 55 can expect to develop AD in their remaining lifetime. Remaining lifetime risk of AD for men is 9%, or almost 1 in 10 men who live to be at least age 55.

Remaining lifetime risk of dementia for women who live to be at least age 55 is 21%. Thus, more than 1 in 5 American women who live to be at least age 55 can expect to develop dementia in their remaining lifetime. Remaining lifetime risk of dementia for men is 14%, or 1 in 7 men who live to be at least age 55. Remaining lifetime risk at age 55 is higher for women than for men because women live longer, on average. Their longer life expectancy increases the time during which they could develop AD or other dementias.

These figures for remaining lifetime risk are conservative because the study on which they are based, the Framingham Heart Study, used a relatively high threshold for including an individual as a person with dementia.¹ The study required that the individual must have dementia specified as at least moderate, according to the study criteria, and that the individual's dementia symptoms must have been present for at least 6 months. Thus, individuals who had very early or mild dementia and individuals with moderate dementia

of less than 6 months' duration were not counted as having dementia. If these individuals had been counted as having dementia, the figures for remaining lifetime risk would be higher.

Implications for Baby Boomers

The baby boomers are people living in the US now who were born from 1946 through 1964. In 2008, the oldest baby boomers, people born in 1946, will be 62. The youngest baby boomers, people who were born in 1964, will be 44. The remaining lifetime risks of AD and dementia apply to baby boomers who are already age 55 or over. The remaining lifetime risks of AD and other dementias also apply to baby boomers who are under age 55, assuming that they live to be at least age 55.

The baby boomer group now includes about 78 million Americans, of whom 27 million are ages 55–62 and 51 million ages 44–54. The Alzheimer's Association estimates that 10 million of these baby boomers can expect to develop AD in their remaining lifetime. Similarly, about 14 million baby boomers can expect to develop dementia, including AD. True lifetime risk for baby boomers will also be greater because deaths from heart disease, cancer, and stroke will probably continue to drop, increasing the lifespan during which the boomers could develop AD or other dementias.

Reference

1. Seshadri S, Wolf PA, Beiser A, et al. Lifetime risk of dementia and Alzheimer's disease: the impact of mortality on risk estimates in the Framingham Study. *Neurology*. 1997;49:1498-1504.

PROVIDER ACTION

Impact to You

No matter what your specialty, you are likely to regularly care for patients suffering from AD. Over 5 million Americans currently have AD and another 10 million baby boomers will eventually have it.

What You Need to Know

Providers need to know that dementia is a clinical syndrome of loss or decline in memory and other cognitive abilities. Providers must also be knowledgeable about the risk factors and the populations most likely to have AD.

What You Need to Do

The starting point is to create a process whereby you encourage caregivers to bring potential dementia patients to your office for diagnosis. Making the correct diagnosis and prescribing the most appropriate treatment plan are essential.

411,000 new cases of AD. That number is expected to increase to 454,000 new cases a year by 2010, 615,000 new cases a year by 2030, and 959,000 new cases a year by 2050.²⁰

- The number of people aged 65 and over with AD is estimated to reach 7.7 million in 2030, a greater than 50% increase from the 5 million aged 65 and over who are currently affected.²¹
- By 2050, the number of individuals aged 65 and over with AD could range from 11 million to 16 million unless science finds a way to prevent or effectively treat the disease. By that date, more than 60% of people with AD will be aged 85 or older.²¹ **MPM**

References

1. Plassman BL, Langa KM, Fisher GG, et al. Prevalence of dementia in the United States: the Aging, Demographics, and Memory Study. *Neuroepidemiology*. 2007;29:125-132.
2. Bachman DL, Wolf PA, Linn RT, et al. Incidence of dementia and probable Alzheimer's disease in a general population. *Neurology*. 1993;43:515-519.
3. Fillenbaum GG, Heyman A, Huber MS, et al. The prevalence and 3-year incidence of dementia in older Black and White community residents. *J Clin Epidemiol*. 1998;51(7):587-595.
4. Fitzpatrick AL, Kuller LH, Ives DG, et al. Incidence and prevalence of dementia in the Cardiovascular Health Study. *J Am Geriatr Soc*. 2004;52:195-204.
5. Kukull WA, Higdon R, Bowen JD, et al. Dementia and Alzheimer's disease incidence: a prospective cohort study. *Arch Neurol*. 2002;59:1737-1746.

6. Rocca WA, Cha RH, Waring SC, Kokmen E. Incidence of dementia and Alzheimer's disease: a reanalysis of data from Rochester, Minnesota, 1975-1984. *Am J Epidemiol*. 1998;148(1):51-62.

7. Barnes LL, Wilson RS, Schneider JA, Bienias JL, Evans DA, Bennett DA. Gender, cognitive decline, and risk of AD in older persons. *Neurology*. 2003;60:1777-1781.

8. Evans DA, Bennett DA, Wilson RS, et al. Incidence of Alzheimer disease in a biracial urban community: relation to apolipoprotein E allele status. *Arch Neurol*. 2003;60:185-189.

9. Hebert LE, Scherr PA, McCann JJ, Beckett LA, Evans DA. Is the risk of developing Alzheimer's disease greater for women than for men? *Am J Epidemiol*. 2001;153(2):132-136.

10. Miech RA, Breitner JCS, Zandi PP, Khachaturian AS, Anthony JC, Mayer L. Incidence of AD may decline in the early 90s for men, later for women. *Neurology*. 2002;58:209-218.

11. Gurland BJ, Wilder DE, Lantigua R, et al. Rates of dementia in three ethnorracial groups. *Int J Geriatr Psychiatr*. 1999;14:481-493.

12. Stern Y, Gurland B, Tatemichi TK, Tang MX, Wilder D, Mayeux R. Influence of education and occupation on the incidence of Alzheimer's disease. *JAMA*. 1994;271(13):1004-1010.

13. Evans DA, Hebert LE, Beckett LA, et al. Education and other measures of socioeconomic status and risk of incident Alzheimer disease in a defined population of older persons. *Arch Neurol*. 1997;54(11):1399-1405.

14. Callahan DM, Hall KS, Hui SL, Musick BS, Unverzagt FW, Hendrie HC. Relationship of age, education, and occupation with dementia among a community-based sample of African Americans. *Arch Neurol*. 1996;53(2):134-140.

15. Scarmeas N, Stern Y. Cognitive reserve: implications for diagnosis and prevention of Alzheimer's disease. *Curr Neurol Neurosci Rep*. 2004;4:374-380.

16. Hall KS, Gao S, Unverzagt FW, Hendrie HC. Low education and childhood rural residence: risk for Alzheimer's disease in African Americans. *Neurology*. 2000;54(1):95-99.

17. Ngandu T, Von Strauss E, Helkala E-L, et al. Education and dementia: what lies behind the association? *Neurology*. 2007;69(14):1442-1450.

18. Shadlen M-F, Siscovick D, Fitzpatrick AL, Dulberg C, Kuller LH, Jackson S. Education, cognitive test scores, and black-white differences in dementia risk. *J Am Geriatr Soc*. 2006;54(6):898-905.

19. Tang MX, Cross P, Andrews H, et al. Incidence of AD in African-Americans, Caribbean Hispanics, and Caucasians in northern Manhattan. *Neurology*. 2001;56:49-56.

20. Hebert LE, Beckett LA, Scherr PA, Evans DA. Annual incidence of Alzheimer disease in the United States projected to the years 2000 through 2050. *Alzheimer Dis Assoc Disord*. 2001;15:169-173.

21. Hebert LE, Scherr PA, Bienias JL, Bennett DA, Evans DA. Alzheimer's disease in the U.S. population: prevalence estimates using the 2000 census. *Arch Neurol*. 2003;60:1119-1122.

End Notes

i Number of Americans age 65 and over with AD: Denis Evans, MD, and colleagues computed the 5 million number in early 2007, at the request of the Alzheimer's Association. The number is based on linear extrapolation from their previously published prevalence estimates for 2000 (4.5 million) and 2010 (5.1 million). See Hebert LE, Scherr PA, Bienias JL, Bennett DA, Evans DA.

Alzheimer's disease in the US population: prevalence estimates using the 2000 census. *Arch Neurol*. 2003;60:1119-1122. These prevalence numbers are based on incidence data from the Chicago Health and Aging Project (CHAP).

ii The 200,000 number is based on data from a 2006 Alzheimer's Association report. See Alzheimer's Association. *Early Onset Dementia: A National Challenge, A Future Crisis*. Washington, DC: Alzheimer's Association, June 2006. Accessible at <http://www.alz.org>, search "early onset report." The report shows that about 500,000 Americans age 55-64 have AD or other dementias. The Alzheimer's Association estimates that about 40% of these people have AD, or about 200,000 people. The 200,000 number does not include Americans under age 65 with other dementias.

iii The 13% number is calculated by dividing the number of people age 65 and over with AD (5 million) by the US population age 65 and over in November 2007, the latest available data from the US Census Bureau, (38 million) = 13%. Thirteen percent is the same as 1 in 8.

iv The 71 seconds number is calculated by dividing the number of seconds in a year (31,536,000) by the number of new cases in a year. Hebert et al. (2001) estimated that there would be 411,000 new cases in 2000 and 454,000 new cases in 2010. See Hebert LE, Beckett LA, Scherr PA, Evans DA. Annual incidence of Alzheimer disease in the United States projected to the years 2000 through 2050. *Alzheimer Dis Assoc Disord*. 2001;15:169-173. The Alzheimer's Association calculated that the incidence of new cases in 2008 would be 445,000 by multiplying the 10-year change from 411,000 to 454,000 (43,000) by 0.8 (for the number of years from 2000 to 2008 divided by the number of years from 2000 to 2010), adding that result (34,400) to the Hebert et al. 2001 estimate for 2000 (411,000) = 445,400. 31,536,000 divided by 445,400 = 70.8 seconds, rounded to 71 seconds. Using the same method of calculation for 2050, 31,536,000 divided by 959,000 (from Hebert et al.) = 32.8 seconds, rounded to 33 seconds.

v These data reflect the conclusions of an expert panel of physicians and psychologists about the primary cause of dementia in each subject found to have dementia in the Aging, Demographics, and Memory Study (ADAMS). Some subjects were also given secondary diagnoses in recognition of the growing awareness that dementia is often associated with more than 1 disease or condition.