Alzheimer's Disease Facts and Figures 2008:

A Report from the Alzheimer's Association

PART 5

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 fifth of a series on AD, *Assisted Living Consult* reprints the last part of the Alzheimer's Association report. This section discusses mortality data for AD. The third article on the series was on page 36 of the July/August issue (www.assistedlivingconsult.com/issues/04-04/alc78-Alzheimers-721.pdf). The fourth was on page 22 of the September/October issue (www.assistedlivingconsult.com/issues/04-05/alc910-Alzheimers%20pt%204-922a.pdf).

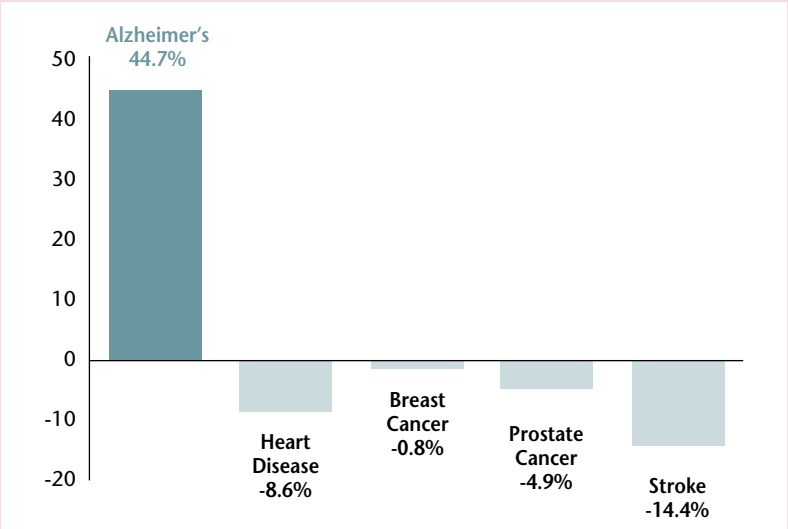
Alzheimer's disease is among the top 10 leading causes of death for people of all ages, and is No. 5 for those aged 65 and older. In 2005, the death certificates of about 72,000 people reported AD as the cause of death; this number is likely to be low because many studies say that deaths due to AD are substantially underreported on death certificates. Death rates from the disease vary a great deal across the states due to differences in state demographics and reporting practices. Death rates from AD increase as people age and have been increasing over time. For example, the death rate from AD for those aged 85 and over increased by 22.6% between 2000 and 2004. More than two-thirds of those dying from de-

Table 1.
Percentage Change in Leading Causes of Death from 2000 to 2005

Cause	2000	2005	Percentage Change
Heart disease	710,760	649,399	-8.6%
Breast cancer	41,200	40,870	-0.8%
Prostate cancer	31,900	30,350	-4.9%
Stroke	167,661	143,497	-14.4%
Alzheimer's	49,558	71,696	+44.7%

Sources: CDC, National Vital Statistics Reports, and Reports of the American Cancer Society.

Figure 1.
Percentage Change in Leading Causes of Death from 2000 to 2005



mentia did so in nursing homes, compared with roughly 70% of cancer patients who died at home or in the hospital. Location of death varies across states.

Deaths from Alzheimer's Disease

Alzheimer's disease was listed as the "underlying cause of death" for 71,696 Americans in 2005. It was the 7th-leading cause of death for people of all ages and the 5th-leading cause of death for people aged 65 and over.[1]

The total number of deaths attributed to AD has increased over the last 15 years. In 1991, only 14,112 death certificates recorded AD as the underlying cause.[2] From 2000 to 2005, deaths attributed to AD increased by 44.7%, while the No. 1 cause of death, heart disease, decreased by 8.6%. Table 1 and Figure 1 show the number of deaths and percentage change in number of deaths from selected diseases from 2000 to 2005.

Even though deaths attributed to AD are increasing, the number may fail to reflect the disease's full public health impact. Numerous studies have suggested that AD is substantially underreported on death certificates as a cause of death for people living in the community. Because most individuals with AD are age 65 and older, they also tend to have other serious coexisting medical conditions associated with aging, such as heart disease or stroke. Physicians may tend to attribute death primarily to one of these other conditions even when AD is present. In many cases in which the medical record fails to reflect an AD diagnosis, the certifying physician may not be aware that the individual had the disease.

In cases in which AD is not listed as the underlying cause of death, it may not even be listed as a contributing factor. Nevertheless, people with AD in all age groups generally have decreased survival when compared to survival of those in the general US population.

One 2004 study noted that people newly diagnosed with AD survived about half as long as those of similar age who did not have the disease.[3] In this study, average survival time was 4 to 6 years after diagnosis, but survival can be as long as 20 years from the first symptoms (although these early symptoms may be fairly subtle and not immediately recognized).

Another study reported that when persons with AD were hospitalized for pneumonia or hip fracture, more than half died within 6 months compared with about 13% of cognitively intact patients, after receiving the same types of treatments.[4]

The mechanisms by which dementia leads to death may create ambiguity about the underlying cause of death. Severe dementia frequently causes such complications as immobility, swallowing disorders, or malnutrition. These complications can significantly increase the risk of developing pneumonia, which has been found in several studies to be the most commonly identified cause of death among elderly persons with AD and other dementias. One researcher described the situation as a "blurred distinction between death *with* dementia and death *from* dementia."[5]

Table 2.
Number of Deaths Due to Alzheimer's Disease and Rate per 100,000 Population by Selected States, 2004

State	Number of Deaths	Age-Adjusted Rate per 100,000
Arizona	1675	30.0
California	6964	21.8
Florida	4307	17.8
Illinois	2595	19.6
Massachusetts	1673	20.8
New Jersey	1711	17.0
New York	1989	9.2
Pennsylvania	3277	18.6
Texas	4336	26.4
Washington	2233	36.1

Source: CDC, National Center for Health Statistics. Deaths: final data for 2004. *National Vital Statistics Reports*. 2007;55(19):1-104.

State-by-State Deaths from Alzheimer's Disease

The state with the highest age-adjusted death rate attributed to AD in 2004 was Washington, where the rate was 36.1 per 100,000 (2233 deaths); the lowest rate was 9.2 per 100,000 in New York, or 1989 deaths[6] (Table 2).

Differences across states in death rates attributed to AD can result from several factors. For example, death rates from AD vary by ethnicity, so a state's rate is likely to reflect its population's ethnic profile. Another possible reason for the differences in these rates is variability across states in how the cause of death is reported on death certificates.

Table 3.
Death Rates by Age for Alzheimer's Disease, 2000 and 2004

Age	2000	2004
45-54	0.2	0.2
55-64	2.0	1.9
65-74	18.7	19.7
75-84	139.6	168.7
85+	667.7	818.8

Source: CDC, National Center for Health Statistics. Deaths: final data for 2004. *National Vital Statistics Reports.* 2007;55(19):1-104.

Table 4.
Death Rates by Ethnicity and Gender for Alzheimer's Disease, 2004

	Male	Female
All races	17.7	23.8
African-American	15.2	19.9
Hispanic	10.8	14.1
Caucasian	18.3	24.7

Source: CDC, National Center for Health Statistics. Deaths: final data for 2004. *National Vital Statistics Reports.* 2007;55(19):1-104.

Death Rates by Age, Gender, and Ethnicity

Rates of AD deaths increase rapidly as people age and have increased for the oldest age groups since 2000. For example, the death rate for those aged 75 to 84 increased from 139.6 per 100,000 in 2000 to 168.7 per 100,000 in 2004[6] (Table 3). The death rate for those aged 85 and over increased by 22.6% during the same time period to reach 818.8 per 100,000 in 2004. It is important to note that people under age 65 also die from AD, although at a much lower rate than older age groups. Reasons for increased death rates due to AD may include the fact that death rates from other diseases, such as heart disease and cancer, are declining. Thus, people who would have died of these diseases could live longer and have an increased risk of dying of AD.

In 2004, age-adjusted death rates for AD varied by ethnicity, with Caucasian women having the highest rates, at 24.7 per 100,000 persons[6] (Table 4). African-American women were next, with a death rate of 19.9 per 100,000. Hispanic persons had the lowest death rates, with male Hispanics' rate being the lowest of all groups, at 10.8 per 100,000.

Table 5.
Location of Death for People with Dementia, Aged 65+, 2001

Location of Death	Percent
Hospital	15.6%
Nursing home	66.9%
Home	12.7%
Other	4.7%

Source: Mitchell SL, Teno JM, Miller SC, Mor V. A national study of the location of death for older persons with dementia. *J Am Geriatr Soc.* 2005;53:299-305.

Location of Death

A study of national death certificates for 2001 found that 66.9% of people aged 65 and over who died from dementia did so in nursing homes[7] (Table 5). Only 15.6% of this group died in the hospital, and only 12.7% at home. In contrast, 37.8% of cancer patients died at home and 35.4% in the hospital. About half of people who died from other diseases did so in the hospital.

These percentages vary a great deal across regions of the country. For example, the percentage of dementia deaths in hospitals ranged from 5% in Rhode Island to 37% in the District of Columbia. Those with dementia died more frequently in the hospital in the southeastern states. ALC

References

1. Centers for Disease Control and Prevention (CDC), National Center for Health Statistics. Deaths: preliminary data for 2005 health e-stats. National Vital Statistics Reports. CDC Web site. www.cdc.gov/nchs/products/pubs/pubd/hestats/prelimdeaths05/prelimdeaths05.htm. September 12, 2007. Accessed July 1, 2008.

2. Hoyert DL. *Mortality trends for Alzheimer's disease*, 1979-91. National Center for Health Statistics. Vital and Health Statistics. 1996; 20(28):1-23.

3. Larson EB, Shadlen M, Wang L, McCormick WC, Bowen JD, Teri L, et al. Survival after initial diagnosis of Alzheimer disease. *Ann Intern Med.* 2004;140:501-509.

4. Morrison RS, Siu AL. Survival in end-stage dementia following acute illness. *JAMA.* 2000; 284:47-52.

5. Ganguli M, Rodriguez EG. Reporting of dementia on death certificates. A community study. *J Am Geriatr Soc.* 1999;47:842-849.

6. CDC, National Center for Health Statistics. Deaths: final data for 2004. *National Vital Statistics Reports.* 2007;55(19):1-104.

7. Mitchell SL, Teno JM, Miller SC, Mor V. A national study of the location of death for older persons with dementia. *J Am Geriatr Soc.* 2005:53:299-305.