The Impact of Alzheimer’s Disease

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Richard J. Hodes, M.D.
Director
National Institute on Aging
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Prevalence of Probable Alzheimer’s Disease

Number of Persons in US with AD (millions)

Percent of Persons with AD by Age

Evans, et al. JAMA, 262, 1989
# Leading Causes of Death, Adults 65+ Years, 2010

<table>
<thead>
<tr>
<th>Rank</th>
<th>Cause of Death</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Heart disease</td>
</tr>
<tr>
<td>2</td>
<td>Cancer</td>
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<tr>
<td>3</td>
<td>Chronic lower respiratory diseases</td>
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<tr>
<td>4</td>
<td>Stroke</td>
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<tr>
<td>5</td>
<td>Alzheimer’s disease</td>
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<tr>
<td>6</td>
<td>Diabetes</td>
</tr>
<tr>
<td>7</td>
<td>Influenza and pneumonia</td>
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<tr>
<td>8</td>
<td>Kidney disease</td>
</tr>
<tr>
<td>9</td>
<td>Accidents (unintentional injuries)</td>
</tr>
<tr>
<td>10</td>
<td>Septicemia</td>
</tr>
</tbody>
</table>

Percent Change in Age-Adjusted Death Rates Between 2000 and 2010

- Alzheimer's disease: 38.7%
- Diabetes: -4.5%
- Cancer: -31.6%
- Heart Disease: -30.5%
- Stroke: -35.8%

NOTES: Data are for all ages and are age-adjusted.
The Monetary Costs of Dementia in the U.S.

$\text{s in Billions}$

- projections in 2010 dollars

Cost of Care

• Fewer than 1/5 of older people have enough personal resources to live in a nursing home for more than 3 years, and nearly 2/3 cannot afford 1 year.

• Home and community-based services for long-term care are becoming increasingly popular; Medicaid funding for these services increased from 13% of total funding in 1990 to 43% in 2007.

• NIA-funded Health and Retirement Study data suggest that a significant percentage of older Americans engage in caregiving:
  ➢ Among individuals aged 65-74, 37.8 percent provided caregiving
  ➢ Among individuals aged 75 and older, 19.2 percent provided caregiving
  ➢ An estimated value of these unpaid activities was $83.4 billion in 2002

From 65+ in the United States: 2010
Cost Impact of AD Prevention

• A breakthrough in 2015 that delayed the age of onset of AD by five years would reduce total costs immediately.

• By 2020, total costs to all payers for the care of people with the condition would be $50 billion less than would be expected without the breakthrough.

• By 2050, the reduction in total costs to all payers would be $447 billion.

• Reductions in Medicare costs would account for almost half of the decrease in costs to all payers.

Source: Changing the Trajectory of Alzheimer’s Disease: A National Imperative; Alzheimer’s Association, 2010
Declining dementia rates?

- Evidence from US and Europe suggests dementia rates may be declining.
  - *National Long-term Care Survey:* Prevalence decline persons ≥65 years of age (5.7% in 1982 vs. 2.9% in 1999)
  - *Health & Retirement Study:* Prevalence decline among persons ≥70 years of age (12.2% in 1993 vs. 8.7% in 2002)
- Possible reasons for the decline: greater educational levels and economic well-being; improvements in general health.
- US may be in a sweet spot where dementia rates are falling before they rise due to obesity and diabetes epidemics.
- Further study is needed to monitor trends.
Tracking Alzheimer’s pathophysiology – a model of dynamic biomarkers

**Amyloid PET Scans in Presymptomatic Early-Onset Alzheimer’s Disease**

**Gene Carriers**

- Age 35-39 Years
- Age 25-29 Years

**Non-Carriers**

**Colombian Kindred**
- N = 5000 living individuals from ~ 25 families
- 1500 with the E280A (Glu280Ala) Presenilin1 mutation
- Autosomal dominant, 100% penetrance
- Median age of MCI = 44 years, dementia = 49 years

Double-blind, placebo-controlled trial for up to 60 months
- crenezumab 300 mg SC every 2 weeks

Health sector spending as % of GDP
An efficiency problem...spending much more but not getting much health as a result

Figure 1. There are large differences in life expectancy and health care spending across OECD countries 2008

1. Or latest year available.

Source: OECD Health Data 2010.
Prevalence of Chronic Disease and Disability among People Aged 50-74 in the US, England, and 10 Other European Nations: 2004

Source: Adapted from Avendano, Glymour, Banks, and Mackenbach, 2009.
The explanation is not population diversity in the US

Heart Disease Prevalence
Ages 50-74

Source: Avendano et al., 2009.