Trends in Cognitively Healthy and Cognitively Impaired Life Expectancy in the United States: 2000 - 2010

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1. How have the prevalence of dementia, cognitive loss without dementia, and normal cognition changed in the older population in recent years?
2. How does this interact with changes in life expectancy to affect the length of cognitively healthy life?

• With increasing life expectancy at ages when incurable - chronic conditions dominate we have seen increases in the prevalence and length of life spent with many diseases.
• Is this true for cognition?
Cognition in the Health and Retirement Study

• Nationally representative longitudinal sample with data collection every 2 years beginning in 1992 which Includes the institutional population
• Approximately – 20,000 + at each interview
• Defining Dementia in the HRS – based on special sample of about 1,000 (ADAMS) who received a Neuropsych exam
  - Equipercentile Equating
  – Define cut-points on HRS cognitive (and other) measures that result in similar dementia prevalence estimates as the “gold-standard” ADAMS estimates
Defining Dementia in HRS

- **Self-respondents**: 27-point cognitive scale cognitive based on performance
  - a ten item immediate word recall (short term memory)
  - a ten item delayed word recall (longer-term memory)
  - a five item serial 7s working memory task
  - Backward counting, score (0-2)

- **Demented** (0-6), **CIND** (7-11), or healthy (12-27).

- **Proxy-respondents**:
  - 1) proxy assessment of memory;
  - 2) proxy assessment of IADL limitations; and
  - 3) interviewer assessment of cognitive impairment
  - 11-point combined scale
• We use data from 2000 and 2010 and estimate age-gender-specific cognitive status for those 65+

• Estimate Life expectancy: With good cognitive functioning, with CIND, with Dementia

• We do this for the total population and for three educational groups: high, medium, low
Data and Method

Mortality Data

- For educational groups we use HRS mortality estimated from the 4 year periods after the survey.

Method

- Sullivan method – Distributes years lived into states of health using the prevalence of health states and then divides total life expectancy into states.
Life Expectancy 2000-2010: Increases but less for women

At Birth

- Male, 2000: 70, 2010: 80
- Female, 2000: 80, 2010: 90

At Age 65

- Male, 2000: 15, 2010: 20
- Female, 2000: 20, 2010: 25
% With Dementia decreases

Male 2000  Male 2010  Female 2000  Female 2010
% With Cognitive Impairment No Dementia

Male 2000  Male 2010  Female 2000  Female 2010

65-69  70-74  75-79  80-84  85+

0  10  20  30  40
% With Good Cognition Increases

- **Male 2000**
- **Male 2010**
- **Female 2000**
- **Female 2010**

The graph shows the percentage of individuals with good cognition across different age groups for males and females in the years 2000 and 2010.
Male Life Expectancy at age 65: Cognitively intact, with CIND, with dementia

![Graph showing life expectancy at age 65 for different cognitive conditions in 2000 and 2010.](image)
Change in Male Life Expectancy at age 65:
Cognitively intact, with CIND, with dementia

Changes from 2000 to 2010

<table>
<thead>
<tr>
<th>Condition</th>
<th>Change in Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitively Intact</td>
<td>1.8</td>
</tr>
<tr>
<td>CIND</td>
<td>0.0</td>
</tr>
<tr>
<td>Dementia</td>
<td>-0.4</td>
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</tbody>
</table>
Female Life Expectancy at age 65: Cognitively intact, with CIND, with dementia

- Cognitively Intact: 12.5 years in 2000, 14.1 years in 2010
- CIND: 4.0 years in 2000, 3.9 years in 2010
- Dementia: 2.6 years in 2000, 2.3 years in 2010
Change in Female Life Expectancy at age 65:
Cognitively intact, with CIND, with dementia

Change from 2000 to 2010

- Cognitively Intact: +1.6 years
- CIND: -0.1 years
- Dementia: -0.3 years
Changes in Proportion of Life at age 65 with and without cognitive problems from 2000 to 2010

Male

- Cognitively Intact: 3.9%
- CIND: -2.1%
- Dementia: -3.3%

Female

- Cognitively Intact: 4.1%
- CIND: -1.7%
- Dementia: -2.3%
Conclusions for total population:

Compression of life expectancy with dementia

Decrease in absolute and relative years with cognitive problems

Extension of cognitively healthy life expectancy
Did this characterize Americans of all socioeconomic groups?

Education.

HIGH – 16+ years
Medium – 12-15 years
Low – 0-11 years

We use the Health and Retirement Study to estimate life expectancy for education groups.
% with Dementia by Education in 2000 and 2010: Decreases among those with lowest education
% with Dementia by Education in 2000 and 2010: Decreases all education groups at some ages

Females

- 2000 Edu: 0-11 yrs
- 2000 Edu: 12-15 yrs
- 2000 Edu: 16+ yrs
- 2010 Edu: 0-11 yrs
- 2010 Edu: 12-15 yrs
- 2010 Edu: 16+ yrs
% with Good Cognition by Education in 2000 and 2010:

Increases among the lowest group

Males
% with Good Cognition by Education in 2000 and 2010: Increases at highest education

Females
Life Expectancy by Education at Age 65: 2000 and 2010

**Male**

- High: 2000: [Bar height], 2010: [Bar height]
- Low: 2000: [Bar height], 2010: [Bar height]

**Female**

- High: 2000: [Bar height], 2010: [Bar height]
- Low: 2000: [Bar height], 2010: [Bar height]
Male Life Expectancy at age 65 in cognitive states by Education

2000

- **High**: 17 (Good: 15, Dementia: 1, CIND: 1)
- **Med**: 13 (Good: 11, Dementia: 1, CIND: 1)
- **Low**: 10 (Good: 8, Dementia: 1, CIND: 1)
Male Cognitive Life Expectancy by Education

Change from 2000 to 2010 for Age 65
Female Cognitive Life Expectancy by Education

2000

- High
- Med
- Low

- Good
- Dementia
- CIND
Female Cognitive Life Expectancy by Education

Change from 2000 to 2010 for Age 65

Good
Dementia
CIND
Conclusion

- **Men**
  - Compression of morbidity occurred for men
  - In two higher education groups because cognitively healthy life increased absolutely and relatively
  - Among those with the lowest education, compression of cognitive morbidity occurred because of increase in years with good functioning and decrease in years with dementia

- **Women**
  - High and middle education experienced a compression of cognitive morbidity because of lengthening of life with good cognition and some decrease in life with dementia.
  - Low education increase in life with good cognition and life with CIND, no change in life with dementia. Proportion of life with good cognition did not change.
Implications

This is the first indication for the US that there has been a compression of cognitive morbidity.

Leads to expectation of longer life with good functioning – but differential by gender and by educational group.

More years of healthy life will reduce costs of medical care and caregiving.

Healthy life is about life cycles – growth in the older population is the impetus for increasing cases of dementia – Better health through life is probably at root of improving cognition.
Acknowledgements

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