Changes in Active Life Expectancy by Race and Sex between 1984-2000

Aaron Hagedorn

Introduction

Trends in both mortality and disability have differed for population subgroups in the United States. Mortality rates have declined more for men than for women in recent years; disability rates have declined more for whites than for blacks. How changes in mortality and disability combine to affect the length of active life is not clear. Women are known to have more disability but lower mortality resulting in longer active and longer inactive life (Crimmins, Hayward, Saito, 1996; Robine and Ritchie, 1991); the Black population of the U.S. lives both shorter and more disabled lives (Hayward & Heron, 1999). Furthermore, the racial difference in health expectancy may be stronger for women (Mendes de Leon, Barnes, Bienias, Skarupski, and Evans, 2005). This paper investigates whether changes in disability incidence and mortality in recent years have related to improvements in active life expectancy for men and women and for Blacks and non-Blacks.

Data

The data are based on two nationally representative longitudinal data sets with waves collected in the following years: 1984,1986,1988,1990 and 1994, 1996-1997, and 1998-2000. The data are known as the Longitudinal Study of Aging (LSOA I) and the Second Longitudinal Study of Aging (LSOA II). Each data set began with a representative sample of people aged 70 and older who lived in the community. There are 7,527 persons age 70 and over in LSOA I, and 9,447 persons age 70 and over in LSOA II. Both data sets are longitudinal, however the LSOA I is used to represent disability in the 1980s, while the LSOA II is used to represent disability in the 1990s.

Method

The analysis uses a multistate life table approach based on maximum likelihood models which are used to calculate transition rates between states of health as well as death. The maximum-likelihood approach expresses the probability of an observed individual-level transition that is similar to the continuous time approach (Laditka & Wolf, 1998). The multistate life table is calculated using methods developed by Brouard & Lievre known by the acronym IMaCH (**I**nterpolated **MA**rkov **Ch**ain). This approach is used because it is able to handle missing data, varying interval lengths, and provides confidence intervals.

Active life expectancy is defined as life without ADL or IADL disability which is defined as being unable to perform at least one of 5 ADLs and 5 IADLs. The ADL and IADL measures include: bathing, dressing eating, getting in/out of bed or chairs, toileting, preparing meals, shopping for groceries, managing money, using the telephone, and doing light house work.

Results

The results show no significant changes at age 70 in total life expectancy or in active or inactive life expectancy in the black population between 1987 and 1997. The point estimate of total life expectancy for blacks is actually .2 years lower at the later time, with a .7 increase in active life expectancy, and a decrease of 1 year in disabled life expectancy. In contrast, among the non-black population, there was a significant increase in total life expectancy at age 70 of .7 years and the increase comes from the significant increase (.8) in active life expectancy and a small non-significant change in inactive life. The result is a growing gap at the older ages between blacks and non-blacks in total life expectancy and the proportion of active life for whites at all older ages remains higher for whites (Table 2).

There were no significant changes in total life expectancy for women in this age range during this decade (Table 3). Women did experience significant increases in active life expectancy, by approximately half a year at age 70, suggesting that more recent elderly women live a shorter portion of their life disabled. Total life expectancy at age 70 did increase by about a year for men. Furthermore, men experienced significant increases in active life expectancy, by approximately 1.1 years, at age 70. The proportion of life active has increased at most older ages for men.

In contrast to the diverging race differences, older men have narrowed the gap in life expectancy from 4 years at age 70, to 3.2 years over the time period 1987-1997. The narrowed gap is also found in active life expectancy, where men have added 50% more years in good health than women at age 70. Women still live more years in active health, but a smaller proportion of their remaining years are spent active.

Conclusion

Although the elderly population in general is living less time with disability in more recent years, not all groups have befitted equally.

Table 1: Life Expectancy (LE) by Race: Total, Active, and Disabled

Black

Age	1984			1994		
	Total LE	Active LE	Disabled LE	Total LE	Active LE	Disabled LE
70	13.55	9.68	3.87	13.33	10.44	2.90
80	8.33	4.18	4.15	8.37	5.38	2.99
90	5.23	1.19	4.04	5.38	2.40*	2.98

* denotes 1994 value significantly different from 1984, P<.05

Non-Black

Age	1984			1994		
	Total LE	Active LE	Disabled LE	Total LE	Active LE	Disabled LE
70	13.82	11.06	2.76	14.55*	11.89*	2.65
80	8.41	5.35	3.06	9.15*	6.39*	2.76
90	5.03	1.81	3.22	5.75	2.94*	2.82

* denotes 1994 value significantly different than 1984, P<.05

Table 2: Proportion of Remaining Expected Life in Active State by Race, Sex and Decade

Age	1984 Black	1994 Black	1984 non-Black	1994 non-Black
70	0.71	0.78	0.80	0.82*
80	0.50	0.64	0.64	0.70*
90	0.23	0.45*	0.36	0.51*

Proportion of remaining life expected in active state by sex and decade

Age	1984 Male	1994 male	1984 Female	1994 Female
70	0.84	0.87*	0.76	0.78
80	0.69	0.77*	0.60	0.66*
90	0.42	0.60*	0.33	0.48*

Table 3: Life expectancy (LE) by Sex: Total, Active, and Disabled

Men

	1984			1994		
Age	Total LE	Active LE	Disabled LE	Total LE	Active LE	Disabled LE
70	11.60	9.78	1.82	12.62*	10.94*	1.69
80	6.83	4.73	2.10	7.61*	5.85*	1.75
90	4.02	1.68	2.34	4.53	2.72*	1.81

Women

	1984			1994		
Age	Total LE	Active LE	Disabled LE	Total LE	Active LE	Disabled LE
70	15.51	11.84	3.67	15.82	12.40	3.42
80	9.37	5.58	3.79	10.00	6.60*	3.40
90	5.44	1.80	3.63	6.24	2.99*	3.25

* denotes 1994 value significantly different than 1984, P<.05