Impact of Vision Loss on Active Life Expectancy in the U.S.

Poor vision loss may limit both quality and quantity of life in older adults. We use 16 years of the Health and Retirement Study, separating it into two cohorts, between 1998-2006 and 2006-2014. This allows us to examine the effect of age, cohort, and time varying covariates such as low vision, socioeconomic status, and functional health. Low vision is classified as poor when respondents said they see "not very well" and treated as a time varying covariate. Disability was measured as having difficulty with any of the 6 Activities of Daily Living or 6 Instrumental Activities of Daily Living. We used the Stochastic Population Analysis for Complex Events (SPACE) program to estimate Multistate Life Table (MSLT) functions and their sampling variability. This approach uses microsimulation and the bootstrap method to estimate the sampling variability. The bootstrap method takes sample design into account to correct the potential bias in variance estimates. The resulting pooled data set had 31,608 participants, with 104,214 observed time intervals. The results indicate that among those who experienced low vision loss over the survey period, total life expectancy at age 50 was 5 years less than for those who reported vision loss (total life expectancy difference of 5.12 years for males, 5.35 years for females). The largest differences were seen in disabled years, with approximately 9.5 fewer years lived healthy for women at age 50 with poor vision. The transition rates to disability are clearly higher for females with poor vision loss, and recovery rates are substantially lower for those with poor vision loss. Mortality is highest for males with poor vision loss, and lowest for females with good vision loss. Experiencing vision loss has an impact on both active life expectancy and mortality risk. We compare two models, the first controls for age and time varying vision loss, investigating active and disabled life expectancy among older men and women. Our second model controls for race, education, wealth, and the presence of chronic conditions.

Table 1: Sample description

Sex	Number	Percent
Men	13,975	46.78
Women	17,633	53.22
Deaths	10,499	32.91
Race/Ethnicity/Nativity		
White	21,616	79.12
Black	5,555	10.10
US Born Hispanic	1,393	3.36
FB Hispanic	2,156	4.38
Others	888	3.04
Mean Years of		3.23
Education	12.6	std dev
N	31,608	

Table 2: Sample disability prevalence by type of disability

ADL

No ADL	78.01
ADL	16.03
Death	5.96

IADL

No IADL	78.95
IADL	14.62
Death	6.43

Disability (ADL+IADL)

No disability	71.49
Disability	22.15
Death	6.36

Functional Limitation, Disability (ADL+IADL+Nagi)

No FL, no Disab	14.59
FL, but no Disab	53.62
Disability	24.7
Death	7.1

Table 3: Population Based Life Expectancy and Health Expectancy by vision and age: **Males** controlling for race, education, wealth, and the presence of chronic conditions

Age	Vision	Total Life Expectancy (TLE)	Healthy Life Expectancy (HLE)	Disabled Life Expectancy (DLE)	Difference by Vision TLE	Difference by Vision HLE	Difference by Vision DLE
50	Good Vision	30.27	24.74	5.37	5.12	8.96	-3.87
50	Poor Vision	25.15	15.78	9.24			
60	Good Vision	22.13	17.31	4.71	4.37	7.13	-2.79
60	Poor Vision	17.76	10.17	7.50			
70	Good Vision	15.25	11.33	3.83	3.37	5.20	-1.85
70	Poor Vision	11.88	6.13	5.68			
80	Good Vision	9.88	6.88	2.95	2.35	3.41	-1.06
80	Poor Vision	7.52	3.47	4.01			

Table 4: Table 3: Population Based Life Expectancy and Health Expectancy by vision and age: **Females** controlling for race, education, wealth, and the presence of chronic conditions

Age	Vision	Total Life Expectancy (TLE)	Healthy Life Expectancy (HLE)	Disabled Life Expectancy (DLE)	Difference by Vision TLE	Difference by Vision HLE	Difference by Vision DLE
50	Good Vision	34.69	27.23	7.37	5.35	9.45	-4.12
50	Poor Vision	29.33	17.78	11.49			
60	Good Vision	25.87	19.07	6.74	4.74	7.84	-3.11
60	Poor Vision	21.13	11.23	9.85			
70	Good Vision	17.99	12.26	5.69	3.62	5.60	-1.99
70	Poor Vision	14.36	6.66	7.67			
80	Good Vision	11.74	7.29	4.42	2.61	3.69	-1.08
80	Poor Vision	9.13	3.60	5.51			