Self-Rated Health and 5-Year Mortality Across Cohorts: Change or Stability in Predictive Validity?

Edward R. Berchick
Department of Sociology & the Office of Population Research
Princeton University

Background

- Self-rated health (SRH) is often used to assess cohort trends in health and health inequalities, in part due to its association with subsequent health and mortality.

- In addition to variation by education, race/ethnicity, sex,[1-3] there may be differences in SRH's mortality predictive validity across birth cohorts:
  - *Differences in reference groups:* Younger cohorts compare themselves to age peers, i.e. persons who have reduced mortality and morbidity rates.
  - *Differences in health assessment:* Younger cohorts have experienced lower mortality rates and have enjoyed greater optimism about the ability of medical systems to address health needs.[5] Post-materialism also implies a shift to higher order wants and needs.[6]
  - *Compositional changes:* Younger cohorts are better educated and have smaller shares that identify as white.[1-3]
  - *Changing health burden:* Younger cohorts experience causes of death that are more strongly associated with SRH than accidental and intentional causes.[4]

- Predictive validity trends offer insight into how persons born at different times evaluate their wellbeing and reveal whether research on health trends using SRH captures change in underlying epidemiologic phenomena.

Data

Analyses use data from the 1986-2001 waves of **the National Health Interview Survey (NHIS)** and **NHIS Linked Mortality Files (NHIS-LMF)**. The NHIS-LMF matches NHIS respondents to available death records.

As healthier individuals from a given cohort are more likely to survive across annual waves, I restrict my sample to persons aged 50-54 or 60-64 years during the 1986, 1991, 1996, and 2001 surveys, which corresponds to the following birth cohorts: 1936-40, 1941-45, 1946-50, and 1951-55 for the 50-54 year old sample, and 1926-30, 1931-35, 1936-40, and 1941-45 for the older sample.

Is there change in the association between SRH and 5-year mortality across cohorts?

From nested proportional hazard models, I find no change in the association between SRH (ordinal: 0=excellent,..., 4=poor) and 5-year mortality across birth cohorts among 50-54 year olds:

Table 1: Hazard Ratios and Standard Errors, Cox Proportional Hazards Models, Ages 50-54

Ages 50-54:	Model 1	Model 2	Model 3	Model 4
SRH	1.736*** (.160)	1.725*** (.159)	1.726*** (.161)	1.698*** (.157)
Cohort	1.023 (.034)	1.023 (.034)	1.019 (.034)	1.018 (.034)
SRH x Cohort	.916 (.076)	.915 (.076)	.925 (.077)	.914 (.076)
Female	.697*** (.060)	.694*** (.060)	.690*** (.060)	.664*** (.059)
South	1.014 (.091)	1.008 (.090)	.999 (.090)	1.010 (.091)
Non-white		1.116 (.116)	1.112 (.113)	1.038 (.106)
Yrs. education			.997 (.016)	1.001 (.016)
College degree +			.936 (.140)	.914 (.137)
Never married				1.495*** (.155)
Formerly married				2.110 *** (.310)

However, there is evidence for a weakening association between SRH and 5-year mortality for older individuals:

Table 2: Hazard Ratios and Standard Errors, Cox Proportional Hazards Models, Ages 60-64

Ages 60-64:	Model 1	Model 2	Model 3	Model 4
SRH	1.607*** (.106)	1.606*** (.106)	1.606*** (.108)	1.591*** (.107)
Cohort	1.064* (.027)	1.064* (.027)	1.060* (.027)	1.061** (.028)
SRH x Cohort	.805** (.067)	.805* (.057)	.817* (.058)	.814** (.058)
Female	.541*** (.034)	.541*** (.034)	.537*** (.035)	.508*** (.034)
South	1.024 (.066)	1.024 (.034)	1.015 (.066)	1.021 (.067)
Non-white		1.012 (.077)	1.014 (.079)	.975 (.076)
Yrs. education			.998 (.010)	.992 (.011)
College degree +			.788† (.097)	.775* (.095)
Never married				1.531*** (.200)
Formerly married				1.335*** (.099)

Is there variation across groups?

Health and social changes were not uniformly experienced across the American population; shifts health assessment and reference group selection may have been differentially experienced. To explore this possibility, I estimate three additional models that include a three-way interaction term.

Table 3: Hazard Ratios and Standard Errors, Three-way Interaction Term, Cox Proportional Hazards Models, Ages 50-54 and 60-64

	50-54 Year Old Sample	60-64 Year Old Sample
	Hazard Ratio (S.E.)	Hazard Ratio (S.E.)
Race		
SRH x Cohort x Nonwhite	.974 (.024)	.976 (.019)
Education		
SRH x Cohort x BA	1.052 (.031) †	1.042 (.027)
Marital Status		
SRH x Cohort x Married	.989 (.022)	1.012 (.017)

Contrary to hypotheses, no evidence of differential trends by race, education, and marital status was found.

*For all analyses, preliminary robustness checks (indicator variables for cohort and SRH, binary measure of fair/poor SRH, and discrete logit, Weibull, and Gompertz specifications) yield similar estimates.

Explanations for the observed pattern

Comparing results across columns of the tables indicates that compositional factors fail to explain observed patterns.

Possible explanations for the observed stability for 50-54 year olds but instability across 60-64 year olds include:

(1) Younger individuals face fewer health events, and may spend less time focusing on their health or that of their peers. Thus, health issues may be less salient to younger people.

(2) Older individuals face a greater chronic disease burden. Causes of death due to chronic conditions are more strongly associated with SRH than other causes.[4]

(3) The two samples contain different cohorts. Historical events that affected only certain cohorts could contribute to the observed results.

Conclusions

Research using SRH to measure cohort differences in health appears to capture *both* changes in the subjective experience of health as well as physical health itself.

However, due to data limitations and the limited age ranges/ cohorts examined, future work is required to provide a wider perspective, and to interrogate what is propelling the observed differences between younger and older individuals.

References

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Contact information

Email: berchick@princeton.edu
Website: www.princeton.edu/~berchick/