Timing and predictors of early mortality among a cohort of American men from the National Survey of Adolescent Males

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Introduction

Males have higher death rates at almost every age than females in the United States (CDC; 2007), yet why do some men die younger than other men? The early adult years are a part of the life course where a variety of inequalities in demographic characteristics and behaviors may explain differentials in early male mortality.

In the proposed paper, we aim to use a newly available source of data, the fourth wave of the National Survey of Adolescent Males (NSAM), to investigate mortality differentials among men under 40. Factors that have been associated with early male death include urbanicity, ethnicity, family structure during childhood and adolescence, educational attainment, school attendance, maternal education and region of residence. NSAM has data for these factors, as well as others that are thought to be associated with mortality such as smoking and risk-taking behaviors in adolescence.

Methods

National Survey of Adolescent Males

We use data from NSAM for our analyses. The survey began in 1988 with in-person interviews among a nationally representative sample of 1,880 never-married men ages 15 to 19 that were living in households in the conterminous United States. The NSAM used a multistage, stratified sample that over-sampled African Americans and Latinos. Non-response was somewhat less common in African America households than European American households. We developed weights to compensate for non-response, which were post-stratified to correspond with the March 1987 Current Population Survey weighting schema (CDC 1987). Although there have been four waves of NSAM data collection, all the predictor variables for the analysis will come from the initial wave with the exception of the outcome variable.

The outcome variable

The outcome variable for this analysis is death. In order to confirm reported deaths in the NSAM sample, we pulled demographic data from the NSAM database for any participant labeled as "unable to locate" or "dead" by 2009 by ISR Temple, the survey research organization who did the field work for the fourth wave of data collection. These labels came from field enumerator accounts during data collection. The demographic data from these participants were sent to the National Death Index (NDI), who matched these cases based on full name, date of birth, date of death, and social security number (SSN). This list was returned to the NSAM team, who counted a death as confirmed if there was a perfect match on all nine digits of the SSN. If a participant did not have a SSN or if it was unknown, deaths were confirmed only if there was a perfect match on all remaining demographic data. To have a more conservative estimate, those who were not confirmed dead were considered alive. Therefore, the denominator for this analysis includes men who were incarcerated, incapacitated, and/or unable to be located at wave four data collection. Lastly, the NSAM team

collected cause of death (COD) codes from confirmed matches, and matched these codes to those found in the International Classification of Diseases 10 and 11.

Predictor variables

If our paper is accepted, our analysis of the predictors of the early male death will include social, demographic and behavior factors collected in 1988. These will include urbanicity, ethnicity, family structure during childhood and adolescence, educational attainment, school attendance, maternal education, region of residence, smoking habits, and other risk-taking behaviors.

Life Table and Cox Proportional Hazard Model

First, to assess if our mortality rates were comparable to U.S. estimates, we used information from the U.S. National Vital Statistics Records (NVSR) from 2007, the last available year, to compare with our sample for the single-decrement life table. This analysis is complete and we discuss it below. We plan to model the timing of death using a Cox Proportional Hazard (CPH) analyses. In addition to conducting unweighted analyses, we weighted both analyses to account for oversampling.

We will perform a univariate analyses for all independent variables and mortality between 1988 and 2009. P-values for the univariate analysis will be determined using Chi Squared test. In addition, we will check for collinearity. Lastly, we will conduct univariate and multivariate CPH regressions. Significance values are set at a p-value of 0.05. All variables will be kept in the final model regardless of significance level, as they are deemed theoretically important. We will check assumptions of CPH model using a global Chi Squared test.

We have few missing values for our variables. We will make assumptions about how those values are missing (e.g. at random) and how we will handle missingness (e.g. with imputation).

Preliminary and forthcoming results

In total, there were 69 confirmed deaths out of 1,880 participants, which represent about 4% of the sample. As is shown in **Table 1**, the majority of deaths (nearly 60%) took place between Wave 3 and 4.

COD information appears in **Table 2** and is compared to the 2007 NVSR estimates for males ages 25-34. This age group was used because it represented the age group with the majority of NSAM deaths. COD categories have been changed slightly from the NVSR for presentation purpose, with a few additional breakouts of COD to highlight specific COD of interest within the NSAM sample.

Accidents represent the highest proportion of deaths nationally (38%) compared to only 24% of NSAM deaths. Non-vehicular accidental deaths in the NSAM sample (N=15) include two falls, seven poisonings (e.g. overdose from drugs or alcohol), three deaths by drowning, and three

unspecified accidents. Vehicular deaths (N=13) for this sample were associated with four motorcycling or off-terrain recreation vehicle deaths; in seven vehicular-related deaths the participant was the driver. Intentional self-harm (i.e. suicide) rates were similar between the two samples, though there was slightly smaller proportion of homicide in NSAM than in the NVSR. Natural causes (a term we will likely replace with another in the final presentation, if accepted) for the NSAM men (N=18) were mostly due to cardiac diseases and other disorders, including three cancer deaths, four obesity-related deaths, and one diabetes-related death. Regardless of cause, nine of the deaths had concomitant substance abuse. Six of the 69 COD were unknown.

Figure 1 shows the results of the unweighted life table analysis comparing the NSAM proportions surviving to the NVSR estimates. Before age 24, the NVSR estimate is within the NSAM confidence intervals; however, after this age the NSAM men have higher mortality.

In addition to the tables and figures presented in this abstract, if this paper is accepted we will present the results from our weighted life table and the hazards regression of the timing of death on social, demographic and behavioral factors.

Discussion

If our paper is accepted, we will comment on the results of timing and cause of death within the NSAM sample, as well as the results from the hazards regressions, within the context of current literature. It is our hope that these analyses will help shed light on the important issue of inequality in mortality among American men.

References

CDC, 1987. The 1987 Current Population Survey. Available at http://wonder.cdc.gov/wonder/sci_data/census/cps/type_txt/cps87.asp

CDC 2007. Available at http://www.cdc.gov/nchs/data/nvsr/nvsr59/nvsr59_09.pdf

Tables and Figures

Table 1: Distribution of NSAM deaths between 1988 and 2009

Status	**No. participants (% of total sample)**	**% of Deaths**
Alive in 2009	1811 (96.3)	
Dead by 2009	69 (3.7)	100.0
Death between 1988 and 1991 (NSAM Wave I-II)	9 (<1.0)	13.0
Death between 1991 and 1995 (NSAM Wave II-III)	19 (1.0)	27.5
Death between 1995 and 2008 (NSAM Wave III-IV)	41 (2.2)	59.4
TOTAL	1,880 (100.0)	

T**able 2:** Cause of death information for NVSR (2007) and NSAM

	NVSR: All races, male, 25-34 years	**NSAM sample**	
Category of death	**%**	**%**	**No.**
Accidents (unintentional injuries)	**38%**	**24%**	28
Non-vehicular	-	22%	15
Vehicular	-	19%	13
Intentional self-harm (suicide)	**14%**	**16%**	11
Assault (homicide)	**14%**	**9%**	6
"Natural causes"	**17%**	**26%**	18
Unknown	-	9%	6

Figure 1: Proportion surviving: U.S. Vital Statistics and NSAM Estimates (unweighted), where LCI=lower confidence interval and UCI=upper confidence interval.