Are Marital Status Differences in Health Increasing or Decreasing by Cohort? An Examination by Race and Gender for Younger Adults

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Abstract. While researchers continue to emphasize the value of marriage for health, we know surprisingly little about how the association between marital status and health has changed across birth cohort. In this paper, I use pooled repeated cross-sectional data from the National Health Interview Survey (NHIS) to examine cohort pattern in the relationship between marital status and health between birth cohort 1918 and 1978. Self-rated health is the primary outcome measurement in the present study. Results from ordered logistic regression models show that health differences between the married and other non-married groups including widowed, divorced/separated and never married became widened across cohort from 1918 to 1978. Moreover, divergence trend in health between the married with the other marital groups was more profound among women than men and among non-Hispanic whites than African Americans.

The relationship between marital status and health is one of the most robust results in social science. The married are generally healthier and thy live longer than the unmarried. Although a substantial literature has established the link between marital status and health, little is known about how this association changed across cohort. In the context of raid marriage change, the cost and benefit of marriage for health may also change. Several factors may contribute to the changing relationship between marital status and health by cohort. For example, normative and attitudinal change about marriage accompanied by changes in family structural across cohort may lead to changing stress processes associated with different marital status. In comparison to their older cohort counterparts, younger cohorts experience more divorce and separation. Therefore, becoming divorce and separate may become less stressful and thus less harmful to physical health for the younger cohorts relative to the older cohorts.

In this paper, I use pooled repeated cross-sectional data from the National Health Interview Survey (NHIS) to examine cohort pattern in the relationship between marital status and health between birth cohort 1918 and 1978. Self-rated health is the primary outcome measurement in the present study. The primary goal of this study is to answer two major questions. Are marital differences in health increasing or decreasing across cohorts in the United States? Are there any gender and racial/ethnic differences in those cohort trends?

BACKGROUND

The health advantage of the married over the unmarried is a well-documented relationship in social science. The married are in general healthier than the unmarried including the never married, divorced, separated, widowed and cohabiting (Kobrin and

Hendershot 1977; Umberson 1987; House, Landis and Umberson 1988; Goldman 1993; Rogers 1995; Waite 1995; Waite and Lehrer 2003). A growing body of literature has been involved in providing explanations for the link between marital status and health. The primary mechanisms for this association are mainly from three theoretical arguments.

First, the marital resource model suggests that health differences by marital status can be explained by the greater economic resources, social integration, and regulation of health behavior that the married enjoy relative to the unmarried (Ross, Mirowsky and Goldsteen 1990; Williams and Umberson 2004). Second, in contrast to the marital resource model which attributes marital benefits to the positive effects experienced by the married, the crisis model suggests that the strains of marital dissolution are the primary factor responsible for undermining the health of the divorced, separated and widowed which, in turn, leads to marital status differences in health (Booth and Amato 1991; Williams and Umberson 2004). Both marital resource and crisis models imply that the association between marital status and health is a casual relationship, which is not agreed by some researches who suggest that this association is a spurious relationship. The argument for the spurious relationship between marital status and health is also referred as the selection model. The marriage selection model suggests that individuals in better health or with more favorable health characteristics are more likely to be selected into marriage while those in worse health or with fewer favorable health characteristics are more likely to be selected out of marriage.

Although little empirically documented, the mechanisms linking the association between martial status and health are expected to change across cohorts. There are at

least three reasons for expecting changing links between marital status and health by cohort in the United States. They are family normative change (Bumpass 1990), marriage gain decline (Becker 1981), and marriage selection change (Raley and Bumpass 1990) across cohort.

Family Normative and Attitudinal Change

Compared to the older birth cohorts, younger birth cohorts in the United States experienced tremendous change in marriage. Marriage age was delayed; the duration of being single increased; and cohabitation and marital dissolution rose dramatically among younger birth cohorts. Some family scholars argue that these changes provide evidence that marriage has become less popular and valued among Americans (Bumpass 1990). As the proportion of individuals who divorce and never marry increase, these statuses also become more normative and less stigmatized among the younger cohorts in comparison to older cohorts.

Moreover, increase in marriage dissolution and being never married are also more pronounced among African Americans than non-Hispanic whites. Among whites, declines in marriage largely represent delays in marriage, whereas, among African Americans, declines reflect both delays and decreases in the probability of ever marrying (Bennette, Bloom, and Craig 1989). Being African American or is associated with a higher risk of union dissolution (Raley and Bumpass 2003) as well as lower likelihood of transition into marriage (Oppenheimer, Kalmijn and Lim 1997). Although the probability of divorce has remained constant since 1980 in the United States (Goldstein 1999), the plateau in divorce only exists among whites and higher socioeconomic status groups rather than African Americans and lower socioeconomic status groups (Raley and

Bumpass 2003). The more common occurrence of divorce, separation, cohabitation and never-married status among African Americans than non-Hispanic whites suggests that being unmarried might be more acceptable to those groups than to their white. This may result in more dampened negative effects from those statuses for the former than the latter groups. Therefore, I hypothesize that health differentials by marital status are more likely to decrease/less likely to increase among African Americans than non-Hispanic whites across cohort.

Marriage Gain Decline

The marital resource model suggests that health differences by marital status can be explained by social integration, regulation of health behavior and the greater economic resources, that the married enjoy relative to the unmarried (Ross, Mirowsky and Goldsteen 1990; Umberson 1992; Williams and Umberson 2004).

One of the most influential theories explaining family changes is from the economist, Gary Becker (1978, 1981), who attributes recent family changes to a decline in gains from marriage. According to Becker, people get married in order to maximize their utility. Marriage makes individuals better off partly by allowing for specialization between the husband and wife, which yields greater productivity (Becker 1981). As the division of household labor decreases with increases in women's education and employment, specialization declines and the economic gain from marriage diminishes. Marriage becomes less valued as a source of economic stability (Teachman et al. 2000). Thus, individuals have become less inclined to stay married. As aforementioned, one of the mechanisms through which marriage benefits health is increased economic resources. If women's employment and independence diminishes the benefit of specialization

between spouses and thus reduces the economic gain of marriage, then I should find that the marriage benefits to health have decreased over time.

More over, previous studies also suggest greater economic resources through marriage play a more important role in accounting for the marital advantage in health for women than for men (Zick and Smith 1991; Lillard and Waite 1995), the decline in marriage economic gain may reduce the marital advantage in health for women more than men. This leads to my hypothesis regarding gender differences in the cohort trends: health differentials by marital status are more likely to decrease/less likely to increase among women than men across cohort.

Marriage Selection Change

Many studies argue that selection of the healthiest individuals into marriage may account for the lower mortality rates and better health status among the married. Spouses may be selected for better health not only *directly* through the exclusion of mentally and physically ill persons from marriage but also *indirectly* through a wide range of selection criteria including socioeconomic status (Oppenheimer 2003; Xie et al. 2003), health behaviors (Fu and Goldman 1996), and psychological characteristics (Mastekaasa 1992).

Marriage selection works through two stages. The first stage occurs because individuals in better health or with more favorable health characteristics are more likely to experience transitions into marriage. Research about marriage formation suggests that low SES (especially for men) and being African American are both negatively associated with the likelihood and timing of marriage (Oppenheimer, Kalmijn and Lim 1997; Oppenheimer 2003; Xie et al. 2003; Carlson, Mclanahan and England 2004). Although not as well documented as income, education, and race, other selection criteria such as

psychological well-being (Masterkassa1992) and health behavior (Fu and Goldman 1996) may also be operative.

The second stage occurs because those in poorer health or with fewer favorable health characteristics are more likely to experience transitions out of marriage. Raley and Bumpass (2003) suggest that lower socioeconomic status, African American status and fewer socioeconomic resources are all associated with higher risk of union dissolution and that the differentials in marital dissolution between those social groups have increased since 1980.

Change in the relative number of individuals selected into or out of marriage suggests that selection criteria may have changed in the context of family change. Changes in marriage selection suggest that the association between marital status and health would change over time, although predictions about the direction of change are unclear. On the one hand, more people divorce, separate, never marry, and cohabit, suggesting that the negative criteria associated with selection out of marriage may have diminished so that disadvantages associated with those non-married statuses may have diminished over historical time. On the other hand, fewer people get married suggesting that selection into marriage may have become more relevant over time and the advantage of the married over the non-married may have increased.

Taken together, although both marital resource and crisis model suggest that health differences by marital status may have decreased across cohort, selection model suggest mixed directions for this trends. These literature also suggests potential race and gender differences in these cohort trends.

DATA

The data for this study is from the pooled cross-sectional data from the National Health Interview Survey (NHIS) 1982-2003. This pooled data covers birth cohort from 1918 to 1978. The NHIS is a multistage probability survey conducted annually by United States Department of Health and Human Services and the National Center for Health Statistics and is representative of the civilian noninstitutionalized population of the United States (U.S. Dept. of Health and Human Services, National Center for Health Statistics 2000a). All analyses presented here are weighted to adjust for this sampling design and robust standard errors are reported.

I include only those who are non-Hispanic white or African American and between age 25 and 64 when the surveys were conducted in this study. NHIS collects health information for all family members but information on each family member is reported by one primary respondent in the home (U.S. Dept. of Health and Human Services, National Center for Health Statistics 2000b). Due to concerns about validity and reliability of proxy reports on family members' health, our analyses are limited to the primary respondents' reports on his/her own health status. Cohabiting respondents are excluded from the analysis because the NHIS did not collect information on cohabiting status prior to 1997. Missing cases on either marital status or self-rated health are excluded. Finally, 576,155 observations are included in the analysis.

Table 1 shows the sample composition of the data. In this sample, more than half are currently married, less than four percent are widowed, about 18 percent are either divorced or separated, and nearly fourteen percent are never married. As for the health status, about 35 percent of the sample report excellent health. About 31 and 24 percent

report very good and good health respectively, while about 8 and 3 percent report fair and poor health respectively. About fourteen percent of the sample have no high school diploma. About 36 percent of them are high school graduates. Those with some college account for about 25 percent of the sample. College graduates also account for a quarter of the total sample. More than half of the respondents in the sample are women and nearly 87 percent are non-Hispanic white. The mean age of the sample is about 43.

Table 1 about here.

MEASURE

The primary outcome variable for this study is *self-rated health* which is one of the most well-used reliable health measures (Idler and Benyamini 1997). Self-rated health is scored from 1 to 5 with 1 for excellent, 2 for very good, 3 for good, 4 for fair, and 5 for poor.

Marital status is based on the survey question, "Are you now married, widowed, divorced, separated or never married?" Five categories of marital status are included in the final analysis: married, widowed, divorced, separated, and never married, with the married as the reference group.

Birth cohort is indicated by the year of birth which is calculated by survey minus age. I centered this cohort variable at the center value, 1948 in the final analysis.

Other covariates in the analysis include age (centered at mean age of 48), gender (female=1, male=0), race (non-Hispanic African American=1, non-Hispanic white=0) and education (no high school diploma, high school graduate, some college, and college graduate with the last category as the reference group) which are known to be potential confounders for the relationship between marital status and health. Because the marital

association with health depends on age (Umberson et al. 2006), the estimated period trends will be biased if the age interaction is ignored (see Lynch 2003). In order to control the age pattern of the marital differences in health, we include interaction terms between age and marital status in our final models. About 1% of observations have missing information on education and they are recoded at the mean value for the survey year. We do not control for income in the analysis because of the endogenous relationship between income and marital status (Becker 1981; Brines and Joyner 1999).

STATISTICAL MODELS

I use ordered logistic regression model to estimate the age-period-cohort model (with period effect omitted). The ordered logistic regression model can be specified as:

$$\log\frac{(y \geq k \mid X_i, M_j, T)}{(y < k \mid X_i, M_j, T)} = \tau_k + \alpha T + \sum \beta_j M_j + \sum \gamma_j M_j T + \sum \pi_i X_i$$

where y represents self-rated health; k represents the category of health status; τ_k represents the intercepts corresponding the kth health category; T is the period time variable and α is its coefficient; M_j represents the set of marital status dummy variables and β_j represents the corresponding coefficients ("married" is the reference group); γ_j represents the corresponding coefficients for the set of interaction terms of marital status and time; X_i stands for the other covariates included in the model and π_i for the corresponding coefficients. γ_j is of the most interest to this study as it reflects trends in health differences by marital status.

RESULTS

Descriptive Results

Table 2 present the descriptive characteristics of each marital groups for three selected three-year birth cohort groups, 1918-1920, 1947-1949 and 1976-1978. Table 2

show that the sample from 1976-1978 birth cohort have lower proportion of being married in comparison to the other two older birth cohorts. The proportion of being married among the younger adult sample decreased rapidly across cohorts. The proportion of divorced/separated is much higher among the middle birth cohort than the younger and older cohorts. The lower proportion of divorce/separation in the younger birth cohort is mainly resulted from the fact that most of them are still single. For each marital group, we see an increasing proportion reporting excellent/very good health across cohorts. This is also true for education. Across cohorts, the proportion of college graduates increased for each marital group. Not surprisingly, younger cohorts are in younger ages than the older cohorts. Gender and race compositions show modest change across cohort. These changes by cohort are generally consistent with previously documented demographic trends (CITE)

Table 2 about here.

Estimated Cohort Trends From Ordered Logistic Regressions

In order to better understand cohort trends in the association between marital status and health, I estimated ordered logistic regression models. Table 3 shows the estimated cohort trends in health differences by marital status. Model 1 is the basic model without control interactions with race and gender. Model 2 takes account of the potential race interactions with cohort trends by marital status. Model 3 controls the gender differences in cohort trends by marital status. Model 4 is the final model including all covariates and interaction terms in Model 1 to Model 3. My discussion about the estimated cohort trends is mainly based on the final Model 4. I calculated the predicted

value of probability of reporting excellent/very good health based on the estimations from Model 4 of Table 3 and then illustrate those results in Figure 1.

The first set of covariates in Model 4, e.g. cohort X marital status reflect the general cohort trends in self-rated health by marital status for the reference group, e.g. Non-Hispanic white men. The left upper graph in Figure 1 is an illustration for those cohort trends for non-Hispanic white men. From this graph in Figure 1, we can see that the probability of reporting excellent/very good health changed little for the married non-Hispanic white men across cohort. However, the probability declined for all other marital status groups. It declined most rapidly among the never married while least rapid among the widowed. Therefore, we see a widening gap in health between the married and each of the non-married group.

The next two sets of covariates in Model 4 of Table 3 indicate the race and gender differences in cohort trends in self-rated health by marital status. I converted those results into the other three graphs in Figure 1. The upper right graph in Figure 1 shows the cohort trends for African American men. The two lower graphs in Figure 1 illustrate the cohort trends for white and African American women. I first compare the graphs in the same row, e.g. non-Hispanic white men versus African American men; and non-Hispanic white women versus African American women to get race differences in those cohort trends. Then I compare the graphs in the same column, e.g. non-Hispanic white men versus noon-Hispanic white women; and African American men versus African American women to get gender differences in those cohort trends.

Race. In contrast with the married whites whose probability of reporting excellent/very good health remained stable, the married African American men showed dramatic

increase in probability of reporting excellent/very good health by cohort. Thus, we see that the health difference between the white married men and their African American counterparts decreased across cohort. Moreover, the probability of reporting excellent/very good health also increased across cohort for those non-married groups-including widowed, divorced/separate and never married-among African American men, although it decreased for each of those non-married groups among white men. Indeed, we see a modest narrowing trend between the married and widowed for African American men. Moreover, the divergence trend in self-rated health between the married and either divorced/separated or never married was more profound for whites than African Americans.

Next I compare the two lower graphs in Figure 1 for white and African American women. In comparison to white married women who showed decreasing probability of reporting excellent/very good health across cohort, their African American counterparts show improvement in health across cohort. Similarly, although self-rated health declined for white widowed women, African American widowed women became more likely to report excellent/very good health across cohort. Indeed, the difference in probability of reporting excellent/very good health between the married and widowed showed modest decrease among African American women, while it increased for white women. Moreover, the divergence trend in health between the married and either divorced/separated or never married was more pronounced among white women than African American women.

Summary. While both married African American men and women increase the probability of reporting excellent/very good health across cohort while their white

counterparts remained stable or show modest decrease. For both men and women, health difference between the married and widowed decreased across cohort for African American women but increased for non-Hispanic whites. The divergent trend in health between the married and either divorced/separated or never married was more pronounced among whites than African Americans for both men and women.

Gender. Comparing graphs for white men and women in the left column of Figure 1 show the gender differences in the cohort trends in health by marital status. Although married white men show little change in probability of reporting excellent/very good health across cohort, this probability decreased across cohort for white women. The divergence trend in self-rated health between the married and widowed was at the same rate for white men and women. However, the divergence trend between the married and either divorced/separated or never married was more pronounced for white men than white women.

Finally, I compare the two graphs for African American men and women in the right column of Figure 1. In comparison to African American married men, African American married women show a relatively slower increase in probability of reporting excellent/very good health. Health difference between the married and widowed decreased modestly across cohort for both African American men and women. However, the widening health gap between the married and either divorced/separated or never married is more pronounced among African American women than African American men.

Summary. Relative to their male counterparts, white women are more likely to experience decline in health across cohort. For African Americans, married women

increased the probability of reporting excellent/very good health across cohort less rapidly then African American married men. Health trend between the married and widowed did not show different pattern between men and women. However, for both race groups, divergence trend in health between the married and either divorced/separated or never married is more pronounced among women than men.

DISCUSSION

While family demographers are concentrated on the debates about why family changes, medical sociologists focus on a life course perspective to examine the relationship between marital status and health. Neither of them considers the implications of the recent family change on the association between marital status and health. While researchers continue to emphasize the value of marriage for health, we know surprisingly little about how the association between marital status and health has changed across birth cohort.

TABLE 1. Weighted Summary Statistics of Analyzed Variables

	Mean	S.D.
Age	42.51	11.17
		Range
Birth cohort		[1918, 1978]
		Percentage
Marital Status		
Married		64.76
Widowed		3.56
Divorced/Separated		17.75
Never married		13.93
Health Status		
Excellent		34.57
Very Good		30.79
Good		23.54
Fair		7.95
Poor		3.15
Education		
No High School Diploma		13.96
High School Graduate		36.18
Some College		24.78
College Graduate		25.08
Gender		
Women		61.78
Men		38.22
Race		
Non-Hispanic Whites		86.98
Non-Hispanic African Americans		13.02
N		576155

TABLE 2. Weighted Descriptive Characteristics by Marital Status and Selected Birth Cohorts

		1918-1920	1947-1949	1976-1978
Married	Proportion of Total Sample	65.87	66.45	42.47
	Excellent/very good Heath (%)	38.39	67.98	79.54
	College Graduate (%)	10.71	28.62	28.04
	Mean Age	63.35	43.83	25.69
	Women (%)	56.36	62.71	67.51
	African Americans (%)	6.01	7.53	10.05
Widowed	Proportion of Total Sample	20.15	2.22	0.13
	Excellent/very good Heath (%)	42.19	51.64	69.99
	College Graduate (%)	6.61	19.30	0.00
	Mean Age	63.36	47.78	25.41
	Women (%)	84.45	83.38	70.92
	African Americans (%)	15.09	25.75	59.09
Divorced/ Separated	Proportion of Total Sample	9.36	22.58	7.76
	Excellent/very good Heath (%)	35.94	61.91	70.85
	College Graduate (%)	13.00	26.02	17.17
	Mean Age	63.34	44.88	25.77
	Women (%)	61.89	62.04	66.20
	African Americans (%)	16.51	18.80	21.07
Never Married	Proportion of Total Sample	4.63	8.75	49.64
	Excellent/very good Heath (%)	37.82	61.43	76.81
	College Graduate (%)	18.59	40.52	41.31
	Mean Age	63.43	43.59	25.59
	Women (%)	57.68	50.10	47.13
	African Americans (%)	13.33	22.50	26.20

TABLE 3. Cohort Trends in Marital Association With Health from Ordered Logistic Models

	Model 1	Model 2	Model 3	Model 4
CohortXMarital Status (0=Married)				
Cohort	-0.007**	-0.008***	-0.003	-0.004
CohortXWidowed	-0.005	-0.008**	-0.004	-0.007*
CohortXDivorced/Separated	-0.011***	-0.014***	-0.009***	-0.011***
CohortXNever Married	-0.009***	-0.014***	-0.011***	-0.014***
CohortXMarital StatusXRace (0=Married, NHW)				
CohortXNHB		0.012***		0.012***
CohortXWidowedXNHB		0.009***		0.009***
CohortXDivorced/SeparatedXNHB		0.005**		0.006***
CohortXNever MarriedXNHB		0.010***		0.012***
CohortXMarital StatusXGender (0=Married, male)				
CohortXFemale			-0.006***	-0.006***
CohortXWidowedXFemale			0.001	0.001
CohortXDivorced/SeparatedXFemale			-0.004	-0.004*
CohortXNever MarriedXFemale			0.001	-0.003*
Marital Status (0=Married)				
Widowed	-0.253***	-0.241***	-0.259***	-0.247***
Divorced/Separated	-0.169***	-0.161***	-0.170***	-0.162***
Never Married	-0.228***	-0.226***	-0.229***	-0.228***
Sociodemographic Characteristics				
Age	-0.041***	-0.040***	-0.040***	-0.040***
AgeXWidowed	0.006*	0.006*	0.006*	0.006*
AgeXDivorced/Separated	-0.011***	-0.011***	-0.011***	-0.011***
AgeXNever Married	-0.011***	-0.012***	-0.011***	-0.012***
Female	-0.078***	-0.083***	-0.065**	-0.064**
Black	-0.514***	-0.577***	-0.511***	-0.577***
College Graduate	---			
Some College	-0.546***	-0.551***	-0.548***	-0.554***
High School Graduate	-0.877***	-0.883***	-0.882***	-0.890***
No diploma	-1.780***	-1.775***	-1.782***	-1.777***
survey 1997+	0.057	0.055	0.056	0.055
cut1	-4.569	-4.589	-4.566	-4.583
cut2	-3.142	-3.157	-3.138	-3.151
cut3	-1.532	-1.543	-1.528	-1.536
cut4	-.116	-0.126	-.112	-0.119
Pseudo R2	0.055	0.056	0.056	0.056
N			576155	

***p<0.001; **p<0.01; *p<0.05

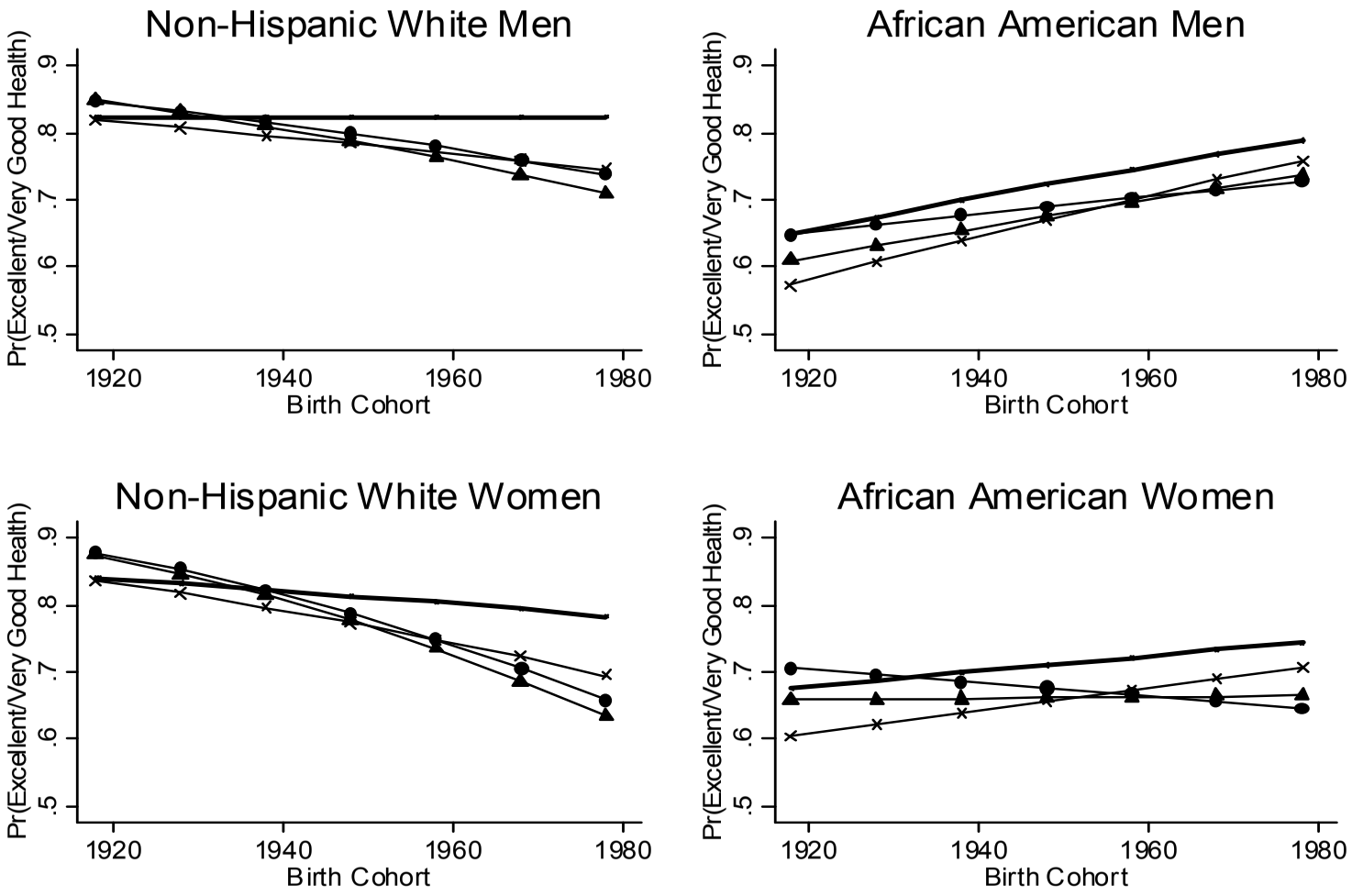

Figure 1. Estimated Cohort Trends by Marital Status, Race and Gender