**When Labor's Lost: Health, Family Life, Incarceration, and Education
in a Time of Declining Economic Opportunity for Men[1]**

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While the 20th century was largely a time of rising prosperity for American families,

the economic progress of U.S. men has stagnated in recent decades. The labor force

participation rate of men ages 25 to 54 peaked at 97 percent in the mid-1960s and has

declined by roughly eight percentage points since then, while men's real median earnings

have been flat since the early 1970s.[2] These population averages mask larger declines in

participation among less educated and non-white men (Juhn and Potter, 2006) as well as

substantial increases in wage inequality (Autor, Katz, and Kearney, 2008). A large economic

literature has arisen to explore these trends, encompassing demand-side factors like skill-

biased technological change (Acemoglu and Autor, 2010) and globalization (Autor, Dorn,

and Hanson, 2013) as well as supply-side factors such as rising spousal employment,

greater use of the Social Security Disability Insurance program (Autor and Duggan, 2003),

and rising utility of leisure due to improvements in video game technology (Aguiar et al.,

2017).

In this paper, we seek to illuminate the broader context in which men are

experiencing economic stagnation. Have changes in health and family life followed the

changes in men's economic status? Are there relevant trends in education and

[2] Sources: https://data.bls.gov/timeseries/LNS11300061 and https://www.census.gov/content/dam/Census/library/publications/2017/demo/P60-259.pdf (Figure 2). See also CEA (2016) for a useful review of the participation trend and possible explanations.

incarceration that may be related to trends in male labor force participation and earnings? To begin to answer these questions, we first explore changes over time in men's health, family life, education, and incarceration, key indicators that may by affected by men's sluggish economic progress or play a role in explaining it. We focus on prime age men, namely those ages 25 to 54, and on the years 1980 to 2016, encompassing much of the period of reduced economic progress. In some cases, we draw comparisons between men and women or highlight trends by race and ethnicity or geography. In the concluding discussion, we explore the relevance of these trends in the context of men's economic stagnation.

I. Health: Mortality

We begin our discussion of health by looking at mortality rates, perhaps the most widely-used measure of health. By this metric, the health of prime-aged men steadily improved during the 1980s and 1990s. For example, the annual mortality rates among men ages 25 to 34, 35 to 44, and 45 to 54 declined by 29 percent, 15 percent, and 29 percent, respectively, between 1980 and 2000. Weighting each of these three age groups equally, the mortality rate (per 100,000) among men ages 25 to 54 fell from 421 in 1980 to 312 in 2000, a 26 percent decline.[3] This was a larger decline than the corresponding drop of 20 percent among prime-aged women during the same period. Despite this differential

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[3] We take an unweighted average in calculating the mortality rate for prime-age men (ages 25 to 54) in order to reduce sensitivity to changes in the age distribution within this age group. If, for example, the share of the population 45-54 rises relative to the share 25-34, this would mechanically increase mortality rates (in the absence of such a correction). Gelman and Auerbach (2016) argue for using even finer age adjustments when assessing mortality trends, as a population shift within a given age group (e.g., having fewer 45 year olds and more 54 year olds) can have an impact on the mortality rate within even a narrowly-defined group.

improvement, prime-aged men still had an 80 percent higher mortality rate than prime-aged women in 2000.

As seen in Table 1, more than half of the improvement for prime-aged men was driven by falling heart disease mortality while nearly one-fourth was the result of an impressive reduction in cancer mortality. The rest was explained by large reductions in homicides and in motor vehicle accident deaths. The mortality rate among prime-aged men for all other causes during this 20-year period was essentially unchanged.

Table 1: Male Mortality Rates by Cause, Ages 25 to 54[1], 1980 to 2000

Cause	Annual Mortality Rates per 100,000				
	1980	**2000**	**Change**	**% Change**	**Share of Total Change**
Heart disease	120.9	63.7	-57.2	-47%	53%
Cancer	82.0	57.6	-24.4	-30%	22%
Homicides	24.9	11.3	-13.6	-55%	13%
Motor vehicles	35.2	22.6	-12.6	-36%	12%
All other	157.9	157.0	-0.9	-1%	1%
Total	420.9	312.2	-108.7	-26%	-

(1) The mortality rate for men ages 25-54 is computed as a simple average of the rate for men ages 25-34, 35-44, and 45-54, in order to minimize the effect of changing age distribution of the population over time.

The substantial reduction in mortality among prime-aged men did not continue after 2000. As shown in Table 2, the mortality rate fell by less than 2 percent (from 312 to 307 per 100,000) from 2000 to 2016. This overall change masks substantial heterogeneity among the three age groups. Perhaps most strikingly, the mortality rate among men ages 25 to 34 increased by 28 percent (from 139 to 178) during this 16-year period, corresponding to an annual growth rate of 1.6 percent. While mortality rates did fall for men ages 35 to 44 and 45 to 54, the annual rate of decline was much slower than it was from 1980 through 2000.

Table 2: Male Mortality Rates by Age, 1980 to 2016

Age Group	Annual Mortality Rates per 100,000				
	1980	**2000**	**2016**	**Annual % Change**	
				1980-2000	**2000-2016**
25 to 34	196	139	178	-1.7%	1.6%
35 to 44	299	255	244	-0.8%	-0.3%
45 to 54	767	543	498	-1.7%	-0.5%
25 to 54[1]	421	312	307	-1.5%	-0.1%

(1) The mortality rate for men ages 25-54 is computed as a simple average of the rate for men ages 25-34, 35-44, and 45-54, in order to minimize the effect of changing age distribution of the population over time.

A closer examination of the changes since 2000 in prime-age mortality rates by cause, as reported in Table 3 for the top ten causes of death (in 2000), helps to explain the overall trend. First, the pace of improvement in heart disease mortality slowed considerably, with the annual mortality rate falling by just 11 deaths per 100,000 between 2000 and 2016 versus by 57 deaths per 100 between 1980 and 2000 (Table 1). Second, the death rate from accidents rose substantially, with this entirely driven by an increase in drug overdose deaths, which nearly quadrupled – from 12 to 45 per 100,000 – between 2000 and 2016, even as mortality from motor vehicle and other accidents fell modestly. Third, there was a significant increase in the suicide rate, which had declined slightly between 1980 and 2000. There were also increases in the homicide rate and in the death rate from diabetes that were small relative to overall mortality but represent increases of over 20 percent relative to their 2000 values.

Offsetting these increases were declines in cancer mortality, which continued at a pace similar to that seen in the earlier period, as well as a remarkable 75 percent decline in

the mortality rate from HIV/AIDS, which went from being the 5th most common cause of

death among prime-aged men in 2000 to the 10th most common in 2016.

Table 3: Male Mortality Rates by Cause, Ages 25 to 54[1], 2000 to 2016

Cause	Annual Mortality Rates per 100,000			
	2000	2016	Change	% Change
Heart Disease	63.7	52.7	-11.0	-17%
Cancer	57.6	41.8	-15.8	-27%
Accidents	48.3	76.1	27.8	57%
Accidental Poisonings	12.0	44.5	32.5	271%
Motor Vehicles	22.6	20.9	-1.7	-8%
All Other Accidents	13.7	10.7	-3.0	-22%
Suicide	21.6	27.2	5.6	26%
HIV	15.2	3.8	-11.4	-75%
Chronic Liver Disease & Cirrhosis	12.9	12.3	-0.6	-4%
Homicide	11.3	13.7	2.4	22%
Cerebrovascular Disease	8.3	7.0	-1.3	-16%
Diabetes Mellitus	7.4	9.0	1.6	21%
Chronic Lower Respiratory Diseases	3.9	3.9	0.0	1%
All Other Causes	62.0	59.1	-2.8	-5%
Total	312.2	306.7	-5.5	-2%

(1) The mortality rate for men ages 25-54 is computed as a simple average of the rate for men ages 25-34, 35-44, and 45-54, in order to minimize the effect of changing age distribution of the population over time.

These trends in mortality by cause of death also explain why young men fared

worse in the recent period. Mortality rates from drug overdose and suicide as well as the

increase in these rates between 2000 and 2016 are very similar across all age groups. By

contrast, men ages 45 to 54 die from heart disease and cancer at rates more than ten times

those of men 25 to 34. Thus, declines since 2000 in heart disease mortality (albeit smaller

than those seen in earlier periods) and in cancer mortality have been sufficient to outweigh

increases in drug overdose and suicide deaths for men 35 to 54, but not for men 25 to 34.

Partly because of these differential patterns by cause of death, mortality trends

since 2000 have varied substantially by race and ethnicity, as highlighted by Case and

Deaton (2015, 2017). For example, the mortality rate among black prime-aged men declined at a similar rate before and after 2000 (2.0 percent annually from 1980 to 2000 versus 1.8 percent annually from 2000 to 2016). By contrast, the mortality rate among white prime-aged men increased by 0.3 percent annually after 2000 versus a 1.4 percent annual decline in the preceding 20 years. One of the most important drivers of this difference was the differential benefit from declining HIV/AIDS mortality. Black prime-aged men were 7 times more likely than white prime-aged men in 2000 to die from HIV/AIDS (65 versus 9 per 100,000), and thus benefitted far more from the subsequent plunge in the HIV/AIDS mortality rate.

In addition, black men saw much smaller increases in the suicide rate (7 percent versus 32 percent for white men) and were much less likely to commit suicide initially. As a result, white men are now more than twice as likely as black men to commit suicide (31 versus 13 per 100,000). Finally, the death rates from (primarily drug and alcohol-induced) accidents increased by 5 times as much among white prime-aged men as among black men of the same age. Thus even though black men have been more affected by the increase in the homicide rate since 2000, this change is dwarfed by the combination of HIV/AIDS, drug-and-alcohol-induced accidents, and suicides.

In addition to the striking differences by race, there are also notable differences by ethnicity. While mortality rates among Hispanic or Latino prime-aged males fell by 1.2 percent annually from 2000 to 2016, the corresponding rate among their non-Hispanic white counterparts rose by 0.7 percent annually.[4] As a result of these changes, mortality

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[4] The CDC did not collect data on ethnicity in 1980 so it is not possible to compare the 1980 to 2000 trends with the 2000 to 2016 trends for these two groups.

rates among white, non-Hispanic prime-aged males are now more than 50 percent higher than among Hispanic prime-aged males (320 versus 211 per 100,000).[5]

Perhaps no two places in the U.S. more clearly indicate the effect of these disparate trends by race and ethnicity than Washington, D.C. and the state of West Virginia. The borders of these two places are less than 60 miles apart and yet they have a very different demographic makeup.[6] Washington, D.C. has a smaller share of its population that is non-Hispanic white (35 percent) than any other state, while West Virginia has the third highest share (93 percent). From 2000 to 2016, the mortality rate among prime-aged men in the state of West Virginia increased by 40 percent, from 371 to 521 per 100,000. During this same 16-year time period, the prime-aged male mortality rate fell by 44 percent among men in Washington, D.C., from 660 to 369 per 100,000. Put another way, in 2000 the mortality rate for prime-aged men was 78 percent higher in Washington, D.C. than in West Virginia whereas by 2016 this rate was 41 percent higher in West Virginia. Only the state of New Hampshire had a higher increase (50 percent) than West Virginia during this 16-year period, though because it started at a much lower base in 2000, its 2016 level (334 per 100,000) was still more than one-third lower than West Virginia's.

Table 4 lists the five states with the largest increases in the prime-aged male mortality rate and the five states (including Washington, D.C.) with the largest reductions.[7] In addition to New Hampshire and West Virginia, increases of more than 25 percent were

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[5] Increases in mortality have been even greater for white non-Hispanics with low levels of education, as documented in Case and Deaton (2017).

[6] There are of course other differences. For example the share of the West Virginia population with a college degree was 17.5 percent in 2010, versus 50.1 percent in that same year in Washington, D.C. (Source: https://www.census.gov/newsroom/releases/xls/cb12-33table1states.xls).

[7] For an in-depth analysis of mortality rate trends by state, see US Burden of Disease Collaborators (2018).

recorded in Ohio, Kentucky, and Maine. While no state had a reduction nearly as large as

Washington, D.C.'s, the four states with the largest reductions (New York, California, Texas,

and Florida) are all among the states with the largest non-white population share. In 2016,

the mortality rate in West Virginia was 125 percent higher than that in California, a larger

gap than that between prime-aged men and women nationwide that year (72 percent).

Table 4: Male Mortality Rates for Selected US States, Ages 25 to 54[1], 2000 and 2016

Largest Mortality Increases				Largest Mortality Declines			
State	**2000**	**2016**	**% Change**	**State**	**2000**	**2016**	**% Change**
NH	223	334	+50%	DC	660	369	-44%
WV	371	521	+40%	NY	295	249	-16%
OH	303	387	+28%	CA	271	231	-15%
KY	356	451	+27%	TX	316	276	-13%
ME	257	323	+26%	FL	372	334	-10%

(1) The mortality rate for men ages 25-54 is computed as a simple average of the rate for men ages 25-34, 35-44, and 45-54, in order to minimize the effect of changing age distribution of the population over time. Rates are per 100,000 individuals.

II: Health: Self-Reported Measures and Disability Insurance

Next, we examine trends in other health measures, which may capture health issues

that are more prevalent among prime-age men than mortality and potentially even more

pertinent to labor force participation. We use data from the National Health Interview

Survey (NHIS) as well the Current Population Survey (CPS), weighted to reflect population

values, and report values for a variety of measures frequently used in the literature on

health and disability trends. As the NHIS was substantially redesigned in 1997, we focus on

a comparison between 2000 and 2016.

Table 5 reports values first for self-reported health, a commonly-used measure of

overall health. In 2016, the share of men reporting themselves to be in either fair or poor

health was 5.6 percent for men ages 25 to 34, 7.6 percent for those 35 to 44, and 12.2

percent for those 45 to 54. These values have increased since 2000, by about 1.6

percentage points in the two younger groups and half that amount in the oldest group, and

are similar to the share reporting that they have a work-limiting disability. The share of

individuals reporting that they have difficulty with any of nine physical functions is slightly

higher and has grown more rapidly over time for the oldest group.[8]

Table 5: Health Measures, Men Ages 25 to 54, 2000 and 2016

Health Measure	Age Group	Share with Condition		Change
		2000	2016	
Fair/Poor Health	25-34	3.9%	5.6%	1.7%
	35-44	6.0%	7.6%	1.6%
	45-54	11.4%	12.2%	0.8%
Work-Limiting Disability	25-34	3.5%	5.6%	2.1%
	35-44	7.2%	6.7%	-0.5%
	45-54	10.1%	11.0%	0.9%
Physical Limitations	25-34	5.4%	6.2%	0.8%
	35-44	7.9%	9.0%	1.1%
	45-54	11.0%	13.5%	2.4%
ADL Difficulties	25-34	0.3%	0.9%	0.6%
	35-44	0.5%	0.8%	0.3%
	45-54	0.9%	1.4%	0.5%
IADL Difficulties	25-34	0.7%	1.5%	0.8%
	35-44	1.1%	1.6%	0.5%
	45-54	1.6%	2.8%	1.2%
Obesity	25-34	18.5%	25.0%	6.5%
	35-44	21.1%	31.0%	9.9%
	45-54	23.9%	34.6%	10.7%

Note: Source for all measures is the NHIS, except work-limiting disability, which comes from the CPS.
Fair/poor health is based on self-reported health. Physical limitations and ADL/IADL difficulties refer to the
share reporting difficulty with any physical activity or ADL/IADL; see text for more information. Obesity is
defined as having a BMI over 30.

Table 5 also lists the share of individuals reporting difficulty with any activities of

daily living (ADLs), which are personal care needs such as eating and bathing, or with

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[8] The nine physical activities include: walking a quarter mile, climbing ten steps, standing two hours, sitting
two hours, stooping/bending/kneeling, reaching over one's head, grasping small objects, carrying ten pounds,
and moving large objects.

instrumental activities of daily living (IADLs), which are routine functions such as household chores and shopping.[9] As Martin et al. (2010) note, the disability process may be viewed as proceeding from having a specific pathology or disease to experiencing difficulties in physical or other functioning to having difficulties with ADLs and IADLs. The rate of difficulties with ADLs or IADLs is expected to be lower because it is a later step in the process. The values in Table 5 support this hypothesis, as rates of ADL and IADL difficulties are below 3 percent for all groups in 2016, though their growth since 2000 (relative to initial values) has been more rapid than for other measures. Finally, the table reports obesity rates, which also rise with age and over time, surpassing one-third for men in the oldest group by 2016.

Previous work by Duggan and Imberman (2011) used the earlier version of this NHIS data and found a small increase in work and activity limitations among prime-aged men from 1984 through 1996. Combining this with the more recent data summarized above, the picture that emerges is one in which the prevalence of health issues among prime-aged men has risen modestly over time. These findings echo those of Martin and Schoeni (2014), who find that the increase in limitations is partly explained by the rise in BMI. Nonetheless, levels of health problems remain relatively low, particularly at younger ages and for the ADL and IADL measures that reflect later stages of disablement.

Trends in receipt of disability benefits are also of interest, as receipt is related to health though the medical eligibility requirement, yet also potentially subject to influence by economic factors (Autor and Duggan, 2003). Of the many programs that aim to support

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[9] ADLs include bathing or showering, dressing, eating, using the toilet, getting around inside the home, and getting in or out of be or chairs. IADLs refer to routine needs such as everyday household chores, doing necessary business, shopping, or getting around for other purposes.

those in poor health, perhaps the most important among men ages 25 to 54 are the federal

Social Security Disability Insurance (SSDI) and Supplemental Security Income (SSI)

programs. Approximately 3 million (or 4.5 percent of) prime-aged men currently receive

SSDI or SSI benefits, which provide cash benefits to individuals unable to engage in

substantial gainful activity. Average monthly benefits among non-elderly adult males

enrolled in the SSDI and SSI programs are approximately $1,300 and $600, respectively.

SSDI and SSI recipients also typically qualify for health insurance through the federal

Medicare and federal-state Medicaid programs, respectively. Individuals must have

worked in at least 5 of the 10 most recent years to be potentially eligible for SSDI benefits,

while no work history is required for the means-tested SSI program.

The medical eligibility criteria for non-elderly adult applicants to the SSDI and SSI

programs are identical, though these criteria have changed in important ways during the

past 40 years. Most notably, the criteria for both programs became much more stringent in

the late 1970s and early 1980s and then much more lenient beginning in 1984. At that

time, the most common conditions with which individuals qualified for SSDI benefits were

circulatory conditions (e.g., heart attacks and stroke) and cancer. But as a result of the 1984

changes, it became easier for individuals with relatively subjective conditions such as back

pain and depression to qualify for the program and the award rates for these conditions

increased substantially. Additionally, increases in wage inequality interacted with both

programs' benefit formulas led to substantial increases in program replacement rates for

low-skilled workers (Autor and Duggan, 2006).

Partly because of the changes in the programs' medical eligibility criteria, the

fraction of prime-age men receiving benefits from the SSDI and/or SSI programs declined

in the early 1980s and then rose steadily for decades (Liebman, 2015). For example, as shown in Table 6, the fraction of men 45-54 receiving SSDI benefits fell from 4.1 percent to 3.4 percent in the first few years of the 1980s and then rose steadily to 5.7 percent by 2010. SSI enrollment followed a similar pattern over this period, with SSI receipt higher than SSDI receipt among those ages 25 to 34 and lower among those ages 35 to 54.

Table 6: SSDI and SSI Enrollment, Men Ages 25 to 54, 1980 to 2017

Program	Age Group	Share of Men Enrolled				
		1980	1984	2000	2010	2017
SSDI	25-34	0.8%	0.8%	0.9%	1.2%	0.9%
	35-44	1.7%	1.8%	2.4%	2.5%	2.2%
	45-54	4.1%	3.4%	4.8%	5.7%	5.0%
SSI	25-34	0.9%		1.6%	2.5%	2.7%
	35-44	0.8%		1.7%	1.8%	1.8%
	45-54	1.4%		2.0%	2.3%	2.5%

Following 30 years of steady expansion, SSDI enrollment actually started to decline in 2014, with the share of men on SSDI in all three of the age groups of interest lower in 2016 than six years earlier. This decline is to some extent surprising given the trends in mortality described above. Recent research indicates that the steadily improving economy and the tightening of the program's medical eligibility criteria are the key factors driving this reduction in program enrollment (Maestas, 2018). Related research has shown that SSDI benefit income reduces mortality among beneficiaries, suggesting that the tightening eligibility for this program may be contributing to the recent mortality increases described above (Gelber and Moore, 2018).

There exists substantial variation across and within states with respect to SSDI and SSI enrollment. States with an especially high percentage of prime-age adults enrolled in one or both programs include West Virginia (8.5), Kentucky (7.6), Alabama (7.4), and

Arkansas (7.3) while low enrollment states include Utah (2.3), Colorado (2.6), Hawaii (2.6), and North Dakota (2.7). Perhaps not surprisingly, disability enrollment is highly correlated with the state-level mortality rates among prime-aged men described above and has risen significantly more in those parts of the country hit harder by adverse economic shocks in recent decades (Autor, Dorn, and Hansen, 2016).

Overall, the picture that emerges is one where mortality gains have slowed and a number of health measures have deteriorated modestly since 2000 for the population as a whole. However, trends differ substantially by race, ethnicity, and geographic area, with some groups experiencing substantial health declines while others see continued gains.

III. Marital and Family Status

The marital patterns of men were remarkably stable during the century leading up to 1980 (Stevenson and Wolfers, 2007).[10] In the decades since, however, men have been marrying later, as seen in Figure 1. While half of 25-year-old men were married in 1980, less than 20 percent of this group was married in 2017. Men are not only getting married later but are also less likely to ever get married.[11]

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[10] As these authors document, there was a brief aberration from this pattern in the 1950s and 1960s, when median age at first marriage fell by several years; however, it soon began to rise, such that the proportion married by age in 1980 was quite similar to that seen in 1880.

[11] The figure reports the share of men *currently* married, which is lower than the share of men *ever* married since it excludes currently unmarried men who were previously married. However, separate tabulations of CPS data confirm that the share that has never been married has also risen over time – for example, among men ages 45 to 54, this share rose from 6 percent for men in 1980 to 16 percent in 2017.

Figure 1: Share of Men Married by Age and Year
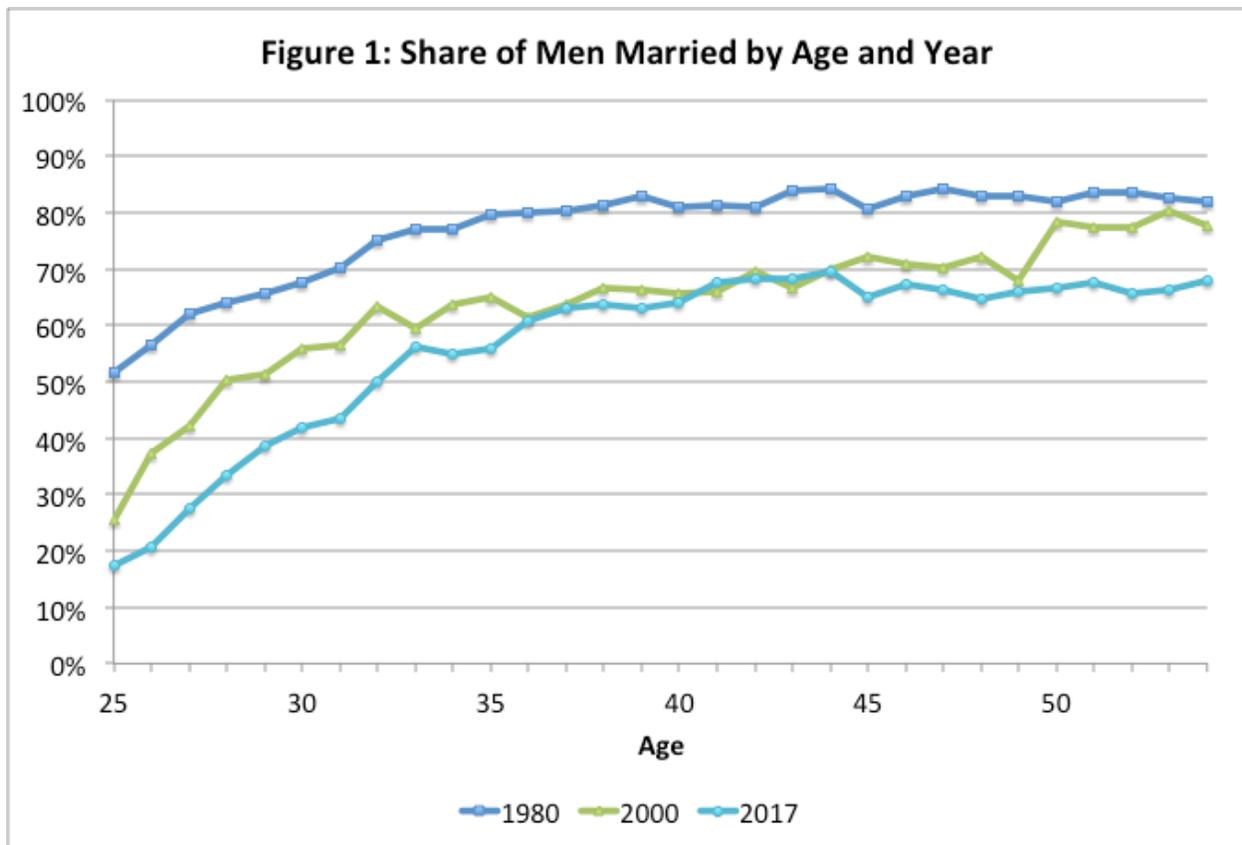
Source: Current Population Survey (CPS)

Figure 2 examines how men's marital status has changed over time across race and education groups, focusing on the share married at age 40. Marriage rates for Whites in 1980 were much higher than for Blacks and both groups experienced substantial declines over time. The differences by education are striking – marriage rates were essentially identical across all education groups in 1980, but by 2017 had dropped by over 25 percentage points among high school dropouts and high school graduates and by 20 points among those with some college, while remaining nearly unchanged among college graduates. This reflects the fact that men with less education are now less likely to ever get married, more likely to get divorced, and less likely to remarry than their counterparts with more education (Aughinbaugh et al., 2013).

Figure 2: Share of Men Married at Age 40 by Race and Education, 1980 and 2017
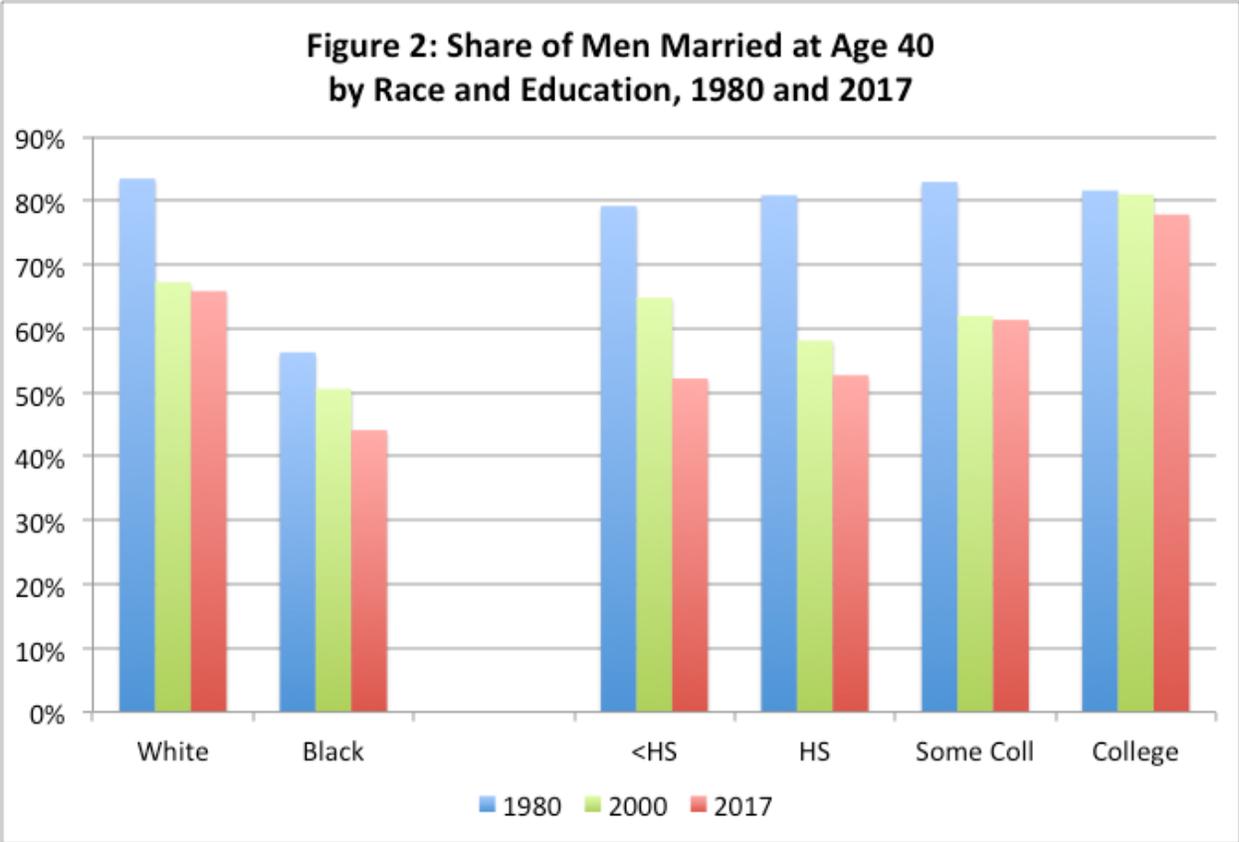
Source: Current Population Survey (CPS)

While many of the theories that have been put forth to explain the changes in marriage rates focus on women,[12] there are several hypotheses that relate to men's economic status, including rising wage inequality (Loughran, 2002) and a decline in the availability of marriageable men (Brien, 1997). The later may be important in explaining black-white differences, since black men face a higher risk of incarceration and unemployment, among other differences. Being married may also affect men's earnings (Ahituv and Lerman, 2007), complicating efforts to estimate how men's economic status affects marriage decisions.

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[12] These theories include greater access to contraception, greater opportunities for women in the labor market, and a rise in welfare support for single mothers; see Loughran and Zissimopoulos (2009).

Trends in having children mirror those in marriage, with men today having children later and being less likely to ever have them as compared to earlier cohorts. Figure 3 shows the share of men with children (including own and step children) in the household by age and year. At ages 25 to 34, the share of men living with children was about 20 percentage points lower in 2017 than in 1980. While the gap narrows somewhat at older ages, men at every age are less likely to be living with children in 2017 than they were in 1980.

Figure 3: Share Living with Children by Age and Year
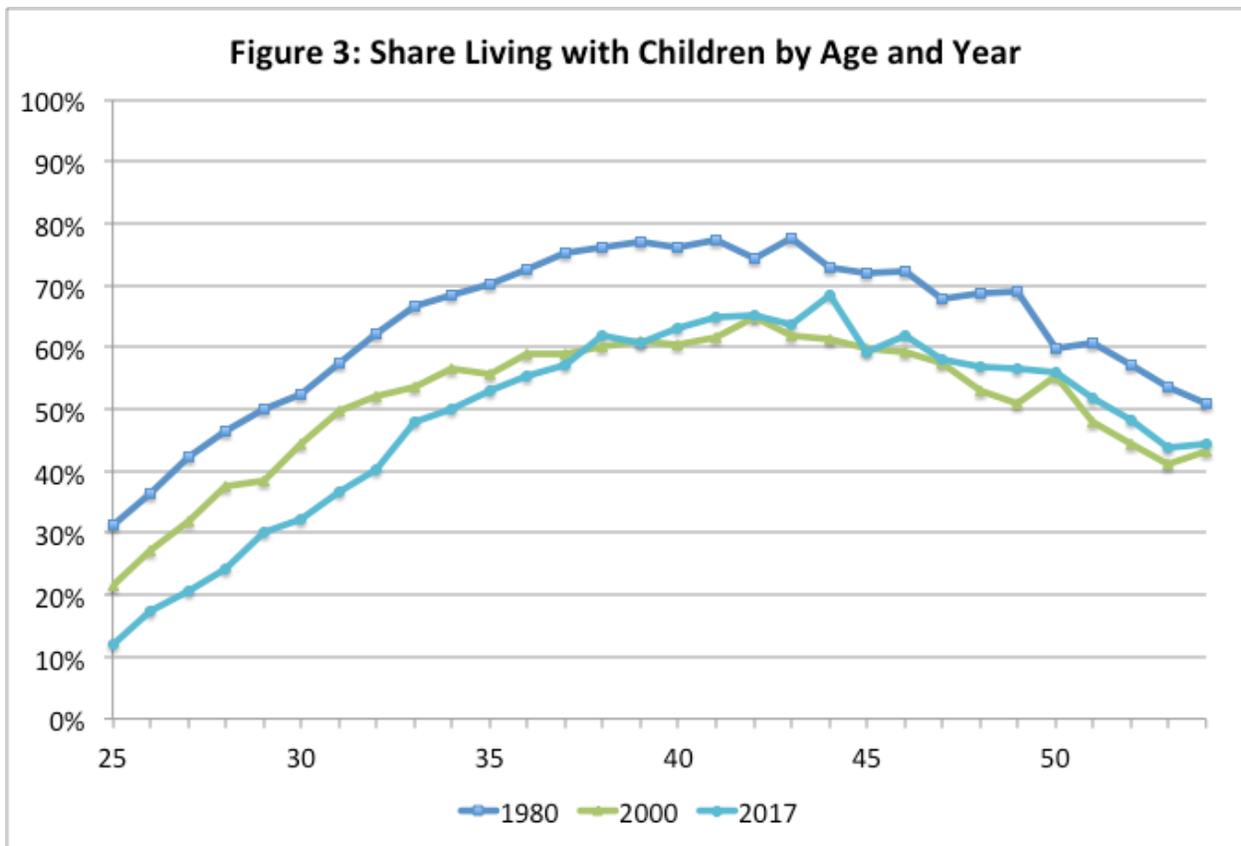
Source: Current Population Survey (using NCHILD variable from IPUMS version of data).

Young adults are also increasingly likely to be living with their parents. In 2015, nearly 20 percent of adults ages 25 to 34 were living in their parents' home (Vesta, 2017).

Relative to other young adults, those living at home were more likely to be male and less likely to be employed or to have a college degree. There are substantial geographic differences in living with parents that appear related at least in part to differences in cost of living, with particularly high rates in high-cost states such as New York and Connecticut.

IV. Education

Next, we describe changes in men's educational attainment over the last several decades. As illustrated in Table 7, gains have slowed over time. Men ages 45 to 54 experienced a 22 percentage point decline in the share of high school dropouts between 1980 and 2000, as well as a 15-point increase in the share with some college and a 12-point increase in the share with a college degree. This reflects the fact that men born between 1946 and 1955 (who were ages 45 to 54 in 2000) made very different educational choices than those born twenty years earlier. By contrast, changes between 2000 to 2017 were much smaller. In the same vein, the share of men ages 25 to 34 with a college degree grew by only 6 percentage points over the period 1980 to 2017, indicating that more recent birth cohorts are only slightly more likely to seek higher education than their predecesors.
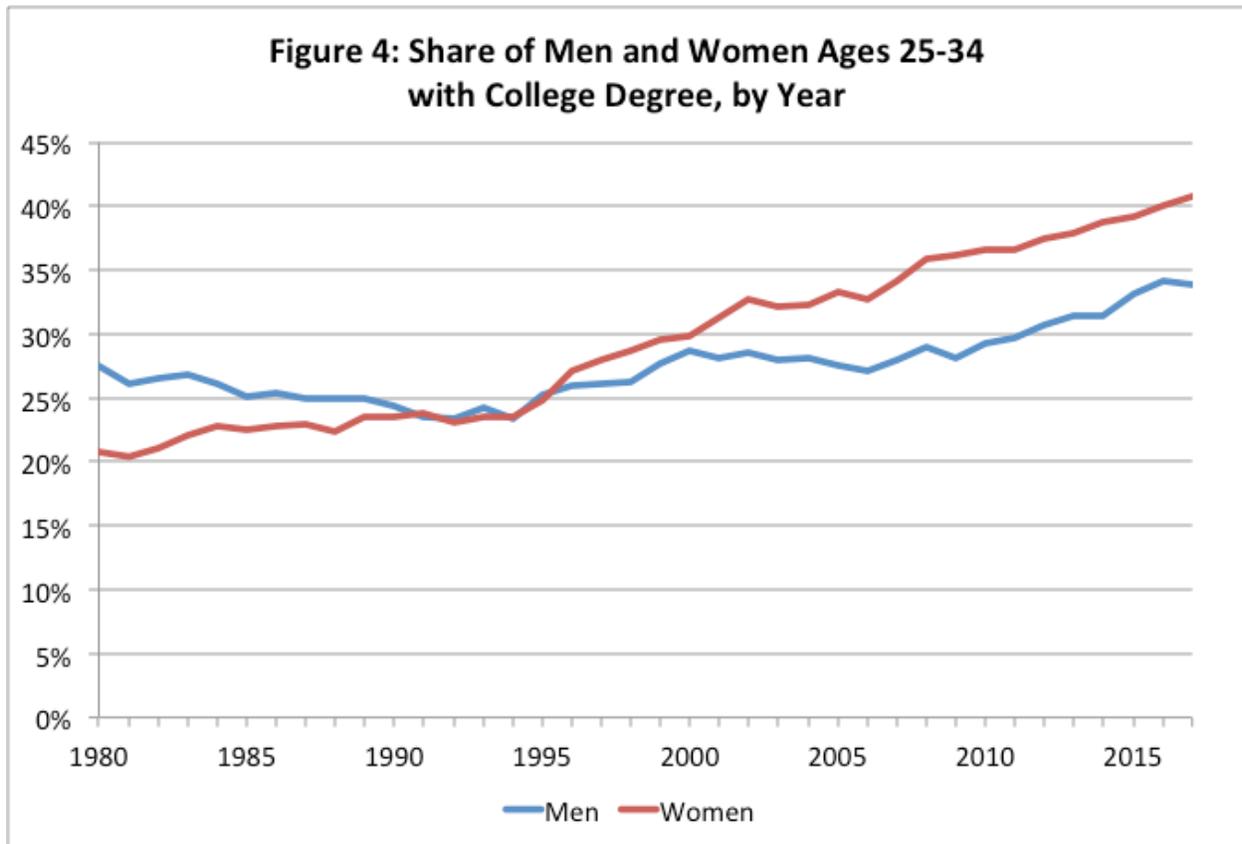
Table 7: Educational Attainment, Men Ages 25-54, 1980 to 2017

Age Group	Education Level	1980	2000	2017	Change, 1980 - 2000	Change, 2000 - 2017
25-34	<HS	14.1%	13.0%	8.9%	-1.0%	-4.2%
	High School	35.3%	32.4%	29.3%	-2.9%	-3.1%
	Some College	23.1%	25.9%	28.0%	2.8%	2.1%
	College	27.5%	28.7%	33.8%	1.1%	5.1%
35-44	<HS	21.6%	12.0%	11.2%	-9.6%	-0.8%
	High School	36.7%	34.8%	27.7%	-1.9%	-7.1%
	Some College	16.8%	26.0%	25.2%	9.2%	-0.8%
	College	24.9%	27.2%	35.9%	2.3%	8.7%
45-54	<HS	33.3%	11.7%	10.9%	-21.6%	-0.8%
	High School	34.1%	28.6%	32.1%	-5.6%	3.5%
	Some College	12.3%	27.4%	24.4%	15.1%	-2.9%

	College	20.4%	32.4%	32.6%	12.0%	0.2%

Source: Current Population Survey

Gains in educational attainment for men have also lagged behind gains for women in recent years, as displayed in Figure 4. Notably, the share of women ages 25 to 34 with a college degree surpassed the share of men of this age with a college degree in the mid-1990s. By 2017, this gender gap had grown to 7 percentage points. Jacob (2002) finds that differences in the return to attending college and in cognitive skills account for the vast majority of the gender gap in college attendance among a cohort making these decisions in the mid-1990s.

Figure 4: Share of Men and Women Ages 25-34 with College Degree, by Year

Source: Current Population Survey

There have also been differential gains in educational attainment by race. As shown in Table 8, the share of black men ages 45 to 54 who did not complete high school fell by

nearly 50 percentage points between 1980 and 2017, more than twice the decline for all men (Table 7). Similarly, black men in each of the three age groups had larger increases in the share with some college or with a college degree between 1980 and 2017 than did U.S. men as a whole. While there remains a racial gap in educational attainment, its magnitude shrank considerably over this era. In terms of trends by ethnicity, Ryan and Bauman (2016) show that trends for native-born Hispanics are similar to those for blacks.

Table 8: Educational Attainment, Black Men Ages 25-54, 1980 to 2017

Age Group	Education Level	1980	2000	2017	Change, 1980 - 2000	Change, 2000 - 2017
25-34	<HS	24.6%	12.3%	9.8%	-12.3%	-2.5%
	High School	39.3%	41.4%	33.7%	2.1%	-7.7%
	Some College	23.8%	28.1%	34.9%	4.3%	6.8%
	College	12.3%	18.2%	21.6%	5.9%	3.4%
35-44	<HS	37.1%	11.6%	10.4%	-25.5%	-1.2%
	High School	41.4%	41.6%	34.7%	0.3%	-6.9%
	Some College	14.2%	29.6%	29.3%	15.3%	-0.2%
	College	7.3%	17.2%	25.6%	9.9%	8.3%
45-54	<HS	59.8%	19.0%	11.1%	-40.8%	-7.9%
	High School	25.1%	33.5%	39.8%	8.4%	6.4%
	Some College	7.9%	28.1%	27.5%	20.2%	-0.7%
	College	7.2%	19.4%	21.6%	12.2%	2.2%

Source: Current Population Survey

V. Incarceration

Finally, we consider how the incarceration rate of prime-aged men in the U.S. has evolved in recent decades and how this has varied by race and ethnicity. Previous research has differentiated between the current and potential future effects of incarceration. When a person is in jail or prison, he/she is typically unable to have a job, to pursue educational opportunities, or to spend time with family members or friends. Even after release from prison or jail, there may be long-term effects that reduce one's earnings potential or health.

Thus changes in a group's incarceration rate are likely to have current and future effects on their earnings, health, education, and family formation.

The U.S. incarcerated population grew rapidly in the 1980s and 1990s, with the number of people in federal or state prison or in county or city jails jumping from 500 thousand in 1980 to 2 million in 2000.[13] Many factors contributed to the increase, including rising crime rates. However, rising arrest rates (especially for drug-related crimes), increased probabilities of incarceration conditional on arrest, and longer sentence lengths were far more important than the rise in crime (NAS, 2014).[14]

Prime-aged men were particularly affected by changes in the incarceration rate since they accounted for more than 70 percent of all incarcerated individuals during this period.[15] As shown in Table 9, the rising incarceration rate hit younger men especially hard, with the fraction of men aged 25 to 34 in prison or jail rising from 1.3 percent in 1980 to 3.5 percent by 2000.[16]

Table 9: Male Incarceration Rate, Ages 25 to 54, 1980 to 2016

Age Group	Incarceration Rate per 100,000 Men		
	1980	2000	2016
25-34	1,321	3,479	2,776
35-44	868	2,288	2,642

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[13] Source: https://www.bjs.gov/index.cfm?ty=kfdetail&iid=487

[14] Additionally the reduction in the capacity of institutions for those with mental illness explained 4 to 7 percent of the increase in the prison population from 1980 to 2000 (Raphael and Stoll, 2013).

[15] Prime-aged men account for a larger share of the incarcerated population than of all criminals since those who commit crimes in their late teens or early twenties may remain incarcerated for many years after that. For example while men 25-54 accounted for 77 percent of male prisoners in 2000, they accounted for just 46 percent of males arrested for murder and 55 percent of male murder victims. In contrast, males 18 to 24 accounted for 37 percent of murder offenders in that same year but just 19 percent of incarcerated males.

[16] Data on the jail population in each year is unavailable and so we assume the same age distribution in the jail population as in the prison population. The number of men in prison is about twice as large as the number of men in jail during our study period.

| 45-54 | 383 | 1,009 | 1,781 |
| 25-54[1] | 857 | 2,259 | 2,400 |

(1) The incarceration rate for men ages 25-54 is computed as a simple average of the rate for men ages 25-34, 35-44, and 45-54, in order to minimize the effect of changing age distribution of the population over time.

Men in the 35 to 44 and 45 to 54 age ranges also became much more likely to be incarcerated during this same 20-year period. Weighting each of the three age groups equally, the incarceration rate of prime-aged men increased by approximately 160 percent from 0.9 percent to 2.3 percent.

Following this period of rapid growth, the incarcerated population grew much more slowly starting in the late 1990s, peaked in 2008, and has declined modestly over the past decade. This changing trend was primarily driven by the decline in crime that began in the mid-1990s and continued through 2014 – for example, the nation's violent crime rate fell by almost 50 percent (from 712 to 362 violent crimes per 100 thousand residents) over this period. The resulting decline in incarceration was concentrated among younger adults. As shown in Table 9, the fraction of men aged 25 to 34 in prison or jail fell from 3.5 percent in 2000 to 2.8 percent by 2016. In contrast, incarceration rates continued to increase (though at a slower rate) for older men in the 35 to 44 and 45 to 54 age ranges. This difference likely reflects the fact that prisoners in their forties and early fifties were more likely to have committed their crimes as young adults before crime rates started to fall.

The importance of recent changes in the incarceration rate differed substantially by race. Most notably, as shown in Table 10, black men in the 25 to 34 age range saw their incarceration rate fall from 12.8 percent in 2000 to 7.4 percent by 2016, following an even larger increase from 1980 to 2000. The corresponding reduction from 2000 to 2016 among young white men was minimal, from 1.7 to 1.6 percent. Incarceration rates also fell

for black men ages 35 to 44, while rising for older black men. As was the case for falling

HIV/AIDS mortality, black men stood to gain more from the declining incarceration rate in

recent years because of their higher baseline rate of incarceration. Finally, while data for

Hispanic men are not available for 1980, the incarceration rates for this group followed a

generally similar pattern, with large reductions for younger men and increases for older

men since 2000.

Table 10: Male Incarceration Rate by Race and Ethnicity, Ages 25 to 54, 1980 to 2016

Race/Ethnicity	Age Group	Incarceration Rate per 100,000 Men		
		1980	**2000**	**2016**
White	25-34	735	1,746	1,568
	35-44	534	1,269	1,560
	45-54	270	642	1,121
Black	25-34	5,533	12,752	7,378
	35-44	3,741	8,621	7,393
	45-54	1,620	3,733	5,037
Hispanic	25-34	--	3,931	3,056
	35-44	--	2,948	2,819
	45-54	--	1,597	1,932

VI. Discussion

The lives of prime-aged men have changed in important ways in recent decades.

While the health of most prime-age men is generally still quite good, the risk of death from

drug overdose and suicide has risen substantially. More prime-aged men have health

limitations and more are receiving disability benefits through the SSDI and SSI programs.

Men are marrying and starting their families later and are less likely to ever get married.

Men have been surpassed by women in educational attainment and – despite recent

declines – continue to face the world's highest rates of incarceration.

In a number of areas, trends for black men have been more favorable than for white men, leading to a narrowing (but not the elimination) of black-white gaps. For example, gains in education among black prime-aged men have far outpaced those for white prime-aged men in recent years. Similarly, black men have benefited differentially from the decline in mortality from HIV/AIDS since 2000. At that time, black men's mortality rate from this disease was greater than white men's current death rate from opioid and other drug-related deaths. And finally, the overall decline in the nation's incarceration rate has differentially affected younger black men.

Are these trends a consequence or a cause of men's changing economic opportunities? While establishing causality for such a wide range of health and other outcomes is inherently difficult, recent research provides some clues. Pierce and Schott (2017) find that the lowering of trade barriers with China around 2000 differentially affected economic opportunities among less-educated men and led to substantial increases in both suicide and opioid overdose mortality rates. This is consistent with Case and Deaton (2017), who find an increase in mortality rates among prime-aged white men without a college degree but no corresponding reduction for their counterparts with a college degree, as well as increases in reports of pain (which is often treated with opioids) exclusively among the less educated.

More recent research suggests a link between changing economic conditions and family structure as well. Autor et al. (2017) show that areas with trade-induced declines in manufacturing employment experienced increases in idleness among prime-aged men and that these men were also less likely to marry or to have children. Correspondingly, these

same areas experienced increases in the proportion of children living with just one parent and in the fraction of children living below the poverty line.

This line of reasoning is consistent with Case and Deaton's (2017) theory of "cumulative disadvantage." Motivated by a rise in "deaths of despair" from drug poisonings, suicide, and alcohol-related liver disease, particularly among less-educated, non-Hispanic whites, they posit that worsening labor market opportunities for successive cohorts of less-educated whites affect employment, health, and marriage and family outcomes. This is an active area of research. For example, Ruhm (2018) argues that the rise in opioid use is more strongly related to drug access (the "drug environment") than to economic conditions. Krueger's (2017) surprising finding that nearly half of prime-aged men who are out of the labor force take pain medication on a daily basis does not establish the direction of causality between employment and opioid use, but does underscore the importance of future research that might do so.

The connection of economic factors to the growing advantage of women over men in educational attainment may be more subtle than for health or family formation. Given the steady increase in the return to a college degree during our study period, one might have expected prime-aged men to respond – as women appear to have done (Jacob, 2002) – by attending college and community college in greater numbers. The fact that men ages 25 to 34 experienced larger gains in educational attainment in the period since 2000 than between 1980 and 2000 is consistent with men responding to increasing (or increasingly evident) returns to education, but further research is needed to establish this pathway.

The connection between economic factors and incarceration is also not simple to discern. On the one hand, neither the rise nor the drop in incarceration rate appears to be

primarily driven by economic factors.[17] But falling incarceration rates may affect men's

economic outcomes. Perhaps surprisingly, Kling (2006) finds no substantial evidence that

longer prison sentences have a negative effect on employment or earnings. However,

recent work by Doleac and and Hanson (2017) finds that "Ban the Box" policies, which limit

employers' ability to use criminal background checks in the hiring process, decrease

employment for young, low-skilled black and Hispanic men, suggesting that employers may

prefer not to hire ex-offenders (who are disproportionately represented among these

groups).   As young black and Hispanic men have historically experienced higher

incarceration rates, they face larger potential employment gains from the recent decline in

incarceration; by contrast, effects for white men would be expected to be smaller.

As researchers continue to explore the causes and consequences of the trends

highlighted above, we call attention to perhaps the most significant change among prime-

aged men in recent decades. In 1980, fully 45 percent of prime-aged men had previously

served in the military. This number steadily declined during the next 36 years and stood at

just 10 percent by 2016. Much of the economics literature has examined the effect of

military service by using plausibly exogenous variation in the likelihood of service driven

by one's draft lottery number (Angrist, 1990). This research has tended to find quite

modest long-term effects of military service on employment, earnings, and health status.[18]

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[17] As noted above, the rise in incarceration was largely due to changes in criminal justice policy and the fall to
declining crime rates; Levitt (2004) does not point to economic conditions as a key factor in explaining the
decline in crime, though this does not rule out the possibility of some relationship – for example, Raphael and
Winter-Ember (2001) find a link between unemployment and property crime.

[18] For example, see Angrist et al. (2010) and Angrist and Chen (2011). Interestingly, while Angrist (1990)
finds that Vietnam-era service has a negative effect on the earnings of white veterans in the short-to-medium
turn, Angrist (1998) finds a positive effect of post-Vietnam service on black veterans over a comparable time
period.

However, these studies are unable to capture the peer effects or general equilibrium effects of military service. Recent research has suggested substantial gains to cognitive and non-cognitive skills stemming from military service (Spiro et al., 2015) and associated benefits such as the GI bill. Overall, we see a strong need for further work to investigate how changing economic opportunities, declines in military service, and other factors are contributing to or cushioning the problems of men.

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