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Health inequality and population variation in fertility-timing

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Abstract

We estimate the impact of fertility-timing on the chances that children in poor urban African American communities will have surviving and able-bodied parents until maturity. To do so, we use census and vital statistics data to compute age- and sex-specific rates of mortality and functional limitation among prime-aged adult residents of impoverished African American areas in Harlem, Detroit, Chicago, and the Watts area of Los Angeles and for blacks and whites nationwide. Findings are consistent with the hypothesis that the early fertility-timing characteristic of poor urban African American populations mitigates some of the costs to families associated with excess mortality and early health deterioration in young through middle adulthood.

Keywords: Mortality; Disability; Poverty; Race; Underclass; Teenage childbearing

Introduction

African Americans suffer disproportionately high rates of many diseases and disorders, (US DHHS, 1991) and racial gaps in some health status indicators, most notably premature mortality, may be growing (Feldman et al., 1989; Pappas et al., 1993; Preston and Elo 1995). Studies have consistently shown racial or socioeconomic differences in morbidity and mortality to be most pronounced in the young and middle-adult ages. In an analysis of national survey data, House et al. (1990) found that functional status differentials by socioeconomic group were large at all ages, but widened after age 25 and were most pronounced among those ages 35–64. Elo and Preston (1996) observed a large and unexplained racial disparity in mortality between the ages of 25 and 64 using the National Longitudinal Mortality Survey. Geronimus (1994) described widening racial differentials in women's health status over the reproductive ages for diverse indicators including hypertension prevalence and circulating blood lead levels. These findings reflect state or national averages and may seriously understate the rate of health deterioration among African Americans in poverty. Studies suggest that young to middle-aged African Americans in persistently poor populations face extremely disadvantageous mortality schedules (McCord and Freeman, 1990; Geronimus et al., 1996). Chronic diseases are the primary causes of

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premature death in these populations suggesting the possibility of excessive rates of morbidity and disability among reproductive and working-age adults as well (Geronimus et al., 1996).

Pervasive and severe threats to the health of young through middle-aged adults may reverberate throughout entire communities. In the United States, adults of these ages are expected to be important contributors to family economies and caretaking systems. It is possible that uncertain health at these socially critical ages would exert pressure to adapt family organization to mitigate risks associated with the premature loss or disability of adults.

Dramatic declines in US mortality among adults aged 20–50 years old have received credit for contributing to significant changes in the American family landscape, including enhanced independence of the nuclear family and the disappearance of orphanages (Uhlenberg, 1980). Communities who have not enjoyed these declines in full measure might be expected to exhibit different family adjustments. Indeed, the hypothesis that populations faced with severe health uncertainty in young through middle-adulthood may adapt their social or family structures in response has been discussed in the context of the heterosexually-based African AIDS epidemic (Caldwell et al., 1989; Caldwell, 1997; Palloni and Lee, 1993; Van de Walle, 1990; Foster et al., 1997; Urassa et al., 1997). For example, in the African context, Palloni and Lee (1990) posited important implications of the epidemic for families, as it increases the probability of widow or orphanhood, prolonged disability within the family, damage to the family economy and care systems, and pressure for multigenerational residential arrangements. The ravages of AIDS provide a dramatic case of increasing significance in some poor US communities (Holmes et al., 1990; Geronimus et al., 1996) of the more general hypothesis that population variation in family structure or fertility behavior may, in part, reflect health inequality.

Differences in key aspects of fertility and family behavior between US blacks and whites are striking. On average, African American mothers begin childbearing at younger ages than whites, and 43% of black first births are to teen mothers compared to 22% of white first births (Ventura et al., 1997). The majority (75%) of black first births are nonmarital compared to 29% of white first births (NCHS, 1996). African American children are also more likely than white to live in extended or multigenerational family households or to live in households where neither biological parent is present (Hogan et al., 1990; Sandven and Resnick, 1990; Hunter and Ensminger, 1992). These different childbearing and family patterns are most prevalent among African Americans who are socioeconomically disadvantaged (Hayes, 1987; Abrahamse et al., 1980; Geronimus and Korenman, 1992, 1993). These patterns have been documented throughout this century (Evans, 1986; DuBois, 1908; Morgan et al., 1993; McDaniel and Morgan, 1996).

A common interpretation is that such fertility and family patterns cause or intensify the many disadvantages poor African American children suffer. In this light, the persistence of these behaviors has been a puzzle as well as a source of social concern. Teenage childbearing among African American residents of central cities, in particular, has been problematized as a "ghetto related" behavior or a defining characteristic of "the urban underclass" (Jencks, 1992; Wilson, 1996). The concept of an "underclass" gained currency in the United States in the 1980s. While the population characterized in this way is somewhat ambiguous, the image conjured up by this term encompasses African American residents of urban areas of concentrated poverty who have not mastered the cultural skills most Americans value, and who fail to conform to American ideals about social behavior (Jencks, 1992). These failures are thought to perpetuate their impoverishment and social isolation from the mainstream, rather than to be emblematic of cultural diversity or the pursuit of reasonable goals in the face of structural barriers to their achievement. One of the most widely accepted and intensely held norms in late 20th Century America is that teenagers should not have children (Jencks, 1992). In the underclass perspective, then, high rates of teen childbearing among urban African Americans are seen as a conclusive violation. Moreover, this particular violation is perceived to be harmful to children and families and to be a primary contributor to the persistence of severe intergenerational disadvantage and antisocial behavior (Alter, 1994; Geronimus, 1997).

However, an alternative explanation for high rates of early childbearing in impoverished urban African American communities is that fertility-timing varies among populations because of the contingencies members of different populations face in their efforts to provide for the survival and well-being of families (Chisholm, 1993; Geronimus, 1987, 1994, 1996a; Burton, 1990; Wilson and Daly, 1997). Such variable contingencies include prospects for labor force participation, educational opportunities, and other structural or economic factors. An additional contingency poor African Americans may contend with is early adult health deterioration, or "weathering" (Geronimus, 1994). Pervasive health uncertainty, expectations of premature illness or mortality, and other disadvantages might exert pressure on inner city youth toward accelerated life-course timetables and early fertility.

Qualitative findings, including ethnographic studies in unique settings and small-scale interview studies, are suggestive that health uncertainty and early-fertility

timing norms in poor African American populations may be linked (Burton, 1990; Stack and Burton, 1993; Geronimus, 1996a). These studies provide rich data on the possible intra-family mechanisms that may mediate associations between health uncertainty and fertility-timing. However, these investigations focus on a small sample of individuals or families in specific communities and are not easily reproduced. To complement these studies, it remains for investigators to systematically quantify at the population level whether, in the context of pervasive health uncertainty, early fertility may have measurable benefits using quantitative methods that are easily replicated in several populations. Here, we begin to quantify the costs of delayed childbearing to poor, urban African American populations in terms of the loss of able-bodied caretakers. We study urban African American populations that typify populations engendering concern about "underclass" behaviors. In these populations and for blacks and white nationwide, we measure the impact of delayed relative to early fertility on the probability that parents will survive, able-bodied until children are grown.

Data and methods

Data

Our study populations are the black residents of four geographic aggregates of impoverished census tracts or zip codes: Harlem, Detroit (central city), Chicago (south side) and the Watts area of Los Angeles. We also analyze data for blacks and whites nationwide. The Census and Vital Statistics category of "Black" includes foreign-born individuals, however, the vast majority of the individuals in the study populations are native-born (Detroit, Chicago, and Watts, 99%; Harlem, 94%; and nationwide, 96%). Therefore, we use the terms "Black" and "African American" interchangeably.

The local populations were chosen as a regionally diverse set that would commonly be thought of as "underclass" populations. While all four local populations are poor, urban and African American, they each have salient features that might differentiate them from the others. For example, New York City has been affected by rising HIV prevalence more than many other urban black populations. Detroit is a classic rust belt city; Chicago is a Midwestern commercial city; while LA is a "newer" western city. The choice of specific populations also reflects practical considerations. Each is sufficiently large for detailed analyses of mortality in persons 15 to 64 years of age and comes from a state that provides information on vital statistics with geographic identifiers and, for populations with a large percentage of Hispanics, differentiation between non-Hispanic and Hispanic residents.

For each population, we combined information from death certificates for the three years from 1989 to 1991 with age-stratified counts of persons from each sex from the 1990 US Census to calculate age- and sex-specific death rates. To reduce bias due to undercounting in the Census, we adjusted the population counts using national race- age- and sex-specific rates of undercount.

Using data from the 5% Public Use Micro data Sample of the 1990 US Census, we calculated disability rates by race, age and sex using the responses to questions about limitations in work[1], mobility[2] and personal activities[3] resulting from health conditions of at least 6 months duration. A person was classified as disabled if she or he responded affirmatively to any of these questions. Although these variables are also included in the STF files by census tract, county and zip code, the age detail is much too broad for our purposes (16–64, 65+). On the Micro data files, the work disability and activity limitation data can be tabulated at single years of age.

Mortality is an objective state and coverage of mortal events in death certificate data is virtually universal. Self-reported functional limitations may be subject to ascertainment biases. While subjective, self-reported measures of health are highly correlated with clinical measures of morbidity and predict subsequent death, health care utilization, and labor market behavior (Idler and Benyamini, 1997; Manning et al., 1982). The Census questions on work disability are similar to those asked on the National Health Interview Survey (NHIS) which has used and improved these questions over a 20-year period. For men or women in age groups where it has been tabulated, the NHIS and the Census yield similar estimates (Waidmann et al., 1995).

The work disability question relates directly to the capacity to fulfill the parenting function of economic provision. In addition, tabulations based on data from the NHIS show that very similar proportions of women report a limitation in their capacity to perform

[1] "Does this person have a physical, mental, or other health condition that has lasted for 6 or more months and which limits the kind or amount of work this person can do at a job?"

[2] "Because of a health condition that has lasted for 6 or more months, does this person have any difficulty going outside the home alone, for example, to shop or visit a doctor's office?"

[3] "Because of a health condition that has lasted for 6 or more months, does this person have any difficulty taking care of his or her personal needs, such as bathing, dressing, or getting around inside the home?"

Table 1
Summary data on study areas, 1990[a]

Area	Population size	Mean family income	% Families in poverty
US Whites	199,827,064	49,248	6.4
US Blacks	29,930,524	29,337	25.7
Harlem			
Mortality area	101,697	24,174	33.1
PUMA area	89,677	24,196	33.2
Detroit			
Mortality area	98,833	19,841	44.3
PUMA area	88,586	21,602	40.8
Chicago			
Mortality area	101,895	16,651	58.2
PUMA area	120,328	21,882	49.9
Watts			
Mortality area	122,361	24,073	34.2
PUMA area	103,995	21,832	38.6

[a] Data are from 1990 US Census. Mortality area descriptions: Harlem refers to African American residents of the Central Harlem Health Center District; Detroit to African American residents of the Central, University, Central Business District, Foch, Jefferson-Mack, Airport, St. Jean, Chene and Jeffries neighborhoods; Chicago to African American residents of southside Community Areas of Near Southside, Douglas, Oakland, Fuller Park, Grand Boulevard, and Washington Park; Watts to African American residents of the Watts area of South Central Los Angeles and adjacent areas to the south and west. In each case the PUMA that most closely approximates the mortality area is used as the PUMA area.

their normal activities (including parenting and domestic work) and a limitation in their capacity to work (Waidmann et al., 1995). The mobility and personal care limitation questions are indicative of the physical capacity to parent as well as of the possibility that healthy adults in the household have caretaking burdens competing with their ability to be optimally responsive to their children's needs. Nationally, the fraction of individuals identified in the Census as having either mobility or personal care limitations is approximately equal to the fraction identified as having at least one limitation in an Activity of Daily Living (ADL) or in an Instrumental Activity of Daily Living (IADL) using the NHIS disability supplement. LeClere and Kowalewski (1994) demonstrated an association between parental functional status and child behavioral outcomes, suggesting that the ability to perform normal age appropriate activities is a useful measure for detecting an impact on children.

We matched geographic identification among data sets as closely as possible. In particular, to protect confidentiality, the Census PUMs data are available by Public Use Micro data Areas (PUMAs) rather than by census tract or zipcode. In all of our local areas, the 1990 PUMA designations correspond closely to the geographic sample definitions used in the mortality analyses. In Table 1, we provide descriptive statistics for the populations used for the mortality analyses compared to those for the analyses of functional limitation. While these populations are not perfect matches, there is substantial overlap. They are generally comparable in terms of socioeconomic characteristics such as mean family income and per cent of families in poverty, and always fare worse on these indicators than black nationwide.

Methods

For each local population and for blacks or whites nationwide, our object is to calculate (1) 20-year survival rates, conditional on living to various ages (15, 20, 25, etc.); (2) the probability that survivors are able-bodied; and (3) the joint probability of surviving and being able-bodied.

We use Greville's method to calculate the life-table death rates (${}_nq_x$) which we then use to construct the probability of survival to age x, l_x [$l_{x+n}=(1-{}_nq_x)l_x$]. Using these survival probabilities, we calculate the probability that a parent would survive to the child's 20th birthday assuming that the parent was age x at the child's birth ($P^{20}(x)=l_{x+20}/l_x$) where x can be 15, 20, 25 or 30.

Because of the small sample sizes available to study disability in our specific populations (5% sample sizes vary from 735 to 1073 for men and from 1110 to 1712 for women), there is a large amount of variability in the disability estimates by single year of age. To minimize this variability in the local estimates of disability rates, we estimate predicted prevalence of disability at various ages under the assumption that the local area age specific disability trajectories follow the same pattern as the age specific disability trajectories for

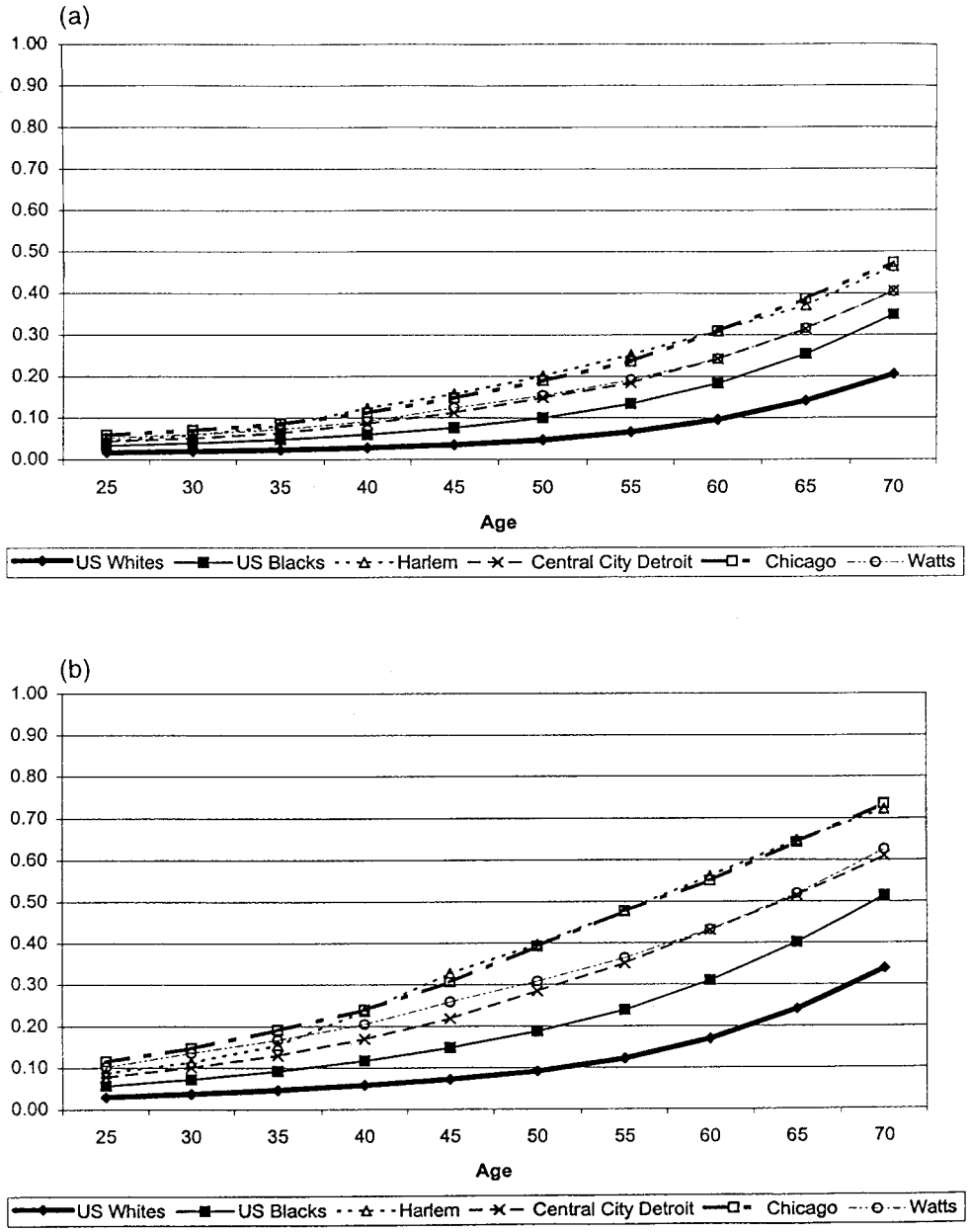


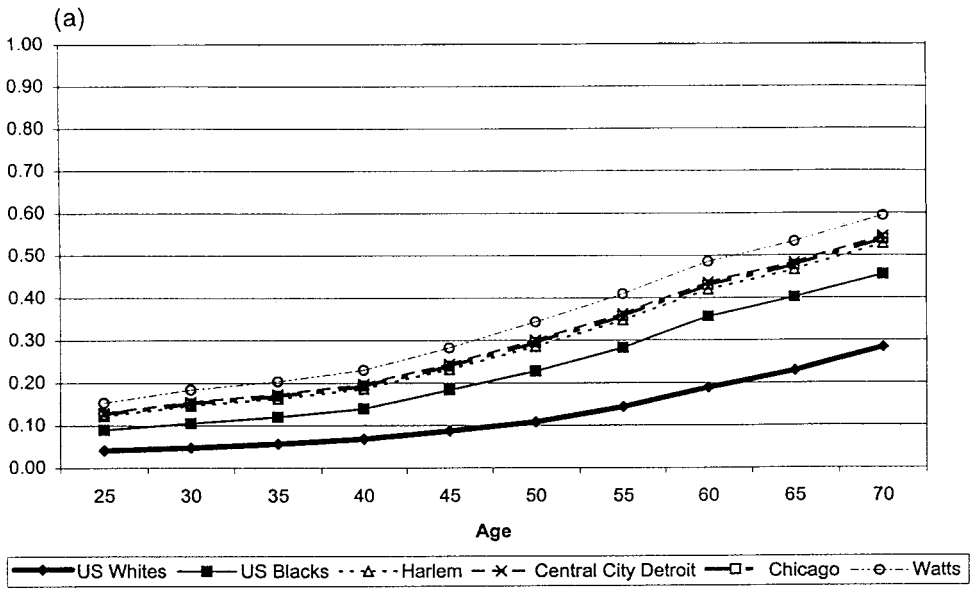
Fig. 1. (a) Probability of dying by various ages in selected populations, women, 1990. (b) Probability of dying by various ages in selected populations, men, 1990.

African American women and men in the country as a whole, but that their level may vary. In particular, we estimate the following model for men and women separately:

$$\ln\lfloor d_{ij}/(1-d_{ij})\rfloor = \alpha_i + \beta_j \quad (1)$$

where d_{ij} represents the fraction of the population in the i-th single year of age and j-th location that is disabled, and α_i and β_j are age and location specific parameters. Since we used the entire 5% sample of African American women and men to estimate (1), α_i represents age specific national averages, while β_j represents local area deviations around these averages.

Predicted disability rates are then calculated as:



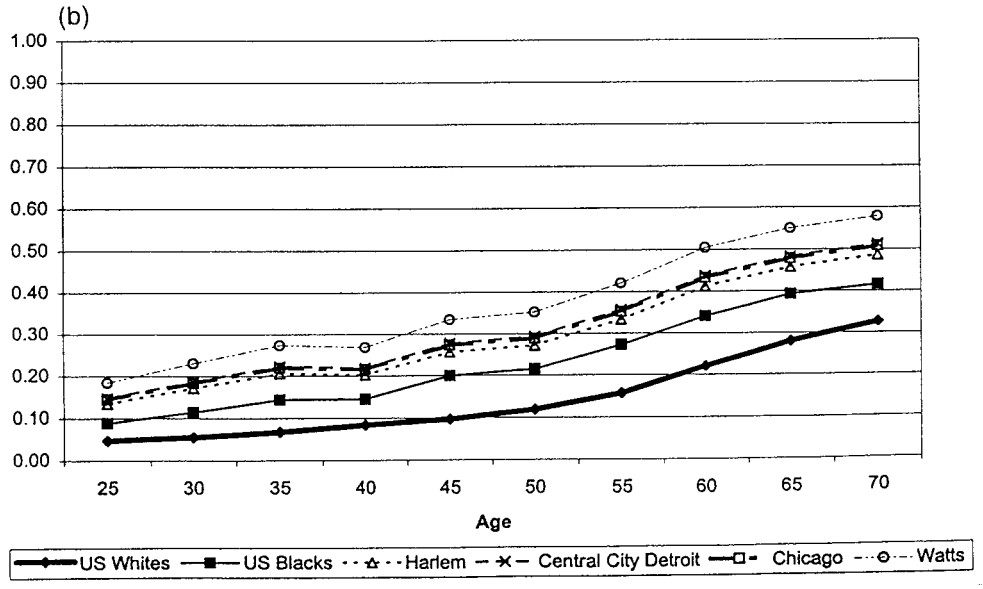
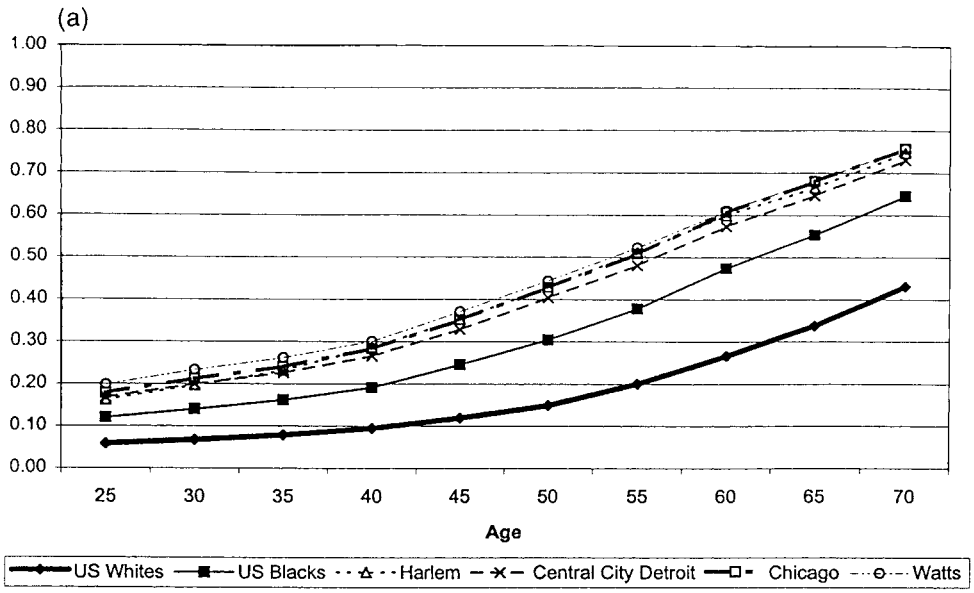


Fig. 2. (a) Predicted prevalence of disability by age in selected populations, women, 1990. (b) Predicted prevalence of disability by age in selected populations, men, 1990.

$$\hat{d}_{ij} = \frac{e^{\hat{\alpha}_i+\hat{\beta}_j}}{1+e^{\hat{\alpha}_i+\hat{\beta}_j}}. \quad (2)$$

It is the $\hat{d}'_{ij}$s that we report.

We then calculate the probabilities that surviving mothers and fathers are able-bodied (have no health-related activity limitation) at the child's 20th birthday depending on the parents age at the child's birth (i.e., $1-\hat{d}_{(x+20)j}$, where x represents the age of the mother or father at birth). Finally, we calculate the joint probability that a parent is alive and able bodied at the child's 20th birthday as $(1-\hat{d}_{(x+20)j})P^{20}(x)$. We made similar calculations for grandmothers' probabilities of being alive and able-bodied at the child's 5th and 20th birthdays, assuming that the surviving grandmother was 20 when the parent was born.



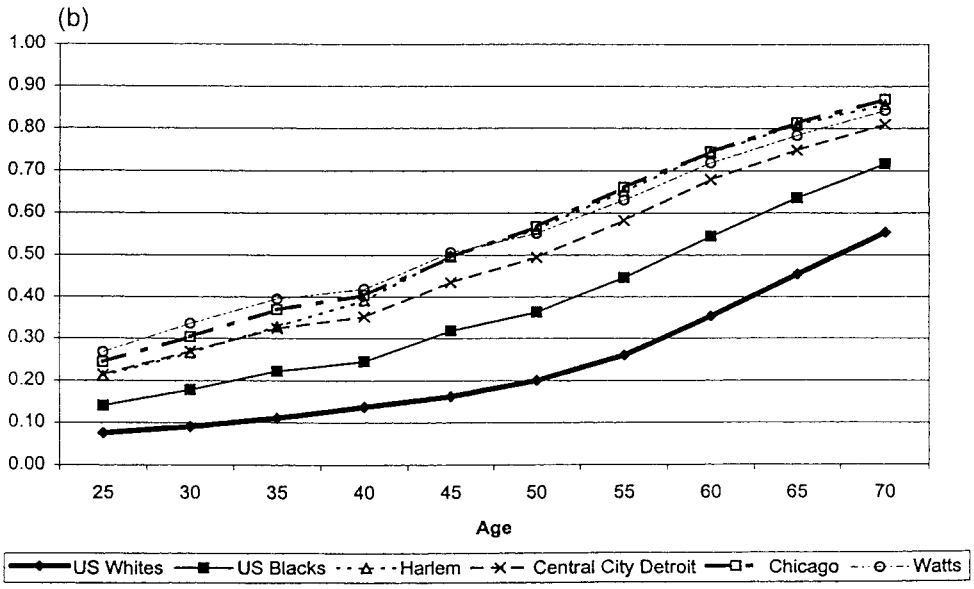


Fig. 3. (a) Predicted probability of death or disability by age in selected populations, women, 1990. (b) Predicted probability of death or disability by age in selected populations, men, 1990.

We estimated the sampling variability associated with the mortality calculations using standard formulas (Smith, 1992). Given the population base for these calculations, these estimates are highly reliable (for the local area estimates, standard errors for l_x rarely rise above 3%). Discernable differences in mortality between populations that are quantitatively meaningful are also statistically significant. Standard errors for the functional limitations analyses were derived taking account of the fact that the census samples are not simple random samples of the population (Huber, 1967). For the local area estimates, the standard errors on the age specific odds of being disabled were all approximately 10%. While the disability rates are less reliably estimated than the mortality rates, the disability levels in the local populations are individually and

jointly statistically significantly different from those for blacks or for whites nationwide at conventional levels.

Results

In Figs. 1a (for women) and 1b (for men), we report the probability of dying by various adult ages for each population. Differences in the probability of dying or in middle age are marked. White women nationwide enjoy the lowest probability of dying at all ages. Black women nationwide have somewhat higher probabilities; the typical black woman nationwide has approximately the same probability of dying by the age 60 as the typical white woman has by age 70. Women residents of the four local populations suffer substantially worse mortality profiles. They experience the same or higher probability of death by age 55 as the typical white woman does at 70. Residents of Detroit and Watts have virtually identical mortality profiles; those for Harlem and Chicago also resemble each other and are more severe. A Harlem or Chicago woman has a higher probability of dying by age 40 than a white woman nationwide has of dying by age 60. A Harlem or Chicago woman faces a slightly better than even chance of surviving to age 70, while, nationwide, two out of three black women or four out of five white women can expect to live to that age.

For men, the relative pattern across the populations are similar, but the probabilities of dying are higher and the disparities among local relative to national populations are larger. Men in the local populations face approximately the same probability of dying by age 35 as white men nationwide face by age 60. One-third of Harlem or Chicago men can expect to die by age 45, compared to 7% of white men nationwide, 15% of black men nationwide, and roughly one-quarter of men in Detroit or Watts. Harlem and Chicago men face about an even chance of dying by age 55, and about two-thirds can expect to die by age 65 compared to one-quarter of white men nationwide or 40% of black.

In Figs. 2a and b, we report each population's sex-specific prevalence of functional limitation at various ages, conditional on survival to that age. Of those who do survive to various ages, a larger proportion of the African American population is predicted to be disabled than of the white American population nationwide. Blacks nationwide have disability prevalence rates through age 55 that are estimated to be approximately twice the rates for whites. Disability rates are even larger for the local areas, as much as three times the white rate nationwide for a given age. Harlem, Detroit, and Chicago residents exhibit almost identical disability profiles, while those for Watts are more severe. At older ages, the same patterns of disparities are evident, but less pronounced. Residents of the poor populations experience about the same prevalence of disability at age 35 or 40 as do whites nationwide at age 60. By age 50, approximately one-third of surviving residents of the poor populations are estimated to be disabled, a prevalence rate which whites nationwide do not reach until age 70. In contrast, at ages 65 and 70 the majority of surviving Harlem, Detroit, Chicago or Watts residents are estimated to be disabled.

Figs. 3a or b show each population's sex-specific probability of death or disability by a given young through middle-adult age. These summary curves clearly illustrate that there are large differences between blacks and whites nationwide and also between blacks nationwide and those in the local populations. These differences emerge by age 25 and persist or widen between ages 25 and 70. At least half

Table 2
Parent's probability of survival to child's 20th birthday by parent's age at child's birth

	US		Local populations			
Age at birth	Whites	Blacks	Harlem	Detroit	Chicago	Watts
			Mothers			
15	0.99	0.98	0.95	0.97	0.95	0.96
20	0.99	0.97	0.91	0.95	0.93	0.95
25	0.98	0.96	0.88	0.93	0.90	0.92
30	0.97	0.94	0.85	0.90	0.87	0.90
			Fathers			
15	0.97	0.94	0.89	0.90	0.86	0.87
20	0.96	0.92	0.82	0.88	0.82	0.85
25	0.96	0.90	0.74	0.85	0.78	0.83
30	0.94	0.88	0.68	0.80	0.71	0.80

Table 3
Predicted prevalence of parental disability at child's 20th birthday by parental age at child's birth

	US		Local populations			
Age at birth	Whites	Blacks	Harlem	Detroit	Chicago	Watts
			Mothers % disabled			
15	6	12	16	17	17	20
20	7	14	19	20	19	23
25	9	18	23	24	24	29
30	11	23	29	30	29	35
			Fathers % disabled			
15	7	14	20	22	22	27
20	8	15	20	22	22	27
25	10	20	26	28	27	33
30	12	22	27	29	29	35

Table 4
Parent's probability of surviving able-bodied to child's 20th birthday by parent's age at child's birth

	US		Local populations			
Age at birth	Whites	Blacks	Harlem	Detroit	Chicago	Watts
				Mothers		
15	0.93	0.86	0.80	0.80	0.79	0.77
20	0.92	0.83	0.74	0.76	0.75	0.73
25	0.90	0.78	0.68	0.70	0.69	0.66
30	0.87	0.72	0.61	0.63	0.69	0.59
				Fathers		
15	0.90	0.80	0.71	0.70	0.67	0.63
20	0.88	0.79	0.65	0.69	0.65	0.62
25	0.86	0.72	0.55	0.61	0.57	0.55
30	0.83	0.69	0.50	0.56	0.51	0.52

of the men and 40% of the women in each local population can expect to die or become disabled by age 50. Comparable proportions of whites nationwide are not achieved until almost age 70.

Given these probabilities of mortality and estimated prevalence rates of disability, how much difference does parental fertility-timing make a child's chance of having living parents who are able-bodied until maturity? The findings reported in Tables 2–4 address this question.

Mothers and fathers

In Table 2, we report the probability that a parent survives until a child's 20th birthday according to the parent's age at the child's birth. Virtually any white mother nationwide who bears a child between the ages of 15 and 30 will survive until her child's 20th birthday with almost no variation in probability according to whether she is 15 or 30 at the child's birth. So, too, the vast majority of black mothers nationwide will survive to their child's 20th birthday, with typical black mothers who are 30 at the child's birth only 4% less likely to survive to the child's 20th birthday than those who are 15.

Most mothers in the four urban poor African American populations will also survive to see their children grow up, but the absolute probabilities are somewhat smaller than the national averages and the reduction in probabilities associated with childbearing at older ages is larger. The probability that a 15-year-old mother in one of the poor study populations survives to her child's 20th birthday is approximately the same as the probability that a typical 30-year-old white mother in the nation does. Twenty through thirty-year-old mothers in the poor study populations have lower rates of survival to their children's 20th birthdays than mothers of any age nationwide, and they experience a 6–10 point reduction in their probability of survival, depending on the specific population, if they postpone childbirth from age 15 to age 30. Ten to fifteen percent of 30-year-old mothers in the local populations cannot expect to survive until their child's 20th birthday, compared to 3% of white and 6% of black 30-year-old mothers nationwide.

For fathers, the patterns by age and population are similar, but the absolute differences are more substantial. The vast majority of white fathers nationwide will survive to their child's 20th birthday no matter whether they are 15 or 30 at the child's birth. Typical black fathers in the nation are also highly likely to survive to see their children grow up, although 12% of those who wait until age 30 to father the child will not see that child grow up.

For fathers in the urban poor African American study populations, the chances of surviving until a child's 20th birthday are noticeably smaller and vary with paternal age at the child's birth. Fifteen-year-old fathers in Harlem, Detroit, Chicago or Watts have less chance of surviving to their child's 20th birthday than the typical 30-year-old white father nationwide. Those who wait to age 20 have a lower probability than typical black fathers nationwide. Those who wait until age 25 or 30 experience particularly low probabilities of surviving to their child's 20th birthday. Harlem is the most extreme case. Over 30% of Harlem men who wait to father a child until age 30 are not likely to survive to that child's 20th birthday. This represents a 21 percentage point reduction compared to if the Harlem man was 15 at the child's birth and a 26% lower probability than his white 30-year-old counterpart faces nationwide.

Among those parents who survive to a child's 20th birthday, Table 3 presents their predicted prevalence of disability, according to the parent's age at the child's birth. Almost all white parents who are between the ages of 15 and 30 at their child's birth and survive to their child's 20th birthday can expect to be able-bodied at that point. Even those who postpone childbirth until the age 30 have a predicted disability rate that is only 11 or 12%. For black parents nationwide, the estimated probability that a parent will be disabled at the child's 20th birthday is approximately double the white rate for a given parental age at the child's birth. Approximately one-tenth of those who bear their child at age 15 and one-fifth of those who wait until age 30 can expect to be disabled when the child turns 20.

Predicted disability rates among surviving parents in the urban poor African American populations are particularly high. For both mothers and fathers and at all parental ages at the child's birth, surviving residents of the poor, African American study populations have

Table 5
Probability that grandmothers survive, able-bodied to grandchild's 5th or 20th birthday by mothers age at child's birth

	US		Local populations			
Daughter's age at birth	Whites	Blacks	Harlem	Detroit	Chicago	Watts
Probability that grandmother survives/able-bodied until grandchild is 5						
15	0.92	0.83	0.74	0.76	0.75	0.73
20	0.89	0.78	0.67	0.70	0.68	0.66
25	0.86	0.72	0.59	0.62	0.60	0.58
30	0.81	0.64	0.51	0.54	0.52	0.50
Probability that grandmother survives/able-bodied until grandchild is 20						
15	0.81	0.64	0.51	0.54	0.52	0.50
20	0.74	0.54	0.42	0.44	0.41	0.41
25	0.67	0.46	0.35	0.37	0.34	0.33
30	0.58	0.32	0.26	0.28	0.26	0.25

predicted rates of disability that are approximately 1.5 times larger than the rates predicted for blacks nationwide and three times larger than those predicted for whites nationwide. Fifteen-year-old mothers or fathers in these populations who survive to their child's 20th birthday have disability rates that are 1.5–2 times higher than white parents who were 30 at the birth of their child. About one-third of residents of the study populations who postpone childbirth to age 30 and survive can expect to be disabled by the child's 20th birthday. Watts residents suffer the highest disability rates. One-fifth of mothers and one-quarter of fathers in Watts who become parents at age 15 and survive to the child's 20th birthday can expect to be disabled. About one-third of Watts mothers or fathers who survive to age 25 or 30 and postpone childbearing until then can expect to be disabled by their child's 20th birthday.

Given the predicted prevalence of disability at various ages and the probability of survival to various ages estimated for each population, what is the joint probability a young person faces of surviving, able-bodied until her child grows up and how much does that probability vary with the parent's age at the child's birth? The estimates presented in Table 4 show that the probability that a child has a living and able-bodied mother or father at age 20 is generally lower and varies more noticeably by parental age at birth in the local populations than nationwide. Among whites nationwide, differences in the probability of surviving able-bodied to see one's child reach age 20 vary by less than 10% whether one bear's the child at age 15 or waits until age 30. Differences between ages 15 and 25 are trivial. For blacks nationwide, the probabilities are smaller and the drop in probability with increasing parental age are larger. The typical black 15 year old parent nationwide has about the same probability of surviving, able-bodied to a child's 20th birthday as a 30 year old white parent nationwide. Less than three-quarters of blacks nationwide who postpone childbirth until age 30 can expect to survive and be able-bodied at the child's 20th birthday.

The profile for residents of the poor African American study populations is bleaker. They face much smaller probabilities of surviving, able-bodied to see their children grow up, no matter how early they bear the child, and they have a noticeably greater chance of doing so, if they are 15 years old at childbirth than even at 20. Those who become parents at age 15 have substantially lower probabilities of surviving, able-bodied to their child's 20th birthday than do whites nationwide who postpone parenthood until age 30. For residents of the poor study populations, delaying childbearing until age 25 or 30 reduces the probability precipitously. In fact, fathers who wait until age 30 to have the child face only about an even chance of surviving able-bodied to their child's 20th birthday. The probability for mothers is only about 60%.

Grandmothers

In Table 5, we report estimated probabilities that grandmothers survive, able-bodied until their grandchildren are age 5 and until they have reached age 20, depending on maternal age at birth. We consider the child's preschool years separately, because grandmothers in poor, African American populations may be actively involved in grandchild rearing if working mothers of preschoolers turn to grandmothers for child care. Given the growing prevalence of HIV among young adults in some poor, urban locales and the work or school requirements on which cash assistance to needy families is now contingent, the reliance on grandmothers for child care may be becoming more necessary in some poor communities.

Nationwide, the probability that a grandmother will

survive, able-bodied until her grandchild reaches age 5 shows relatively little variation with maternal age at the child's birth. The vast majority of white grandmothers survive, able-bodied until their grandchildren's 5th birthday, no matter whether their daughters are 15 or 30 years old at childbirth. However, for blacks nationwide, the probability that a grandmother survives, able-bodied until her grandchild's 5th birthday is lower at every maternal age and is sensitive to maternal age at the child's birth. While 83% of black grandmothers nationwide will survive able-bodied to their grandchild's 5th birthday if their daughter bears that child when she is 15, only 64% will survive able-bodied if their daughter waits until she is 30.

In Harlem, Detroit, Chicago and Watts, the probability that a grandmother survives to her grandchild's 5th or 20th birthday is highly sensitive to maternal age at the child's birth. Only three-quarters of *teenage* mothers in these populations can expect their own mothers to survive, able-bodied until their children reach age 5! This is a somewhat lower percentage than typical 30 year old mothers nationwide can expect. In the poor study populations, women who postpone childbearing to age 30 have only about an even chance of their children having living and able-bodied grandmothers at their 5th birthday.

Mothers in the local populations who postpone childbirth to age 20 face less than an even chance that their children will have living and able-bodied grandmothers until they grow up, compared to three-quarters of white mothers nationwide. For Harlem, Detroit, Chicago or Watts grandmothers whose daughters delay childbearing to age 30, only about one-quarter can expect to be alive and well when their grandchildren grow up (compared to 58% for whites nationwide).

Discussion

The findings document important disparities in the levels and trajectories of mortality and functional limitation among young through middle-aged adults in the United States. They suggest that white youth nationwide have reason to take for granted their good health through middle age. For the typical white American, health considerations need not be a factor in the decision of whether to become a teenage parent or to postpone childbearing into or through the 20s. Urban, African American adolescents, on the other hand, face more dismal health prospects. Their likelihood of surviving, able-bodied to see their children grow up is not only lower on average than for their black or white counterparts nationwide, but also noticeably decreases as they increase their childbearing age. Peak maternal health and access to social support for childbearing and rearing might converge at a young age in this population.

In persistently impoverished, urban African American populations, early fertility may mitigate the threat to family economies and caretaking systems imposed by the heavy burden of chronic disease and premature death borne by young through middle aged adults. It improves the chances that children avoid orphanhood and will have caretakers who not only survive, but are also able-bodied, while reducing the chance that they will need to compete with ailing elders for parent's energies. When making reproductive decisions, urban, African American teenagers and the elders who advice them face a qualitatively different set of trade-offs from their socioeconomically advantaged peers. In this context, the current study findings are consistent with the hypothesis that high rates of teenage childbearing in poor urban African American populations may be, in part, responsive to severe health uncertainty in middle-adulthood.

The current findings suggest specific benefits of early childbearing in poor communities subject to pervasive health uncertainty, but do not systematically address the question of whether childbearing decisions are actually affected by these benefits. They could be affected, for example, either because individuals are aware of the benefits (i.e., they make conscious fertility-related decisions taking account of these benefits), or because these benefits have been distilled into a pervasive logical structure (e.g., "common sense") that influences cultural norms and social expectations regarding appropriate ages for childbearing (Geertz, 1983; LeVine and Scrimshaw, 1983; Geronimus, 1996a). Life history theorists have advanced the additional possibility that a community's mortality experience may be a distal contributor to fertility timing, operating through family stress and composition to affect children's biological development (e.g., pubertal timing) and psychological development (e.g., attachment style) (Chisholm, 1993). Whether the mechanisms operate at the individual, social, or cultural levels and the degree to which they operate through conscious awareness compared to being unreflective sociocultural or even endocrinological processes requires further investigations.

Our findings, suggesting benefits to early fertility in a diverse set of persistently impoverished urban locales, are of sufficient magnitude that it is plausible they could be salient to residents of these locales. We do not assume that poor, urban teens or their elders know the statistical odds they face of early death or disability; however, given the pervasiveness of early death and disability in the communities described here, we would expect that their life experiences impress some version of these facts on them (Geronimus, 1996a). Qualitative analyses suggest health considerations play

some role in fertility-timing decisions in specific persistently impoverished locales (Burton, 1990; Stack and Burton, 1993; Geronimus, 1996a). Wilson and Daly (1997) analysed community areas within one metropolitan area (Chicago) which varied in male life expectancy from 54 to 77 years. They found the teen birth rate varied across areas and was inversely correlated with male life expectancy. Of course there are other important differences between poor urban communities and other locales that might also contribute to differences in fertility-timing distributions—such as in prospects for labor force participation. The extent to which early fertility may be responsive to health as opposed to other considerations or constraints is an unanswered question.

Whatever their impact on fertility behavior, specific costs of postponed fertility to children in impoverished, urban locales are now delineated. They include increased chances of having a single parent or being orphaned, of being cared for by functionally impaired adults, of competing for care with disabled adults, or of participating in the care of disabled adults. These costs are important to children's well-being and need to be attended to as part of efforts to reduce early childbearing.

The negative impact of parental death on children's well-being is evident (Altschul, 1988). The potential implications of early adult disability for childbearing and rearing are several. To the extent that functional limitations are symptomatic of underlying morbidity, they, too, raise questions about parental longevity and also suggest an increased chance of poor infant outcome. Indeed, a methodologically diverse literature now consistently indicates that for first-born black children, those with teen mothers are *less* likely to be born low birth weight or to die as infants than those with older mothers, particularly in areas of concentrated poverty (Geronimus, 1987, 1996b; Geronimus and Korenman, 1993; McCarthy and Hardy, 1993; Wolpin and Rosenweig, 1995). For example, in Harlem, infant mortality rates for teens are half those for mothers in their 20 s (Geronimus, 1997). Early health deterioration of African American women over the reproductive ages is one proximate cause (Geronimus, 1996b). In addition, if a functional limitation interferes with a parent's potential to participate in the labor force, a family's financial security is threatened. Bound et al. (1995; 1996) found that excess morbidity among African Americans explains lower labor force participation rates among black compared to white men, and reduced labor force participation rates among black women as they age from young through middle adulthood. Having a disabled family member in the home may adversely affect children's care. LeClere and Kowalewski (1994) found parental disability to be associated with behavioral problems and developmental delays among children. Children with ailing elders may compete with them for care from healthy (but overtaxed) adults. For lack of alternatives, children may even be expected to provide care for dependent elders (Burton, 1990; Stack and Burton, 1993).

The population variation we found in the probability that grandmothers survive, able bodied through their children's preschool years or childhood raises special concerns. Working mothers in poor communities often have no alternative but to rely on kin—especially grandmothers—for child care. Recently enacted US welfare regulations are intended to move more poor mothers into the labor force, even when their children are as young as 12 weeks old, intensifying their child care needs. Our findings suggest that informal support systems are not likely to fill this gap or may do so at the cost of further overburdening ailing elders and placing children at risk of being cared for by adults who suffer functional limitations.

Although the current findings suggest quantifiable benefits to early fertility in some populations, this does not imply the absence of costs. To date, great attention has been paid to estimating costs of early fertility. Providing information on possible benefits may improve social understanding of the persistence of early fertility in some poor populations, despite its costs. The findings suggest alternatives to interpreting high rates of teen childbearing among African American residents of impoverished urban areas as signifying values that set them apart from the mainstream and harm children. For example, early fertility in this population may express the attempt to embrace the widely shared value that responsible parents strive to bring children into the world when they are most prepared to provide for their children's well-being (Geronimus, 1997). For urban, African Americans in poverty, such attempts are made under adverse circumstances that constrain and qualitatively alter the routes available for achieving this ideal. The current study findings contribute to the ongoing social dialogue about the nature of poverty and its relationship to behavior. They help elucidate the health contours of the social reality poor, urban African Americans experience, the reality that provides the context for their earlier fertility timing distribution relative to national averages.

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