

# Race and Mortality

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In February of 1998, President Clinton announced a plan to spend \$400 million over five years to address racial disparities in health. The campaign, termed the “Race and Health Initiative” and implemented by the Department of Health and Human Services (HHS) under the direction of Surgeon General David Satcher, is principally focused on what are perceived to be the starkest racial and ethnic disparities in morbidity and mortality. Its hope is to eliminate the disparities in infant mortality and five other areas by the year 2010. The other areas include cancer, cardiovascular disease, diabetes, AIDS, and immunization rates.

In September 1998, HHS convened a meeting of 250 policymakers, industry and community leaders and representatives of community health organizations to discuss strategies for implementing the initiative. HHS maintains an extensive web page on the initiative, which analyzes racial disparities in the six subject areas, sets out long-range and short-term goals in each area, and provides information on activities and available grants. The initiative appears to represent a substantial commitment to reducing the health gap between whites and racial minorities.

It is difficult ever to say that too much money is being spent to address racial and socioeconomic disparities in health. At the same time, one would hope that funds aimed at eliminating disparities in health outcomes are used efficiently and that the results of such efforts are thoughtfully appraised. There are, however, certain things about racial differences in mortality and survival, including the curious relationship between the two, that neither the surgeon general nor anyone else studying health issues seems yet to understand. That lack of understanding has already led to a vast amount of questionable research and misguided commentary. It is likely also to lead both to ineffective application of resources in programs like the race and health initiative and to misinterpretation of the results of such programs.

## Racial Disparities in Infant Mortality

Consider the racial disparity in infant mortality. It has received much attention from social and medical scientists since commentators some years ago observed with alarm that in 1983 the ratio of the black infant mortality rate to the white infant mortality rate had reached its highest point in history. That year, the black rate (19.2 deaths per thousand live births) was 1.98 times the white rate (9.7). In the years

that followed, while infant mortality declined for all groups, the racial gap widened. Though the Bush administration made reducing the black-white infant mortality ratio a health policy priority, by 1990 black infants were 2.4 times as likely to die as white infants. In 1994, the Centers for Disease Control and Prevention (CDC) predicted that by the year 2000, the black infant mortality rate might be three times the white rate. As Dr. Satcher, then director of the CDC, put it, the good news was that there continued to be significant declines in infant mortality for blacks and whites alike, but the bad news was that infant mortality was not declining as fast among blacks and whites alike, but the bad news was that infant mortality was not declining as fast among blacks. The most recent available data show that in 1997, with the black and white rates at 14.2 and 6.0 deaths per thousand live births, the black rate was still approximately 2.4 times the white rate.

Researchers have also been finding that the racial gap in infant mortality persists at higher as well as lower socioeconomic levels. A widely publicized study appearing in the *New England Journal of Medicine* in 1992 found that the racial disparity in infant mortality where both parents were college educated was comparable to that in the nation at large, a counterintuitive result that some thought must be attributable to genetics or racism. A 1995 study by the CDC found the racial gap to be increasing at all socioeconomic levels and actually to be greater among better-educated and more affluent groups.

## The Paradox of Success and Failure

The only thing actually remarkable about increasing racial disparities in infant mortality or the large disparities even at higher socioeconomic levels, however, is that no one appears to understand that these phenomena are entirely to be expected. The reason is easy enough to state (if perhaps not so easy immediately to understand): Whenever two groups differ in their susceptibility to some condition, the less prevalent the condition, the greater will tend to be the disparity in rates of experiencing the condition.

This tendency can be effectively illustrated by income data. Blacks are more likely to be poor than whites. In 1990, blacks were 3.0 times as likely as whites to fall below the poverty line (31.9 percent for blacks compared with 10.7 percent for whites). And, as is almost invariably the case when one group is more likely to experience some condition than another group, the racial disparity in rates of being very poor is even greater than the racial disparity in

being poor. In 1990, blacks were 3.8 times as likely as whites to fall below 50 percent of the poverty line (14.4 percent for blacks compared with 3.8 percent for whites).

Because blacks are more susceptible to poverty than whites, programs to reduce poverty are generally thought to be especially beneficial to blacks. Clearly they are. Consider, however, the consequences of an anti-poverty program that enabled all persons living on incomes between the poverty line and 50 percent of the poverty line in 1990 to escape poverty. The decline in the black poverty rate would be about 55 percent (from 31.9 percent to 14.4 percent). Thus, as indicated above, the ratio of the black poverty rate to the white poverty rate would increase substantially. That is, the black poverty rate would rise from 3.0 times the white rate to 3.8 times the white rate. On the other hand, if poverty were to increase rather than decline, whites would tend to experience the greater proportionate increase, and the ratio of the black rate to the white rate would decrease.

But it is not merely the case that the less prevalent a condition, the *greater* will tend to be demographic disparities in *experiencing* the condition. It is also the case that the less prevalent the condition, the *smaller* will tend to be demographic disparities in *avoiding* the condition. Thus, as a result of the hypothetical reduction in poverty just described, the black rate of avoiding poverty, which had been 76 percent of the white rate (68.1 over 89.3), now would be 89 percent of the white rate (85.6 over 96.2). From this perspective, blacks did disproportionately benefit from the reduction in poverty, even though their relative susceptibility to poverty increased. In other words, racial disparities in experiencing a condition and in avoiding the condition move in opposite directions when changes occur in the prevalence of the condition.

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The tendencies can also be illustrated by data on test scores. Consider two normal distributions of test scores where Group A has an average score of approximately one-half a standard deviation higher than the average for Group B. This means that roughly 30 percent of Group B will score above the average for Group A. If we set the cutoff at a point where 50 percent of Group A fails the test, then 70 percent of Group B will fail the test. Thus, Group B's failure rate is 1.4 times Group A's failure rate (70 over 50), and Group B's pass rate is 60 percent of Group A's pass rate (30 over 50). If we now lower the cutoff to a point where only 30 percent of Group A fails the test, 50 percent of Group B would fail the test. At this point, then, Group B's failure rate is 1.7 times Group A's failure rate (50 over 30), while Group B's pass rate is 71 percent of Group A's pass rate (50 over 70).

Thus, the lowering of a cutoff increases the disparity between failure rates at the same time that it reduces the disparity between pass rates. It is worth noting, moreover, that because lowering cutoff scores reduces racial disparities in pass rates, lowering cutoff scores is universally regarded as a way of reducing the discriminatory effect of a test even though lowering the cutoff will increase the racial disparity in failure rates. It should be recognized, however, that exactly the same results would occur if instead of lowering a cutoff point, we improved education sufficiently to enable everyone previously scoring between the two cutoff points now to score above the higher cutoff. Thus, if the literacy program President Clinton announced a month after he announced the minority health initiative proves to be successful, it can be expected to increase racial disparities in illiteracy rates while reducing racial disparities in literacy rates.

Two other aspects of the described tendencies warrant mention at this point. First, with regard to all dichotomous

(yes/no) outcomes, both the size of demographic disparities between rates of experiencing some adverse condition (call it “failure”) and the size of demographic disparities between rates of avoiding the condition (call it “success”) obviously are influenced by the size of the difference between group averages. In cases where success and failure are determined by some arbitrary point on an observable continuum, as in the case of a poverty line or test cutoff, group averages usually are discernable enough. In the case of other dichotomous outcomes, including mortality and survival, group averages usually are more abstract and involve the interaction of multiple factors associated with the outcome. Some part of the purpose of most studies of group differences in success or failure is to better understand the relationship of group averages, or, more distribution of the factors associated with the outcome being examined.

Nothing said here should be interpreted to minimize the role of differences between group averages in observed disparities in success and failure. It must nevertheless be recognized that seemingly immense disparities in failure rates can be functions of modest average differences in the factors related to the outcome in conjunction with the rarity of failure in the particular setting. In such circumstances, the seemingly immense disparity in failure rates generally will be accompanied by a small or insignificant disparity in success rates. Thus, that some rate for one group is two or three times that of another group may be far less meaningful than it might appear at first sight.

Nor should anything said here be read to suggest that increases or decreases in disparities in some outcome are never the result of changes in the differences between group averages. But it must be recognized that increasing disparities in failure rates when failure is declining do not necessarily mean that group averages are growing farther apart any more than decreasing disparities between failure rates when a condition is increasing mean that group averages have moved closer together.

Second, there exists a significant corollary to the tendency whereby the less prevalent a condition the greater the disparity in experiencing the condition. That corollary is that the less prevalent the condition, the larger will be the proportion of those experiencing the condition comprised by the more susceptible group. In other words, lower a cutoff score, and the lower-scoring group will comprise a larger proportion of those who fail; reduce poverty and poorer groups will comprise a larger proportion of the poor. On the other hand, counterintuitive though it may seem, the more susceptible group will also comprise a larger proportion of those who avoid the condition.

This can be illustrated by reference to the hypothetical test score data just described. Assuming that each group is comprised of 100 persons, using the higher cutoff, Group B would comprise 58 percent (70 of 120) of those who fail and 38 percent (30 of 80) of those who pass. With the lower cutoff, Group B comprises 63 percent (50 of 80) of those who fail and 41 percent (50 of 120) of those who pass.

By contrast, raising the cutoff will cause Group B to comprise both a smaller proportion of those who fail and a smaller proportion of those who pass.

## **Universal Tendencies**

The tendencies observed in income data and test scores also operate with regard to infant mortality, as well as just about every other adverse (or favorable) circumstance by which social and medical scientists appraise the relative well-being of demographic groups. When in 1983, the ratio of the black infant mortality rate to the white infant mortality rate reached its highest point ever, the black and white infant mortality rates each reached its lowest point ever, as did the racial disparity in survival rates. Indeed, in the decade preceding 1983, almost every year had brought a record low in black and white infant mortality rates, accompanied by a record high in the racial disparity between such rates and a record low in the racial disparity between survival rates. As infant mortality continued to decline in the ensuing years, these patterns generally continued (although, with the black survival rate now above 99 percent of the white rate there no longer is a discernible consistent pattern in survival rates). With regard to the crucial question of whether there has been any sort of true change in the relative life chances of black and white infants that is not simply a function of the overall decline, the matter has yet to be thoughtfully examined.

The same statistical tendencies explain why racial disparities in infant mortality rates could be greatest among families at high socioeconomic levels. Income data is again illustrative. Incomes of black and white married-couple families are much more alike than incomes of black and white female-headed families. This tends to reduce racial disparities both in experiencing poverty and in avoiding poverty for married-couple families compared with female-headed families. Nevertheless, because poverty is so much less prevalent among married-couple families than among female-headed families, the disparity between the poverty rates of black and white married-couple families is considerably greater than the disparity between the poverty rates of black and white female-headed families. In 1990, for married-couple families the black poverty rate (14.3 percent) was 2.3 times the white rate (6.1 percent); for female-headed families the black poverty rate (50.6 percent) was only 1.7 times the white rate (29.8 percent).

On the other hand, in consequence of the combined effects of the greater similarity in the incomes of black and white married-couple families and the lower poverty rates of such families than of black and white female-headed families, the black rate of avoiding poverty was much closer to the white rate of avoiding poverty among married-couple families than among female-headed families. For married-couple families the black rate of avoiding poverty was 91 percent of the white rate (85.7 over 93.9); for female-headed families the black rate was only 70 percent of the white rate (49.4 over 70.2).

In exactly the same way, the greater similarity of blacks and whites at higher socioeconomic levels tends to narrow the racial gaps in both infant mortality and infant survival. But because infant mortality is so much rarer at higher socioeconomic levels, the racial disparity in infant mortality rates remains quite large. The racial disparity between infant survival rates at higher socioeconomic levels, however, is extremely small.

## **Universal Misunderstanding**

Notwithstanding the fundamental nature of the described tendencies, for over a decade the leading medical journals of the United States and the United Kingdom have puzzled over increasing racial and socioeconomic disparities in mortality *despite* general declines in mortality. That the disparities increase *because* of the general declines in mortality is entirely overlooked, as are the declining disparities in survival rates. In fact, increasing disparities in mortality have been casually termed increasing disparities in “survival,” without recognition that survival disparities actually have decreased.

The tendencies also operate in comparisons of socioeconomic disparities within racial groups. Notice above that the poverty rate for white female-headed families (29.8 percent) was 4.9 times the rate for white married-couple families (6.1 percent), while the poverty rate for black female-headed families (50.6 percent) was only 3.5 times the rate for black married couple-families (14.3 percent). The greater disparity among whites occurs simply because poverty is rarer among whites and despite the fact that the income disparity between married-couple and female-headed families is smaller among whites than among blacks. On the other hand, the disparity between the rates at which female-headed and married-couple families avoid poverty is much smaller for whites than for blacks. Nevertheless, when studies repeatedly find that the socioeconomic disparity in mortality or some other adverse outcome is greater among whites than among blacks, observers hypothesize about the possible causes of that pattern without regard to the fact that the pattern is nearly inevitable. They also overlook that the socioeconomic difference in the opposite outcome tends to be smaller among whites than among blacks.

The tendencies have implications beyond the types of comparisons just noted. For example, studies have found that racial disparities in low birth weight are even greater among low risk groups than high risk groups. The pattern, however, flows inexorably from the fact that low birth weight is rarer among low risk groups than high risk groups.

One area where the failure to understand these tendencies may result in the misinterpretation of costly research involves the requirement of federal law that medical research supported by the National Institutes of Health attempt to determine whether the therapies or procedures being studied affect minorities and women

differently from the way they affect whites and men. To understand just how the results of such studies might be misconstrued consider the consequences of paying a thousand dollars to every family below the poverty line. Whites would experience a greater decline in poverty rates, while blacks would experience a greater increase in rates of avoiding poverty.

There is reason to expect that some racial or gender difference in the effect of an ameliorative therapy or procedure will be found wherever racial or gender groups differ in their susceptibility to some condition that the therapy or procedure can abate. Like the thousand dollar payment to families in poverty, the therapy or procedure can be expected to cause a greater decline in rates of experiencing or dying from the condition among the less susceptible group and a greater increase in rates of avoiding or surviving the condition among the more susceptible group. There seems little prospect, however, that the purely statistical origin of such differences will be recognized.

The medical sciences are not alone in their misunderstanding of these tendencies. Despite the evident utility of income data in illustrating the tendencies, they have been entirely ignored in the study of group differences in poverty. Following dramatic declines in poverty from 1959 through the mid-1970s, changes in the relative well-being of various groups were repeatedly appraised in terms of increasing disparities in poverty rates. The near inevitable connection between these patterns and declining poverty went unremarked upon, as did the decreasing disparities in rates of avoiding poverty.

## **Social Science and the Law**

As explained earlier, a corollary to the tendency for disparities in poverty rates to increase when poverty declines is the tendency for more poverty-prone groups to make up a larger proportion of the population that remains poor after an overall decline in poverty. Thus, during the period of dramatic and consistent declines in poverty between 1959 and the middle 1970s female-headed families came to comprise a much higher proportion of the poor than they had previously. This pattern was then denominated the “feminization of poverty,” and in 1980 a presidential advisory panel lamented that, if current trends continued, by the year 2000 the poverty population would be entirely comprised of female-headed families.

As this provocative prediction was repeatedly quoted over the ensuing years, no one questioned why a society should be concerned that poverty would be limited solely to the most poverty-prone groups, as would certainly be the case we were to verge on the total elimination of poverty (including the poverty of female-headed families). In any event, by the time the feminization of poverty was identified, the dramatic and consistent decline in poverty that was one of its principal causes had already ceased. The most recent data show poverty just about as feminized as it was 20 years earlier. Those who have even noticed that the

pattern ceased long ago, however, have failed to recognize the reason.

Neither poverty nor disease, nor any of the other varied adverse circumstances to which the described tendencies apply, always decline. And when a condition does increase, it is sometimes considered newsworthy that it has increased more among the least susceptible group. But it is when the condition does not increase more in the least susceptible group that the matter actually is newsworthy.

Comparable misunderstanding prevails in the law. The federal government encourages lenders to relax the criteria that disproportionately disqualify minorities seeking home mortgages. At the same time, federal agencies scrutinize most closely the banks with the largest racial disparities in mortgage rejection rates, and fair housing groups target such banks for litigation. They do so apparently unaware that relaxing lending criteria, like lowering test cutoffs, increases racial disparities in rejection rates, or that the banks with the largest disparities in rejection rates tend to have the smallest disparities in approval rates. And if minorities are avoiding the banks reported to have high rejection rate disparities, they are probably making a mistake. For such banks tend to be the places where minorities, like whites, have the greatest chance that their loan applications will be approved.

Mortgage lending studies have lately taken to refuting claims that income differences account for racial disparities in rejection rates by pointing to findings that the disparities are greatest among the highest income groups. The near inevitability of this pattern, as well as the corresponding pattern of lower approval rate disparities among higher income groups, have gone unnoticed.

In 1998, William Bowen and Derek Bok published a study of the results of racial preferences at highly selective universities, citing as support for such measures the fact that racial disparities in graduation rates at such institutions are smaller than at less selective universities. Opponents of affirmative action have criticized the focus on graduation rates, arguing that the picture changes dramatically if racial disparities in dropout rates are examined instead. These disparities are considerably higher at elite universities than at less selective schools.

Who has the better point? Because graduation rates are higher at more selective institutions, it is to be expected that at such institutions racial disparities in graduation rates will be smaller and racial disparities in drop-out rates will be larger than at other institutions. Since both results are to be expected, neither point probative of anything and hence not worth making at all unless an effort is made to determine whether a pattern is more or less pronounced than would be expected to occur solely because of the statistical tendencies.

## **Results of the Race and Health Initiative**

In the case of infant mortality, a program specifically directed at reducing black infant mortality might well

reduce the racial gap in infant mortality rates in a true sense. We would recognize this, for example, if the black rate declined while the white rate changed not at all. But the race and health initiative's most effective measures are likely merely to expand education and health services for socioeconomic groups where factors associated with infant health are most lacking. In essence, then, the program will be but a further generalized assault on infant mortality. And like the campaign against infant mortality throughout recent decades, the probable result, assuming the program is effective, will be to increase the difference between black and white infant mortality rates.

The short-term goal established by HHS in the case of infant mortality is a 22 percent reduction in the black infant mortality rate by the year 2000. The stated goal says nothing about reducing the racial disparity. It appears, however, that establishing the goal in terms solely of a reduction in the black rate, without reference to the racial disparity, merely reflects bureaucratic caution rather than an understanding of the nearly inexorable tendency for a reduction in the black mortality rate to be attended by an increase in the racial disparity. The managers of the program probably recognize that recent trends suggest that the black infant mortality rate may well be reduced but offer little prospect for reducing the racial disparity.

Very likely, however, we will one day see a reduction in the racial disparity in infant mortality. But that result will have to be appraised with great caution. In the case of infant mortality and other relatively rare and declining conditions, we are likely to approach a certain irreducible minimum mortality rate that will persist regardless of socioeconomic status and access to the best medical resources. When this occurs, the gap between observed black and white mortality rates probably will diminish regardless of any true change in the relative health of black and white infants. Yet, if one separated out preventable mortality – which is society's true concern – one would likely find the racial gap continuing to grow.

That is, suppose that given the state of medical science, even among the most affluent groups infant deaths cannot reasonably be reduced below 3 deaths per thousand live births. Suppose also that when the white rate reached 5 the black rate reached 11. Researchers might well see progress in the fact that the black-white infant mortality ratio had been reduced to 2.2 from the 2.4 ratio of 1997. Yet, the ratio of black to white preventable infant mortality would be 4.0 – i.e.,  $8(11 \text{ minus } 3) \text{ over } 2(5 \text{ minus } 3)$ . This would be higher than the black-white ratio of preventable infant mortality in 1997. Assuming the same irreducible minimum, the 14.2 black rate and 6.0 white rate that year would translate into a ratio of preventable deaths of only 3.7 – i.e.,  $11.2(14.2 \text{ minus } 3) \text{ over } 3(6 \text{ minus } 3)$ .

It is possible that in the United States infant mortality may reach close enough to an irreducible minimum before the year 2010 that the pattern of increasing racial disparities will cease. That is less likely in the case of the four other

mortality and morbidity rates on which the health initiative has focused. Thus, based solely on the types of mortality comparisons currently employed by researchers, it might be concluded that the initiative was more effective in the case of infant mortality than in the case of other conditions. In reality, however, there would be no basis for such a conclusion. Indeed, unless the described statistical tendencies are accounted for in any appraisal of the relative progress in different areas, no such appraisal can be relied upon. T any rate, when the racial gap in infant mortality does begin to decline, there may be no more reason for finding meaning in that decline than there is for now finding meaning in the increases observed in recent decades.

As it happens, solely as a matter of convention, in the sixth area on which the initiative has focused – immunization – the racial gap is measured in terms of rates of being immunized rather than rates of failing to be immunized. Because overall immunization rates have been increasing, racial disparities have been declining. Since racial disparities in rates of failing to be immunized have also fallen, there probably has occurred a genuine reduction in the relevant racial differences. In noting the decreasing disparity between the immunization rates, however, HHS shows no recognition that because immunization rates are increasing, racial disparities in immunization rates will almost invariably decline.

Similarly, in endeavoring to sort out the causes of the racial disparity in infant mortality, HHS has noted that in 1996 84 percent of white pregnant women received prenatal care compared with approximately 71 percent of black and Hispanic pregnant women. In other words, the black and Hispanic rate is approximately 85 percent (71 over 84) of the white rate. The race and health initiative almost certainly will increase the overall rates for prenatal care and in doing so will almost certainly reduce the racial disparity in rates of receiving prenatal care. But it is almost equally certain that there will be a corresponding increase in the racial disparity in failing to receive prenatal care. The latter change is likely to go unnoticed, however, and researchers may well ponder why such progress in eliminating the racial gap in prenatal care is not accompanied by any like progress in reducing the racial gap in infant mortality.

To be sure, the described tendencies may not predominate in every comparison of demographic disparities. Irregularities in the distributions of various factors among different populations, as well as irregularities in small data sets, may sometimes cause the tendency not to be observed at all. The size of one average difference underlying success and failure disparities can be sufficiently larger than another average difference to counteract entirely the statistical tendency on one side of the equation as it amplifies the tendency on the other side. And there certainly occur changes in the relative susceptibility of two groups to some condition that are not solely a function of the change in the prevalence of the condition. For example, that illegitimacy rates appear to be declining more among

blacks than among whites, being contrary to the usual tendency (and not involving an irreducible minimum), suggests a true change in the relative susceptibility of blacks and whites. Nevertheless, invariably the tendencies described here constitute a crucial part of the picture and, unless that part of the picture is understood, it is impossible to draw meaningful conclusions about data on group differences. It is also impossible to intelligently direct resources to moderating or eliminating those differences.

The director of the National Center of Health Statistics recently acknowledged that he had not previously recognized the role of these tendencies in the observed changing demographic disparities in health outcomes, but suggested that they may be considered in further research. There is not yet cause for much optimism, however. In health research, as elsewhere, the study of racial and gender disparities is as much an industry as a science. And there is greater incentive to study the large and increasing disparities in failure rates when failure, however measured, is declining than to sort out true changes from apparent ones. That is particularly so given that existing tools for sorting out the real from the apparent rarely will allow the conscientious researcher to say much more than that is difficult to tell whether there has been any true changes and may never allow the conscientious researcher to say anything dramatic.

Moreover, an unfortunate consequence of the curious relationship between disparities in success rates and disparities in failure rates is that diametrically opposed interpretations of patterns can be supported by different aspects of the same data. And there seems not yet to be universal recognition of the illegitimacy of discourse based on measures chosen to support a position without concern for the underlying reality.

In any event, now at the year 2000, substantial resources continue to be devoted to the study of differences among demographic groups. The more important that research, the more crucial it is that it be carried out with a greater understanding of fundamental statistical tendencies than has generally been reflected in research of this nature.