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What Infant Mortality Tells Us

> Infant Mortality is the most sensitive index we possess of social welfare and sanitary administration.[1]

In this issue of the Journal, Collins and David looked at the birthweights of White and Black babies in different Chicago neighborhoods.[2] They found that the proportion of low birthweight babies rose for both Blacks and Whites as the census tract median income fell regardless of maternal age, education, or marital status, suggesting that the social and physical environment where the mother lived had some influence on the outcome of her pregnancies.

The paper stimulated me to think about how infant mortality rates had improved yet not improved during the four decades of my own career in public health.

The first research paper I presented to an audience was at the 1949 meeting of the American Public Health Association. The title of the paper was, "The Relationship of Fetal and Infant Mortality to Residential Segregation. An Inquiry into Social Epidemiology."[3] It was an ecologic study demonstrating that in New York City neighborhoods, fetal, neonatal and post-neonatal mortality rates of both Black and White infants rose dramatically as the proportion of Black infants in the neighborhood rose. In fact, the infant mortality of Black infants in neighborhoods with few Blacks was substantially lower than the comparable rate in White infants whose parents resided in the Negro ghetto. Moreover, according to census figures, the educational levels and occupational classifications of the two groups of Blacks were similar suggesting that the ghetto environment itself had something to do with the high Black mortality rates. This was long before computers and regressions; the data were painfully put together with the help of a hand-operated calculator.

Collins and David also found that the differential effect of traditional pregnancy risk factors was greatest in the poorest neighborhoods. I had come to a similar conclusion after analyzing birthweights in South India in the 1950s.[4] A follow-up study of children born on the island of Kauai, published in 1967, documented that this differential effect extends well into childhood.[5,6]

In 1947, infant mortality in the United States was 32.2 per 1,000 live births;[7] the rate was 10.1 in 1987.[8] The rate has not declined regularly during these four decades. The greatest declines were during the 1940s (37.9 percent) and 1970s (37.0 percent). The earlier decline was coincident with the advent of antibiotics whose effect was felt primarily on post-neonatal mortality. During the 1970s, with the spread of neonatal intensive care units and technological advances in neonatal care, the decline was felt primarily on neonatal mortality. In between these two decades and since 1980, coincident, in both cases, with the actions of conservative administrations in Washington, declines have been much slower.

Both Blacks and Whites appear to have benefited from the application of new scientific knowledge as reflected in infant mortality rates. Yet the position of Blacks relative to that of Whites has remained unchanged or has deteriorated. This is the opposite of what might have been anticipated because the Black rates were farthest away from some theoretically irreducible minimum.

The Black/White infant mortality rate ratios were 1.61 in 1947, 1.93 in 1960, and 2.08 in 1987. Most of the improvement in rate ratios occurred between 1950 and 1960 and may have reflected underreported births and hebdomadal deaths among Blacks in these earlier years.[9] The ratio remained essentially unchanged after 1960 until 1986–87 when the rise in ratio was primarily in the neonatal mortality Black/White rate

ratio (2.13, in 1987). The recent rise may reflect the invasion of illicit drugs into the already hazardous and impoverished Black neighborhoods and the neglect of human services by a conservative government. Another paper in this issue of the Journal lends weight to the former suggestion.[10]

The paradox of falling death rates that maintain the same relation to each other suggests that the distribution of the benefits of scientific knowledge has followed a set pattern already fixed in an unchanging social order. Technologic change has surely occurred and left its mark on infant mortality during these four decades. Social change, as reflected in infant mortality rate ratios, has remained static or retrogressed.

The elevated infant mortality of Blacks has been a rallying cry of social reformers during all four decades; yet outcries and the sporadic actions that spawned new programs for limited periods of time seem to have had no effect.

Studies attempting to explain the elevated mortality in Blacks, like all epidemiologic studies of rare events, require large numbers and rely on crude indicators which in themselves have no direct effect on fertility, pregnancy and pregnancy outcomes. The questions we asked in 1967 are still unanswered.

> "To what extent and through what mediating channels do social and economic conditions (as reflected by parental education, income, housing, occupation) affect infant and perinatal mortality? How much of this effect is related to the type and quality of care received, its availability and accessibility and the motivation to utilize it? How much of the effect is an outcome of the mother's earlier growth experience in an underpriviliged environment, manifested at conception as a reduced capacity to bear healthy children?"[11]

We know that all these crude indicators as well as other more biologically based factors are associated with pregnancy outcomes, but we do not know their relative importance or (with the exception of the interaction of neighborhood with other risk factors that was noted earlier) the ways in which they interact.

We would not need to ask these questions if we were willing to tackle all of the indicators (housing, neighborhoods, prenatal care, family planning, education, income, employment, and motivation) at the same time. We would still be left with a time lag manifest in the generational effects demonstrated many years ago by Dugald Baird and Raymond Illesley and recently reemphasized.[12] This aspect of the issue is the most frightening. The Kauai studies[5,6] tell us that by neglecting the present we perpetuate the current rate ratios. Yet, the general concept of an underclass perpetuating itself is also not new. It was pointed out clearly by Bradley Buell almost 40 years ago.[13]

"Is there a thing of which it is said, 'See this is new?' "[14] asked the preacher. Taking infant mortality as an indicator we can answer: Yes and No. Knowledge converted to applied technology is new. Knowledge that has not been converted to social action is not new.

Daniel Koshland has recently written, "The new knowledge—which translates into living standards—can be used for good or evil, can be distributed fairly or unfairly. The challenge to science is to generate new discoveries. The challenge to society is to use those discoveries for the benefit of all."[15]

Public health deals directly with the application and distribution of new knowledge; yet public health is but one instrument of the society challenged to use the new knowledge for the benefit of all. Knowledge of how to prevent infant deaths has been used for the betterment of the statistics of the body politic, but has had no effect on equity manifested by the unchanged inequality of the body's parts. How can those devoted to the public health ethic deal with the paradoxical situation in which public health is placed?

Although not reflected in Black/White infant mortality rate ratios, real changes have taken place in the legal and moral basis of race relations during the past four decades. These changes give hope that the rediscovery of past knowledge and the reiteration of old lessons will someday be reinforced by a constituency strong enough to effect social change. The spirit of public health lives in this conviction: that a future society will authorize the major investments in change required to produce an equity reflected in the mortality rates of its infants.

"*How long, O Lord, how long?*[16]

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