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RACIAL DIFFERENCES IN THE RELATIONSHIP BETWEEN INFANT MORTALITY AND SOCIOECONOMIC STATUS

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Summary. This study presents an ecological analysis of the relationship between infant mortality and economic status by race in metropolitan Ohio, using census data on mother's residence and economic status determined by the percentage of low-income families living in each area. The analysis updates previous studies as white–non-white comparisons for total infant mortality are examined for the US censuses of 1960, 1970, 1980, 1990 and 2000; and more detailed period- and broad cause-specific rates are presented for 2000. A pronounced inverse association is consistently found between income status and infant mortality for whites, while for non-whites this pattern first emerges in 1979–81, disappears during the 1980s and then returns more strongly during the 1990s. Similarly, the 2000 data reveal a consistent inverse pattern between income status and infant mortality for white and non-white neonatal and postneonatal death rates, as well as exogenous cause-specific death rates. It is concluded that low-income whites and non-whites have infant mortality rates substantially higher than the overall rate for the population. Policy implications are discussed.

Introduction

Throughout the 20th century the American health care system made remarkable progress reducing death rates, particularly during infancy. An infant mortality rate in excess of 100 at the beginning of the century has fallen to only 7·0 per 1000 live births in 2002 (MacDorman *et al.*, 2005). However, this progress has not been shared equally by all population segments. Numerous studies have shown that lower socioeconomic groups continue to be at a pronounced disadvantage when it comes to the probability that a newborn infant will survive the first year of life (see Stockwell *et al.,* 2005, for a review). More specifically, the non-white population in the United States generally experiences higher infant mortality than whites, while the black minority has an infant mortality rate that is nearly two and a half times higher than that of whites (National Center for Health Statistics, 2005). While part of this

difference may be because non-whites on average have a lower socioeconomic status, the white–non-white differential persists even after controlling for socioeconomic differences (Carlson, 1984; Kleinman, 1985; Fingerhut *et al.,* 1987; Schoendorf *et al*., 1992; Hogue & Hargraves, 1993; Hummer, 1993; Williams & Collins, 1995; Din-Dzietham & Hertz-Picciotto, 1998).

Various hypotheses have been advanced to explain this differential. These focus on many factors, including: differences in maternal health and health care practices (Hummer, 1993; Kinch *et al*., 2000); lack of adequate prenatal care among non-whites (Kleinman, 1985; Finch *et al*., 1998); a greater risk among non-whites, irrespective of socioeconomic status, of having a low birth weight baby (Carlson, 1984; Brown, 1985; McCormick, 1985; Hogue *et al*., 1987; O'Hare *et al*., 1991; Schoendorf *et al.,* 1992; Williams & Collins, 1995; Geronimus, 1996); the cumulative effects of centuries of nutritional deprivation in the United States (Weaver, 1977*)*; differences in behaviour (Kinch *et al.,* 2000); marital status (Rogers, 1992; MacDorman & Atkinson, 1999); residential segregation (Wilson, 1987; Polednak, 1996); and, racism and discrimination (Hogue & Hargraves, 1993; Cramer, 1996; Williams, 1997). Given the persistence of distinct outcomes for whites and non-whites, it is clear that studies on the relationship between socioeconomic status and infant mortality must continue to look at the situation separately for the two racial groups. This study will do so by presenting a longitudinal examination of the relationship between socioeconomic status and infant mortality in metropolitan Ohio in an effort to better understand the nature of white–non-white differences regarding this relationship.

Data and Methods

This longitudinal study examines the relationship between infant mortality and socioeconomic status at five periods centred on the censuses of 1960, 1970, 1980, 1990 and 2000. For each of these dates a basic data file was constructed by merging the state census tract tapes with vital statistics tapes supplied by the Ohio Department of Health. Using this master file the basic relationship between the major components of infant mortality and socioeconomic status was examined within an ecological framework in which the primary analytical unit was the census tract of mother's usual residence. The independent variable was defined as the percentage of low-income families in each census tract at the time of the decennial census. The low-income cut-off points, defined as roughly 50% of the median family income in metropolitan Ohio for the year preceding the census enumeration, were US$3000 in 1960, US$5000 in 1970, US$10,000 in 1980, US$15,000 in 1990, and US$25,000 in 2000. The dependent variable data consisted of the number of live births in each census tract during the census years, and the number of infant deaths occurring during the 3 years centred on each census date, thus providing the data needed to calculate conventional 3-year average infant mortality rates (Shryock & Siegel, 1976).

Although the data were compiled from individual census tracts it was not feasible to carry out the analysis based on such units. This was because of rate instability due primarily to an absence of any infant deaths, even over a 3-year period, yielding an infant mortality rate of zero. This problem became especially serious when examining the relationship for particular subgroups in the population (e.g. race-specific rates by

age and cause of death). The analysis was therefore based on broader combinations of tracts. Specifically, the family income measure was used to aggregate the census tracts of the several metropolitan centres so that, for all periods studied, approximately 20% of the tracts fell into each area. The number of deaths in specific age–race–cause groups was sometimes insufficient to justify calculating an infant mortality rate; hence the cause of death analysis is limited to broad exogenous and endogenous categories.

For 1959–61 and 1969–71 the data refer to a three-city aggregate. For subsequent dates, however, the data refer to a larger aggregate comprised of eight (1979–81), seven (1989–91) and six cities (1999–2001). The use of larger aggregates for the three later dates was based on the availability of data for more cities, as well as a desire to minimize the potential for rate instability that could arise because of the general decline in infant mortality that has occurred over the years. Further justification for the use of the multiple-city aggregates was provided by looking at 1979–81 and 1989–91, the two dates for which data were available for both three-city and multiple-city aggregates, and comparing resulting infant mortality rates. While the multiple-city aggregates yielded somewhat higher levels of infant mortality in all income groups, there were no noteworthy differences between them with respect to the overall pattern of the relationship (see Stockwell *et al.*, 1988, and Stockwell & Goza, 1994).

Results

General trends, 1960–2000

The trends in the association between infant mortality and area economic status for whites and non-whites from 1960 to 2000 show notable racial differences and their persistence over time (see Table 1). For whites a strong and consistent inverse association between infant mortality and family income in 1960 gave way to a blurred pattern in 1970. Although the 1970 gap between the highest and lowest income areas was slightly greater than it had been a decade earlier (i.e. the ratio of the infant mortality rate in Area V, the poorest, to that of Area I, the wealthiest, increased from 1·8 to 2·4), the rates for the three middle areas converged around the rate for all areas combined. While risky to try and connect broad up-and-down trends in the economy with changes in infant mortality levels, it has been suggested (Stockwell *et al.*, 1988) that the blurring of the association in 1970, which was also observed in other studies (McMahon *et al.*, 1972; Kitagawa & Hauser, 1973; Antonovsky & Bernstein, 1977; Markides & McFarland, 1982), could be explained in terms of the prevailing socioeconomic environment. That is, during the 1960s maternal and child health care facilities in the United States were expanding, the overall economy was growing fairly rapidly (e.g. median family income was increasing at a rate of about 3% a year), and the nation was engaged in a massive 'War on Poverty' that included a variety of federally funded programmes (e.g. Medicaid and Food Stamps) aimed at enhancing the quality of life of the economically disadvantaged. Although the persistence in 1970 of a markedly higher infant mortality rate for the lowest economic area clearly showed that the beneficial effects of these developments had not fully penetrated the

Table 1. Infant mortality rates, by race, in the income areas of metropolitan Ohio (deaths per 1000 live births): 1960–2000

Income areas	Years				
	1959–61	1969–71	1979–81	1989–91	1999–01
			White		
All areas	22·8	16·5	12·7	9·5	7·1
I (High)	17·7	11·2	8·2	6·7	5·8
II	20·5	17·9	12·8	7·7	6·5
III	25·8	15·7	14·5	10·6	6·8
IV	27·1	18·8	15·6	10·7	10·1
V (Low)	32·4	27·1	17·6	16·2	14·4
Ratio: V/I	1·83	2·42	2·15	2·42	2·48
			Non-white		
All areas	35·6	27·1	22·5	18·1	15·6
I (High)	*	*	14·2	17·8	8·5
II	27·1	29·1	19·6	15·9	11·9
III	25·2	25·6	19·2	17·2	14·8
IV	40·0	25·6	23·0	17·7	16·8
V (Low)	36·8	29·8	26·7	19·7	17·9
Ratio: V/I	—	—	1·88	1·11	2·11
Non-white/white ratio	1·56	1·64	1·77	1·91	2·20

*Fewer than ten deaths; rate not computed.

poorest area, it was equally clear that the level of living improved substantially for many segments of the population and that these improvements were associated with a blurring of the inverse relationship between income status and infant mortality.

By 1980, however, and continuing in both 1990 and 2000, the converging trend was no longer evident. Once again there was a strong and consistent inverse association between white infant mortality rates and economic status across all five income areas. Although all segments experienced significant declines in absolute levels of infant mortality since 1960, the declines were most pronounced among the three wealthiest areas leading to a pattern in 2000 that resembles that prevailing in 1960. In 1980, 1990 and 2000 the white infant mortality rate rose steadily on moving down the income groupings from Area I to Area V. The rate for middle Area III was similar to the total for all areas combined.

Economic trends may again help explain these more recent developments. The return to a pronounced and consistent inverse relationship is perhaps due to the decline in the relative level of living of the lower middle class segments of the population that accompanied the general deterioration of the American economy in the late 1970s and its continued poor performance throughout the 1980s. Moreover, in the 1980s many of the federally funded programmes that provided health care for the poor were reduced (Rogers, 1992). A growing number of physicians refused to accept Medicaid prenatal patients, and many hospitals limited the number of

Medicaid patients they would accept (Cockerham, 1988). Whatever the reason, it is clear that despite marked declines in infant mortality at all income levels since 1960, the nature and magnitude of the pronounced economic differential in white infant mortality did not lessen, but rather increased over time such that the white Area V/Area I ratio was more pronounced in 2000 (2·48) than in 1960 (1·83).

A markedly different experience characterizes non-whites, the vast majority of whom are black. Table 1 shows that the white–non-white differential has widened over the entire period examined. In metropolitan Ohio in 1960 the non-white infant mortality rate was approximately half as high again as that of the white population (1·56), but by 2000 it was more than twice as high (2·20). The pronounced divergence of white and non-white mortality rates since the 1970s has been noted elsewhere (Navarro, 1990; Rogers, 1992), and it corresponds with reductions in federal programmes that provided health services for the poor (Mandinger, 1985; Cockerham, 1988; Rogers, 1992; Hummer *et al.*, 1999), among whom non-whites and other ethnic minority groups are significantly over-represented (e.g. in 2004 the poverty rate for blacks in the United States was 24·7% as compared with 8·6% for whites) (DeNavas-Walt *et al.*, 2005).

In both 1960 and 1970 non-white death rates revealed few systematic differences from one area to another. The rates of the middle areas were blurred and there was no clear relationship for non-whites between economic status and infant mortality.

The 1980 data indicated a more general inverse relationship for non-whites, although it was less apparent and weaker than for whites, as the non-white V/I ratio was 1·88 versus 2·15 for whites. However, this trend was not sustained. More specifically, although the non-white death rates for Areas IV and V declined approximately 25% between 1980 and 1990, the infant mortality rate for the highest income area increased by 25%, thus blurring the inverse association otherwise observed in 1990. Meanwhile, the three middle-income areas had infant mortality rates that were below the rate for all areas combined, as only the lowest income area had an infant mortality rate higher than the overall rate.

The 2000 data reveal a major reversal from the prior decade. Namely, the infant mortality rate for Area I declined over 50% between 1990 and 2000, the largest improvement for any area regardless of race or time. Furthermore, there was a pronounced inverse relationship between non-white economic status and infant mortality. As such, the income status of non-whites became more meaningful as the V/I ratio rose from 1·11 in 1990 to 2·11 in 2000.

The reasons for these changing patterns of association with income levels are not clear. It can be hypothesized that there has been a real improvement in the life chances of some non-whites as a consequence of the major civil rights reforms instituted in the 1960s. In 1960 and 1970, it was apparent that non-white infant mortality rates were high regardless of the income status of the neighbourhood in which they lived. Unlike whites, non-whites, especially middle-class non-whites, did not seem to benefit from living in a higher income area. By 1980, however, some of the health benefits associated with higher income status were beginning to be realized by higher status non-whites, although such benefits were much less apparent than they were for the white population. However, such gains were temporary, as by 1990 the highest income area had regressed significantly, blurring the inverse association that

Table 2. Infant mortality rates, by race, for income areas in a metropolitan aggregate: Ohio, 2000

Income areas	Total	Neonatal	Postneonatal
		White	
All areas	7·1	5·1	2·0
I (High income)	5·8	4·7	1·1
II	6·5	4·7	1·8
III	6·8	4·3	2·5
IV	10·1	6·1	4·0
V (Low income)	14·4	10·9	3·5
Ratio: V/I	2·5	2·4	3·2
		Non-white	
All areas	15·6	10·8	4·8
I (High income)	8·5	6·3	2·2
II	11·9	8·9	3·0
III	14·8	11·1	3·7
IV	16·8	11·3	5·5
V (Low income)	17·9	11·7	6·2
Ratio: V/I	2·1	1·9	2·8
Non-white/white ratio	2·2	2·1	2·4

began to appear in 1980. The worsening infant mortality rate among Area I also meant the income status of non-whites meant less in 1990 that it had in 1980 as the V/I ratio fell from 1·88 to 1·11. Likewise, the stagnation of non-white infant death rates above the lowest economic area during the 1980s suggests that the sluggish American economy of the late 1970s and the 1980s, as well as the reduction in health care programmes, had a significantly greater effect on the life chances of higher status non-whites. Clearly, in 1990 higher status non-whites in the Ohio metropolitan sample did not enjoy the same health benefits that characterized their white counterparts. During the 1990s, however, a significant reversal occurred, such that by 2000 non-whites in the highest income area had experienced a significant reduction in their infant mortality rate. As a consequence, there was a clear and pronounced inverse relationship between non-white economic status and infant mortality. Until this time, non-whites who resided in high-income areas were unable to transform their socioeconomic position into good health in the same way as whites (Williams, 1996, 1997). This pronounced non-white inverse relationship becomes even more apparent when the age and cause patterns revealed by the 2000 six-city data base are examined.

Age patterns, 2000

Table 2 presents white and non-white infant mortality rates, total- and period-specific, for the five income areas in the six-city metropolitan aggregate. The total infant mortality rates suggest three major conclusions. First, non-white infant mortality levels are always more than twice as high as those of whites. For

Table 3. Exogenous and endogenous cause-specific infant mortality rates, by race, for income areas in a metropolitan aggregate: Ohio, 2000

Income areas	Total	Exogenous causes	Endogenous causes	Exogenous proportion of deaths
		White		
All areas	7·1	2·5	4·6	35·2
I (High income)	5·8	1·7	4·1	29·2
II	6·5	2·2	4·3	33·2
III	6·8	2·7	4·1	39·8
IV	10·1	4·3	5·8	42·2
V (Low income)	14·4	5·8	8·6	40·3
Ratio: V/I	2·5	3·4	2·1	1·7
		Non-white		
All areas	15·6	5·9	9·7	37·8
I (High income)	8·5	3·3	5·2	39·1
II	11·9	3·5	8·4	29·5
III	14·8	4·7	10·1	32·0
IV	16·8	6·0	10·8	36·0
V (Low income)	17·9	8·1	9·8	45·2
Ratio: V/I	2·1	2·5	1·9	1·2
Non-white/white ratio	2·2	2·4	2·1	1·1

postneonatal deaths, the type most closely related to socioeconomic factors such as poverty (Gortmaker & Wise, 1997), this ratio rises to 2·40. Second, with respect to the socioeconomic differential, the inverse association is stronger for whites, and this characterization applies to the total, neonatal and postneonatal components of infant mortality. Third, although the general pattern for both white and non-whites is uniform with higher status areas experiencing lower infant mortality levels, this was not the case for white neonatal mortality where a non-linear association is observed.

Cause patterns, 2000

Although a detailed cause-specific analysis by race is not possible, the differences can be explained in terms of the two basic cause groups – the biologically related endogenous causes (e.g. congenital anomalies, complications of labour), and the environmentally related exogenous ones (e.g. pneumonia, infections and parasitic diseases, accidents). The former category includes low birth weight, which was the leading cause of infant mortality in the Ohio metropolitan aggregate, accounting for 24% of the deaths under 1 year of age during the 1999–2001 period. The data in Table 3 show that the non-white rates in metropolitan Ohio are at least twice as high as the corresponding white rates for both exogenous and endogenous cause groups. These results are consistent with national data (National Center for Health Statistics, 2005) and suggest that in addition to the effect of low birth weight an understanding of the persistent infant mortality gap between whites and non-whites needs to focus

on all major causes of death. With respect to white and non-white socioeconomic differentials, there is a strong and consistent inverse association with income status and the environmentally related exogenous death rates. Meanwhile, the association between endogenous death rates and income areas is non-linear for the three highest white income areas, while among non-whites there is a consistent inverse association until arriving at income area V.

For whites the Area V exogenous death rate is nearly three and a half times greater than that of Area I, whereas the Area V endogenous death rate is only slightly more than twice as high as the corresponding Area I death rate. Further, there is a tendency for the exogenous causes to account for a higher percentage of total deaths as income status decreases. Thus despite the much lower absolute death rates, the increased risk of dying as economic status declines is relatively much greater for the environmentally related exogenous causes than it is for the endogenous conditions. Although the inverse association between infant mortality and economic status is more pronounced for conditions that are amenable to societal control, the existence of a fairly consistent and pronounced inverse relationship for the endogenous conditions that account for the vast majority of infant deaths should not be ignored.

A cause-specific analysis reveals that the non-white situation is very different from that of whites. To begin, the non-white percentage attributable to exogenous causes is higher in Area I than in Areas II, III or IV. Only Area V's exogenous fraction was higher. As such, there is no clear pattern to this non-white socioeconomic relationship. Rather, for the exogenous fraction of deaths there appears to be a U-shaped pattern, with the highest death rates occurring in Areas I and V. Endogenous cause rates generally conformed to an inverse relationship, with the exception of income area V where the mortality rate was lower than those of income areas III and IV.

For both the exogenous and endogenous death rates there is more convergence among non-whites than whites. Although an inverse association between infant mortality types and economic status has finally emerged, this finding suggests that in relative terms higher status non-whites continue to benefit less than do whites of the same economic status.

Discussion

Just as the relative mortality differences among socioeconomic status groups have persisted over the years, national statistics show that there has been little if any change in the long-standing white–non-white infant mortality differential. This analysis examining forty years of demographic data reveals that despite substantial declines for both racial groups, a disturbing trend continues. Namely, the infant mortality rate for non-whites continues to increase *vis-à-vis* that of whites, such that in 2000 it was 2·2 times that of the white population. Moreover, this racial differential has increased by more that 40% from 1960 to 2000.

The data presented here also reveal a notable racial difference with respect to the socioeconomic mortality differential in infancy. In contrast to the white population, with the exception of 2000 data, non-whites in metropolitan Ohio have not shown an inverse association between infant mortality and economic status. On the contrary,

there has been relatively little variation in non-white infant mortality rates across the income areas. The general trend analysis based on the three-city data base showed that in 1960 the non-white infant death rate fluctuated erratically from one income area to another; and in 1970, when there was a general converging trend among white middle-income areas, there was little difference in non-white infant mortality rates from one income area to another. In 1980, however, the available data suggested an emerging inverse relationship for non-whites. However, analysis of the seven-city data base showed no clear pattern to the relationship between non-white infant mortality rates and area income levels in metropolitan Ohio for the 1989–91 period. For the 1999–2001 period, however, significant changes were observed, as a clear inverse relationship was noted among non-whites. Although non-whites experience more convergence than whites do for all ages and causes considered, this is the first time that those few non-whites who live in higher income areas were able to systematically benefit from the income status of the neighbourhood in which they live. Still, for every comparison made (i.e. total infant deaths, age at death, and cause-specific death rates) non-white infant mortality rates were higher, regardless of the income status of the neighbourhood in which they lived.

These results raise several important questions that we are unable to answer at the present time, but will attempt to address in the future. Why in 2000 did the inverse relationship between infant mortality and income area finally emerge for non-whites? Will this pattern continue into the future or will it revert back to the almost random pattern of earlier years? These findings emphasize the importance of continuing to study the relationship between infant mortality and socioeconomic status separately for whites and non-whites, or for any other sizeable ethnic group within the study population. For example, the nature of the association between socioeconomic status and infant mortality among Hispanic groups also differs from that of the dominant Anglo population (Levin & Markides, 1985; Smith & Bradshaw, 2006), and there is evidence that certain south-east Asian immigrant groups experience infant mortality levels that are much lower than would be expected on the basis of their socioeconomic characteristics (Rumbaut & Weeks, 1989).

Conclusions

Two important conclusions are to be drawn from this study. The first is that, irrespective of race, little progress has been made in closing the long-standing gaps in infant mortality levels between the more- and less-favoured groups in American society. Instead, these differences have become more pronounced during the forty-year period examined. Furthermore, in metropolitan Ohio, low economic status whites and non-whites experience infant mortality rates that are substantially higher than the rate for the population as a whole. The persistence of such a mortality differential when good health and access to good health care are seen as basic human rights for all citizens, and not just an expensive privilege for those who can afford it, is a serious social problem.

The second major finding is that when considering race, the white–non-white infant mortality differential not only persists, but has continued to widen during the forty-year period considered. This is especially troubling given the billions of dollars

spent during this time to improve the health services provided to Americans. Finding ways to close the status and racial gaps poses major challenges to US society.

The substantial declines in infant mortality across all class and race categories since the 1960s attest to the positive effect of both the general rise in the overall standard of living of the population and the sometimes dramatic advances made in infant care technology (e.g. progress in neonatology and the establishment of neonatal intensive care units in all major metropolitan hospitals); they also reflect the efforts of the Federal Government to extend maternal and child health education and service programmes to the more socially vulnerable groups in the population (Stockwell *et al*., 1987; Moss & Carver, 1998). At the same time, the persistence of long established economic and racial differentials attests to the failure of health facilities and services to penetrate equally throughout all segments of society (Yankauer, 1990). While maintaining existing programmes, there is also a need for increased efforts to see that the benefits reach the socially and economically deprived members of society that are most in need, whereas present social policy seems to be moving in the opposite direction. This has long been recognized by health researchers but now, as national attention continues to focus on the issue of health care in general, it is hoped that it will be more generally accepted by society at large.

However, better medical care alone will not solve the problem (Wise *et al.*, 1988; Hogue & Hargraves, 1993; Williams & Collins, 1995; Polednak, 1996; Gortmaker & Wise, 1997). Medical care alone does not explain why Japan has an infant mortality rate of 3·0 and ranks number three internationally, while the United States ranks 28th with an infant mortality rate of 7·0; this despite the fact that significantly fewer financial resources are spent on hospitals and medical research in Japan. There is an equal need for strategies that extend well beyond the simple provision of perinatal care. Educational efforts must be expanded to reduce the incidence of unhealthy behaviours such as poor eating habits and/or smoking or other drug use during pregnancy (Kleinman & Madans, 1985). This could in part be met by better and more accessible prenatal care. Outreach programmes and other educational efforts aimed at teenagers, and even pre-teens, could also help to instil in young people the importance of health behaviours in general, not merely during pregnancy. Moreover, if such programmes included sex education and family planning they might contribute to a reduction in teenage pregnancy, which is also associated with higher levels of infant mortality because some teenage mothers receive inadequate prenatal care (Geronimus, 1987). In the long run, and as the Japanese experience suggests, the establishment of stronger family support policies, rather than further medical advances, may have the greatest impact on narrowing existing class and race differences in infant mortality.

There has also been a growing awareness among health practitioners of the need to develop policies and programmes that would reduce the effects of poverty, and improve the quality of life experienced by low-income groups (Stockwell *et al*., 1987; Gortmaker & Wise, 1997; Hummer *et al*., 1999). Good prenatal care and better health education are of limited value where there is insufficient money to purchase recommended foods, or where housing conditions are such that infants experience an abnormally high risk of infection.

Socioeconomic factors and racial mortality are closely interrelated; in fact, the former was frequently cited as the major explanation of the latter (Navarro, 1990;

Keil *et al*., 1992); but the extent to which economic factors explain the racial differences is far from clear. Some recent studies have suggested that this social causation hypothesis is valid and that if socioeconomic differences are controlled racial differentials in mortality should diminish (Keil *et al*., 1992; Rogers, 1992). However, this hypothesis may not apply equally to all components of mortality. For example, Hummer (1993) showed that socioeconomic factors are more relevant for explaining the exogenous cause racial mortality differences, whereas maternal health and health care factors are more relevant to differences resulting from endogenous causes.

The data presented in this study also pose a challenge to the social causation explanation. There is of course a problem of ecological correlation with the Ohio data, but they do suggest that race has an independent influence on levels of infant mortality. Other recent studies have also suggested that race exerts a strong independent effect on infant mortality levels, thus emphasizing the need for further research. The challenge for social scientists is to dig deeper, think harder and be more creative in the search for a fuller sociological explanation of racial differences in health.

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