Income Inequality and Mortality in Metropolitan Areas of the United States

ABSTRACT

Objectives. This study examined associations between income inequality and mortality in 282 US metropolitan areas.

Methods. Income inequality measures were calculated from the 1990 US Census. Mortality was calculated from National Center for Health Statistics data and modeled with weighted linear regressions of the log age-adjusted rate.

Results. Excess mortality between metropolitan areas with high and low income inequality ranged from 64.7 to 95.8 deaths per 100 000 depending on the inequality measure. In age-specific analyses, income inequality was most evident for infant mortality and for mortality between ages 15 and 64.

Conclusions. Higher income inequality is associated with increased mortality at all per capita income levels. Areas with high income inequality and low average income had excess mortality of 139.8 deaths per 100 000 compared with areas with low inequality and high income. The magnitude of this mortality difference is comparable to the combined loss of life from lung cancer, diabetes, motor vehicle crashes, human immunodeficiency virus (HIV) infection, suicide, and homicide in 1995. Given the mortality burden associated with income inequality, public and private sector initiatives to reduce economic inequalities should be a high priority. (*Am J Public Health.* 1998; 88:1074–1080)

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Introduction

While a large number of studies have demonstrated that absolute levels of income are related to morbidity and mortality,[1–5] two recent US reports have also shown strong associations between levels of income inequality and mortality, after adjustment for absolute income differences, in the 50 US states.[6,7] These findings suggest that it is not only the absolute amount of income that is important for health, but also the relative disparity with which income is distributed in a population.[8] The hypothesis that the size of the gap between the rich and the poor in a society is importantly related to health is intriguing and deserves further investigation. If relative position in the income distribution is an important determinant of health, then it is possible that more equitable societies may experience better overall levels of health than societies where there is a large gap between the rich and the poor. Examining the extent of income disparity may help us understand why people in countries with low income such as China, Bangladesh, and parts of India[9] have higher survival rates beyond ages 30 to 40 than African Americans living in Harlem, where real incomes are higher.[10]

To date, the small number of studies that have attempted to investigate associations between income inequality and health have largely focused on international comparisons.[11–13] There are many unanswered questions concerning this association,[14] and little is known about how disparities in income distribution affect health within the United States. We investigated the association of income inequality and mortality in metropolitan areas of the United States.[15] Our objectives were to examine whether associations varied according to the measure of income inequality and to gain estimates of the absolute magnitude of the effects of income inequality on mortality.

Methods

Associations between income inequality and mortality were studied in 283 metropolitan areas defined by the Federal Office of Management and Budget and used in the 1990 US Census. Metropolitan areas comprise a core area or city containing a large population nucleus and adjacent communities having a high degree of economic and social integration with the core. Metropolitan areas consist of entire counties, except in New England, where New England county metropolitan areas were used as the units of analysis. In total, 282 US metropolitan areas were included in these analyses (mortality data were not available for Anchorage, Alaska). In 1990, metropolitan area populations ranged from 56 735 for Enid, Okla, to 18 087 251 for New York, NY; the median population was 242 622.

Assessment of Income Inequality

To calculate income distributions, we used information on gross household income from all sources, including government transfers such as Aid to Families with Dependent Children, from the 1990 US Census Summary Tape File STF3C. Income

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distributions were based on the number of households in each of 25 income intervals, the midpoint of each interval, and the aggregate income in and below the top income interval (which is open-ended).

In general terms, measures of income inequality seek to represent the allocation of income in a population. There is no one best method for assessing income inequality,[16,17] so a variety of measures were calculated on the basis of gross income distributions. We included measures commonly used in econometric analyses of income inequality, a measure used in our earlier analyses of US states[6] (income share at the 50th percentile), and income share ratios between the 90th, 50th, and 10th percentiles of the distribution. Preliminary analyses had shown somewhat larger variation in income shares at the bottom of the income distribution than at the top.

The 3 common measures of income inequality used in these analyses were the Gini coefficient, the Atkinson Deprivation Index, and the Theil Entropy Index. Detailed descriptions of their derivation and calculation are available elsewhere.[16] The Gini coefficient is discussed as an example of the logic behind the measurement of income inequality; it provides an overall estimate of income inequality derived from the relationship between cumulative proportions of the population, plotted against cumulative proportions of income. The Gini coefficient is calculated as a ratio of the area between the actual income distribution (the Lorenz curve) and the diagonal to the total area under the diagonal. Higher Gini coefficients mean greater income inequality and range from 0, meaning perfect equality, to 1, perfect inequality of income distribution. Perfectly equal income distribution would be achieved if 10% of the population received 10% of the total income, 20% of the population received 20% of the total income, and so on. If each percentile of the population received the equivalent share of total income, then the Gini coefficient would be 0. However, if only one household in the population received all the income, the Gini coefficient would be 1.

The Atkinson Deprivation Index is based on the ratio of the "equally distributed equivalent" income to the mean of the actual income distribution and incorporates a "social welfare function" that explicitly applies a normative weighting based on society's aversion to inequality.[18] The equation for the Atkinson index (A) is given below:

$$A = 1 - \frac{y_e}{\mu}.$$

In this equation, μ is the mean income in the metropolitan statistical area and y_e is given by the expression

$$y_e = [\sum_{i=1}^{25} p_i y_i^{1-\epsilon}]^{\frac{1}{1-\epsilon}},$$

in which p_i is the proportion of households in the ith income interval, y_i is the average income in the ith interval, ϵ is a parameter that reflects society's preference for equality, and the sum is taken over all 25 income intervals. Consistent with previous research, we used 2 values of this aversion weighting (e = 0.5 and 2.0 to indicate low and high aversion to inequality).[19,20]

The Theil Entropy Index (T) is derived from information theory and likens the dispersion of income shares across the population to the concept of entropy.[21] In this equation, s_j is the share of total income in the jth income decile and the sum is taken over all deciles:

$$T = \sum_{j=1}^{10} [s_j \log(10) + s_j \log(s_j)].$$

In addition to these econometric indicators, we calculated income inequality measures on the basis of shares of total income. These measures related how much of the total income was received by a particular proportion of the population. From our previous study of US states, we used the income share held by the least well-off 50% of the population. A larger share indicates that the bottom half of the population receives more of the total income and suggests lower income inequality in that area.[6] We also calculated the ratio of income share held below the 50th percentile to the share held below the 10th, and the ratio of income share held below the 90th percentile to that below the 10th (higher ratios indicate greater income inequality).

Assessment of Mortality

Mortality information from the National Center for Health Statistics Compressed Mortality Files for 1989 through 1991 was used to calculate mortality rates in each metropolitan area. As mortality information is not routinely available for metropolitan areas, numbers of deaths and populations were aggregated for each county constituting the metropolitan area and were age-adjusted, with the 1990 US population divided into 13 age groups. Average mortality per 100 000 ranged from 642.5 to 1092.9; the average was 849.6. Excess mortality was calculated as the difference in mortality rates between high and low income inequality quartiles and indicates the absolute disease burden associated with differences in income inequality. We believe that absolute measures such as excess mortality are an appropriate yardstick for assessing the importance of income inequalities to population health.[22,23]

Assessment of Covariates

For each metropolitan area, information on median household size, per capita income, and percentage of the population with incomes less than 200% of the federally designated poverty level ($12 674 for a four-person household) was obtained from the 1990 US Census Summary Tape File STF3C. The proportion of the population with incomes less than 200% of poverty is a widely used indicator of the prevalence of low-income households. Preliminary analyses using the proportion of the population in poverty produced almost identical results. Median household size was used to adjust for differences in the number of people supported by the income. Median household size, per capita income, and proportion of the population with incomes less than 200% of poverty were modeled continuously in all analyses except those that are reported in Figure 1, in which per capita income was divided into quartiles and modeled with indicator variables. Preliminary analyses stratified by, and then adjusted for, population and geographic size of the metropolitan area showed no evidence of interaction or confounding (data not shown).

Statistical Methods

Associations between income inequality and mortality were modeled with weighted linear regressions of the log age-adjusted or age-specific mortality rate. The distribution of each inequality measure was divided into quartiles, and indicator variables were used in all analyses, with the first (low) quartile as the reference. Observations were weighted by the reciprocal of the variance of the log mortality rate in each metropolitan area to account for differences in the variance of the rates.[24] Rates based on larger numbers of deaths and smaller variance received higher weighting than those based on smaller numbers. To check that results were robust with regard to the method of modeling, we also analyzed these associations with Poisson regression techniques and unweighted linear regression, and found almost identical results. Because the weighted linear regression technique offers more flexibility in adjustment for covariates, all analyses reported here are based on weighted linear regressions of the log mortality rate.

To calculate absolute mortality in the high and low quartiles of income inequality, we used median values of the covariates to evaluate the linear predictor from the model. These estimates of log mortality rate were then exponentiated to yield absolute mortality rates for each of the income inequality quartiles. The statistical significance of adding income inequality measures to models containing the covariates was tested with a general linear F test with 3 and 276 *df*.[24] Analyses were conducted with the PROC REG procedure in SAS version 6.12 on a Sun workstation.[25]

Results

Table 1 shows medians, ranges, and Pearson correlations for age-adjusted mortality, income inequality measures, per capita income, proportion of the population with incomes less than 200% of poverty, and 1990 population size for the 282 metropolitan areas. Income inequality measures such as the ratio of the income share held below the 90th and 50th percentiles to that held below the 10th had the largest ranges (90th:10th percentile ratio range = 39.48–95.21). The correlations displayed in Table 1 show that associations between the measures of income inequality ranged from $r = 0.55$ for the Theil index and ratio of income share below 50th percentile to income share below 10th percentile to $r = 0.99$ for the Gini coefficient and both the Atkinson ($e = 0.5$) and Theil indices. The income inequality measures were all significantly related to mortality, although the strengths of association differed. The strongest correlations with mortality ($r = 0.52$ and $r = 0.51$) were observed for the ratios of income shares held below the 90th and 50th percentiles to that held below the 10th percentile of the income distribution. Both per capita income and proportion of the population with incomes less than 200% of poverty were modestly associated with mortality ($r = -0.28$ and $r = 0.26$, respectively), but the population size of the metropolitan area was unrelated.

Table 2 shows unadjusted associations between different measures of income inequality and age-adjusted total mortality (model 1), associations adjusted for per capita income and median household size (model 2), and associations adjusted for proportion of the population with incomes less than 200% of poverty and median household size (model 3). Per capita income and proportion with incomes less than 200% of poverty were not modeled together because they were highly correlated ($r = -0.84$). Preliminary analyses showed that models containing both were uninterpretable owing to problems of collinearity. No evidence of interaction was found between income inequality and absolute per capita income (data not shown). Each model presented in Table 2 shows the excess mortality in metropolitan areas in the high-inequality quartile compared with the low-inequality quartile. An F statistic tests the significance of the income inequality measure in each model, and the percentage of

TABLE 1—Pearson Correlation Coefficients for Age-Adjusted Total Mortality, Income Inequality Measures, Per Capita Income, Proportion of the Population with Incomes Less than 200% of Poverty, and Population Size: 282 US Metropolitan Areas, 1990

Variable (Median; Range)	Gini Coefficient	Theil Entropy Index	Atkinson Deprivation Index with $e = 0.5$	Below 50th Percentile Share	50th:10th Percentile Share Ratio	Atkinson Deprivation Index with $e = 2.0$	90th:10th Percentile Share Ratio	Per Capita Income	Proportion < 200% Poverty	Population Size
Age-adjusted total mortality (847.1; 642.5–1092.9)	0.25	0.21	0.27	−0.33	0.51	0.40	0.52	−0.28	0.26	0.05[a]
Gini coefficient (0.42; 0.36–0.50)		0.99	0.99	−0.98	0.58	0.89	0.70	−0.20	0.59	0.12[b]
Theil Entropy Index (0.29; 0.22–0.43)			0.99	−0.96	0.55	0.87	0.67	−0.15[c]	0.56	0.12[d]
Atkinson Deprivation Index with $e = 0.5$ (0.16; 0.12–0.22)				−0.97	0.60	0.90	0.72	−0.20	0.58	0.12[b]
Below 50th percentile share (0.21; 0.15–0.25)					−0.61	−0.90	−0.76	0.30	−0.63	−0.08[e]
50th:10th percentile share ratio (16.79; 11.93–25.80)						0.81	0.97	−0.09[f]	0.27	0.12[b]
Atkinson Deprivation Index with $e = 2.0$ (0.58; 0.47–0.68)							0.88	−0.05[g]	0.39	0.22
90th:10th percentile share ratio (55.4; 39.48–95.21)								−0.20	0.41	0.09[f]
Per capita income (12.93; 6.63–26.16)									−0.84	0.40
Proportion < 200% poverty (32.05; 14.35–69.27)										−0.22

Note. See Methods section of text for explanation of income inequality measures. All *P*'s < .001 unless otherwise noted.

[a] $P = .35$; [b] $P = .05$; [c] $P = .009$; [d] $P = .04$; [e] $P = .18$; [f] $P = .12$; [g] $P = .36$.

TABLE 2—Associations between Income Inequality and Age-Adjusted Total Mortality: 282 US Metropolitan Areas, 1989–1991

Income Inequality Measure[a]	Model 1 (Unadjusted): Excess Mortality per 100 000[b]	F^c	Adjusted R^2	Model 2 (Model 1 + Per Capita Income and Median Household Size): Excess Mortality per 100 000[b]	F^c	Adjusted R^2	Model 3 (Model 1 + Proportion < 200% Poverty and Median Household Size): Excess Mortality per 100 000[b]	F^c	Adjusted R^2
Gini coefficient	64.7	13.1	11.5	64.3	14.0	15.3	61.5	12.3	13.8
Theil Entropy Index	65.3	13.6	11.8	65.0	14.5	15.7	62.2	12.6	14.1
Atkinson Deprivation Index with $e = 0.5$	65.5	17.9	15.3	65.2	18.0	18.4	65.2	16.5	17.2
Below 50th percentile share	71.9	18.7	15.9	70.7	18.7	18.9	69.7	18.4	17.6
50th:10th percentile share ratio	89.4	31.3	24.4	112.2	41.3	32.6	92.8	30.2	26.4
Atkinson Deprivation Index with $e = 2.0$	89.4	28.0	22.4	108.7	38.8	31.4	87.6	26.2	23.9
90th:10th percentile share ratio	95.8	40.1	29.4	116.8	49.9	36.7	97.5	37.1	30.3

[a]See Methods section of text for explanation of income inequality measures.
[b]Excess mortality due to income inequality is calculated as the difference in age-adjusted mortality rates between the lowest and highest quartiles of income inequality.
[c]F statistic tests the overall significance of the income inequality measure in each model. All P's < 001.

variance explained by the full model (adjusted R^2) indicates the overall model fit.

Excess mortality and the R^2 values indicated that the Atkinson Deprivation Index ($e = 2.0$, meaning high aversion to inequality) and income shares held below the 90th and 50th percentiles, compared with the share held below the 10th percentile, had the strongest associations with mortality. However, income inequality was importantly related to mortality regardless of which measure was used and was a statistically significant addition to every model. The unadjusted excess mortality rate difference due to inequality varied from 64.7 per 100 000 when inequality was measured by the Gini coefficient to 95.8 per 100 000 when equality was measured by the ratio of income share held below the 90th percentile to the share held below the 10th percentile. Adjustment for per capita income and median household size in model 2 did not diminish the excess mortality associated with income inequality. Similar patterns were evident with adjustment for median household size and proportion with incomes less than 200% of poverty (model 3).

Table 3 shows associations between the inequality measure with the strongest mortality association—the ratio of income share held below the 90th percentile to the share held below the 10th percentile—and age-specific mortality. Mortality rates were also age-adjusted within each of the age-specific groups, except for infant mortality. Table 3 shows excess mortality due to income inequality, the attributable proportion (interpreted as the excess mortality between high- and low-inequality quartiles as a proportion of the mortality rate in the high-inequality quartile), an F statistic that tests the significance of the income inequality measure, and percentage of variance explained by the model (adjusted R^2).

The effect of income inequality was most evident for infant mortality and mortality in age groups 15 to 34 years and 35 to 64 years. With regard to infant mortality, there were 210.5 excess deaths per 100 000 in the high- compared with the low-inequality metropolitan areas, after adjustment for differences in per capita income and household size. This suggests that in high-inequality metropolitan areas, 19.3% of the elevated infant mortality rate may be associated with the effects of income inequality. For mortality in the 35- to 64-year-old group, the measure of income inequality, per capita income, and median household size explained 46.1% of the variance in total mortality across metropolitan areas.

Figure 1 shows the joint distribution of age-adjusted mortality for quartiles of income inequality (ratio of income share held below the 90th percentile to that held below the 10th percentile) and quartiles of per capita income. The figure is intended to demonstrate the joint effects of these factors on mortality differences between metropolitan areas. Significant mortality effects of income inequality were evident at every level of per capita income. When we compared the most extreme differences in the age-adjusted mortality rate between metropolitan areas with high income inequality and low per capita income (925.7 deaths per 100 000) and areas with low income inequality and high per capita income (785.9 deaths per 100 000), the excess mortality was 139.8 deaths per 100 000.

Discussion

Our findings show that metropolitan areas with high income inequality had significantly greater age-adjusted total mortality than those with low inequality, regardless of which

TABLE 3—Associations between Income Inequality (Ratio of Income Share Held below 90th Percentile to Share Held below 10th Percentile) and Age-Specific Mortality, Adjusted for Per Capita Income and Median Household Size: 282 US Metropolitan Areas, 1989–1991

Age Group, y	Excess Mortality per 100 000[a]	Attributable Proportion[b]	F^c	Variance Explained by Whole Model, %
< 1	210.5	19.3	25.3	21.2
1–14	3.0	8.6	13.7	23.4
15–34	35.0	25.1	49.3	37.7
35–64	132.4	21.3	80.2	46.1
65+	459.9	8.8	18.0	23.3

[a]Excess mortality due to income inequality is calculated as the difference in mortality rates between the lowest and highest quartiles of income inequality, adjusted for per capita income and median household size.
[b]Attributable proportion is calculated as the excess mortality rate divided by the mortality rate in the highest quartile of income inequality.
[c]The F statistic tests the overall significance of the income inequality measure in each age-specific model. All P's < .001.

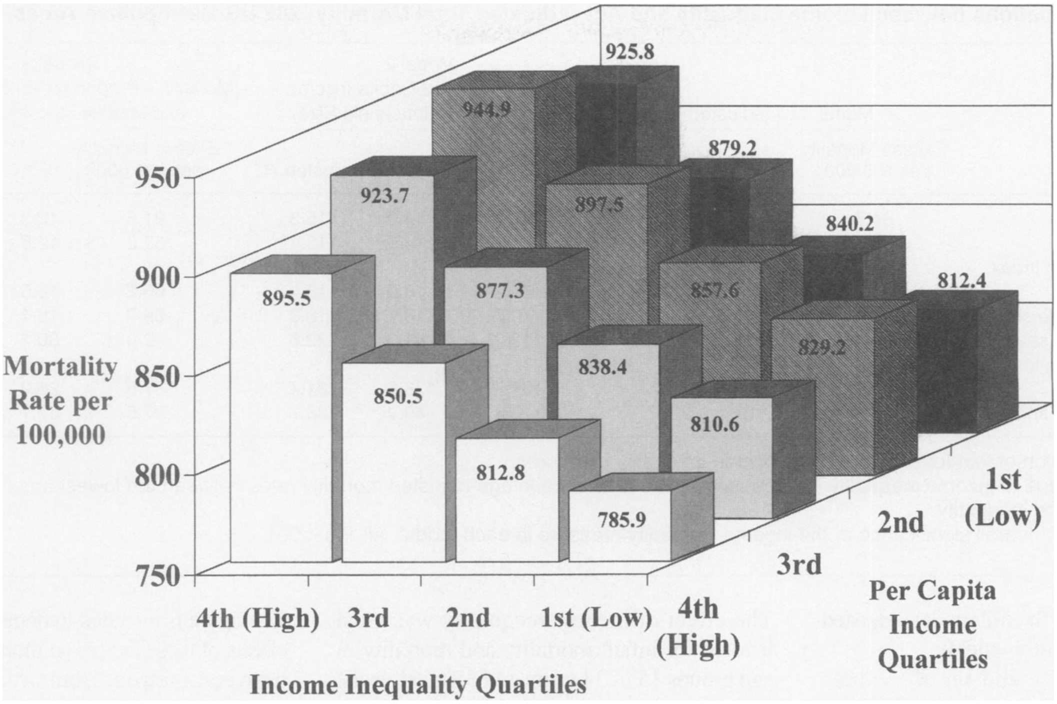

FIGURE 1—Quartiles of income inequality and per capita income, adjusted for median household size, and age-adjusted total mortality (per 100 000): 282 US metropolitan areas, 1989–1991.

measure of inequality was used. The mortality effects of income inequality differed by age, appearing to be concentrated in the age groups birth to 1 year and 15 to 64 years. The weakest effects were observed for deaths between the ages of 1 and 14, where average mortality was low (31.2 deaths per 100 000) and the major cause of death was accidents. The lack of effect of income inequality observed here was consistent with studies that have shown no overall association between individual socioeconomic status and risk of accidents in similar age groups.[26,27] We should also note that we used data from metropolitan areas only, and so our findings do not address the relationship between income inequality and mortality in rural areas.

Associations between income inequality and mortality varied across inequality measures and were strongest for the ratios of income shares held below the 90th and 50th percentiles to that held below the 10th percentile. It is possible that overall inequality measures such as the Gini coefficient are less sensitive to associations with health status, because they have bounded ranges and do not explicitly incorporate variation at the bottom of the income distribution. The associations between different income inequality measures and mortality found in these data are consistent with a study of US states.[19] In addition, the present study was cross-sectional, so future research will have to clarify which measures are best suited to the complex task of examining changes in inequality[28] in regard to mortality.

The levels of inequality calculated here are consistent with those found in other data. Our results for metropolitan areas show a median Gini coefficient of 0.42, while US Census Bureau data show that the national Gini coefficient in 1990 was 0.43.[29] Gini coefficients of this size indicate a relatively high degree of inequality by international standards.[30] The differences among metropolitan areas of the United States in terms of their levels of income inequality are as large as the differences observed among the countries of Europe. The Gini coefficient ranged from 0.36 to 0.50 among US metropolitan areas. While not strictly comparable with our data because they are based on different sources and definitions of income, data from the Luxembourg Income Study showed that Finland, a more equitable country, had a Gini coefficient for earnings inequality of 0.34, compared with Russia's Gini coefficient of 0.55.[31]

These data show that the mortality effects of income inequality were not diminished by adjustment for average per capita income, median household size, or proportion of the population with incomes less than 200% of poverty. This suggests that the elevated mortality observed in metropolitan areas with high income inequality was not due to the fact that these areas had lower average absolute income levels or that they had higher proportions of low-income households. However, we caution against a conclusion that absolute income levels are unimportant to health. As Figure 1 shows, higher per capita income was still significantly associated with lower mortality ($r = -0.21$), although this association was weaker than the effects of income inequality on mortality.

Furthermore, in a recent study of the association between "community income inequality," family income (measured at the individual level), and mortality, adjustment for family income reduced the effect of community income inequality on individual mortality to statistical insignificance.[32] We believe there are important issues in that study concerning the validity of using primary sampling units from a large national study to generate income distributions within local communities and the interpretation of the findings as an ecological fallacy.[32] Nevertheless, the cross-level confounding in those data by family-level income can be interpreted as indicating that areas with higher income inequality tended to have more families with lower incomes. We do not believe this represents an example of ecological fallacy—rather, it may demonstrate one of the mechanisms that link income inequality to individual mortality.

Inequality in the distribution of income should be understood as reflecting structural characteristics of the economy. Macroeconomic forces, such as differential monetary returns on education and skills, wage restraint pressures, and economic returns on capital compared with labor, influence the distribution of income.[33–35] These same forces are partly responsible for allocating low income to some families. Studies examining the cross-level relationships between ecological measures of income inequality, individual measures of income, and health are not tests of the validity of the ecological association between income inequality and health—they are elaborations of that ecological association.[36]

With regard to other potential confounders, metropolitan areas of the United States differ in many characteristics in addition to the extent of income inequality. Assessment of confounding of the association between income inequality and mortality should be based on conceptual models of disease causation that attempt to lay out the precursors and consequences of income inequality and their relationships to health. For example, it may not be appropriate to adjust for differences among metropolitan areas in workforce composition (e.g., numbers of professional, manufacturing, and service sector jobs). These jobs exist before income is allocated to the individuals who hold them, and so the distribution of particular types of jobs across metropolitan areas precedes and partly determines the income distribution of that area.

While these conceptual models remain largely undeveloped, this study showed that associations between income inequality and mortality were not due to differences in the size, population, average household size, per capita income, or proportion of low-income households among US metropolitan areas. Much remains to be understood about which factors act as confounders and which act as potential pathways linking income inequality to mortality. Our earlier research on US states has shown high correlations between income inequality and a variety of social indicators, including violent crime rates, per capita medical care expenditures, proportions of sedentary behavior and smoking, percentage unemployed, educational spending, high school graduation rates, library books per capita, and fifth-grade reading and math scores.[6] It has also been shown that high income inequality may be associated with an undesirable psychosocial climate that directly influences health by affecting levels of social cohesion.[37]

At this stage there is little evidence about how income inequality might be linked to population health, but we propose a hypothesis that has 2 intertwining strands.[14] First, income inequality may be associated with a set of social processes and economic policies that systematically underinvest in physical and social infrastructure (such as education), and this underinvestment may have health consequences. Second, large disparities in income distribution may have direct consequences on people's perceptions of their relative place in the social environment, leading to behavioral and cognitive states that influence health.[38]

By international standards, the United States has some of the highest levels of income inequality in the world.[30] One obvious policy implication of these findings is that serious steps should be taken to reduce income disparities within the United States. The standard political argument against income redistribution is framed in terms of a trade-off between overall economic growth and more equitable distribution of income. This approach is used whether the debate concerns economies of developed or developing countries, and it involves restraining wage increases, cutting social spending, delaying investment in public infrastructure, and abandoning redistribution of social goods to avoid stifling overall growth in the economy. According to this approach, the best way to improve the lot of those at the bottom of the income distribution is to enlarge the size of the economic pie. Evidence is mounting that this strategy of overall economic growth may be relatively ineffective in helping the disadvantaged members of the population and that a rising tide does not lift all boats evenly.[39,40] Between 1979 and 1993, the bottom two-thirds of the population experienced stagnant or declining real incomes, while income inequality reached a 60-year high.[29] Recent evidence suggests that there may be no intrinsic trade-off between long-run efficiency and equity. Policies that promote the accumulation of productive assets across the income spectrum are also important for achieving overall economic growth.[41]

Conclusions

Understanding patterns of population health requires consideration of factors that lie well beyond specification in individuals.[42] Inequitable distribution of income results from the complex interaction of particular economic, historical, and social factors. The size of the gap between rich and poor may be a useful summary indicator of the potential for these economic, historical, and social factors to influence levels of population health. Income inequality should be considered a structural characteristic of the economy, and although disparities in the distribution of income are not measurable in individuals, they may affect disease processes that occur in individuals.

The data shown in Figure 1 suggest that if metropolitan areas with the combination of high income inequality and low per capita income had the age-adjusted total mortality of areas with low inequality and high per capita income, mortality would be reduced by 139.8 deaths per 100 000. To place the magnitude of this difference in some perspective, an appropriate comparison would be that this mortality difference exceeds the combined loss of life from lung cancer, diabetes, motor vehicle crashes, HIV infection, suicide, and homicide in 1995.[43] Given the mortality burden associated with income inequality, business, private, and public sector initiatives to reduce economic inequalities should be a high priority. □

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