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Income inequality and population health

Evidence favouring a negative correlation between income inequality and life expectancy has disappeared

Papers pp 13, 16, 20, 23

In 1992, the *BMJ* published a now famous paper showing a strong negative correlation between income inequality and life expectancy. Among nine Western industrialised countries those which had less income inequality seemed to have higher life expectancy.[1] A few years later this was replicated in analyses looking at income inequality and mortality in states within the United States—analyses which seemed more secure because of having more and better quality data.[2 3] These findings, which suggested that income inequality is bad for the health of the whole population and not only for those with the lowest incomes, were seen to have important implications. Reducing the inequality would be in everyone's interest, including those with higher incomes.

A novel area of research was born, adding new perspectives to conventional studies of health inequalities. These had tended to focus on relations between socioeconomic factors and health of the individual, while the findings on income inequality suggested that contextual effects of inequality might be just as important. Considerable dissent, however, emerged on the explanation of these effects. Some favoured softer psychosocial pathways (for example through feelings of relative deprivation, or disruption of social cohesion) while others favoured harder material pathways (for example through underinvestment in public resources).[4–6] Support was found for some of these mechanisms, which are also important in their own right, and the debate on income inequality versus mortality acted as a strong stimulus for further work on factors such as social cohesion and social capital.[7] Although most of the papers dealt with mortality or life expectancy as measures of the health of the population, results from geographical analyses within the United States suggested possible effects of income inequality on self rated health as well.[8]

All along, however, critical questions were being asked about the quality and interpretation of the data. In an early exchange, serious criticisms of the selection of countries, the quality of the data, and the lack of control for confounding in the *BMJ* paper of 1992 were only half countered.[9 10] Although many aspects of this debate are still unresolved, it has recently become clear that the findings in that paper were an artefact of the selection of countries. Now that good data on income inequality have become available for 16 western industrialised countries, the association between income inequality and life expectancy has disappeared.[11]

This reduces the evidence favouring the correlation of income inequality and mortality almost entirely to analyses of geographical units within the United States. An interesting comparison between the United States and Canada had already shown that this correlation at the level of states exists only in the former, and on the basis of the available evidence we can conclude that the United States is the exception.[12] But even within the United States it is not certain that the association reflects a contextual effect of income inequality on everyone's mortality. It has been shown that the association between income inequality and mortality at the aggregate level could theoretically be the result of a curvilinear relation between the two at the individual level, a finding which would remove the need to postulate a contextual effect.[13 14] This can only be resolved with data on mortality that permit a simultaneous analysis of effects of income on mortality at the individual and aggregate (for example, state) level, and such data are scarce.[15] For self rated health such data are easier to find, and multilevel analyses of the effects of income inequality on self rated health, controlling for the effects of individual income, have produced inconsistent results, but mostly suggest that, at least within the United States, there may be an independent but small effect of income inequality on self rated health.[8 16–19]

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This issue contains four papers which add new elements to this overall picture.[20–23] Osler et al present the results of an analysis of mortality in a small area in Copenhagen, Denmark (p 13), and they use the type of multilevel data that we need to disentangle the effects of income on mortality at the aggregate level from those at the individual level.[20] They find no association between income inequality and mortality after adjustment for individual income and suggest that the Danish welfare state evens out differences in the effect on mortality of income inequality between areas.[20] Another possible explanation is that some of the possible pathways linking income inequality and mortality cannot be expected to operate at this low geographical level. Would individuals feel relatively deprived because of a comparison with others' incomes in the same small area, or because of comparisons within a larger social environment? Would income inequality be associated with underinvestment in public resources within the same small area, or would this mechanism operate on a larger geographical scale? It would be useful to replicate these analyses with different geographical scales, and in different European countries.

Muller shows that most of the correlation between income inequality and mortality at the aggregate level in the United States can be explained away by differences in average levels of formal education (p 23).[21] This is not surprising in itself, because others have shown before that income inequality is strongly and negatively associated with measures of educational achievement in the United States.[2] The main issue is whether we should see educational achievement as a confounder or an intermediary between income inequality and mortality. One could argue that high levels of income inequality, and the associated underinvestment in public resources, might in the long run lead to lower levels of educational achievement. This would then make educational achievement an intermediary on the causal path from income inequality to mortality. On the other hand, it is unlikely that variations at the level of the state in educational achievement are entirely due to variations in income, so confounding may also be involved. We urgently need better conceptual frameworks—with input from economics, education, science, and other disciplines—if we want to make progress based on empirical analyses like this.

Shibuya et al present the results of an interesting study from Japan, where income inequality is reported to have increased substantially over the past decade (p 16).[22] They show that, although income inequality at the level of prefectures is weakly associated with poor or fair self rated health, this is no longer so when individual income is controlled for. Income measured at the individual level is an important determinant of self rated health in Japan and because income inequality is an important determinant of variations in individual income it does not need to have an independent effect to deserve the attention of policymakers.

Finally, Sturm and Gresenz look at the effects of income inequality in the United States on self reported chronic conditions and depressive and anxiety disorder as assessed by clinical screeners (p 20).[23] Again, strong associations exist with individual income, but even without controlling for individual income there are no indications for an effect of income inequality as such.

Overall these papers reinforce the idea that the evidence for a correlation between income inequality and the health of the population is slowly dissipating. There is very little confirmation of such a relation outside the United States. Within the United States it has still to be convincingly demonstrated that it is not due to curvilinear individual level relationships and confounding. This should give no reason for concern—after all, conjecture and refutation are science's core business. In the process, new research avenues have opened and a better understanding of the potential importance of contextual factors for population health has emerged. Most importantly, perhaps, the powerful impact of individual income on mortality has been rediscovered and still demands the urgent attention of policymakers and politicians around the world.

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