Editors

Should we aim to reduce relative or absolute inequalities in mortality?

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Suppose that in country X the mortality rate declines from 100 to 50 among the rich and from 200 to 120 among the poor. This fictitious but realistic example illustrates a fundamental disagreement, because while the decline in mortality will be welcomed by everyone, the resulting change in magnitude of inequalities between rich and poor will not. Some will regret that inequalities have gone up because the rate ratio has increased from 2.0 (200/100) to 2.4 (120/50). Others will rejoice that inequalities have gone down because the rate difference has fallen from 100 (200–100) to 70 (120–50). Such opposing trends for relative and absolute inequalities are quite common, as recent studies of trends in health inequalities in European countries have shown. ¹

The reason why such opposing trends are quite common is the result of a mathematical regularity that is often observed in epidemiology: where and when the background risk of mortality is lower, relative risks of mortality for a particular determinant tend to be higher. This is also true in social epidemiology: relative inequalities by socioeconomic group tend to be higher when average mortality rates are lower.² Although it is not a mathematical necessity—there are empirical examples of lower mortality rates going together with smaller relative inequalities³—the regularity is strong enough to produce many occasions in real life in which a choice has to be made between the two perspectives. But on what grounds to choose between relative and absolute inequalities?

Some of the arguments against relative inequalities are mathematical. One problem with relative measures is that when ratios of mortality go up, ratios of the reverse outcome (survival) will go down, and vice versa, leading to diametrically opposed conclusions.⁴ In the example quoted earlier, suppose that rich and poor groups both have 1000 members. Although the rate ratio of mortality goes up from 2.0 to 2.4, the rate ratio of survival goes down from 1.12 (900/800) to 1.08 (950/880). Are inequalities going up or down? This ambiguity of relative measures does not apply to absolute inequalities, because these are insensitive to such reversals. In the example quoted earlier, the rate differences for mortality and survival are identical, except for a change of sign (100 = 200 – 100 = 800 – 900 and 70 = 120 – 50 = 880 – 950).

On the other hand, one could also mount mathematical arguments against absolute measures of inequality. When overall mortality levels fall, absolute inequalities in mortality will fall as well, without any changes in the socioeconomic distribution of risk or protective factors for mortality. Although this is even less an inevitability than the association between overall levels and relative inequalities—there are many empirical examples of overall levels going down with absolute inequalities going up⁵—it is true that changes in absolute inequalities do not necessarily reflect distributional changes.

Determining whether inequalities are increasing or decreasing is, however, a matter of ethics as well as mathematics. Embedded in quantitative measures of relative and absolute inequalities are value judgements.⁶ Using the rate ratio implies a strictly egalitarian position, in which what matters is equality in itself, independent of other considerations such as the absolute rates of disease for each group. Using the rate difference implies the more pragmatic view that absolute rates matter most for people in lower socioeconomic groups, and that a smaller absolute mortality excess is thus to be preferred even if it goes together with a larger relative mortality excess, as in our numerical example.

In my view, there is a strong case to be made for the ‘Realpolitik’ of aiming to reduce absolute inequalities in mortality. In a context of rapidly declining mortality rates, it is extremely difficult to reduce relative inequalities in mortality. This is not only suggested by the near absence of empirically observed reductions of relative inequalities, ¹ but can also be underpinned by theoretical reasons. A reduction of relative inequalities in mortality requires larger relative reductions in mortality in lower than in higher socioeconomic groups. In our example, mortality among the poor would have to go down by >50% (i.e., the relative decline observed among the rich) to reduce the rate ratio to less than 2.0.

It can easily be seen that even achieving an equal relative decline is very hard. This requires that our intervention reaches equal proportions of people with a lower and higher socioeconomic position, and saves equal proportions of those reached with a lower and higher socioeconomic position—conditions that both are very difficult to fulfil. For a greater relative decline in lower socioeconomic groups one would have to do much more than creating equal reach and equal effectiveness. One would need to create greater reach and/or greater effectiveness among people with a lower socioeconomic position and therefore spend considerably larger efforts on people with a lower socioeconomic position.

Although this is not impossible, it would necessitate a massive shift of resources that has so far not been politically feasible. Should we aim to reduce relative or absolute inequalities in mortality? Well, both if possible, but count your blessings when only absolute inequalities go down.

References