

[The comment below was posted on journalreview.org on February 26, 2010. Following the closing of that site, the comment was posted here in September 2012.]

The importance of distinguishing mortality inequalities from survival inequalities

Cancer outcomes is an area of health inequalities research where researchers sometimes analyze survival inequalities and sometimes analyze mortality inequalities and sometimes talk as if they are analyzing one when they in fact are analyzing the other. The title and some of the language of the study by Hill et al.[1] suggest that the study is analyzing survival inequalities between Maori and non-Maori New Zealanders with colon cancer. But the study actually analyzes inequalities in terms of relative differences in mortality.

Of course, where there are inequalities in mortality there necessarily will be inequalities in survival. And, while the size of a relative inequality will be affected by whether one analyzes survival or mortality, as far as I can tell, the technique the authors employed to adjust for relevant factors should achieve the same proportionate reduction in the relative difference in survival that it does in the relative difference in mortality (though that only holds where adjustment is based on attributing the risk profile of one group to that of the other, not where adjustment is based on attributing a total profile to both groups, as discussed with regard to reductions of relative and absolute differences in my second comment on Lynch et al.[2]). Thus, the significant conclusions of the study seem unaffected by the choice of relative difference.

But there exist several contexts where whether one examines relative differences in mortality or relative differences in survival can have substantial implications. These implications arise from the statistical pattern whereby, solely for reasons related to the shapes of normal risk distributions, the rarer an outcome the greater tends to be the relative difference in experiencing it and the smaller will tends to be the relative difference in avoiding it.[3,4]

For one thing, as medical progress reduces mortality from various cancers, relative difference in mortality will tend to increase while relative differences in survival will tend to decline (allowing, of course, that other factors may outweigh one tendency while enhancing the other) Among a variety of other things, the comparative size of cancer outcome inequalities observed within particular population subgroups or with regard to particular cancers can be much affected by whether one examines relative differences in survival or mortality. See discussion of the latter with respect to a study by Jeffreys et al.,[5] of socioeconomic differences among New Zealanders in cancer survival by cancer type on the Mortality and Survival sub-page of the Scanlan's Rule page of jpscanlan.com.[6]

The key point is not that the relative difference in one outcome is a superior measure to the relative difference in the opposite outcome. Rather, both measures are flawed indicators of the comparative size of the inequalities because both are affected by the overall prevalence of an outcome. All health inequalities research ought to be undertaken with a recognition of these issues and seek to appraise the size of inequalities through measures that are unaffected by the overall prevalence of an outcome.[7,8] Such issues aside, however, researchers should be mindful of the potential implications of measuring inequalities in terms of relative differences in

one outcome rather than relative differences in the opposite outcome and be precise throughout their studies as to which relative difference they are analyzing.

References:

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