Reviewer's report

Title: Redistribution of Heart Failure as the Cause of Death: The Atherosclerosis Risk in Communities Study

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Reviewer: Andrew Moran

Reviewer's report:

Snyder et al. present an excellent analysis that extends recent work on the problem of redistributing ill-defined deaths, particularly heart failure deaths. Many of these analyses have been empiric analyses of coded vital statistics data, and this analysis attempts to ground the methods by comparing with CHD deaths ascertained with standard high quality methods in an established surveillance study.

One complaint with the paper is that the ARIC study only ascertained CHD deaths, but this is a limitation of the original study design. Another complaint is that the investigators did not apply the coarsed exact matching procedure to the ARIC deaths. Are the ICD codes from these death certificates, other than CHD, still available? If so, direct comparison of the CHD proportion using the two methods on the same data would provide a firmer link between the state-level data and the ARIC data.

In the discussion, there is a lack of discussion of the limitations of the ICD system. Do the authors agree that heart failure should not be an UCD? The rationale probably has to do with notion that the designated UCDs are preventable upstream of HF deaths. CHD and hypertension, and other causes, often co-exist in the same HF patient. What do the authors think of the lack of overlap in the one-cause-one-death approach of the ICD?

Abstract:

Instead of “HF is an ill-defined UCD”, state “HF is sometimes incorrectly entered as an UCD”

Delete “to our knowledge”

Change “sex- and race-specific redistribution of deaths and” to “sex- and race-specific redistribution of deaths on”

Background:

Page 5: Need to explain UCD better: state explicitly that HF is considered a mediator between UCD and death

“considered” too weak in para one of page 5—it is a requirement not to use HF as an UCD by ICD rules

State how the ARIC study plays in the analysis on page 6 last para:
“High quality coronary heart disease cause of death ascertainment from the population disease surveillance study of U.S. communities, the ARIC study, was used to assess the accuracy of the coarsened exact method”

Methods:
Reason for excluding age <55? It makes sense but must be stated openly
ARIC classification versus “preferred diagnosis” mentioned in the appendix tables not described

Results:
End of page 11: as above; what is the “preferred clinical classification used by reviewers”?

Discussion:
Page 12: three percent is a “small %, but on a national scale this represents X deaths”
See the major comments above about the need for more discussion of the ICD system and its limitations.

Conclusion:
Should this method be used by government agencies and researchers?
Is further research needed before it is implemented?

Figures:
Need to label Y axis as “percent increase in CHD mort rate” and no need to use (%) twice

Supplement:
Figure A1, A2, A3 would benefit from color coding of states

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:
I have no competing interests