

Avoidable mortality does not allow valid conclusions on population health and health system quality in Western Europe

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Recently, Cherla et al. and Hrzic et al. reported trends in avoidable (cardiovascular) mortality, respectively its impact on life expectancy.^{1,2} We seize this opportunity to fundamentally question the validity of conclusions from “avoidable mortality”.

Avoidable mortality summarizes premature deaths (<75 years) from conditions regarded as avoidable by prevention, or by early diagnosis and high-quality treatment. Avoidable mortality is used to assess effectiveness of prevention and quality of health systems. Conclusions from avoidable mortality rely on the assumption that unambiguous links exist between disease-specific interventions (preventive, diagnostic and therapeutic) and the respective mortality rates.

According to avoidable mortality, prevention effectiveness and quality of care differ greatly in West-Europe – even in countries with high-quality comprehensive healthcare.¹ A reason behind these rather contra-intuitive results is that disease-specific mortality rates do not necessarily reflect a populations’ disease-specific morbidity – especially for cardiovascular diseases.³ This was shown also in an evaluation study to select diseases amenable to health care where mortality trend changes and introduction of diagnostic/therapeutic innovations matched only for colorectal and cervical cancer, and cerebrovascular disease.⁴

Mortality rates for unambiguous causes of death (Fig. 1a and b) more likely provide valid estimates of population morbidity and incidence of (external) causes. If a causal chain leading to death comprises several conditions, the recorded cause of death might not reflect the true underlying morbidity any longer. In Fig. 1c, acute myocardial infarction (AMI) is the underlying (avoidable) cause of death. However, death certification might state ‘coronary heart disease (CHD)’, an avoidable cause of death, or even ‘heart failure’, ‘cardiac arrest’ or ‘unknown cause’, which are ill-defined causes of death and as such non-avoidable.

Even more critical for the validity of conclusions from avoidable mortality is the neglect of multi-morbidity, which is highly prevalent also in ages <75

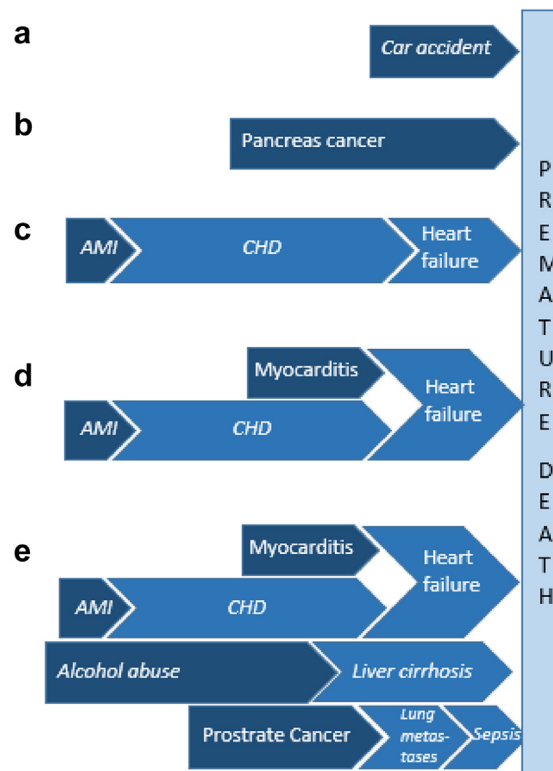


Fig. 1: (a–e) Five causal chains leading to premature death. Conditions initiating a causal chain (dark blue arrows) qualify as underlying cause of death, conditions in italics indicate avoidable causes. In death certification, additionally, other conditions -not present at the time of death- or ill-defined causes could be selected as causes of death. AMI: acute myocardial infarction, CHD: coronary heart disease.

years.⁵ When several causal chains exist (Fig. 1d and e), the highly subjective decision, which (known) condition to enter on a death certificate is affected by national and time-dependent preferences.³ In Fig. 1e, the premature death could be classified equally avoidable or non-avoidable - depending foremost on the certifying



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physician's preferences, without allowing valid inferences on quality of health care.

Disease-specific –especially cardiovascular- mortality rates in uni-causal mortality registries are often non-quantifiably distorted. They cannot reflect disease-specific morbidity, and consequently, cannot reflect changes in morbidity caused by health care innovations.

Non-disease-specific premature mortality and potential years of life lost allow more valid conclusions on population morbidity.

Contributors

Susanne Stolpe initiated, drafted and wrote the letter and designed the figure. Bernd Kowall discussed the content and scope, commented on draft versions and repeatedly reviewed the letter and figure.

Declaration of interests

The authors SSt and BK declare that they have no conflicts of interest.

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References

- 1 Cherla A, Kyriopoulos I, Pearcy P, et al. Trends in avoidable mortality from cardiovascular diseases in the European Union, 1995-2020: a retrospective secondary data analysis. *Lancet Reg Health Eur*. 2024;47:101079. <https://doi.org/10.1016/j.lanepe.2024.101079>.
- 2 Hrzic R, Vogt T. The contribution of avoidable mortality to life expectancy differences and lifespan disparities in the European Union: a population-based study. *Lancet Reg Health Eur*. 2024;46:101042. <https://doi.org/10.1016/j.lanepe.2024.101042>.
- 3 Stolpe S, Kowall B, Stang A. Decline of coronary heart disease mortality is strongly effected by changing patterns of underlying causes of death: an analysis of mortality data from 27 countries of the WHO European region 2000 and 2013. *Eur J Epidemiol*. 2021;36(1):57–68. <https://doi.org/10.1007/s10654-020-00699-0>.
- 4 Mackenbach JP, Hoffmann R, Khoshaba B, et al. Using 'amenable mortality' as indicator of healthcare effectiveness in international comparisons: results of a validation study. *J Epidemiol Community Health*. 2013;67(2):139–146. <https://doi.org/10.1136/jech-2012-201471>.
- 5 Souza DLB, Oliveras-Fabregas A, Minobes-Molina E, de Camargo Cancela M, Galbany-Estragués P, Jerez-Roig J. Trends of multimorbidity in 15 European countries: a population-based study in community-dwelling adults aged 50 and over. *BMC Public Health*. 2021;21(1):76. <https://doi.org/10.1186/s12889-020-10084-x>.