Premature mortality projections to inform clinical practice and public health priorities

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Premature mortality is an indicator of unmet life expectancy and reflects a country's health achievements considering that many of the causes of premature mortality are preventable. Comprehensive, long-term population-based projections of premature mortality are essential to improve clinical practice and our understanding of health systems performance, aiding decisions related to public health priorities. While some studies have reported long-term mortality projections for all causes, the Global Burden of Disease (GBD) study highlighted mortality projections by age, sex and location in 195 countries and territories including Australia.[1] However, their standardised modelling approach and insights into premature mortality have limitations for individual countries.

In *The Lancet Regional Health—Western Pacific*, Luo et al. report findings from a statistical modelling study on trends and future projections of premature mortality in Australia to 2044.[2] Using Australian mortality data, the authors estimate the number of deaths and potential years of life lost (PYLL) due to premature mortality across 59 specific causes. The inclusion of cigarette smoking exposure data allows for the projection of lung cancer deaths. The study found that over the 25 years from 1994 to 2019, the overall age-standardised premature mortality rate declined from 292.1 per 100,000 population to 162.4 (44.4% decline). This decline is projected to slow during 2040–2044 to 141.7 deaths per 100,000 population (12.7% reduction). Despite this decline in mortality rates, the total number of premature deaths is expected to rise by 22.8%, increasing from 272,815 deaths in the period from 2015 to 2019 to 334,894 deaths from 2040 to 2044. This projection implies a staggering 1.58 million premature deaths in Australia over the next 25 years, contributing to a cumulative loss of 24.5 million PYLL. Among the major causes of premature mortality in Australia, cancer is projected to persist as the leading cause by 2044, followed by cardiovascular disease (CVD), external causes including injury, poisoning, and suicide, and lung diseases.

The study by Luo et al. makes an important contribution to the literature showing that the decrease in overall premature mortality rates between 2020 and 2044 will exhibit a more gradual trajectory compared to the declines observed over the preceding 25 years. This observation implies that the benefits derived from established public health interventions implemented during the past two decades may gradually diminish over time. The anticipated surge in absolute numbers of premature deaths will strain healthcare systems and investments such that policymakers will need to contend with the need for increased resource allocation, healthcare infrastructure enhancement, and strategic workforce planning to prevent the projected rise. Moreover, the sustained prominence of cancer and CVD as leading causes of premature mortality necessitates population-wide prevention efforts and targeted interventions. Healthcare practitioners are presented with an opportunity to recalibrate their focus towards proactive preventive measures, emphasising population-wide prevention efforts paired with early detection, and comprehensive treatment strategies. These projections can be used as reference points for assessing the effects of forthcoming interventions and guide clinicians on which high-risk patient groups to prioritise.

A limitation of the study was the lack of analyses by rural-urban regions, socio-economic and indigenous status, concealing disparities in premature mortality that could exist within diverse subpopulations within Australia. As with other modelled studies, projections were contingent upon the assumptions made and did not incorporate potential impacts of past or forthcoming interventions, nor any unforeseen health events, and should therefore be interpreted with caution. Future research should explore presentation by state and territory level and by ethnicity, which is also a limitation of the existing GBD Australia data.[3] Nonetheless, the study's conclusion is clear: despite the ongoing decline in overall premature mortality rates in Australia, the absolute number of premature deaths is anticipated to remain substantial, with cancer and CVD persisting as the primary causes in the years ahead. These projections establish the need for clinicians and public health practitioners to work together in a pluralistic manner involving the community, people at risk of diseases, patients, and policymakers, going beyond the healthcare delivery sector to maximise gains and accrue additional

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benefits than merely reacting to diseases that accrue over the life course.

A critical imperative for Australia is addressing the health vulnerabilities and requirements of disadvantaged, Indigenous Australians and individuals affected by non-communicable diseases (NCDs).[3–5] However, many NCDs and their risk factors in Australia remain undiagnosed and uncontrolled and are often managed in isolation by general practitioners, specialists, and allied health professionals. The findings by Luo et al. hold significant implications for the broader global health agenda, notably aligning with the United Nations Sustainable Development Goal (SDG) 3.4. Aiming to decrease NCD-related premature mortality by one-third between 2015 and 2030. Cao et al. demonstrated that achieving a one-third decrease in NCD-related premature mortality would result in an increase of 0.8 years in global expected life-years lived by individuals aged 30–70 years.[6] Many NCDs share common lifestyle-related risk factors, such as unhealthy diet, physical inactivity, smoking, obesity, hypertension, diabetes, and elevated cholesterol levels. These shared risk factors present opportunities for synergistic approaches that can span across all populations, aiming to promote healthy lifestyles, and enhance comprehensive prevention and management of NCDs.

Evidence suggests that in high-income countries long-term changes in NCD mortality rarely follow a linear trajectory; instead, they exhibit extended periods of gradual decline or occasional increases. In Australia, age-standardised NCD mortality rates for males aged 30–69 years increased by 9% between 1950 and 1970, followed by a substantial decline of 43% from 1970 to 1990. This decline was primarily attributed to effective anti-smoking programs and success in reducing blood pressure and cholesterol levels.[7–9] However, variations in NCD premature mortality exist between men and women due to differences in risk factor prevalence. The higher NCD mortality among men is largely driven by higher smoking rates; however, subsequent declines were more rapid among men.[9] The slowdowns in reducing premature mortality in Australia coupled with increasing difficulty in lowering risk factors below their already low levels, suggests that achieving the SDG target of a one-third reduction in NCD mortality by 2030 may prove more formidable than historical trends imply.

Reducing premature NCD-related mortality through population-wide and targeted risk factor reduction is a priority for Australia. This can be achieved by addressing a few key behavioural risk factors including a healthy diet, reducing weight, adequate sleep, and physical activity.[10] Australia needs to maintain the existing NCD prevention programs, but more of the same programs might not be sufficient with further investment in childhood prevention to limit cumulative negative long-term effects on adults and lift the profile of those who are severely affected, i.e. Indigenous Australians needed. This calls for more advanced prevention 2.0 and innovative approaches, leveraging digital health and artificial intelligence, to enhance disease surveillance, risk assessment, and personalised interventions. Policymakers and practitioners must collaborate to streamline efforts, strengthen public health initiatives, and implement evidence-based interventions to mitigate the impending challenges and optimise opportunities to prevent premature mortality and improve population health outcomes in Australia.

Contributors

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Declaration of interests

We declare no competing interests.

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