Burden of disease scenarios by state in the USA, 2022-50: a forecasting analysis for the Global Burden of Disease Study 2021

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Abstract

Background: The capacity to anticipate future health issues is important for both policy makers and practitioners in the USA, as such insights can facilitate effective planning, investment, and implementation strategies. Forecasting trends in disease and injury burden is not only crucial for policy makers but also garners substantial interest from the general populace and leads to a better-informed public. Through the integration of new data sources, the refinement of methodologies, and the inclusion of additional causes, we have improved our previous forecasting efforts within the scope of the Global Burden of Diseases, Injuries, and Risk Factors Study (GBD) to produce forecasts at the state and national levels for the USA under various possible scenarios.

Methods: We developed a comprehensive framework for forecasting life expectancy, healthy life expectancy (HALE), cause-specific mortality, and disability-adjusted life-years (DALYs) due to 359 causes of disease and injury burden from 2022 to 2050 for the USA and all 50 states and Washington, DC. Using the GBD 2021 Future Health Scenarios modelling framework, we forecasted drivers of disease, demographic drivers, risk factors, temperature and particulate matter, mortality and years of life lost (YLL), population, and non-fatal burden. In addition to a reference scenario (representing the most probable future trajectory), we explored various future scenarios and their potential impacts over the next several decades on human health. These alternative scenarios comprised four risk elimination scenarios (including safer environment, improved behavioural and metabolic risks, improved childhood nutrition and vaccination, and a combined scenario) and three USA-specific scenarios based on risk exposure or attributable burden in the best-performing US states (improved high adult BMI and high fasting plasma glucose [FPG], improved smoking, and improved drug use [encompassing opioids, cocaine, amphetamine, and others]).

Findings: Life expectancy in the USA is projected to increase from 78·3 years (95% uncertainty interval 78·1-78·5) in 2022 to 79·9 years (79·5-80·2) in 2035, and to 80·4 years (79·8-81·0) in 2050 for all sexes combined. This increase is forecasted to be modest compared with that in other countries around the world, resulting in the USA declining in global rank over the 2022-50 forecasted period among the 204 countries and territories in GBD, from 49th to 66th. There is projected to be a decline in female life expectancy in West Virginia between 1990 and 2050, and little change in Arkansas and Oklahoma. Additionally, after 2023, we projected almost no change in female life expectancy in many states, notably in Oklahoma, South Dakota, Utah, Iowa, Maine, and Wisconsin. Female HALE is projected to decline between 1990 and 2050 in 20 states and to remain unchanged in three others. Drug use disorders and low back pain are projected to be the leading Level 3 causes of age-standardised DALYs in 2050. The age-standardised DALY rate due to drug use disorders is projected to increase considerably between 2022 and 2050 (19·5% [6·9-34·1]). Our combined risk elimination scenario shows that

the USA could gain 3·8 additional years (3·6-4·0) of life expectancy and 4·1 additional years (3·9-4·3) of HALE in 2050 versus the reference scenario. Using our USA-specific scenarios, we forecasted that the USA could gain 0·4 additional years (0·3-0·6) of life expectancy and 0·6 additional years (0·5-0·8) of HALE in 2050 under the improved drug use scenario relative to the reference scenario. Life expectancy and HALE are likewise projected to be 0·4-0·5 years higher in 2050 under the improved adult BMI and FPG and improved smoking scenarios compared with the reference scenario. However, the increases in these scenarios would not substantially improve the USA's global ranking in 2050 (from 66th of 204 in life expectancy in the reference scenario to 63rd-64th in each of the three USA-specific scenarios), indicating that the USA's best-performing states are still lagging behind other countries in their rank throughout the forecasted period. Regardless, an estimated 12·4 million (11·3-13·5) deaths could be averted between 2022 and 2050 if the USA were to follow the combined scenario trajectory rather than the reference scenario. There would also be 1·4 million (0·7-2·2) fewer deaths over the 28-year forecasted period with improved adult BMI and FPG, 2·1 million (1·3-2·9) fewer deaths with improved exposure to smoking, and 1·2 million (0·9-1·5) fewer deaths with lower rates of drug use deaths.

Interpretation: Our findings highlight the alarming trajectory of health challenges in the USA, which, if left unaddressed, could lead to a reversal of the health progress made over the past three decades for some US states and a decline in global health standing for all states. The evidence from our alternative scenarios along with other published studies suggests that through collaborative, evidence-based strategies, there are opportunities to change the trajectory of health outcomes in the USA, such as by investing in scientific innovation, health-care access, preventive health care, risk exposure reduction, and education. Our forecasts clearly show that the time to act is now, as the future of the country's health and wellbeing-as well as its prosperity and leadership position in science and innovation-are at stake.

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