The Global Burden of Disease, injuries, and risk factors in 195 countries; Findings from the 2015 Global Burden of Disease, 1990-2015

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Editorial

Introduction: The Global Burden of Disease 2015 (GBD) is a systematic, scientific effort to quantify the comparative magnitude of health loss from all major diseases, injuries, and risk factors by age, sex, and population. We quantified a complete set of health loss metrics with uncertainty for 195 countries and territories, 11 of which—Brazil, China, India, Japan, Kenya, Mexico, KSA, South Africa, Sweden, the United Kingdom, and the United States—were analyzed at the subnational level. In addition to the traditional health metrics such as disease and injury prevalence and incidence, death numbers and rates, GBD provides several metrics to report results on health loss related to specific diseases, injuries and risk factors: Years of Life Lost due to premature mortality (YLLs), prevalence and prevalence rates for sequelae, Years Lived with Disability (YLDs), and Disability-Adjusted Life Years (DALYs). We also report our findings by the Socio-Demographic Index (SDI), developed as a summary measure of overall development based on estimates of Lag Dependent Income per capita (LDI), average educational attainment over age 15 years, and Total Fertility Rate (TFR). Life expectancy increased from 61.7 years (95% uncertainty interval 61.2-62.2) in 1980 to 71.8 years (71.2-72.4) in 2015. However, for some countries, life expectancy did not improve or declined. We did a systematic review of the scientific literature to identify nationally or subnationally representative nutrition surveys providing data on consumption of each dietary factor (appendix). We also searched the Global Health Data Exchange website for nationally or subnationally representative nutrition surveys and household budget surveys. Additionally, for food groups, we used national sales data from Euromonitor and national availability data from United Nations Food and Agriculture Organization food balance sheets. For nutrients, we used data on their national availability from the Global Nutrient Database.20 For sodium, we collected data on 24 h urinary sodium, where available. For trans fat, we used sales data from Euromonitor on hydrogenated vegetable oil. The list of all dietary data sources used in GBD 2017 is publicly available at the Global Health Data Exchange website. For each dietary factor, we computed a data representativeness index as the fraction of countries for which we identified any data on the risk factor exposure Our dietary data were from multiple sources and were affected by different types of biases. We considered 24 h diet recall as the gold standard method for assessing mean intake at the population level and adjusted dietary data from other sources accordingly. We defined the optimal level of intake as the level of risk exposure that minimises the risk from all causes of death. To estimate the optimal intake for each dietary factor, we first calculated the level of intake associated with the lowest risk of mortality from each disease endpoint based on the studies included in the meta-analyses of the dietary relative risks. Then, we calculated the optimal level of intake as the weighted mean of these numbers using the global proportion of deaths from each disease as the weight. To reflect the uncertainty of optimal level of intake, we assumed a uniform uncertainty distribution of 20% above and below the mean. For sodium, the evidence supporting the selection of the optimal level of intake was uncertain. Therefore, we included a uniform distribution of different optimal levels of intake in the uncertainty estimation sampling. To position countries on the development continuum, we used the Socio-demographic Index (SDI), which is a summary measure calculated on the basis of lag-distributed income per capita, mean educational attainment of individuals aged 15 years or older, and total fertility rate among women younger than 25 years. To estimate gaps in intake or excess of intake of individual components of diet, we compared the current intake of each dietary factor with the midpoint of its optimal range of intake (table). High intake of a dietary component refers to an intake level higher than the midpoint of the optimal range of intake, and low intake refers to an intake level lower than the midpoint of the optimal range of intake. To incorporate the uncertainty of parameters (exposure, relative risk, optimal level of intake, and mortality) as well as modelling uncertainty, we followed a Monte Carlo approach. We repeated all calculations 1000 times using one draw of each parameter at each iteration. Using these 1000 draws, we calculated the mean and 95% uncertainty interval (UI) for the final estimates. At the regional level, in 2017, the intake of all healthy foods was lower than the optimal level in all 21 GBD regions (figure 1). The only exceptions were the intake of vegetables in central Asia, seafood omega-3 fatty acids in high-income Asia Pacific, and legumes in the Caribbean, tropical Latin America, south Asia, western sub-Saharan Africa, and eastern sub-Saharan Africa. Among unhealthy food groups, consumption of sodium and sugar-sweetened beverages were higher than the optimal level in nearly every region. Red meat consumption was highest in Australasia, southern Latin America, and tropical Latin America. High-income North America had the highest processed meat intake followed by high-income Asia Pacific and western Europe. The highest intake of trans fats was observed in high-income North America, central Latin America, and Andean Latin America. In 2017, among the world's 20 most populous countries, Egypt had the highest age-standardised rate of all diet-related deaths (552 [95% UI 490–620] deaths per 100 000 population) and DALYs (11 837 [10 525–13 268] DALYs per 100 000 population) and Japan had the lowest rate of all diet-related deaths (97 [89–106)] deaths per 100 000 population) and DALYs (2300 [2099–2513] DALYs per 100 000 population; figure 2). China had the highest age-standardised rates of diet-related cardiovascular disease deaths (299 [275–324] deaths per 100 000 population) and Egypt had the highest DALY rates (10 811 [9577–12 209] DALYs per 100 000 population). China had highest rates of diet-related cancer deaths and DALYs (42 [34–49] deaths per 100 000 population and 889 [744–1036] DALYs per 100 000 population), and Mexico had the highest rates of diet-related type 2 diabetes deaths and DALYs (35 [28–44] deaths per 100 000 population and 1605 [1231–2034] DALYs per 100 000 population). Japan had the lowest rate of diet-related cardiovascular disease deaths and DALYs (69 [63–75] deaths per 100 000 population and 1507 [1389–1639] DALYs per 100 000 population) and diabetes deaths and DALYs (one [1–1] death per 100 000 population and 234 [161–321] DALYs per 100 000 population). Egypt had the lowest rate of diet-related cancer deaths and DALYs (five [4–6] deaths per 100 000 population and 120 [96–146] DALYs per 100 000 population; appendix). The highest age-standardised proportion of all diet-related deaths (30% [27–33]) and DALYs (23% [21–25]) in adults aged 25 years or older were observed in Egypt, and the lowest proportion of all diet-related deaths (11% [9–12]) and DALYs (7% [6–8]) in the same age group were observed in Nigeria (appendix). The highest proportions of diet-related cardiovascular disease deaths and DALYs in 2017 were observed in Pakistan (60% [95% UI 57–64] of deaths and 66% [62–69] of DALYs), cancer deaths and DALYs in China (16% [13–18] of deaths and 15% [13–17] of DALYs), and type 2 diabetes deaths and DALYs in the USA (41% [34–49] of deaths and 50% [43–58] of DALYs). The lowest proportions of cardiovascular disease deaths and DALYs were seen in Turkey (42% [38–47] of deaths and 44% [40–49] of DALYs), cancer deaths and DALYs in Egypt (4% [3–4] of deaths and 3% [3–4] of DALYs), and type 2 diabetes deaths and DALYs in Bangladesh (25% [17–34] of deaths and 34% [23–45] of DALYs)

Biography: Ali H Mokdad, PhD is the Director of Middle Eastern Initiatives and Professor of Global Health at the Institute for Health Metrics and Evaluation at the University of Washington. He started his career at the US Centers for Disease Control and Prevention (CDC) in 1990. He has published more than 350 articles and numerous reports and received several awards, including the Global Health Achievement Award for his work in Banda Aceh after the tsunami, the Department of Health and Human Services Honor Award for his work on flu monitoring, and the Shepard Award for outstanding scientific contribution to public health.

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