

EDITORIAL

Understanding subnational burden of diseases for better health policy decision making in Ethiopia

Messay Hailu¹, Awoke Misganaw^{1,2*}, Mohsen Naghavi², Christopher J. L. Murray², Lia Tadesse³

Ethiopia has been progressing on key health indicators, but the conflicts and war coupled with drought and emergency conditions, and the COVID-19 pandemic could negatively affect progress (1). This special issue has highlighted substantial health gains from specific diseases and conditions over the past three decades, as well as the disparities between regions and chartered cities, and the opportunity to reduce this burden of premature mortality and disability by addressing specific diseases, risk factors, and social determinants of health. We have identified and ranked potential priorities for action that would reduce the total burden of diseases and provide relevant support for specific regions and chartered cities.

The Ethiopian subnational burden of diseases analysis has been a comprehensive and collaborative scientific effort by the National Data Management and Analytics Center for health (NDMC) under Ethiopian Public Health Institute (EPHI) and the Institute for Health Metrics and Evaluation (IHME, University of Washington). The staff at NDMC (<https://ndmc.ephi.gov.et/>) and a collaborator network of more than 700 Global Burden of Diseases (GBD) Experts have involved in the national and subnational burden of diseases estimation for Ethiopia as part of the 2019 GBD study (2). We provided estimates for Ethiopia's nine regions and two chartered cities from 1990 to 2019. Sidama and South-West Ethiopian Peoples' regional states were reported under Southern Nations Nationalities and Peoples' (SNNP) regional state. To map population for Ethiopia in the 2007, 1994, and 1984 censuses (3–5); we used mainly district (called “woreda”) level mapping. The woreda structure was relatively stable over census years compared to other structures during the political changes between 1980 and 2017 (6).

We have summarized the GBD study methods and techniques, including references for the full GBD methods elsewhere (6). The 2019 GBD study used all available data sources and applied spatiotemporal Gaussian process regression, cause of death ensemble model, Bayesian meta-regression tool, DisMod-MR

2.1, and other models to generate fertility, incidence, prevalence, mortality, cause of death, and disability rates due to 369 diseases and injuries, attributable to 87 risk factors, and over 3,000 disease sequels. We gathered 1,057 distinct data sources for Ethiopia and all regions and cities that included censuses, demographic surveillances, household surveys, disease registries, health services utilization, disease notifications, and other data for this analysis. We estimated the Socio-demographic index (SDI), total fertility rate (TFR), life expectancy, years of life lost (YLL), years lived with disability (YLDs), disability-adjusted life-years (DALYs), and risk-factor attributable to health loss with their corresponding 95% uncertainty intervals (UIs) for Ethiopia's nine regions and two chartered cities from 1990 to 2019. The YLLs are years lost due to premature mortality and calculated by subtracting the age at death from the longest possible life expectancy for a person at that age. Years lived with disability is measured by taking the prevalence of the condition multiplied by the disability weight for that condition. The DALYs are the sum of YLLs and YLDs for each age, sex, location, and year. The risk factor attribution estimations followed the general framework established for comparative risk assessment. The SDI is the geometric mean of 0 to 1 indices of the total fertility rate younger than 25 years, the mean education for those aged 15 years and older, and lag distributed income per person.

In conclusion, this special issue has covered the burden of major public health challenges of Ethiopia that include tuberculosis, malnutrition, malaria, diarrheal diseases, household air pollution, adolescent health, mental health, non-communicable diseases and others to highlight the progress and disparities at national and subnational levels to support policy and practice in Ethiopia. The studies' findings have revealed that although the premature mortality, long-term disability, and total burden due to specific diseases have all shown improvements over the past three decades, premature mortality from both communicable and non-communicable diseases are still high in the most parts of Ethiopia. Therefore, we believe that detailed

¹. Ethiopian Public Health Institute, Ethiopia

². Institute for Health Metrics and Evaluation, University of Washington, USA

³. Ministry of Health, Ethiopia

*Corresponding author_Email: awoket@uw.edu or asterawoke2007@gmail.com

findings from each study could inform health programs, health transformation plans and strategies, essential health service and insurance packages, and the progress towards universal health coverage targets (7–9). This special issue has also highlighted the need for further research, and the importance of generating quality data for better evidence and data-driven health policy decision-making, potential use for training, and design appropriate interventions.

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