

Health disparities across the counties of Kenya and implications for policy makers, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016



Tom Achoki, Molly K Miller-Petrie, Scott D Glenn, Nikhila Kalra, Abaleng Lesego, Gladwell K Gathecha, Uzma Alam, Helen W Kiarie, Isabella Wanjiku Maina, Ifedayo M O Adetifa, Hellen C Barsosio, Tizta Tilahun Degfie, Peter Njenga Keiyoro, Daniel N Kiirithio, Yohannes Kinfu, Damaris K Kinyoki, James M Kisia, Varsha Sarah Krish, Abraham K Lagat, Meghan D Mooney, Wilkister Nyaora Moturi, Charles Richard James Newton, Josephine W Ngunjiri, Molly R Nixon, David O Soti, Steven Van De Vijver, Gerald Yonga, Simon I Hay, Christopher J L Murray, Mohsen Naghavi



Summary

Background The Global Burden of Diseases, Injuries, and Risk Factors Study (GBD) 2016 provided comprehensive estimates of health loss globally. Decision makers in Kenya can use GBD subnational data to target health interventions and address county-level variation in the burden of disease.

Methods We used GBD 2016 estimates of life expectancy at birth, healthy life expectancy, all-cause and cause-specific mortality, years of life lost, years lived with disability, disability-adjusted life-years, and risk factors to analyse health by age and sex at the national and county levels in Kenya from 1990 to 2016.

Findings The national all-cause mortality rate decreased from 850.3 (95% uncertainty interval [UI] 829.8–871.1) deaths per 100 000 in 1990 to 579.0 (562.1–596.0) deaths per 100 000 in 2016. Under-5 mortality declined from 95.4 (95% UI 90.1–101.3) deaths per 1000 livebirths in 1990 to 43.4 (36.9–51.2) deaths per 1000 livebirths in 2016, and maternal mortality fell from 315.7 (242.9–399.4) deaths per 100 000 in 1990 to 257.6 (195.1–335.3) deaths per 100 000 in 2016, with steeper declines after 2006 and heterogeneously across counties. Life expectancy at birth increased by 5.4 (95% UI 3.7–7.2) years, with higher gains in females than males in all but ten counties. Unsafe water, sanitation, and handwashing, unsafe sex, and malnutrition were the leading national risk factors in 2016.

Interpretation Health outcomes have improved in Kenya since 2006. The burden of communicable diseases decreased but continues to predominate the total disease burden in 2016, whereas the non-communicable disease burden increased. Health gains varied strikingly across counties, indicating targeted approaches for health policy are necessary.

Funding Bill & Melinda Gates Foundation.

Copyright © 2018 The Author(s). Published by Elsevier Ltd. This is an Open Access article under the CC BY 4.0 license.

Introduction

The Government of Kenya prioritises health as a strategic sector in its national development agenda. In the national long-term development policy, outlined in *Kenya Vision 2030*,¹ the government commits to making strategic investments in health service provision to improve the quality of life of its population. Further commitments are elaborated in *Kenya Health Policy 2014–2030*,² which aims to achieve universal health coverage by scaling up priority health services to populations in need. In 2013, Kenya devolved health services to 47 semi-autonomous counties established in response to the new constitution of 2010, increasing local autonomy for managing health services.^{3,4} These and other national policies underscore the need to address existing health inequalities as a pathway towards more rapid and sustainable progress.^{5,6}

Kenya has made progress in tackling various health challenges, particularly those linked to priority communicable diseases.^{7,8} Declines in diarrhoea, lower respiratory infections, and vaccine-preventable diseases have occurred alongside decreasing maternal and neonatal mortality, although mortality rates remain comparatively high and unequal across counties.^{7,9,10} The Kenya Expanded Programme on Immunization endorses childhood vaccination for tuberculosis, polio, diphtheria, whooping cough, tetanus, measles, hepatitis B, *Haemophilus influenzae* type b, pneumococcus, and rotavirus.¹¹ Kenya has among the highest rates of HIV/AIDS and tuberculosis in the world, although mortality rates have declined since the early 2000s, particularly for HIV/AIDS.^{12,13} Malaria mortality in children declined substantially between 2003 and 2007,^{14,15} although reports indicate increasing incidence

Lancet Glob Health 2019; 7: e81–95

Published Online

October 25, 2018

[http://dx.doi.org/10.1016/S2214-109X\(18\)30472-8](http://dx.doi.org/10.1016/S2214-109X(18)30472-8)

S2214-109X(18)30472-8

See [Comment](#) page e8

Sloan Management, Massachusetts Institute of Technology, Cambridge, MA, USA (T Achoki PhD); Center for Pharmaceutical Policy and Regulation, Utrecht University, Utrecht, Netherlands (T Achoki); Institute for Health Metrics and Evaluation (M K Miller-Petrie MSc, S D Glenn MSc, N Kalra DPhil, D K Kinyoki PhD, V S Krish BA, M D Mooney BS, M R Nixon PhD, Prof S I Hay FMedSci, Prof C J L Murray DPhil, Prof M Naghavi MD), Department of Health Metrics Sciences (Prof S I Hay, Prof C J L Murray, Prof M Naghavi), University of Washington, Seattle, WA, USA; Strategic Information and Learning, University of Research Company, Gaborone, Botswana (A Lesego MIHMEP); Policy, Planning, and Healthcare Financing Department (I W Maina MPH), Ministry of Health (G K Gathecha MS, H W Kiarie MS), Nairobi, Kenya; International Center for Humanitarian Affairs, Nairobi, Kenya (U Alam PhD); Institute of Tropical Medicine, Jomo Kenyatta University of Agriculture and Technology, Nairobi, Kenya (I W Maina); Department of Infectious Disease Epidemiology, London School of Hygiene & Tropical Medicine, London, UK (I M O Adetifa PhD); Epidemiology and Demography Department (I M O Adetifa) and Malaria Branch (H C Barsosio MSc),