



Non-communicable diseases surveillance: overview of magnitude and determinants in Kenya from STEPwise approach survey of 2015

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Background

Disease surveillance is a scientifically and legally established hallmark of population health whose goal is systematically collecting, interpreting and disseminating data to target and monitor interventions to reduce disease morbidity and mortality [1–5]. However, data is often either lacking or of low quality especially in low- and- middle-income countries (LMICs). For example, more than half of global deaths for 2015 did not have an established cause [6]. The Global Burden of Disease (GBD), the largest descriptive epidemiological study, show low rates of data quality for most LMICs during 1980–2016 [777

factors shared among the major NCDs – tobacco use, harmful consumption of alcohol, unhealthy diet, and physical inactivity – are all highly modifiable to prevent nearly half of premature NCD deaths [30–33].

Among LMIC regions, sub-Saharan Africa (SSA) faces the greatest challenge from NCDs that could pose the next ‘poverty trap’ [34]. While carrying the largest burden of major communicable diseases such as malaria, HIV/AIDS, tuberculosis, and neglected tropical diseases (NTDs) [35–38], the subcontinent is also undergoing critical epidemiological, demographic and socio-economic transformations including nutrition transitions that are resulting in a rise in NCDs such as cancer, hypertension, obesity and diabetes as earlier predicted [29, 39–44]. An ageing and increasing population with

factors for NCDs based on national household expenditure and health utilization data [70]. Key risk factors to NCDs were socio-economic (income, education levels), health systems (e.g., distance to health facilities, cost of care), adverse social interactions in area of residence (e.g., availability and consumption of alcohol and smoking and influencing behavioural factors), and biological factors (e.g., age and gender) [70]. The STEPS has allowed a deeper and more comprehensive understanding of the national NCDs risk-factor profile.

Overview of methods for the Kenya STEPS

The STEPS Kenya 2015 survey was a national cross-sectional household survey conducted between April and June 2015. It was designed to provide estimates for indicators on risk factors for NCDs for persons aged 18–69 years with a sample size of 6,000 individuals to allow national estimates by sex (male and female) and residence (urban and rural areas). Using a three-stage sampling, 200 clusters (100 urban and 100 rural) were selected in stage one, followed by a uniform selection of 30 households in each cluster in stage two, and in stage three one adult aged 18–69 years was randomly selected from each household, with a household defined as people who eat and live together, and approached for the survey. The survey used the fifth National Sample Surveys and Evaluation Programme (NASSEP V) master sample frame that is developed and maintained by Kenya National Bureau of Statistics. The stratified probability proportional to size sampling methodology was developed using 96,251 Enumeration Areas (EAs) generated from the 2009 Kenya Population and Housing Census to form 5,360 clusters split into four equal sub-samples [62]. National sampling frames are necessary for disease surveillance at the household level and evolve over time to reflect population and administrative changes [71]. The Kenya STEPS thus uses the most recent frame (NASSEP V) which was also used in the latest DHS.

The survey used the modular expanded STEPS collecting demographic and behavioural information (step 1), physical measurements (step 2) and biochemical measures (step 3) [60]. After providing informed consent, the participants were interviewed on the four main behavioural risk factors of NCDs (tobacco use, harmful use of alcohol, unhealthy diets, and physical inactivity), and measurements for key biological risk factors for NCDs (overweight and obesity derived from height and weight and central obesity derived from waist and hip circumference, blood pressure and fasting blood glucose, triglyceride, and cholesterol levels) were also taken. The survey was administered using a Personal Digital Assistant (PDA) loaded with the WHO eSTEPS software. Data collection took place during a two-month period (April–

June) in 2015. Complete details of the sample design, methodology and questionnaire are provided in the formal report published by the Ministry of Health [72].

distribution and economic activity. For example, physical inactivity in the STEPS was only 7.7% compared with that in other higher income-level countries like South Africa (44.7%) and Swaziland (49.1%) and the global prevalence of 31% [75]. Without strong culturally miti-

countries over time are able to generate surveillance data for major established and emerging NCDs in their population. Kenya could use a similar approach in future STEPS or similar surveys, to expand the scope of traditional NCD risk factors to lipid disorders including expanding the assessment of diabetes beyond a fasting glucose level that is likely to underestimate the prevalence, to collect data on neglected NCDs like epilepsy and mental health, and on emerging and novel risk factors. This should ideally go in parallel with efforts to develop and maintain complementary data sources, which in the long term, will equip the country with a comprehensive surveillance system for NCDs. With such a pragmatic policy prescription for NCD surveillance, the country also need to step up provision of services for prevention and treatment of NCDs in and outside the health system in line with national and global goals. Ultimately, for Kenya and countries across Africa the path to longer and healthier lives to 2030 [99], and beyond, requires understanding disease profiles matched by the right interventions.

Abbreviations

APHR: African Population and Health Research Centre; ART: antiretroviral treatment; BMI: Body mass index; CDIA: Chronic Disease Initiative for Africa; CHANCES: Consortium on Health and Ageing Network of Cohorts in Europe and the United States; CMNN: communicable, maternal, neonatal, and nutritional conditions; CVD: Cardiovascular diseases; DALYs: disability-adjusted life-years; DHS: Demographic and Health Survey; EAs: Enumeration Areas; FCTC: Framework Convention for Tobacco Control; GATHER: Guidelines for Accurate and Transparent Health Estimates Reporting; GATS: Global Adult Tobacco Survey; GBD: Global Burden of Disease; GSHS: Global school-based student health survey; GTS: Global Tobacco Survey; HALE: healthy life expectancy; HDL: High-density lipoproteins; HDSS: Health and Demographic Surveillance System; HED: heavy episodic drinking; IDSR: Integrated Disease Surveillance and Response; KDHS: Kenya Demographic and Health Survey; KEPH: Kenya Essential Package of Health; KNBS: Kenya National Bureau of Statistics; LICs: low-income countries; LMICS: Low- and middle-income countries; NAS-SEP V: National Sample Surveys and Evaluation Programme; NCDs: Non-communicable diseases; NTDs: neglected tropical diseases; PCA: principal component analysis; PDA: Personal digital assistant; SARAM: Kenya Service Availability and Readiness Assessment Mapping; SDGs: Sustainable Development Goals; SSA: Sub-Saharan Africa; STEPS: WHO STEPwise approach to Surveillance (of NCD risk factors); WHO: World Health Organization

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