

Spatial Disparities in Disability Prevalence at the District Level in Sub-Saharan African Countries

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By

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Introduction

Developing countries continue to experience a relatively high burden of both infectious and non-communicable diseases (1). In terms of disability, the World Health Organization (WHO) estimates that 80% of the world's population living with some form of disability resides in developing countries and that the highest prevalence of disability among individuals below age 60 years is observed in sub-Saharan Africa (2). Evidence from developed regions indicates that people living with disabilities tend to face more adverse economic conditions than others (3), suggesting that persons with disabilities in sub-Saharan Africa may be particularly vulnerable. Yet, knowledge of disability remains limited in the region (2). This is partly due to the lack of robust and comparable measurements of disability. Good measurement is a prerequisite for robust analyses and efficient actions. This is particularly crucial for disability because it is an umbrella term usually employed to designate different aspects of the four components of the disablement process framework: pathology, impairment, functional limitation, and socio-economic participation restriction (4,5). In addition, the term can be culturally dependent and tainted with stigma, leading to potential misreporting (6). In Sub-Saharan Africa, sub-national and comparable estimates of disability prevalence are limited. Where they are available, they are usually either at the level 1 sub-national administrative division (regions) or are local and non-representative (7,8). However, these sub-regional estimates have proven important for planning for other public health issues like HIV (9) or malnutrition (10).

To address the gap of comparable measurement, the Washington Group on Disability Statistics (WG), under the aegis of the United Nations Statistical Division, developed a 'culturally neutral' disability screening tool known as the WG short set of questions (11). This tool is being integrated into national surveys and data is becoming increasingly available, thus opening a new window for international analysis of disability that will help prevent, compensate, and support the participation of people with disabilities.

This paper aims to use mainly these comparable sources of data to estimate and construct an atlas of sub-regional disability prevalence rates. This is particularly timely, as Sustainable Development Goal 10 (SDG-10) emphasizes reducing inequalities and leaving no one behind, especially individuals living with disabilities, by 2030.

Method

The data from the Demographic and Health Surveys (DHS), which utilized the WG tool to measure disability, will be used for our analysis. This is because the WG tool provides non-modelled and comparable data on disability that aligns with the International Classification of Functioning (ICF) framework of the WHO (12). It assesses limitations among individuals aged 5 years and older across six functional domains and basic actions – seeing, hearing, walking, cognition, communication and self-care. To date, the screening tool has been integrated into the disability module of the DHS in the following African countries: Kenya (2022), Malawi (2016), Mali (2018), Mauritania (2019), Mozambique (2022), Nigeria (2018), Rwanda (2019), Senegal (2018-2019), South Africa (2016), Tanzania (2022) and Uganda (2016), enabling multi-country analyses of disability.

The DHS are household-based, two-stage cluster, cross-sectional, and standardized surveys collected by The DHS Program, with data publicly available upon request. In most countries, the DHS provide robust indicators at the first subnational administrative division (regions); however, it is rarely possible to achieve greater granularity due to sample size limitations (13), particularly for relatively rare events such as disability.

Given their importance in policymaking and development planning, we will use the Small Area Estimation (SAE) method to estimate disability prevalence rates at sub-regional levels (the second or third administrative subdivisions within countries). The principle of SAE methods is to ‘borrow strength’ from other data sources to produce reliable estimates for small geographical areas.

Different SAE methods exist. Traditional design-based methods use information outside the survey data (e.g., from censuses) to borrow strength and improve the reliability of direct estimates. However, a challenge is that censuses in many African countries can be quite outdated. Other SAE methods borrow strength from within the targeted survey itself, such as the nearest-neighbor SAE method proposed by Ren (13), or the recent model proposed by Martin and Camarda, which borrows strength across age and space to produce robust estimates involving rare events such as deaths in small areas (14).

In this paper, we will first apply traditional design-based SAE techniques to adjust direct estimates of disability prevalence at the second or third administrative subdivisions within countries. We will then use the nearest-neighbor approaches for a robustness check. To provide a comprehensive view of disability, the atlas will also present prevalence by sex, age group, and type of functional limitations.

The preliminary results presented in the following section of this abstract pertain solely to youth in Malawi.

Expected results

Figure 1 presents preliminary results of direct estimates of disability prevalence among youth (10-17 years) in Malawi. In 2016, a total of 26,194 youths were interviewed, of whom 3,593 reported at least one functional limitation, as assessed by the WG tool, resulting in a disability

prevalence of 14% (CI = 14%-15%). This prevalence varies from 12% (CI = 10%-13%) in the Northern region to 15% (CI = 14%-16%) in the Southern region of the country (Figure 1-a). Direct estimates of prevalence by district (Figure 1-b) reveal that national and regional estimates mask subnational heterogeneities. For example, some districts, such as Mchinji in the Central region—despite having a mid-level regional disability prevalence—actually exhibit one of the highest disability prevalence rates in the country (~20%, CI = 17%-24%). Conversely, Zomba city district in the Southern region—despite having the highest regional disability prevalence—is among the districts with the lowest prevalence (~8%, CI = 5%-12%). The wide confidence intervals (CIs) for these latter estimates are due to small sample sizes, highlighting the need for more advanced techniques to produce more robust estimates in smaller areas. Although these direct estimates require adjustment using small area estimation techniques, this result underscores the importance of analyzing disability prevalence beyond the first subnational administrative division.

We expect to find significant heterogeneity in both national and subnational disability prevalence across the 11 countries included in this study. Our results will provide policymakers with a valuable tool to effectively target administrative areas with urgent needs for prevention, inclusion, and social action for people with disabilities. For researchers, the atlas of comparable disability prevalence will serve as a foundational step in examining and explaining the spatial distribution of disability both across and within countries.

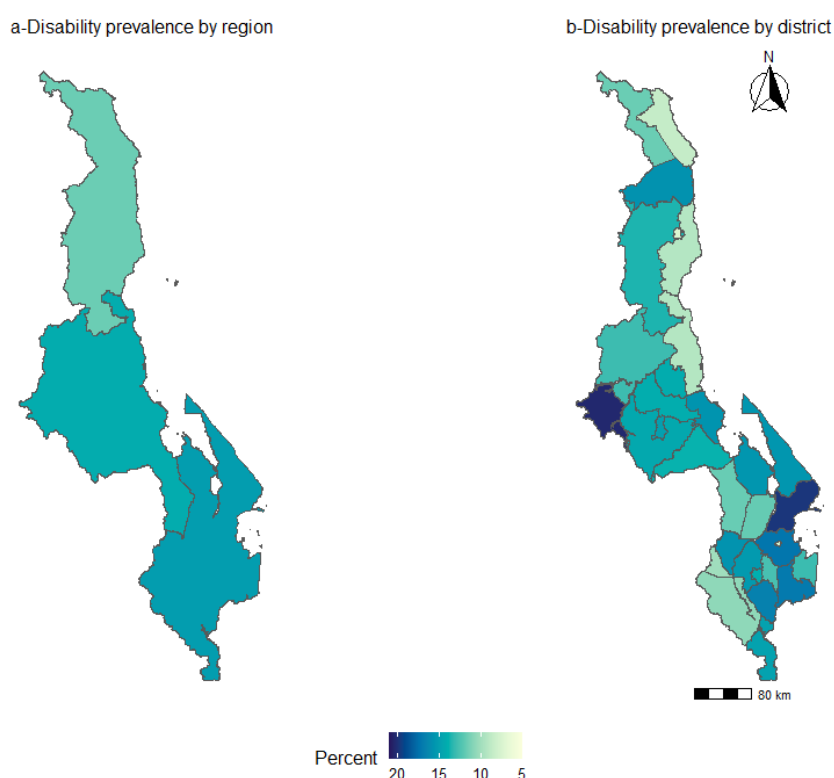


Figure 1: Direct estimates of prevalence of disability among individuals aged 10-17 years old by region and districts in Malawi (2016)

Note: Estimates are weighted using DHS provided weights.

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