

BMJ Open Mapping social determinants of health data in sub-Saharan Africa: a scoping review protocol

Felix Emeka Anyiam ¹, Jessica Gjonaj ², Ngeresa Antony Osango,³
Richard Mugo ³, Peace Aber,⁴ Jasmit Shah,⁵ Judith Mangeni,⁶
Rajesh Vedanthan ^{2,7}, Joseph W Hogan,⁸ Ann Mwangi,^{3,9} Rumi Chunara ^{10,11}

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ABSTRACT

Introduction Research has increasingly underscored the impact of factors such as socioeconomic status, education, healthcare access, housing and environmental conditions in shaping population health outcomes. These factors, collectively called social determinants of health (SDOH), provide crucial context for understanding drivers of health outcomes. In sub-Saharan Africa (SSA), the study of SDOH is critical due to the region's unique sociocultural and economic conditions. Understanding how SDOH interacts with health systems and capturing SDOH in data is crucial for informing modelling efforts and policies improving population health more effectively. This scoping review aims to map the types of data used to capture SDOH in research conducted in SSA, to identify research gaps and to summarise key findings.

Methods This scoping review will follow the Arksey and O'Malley methodological framework, enhanced by Levac *et al*, providing best practices for identifying, selecting and analysing eligible studies. Key steps include (1) identifying the research question, (2) identifying relevant studies, (3) selecting eligible studies via a locally curated search, (4) extracting information, (5) collating, summarising and reporting results and (6) consultation with stakeholders.

Ethics and dissemination Ethical approval is not required, as this review relies solely on published literature. Findings will be disseminated across academic channels (journals, conferences) and through targeted stakeholder engagement efforts, such as policy briefs and public health workshops, to reach policymakers, healthcare practitioners and community health organisations. This dissemination strategy aims to inform health policy and drive programme development in SSA.

INTRODUCTION

Social determinants of health (SDOH) significantly influence health outcomes, particularly in sub-Saharan Africa (SSA), where disparities in income, education and healthcare access persist. Evidence syntheses based in the USA, informed by broader international literature, suggest that clinical care accounts for a relatively small proportion of variation in health outcomes (around 20%), while social determinants of health contribute

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ Broad search criteria used to ensure higher quality data capture.
- ⇒ Long time span covered by the inclusion criteria to capture relevant changes.
- ⇒ Limited to English language, which may exclude relevant non-English research.
- ⇒ Variability in research availability and quality across sub-Saharan Africa countries may affect depth and generalisability of findings.

substantially more, often estimated at up to 50%.¹ While country-specific estimates for SSA remain limited, research from Demographic and Health Surveys data has shown that socioeconomic factors, such as wealth status and maternal education, account for huge variances in maternal health service utilisation across SSA countries.² Young women in the richest wealth quintile are 2.03 times more likely to attend antenatal care, 5.80 times more likely to have skilled birth attendance and 1.24 times more likely to receive postnatal care compared with those in the poorest quintile, highlighting the socioeconomic disparities in maternal health services across the region.² Similarly, maternal and paternal education account for significant variations in child mortality, with global estimates showing that maternal education alone reduces under-5 mortality by up to 31% and each additional year of schooling is associated with a 3.04% decline, trends that are also observed in SSA.³ Studying the impact of these determinants on health is essential for a principled understanding of the root causes of the region's health challenges.

Despite the well-documented impact of SDOH, obtaining reliable and comprehensive data in SSA remains a challenge. Unlike traditional health metrics derived from clinical records, SDOH data require



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For numbered affiliations see end of article.

Correspondence to

Jessica Gjonaj;
jessica.gjonaj@nyulangone.org

multisectoral collection efforts spanning economic, social and environmental domains.⁴ To avoid inconsistencies, the need for standardisation of SDOH indicators in national surveys has also been highlighted.⁵ Emerging research has demonstrated the potential of data science and machine learning in measuring SDOH; for instance, satellite imagery has been used to assess poverty and health risks, with models trained on 40% of India's population predicting 16 well-being indicators from Landsat 7 imagery.⁶ However, SSA still faces barriers such as limited technological infrastructure, funding constraints and gaps in cross-sectoral data integration, making SDOH data harder to obtain in this region, as compared with traditional health metrics.⁴

Even though sourcing SDOH data in the past couple of decades has become a much wider practice, challenges do remain in making sure that this data is made widely available for researchers, physicians and scientists to use. A more recent study looking at the availability of SDOH data in Kenya and the Philippines suggested that although both countries have made expansive efforts to collect more SDOH data—whether that be through governmental bodies or private institutions—these sources are limited due to various constraints such as poor analysis infrastructure and lack of standardised indicators.⁷ A structured review will help identify the types of SDOH data currently available, highlight gaps in data collection and assess the methodological approaches used in measuring these determinants. Another review of data available for use by palliative cancer care professionals in Nigeria, Uganda and Zimbabwe highlights that issues in data collection, storage/support gaps and opportunities for data use are the most critical factors to address when deciding how to guide future development of SDOH data usage.⁸

This scoping review aims to provide a systematic mapping of SDOH data in SSA, facilitating more effective data utilisation for policy and intervention development. By consolidating disparate data sources, this review will enhance the ability of researchers and policymakers to leverage SDOH data for targeted public health strategies, ultimately contributing to health equity and improved population health outcomes in SSA.

METHODS AND ANALYSIS

Protocol design

Our scoping review will adopt the Arksey and O'Malley⁹ methodological framework and be refined by Levac *et al*,¹⁰ ensuring the rigour of our study selection and analysis process. We will use a six-stage approach covering initial research question identification, study selection, data charting, result collation and stakeholder consultation. The review will not be registered with PROSPERO, as it focuses specifically on scoping reviews and will follow the Preferred Reporting Items for Systematic Review and Meta-Analysis extension for Scoping Reviews (PRISMA-ScR) checklist for systematic review protocols.^{11 12}

Table 1 PICOT framework for SDOH data in SSA

Criteria	Determinants
P—Population	Research studies focused on populations within SSA, with a particular emphasis on diverse demographics, including age groups, gender, socioeconomic status and vulnerable or marginalised communities.
I—Interest/Issue	Types of data used to capture SDOH, such as income, education, housing, healthcare access, employment, social support and environmental factors, were examined in relation to their influence on health outcomes within SSA.
C—Comparison	No direct comparison group. However, differences may be observed across subregions, countries or specific demographic groups within SSA to highlight disparities in SDOH and health outcomes.
O—Outcomes	A comprehensive understanding of the types of data used to capture SDOH in SSA health research, including insights into how these data influence morbidity and mortality within the region.
T—Timeline	2000–2024
SDOH, social determinants of health; SSA, sub-Saharan Africa.	

Stage 1: identifying the research question

The primary research question guiding this scoping review is: 'What types of data are used to capture social determinants of health in research studies conducted within sub-Saharan Africa?'

This question seeks to map out the types of data used for SDOH in research in SSA, including their sources, how they are generated and what types of SDOH they cover.

To structure this inquiry, we apply the PICOT framework (table 1), a standardised approach used in evidence-based health research to define key aspects of a study's focus.¹³ The PICOT framework (Population, Intervention/Issue, Comparison, Outcomes and Timeline) helps ensure a systematic and comprehensive approach to identifying relevant studies by clearly outlining inclusion parameters.

Stage 2: identifying relevant studies

To capture the full scope of research on SDOH in SSA, a strategically focused search strategy will be employed to ensure both breadth and feasibility. The search will be conducted in four key electronic databases: PubMed (MEDLINE), Embase, CINAHL and Global Health (CABI). These databases were selected for their strong relevance to health and social science research, as well as their comprehensive coverage of global and regional literature. PubMed will provide access to peer-reviewed biomedical and public health studies, while Embase will

help capture additional international journals and conference proceedings not indexed in PubMed. CINAHL will contribute literature from nursing and allied health disciplines, which are particularly relevant to understanding community-level health determinants. Global Health (CABI) will enhance the search by focusing on public health issues in low- and middle-income countries, including SSA.

To supplement peer-reviewed sources, grey literature will be searched through trusted repositories, including the WHO Global Index Medicus, which aggregates regional health databases with a focus on SSA. Additional grey literature will be identified through targeted searches of relevant government health agencies and policy documents. This refined search strategy is designed to ensure the identification of both scholarly and practice-based evidence while maintaining a manageable scope.

Keywords* and Medical Subject Headings terms will be selected to comprehensively address SDOH and SSA. These terms will include phrases such as 'social determinants of health', 'health disparities', 'sub-Saharan Africa', 'socioeconomic factors' and specific determinants like 'education', 'income inequality', 'environmental health' and 'access to healthcare'. Importantly, this will involve considering contextual SDOH terms specific to the SSA region. For example, when considering income or employment, it is important to factor in the different types of employment people would have in the region (eg, self-employment as agricultural workers or full-time employment at an academic institution). The search will be designed to capture studies addressing both specific SDOH factors and their cumulative impact on health outcomes across various SSA contexts. Accordingly, the keyword list will be developed with input from local experts, iteratively refined within each SDOH category, until no new terms emerge and thematic saturation is reached. Our full search query can be seen in online supplemental appendix 2 located in supplemental materials.

To enhance the robustness of the search, reference lists of all included studies will be reviewed to identify additional sources that may have been missed in the initial search. This backward citation tracking will help ensure that relevant studies, particularly those that may be less widely indexed, are captured in the review. This multi-layered approach aims to establish a comprehensive and representative evidence base for understanding data used to represent SDOH in SSA.

*See online supplemental appendix 1 for an illustrative list of keywords.

Stage 3: study selection of eligible studies

Eligibility criteria for this scoping review will centre on studies that specifically address SDOH within SSA and have been published from the year 2000 to 2024. This time frame allows for assessing research trends over the past two decades, capturing both long-standing and emerging SDOH issues affecting health outcomes in SSA.

The selection process will involve two independent reviewers who will initially screen the titles and abstracts of all identified studies to determine their relevance based on predefined inclusion and exclusion criteria. Studies meeting the initial criteria will undergo a full-text review to assess their comprehensive focus on SDOH in SSA. Any discrepancies between reviewers regarding study eligibility will be discussed and, if unresolved, referred to a third reviewer for final determination, ensuring consistency and rigour in study selection.

To ensure clarity and consistency in identifying SDOH variables, this review will adopt established frameworks that define and categorise SDOH. Specifically, the WHO's Conceptual Framework on SDOH will be used, as it provides a structured approach to identifying upstream and downstream determinants that influence health outcomes. The WHO framework categorises SDOH into two broad domains. The first domain, Structural Determinants, refers to the broader social and economic context that shapes an individual's or population's socioeconomic position. The second domain, Intermediary Determinants, encompasses individual and community-level factors that directly influence health outcomes.

In addition to the WHO framework, this review will also refer to the Commission on Social Determinants of Health model, which emphasises equity and health disparities by linking structural and intermediary determinants. This model is particularly relevant for SSA, where systemic inequities continue to shape health outcomes at multiple levels.¹⁴

Application in study selection

The full-text review phase will assess whether studies explicitly examine SDOH based on these frameworks. Studies that do not analyse variables aligned with the WHO-defined SDOH categories will be excluded. To ensure systematic classification, the data extraction form (table 2) will include a section for categorising each SDOH variable based on these frameworks. A PRISMA flow diagram will be used to document each stage of the selection process, including the number of studies screened, excluded and included. This approach will enhance transparency and reproducibility, providing a clear audit trail of decisions made during study selection. By applying a structured, multistep review process, this stage aims to ensure that only relevant, high-quality studies are included in the scoping review.

Inclusion criteria

1. The study was conducted in SSA or included participants from SSA.
2. The study will examine at least one of the following SDOH variables, based on the definition of SDOH by the WHO Conceptual Framework on SDOH:
 - a. Socioeconomic factors: income, employment, education, financial security.
 - b. Demographic and social identity factors: age, gender, race/ethnicity, marital status, social class.

Table 2 Data charting form

Field	Description
1. Lead author	The primary author of the study, allowing for easy reference and citation.
2. Year of publication	The publication year to track the progression of data on SDOH over time.
3. Title of study	The full title provides context and clarity on the study's focus.
4. Aim of study	The primary objectives or research questions the study aims to address. Specify whether SDOH is the primary exposure, outcome or an adjusted variable in the study.
5. Study design	The research methodology used (eg, cross-sectional, longitudinal, qualitative) to assess study rigour and approach.
6. Setting/country	The geographical location within SSA to identify regional patterns and context-specific findings.
7. First/last author's institution locations	The geographical locations of the institutions associated with the first and last study authors to identify trends in research contributions.
8. Sample size and population	The number and characteristics of participants in the study, including socio-demographics such as age, gender and socioeconomic status.
9. Key social determinants identified	Specific SDOH examined in the study, such as income, education, housing or access to healthcare.
10. Types of data used to measure SDOH	The medium (eg, surveys, administrative data, qualitative interviews) used to capture each SDOH variable.
11. Tools/methods for measuring SDOH	The specific tools, indices, validated scales or methods used to assess SDOH. For example, using mobility data from mobile phones.
12. GRADE assessment	Completeness, representativeness, temporal relevance, origin and governance, and potential for misclassification or measurement error.
13. Study outcomes related to SDOH	Key health outcomes discussed in relation to SDOH, highlighting which health outcomes SDOH are being studied with respect to.

Continued

Table 2 Continued

Field	Description
14. Recommendations from the study	Suggestions provided by the study for addressing or improving SDOH data in SSA.
GRADE, Grading of Recommendations Assessment, Development and Evaluation; SDOH, social determinants of health; SSA, sub-Saharan Africa.	

- Health system access and utilisation: healthcare access, affordability, quality and insurance.
 - Environmental and living conditions: housing, sanitation, air pollution, urban/rural context.
 - Social and community support: social cohesion, discrimination, peer/family support.
 - Behavioural and psychosocial factors: food security, substance use, mental health, stress.
- The study was published in English between 1 January 2000 and 31 December 2024.

Exclusion criteria

Studies will be excluded if they meet any of the following criteria:

- Studies not conducted in SSA or did not include participants from SSA.
- Studies where full-text articles are unavailable for review.
- Studies that do not examine SDOH.
- Studies published in languages other than English or outside the time frame of 2000–2024.

Stage 4: extracting the information

To systematically organise and analyse the information, a structured extraction form will be developed. This form will capture relevant details from each eligible study, enabling a comprehensive and consistent review of the data used in the literature on SDOH in SSA. By using a standardised approach to extracting and organising information, this stage will facilitate the quantitative and qualitative synthesis of the evidence, helping to identify patterns, trends and gaps in data used in the existing literature.

In line with emerging recommendations for scoping reviews that focus on data sources, we will adapt selected principles from the Grading of Recommendations Assessment, Development and Evaluation framework to descriptively assess key attributes of each data source. These include completeness (eg, extent of missingness or population coverage), representativeness (eg, demographic and geographical inclusivity), temporal relevance (eg, data recency and update frequency), origin and governance (eg, source credibility—government, academic, non-governmental organisation (NGO) or commercial) and potential for misclassification or measurement error. No sources will be excluded based on these criteria.¹⁵

Stage 5: collating, summarising and reporting the results

The extracted data will undergo a thematic analysis to synthesise the findings on SDOH in SSA. This analysis will focus on identifying overarching themes, emerging trends, research gaps and significant findings related to the types of data used to capture SDOH in the region. This will provide a structured understanding of how SDOH influences health disparities within SSA.

RESULTS PRESENTATION

Narrative summaries will provide detailed descriptions of key themes and patterns observed in the literature, while tables and charts will be used to display quantitative data, distribution of studies by region, frequency of each determinant studied and any identified associations between specific determinants and health outcomes. Additionally, visual mapping of research gaps will highlight areas where further investigation is needed, supporting targeted future research initiatives.

Thematic categories

To structure the thematic analysis, data will be categorised according to the WHO Conceptual Framework on SDOH, which distinguishes between structural determinants that shape health inequities and intermediary determinants that directly impact health outcomes. The following thematic categories will guide the synthesis of findings:

- ▶ Structural determinants of health inequities: These encompass socioeconomic and political factors, including education, income, employment, social class, governance and public policies that influence health equity in SSA.
- ▶ Intermediary determinants of health: This includes material circumstances (eg, housing, food security, environmental conditions), psychosocial factors (eg, stress, discrimination, social support), behavioural factors (eg, nutrition, substance use, physical activity) and healthcare access and quality.
- ▶ Impact of SDOH on health outcomes: Identifying how specific SDOH factors contribute to health disparities, morbidity and mortality in different populations.
- ▶ Contextual factors influencing SDOH: Examining social cohesion, political stability, cultural influences and historical inequities that shape the distribution of SDOH in SSA.
- ▶ Research gaps and future directions: Identifying understudied determinants, unexamined population groups and limitations in existing data that need further exploration.

Stage 6: consultation

To ensure the relevance and applicability of the review findings, key stakeholders in health policy, programme implementation and research in SSA will be consulted. These will include representatives from government health agencies, multilateral organisations (eg, WHO,

UNICEF), academic institutions, NGOs and healthcare practitioners. Consultations will be conducted through virtual meetings, stakeholder interviews and review workshops, allowing experts to validate findings, provide contextual insights and identify practical applications for policy and programme development. This engagement will help ensure that the review contributes to evidence-based decision-making on SDOH in SSA.

Ethics and dissemination

Ethical approval is not required as this is a scoping review of published literature. Dissemination will target both academic and public health audiences, aiming to impact health policy and programming in SSA. Engagement with local stakeholders will play a critical role in this process.

Patient and public involvement

To ensure transparency, we acknowledge that patients and the public were not involved in any aspect of this research, including its design, implementation, reporting or dissemination. However, this review includes contributions from scientists and researchers from different parts of SSA, ensuring that the study is informed by regional expertise and perspectives on SDOH. While no individuals were directly interviewed, the engagement of SSA-based researchers strengthens the contextual relevance and applicability of the findings.

DISCUSSION

This scoping review protocol outlines a systematic approach to mapping the existing literature on SDOH in SSA. By following a structured framework, this protocol is designed to ensure comprehensive coverage and consistency in identifying and synthesising research that explores how social, economic and environmental factors affect health outcomes in SSA. The significance of conducting this scoping review lies in its potential to consolidate diverse findings on the types of data used to capture SDOH in SSA, which can illuminate patterns and trends across the region while also identifying underexplored determinants and research gaps.

Previous studies on SDOH have underscored the importance of factors such as income, education and healthcare access in influencing health disparities; however, there is a need for a broader synthesis to understand the full range of social determinants and the types of data used to measure them in this context. A key contribution of this scoping review will be to provide a foundational understanding of SDOH data research trends in SSA, which can inform future studies and guide the development of targeted public health policies and interventions on SDOH, as well as provide direction for researchers and stakeholders interested in addressing health inequalities in SSA.

The protocol's reliance on Arksey and O'Malley's framework, enhanced by Levac *et al*, ensures rigour through each stage, from study selection to data charting and synthesis. The inclusion of stakeholder consultation will further

strengthen the review's relevance by validating findings and aligning them with SSA's policy and programme needs. This consultation will involve government health, multilateral organisations, academic and research institutions, NGOs working on health equity and frontline healthcare practitioners. Engaging these stakeholders will help translate the findings into actionable recommendations, ensuring their applicability to policy development, health system planning and programme implementation across SSA.

While this protocol aims to ensure a comprehensive review, certain limitations should be noted. The restriction to English-language studies may introduce language bias, potentially omitting relevant research published in other languages. Additionally, variations in data quality across SSA countries may affect the depth of analysis and the ability to generalise findings. In line with current methodological guidance from the Joanna Briggs Institute and the PRISMA-ScR checklist, a formal risk of bias or methodological quality assessment of individual studies will not be necessary. This decision aligns with the exploratory nature of scoping reviews, which do not typically involve synthesis of findings at the outcome level or critical appraisal to exclude studies.

Despite these limitations, this scoping review is particularly timely, given the growing recognition of SDOH as critical drivers of health outcomes in global and regional health research. The review will consolidate knowledge on the types of data being used to assess SDOH in SSA, shedding light on emerging data sources such as geospatial analysis, mobile phone mobility data and integrated health information systems. Finally, by identifying gaps in SDOH data, this review will help guide future research priorities, ensuring that health interventions are better aligned with the structural and intermediary factors shaping population health in the region.

Author affiliations

¹Health Sciences, Durban University of Technology, Durban, South Africa

²Section for Global Health, Institute for Excellence in Health Equity, NYU Langone Health, New York, New York, USA

³Academic Model Providing Access to Healthcare, Eldoret, Uasin Gishu County, Kenya

⁴Elizabeth Glaser Pediatric AIDS Foundation, Washington, District of Columbia, USA

⁵Internal Medicine, Aga Khan University Hospital, Nairobi, Nairobi, Kenya

⁶Epidemiology and Medical Statistics, School of Public Health, Moi University, Eldoret, Uasin Gishu County, Kenya

⁷Department of Population Health, NYU Langone Health, New York, New York, USA

⁸School of Public Health, Brown University, Providence, Rhode Island, USA

⁹School of Science and Aerospace Studies, Moi University School of Medicine, Eldoret, Central, Kenya

¹⁰School of Global Public Health, New York University, New York, New York, USA

¹¹New York University Tandon School of Engineering, New York, New York, USA

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ORCID iDs

Felix Emeka Anyiam <https://orcid.org/0000-0003-2774-7406>

Jessica Gjonaj <https://orcid.org/0009-0001-9454-9349>

Richard Mugo <https://orcid.org/0000-0001-6046-7217>

Rajesh Vedanthan <https://orcid.org/0000-0001-7138-2382>

Rumi Chunara <https://orcid.org/0000-0002-5346-7259>

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