

BMJ Open Mapping evidence of community health workers delivering physical rehabilitation services in sub-Saharan Africa: a scoping review protocol

Miriam Mapulanga ^{1,2}, Thembelihle Dlungwane²

To cite: Mapulanga M, Dlungwane T. Mapping evidence of community health workers delivering physical rehabilitation services in sub-Saharan Africa: a scoping review protocol. *BMJ Open* 2022;**12**:e053736. doi:10.1136/bmjopen-2021-053736

► Prepublication history for this paper is available online. To view these files, please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2021-053736>).

Received 21 May 2021
Accepted 13 February 2022



© Author(s) (or their employer(s)) 2022. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ.

¹School of Medicine and Health Sciences, Department of Public Health, University of Lusaka, Lusaka, Zambia

²School of Nursing and Public Health, University of Kwazulu-Natal College of Health Sciences, Durban, KZN, South Africa

Correspondence to

Miriam Mapulanga;
mapulanga2002@yahoo.com

ABSTRACT

Introduction Sub-Saharan Africa (SSA) is one of the low-income regions in the world which is affected by the critical shortage of human resources for health amid a high disease burden, including physical disability. Community health workers are viewed as the possible solution to increase population access to health services, including rehabilitation at the community level. The purpose of this scoping review is to map the evidence and scope of physical rehabilitation services delivered by community health workers in SSA.

Methods and analysis The framework by Arksey and O'Malley will be used to guide the scoping review protocol. Database searching will be conducted using PubMed, Scopus, Cochrane Central and databases within the EBSCOhost platform. Other sources of literature will include reference lists, conference presentations and publications on organisational websites such as WHO, Ministries of Health, and Non-governmental Organisations in SSA. The screening will be guided by the inclusion and exclusion criteria. Thematic content analysis aided by NVivo V.12 will be done to present the narrative account of the review. The Mixed Methods Appraisal Tool version 2018 will be used to evaluate the methodological quality of the studies.

Ethics and dissemination The review is part of a larger study that has received ethical clearance. The result will be disseminated using print and electronic media.

INTRODUCTION

Rehabilitation is a set of interventions to address impairments or activity limitations and participation restrictions, as well as personal and environmental factors that have an impact on functioning.¹ Physical rehabilitation, is the restoration, maintenance and promotion of optimal human physical function.² Besides, physical rehabilitation aims to optimise the functioning of the affected persons; and encompasses specific health services that people may require regarding disability, including diagnosis, treatment, surgery, assistive devices and therapy.¹ The need for physical rehabilitation services is increasing due to changes in demographic

Strengths and limitations of this study

- This will be the first scoping review on community health workers' delivery of physical rehabilitation service in sub-Saharan Africa.
- The review will include literature from 1978 onwards to capture both the current context and the dynamic nature of this topic.
- The use of the Mixed Methods Appraisal Tool to appraise the methodological quality of the studies ensures a clear and updated methodological and transparent process that can be replicated.
- The inclusion of both peer-reviewed and grey literature addressing the research topic is a strength.
- The review will not exclude any literature based on language which is a potential strength.

trends leading to the increase in chronic health conditions, thereby dramatically increasing the number of people with disabilities.³ The demand for physical rehabilitation services is due to a 66.2% increase in the years lived with disability (YLD) from 1990 to 2017 with more than 5.1 million YLDs per year but evidence indicates that rehabilitation services remain inaccessible due to various factors, including the shortage of rehabilitation professionals.³⁻⁵

The WHO report states that there are less than 10 skilled rehabilitation practitioners per 1 million population in low/middle-income countries, leading to the chronic scarcity of human resources for health (HRH).⁶ This has resulted in reduced access to rehabilitation services, especially in resource-constrained regions. Sub-Saharan Africa (SSA), a low-resource region, is affected by the critical shortage of HRH amid a high disease burden, including physical disability.⁷ SSA accounts for 12% of the world's population, and 27% of the global disease burden, yet it only has 3.5% of the world's health workers.⁸ Furthermore, with the global crisis of HRH,

about 14.5 million is required to achieve universal health coverage (UHC) and sustainable development goals (SDGs), yet many African countries are facing the most critical health worker crisis. Therefore, the total health worker deficit for Africa is estimated to reach 6.1 million by 2030 which means that the current workforce needs to be scaled up by as much as 140% to attain international health development targets.⁹ Apart from economic resource constraints, the HRH scarcity in SSA is emanated from many causes, including wrong investment in preservice training, brain drain, career changes among health workers, early retirement, morbidity and natural attrition.

Several initiatives are being implemented to bridge the gap in HRH including increasing preservice training, motivating health workers to stay employed, and task shifting to lay health workers like community health workers (CHWs).¹⁰ The community-based rehabilitation (CBR) initiative was put in place to increase access to rehabilitation services of which the community is central in service provision.¹¹ CBR serves as a way of task shifting rehabilitation services from highly trained professionals to lay health workers mainly called CHWs.

The widely accepted definition of CHWs by the WHO Study Group as ‘members of the communities where they work, should be selected by the communities, should be answerable to the communities for their activities, should be supported by the health system but not necessarily a part of its organisation, and have shorter training than professional workers’,¹² has evolved much, as they are not necessarily selected by the communities but organisations spearheading their programmes and have since become part of the health systems.¹³ Therefore, in many SSA countries, CHWs have become an important part of the healthcare workforce and have contributed to the fight against the burden of disease with recorded success.^{14,15} For instance, CHWs have been the backbone in the fight against HIV/AIDS including malaria and have also been attributed to the success recorded in Maternal and Child Health.^{16–19}

Low-income countries have identified the use of CHWs as one strategy to alleviate the HRH crisis, thereby helping to increase access to health services in general.²⁰ CHWs programmes have been extensively used to address the paucity of trained health workers through task shifting. This has led to an increase in access to care, improved health outcomes, and complemented traditional healthcare delivery systems in many resource-constrained settings.²¹ Equally, the framework for the implementation of the global strategy on HRH in the African region proposed a range of actions that countries must implement by 2022 and 2030, including improving the effectiveness of CHWs programmes.^{11,22}

CHWs perform a wide range of tasks such as home visits, screening, health education and promotion and are viewed as the possible solution to increase population access to health services, including rehabilitation at the community level.^{11,23} This delegation of tasks from one cadre to another has been used in many countries and for many decades, either as a response to emergency needs or as a method

to provide adequate care at primary and secondary levels, especially in understaffed rural facilities, to enhance quality and reduce costs.²⁴ This has been evidenced in some settings where duties that should be performed by qualified rehabilitation professionals are allocated to CHWs due to HRH constraints.¹¹ Following a short training in the rehabilitation programme, CHWs have been able to deliver services in disadvantaged communities doing awareness and advocacy aside from rehabilitation services.²⁵

Although CHWs have been the backbone of community health systems in Low-income countries, and have since recorded much success in some areas, for example, in maternal and infectious diseases; the task shifting of physical rehabilitation services to CHWs in SSA remains unclear. With the evidence that SSA has been affected adversely by health worker shortages, with the great need for physical rehabilitation services, this review will shed more light.^{4,9} The purpose of this scoping review is to map evidence of CHWs providing physical rehabilitation services in SSA. It is anticipated that this Scoping review will highlight the scope of physical rehabilitation services delivered by CHWs, their mode of physical rehabilitation services delivery, the barriers and facilitators experienced by CHWs in the delivery of physical rehabilitation services in SSA. This Scoping review results will inform the bigger study taking place in SSA. The results of this study will help to gather evidence about CHWs delivering physical rehabilitation services and identify research gaps and therefore guide in the development of the training model of the CHWs in physical rehabilitation services in SSA.

METHODOLOGY

We will use the scoping review method to systematically search, select and synthesise existing data from 1978 which is the beginning of primary healthcare to answer the research question; what is the evidence of physical rehabilitation services delivered by CHWs in SSA? This scoping review is part of a larger study aiming to establish a model for the training of CHWs in providing physical rehabilitation services and has been registered in OSF registries <https://archiveorg/details/osf-registrations-bmjz-v1>. This review will be guided by the framework of Arksey and O'Malley²⁶ and further enhanced by Levac *et al*²⁷ by identifying the research questions; identifying relevant studies; study selection, charting the data using the Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA-ScR) Extension for Scoping Reviews Guidelines²⁸ and finally collating, summarising and reporting the results.

Eligibility of the research question by scoping review

This study will answer the question: what is the evidence of CHWs providing physical rehabilitation services in SSA? The specific research questions are as follows:

- ▶ What is the scope of physical rehabilitation services delivered by CHWs in SSA?

Table 1 The elements of the population, concept and context criteria will be used to map studies

Criteria	Determinants
Population	Community health workers
Concept	Physical rehabilitation services
Context	Sub-Sahara Africa

- ▶ What is the mode of delivery of physical rehabilitation services delivered by CHWs in SSA?
- ▶ What are the barriers are experienced by CHWs in the delivery of physical rehabilitation services in SSA?
- ▶ What factors facilitate the delivery of physical rehabilitation services in SSA by CHWs?

To determine the eligibility of our research question for a scoping review study, we are going to use the population, concept, and context framework (table 1).

Identifying relevant studies

An in-depth search for relevant literature published from the beginning of primary healthcare in 1978 in the following databases will be done: PubMed, Scopus, Cochrane central, databases within the EBSCOhost platform (Academic Search Complete, ERIC, Health Source—Consumer Edition, Health Source: Nursing/Academic Edition, Medline with Full Text, Open Dissertations). Other sources of literature will include reference lists, conference presentations and publications on organisational websites such as WHO, Ministries of Health and Non-governmental Organisations in SSA. We shall use a mix of Medical Subject Heading terms and the following keywords developed with the aid of the subject librarian as follows: “community health worker*” OR “lay health worker*” OR “rehabilitation assistant*” OR “community rehabilitation worker*” OR “Community Health Aide*” OR “Village Health Worker*” OR “Care giver*” OR “Barefoot Doctor*” in All Text AND “rehabilitation service” OR

“disability service” OR “rehabilitation” OR “community-based rehabilitation” in All Text AND AND “sub Saharan Africa” OR “sub-Saharan Africa” OR “sub-Sahara” OR sub-Sahara OR SSA OR “Africa south of the Sahara” OR Angola OR Benin OR Botswana OR “Burkina Faso” OR Burundi OR “Cabo Verde” OR Cameroon OR “Central African Republic” OR Chad OR Comoros OR Congo OR “Cote d’Ivoire” OR “Equatorial Guinea” OR Eritrea OR Eswatini OR Ethiopia OR Gabon OR “Gambia, the” OR Ghana OR Guinea OR “Guinea-Bissau” OR Kenya OR Lesotho OR Liberia OR Madagascar OR Malawi OR Mali OR Mauritania OR Mauritius OR Mozambique OR Namibia OR Niger OR Nigeria OR Rwanda OR “Sao tome and Principe” OR Senegal OR Seychelles OR “Sierra Leone” OR Somalia OR “South Africa” OR “South Sudan” OR Sudan OR Tanzania OR Togo OR Uganda OR Zambia OR Zimbabwe. The record of the number of publications retrieved and the search date after each session was kept. We shall adopt the search strategy to suit each database. All the searches will be documented in detail showing the keywords, date of search, search engine and the number of publications retrieved. The literature search will be done beginning 1 February–28 February 2022.

To demonstrate the feasibility of answering our research question using a scoping review method, we conducted a pilot search and the results are presented in table 2.

Study selection

To ensure that relevant studies on physical rehabilitation services delivered by CHWs in SSA will be included, selection criteria have been developed.

Inclusion criteria

To be included in the review are citations that present evidence on:

- ▶ CHWs delivering physical rehabilitation services.
- ▶ Literature in form of reports, guidelines, protocols, primary studies will be included.

Table 2 Results of a pilot search

Date of search	Search engine used	Number of articles retrieved	Keywords used
4 October 2021	PubMed	63	“community health worker*” OR “lay health worker*” OR “rehabilitation assistant*” OR “community rehabilitation worker*” OR “Community Health Aide*” OR “Village Health Worker*” OR “Care giver*” OR “Barefoot Doctor*” in All Text AND “rehabilitation service” OR “disability service” OR “physical rehabilitation” OR “rehabilitation” OR “community-based rehabilitation” in All Text AND “sub Saharan Africa” OR “sub-Saharan Africa” OR “sub-Sahara” OR sub-Sahara OR SSA OR “Africa south of the Sahara” OR Angola OR Benin OR Botswana OR “Burkina Faso” OR Burundi OR “Cabo Verde” OR Cameroon OR “Central African Republic” OR Chad OR Comoros OR Congo OR “Cote d’Ivoire” OR “Equatorial Guinea” OR Eritrea OR Eswatini OR Ethiopia OR Gabon OR “Gambia, the” OR Ghana OR Guinea OR “Guinea-Bissau” OR Kenya OR Lesotho OR Liberia OR Madagascar OR malawi OR Mali OR Mauritania OR Mauritius OR Mozambique OR Namibia OR Niger OR Nigeria OR Rwanda OR “Sao tome and Principe” OR Senegal OR Seychelles OR “Sierra Leone” OR Somalia OR “South Africa” OR “South Sudan” OR Sudan OR Tanzania OR Togo OR Uganda OR Zambia OR Zimbabwe
4 October 2021	Scopus	948	
4 October 2021	Health source	263	

- ▶ Reference lists from review articles reporting evidence on physical rehabilitation services provided by CHWs will be included.
- ▶ Literature from the beginning of primary healthcare in 1978 to date will be included.
- ▶ Literature from SSA will be included.
- ▶ Commentaries or opinion pieces will be included.

Exclusion criteria

The following were excluded:

- ▶ Articles of other health workers, not CHWs delivering physical rehabilitation services.
- ▶ Review articles were excluded.
- ▶ Evidence not from SSA was not be included.

Before the abstract and full-text screening phases, the principal investigator will conduct the literature search for relevant records in the electronic databases and search engines. Using the eligibility criteria as a guide, all related titles will be imported onto an Endnote V.20²⁹ library created for this study. A google form with questions for abstract screening will be developed based on the eligibility criteria and piloted. The abstract screening will be conducted by two reviewers independently to ensure consistency and minimise bias. Any discrepancies arising among the two reviewers during the abstract screening stage, discussions will be held until consensus is reached. All eligible records at the abstract screening stage will undergo full-text screening by the two independent reviewers. A third reviewer will be involved to resolve discrepancies between the reviewers at the full article stage. Kappa statistics calculation will be performed to determine the degree of agreement between reviewers at the full-text screening by using STATA V.17 software.³⁰ To ensure the reproducibility of the review, the references of excluded sources and the rationale for exclusion will be provided in an additional file of the completed review. The findings will be summarised using the PRISMA chart (figure 1).

Charting the data

Data will be charted using Google form which will be developed to record necessary information found in the included records (table 3). The data extraction form will be piloted by two independent reviewers using a random sample of 10% of the included records to ensure consistency and accuracy. The data extraction form will then be adjusted as required based on feedback from the reviewers. The data extraction will constantly be updated to enable adequate abstraction of all relevant data to answer the review question.

Collating, summarising and reporting the finding

We will conduct a thematic content analysis, using Nvivo V.12 software, to extract data and summarise findings. We will summarise the results using a narrative approach. The reviewers will analyse the emerging themes from the included articles concerning the research question. The emergent themes will be tabulated to describe the

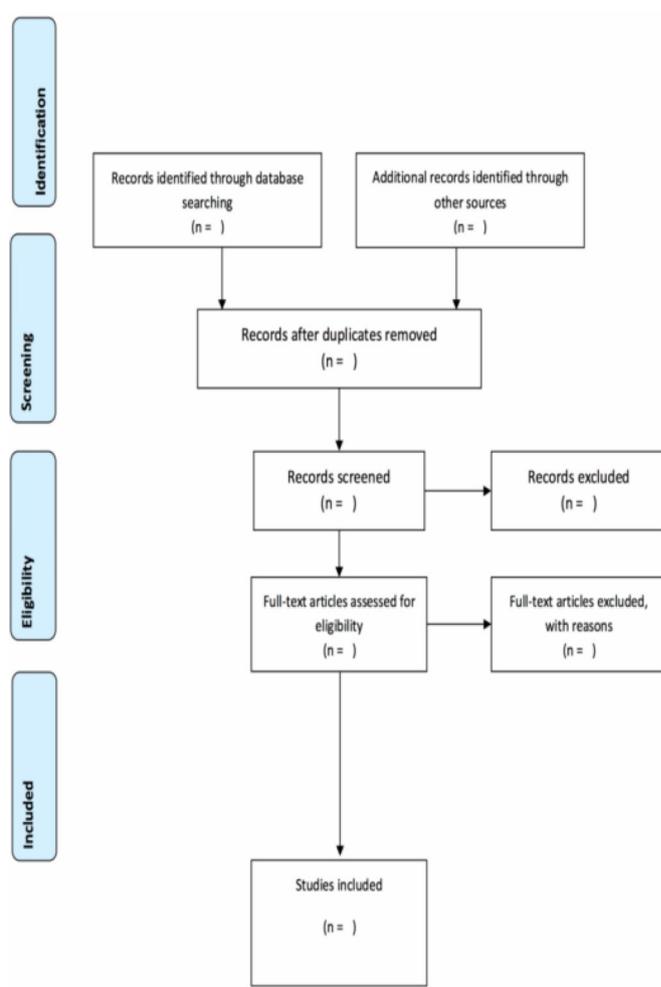


Figure 1 Selection of sources of evidence. Preferred Reporting Items for Systematic Review and Meta-Analyses Extension for Scoping Reviews flow chart which demonstrates the literature search and selection of sources of evidence.

evidence, scope of services, mode of delivery, barriers and facilitators in CHWs' physical rehabilitation service delivery. The implications of the study results for future research, policy and practice will be examined and reported on.

Quality appraisal

The Mixed Methods Appraisal Tool (MMAT) version 2018 will be used to appraise the methodological quality of the studies that will be included in this search.³¹ The criteria for the appropriateness of included sources of evidence will be determined by the aim of the study, appropriate methodology, study design, recruitment strategy and appropriate sampling technique. Other categories include suitable data collection procedures, appropriate data analysis, appropriate data interpretation, presentation of findings, discussion and conclusions of the author from the included articles. The quality appraisal will be carried out to examine the article's strengths, weaknesses and quality of research evidence presented. The quality of all the included articles will be calculated and

Table 3 Data extraction table

Attribute	Findings
Author	
Date of publication	
Study title	
Objective/aim of the study	
Study design	
Country of study	
Type of literature	
Study population	
Sample size	
Intervention(s)	
Methodology	
Relevant findings.	
<i>Evidence</i>	
<i>Scope of physical rehabilitation services</i>	
<i>Mode of delivery</i>	
<i>Barriers to physical rehabilitation service delivery</i>	
<i>Facilitators to physical rehabilitation service delivery</i>	
Most significant findings of the study	
Conclusions	
Notes	

rated using the MMAT guidelines with 25% accounting for low-quality articles, 50% being average, 75% being above average and 100% being high average. To enhance quality assessment criteria for the inclusion of grey literature, the study will consider first and second Tier grey literature only.³² This will ensure that the study designs of the included sources of evidence are appropriate for the research objectives. The quality assessment will also assist in reporting on the risk of bias and the quality of evidence of the included sources.

Patient and public involvement

The patients or the public will not be directly involved in the conception, design, and planning of the study.

Ethics and dissemination

The study is part of a larger study. Ethics approval has been obtained for the whole research, including this scoping review, from the University of KwaZulu Natal Biomedical Research Ethics Committee (BREC/00000569/2019). The study will be disseminated using print and electronic media.

DISCUSSION

This scoping review aims to map evidence of CHWs delivering physical rehabilitation services in SSA. Given the chronic HRH crisis, CHWs are viewed as the solution.^{33–35} Equally task shifting of duties from a highly trained cadre to a lower trained cadre is increasingly used to address HRH shortages.^{36 37} Meanwhile, research relating to task shifting in SSA, tends to focus more on specific health issues as well as on potential health system challenges that can be alleviated by task shifting. CHWs could be an

integral part of delivering physical rehabilitation services in some SSA countries. The findings of the study will generate vital information that will be useful to health-care managers and stakeholders that advocate for UHC in settings with limited access to integrated health services especially in the area of physical rehabilitation services. In line with the above, the study findings will help in bringing out the gaps in service implementation which may help in physical rehabilitation services training for CHWs. This will aid countries in SSA in increasing access and coverage of physical rehabilitation services in line with SDG 3 and SDG 10 which highlights the need for good health with reduced inequalities.³⁸ Additionally, the findings will build and contribute to the body of knowledge on physical rehabilitation services provision, HRH and community health systems. The evidence obtained from this review will be disseminated via publication on several platforms including peer-reviewed journals, conferences and interactions with potential knowledge users.

Contributors The scoping review protocol was conceptualised by MM and developed by MM and TD. MM and TD drafted the protocol. The authors read and approved the final manuscript.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

Provenance and peer review Not commissioned; externally peer reviewed.

Open access This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>.

ORCID iD

Miriam Mapulanga <http://orcid.org/0000-0001-5519-6635>

REFERENCES

- 1 WHO. *Rehabilitation 2030: a call for action*. Geneva: World Health Organization, 2020. <http://www.who.int/disabilities/care/ConceptNote.pdf?ua=1>
- 2 Mitra R. "Principles of Rehabilitation Medicine". *Faculty Bookshelf*. 254. 1st Ed. New York: McGraw-Hill, 2019. <https://hsrc.himmelfarb.gwu.edu/books/254>
- 3 Jesus T, Landry M, Hoenig H. Global need for physical rehabilitation: systematic analysis from the global burden of disease study 2017. *Int J Environ Res Public Health* 2019;16:980.
- 4 Bright T, Wallace S, Kuper H. A systematic review of access to rehabilitation for people with disabilities in low- and middle-income countries. *Int J Environ Res Public Health* 2018;15:2165.
- 5 Gilmore B, MacLachlan M, McVeigh J, et al. A study of human resource competencies required to implement community rehabilitation in less resourced settings. *Hum Resour Health* 2017;15:70.
- 6 WHO. Available: <https://www.who.int/news-room/fact-sheets/detail/rehabilitation>
- 7 Anyangwe SCE, Mtonga C. Inequities in the global health workforce: the greatest impediment to health in sub-Saharan Africa. *Int J Environ Res Public Health* 2007;4:93–100.
- 8 Chen C, Buch E, Wassermann T, et al. A survey of sub-Saharan African medical schools. *Hum Resour Health* 2012;10:4.

- 9 What needs to be done to solve the shortage of health workers in the African region. Available: <https://reliefweb.int/report/world/what-needs-be-done-solve-shortage-health-workers-african-region>
- 10 WHO. Available: <https://www.who.int/bulletin/volumes/87/3/08-051599/en/>
- 11 Dawad S, Jobson G. Community-based rehabilitation programme as a model for task-shifting. *Disabil Rehabil* 2011;33:1997–2005.
- 12 WHO. Available: https://www.who.int/hrh/documents/community_health_workers_brief.pdf
- 13 Tseng Y-H, Griffiths F, de Kadt J, *et al*. Integrating community health workers into the formal health system to improve performance: a qualitative study on the role of on-site supervision in the South African programme. *BMJ Open* 2019;9:e022186.
- 14 Yeboah-Antwi K, Hamer DH, Semrau K, *et al*. Can a community health worker and a trained traditional birth attendant work as a team to deliver child health interventions in rural Zambia? *BMC Health Serv Res* 2014;14:516.
- 15 Yeboah-Antwi K, Pilingana P, Macleod WB, *et al*. Community case management of fever due to malaria and pneumonia in children under five in Zambia: a cluster randomized controlled trial. *PLoS Med* 2010;7:e1000340.
- 16 Schneider H, Lehmann U. From community health workers to community health systems: time to widen the horizon? *Health Syst Reform* 2016;2:112–8.
- 17 Grimsrud A, Sharp J, Kalombo C, *et al*. Implementation of community-based adherence clubs for stable antiretroviral therapy patients in Cape town, South Africa. *J Int AIDS Soc* 2015;18:19984.
- 18 Lewin S, Munabi-Babigumira S, Glenton C, *et al*. Lay health workers in primary and community health care for maternal and child health and the management of infectious diseases. *Cochrane Database Syst Rev* 2010;3:CD004015.
- 19 Mubi M, Janson A, Warsame M, *et al*. Malaria rapid testing by community health workers is effective and safe for targeting malaria treatment: randomised cross-over trial in Tanzania. *PLoS One* 2011;6:e19753.
- 20 Zulu JM, Hurtig A-K, Kinsman J, *et al*. Innovation in health service delivery: integrating community health assistants into the health system at district level in Zambia. *BMC Health Serv Res* 2015;15:38.
- 21 Zulu JM, Kinsman J, Hurtig A-K, *et al*. Integrating community health assistant-driven sexual and reproductive health services in the community health system in Nyimba district in Zambia: mapping key actors, points of integration, and conditions shaping the process. *Reprod Health* 2019;16:122.
- 22 Geldsetzer P, De Neve J-W, Boudreaux C, *et al*. Improving the performance of community health workers in Swaziland: findings from a qualitative study. *Hum Resour Health* 2017;15:68.
- 23 Tsolekile LP, Puoane T, Schneider H, *et al*. The roles of community health workers in management of non-communicable diseases in an urban township. *Afr J Prim Health Care Fam Med* 2014;6:1–8.
- 24 Keller B, McCarthy E, Bradford Vosburg K, *et al*. Task-shifting impact of introducing a pilot community health worker cadre into Zambia's public sector health workforce. *PLoS One* 2017;12:e0181740.
- 25 Nesbit K, Gombwa S, Ngalande A. Rehabilitation training for home-based palliative care community health workers: a pilot study. *Prog Palliat Care* 2015;23:281–7.
- 26 Arksey H, O'Malley L. Scoping studies: towards a methodological framework. *Int J Soc Res Methodol* 2005;8:19–32.
- 27 Levac D, Colquhoun H, O'Brien KK. Scoping studies: advancing the methodology. *Implement Sci* 2010;5:69.
- 28 Tricco AC, Lillie E, Zarin W, *et al*. PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. *Ann Intern Med* 2018;169:467–73.
- 29 Endnote 20, Niles Software, Clarivate Analytics 2020.
- 30 STATA 17, StataCorp LLC, 2021
- 31 Hong QN, Pluye P, Bregues S F, *et al*. *Mixed methods appraisal tool (MMAT), version 2018*. IC Canadian Intellectual Property Office, Industry Canada, 2018.
- 32 Garousi V, Felderer M, Mäntylä MV. Guidelines for including grey literature and conducting multivocal literature reviews in software engineering. *Inf Softw Technol* 2019;106:101–21.
- 33 Bhutta ZA, Lassi ZS, Pariyo G. Global experience of community health workers for delivery of health-related millennium development goals: a systematic review, country case studies, and recommendations for integration into National health systems. *Global Health Workforce Alliance* 2010;1:61.
- 34 Campbell J, Buchan J, Cometto G, *et al*. Human resources for health and universal health coverage: fostering equity and effective coverage. *Bull World Health Organ* 2013;91:853–63.
- 35 Johnson SL, Gunn VL. Community health workers as a component of the health care team. *Pediatr Clin North Am* 2015;62:1313–28.
- 36 Adam T, de Savigny D. Systems thinking for strengthening health systems in LMICs: need for a paradigm shift. *Health Policy Plan* 2012;27 Suppl 4:iv1–3.
- 37 Frenk J. The global health system: strengthening National health systems as the next step for global progress. *PLoS Med* 2010;7:e1000089.
- 38 Take action for the sustainable development goals. Available: <https://www.un.org/sustainabledevelopment/sustainable-development-goals/>