

PROTOCOL

Open Access



Unintended pregnancies among HIV-positive women in sub-Saharan Africa: a scoping review protocol

Racheal Tomilola Oguntade^{1*} , Elizabeth Bolanle Ojewole¹ and Modupe Olufunmilayo Ogunrombi²

Abstract

Background Unintended pregnancies pose a severe threat to the well-being of HIV-positive women and their unborn children. Factors contributing to the high incidence of unintended pregnancies include contraceptive failure, low uptake of contraceptives, and misuse of contraceptives. Despite various contraceptive options, an increased incidence of unintended pregnancies is rampant among HIV-positive women in the region of sub-Saharan Africa. This study seeks to present evidence of unintended pregnancies among women living with HIV in sub-Saharan Africa, including those using contraceptives.

Method This study entails a scoping review to survey and interrogate the literature to provide evidence for the incidence of unintended pregnancies among HIV-positive women in sub-Saharan Africa. A proposed framework by Arksey and O'Malley will guide this scoping review. Peer-reviewed articles which address the research questions will constitute the main search. Electronic databases such as EBSCOhost, Cochrane Library, World of Science, World Health Organization (WHO) library databases, Science Direct, Google Scholar PubMed, and gray literature search will be involved. Reference list from studies included will also be searched. The investigation of articles will be done employing keywords from the studies included. The inclusion and exclusion criteria will guide two separate reviewers with the screening of abstracts and full papers. To summarize the findings from this review, thematic content analysis will be done using NVivo version 11.

Discussion We expect that this review will add to the current body of knowledge on the incidence of unintended pregnancies among HIV-positive women, identify gaps for further future research, and show evidence that may contribute to strengthening the health system's regulations, guidelines, and policies that may help prevent unintended pregnancies among HIV-positive women.

Systematic review registration 10.17605/OSF.IO/EY3R5

Keywords Prevalence, Incidence, Unintended pregnancies, Contraceptives, HIV-positive women, Sub-Saharan Africa

Background

Unintended pregnancy is a major global public health challenge that negatively impacts women, their children, and society [1]. Unintended pregnancy is that which is mistimed or not wanted at all [2, 3]. There was an estimated 44% unintended pregnancies in 2010–2014 globally. Fifty-nine percent of these unintended pregnancies resulted in abortion in developed regions, as did 55% of unintended pregnancies in developing regions [4].

*Correspondence:

Racheal Tomilola Oguntade
218088004@stu.ukzn.ac.za

¹ Discipline of Pharmaceutical Sciences, College of Health Sciences, University of Kwa-Zulu Natal, Durban, South Africa

² Department of Clinical Pharmacology, School of Medicine, Sefako Makgatho Health Sciences University, Ga-Rankuwa, South Africa



© The Author(s) 2023, corrected publication 2023. **Open Access** This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>. The Creative Commons Public Domain Dedication waiver (<http://creativecommons.org/publicdomain/zero/1.0/>) applies to the data made available in this article, unless otherwise stated in a credit line to the data.

Over 70% of the approximately 38 million people living with HIV worldwide are in SSA, and most HIV infections occur in this region [5, 6]. Women are disproportionately affected by HIV as about 7000 young females between ages 15 and 24 were newly infected every week in 2017, accounting for three in five new infections globally [7]. Additionally, women are constantly faced with the threat of maternal morbidity and mortality [8]. In 2017, an estimated maternal mortality ratio (MMR) in low-income countries was 462 per 100 000 live births compared to 11 per 100,000 live births in high-income countries [9, 10].

Unintended pregnancy is a common phenomenon among HIV-positive women, an issue of concern [11]. In 2018, 90% of the 1.3 million pregnant women with HIV globally hailed from sub-Saharan Africa (SSA) [12, 13]. Most HIV-positive women stated their most recent pregnancies were unintended, and some have indicated contraceptive use at the time of conception [14–18]. Also, HIV-positive women have more risks posed to their health than their HIV-negative counterparts. They are more likely to die from pregnancy-related complications in addition to the dangers of infecting their unborn children [19]. More so, most HIV infections in young children are acquired via mother-to-child transmission (MTCT) [20–22]. The issue is more prominent in sub-Saharan African countries because over 80% of children infected with HIV are situated in this region [23]. Unfortunately, unintended pregnancies are accompanied by myriads of adverse outcomes such as maternal depression, low birth weight, intimate partner violence, preterm birth, tobacco use during pregnancy, and infant mortality [24].

HIV-positive women are prone to a greater risk of morbidity and mortality during pregnancy and motherhood [19]. They are also more likely to suffer from a severe illness from sexually transmitted infections [25].

Although the initiation of antiretroviral therapy (ART) has helped improve the quality of life of HIV-positive women [26, 27], it also has associated challenges. Studies have shown the adverse impacts of antiretroviral drugs on pregnant women and their neonates; preterm birth and low birth weight have been reported [19, 28].

Furthermore, several studies have reported drug interactions between certain ARVs and hormonal contraceptives (HCs) [29–31].

This scoping review mainly aims to map the evidence of unintended pregnancies occurring among HIV-positive women in SSA. We anticipate this scoping review will present the current prevalence, incidence, and risk factors of unintended pregnancies among HIV-positive women. It is also expected that this scoping review will expose literature gaps for valuable research that may influence policy decisions and means to reduce the

impact of unintended pregnancies among HIV-positive women in SSA.

Methodology

A scoping review maps the literature on the available topic to recognize critical concepts, theories, sources of evidence, and gaps in literature [32, 33]. It helps to know the nature, range, and extent of research available on a subject, summarize, and circulate the findings across a body of research evidence [34]. Therefore, a scoping review synthesizes the literature to provide an overview of what is available in the research topic area as evidence [35, 36].

The methodological framework proposed by Arksey and O'Malley (2005) will be adopted for this proposed review. Therefore, the following five stages will be followed in this scoping review: (i) recognizing the research question, (ii) recognizing relevant studies, (iii) selection of eligible studies, (iv) charting the data, and (v) collating, summarizing, and reporting the results. This current scoping review intends to chart all research activities in this area; therefore, a quality appraisal will not be carried out.

Recognizing the research question

The main research question this review seeks to provide an answer to is “what is the evidence that HIV-positive women experience unintended pregnancies, including those that may be on contraceptives?”

The research sub-questions are as follows:

1. What is the evidence of the incidence of unintended pregnancies among HIV-positive women of reproductive age?
2. What is the evidence of the incidence of unintended pregnancies among HIV-positive women of reproductive age on contraception?
3. What are the contributing factors to unintended pregnancies among HIV-positive women of reproductive age?

Recognizing relevant studies

Published and unpublished (gray) literature will be explored on unintended pregnancies among HIV-positive women using electronic databases including Cochrane Library, World of Science, PubMed, and WorldCat. Studies reported from the year 2000 until December 2022 will be included. The Medical Subject Headings (MeSH) terms or keywords will include “HIV positive women,” “unintended pregnancies,” “contraception,” “sub-Saharan Africa (SSA),” “low- and middle-income countries,” “unplanned birth,” “unwanted pregnancy,” “unplanned pregnancy,” “unintended births,” and “unwanted births.” The appropriateness

of keywords and databases will be ascertained by piloting the search strategy. To ensure no vital information is left out, keywords may be refined to include different groups of HIV-positive women, such as those using antiretrovirals (ARVs). A hand search will also be conducted of the references cited in the included studies and search on websites including World Health Organization (WHO) to identify other potentially relevant literature. Potentially relevant gray literature will be identified through specific searches of dissertations/theses (ProQuest Dissertations & Theses Global) and conference abstracts. The PEO framework (Table 1) will guide title and abstract screening. Further eligibility criteria will ensure that the content of the included studies is relevant to the research question.

Selection of eligible studies

Inclusion criteria

Studies must meet the following criteria to be included:

- HIV-positive women of reproductive age who experienced unintended pregnancies
- Published from the year 2000 to December 2022
- Qualitative and quantitative studies
- Sub-Saharan African countries (SSA)
- Articles written in English language

Exclusion criteria

Studies must have the following characteristics to be excluded:

- Studies without HIV-positive women of reproductive age
- Studies where the researcher could not get the full-text article

All eligible articles will be imported into Mendeley Desktop software following a comprehensive search using the keywords mentioned earlier. Duplicate reports will be identified and removed. Two separate reviewers will screen the title and abstract of the eligible articles to ascertain if they fit the review. The full-text screening will also be done (see Fig. 1). There will be the involvement of a third reviewer should there be any discrepancies at the stage of full-text screening. The full text of selected articles will be gotten by making all possible efforts to either search the Internet, intreating with the UKZN librarian, or reach the author if need be. Search

Table 1 A PEO framework for eligible studies

P-population	HIV-positive women of reproductive age (15–49 years) in SSA
E-exposure	Unintended pregnancy
O-outcome	Prevalence Incidence Risk factors of unintended pregnancies

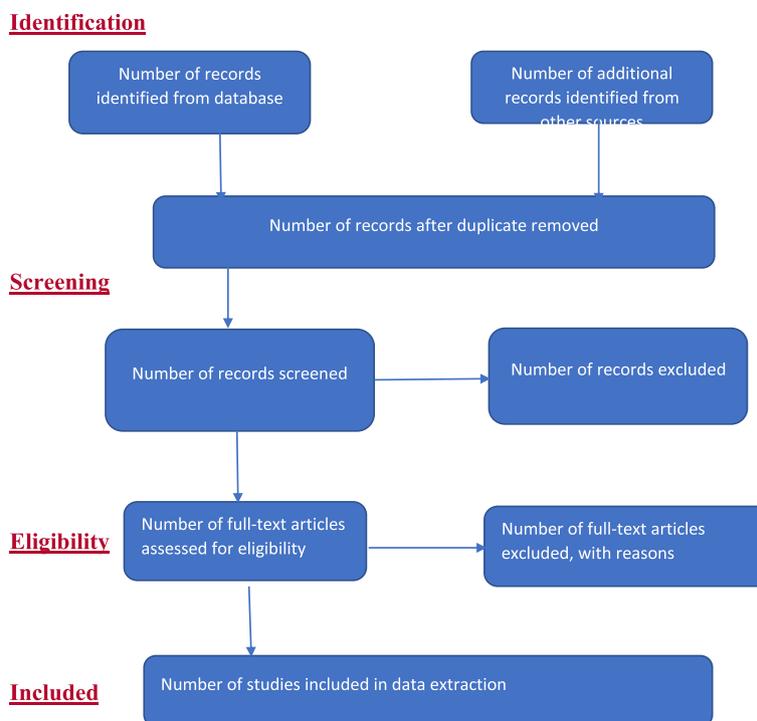


Fig. 1 Study selection flow diagram as described by Arksey and O'Malley [32]

Table 2 Records of the database searched

Date of search	Search engine used	Keyword searched	Number of articles found	Number of eligible articles
----------------	--------------------	------------------	--------------------------	-----------------------------

Table 3 Pilot search in PubMed database

Date of search	Search engine used	Keyword searched	Number of publications retrieved
17/12/22	PubMed	("pregnancy, unplanned"[MeSH Terms] OR ("pregnancy"[All Fields] AND "unplanned"[All Fields]) OR "unplanned pregnancy"[All Fields] OR ("unintended"[All Fields] AND "pregnancy"[All Fields]) OR "unintended pregnancy"[All Fields]) AND ("hiv seropositivity"[MeSH Terms] OR ("hiv"[All Fields] AND "seropositivity"[All Fields]) OR "hiv seropositivity"[All Fields] OR ("hiv"[All Fields] AND "positive"[All Fields]) OR "hiv positive"[All Fields]) AND ("women"[MeSH Terms] OR "women"[All Fields]) AND ("epidemiology"[Subheading] OR "epidemiology"[All Fields] OR "prevalence"[All Fields] OR "prevalence"[MeSH Terms]) AND ("risk factors"[MeSH Terms] OR ("risk"[All Fields] AND "factors"[All Fields]) OR "risk factors"[All Fields]) AND ("epidemiology"[Subheading] OR "epidemiology"[All Fields] OR "incidence"[All Fields] OR "incidence"[MeSH Terms]) AND ("africa south of the sahara"[MeSH Terms] OR ("africa"[All Fields] AND "south"[All Fields] AND "sahara"[All Fields]) OR "africa south of the sahara"[All Fields] OR ("sub"[All Fields] AND "saharan"[All Fields] AND "africa"[All Fields]) OR "sub saharan africa"[All Fields])	2094

record details such as search date, database, number of studies identified, keywords, and number of studies eligible will be appropriately documented. The guideline to report screening results will be adopted from the recommendations in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR) [37]. Mapping will be done using the PRISMA-P chart [38]. Tables 2 and 3 will be used to present the results of the titles searched from various databases.

Charting the data

Relevant information will be extracted from each of the studies included utilizing a data charting form, generated electronically using Google forms. The data extracted will consist of the following (Table 4):

Collating, summarizing, and reporting the results

A narrative approach will present the findings from the studies that meet the inclusion criteria via thematic content analysis. NVivo version 11.0 software will be employed for the extraction themes that are relevant to the study. Collation, summary, and reporting of themes will focus on the outcomes of prevalence, incidence, and risk factors of unintended pregnancy among HIV-positive women. Also, emerging themes will be reported. These results will be described in accordance with the overall purpose of the research and help identify knowledge gaps.

Table 4 Data extraction form

Author and date of publication
Study title
Study aim/objective
Type of study design
Study setting
Study population
Sampling method
Data collection methods
Data analysis method
Significant findings
Conclusion

Discussion

This proposed review is intended to map evidence for the occurrence of unintended pregnancies among HIV-positive women of reproductive age in SSA. It will also help identify risk factors for unintended pregnancies among HIV-positive women and present the burden of unintended pregnancies among HIV-positive women.

Most HIV-positive women have indicated that their pregnancies were unintended [14, 18]. Some reported using contraception at the time of conception [14, 16, 17]. Understanding contraception among HIV-positive women will help make inferences on the menace of unintended pregnancies and suggest practical recommendations for prevention in the nearest future. It will also be a pointer to support further research on contraceptive use among women living with HIV.

Conclusion

This review will show the evidence of unintended pregnancies among HIV-positive women in SSA. The findings of this scoping review will provide helpful information to undertake further research that will help generate the evidence that may be needed to make informed decisions regarding contraceptive use among HIV-positive women in SSA.

Abbreviations

HIV	Human immunodeficiency virus
SSA	Sub-Saharan Africa
WHO	World Health Organization
MMR	Maternal Mortality Ratio
MTCT	Mother-to-child transmission
MeSH	Medical Subject Headings
ARVs	Antiretrovirals
PEO	Population, Exposure, Outcome
PRISMA-ScR	Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews
PRISMA-P	Preferred Reporting Items for Systematic Review and Meta-analysis Protocol

Acknowledgements

We are grateful to the University of KwaZulu-Natal, Durban, for making it easy to write this study protocol by providing us with the required support.

Authors' contributions

RO conceptualized the study and prepared the draft. EO and MO supervised the write up and helped with refining the final protocol. The authors read and approved the final manuscript.

Funding

No funding has been obtained for this proposed study yet.

Availability of data and materials

All data generated and analyzed in this research will constitute the scoping review article.

Declarations

Ethics approval and consent to participate

Not applicable. Exemption obtained (EXM001/21) from Biomedical Research Ethics Committee, University of KwaZulu-Natal.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

Received: 14 October 2021 Accepted: 29 December 2022

Published online: 21 January 2023

References

- Sarder A, Mohammed S, Islam S, Talukder A. Prevalence of unintended pregnancy and its associated factors : evidence from six south Asian countries. *PLoS One*. 2021;1–13. <https://doi.org/10.1371/journal.pone.0245923>.
- Feyissa TR, Harris ML, Melka AS, Loxton D. Unintended Pregnancy in Women Living with HIV in Sub-Saharan Africa: A Systematic Review and Meta-analysis. *AIDS Behav*. 2019;23(6):1431–51. <https://doi.org/10.1007/s10461-018-2346-4>.
- Kwabena E, Id A, Budu E, Sambah F, Baatiema L, Appiah F, et al. Prevalence and determinants of unintended pregnancy in sub-Saharan Africa: a multi-country analysis of demographic and health surveys. *PLoS One*. 2019;14(8):1–16.
- Bearak J, Popinchalk A, Alkema L, Sedgh G. Global, regional, and subregional trends in unintended pregnancy and its outcomes from 1990 to 2014: estimates from a Bayesian hierarchical model. *Lancet Glob Health*. 2018;6(4):e380–9. [https://doi.org/10.1016/S2214-109X\(18\)30029-9](https://doi.org/10.1016/S2214-109X(18)30029-9).
- Bongomin F, Chelangat M, Eriatu A, Onen BC, Cheputyo P, Godmercy SA, et al. Prevalence and factors associated with contraceptive use among HIV-infected women of reproductive age attending infectious disease clinic at Gulu Regional Referral Hospital, Northern Uganda. *Biomed Res Int*. 2018;2018:9680514.
- Nyoni T, Okumu M. COVID-19-compliant strategies for supporting treatment adherence among people living with HIV in sub-Saharan Africa. *AIDS Behav*. 2020;24(9):2473–6. <https://doi.org/10.1007/s10461-020-02888-0>.
- UNAIDS. People living with HIV. *Rehabil Nurs*. 2018;43(3):E10.
- Hofmeyr GJ, Morrison CS, Baeten JM, Chipato T, Donnell D, Gichangi P, et al. Rationale and design of a multi-center, open-label, randomised clinical trial comparing HIV incidence and contraceptive benefits in women using three commonly-used contraceptive methods (the ECHO study). *Gates Open Res*. 2017;1:17.
- WHO. Maternal mortality 2019 <https://www.who.int/news-room/fact-sheets/detail/maternal-mortality>.
- Bauserman M, Thorsten VR, Nolen TL, Patterson J, Lokangaka A, Tshetu A, et al. Maternal mortality in six low and lower-middle income countries from 2010 to 2018: risk factors and trends. *Reprod Health*. 2020;17(Suppl 3):1–10. <https://doi.org/10.1186/s12978-020-00990-z>.
- Brittain K, Phillips TK, Zerbe A, Abrams EJ. Long-term effects of unintended pregnancy on antiretroviral therapy outcomes among South African women living with HIV. *AIDS*. 2019;33(5):885–93.
- Armstrong-Mensah E, Ruiz K, Fofana A, Hawley V. Perinatal HIV transmission prevention: challenges among women living with HIV in sub-Saharan Africa. *Int J Matern Child Heal AIDS*. 2020;9(3):354–9.
- UNICEF. United Nations Children's Fund. Elimination of mother-to-child transmission. New York: United Nations Children's Fund; 2019. <https://data.unicef.org/topic/hiv/aids/emtct/>. Accessed Mar 2020.
- Bankole A, Keogh S, Akinyemi O, Dzekedzeke K, Awolude O, Adewole I. Differences in unintended pregnancy, contraceptive use and abortion by HIV status among women in Nigeria and Zambia. *Int Perspect Sex Reprod Health*. 2014;40(1):28–38.
- Bradley SEK, Polis CB, Bankole A, Croft T. Global contraceptive failure rates: who is most at risk? *Stud Fam Plan*. 2019;50(1):3–24.
- Doherty K, Arena K, Wynn A, Offorjebe OA, Moshashane N, Sickboy O, et al. Unintended pregnancy in Gaborone, Botswana: a cross-sectional study. *Afr J Reprod Health*. 2018;22(2):76–82.
- McCoy SI, Buzdugan R, Ralph LJ, Mushavi A, Mahomva A, Hakobyan A, et al. Unmet need for family planning, contraceptive failure, and unintended pregnancy among HIV-infected and HIV-uninfected women in Zimbabwe. *PLoS One*. 2014;9(8):e105320.
- Patel RC, Morroni C, Scarsi KK, Sripipatana T, Kiarie J, Cohen CR. Concomitant contraceptive implant and efavirenz use in women living with HIV: perspectives on current evidence and policy implications for family planning and HIV treatment guidelines. *J Int AIDS Soc*. 2017;20(1):1–6.
- Lathrop E, Jamieson DJ, Danel I. HIV and maternal mortality. *Int J Gynaecol Obstet*. 2014;127(2):213–5.
- AVERT 2020. Avert (last reviewed December 2018; updated April 2020) Prevention of Mother to Child Transmission (PMTCT) of HIV <https://www.avert.org/professionals/hiv-programming/prevention/prevention-mother-child> (Accessed February, 2021). 2020;(December 2018).
- Mofenson LM. Prevention in neglected subpopulations: prevention of mother-to-child transmission of HIV infection. *Clin Infect Dis*. 2010;50(SUPPL. 3):S130–48.
- Mahy M, Stover J, Kiragu K, Hayashi C, Akwara P, Luo C, et al. What will it take to achieve virtual elimination of mother-to-child transmission of HIV? An assessment of current progress and future needs. *Sex Transm Infect*. 2010;86 Suppl 2(Suppl 2):ii48–55.
- Kassa GM. Mother-to-child transmission of HIV infection and its associated factors in Ethiopia: a systematic review and meta-analysis. *BMC Infect Dis*. 2018;18(1):1–9.

24. Borrero S, Callegari LS, Zhao X, Mor MK, Sileanu FE, Switzer G, et al. Unintended pregnancy and contraceptive use among women veterans: the ECUUN Study. *Gen Intern Med*. 2017;32(8):900–8.
25. Raifman J, Chetty T, Tanser F, Mutevedzi T, Matthews P, Herbst K, et al. Preventing unintended pregnancy and HIV transmission: effects of the HIV treatment cascade on contraceptive use and choice in rural Kwa Zulu-Natal. *J Acquir Immune Defic Syndr*. 2014;67:S218–27.
26. Kasamba I, Baisley K, Mayanja BN, Maher D, Grosskurth H. The impact of antiretroviral treatment on mortality trends of HIV-positive adults in rural Uganda: a longitudinal population-based study, 1999–2009. *Tropical Med Int Health*. 2012;17(8):e66–73.
27. Marston M, Nakiyingi-Miuro J, Hosegood V, Lutalo T, Mtenga B, Zaba B. Measuring the impact of antiretroviral therapy roll-out on population level fertility in three African countries. *PLoS One*. 2016;11(3):1–16.
28. Mishra RK, Chakaravarty R, NS. Pregnancy outcomes following exposure to efavirenz based antiretroviral therapy in indian women. *Indian J Pharmacol*. 2020;52(6):467. https://doi.org/10.4103/ijp.IJP_263_20.
29. Nanda K, Delany-Moretwe S, Dubé K, Lendvay A, Kwok C, Mofife L, et al. Nevirapine-based antiretroviral therapy does not reduce oral contraceptive effectiveness. *Aids*. 2013;27(SUPPL.1):S17–25.
30. Teklu T, Belina S, Chemir F, Tessema M, Yismaw W. Unintended pregnancy and associated factors among hiv positive women in ilu aba bora zone, South Western Ethiopia: a facility-based cross-sectional study. *HIV AIDS (Auckl)*. 2021;13:197–203.
31. Tittle V, Bull L, Boffito M. Pharmacokinetic and pharmacodynamic drug interactions between antiretrovirals and oral contraceptives. *Clin Pharmacokinet*. 2015;54:23–34.
32. Arksey H, O'Malley L. Scoping studies: towards a methodological framework. *Int J Soc Res Methodol Theory Pract*. 2005;8(1):19–32.
33. Naidoo K, Van Wyk J. Protocol for a scoping review of age-related health conditions among geriatric populations in sub-Saharan Africa. *Syst Rev*. 2019;8(1):1–4.
34. Munn Z, Peters MDJ, Stern C, Tufanaru C, McArthur A, Aromataris E. Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach. *BMC Med Res Methodol*. 2018;18(1):1–7.
35. Sucharew H, Macaluso M. Methods for research evidence synthesis: the scoping review approach. *J Hosp Med*. 2019;14(7):416–8.
36. Danquah FI, Yeboah M, Bawontuo V, Kuupiel D. Mapping evidence on the burden and distribution of childhood obesity in sub-Saharan Africa: a scoping review protocol. *Syst Rev*. 2019;8(1):4–9.
37. Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. *Ann Intern Med*. 2018;169(7):467–73.
38. Kamioka H. Preferred reporting items for systematic review and meta-analysis protocols (prisma-p) 2015 statement. *Japanese Pharmacol Ther*. 2019;47(8):1177–85.

Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Ready to submit your research? Choose BMC and benefit from:

- fast, convenient online submission
- thorough peer review by experienced researchers in your field
- rapid publication on acceptance
- support for research data, including large and complex data types
- gold Open Access which fosters wider collaboration and increased citations
- maximum visibility for your research: over 100M website views per year

At BMC, research is always in progress.

Learn more biomedcentral.com/submissions

