



BMJ Open Access to HIV healthcare services by farm workers in sub-Saharan Africa (SSA): a systematic review protocol

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ABSTRACT

Introduction Sub-Saharan Africa (SSA) region harbours the highest burden of HIV infections in the world. Agricultural work has been reported as one of the occupations with a high prevalence of HIV. Farm workers generally have poor access to health services, which prevents them from receiving proper HIV prevention and care. Furthermore, poor policies and policy implementation, and lack of workplace programmes increases farm workers' vulnerability to HIV infection. Thus, the aim of this study is to conduct a systematic review to assess HIV prevention and treatment services and national policies governing access to healthcare services by farm workers in SSA.

Methods and analysis Our systematic review will include studies published from January 1990 to December 2021 within SSA countries. We will use a sensitive search strategy for electronic bibliographic databases and grey literature sources. Databases will include PubMed, CINAHL, Cochrane library, African Index Medicus and Scopus. The main outcomes to be reported will be HIV policy for farmworkers, availability of HIV prevention service(s), availability of treatment and support to farmworkers who are living with HIV, presence of referral structures for farmworkers through the health system and follow-up services for farmworkers who are on antiretroviral therapy. We will synthesise the main characteristics of included studies and use summary measures to describe study characteristics. In a situation where data are not sufficiently homogeneous to perform a quantitative synthesis, we will conduct a narrative synthesis. We will explore themes and relationships between included studies for qualitative data.

Ethics and dissemination The study will use publicly available data and ethics exemption has been obtained from Human Research Ethics Committees, Faculty of Medicine & Health Sciences, Stellenbosch University. The results of this study will be disseminated through peer-reviewed journals, conference presentations and seminars. **PROSPERO registration number** CRD42021277528.

INTRODUCTION

HIV continues to be a global concern, with more than 37 million people infected by the end of 2020.¹ Though there has been a decline of new infections over the past two decades,² HIV ranks among the top 10 causes

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ The study reduces the risk of duplication, gives transparency to the intended methods and processes that will be followed.
- ⇒ The study reduces possible biases and allows for peer review.
- ⇒ The review will be the first to explore and provide a comprehensive overview of existing HIV policies, services and programmes provided to the farm worker's population in the sub-Saharan Africa (SSA) region.
- ⇒ The limitation of this protocol is the scarcity of HIV prevention studies for farm workers in SSA.
- ⇒ Inadequate methodological quality on HIV prevention, treatment and care studies for farm workers is a possible limitation of this review.

of death globally.³ Sub-Saharan Africa (SSA) region harbours the highest burden of HIV in the world, with an estimated 70% of people living with HIV.⁴ South Africa has the highest HIV burden within Southern Africa region and globally. In 2015, the International Labour Organization (ILO) estimated that 26 million workers worldwide aged between 15 and 49 years were living with HIV, while 22.7% of the workforce in South Africa were people living with HIV.⁵ Despite the fact that there are no ongoing studies on measuring HIV burden per specific occupation in South Africa, previous studies conducted at different time points have highlighted that occupations with a high prevalence of HIV are healthcare workers 15.7%,⁶ truck drivers 26%,⁷ mine workers 24.6%⁸ and farm workers with 39% in 2010.⁹ This highlights an important underlying fact that farm workers carry the highest burden of HIV among the working population.

Farm workers face various barriers in accessing HIV prevention and control services, including voluntary counselling and testing, condoms, and antiretroviral therapy (ART). They are a highly mobile population,



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which increases their vulnerability to HIV,¹⁰ as migration is cited to be the strongest single predictor of HIV risk in SSA.¹¹ Farm workers generally have poor access to health services,¹¹ which prevents them from receiving proper HIV prevention, treatment, care and support services. Agricultural and farming areas are normally situated in remote, hard-to-reach areas. These geographical and structural factors, combined with high mobility, affects the farm workers' ability to access health services. These factors highlighted above promulgate the overall health outcome of the farming population.

It is worth noting that other hindering factors that compound farm workers' ability to access healthcare facilities include distance to nearest health facility, long working hours and travel means to access health facilities.¹² In addition, taking time off from farm work to attend to healthcare issues compromises their earning, as such remains a non-priority need to avoid losing income.¹³ Furthermore, poor and/or fragmented policies and policy implementation, as well as lack of workplace programmes increases farm workers' vulnerability to HIV infection.¹¹ There are reportedly high unprotected sexual engagements including low usage of condoms within the farm working environment, that involve casual sex partners^{9 11} as well as lack of HIV knowledge and low risk perception of HIV infection among farming communities.¹¹ These factors increase the vulnerability of the farm workers to HIV infection.¹⁴ Over and above, it has been reported that HIV prevention interventions that have been provided in occupational settings have shown to be effective,¹⁵ and such workplace services may not be a reality for farm workers.

Even though there are studies that report on farm workers' HIV screening, treatment, care and support,^{16 17} the findings from such studies have not highlighted national strategies and approaches in the provision of healthcare services to the farming populations. Furthermore, studies done previously have tended to broadly encompass farm workers within the migrant labourers' paradigm. Farm workers are likely to be internal or external migrants, and they tend to differ from other migrant labourers due to social factors that disadvantage them. Most of the time it is the non-skilled migrant workers who tend to be farm workers, and due to restrictions in immigration policies, they almost always lack legal resident status. This puts them at an increased risk of health and other social challenges within the farming environment¹⁸ more so due to dependence on employer/workplace provisions rather than on national occupational health programmes.^{19 20}

METHODS AND ANALYSIS

This systematic review protocol follows the Cochrane Handbook's guidelines for Systematic Reviews of Interventions and Reports using the Preferred Reporting Items for Systematic Reviews and Meta-analyses Protocols (PRISMA-P).^{21 22}

Objectives

The specific objective of this systematic review is to summarise data on HIV services available for farmworkers in SSA, including services provided at the workplace, by private or NGOs, or provided by the ministries of health. The second objective is to assess the presence of policies that guides provision of HIV services to farmworkers at government or workplace level.

Study participants

Studies that report on farm workers' HIV prevention, treatment, care and support, regardless of age or gender, will be included. These will include all categories of farm worker status, be it migrant and non-migrant, as well as seasonal and permanently employed farm workers. For this systematic review 'farm worker' are defined as persons employed to work on a farm regardless of the migration status, and working in full-time employment, seasonal or temporary basis.

Time frame

Studies published from January 1990 to December 2021 within SSA countries will be included. This will ensure that included studies provide up to recent developments in the provision of services. The dates also factor in the emergence of the HIV pandemic and the introduction of ART programmes and services in SSA.

Outcomes

The study will examine outcomes on availability and access to HIV services for farm workers. The main outcomes of interest are the presence of HIV policy frameworks, guidelines or programmes for HIV prevention, treatment and care services, and other treatment modalities specifically targeting farm workers.

Inclusion criteria

Studies conducted on HIV prevention, treatment, care and support for farm workers in SSA. We will include quantitative studies such as case-control studies, cohort studies and cross-sectional surveys. We will also include qualitative studies such as case studies, phenomenological studies and mixed-methods studies. Furthermore, we will review unpublished quantitative and qualitative data obtained from reports and policy documents. We will include articles published in all languages, including but not limited to English, French and Portuguese. We will use language translation software for studies published in other languages other than English.

Exclusion criteria

We will exclude studies that are done outside of SSA. Letters, editorials, reviews and commentaries, will also be excluded. Studies that do not measure, discuss or report any of the prevention levels of HIV services will be excluded. All studies published before 1990 will be excluded.

Search strategy

We will use a sensitive search strategy for electronic bibliographic databases and grey literature sources (online supplemental file 1). Search terms will be designed for MEDLINE (PubMed) to identify controlled vocabulary of Medical Subject Headings (MeSH) related to HIV and farm workers. We will identify keywords based on our knowledge of the field of HIV infection. MEDLINE search terms will be adapted for other electronic databases to conform to their search functions. Databases will include PubMed via MEDLINE, CINAHL (EBSCO Host) Cumulative Index of Nursing and Allied Health Literature, Cochrane Library, including the Cochrane Central Register of Controlled Trials, African Index Medicus and Scopus.

We will also search the following websites for additional information on HIV services for farmworkers: the SSA Ministries of health for policies and guidelines, the research institutes, the ILO, the WHO and other key non-governmental organizations (NGOs) websites.

Furthermore, we will search grey literature through Google Scholar and Open Grey (SIGLE) for any relevant unpublished work. We will also search for possible additional citations from the reference list, conference abstracts from International Conference on AIDS and STIs in Africa and South African Aids conferences, and presentations using Web of Science Proceedings Citation Index. The search terms will be used in different combinations as per the objective of the review and will include keywords such as HIV/AIDS, HIV workplace service, HIV workplace programme, HIV prevention, HIV policy, mobility and migration, farmworkers' health, migrant farmworkers, migration and health, agriculture, health-care access, seasonal farmworkers, occupational health and SSA. Search results will be managed and remove duplicates using specialised bibliographic software, Endnote reference management tool (<http://endnote.com/>). We will prepare a search diary with details of the databases searched, keywords used and number of search results.

Data extraction, management and selection of eligible studies

Initial screening of titles and abstracts will be undertaken by two reviewers (NM and MM) against the inclusion and exclusion criteria through Rayyan QCRI, the Systematic Reviews web app.²³ Full-text articles will be appraised for relevance and methodological quality by two independent reviewers (NM and MM). Any disagreements on selected articles will be resolved through mutual consensus or involvement of a third reviewer (OA, PN and or ML). Data will be systematically extracted using a standardised data collection tool that will be developed according to the format laid down in the Cochrane Handbook for Systematic Reviews of Interventions. We will extract data about the first author, publication year, journal, language, setting (workplace, private, government services), research methods and outcomes (type of HIV services accessed). The data extraction tool will be

piloted by two reviewers (NM and MM) on at least five randomly selected articles prior, thereafter the tool will be revised accordingly based on observations during the piloting process.

We will make attempts to contact study authors for studies that will have missing data on key variables, or where further clarity is necessary. For missing data that cannot be obtained, a description of such missing data with possible implications thereof will be provided in the review.

Data analysis

We will synthesise the main characteristics of included studies and use summary measures to describe study characteristics as described by the primary authors such as the mean, median, proportions and frequencies. We will use descriptive statistics to determine the proportion of included studies that reported the key outcomes. We will assess homogeneity of the study findings and use the χ^2 and I^2 test to come up with percentage variation across the studies. We will consider I^2 value greater than 75% as considerable heterogeneity. Data will be analysed using Stata statistical software, V.16.1. Subgroup analysis will be done to explore sources of heterogeneity in studies, as heterogeneity is mostly in some individual studies due to variations in study designs and methodology. In a situation where data are not sufficiently homogeneous to perform a quantitative synthesis, we will conduct a narrative synthesis.

In analysing qualitative studies, a thematic framework analysis will be conducted following an inductive approach, where themes will be determined through engagement with extracted data. Coding of data will be done based on the themes identified in the data. We will follow five steps of framework synthesis which include familiarisation with the data, identifying a thematic framework, indexing, charting, mapping and interpretation.²⁴ We will use the Research evidence (SURE) thematic framework²⁵ to guide our thematic analysis. We will present our findings on a summary of qualitative findings' table that will summarise our key findings.

All findings will be presented following the format recommended by PRISMA-P.²⁶

Risk of bias in included studies

To assess the risk of bias within included studies, the methodological quality of studies will be assessed by using the Newcastle-Ottawa scale (NOS) which is used for assessing the quality of non-randomised studies in meta-analysis.²⁷ The NOS for cohort and cross-sectional studies will be modified to meet the systematic review requirements, while the cohort scale will be modified for case studies.

The strength of the body of evidence will be assessed by using the Grading of Recommendations Assessment Development and Evaluation (GRADE) approach.²⁸ The grade certainty of evidence presented as high, moderate, low and very low will be determined based on an assessment of evidence for risk of bias, publication bias and

indirectness. The assessment will be conducted by two reviewers (NM and MM) and where there are disagreements a third reviewer (OA, PN or ML) will be involved to resolve the differences.

To assess our confidence on qualitative findings, we will apply the CERQual approach.²⁹ This approach draws on the GRADE approach and assesses confidence based on four components: the methodological limitations of included studies, the relevance of the included studies to the review question, the coherence of the review findings and the adequacy of data contributing to the review findings. The confidence findings will be reported as either high, moderate, low or very low. The CERQual assessment will appear in a summary of qualitative findings table.

Patient and public involvement

Patients and/or the public will not be involved in this review.

Ethics and dissemination

The study will use publicly available data, hence ethical approval was not warranted. The findings will be disseminated in scientific forums and conferences targeting public health audiences and policymakers using virtual platforms such as webinars.

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Contributors NM conceptualised the study, designed the search strategy and drafted the proposal. MM provided critical feedback on the study protocol, and will contribute to study selection process, and data extraction. PN, OA and ML contributed to critically reviewing the conceptualisation and design of the study protocol. All authors read and approved the final version of the protocol.

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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.

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REFERENCES

- UNAIDS. Global HIV & AIDS statistics — Fact sheet | UNAIDS [Internet]. Available: <https://www.unaids.org/en/resources/fact-sheet> [Accessed 10 Sep 2021].
- Fettig J, Swaminathan M, Murrill CS, et al. Global epidemiology of HIV. *Infect Dis Clin North Am* 2014;28:323–37.
- The top 10 causes of death [Internet]. Available: <https://www.who.int/news-room/fact-sheets/detail/the-top-10-causes-of-death> [Accessed 10 Jun 2021].
- Kharsany ABM, Karim QA. HIV infection and AIDS in sub-Saharan Africa: current status, challenges and opportunities. *Open AIDS J* 2016;10:34–48.
- International Labour Organization. *The impact of HIV and AIDS in the world of work: global estimates*. Geneva, 2018.
- Connelly D, Veriava Y, Roberts S. Prevalence of HIV infection and median CD4 counts among health care workers in South Africa. *S Afr Med J* 2007;97:115–20.
- Delany-Moretlwe S, Bello B, Kinross P, et al. HIV prevalence and risk in long-distance truck drivers in South Africa: a national cross-sectional survey. *Int J STD AIDS* 2014;25:428–38.
- Stevens W, Apostolellis A, Napier G. HIV/AIDS prevalence testing – Merits, methodology and outcomes of a survey conducted at a large mining organisation in South Africa. *South African Med J* 2006;96:134–9.
- Integrated Biological and Behavioural Surveillance Survey (IBBSS) in the Commercial Agricultural Sector in South Africa | Migration Health Research Portal [Internet]. Available: <https://migrationhealthresearch.ion.int/integrated-biological-and-behavioural-surveillance-survey-ibbss-commercial-agricultural-sector-south> [Accessed 7 Jun 2021].
- de Gruchy T. Responding to the health needs of migrant farm workers in South Africa: opportunities and challenges for sustainable community-based responses. *Health Soc Care Community* 2020;28:60–8.
- Nicholas PK, Mfono N, Corless IB, et al. HIV vulnerability in migrant populations in southern Africa: sociological, cultural, health-related, and human-rights perspectives. *Int J Afr Nurs Sci* 2016;5:1–8.
- Arcury TA, Quandt SA. Delivery of health services to migrant and seasonal farmworkers. *Annu Rev Public Health* 2007;28:345–63.
- Vearey J, Richter M, Núñez L, et al. South African HIV/AIDS programming overlooks migration, urban livelihoods, and informal workplaces. *Afr J AIDS Res* 2011;10 Suppl 1:381–91.
- Weine SM, Kashuba AB, Migration L. Labor migration and HIV risk: a systematic review of the literature. *AIDS Behav* 2012;16:1605–21.
- Setswe G. Review of behavioral interventions for reducing the risk of HIV/AIDS in occupational settings. *HIV Adv Res Dev Open Access* 2015;1:1–15.
- de Gruchy T, Kapilashrami A. After the handover: exploring MSF's role in the provision of health care to migrant farm workers in Musina, South Africa. *Glob Public Health* 2019;14:1401–13.
- Bhatasara S, Chiweshe MK. Universal access to HIV treatment in the context of vulnerability: female farm workers in Zimbabwe. *Health Care Women Int* 2015;36:188–204.
- Vearey J, Modisenyane M, Hunter-Adams J. Towards a migration-aware health system in South Africa: a strategic opportunity to address health inequity. *South African Heal Rev* 2017;2017:89–98.
- Setswe GKG. Best practice workplace HIV/AIDS programmes in South Africa: a review of case studies and lessons learned. *Afr J Prim Health Care Fam Med* 2009;1:82–7.
- George G, Gow J, Whiteside A. *Hiv/Aids in private sector companies: cost impacts and responses in southern Africa*. Vol. 3, HIV therapy. UK: Future Medicine Ltd London, 2009: 293–300.
- Higgins JPT, Thomas J, Chandler J. Cochrane handbook for systematic reviews of interventions version 6.0 [Internet]. Cochrane 2019:1–694 www.training.cochrane.org/handbook
- Shamseer L, Moher D, Clarke M, et al. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: elaboration and explanation. *BMJ* 2015;349:g7647.

- 23 Ouzzani M, Hammady H, Fedorowicz Z, *et al.* Rayyan—a web and mobile APP for systematic reviews. *Syst Rev* 2016;5:1–10.
- 24 Noyes J, Popay J, Pearson A. *Cochrane Handbook: chapter 20: qualitative research and Cochrane reviews*, 2016.
- 25 The SURE collaboration. Sure guides for preparing and using evidence-based policy Briefs 5. identifying and addressing barriers to implementing policy options, 2011. Available: www.evipnet.org/sure
- 26 Moher D, Liberati A, Tetzlaff J, *et al.* Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *BMJ* 2009;339:b2535–6.
- 27 Wells G, Wells G, Shea B. The Newcastle-Ottawa scale (NOS) for assessing the quality of Nonrandomised studies in meta-analyses, 2014. Available: http://www.ohri.ca/programs/clinical_epidemiology/oxford.asp [Accessed 13 Sep 2021].
- 28 Schünemann HJ, Schünemann AHJ, Oxman AD, Brozek J, *et al.* Grading quality of evidence and strength of recommendations for diagnostic tests and strategies. *BMJ* 2008;336:1106–10.
- 29 Lewin S, Glenton C, Munthe-Kaas H, *et al.* Using qualitative evidence in decision making for health and social interventions: an approach to assess confidence in findings from qualitative evidence syntheses (GRADE-CERQual). *PLoS Med* 2015;12:e1001895.

Supplementary file 1

Access to HIV Healthcare Services by Farmworkers in sub-Saharan Africa:
Search Strategy

Ovid MEDLINE(R) and Epub Ahead of Print, In-Process, In-Data-Review & Other Non-Indexed Citations, Daily and Versions(R) <1946 to February 23, 2022>

- 1 hiv/ or hiv-1/ or hiv-2/
- 2 HIV*.mp.
- 3 AIDS.mp. or Acquired Immunodeficiency Syndrome/
- 4 (human immun* and deficiency virus).mp. or acquired immunodeficiency syndrome*.tw.
- 5 1 or 2 or 3 or 4
- 6 Anti-Retroviral Agents/ or Antiretroviral Therapy, Highly Active/
- 7 (antiretroviral* or HAART* or (anti and retroviral*) or ARV*).mp.
- 8 5 or 6 or 7
- 9 (sub-Saharan Africa or Angola or Benin or Botswana or "Burkina Faso" or Burundi or Cameroon or "Cape Verde" or "Central African Republic" or Chad).mp.
- 10 (Comoros or Congo Brazzaville or Congo Democratic Republic or "Côte d'Ivoire" or Djibouti or "Equatorial Guinea" or Eritrea or Ethiopia or Gabon or Gambia or Ghana or Guinea or "Guinea-Bissau" or Kenya or Lesotho).mp.
- 11 (Liberia or Madagascar or Malawi or Mali or Mauritania or Mauritius or Mozambique or Namibia or Niger or Nigeria or Reunion or Rwanda).mp.
- 12 ("Sao Tome and Principe" or Senegal or Seychelles or "Sierra Leone" or Somalia or "South Africa" or Sudan or Swaziland or Tanzania or Togo or Uganda or "Western Sahara" or Zambia or Zimbabwe).mp.
- 13 exp "Africa South of the Sahara"/
- 14 9 or 10 or 11 or 12 or 13
- 15 8 and 14
- 16 limit 15 to yr="1990 -Current"
- 17 (Farmworkers or "farm worker*" or "Agricultural worker*" or "migrant farmworkers" or "migrant workers" or "migrant labourer*").mp.
- 18 Farmers/
- 19 ("migrant* adj2 health" or migrants or "mobile population*").mp.
- 20 Rural Population/

Supplementary file 1

- 21 ((rural adj2 population*) or (rural adj2 communit*)).tw.
- 22 plantation worker*.mp.
- 23 agrarian.tw.
- 24 17 or 18 or 19 or 20 or 21 or 22 or 23
- 25 16 and 24
- 26 (Access* or "access to care" or knowledge or availability or provision or guidelines or "National policy" or "strategic plan").tw.
- 27 "Delivery of Health Care"/ or care package*.mp.
- 28 26 or 27
- 29 25 and 28
- 30 limit 30 to humans

Embase 1947-Present, updated daily

- 1 exp Human immunodeficiency virus/ or exp acquired immune deficiency syndrome/ or exp human immunodeficiency virus infection/ or exp human immunodeficiency virus 1/ or exp human immunodeficiency virus 2/
- 2 HIV*.tw.
- 3 AIDS.tw.
- 4 antiretroviral agents.mp. or antiretrovirus agent/
- 5 (HAART* or ARV*).tw.
- 6 1 or 2 or 3 or 4 or 5
- 7 (sub-Saharan Africa or Angola or Benin or Botswana or "Burkina Faso" or Burundi or Cameroon or "Cape Verde" or "Central African Republic" or Chad).mp.
- 8 (Comoros or Congo Brazzaville or Congo Democratic Republic or "Côte d'Ivoire" or Djibouti or "Equatorial Guinea" or Eritrea or Ethiopia or Gabon or Gambia or Ghana or Guinea or "Guinea-Bissau" or Kenya or Lesotho).mp.
- 9 (Liberia or Madagascar or Malawi or Mali or Mauritania or Mauritius or Mozambique or Namibia or Niger or Nigeria or Reunion or Rwanda).mp.
- 10 ("Sao Tome and Principe" or Senegal or Seychelles or "Sierra Leone" or Somalia or "South Africa" or Sudan or Swaziland or Tanzania or Togo or Uganda or "Western Sahara" or Zambia or Zimbabwe).mp.
- 11 exp "Africa south of the Sahara"/ep [Epidemiology]
- 12 7 or 8 or 9 or 10 or 11

Supplementary file 1

- 13 6 and 12
- 14 limit 13 to yr="1990 -Current"
- 15 (Farmworkers or "farm worker*" or "Agricultural worker*" or "migrant farmworkers" or "migrant workers" or "migrant labourer*").mp.
- 16 exp agricultural worker/
- 17 ("migrant* adj2 health" or migrants or "mobile population*").mp.
- 18 exp rural population/
- 19 ((rural adj2 population*) or (rural adj2 communit*)).tw.
- 20 plantation worker*.tw.
- 21 agrarian.tw.
- 22 15 or 16 or 17 or 18 or 19 or 20 or 21
- 23 14 and 22
- 24 (Access* or "access to care" or knowledge or availability or provision or guidelines or "National policy" or "strategic plan").tw.
- 25 health care provision.mp. or health care delivery/
- 26 care package.mp.
- 27 24 or 25 or 26
- 28 23 and 27

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- #1 (HIV* or AIDS or Human Acquired Immunodeficiency Syndrome):ti,ab,kw
- #2 MeSH descriptor: [HIV] explode all trees
- #3 MeSH descriptor: [Acquired Immunodeficiency Syndrome] explode all trees
- #4 (human immun*) and (deficiency virus)
- #5 MeSH descriptor: [Anti-Retroviral Agents] explode all trees
- #6 MeSH descriptor: [Antiretroviral Therapy, Highly Active] explode all trees
- #7 (antiretroviral* or HAART*)
- #8 #1 or #2 or #3 or #4 or #5 or #6 or #7
- #9 ((sub-Saharan Africa or Angola or Benin or Botswana or "Burkina Faso" or Burundi or Cameroon or "Cape Verde" or "Central African Republic" or Chad) or (Comoros or Congo

Supplementary file 1

Brazzaville or Congo Democratic Republic or "Côte d'Ivoire" or Djibouti or "Equatorial Guinea" or Eritrea or Ethiopia or Gabon or Gambia or Ghana or Guinea or "Guinea-Bissau" or Kenya or Lesotho)):ti,ab,kw

#10 ((Liberia or Madagascar or Malawi or Mali or Mauritania or Mauritius or Mozambique or Namibia or Niger or Nigeria or Reunion or Rwanda) or ("Sao Tome and Principe" or Senegal or Seychelles or "Sierra Leone" or Somalia or "South Africa" or Sudan or Swaziland or Tanzania or Togo or Uganda or "Western Sahara" or Zambia or Zimbabwe)):ti,ab,kw

#11 MeSH descriptor: [Africa South of the Sahara] explode all trees

#12 #9 or #10 or #11

#13 #12 and #8

#14 ((Farmworkers or "farm worker*" or "Agricultural worker*" or "migrant farmworkers" or "migrant workers" or "migrant labourer*")):ti,ab,kw

#15 MeSH descriptor: [Farmers] explode all trees

#16 ("migrant* AND health") or migrants or "mobile population*"

#17 MeSH descriptor: [Rural Population] explode all trees

#18 (rural and population*) or (rural and communit*)

#19 plantation worker*

#20 agrarian

#21 #14 or #15 or #16 or #17 or #18 or #19 or #20

#22 #21 and #13

#23 ((Access* or "access to care" or knowledge or availability or provision or guidelines or "National policy" or "strategic plan")):ti,ab,kw

#24 care package*

#25 MeSH descriptor: [Delivery of Health Care] explode all trees

#26 #23 or #24 or #25

#27 #26 and #22

Interface - EBSCOhost Research Databases**Database - CINAHL**

| # | Query |
|----|-----------|
| S9 | S6 AND S7 |

Supplementary file 1

| | |
|----|--|
| S8 | S6 AND S7 |
| S7 | TX (((Access* or "access to care" or knowledge or availability or provision or guidelines or "National policy" or "strategic plan"))) OR MH delivery of health care OR TX care package |
| S6 | S4 AND S5 |
| S5 | TX (((Farmworkers or "farm worker*" or "Agricultural worker*" or "migrant farmworkers" or "migrant workers" or "migrant labourer*"))) OR MH farmers OR TX ("mobile population*" or (rural and population*) or (rural and communit*)) OR TX ((plantation worker*) or agrarian) |
| S4 | S1 AND S2 |
| S3 | S1 AND S2 |
| S2 | TX ((sub-Saharan Africa or Angola or Benin or Botswana or "Burkina Faso" or Burundi or Cameroon or "Cape Verde" or "Central African Republic" or Chad) OR TX ((Comoros or Congo Brazzaville or Congo Democratic Republic or "Côte d'Ivoire" or Djibouti or "Equatorial Guinea" or Eritrea or Ethiopia or Gabon or Gambia or Ghana or Guinea or "Guinea-Bissau" or Kenya or Lesotho)) OR TX ((Liberia or Madagascar or Malawi or Mali or Mauritania or Mauritius or Mozambique or Namibia or Niger or Nigeria or Reunion or Rwanda)) OR TX (("Sao Tome and Principe" or Senegal or Seychelles or "Sierra Leone" or Somalia or "South Africa" or Sudan or Swaziland or Tanzania or Togo or Uganda or "Western Sahara" or Zambia or Zimbabwe)) OR MH africa south of the sahara |
| S1 | TX (HIV* or AIDS or Human Acquired Immunodeficiency Syndrome) OR MH hiv OR MH acquired immunodeficiency syndrome OR MH Anti-Retroviral Agents OR TX antiretroviral therapy |

African Index Medicus

tw:((tw:(hiv* OR aids OR antiretroviral*)) AND (tw:(farmers OR farmworkers OR agricultur* OR rural OR agrarian))) AND (collection_gim:("AIM"))

Web of Science

Editions = CPCI-SSH , CPCI-S

Search #5

#4 AND #3

Search #4

Supplementary file 1

(Farmworkers or "farm worker*" or "Agricultural worker*" or "migrant farmworkers" or "migrant workers" or "migrant labourer*") (Topic) or farmers (Topic) or "rural population*" or "rural communit*" (Topic) or "plantation worker*" or agrarian (Topic)

Search #3

#2 AND #1

Search #2

(sub-Saharan Africa or Angola or Benin or Botswana or "Burkina Faso" or Burundi or Cameroon or "Cape Verde" or "Central African Republic" or Chad) (Topic) or (Comoros or Congo Brazzaville or Congo Democratic Republic or "Côte d'Ivoire" or Djibouti or "Equatorial Guinea" or Eritrea or Ethiopia or Gabon or Gambia or Ghana or Guinea or "Guinea-Bissau" or Kenya or Lesotho) (Topic) or (Liberia or Madagascar or Malawi or Mali or Mauritania or Mauritius or Mozambique or Namibia or Niger or Nigeria or Reunion or Rwanda) (Topic) or ("Sao Tome and Principe" or Senegal or Seychelles or "Sierra Leone" or Somalia or "South Africa" or Sudan or Swaziland or Tanzania or Togo or Uganda or "Western Sahara" or Zambia or Zimbabwe) (Topic)

Search #1

(HIV* or "HIV infection*") OR TOPIC: (AIDS or "acquired immunodeficiency syndrome" or "acquired immunodeficiency syndrome") (Topic)

Google Scholar

(HIV OR AIDS) and sub saharan africa and (rural or farmers) and (access or healthcare or availability)

Screened first 100 results