

Access this article online

Quick Response Code:



Website:

https://journals.lww.com/mejo

DOI:

10.4103/meajo.meajo_320_21

Eye Health Integration in Southern and Eastern Africa: A Scoping Review

Cynthia L. A. Ogundo¹, Covadonga Bascaran², Esmael Habtamu^{2,3,4}, John Buchan², Nyawira Mwangi⁵

Abstract:

Integrated health systems are deemed necessary for the attainment of universal health coverage, and the East, Central, and Southern Africa Health Community (ECSA-HC) recently passed a resolution to endorse the integration of eye health into the wider health system. This review presents the current state of integration of eye health systems in the region. Eight hundred and twelve articles between 1946 and 2020 were identified from four electronic databases that were searched. Article selection and data charting were done by two reviewers independently. Thirty articles met the eligibility criteria and were included in the narrative synthesis. Majority were observational studies (60%) and from Tanzania (43%). No explicit definition of integration was found. Eye health was prioritized at national level in some countries but failed to cascade to the lower levels. Eye health system integration was commonly viewed in terms of service delivery and was targeted at the primary level. Eye care data documentation was inadequate. Workforce integration efforts were focused on training general health-care cadres and communities to create a multidisciplinary team but with some concerns on quality of services. Government funding for eye care was limited. The findings show eye health system integration in the ECSA-HC region has been in progress for about four decades and is focused on the inclusion of eye health services into other health-care programs. Integration of comprehensive eye care into all the health system building blocks, particularly financial integration, needs to be given greater emphasis in the ECSA-HC.

Keywords:

Eye health, health systems, health workforce, integration, ophthalmology, primary eye care, sub-Saharan Africa

Introduction

The term integration is intuitively understood to mean bringing together parts into a whole, but it is a loosely defined term when it comes to health service and may mean different things to different people in different health systems.^[1-4] The understanding and evaluation of integration are, therefore, very subjective. It ranges from the provision of comprehensive services pertaining to one health problem to the inclusion of several services essentially under one roof. Part of the difficulty arises because studies on integration typically look

at one aspect or level of integration though usually with an end goal of positive health outcomes.^[5,6] Currently, integrated health systems are thought of as those that can provide a continuum of care, right from health promotion to palliative care, where and when an individual requires it.^[7]

The Sustainable Development Goals (SDG)^[8] include objectives aimed at improving health outcomes. SDG3, good health and well-being, has universal health coverage (UHC) as a proposed means of attainment.^[9] This focuses on health systems, defined by the World Health Organization (WHO) as consisting, “of all the people and actions whose primary purpose is to improve health.”^[10] This definition goes beyond the traditional

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Ogundo CL, Bascaran C, Habtamu E, Buchan J, Mwangi N. Eye health integration in Southern and Eastern Africa: A scoping review. Middle East Afr J Ophthalmol 2023;30:44-50.

¹Department of

Ophthalmology, Mbagathi Hospital, Nairobi, Kenya,

²International Centre for Eye Health, London School of Hygiene and Tropical Medicine, London, United Kingdom, ³Eyu-Ethiopia: Eye Health Research, Training and Service Centre, Bahir Dar, Ethiopia, ⁴Department of Ophthalmology, College of Medicine and Health Sciences, Bahir Dar University, Bahir Dar, Ethiopia, ⁵Department of Ophthalmology, Kenya Medical Training College, Nairobi, Kenya

Address for correspondence:

Dr. Cynthia L. A. Ogundo,
P.O. Box 3021, 00502
Nairobi, Kenya.
E-mail: cakothe@yahoo.co.uk

Received: 18-12-2021

Revised: 19-11-2023

Accepted: 27-11-2023

Published: 22-01-2024

thinking of health systems as relating only to health-care workers and their clients; it encompasses individuals, institutions, and processes, ranging from traditional medicine providers to international health policies.

To assist in contextualizing the varied health systems globally, the WHO has recommended a framework with six components, leadership and governance; health system financing; health workforce; medical products, vaccines and technologies; service delivery and health information systems.^[11] Together the blocks allow for the functioning of the system as a whole. For example, efficient service delivery can only take place in the presence of adequate financing, while the health workforce performs its functions using medicines and the requisite technologies.

This scoping review was focused on eye health integration practices from countries within the East, Central, and Southern Africa Health Community (ECSA-HC), an intergovernmental health organization that promotes efficiency and relevance in the provision of health services in member countries and their neighbors. ECSA-HC at its 2020 Health Ministers' Conference passed a resolution to integrate the management of eye health conditions at all levels, acknowledging the importance of inclusion of eye care in order to achieve UHC.^[12]

Eye health systems in the ECSA-HC region were initially geared toward the management of infectious eye diseases and cataract. As health care has improved, there has been a shift of focus from infectious diseases toward noncommunicable diseases (NCDs) such as diabetes and with some practices of integrating eye health services into the general health system. This scoping review aims to answer the question: what is the state of integration of eye health systems, described in terms of the health building blocks, in the ECSA-HC region?

Methods

The protocol for the scoping review was developed before data extraction and is reported according to the relevant sections of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses for Scoping Reviews guidelines.^[13] The protocol was registered with Open Science Framework (<https://osf.io>) before beginning the data collection process.^[14]

The inclusion criteria were any intervention/observational studies, reports/policy papers that report on the status of eye health systems, and/or integration of eye health systems; both peer-reviewed papers and grey literature in English were included; the studies had to be in/on Eswatini, Malawi, Mauritius, Kenya, Lesotho, Tanzania, Uganda, Zambia, and Zimbabwe with no restriction on time period.

The exclusion criteria were any paper that does not present data on an aspect of eye health systems or integration of eye health systems, any paper that describes a vertical eye health system exclusively, studies that mention an ECSA-HC country but do not mention eye health systems, and studies that do not involve an aspect of one/more health system building block(s).

The study was carried out in the months of June to August 2020. A search strategy was created and refined in MEDLINE, with the help of an information specialist, and then replicated in three other databases with adjustments made for the specific requirements of the databases as needed. The search strategy is available with the protocol on the registration site <https://bit.ly/3uVMrEn>.

The four electronic databases searched were MEDLINE (1946 to July Week 1 2020), EMBASE (1974–2020 June 30), Global Health (1910–2020 Week 25), and Africa-Wide Information (last search conducted July 7, 2020). These were chosen due to their wide range of biomedical, clinical, and health policy articles as well as a focus on public health and Africa.

Identified titles and their abstracts were exported to the reference software Endnote X7.4 (Clarivate Analytics, Philadelphia, USA) for de-duplication. Two reviewers (CO and DM) independently screened all titles and abstracts and excluded those that did not comply with the inclusion criteria.

Screening of the articles was then done on Covidence systematic review software (Veritas Health Innovation, Melbourne, Australia. Available). The reviewers conducted a pilot phase where both independently reviewed the same 10 reports and achieved an agreement of 70%. After a consensus meeting to review the understanding of the inclusion and exclusion criteria, a further 10 reports were reviewed and a 90% inter-reviewer agreement was achieved. Full texts of eligible documents were then assessed and reasons for exclusion were assigned independently by the two reviewers. The reference lists of eligible articles were scanned to identify any further relevant papers. Any conflicts that arose were resolved by discussion and consensus.

Data relating to the integration of eye health systems from all articles meeting the eligibility criteria were extracted and entered directly into a preformatted data charting form on Google Sheets (Google, Mountain View, California, USA) by the two reviewers independently. For each included article, the following data items were extracted: year of publication, lead author, study design, ECSA-HC country, level of eye health system,

health building block(s) involved, and integration characteristics. Harmonization of the data was achieved through consensus.

In view of the heterogeneity of the included articles and the exploratory nature of the research, preliminary synthesis was done by thematic analysis, and subsequently, summarization in a narrative synthesis was done.

Results

The final search was run in the 1st week of July 2020 and yielded 135 titles from MEDLINE, 299 from EMBASE, 66 from Global Health, and 312 from Africa-Wide Information. After deduplication and relevance screening, 110 articles were identified for full-text eligibility review. Of these, the authors were unable to access 14 full texts and these were therefore excluded from the review. The remaining texts were assessed for eligibility and 30 articles met the criteria and were all included in the analysis.

A summary of the process from initial identification to final inclusion is presented in Figure 1.

The articles included in the analysis ranged in publication year from 1980 to 2020. The general characteristics relating to the study design of included articles, countries from which the articles emanate, and the health system level at which integration appears to be occurring are presented in Table 1. Thereafter, the results pertaining to integration are presented based on the health building blocks.

Tanzania yielded the largest number of articles. There is a notable increase in number of published articles as the years progressed, with observational studies forming the bulk of included studies and the primary level of the health system receiving the most attention. All included articles addressed integration in some way; however, none of the included articles gave an explicit definition of integration of eye health systems.

A strong commitment to the integration of eye health systems is evident at national level in some countries, with eye health being prioritized and incorporated into national health plans in Kenya, Uganda, and Zambia.^[15,16] The Malawian Health Ministry identified child eye health as a priority and formed partnerships to provide the necessary services.^[17] In Kenya, the creation of the retinoblastoma strategy group illustrates multisectoral collaboration and a multidisciplinary approach to care.^[18] However, this enthusiastic support at national level fails to cascade to the primary level where there is a general feeling of poor support from supervisors leading to low productivity.^[19,20] In one example from Tanzania, government dispensary health workers, many of whom

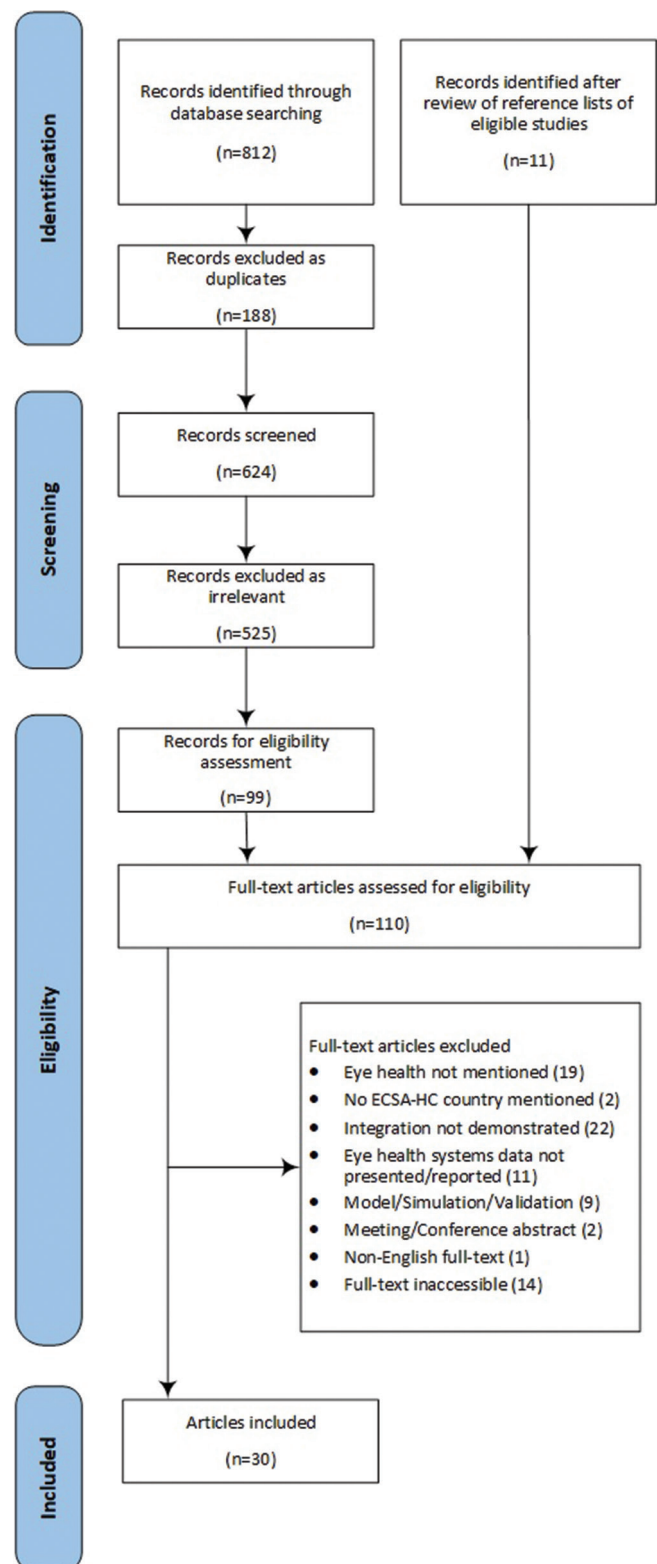


Figure 1: PRISMA flow diagram of article selection

had undergone specific primary eye care training, were only seeing three eye patients per month on average.^[21]

Generally, eye health data are not adequately collected^[22] and even where it is well collected, the data on eye health

Table 1: General characteristics of included articles

Characteristics	Distribution (n)
Study design	
Evaluation	3
Intervention	6
Mixed methods	1
Observational	18
Policy	2
Setting	
Eswatini	1
Kenya	6
Lesotho	1
Malawi	8
Mauritius	0
Tanzania	13
Uganda	3
Zambia	3
Zimbabwe	2
Year of publication	
1980–1990	3
1991–2001	1
2002–2012	8
2013–2020	18
Eye health system tier of integration	
Community	4
Primary	9
Secondary	1
Tertiary	3
General	13

commonly do not make it into the health management information system (HMIS) or health reports.^[19,22,23] There are a few instances where evidence generated from eye health data has led to the formulation of guidelines and national eye plans,^[18,24] and some countries, such as Kenya and Zambia, are planning to improve their HMIS eye health data collection and incorporate evidence into their planning activities.^[15,16] Only one study from Kenya made direct reference to maintaining electronic patient records, and this was confined to the eye clinic and not interconnected across the hospital services.^[25]

Service delivery as a target area for integration was addressed in the majority of articles. Increased geographic coverage and access to eye care at primary level were achieved through the delivery of primary eye care by community members and/or primary health workers.^[17,19,22,26,27] Successful performance monitoring was achieved in some settings, mostly aimed at the workers providing primary eye care.^[28–30] For instance, in one area of Malawi, between 1999 and 2006, those with blinding cataract who accessed surgery went from 1 in 7–4 in 5 with referrals coming in from community case finders, mobile clinics, and community-based health-care workers who had been trained to identify cataract.

Two studies from Tanzania and Zambia reported a lack of regular maintenance for ophthalmic equipment. It was noted that hospital maintenance technicians were not usually involved in the procurement and installation of ophthalmic equipment.^[22,31] There was no explicit mention of the availability of eye health medicines or supplies in any of the included articles.

In the eye health system, workforce integration has taken the form of training physicians, usually junior doctors, to deliver some eye care services for example prescribing near-vision glasses.^[17,28,29] Additionally, several countries report the creation of multidisciplinary teams to take care of particular categories of patients such as in diabetes with nurses and physicians and in retinoblastoma with pathologists, oncologists, laboratory technicians, and social workers coming together with ophthalmologists.^[18,23,25] In countries such as Malawi and Tanzania, eye health workforce integration into the wider health system has been done at primary level by upskilling and delegating primary and maternal health workers for case finding of eye conditions.^[19,27,30,32,33] There are some concerns about the quality of eye care provided by these integrated workers;^[21,33,34] one study from Malawi found that trained community members were more effective at identifying blind children than trained primary health-care workers (PHWs),^[33] but there is also a suggestion that regular supervision can possibly enhance their knowledge and skills.^[35–37]

None of the included studies discussed specific government funding mechanisms related to the integration of eye care. Articles from three of the countries reported that there was no designated budget line for eye care at national level and the tendency is to rely on outside funds from nongovernmental organizations and user fees to fund eye care.^[19,22,28]

Discussion

The majority of included articles were observational studies, which is not surprising given that qualitative descriptive methods are probably the easiest way to study eye health system integration, particularly when the lack of a universal definition on integration is taken into account. Only 30 papers met the criteria for this scoping review; this could be an indication that not much has been published concerning integration in the region, rather than evidence of a limited integration of eye systems. For example, diabetic retinopathy screening is integrated into primary health care in Mauritius [personal communication Dr. Kaminee Balloo Ghoorah, ophthalmologist/vitreoretinal surgeon, Mauritius], but no reports on this were identified through our search. This may also reflect the fact that the concept of integration in the context of eye health systems has

only fairly recently been the explicit focus of global policy and strategy papers like the World Report on Vision.^[38]

Integration of eye health systems in the ECSA-HC seems to be mostly reported from the perspective of inclusion of eye health service delivery into other health activities. Eswatini, Kenya, Lesotho, Malawi, Tanzania, Uganda, and Zimbabwe have eye health plans that recognize the need for integration into the wider health system.^[15,16,39] Collaborations exist between ministries, health disciplines, and even community members that demonstrate a commitment to integration. A recent meta-synthesis of eye health system assessments including three ECSA-HC countries – Kenya, Tanzania, and Malawi – also reported that across the board, the assessments found considerable progress in the integration of eye health systems particularly in regard to national-level eye health governance.^[40] The collaborations, particularly at national level, can be leveraged for continued strengthening of eye health system integration.

The emphasis on service delivery has led to PHWs, usually nurses, engaging in the provision of basic eye care, thereby increasing the accessibility of eye health.^[22,26,27] This is evidenced by improvement in case finding and referral resulting in earlier patient presentation and better outcomes.^[29,41] This in turn increases confidence in eye health systems allowing greater patient engagement and motivating the providers of eye care. This positive feedback would be a great boost for continued efforts at integration. While some levels of service delivery integration seem to be successful, there are questions about the quality of the PHWs' skills, for example, the Malawi study that had better case finding from community members than PHWs.^[33] Quality care is likely to be a system-wide problem and not necessarily specific to eye health systems.^[40] Successes in eye care delivery models and programs have led to the creation of guidelines and the combination of eye health interventions with other health interventions such as ivermectin distribution with Vitamin A distribution.^[18,26]

Monitoring and evaluation are key elements for effective and efficient health-care delivery. A number of articles in the scoping review addressed the evaluation of skills and knowledge of PHWs;^[35-37] however, there was very little if any account taken of systems or processes necessary for quality training and service delivery.^[20,21,37] This lack of unitary evaluation could be the cause for or the result of lack of standardized protocols for eye health system integration.

Challenges faced in data collection and its utilization in the wider health system have led to the development of improvement strategies such as in Tanzania where

community-generated health data are being integrated into the Ministry of Health information systems.^[42] The inclusion of eye health data into such systems would greatly improve integration. It is recognized that more emphasis needs to be made to translate data into information for decision-making and service implementation. Electronic medical records and systems would be useful in promoting physician integration and improving monitoring of performance as well as patient satisfaction. This has been deployed with some success in Zambia with regard to pediatric and maternal health^[42] and could be extended to include eye health. Recent efforts to compile expert opinion on which eye health indicators are more important to monitor eye health and UHC could inform national efforts to monitor the progress of eye health.^[43]

Improvement in health care has in recent years caused a shift in focus from infectious diseases to NCD, bringing diabetes mellitus to the forefront. With eye health having been placed under the NCD umbrella in a number of countries, standardized care delivery through inter-professional teams seems to be concentrated on diabetes care.^[25,41,44] Despite some limitations, this has largely been an enabler to the integration of eye health systems. While allowing integration of eye health into diabetes clinics and access to greater funding, it could potentially slow integration into the wider health system as focus has remained restricted to diabetic retinopathy services. The diabetes care model can be used as a learning point for a strategy of incremental integration. The example of bringing pathologists and oncologists on board as in retinoblastoma care^[18] is further evidence that incremental integration could be feasible in the region, if developed and implemented carefully. Other areas where horizontal integration could take place, are in the inclusion of retinopathy of prematurity screening in neonatal services and vision screening in health promotion exercises are indicated in the Lancet Commission on Global Eye Health.^[45]

In addition, integrated diabetes care has also brought to the limelight the dependency of eye health on technology.^[22,31] This attention can be leveraged to improve the maintenance of health equipment in general and eye health equipment in particular. This could potentially lead to better performance management as servicing of equipment becomes a monitoring and evaluation checkpoint.

Even though a number of governments provide salaries for some of the eye health workforce, insufficient funding for eye health is still a problem and this review found no mechanisms in place for equitable funding. Intention alone with no financial backing or committed action plan will be detrimental to integration efforts and

service delivery.^[20] Deliberate and sustained effort will be needed from governments to ensure that eye health is included in budgetary processes and social health insurance packages. Some countries such as India and Ghana are already including some treatments for eye conditions in their insurance schemes.^[46]

Despite the lack of clear definitions for integration, the review showed the presence of ongoing eye health system integration in the region. A clear definition would allow the various stakeholders in eye health systems to gauge how much integration has taken place as there would be a standard against which to measure progress. It would also enhance the quality of any future intervention or evaluation studies and allow for comparisons between the same.

This is the first study to systematically review the available literature on eye health system integration in the region; the limitations of this study were as follows: it was not possible to obtain the full text for 14 out of the 110 reports included after screening titles and abstracts and some of them may have been eligible for this review. Only four of the ten authors contacted to provide full texts responded. Not all the ECSA-HC countries were represented in the scoping review as no eligible articles pertaining to some of them were found. All these create some potential for selection bias.

The main preoccupation in integration has been with service delivery and is currently focused on diabetes care and the provision of primary eye care at primary level. With the exception of diabetic retinopathy screening, most of the focus has remained on treatment and as such the goal of a truly integrated health system as envisioned by the WHO is still elusive. The authors agree with the WHO concept of integrated care being one that can provide a continuum of care from preventive and promotive to rehabilitation and palliative. The International Agency for Prevention of Blindness further elaborates on this to include incorporation of eye care into national planning of health systems as well as other development sectors such as education and finally ensuring that the services are accessible to all who need them.^[47] It is the authors' opinion that the concepts forwarded by these two bodies encompass what the ideal integrated eye care system should look like. Despite the lack of a universal definition, the authors believe that the National Health Service of the United Kingdom provides a good template for the integration of eye care as evidenced by the guidelines issued in 2021.^[48] Integration of comprehensive eye care into all the health system building blocks needs to be given greater emphasis in the ECSA-HC region. Financial integration particularly still seems to be a major gap in the ECSA-HC region and should be addressed with dedicated eye care funding

from governments and inclusion of eye care in essential health-care packages in the region. Documentation and publication of integration efforts and achievements should be encouraged in the ECSA-HC region to reflect the true state of affairs.

Acknowledgments

We would like to thank Iris Gordon for her assistance in creating the data searches for eligible articles.

Consent for publication

Consent was obtained to mention Dr. Kaminee Balloo Ghoorah by name as a reference source.

Financial support and sponsorship

CO received a scholarship from the Commonwealth Shared Scholarship Scheme (CSSS), part of which was used to fund this study. The CSSS had no role in the design of the study nor collection, analysis, and interpretation of data nor in writing the manuscript.

Conflicts of interest

There are no conflicts of interest.

References

- Goodwin N. Understanding integrated care: A complex process, a fundamental principle. *Int J Integr Care* 2013;13:e011.
- Topp SM, Abimbola S, Joshi R, Negin J. How to assess and prepare health systems in low- and middle-income countries for integration of services-a systematic review. *Health Policy Plan* 2018;33:298-312.
- Armitage GD, Suter E, Oelke ND, Adair CE. Health systems integration: State of the evidence. *Int J Integr Care* 2009;9:e82.
- du Toit R, Faal HB, Etya'ale D, Wiafe B, Mason I, Graham R, *et al.* Evidence for integrating eye health into primary health care in Africa: A health systems strengthening approach. *BMC Health Serv Res* 2013;13:102.
- Mensah EO, Aikins MK, Gyapong M, Anto F, Bockarie MJ, Gyapong JO. Extent of integration of priority interventions into general health systems: A case study of neglected tropical diseases programme in the Western region of Ghana. *PLoS Negl Trop Dis* 2016;10:e0004725.
- Deconinck H, Hallarou M, Criel B, Donnen P, Macq J. Integrating acute malnutrition interventions into national health systems: Lessons from Niger. *BMC Public Health* 2016;16:249.
- Framework on integrated, people-centred health services Sixty-Ninth World Health Assembly A69/39 2016.
- United Nations. Transforming Our World: The 2030 Agenda for Sustainable Development. Available from: <https://sdgs.un.org/2030agenda>. [Last accessed on 2020 Aug 25].
- World Health Organization. Sustainable Development Goals. World Health Organization; 2020. Available from: <https://www.who.int/sdg/targets/en/>. [Last accessed on 2020 Feb 20].
- World Health Organization. The World Health Report 2000: Health Systems: Improving Performance. Geneva: World Health Organization; 2000.
- World Health Organization. Everybody's Business—Strengthening Health Systems to Improve Health Outcomes: WHO's Framework for Action. Geneva, Switzerland: WHO Document Production Services, World Health Organization; 2007.
- East, Central And Southern Africa Health Community Resolutions of The Health Ministers' Conferences 1974-2020.

13. 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;169:467-73.
14. Ogundo CA, Covadonga B, Mwangi N, Mutie D. Scoping review: State of Integration of Eye Health Systems in East, Central and Southern Africa Health Community. Available from: <https://osf.io/fg8vn>. [Last accessed on 2021 Jun 29].
15. Ramke J, Zwi AB, Silva JC, Mwangi N, Rono H, Gichangi M, *et al.* Evidence for national universal eye health plans. *Bull World Health Organ* 2018;96:695-704.
16. Republic of Zambia Ministry of Health National Health Strategic Plan 2011-2015.
17. Jamison A, Mackinnon JR, Lavy TE, Manda C, Msukwa G. Establishing a pediatric ophthalmology service in Malawi: Developments in childhood cataract surgery. *Middle East Afr J Ophthalmol* 2019;26:77-82.
18. Hill JA, Kimani K, White A, Barasa F, Livingstone M, Gallie BL, *et al.* Achieving optimal cancer outcomes in East Africa through multidisciplinary partnership: A case study of the Kenyan National Retinoblastoma Strategy group. *Global Health* 2016;12:23.
19. Jolley E, Mafwiri M, Hunter J, Schmidt E. Integration of eye health into primary care services in Tanzania: A qualitative investigation of experiences in two districts. *BMC Health Serv Res* 2017;17:823.
20. Sukati VN, Moodley VR, Mashige KP. A situational analysis of eye care services in Swaziland. *J Public Health Afr* 2018;9:892.
21. Byamukama E, Courtright P. Knowledge, skills, and productivity in primary eye care among health workers in Tanzania: Need for reassessment of expectations? *Int Health* 2010;2:247-52.
22. Bozzani FM, Griffiths UK, Blanchet K, Schmidt E. Health systems analysis of eye care services in Zambia: Evaluating progress towards VISION 2020 goals. *BMC Health Serv Res* 2014;14:94.
23. Matimba A, Woodward RL, Gwanzura L, Mangwiro JC, Guramatunhu S. Implementation of tele-ophthalmology for diabetic patients in a resource-limited setting in sub-Saharan Africa. *Diabetes* 2015;1:A170.
24. Chirambo MC. Primary eye care in Malawi. *World Health Forum* 1987;8:204-7.
25. Kurji K, Kiage D, Rudnisky CJ, Damji KF. Improving diabetic retinopathy screening in Africa: Patient satisfaction with teleophthalmology versus ophthalmologist-based screening. *Middle East Afr J Ophthalmol* 2013;20:56-60.
26. Meredith SE, Cross C, Amazigo UV. Empowering communities in combating river blindness and the role of NGOs: Case studies from Cameroon, Mali, Nigeria, and Uganda. *Health Res Policy Syst* 2012;10:16.
27. Chirambo MC, Schwab L. Ophthalmology in Malawi. *Arch Ophthalmol* 1989;107:1826-9.
28. Laviers H, Burhan I, Omar F, Jecha H, Gilbert C. Evaluation of distribution of presbyopic correction through primary healthcare centres in Zanzibar, East Africa. *Br J Ophthalmol* 2011;95:783-7.
29. van der Windt C, Chana HS. Cataract surgery at district hospital level. *Int Ophthalmol* 1993;17:265-8.
30. Dean WH, Sherwin JC, Kambewa E, Metcalfe NH. Addressing cataract in rural Malawi: The Nkhoma eye programme. *Community Eye Health* 2014;27:6.
31. Poore S, Foster A, Zondervan M, Blanchet K. Planning and developing services for diabetic retinopathy in Sub-Saharan Africa. *Int J Health Policy Manag* 2015;4:19-28.
32. Mafwiri M, Malik AN, Gilbert C. Integrating child eye health within primary health care: A case study. *Community Eye Health* 2018;30:78-9.
33. Kalua K, Ng'ongola RT, Mbewe F, Gilbert C. Using primary health care (PHC) workers and key informants for community based detection of blindness in children in Southern Malawi. *Hum Resour Health* 2012;10:37.
34. Mafwiri MM, Jolley E, Hunter J, Gilbert CE, Schmidt E. Mixed methods evaluation of a primary eye care training programme for primary health workers in Morogoro Tanzania. *BMC Nurs* 2016;15:41.
35. Kalua K, Gichangi M, Barassa E, Eliah E, Lewallen S, Courtright P. A randomised controlled trial to investigate effects of enhanced supervision on primary eye care services at health centres in Kenya, Malawi and Tanzania. *BMC Health Serv Res* 2014;14 Suppl 1:S6.
36. Gichangi M, Kalua K, Barassa E, Eliah E, Lewallen S, Courtright P. Task shifting for eye care in Eastern Africa: General nurses as trichiasis surgeons in Kenya, Malawi, and Tanzania. *Ophthalmic Epidemiol* 2015;22:226-30.
37. Kalua K, Gichangi M, Barassa E, Eliah E, Lewallen S, Courtright P. Skills of general health workers in primary eye care in Kenya, Malawi and Tanzania. *Hum Resour Health* 2014;12 Suppl 1:S2.
38. World Health Organization. World Report on Vision. Geneva: World Health Organization; 2019.
39. Available from: <https://atlas.iapb.org/global-action-plan/gap-indicators/>. [Last accessed on 2020 May 13].
40. Bechange S, Jolley E, Virendrakumar B, Pente V, Milgate J, Schmidt E. Strengths and weaknesses of eye care services in sub-Saharan Africa: A meta-synthesis of eye health system assessments. *BMC Health Serv Res* 2020;20:381.
41. Munyogwa MJ, William R, Kibusi SM, Gibore NS. Clinical characteristics and health care received among patients with type 2 diabetes attending secondary and tertiary healthcare facilities in Mwanza Region, Tanzania: A cross-sectional study. *BMC Health Serv Res* 2020;20:527.
42. Mutale W, Chintu N, Amoroso C, Awoonor-Williams K, Phillips J, Baynes C, *et al.* Improving health information systems for decision making across five sub-Saharan African countries: Implementation strategies from the African health initiative. *BMC Health Serv Res* 2013;13 Suppl 2:S9.
43. McCormick I, Mactaggart I, Resnikoff S, Muirhead D, Murthy GV, Silva JC, *et al.* Eye health indicators for universal health coverage: Results of a global expert prioritisation process. *Br J Ophthalmol* 2022;106:893-901.
44. Pérez GM, Swart W, Munyenembe JK, Saranchuk P. Barriers to pilot mobile teleophthalmology in a rural hospital in Southern Malawi. *Pan Afr Med J* 2014;19:136.
45. Burton MJ, Ramke J, Marques AP, Bourne RR, Congdon N, Jones I, *et al.* The Lancet global health commission on global eye health: Vision beyond 2020. *Lancet Glob Health* 2021;9:e489-551.
46. Blanchet K, Gilbert C, de Savigny D. Rethinking eye health systems to achieve universal coverage: The role of research. *Br J Ophthalmol* 2014;98:1325-8.
47. Shrestha J. Integrated People-Centred Eye Care-Understanding Before Advocating. Available from: <https://www.iapb.org/blog/integrated-people-centred-eye-care-ipc-understanding-before-advocating/>. [Last accessed on 2023 Nov 14].
48. National Health Services England. Eye Care Planning Implementation Guidance 2021-22 Summary (Annexe). National Health Services England; 2021.