Eye health system assessment
Mainland Tanzania

Sightsavers

Authors

Nkundwe Mwakyusa[1], Gosbert Katunzi[2], Bernadetha Shilio[1], Hitruda Temba [3], Christina Mbise[2] , Vumilia Mmari[4], Eden Mashayo[5], Stevens Bechange[2]

From [1]National eye care programme: Ministry of Health, Community Development, Gender, Elderly and Children, Tanzania; [2]Sightsavers Tanzania country programme; [3]Planning and Policy Department, Ministry of Health, Community Development, Gender, Elderly and Children, Tanzania; [4]Human Resource Development Department, Ministry of Health, Community Development, Gender, Elderly and Children, Tanzania; and [5]BrienHolden Vision Institute, Tanzania Office

Acknowledgements

Sightsavers

Eye health system assessment

Mainland Tanzania

May 2017

Sightsavers

Table of Contents

Sightsavers

Sightsavers

List of annexes

1. List of members interviewed at national, regional and district levels
2. Eye health section establishment proposal
3. National eye health terms of reference
4. Situation of eye health at regional referral hospitals
5. Eye health services not covered in the NHIF benefit package

List of tables

1. Available human resource for health
2. Eye health development partners and local NGOs
3. Availability and gaps in eye health human resource in mainland Tanzania
4. Training trend for ophthalmologists, AMOOs, ONOs and optometrists in the country

List of figures

1. Building blocks of the health system
2. The health care pyramid in Tanzania
3. Relations between levels of management in health services
4. Percentage of government of Tanzania (GOT) budget 2006/07- 2014/15
5. Percentage of persons with disability by type, 2012 National Census
6. 2015 organisational structure of the MOHSW, currently MOHCDGEC
7. Organisation of eye health service provision and coordination
8. Distribution of eye health human resource cadres in mainland Tanzania

Sightsavers

List of abbreviations and acronyms

AMOO	Assistant medical officer in ophthalmology
BHVI	BrienHolden Vision Institute
CBM	Christoffel-Blinden Mission
CCBRT	Comprehensive community-based rehabilitation in Tanzania
CHF/TIKA	Community health fund/Tiba kwa Kadi
CCHP	Comprehensive council health plan
CHSB	Council health services board
CHMT	Council health management team
CPD	Continued professional development
CSR	Cataract surgical rate
DHIS	District health information system
DHS	Demographic and health surveys
DOH	Department of Health
EHSA	Eye health systems assessment
eHSS	Eye health systems strengthening
GOT	Government of Tanzania
HFGC	Health facility governing committee
HMIS	Health management information system
HRD	Human resource department
HReH	Human resources for eye health
HRH	Human resources for health
HRHIS	Human resources for health information system
HSSP	Health sector strategic plan
ICEH	International Centre for Eye Health
IDSR	Integrated disease surveillance and response
KCMC	Kilimanjaro Christian Medical Centre
LGA	Local Government Authority

Sightsavers

LSHTM	London School of Hygiene and Tropical Medicine
MBP	Minimum benefit package
MNH	Muhimbili National Hospital
MOHCDGEC	Ministry of Health, Community Development, Gender, Elderly and Children
MOF	Ministry of Finance
MSD	Medical Stores Department
MUHAS	Muhimbili University of Health and Allied Sciences
MTC	Medicines and therapeutic committee
MTUHA	Mfumo wa Takwimu na Ufuatiliaji wa Huduma za Afya
NACTE	National Council for Technical Education
NBS	National Bureau of Statistics
NCD	Non-communicable disease
NGO	Non-governmental organisations
NECP	National eye care programme
NEHCIP	National essential health care interventions package
NHIF	National health insurance fund
NIMR	National Institute for Medical Research
NSSF	National social security fund
ONO	Ophthalmic nursing officer
PEC	Primary eye care
PMORALG	Prime Ministers' Office, Regional Authorities and Local Government
RAAB	Rapid assessment of avoidable blindness
RHMT	Regional health management teams
RRH	Regional referral hospital
SNHI	Single national health insurance
SWAp	Sector wide approaches
TFDA	Tanzania Food and Drug Agency
TIIS	Training institutions information system

Sightsavers

TLB	Tanzania League of the Blind
TSB	Tanzania Society for the Blind
TWG	Technical working group
USAID	United States Agency for International Development
WB	World Bank
WHO	World Health Organization

Sightsavers

Executive summary

Background and rationale

A health system can be viewed as an arrangement of complex and multi-layered structures functioning to promote the health of a population. Eye health system assessments examine different components of an eye health system within its wider context. With funding from Sightsavers, this study was carried out to assess the strengths and weaknesses of the eye health system in mainland Tanzania, to facilitate the design of new eye health initiatives aimed at improving, and the scaling-up of, eye care services in the country.

This study had four specific objectives:
1. Describe the nature and functioning of the broader country health system in Tanzania
2. Describe the nature, scope and functioning of the eye health system and how it is integrated in the broader health system
3. Document and disseminate 'lessons learned' and best practices for consideration during relevant policy review/formulation processes
4. Determine the relative strengths and weaknesses of the eye health system and make recommendations for strengthening the country's eye health system and innovations

Data and methods

Data was collected from July to September 2016 using methods outlined in the eye health system assessment (EHSA) tool developed in 2012 by a consortium of eye care and health experts, coordinated by the International Centre for Eye Health (ICEH) at the London School of Hygiene and Tropical Medicine (LSHTM) and funded by Sightsavers.

Review and analysis of relevant documents was combined with 36 in-depth interviews and eight focus group discussions with selected stakeholders, both in the eye health sector and the broader health system. Supported by a series of probing questions, data was collected for each of the eye health system assessment modules using the indicators detailed in the EHSA tool. Intensive data analysis began after the fieldwork had been completed; the process included an analysis workshop that brought together all co-investigators and Sightsavers Tanzania programme staff, to enable everybody's active participation and contributions to this report.

Sightsavers

Key findings

Eye health governance

Strengths

- The process of setting health priorities within the Ministry of Health, Community Development, Gender, Elderly and Children (MOHCDGEC) is participatory and includes different departments.
- Different stakeholders are involved in decision making and budgeting at all levels.
- Planning is based on the prevailing strategic plan and guided by a number of policy documents and planning tools.

Weaknesses

- Management of eye health interventions in the MOHCDGEC falls under two directorates, the Directorate of Curative Services and the Directorate of Preventive Services, which limits coordination between different stakeholders.
- The national eye care programme (NECP) sits under the non-communicable diseases (NCDs) section of the curative services department and does not get as much priority as other NCDs.
- There are gaps in the number of staff and skills available to NECP to ensure adequate fulfilment of different roles and responsibilities.
- NECP is not adequately supported by the national eye health committee (NEHC); and the NGO eye health forum is inactive.
- Eye health stakeholders are not adequately involved in setting health priorities and budgets at all levels.
- There is poor alignment of priorities between international NGOs and country needs.

Eye health financing

Strengths

- The government contributes to health care financing, including eye health.
- Eye health services are covered by health insurance and around 27 per cent of the population is enrolled in pre-payment schemes.
- Accelerating insurance coverage by the year 2020 to achieve universal health coverage is a government priority.
- There are exemption and fee waiver policies for vulnerable populations at the facility level.

Sightsavers

- There are local and international NGOs funding eye health interventions through government partnership frameworks.

Weaknesses

- Eye care services receive limited financial resources to meet population needs.
- Eye care coordination at the national level has not been funded by the government since 2010.
- There is a limited number of eye health NGOs in the country and their support covers only a few regions.
- There are no mechanisms to ring-fence financial revenues generated by eye health at the facility level.
- Not all eye services are covered by the national health insurance fund (NHIF) benefit package.

Eye health service delivery

Strengths

- A wide range of eye health services is available in the country, ranging from primary eye care to highly specialised services.
- There is one national, four zonal and 28 regional hospitals providing eye care services.
- The national hospital and all four zonal referral hospitals are staffed with ophthalmologists and optometrists.
- There are private and faith-based eye hospitals and clinics, which contribute significantly to the availability of eye care services in the country.
- There is a standard treatment guideline for eye health.

Weaknesses

- There is limited eye health infrastructure, particularly at district and regional levels.
- Most regional and district hospitals lack basic ophthalmological equipment and instruments.
- Only 6 out of 28 regional referral hospitals are staffed with ophthalmologists.
- There are limited resources for eye health promotion services.
- Clinical supervision is not available at all levels and is dependent on the availability of donor funding.
- Health facilities providing cataract surgical services do not routinely monitor surgery outcomes.
- Eye health workers do not always follow the standard treatment guidelines.

Sightsavers

- Different bodies within the Ministry register private eye care facilities; posing challenges in ensuring and monitoring quality of services offered.

Eye health medicines and medical products

Strengths

- Essential eye medicines, equipment and supplies are currently included in the Medical Stores Department (MSD) catalogue under non-priced items.
- There is the Tanzania Food and Drug Authority (TFDA), responsible for monitoring quality, safety and effectiveness of medicines and medical devices in the country.
- There are procedures in place to report poor quality medicines and adverse effects, including those for eye care.
- Development partners provide equipment, medicines and supplies to selected hospitals.

Weaknesses

- Eye equipment, medicines and supplies are not readily available through the existing public procurement system; and there were observed stock-outs of essential eye medicines and supplies in most health facilities surveyed in this study.
- There are challenging public procurement mechanisms, which create difficulties in timely procurement of products.
- There is no specific budget allocation for eye equipment and medicines, and they tend to be given lower priority in the public procurement system.
- The TFDA quality surveillance system does not include eye care medicines and supplies.

Human resources for eye health

Strengths

- There is a national health policy for human resources for health (HRH), which translates in to the staffing levels for the health sector.
- Eye health personnel is included in the HRH staffing levels.
- There are training institutions for key eye health cadres.
- There is an increased interest among junior doctors to pursue further studies (M.Med) in ophthalmology.

Sightsavers

Weaknesses

- There is a shortage and unequal distribution of eye health workers in the country.
- Eye health staff often work in other health areas due to the lack of space, equipment and medicines for eye health.
- There are limited sponsorships for M.Med ophthalmology training from the government.
- Development partners' support to human resources for eye health (HReH) training is poorly coordinated with the Ministry.
- The reforms of the mid-level training systems created challenges for training mid-level cadres in eye health.
- Assistant medical officers in ophthalmology (AMOOs) and ophthalmic nursing officers (ONOs) are often demotivated to perform eye care work, as the current government scheme of service does not recognise their additional professional qualifications.

Eye health management information system (eHMIS)

Strengths

- There is a form (MTUHA book 16) for recording and reporting eye health data from district and regional hospitals and private clinics; and the data is entered into the web-based system, district health information software (DHIS 2).
- There are health management information system focal persons in hospitals and HMIS coordinators at regional and district levels.
- There is an integrated disease surveillance and response (IDSR) system, which includes eye conditions.

Weaknesses

- Eye health indicators are not among the 64 health sector performance indicators.
- The current HMIS does not capture information from the national and zonal referral hospitals.
- Many private hospitals/clinics offering eye services do not report eye patient information to the district authorities.
- Eye health outreach data is not captured in the HMIS.
- There is limited sharing of data among different eye health stakeholders and the public.
- There is a lack of linkages (interoperability) between the HMIS and other health information systems, such as the human resources for health information system (HRHIS) and the training institutions information system (TIIS).

Sightsavers

Conclusions and recommendations

The authors of the report recommend that local, national and international stakeholders, while developing new eye health initiatives, policies and projects, take the key findings of this assessment into consideration. Some specific priorities from this assessment may include, but are not limited to, the following recommendations:

Eye health governance:

- Improve coordination between different directorates responsible for eye health programmes at the national level;
- Improve coordination of different activities of international partners with the Ministry and other government structures;
- Improve support of the national eye care programme by the national eye health committee and NGO eye health forum.

Eye health financing:

- Earmark allocations for eye health in the government's health expenditure;
- Establish mechanisms for ring-fencing eye care revenues at the facility level;
- Eye health service delivery:
- Develop guidelines and establish mechanisms for regular monitoring cataract surgery outcomes;
- Ensure that the standard treatment guidelines are used at all levels;
- Ensure consistency in registration and monitoring quality of services provided by private eye care hospitals/clinics;

Eye health medicines and products:

- Integrate eye medicines, equipment and supplies in the priced MSD catalogue;
- Include eye health medicines and supplies in the quality surveillance processes;

Human resources for eye health:

- Develop strategies to address challenges in training mid-level personnel for eye health;
- Ensure that additional qualifications of eye health personnel are recognised in the carrier and remuneration frameworks;

Sightsavers

Eye health HMIS

- Include eye health indicators in the health sector performance indicator framework;
- Develop mechanisms for capturing eye health data from the national and zonal hospitals; outreach activities and private sector providers;
- Strengthen capacities for collating and analysing eye health information at all levels.

1. Introduction

Governments across the world face diverse challenges in meeting their populations' health needs. This is especially the case in sub-Saharan Africa, where, while facing a multitude of economic and development constraints, countries need to respond to diverse health threats such as HIV/AIDS, tuberculosis, malaria, malnutrition, Ebola and a growing burden of non-communicable diseases (1-3). There is an increasing acknowledgment that, to be able to address these challenges, health systems' re-orientation is required (4-6).

Global health funding to some of the poorest countries has more than doubled in the past decade – however, debates continue as to whether such investments have helped to address the priority health needs of recipient populations (7, 8). This is in view of the fact that most of the funding has been through disease-focused global health initiatives, which have arguably led to planning and implementation *regimes*, parallel to the national health systems (7, 9). Proponents have argued that such investments have enabled rapid scale-up of services in high disease burden and low resource settings, while opponents have argued that such initiatives may have been detrimental to a sustainable, integrated approach to the development of health systems in such countries (9, 10).

Over the last decade, increasing efforts have been invested in exploring the relationship between the eye health system and the general health system in many countries. Data from multiple studies globally suggest that up to 80 per cent of visual impairment is either preventable or curable through effective eye care services (11, 12). With advances in technology and new information, it has been argued that many avoidable causes of vision loss can be effectively addressed, but the effectiveness of eye care programming can only be improved through better understanding of how health systems function (13, 14).

In 2012, funded by Sightsavers, a consortium of eye care and health experts, coordinated by the International Centre for Eye Health (ICEH) at the London School of Hygiene and Tropical Medicine (LSHTM), developed the eye health systems assessment (EHSA) tool. The tool builds on the more general health systems assessment (HSA) approach, previously developed and promoted by the United States Agency for International Development (USAID). The developers of the EHSA tool identify and emphasise two broad objectives for an eye health systems assessment: (1) to enable national and international eye care actors to regularly assess a country's eye health system, in order to diagnose the relative strengths and weaknesses of the eye health system, to plan, prioritise key weakness areas, and identify potential solutions or recommendations for eye

Sightsavers

care interventions; and (2) to assist national eye health authorities and international organisations to include eye health systems' interventions in eye care programming, and into the general health system.

Anchored in the VISION 2020 principles, Sightsavers and several other partners in the eye health sector have been supporting the Tanzanian Ministry of Health, Community Development, Gender, Elders and Children (MOHCDGEC) to establish a strong eye health system, as articulated in the 2011-2016 national eye care strategic plan. As the current eye health strategic plan was coming to an end in 2016, it was thought that an assessment of the eye health system in Tanzania should be undertaken to generate information that would guide the development of the new strategic plan and inform the design of new eye health initiatives in Tanzania. The methodology followed during this assessment is built on the findings and recommendations of earlier eye health systems' assessments in other countries, including Zambia, Ghana and Sierra Leone, Cambodia (15), (16) (17). The data from this study is expected to help MOHCDGEC advocate additional resources from government and non-government entities to improve provision of eye health services in the country.

2. Objectives and analytical framework

2.1. Overall objective

The overall objective of this assessment was to examine and document different components of the eye health system and its links with the broader health system, thus providing a basis for targeted programmatic work to strengthen eye health within the Tanzanian general health system.

2.2. Specific objectives:

I.   Describe the nature and functioning of the broader health system in Tanzania
II. Describe the nature, scope and functioning of the eye health system and how it is integrated in the broader health system
III. Document and disseminate 'lessons learned' and best practices for consideration during relevant policy review/formulation
IV. Determine relative strengths and weaknesses of the eye health system and identify potential recommendations for country-specific eye health system strengthening

Sightsavers

2.3. Analytical framework

In order to perform well, health systems must carry out a number of basic functions, formulated as "six essential building blocks" proposed by the World Health Organization (WHO), as shown in figure 1 below:

- Good health service delivery – the ability to efficiently and equitably deliver effective, safe, quality personal and non-personal interventions to those who need them.
- A well-performing health workforce that is competent, responsive, fair and efficient in achieving the best health outcomes possible, given available resources and circumstances.
- A well-functioning health information system that ensures the production, analysis, dissemination and use of reliable and timely information on health determinants, health systems' performance and health status.
- A well-functioning system for providing equitable access to quality, safe and efficacious essential pharmaceutical and health products and technologies.
- Good health financing systems to raise adequate funds for health, and to ensure protection for financial risks.
- Effective leadership and governance to ensure strategic policy frameworks exist and are combined with effective oversight, coalition building, and the provision of appropriate regulations and incentives, and accountability.

Sightsavers
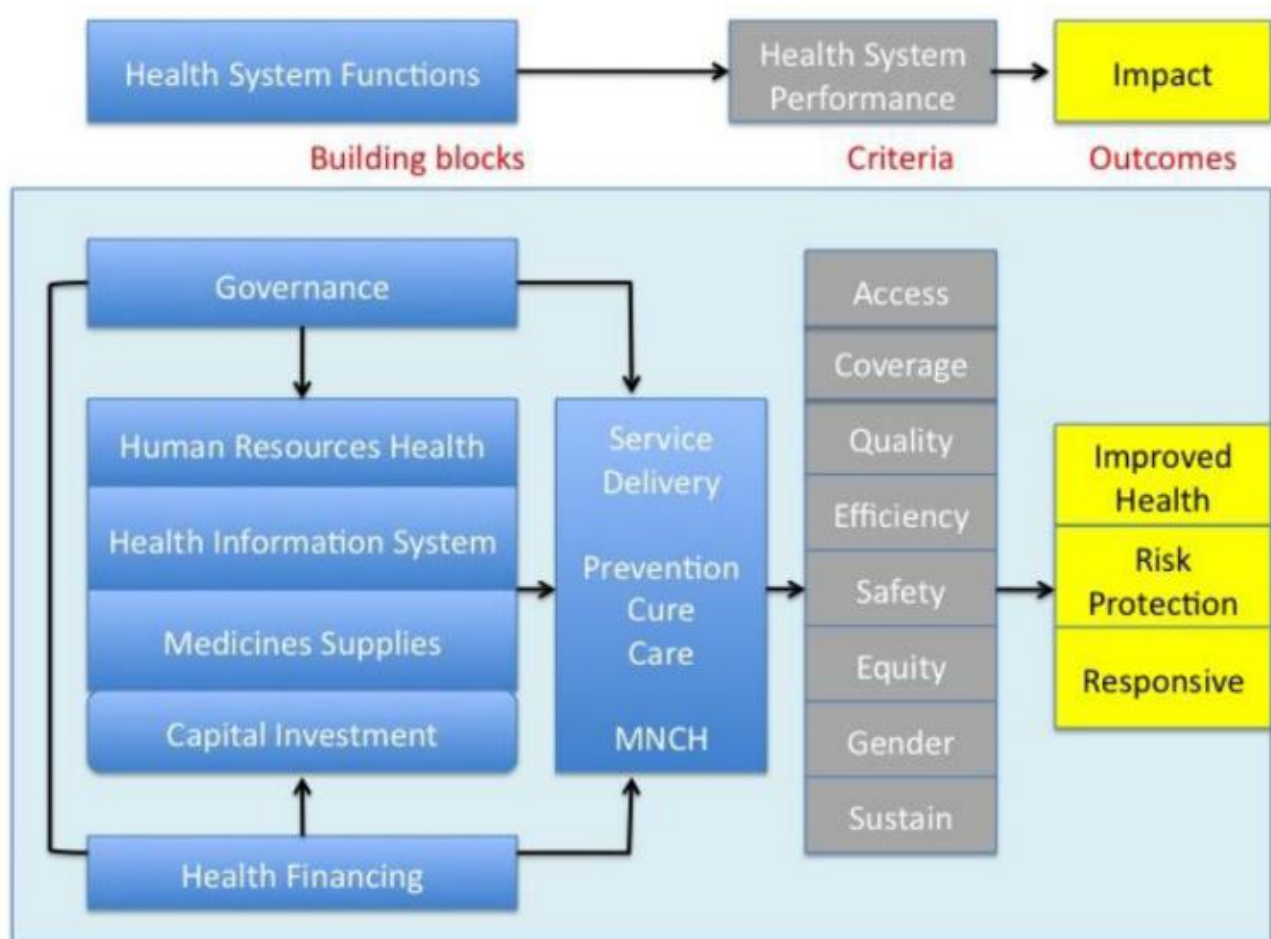
Figure 1: building blocks of the health systems

Source: HSSP IV, as adapted from WHO Framework for action 2007, Strengthening health systems to improve health outcomes

It is expected that the collected data will be used to guide future eye health programming at the national level by providing information on the following:

1) Detailed description and analysis of the relative strengths and weaknesses of the country eye health system, including linkages to other services and potential solutions or recommendations for eye care interventions

2) Data-informed suggestions to guide optimal future investments in eye health by the government, other national eye health-implementing entities and eye health-focused international organisations. This data could potentially feed into and inform future health system-strengthening research that focuses on eye health in Tanzania and other countries in the region

Sightsavers

3. Methodology

3.1 Study design

Using elements of the EHSA approach outlined in the EHSA tool (18), this study employed a primarily qualitative methodology, comprising document reviews and in-depth interviews (IDIs) and focus group discussions (FGDs) with various actors in the eye health system, as well as the country's broader health sector. The fieldwork was conducted over two months during the third quarter of 2016.

3.2. Sampling

Of the 28 regions that make up mainland Tanzania, four were selected for this study: Dar es Salaam (capital city), Kigoma, Lindi and Morogoro. These regions were purposefully selected to have diversity in zonal representation in the findings. The choice of these regions was not intended to be statistically representative, but to provide insights into some of the strengths and weaknesses, or gaps, in eye health service provision across the country. The respondents for FGDs and IDIs were also selected, taking into consideration the nature of their involvement in the health system in general, as well as eye care, specifically. These were key stakeholders involved in eye care services, such as heads of eye care implementing NGOs, heads of various units at the MOHCDGEC and members of the regional and district council health management teams (CHMTs), as summarised in annex 1.

3.3. Data collection, management and analysis

A semi-structured interview guide was used to conduct 36 IDIs and eight FGDs. Interviews and focus group discussions were tape-recorded, and notes from each session were recorded in notebooks. In the interest of time, the document review was carried out at the same time as the stakeholder interviews. At the end of each meeting, key informants were asked for documents relating to eye health. Soft copies were collected on a flash disk or emailed and, where only hard copies were available, they were borrowed for scanning.

The data from FGDs and IDIs was recorded by digital audio-recorder and then transcribed verbatim and translated from Kiswahili to English. This data was carefully checked against handwritten notes taken during the interviews. The interview transcripts were analysed thematically. A grounded theoretical approach was used, beginning with an intense reading of the transcripts and a provisional coding of themes and sub-themes. Once the initial coding was complete, the full team of investigators did a second round of coding and analysis and the emerging themes were related back to the research questions.

Sightsavers

3.4. Ethical considerations

The study received ethical approval from the National Institute for Medical Research (NIMR) of Tanzania. Due care was taken to ensure that all those who accepted to participate in the study did so voluntarily. Respondents were individually requested to give their informed consent after a thorough explanation of the aims of the study had been provided and discussed with them. Additionally, consent for audio recording was sought prior to each interview session. Confidentiality was maintained throughout the study and all respondents were accorded protection of anonymity. Identifiable information on respondents was not used in analyses and write-up.

4. Tanzania health system overview

4.1 Country context

Tanzania is a predominantly rural country with an estimated 71 per cent of the population living in rural areas and involved primarily in subsistence agriculture (19). The country's estimated Gross Domestic Product (GDP) per capita is US$695 with approximately 38.2 per cent of the population living on less than US$1 a day (20). An estimated per capita expenditure on health is US$50, with more than half paid out-of-pocket (21). It is estimated that 65 per cent of the population live within a 5km radius of a health facility (22). The country has a very high level of fertility, with a total fertility rate (TFR) of 5.7 children per woman of fertile age, crude birth rate (CBR) of 39.15 per 1,000 persons, and an annual population growth rate of 2.7 per cent (23). As a result, the population is very young, with 44.2 per cent estimated to be below 15 years of age. According to the National Bureau of Statistics (NBS) Census of 2012, life expectancy at birth is 60 years for men and 63 years for women (19).

4.2 Health services structure in Tanzania

The health care delivery system in the country takes on a pyramidal structure with primary health care services sitting at the base of the pyramid (see figure 2). At the community level, health promotion and prevention activities bring health to the families in villages and neighbourhoods – often along the lines of disease control programmes. Public and private providers at dispensaries provide preventive and curative outpatient services, while health centres can also admit patients, and sometimes provide surgical services. Council hospitals provide medical and basic surgical services to referred patients. Regional Referral Hospitals (RRH) function as the highest referral centres at the regional level and provide specialist medical care. Zonal and national hospitals offer advanced medical care for referred patients. Apart from service delivery, some council and regional referral

Sightsavers

hospitals, zonal and national hospitals are used as teaching hospitals for medical, paramedical and nursing training. There are 5,414 public health facilities including faith-based organisations (FBOs) with 48,993 beds. Private health facilities are 2,048 in total, with 1,987 beds (22).
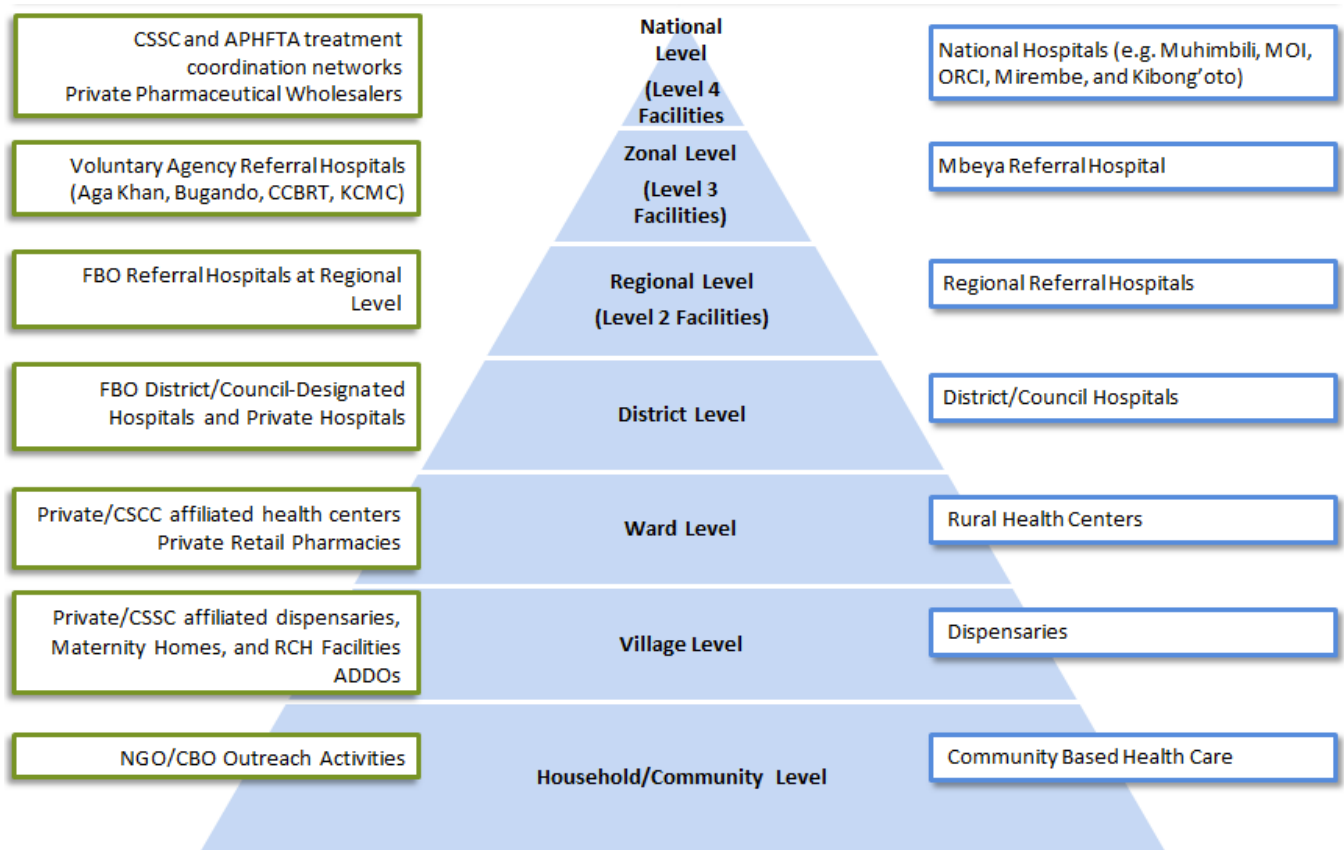

CSSC and APHFTA treatment coordination networks Private Pharmaceutical Wholesalers	National Level (Level 4 Facilities)	National Hospitals (e.g. Muhimbili, MOI, ORCI, Mirembe, and Kibong'oto)
Voluntary Agency Referral Hospitals (Aga Khan, Bugando, CCBRT, KCMC)	Zonal Level (Level 3 Facilities)	Mbeya Referral Hospital
FBO Referral Hospitals at Regional Level	Regional Level (Level 2 Facilities)	Regional Referral Hospitals
FBO District/Council-Designated Hospitals and Private Hospitals	District Level	District/Council Hospitals
Private/CSCC affiliated health centers Private Retail Pharmacies	Ward Level	Rural Health Centers
Private/CSCC affiliated dispensaries, Maternity Homes, and RCH Facilities ADDOs	Village Level	Dispensaries
NGO/CBO Outreach Activities	Household/Community Level	Community Based Health Care

Figure 2: the health care pyramid in Tanzania (public and private equivalent)

Source: HSSP IV

4.3. Management of health services

Management and administration of public services at regional and council levels is under the President's Office – Regional Administration and Local Government (PORALG). At the council level, the local government authorities (LGAs) are responsible for planning, delivering and overseeing public services, while the Council Health Management Teams (CHMTs) manage health care services. Council health services consist of primary referral hospitals and primary health care facilities (including health centres and dispensaries). All CHMTs produce an annual comprehensive council health plan (CCHP), which shows the activities and budgets for the services. There tend to be many activities off-plan and off-budget, initiated through non-governmental organisations (NGOs) or disease control

Sightsavers

programmes (24). Health facility governing committees (HFGCs) and council health services boards (CHSBs) are bodies with community representatives, designed to contribute to the management of health institutions, but which are sometimes dysfunctional. Regional health management teams (RHMTs) work under the regional administration under PORALG. They oversee the work of the regional referral hospitals and the CHMTs. RHMTs provide technical and administrative support to those entities. The Department of Health (DOH) in PORALG oversees the council and regional health services, administratively.

PORALG supervises planning, reporting and financial accounting. However, it is the MOHCDGEC, which has the overall responsibility for health services in the country and defines priorities for services in the health sector, as guided by the National Essential Health Care Interventions Package – Tanzania (NEHCIP-Tz). While the Ministry provides technical guidance to organisations involved in service delivery, and defines, controls and promotes maintenance of quality standards, some stewardship functions are delegated to PORALG and other statutory health agencies, *e.g.*, Medical Stores Department (MSD), Tanzania Food and Drug Authority (FDA) etc. Figure 3 shows technical and administrative relations within the government structure.
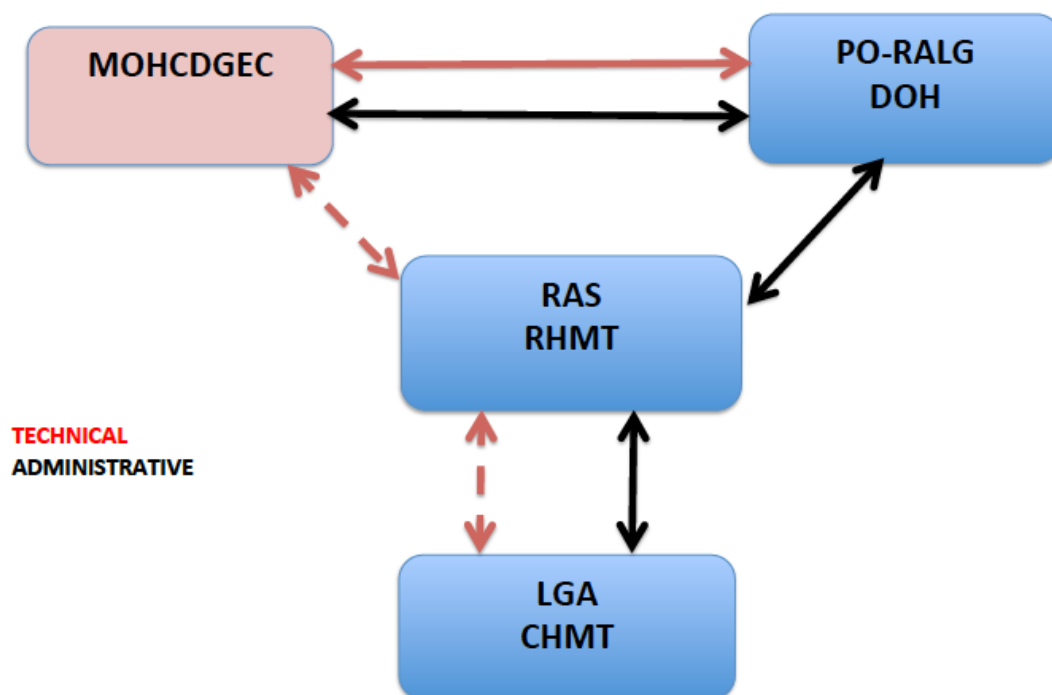

Figure 3: relations between levels of management in health services

Source: adapted from HSSP IV

Sightsavers

4.4. Human resources for health

While Tanzania is one of the countries with the highest need for health services, it suffers from a serious shortage of health workers (see Table 1 below). It had been estimated that the supply of health workers would reach 60 per cent of the estimated need in Tanzania by 2015 (25). However, due to a multiplicity of challenges, this aspirational target could not be achieved.

The continuing dire human resources for health (HRH) situation in the country could be partly attributed to government civil service reform policies of the 1990s that focused on cutting down the number of civil servants and freezing employment opportunities in the public sector generally. These reforms also came with the establishment of budget ceilings, which restricted the amount of resources that could be allocated to various activities, including workforce related issues. Other notable contributing factors to this situation include weak planning and forecasting of HRH requirements; inadequate involvement of key stakeholders in HRH planning; and brain drain within and outside the country.

To address these challenges, the MOHCDGEC initiated processes to develop strategies and interventions that focused on increasing production, quality and recruitment of HRH graduates. The key strategic documents and interventions developed include the HRH policy guideline (2005), the HRH strategic plan (2008-2013), the human resources information system (HRIS) and the training institutions information system (TIIS). Currently, the MOHCDGEC, in collaboration with other stakeholders, is implementing a second HRH strategic plan (2014-2019).

Table 1: Available human resource for health

Level of Care	Required	Available	Deficit	% Shortage
Heath Service Delivery Facilities	145,454	63,447	82,007	56.38%
Health Training Institutions	4,325	2,820	1,505	34.79%
Total	149,779	66,267	83,512	56%

Source: human resource for health strategic plan, 2014

HRH availability varies across the regions with health workers' density ranging from four per 10,000 population to 10 per 10,000 population. Regions with the better HRH situation include Kilimanjaro, Dar es Salaam, Iringa, Lindi and Pwani.

Sightsavers

4.5. Professional regulatory bodies

In the health sector, either Councils or Boards regulate professional conduct. The Councils include the Medical Council of Tanganyika, the Tanzania Nurses and Midwives Council, the Pharmaceutical Council, the Health Laboratory Practitioners Council, the Medical Radiology and Imaging Professionals Council, the Optometry Council, the Environmental Health Practitioners Registration Council and the Traditional and Alternative Health Practice Council. There is also the Private Health Laboratory Board and the Private Hospitals Advisory Board. These bodies contribute to Continue Professional Development (CPD) coordination and accreditation by accrediting CPD providers and courses and providing technical assistance in preparation and implementation of CPD activities. It is expected that by 2020 all CPD activities in the health sector will be subject to accreditation. The system of re-registration for health professionals has already been introduced as part of the quality assurance system.

4.6. Professional associations

Professional associations play an important role in promoting professional standards, commitment, attitudes and ethics. Through professional regulatory bodies, the MOHCDGEC is planning to build a capacity of professional associations to organise and conduct regular CPD activities in line with national CPD guidelines, as approved by the statutory regulatory bodies.

4.7. Medicines, equipment and supplies

The availability of key medicines in health facilities remains low. Health facilities (dispensaries, health centres, and district, regional and zonal referral hospitals) have accounts at the MSD, through which funds for medicines, equipment and supplies are credited from the MOHCDGEC after receiving the same from the Treasury.

Funding for medical supplies is limited by disbursement issues that continue to affect the utilisation of inadequate resources. Moreover, the MSD working capital has shrunk due to the failure to budget for distribution costs for externally-financed products. This has eventually negatively affected MSD's capacity of stock level and order fulfillment rate for medicines and other supplies. Efforts are ongoing to increase the availability of locally-manufactured medicines from the current 30 per cent of the requirement.

In the effort to ensure better procurement and information management, a logistics management unit within the Ministry of Health developed an electronic logistic management information system (e-LMIS) to reduce waste and improve efficiency and availability of medicines to the population.

Sightsavers

The MOHCDGEC, through TFDA, ensures the quality, safety and effectiveness of all medicines, foods, medical devices and cosmetics in the country. Furthermore, the MOHCDGEC has developed medicines and therapeutics committee (MTC) guidelines, and regularly updates and distributes the standard treatment guidelines and national essential medicines list to ensure rational use of medicines. Subsequently, the pharmaceutical council is in place to regulate and control the pharmacy profession and practice.

4.8. Health management information system

The national health management information system (HMIS) has been in operation countrywide since 1997, and is used to collect all basic health and facility administration data through the books of HMIS, commonly known as *Mfumo wa Takwimu na Ufuatiliaji wa Huduma za Afya* (MTUHA), in Swahili. A comprehensive revision of this system was conducted in 2007-2012, whereby the number of MTUHA books was increased from 12 to 16 to accommodate eye health. There is a MTUHA focal person in each district and region who is responsible for ensuring that data from all health facilities in their respective district/region is collected and reported accordingly.

Indicators across the HMIS tools have been harmonised and data collection tools for disease control programmes are in place, allowing for integration of the systems. In 2013, web-based software (DHIS 2) was introduced for reporting information from health facilities at district and regional levels, as well as for the analysis and dissemination of data at national level.

Due to the shortage of health workers, it is difficult for available staff to keep up with appropriate capturing of patient and other relevant information. This situation is worsened by the prevailing shortage of medical record staff to facilitate the feeding of data into DHIS 2, and hence affecting overall performance in terms of data accuracy and timeliness. Data analysis at the facility level is done using the DHIS 2, except where computers are not available, in which case it is done manually. The use of data for decision making at facilities varies, depending on the initiative of the facility in charge.

At district level, councils are required to prepare comprehensive council health plans (CCHP) based on the burden of disease and other health information from health facilities under them, and make use of the health information collected. The same applies to national level during the preparation of various strategic documents and guidelines.

4.9. Health care financing

Tanzania has recorded increases in total health expenditure over the past five years, however, the per capita expenditure corrected for inflation remains flat (figure 4 below). According to the national health accounts report, 2014, approximately 8 per cent of

Sightsavers

government expenditure goes on health, which is far short of the 15 per cent target pledged by African governments under the Abuja Declaration. The sector remains heavily dependent on external resources through basket funding, programme funding and off-budget donor funding.

New mechanisms to remove financial barriers for the population to access health services, and ensure sustainability of services, are planned to be implemented in the health sector strategic plan – HSSP IV (2015/16 to 2019/20). Currently, there are different health insurance schemes in operation in Tanzania. These include Community Health Fund/Tiba kwa Kadi (CHF/TIKA), National Health Insurance Fund (NHIF), National Social Security Fund (NSSF) – Social Health Insurance Benefit (SHIB) and many other private schemes, which cover less than a third of the population. The Single National Health Insurance (SNHI) is a resource for health mobilisation tool, which is expected to be in countrywide operation by 2020. The SNHI will be used to procure health services that are agreed as part of the standard minimum benefit package (MBP). The MBP is a formulated package of services that can arguably be sustainably funded within the available resources pooled for the SNHI. The SNHI will therefore pay health facilities the services to reinvest in procurement of medicines, health products and other supplies, as well as maintenance of infrastructure.

The analysis of sustainability implications for Tanzania's HSSP IV using OneHealth Tool in September 2015 showed that here is a difference between estimated fiscal space and costs, and hence a potential funding gap for implementing the HSSP IV (26).
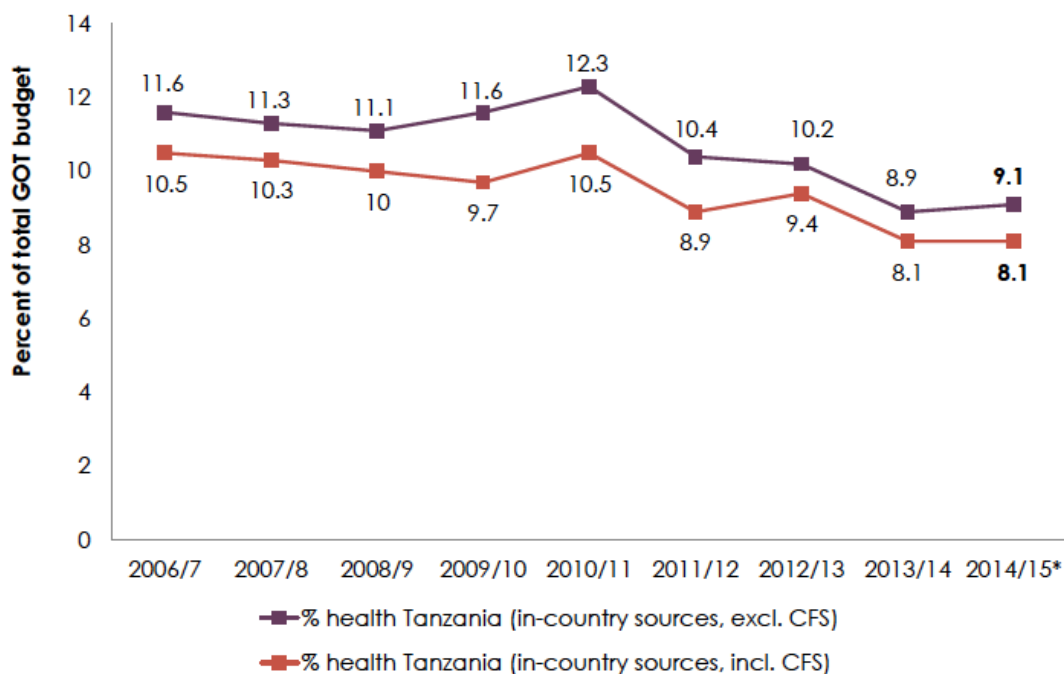

Figure 4: percentage of Government of Tanzania GOT budget 2006/07 - 2014/15

Source: public expenditure review presentation to joint annual health sector review, 2014

Sightsavers

5. Overview of eye health system in Tanzania

5.1. Eye health status

There has been no nationally-representative, population-based blindness prevalence survey in Tanzania. However, during the 2012 national population and housing census, seeing disability was reported as the most frequent type of disability among the respondents (19) (see figure 5 below).
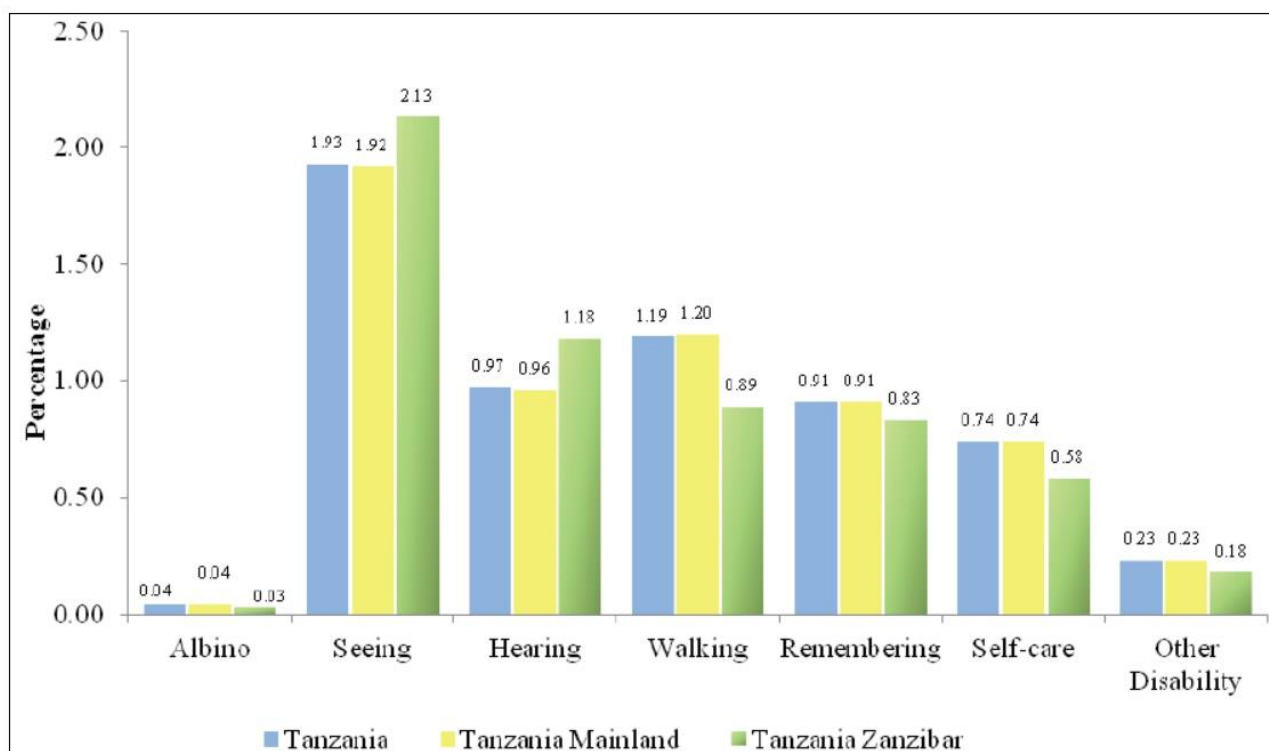

Figure 5: percentage of persons with disability by type, 2012 National Census

Source: National Bureau of Statistics

For planning purposes, the MOHCDGEC relies on the WHO estimates of prevalence of blindness for countries in sub-Saharan Africa, which is 0.7 per cent (11). A rapid assessment of avoidable blindness (RAAB) was conducted in Rombo, Kilimanjaro region in 2009. The prevalence of visual impairment, severe visual impairment and blindness in adults aged 50 years and above was found to be 5.4 per cent, 0.99 per cent and 2.4 per cent, respectively and the main three causes of blindness were cataract (51.2 per cent), posterior segment diseases (35.7 per cent) and refractive errors (32.7 per cent) (27). In addition, a rapid assessment of cataract surgical services was conducted in Kyela, Mbeya region in 2006. This assessment revealed that the prevalence of blindness, severe visual

Sightsavers

impairment and blindness in adults aged 50 years and above was 5.8 per cent, 23.1 per cent and 11.6 per cent, respectively, with the main causes being cataract, posterior segment diseases, refractive errors, other corneal opacities and surgical complications (11, 28).

Although cataract has been reported to be the leading cause of avoidable blindness among adults, the cataract surgical rate (CSR) – an indicator of cataract surgical service delivery – remains low. According to recent estimates, the cataract surgical coverage among people at 3/60 was 68.9 per cent (27).

5.2. Eye health governance

Key findings

Strengths

- The process of setting health priorities within the MOHCDGEC is participatory and includes different departments.
- Different stakeholders are involved in decision-making and budgeting at all levels.
- Planning is based on the prevailing strategic plan and guided by a number of policy documents and planning tools.

Weaknesses

- Management of eye health interventions in the MOHCDGEC falls under two directorates: the Directorate of Curative Services and the Directorate of Preventive Services; which limits coordination between different stakeholders.
- The national eye care programme (NECP) sits under the NCD's section of the curative services department, and does not get as much priority as other NCDs – namely cardiovascular diseases, diabetes, mental health, substance abuse, cancers and chronic respiratory diseases.
- There are gaps in the number of staff and skills available to NECP to ensure adequate fulfillment of different roles and responsibilities.
- The national eye health committee (NEHC) does not adequately support NECP; and the NGO eye health forum is inactive.
- Eye health stakeholders are not adequately involved in setting health priorities and budgets at all levels.
- There is poor alignment of priorities between international NGOs and country needs.

5.2.1. Eye health within the MOHCDGEC structure

In the present MOHCDGEC structure, eye health sits within the section of non-communicable diseases, Mental Health and Substance Abuse of the Department of

Sightsavers

Curative Services (figure 6). The NCD section has several other units, including diabetes, cancers, cardiovascular diseases, sickle cell disease (SCD), and renal.
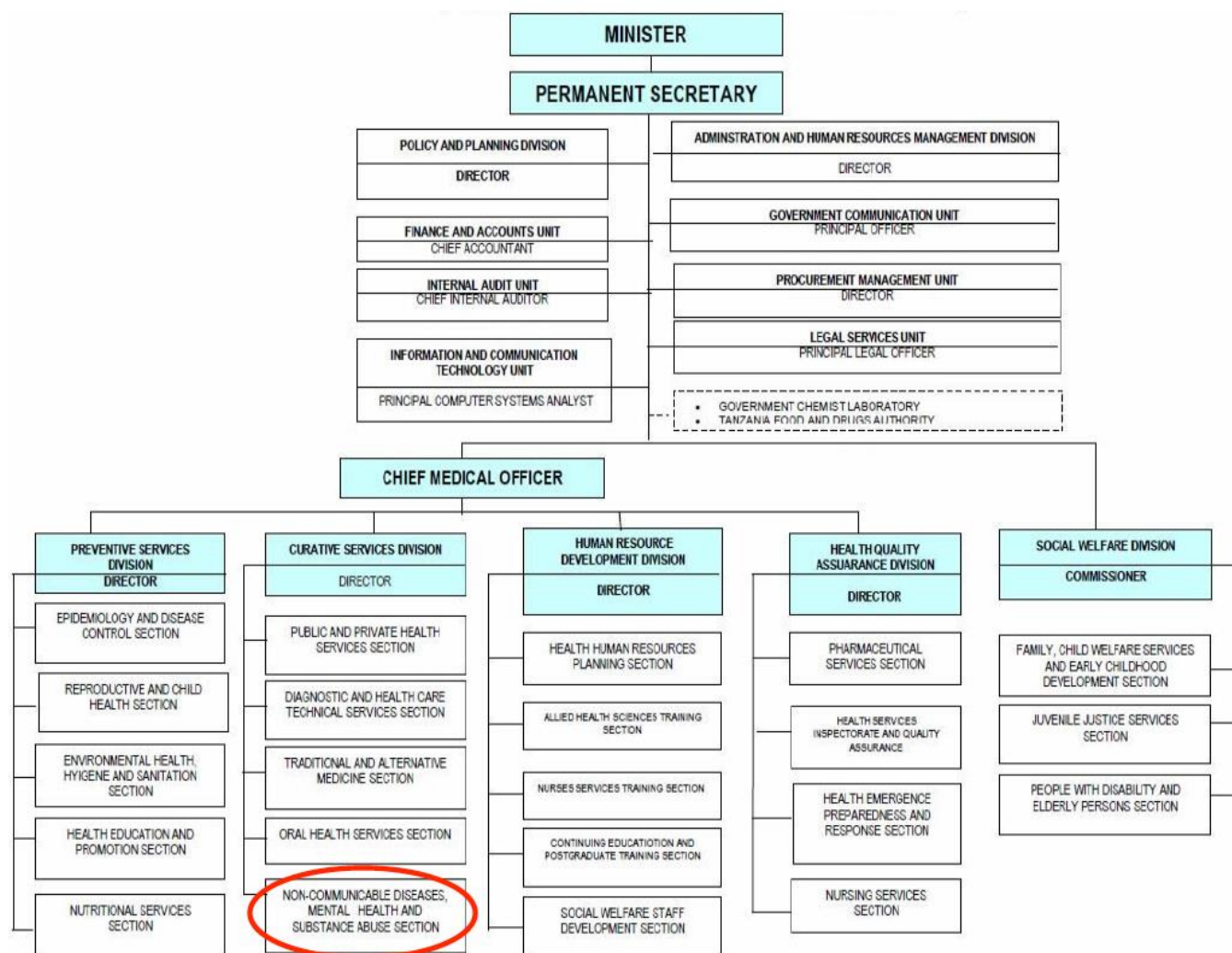
Figure 6: 2015 organisational structure of the MOHSW, currently MOHCDGEC.

Source: Ministry of Health, Community Development, Gender, Elderly and Children website

The current organisational arrangement does not provide for eye health to be adequately addressed in the health agenda. This is because eye health is a specialised health care field and addressing the needs of eye health alongside other health care services often results in an unintentional overlook of eye health. The uniqueness of eye health as a clinical specialty includes the following:

- Eye care procedures, such as eye surgery that requires specialised equipment, which may not be used by other services;
- Often unique eye medicines and supplies;
- Many eye care services that cannot be provided by general clinical staff, and require specialty training.

Sightsavers

The national eye care programme (NECP) has submitted a proposal to the management of the MOHCDGEC to request an establishment of an eye health section within the Ministry. It is envisaged that under this section there will be units focusing on the key areas of eye health, to facilitate a comprehensive approach to eye health in the country (annex 2).

5.2.2. Coordination of eye health services

The national eye care programme was established in 1986 for coordinating eye care services in the country. Initially, the programme was under the epidemiology and disease control section of the Department of Preventive Services. Two vertical disease programmes were implemented under the NECP: the national onchocerciasis control programme and the national trachoma control programme. In 2011, the NECP was moved to the Department of Curative Services but the two, vertical disease programmes remained in the Department of Preventive Services under the neglected tropical diseases programme.

The national level eye care coordination interventions are mainly supported by Sightsavers, including monthly allowance to the accountant. Currently, the NECP has four staff: two government employees – the programme manager and one programme officer, as well as an administrator and a driver who are paid monthly allowances, on contract basis, through support from the partner NGO, Brien Holden Vision Institute (BHVI).

The roles and responsibilities of NECP include, but not limited to, the following:

1. Developing and reviewing policy guidelines, strategic plans, standards and manuals for eye care

2. Coordinating capacity building and training programmes for eye care

3. Coordinating base station and outreach eye care services provided by local and international providers/NGOs

4. Acting as a link between the Ministry and partner NGOs (local and international)

5. Initiating and facilitating various operational research activities in eye care

6. Monitoring and evaluating eye care services, including assuring the quality of services provided at all levels

7. Mobilising financial, material and human resources for eye care services in the country

The link between eye health service provision and coordination is presented in figure 7 below.

As far as coordination with various eye health stakeholders is concerned, there is the national eye health committee (NEHC), an advisory body to the Ministry on matters related to eye health. The committee is comprised of various stakeholders in eye health in the country (annex 3). However, the NECP has been challenged by limited support from the

Sightsavers

NEHC, which has not been supporting the programme as expected, despite verbal commitments by its members during the formation of sub-committees. There is also an NGO eye health forum, which is currently inactive. There is an imperative need to look at how the NEHC could provide more effective support in moving the eye health agenda forward.
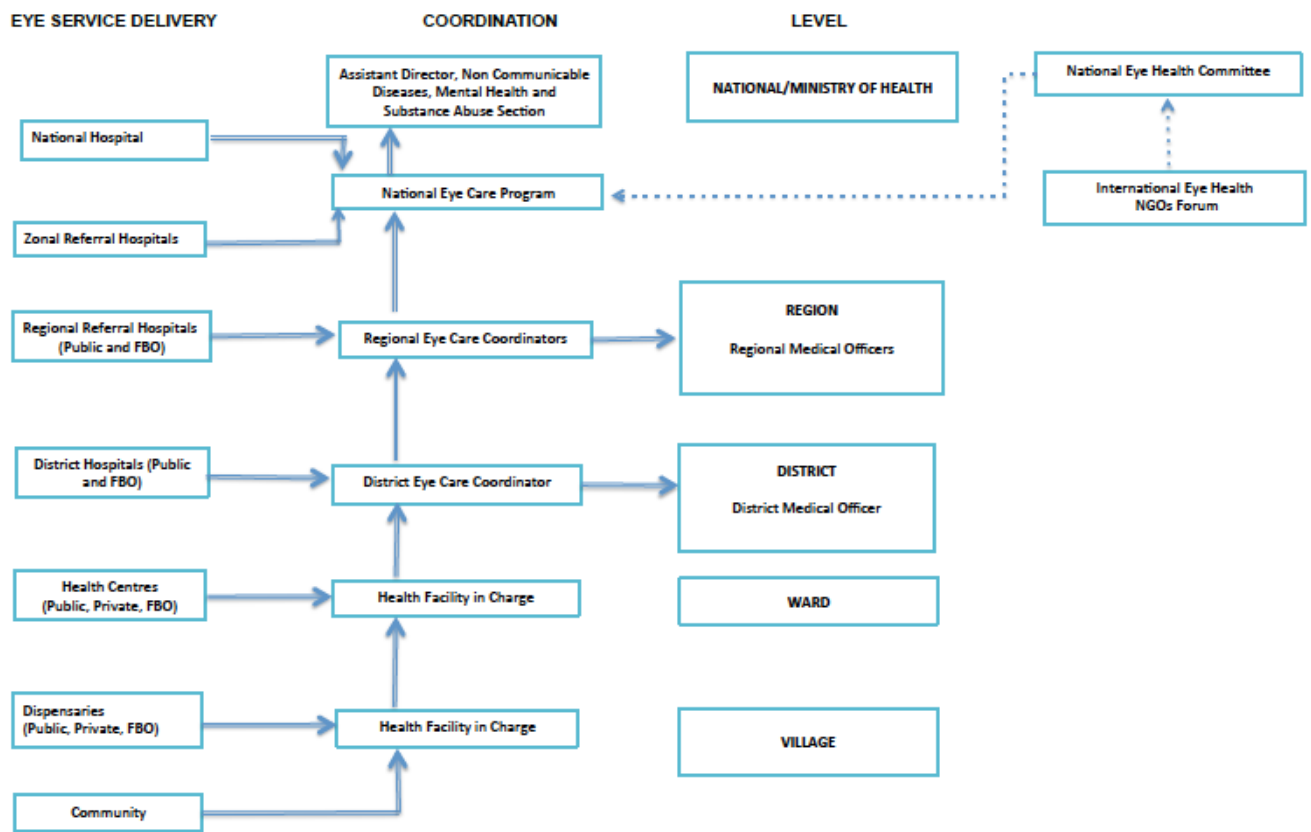
Figure 7: organisation of eye health service provision and coordination

Source: national eye care programme

5.2.3. Strategies and policies related to eye health

Eye health interventions are implemented in response to key national level policy documents, the Tanzania Development Vision 2025, the national health policy and the Health Sector Strategic Plan IV, with a focus on integration, partnership and decentralisation.

The key documents are further translated into various policy guidelines, standards and strategic plans. Some of the documents that relate to eye health include the national eye care strategic plan 2011-2016, the national eye care policy guidelines 2007, the primary

Sightsavers

eye care manual 2011, and the guidelines on child eye health for workers at regional and district levels. Other guiding policies include: the national essential list of medicines and standard treatment guidelines, 2012; staffing levels for the Ministry of Health departments, service facilities, health training institutions and agencies, 2014-2019. Others are the human resources for health strategic plan, 2014-2019; the national policy guidelines for health promotion, 2015; the national strategic plan for health promotion, 2015; the national community-based health programme policy guidelines, 2014; and comprehensive council health plans (CCHP) guidelines.

The Ministry also takes into account major global policies, including the Vision 2020 initiative, which was officially endorsed by the government of Tanzania in 2003; the global action plan, 2014-2019; and the human resources for eye health strategic plan, 2014-2023.

5.2.4. Process of setting priorities for health care interventions

The findings of this study indicate that, at Ministry level, the process for setting health priorities is participatory and ensures that all departments/directorates have an equal chance to contribute to the development of strategic plans, budgeting and annual resource allocation. At the national level, most stakeholders get involved in decision making during health sector strategic planning and annual joint health sector reviews.

With regards to eye health, however, there is a gap in engagement in such fora. Although a number of national stakeholders argued that the NECP had equal opportunities to participate, some suggested that eye health continues to receive less attention when it comes to the actual allocation of resources. As expected, the diseases that lead to premature mortality (for example, HIV/AIDS, maternal and child health, TB, malaria) receive the highest priority at the national health agenda. In addition, these 'high priority diseases' tend to be heavily supported by large development partners, and many government systems and platforms are set up to facilitate the implementation of these heavily resourced programmes.

Data collected at regional and district levels suggest that the process of priority setting tends to mirror the national level; and the key stakeholders are involved in priority setting and budgeting through relevant committees (facility, village, ward, and district). The process is usually informed by routinely collected data and the focus is on the top ten diseases identified for each facility/community, as per records in the HMIS. Both regional and district level stakeholders indicated that eye diseases rarely fall among the top ten priorities for districts or regions. The interviewees also acknowledged that there is limited data on eye problems to feed into the planning process. The problem of limited data was explained by the shortage of workers skilled to identify and report eye conditions in the HMIS. Only one district out of the eight visited in this study, reported allocation of resources to eye care as one of the local priorities. The study also reported limited involvement of people with disabilities in decision making.

Sightsavers

It was also suggested that some international NGOs set eye health priorities based on the global priorities, which are not always aligned with the country's needs.

5.3. Eye health financing

Key findings

Strengths

- The government contributes to health care services, including eye health.
- Eye health services are covered by health insurance and around 27 per cent of the population is covered with pre-payment schemes.
- Accelerating insurance cover by the year 2020 to achieve universal health coverage is a government priority.
- There are exemption and fee waiver policies for vulnerable populations at the facility level.
- There are local and international NGOs supporting eye health interventions through government partnership frameworks.

Weaknesses

- Eye care services receive limited financial resources to meet the needs of the population.
- Since 2010, the government has not funded eye care coordination at a national level.
- There is a limited number of eye health NGOs in the country and their support covers only a
  few regions.
- There are no mechanisms in place to ring-fence financial revenues generated by eye health at the facility level.
- Not all eye services are covered by the NHIF benefit package.

5.3.1. Financing of eye health services from domestic sources

Eye health services, like other health services in Tanzania, are financed by the following sources: the government; development partners; local NGOs; health insurance schemes; and out-of-pocket payments.

The central government and development partners are the main financing sources for coordination of eye health services at Ministry level. The national eye care programme is funded by the government through the medium-term expenditure framework (MTEF),

Sightsavers

which is developed annually. However, the programme has not received any allocation in the MTEF since 2010.

Regions and districts access funds through their MTEFs and comprehensive council health plans (CCHPs). Prioritisation at district level follows the prevailing CCHP guideline, in which eye care is indicated as priority area 5 (diseases of local priority; these include eye care, oral health, skin diseases and neglected tropical diseases). This priority area is allocated 0.5 per cent of the total annual budget among the list of 13 priority areas at council level.

The national health insurance fund (NHIF), whose primary role is to ensure accessibility of health care services to all public servants, sets priorities for all health conditions, except a few chronic diseases like cancers and chronic renal failure. The benefit package is usually agreed based on the previous annual expenditure and projected spending in the new year; and the annual budget is set accordingly. However, there are variations in the services provided based on the status of health facilities and the economy of the area. The national coverage with health insurance stands at 27 per cent (26). However, not all eye health services are covered under the NHIF benefit package. Annex 5 indicates eye supplies and services that are not covered.

Health facilities receive funds for eye care through government-managed pre-payment schemes (NHIF and CHF/TIKA), and from a number of private health insurance schemes. At the facility level, there are also user fees for those not enrolled in the pre-payment schemes. However, also at this level, all funds collected through eye clinics are managed centrally and there are no ring-fenced allocations for eye health.

There are a number of fee exemption and waiver polices for vulnerable populations, such as children under five years of age; Tanzanian citizens aged 60 years and above; people with chronic illnesses; and those who cannot afford treatment costs. But policy implementation is hampered by the lack of human resources, medicines, equipment and supplies. Eye medicines, supplies and equipment constitute a minimal allocation of funds at the facility level, since there is no specified percentage allocation for eye health out of funds available for medical commodities. The only health resource allocation formula in use currently stipulates that 70 per cent of medical commodities funds is allocated to pharmaceuticals; 10 per cent to medical equipment; 10 per cent to laboratory reagents; 5 per cent to dental equipment; and 5 per cent to medical equipment.

It is envisaged that funding for eye care services will improve through the new financing mechanism – the single national health insurance, which will be in operation by 2020. The scheme will be mandatory and the resource gaps will be filled by levies and special taxes at central government level. Although, the analysis of sustainability of the scheme made in September 2015 suggests that for eye health, where more emphasis is put on access to medicines, appropriate equipment and infrastructure and skilled human resources, nearly US$10 million is needed between 2015/16 and 2019/20 to implement the HSSP IV. Ophthalmological interventions represent only 0.2 per cent of the total HSSP IV health

Sightsavers

service costs. It is therefore anticipated that, due to prioritisation of other services, there may still be an eye care coverage gap in 2019/20.

5.3.2. Financing of eye health services by development partners

Development partners support eye health system strengthening and service delivery in a number of regions and districts through long-term projects and short-term engagement. These partners (table 2) mobilise resources within and outside the country through various mechanisms, and finance eye health services through specific projects, with the coverage limited to a few geographical locations.

The funds are not usually reflected in the MTEF since they are not known during the budgeting period. They involve different procedures and timelines and, in some cases, there is a lack of national level coordination.

Sightsavers

Table 2: Eye health development partners and local NGOs

SN	DEVELOPMENT PARTNER/NGO NAME	AREA OF SUPPORT	GEOGRAPHICAL COVERAGE/LEVEL SUPPORTED
1.	Sightsavers Tanzania	System strengthening - eye care coordination -capacity building on planning, advocacy and HMIS; Comprehensive eye care	National-MOHCDGEC, Regions - Iringa, Kigoma, Morogoro Mbeya, Rukwa, Tabora and Manyara Regions for eye care coordinaton, Morogoro and Singida regions for comprehensive eye care
2.	Brien Holden Vision Institute	Primary eye care (community to districts level) and school eye health; Optometry services.	Standard Chartered Bank supported SiB CEH project in Mwanza and Mbeya; Vision centres in coast region, Mwanza, Lindi, Singida, Mtwara, Shinyanga, Dodoma, Mbeya and Simiyu,
3.	CBM	Hospital-based and outreach comprehensive eye services; Human resource development.	Support mainly faith-based facilities (Sengerema DDH, Ndolage Lutheran Hospital, Mvumi DDH, Ilembula Lutheran Hospital, Kolandoto Hospital, Kabanga Hospital, CCBRT and KCMC); Standard Chartered Bank supported SiB CEH project in Mbeya, Mwanza, Rukwa, Tabora, Manyara, Dar Es Salaam.
4.	Heart to Heart Foundation	Comprehensive eye care	Mtwara region.
5.	Lions Club	Supports eye health service delivery through outreach screening and surgical camps	Needy communities, as per the NGO's interest.
6.	Bilal Muslim	Support eye health service delivery through outreach screening and surgical camps	Needy communities, as per the NGO's interest.

Source: national eye care programme

Sightsavers

5.4. Eye health service delivery

Key findings

Strengths

- A wide range of eye health services is available in the country, ranging from primary eye care to highly specialised services.
- There is one national, four zonal and 28 regional hospitals providing eye care services.
- The national hospital and all four zonal referral hospitals are staffed with ophthalmologists and optometrists.
- There are private and faith-based eye hospitals and clinics, which contribute significantly to the availability of eye care services in the country.
- There are standard treatment guidelines for eye health.

Weaknesses

- There is a limited eye health infrastructure, particularly at district and regional levels.
- Most regional and district hospitals lack basic ophthalmological equipment and instruments.
- Only six out of 28 regional referral hospitals are staffed with ophthalmologists.
- There are limited resources for eye health promotion services.
- Clinical supervision is not available at all levels and is dependent on the availability of donor funding.
- Health facilities providing cataract surgical services do not routinely monitor surgery outcomes.
- Eye health workers do not always follow the standard treatment guidelines.
- Different bodies within the Ministry register private eye care facilities; posing challenges in ensuring and monitoring the quality of services offered.

5.4.1. Availability of eye care services

Eye health services in Tanzania are being provided at different levels, but the range of services varies according to the type of the facility, available space and equipment, and relevant health care worker skills (annex 4). Overall, 71 per cent of the Tanzanian population live within 5km of a health facility.

5.4.2. National hospital and zonal referral hospitals for eye health

There is one national hospital – the Muhimbili National Hospital (MNH), and three zonal referral hospitals – Kilimanjaro Christian Medical Centre (KCMC), Mbeya Referral Hospital

Sightsavers

and Bugando Medical Centre, in Tanzania. MNH and KCMC provide general outpatient eye services, general eye surgical services and specialised eye services (paediatrics, medical retina, glaucoma). In addition, KCMC provides oculoplastic, vitreo-retina and ophthalmic oncology services.

The assessment found that both the MNH and KCMC have sufficient space for outpatient eye care services, as well as dedicated eye theatres. KCMC also has a dedicated ward for eye patients, while MNH shares a ward between eye and Ear Nose and Throat (ENT) patients. Mbeya Referral Hospital and Bugando Medical Centre) have limited space for both outpatient and inpatient care. In addition, these two hospitals do not have dedicated theatres for eye procedures and have to book special days for eye surgeries in the main operating theatres.

MNH and KCMC have most of the required equipment for eye care, including sophisticated equipment, such as an optical coherence tomography (OCT) machine, laser machines, a phacoemulsification machine, and fund us camera. The Mbeya Referral Hospital and Bugando Medical Centre have some of the required basic eye diagnostic equipment.

MNH and KCMC are also much better equipped with eye medicines and supplies than the two other zonal hospitals, which is partly explained by the support that MNH and KCMC receive from international development partners.

With regard to human resources, MNH and all zonal hospitals have the required cadres of skilled eye care workers (ophthalmologist, ophthalmic nurse officers and optometrist). However, none of these hospitals meets the required numbers of sub-specialty skills (paediatrics, medical and vitreo-retina, oculoplastic, oncology, glaucoma), as specified in the Ministry of Health's recommended staffing levels for 2014-2019 (29).

5.4.3 Regional referral hospitals

The availability of space and services in other regional hospitals of the country varies. All 28 regional referral hospitals have space for eye care outpatient services, nine have dedicated theatres and two have dedicated wards for patients with eye problems. New regions, namely Geita, Njombe, Songwe, Simiyu and Katavi, do not have regional hospitals providing eye care services. In these regions, district hospitals at regional headquarters serve as the region's referral centres. The situation with equipment, medicines and supplies also varies, with many regional hospitals lacking the minimum standards of required eye diagnostic equipment; there is also limited availability of eye medicines and supplies. The only eye medicines commonly available in regional hospitals are tetracycline and chloramphenical eye ointment.

Out of 28 regional hospitals, only six have an ophthalmologist; the majority of the regional hospitals have only an assistant medical officer (AMO)-ophthalmology, while five regional hospitals have neither an ophthalmologist nor an AMO-ophthalmology. Most regional

Sightsavers

hospitals have ophthalmic nursing officers (ONOs); however, many of them are either about to retire or are working in areas with limited availability for eye health services. All regions (except Katavi) have at least one optometrist.

All regional hospitals are expected to provide general outpatient and surgical services. However, the availability of these services is limited due to the lack of space, equipment and skilled eye care staff.

5.4.4. District hospitals

Eye care services offered at district hospitals include general outpatient eye services, minor surgical procedures and referrals. The majority of district hospitals in the country do not have dedicated space for eye care.

Out of six district hospitals assessed in this study, three had dedicated space for eye services, but the space was not easily accessible for patients with visual impairments. In two district hospitals, (Kibondo and Ruangwa) eye care services shared space with other services, such as an elderly clinic, medical records keeping, or a store.

The six district hospitals visited in this study did not have a minimum set of recommended equipment, as specified in the 2011-2016 national eye care strategic plan. An earlier assessment of diabetes and diabetic retinopathy services in the country showed that only 11 per cent of public district hospitals had basic eye diagnostic equipment (a slit lamp and a direct ophthalmoscope) (30).

The availability of eye medicines and supplies in the visited district hospitals was similar to that of the regional hospitals. In the majority of the district hospitals assessed, an optometrist or an ophthalmic assistant provided eye care services, and only two out of six hospitals had an AMO-ophthalmology.

5.4.5. Private and faith-based health facilities

In addition to government facilities, there is a range of private and faith-based health care providers who offer eye care services. In most regions, there are private optometry clinics, while in major cities, like Dar es Salaam, Arusha and Mwanza, there are private hospitals, which offer outpatient and inpatient eye care services. There is a specialised hospital with dedicated space, wards and theatre for eye care services in Dar es Salaam and there are faith-based hospitals in Kolandoto, Mvumi, Sengerema, St. Elizabeth, Ilembula, Kabanga, Ndolage, Dareda, Hydom, Peramiho, and Ndanda. All have dedicated space for outpatient eye care services and some have dedicated theatres and eye wards.

Most private hospitals and FBOs have basic diagnostic and surgical equipment. The specialised hospital in Dar es Salaam has most of the required equipment, including an OCT machine, laser machines, a phacoemulsification machine and a fundus camera. Most

private optometry clinics also have the basic required diagnostic equipment and optical workshops.

The availability of eye medicines and supplies at private hospitals and FBOs is also better than in public health facilities, as they use their own resources and procurement procedures, with a wide choice of vendors. Public facilities are less flexible and have to abide by government procurement rules.

The specialised eye care hospital in Dar es Salam has four ophthalmologists, three AMOs-ophthalmology, and five optometrists; although the number and skills mix does not conform to the recommended staffing level for a specialised eye hospital. As a result, most patients are attended to by the AMO and general nurses who have been given some basic on the job training in eye health. All private hospitals in the major cities have a full-time optometrist and a part-time ophthalmologist. Out of the eleven FBO hospitals with eye services, ten had AMOs-o, one had an ophthalmologist and only a few had an optometrist and/or an ONO.

5.4.6. Health promotion services

There is a well-established health education and promotion section in the Ministry under the Directorate of Preventive Services. Its primary role includes the provision of health education through school programmes, as well as communication of health materials and messages. In addition to using traditional means of communication, such as radio and television, the section has started using social media and mobile networks to promote health and educate people on various health issues. However, the study found that due to the limited financial resources available for health promotion, many activities, including those for eye health, remain undone.

Key channels for promoting eye health include national events, such as launching national eye projects, the national eye health strategic plan, and international days including World Sight Day, World Diabetes Day and White Cane Day). Some regions and districts use locally available media, like radio and television, to promote eye health during the national events. Eye NGOs also conduct eye health promotion events, but these are often small-scale and are not well-coordinated with the national health promotion unit.

5.4.7 Eye health services quality assurance

There are standard treatment guidelines, which aim to ensure the adequacy of standards and quality of services offered. The guidelines include the management of most eye conditions. It is updated every two years. This assessment found that the guidelines were readily available in almost all districts and regions surveyed; however, some practitioners do not always follow them in their routine service delivery. With regard to the clinical supervision for eye care services, these are not done at all levels of care. National level

Sightsavers

stakeholders reported that clinical supervision is done sporadically, depending on the availability of donor support.

Private eye care facilities are registered by different registration bodies, including the Public and Private Health Facilities Advisory Board, the Optometry Council and the Tanzania Nurses and Midwifery Council – this creates challenges for ensuring a unified quality of services offered. It was also noted that facilities offering cataract surgeries do not monitor cataract surgical outcomes in their routine post-operative follow up.

5.5. Eye health medicines and medical products

Key findings

Strengths

- Essential eye medicines, equipment and supplies are currently included in the Medical Stores Department (MSD) catalogue under non-priced items.
- There is the Tanzania Food and Drug Authority (TFDA), which is responsible for the monitoring quality, safety and effectiveness of medicines and medical devices in the country. There are procedures in place to report poor quality medicines and adverse effects, including those for eye care.
- Development partners provide equipment, medicines and supplies to selected hospitals.

Weaknesses

- Eye equipment, medicines and supplies are not readily available through the existing public procurement system; and there were observed stock-outs of essential eye medicines and supplies in most health facilities surveyed in this study.
- There are challenging public procurement mechanisms, which create difficulties in the timely availability of products.
- There is no specific budget allocation for eye equipment and medicines, and these tend to be given lower priority in the public procurement system.
- The TFDA quality surveillance system does not include eye care medicines and supplies.

Sightsavers

5.5.1. Accessibility and availability of eye care commodities (drugs and supplies)

The study found that, until recently, the majority of eye care medicines and products had not been included in the Medical Store Department (MSD) price list. However, Ministry officials reported that as of 2015/16, most of the *essential* eye care medicines and equipment had been included in the new MSD catalogue, but in a non-priced items section. Actions are underway to establish indicative prices from relevant suppliers.

It was also reported that there were problems with accessing eye care medicines and supplies at regional and district levels, largely due to the exclusion of these products from the MSD list and challenging public procurement mechanisms.

The shortage of eye medicines and equipment is currently addressed through an ongoing collaboration with the Vision 2020 links programme, which donates eye equipment, medicines and supplies to the zonal referral hospitals. There are also several development partners who provide support to selected health facilities in the country.

5.5.2. Quality, safety and efficacy of eye care drugs and commodities

The Tanzania Food and Drug Authority (TFDA) is the regulatory body responsible for controlling the quality, safety and effectiveness of food, medicines, cosmetics and medical devices used, including those for eye care. The TFDA conducts regular post-marketing surveillance, whereby some of the selected medicines (of public importance) are assessed for quality, safety and efficacy. However, there were no eye care products included in the surveillance at the time of this study.

TFDA also issues the 'blue form', which is used to report poor quality drugs suspected by pharmacists. At regional and district levels, health providers use the 'yellow form' to report adverse events following the use of medicines. This procedure applies to all drug products, including those for eye care.

5.6. Human resources for eye health

Key findings

Strengths

- There is a national health policy for HRH, which translates into staffing levels for the health sector.
- Eye health personnel is included in HRH staffing levels.
- There are training institutions for key eye health cadres.

Sightsavers

- There is an increased interest among junior doctors (MDs) to pursue further studies (M. Med) in ophthalmology.

Weaknesses

- There is a shortage and unequal distribution of eye health workers in the country.
- Eye health staff often work in other health areas due to the lack of space, equipment and medicines for eye health.
- There are limited sponsorships for M.Med ophthalmology training from the government.
- Development partners' support to HReH training is poorly coordinated with the Ministry.
- Reforms of mid-level training systems created challenges for training mid-level cadres in eye health.
- AMOOs and ONOs are often demotivated to perform eye care work, as the current government scheme of service does not recognise their additional professional qualifications.

5.6.1. National policies and strategies on HRH

The national health policy recognises HRH as a key component of the health care system. The policy emphasises the need for having a sufficient number of skilled health professionals at all levels to provide quality health services, including qualified staff for managerial and leadership positions for the health sector. This is reflected in the recommended health sector staffing levels, which include human resources for eye health (HReH) needs at various levels, including training institutions.

There is also the national human resource for health strategic plan, 2014-2019, which addresses HRH production, planning, development, management, utilisation, and monitoring. However, it does not include medicine or nursing specialties, so HReH are not included.

The Ministry has two HRH information systems: the human resource for health information system (HRHIS) and the training institutions information system (TIIS), which include eye health staff. The systems monitor recruitment, production and retention of HRH. In addition, there are President's Office – Public Service Management (POPSM) permits, and HRH posting reports, which are also used for annual monitoring of the HRH plan implementation.

Sightsavers

5.6.2. Numbers and distribution of human resources for eye health

The numbers and regional distribution of various cadres for eye health in mainland Tanzania are shown in figure 8 below.
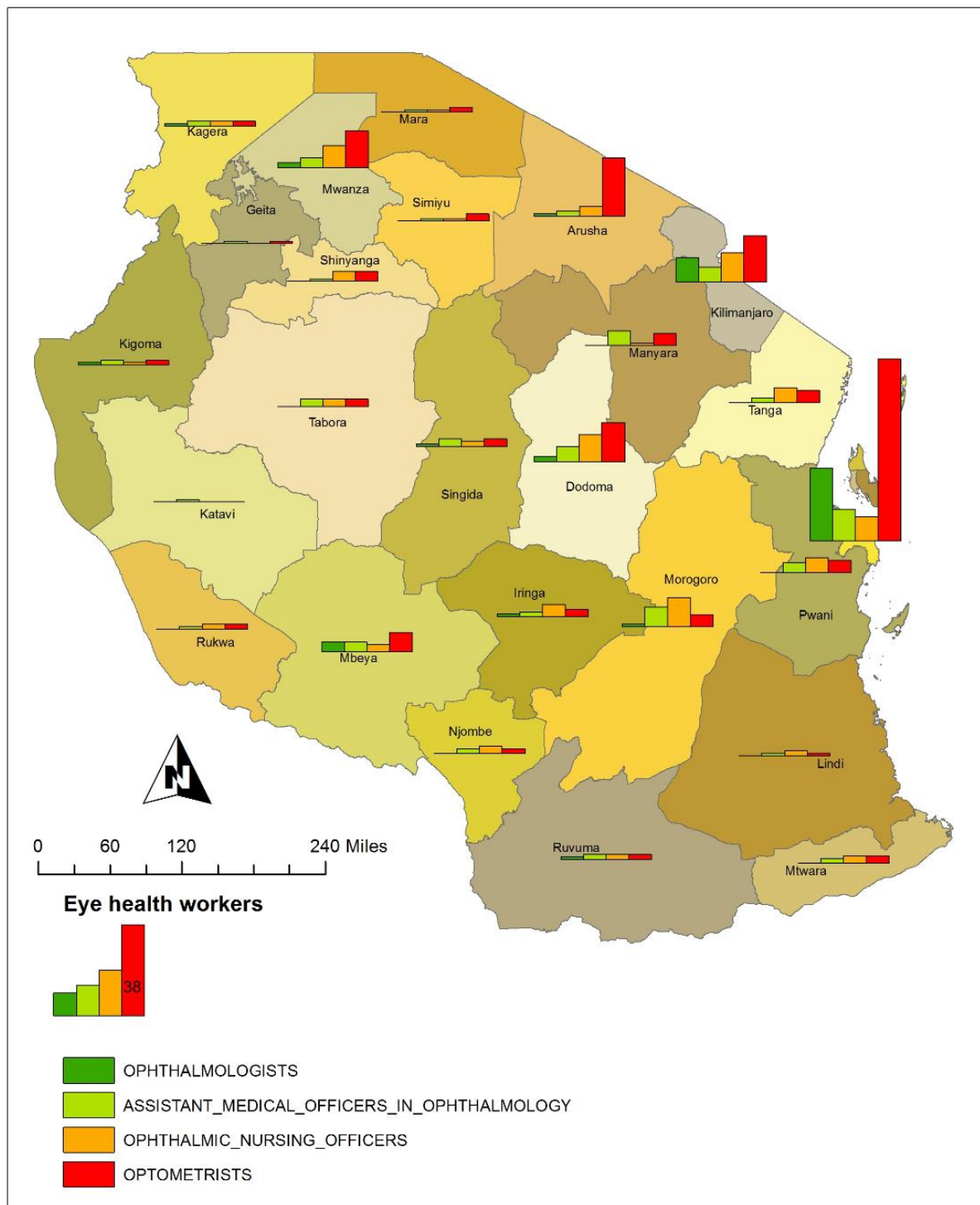

Figure 8: distribution of eye health human resource cadres in mainland Tanzania

Source: national eye care programme

In 2016, there were 55 ophthalmologists, 81 AMOOs, 105 ONOs and 212 optometrists in the country. As with similar contexts, the majority of ophthalmologists and optometrists are located in Dar es Salaam and the big cities of Kilimanjaro and Arusha regions, with many of them working in private clinics (see figure 8 above).

Overall, the eye health sector is severely understaffed, with nearly 70 per cent of the required positions being vacant (see table 3 below). In addition, some eye care staff deployed in public sector work in other health areas due to the lack of space, equipment and medicines available for eye health.

Table 3: Availability and gaps in eye health human resources in mainland Tanzania

Cadre	Minimum required number based on country needs	Currently available	Gap
Ophthalmologists	144	55	104
Assistant medical officers in ophthalmology	216	81	136
Ophthalmic nursing officers	1222	105	907
Optometrists	1141	212	884

Source: national eye care programme

An earlier study conducted in both mainland Tanzania and Zanzibar estimated that overall in 2011, the Republic of Tanzania had 1.6 surgeons per million population – this is much lower than the Vision 2020 recommended levels of 4 per million (31). The estimated number of annual surgeries per surgeon was 340 compared to the recommended levels of 500 per surgeon per year. The ratio of OCOs/nurses in the same study was 3.8 per million (compared to the Vision 2020 target of 10 per million); and the number of optometrists/perfectionists was 7.3 per million (compared to the target of 20 per million).

5.6.3. Training of human resources for eye health

The training of eye care workers takes place at both pre- and in-service levels. Optometrists are the only cadre that undergo pre-service training in eye health. Training for this cadre takes place at the KCMC School of Optometry, which is under the MOHCDGEC, and awards a diploma in Optometry. A course awarding BSCs in Optometry was recently established in the Kilimanjaro Christian Medical University College (KCMUCo) under the Tumaini University.

Sightsavers

Four institutions provide in-service training to three cadres in eye health:

* KCMUCo (under the Tumaini University) and Muhimbili University of Health and Allied Sciences (MUHAS) train ophthalmologists;
* the AMOO School at KCMC trains AMOOs; and
* the School of Advanced Ophthalmic Nurses (SAON) at KCMC trains ophthalmic nurses.
* MUHAS, KCMUCo and AMOO School also train eye care professionals from other countries in Africa.

There was a recent increase in the number of candidates qualified for M.Med in Ophthalmology, from five candidates before 2010, to 15 candidates in 2016. However, government sponsorship for ophthalmology training is limited. Although there are developments supporting M.Meds in ophthalmology training, this is done without engagement of the Directorate of Human Resource and NECP at MOHCDGEC, and this poses challenges for the countrywide coordination and distribution of this cadre.

Assistant medical officers in ophthalmology are senior eye health professionals working in many regional referral hospitals. The entry qualification for AMOO training is two years of training in advanced clinical medicine, which is obtained post-diploma in clinical medicine (2 or 3 years).

Training of ONs at the KCMC School of Advanced Ophthalmic Nursing started in October 1994. It offers an Advanced Diploma in Ophthalmic Nursing to registered nurses, and the school's enrolment capacity is 25 nurses every two years.

5.6.4. AMOO and ONO training reforms

In 2006, the country's education framework changed and required phasing out the advanced diploma awards began as they were no longer pegged to the National Technical Award (NTA) implementation and accreditation system under the National Council for Technical Education (NACTE). The adoption and implementation of the competency-based education and training (COBET) system was introduced as a mandatory requirement for technical training programmes to be accredited by NACTE. This affected the training of health workers, including AMOOs and ONOs.

The option for ONOs training was either to develop a curriculum for the diploma or for the bachelor's degree in ophthalmic nursing. The Ministry of Health prepared the bachelor's degree curriculum, but up to date this curriculum has not been implemented due to the limited capacity of the teaching faculty in the country. As a result, there were no candidates for this training.

The option for AMOOs was to stop current training and align with the NTA system level 8 (Bachelor of Clinical Medicine). There are concerns among various stakeholders about this degree, hence even the general Bachelor of Clinical Medicine training had not started. As

Sightsavers

eye health is a specialty area, it is challenging to align the AMOO cadre with the rest of the system.

AMOOs and ONOs currently in post are often demotivated to perform eye care work, as the current government scheme of service does not recognise their additional professional qualifications.

Table 4 below shows the numbers of different eye health cadres trained in 2011-2015.

Table 4: Training of ophthalmologists, AMOOs, ONOs and optometrists in the country (2011-2015)

Year	Number of ophthalmologists graduated	Number of AMOOs graduated	Number of ONOs graduated	Number of optometrists graduated
2011	4	4	0	13
2012	3	6	0	13
2013	4	10	0	16
2014	5	6	0	15
2015	6	3	0	11

Source: Muhimbili University of Health and Allied Sciences, Kilimanjaro Christian Medical College, Optometry School, School of Advanced Ophthalmic Nursing, AMOO School

5.7. Eye health management information (eHMIS)

Key findings

Strengths

- There is a form (MTUHA book 16) for recording and reporting eye health data from district and regional hospitals and private clinics – the data is entered into the web-based system, district health information software, (DHIS 2)
- There are HMIS focal persons in hospitals and HMIS coordinators at regional and district levels.
- There is an integrated disease surveillance and response (IDSR) system, which includes eye conditions.

Sightsavers

Weaknesses

- Eye health indicators are not among the 64 health sector performance indicators.
- The current HMIS does not capture information from the national and zonal referral hospitals.
- Many private hospitals/clinics offering eye services do not report eye patient information to the district authorities.
- Eye health outreach data is not captured in the HMIS.
- There is limited sharing of data among different eye health stakeholders and the public.
- There is a lack of linkages (interoperability) between the HMIS and other health information systems, such as the human resources for health information system (HRHIS) and training institutions information system (TIIS).

5.7.1. Eye health in the HMIS and surveillance systems

Eye health data is currently collected using a separate HMIS book (HMIS book no. 16) since early 2015. This provides data on different eye problems affecting communities. The current health management information system (HMIS) has 64 health sector performance indicators, of which 43 are routinely collected, including input, output and outcome. The 64 indicators are monitored monthly, quarterly or annually. At present, none of these indicators include eye health. However, actions are underway to incorporate eye health in the health sector performance indicators and to ensure that they are accessible through the Ministry's web portal.

The weekly integrated disease surveillance and response (IDSR) system at district level captures only one eye condition: acute hemorrhagic viral conjunctivitis, although the IDSR guideline recommends reporting three eye conditions (acute hemorrhagic viral keratoconjuctivitis, cataract and trachoma) as priority diseases (32). Additionally, there are no links (interoperability) between the HMIS and other health information systems, such as HRHIS and TIIS (32).

5.7.2. Eye health data: sources, management, dissemination and use

The primary data source for eye health is *"MTUHA (HMIS) book 16"* which has been in use since January 2015. The book is available in district and regional hospitals and private eye clinics, and includes all patient information, examinations, diagnosis and treatment. Monthly summary reports from each facility are entered in the web-based system, DHIS 2, and key users at all levels can access the data. The "*MTUHA (HMIS) book 5"* is used to collect eye health data from dispensaries, health centres and hospitals with no skilled eye care workers.

The assessment found that although there are HMIS focal persons in hospitals and HMIS coordinators at regional and district levels, not all eligible hospitals report data on eye health. This is largely due to the lack of skilled eye health workers in many local level

Sightsavers

facilities. For example, only 165 out of 347 (48 per cent) eligible hospitals reported eye health data in 2015. The hospitals that do report the data experience challenges with quality, accuracy, timeliness and completeness. Currently, efforts are being made to improve data quality through enhanced supervision and feedback.

Data on outreach services is not captured in most cases due to the limitations of data collection systems at this level. Furthermore, the majority of private eye care clinics do not report data to the district councils.

It was reported that where available eye health data was used for planning at district and regional levels, at the national level, the use of the collected data was limited, due to restricted resources and skills in data management.

Eye health information is also generated from population-based surveys, which are conducted sporadically in the beginning or at the end of eye health projects. However, data from such surveys is rarely shared with other stakeholders.

6. Summary of findings and conclusions

This study used the EHSA tool to assess strengths and weaknesses of the eye health system in mainland Tanzania and to explore the ways through which this process is integrated within the broader health system. The key findings of the assessment are summarised below.

6.1. Key findings

Eye health governance

Strengths

- The process of setting health priorities within the MOHCDGEC is participatory and includes different departments.
- Different stakeholders are involved in the process of decision making and budgeting at all levels.
- Planning is based on the prevailing strategic plan and guided by a number of policy documents and planning tools.

Weaknesses

- Management of eye health interventions in the MOHCDGEC falls under two directorates: the directorate of curative services and the directorate of preventive services; which limits coordination between different stakeholders.

Sightsavers

- The national eye care programme (NECP) sits under the NCD's section of the curative services department and does not get as much priority as other NCDs – namely, cardiovascular diseases, diabetes, mental health, substance abuse, cancers and chronic respiratory diseases.
- There are gaps in the number of staff and skills available to NECP to ensure adequate fulfilment of different roles and responsibilities.
- The national eye health committee (NEHC) does not adequately support NECP; and the NGO eye health forum is inactive.
- Eye health stakeholders are not adequately involved in setting health priorities and budgets at all levels.
- There is poor alignment of priorities between international NGOs and the needs of the country.

Eye health financing

Strengths

- The government contributes to health care services, including eye health.
- Eye health services are covered by health insurance, and around 27 per cent of the population is covered with pre-payment schemes.
- Accelerating insurance cover by the year 2020 to achieve universal health coverage is a government priority.
- There are exemption and fee waiver policies for vulnerable populations at the facility level.
- There are local and international NGOs supporting eye health interventions through government partnership frameworks.

Weaknesses

- Eye care services receive limited financial resources to meet population needs.
- Since 2010, the government has not funded eye care coordination at a national level.
- There is a limited number of eye health NGOs in the country and their support covers only a
  few regions.
- There are no mechanisms to ring-fence financial revenues generated by eye health at the
  facility level.
- Not all eye services are covered by the NHIF benefit package.

Sightsavers

Eye health service delivery

Strengths

- A wide range of eye health services is available in the country, ranging from primary eye care to highly specialised services.
- There is one national, and four zonal and 28 regional hospitals providing eye care services.
- The national hospital and all four zonal referral hospitals are staffed with ophthalmologists and optometrists.
- There are private and faith-based eye hospitals and clinics, which contribute significantly to the availability of eye care services in the country.
- There are standard treatment guidelines for eye health.

Weaknesses

- There is a limited eye health infrastructure, particularly at district and regional levels.
- Most regional and district hospitals lack basic ophthalmological equipment and instruments.
- Only six out of 28 regional referral hospitals are staffed with ophthalmologists.
- There are limited resources for eye health promotion services.
- Clinical supervision is not available at all levels and is dependent on the availability of donor funding.
- Health facilities providing cataract surgical services do not routinely monitor surgery outcomes.
- The standard treatment guidelines are not always followed by eye health workers.
- Different bodies within the Ministry register private eye care facilities; posing challenges in ensuring and monitoring quality of the services offered.

Eye health medicines and medical products

Strengths

- Essential eye medicines, equipment and supplies are currently included in the Medical Stores Department (MSD) catalogue under non-priced items.
- There is the Tanzania Food and Drug Authority (TFDA), which is responsible for monitoring quality, safety and effectiveness of medicines and medical devices in the country. There are procedures in place to report poor quality medicines and adverse effects, including those for eye care.
- Development partners provide equipment, medicines and supplies to selected hospitals.

Sightsavers

Weaknesses

- Eye equipment, medicines and supplies are not readily available through the existing public procurement system; and there were observed stock-outs of essential eye medicines and supplies in most health facilities surveyed in this study.
- There are challenging public procurement mechanisms, which create difficulties in timely availability of products.
- There is no specific budget allocation for eye equipment and medicines, and they tend to be given lower priority in the public procurement system.
- The TFDA quality surveillance system does not include eye care medicines and supplies.

Human resource for eye health

Strengths

- There is a national health policy for HRH, which translates into staffing levels for the health sector.
- Eye health personnel is included in HRH staffing levels.
- There are training institutions for key eye health cadres.
- There is an increased interest among junior doctors (MDs) to pursue further studies (M.Med)
  in ophthalmology.

Weaknesses

- There is a shortage and unequal distribution of eye health workers in the country.
- Eye health staff often work in other health areas due to the lack of space, equipment and medicines for eye health.
- There are limited sponsorships for M.Med ophthalmology training from the government.
- Development partners' support to HReH training is poorly coordinated with the Ministry.
- Reforms of mid-level training systems created challenges for training mid-level cadres in eye health.
- AMOOs and ONOs are often demotivated to perform eye care work, as the current government scheme of service does not recognise their additional professional qualifications.

Sightsavers

Eye health management information system (eHMIS)

Strengths

- There is a form (MTUHA book 16) for recording and reporting eye health data from the district and regional hospitals and private clinics; the data is entered into the web-based system, district health information software (DHIS 2).
- There are HMIS focal persons in hospitals and HMIS coordinators at regional and district levels.
- There is an integrated disease surveillance and response (IDSR) system that includes eye conditions.

Weaknesses

- Eye health indicators are not among the 64 health sector performance indicators.
- The current HMIS does not capture information from the national and zonal referral hospitals.
- Many private hospitals/clinics offering eye services do not report eye patient information to the district authorities.
- Eye health outreach data is not captured in the HMIS.
- There is limited sharing of data among different eye health stakeholders and the public.
- There is a lack of links (interoperability) between the HMIS and other health information systems, such as the human resources for health information system (HRHIS) and training institutions information system (TIIS).

6.2. Conclusions and recommendations

The authors of the report recommend that local, national and international stakeholders, while developing new eye health initiatives, policies and projects, take the key findings of this assessment into consideration. Some specific priorities arising from this assessment may include, but are not limited to, the following recommendations:

Eye health governance:

- Improve coordination between different directorates responsible for eye health programmes at a national level;
- Improve coordination of different activities of international partners with the Ministry and other government structures;
- Improve support of the national eye care programme by the national eye health committee and NGO Eye health forum;

Sightsavers

Eye health financing:

- Earmark allocations for eye health in the government's health expenditure;
- Establish mechanisms for ring-fencing eye care revenues at the facility level;

Eye health service delivery:

- Develop guidelines and establish mechanisms for the regular monitoring of cataract surgery outcomes;
- Ensure that the standard treatment guidelines are used at all levels;
- Ensure consistency in registration and monitoring the quality of services provided by private eye care hospitals/clinics;

Eye health medicines and products:

- Integrate eye medicines, equipment and supplies in the priced MSD catalogue;
- Include eye health medicines and supplies in quality surveillance processes;

Human resources for eye health:

- Develop strategies to address challenges in training mid-level personnel for eye health;
- Ensure that additional qualifications of eye health personnel are recognised in the carrier and remuneration frameworks;

Eye health HMIS:

- Include eye health indicators in the health sector performance indicator framework;
- Develop mechanisms for capturing eye health data from national and zonal hospitals; outreach activities and private sector providers;
- Strengthen capacities for collating and analysing eye health information at all levels.

Sightsavers

References

1. Kavishe B, Biraro S, Baisley K, Vanobberghen F, Kapiga S, Munderi P, et al. High prevalence of hypertension and of risk factors for non-communicable diseases (NCDs): a population-based, cross-sectional survey of NCDS and HIV infection in Northwestern Tanzania and Southern Uganda. BMC medicine. 2015;13(1):126.

2. Liu Y, Dalal K, Stollenwerk B. The association between health system development and the burden of cardiovascular disease: An analysis of WHO country profiles. PloS one. 2013;8(4):e61718.

3. Boulton J. Ebola revisited: lessons in managing global epidemics. British Journal of Nursing. 2015;24(13).

4. Muldoon KA, Galway LP, Nakajima M, Kanters S, Hogg RS, Bendavid E, et al. Health system determinants of infant, child and maternal mortality: A cross-sectional study of UN member countries. Globalisation and health. 2011;7(1):42.

5. Kruk ME, Mbaruku G. Public health successes and frail health systems in Tanzania. The Lancet Global Health. 2015;3(7):e348-e9.

6. Sambo LG, Kirigia JM. Investing in health systems for universal health coverage in Africa. BMC international health and human rights. 2014;14(1):28.

7. Biesma RG, Brugha R, Harmer A, Walsh A, Spicer N, Walt G. The effects of global health initiatives on country health systems: a review of the evidence from HIV/AIDS control. Health policy and planning. 2009;24(4):239-52.

8. Babaria P. Threatened Hope – PEPFAR and Health in Africa. New England Journal of Medicine. 2013;369(15):1388-9.

9. Mussa AH, Pfeiffer J, Gloyd SS, Sherr K. Vertical funding, NGOs, and health system strengthening: Perspectives of public sector health workers in Mozambique. cell. 2012;258(82):3031730.

10. Lee MM, Izama MP. Aid externalities: Evidence from PEPFAR in Africa. World Development. 2015;67:281-94.

11. Pascolini D, Mariotti SP. Global estimates of visual impairment: 2010. British Journal of Ophthalmology. 2011:bjophthalmol-2011-300539.

12. Organization WH. Universal eye health: a global action plan 2014-2019. 2013.

13. 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 epidemiology. 2015;22(3):226-30.

14. Briesen S, Geneau R, Roberts H, Opiyo J, Courtright P. Understanding why patients with cataract refuse free surgery: the influence of rumours in Kenya. Tropical Medicine and International Health. 2010;15(5):534-9.

Sightsavers

15. Bozzani F, Griffiths U. Situation analysis of eye health care in Zambia. London: London School of Hygiene and Tropical Medicine. 2011.

16. Sok K, Ngy M, Do S, Sau S, Mueller A, Blanchet K. Eye Health Systems Assessment Cambodia. Khmner-Soviet Friendship Hospital, Ministry of Health, Cambodia; WHO/ Western Pacific Regional Office.

    International Centre for Eye Health, London School of Hygiene and Tropical Medicine; 2013.

17. Potter AL, Vandy M, Smart N, Blanchet Kl. Eye Health Systems Assessment Sierra Leone. Ministry of Health and Sanitation

    International Centre for Eye Health

    Sightsavers.; 2013.

18. Blanchet K, Gilbert C, Lindfield R, Crook S. Eye health systems assessment (EHSA): How to connect eye care with the general health system. London: International Centre for Eye Health, London School of Hygiene and Tropical Medicine. 2012.

19. Statistics NBo. Basic Demographic and Socio-Economic Profile. In: Finance Mo, editor.: Ministry of Finance; 2014.

20. GDP per Capita (US$): World BAnk 2015 [Available from: http://data.worldbank.org/indicator/NY.GDP.PCAP.CD]

21. Project HP. Tanzania Health Financing profile Health Policy Project 2016 [Available from: https://www.healthpolicyproject.com/pubs/7887/Tanzania_HFP.pdf.

22. Health Sector Strategic Plan IV. In: Welfare MoHaS, editor. 2015.

23. Birth rate, crude: World Bank 2014 [Available from: http://data.worldbank.org/indicator/SP.DYN.CBRT.IN.]

24. Health Sector Strategic Plan III. In: Welfare MoHaS, editor. 2009.

25. Kurowski C, Wyss K, Abdulla S, Yémadji N, Mills A. Human resources for health: requirements and availability in the context of scaling-up priority interventions in low-income countries. Case studies from Tanzania and Chad. 2004.

26. Barker C, A. Dutta, and the OneHealth Study Team. Sustainability Implications for Tanzania's Fourth Health Sector Strategic Plan, 2015/16–2019/20. Washington, DC: Futures Group, Health Policy Project; 2015.

27. Habiyakire C, Kabona G, Courtright P, Lewallen S. Rapid assessment of avoidable blindness and cataract surgical services in Kilimanjaro region, Tanzania. Ophthalmic epidemiology. 2010;17(2):90-4.

28. Sanyiwa A. Rapid Assessment of Cataract Surgical services. Unpublished report. 2007.

Sightsavers

29.   Staffing levels : 2014-2019. Ministry of Health and Social Welfare; 2014.

30.   Mafwiri M, Mwakyusa N, Shilio B, Sanyiwa A, Lutale J, Dhalla K, et al. Situational analysis of infrastructure and human resources for diabetic retinopathy services in Tanzania. JOECSA. 2015;18(2).

31.   Palmer JJ, Chinanayi F, Gilbert A, Pillay D, Fox S, Jaggernath J, et al. Mapping human resources for eye health in 21 countries of sub-Saharan Africa: current progress towards VISION 2020. Human Resources for Health. 2014;12(1):44.

32.   Musau S, Chee G, Patsika R, Malangalila E, Chitama D, Van Praag E, et al. Tanzania health system assessment 2010. Bethesda, MD: Health Systems. 2011;20:20.
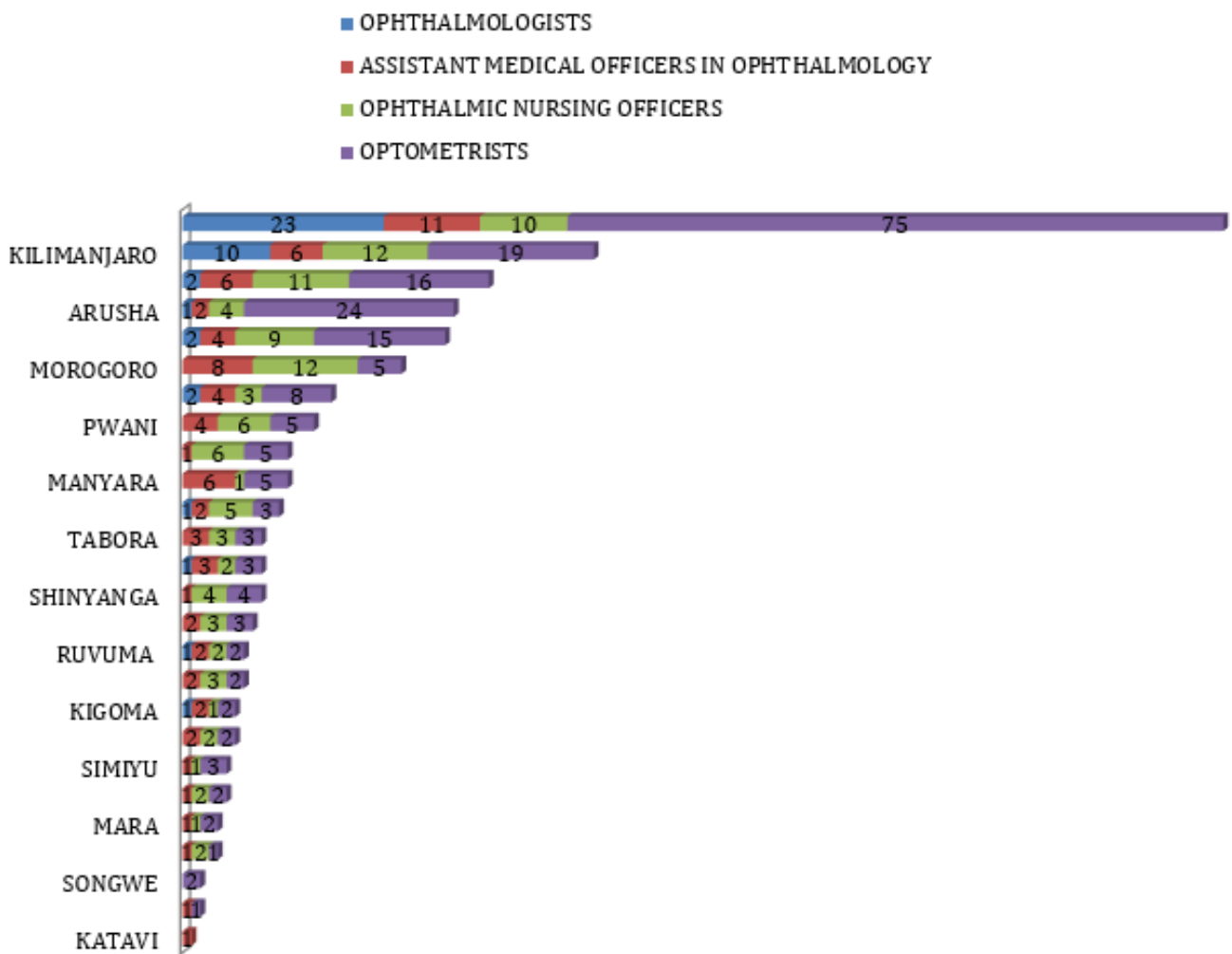
Sightsavers

Annex

Figure 9: distribution of eye health human resource cadres in mainland Tanzania

Source: national eye care programme

Sightsavers