

KENYA EYE HEALTH SYSTEM ASSESSMENT

NOVEMBER 2017





Acknowledgements

The Kenya Eye Health Systems Assessment (EHSA) Report is the product of a combined team effort of the national and county Ministries of Health working together. The team of investigators comprised Dr Richard Ayah, a lecturer at the University of Nairobi's School of Public Health and a health systems management expert, and Dr Michael Gichangi, Deputy Director of Medical Services and the Head of Ophthalmic Services Unit (OSU) in the National Ministry of Health (MoH), who held the positions of principal and co-principal investigators respectively. Other investigators drawn from the MoH and Kenya Medical Training College (KMTTC) included experts in at least one component of the six building blocks, including Dr Judith Awinja (Leadership and Governance); Dr Dorothy Mutie (Service Provision); Dr Jebichi Maswani (Human Resource for Health); Dr Josephat Mbuva (Medical Products & Technology); Dr Martha Muthami (Health Information Systems) and Dr Nyawira Mwangi (Human Resource for Health). Special thanks also go to Helen Bokea of CBM for her valuable input into the process.

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Abbreviations and acronyms

CHAK	Christian Health Association of Kenya
CHPS	Community-based Health Planning and Services Initiative
CSR	Cataract Surgical Rate (cataract operations per million population per yr)
CHIMS	County Health Information Management System
CHMT	County Health Management Team
CHPS	Community-based Health Planning and Service
DANIDA	Danish International Development Agency
CDHS	County Directors of Health Services
OSU	Ophthalmic Services Unit
EHSA	Eye Health System Assessment
FBO	Faith-based Organisation(s)
HIS	Health Information System(s)
HR	Human Resources
HRH	Human Resources for Health
HReH	Human Resources for Eye Health
KSB	Kenya Society of the Blind
KEPH	Kenya Essential Package for Health
KHPF	Kenya Health Policy Framework
KHSSIP	Kenya Health Sector Strategic and Investment Plan
MDG	Millennium Development Goal
MOE	Ministry of Education
MOH	Ministry of Health
NCD	Non-Communicable Disease(s)
NHIF	National Health Insurance Fund
NTD	Neglected Tropical Disease(s)
OEU	Operation Eyesight Universal

ON	Ophthalmic Nurse
OOP	Out of Pocket Payment
OPD	Outpatient Department
PEC	Primary Eye Care
PHC	Primary Health Care
RO	Regional Ophthalmologist
SARAM	Service Readiness Assessment
SSA	Sub-Saharan Africa
SS	Sightsavers
THE	Total Health Expenditure
USAID	US Agency for International Development
WHO	World Health Organization

Executive summary

The goal of providing adequate and equitable healthcare that meets the needs and aspirations of Kenyans continues to be undermined by weak national and local health systems. Eye health care is no exception, despite efforts to plan for and implement improved eye health provision. Kenya has its sixth Strategic Plan for Eye Health and Blindness Prevention, but has never conducted a health system assessment focused on eye health.

This assessment aimed to provide a comprehensive overview of the key health system functions as they relate to eye health in Kenya. It is based on the World Health Organisation's health system strengthening building blocks framework. Using a tool adapted from the Eye Health Systems Assessment (EHSA) manual and the WHO Eye Care System Assessment Tool (ECSAT), data was collected from four counties of Kajiado, Nakuru, Homa Bay and Nairobi, representing the upper, middle and lower strata of the Kenya Human Development Index and the capital city.

Overall, the eye health system delivery involves multiple partners, including government and non-governmental actors, many supported by international donors, mitigating the limited resources available for programme coordination by the national government. There was, however, limited integration of eye health services in the county planning and limited involvement of the eye health leadership in decision-making at the highest level.

Health insurance in the form of national health insurance fund is available for common conditions reducing financial barriers to access, but there are exceptions for refractive error and low vision services resulting in significant out-of-pocket payments.

Human resources for eye health (HReH), though increasing in number, increase at a rate far below the population growth; and the low numbers are exacerbated by unequal distribution, with a high concentration of subspecialties in Nairobi. The active private sector includes primarily opticians and optometrists.

Eye health services are not integrated in primary healthcare and there was limited availability of refraction and low vision services in most counties surveyed. Across the counties, tertiary eye care services were few, though all had outreach programmes in place. Planning for effective provision of care was undermined by the lack of analysis of eye care data collected at the facility level, although the key indicators for eye health were available.

This assessment shows gaps in various domains of the Kenyan eye health system, including governance/leadership, health information and human resources; all affecting the delivery of eye care services. The study provides useful insights into where Kenya is in meeting VISION 2020 targets as well as the basis for work to strengthen the eye health system and improve outcomes for leading eye conditions.

1. Introduction

Countries in sub-Saharan Africa face the issue of growing populations and experience multiple challenges for sustained economic development (1). While there has been a significant improvement in population health measured by reductions in infant and maternal mortality, the disease burden from both communicable and non-communicable conditions remains high.

There is an increasing acknowledgment that a “health system approach” that emphasises building a strong health system, rather than vertical programmes, is needed to achieve and sustain health gains (1). ‘Systems thinking’ is an approach to problem-solving that views problems as part of a wider dynamic system, which deploys explicit models with clearly laid out assumptions, and can be calibrated with data and repeated by others (2).

The Health Systems Assessment (HSA) approach for rapid assessments of strengths and weaknesses of a country’s health system has been promoted by US Agency for International Development (USAID) (3,4). The results can be used to better understand the behaviour of a health system and identify and address financing, governance, operational and capacity constraints (5). The first health system assessment in Kenya was conducted in 2010 under the auspices of the Health Systems 20/20 project.(5).

The key results were the weak stewardship by the then two Ministries of Health (MoH), high levels of household expenditure, inadequate Human Resources for Health (HRH), the lack of processes for determining essential medical products, weak health information systems and limited service delivery undermined by various system deficiencies. Some of the main findings of the 2010 study are summarised in Table 1.

Table 1: Summary of the Kenya Health System Assessment (2010) findings

Governance: the Ministry of Health had two divisions responsible for the delivery of services: the Ministry of Medical Services, which administered secondary and tertiary hospitals, and the Ministry of Public Health and Sanitation, which administered primary health facilities. This substantially slowed down the implementation and made the governance function complicated. Performance base contracting was introduced.

Health Financing: households had the largest share of health expenditure (35.9 per cent), followed by government and donor contributions (30 per cent each). There were proposals to restructure the National Health Insurance Fund.

Human Resources for Health: there was a critical shortage of health workers, with unequal distribution by rural/urban location, by region and by level of health facility.

Service Delivery: service provision was constrained by the lack of human resources, finances and medical products. Quality was constrained by inadequate standards and the lack of their enforcement.

Around 80 per cent of visual impairment is preventable or curable through effective eye care services (2,6). Over the past few years, there have been increasing efforts to explore the relationship between eye health systems and general health systems (7,8).

The Eye Health System Assessment (EHSA) Approach is designed to provide a rapid yet comprehensive assessment of the key health system functions as they relate to eye health, and their interactions, based on the health system 'building blocks' framework developed by the World Health Organisation (WHO) (3) (Figure 1).

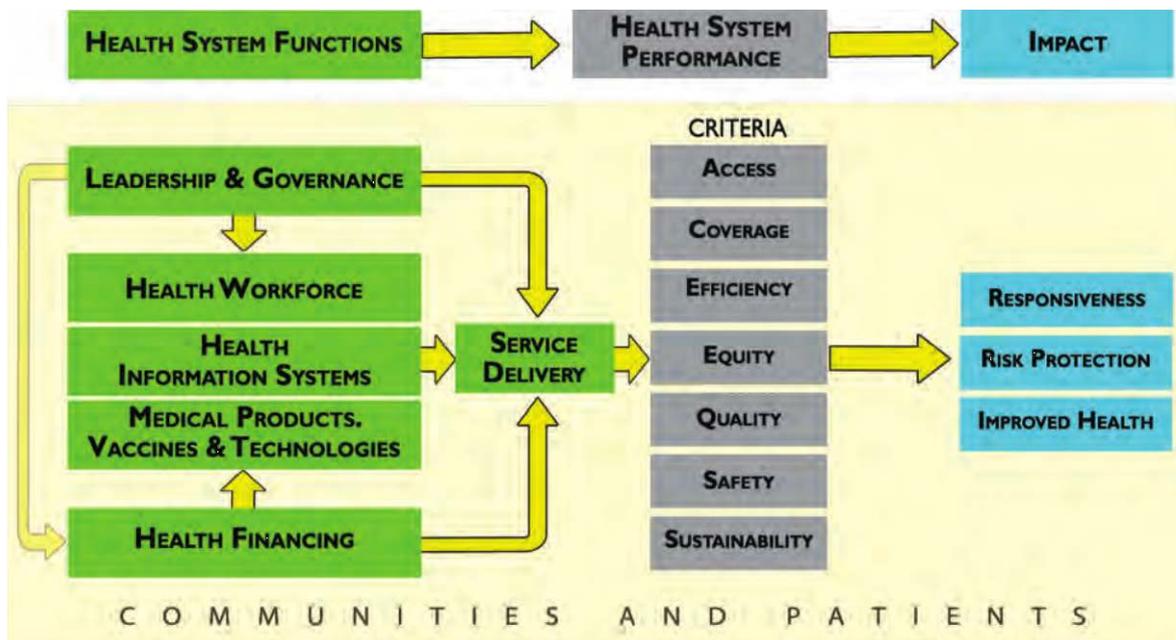


Figure 1: WHO health system building blocks interactions

The current Kenya Health Policy (2014-2030) includes two additional areas considered important for the Kenya's health system: Infrastructure, and Research and Development (9). This study sought to identify all relevant actors and stakeholders in each building block, as well as their roles and relationships.

1.1 Rationale

No eye health system assessment has ever been conducted in Kenya. The Health Systems Assessment 2010 covered the health system in general, but it is not known to what extent the findings apply to eye care settings (10). The structure of the Ministry of Health has since changed with the merger of two Ministries and devolution of service provision to county governments. The context in 2016 and the issues at play were therefore expected to be different from those found in 2010. Strengthening Kenya's eye health system requires a thorough understanding of its unique strengths and weaknesses, within the wider health system context. This eye health systems assessment was conducted in the context of a wider eye diseases and systems study, with the rationale that a better understanding of how the eye health system functions coupled with the prevalence of eye diseases survey could improve the effectiveness of eye care interventions and ultimately health outcomes (11,12).

1.2 Objectives of the EHSA

The consensus emerging in the international eye care community is that the effectiveness of eye care interventions can only be improved through a better understanding and strengthening of health system functions. The EHSA focus was not necessarily to discover new evidence, but rather examine all components of the eye health system and their inter-relationships, and make important recommendations that improve the whole eye health system. The objectives of the Eye Health System Assessment were:

1. Describe the governance functions of eye health system
2. Outline the health financing mechanisms currently in operation
3. Describe eye health service delivery
4. Determine available human resources for eye health
5. Determine available medical products and technologies relevant to eye health
6. Assess the eye health information system
7. Assess the available eye health infrastructure
8. Describe research and development relevant to eye health

This report documents assessment findings, providing a basis for work to strengthen the eye health system in Kenya and improve eye health outcomes.

2. Methodology

The EHSA approach is based on the WHO 'building blocks' framework and assesses leadership and governance; delivery of services; human resources; information systems; and medical products and technologies (13). The approach was developed by a consortium of eye health experts coordinated by the International Centre for Eye Health at the London School of Hygiene and Tropical Medicine, with the funding from Sightsavers (14). The approach undertakes strengths, weakness, opportunities and threats (SWOT) analysis in relation to eye health (15).

The aim of an EHSA is to synthesise available information to understand the functions of an eye health system and its relationship with the wider health system. In Kenya a consultative approach was adopted, taking into account lessons learned from other country assessments (7,16); relevant consultations took place with the National and county eye health stakeholders and the Sightsavers Kenya Country Office.

The assessment was undertaken following a number of steps. A draft report was shared with various stakeholders during a one-day stakeholder validation meeting in Nairobi, which was followed by completion of the final report (Figure 2). A summary of all stakeholder meetings held is provided in Appendix 1.

Step	Activities	Timelines
Preparatory work	<ul style="list-style-type: none"> • Develop complete proposal • Obtain ethical and administrative approval for assessment • Stakeholder workshop 	Apr-May 2016
Mobilise EHSA team	<ul style="list-style-type: none"> • Identify EHSA team • Develop indicators for each eye health system function to drive data collection • Develop budget 	
Data collection	<ul style="list-style-type: none"> • Compile and review background materials • Identify information gaps • Data abstraction at health facility • Key informant interviews 	Jun-Jul 2016
Data analysis and report writing	<ul style="list-style-type: none"> • First draft assessment report • Share with stakeholders for validation 	Aug-Dec 2016
EHSA workshop and dissemination	<ul style="list-style-type: none"> • Stakeholder Validation Workshop • Launch report • Develop action plan 	May-July 2017

Figure 2: Steps in the approach to the eye health system assessment in Kenya 2016

2.1 Study population

To derive a sample that would provide a reasonable representation of eye health facilities in Kenya, we used the Kenya Human Development Index (HDI) (17) to select four different counties (4); one each from the uppermost, middle and lowermost strata, as well as Nairobi City County, the capital of Kenya. Similarly to other African countries, the capital was included as an example of the best available care in the country (18,19). In each stratum, all the counties that had similar HDI scores were considered eligible. The selection of one county per stratum was based on accessibility, logistics and security. The four counties included in the assessment were Nairobi, Kajiado, Nakuru and Homa-Bay. The counties' HDIs were 0.64, 0.59, 0.52 and 0.41 respectively, compared with the national HDI of 0.548 (17).

2.2 Study areas

The four selected counties were chosen to give a picture of the best available, relatively strong, medium and relatively weak eye health systems. The sample was not intended to be statistically representative of the whole country.

2.2.1 Kajiado County

Kajiado County has a population of 778,394 people and is located in the Rift Valley in the southern part of Kenya. It borders the Republic of Tanzania to the south-west, Taita Taveta County in the south-east, Machakos and Makueni Counties in the east, Nairobi County in the north-east, Kiambu County in the north and Narok County in the west. The county covers an area of 21,900.9 square kilometres. There are five constituencies in the county: Kajiado South, Kajiado Central, Kajiado West, Kajiado East and Kajiado North. The county is further divided into five administrative sub-counties: Kajiado Central, Kajiado North, Loitokitok, Isinya and Mashuuru. Most of the county is classified as arid and semi-arid, with livestock rearing being the predominant economic activity.

The county health system has 307 tier 2 and 15 tier 3 health facilities. The four-tier system is described under section 3.1. The majority of the facilities (59 per cent) are private, while 30 per cent are government, 6 per cent are faith-based and the rest are community or NGO-led (5 per cent).

2.2.2 Homa Bay County

Homa Bay County has a population of 1,091,515 people and is located in the south-west region of Kenya, alongside Lake Victoria. The county borders Kisumu and Siaya Counties to the north, Kisii and Nyamira Counties in the east, Migori County in the south and the Republic of Uganda in the west. The county is divided into six districts: Homa Bay, Ndhiwa, Mbita, Suba, Rachwonyo South and Rachwonyo North. The county is further subdivided into eight constituencies: Kasipul-Kabondo, Kasipul, Karachwonyo, Rangwe, Homa Bay Town, Ndhiwa, Suba North and Suba South. The county has a total area of 2,495.6 square kilometres.

The county's main economic activities include farming, fishing, livestock rearing and trading activities. There are also lake transport activities using motorboats, building stone and sand harvesting at Kendu Bay and tourist attraction sites around Lake Victoria.

The county's health system consists of 221 tier 2 and 16 tier 3 health facilities. Two thirds of the facilities are government owned, and one in six facilities are part of the national government structure. One in 20 facilities in the county are faith-based and community owned.

2.2.3 Nakuru County

Nakuru County has a population of 1,815,795 people; it lies within the Great Rift Valley and borders seven other counties: Kericho in the west, Baringo and Laikipia in the north, Nyandarua in the east, Narok in the south-west and Kajiado and Kiambu in the south. The county is made up of 11 constituencies: Naivasha, Nakuru Town West, Nakuru Town East, Kuresoi South, Kuresoi North, Molo, Rongai, Subukia, Njoro, Gilgil and Bahati. The county covers an area of 7496.5 square kilometres. Commercial and smallholder agriculture and tourism are the main economic activities in the county.

The county's health system consists of 372 tier 2, 22 tier 3 and one tier 4 (referral) facilities. Government-owned health facilities constitute 37.7 per cent; while 41.3 per cent are private for profit, 10 per cent each are faith-based, and community or NGO-led.

2.2.4 Nairobi County

Nairobi County incorporates the capital city. It is geographically the smallest (696 square kilometres) but most populous county with a population of 3,554,261 people. The county is divided into 17 constituencies: Westlands, Dagoretti North, Dagoretti South, Lang'ata, Kibra, Roysambu, Kasarani, Ruaraka, Embakasi South, Embakasi North, Embakasi Central, Embakasi East, Embakasi West, Kamkunji, Makadara and Mathare.

The county's health system has 866 tier 2, 33 tier 3 and four tier 5 health facilities. The majority (60.2 per cent) are private, 15.4 per cent are government owned, 14 per cent are faith-based and the rest are community or NGO-led (10.4 per cent).

2.3 The EHSA assessment team

The assessment team was drawn from ophthalmologists, health system practitioners and a biostatistician from the University of Nairobi, as well as representatives of the Ministry of Health, Kenya Medical Training College (KMTTC), Kenya Medical Research Institute (KEMRI) and the Regional Trachoma Prevention Programme for Africa. The assessment team was led by Dr Michael Gichangi, Head of Ophthalmic Services Unit at the Ministry of Health, while the process of compiling the report was led by Dr Richard Ayah from the University of Nairobi (Appendix 2).

2.4 Data collection

A mixed method approach was adopted. A document review of published studies, reports and grey literature was done (Appendix 3). Initial documents were identified by the EHSA team and supplemented by additional documents suggested by key informants during interviews.

The data collection tool was adapted from the EHSA manual and the WHO ECSAT tool (previously tested in Kenya in 2015) (14). In addition, two domains of infrastructure and research & development, contained in the current Kenya Health Policy, were added to complement the assessment (20).

The routinely available programme data was supplemented by the key informant interviews with relevant actors at the national and county levels. Data collection took place between June 2016 and May 2017.

2.5 Ethical considerations

The Principal Secretary of the National Ministry of Health approved the study. Administrative clearance to extract the data was given by the Ministry of Health. All interviews were conducted only after an informed verbal consent had been obtained from each respondent.

3. Kenya health system overview

Since 2011, Kenya's economy has grown by an average of 5.5 per cent and the gross domestic product (GDP) was estimated at US\$63 billion in 2014 (21). Kenya's population growth has been 2.8 per cent per annum and the total population was estimated at 44.8 million, of whom just under half lived below the poverty line in 2014 (22). Life expectancy at birth in 2014 was 58 years, and the infant mortality rate was estimated at 39 per 1,000 live births (21).

The Kenyan Constitution provides that "every person has the right to the highest attainable standard of health". It further outlines that "a person shall not be denied emergency medical treatment" and that "the State shall provide appropriate social security to persons who are unable to support themselves and their dependents" (Republic of Kenya, 2010, p31).

Kenya's long-term health sector strategic focus is guided by the Health Policy 2014-2030, which outlines six policy objectives intended to lay the foundation for achieving Vision 2030 (20). Vision 2030 aims to transform Kenya into a globally competitive and prosperous country with high quality of life by 2030. At the national level the Ministry of Health is expected to provide overall supervision, development and enforcement of guidelines, standards and norms for different activities at different levels of the system (23).

The Kenya Health Sector Strategic and Investment Plan 2014-2018 highlights the key strengths and weaknesses of the health system (Table 2).

Table 2: Strengths and weaknesses of the Kenya health system highlighted in the Health Sector Strategic and Investment Plan, 2014-2018

Kenya health system strengths

- National and county health management teams have been established.
- Devolution created flexibility at the county level to plan, monitor and coordinate service delivery and manage posting and performance of Human Resources for Health.
- Decentralisation of financial management permits counties to allocate and manage their resources, and to mobilise additional funds from donors.
- Introduction of the county HMIS provides a chance to standardise, collect and collate essential data at the county level.

Kenya health system weaknesses

- Weak governance undermines the overall performance of the system, including communication and information flow.
- Health system weaknesses impede the scale-up of cost-effective interventions; there are pressures to spend on specialised services rather than Primary Health Care (PHC), while referral systems remain weak and there is insufficient attention given to reducing risk factors and complications.
- There are inequalities in geographical and financial access to services with low National Health Insurance Fund (NHIF) registration in some counties
- There are inadequate budgetary provisions and irregular flow of funds; and there is a lack of explicit budget allocation criteria.
- There is inadequate accountability for performance, poor supervision of health facilities and low morale among staff.
- There are deficiencies in health information management, with inadequate use of data in defining county priorities, resource allocation, decision-making, or monitoring and evaluation.

- Human resource production is not matched with the need; there are chronic staffing imbalances due to attrition and inequitable distribution
- Medical supply purchasing systems fail to ensure value for money; centralised procurement systems do not always bring economies of scale; and there is inadequate coordination of operational logistics and poor maintenance of equipment.
- Public and private sectors continue to operate separately; NGOs play limited role in planning and evaluating health services.

3.1 National and devolved health systems

The health sector in Kenya comprises the public system (MOH, parastatals and local government) and the private sector, which includes private for-profit, non-governmental and faith-based organisations. The Kenya Service Availability and Readiness Assessment (SARAM) 2013 identified 8,401 health facilities in Kenya, of which 49 per cent were public, 16 per cent were private not-for-profit and 33 per cent were private for-profit (20). Health service delivery is organised as a four-tier system (Table 3) (24).

Table 3: Four-tier system: Kenya Essential Package of Health levels.

Under current health policy, health service delivery is organised around four tiers: community, primary care, primary referral and tertiary referral services.

Tier 1 (Previously Level I): Community services will focus on creating appropriate demand for services.

Tier 2 (Previously Level II and III): Primary care services will comprise all dispensaries, health centres and maternity homes of both public and private providers.

Tier 3 (Previously Level IV): County referral services will include hospitals operating in, and managed by a given county both public and private. Together, all these hospitals in a given county form the County Referral System.

Tier 4 (Previously Level V and VI): National referral services will include the service units providing tertiary / highly specialised services including high-level specialist medical care.

Source: (6)

Under the devolved health system, all referral hospitals (level five and six hospitals) are tier 4 facilities, while primary care service units are tier 1 and include either health centres or dispensaries (mobile clinics in the areas where population density is very low, and/or mobile). In the long run the health sector aims to upgrade all dispensaries into full primary care units (model health centres) (Figure 3) (25). The constitution places national referral health facilities under the national government, while county governments are responsible for primary healthcare (26).

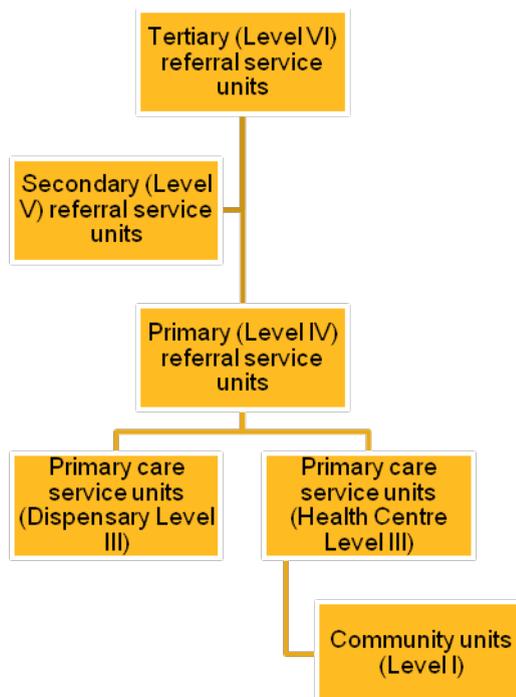


Figure 3: Organisation of health services in a devolved system

Source. Kenya Health Policy Framework 2014-2030

In 2012, Kenya had 8,401 health facilities, of which 588 were hospitals, 1,092 were health centres, 3,864 were dispensaries, 2,604 were private clinics and 336 were maternity and nursing homes. Two thirds of all health facilities were in rural areas (20).

3.2 Health financing

National health accounts (NHAs) are a way for policymakers to learn retrospectively from past expenditures, to improve planning and allocation of resources while reducing health inequity and increasing system's accountability. The last NHAs were for the period 2012/13, where the total health expenditure (THE) was estimated at Kshs 234 billion (US\$2,743 million) up from Kshs 163 billion (US\$2,155 million) in 2009/10. The government expenditure on health as a percentage of the total government expenditure increased from 4.6 per cent in 2009/10 to 6.1 per cent in 2012/13, reversing a downward trend over the previous 10 years (7). THE per capita increased from Kshs 4,232 (US\$56) in 2009/10 to Kshs 5,680 (US\$67) in 2012/13.

From an equity perspective, households' out-of-pocket expenditure (OOP), excluding cost sharing, remains significant at 27 per cent of THE compared to the government and donor shares of 41 per cent and 26 per cent respectively. The 2012/13 NHA reflects a decline in donor contribution to THE for the first time. The recognition of Kenya as a lower middle-income country (27) is likely to result in further reductions in donor funding, leading to pressures for the country to finance its health sector from domestic sources. In terms of utilisation of funds, the public sector providers' share was 39 per cent, while private providers share was 22 per cent. Public

health programmes used 16 per cent of funds and health administration was 19 per cent, with others at 4 per cent (28).

3.2.1 County health budgets

In 2013 the health service delivery function was formally transferred to counties, with one third of the total devolved budget of Kshs 210 billion (fiscal year 2013/14) allocated to health (29).

In addition to the county funds from tax revenue allocations, there were conditional grants for the health sector including allocations to support abolition of user fees in health centres and dispensaries (Kshs 900m); a capacity-building programme by the World Bank for health centres, dispensaries and Community Health Management Teams (CHMTs) to incentivise health workers (Kshs1.3B); a Danish International Development Agency (DANIDA) Health Sector Programme Support III grant (Kshs 422m); and allocations to supplement financing for level five hospitals (Kshs 4b) (30).

Five conditions – HIV/AIDS, reproductive health, malaria, respiratory infections and vaccine preventable diseases – used more than 50 per cent of the total health expenditure (Table 4).

Table 4: Total health expenditure by disease condition

Disease condition	Proportion of total health expenditure (%)
HIV/AIDS	18.7
Reproductive health	12.9
Malaria	9.8
Respiratory infections	6.5
Vaccine-preventable diseases	6.3
Non-communicable diseases	6.2
Other	35.6

3.3 Human resource for health

Health workforce is one of seven policy priorities specified in the Kenya Health Policy. National norms and standards have been developed to outline the minimum requirements and an appropriate mix of human resources and infrastructure required to serve populations at different tiers and different types of health services (Table 5) (31).

Table 5: Absolute staffing needs by population for selected categories

Staff category	Sub-categories	Total staff needs	Norms 10,000 persons	
			By staff category	By sub-categories
Laboratory staff	Laboratory assistant	11,137	4.1	2.5
	Laboratory technician/scientist	5,569		1.3
	Laboratory technologist	1,471		0.3
Medical practitioners	Nutritionist	2,335	7.2	0.5
	Clinical officer	16,278		3.7
	Medical officer	13,141		3.0
Midwives	Registered midwife	13,308		3.0
Surgical specialists	ENT	452	1.1	0.1
	General surgeon	947		0.2
	Obstetrics / Gynaecology	585		0.1
	Ophthalmologist	552		0.1
	Orthopaedician	495		0.1
	Paediatrician	506		0.1
Nurses	Enrolled nurse	23,574	8.7	5.4
	Registered nurse	11,335		2.6
	BSN nurse	467		0.1
	Specialised nurse	2,939		0.7
Pharmacy staff	Pharmacy technologist	3,106	0.9	0.7
	Pharmacist	724		0.2
Community staff	Trained Community Health Worker	120,886	28.3	27.5
	Social Health Worker	3,528		0.8
Management staff	Health Records and Information Officer	4,071	1.2	0.9

Source: (8)

Kenya is among 36 African countries experiencing a severe and chronic crisis in the area of Human Resources for Health (HRH) (25). While the public sector remains the largest employer of health workers, the vacancy rate in public institutions is high, at about 70 per cent of the expected norms (24). The major causes of the crisis are inadequate and inequitable distribution of health workers; high staff turnover; weak health workforce planning and development; deficient information systems for human resources; migration; insufficient training capacity to meet the need; inadequate remuneration; and poor working conditions. These factors contribute to major challenges to attract and retain health workers, particularly in rural areas (10).

The Constitution of Kenya and the Kenya Health Policy 2014-2030 highlights the need to focus on strengthening human resource development and systems and practices by improving the production of health workers (numbers and quality); ensuring the appropriate and equitable distribution of health workers; and improving work incentives for health workers.

3.4 Health information systems

Health information investments define the inputs required for information generation, validation, analysis, dissemination and utilisation. This relates to routine health information, vital statistics information, disease surveillance information and health survey information.

The County Health Information Management System (CHIMS) has been introduced with the aim of improving efficiency and effectiveness in data management at the community, facility and county/national levels of the government. However, there remains low data demand and use by healthcare practitioners in Kenya (32).

3.5 Infrastructure

Health infrastructure is one of the eight policy areas identified by the health sector as priority areas of investments (input) to enable the achievement of six main policy objectives. The health infrastructure here refers to physical infrastructure, equipment, transport and Information Communication Technology (ICT) relevant to health care delivery. This, in turn, is expected to lead to an increased demand and improved access to quality health care (24).

4. Eye health system overview

4.1 Eye health status

The prevalence of blindness in Kenya is estimated at 0.7 per cent: 250,000 people are estimated to be blind, with another 750,000 people suffering from low vision. Cataract is the leading cause of blindness, accounting for 43 per cent of cases. Trachoma is the second leading cause, accounting for 19 per cent of blindness, followed by glaucoma and childhood blindness, accounting for 9 per cent and 6 per cent respectively (6). This implies that more than 80 per cent of blindness in Kenya is preventable or curable. However, there is a need for a more comprehensive national survey to establish the burden of eye diseases more accurately.

4.2 Governance and leadership in eye health

4.2.1 Key findings

Strengths

- Kenya has a National Strategic Plan for Eye Health and Blindness Prevention, which cascades from the National Health Policy.
- There is a national coordination structure: the Ophthalmic Services Unit (OSU).
- Eye health is delivered through a partnership between government, NGO and private-sector providers and there is a National Prevention of Blindness Working Group that brings together different stakeholders under the leadership of OSU.

Weaknesses

- There is an observed disconnect between national and county-level policies, and there is limited capacity to disseminate national policies to devolved structures.
- Eye health is not present in the county health governance organograms, and many counties do not have prevention of blindness communities.

4.2.2 Eye health strategies and policies

There is a National Strategic Plan for Eye Health and Blindness Prevention (2012-2018), which cascades from the National Health Policy (24) (9,10) (Ministry of Health, 2012a, 2014b). Eye health also follows a number of other relevant national strategies, such as the National referral strategy (33). The government of Kenya is also a signatory to VISION 2020, which commits the country to the globally agreed targets (34).

This assessment revealed that Kajiado, Nakuru and Homa Bay Counties had the Kenya Health Policy framework (KHPF) document. Homa Bay had it in both soft and hard copies, while Kajiado had hard copies only. Nakuru did not specify the format in which it had the document, and in Nairobi, the document was available in a quarter of facilities visited.

The Eye Health Strategic Plan was available in hard copy and only in Homa Bay and a quarter of the facilities visited in Nairobi (Table 6).

Table 6: Availability of policy documents by county

Policy document	County			
	Kajiado	Nakuru	Homa Bay	Nairobi
Availability of Kenya Health Policy Framework	Yes	Yes	Yes	2/8
Availability of National Strategic Plan for Eye Health and Blindness Prevention 2012-2018	No	No	Yes	2/9
Customisation to the national plan	No response	No	Yes	No
Monitoring of the plan	No response	Yes	Yes	No

4.2.3 National level governance

Eye care services (prevention and treatment) in Kenya are coordinated through the Ophthalmic Services Unit (OSU), headed by a deputy director of medical services.

At the national level, OSU oversees provision of public eye health services, which is a delegated function of the Ministry of Health. The unit has a mandate to reduce avoidable blindness by providing preventive and curative eye care services and integration of primary eye care (PEC) into the existing primary health care (PHC) system. The head of the Ophthalmic Services Unit plays a key role as the chief advisor to the government on strategic directions with respect to eye health and blindness prevention. The unit oversees, coordinates and assures quality of eye care services at the national level and facilitates the training, deployment and distribution of resources and eye care workers in the country. OSU has a number of sections: community services, preventive services, clinical services and eye health information/epidemiology.

The National Prevention of Blindness Working Group, which brings together eye care service providers within the government, mission and NGO sectors, has been mandated with the critical task of developing eye health policies and ensuring its implementation. Eye care service coordination reflects a partnership between the national government and international and local NGOs (6).

4.2.4 County and sub-county-level governance

At the county level, the county Health Management Team (CHMT) has responsibility for the delivery of all health services, public and private, including eye health services. Although the coordination structure for eye health is well established at the national level, this may not be the case at the county level: counties have been mandated to implement their own eye care plans with the assistance from partners and donors. At the county level, the Ophthalmic Services Unit advocates for inclusion of eye care plans in national and county annual operational plans and development of creative approaches to mobilise resources for eye health. These include

promoting multi-sectoral collaboration and involving other relevant ministries and programmes, such as water and sanitation, community development, education, and the National Health Insurance Fund (NHIF). County prevention of blindness committees have been formed in some counties.

This assessment found that eye health was not explicitly mentioned in any of the counties included in the study and none of the four counties had an eye health or prevention of blindness committee. This indicated weaknesses in cascading down the national eye health governance structures to the devolved county units.

In terms of focal eye health persons, the study found county variations. In Homa Bay there were eye contact persons at level three (referral hospital) and level two (health centre and dispensary). Kajiado and Nakuru did not have eye contact persons at level two. There was no eye health governance information for Nairobi County. Where present, eye health contact persons were formally appointed and had links with the eye health national level.

4.2.5 Other eye care stakeholders

Various international and local NGOs play an important role in supporting eye care in Kenya. These include Sightsavers, Christian Blind Mission (CBM), Operation Eye Sight Universal, Fred Hollows Foundation (FHF), AMREF, Lions, Sight By Wings, Kenya Society for the Blind, Salus Oculi Kenya and Rotary Club among others (6). The Ophthalmic Services Unit is responsible for coordinating eye care services between different stakeholders.

Many NGOs are focused on specific eye conditions. For example, trachoma, endemic in 12 counties receives support from eight key NGO partners (Table 7).

Table 7: Key partners working to eliminate trachoma in Kenya

Trachoma Elimination Programme: Key Partners

Sightsavers International (SSI)
Fred Hollows Foundation (FHF)
Christian Blind Mission (CBM)
Operation Eye-Sight Universal (OEU)
Spanish Doctors
African Medical Research Foundation (AMREF)
International Trachoma Initiative (ITI)
Lions Club International

The Kenya Society of the Blind (KSB), established in 1956 through an Act of Parliament, has a mandate to offer, support and coordinate comprehensive eye care services in Kenya. KSB works in collaboration with the Ministry of Health. The Ministry is represented in the KSB Board by an appointee of the Principal Secretary.

During the assessment in the selected counties, a variety of organisations were involved in eye health activities at various levels. Nairobi and Kajiado Counties had the highest number of registered organisations involved in eye health (Table 8). Some of the key organisations involved at the county level included AMREF, Lion’s Club, Sightsavers, PCEA Kikuyu Hospital, St Mary’s Hospital, AIC Kajiado and Kisii Eye Centre. AMREF Health Africa and Sightsavers were cited as organisations that had some policy influence.

Table 8: Organisations involved in county eye health activities at all levels

County	Organisations	Main area of focus	Influence over implementation
Kajiado	Sightsavers, AMREF, AIC, Lutheran Church	Eye camps-general screening and surgery treatment of ocular morbidity cases	Yes
Nakuru	Lions Club Nakuru	Screening and cataract surgery (2)	No
Homa Bay	Kisii Eye Centre	Cataract surgery (1)	No
Nairobi	PCEA Kikuyu Hospital, St. Mary’s Hospital, Lion’s Club	General eye diseases, cataract surgery	Yes

There are also private-sector companies such as Safaricom and Unilever that support eye care under their corporate social responsibility programmes (35). The consensus of the stakeholder workshop conducted as part of this assessment was that the private-sector contribution was not adequately captured, and that they do a lot more than they are acknowledged for as they have more eye facilities than public health care.

4.3 Eye health financing

4.3.1 Key findings

Strengths

- The National Health Insurance Fund (NHIF) scheme covers a range of health conditions, including eye diseases.

Weaknesses

- There was no information available on eye health expenditure at the national or county level in this study.
- A general view is that resources available for eye care provision and coordination at different levels are very limited.
- Out-of-pocket expenditures are thought to be an important barrier to eye care services, particularly refractive error and low-vision services.

4.3.2 Eye care services financing

Eye conditions are not included in the analysis of the national health accounts. It was estimated that eliminating avoidable blindness and visual impairment in the period 2013 to 2020 would cost Kenya US\$211.8 million, which is about 10 per cent of the total health expenditure (THE) in the country, or roughly what is currently spent on malaria (11).

This assessment was not able to obtain data on eye health financing at the county level. It was stated that county hospitals were all funded through the county health budgets, which were approved annually. However, facility-level respondents across all counties could not provide data on the total expenditure in their facilities and were unable to estimate the proportion of annual expenditure allocated to eye care commodities.

The National Health Insurance Fund includes provisions for various health conditions, including eye health. However, NHIF does not cover refraction and low-vision services; optical aids are excluded from the package, leaving out-of-pocket expenditures to be the only method of financing these services (36).

A general view among stakeholders was that eye health received limited budget allocations because eye conditions were not life threatening and other health departments were prioritised. In Kajiado, there were no specific budgetary allocations for eye health, and eye commodities were purchased using the general procurement budget. In Nairobi, one facility respondent pointed out that the eye clinic was expected to sustain itself financially using user fee contributions. There are also limited resources for eye health coordination at both the national and county levels.

No information on user fees charged for eye care services at the facility level was collected in this assessment. However, the costs of eye care services varied from county to county. A list of

services provided by a facility and prices were usually included in a service charter displayed on the billboard at the entrance of each facility. Kajiado and Nairobi also reported having hospital price lists (Table 9).

Table 9: Information on costs of eye care services available in the counties included in the study

Information available	County			
	Kajiado	Nakuru	Homa Bay	Nairobi
Displayed service charter	Yes	Yes	Yes	Yes
Hospital price list	Yes	No	No	Yes
Cost of services available in the HIS ¹	Yes	No	No	Yes

Note 1: HIS: Health information systems

4.4 Eye health service delivery

4.4.1 Key findings

Strengths

- Various eye care services are available at different levels of the health system.
- There are functional outreach programmes available in counties.
- The majority of county hospitals are staffed with at least one Ophthalmic Nurses (ONs).
- The majority of assessed hospitals reported good visual outcomes after cataract surgery.

Weaknesses

- Secondary and tertiary eye care services are limited to county hospitals.
- There are major gaps in the provision of primary eye care services.
- Among the assessed counties, only Nairobi had facilities to manage retinopathy of prematurity (ROP).
- There is limited eye care subspecialty available within the system.
- Access to refractive error and low-vision services is restricted due to financial constraints.
- The quality of eye care services is not uniformly monitored.

4.4.2 Eye care service providers at different levels

The Kenyan health delivery system comprises government, NGO, mission and private facilities operating at various levels; the same applies to eye care.

Concerning the private sector, there are only a few private hospitals and clinics providing specialised eye care services, mainly in urban areas. There are, however, many privately owned pharmacies in which eye care drugs are readily available. The majority of optometrists are also private practitioners, and refractive error services are provided mainly by the private sector with many optician shops, including several multi-branch companies located mainly in major towns. The only exception is six regional hospitals and teaching hospitals, which have refraction and low-vision clinics.

Eye care services in Kenya are delivered at all four tiers of the health system, with the norms and standards outlining the expected population coverage for all health services (Table 9). A national referral hospital is expected to cater for a population of five million, while a county referral hospital covers one million population. Sub-county hospitals are expected to cover 100,000 people, while health centres and dispensaries are expected to cover 30,000 and 10,000 people respectively. In practice, however, only 63 per cent of Kenyans have access to government health services located within an hour of their homes (29).

Table 10: Levels of care in the Kenya health system

Level	Type of facility and staff (number)	Cadre of eye care medical staff	Population ('000 people)	Eye care services
National	Referral and teaching hospital (9)	Ophthalmologists, ophthalmic nurses and optometrists	5,000	Cataract surgery, outpatients' department (OPD), refraction
County	County hospital (44)	County ophthalmologist and ophthalmic nurses	1,000	Cataract surgery, OPD and refraction
Sub-county	Sub-county hospital (440)	Ophthalmologist and ophthalmic nurses	100	OPD, outreach and refraction
Community	Health centre, dispensary	None available	30,10	No eye care services

The types of eye care services available at different levels of the system are shown in Table 10. County hospitals provide outpatient services, refraction services and cataract surgery and undertake some cataract surgical outreach to county hospitals.

The sub-county includes sub-county hospitals, health centres and dispensaries. Ophthalmic nurses (ONs) act as gatekeepers to eye care services and provide eye services at this level. Over the past few years the National Eye Care Programme has been working towards having at least one ophthalmic nurse for every sub-county hospital (6). Ophthalmic nurses are expected to run an outpatient service for eye conditions, referring complex or surgical patients to the ophthalmologist at the county referral hospital.

There is little eye care delivery at the primary health level (health centres and community-based Health Planning and Service [CHPS] compounds), apart from outreach undertaken by county ONs, or in those few areas supported by NGOs where primary eye care workers or volunteers have been trained to treat basic eye conditions and refer for further management.

At the community level, the role of eye care volunteers is to identify cataract patients and escort them to the dispensaries. The lack of awareness of eye health at the community level has been cited as a barrier to the development of primary eye care (6).

4.4.3 Availability and access to services in the study counties

4.4.3.1 Availability of facilities at different levels

The number of facilities providing eye care services at different levels in the counties included in this assessment varied. Kajiado had the lowest number of facilities at tiers 1, 2 and 3 (two at each level); one facility was an NGO and none of the facilities was private. Homa Bay had 12 tier 2 facilities and seven tier 3 facilities; almost all facilities were government with only one clinic being private. In contrast, Nakuru had five private clinics and 18 government facilities; 42 facilities were tier 1 and 2, and 13 facilities were tier 3. Nairobi had 30 tier 1 and 2 facilities and 10 tier 3 facilities. Ten clinics in Nairobi were private (Table 11).

Table 11: Number of facilities providing eye care services, at different tiers in the county

County	Tier 1-2	Tier 3	GOK	Private clinics	Private hospitals	NGO	Others	Remarks
Kajiado	2	2	3	None	None	1	None	Facilities offer services as part of general OPD
Nakuru	42	13	52	5	None	1	None	Tier 1 and 2 refer most patients to tier 3 and 4
Homa Bay	12	7	18	1	None	None	None	None
Nairobi	30	10	30	10	None	None	None	None

Based on the expected national norms and standards, Kajiado and Nairobi were significantly underserved by the number of facilities available; Homa Bay had insufficient number of facilities at tier 1 and 2, while Nakuru had an adequate number of facilities at all levels (Table 12).

Table 12: Population per facility by county

County	Population	Population/ Facility		Remark
		Tier 1-2	Tier 3	
Kajiado	815,568	407,784	407,784	Too few health facilities
Nakuru	1,960,833	46,687	150,833	Health facility numbers adequate
Homa Bay	1,130,854	94,238	161,551	Underserved at tier 1 and 2
Nairobi	3,994,003	133,133	399,400	Too few health facilities

4.4.3.2 A range of eye health services available

The study found a basic level of eye care services across all counties included in the study. However, a range of services and population coverage varied between and within the counties, which could be due to various factors including distribution of human resources; costs of treatment; availability of equipment (eg keratometer, A and B ultrasound scan); community awareness; and distance to the facilities. The shortcomings of the system have been recognised

at the national level, with efforts to increase access to services through awareness raising campaigns and changes in the NHIF scheme.

Inpatient and comprehensive eye care services: All counties included in the study had at least one facility offering comprehensive eye care services, while Nairobi had four of such facilities. Five per cent of inpatient beds in Nakuru and Homa Bay facilities were allocated for eye care, but there was no formal allocation of beds in Kajiado and Nairobi.

Tertiary eye care services: Only Nairobi and Nakuru Counties offered tertiary eye care services. Nairobi County had a Lion's Club-run facility and Kenyatta National Hospital. In Nakuru, the spectrum of tertiary services offered was up to laser surgery. Two other counties, Kajiado and Homa Bay, did not have any centres offering tertiary eye care.

Telemedicine: Telemedicine was available in one county (Kajiado), but it was not utilised for eye care.

Outreach: All counties had outreach teams from outside the county. In Nairobi, eye outreaches were part of general medical outreach programmes. Only one county, Homa Bay, had outreaches carried out by personnel from within the county. The study found that outreach programmes were not delivered in a systematic way. There was also a lack of community-based services and inadequate screening and eye health education.

A general view among the respondents interviewed in the study was that eye care services included primarily diagnostic and treatment activities, with limited attention given to prevention, early detection or rehabilitation.

The study also assessed a range of children and school-based services relevant to eye care, and the findings are presented in Table 13. Newborn eye care strategies were generally in place, but low birth weight eye care was done routinely only in Nakuru. School-based eye care was offered in all counties, but the services differed; and only teacher training to carry out vision assessment was reported across all counties.

Table 13: Strategies/activities to ensure access to child eye care services

County	Newborn	Low birth weight	School-based
Kajiado	Installation of TEO in all newborns Early referral for newborns noted to have any eye problems	None	Teachers trained on vision assessment School health clubs targeting trachoma through face washing School children prioritised in eye clinics
Nakuru	Routine eye exam at birth in in the facilities by midwives Routine prophylactic tetracycline ointment application	Routine eye exam at birth in in the facilities by midwives Routine prophylactic tetracycline ointment application	Refractive error screening, training of teachers to enable them identify visual challenges among students
Homa Bay	Examination after delivery, prophylaxis with TEO	None	Some teachers have been trained on recognition and referral of eye cases, school screening with the aid of partners, but this has stopped due to lack of funding
Nairobi	Installation of TEO in all newborns Health education during ANC	None	Some teachers have been trained on recognition of eye cases

4.4.3.3 Quality of eye care services

Quality of care is an important element in the practice of ophthalmic services and it is essential that the available standards and guidelines be followed at all times. The counties included in this assessment reported conducting audit checks to address the quality of eye health practice (Table 14).

Table 14: Strategies used for monitoring quality of eye care services

Information available	County			
	Kajiado	Nakuru	Homa Bay	Nairobi
Review meetings after each outreach	Yes	No	No	Yes
Monthly clinical audits	No	No	Yes	Yes
Cataract surgery audits	Yes	Yes	No	Yes

In this study, diagnostic and treatment procedures for eye care were available in tier 1, 2 and 3 facilities. However, the procedures were not defined or grouped according to the facility level. All counties had similar procedures for all three tiers.

4.4.3.4 Specific eye-services available in the counties assessed in the study

Table 15 presents a summary of various services in the four surveyed counties over the past year.

Table 15: Availability of diagnostic and treatment protocols for eye care at all facilities

County	Eye care procedures	Diagnostic and treatment procedures (Tier 1-2)	Procedures in Tier 3	Remarks
Kajiado	Yes	Diagnostics: primary eye care basic skills, cataract protocol, emergency diagnosis and treatment protocol, trachoma. Treatments: IMCL protocol (eye section), emergency diagnosis and treatment, community eye care (eye injury)	Yes	1. Diagnostics: cataract, trachoma, retinoblastoma. Treatments: emergency diagnosis and treatment protocols, locally developed protocols for common eye ailments
Nakuru	Yes	1) Primary eye care skills chart, early infant eye disease identification, acute red eye diagnostics chart 2) Acute eye trauma management, early infant eye disease management, diabetic retinopathy referral criteria and management, how to remove foreign body chart	Yes	1) Common eye disease chart, retinoblastoma guidelines, prevention of blindness chart 2) acute red eye management, eye trauma management, treatment of common eye diseases
Homa Bay	No	1) Clinical guidelines for health workers on eye diseases, retinoblastoma guidelines, Kenya national plan for trachoma, glaucoma guidelines, guidelines on diabetes retinopathy 2) same as diagnostics	Yes	1) Clinical guidelines for health workers, childhood blindness, retinoblastoma, glaucoma and diabetes 2) clinical guidelines for health workers, childhood blindness glaucoma and diabetes

4.4.4 Cataract surgery

It is estimated that 43 per cent of blindness in Kenya (120,000 people) is due to cataract. The Ministry of Health estimates that around 64.5 per cent of those in need of cataract surgery could access services in 2010 (6). Cataract surgical rate (CSR) refers to the number of cataract operations per million population per year and is a measure of the delivery of cataract surgical services. In Kenya, the CSR in 2010 was 589 per million. This was low compared to the WHO recommended target of 2,000 for African countries, increasing to 3,000 per million by 2020. Increasing life expectancy can only add to the burden of this disease in the country.

The CSR varied across the counties included in this study, with Nairobi recording the highest level (Table 16). Low CSRs were attributed to low numbers of ophthalmologists and irregular

surgical outreach, although a better understanding of barriers to services is required, as even in urban areas where there were ophthalmologists and equipment, the output appeared to be well below the target, a result that requires further study.

Table 16: Cataract surgery done in the four counties (2013-2015)

County	Kajiado	Homa Bay	Nairobi	Nakuru
Population '000	778	1,092	3,554	1,815
Cataract surgeon/million pop	4	1.8	0.3	1.7
Cataract surgeries done				
2013		115	330	
2014		106	348	
2015		130	421	
Number of facilities offering cataract surgical services				
Facility type				
Service clubs	2	1	1	C
GOK facilities	0	0	3	0
Private facilities	0	0	0	1
FBOs	0	0	2	0
Level quality measurement is done				
Measure of quality of cataract surgeries	WHO cataract audit tool (Individual surgeon)	Cataract audit forms (Facility)	Cataract audit forms WHO cataract audit tool Patient notes	Cataract audit surgical outcome tool (Facility)
% of IOL implanted at the time of surgery	98.8%	90%	99%	98%
Outcome of cataract surgeries¹	Good	Good	No comment (8/9)	Good

Waiting time for cataract surgical services: Waiting time for cataract surgery reported in the study ranged from one week in Kajiado government facilities and Nakuru faith-based facilities to two months in Nakuru government facilities. In the programmes with outreach services, waiting time was not recorded: an omission that should be addressed.

Quality of cataract services: Quality of cataract surgery was monitored in three counties: Nakuru, Homa Bay and Kajiado. The results indicate good visual outcomes. The WHO cataract audit tool was used to assess quality in these counties (Table 16).

¹ Good outcome definition: $\geq 85\%$ with VA of 6/18 or better; borderline outcome: 10% with VA, $< 6/18-6/60$; poor outcomes: 5% with VA $< 6/60$

b) Refraction and low-vision services

There is little population-based data available on refractive errors in East Africa. The Kenya National Strategic Plan for Eye Health and Blindness Prevention 2012-2018 identifies criteria for significant refractive errors to be myopia of at least -0.5 dioptres and hyperopia of at least +2.0 dioptres (6).

It was reported during the assessment that the majority of the population in the four counties surveyed did not have access to refractive error and low-vision services, as these were available largely in the private sector, with the exception of Nakuru and Homa Bay Counties, where some government facilities offered low-vision services. However even in these two counties the number of low-vision devices acquired in the year preceding this study was very low, at 40 in Nakuru and none in Homa Bay. Kajiado County did not offer low-vision services, but reported rehabilitation services related to low vision. The key barrier to refractive error and low-vision services was reported to be financial constraints, as these services were not covered in the NHIF and relied primarily on out-of-pocket payments (Table 16).

c) Diabetic retinopathy

The national prevalence rate of diabetes in Kenya is estimated at 1.9 per cent (12). Urban poor have a higher prevalence rate among adults of 5.3 per cent (13). Anecdotal evidence from health care services suggests that the incidence of diabetes is on the increase (37). Diabetic retinopathy is an early indicator of cardiovascular morbidity and an important cause of blindness, particularly in working-age adults. The prevalence of diabetic retinopathy in Kenya is estimated at 35.9 per cent among people aged 50 and above suffering from diabetes (38). Other studies suggest that almost 50 per cent of diagnosed diabetics in Nairobi and nearly 20 per cent in rural Central Kenya had diabetic retinopathy, with the majority never having undergone an eye examination (6). Blindness from diabetic retinopathy is an emerging condition leading to the loss of economic productivity and rising healthcare costs.

Respondents in the three surveyed counties were aware of the national guidelines for managing diabetic retinopathy. However, only one county had the guidelines available for inspection (Table 16). Local ophthalmologists and clinical officers in charge of diabetes were named as the custodians of the guidelines.

Only one government facility located in Nakuru had functional laser for diabetic retinopathy. In the year preceding the assessment, Nakuru provided laser services to 128 patients. There was a non-functional laser in Homa Bay. In Nairobi only private facilities offered laser services. Fees charged for laser therapy for diabetic retinopathy in Nakuru were on average two thousand Kenyan shillings; however, no comparative cost data was available from other counties.

d) Retinopathy of prematurity (ROP)

Only Kajiado County reported screening newborn babies for ROP, but only Nairobi had facilities that could provide treatment for ROP (Table 17).

e) Glaucoma

Glaucoma is the most common cause of irreversible blindness, accounting for 6 per cent of blindness in Kenya (estimated 25,200 people); it is diagnosed in 2 per cent of patients attending eye clinics in Kenya (6). Early detection and treatment are essential to preserve sight. The significant proportion of undetected cases in Kenya is attributed to the lack of national policies, trained personnel and adequate facilities.

Respondents in all surveyed counties were aware of the guidelines for glaucoma management, and the guidelines were available in Homa Bay, Nairobi and Nakuru. Visual field testing was available but not performed in Homa Bay; in Nairobi, it was done by service clubs² such as Lions Club International.

f) Specialist eye care services

There were no corneal transplants or refractive surgeries available in Nakuru, Homa-Bay and Kajiado. Nairobi reported having a cornea bank; however, the number of corneal surgeries was not reported. Vitreo-retinal subspecialists were available only in Nairobi.

g) Childhood eye health

It was reported that every newborn child in Kenya should receive prophylactic antibiotic eye ointment with a referral to eye care services, if the midwife identifies any problems. Measles vaccines are also provided as part of the Child Welfare Programme. All respondents in Kajiado and Nakuru, more than half of those in Homa Bay and one in five respondents in Nairobi reported school-based eye screening activities. The most common intervention reported was teacher training to recognise eye problems, with a referral system in place for those children found to have problems. However, the reported number of patients with anomalies managed was low.

²A service club or service organisation is a voluntary non-profit organisation where members meet regularly to perform charitable works either by direct hands-on efforts or by raising money for other organisations.

Table 17: Selected eye services reported in the surveyed counties in the past calendar year

Defect	Description	Homa Bay	Kajiado	Nairobi	Nakuru
	Number of glasses prescribed (last 1 year)	436	120	142	3,963
	Actual number of glasses dispensed	6	No optical shop	21,317	1,321
	Average cost for the basic good quality prescription glasses (KES)	4,000-10,000	4,500	3,000-4,500	4,500
Eye care for children	Newborn children were routinely examined for eye conditions	12,141	No response	No response	100%
	Proportion of newborn babies receiving prophylaxis for ON at birth in the health facilities?	99%	80%	100%	100%
Diabetic retinopathy	Patients with diabetes (routinely) referred for eye examinations	68	66	3,997	240
	How many of these actually received an eye examination?	68	66	1485	240

4.5 Human resources for eye health

4.5.1 Key findings

Strengths

- There are various cadres available in eye health at different levels.
- Training opportunities from basic training to sub-speciality are available in the country.
- There are HRH strategic plans, norms and standards.
- The overall number of cataract surgeons/ophthalmologists meets Vision 2020-recommended levels.
- There has been an increase in mid-level eye health personnel in recent years.

Weaknesses

- There is a shortage of eye health personnel across the counties.
- There is an unequal distribution of HReH available.
- There are no opportunities for optometrist deployment in the public sector.
- There are weak referral systems from lower to upper-level facilities.
- There is insufficient data for HReH planning.
- The role of general health care workers in eye care is not well defined.
- The system of supervision and accountability for different cadres is not clear.

For eye health goals to be achieved, adequate numbers of eye care workers with appropriate training should be available. Together with Botswana, Senegal, Gambia and Sudan, Kenya as a whole meets the suggested Vision 2020 targets for cataract surgeons/ophthalmologists (39). However, like many other sub-Saharan African countries, Kenya suffers from geographical misdistribution of eye care staff, with the greatest numbers available in urban and non-arid areas (40,41).

Furthermore, although there is a Ministry of Health policy for continuous recruitment and deployment of various cadres in primary care, there are few optometrists, ophthalmic nurses and ophthalmic clinical officers at this level.

Many county-level governments are experiencing a severe HRH crisis in eye care due to inadequate numbers and unequal distribution of health workers; high staff turnover; weak information systems for workforce planning and development; migration; insufficient training capacity; inadequate remuneration; and poor working conditions to attract and retain staff, particularly in rural areas. Many respondents suggested that there was a need to increase training of HReH, improve their deployment strategies, and motivate them to improve productivity.

4.5.2 HReH numbers and trends

Training for all cadres, from basic training to sub-specialty, is available in Kenya. The University of Nairobi and Kenya Medical Training Centre plays a significant role in training eye care workers. However, the training provisions are not aligned with the service needs and counties rarely look at the specialisations needed. A shortage of eye care workers was reported in all four counties included in the study (Table 18 and Figure 5).

Table 18: Eye care cadre per million population per county

County (population in millions)	Ratio (per million)					
	Ophthalmologist	Cataract surgeon	OCO	ON	Optometrist	Ophthalmic assistant
Homa Bay (1.1)	0.9	1.8	0	2.7	0	10
Kajiado (0.8)	1.3	4	0	4	1.3	5
Nairobi (3.6)	0.6	0.3	1.4	-	-	-
Nakuru (1.8)	0.6	1.7	1.1	2.8	0	0
WHO recommends	1:400,000	1:250,000	1:200,000	1:200,000	1:100,000	-

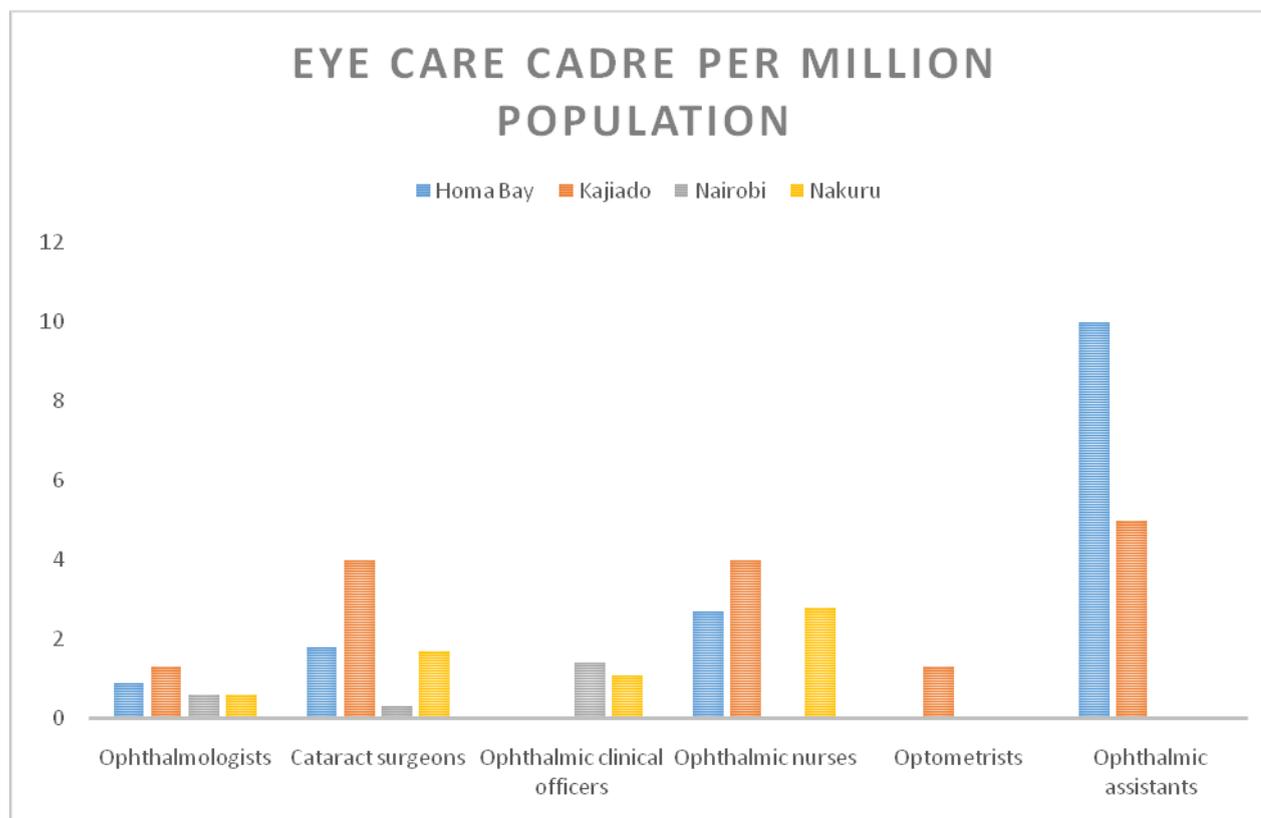


Figure 5: Eye care cadre per million population

The numbers and skill mix of human resources for eye health have remained relatively stable over the past five years in all the four counties (Figures 5-9). The cadres that have had a notable increase are ophthalmic assistants in the counties, where they have this cadre, and ophthalmic nurses. Nakuru showed the highest increase in the number of ONs among the counties surveyed. Kajiado is the only county with a significant increase in the number of cataract surgeons, while Nairobi has shown an increase in ophthalmic clinical officers (OCOs).

In total, the four surveyed counties had the following cadres at tiers 3 and 4: five ophthalmologists, nine cataract surgeons, seven OCOs, 10 ONs, 10 optometrists and 15 ophthalmic assistants. Apart from optometrists, all of whom worked in the private sector, the remaining cadres worked almost exclusively in the public sector with the exception of one cataract surgeon, who worked in a faith-based organisation.

In all the counties apart from Homa Bay, eye health services were included in the routine supervision by CHMTs.

Interview respondents pointed out to a need to strengthen the referral system from lower level facilities to tiers 3 and 4. They also stressed a need to foster collaboration among eye care professionals and non-eye healthcare workers, develop training programmes and curricula and invest more in supervision in eye care.

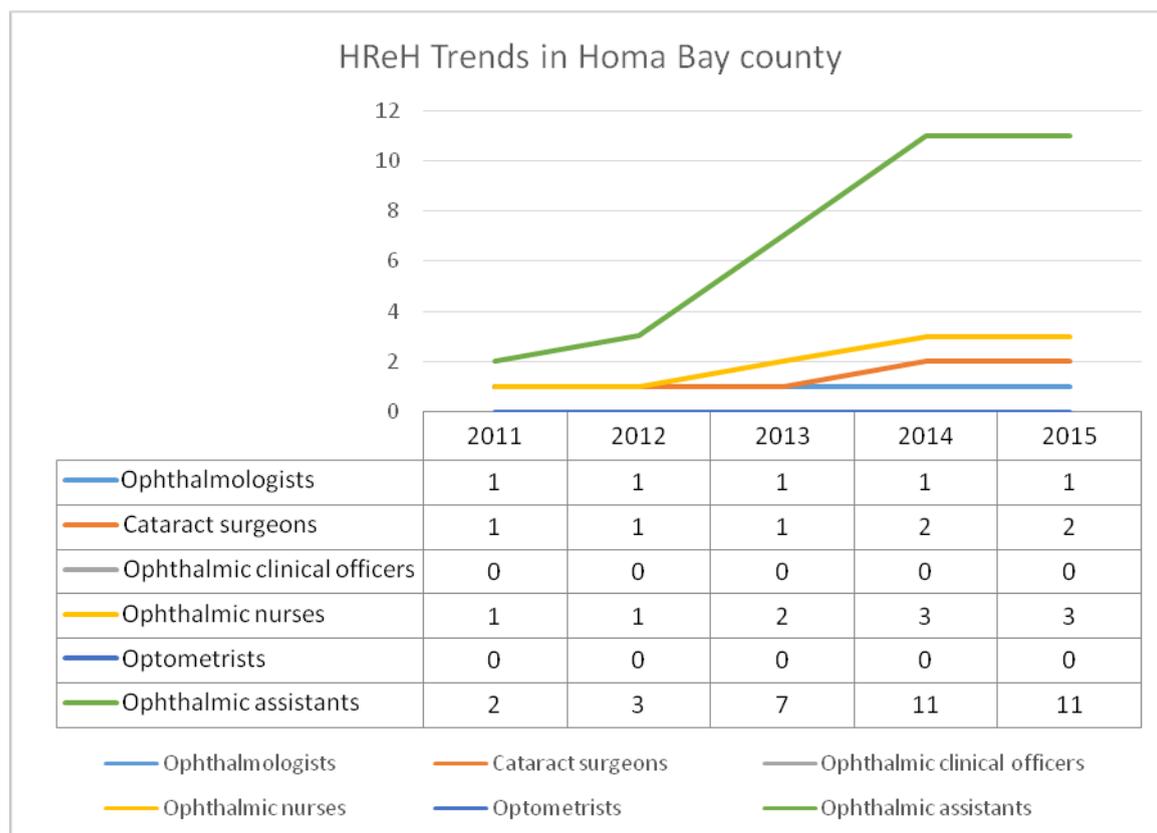


Figure 6: HRH trends in Homa Bay County

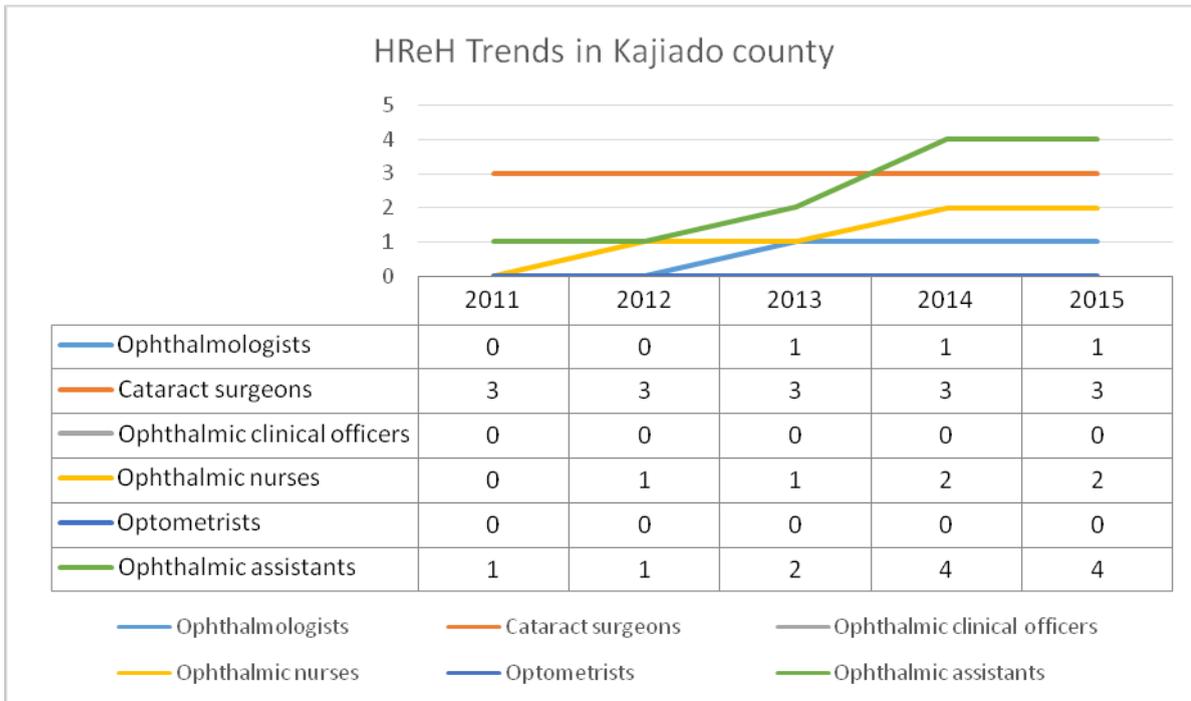


Figure 7: HRH trends in Kajiado County

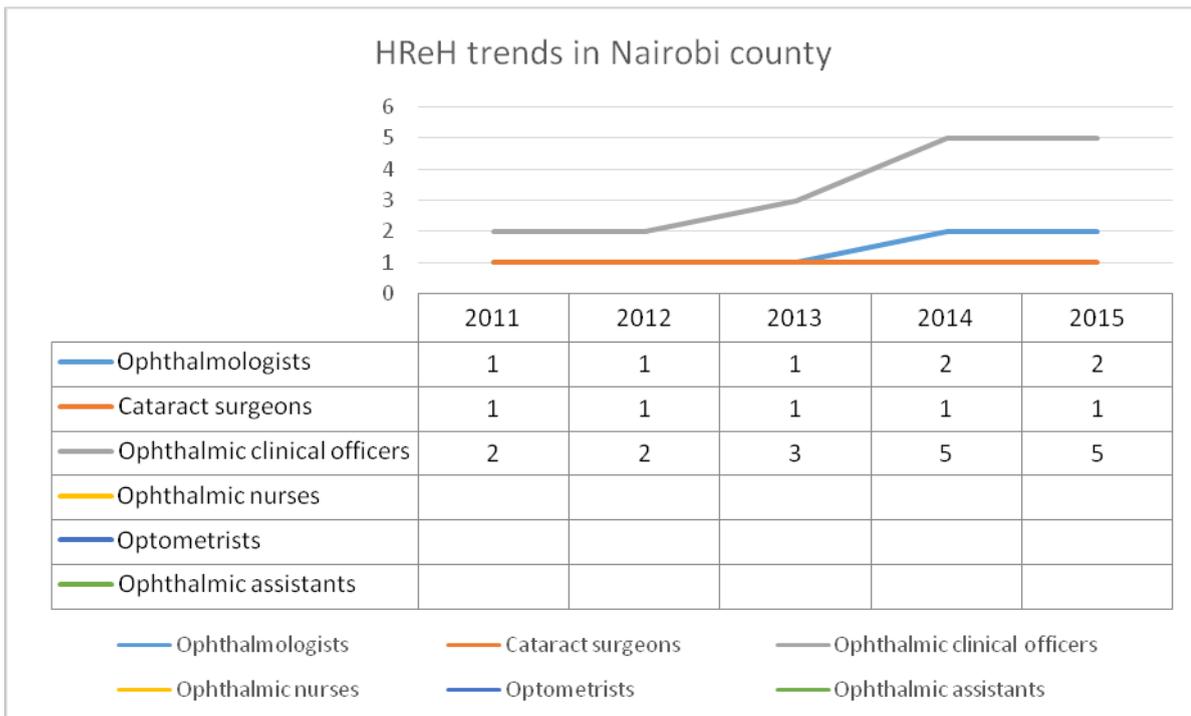


Figure 8: HRH trends in Nairobi County

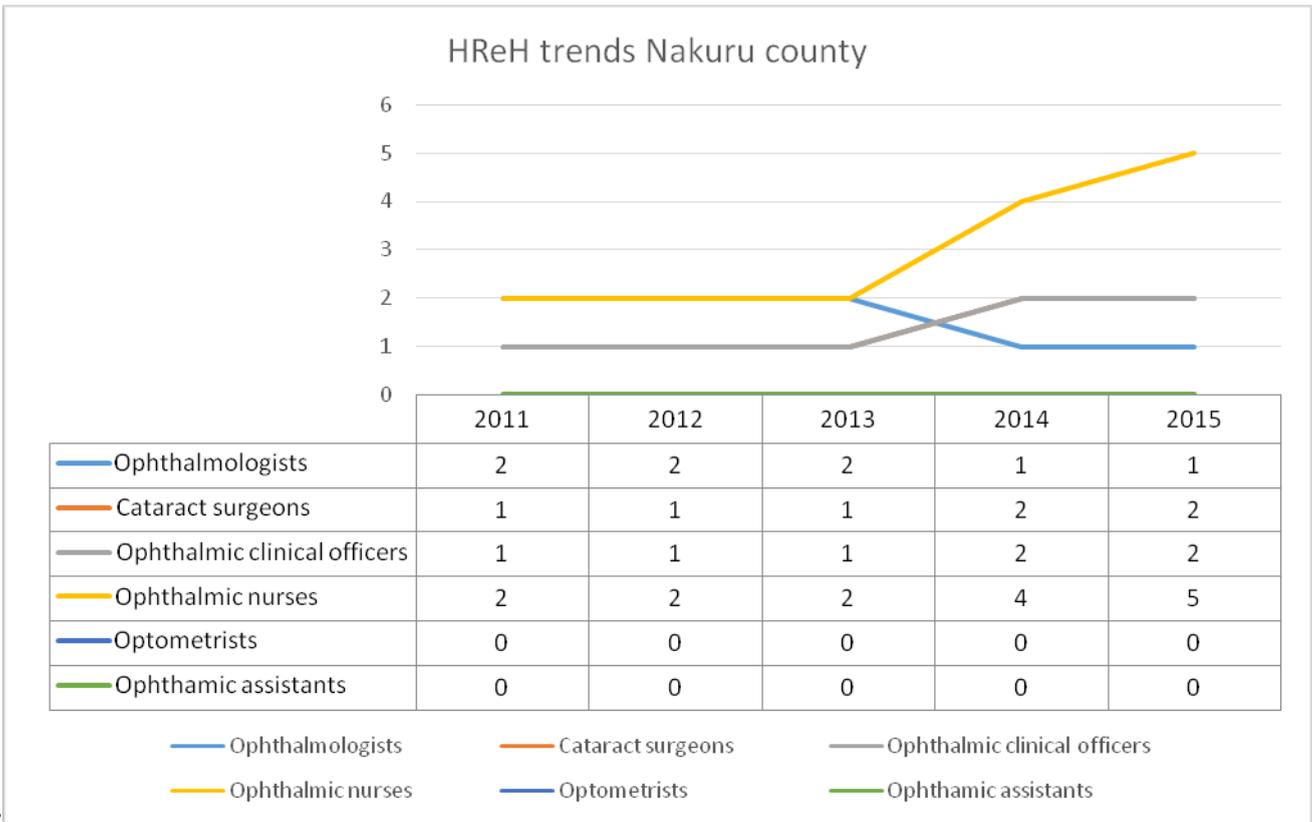


Figure 9: HReH trends in Nakuru County

4.6 Infrastructure

4.6.1 Key findings

Strengths

- The National Plan for Eye Health and Prevention of Blindness identifies a set of equipment and physical infrastructure essential for a functional eye unit to deliver comprehensive eye care services.
- Overall, there was basic infrastructure for eye care, including surgical services, in the facilities included in the assessment.
- Many facilities had equipment inventory systems.

Weaknesses

- Health infrastructure for tertiary eye care services was limited across the counties surveyed.
- Many pieces of equipment for tertiary eye care were non-functional.
- The availability of equipment procurement, maintenance and disposal systems varies between and within the counties.

The National Strategic Plan for Eye Health and Blindness Prevention identifies a set of equipment and physical infrastructure that is essential for a functional eye unit to deliver comprehensive eye care services and achieve universal eye health (2):

In 2013, Kenya undertook a national Service Readiness Assessment survey (SARAM) to assess government preparedness for health care delivery in the devolved county governments. The aim was to understand the capacity for service provision across the counties by generating reliable information on service delivery, availability and functionality of basic inputs and the ability to deliver basic health interventions (20). The SARAM reported on physical infrastructure in outpatient and in-patient facilities, including the sets of equipment for ophthalmic services across all counties.

In this assessment, physical infrastructure was assessed in government (71%), private (25%) and faith-based (4%) facilities. Only two of these facilities offered comprehensive eye care services. Private and government facilities included two optical workshops each. Outreach vehicles were available in one government and one faith-based facility; private facilities did not have any outreach vehicles (Table 19).

Table 19: Eye care service infrastructure in the facilities included in the assessment

Facility ownership	Number of eye care services						
	PEC	CEC	Tertiary	Surgical services	Eye units	Optical workshop	Outreach vehicle
GOK	17	2	2	2	5	1	1
FBO	1	1	0	0	2	1	1
Private	6	0	1	1	0	2	0

All government and faith-based facilities included in the survey reported having architectural sketch plans and certificates of approval for constructed buildings, while private facilities appeared not to have these documents (Table 20).

Table 20: Availability of sketch plans by facility ownership

	Sketch plans	Certificate	Norms 1	Norms 2
GOK	55	55	2	2
FBO	1	1	1	1
Private	0	0	0	0

Basic diagnostic and surgical equipment was available and generally functional across the four counties surveyed (Table 21). Overall, 11.6% of equipment was found to be non-functional. While the number of equipment for tertiary eye care was low, the facilities reported a relatively high level of non-functional equipment, with only one visual field analyser and one of two laser machines (argon) working; while ocular computerised tomogram and fundus camera were present but not functional.

Table 21: Total number of functional diagnostic and surgical equipment per county in the public sector

<u>Diagnostic equipment</u>	Number functional			<u>Surgical equipment</u>	Number functional		
	Kajiado	Homa Bay	Nakuru		Kajiado	Homa Bay	Nakuru
Snellen's chart	25	19	14	Operating microscope	4	2	4
Slit lamp	2	3	3	Cataract sets	14	5	18
Ophthalmoscope	10	5	9	Glaucoma sets	2	2	0
Refraction box/ trial Frames	6	10	3	Lid sets/ Enucleation set	19	1	8
Retinoscope	2	3	3	Chalazion sets	2	1	13

Note: Nairobi data missing

Three counties, Kajiado, Homa Bay and Nakuru, reported having equipment procurement systems in 18 facilities, equipment maintenance systems in 16 facilities and equipment disposal systems in 15 facilities. Sixty-two facilities had an equipment inventory system. The amount of equipment and availability of skilled eye care workers could not be directly correlated to the cataract surgery outputs, which in all counties appeared low relative to available resources (Table 22).

Table 22: Comparison of cataract surgery outcomes and equipment availability

Equipment	Kajiado	Nairobi	Homa Bay	Nakuru
Operating microscopes	4	Not available	2	4
Cataract sets	14	Not available	5	18
Skilled eye care workers (OS/CS/ON)	6	Not available	6	11
Cataract surgeries (2013,14,15) (average annual)	174	Not available	574	534

4.7 Health information systems for eye health

4.7.1 Key findings

Strengths

- Eye health indicators are collected at the facility level and entered into the county and National Health Information Systems DHIS2.
- International NGOs collect detailed data in the regions where they work.

Weaknesses

- Data collected at the facility level is rarely used to inform decision making and planning at the county level.
- There are different data collection tools, which create burden for staff and affect data quality and comparability.
- There is no system to feed back data to eye care staff.
- Private facilities have low data reporting rate.

Investments in health information systems are critical to support effective planning and prioritisation of healthcare resources. An overall conclusion of this assessment was that data available for eye care planning was limited. Four major domains of a health information system include health status, service coverage, risk factors and health system indicators. None of the domains was effectively reported for eye health at either national or county level.

It was also suggested that the minimum set of indicators to be captured for effective planning and monitoring in eye health should include: acute eye infection (split by cause); outpatient department (OPD) visits (all eye conditions, including glaucoma); surgeries (split by all eye conditions, including cataract); and trauma to the eye (accident/injury), by cause.

The study found that health information systems in different counties reported different outputs. The main indicators reported were the workload (eg surgeries and outreaches) and the types of eye conditions managed (Table 23).

Table 23: Eye care service indicators reported in the sample study counties

Information available	County			
	Kajiado	Nakuru	Homa Bay	Nairobi
Eye care indicators reported to the county Ministry of Health	1) Workload 2) Surgeries done 3) Outreaches done and output	1) Morbidity data 2) Surgery data	1) Workload 2) Types of eye conditions 3) Surgeries done	Breakdown of eye conditions, surgeries done, workload

At the facility level, both outpatient eye clinic registers and general outpatient registers were in use. Homa Bay County used all data collection tools available for eye care. Nakuru County used only inpatient and theatre registers. Primary data collection tools for eye health were available in Homa Bay, Nairobi and Nakuru. Kajiado lacked both registers and summary forms (Table 24).

Table 24: Registers available for routine clinical data collection

County	Registers
Homa Bay	MOH 301(improvised), improvised registers
Kajiado	MOH 204A – under 5 years MOH 205B – over 5 years
Nairobi	OPD Register
Nakuru	MOH 705A, MOH 705B, (MOH 711A, MOH 701A, MOH 701B, MOH 204A, MOH 204B

In Nakuru County, 22 facilities responded about their health information systems; 86 per cent of them had registers collecting primary data on eye health. However only 18.2 per cent used summary forms to process or transfer data to the next level, although 45.5 per cent of facilities had their eye health data entered into the national data management system, DHIS2 (Tables 24 and 25). In general, eye care staff lacked the capacity to conduct data analysis.

Disaggregation of data by age was done in Homa Bay and Nakuru, while disaggregation by sex and administrative unit was done in all counties except Kajiado. Kajiado reported no disaggregation of data by any criteria (Table 25).

Table 25: Eye health data collection

		County			
		Homa Bay	Kajiado	Nairobi	Nakuru
Disaggregation of data and information	Age	Yes	No	No	Yes
	Sex	Yes	No	Yes	Yes
	Admin unit	Yes	No	Yes	Yes
	Level of care	Yes	No	Yes	No
Summary forms in use for ophthalmic services		MOH 705A MOH 705B	MOH 701 MOH705A	MOH 705A MOH705B	MOH 705A MOH705B
Routine data entered into DHIS2	Yes	Yes	Yes	Yes	
Officer responsible for data entry (DHIS2)	HRIO	HRIO	HRIO	HRIO	
Availability of electronic system for collecting and reporting eye health data	NO	Yes	No	Yes	
Type of electronic system	EMR	MEDBOSS eye module	MS Access	Redcap-cataract audit software	
Proportion of facilities in the county offering eye health care reporting routinely					
Proportion of facilities reporting	>80%	>80%	50-80%	50-80%	
Timeliness in Reporting	50-80%	50-80%	50-80%	Less than 50%	

All four counties reported entering at least some eye health data into the county health information system (DHIS2) (table 26). It was also suggested that the facility-level data management software could be integrated with the National DHIS2. However, this required automated data collection at patient level for efficiency and quality. The average data reporting rate for Kenya as a whole was over 90 per cent. Nairobi and Nakuru Counties had a below-average reporting rate. There were no reported consequences for counties for non-reporting or incomplete reporting of data.

Table 26: Facility level data collection tools by county

Available data recording tools	County			
	Homa Bay	Kajiado	Nairobi	Nakuru
Inclusion of eye care indicators in the minimum core indicators in the county	No	No	No	Yes
Participation in development of health sector routine indicators	No	No	No	Yes
HIS resources available (paper-based)				
Eye clinic outpatient register	Yes	Yes	Yes	No
Inpatient register	Yes	Yes	No	No
Theatre register	Yes	No	No	Yes
Eye morbidity summary sheet	Yes	Yes	No	Yes

It was argued that it was important to develop strategies and incentives for private facilities to report their data to the National HIS, as no county had a more than 50 per cent reporting rate from these facilities. It was also recommended that specific eye conditions are included in the periodic county disease surveillance system.

All surveyed counties said that the Ministry of Health HIS was the only channel for reporting routine eye health data, but international NGOs collected detailed data in the regions where they worked. Concerning the data use, interview respondents reported various ways of sharing and using the data (Tables 27 and 28). Facility staff reported using data for planning and budgeting, but the data was not fed back down to various units within the hospitals. A few respondents reported compiling data for the purpose of advocacy at the county level. Thus, information gathered in Kajiado and Nakuru Counties was used to advocate for more technical and financial support to eye health, particularly additional HReH. In Homa Bay and Nairobi, half of the respondents said that they used data for proposal writing and attracting attention of policymakers to the areas of need (Table 29).

It was further reported that although data on eye health was collected at the facility level, it was not summarised or presented in the county health reports, which tended to focus on HIV/AIDS and immunisation. This means that eye health data was rarely available beyond the facility level, which undermined the importance of eye conditions and their links with other co-morbidities, especially non-communicable diseases, such as hypertension and diabetes.

Table 27: Using eye care data in the study sample counties

	County			
	Homa Bay	Kajiado	Nairobi	Nakuru
Eye conditions that should be included in periodic county disease surveillance	Cataract Glaucoma	Trachoma Conjunctivitis	Cataract Conjunctivitis, Glaucoma	Trachoma
Use of eye care data at county level (Past year)	No	No	No	Yes
Use of eye care data at facility level (Past year)	Yes	Yes	Yes	Yes
	Planning (budgeting) purposes	Drugs purchase Trachoma cases leading to screening	Planning	Budgeting

Table 28: Sharing eye health data in the study sample.

County	Data shared	With who	Criteria to access
Homa Bay	Yes	c	4
Kajiado	Yes	c	4
Nairobi	Yes	a	3
		c	3
		d	3
		e	4
		Nakuru	Yes
		b	2
		c	3
		d	1
		e	1

Table key:

a: All officers in the institution; b=only officers within ophthalmology department;
c: Officers involved in data management (ophthalmology staff and Health records info officers);
d: County and national officers;

e: Any interested member of the public;
1: Write officially to request;
2: Verbal request;
3: Access only by system credentials (password protected data);
4: No official process.

Table 29: Results of advocacy by eye care service providers

County	Results availability	Area of need
Kajiado	Yes	Areas of need identified and brought to the attention of county leadership to lobby for support
Nakuru	Yes	Human resource requests, lobby for more funds to be used to support eye health, ie equipment, consumables
Homa Bay	No	Areas of need identified to bring to the attention
Nairobi	No	Used to write proposals

4.8 Medicines, medical products and technologies for eye health

4.8.1 Key findings

Strengths

- Kenya has the Essential Medicines List, which was last updated in 2016; the list includes commodities for eye health.
- Eye care conditions are adequately covered in the clinical management and referral guidelines for common conditions.
- All counties included in the assessment were aware of the Essential Medicines List and the clinical guidelines.

Weaknesses

- There are significant variations in expenditure on medical commodities between the counties.
- The Essential Medicines List and the clinical guidelines were available only in one of the counties surveyed.

Health Products and Technologies (HPT) include “organised technologies and skills in the form of devices, medicines, vaccines, biological equipment, procedures and systems developed to solve a health problem and improve quality of life” (42). HPT are critical for quality health care delivery, therefore best practice dictates the need to define and document essential health products for any country’s health care system. Documents such as the Essential Medicines List (EML) should be derived from evidence-based practice and regularly updated. Regularly updated EML and other products lists, such as the Essential Medical Supplies List and the clinical guidelines, are useful in guiding the selection for procurement process and rational use.

As a country, Kenya has followed good practices for developing and updating the Essential Medicines List and clinical guidelines. The last edition of the Kenya Essential Medicines List (KEML) was done in 2016 (43). Eye care medicines and other medical supplies were adequately listed in both past and present editions of the Essential lists. Similarly, eye care conditions are adequately covered in the clinical management guidelines for common conditions (44).

To support the procurement system of public medical supplies, the government has established and fully operationalised the Kenya Medical Supplies Agency (KEMSA).

Three out of the four counties included in this assessment provided data on the expenditure on general medical commodities procured in financial years 2013/14 and 2014/15. There were significant differences between the counties with Kajiado expenditures being eight to ten times lower than in Nairobi and Nakuru. Only Kajiado provided data on expenditure for commodities for eye care, which was 1.8 and 2.1 per cent of the total annual expenditure on commodities in the

two financial years respectively. All counties reported using consumption and morbidity data to assess needs for their eye care medical supplies.

All counties reported being aware of both KEML and the clinical management and referral guidelines. However, the documents were available only in Homa Bay. Capacity building on the use of the clinical guidelines was reported in two counties, Kajiado and Nairobi. However eye care staff were not involved in this exercise.

4.9 Research and development

4.9.1 Key findings

Strengths

- The four counties surveyed all had county research plans.

Weaknesses

- None of the counties had a database or record of eye health research conducted in the county.
- None of the counties had an eye health research and development budget.
- There were no records of how eye health research findings were disseminated.

Research and development are essential for public health action as they form the foundation for policy making, planning, programming and accountability. Health systems research is defined as the production and application of knowledge to improve how societies organise themselves to achieve health goals (45). Health systems research can address issues at any or several of the six building blocks of a health system. For example, research and development can provide information on how to improve effectiveness of human resource management to ensure higher-quality service such as better compliance with treatment guidelines. The objective of health systems research is ultimately to promote the coverage, quality, efficiency and equity of health systems. Health system research and development focuses on health policy and health services research. Research identifies best practices across the health system building blocks and provides information necessary for the elimination of barriers to health care provision and access. At the policy level, health system research provides a linkage between researchers and policy makers and therefore the governance of a health system.

Another significant objective of health systems research is impact measurement. A significant amount of resources is allocated to healthcare provision and therefore measurement of impact is essential. Some of the key challenges experienced by health system research and development in resource-limited settings are the lack of sustainable funding and limited research capacity. Research and development capacity building requires resources, infrastructure and strengthening surveillance systems.

Three of the four counties surveyed (Nairobi, Homa Bay and Nakuru) stated that they had a county research agenda. However, none of these counties had a database or record of eye health research conducted in the county. None of the counties had an eye health research and development budget and none had a record of how eye health research findings were disseminated to stakeholders, such as community members, county governments, and non-state actors, among others. Finally, none of the counties had written clinical guidelines based on the research in their respective health facilities. Overall, the findings suggest that whereas a research agenda might exist, implementation of the agenda is lacking.

5. Conclusion

The rapid assessment shows gaps in all health system domains, particularly in governance/leadership, health information and human resources, all of which affect the delivery of eye care in Kenya. The results of this study provide some insights into where Kenya is in meeting VISION 2020 targets. They also provide a basis for work to strengthen the national county level eye health systems and improve eye health outcomes.

5.1 Key findings

5.1.1 Governance and leadership in eye health

Strengths

- Kenya has a National Strategic Plan for Eye Health and Blindness Prevention, which cascades from the National Health Policy.
- There is a national coordination structure, the Ophthalmic Services Unit (OSU).
- Eye health is delivered through a partnership between government, NGO and private sector providers and there is a National Prevention of Blindness Working Group that brings together different stakeholders under the leadership of OSU.

Weaknesses

- There is an observed disconnect between national and county-level policies and there is limited capacity to disseminate national policies to devolved structures.
- Eye health is not present in the county health governance organograms and many counties do not have prevention of blindness communities.

5.1.2 Eye health financing

Strengths

- The National Health Insurance Fund (NHIF) scheme covers a range of health conditions, including eye diseases.

Weaknesses

- There was no information available on eye health expenditure at the national or county level in this study.
- A general view is that resources available for eye care provision and coordination at different levels are very limited.
- Out-of-pocket expenditures are thought to be an important barrier to eye care services, particularly refractive error and low vision services.

5.1.3 Eye health service delivery

Strengths

- Various eye care services are available at different levels of the health system.
- There are functional outreach programmes available in counties.
- The majority of county hospitals are staffed with ophthalmic nurses (ONs).
- The majority of assessed hospitals reported good visual outcomes after cataract surgery.

Weaknesses

- Secondary and tertiary eye care services are limited to county hospitals.
- There are major gaps in the provision of primary eye care services.
- Only Nairobi among the assessed counties had facilities to manage retinopathy of prematurity (ROP).
- There is limited eye care subspecialty available within the system.
- Access to refractive error and low-vision services is restricted due to financial constraints.
- The quality of eye care services is not uniformly monitored.

5.1.4 Human resources for eye health

Strengths

- There are various cadres available in eye health at different levels.
- Training opportunities from basic training to sub-speciality are available in the country.
- There are HRH strategic plans, norms and standards.
- The overall number of cataract surgeons/ophthalmologists meets Vision 2020 recommended levels.
- There has been an increase in mid-level eye health personnel in recent years.

Weaknesses

- There is a shortage of eye health personnel across the counties.
- There is an unequal distribution of HReH available.
- There are no opportunities for optometrist deployment in the public sector.
- There are weak referral systems from lower to upper-level facilities.

- There is insufficient data for HReH planning.
- The role of general health care workers in eye care is not well defined.
- The system of supervision and accountability for different cadres is not clear.

5.1.5 Infrastructure in eye health

Strengths

- The National Plan for Eye Health and Prevention of Blindness identifies a set of equipment and physical infrastructure essential for a functional eye unit to deliver comprehensive eye care services.
- Overall, there was basic infrastructure for eye care, including surgical services, in the facilities included in the assessment.
- Many facilities had equipment inventory systems.

Weaknesses

- Health infrastructure for tertiary eye care services was limited across the counties surveyed.
- Many pieces of equipment for tertiary eye care were non-functional.
- The availability of equipment procurement, maintenance and disposal systems varies between and within the counties.

5.1.6 Health information systems for eye health

Strengths

- Eye health indicators are collected at the facility level and entered into the county and National Health Information Systems DHIS2.
- International NGOs collect data in the regions where they work.

Weaknesses

- Data collected at the facility level is rarely used to inform decision making and planning at the county level.
- There are different data collection tools, which create burden for staff and affect data quality and comparability.
- There is no system to feed back data to eye care.

5.1.7 Medicines, medical products and technologies for eye health

Strengths

- Kenya has the Essential Medicines List, which was last updated in 2016; the list includes commodities for eye health.
- Eye care conditions are adequately covered in the clinical management and referral guidelines for common conditions.
- All counties included in the assessment were aware of the Essential Medicines List and the clinical guidelines.

Weaknesses

- There are significant variations in expenditure on medical commodities between the counties.
- The Essential Medicines List and the clinical guidelines were available only in one of the counties surveyed.

5.1.8 Research and development for eye health

Strengths

- The four counties surveyed had county research agendas.

Weaknesses

- None of the counties had a database or record of eye health research conducted in the county.
- None of the counties had an eye health research and development budget.

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Appendices

Appendix 1: Summary of stakeholder meetings held

Inception Meeting: Silver Springs Hotel, 27 January 2016

Participants

NAME	INSTITUTION
1DrStephenGichuhi	UoN-Ophthalmology
2Dr.KibataGitheko	PrivatePractitioner-Ophthalmology
3Prof.JosephWang'ombe	School of Public Health-UoN
4DrP.J.Muriithi	School of Public Health-UoN
5Dr Richard Ayah	School of Public Health-UoN
6DrLucyBitok	SchoolofNursingUoN
7DrMarthaMuthami	MoH-HMIS
89DrJudithAwinja	MoH-HSS/P
10Dr.J. Mbuva	MoH-Pharmacist
11DrIsabellaMaina	MoH
12DrSamuelWere	MoH
13DrSamuelKabuel	APBHRReHAdvocate
14M/SJuliana Kivasu	KSB
15CEO-KuBKUB	
16DavidNjoroge	MoH-HRH
17DrJ.F.Maswan	KMTC-HSS
18FredKimemia	KeHSMA
19PeterKithuka	KenyattaUniversityHSM
20ErnestBarasa	MoH-OSU
21DrMonicahBitok	MoH-OSU
22FelistaMburu	MoH-OSU
23JohnSoine	MoH-OCO/CS
24IsaackKipngetch	NHIF,OCO/CS
25DrJoyceNato	WHO
26DrDorothyMutie	MoH
27M/S Alice Mwangi	OEU
28M/S Jane Ohuma	FHF
29M/R David Munyendo	CBM
30M/S Hellen Bokea	CBM
31DrIbrahimMatende	COECSA
32MrLaurenceMuthami	KEMRI-Statistics
33CatherineMwaura	KMTC-OphthalmicNurse
34JosiahOnyango	COECSA
35NjaniNderitu	Opticians
36PeterOtinda	SIGHTSAVERS/Rapporteur
37ElizabethOyugi	SIGHTSAVERS
38FrancisDikir	AMREF

NAME INSTITUTION
39 M. Gichangi OSU
40 Atefera SIGHTSAVERS CoFacilitator
41 S. Bechange SIGHTSAVERS CoFacilitator
42 N. Mwangi Facilitator
43 Grace Mwangi Rapporteur
43 Sarah Maiywa Sightsavers

Report Writing Workshop: 1-2 September 2016, Maanzoni Lodge Machakos

Meeting objective: To develop a zero draft of the report.

Wednesday 31 August: arrival		
Thursday 1 September		
TIME	ACTIVITY	FACILITATOR
8.10AM – 8.20 AM	Welcome remarks and Participant introductions	Elizabeth Owuor-Oyugi, Country Director Sightsavers Kenya
8.20 AM – 8.45 AM	Overview of the EHSA process	
8.45 AM – 9.00 AM	Outline of report writing workshop, expectations	Dr. Richard Ayah
9.00 AM – 10.30 AM	Writing	ALL
Tea Break		
10.45 AM – 12.58 PM	Writing	ALL
Lunch		
14.05 PM – 15.00PM	Plenary: Are we moving in the right direction? (Each section author presents 10 mins)	ALL
15.00 PM – 17.00 PM	Writing, take tea break at leisure	ALL
End of Day 1		
Friday 2 September 2		
8.10AM – 8.20 AM	Recap day 1	
8.20 AM – 9.30 AM	Writing	All
9.30 AM – 10.30 AM	Are we on track? Plenary: (each section author presents 10 mins)	ALL
Tea break		
10.50 - 1250 AM	Writing	ALL
Lunch		

1350 PM – 1515 PM	Plenary. What are the key findings?	ALL
1515PM – 1545 PM	Writing	ALL
1545 PM – 1600 PM	Wrap up	Ministry of Health
Departure at leisure		

Appendix 2: Eye health system assessment team

Name	Title and organisation	Team role
Dr. Michael Gichangi MBChB, M.Ed.(Ophth), MSc(Public health for eye care)	Deputy Director of Medical Services/Head: Ophthalmic Services Unit, Ministry of Health	Co-Investigator
Dr. Richard Ayah MBChB, MSc (Health systems management)	Lecturer School of Public Health University of Nairobi	Co-Investigator
Dr. Judith Awinja	Ministry of Health	Investigator
Dr. Dorothy Mutie MBChB, M.Med(Ophth), MSc(Public health for eye care)	Kenya Medical Training Centre (KMTC), Nairobi	Investigator
Dr. Jebichi Maswan BDS, MPH, MBA	Head, Institutional Advancement Kenya Medical Training College (KMTC), Nairobi	Investigator
Dr Josphat Mbuva BPharm	Ministry of Health	Investigator
Dr. Martha Muthami MBChB, MSc (Applied Epidemiology)	Health Management Information Systems, Ministry of Health	Investigator
Helen Bokea, B.Ed., MSc, MPH	Regional Trachoma Programme Coordinator, Africa	Investigator
Dr. Nyawira Mwangi MbChb, MSc (public health for eye care)	Lecturer Kenya Medical Training Centre (KMTC), Nairobi	Investigator
Mr Lawrence Muthami	Statistician, KEMRI	

Appendix 3: List of documents consulted

- Transition to Devolved Government Act 2012
- Kenya Demographic and Health Survey 2014
- Government's development blue print; Vision 2030
- Kenya National Plan for Elimination of Trachoma, Kenya National Primary eye care Manual 2011
- Republic of Kenya. The Constitution of Kenya, 2010, Human Rights (2010). Kenya: National Council for Law Reporting with the Authority of the Attorney General
- National Health sector strategic Plan II, Kenya Health Sector Policy framework (1994-2010)
- Ministry of Public Health and Sanitation strategic Plan (2008-2012) and Ministry of Medical Services strategic plan (2008 – 2012)
- Ministry of Health. 2015. *Kenya National Health Accounts 2012/13*. Nairobi: Ministry of Health
- MOH, Kenya Essential Medicines List 2010(KEML 2010)
- MOH, Kenya Essential Medicines List 2016(KEML 2016)
- MOH, Kenya Essential Medical Supplies List 2016(KEMSL 2016)
- MOH, Clinical Management and Referral Guidelines Vol. I,II& III 2009

Table 30: Steps in the approach to Eye Health System Assessment in Kenya

Activity	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Proposal development											
Ethics review											
Data collection											
Data analysis											
Report writing											
Dissemination workshop											

Appendix 4: County organograms

KAJIADO ORGANOGRAM

Governor (Executive)



County Executive Committee Members



CEC, Health Kajiado



Chief Officer



County Director of Health



County Health Management Team (Personnel heading various units)

NAKURU ORGANOGRAM

Chief Officer



Director of Medical Services

Director of Public Health

Director of Administration of Health



County Health Administration Officer



Nutrition

Rehabilitation

Procurement

Nursing



HOMA BAY ORGANOGRAM

CEC – Overall supervisor

Chief Officer

Administrative Officer

Accounting Officer

Authorizing Officer

County Director of Health – Technical Need

Deputy Director (Rehabilitation Services)

Deputy Director (Promoting)

County Health Management Team – Clinical, Nutrition

County Teaching and Referral Hospitals

