REPUBLIC OF KENYA

Ministry of Health

Kenya National Ear and Hearing Care Strategic Plan

2023-2028

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Foreword

This Ear and hearing care strategic plan 2023-2028 present the Ministry of Health's five-year proposed strategies for ear and hearing care in Kenya. It sets the strategic direction for the National Ear and Hearing Care System and presents information on the priorities, objectives, and indicators that the Ministry has adopted regarding the main ear and hearing conditions in the Country. The main conditions include Infections of the external ear, otitis media and its sequelae, congenital deafness, noise induced hearing loss, age-related hearing loss and hearing loss due to exposure to ototoxic substances at the workplace and from various health interventions such as chemotherapy.

The strategic objectives in this plan are oriented to the WHO's six building blocks of Health Systems and Kenya Health Policy framework investment areas and Objectives. In addition, the strategic objectives are guided by the world report on hearing launched in 2021. The Ministry of Health aims at strengthening partnerships and networking, coordination, and joint monitoring with respect to various aspects of the Ear and hearing care delivery in the country. The critical factors of success for this strategic plan will be built on: Governance structures both at National and County levels, finances required to fund this strategy, human resources to manage and offer quality services to patients, effective delivery of ear and hearing health care services, operational ear and hearing health information systems, adequate and appropriate hearing health products and technologies, adequate and appropriate ear and hearing health infrastructure, the use of evidence in decision making, quality service delivery and any other aspects of implementation.

The mechanisms to assure quality in all aspects of implementing this plan will be put in place as a means of delivering the highest attainable standards of health for all Kenyans. The Ministry of Health National Ear and Hearing Technical Working Group and the county focal persons will oversee the coordination and implementation of this Strategic plan. A detailed and joint monitoring and evaluation plan with specific key performance indicators will ensure the achievement of the best outcomes.

It is worth to note that this strategic plan was developed following extensive consultations with key players in ear and hearing care stakeholders in the health sector. The plan will serve as a guide for understanding the ear and hearing health priority needs and how to deliver them while embracing the health system and adopting a people centered approach. This is an integral part of Universal Health Coverage. Therefore, the Ministry of Health calls upon all ear and hearing care stakeholders to use this strategic plan to guarantee access to delivery of quality, affordable and accessible ear, and hearing care services in the Country.

Nakhumicha S. Wafula
CABINET SECRETARY

Preface

The National Strategic Plan for Ear and hearing care 2023-2028 was developed following extensive consultations with key players in ear and hearing care stakeholders in the health sector. It was informed by evidence generated from recent studies, the lapsed Ear and Hearing Care Strategic Plan 2016-2020, the National Health Sector Strategic Plan 2018-2023, the Kenya Health Policy 2014-2030, and the World report on hearing 2021. All Kenyans need quality ear and hearing services throughout the course of their lifetime, ranging from newborn and school-based hearing screening, screening of the at-risk populations and elderly screening, hearing aid fitting and hearing and speech rehabilitation services and basic treatment of common ear diseases. This is essential to avoid the populations from developing hearing impairment which is often viewed as a silent disability.

The plan will serve as a guide for understanding the ear health priority needs, how to deliver them, embracing the health system and people centered approach as an integral part of Universal Health Coverage. It further gives the appropriate tools for both national and county governments to use in the development of County health plans and how the development partners will engage in sharing resources for ear and hearing care at different levels of care. It will be a key tool in facilitating optimal utilization of resources for deliberate improvement of ear and hearing services, not forgetting enabling the communities to take charge of their ear and hearing health through public and primary health interventions.

Ear and hearing care should be provided at all the levels of healthcare delivery. At level 1, the Community Health Assistants together with community health workers will be trained to undertake basic community ear and hearing screening. At level 2 and 3 ear and hearing health services will be provided by Clinical Officers and Nurses. At level 4 and 5 facilities, services will be provided by ear and hearing care specialists that include ENT Surgeons, ENT Clinical Officers, Audiologists, Speech and language pathologists, trained ENT Nurses, Audiology technicians and hearing aid technologists. At level 6, in addition, services will be provided by Sub-specialist ENT surgeons.

This plan will guide the establishment of at least one (1) ear and hearing care clinic in every sub county, a wellness center for every maternity and labor ward for screening of congenital ear and hearing abnormalities, formation of community-based ear and hearing care screening centers, school-based hearing screening programs, training of adequate personnel and having ear and hearing care commodities forming part of the Kenya Essential Medicines and Supplies List. A monitoring and evaluation mechanism will be put in place to track progress in implementation. Therefore, this is to recommend that this Strategic Plan be used by all the stakeholders in ear and hearing care towards achieving Universal Health Coverage.

Eng. Peter Tum, EBS

PRINCIPAL SECRETARY

Acknowledgement

This National Strategic Plan for EHC is the result of concerted efforts from various individuals and institutions. The Ministry of Health would like to thank all who participated in the development process. In this regard the efforts of the experts from University of Nairobi, Kenyatta National Hospital, Kenyatta University Teaching Research and Referral Hospital, Ministry of Education, Kenya Ear Nose and throat Society, Kenya Society of Audiology, Association of Speech and Language Therapists Kenya, Christoffel-Blinden Mission (CBM), Operation Ear Drop and the World Health Organization (WHO) is highly commended. The TWG members represented the following organizations and institutions:

- Ministry of Health (MoH)
- The University of Nairobi (UoN)
- Ministry of Education (MoE)
- Council of Governors (CoG)
- Kenyatta National Hospital (KNH)
- Kenyatta University Teaching Research and Referral Hospital (KUTRRH)
- Kenya Medical Training College
- Kenya Institute of Special Education
- Christoffel-Blinden Mission (CBM)
- Operation Ear Drop (OED)

The development of this Strategic Plan would not have been possible without guidance of the cabinet secretary for health, both principal secretaries for State Departments of Medical Services and Public Health and Standards. The ministry also acknowledges the generous financial support from World Health Organization, CBM and MED-EL. The efforts of the members of the Technical Working Group led by Prof. Isaac Muthure Macharia are appreciated. A special word of thanks goes to the Ag. Director, Directorate of Healthcare Services Dr. Zeinab Gura, Head, Clinical Services and Coordinator of EHC Mr. Manaseh Bocha, Secretary of the Ear and Hearing Care TWG Ms. Serah Ndegwa, Members of the TWG Dr. Lilian Mokoh, Mr. Japheth Athanasio, Dr. Joyce Nato, Mr. David Muyendo, Ms. Nancy Kemunto, Dr. Geoffrey Otumo, Dr. Michael Sitima, Dr. John Ayugi, Mr. Mebor Abuor, Ms. Sheilah Lutta, Ms. AnnAlice Ouma, Mr. Zachary Wanjohi, Mr. Robert Njaramba, Dr. Maureen Kinge, Mr. Francis Gitau and Mr. Cornelius Mwanza . Finally, members of the Secretariat of the EHC TWG Mr. Saleh A. Bardad, Ms. Perez Wawire, Dr. Debra Okumu, Ms. Rose Wanjiku, Ms. Esther Wanja and Ms. Joyce Mokua.

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Definition of Terms

Audiology: The branch of science and medicine concerned with the sense of hearing and balance.

Chronic Suppurative Otitis Media (CSOM): Persistent ear discharge through a persistent perforation (hole) in the eardrum. Definition of CSOM varies in the duration of persistent ear discharge (from 2 weeks to 12 weeks).

Community health worker: lay members of the community who work either for pay or as volunteers in association with the local health care system in both urban and rural environments.

Community health assistant: a health worker equipped with relevant skills, knowledge, and experience forming the link between the community and the link facility.

Disabling hearing loss: is a hearing loss of 30 dB and above in better hearing ear.

Ear and Hearing Care Services: These are healthcare services comprised of preventive and promotive services; medical and surgical treatments: habilitation and rehabilitation services that address ear diseases and hearing loss.

Ear and Hearing Care personnel: These are healthcare workers specially trained to manage ear diseases and hearing loss at an advance level.

Hearing loss: Is a decline in the ability to perceive sound.

Noise Induced Hearing Loss: hearing loss as a result of exposure to excessively loud sounds and cannot be treated surgically or medically.

Otitis Media (OM): Refers to all forms of inflammation and infection of the middle ear. Active inflammation or infection is nearly always associated with a middle ear effusion (fluid in the middle ear space).

Otitis Media with Effusion (OME): Presence of fluid behind the eardrum without any acute symptoms.

Otoacoustic Emission: Sounds produced by a part of the cochlea when stimulated by a sound signal, click sounds.

Abbreviations

ABR	Auditory Brainstem Response
BTE	Behind the Ear
CBOs	Community Based Organizations
CBR	Community Based Rehabilitation
CIC	Completely in the Canal
CHA	Community Health Assistant
CHIS	Community Health Information System
CHW	Community Health Worker
CHU	Community Health Unit
CME	Continuing Medical Education
COENT	Clinical Officers Ear, Nose & Throat
CSOM	Chronic Suppurative Otitis Media
CQI	Continuous Quality Improvement
DHP	Digital Health Platform
EARCs	Education Assessment Resource Centers
EHC	Ear and Hearing Care
ENT	Ear Nose and Throat
ESHL	Educationally Significant Hearing loss
FBOs	Faith Based Organization
ISCO	International standard classification of occupation
GOK	Government of Kenya
HIV	Human Immunodeficiency Virus
HL	Hearing Loss
HR	Human Resource
HMIS	Health Management Information System
ICT	Information Communication Technology
KDHS	Kenya Demographic Health Survey
KEMSA	Kenya Essential Medical Supplies Authority
KEMSL	Kenya Essential Medical Supply List
KEPH	Kenya Essential Packages for Health

KHIS	Kenya Health Information System
KHPOA	Kenya Health Professionals Oversight Authority
KHRAC	Kenya Human Resource Advisory Council
KNBS	Kenya National Bureau of Statistic
KMTC	Kenya Medical Training College
LMIC	Low to Middle Income Country
MCH	Maternal Child Health
M&E	Monitoring and evaluation
MEDs	Mission of Essential Drugs
MOE	Ministry of Education
MOH	Ministry of Health
MOU	Memorandum of Understanding
NGOs	Non-Governmental Organizations
NHIF	National Health Insurance Fund
OAE	Otoacoustic Emissions
OME	Otitis Media Effusion
PHCWs	Primary Health Care Workers
SARAM	Service Availability Readiness Assessment Mapping
SDG	Sustainable Development Goals
SLI	Sign Language Interpreters
SLT	Speech and Language Therapists
STP	Standard Treatment Procedures
TB	Tuberculosis
TWG	Technical Working Group
UHC	Universal Health Care
UON	University of Nairobi
URTIs	Upper respiratory Tract Infections
VNG	Video-Nystagmography Machine
WHO	World Health Organization

Chapter One: Background

1.1 Introduction

The National Ear and Hearing Care Strategic plan in Kenya (2023 -2028) has been revised based on the Kenya national strategy for ear and hearing care (2016 to 2020) and the world report on hearing (2021). The lessons learnt from the partial implementation of the 2016 to 2020 strategy and a situational analysis of ear and hearing care services in Kenya done before the development of the strategy formed a valuable resource in the revision.

The situational analysis identified the existing gaps in the provision of ear and hearing care services in the country that needed to be strengthened, scaled up and integrated into primary healthcare to ensure provision of universal ear and hearing care to individuals across the life course. The development of this strategy was through a multi-stakeholder and multi-sectoral participatory process led by the Ministry of Health in collaboration with county governments, Ministry of Education, development partners, non-governmental organizations, and other stakeholders through a national technical working group.

The plan has been aligned to the current Kenya Health Sector Strategic and Investment plan 2018-2023, the Kenya Health policy 2014-2030, WHO Ear and hearing care planning and monitoring of national strategies manual among other guiding documents.

The World health organization estimates that there are 466 million people with disabling hearing loss globally with 80% of this global burden in low to middle income countries (WHO). By 2050 nearly 1 in every 4 people globally will have some degree of hearing loss and out of every 2 young people, 1 will be having a hearing impairment. Out of these, 1 in every 3 people globally will require ear and hearing care services, with 1 out of every 14- requiring hearing rehabilitation. The global number of years lived with disability attributed to hearing loss by 2019 was 43.5 million, with age related hearing loss being the third largest source of Years Lived with Disability (YLDs) (WHO). In Kenya hearing impairment is the fourth leading cause of disability in the country. As the country's health systems and policies move towards the attainment of Universal Health Coverage, ear and hearing care should be integrated within the systems to achieve accessible and affordable universal people centered ear and hearing care.

The attainment of Universal Health Coverage (UHC) is among Kenya’s vision 2030 and it calls for the need to implement a robust access and coverage of essential health services, among them EHC. Governments which invest in EHC have demonstrated a great economic gain. The WHO estimates a return of $16 for every 1 dollar invested in EHC over a 10-year period (WHO).

The world report on hearing has set global targets for scaling up EHC services in countries by 2030. These include 20% relative increase in the effective coverage of newborn hearing screening services, 20% relative increase in the effective coverage of adults with hearing loss that use hearing technology and a 20% relative reduction in the prevalence of chronic ear diseases and unaddressed hearing loss in school age children 5-9 years (WHO). This action requires member states to integrate ear and hearing care within their existing health systems using a people centered approach.

According to the World Report on Hearing 2021, untreated infections and noise induced hearing loss are responsible for preventable deafness which represents 60% of the total burden of people with hearing impairment. It is estimated that 135 million people in Africa suffer from a form of hearing loss with most people with hearing impairment being over the age of 60 years. This is as a result of an increase in the growing aging population due to increased life expectancy, along with behavioral, lifestyle changes and urbanization. The number of people at risk of developing hearing loss in the population is thus expected to dramatically increase in the coming decades. Furthermore, this burden of hearing loss and ear diseases is not borne equally as it tends to be greater in low and middle-income countries and among underserved populations, such as migrants, refugees, persons with disabilities, and in rural communities.

The Kenya Health Information System (KHIS) 2022 reported a total 837,416 ear diseases in the country with 264,789 cases being children under 5 years while 15% of adults above 50 years old have hearing problems (KNBS). Preventable causes of hearing loss such as ear infections and noise induced hearing loss form the bulk of the ear conditions in the country. Otitis Media, which is the commonest cause of preventable hearing impairment in childhood, which is estimated to have a prevalence of 12 to 24 per 1000 among school going children in rural Kenya (Simões et al., 2016). Common infections such as bacterial meningitis and congenital rubella contribute to the bulk of preventable hearing loss by immunization. A study conducted at Kenyatta National Hospital showed a 44% prevalence of hearing loss among children treated for bacterial meningitis (Karanja et al., 2014). Medical interventions such as use of antibiotics, cancer drugs and head and neck radiotherapy also increase the burden of hearing loss.

Noise induced hearing loss is of public health concern due to inefficient implementation of rules and regulations on safety and effective noise reduction measures. A study evaluating occupational noise exposure among workers in the metal fabricating industry showed that all workers were exposed to hazardous noise levels and only 2.9% wear protective gear (Kilonzo). Noise reduction measures should not only be implemented in occupational settings but also in social and entertainment venues in order to effectively employ hearing conservation measures that cut across the life course.

Ototoxic exposure to medications and chemicals together with a rise in the burden of non-communicable diseases such as diabetes and cancer may also directly or indirectly affect an individual's hearing throughout their life course.

There is a need to gather proper epidemiological data on the state of ear and hearing care in the country in order to establish the true burden and the needs of the population. There also exist gaps in human resources for health and requisite health infrastructure necessary for providing affordable and accessible ear and hearing care services in the country. Therefore, this national EHC strategic plan provides direction for all stakeholders in the health sector for the provision of integrated people centered ear and hearing care

1.2 Broad Objective

To provide a framework for provision of universal access to integrated people centered ear and hearing care across the life course.

1.3 Specific Objectives

a) To improve access and coverage for ear and hearing care services in delivery of UHC.
b) To Integrate ear and hearing care in school health programs.
c) To enhance capacity building and training of health care workers for delivery of EHC services.
d) To accelerate EHC services through collaboration with stakeholders.
e) To strengthen habilitation and rehabilitation services leveraging on technologies.
f) To operationalize monitoring and evaluation mechanism for evidence-based decision making.

1.4 Justification

The Ministry of Health developed the first strategic plan 2016-2020 that required a review after the lapse of five years. Within the five-year implementation period, there were lessons learnt and policy direction adjustments made towards the achievement of Universal Health Coverage (UHC).

During this period the World Health Organization outlined the need for governments to adopt EHC as an investment through the primary healthcare approach since the interventions will bring about a great economical gain within 10 years. Globally, the overall cost of unaddressed hearing loss is greater $980 billion annually with 53% of the costs being in low to middle income countries (WHO). This cost is mainly related to health, education, loss of productivity and societal costs. Most of these costs can be mitigated using cost-effective public health interventions in EHC.

The justification of this strategy therefore, is to: -

I. Review the 2016-2020 strategic plan to align with the Ministry's strategic direction on attainment of UHC.
II. Adopt the World Report on Hearing recommendations to;

a) Prevent hearing loss through cost effective, accessible public health interventions, leveraging on technological advances that can be used for timely identification of ear diseases and hearing loss at any time across the life course.
b) Systematic hearing screening of newborn babies and Infants, Pre-school and school age children, people exposed to noise or chemicals at work, people receiving ototoxic medicine and older adults to prevent hearing disability.
c) Prevent hearing disability by adequate habilitation and rehabilitation measures that enable people with hearing disability to engage in active economic activities for nation building.

1.5 Scope and Application

Ear and hearing care practices at all the Kenya Essential Packages for Health (KEPH) levels in the country.

1.6 Target Audience

Ear and hearing care practitioners in the public and private sector and stakeholders in EHC.

Chapter Two: Situational Analysis

The National Ear and Hearing Care Strategic plan in Kenya 2023 -2028 has been revised based on the 2016 -2020 National Strategy for EHC and from the recommendations of the World Report on Hearing 2021. The revision took cognizance of the lessons learnt and identified gaps in the implementation of the previous National Strategy for EHC. The previous Strategy achieved the development of the Schemes of service for Audiology and Speech and Language Therapy personnel, who are an integral part of EHC service delivery. After the Launch and dissemination of the previous Strategy to 11 counties, it was noted that the Counties had not yet appointed EHC focal persons to implement the Strategy. This limited the cascading of EHC services to the lowest KEPH level.

The major challenges faced in the implementation included a deficit of key indicators for EHC in the monitoring and evaluation plan, lack of coverage of EHC services and commodities in KEMSL and the lack of comprehensive cover for EHC services and Commodities by the NHIF. EHC centers and Clinics were also inadequate across the Country.

2.1 Country Context

Kenya is one of the countries in the East African community and has a total area of 580,367 square kilometers. It borders South Sudan and Ethiopia to the North, Somalia to the North East, Uganda to the west and Tanzania to the South with the Indian Ocean forming the south eastern coast line. Administratively, the country is divided into 47 devolved counties led by governors, all under one Republic of Kenya led by the President.

The population of Kenya is 47.6 million as per the 2019 population census. The official languages are English and Kiswahili with a variety of other languages from different indigenous tribes in Kenya. Majority of the population in Kenya is young, with 73% of the population being below 30 years of age and a life expectancy of 66 years as per the census (KNBS).

Kenya is classified as a low to middle income economy country (LMIC) and has the largest growing economy in East and Central Africa. In the last decade, the GDP growth rate has been above 5 % and the percentage of persons living below the poverty line declined from 46.8% in 2005-2006 to 36.1 % in 2015-2016 financial years (LMIC) (*7)*. The country has made significant political, social, and economic reforms that have largely driven sustained economic growth, social development, and political gains over the past decade. However, its key development challenges still include poverty, inequality, climate change and the vulnerability of the economy to internal and external shocks.

Like the rest of the world, the nation is striving to attain the Sustainable Development Goals (SDGs), among them the Universal Health Coverage (UHC) by year 2030. One of the government's

agenda and priorities is to ensure that all its citizens have access to quality and affordable healthcare for the attainment of UHC. In addition to all other healthcare services, WHO recommends governments to promote People Centered Ear and Hearing Care using the primary health care approach in order to achieve its global targets.

2.2 General Health Care and Referral System

2.2.1 General Health Care System

The Kenyan health system has six KEPH levels of care with four categories of services providers namely; government (GOK), private, faith-based and NGO health facilities as shown in the table below.

Table 1: Kenya Essential Packages for Health facilities in the country

	KEPH level	MOH	Private Practice	Faith-Based Organization	NGO	Total	percentage
Primary Care Services	Level 2+3	5,471	4,791	926	359	11,547	93.2%
	Level 2	4,414	3,969	722	297	9,402	75.9%
	Level 3	1,057	822	204	62	2,145	17.3%
County Referral Health Services	Level 4+5	368	350	109	12	839	6.8%
	Level 4	355	346	106	12	819	6.6%
	Level 5	13	4	3	0	20	0.2%
National Referral Services	Level 6	6	1	0	0	7	0.1%
Total		5,845	5,142	1,035	371	12,393	100%
Percentage		47.2%	41.5%	8.4%	3.0%	100%	

Source: Kenya Health Sector Referral Strategy 2014-2018, Ministry of Health

As per the Kenya Health Sector Referral Strategy 2014-2018 there are 12,394 health facilities in Kenya, of which 47.2% are public, 41.5% are private, 8.4% are Faith-based organizations and 3.0% are non-government organizations (MOH)

EHC services are available in several of these facilities and there is deliberate effort to extend these services and integrate the services into the community.

2.2.2 Referral System

The Kenya Health Sector Referral Strategy (2014– 2018) classifies the different referral service putting into consideration, the existing infrastructure in the KEPH levels as follows: -

i. Community health services (level 1) facilitate linkage to primary health care services.

ii. Primary health care services (levels 2 and 3) manage referrals from communities and facilitate referrals to the nearest county referral facilities.
iii. County health referral services (levels 4 and 5) form the county referral system, with specific services shared among the existing county referral facilities to form an effective network of comprehensive referral services.
iv. National health referral services (level 6) form the national centers of excellence providing specialized services and training of health care workers.

In some county referral hospitals in Kenya, there are EHC units although with different capacities. Most of them can offer emergency EHC services, and some offer surgical services with options for onward referral to level 6. Referrals are usually received from Primary care facilities within the counties, other County health facilities, Community health units. There are also the apex national referral services at level 6 which operate with a defined level of autonomy. In Kenya, there are three national referral hospitals namely Kenyatta National Hospital, Moi Teaching and Referral Hospital and Kenyatta University Teaching Research and Referral hospital that offer highly specialized EHC services. In addition, there are some Faith Based and privately owned facilities that offer specialized EHC services

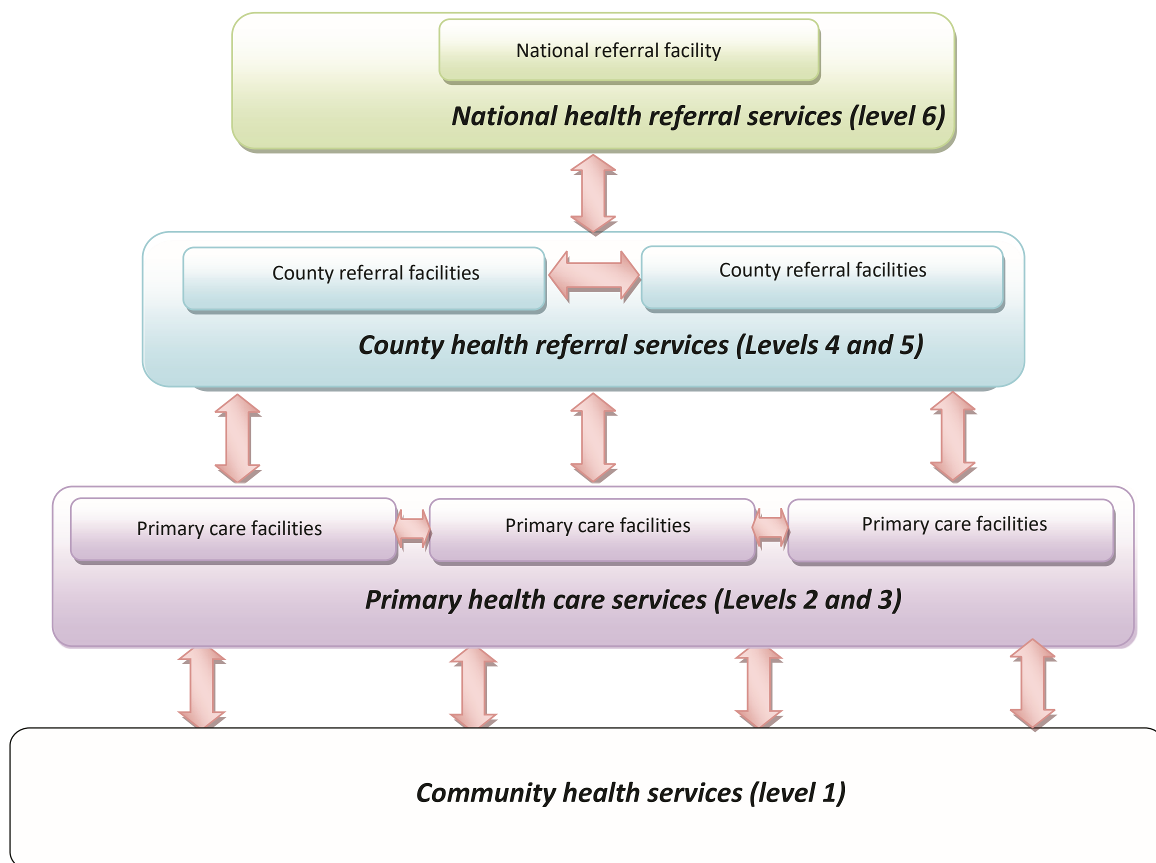
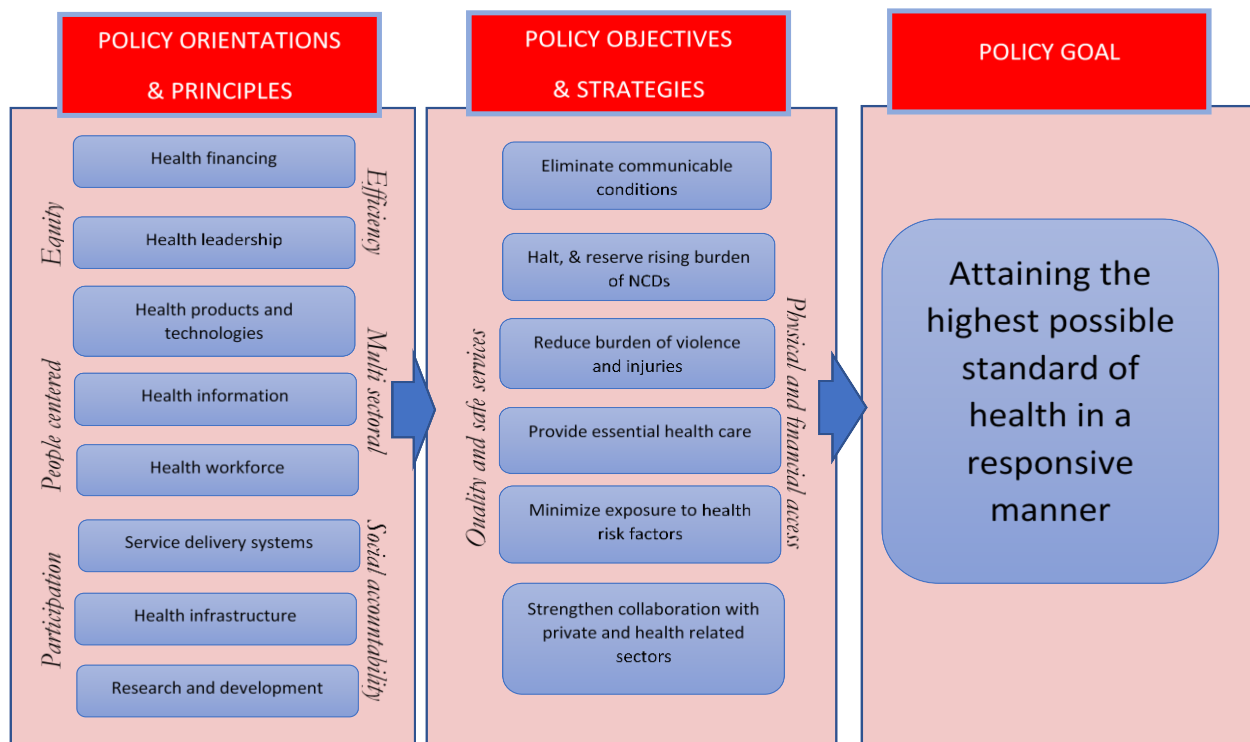


Figure 1: Kenya referral structure

Source; Kenya Health Sector Referral Implementation Guidelines 2014

2.3 Policy Framework for EHC

Kenya Health Policy 2014 -2030 is the overarching policy document that provides the long-term direction for health in the country. The policy outlines the intentions the country will take towards attaining the overall health aspirations of the people of Kenya through supporting provision of equitable, affordable, and quality health and related services for achieving the highest attainable standards of healthcare (MOH). The general policy orientations, objectives and goal are illustrated in the diagram below:



Source; Kenya Health Policy 2014-2030

Figure 2: Kenya Health Policy framework

EHC receives support from both developmental local NGOs and Faith Based organizations to achieve its desired outcomes. Counties are also encouraged to form partnerships that will help in sustaining all EHC activities and projects.

2.4 Ear and Hearing Care

2.4.1 Leadership and Governance

The devolved system of governance assigns specific functions to the national and county governments as defined by the

constitution. While the National Ministry of Health provides leadership in policy development, management of national referral facilities, and capacity development. The devolved functions of the County Health Services are county health facilities, pharmacies, ambulance services, promotion of primary health care, licensing and control of undertakings that sell food to the public and veterinary services. The two levels of Governments are distinct and inter-dependent and conduct their mutual relations based on consultation, collaboration, and cooperation. There has been inadequate coordination of EHC services in the country necessitating the appointment of the Inter-agency national Technical Work Group (TWG), to oversee the EHC activities.

The team brings together representatives from all the EHC stakeholders, including Ministry of Health personnel, County governments through Council of governors, training institutions, and NGOs. The TWG provides oversight in EHC services in Kenya and facilitates the implementation of the EHC strategy and policy guidelines.

There are no proper linkages between the National TWG and the Counties. Therefore, there is a need for each County to appoint an EHC focal person or EHC coordinator to support implementation of EHC activities. There is also a need to map out EHC Stakeholders in every County and in all healthcare facilities in all levels which shall offer EHC services to facilitate all activities, coordination, and engagements.

2.4.2 Service Delivery

Ear and hearing care is provided within the national health system and can be found at most levels that offer secondary and tertiary healthcare services but may not be to the same extent in all counties. The services include treatment of ear conditions, disease prevention, identification, referral and follow up of those found to have ear problems and hearing loss.

There is inadequate human resource for EHC in the country, cutting across all levels of service provision with most specialists concentrated in the urban areas, making access to quality EHC difficult for most Kenyans.

At the community level, primary ear and hearing care including health promotion, early identification, and intervention for those at risk of hearing loss is not carried out by the family unit and Community Health Workers due to lack of prior training in primary ear and hearing care, non-existence of IEC materials on EHC health education and Edutainment.

At level 2 and 3 (Dispensaries and Health Centers), ear and hearing health services are provided by Primary Health Care Workers trained in health disciplines such as Clinical Officers and Nurses with basic knowledge on managing simple ear infections. Those cases that they may not manage at this level, are identified, and referred appropriately to established institutions with ear specialists.

At level 4 (Sub- County hospitals), ENT Clinical Officers are the first level of EHC

provision in most of the sub-county hospitals. Over the past few years, efforts have been made to have at least one ENT clinical officer for every sub-county hospital. They run outpatient services for ear conditions, providing primary EHC and make appropriate referrals. Some hospitals at this level have ENT surgeons who offer specialized surgical services.

At level 5 (County referral hospitals), services are provided by ENT Surgeons, ENT Clinical Officers, Audiologists, Speech and language pathologists, ENT Nurses, Audiology technicians and hearing aid technologists.

At level 6 (National referral hospitals), Sub Specialist surgeons offer highly specialized EHC services in addition to all services offered at the lower levels. Kenyatta National hospital is currently the only public level 6 hospital offering comprehensive EHC services, albeit with inadequate staff. These centers also provide teaching and attachment centers for internship and trainees in EHC.

There is a need for all counties to have Audiologists, speech, and language pathologists. The schemes of service for these personnel have already been approved by the public service Commission as key Service providers.

2.4.3 Human Resource For EHC

The critical EHC team includes ENT surgeons, ENT clinical officers, audiologists, speech and language pathologists, special education teachers, nurses, and hearing aid technicians.

However, at National and County level, the EHC personnel are inadequate to meet the needs of the entire population. These services are also unevenly distributed thereby contributing to low access. Majority of the Specialists work within urban and non-arid areas. With a growing population and increased awareness of EHC services, the limited number of EHC workers will be further strained, posing a threat to quality of services. This calls for an increase in the number of EHC health workers trained to help reduce the gap (MOH). The table below shows the documented numbers of EHC personnel

Table 2: Documented numbers of EHC personnel

ISCO Classification	Occupation Title in Kenya	Stock of qualified (Registered) health workers)	Number Employed in Public Sector	Employed in Private Sectors	Density per 10,000 population
2212 - Specialist medical practitioners	ENT Surgeon	75	36	39	0.015
2269 - Health professionals not elsewhere classified	ENT Clinical officer	160	94	66	0.033

Source: Health Market Labor Analysis (HMLA 2022)

2.4.3.1 Training of Human Resource for EHC

Training of EHC service providers is mainly by the public institutions, the University of Nairobi (UoN) for Master of Medicine in ENT Head and neck Surgery. The Kenya Medical Training College (KMTC) is the main training institution for the mid-level cadres for EHC for the Higher diploma and Certificate courses. There are efforts to establish training programs in Audiology, Speech and Language Therapy and to open new training campuses to avail more EHC providers in the Country.

2.4.3.2 Regulation of Health Workforce

The Kenya Human Resource Advisory Council (KHRAC) was created through an act of parliament with the main mandate of reviewing policy and establishing uniform norms and standards, as well as addressing the uneven distribution of the health workforce.

The Kenya Health Professionals Oversight Authority (KHPOA) Kenya Health Oversight Authority is a corporate body established through an Act of Parliament to coordinate all the regulatory bodies in the health sector. Its main roles are to ensure necessary standards for all health professionals are not compromised by regulatory bodies, to maintain a duplicate register of all health professionals at national and county level, and to coordinate joint inspection of health facilities.

The various regulatory bodies normally set Standards and scope of practice for the EHC cadres.

2.5 Infrastructure

The Kenya Service Availability Readiness Assessment Mapping (SARAM) conducted in 2013 (MOH), provides an understanding of the capacity for service provision across the counties, at the same time it generates reliable information on service delivery, availability and functionality of basic inputs and the capacity of the counties to provide basic health interventions not only to the essential services but also to EHC.

The Norms and Standards for health infrastructure 2017 makes provision for ENT service provision and infrastructure at level 4, 5 and 6. Generally, most health facilities with EHC services do not have ideal infrastructure to offer quality services. Audiology assessment and services require sound proof rooms and earmold laboratories which are not available in most referral facilities. It is the mandate of the government at the two levels to ensure all the necessary infrastructure is available for EHC provision as they are currently not available.

2.6 Health Care Financing

In Kenya, 12.7% of the population, do not seek health care when they are ill mainly because of the high cost of services, while 6.2% of households are at risk of impoverishment because of expenditure. The government's agenda is to enroll more Kenyans under NHIF to prevent catastrophic expenditures while seeking health care (MoH)

Hearing capacity of an individual tends to decline with age depending on the risk factors one is exposed to. According to

KDHS 2022, 15% of adults above 50 years old have hearing problems (KNBS). Thus, the aging population of Kenyans require a scheme to cover for their need to access EHC services which can even be pegged on the retirement package.

2.7. Ear Conditions in Kenya and Health Information Systems

There is no accurate prevalence data on ear conditions in Kenya due to challenges within the health information system. The indicators in EHC are not integrated into the KHIS and community health information system. EHC indicators are yet to be loaded into the Kenya Health Information System. There is a need for KHIS to capture ear diseases, conditions, and hearing loss in order to establish the burden of ear and hearing diseases in the country.

2.8 Health Products and Technologies

Equitable access to medical products and technologies that are of assured quality, safety, efficacy, and cost effective is important for a well-functioning health system.

Access to Essential Medicines is a core component of the right to health, and a requisite to the attainment of national health goals and priorities. The Kenya Essential Medicines Supplies List (KEMSL) has captured some EHC supplies and commodities for use at various levels of care. Medical consumables and equipment at both the national and county governments are procured through Kenya Medical Supplies Authority (KEMSA) or the Mission for Essential Drugs and Supplies (MEDS). However, not all the medical supplies and commodities are stocked in KEMSA since they are not captured in the KEMSL. Therefore, there is a need to update the KEMSL to capture essential EHC supplies and commodities to improve access. Provision of affordable and accessible hearing devices and technology, which are restricted and regulated to ensure good quality and affordable products for all Kenyans.

2.9 Research

A lack of coordinated mechanisms for EHC research is occasioned by the un-availability of a national research committee or national EHC research resource center resulting in no focused EHC research agenda to guide operational and academic purposes. A lot of baseline, impact and surveillance surveys have also been undertaken under several projects and partnerships but this work has not been published due to limitations in manuscript writing skills for targeted peer reviewed journals and general under-funding for EHC research work.

2.10 Process and Methodology

The National EHC Strategic Plan was developed through a participatory process and incorporated diverse inputs and views from various stakeholders. Desk reviews from relevant national and global health frameworks, evaluations of strategic plans, policies, guidelines including national morbidity data were among sources of information used to design the strategic plan.

2.11 Environmental scan

2.11.1 SWOT Analysis

Table 3: SWOT Analysis

SITUATIONAL ANALYSIS		
STRENGTHS	**IMPLICATION**	**RESPONSE**
1. Political goodwill 2. Pre-existing national strategy and guidelines 3. Presence of National TWG 4. Dedicated focal person in charge of ear and hearing care in the ministry of health	1. Support integration and implementation of strategy and guidelines 2. Existing guidelines to build on and improve 3. Oversee smooth implementation and roll out of national EHC 4. Informed coordination and follow up of EHC activities at the national level	1. Take advantage of the existing political goodwill to roll out the Strategy 2. Revise and update the existing documents 3. Draft follow up strategy and frequent meetings to roll out EHC 4. Ensure efficient coordination and communication between the TWG and the national government
WEAKNESS	**IMPLICATION**	**RESPONSE**
1. Delayed implementation of existing policies, strategy, and guidelines 2. Inadequate resources to implement the existing strategy and guidelines 3. Lack of locally available and sustainable projects to support technology for management and rehabilitation of hearing services	1. Existing guidelines not widely disseminated and implemented 2. Delay in the rollout and implementation of guidelines 3. Uncertainties in the supply, maintenance, and high cost of technology in ear and hearing care and are expensive	1. Ensure implementation of the revised and updated guidelines and strategy 2. Resource mobilization to ensure implementation of EHC 3. Ensure the establishment of a center of excellence for innovation, research, assembly, and local manufacture of technology for EHC
OPPORTUNITIES	**IMPLICATION**	**RESPONSE**
1. Availability of funding 2. Availability of training institutions and trainees in ear and hearing care 3. Devolution of health services and existing organizational health structures in the county levels 4. Existing good infrastructure for the delivery of ear and hearing care; roads, internet connectivity, physical buildings etc.	1. Ability to achieve our goals and objectives for EHC 2. Adequate human resource for EHC 3. Increased access to EHC. 4. Improved accessibility and coverage for implementation monitoring and evaluation of EHC	1. Foster strong multisector partnerships in supporting EHC projects 2. Contribute to regulation and employment of highly skilled competent EHC workers 3. Take advantage of devolved healthcare structures through continuous communication and engagement to improve access to EHC 4. Maximize on existing infrastructure to effectively roll out EHC
THREATS	**IMPLICATION**	**RESPONSE**
1. Political uncertainty. 2. Social cultural misconceptions Pandemics and other public health emergencies such as drought and climate change	1. Stalled EHC programs. 2. Negative attitude towards implementation of EHC 3. Change of government priorities within the health systems	1. Adapt to change with change in political structures 2. Integration of the greater community awareness strategies in EHC 3. Continuous lobbying and engagement of EHC to the relevant stakeholders

2.11.2 PESTEL Analysis

Table 4: Pestel Analysis

PESTEL ANALYSIS		
FACTOR	**IMPLICATION**	**RESPONSE**
1. **POLITICAL**		
The government of Kenya prioritized the implementation of Universal Health coverage (UHC) as part of vision 2030	Political goodwill will fast track the implementation of ear and hearing care services for universal health coverage	Need to take advantage of the political goodwill to advance the implementation of ear and hearing care services
2. **ECONOMIC**		
Inequitable distribution of resources	Results in skewed distribution for Ear and Hearing Care services for universal access coverage	Resources should be equitably distributed for universal access and coverage of Ear and Hearing Care services
3. **SOCIAL CULTURAL**		
Some socio-cultural habits believing that hearing loss is a result of witchcraft	This can cause delay in early screening, identification, treatment of Ear and Hearing care anomalies	Communities should be sensitized on retrogressive socio-cultural practices
4. **TECHNOLOGICAL**		
Leveraging on technological advances and innovations to provide tools that can be used to identify and rehabilitate ear diseases and hearing loss at any time across the life course	Lack of use of technological advances can hamper the systematic hearing screening of newborn babies and infants, pre-school and school age children, people exposed to noise or chemicals at work, people receiving ototoxic medicine and older adults and their rehabilitation	Scale up the use of technological advances to systematically conduct hearing screening of newborn babies and infants, pre-school and school age children, people exposed to noise or chemicals at work, people receiving ototoxic medicine and older adults and rehabilitation
5. ECOLOGICAL		
Hazardous noise from occupational environmental entertainment venues together with improper use of personal listening devices	Can cause a degree of hearing loss	Noise reduction measures should be employed
NEMA environmental laws on noise pollution to be implemented fully	These if not observed can escalate noise pollution to unprecedented levels	The relevant environmental laws on noise pollution to be observed
6. LEGAL		
Governed by the by-laws of the city/county councils where noise pollution is prohibited	If by laws are not adhered to can escalate to noise pollution	Adhere to the appropriate noise reduction laws and measures

Chapter Three: The Strategic Model for Ear and Hearing Care

The Kenya national strategy for ear and hearing care is built on a foundation with a vision, mission, goal, and specific objectives.

Vision: An integrated people centered ear and hearing care throughout the life course of an individual.

Mission: To provide quality, affordable and accessible ear, and hearing care services without suffering financial hardship to all citizens in Kenya.

Strategic Directions

I. Establishment of Ear and Hearing care clinics at least 1 for every sub county in the country.
II. Establishment of an EHC wellness center for screening of ear and hearing abnormalities in Maternity units.
III. Integration of ear and hearing care in school health programs
IV. Sensitization, Capacity building and Training of health care workers on early diagnosis and essentials of ear and hearing care.
V. Collaboration with key partners and stakeholders for delivery of ear and hearing care program in the country.
VI. Operationalize monitoring and evaluation mechanism with key indicators for evidence-based decision making.

This EHC strategy has been formulated based on the framework of the Kenya Health Policy Framework 2014 -2030, National Health Sector Strategic plan 2018-2023 and Ear-Hearing Care strategic plan 2016-2020. Therefore, the Counties are called upon to adopt their specific strategies based on this EHC Strategic plan and include the following 8 thematic areas:

3.1 Key strategic investment areas

3.1.1 Leadership and Governance

a. Improve Governance arrangements in EHC.
b. Strengthen EHC stewardship and partnership.

3.1.2 EHC Health Care Financing

a. To define the different sources of funds for EHC and strategies to mobilize the resources, for implementation of EHC Strategy.

3.1.3 EHC Health Infrastructure

a. To develop and provide requisite infrastructure for EHC.
b. Outline Equipment needed for enhanced EHC health service delivery and their maintenance.

3.1.4 EHC Human Resources for Health

a. Avail adequate EHC trained health care workers at all levels of the health system.

b. Lay out mechanisms of delegation of tasks among non EHC HCW.
c. Provide a training infrastructure for advancement and training of EHC across all the HCW cadres from level 1 to 6.

3.1.5 EHC Health Products and Technologies

a. Improve availability of ear and hearing drugs and products by strengthening the supply chain system to including EHC medicines and commodities.
b. Enhance quality of EHC health commodities.
c. Promote use of innovation and technology in EHC health sector.

3.1.6 Health Service Delivery

a. Improve quality of management of ear and hearing diseases.
b. Set up hearing screening services across the life course of the individual.
c. Behavior change communication, community engagement, awareness and empowerment of ear and hearing health.
d. Reduce the burden of hearing impairment through delivery of integrated patient services and use of sign language to promote inclusivity.
e. Provide rehabilitative care for the deaf and offer sign language facilities in public and private sectors.
f. Promote surgical outcome monitoring and service quality Assurance.
g. Continuous Quality Assurance of EHC services in the country.

3.1.7 EHC Health Information Systems

a. Enhance collection and reporting of EHC health data at all levels.
b. Improve quality of data at all levels
c. Promote utilization of data for decision making at all levels.

3.1.8 EHC Research

a. Promote data privacy and protection.
b. Promote evidence-based decision making in EHC through research.
c. Coordinate National research agenda and publications in EHC.
d. Promotion of Learning and teaching through conferences, workshops, and symposiums.

3.2 Prioritized Interventions

3.2.1 Health Sector Leadership and Governance

Leadership and governance entail organization, decision making and coordination of the EHC health policy and strategies. The set Leadership and governance structures will guide the strategic direction, development of appropriate plans and policies with effective oversight, regulation, motivation, and essential partnerships integrated into the health system all to achieve the desired results. Governance is anchored on existing legal Frameworks and regulation for both Public and Private Sectors. Effective leadership and governance at all levels of care is key to achieving the

desired goals of this Strategic plan. The structures described here will provide appropriate linkages and collaborations between the EHC health subsector and the national health sector. The focus will be to reduce EHC related mortality, the number of years lived with disability and increased life expectancy and overall increased productivity in the nation.

Table 5: Gap analysis on EHC governance

Gaps	Proposed actions
1. Lack of EHC focal person /EHC champions in the county level	1. Identify and appoint focal persons/champions to drive the EHC agenda in the counties
2. Lack of implementation of EHC strategies and guidelines at the national level and counties	2. Adoption and implementation of the strategies and the guidelines
3. Lack of equitable distribution of resources for EHC	3. Development of a framework to ensure equitable distribution of resources for proper service delivery
4. Political uncertainty and change of governance	4. Have flexibility to adapt to change in governance and work in the government in place
5. Lack of appropriate linkages for EHC continuum of care	5. Establishing a clear referral system and creating partnership between government and private EHC service providers /donors for continuum of ear and hearing care
6. Weak link between inter-agency coordinating committee on matters EHC	6. Embrace county governments and other stakeholders to take up EHC
7. EHC is not prioritized especially at the county level where health decisions are being made	7. Ensure National and county health plans to include EHC
8. Lack of proper documentation of EHC data	8. Establish a monitoring and evaluating framework to implement EHC at all levels of service delivery

3.2.2 Health Care Financing

The overall goal of the health finance investment area in the plan is to mobilize financial resources to facilitate the EHC service delivery. The key aspects of health systems financing include resource mobilization, risk pooling and purchase of services. Financial requirements are further elaborated in chapter 6.

Table 6: Gap analysis on healthcare financing for EHC

Gaps	Proposed Actions
1. The current health care financing system is not adequate to ensure access to high impact cost effective and preventive EHC interventions	1. Increase resource mobilization for EHC though new partners in EHC and enhanced contribution of private and the development partners
2. The NHIF does not cover all vulnerable groups and does not include payment for hearing aids in the Student NHIF cover (Edu-Afya).	2. Increase efficiency of coordinated donor support through the Kenya Health Partnership Framework 2018-2030
3. There is an overreliance on partner funding. Funding and budget allocation by the government is inadequate, especially at the county level	3. Increased contributions to the NHIF by informal sector workers
4. Underutilized value for money invested in EHC by the providers 5. Inadequate capital investments by government	4. Equitable resource allocation and utilization though NHIF cover for vulnerable groups and increased NHIF coverage of EHC services, especially hearing aids for school going children and teenage students.

3.2.3 Health Infrastructure

The health infrastructure here referred to include physical infrastructure, equipment, transport, and information Communication Technology (ICT), relevant to EHC health care delivery. Provision of appropriate infrastructure is expected to improve access to quality EHC. This EHC health strategic plan aims at identifying sets of equipment and physical infrastructure that would form the basis for a functional and comprehensive delivery of EHC services that would lead to the realization of Universal Health Coverage. The requisite structure of an EHC health service delivery point includes the following: -

EHC Clinic: Consulting Rooms, Examinations and Procedure Rooms, Minor Theatre, ENT Theatre.

ENT Wards: - Male and female wards, usually not very Large Numbers, usually a 120-bed capacity ward, large enough to be the level of a Tertiary EHC Hospital.

A basic ENT Unit for a level 4 hospital would have about 32 bed capacity.
The minimum requirements vary according to levels of care as follows: -
Level 1 – none
Level 2&3 - Dedicated or shared room, Head light, otoscope.
Level 4 & 5 Sub –County and County hospitals: 2 or more dedicated rooms with basic equipment for surgery and audio metrical services. Also dedicated or shared ENT theatre for County Referral hospitals, separate ENT unit with waiting bay and consultation rooms, operating theatre, basic equipment for surgery and Audiometric services plus hearing aid lab or workshop for regional hospitals.

Level 6: As the Regional Hospitals above plus sub-specialized Otologists and training facility for both under and postgraduate students.

Table 7: Gap analysis on EHC Health Infrastructure

Gaps	Proposed Actions
1. There is a lack of appropriate infrastructure at all levels of EHC services. 2. Lack of EHC screening centers in the community 3. Lack of regional centers of excellence	1. Set up at least one EHC clinic in each sub county (295) in the country. 2. Ensure formation of community EHC screening centers. 3. Establish 10 regional centers and strengthen 5 existing national centers of excellence

3.2.4 Human Resources for Health

Human resources for EHC is a key building block underpinning any health system. The human resource development component encompasses a well-trained, adequately equipped and equitably distributed team of ear and hearing health professionals with the right cadre skills mix that is fit for the purpose to provide equitable, affordable, and high-quality comprehensive ear and hearing care to communities. To address the high disease burden and inadequate number of EHC health workforce, the national and County governments need to work together with training institutions to increase the number of trained specialists produced per year as outlined in the strategy.

Table 8: Gap analysis on EHC Human Resources

Gaps	Proposed actions
1. Inadequate basic knowledge amongst HCW across all levels of health care	1. Training on EHC and continuous medical education (CME)for HCW in all levels of care
2. Inadequate trained EHC specialized personnel	2. Training of more EHC specialized personnel
3. Inequitable distribution of EHC human resources	3. Engage the Kenya human resource advisory council for recommendations on the requirements 4. Ensure the equitable distribution of EHC human resources.
4. Inadequate training institutions for EHC personnel	5. Engage MOE to charter more universities that offer health sciences related courses to offer EHC related programs 6. KMTC and other Middle Level Colleges to increase number of campuses offering EHC courses.
5. Lack of harmonized uniform curriculum for training of EHC	7. Have a uniform curriculum for all learning institutions
6. Lack of structures for capacity building of the non-medical EHC workers e.g., teachers, parents, and care givers	8. Development of a framework for capacity building of the non-medical EHC workers e.g., teachers, parents, and caregivers
7. Lack of proper design of task shifting and task sharing models across different capacity in EHC	9. Development of a structured design for task shifting and task sharing

8. Lack of financial resources for career and professional development	10. Collaboration between the MOH and private partners to lobby for financial resources to further professional development
9. Inadequate numbers of trained personnel in sign language for effective communication to ensure provision of UHC services to persons with hearing impairment	11. Train EHC personnel on sign language for effective communication increase UHC service delivery to the hearing impaired
10. Lack of indicators for monitoring and evaluation of capacity building amongst EHC HCW	12. Development of monitoring and evaluation indicators for capacity building for EHC HCW

3.2.5 Health Products and Technologies

Equitable access to medical products and technologies that are of assured quality, safety, efficacy, and cost effective is important for a well-functioning health system. To achieve this, there is a need to have national policies, standards, guidelines, and regulations that support reliable manufacturing practices and support the rational use of medicines, commodities, and equipment, through guidelines and strategies that assure adherence, reduced resistance and maximize patient safety and training. The strategy outlines the areas of focus to ensure access to EHC health products and technologies.

Table 9: Gap analysis on EHC Health Products and Technologies

Gaps	Proposed Actions
1. Not all EHC drugs and commodities in the KEMSL are purchased by KEMSA	1. Procurement of EHC drugs and commodities through KEMSA 2. Provide the KEMSL list to KEMSA for procurement of all the listed items for EHC
2. Lack of itemized List of Hearing Devices required for Rehabilitation and Habilitation	3. Provision of an itemized list of the types (BTE, RIC, CIC) and models of hearing aids, hearing devices and accessories. 4. Develop product specification for the various hearing devices 5. Develop a list of the itemized list of hearing devices required for rehabilitation and Habilitation
3. Inadequate use of hearing care technology in ear and hearing care	6. Incorporate use of hearing technologies and telemedicine in EHC

3.2.6 Health Service Delivery

EHC services are delivered as an integral part of the integrated healthcare services. Requisite health infrastructure and human resources at all levels is needed. This strategy is to ensure an effective and efficient way of delivering these services to the community. The Key aspect of the plan includes:

- Scaling up prevention of ear diseases, enhance community awareness and empowerment on ear and hearing health, reduce the burden of hearing impairment due to diseases, reduce exposure to harmful levels of noise and lastly improve quality of ear and hearing health services received by the community.
- Continuous Quality Improvement (CQI) where every individual regardless of their status or position, should be encouraged to find ways to improve their quality of life through EHC wellness programs.
- Non clinical Care-Communication during care, waiting time Gaps – challenges Proposed actions, interventions.
- Training of CHAs and CHWs in primary EHC often depends on external partner support through specific programs and often, EHC services are not included.
- Increase the number of counties where EHC is provided.

Table 10: Gap analysis on EHC health service delivery

Gaps	Proposed Actions
Maternal 1. Lack of indicators for screening and identifying risk factor for hearing loss 2. Lack of awareness of hearing loss risk factors to their unborn babies 3. Lack of awareness of health promoting practices to prevent hearing loss to their unborn babies	1. Developing indicators for screening and identifying risk for hearing loss. 2. Develop a simple health information booklet to guide on risk factors of hearing loss to their unborn babies 3. Establish a guideline for continuous health talks and CMEs for health promoting practice to preventive hearing loss to their unborn babies
Newborn 1. Lack of structure for universal newborn hearing screening in hospital 2. Lack of structure for community-based hearing screening for at risk newborns and infants	1. Develop a clear structure for universal hearing screening in hospital 2. Develop a structure for community-based hearing screening for at risk children
Immunization 1. Lack of awareness of the importance of immunization in EHC	1. Put emphasis on the importance of immunizations thus prevent hearing loss by giving more health talks and reference materials on the same
School based 1. lack of implementation structure for school-based screening programs 2. Lack of proper support mechanism in the existing EARC centers	1. Enforce implementation of the existing structure for school-based screening programs 2. Develop a support mechanism in the existing EARC centers
Ototoxicity 1. Lack of structure for ototoxicity monitoring programs among at risk population 2. Lack of implementation of some of the existing ototoxicity monitoring program e.g., TB and HIV 3. Poor implementation of existing guidelines of handling ototoxic materials and chemicals in industries and health institutions	1. Create structure for ototoxicity monitoring by coming up with key indicators that will be followed and data captured for consumption and decision making 2. Perform a survey of the program, enforcement, monitoring and evaluation of the program 3. collaboration with various institutions to enforce the existing guidelines and have a monitoring and evaluation plan
Chronic diseases 1. Lack of screening and interventions for individuals with chronic health conditions that affect hearing such as diabetes	1. Establish a protocols and guidelines for screening and intervention that can be used across all health care levels
Noise induced Hearing Loss (NIHL) 1. Lack of implementation and enforcement of existing national guidelines on noise reduction 2. Lack of awareness of the impact of noise to hearing in the workplace and entertainment venues	1. collaboration with other institutions to ensure that the guidelines for noise reduction are followed 2. Create awareness on the impact of noise on hearing 3. Collaborations with other institutions to ensure that the guidelines are being adhered to in the workplace and the entertainment venues
Elderly screening programs 1. Lack of screening programs on hearing loss among the elderly persons	1. Establish guidelines for a hearing loss screening program for the elderly

3.2.7 EHC Health Information Systems

Health Information Systems (HIS) provides evidence for policy and program decisions. It is important in monitoring EHC patient care, improving disease surveillance and pinpointing outbreaks, and speeding up health data access. Many hospitals have adopted hospital information and records systems making data management easier. Although there are challenges with low reporting rates and accuracy of data, the strategy has addressed this through regular support supervision, routine DQAs and training of Health Records and Information Officers. Utilization of information also needs to be strengthened at all levels of the system, through enhancing the culture and practice of "Data and Information use and sharing for Decision-Making" and capacity building at national, county and facility levels.

Table 11: Gap analysis on EHC Health information system

Gaps	Proposed Actions
1. Lack of Compatibility of different HISs at the same facility level as well as up/down referral	1. Development of a module for EHC that can be utilized at service delivery points in the Digital Health Platform (DHP).
2. Lack of patient tracking system for up or down referral	2. Determine population needs and priorities at different stages of the life course by adapting the *WHO Ear and hearing: survey handbook*.
3. Lack of coordination between school-based reporting and healthcare reporting systems for children identified to have ear and hearing diseases	3. Assess the health systems' capacity for pro vision of required clinical services; identify gaps and monitor its performance by adapting the WHO Ear and hearing care: situation analysis tool
4. Lack of ear and hearing items assessed in the mother and Child Health booklet and MCH register during newborn and early childhood service delivery	4. Develop indicators specific to the different healthcare levels based on the level of service provision and data collection capabilities to be integrated into the HIS. 5. Set realistic, relevant, and time-bound national targets based on WHO set global targets on EHC. 6. Adapt the WHO screening tool for standardization of data collection. 7. Establish an EHC M&E team at MOH and county level that can abstract data from the different HIS and assess progress of different EHC activities

3.2.8 Research

The best way new treatments and technologies are developed is through research. The world today has a much better understanding of EHC than we did 10 years ago through research evidence. This investment area provides an opportunity to explore various elements of EHC to provide a platform for scientists to carry out more research. This will provide confidence in refining the EHC policies through evidence.

Table 12: Gap analysis on EHC Research

Gaps	Proposed Actions
1. Lack of research champions to assist in development and guidance of research labs that build on the knowledge generated in EHC at various levels.	1. Identify and train research champions to mentor novice researchers in EHC
2. Inadequate funding for research activities	2. Identify priority areas for research on EHC
3. Low level knowledge on ongoing research activities affecting EHC	3. Create knowledge and products that can be adapted to different cultural and socioeconomic settings
4. Inadequate local data to inform policy and EHC activities.	4. Translate quality evidence into affordable health technologies and evidence-informed policies
5. Large volume of unpublished research on EHC in learning institutions and health facilities	5. To develop an EHC website where researchers with common interests can connect, grants and funding opportunities can be posted and areas of data paucity can be highlighted. 6. Develop manuscript writing workshops inserted within larger EHC related activities e.g., conferences and meetings. 7. Highlight gaps and challenges in EHC and develop and innovators award for persons helping to bridge these gaps

3.3 Integrating Ear and Hearing Care Service Package

Comprehensive Ear and Hearing Care services are comprised of preventive and promotive services; medical and surgical treatments: habilitation and rehabilitation services. These services integrated onto the existing physical and human resource infrastructures, health information systems, medical supplies, and distribution chain. Mechanisms for monitoring and evaluation with evidence-based practice should be put in place for planning, action, and reflection. Training and capacity building of primary healthcare workers is the backbone of integration of EHC within primary healthcare with the aim of achieving UHC. The proposed EHC service packages to be offered at various levels of care are summarized in the table below

Table 13:EHC service package

Level of care	Service package	Human resource
Level 1	1. Mobile based (Tablet), hearing screening 2. Community based elderly hearing screening	CHWs
Level 2 and 3	As above plus 1. Ear syringing 2. Foreign body removal 3. Diagnosis and treatment of basic ear diseases	1. Nurses 2. Clinical Officers
Level 4	All the above plus 1. Aural toileting and suction 2. Diagnostic audiometry 3. Vestibular testing 4. High risk individual hearing screening 5. Hearing aid fitting 6. Speech and auditory therapy 7. Surgical services (Tympanoplasty mastoidectomy and middle ear exploration	All the above plus 1. ENT Clinical Officers 2. Audiologists 3. Speech Therapists 4. Hearing Mold technician
Level 5 and 6	All the above plus 1. Cochlear implant surgery, lateral skull base surgery, oncological surgery 2. Cochlear implant programming and switching on	All the above plus 1. ENT Surgeons 2. ENT subspecialists

**Medical supplies and technologies are attached in annex III*

3. 3.1 Training and Capacity Building

This strategy advocates for training and capacity building of the existing healthcare workers to adopt the WHO three-tiered training program for training PHCWs. The training module utilizes the primary ear and hearing care manuals for various cadres as outlined below.

NB: Specialized training for EHC health care workers should be conducted in line with their scope of practice for EHC personnel.

Table 14: Training and Capacity building for Primary Health Care Workers

Level of Training	Health workers to be trained	Objective of training	Facilities where it can be in use
Level 1 (Basic)	CHWs, Parents, EARCs and other members of the community	1. Community involvement 2. Awareness creation and advocacy 3. Questionnaire based hearing screening	Clinics, Schools, Churches, Local clubs, and societies
Level 2 (Intermediate)	Nurses, Midwives, Clinical Officers	1. Prevention, diagnosis and treatment of common ear diseases and hearing impairment	Hospitals, Clinics, Medical training College and institutions
Level 3 (Advanced)	Medical Officers, Pediatricians, Physicians, Family physicians and other consultants	1. Prevalence, Causes, prevention of ear diseases and hearing impairment 2. Medical, surgical management and rehabilitation of hearing impairment	Hospitals, Clinics, Medical training College and institutions

Chapter Four: Implementation & Co-ordination Framework

A multisectoral approach involving all stakeholders is necessary for successful implementation of various aspects of this strategy. The national government, international organizations, development partners, on-governmental organizations, professional bodies, Faith and Community Based organizations, communities, and families all share responsibilities in ensuring fulfillment of citizens' rights to EHC services. Partners need to work together through information sharing, adoption of innovative approaches, avoidance of conflict of interest and duplication of efforts to maximize use of available resources

4.1 Roles and Responsibilities of Various Stakeholders

Table 15: Responsibilities of various Stakeholders

Stakeholders	Roles and Responsibilities
National Government	1. Provide an enabling environment for the implementation of key activities in the EHC strategic plan. 2. Allocate necessary resources using existing national initiatives for the implementation of the strategy 3. Provide regulatory services to maintain quality of care 4. Ensure regular monitoring and evaluation of progress made by stake-holders 5. Engage private sector, NGOs, FBOs, CBOs operating at different levels of health care through monitoring and coordination of their activities. 6. Mobilize and provide technical and financial support for the planning, implementation monitoring and evaluation. 7. Recognize the need, strengthen rehabilitation services, and train personnel
County Governments	1. To implement the Strategic plan and guidelines for EHC 2. To integrate EHC strategic plan into the County integrated development plan. 3. To identify and appoint EHC focal persons
Development Partners	1. Place ear health and hearing loss on the global public health agenda 2. Advocate for more resources 3. Support national and regional capacity building of policy and decision makers on the strategy 4. Support social mobilization activities to promote appropriate practices in the area of EHC 5. Support monitoring and evaluation of the implementation of the strategy 6. Support the revision of pre-service curricula for health care workers at different levels to incorporate EHC
Private Sector, NGOs, FBOs, CBOs	1. Participate in provision of ear and hearing care 2. Provide their members with accurate information on EHC 3. Provide community-based support through existing community support groups and initiatives 4. Advocate for EHC services at local, national, and international levels.

Education, Training and Research Institutions	1. Review and integrate EHC in the existing curricula in their respective institutions. 2. Train competent and skilled human resource for EHC. 3. Support the government in ensuring maintenance of quality EHC. 4. To regularly conduct operations and outcomes research and disseminate findings to all stakeholders. 5. To support the MOH in translation of research findings into programming and service delivery.
Professional Associations	Collaborate with the Ministry of Health in the following: - 1. Establish Centres of Excellence in the National Referral Facilities 2. Provide health services 3. Monitor service provision 4. Monitor diseases including establishment of registries, 5. Provide rehabilitation services 6. Conduct research and share findings to inform policy
Individuals, Families and Communities	Individuals, parents, and care givers are of utmost importance as they have a direct responsibility over their own health. They therefore need to: 1. Observe preventive and promote health care practices 2. Timely seek health care 3. Comply with treatment and advice from health care workers 4. Participate in awareness creation on positive health care practices 5. Advocate for resources 6. Hold their leaders accountable and demand for services
Media	1. Advocacy and Communication

Chapter Five: Monitoring & Evaluation Plan

The Monitoring and Evaluation (M & E) process will adopt Action Research, a term for a variety of methodologies that at their core are cycles of planning, action, and reflection. This is a useful approach because we are integrating M&E into on-going plans and activities of the strategy. Monthly data will be collected and recorded to track ear health indicators in each county. Review meetings and workshops will be scheduled through the National ear health working Group to review performance. The following M&E indicators will be tracked for each ear health thematic area.

Table 16: Monitoring and evaluation plan

Process Indicators												
Strategic Objective 1: To accelerate EHC services through collaboration with stakeholders								**Timelines**				
Activity	**Output**	**Key Indicator**	**Baseline**	**Target**	**Lead Agency**	**Source of data**	**frequency of data collection**	**2023 /24**	**2024 /25**	**2025 /26**	2026 /27	2027 /28
Disseminate the reviewed EHC strategic plan and implementation guidelines to counties	Disseminated the reviewed EHC strategic plan and implementation guidelines to counties	No. of counties implementing the disseminated strategic plan and guidelines	0	47	MoH	DHIS Health facility sheets	Quarterly	x	x			
Appoint EHC County and facility focal persons across the Country	Appointed EHC County and facility focal persons across the Country	Number of EHC County focal persons appointed	0	47	CHMT HFMT	Appointment letters Checklist	Once As need arises	x	x			
		Number of EHC facility focal persons appointed	0	47				x	x			

Identify key stakeholders for EHC agenda in Kenya	Identified key stakeholders for EHC agenda in Kenya	Number of stakeholders engaged	4	10	MoH County Government	MOUs	Quarterly	x	x	x	x	x
Identify program implementation team for effective management	Identified program implementation team for effective management	Program implementation team in place	0	1	MoH	HR department	Once As need arises	x	x			
Advocacy for resource allocation from the National government toward EHC	Advocacy for resource allocated from the National government toward EHC	Proportion of budget allocated towards EHC	0	0.05%	Treasury MoH	Budget allocation and utilization	Yearly	x	x	x	x	x
Lobbying NHIF for increase in resources for EHC services	Lobby NHIF for increased in resources for EHC services	Number of pre-authorized EHC interventions by NHIF	2	5	County MoH	CFP FFP	Monthly	x	x	x	x	x
Outcome Indicators						**Timelines**						
Outcome	**Key performance Indicator**	**Frequency of data collection**	**Baseline**	**End-term**								
Enhanced leadership and governance for EHC services	Proportion of counties with functional EHC committees	Yearly	0	47								
knowledge management among EHC personnel	proportion of county focal persons with basic level of knowledge on EHC	Bi-annually	0	100%								

Process indicators												
Strategic Objective 2: To improve access and coverage for ear and hearing care services in the delivery of UHC								**Timelines**				
Activity	**Output**	**Key Indicator**	**Baseline**	**Target**	**Lead Agency**	**Source of data**	**frequency of data collection**	**2023 /24**	**2024 /25**	**2025 /26**	2026 /27	2027 /28
Establish and strengthen ear and hearing care clinics at sub-county facilities	Ear and hearing care clinics established in sub-county facilities	Proportion of sub-county facilities providing EHC services	16	31	MoH County	County health facility reports	Quarterly	10%	30%	60%	75%	85%
		Proportion of individuals utilizing EHC services	TBD(n)	n+20%	County Facilities	Health facility reports KHIS	Quarterly	20%	40%	60%	85%	100%
Sensitization of Community health units on EHC services	Community health units sensitized on EHC services	Number of community health units sensitized on EHC services	TBD(n)	n+20%	County	CHIS	Quarterly	x	x	x	x	x
Establish newborn and infant screening in MCH service centers	Established newborn and infant screening in MCH service centers	Proportion of MCH centers conducting newborn and infant screening services	0	15	County	Health facility data sheet KHIS	Quarterly	10%	30%	60%	75%	85%
		Proportion of newborns and infants screened	TBD(n)	n+20%	County	Health facility data sheet KHIS	Quarterly	x	x	x	x	x
Integrate EHC screening in special clinics (Diabetes, TB, Cancer)	Integrated EHC screening in special clinics (Diabetes, TB, Cancer)	Number of special clinics conducting screening services	0	15	County	Health facility data sheet KHIS	Quarterly	x	x	x	x	x
		Proportion of patients	TBD(n)	n+20%	County	Health facility data sheet KHIS	Quarterly	x	x	x	x	x

		screened for hearing loss										
Develop quality assurance standard tools	Quality assurance standard tools developed	Assessment tools in place	0	1	MoH	Quality assurance tool	Once	x	x			
Monitor use of the quality assurance tool in facilities providing EHC services	Monitored use of the quality assurance tool in facilities providing EHC services	Proportion of facilities using quality improvement tool	0	15	County	Quality assurance reports	Quarterly	10%	30%	60%	75%	85%
Outcome Indicators				**Timelines**								
Outcome	**Key performance Indicator**	**Frequency of data collection**	**Baseline**	**End-term**								
Readiness of EHC services	Proportion of EHC facilities equipped to offer comprehensive EHC services	Yearly	TBD(n)	n+20%								
Availability of comprehensive EHC services	Proportion of facilities with available comprehensive EHC services	Yearly	TBD(n)	n+20%								
Uptake of EHC services	Proportion of patients utilizing EHC services	Monthly	TBD(n)	n+20%								
Process indicators												
Strategic Objective 3: To Integrate ear and hearing care in school health programs								**Timelines**				

Activity	Output	Key Indicator	Baseline	Target	Lead Agency	Source of data	frequency of data collection	2023 /24	2024 /25	2025 /26	2026 /27	2027 /28
Conduct School based Sensitization on Ear Hygiene & screening of EHC to school going children	Schools with functional school-based screening of EHC	Proportion of schools sensitized in the Country	TBD(n)	n+20%	MoH MoE County	Sensitization reports Minutes CFP	Bi-annually	10%	30%	60%	75%	85%
		Proportion of pupils referred from the EH screening in the schools	TBD(n)	n+20%	MoH MoE County	Sensitization reports Minutes CFP	Bi-annually	10%	30%	60%	75%	85%
Outcome Indicators			**Timelines**									
Outcome	**Key performance Indicator**	**Frequency of data collection**	**Baseline**	**End-term**								
EHC school-based health coverage enhanced	Proportion of school coverage with Integrated ear and hearing care programs	Quarterly	TBD(n)	n+20%								
Process indicators												
Strategic Objective 4: To enhance capacity building and training of health care workers for delivery of EHC service								**Timelines**				
Activity	**Output**	**Key Indicator**	**Baseline**	**Target**	**Lead Agency**	**Source of data**	**frequency of data collection**	**2023 /24**	**2024 /25**	**2025 /26**	2026 /27	2027 /28
Policy development for training and integration of sign language into the medical training of HCW	Sign language integration Policy for tertiary medical institutions developed	Policy in place	No	Yes	MoH	Policy document	Once	x	x			

Train on Advanced Hearing technology- ENT surgeons, Audiologists and SLT	Trained ENT surgeons, Audiologists and SLT	Number of ENT surgeons, audiologists and SLTs trained	TBD(n)	n+20%	MOE MOH Training Institutions and universities	Training institutions	Annually	x	x	x	x	x
Train EHC personnel- ENT Clinical officers, ENT Nurses,	Trained EHC personnel	Number of EHC personnel trained	TBD	141 (3/County)	MOE /MOH	Training institutions Human resource Professional associations	Bi-annually	x	x	x	x	x
Training of PHCWs & CHWs on EHC	Capacity built and trained PHCWs on EHC	Proportion of PHCWs trained in EHC	0	20%	MoH County	Training reports	Bi-annually	x	x	x	x	x
Establishment of Mentorship programs for skilled EHC personnel	Mentored EHC personnel	Proportion of the EHC personnel Mentored in the counties	0	80%	County	County CHEW	Bi-annually	20%	40%	60%	85%	100%
Train professions on ear mold and fitting	Trained professions on ear mold and fitting	Number of professionals trained on molding	0	15	MoH Medical training institutions and universities	Training reports on short courses	Annually	x	x	x	x	x
		Number of personnel trained on fitting	0	15	MoH Medical training institutions and universities	Training reports	Annually	x	x	x	x	x
Train technicians on hearing aids maintenance	Trained technicians on hearing aids maintenance	Number of technicians trained	0	15	MoH Medical training institutions	Training reports	Annually	x	x	x	x	x

					and universities								
		Number of hearing aids maintained	TBD(n)	n+20%	MoH Medical training institutions and universities	Training reports	Annually	x	x	x	x	x	
Outcome Indicators			**Timelines**										
Outcome	**Key performance Indicator**	**Frequency of data collection**	**Baseline**	**End-term**									
Integrated sign language curriculum to all tertiary medical institutions offering medical courses	Proportion of medical institutions of higher learning and universities offering sign language courses in EHC	Yearly	0	50%									
HCW with skills for early diagnosis and Timely Intervention of EHC conditions	Proportion of health workers practicing skilled EHC practice	Yearly	TBD(n)	n+50%									
Process Indicators													
Strategic Objective 5: To strengthen habilitation and rehabilitation services leveraging on technology								**Timelines**					
Activity	**Output**	**Key Indicator**	**Baseline**	**Target**	**Lead Agency**	**Source of data**	**frequency of data collection**	**2023 /24**	**2024 /25**	**2025 /26**	2026 /27	2027 /28	

Develop specification of EHC commodities	Specification of EHC commodities developed	Specifications developed	0	1	MoH KEMSA	Specification guidelines developed	Annually	x	x			
Establish mechanisms for dispensing of hearing aids, and other EHC devices through stakeholder engagement	Established Mechanisms for dispensing of EHC commodities	Number of dispensed devices from public health facilities	TBD(n)	n+20%	MoH KEMSA	KEMSA	Annually	x	x	x	x	x
		Number of stakeholders engaged for EHC	TBD	4	MoH	MOUs signed	Annually	x	x	x	x	x
Establish technology sound ear mold laboratories in EHC	Established ear mold laboratories	Number of ear molds labs established	0	15	MoH Partners	Health facility data sheets	Annually	x	x	x	x	x
Strengthen cochlea implant accessibility through PPP for availability in public sector	Access to cochlea implant services in public sector	Number of cases with congenital hearing loss who access cochlea implants	TBD(n)	n+20%	MoH Partners	Health facility data sheets	Quarterly	x	x	x	x	x
Outcome Indicators Timelines			**Timelines**									
Outcome	**Key performance Indicator**	**Frequency of data collection**	**Baseline**	**End-term**								
Accessibility of rehabilitative EHC services	Proportion of population with congenital cases who accessed Cochlea habilitative services	Quarterly	TBD(n)	n+20%								

	Proportion of population that access rehabilitative services	Quarterly	TBD(n)	n+20%								
Availability of ear mold laboratories in every EHC center	Proportion of technology sound ear mold laboratories established	Annually	0	100%								
Process indicators												
Strategic Objective 6: To operationalize monitoring and evaluation mechanism for evidence-based decision making								**Timelines**				
Activity	**Output**	**Key Indicator**	**Baseline**	**Target**	**Lead Agency**	**Source of data**	**frequency of data collection**	**2023 /24**	**2024 /25**	**2025 /26**	2026 /27	2027 /28
Integrate key EHC indicators into the KHIS	integration key EHC indicators into the KHIS	Number of EHC tool (registers, MCH booklets, Community tools) developed	0	6	MOH	Registers, MOH booklets, Community tools	Annually	x	x			
		Number of EHC indicators integrated into KHIS	1	6	MOH	Registers, MOH booklets, Community tools	Annually	x	x			
Conduct quarterly data review meetings by M&E team	Quarterly reports	Number of data review meetings held annually	0	4	MOH	Report / Minutes	Quarterly	x	x	x	x	x
establish data collection and reporting of EHC data at all levels	EHC reports in KHIS	Number of facilities reporting on ear and hearing care indicators	TBD(n)	47	MOH County	KHIS	Bi-annually	x	x			
Conduct quarterly EHC	EHC data Quality improvement	Number of counties	0	47	County	Reports/Minutes	Quarterly	x	x	x	x	x

data quality audit meetings at county level		conducting quarterly EHC DQA meetings										
Conduct baseline survey on EHC services	Conducted baseline survey on EHC	Baseline survey conducted	0	1	MOH	Survey data	Once	x	x			
Outcome Indicators Timelines			**Timelines**									
Outcome	**Key performance Indicator**	**Frequency of data collection**	**Baseline**	**End-term**								
Enhanced quality data collection through electronic records Management	Proportion of public hospitals (level 4 and above) with functional EHC electronic health records	Quarterly	TBD(n)	100%								
	Proportion of health facilities submitting timely information (%)	Quarterly	TBD(n)	100%								

Chapter Six: Costing & Budgeting

6.1 Expected Costing and Budgeting Outcomes

The costing of this program was done using an inputs-based costing methodology where every program utilizes inputs with identifiable costs. The one health international tool was utilized to define most of the tenets and cost approaches. The costing and budgeting was conducted with expert consultation from the Health systems strengthening specialist, the monitoring and evaluation team, Health economist and ENT surgeon.

This brought forward the normative unit costs of all the EHC services by cost centers, level of care, and for each of the five years of the EHC Standard Procedures (SP) FY2023-28. These methods consequently allowed for the estimation of budget for the years under consideration from both the unit costs established with projected service volume (projected workload) as well as program costs and operationalization costs of the Strategic Plan.

This budget will help streamline and plan for prevention and treatment of ear diseases and hearing impairments in Kenya.

6.1.1 Costing Assumptions

The costing of this strategic plan considered the following assumptions

I. Costing in dollar estimates to eliminate the need for inflationary pressures on the local currency unit.
II. Standard Treatment Procedures (STP) uniformity at both county referral hospitals and referral and teaching levels of care
III. Standard price list for all items regardless of differences in procurement by various implementing centers.
IV. Availability of staff for all levels costed for the SP plan budget estimates.
V. Normative costs are the ideal costs and thus actual costs would be there from realistic guidelines on the ground that are derivatives of the STPs vis a vis the actual STPs that when used to cost services have given us the normative costs.
VI. Normative costs assume no resource constraints
VII. STPs are universal for all EHC services rendered in a single level of care
VIII. Prices are standard from various verifiable sources but subject to fluctuations, most prices have FY 2022 base prices.
IX. There is facility bypass as patients prefer bigger facilities as opposed to smaller effective ones near their settlements due to perception and experience with frustrations at lower-level facilities for example, due to lack of drugs, HRH, equipment, closing/working hours, etc. This would affect service volumes by facilities hence different values from the KEPH service volumes.
X. Operational expenditures (OPEX) are estimated at standard rates for all services provided at a particular level of care.

6.2 Costing Estimates

Table 17: EHC Costed Standard Treatment Procedure (STP)

	Level of Care	Services	Time, Minutes, Cadre	Labour Imputations	Drugs	OPEX allocations till discharge	estimated unit cost
STP 0	Level1	mobile based (Tablet) Hearing screening community based Elderly hearing screening	CHV 15 minutes, 15 minutes CHV revisit (defaulter tracking and revisits)	allowances/30 days*8 hours p.d* 60 minutes	national outreach services guidelines	$ 3.00	$ 8.00
STP 1	Level 2 and 3	**As above plus**					
		1.Ear syringing	5 mins-triage nurse, 10 minutes nurse diagnosis, 15 minutes treatment, prescription	equals labour minutes * (total monthly salary and average monthly labour capacity devt/12)/4 weeks=40 hours*60 minutes per hour	STP defined, WHO, MoH, clinical interviews	$15.00	$ 36.00
		2.Foreign Body Removal	5 mins-triage nurse, 10 minutes nurse diagnosis, 15 minutes treatment, prescription	equals labour minutes * (total monthly salary and average monthly labour capacity devt/12)/4 weeks=40 hours*60 minutes per hour	STP defined, WHO, MoH, clinical interviews	$15.00	$ 36.00
		3.Diagnosis and treatment of basic ear diseases	5 mins-triage nurse, 10 minutes nurse diagnosis, 15 minutes treatment, prescription	equals labour minutes * (total monthly salary and average monthly labour capacity devt/12)/4 weeks=40 hours*60 minutes per hour	STP defined, WHO, MoH, clinical interviews	$15.00	$ 36.00
STP 2	Level 4	**All above plus**					
		1.Diagnostic Audiometry	5 mins-triage nurse, 10 minutes CO/ nurse/ MO diagnosis, 15 minutes treatment, prescription, 1 technician 20 minutes, 1 other pharm tech	equals labour minutes * (total monthly salary and average monthly labour capacity devt/12)/4 weeks=40 hours*60 minutes per hour	STP defined, WHO, MoH, clinical interviews	$30.00	$ 25.00

		2.Vestibular testing	5 mins-triage nurse, 10 minutes CO/ nurse/ MO diagnosis, 15 minutes treatment, prescription, 1 technician 20 minutes, 1 other pharm tech	equals labour minutes * (total monthly salary and average monthly labour capacity devt/12)/4 weeks=40 hours*60 minutes per hour	STP defined, WHO, MoH, clinical interviews	$30.00	$ 25.00
		3.Newborn Screening	5 mins-triage nurse, 10 minutes CO/ nurse/ MO diagnosis, 15 minutes treatment, prescription, 1 technician 20 minutes, 1 other pharm tech	equals labour minutes * (total monthly salary and average monthly labour capacity devt/12)/4 weeks=40 hours*60 minutes per hour	STP defined, WHO, MoH, clinical interviews	$30.00	$ 25.00
		4.High risk individual hearing screening	5 mins-triage nurse, 10 minutes CO/ nurse/ MO diagnosis, 15 minutes treatment, prescription, 1 technician 20 minutes, 1 other pharm tech	equals labour minutes * (total monthly salary and average monthly labour capacity devt/12)/4 weeks=40 hours*60 minutes per hour	STP defined, WHO, MoH, clinical interviews	$30.00	$ 148.00
		5Hearing aid fitting	5 mins-triage nurse, 10 minutes CO/ nurse/ MO diagnosis, 15 minutes treatment, prescription, 1 technician 20 minutes, 1 other pharm tech	equals labour minutes * (total monthly salary and average monthly labour capacity devt/12)/4 weeks=40 hours*60 minutes per hour	STP defined, WHO, MoH, clinical interviews	$30.00	$ 1,802.35
		6.Speech and auditory therapy	5 mins-triage nurse, 10 minutes CO/ nurse/ MO diagnosis, 15 minutes treatment, prescription, 1 technician 20 minutes, 1 other pharm tech	equals labour minutes * (total monthly salary and average monthly labour capacity devt/12)/4 weeks=40 hours*60 minutes per hour	STP defined, WHO, MoH, clinical interviews	$30.00	$ 1,266.50
		7.Surgical Services (Tympanoplasty, Mastoidectomy middle ear exploration	5 mins-triage nurse, 10 minutes CO/ nurse/ MO diagnosis, 15 minutes treatment, prescription, 1 technician 20 minutes, 1 other pharm tech	equals labour minutes * (total monthly salary and average monthly labour capacity devt/12)/4 weeks=40 hours*60 minutes per hour	STP defined, WHO, MoH, clinical interviews	$30.00	$ 1,802.35
		8.Aural toilet and Suction	5 mins-triage nurse, 10 minutes CO/ nurse/ MO diagnosis, 15 minutes treatment, prescription, 1 technician 20 minutes, 1 other pharm tech	equals labour minutes * (total monthly salary and average monthly labour capacity devt/12)/4 weeks=40 hours*60 minutes per hour	STP defined, WHO, MoH, clinical interviews	$30.00	$ 182.50
STP 3	Level 5 and 6	**All above plus**					

		1. Cochlear Implant surgery, lateral skull base surgery, Oncological surgery	5 mins-triage nurse + 5 minutes*5 revisits , 10 minutes CO/ nurse/ MO diagnosis, 15 minutes treatment, prescription, 1 technician 20 minutes, 1 other pharm tech+ 10 minutes*5 revisits , 1 med engineer 30 hour, 1 audiology specialist 60 minutes+ 10 minutes*5 revisits , 1 theatre nurse 60 minutes, 1 recovery room nurse/ward 60 minutes* 3 days ALOS (inpatient) + 10 minutes*5 revisits	equals labour minutes * (total monthly salary and average monthly labour capacity devt/12)/4 weeks=40 hours*60 minutes per hour	STP defined, WHO, MoH, clinical interviews	$45.00	$ 2,567.88
		2. Cochlear implant programming and switch on	5 mins-triage nurse + 5 minutes*5 revisits , 10 minutes CO/ nurse/ MO diagnosis, 15 minutes treatment, prescription, 1 technician 20 minutes, 1 other pharm tech+ 10 minutes*5 revisits , 1 med engineer 30 hour, 1 audiology specialist 60 minutes+ 10 minutes*5 revisits , 1 theatre nurse 60 minutes, 1 recovery room nurse/ward 60 minutes* 3 days ALOS (inpatient) + 10 minutes*5 revisits	equals labour minutes * (total monthly salary and average monthly labour capacity devt/12)/4 weeks=40 hours*60 minutes per hour	STP defined, WHO, MoH, clinical interviews	$45.00	$ 2,567.88

Table 18: Extrapolation costs for workload service volume

Extrapolations for service volume	Unit cost	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Community/ dispensaries L1,2	$ 8.00	341,000	372,000	403,000	434,000	465,000	496,000	527,000	558,000	589,000	620,000
Health Centers L3	$ 8.00	71,302	77,784	84,266	90,748	97,230	103,712	110,194	116,676	123,158	129,640
SC Hospitals L4	$ 36.00	60,500	66,000	71,500	77,000	82,500	88,000	93,500	99,000	104,500	110,000
CR Hospitals L5	$ 659.59	27,500	30,000	32,500	35,000	37,500	40,000	42,500	45,000	47,500	50,000
Referral Hospitals L6	$ 2,567.88	49,500	54,000	58,500	63,000	67,500	72,000	76,500	81,000	85,500	90,000
Total		550,000	600,000	650,000	700,000	750,000	800,000	850,000	900,000	950,000	1,000,000

Table 19: Operationalizing costing

Strategic Objective 1: To accelerate EHC services through collaboration with stakeholders	BUDGET				
Activity	**2023 /24**	**2024/25**	**2025 /26**	**2026 /27**	**2027 /28**
Disseminate the reviewed EHC strategic plan and implementation guidelines to counties	$ 22,900.80	$ 17,633.60	-	-	-
Advocacy for resource allocation from the National government toward EHC	$ 22,900.80	$ 24,045.00	$ 25,190	$ 26,336	$ 27,450
Strategic Objective 2: To improve access and coverage for ear and hearing care services in the delivery of UHC					
Establish and strengthen ear and hearing care clinics at sub-county facilities	$ 38,167.9	$ 152,671.00	$ 160,305.3	$ 167,938.9	$ 175,572.5
Sensitization of Community health units on EHC services	$ 22,900.80	$ 24,045.00	$ 25,190	$ 26,336	$ 27,450
Establish newborn and infant screening in MCH service centers	$ 22,900.80	$ 24,045.00	$ 25,190	$ 26,336	$ 27,450

Integrate EHC screening in special clinics (Diabetes, TB, Cancer)	$ 7,633.6	$ 8,015.3	$ 8,397	$ 8,778.7	$ 9,160.4
Develop quality assurance standard tools	$ 15,267.2	$ 16,030.6	-	-	-
Strategic Objective 3: To Integrate ear and hearing care in school health programs					
Conduct School based Sensitization on Ear Hygiene & screening of EHC to school going children	$ 76,33.6	$ 8,015.3	$ 8,397	$ 8,778.7	$ 9,160.4
Strategic Objective 4: To enhance capacity building and training of health care workers for delivery of EHC service					
Policy development for training and integration of sign language into the medical training of HCW	$ 19,083.9	$ 20,038.1	-	-	-
Train on Advanced Hearing technology- ENT surgeons, ENT clinical Officers, Audiologists and SLT	$ 45,801.5	$ 48,091.6	$ 50,381.7	$ 52,671.8	$ 54,961.9
Training of PHCWs & CHWs on EHC	$ 22,900.80	$ 24,045.00	$ 25,190	$ 26,336	$ 27,450
Establishment of Mentorship programs for skilled EHC personnel	$ 15,267.2	$ 16,030.6	$ 16,794	$ 17,557.5	$ 18,320.8
Train professions on ear mold and fitting	$ 22,900.80	$ 24,045.00	$ 25,190	$ 26,336	$ 27,450
Strategic Objective 5: To strengthen habilitation and rehabilitation services leveraging on technology					
Develop specification of EHC commodities	$ 22,900.80	$ 24,045.00	-	-	-
Establish mechanisms for dispensing of hearing aids, and other EHC devices through stakeholder engagement	$ 22,900.80	$ 24,045.00	$ 25,190	$ 26,336	$ 27,450
Establish technology sound ear mold laboratories in EHC	$ 22,900.80	$ 24,045.00	$ 25,190	$ 26,336	$ 27,450
Strategic Objective 6: To operationalize monitoring and evaluation mechanism for evidence-based decision making					
Conduct bi-annually data review meetings by M&E team	$ 22,900.80	$ 24,045.00	$ 25,190	$ 26,336	$ 27,450
Establish data collection and reporting of EHC data at all level	$ 19,083.9	$ 20,038.1	-	-	-
Conduct bi-annually EHC data quality audit meetings at county level	$ 22,900.80	$ 24,045.00	$ 25,190	$ 26,336	$ 27,450
Conduct baseline survey on EHC services	$ 19,083.9	$ 20,038.1	-	-	-
Total	$ 438,931.50	$ 567,052.30	$ 470,985	$ 492,747.8	$ 514,226

Table 20: Overall Normative service & operationalization budget projections

Level of Care	unit cost	2023	2024	2025	2026	2027	2028
Community/ dispensaries L1,2	$ 8.00	$ 3,720,000	$ 3,968,000	$ 4,216,000	$ 4,464,000	$ 4,712,000	$ 4,960,000
Health Centers L3	$ 8.00	$ 777,839	$ 829,694	$ 881,550	$ 933,406	$ 985,262	$ 1,037,118
SC Hospitals L4	$ 36.00	$ 2,970,000	$ 3,168,000	$ 3,366,000	$ 3,564,000	$ 3,762,000	$ 3,960,000
CR Hospitals L5	$ 659.59	$ 24,734,531	$ 26,383,500	$ 28,032,469	$ 29,681,438	$ 31,330,406	$ 32,979,375
Referral Hospitals L6	$ 2,567.88	$ 173,331,900	$ 184,887,360	$ 196,442,820	$ 207,998,280	$ 219,553,740	$ 231,109,200
Operationalization and implementation of the Strategic Plan	-	$ 438,931.50	$ 567,052.30	$ 470,985	$ 492,747.8	$ 514,226	-
Total Annual Budget for EHC		**$ 206,026,636.5**	**$ 219,803,606.3**	**$ 233,409,824**	**$ 247,133,871.8**	**$ 260,857,634**	**$ 274,045,693**

Annexes

Annex I: Indicator Definition

Indicator Definition		
Outcome Indicator	**Numerator**	**Denominator**
Proportion of counties with functional EHC committees	Number of counties with functional EHC committees	Number of counties with EHC committees
proportion of county focal persons with basic level of knowledge on EHC	Number of county focal persons scoring 50% and above	Total number of county focal persons
Proportion of EHC facilities equipped to offer comprehensive EHC services	Number of EHC facilities equipped offer comprehensive EHC services	Total number of EHC facilities
Proportion of facilities with available comprehensive EHC services	Number of facilities with available comprehensive EHC services	Total number of EHC facilities
Proportion of patients utilizing EHC services	Number of people receiving EHC services	Number of people needing EHC services
Proportion of schools with Integrated ear and hearing care programs	Number of schools with integrating EHC into the school program	Total number of schools
Proportion of medical institutions of higher learning and universities offering sign language courses in EHC	Number of medical institutions of higher learning and universities offering sign language courses in EHC	Total number of medical institutions
Proportion of health workers practicing skilled EHC practice	Number of health workers practicing skilled EHC practice	Total number of health workers
Proportion of population with congenital cases who accessed Cochlea EHC habilitative services	Number of congenital cases who accessed Cochlea EHC habilitative services	Total number requiring cochlear EHC habilitative services
Proportion of population that access rehabilitative EHC services	Number of populations accessing rehabilitation services	Number of populations requiring rehabilitation services
Proportion of technology sound earmold laboratories established	Number of earmold laboratories established in facilities	Number of facilities needing earmold laboratories
Process indicators	**Numerator**	**Denominator**
Proportion of sub-county facilities providing EHC services	Number of sub county facilities providing EHC services	Total number of sub county facilities
Proportion of individuals utilizing EHC services	Number of people receiving EHC services	Number of people needing EHC services
Proportion of MCH centres conducting new born and infant screening services	Number of MCH centres conducting new born and infant screening services	Total number of MCH centres
Proportion of new-borns and infants screened	Number of new-borns screened	Number of live births
Proportion of patients screened for hearing loss	Number of patients screened in special clinics (diabetes, cancer, TB clinics)	Total number of patients attending special clinics (diabetes, cancer, TB clinics)
Proportion of facilities using quality improvement tool	Number of facilities using quality improvement tool	Total number of facilities
Proportion of schools sensitized in the Country	Number of schools sensitized in the Country	Total number of schools in the country
Proportion of pupils referred from the EH screening in the schools	Number of pupils referred from EHC screening	Number of pupils screened
Proportion of PHCWs trained in EHC	Number of PHCWs trained in EHC	Total number of PHCWs

Annex II: Service List for SP Costing, Budgeting

Level of care	Services
Level1	mobile based (Tablet) Hearing screening community based Elderly hearing screening
Level 2 and 3	**As above plus**
	1.Ear syringing
	2.Foreign Body Removal
	3.Diagnosis and treatment of basic ear diseases
Level 4	**All above plus**
	1.Diagnostic Audiometry
	2.Vestibular testing
	3.Newborn Screening
	4.High risk individual hearing screening
	5Hearing aid fitting
	6.Speech and auditory therapy
	7. Surgical Services (Tympanoplasty, Mastoidectomy middle ear exploration
	8.Aural toilet and Suction
Level 5 and 6	**All above plus**
	1. Cochlear Implant surgery, lateral skull base surgery, oncological surgery
	2. Cochlear implant programming and switch on

Annex III: List of Medical supplies

MEDICAL SUPPLIES BY LEVEL OF CARE			
Item	Quantity	Unit Price	Total Cost
Otoscope Heine Beta 2,5 V K 180	1	$ 400	$ 400
50 reusable Otoscope tips for Heine Beta K 180	1	$ 260	$ 260
Ear syringe	1	$ 110	$ 110
Nasal specular	5	$ 55	$ 275
Bajonnett forceps	10	$ 19	$ 190
Ear wax hooks	20	$ 11	$ 220
Cotton wool holder	20	$ 4	$ 80
Kidney dishes	2	$ 3	$ 6
46070R solid state head portable light with rigid band	1	$ 550	$ 550
Metal tongue depressor	10	$ 4	$ 40
TOTAL			**$ 2,131**
ENT Clinical Equipment at SCH			
Otoscope Heine Beta 2,5 V K 180	2	$ 200	$ 400
50 reusable Otoscope tips for Heine Beta K 180	1	$ 200	$ 200
Ear syringe	2	$ 60	$ 120
Nasal specula	5	$ 40	$ 200
Bajonnett forceps	10	$ 12	$ 120
Ear wax hooks	20	$ 10	$ 200
Cotton wool holder	20	$ 6	$ 120
Kidney dishes	2	$ 6	$ 12
46070R solid state head portable light with rigid band	1	$ 500	$ 500
Suction tips 2 mm	20	$ 11	$ 220
Suction tips 1,5 mm	10	$ 11	$ 110
Suction connector	3	$ 13	$ 39
Ear curettes	10	$ 15	$ 150
Laryngeal mirrors	10	$ 5	$ 50
Punch biopsy forceps for nose/throat biopsies	4	$ 50	$ 200
Myringotomy knifes	5	$ 60	$ 300
Rosen micro sharp needles	10	$ 35	$ 350
Ear biopsy forceps (delicate 4mm)	4	$ 150	$ 600
Microcrocodile forceps (delicate 6 mm)	10	$ 120	$ 1,200
Dry heat sterilizer Type 75	1	$ 600	$ 600
0° Endoscope	1	$ 2,000	$ 2,000
30° Endoscope	1	$ 2,000	$ 2,000
90° Endoscope model 8707DA	1	$ 2,000	$ 2,000
Flexible Endoscope model 11101RP	1	$ 6,000	$ 6,000
Surgical stool (Swivel stool) Ecco-Pedes, soft cast.	1	$ 450	$ 450
ENT units modula with suction 4 cold light sources	1	$ 28,000	$ 28,000
TOTAL			**$ 46,545**

ENT Surgical Equipment at SCH	**Quantity**	**Unit Price**	**Total Cost**
Microscope Kaps SOM 62 with Co-observation tube monocular	1	$ 14	$ 14
Headlight KS70	1	$ 500	$ 500
0° Endoscope	1	$ 2,000	$ 2,000
30° Endoscope	1	$ 2,000	$ 2,000
90° Endoscope model 8707DA	1	$ 2,000	$ 2,000
Flexible Endoscope model 11101RP	1	$ 6,000	$ 6,000
Light source	1	$ 3,000	$ 3,000
Drill machine Chirurgie motor system MD 10	1	$ 5,000	$ 5,000
Suction pump AC30 portable mains and battery	1	$ 650	$ 650
ENT theatre stool Akrus AK 445 Height adjustable heater	1	$ 2,500	$ 2,500
Diathermy Erbotom VIO 50	1	$ 5,000	$ 5,000
Adenotonsillectomy surgical set	3	$ 5,000	$ 15,000
FESS surgical set	1	$ 14,000	$ 14,000
Tracheostomy surgical set	2	$ 3,500	$ 7,000
Laryngoscopy surgical set adult	1	$ 14,000	$ 14,000
Laryngoscopy surgical set child	1	$ 14,000	$ 14,000
Rigid esophagoscopy surgical set adult	1	$ 25,000	$ 25,000
Rigid oesophagoscope surgical set child	1	$ 18,000	$ 18,000
Rigid bronchoscopy surgical set adult	1	$ 18,000	$ 18,000
Rigid bronchoscopy surgical set child	1	$ 18,000	$ 18,000
Tympanoplasty surgical set	2	$ 5,000	$ 10,000
Grommet surgical set	2	$ 1,000	$ 2,000
Mastoidectomy surgical set	1	$ 4,000	$ 4,000
head and neck set surgical set	1	$ 4,000	$ 4,000
Telepac X with Telepack X LED endoscopic video unit	2	$ 13,000	$ 26,000
TOTAL			**$ 220,164**
Furniture and Office Equipment in Secondary Level Institutions	**Quantity**	**Unit Price**	**Total Cost**
Desk	2	$ 400	$ 800
Chair	6	$ 60	$ 360
Cabinet	1	$ 350	$ 350
PC	2	$ 600	$ 1,200
Printer	1	$ 300	$ 300
Scanner	1	$ 200	$ 200
Laptop	2	$ 500	$ 1,000
TOTAL			$ 4,210
Proposed EHC Clinical Equipment in CRH	**Quantity**	**Unit Price**	**Total Cost**
Otoscopes Heine Beta 2,5 V K 180	2	$ 400	$ 800
Bajonet forceps	20	$ 12	$ 240

Nasal specula	30	$ 40	$ 1,200
Tongue depressor (metal)	30	$ 6	$ 180
Ear wax hooks	40	$ 10	$ 400
Cotton wool holder	40	$ 6	$ 240
Suction tips	40	$ 11	$ 440
Suction connectors	5	$ 15	$ 75
Ear curettes	20	$ 15	$ 300
Laryngeal mirrors	20	$ 5	$ 100
Punch biopsy forceps	8	$ 50	$ 400
Myringotomy knifes	4	$ 60	$ 240
Rosen micro sharp needles	8	$ 35	$ 280
Ear biopsy forceps	8	$ 150	$ 1,200
Ear syringes	4	$ 60	$ 240
Microcrocodile forceps delicate 6mm	20	$ 120	$ 2,400
Kidney dishes	8	$ 8	$ 64
Dry heat sterilizer Type 75	1	$ 500	$ 500
0° Endoscope	2	$ 2,000	$ 4,000
30° Endoscope	2	$ 2,000	$ 4,000
90° Endoscope model 8707DA	2	$ 2,000	$ 4,000
Flexible Endoscope model 11101RP	2	$ 6,000	$ 12,000
Surgical stool (Swivel stool) Ecco-Pedes, soft castor	2	$ 500	$ 1,000
ENT units modula with suction 4 cold light sources	2	$ 28,000	$ 56,000
Telepack X with Telepack X LED endoscopic video unit	2	$ 13,000	$ 26,000
Videostroboscope	1	$ 20,000	$ 20,000
TOTAL			**$ 136,299**
Furniture and Office Equipment CRH			
Desk	2	$ 400	$ 800
Chair	6	$ 60	$ 360
Cabinet	1	$ 350	$ 350
PC	2	$ 600	$ 1,200
Printer	1	$ 300	$ 300
Scanner	1	$ 200	$ 200
Laptop	2	$ 500	$ 1,000
TOTAL			$ 4,210
EHC Clinical Equipment in National Teaching & Referral Hospitals	**Quantity**	**Unit Price**	**Total Cost**
Otoscopes Heine Beta 2,5 V K 180	5	$ 400	$ 2,000
Bajonet forceps	50	$ 12	$ 600
Nasal specula	50	$ 40	$ 2,000
Tongue depressor (metal)	50	$ 6	$ 300
Ear wax hooks	100	$ 10	$ 1,000
Cotton wool holder	50	$ 6	$ 300
Suction tips	100	$ 11	$ 1,100

Suction connectors	10	$ 15	$ 150
Ear curettes	50	$ 15	$ 750
Laryngeal mirrors	25	$ 20	$ 500
Punch biopsy forceps	25	$ 50	$ 1,250
Children laryngeal mirrors	25	$ 20	$ 500
Adult laryngeal mirrors	20	$ 20	$ 400
Myringotomy knifes	20	$ 60	$ 1,200
Rosen micro sharp needles	20	$ 35	$ 700
Ear biopsy forceps	40	$ 150	$ 6,000
Ear syringes	6	$ 60	$ 360
Microcrocodile forceps delicate 6mm	100	$ 120	$ 12,000
Kidney dishes	15	$ 8	$ 120
Dry heat sterilizer Type 75	6	$ 500	$ 3,000
0° Endoscope	6	$ 2,000	$ 12,000
30° Endoscope	6	$ 2,000	$ 12,000
90° Endoscope model 8707DA	6	$ 2,000	$ 12,000
Flexible Endoscope model 11101RP	0	$ 6,000	$ -
Surgical stool (Swivel stool) Ecco-Pedes, soft castor	5	$ 500	$ 2,500
ENT units modula with suction 4 cold light sourcesH	5	$ 28,000	$ 140,000
Telepack X with Telepack X LED endoscopic video unit	2	$ 13,000	$ 26,000
Videostroboscope	1	$ 20,000	$ 20,000
TOTAL			**$ 256,230**
Furniture and Office Equipment in tertiary level institutions (CRH, Referrals)	**Quantity**	**Unit Price**	**Total Cost**
Desk	5	$ 400	$ 2,000
Chair	15	$ 60	$ 900
Cabinet	5	$ 350	$ 1,750
PC	5	$ 600	$ 3,000
Printer	1	$ 300	$ 300
Scanner	1	$ 200	$ 200
Laptop	5	$ 500	$ 2,500
TOTAL			**$ 10,650**
Surgical Equipment at the CRH Level	**Quantity**	**Unit Price**	**Total Cost**
0° Endoscope	1	$ 3,000	$ 3,000
30° Endoscope	1	$ 3,000	$ 3,000
70° Endoscope	1	$ 3,000	$ 3,000
90° Endoscope model 8707DA	1	$ 3,000	$ 3,000
Flexible Endoscope model 11101RP	1	$ 6,000	$ 6,000
Telepack X with Telepack X LED endoscopic video unit	1	$ 13,000	$ 13,000
Drill machine Chirurgie motor system MD 10	1	$ 5,000	$ 5,000
Suction pump AC30 portable mains and battery	1	$ 650	$ 650
ENT theatre stool Akrus AK 445 Height adjustable head	1	$ 2,500	$ 2,500

Surgical stool (Swivel stool) Ecco-Pedes, soft castors	1	$ 500	$ 500
Diathermy Erbotom VIO 200	1	$ 8,000	$ 8,000
Co2 Laser CO2 Laser UNILAS 10600	1	$ 60,000	$ 60,000
Microscope with 2 binocular OPMI VARIO 700	1	$ 150,000	$ 150,000
Headlight KS70	2	$ 500	$ 1,000
Adenotonsillectomy surgical set	5	$ 5,000	$ 25,000
FESS surgical set	2	$ 14,000	$ 28,000
Laryngoscopy surgical set adult	1	$ 14,000	$ 14,000
Laryngoscopy surgical set child	1	$ 14,000	$ 14,000
Rigid esophagoscopy surgical set adult	1	$ 25,000	$ 25,000
Rigid oesophagoscope surgical set child	1	$ 18,000	$ 18,000
Rigid bronchoscopy surgical set adult	2	$ 18,000	$ 36,000
Rigid bronchoscopy surgical set child	1	$ 18,000	$ 18,000
Tympanoplasty surgical set	3	$ 5,000	$ 15,000
Grommet surgical set	5	$ 1,000	$ 5,000
Mastoidectomy surgical set	1	$ 4,000	$ 4,000
Head and neck set surgical set	1	$ 4,000	$ 4,000
IPC Console 1898001 with Indigo high-speed drill,	1	$ 50,000	$ 50,000
Facial nerve monitor	1	$ 30,000	$ 30,000
TOTAL			**$ 463,000**
Surgical Equipment at the Referral Hospital Level			
0° Endoscope	3	$ 3,000	$ 9,000
30° Endoscope	3	$ 3,000	$ 9,000
70° Endoscope	3	$ 3,000	$ 9,000
90° Endoscope model 8707DA	3	$ 3,000	$ 9,000
Flexible Endoscope model 11101RP	3	$ 6,000	$ 18,000
Telepack X with Telepack X LED endoscopic video unit	2	$ 13,000	$ 26,000
Drill machine Chirurgie motor system MD 10	1	$ 5,000	$ 5,000
Suction pump AC30 portable mains and battery	3	$ 650	$ 1,950
ENT theatre stool Akrus AK 445 Height adjustable head	3	$ 2,500	$ 7,500
Surgical stool (Swivel stool) Ecco-Pedes, soft castors	3	$ 500	$ 1,500
Diathermy Erbotom VIO 200	3	$ 8,000	$ 24,000
Co2 Laser CO2 Laser UNILAS 10600	2	$ 60,000	$ 120,000
Microscope with 2 binocular OPMI VARIO 700	2	$ 150,000	$ 300,000
Headlight KS70	4	$ 500	$ 2,000
Adenotonsillectomy surgical set	8	$ 5,000	$ 40,000
FESS surgical set	3	$ 14,000	$ 42,000
Tracheostomy surgical set	4	$ 3,500	$ 14,000
Laryngoscopy surgical set adult	2	$ 14,000	$ 28,000
Laryngoscopy surgical set child	2	$ 14,000	$ 28,000
Rigid esophagoscopy surgical set adult	2	$ 25,000	$ 50,000
Rigid oesophagoscope surgical set child	3	$ 18,000	$ 54,000
Rigid bronchoscopy surgical set adult	3	$ 18,000	$ 54,000

Rigid bronchoscopy surgical set child	4	$ 18,000	$ 72,000
Grommet surgical set	8	$ 1,000	$ 8,000
Mastoidectomy surgical set	2	$ 4,000	$ 8,000
Head and neck set surgical set	2	$ 4,000	$ 8,000
IPC Console 1898001 with Indigo high-speed drill,	1	$ 50,000	$ 50,000
Facial nerve monitor	2	$ 30,000	$ 60,000
TOTAL			**$ 1,117,950**
Audiology Equipment at the Health Center Level	**Quantity**	**Unit Price**	**Total Cost**
Screening Audiometer	1	$ 3,000	$ 3,000
Hand held Paediatric Audiometer (Warbler)	1	$ 2,000	$ 2,000
Screening OAE	1	$ 7,000	$ 7,000
Consumables			
Tympanometry Tips	5	$ 150	$ 750
OAE tips	5	$ 150	$ 750
TOTAL			**$ 13,500**
Audiology Equipment at the SCH Level			
Hand held Paediatric Audiometer (Warbler)	1	$ 2,000	$ 2,000
Screening Audiometer	1	$ 3,000	$ 3,000
Diagnostic Audiometer	1	$ 7,000	$ 7,000
Tympanometer	1	$ 7,000	$ 7,000
Screening OAE	1	$ 4,000	$ 4,000
Hearing aid maintenance station	1	$ 3,000	$ 3,000
Consumables			
Tympanometry Tips	5	$ 150	$ 750
OAE tips	5	$ 150	$ 750
TOTAL			$ 27, 500
Audiology Equipment at the CRH level	**Quantity**	**Unit Price**	**Total Cost**
Diagnostic Audiometer	2	$ 7,000	$ 14,000
Diagnostic Tympanometer	1	$ 4,000	$ 4,000
Screening Tympanometer	2	$ 7,000	$ 14,000
Screening OAE	2	$ 7,000	$ 14,000
ABR/ASSR/OAE	1	$ 30,000	$ 30,000
Video Nystagmography	1	$ 25,000	$ 25,000
Sound proof booth 3mx3m	1	$ 10,000	$ 10,000
Hearing aid Verification unit	1	$ 18,000	$ 18,000
Visual Reinforced Audiometry equipment	1	$ 10,500	$ 10,500
NOAH software	1	$ 1,200	$ 1,200
Programing Computer	1	$ 600	$ 600
Printer	1	$ 500	$ 500
Hearing aid maintenance station	1	$ 3,000	$ 3,000
Hand held Paediatric Audiometer (Warbler)	2	$ 2,000	$ 4,000

Hearing aid programmer	1	$ 1,200	$ 1,200
Consumables			
Tympanometry Tips	7	$ 150	$ 1,050
OAE tips	7	$ 150	$ 1,050
Neuroprep/conducting paste	5	$ 150	$ 1,050
Insert phone tips	7	$ 100	$ 500
ABR/ASSR/OAE electrodes	7	$ 150	$ 1,050
Drill bits and burrs for workstation	7	$ 500	$ 3,500
TOTAL			**$ 158,200**
Audiology Equipment at the National Referral Hospital Level	**Quantity**	**Unit Price**	**Total Cost**
Diagnostic Audiometer	2	$ 7,000	$ 14,000
Diagnostic Tympanometer	4	$ 4,000	$ 16,000
Screening Tympanometer	2	$ 7,000	$ 14,000
Screening OAE	4	$ 4,000	$ 16,000
ABR/ASSR/OAE	1	$ 30,000	$ 30,000
Video Nystagmography	2	$ 25,000	$ 50,000
Sound proof booth 3mx3m	2	$ 10,000	$ 20,000
Hearing aid Verification unit	2	$ 18,000	$ 36,000
Visual Reinforced Audiometry equipment	1	$ 10,500	$ 10,500
NOAH software	1	$ 1,200	$ 1,200
Programming Computer	2	$ 600	$ 1,200
Printer	2	$ 500	$ 1,000
Hearing aid maintenance station	1	$ 3,000	$ 3,000
Hand held Paediatric Audiometer (Warbler)	3	$ 2,000	$ 6,000
Hearing aid programmer	2	$ 1,200	$ 2,400
Consumables			
Tympanometry Tips	10	$ 150	$ 1,500
OAE tips	10	$ 150	$ 1,500
Neuroprep/conducting paste	10	$ 150	$ 1,500
Insert phone tips	10	$ 100	$ 1,000
ABR/ASSR/OAE electrodes	10	$ 150	$ 1,500
Drill bits and burrs for workstation	5	$ 500	$ 5,000
TOTAL			**$ 233,300**

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