REPUBLIC OF RWANDA

MINISTRY OF HEALTH
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NATIONAL EAR AND HEARING CARE PLAN

2018-2024

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ABBREVIATIONS AND ACRONYMS

BCC	Behavior Change Communication
CBHI	Community Based Health Insurance
CBM	Christian Blind Mission
CHUB	Centre HospitalierUniversitaire/University Teaching Hospitalof Butare(UTHB)
CHUK	Centre HospitalierUniversitaire/Univesity Teaching Hospital of Kigali (UTHK)
CHWs	Community Health Workers
CMHS	College of Medical and Health Sciences
CPD	Continuous Professional Development
CSOM	Chronic Suppurative Otitis Media
CSOs	Civil Society Organizations
DFID	Department for International Development
DH	District Hospital
DHMT	District Health Management Team
DHU	District Health Unit
DPs	Development Partners
EAC	East African Community
EHC	Ear and Hearing Care
EICV	Household Living Conditions Survey
EmONC	Emergency Obstetrical and Neonatal care
EMR	Electronic Medical Records
ENT	Ear Nose and Throat
EPI	Expanded Program of Immunization
FBOs	Faith Based Organizations
MCH	Maternal and Child Health
MDGs	Millennium Development Goals
MIFOTRA	Ministry of Labor and Public Service
MIGEPROF	Ministry of Gender and Family Promotion
MINALOC	Ministry of Local Government
MINECOFIN	Ministry of Finance and Economic Planning
MINEDUC	Ministry of Education
MININFRA	Ministry of Infrastructure
MoH	Ministry of Health
MTR	Mid-Term Review
NCC	National Children Council
NCDs	Non Communicable Diseases
NCPD	National Council of People with Disabilities
NEHCP	National Ear and Hearing Care Plan
NGOs	Nongovernmental Organizations
NISR	National Institute of Statistics Rwanda
NNMC	National Nursing and Midwifery Council
NPA	Norwegian People Aid
NRH	National Referral Hospital
NST	National Strategy for Transformation
OAU	Organization of African Unity
OPD	Outpatient Department
PH	Provincial Hospital
PWD	People With Disabilities
RAHPC	Rwanda Allied Health Professional Council
RBC	Rwanda Biomedical Centre

RGAC	Rwanda Governance Advisory Council
RMC	Rwanda Medical and Dental Council
RMH	Rwanda Military Hospital
RNUD	Rwanda National Union of the Deaf
ROHNSS	Rwanda Otolaryngology, Head and Neck Surgery Society
SDGs	Sustainable Development Goals
SMM	Senior Management Meeting
SOPs	Standard Operating Procedures
SPIU	Single Project Implementation Unit
TWG	Technical Working Group
U-5	Children aged under five years
UN	United Nations
UNDP	United Nations Development Program
UNICEF	United Nations Children's Fund
UR	University of Rwanda
USAID	United States Agency for International Development
USD	United States Dollar
UTH	University Teaching Hospital
VSO	Voluntary Services Overseas
WHA	World Health Assembly
WHO	World Health Organization
YLD	Years Lived with Disability

FOREWORD

The National Ear and Hearing Care Plan has been developed in line with the Health Sector Policy and the 4th Health Sector Strategic Plan (2018-2024), whose overall goal is to continuously put in place an effective healthcare system capable of providing increasingly specialized services, that focus on healthcare accessibility, affordability, quality, efficient delivery of healthcare, and the use of technology as enablers to achieving Universal Health Coverage.

To date, Ear and Hearing Care has been provided in the national referral hospitals, and is still considered as a specialized service, with limited access by the general population. Based on existing realities and the national vision, the NEHCP will facilitate streamlining efforts for the prevention and treatment of ear and hearing impairments in Rwanda. Using a public health approach integrated into the country's health system and service delivery, the National Ear and Hearing Care Plan will improve access to Ear and Hearing Care services across the country.

As per the WHO estimates, hearing loss is increasingly becoming the most common sensory deficit in humans, with some 5.3% of the population worldwide affected, mainly children. Even if hearing loss and deafness are silent and do not often attract public attention, they have several negative consequences on individuals, families, communities and countries.

Many causes of hearing loss can be prevented or mitigated, including otitis media, exposure to excessive noise, exposure to ototoxic substances, and vaccine-preventable infectious diseases. The objective of the NEHCP is to translate into action the mission of Rwanda's Health Sector, that is to provide and continually improve affordable promotional, preventive, curative and rehabilitative healthcare services of the highest quality in the field of ear and hearing care, thereby contributing to the reduction of poverty and enhancing the well-being of the population.

The Government of Rwanda has deployed important efforts to improve the health status of the population and commendable results have been achieved. The National Ear and Hearing Care Plan will help to reduce the prevalence, incidence, and impact of hearing loss in the community, through public health approaches that are integrated with the country's health system and service delivery. Also it will facilitate the mobilization of additional efforts needed to address ear and hearing issues and to coordinate all stakeholders involved in this area of healthcare.

On this note, I would like to acknowledge the contributions of institutions, organizations and individuals who contributed to the development of this plan. Thanks to all public institutions, civil society organizations and development partners who sent their technical staff to provide their expertise in the development of the plan. Special thanks to Starkey Hearing Foundation for their financial support and valuable expertise provided throughout the whole process of the National Ear and Hearing Care Plan.

Dr. Diane GASHUMBA
Minister of Health

TERMINOLOGY FOR EAR AND HEARING CARE

Table 1: Terminology for Ear and Hearing Care

Audiologist	Health Professionals who deal specifically with hearing, balance, and similar problems. Audiologists have expertise in non-medical areas of hearing services, including complex hearing assessment and rehabilitation of hearing impairment. A professional who has completed a prescribed certificate course in hearing aid prescription and evaluation
Audiological assistant	A professional who has completed a certificate course in hearing aid prescription and evaluation.
Deaf	A person who cannot hear. When referring to a deaf person, 'Deaf' refers to deaf people in general.
Hearing device or Hearing aid	Device designed to improve hearing for purposes of hearing rehabilitation, including the ear mould and any other attachments necessary for the operation of the device.
Hearing loss	There are three types of hearing loss • conductive hearing loss (when sounds are blocked from reaching the hearing nerve) • sensorineural hearing loss (when sounds can reach the hearing nerve but are not sent to the brain) and • mixed hearing loss (a combination of conductive and sensorineural hearing loss).
Hearing loss	Also known as hearing impairment, is a partial or total inability to hear. Hearing loss may occur in one or both ears. It can be temporary or permanent.
Disabling hearing loss	Hearing loss greater than 40dB in the better hearing ear in adults and a hearing loss greater than 30dB in the better hearing ear in children.
Hearing services	Hearing services may include the assessment of hearing loss and hearing rehabilitation.
Otologist or Neurotologist	This ENT specialist focusses specifically on the ear. Otologists focus on diseases of the ears and perform related surgeries to correct these disorders.

Hearing aid specialist **Hearing aid technician**	This refers to a specialist in the selection, fitting, and adjustment of hearing aids. Some of them have attained independent board certification as Hearing Instrument Specialists (BC-HIS) by the International Hearing Society.
Otolaryngologist or **ENT (ear, nose, and throat) doctor**	• This refers to a physician who has received advanced training in medical conditions involving the ear, nose, and throat. ENT specialists diagnose and treat diseases of the ear, and carry out medical and surgical treatments for certain types of hearing loss. .
Conductive Hearing Loss	This is attributed to problems with the ear canal, ear drum, or middle ear and its little bones (the malleus, incus, and stapes).
Sensorineural Hearing Loss	This is due to problems of the inner ear, also known as nerve-related hearing loss.
Mixed Hearing Loss	This is caused by a combination of conductive damage in the outer or middle ear and sensori-neural damage in the inner ear (cochlea) or auditory nerve.
Otitis media	This refers to the inflammation of the middle ear

EXECUTIVE SUMMARY

The Rwanda National Ear and Hearing Care Plan (NEHCP) is a sub-strategic plan of the Rwanda Fourth Health Sector Strategic Plan (HSSP IV) that was adopted by the Rwanda Health Sector in 2018. HSSP IV has determined important strategic directions that will guide the sector over the seven years ahead, including those in relation to ear and hearing loss: strengthening the prevention of hearing loss through safe motherhood and immunization, as well as early identification and treatment of causes of preventable hearing loss, and investing in specific rehabilitation services by making available affordable hearing devices.

The NEHCP aims at finding lasting solutions to existing challenges for ear and hearing care in Rwanda. It provides orientations on how to address ear and hearing care challenges that were identified in infrastructure and equipment, staff, prevention, care, and rehabilitation (service delivery). It also proposes approaches for a better stakeholder coordination in terms of implementation and resource mobilization.

The NEHCP priorities are the following:

- Preventing all avoidable causes of hearing loss and deafness, disease, and injury (trauma, noise pollution).
- Scaling up, strengthening, decentralizing and integrating ear and hearing care services across the Rwanda healthcare system;
- Ensuring universal coverage of rehabilitation services and packages for all persons suffering from hearing loss and deafness;
- Raising public awareness on causes and issues of ear and hearing care

The plan covers a period of seven years (2018-2024), and outlines interventions and actions to be undertaken by various stakeholders, including public institutions and agencies, development partners, and non-government organizations.

0. INTRODUCTION

0.1 Background and Context

Estimates by the World Health Organization(WHO) show that most of situations that lead to hearing loss are preventable. This is because around 60% of hearing loss observed in children can be prevented through the implementation of public health strategies. In addition, for those who have hearing loss, appropriate interventions can highly improve their quality of life.

Based on the above evidence, the resolution WHA 48.9 in 1995 urges member states to prepare national plans for the prevention and control of major causes of avoidable hearing loss, especially for early detection and management within the framework of the primary healthcare system.

In Rwanda, the 2012 population and household census estimated that 5% (446,453) of the national population were persons with disabilities (PWDs). Hearing and speaking impairments seem to be rarer, at respectively 8% and 4% of the population with a disability (NISR, Rwanda 4th Population and Housing Census, 2012). According to the same census, 68% of all sight-related disabilities have been caused by a disease or illness, and this is the case for 64% of all hearing disabilities, while congenital factors are the second cause of hearing loss (23%).

With regard to Ear and Hearing Care provision in Rwanda, it is still considered as a specialized healthcare service and has not yet been designed to fit across the continuum of care in the Rwanda Healthcare system. There is still a shortage of qualified personnel (especially ENT surgeons, audiologists, sign language translators, and speech therapists) and a limited number of appropriate infrastructure for a proper prevention, treatment, rehabilitation, socio-economic reintegration in relation with Ear and Hearing care, as well as the management of hearing disorders. The Education of people with hearing loss and impairment is usually provided in the few existing "Deaf Schools" and is mostly supported by non-government actors, such as faith-based organizations.

It is against this background that the Rwanda Ministry of Health, in collaboration with its key stakeholders, has decided to develop a National Ear and Hearing Care Plan. The development of the NEHCP aligns with the Universal Health Coverage main goal and the Government of Rwanda resolution that "No One Should Be Left Behind". It seeks to implement two strategic directions in the Health Sector Strategic Plan 2018-2024 (HSSP IV):

- Strengthening the prevention of hearing loss through safe motherhood and immunization and early identification and treatment of causes of preventable hearing loss.
- Investing in specific rehabilitation services by availing making hearing devices available and affordable for all people in need in Rwanda.

0.2 Purpose of NEHCP

The National Ear and Hearing Care Plan (2018-2014) translates into actions the mission of Rwanda's Health Sector: continuous provision and improvement of affordable promotional, preventive, curative, and rehabilitative healthcare services of the highest quality. It lays out strategies and interventions that are meant to significantly reduce the risk of hearing loss and improve the management of hearing impairments in Rwanda. The plan is expected to contribute to the decrease in the prevalence and incidence of hearing loss in Rwanda. Furthermore, it will facilitate the streamlining of efforts for the prevention and treatment of ear and hearing impairments and loss in Rwanda.

0.3 Process for the development of the NEHCP

The development of the NEHCP consisted of the following six key phases:

- A "desk review" of existing national and international documents related to Ear and Hearing Care was conducted to get baseline information for ear and hearing care in Rwanda;
- An analysis of the Rwanda health system and stakeholders has been conducted to identify existing actions and problems in the field of ear and hearing care;
- In order to collect opinions and inputs of stakeholders, two consultative workshops have been organized. The first workshop was focused on discussions about the situation of ear and hearing care in Rwanda. This workshop allowed to identify and agree on challenges and gaps;
- Based on data from the situational analysis, a draft NEHCP was prepared and shared with all participants in the first workshop for inputs. The second workshop considered and discussed the draft NEHCP and allowed a consensus on strategic objectives, strategic interventions, implementation, and monitoring mechanisms;
- Right after the second workshop, all relevant inputs and comments were integrated, and a new draft of NEHCP was produced and submitted to stakeholders for review and additional inputs. A one-week period was given to all stakeholders to send in their feedback.
- The last step for the development of the plan was its costing. After the costing, the final plan was submitted to the Ministry of Health to go through the internal approval and validation process of strategic documents.

1. SITUATIONAL ANALYSIS

1.1 Population Profile

Rwanda has 11.8 million people (estimation of 2016), of which 48% are youths aged under 17 years. The majority of the population lives in rural areas (71%), and depends on agriculture, which contributes to 30% of GDP (2016). For the last 15 years, Rwanda has registered important achievements in terms of socioeconomic development. For instance, Rwanda has achieved all health-related MDG targets, and all health indicators have been improving steadily.

Table 2: Progress of Key Health Sector Indicators

Indicator	Year 2000	Year 2015	Source
Life Expectancy at Birth (projection 2017) in years	38.1	66.6	2012 Census
Maternal Mortality Ratio/Live Births(/100000)	1071	210	DHS
Infant Mortality Rate/Live births(/1000)	107	32	DHS
Under-five Child Mortality/Live Births(/1000)	196	50	DHS
Total Fertility Rate	6.5	4.2	DHS
Prevalence of Modern contraception	4%	48%	DHS
Proportion of Births attended in health facilities	23	91	DHS
Proportion of Children aged 12-23 months fully immunized	69	93	DHS
Acute malnutrition among U-5 children	7%	2%	DHS
Chronic malnutrition among U-5 children	51% (2005)	38%	DHS
Average minutes to reach a nearby health facility	95.1 (2005)	56.9	EICV
Proportion of people covered by a health insurance	7 (2003)	90 (2017)	MoH

1.2 Organization of Rwanda's Health System

1.2.1 Health Facilities

The national health system comprises of fourlevels of service delivery, from the community level tothe national level. It provides integrated and continuous care that starts with the community and goes throughhh health posts and health centers, district hospitals, provincial hospitals, up to the national referral hospitals. There is good geographical coverage with a functional referral system, and an adequate fleet of ambulances for the pre-hospital and emergency services. Healthcare packages have been revised for each level (2017). At each level of administrative structure there is a corresponding healthcare structure.

Table 3: Structure of the National Health System

	Administrative structure	Number	Health structure	Number
1	Village (Umudugudu)	14,837	CHWs	45,516
2	Cell (Akagari)	2,148	Health Posts	522
3	Sectors (Umurenge)	416	Health Centers	503
4	District (Akarere)	30	District Hospitals	36
5	Provinces	4	Provincial Hospitals	4
6	National Level	1	National Referral Hospital	8

Source: HMIS 2018

At the community level, Community Health Workers (CHWs), live in close contact with the population, and participate in the disease prevention, treatment and health promotion programs. Health Centers and health posts are responsible for the majority of infectious disease consultations and all common promotional and preventive interventions.

District hospitals provide preventive and curative healthcare (secondary healthcare). At the tertiary level, referral and provincial hospitals provide specialized healthcare services to cases referred from district hospitals.

Referral and provincial hospitals provide more advanced specialized healthcare services and conduct research. They also have teaching and training for medical staff in their package.

1.2.2 Leadership and Governance

To date, there is no specific policy, strategy, or plan that is exclusively dedicated to ear and hearing care in Rwanda. However, aspects of ear and hearing care are integrated in different policy and legal documents.

For instance, the HSSP IV insists on the need to strengthen the prevention of hearing loss through safe motherhood and immunization, as well as early identification and treatment of causes of preventable hearing loss; it also calls for more investments in specific rehabilitation services by availing and making affordable hearing devices for all people in need in Rwanda.

1.2.3 Legal and policy context

Rwanda has ratified the United Convention on the Rights of Persons with Disabilities which promotes, protects, and ensures the full and equal enjoyment of all human rights and fundamental freedoms by all persons with disabilities.

Rwanda is one of the countries which have ratified the international conventions and protocols related to the rights of persons with disabilities: the UN Convention on the Rights of Persons with Disabilities and its Optional Protocol (ratified on 15th December 2008), the UN Convention on the Rights of the Child (ratified September 1990), the UN Guidelines for the Alternative Care of Children, the African Charter on the Rights and Welfare of the Child (OAU 1999), article 13, Rwanda has also enacted national legal and policy instruments for the protection of the rights of persons with disabilities, including those affected by hearing loss. The instruments in place include:

- Law no. 01/2007 relating to the protection of disabled persons,
- Ministerial Order n°05/09 of 30/03/2009 establishes modalities of State assistance to a needy disabled person.
- Law n° 054/2011 on the Rights and the Protection of the Child (December 2011),
- Organic Law n° 04/2005 determining the modalities of protection, conservation and promotion of the environment in Rwanda that provides for noise-induced pollution (art.37 and 108),
- Integrated Child Rights Policy (2011);
- Disability Mainstreaming Guidelines (2014)
- Early Childhood Development policy and strategy (2016);
- Social Protection policy and strategy,
- Health Sector Policy
- Community Based Health Insurance policy and law,
- Occupational health and safety policy (2014),
- National Policy on Inclusive and Special Needs Education 2015

All these legal and policy documents talk about the protection and rehabilitation of people with disabilities and highlights what should be for those affected or at isk of being affected by hearing loss.

1.2.4 Institutional framework

There are many institutions whose mandate and missions contribute or influence ear and hearing care in Rwanda. On the side of public institutions, there is a social cluster which brings together Ministries and institutions whose mission and mandate play a role in the protection of disadvantaged persons, including those affected or at the risk of being affected by hearing loss.

There are also other non-government stakeholders who play a big role in the rehabilitation of people with hearing impairments. The Rwanda National Union of the Deaf (RNUD) brings together all categories of deaf people to address their social, economic, cultural and political needs. The Rwanda Otolaryngology, Head and Neck Surgery Society (ROHNSS) is also an association of ENT specialists who have committed to fostering effective and efficient ENT services in the country.

1.2.5 Health workforce

The number of health professionals in the area of ear and hearing care is still limited in Rwanda, there is a very serious shortage of ear care providers across all categories. Of the 1392 registered medical doctors operating in Rwanda by 2016, only 13 are (ENT) specialists, mostly deployed in the 4 national referral hospitals (CHUK, CHUB, RMH, KFH) and some private clinics. ENT training is included in the Human Resources for Health (HRH) program.

1.2.6 Medical Products and Health Technology

The Rwanda Ministry of Health regularly publishes a list of minimum medicines and other commodities needed for a basic healthcare system. Those medicines are subsidized and distributed as a priority to the public sector. However, on the latest list published in 2015, most of ENT pharmaceutical products including hearing devices were not included. This makes it complicated for health insurance to include these products in items that they cover for their clients.

1.2.7 Health Financing

Ear and hearing care services are included in the national health system, up to referral hospitals. Medical consultations related to ear and hearing care are covered by health insurance. The issue with the health financing of ear and hearing care is that only a limited number of medical products and devices that are covered by health insurance because they are very expensive. There is hope that this issue will be gradually addressed through the implementation of the new Public Health Facilities Service Packages that was developed in 2017.

1.2.8 Health Information and Research

In terms of health information and research, the Ministry of Health conducts population based surveys and studies, and tracks routine health facility data using the Health Management Information System (HMIS). Health facility data related to ENT are currently collected at tertiary level. There is a need to define EHC specific indicators to ensure proper data management for this field. However, disabilities are included in the data collected during the national population and housing census and it is disaggregated according to the categories and causes of disability, even if the cause is not known for a large proportion of cases.

For research, the MoH has the National Health Research Agenda and the guidelines to ensure all the research conducted in the health sector is aligned with the national and sector priorities. Currently, many

research papers have been published on disability in general. Some operation research papers on EHC have been published and several dissertations are being presented by ENT students. Those documents have been consulted and used to inform the planning process.

1.3 Stakeholder analysis

To date, there are six centers exclusively dedicated to the care of deaf children and adult persons. There are two centers in Huye District, and one Center in Musanze, Nyabihu, and Nyagatare Districts. There are over 40 other centers providing care and rehabilitation services for different types of disabilities, including hearing loss. Most of these centers are owned by charity and faith-based organizations. However, there is a close collaboration between the centers' owners and the Government of Rwanda, which pays salaries for the teachers and other technicians working in these centers.

In the public sector, the Ministry of Local Government (MINALOC), the Ministry of Gender and Family Promotion (MIGEPROF), the Ministry of Education (MINEDUC), and the National Council of Persons with Disabilities (NCPD), are key partners in mainstreaming healthcare services for people with disabilities, including those with hearing loss, across social protection programs.

The Rwanda National Union of the Deaf (RNUD) has been established as a forum to advocate for all categories of deaf people and to address their social, economic, cultural and political needs. Among organizations involved in ear and hearing care is The Starkey Hearing Foundation, which has been key in the distribution of hearing aids, infrastructure, policy advocacy, research, capacity building, and training in Rwanda.

1.4 The status of EHC in Rwanda

Data from the Rwanda 2012 population and household census estimated the prevalence of hearing disability at 0.4%. Moreover, of all people with disability in Rwanda, 16% have hearing disability. With regard to the cause behind hearing impairment, 64% of all hearing disabilities and speaking impairments were reported to have been caused by a disease or illness, with congenital factors being the top cause.

A study conducted by Edgard Gasanain CHUK in 2014, observed that 58% of the 394 patients suffering from hearing loss presented mild hearing loss, 29.4% of hearing loss was moderate, 6% was severe, and 1% was profound. Moreover, the right ear was involved in 23.3% of hearing loss, and 37.9% concerned the left ear, while both ears were involved in 38.8% of all hearing loss cases. The study identified chronic suppurative otitis media (CSOM: 35%), head trauma (13.95%), ageing (11.42%) and otitis media (7.4%), ototoxic medicines (4.8%), sensori-neural hearing loss (4.3%), and ear wax (3.8%) as the lead causes of hearing impairments.

The causes of hearing loss were not determined in 15.22% of the patients and both sex were equally affected. Hereditary (genetic) causes were responsible for more than 50% of hearing loss among

children. Due to the importance of hearing for pursuing studies, most of the patients were students (50%). It is thought that other categories of the population do not systematically seek healthcare as ear disease may not be harmful (Gasana, 2014).

Another situation concerns the availability and utilization of hearing devices. In a study conducted in schools for children with hearing loss, 55.1% of participants had previously used hearing aids for hearing amplification but, of those, 86.5% reported no improvement in functional hearing, 11.5% reported that the HA received had worsened their situation. Only 2% of participants reported an improved hearing capacity. None of the participants was using a hearing aid at the time of the study (Gasore Aaron, 2017).

The accessibility to ENT healthcare services is currently inadequate, mainly because of the high cost, the limited number of healthcare facilities with ENT services, and the limited number of ENT health professionals.

To date, ENT services are available in only 4 national referral hospitals and in Rwamagana Provincial Hospital, and there are only 13 licensed operational ENT specialists grouped in the Rwanda Otolaryngology, Head and Neck Surgery Society (ROHNSS).

Efforts to prevent hearing loss are mainstreamed across the Maternal and Child Health Program through the following components: Emergency Obstetric and Neonatal Care (EmONC), Expanded Program of Immunization (EPI) and the Integrated Management of Childhood Illnesses (IMCI).

For patients already victims of hearing loss and deafness, rehabilitation programs exist: special schools for deaf (Huye, Kigali, Musanze, Nyabihu, Nyagatare, etc., mixed special schools for children with disabilities, and mainstream schools (92 schools). Dispensing of hearing aids is currently done at the Rwanda Military Hospital, but the cost is prohibitive. SHF has, over the years, donated hearing aids to patients in need, but the demand is still enormous. Most rehabilitation programs are funded through charity organizations.

1.5 SWOT table: Summary of the status of EHC

STRENGTHS	WEAKNESSES
• **Presence of legislation, policies, and strategies** promoting the rights of people with disabilities • Existing of EHC services in referral hospitals • Existence of ENT guidelines for tertiary level • Existence of a local training program for ENT specialists • Strong maternal and child health programs: EmONC, IMCI, Immunization programs that contribute to the prevention of hearing loss related to infections • High coverage of health insurance	• Centralization of EHC service and lack of EHC service packages at primary and secondary levels of healthcare system • Lack of trained audiologists and speech therapists to provide specialized services. • Lack of strategy for the distribution and maintenance of hearing aids • Lack of coordination of stakeholders due to the absence of national EHC strategy and mapping. • Insufficient services for deaf and deaf-blind people • Lack of systematic screening for children with potential hearing loss • Quality care (e.g.: sign language interpreters in health facilities)
OPPORTUNITIES	**THREATS**
• Presence of development partners working in the field of EHC. • Existence of statistical data at national and district levels • National Council of Persons with Disabilities • Presence of associations dedicated to the rights of people with disabilities in general and people with hearing impairments in particular. • A decentralized healthcare system	• High cost of EHC services and hearing aids • Dependency on charity organizations for funding EHC services; • Absence of EHC medicines in the WHO and National List of Essential Medicines • Absence of a clear supply chain for hearing aids (from procurement to end-user delivery)

2. PRIORITY OF THE NEHCP

The NEHCP draws from the mission and vision of the National Strategy for Transformation (NST), the Health Sector Policy, and the Health Sector Strategic Plan (HSSP IV). In view of gaps and weaknesses identified in the situation analysis above regarding EHC in Rwanda, this National Ear and Hearing Care Plan aims at ensuring universal accessibility (geographical and financial) to **quality Ear and Hearing Care services** (preventive, curative, rehabilitative and promotional services) for all Rwandans in need. More specifically, the following key priority areas will guide national efforts to improve EHC for the next seven years (2018-2024) are:

- Strengthening the leadership and governance of efforts for Ear and Hearing Care in Rwanda;
- Raising public awareness on risk factors, causes, prevention measures, and available care and support services for the management of ear and hearing loss in Rwanda;
- Scale-up of EHC services across the Rwanda healthcare system through a comprehensive institutional capacity development and health system strengthening: infrastructure, equipment, training, EHC workforce, service delivery, health information, and research.

2.1 Strategies and interventions to address identified gaps and challenges

2.1.1 Strengthening the leadership and governance of efforts for Ear and Hearing Care in Rwanda

Challenges/Gaps	Strategies/Interventions
1. Limited coordination of stakeholders and interventions, as well as the reporting mechanisms on EHC interventions	• Integration of EHC in the existing coordination structures at central and decentralized levels. • Develop and implement national guidelines for the implementation of ear and hearing care interventions
2. Legal and policy framework for ear and hearing care not satisfactorily implemented	• Review the existing ENT guidelines and adapt them to the existing structure of healthcare provision from the Community to Referral level • Strengthen the enactment and enforcement of legal and regulatory framework

2.1.2 Scale-up of EHC Service Delivery and institutional capacity development

2.1.2.1 Service delivery

Challenges	Strategies/Interventions
• EHC services centralized in referral hospitals	• Develop national outreach program for specialized EHC services, targeting mainly schools as places where it's possible to reach the maximum number of children with the ear and hearing problems. These are one of the underlying causes for school under-performance, and they often go unrecognized when at the low/middle phase.

	• Decentralize and integrate EHC services across Rwanda's healthcare system.
• EHC minimum packages not well defined at different levels of Rwanda's healthcare system	• Define and implement minimum packages of EHC services at each and every level of the Rwanda healthcare system;
• Limited number of EHC medicines from the essential medicine list, which makes it complicated for health insurance companies to fully consider EHC in the packages they cover.	• Review existing EHC treatment and services packages, develop and implement national guidelines for EHC, and update the existing health service package at different levels.

2.1.2.2 Infrastructure and equipment

Challenges	Strategies/Interventions
• Shortage of equipment and infrastructure at all levels	• Ensure that Health Centers, District Hospitals, and Referral Hospitals are equipped with up–to-date tools, equipment, and infrastructure for appropriate provision of ear and hearing care services at their respective levels.
• Limited accessibility and availability to medical products, commodities, and devices for ear and hearing care services.	• Adopt and implement a national policy for ensuring the availability of and accessibility to ear and hearing care medical products, commodities, and devices that are not covered by health insurance.
• EHC -procedures and devices not available at all levels	• Inclusion of hearing devices in the current tariffs for reimbursement by existing health insurance schemes • Advocate for inclusion of procedures in the WHO essential list of medicines and procedures • Engage the Private Sector to establish the plant for production of hearing devices • Consider making assistive devices more accessible by all the population through the centralization of their procurement/supply chain at national decentralized level (one basket funding)
• Limited accessibility to existing ear and hearing care facilities and services	• Ensure the integration of Ear and Hearing care services into normal healthcare service delivery at every level in the Rwanda healthcare system • Develop, disseminate, and/or integrate training modules or guidelines/ medical protocols in the existing training/guide of the healthcare service providers on how to conduct early

	screening and referral of hearing loss across the Rwanda healthcare system.

2.1.2.3 Workforce

CHALLENGES	STRATEGIES/INTERVENTIONS
• **Limited number of skilled personnel at all levels**	• Organize in-services training for personnel at different levels (CHW, Nurses, Medical Doctors) • Strengthen and continue investing in the local training of specialized healthcare providers required at every level of ear and hearing care.

2.1.2.4 Monitoring and Evaluation, Information System, Research

CHALLENGES	STRATEGIES/INTERVENTIONS
• Health Facility data about EHC are not routinely and properly collected by all health facilities • EHC indicators not clearly defined in the Rwanda Health Management Information system • No mechanisms to track data on children or other people in the rehabilitation centers; • Limited number of researches on EHC in Rwanda.	• Integrate EHC in the Rwanda Health Management Information Systems; • Establish and strengthen mechanisms to track data on EHC services provided by specialized rehabilitation services and avail the detailed tool that can capture all information on the disease (ENT problem); • Promote targeted researches on EHC interventions in Rwanda.

2.1.3 Public awareness raising on EHC

CHALLENGES	STRATEGIES/INTERVENTIONS
• Limited knowledge about risk factors for ear and hearing loss and impairment.	• Raise the awareness of the general population on all aspects of ear and hearing care; • Promote the early seeking of medical care in case of hearing loss, when there is still more chances for treatment/rehabilitation;
• Limited compliance with laws, policies and regulations for minimizing risk factors for hearing loss or accidents.	• Ensure that laws, policies and regulations for minimizing risk factors for hearing loss or accidents are implemented and enforced by all concerned parties

3. MAINSTREAMING EAR AND HEARING CARE SERVICES

The Ear and Hearing Care service delivery is composed by prevention activities, early detection and identification, management (medical and surgical treatment), referral system, medical rehabilitation of hearing and speech disorders, supply and distribution of hearing aids, and awareness and information campaigns.

3.1 Community Health Centers (Primary Healthcare)

Their primary mandate will be to ensure early detection and identification of ear and hearing problems: Parents, community health workers, school teachers, nurses, midwives and other health providers at the primary healthcare level, will be sensitized and/or trained on ear and hearing care. Selected and trained school teachers will be able to screen the children in the school under the supervision of health centers and identify those with ear or hearing problems and refer them for appropriate management. Screening campaigns for children and adults will be carried out during the Maternal and Child Health Week. They may also be integrated in the agenda of Army and Police Weeks, as well as combined with eye healthcare actions. The community Health EHC package:

- Promotion of ear and hearing health by creating public awareness
- Promoting and teaching of healthy ear and hearing habits
- Training of CHWs on ear and hearing care
- Training of teachers on EHC screening in schools
- Creation of awareness of avoidable causes of hearing loss and ear disease
- Carrying out public health actions through promotion and implementation of community MCH programs
- Protection against excessive noise and improving the acoustic environment.
- Promoting and enabling the identification of ear disease and hearing loss in infants, children and adults
- Carrying out screening of children in schools
- Referring cases of suspected hearing loss for hearing tests and ear check-ups
- Promoting the integration of people with hearing loss in the community.
- Preventing harmful noise and screening for hearing loss in workplaces

3.2 Health Centers (Primary Ear and Hearing Care)

At this level, Health Centers will be the mainly responsible for the early treatment of ear diseases. EHC will be integrated into normal healthcare delivery. Trained nurses, midwives and doctors in outreach visits will be able to identify and treat on time, all common ear diseases and conditions that are responsible for hearing loss, such ear wax, acute otitis media, foreign bodies, screen for hearing loss in general. Simple methods like the WFA® Community-based hearing healthcare method can be used to identify, treat, and rehabilitate people with hearing loss in the community. Patients requiring special diagnostic facilities, complicated cases, and those needing surgical intervention will be referred to the District hospital. The screening of children in schools will be supervised at this level, with no speech infrastructure needed. Specific equipment for primary Ear and Hearing Care will be progressively provided in health centers for this preventive measure.

3.3 Secondary Healthcare: District Hospital Package

At the level of secondary healthcare, District Hospitals will be responsible for the treatment of ear diseases and complicated cases. In accordance with the health services package assigned to the District Hospital, complicated cases and those requiring specialized diagnostic will be managed by the ENT service at this level. ENT doctors and Audiologists will provide comprehensive preventive, promotional, curative, and medical rehabilitative services.

Basic equipment like otoscope, hearing assessment machine, equipment to remove foreign bodies, headlight, designated room or special room, and theatre will be needed at this level. The comprehensive list of clinical and surgical equipment needed to create an EHC service in the district level is annexed to the plan.

Pediatricians will treat ear diseases occurring in children to prevent the progress to disabling hearing loss and deafness. At this level, they liaise and coordinate with rehabilitation centers for the integrated and holistic management of hearing impairment. Some ear and hearing problems addressed in district hospitals include: repair of keloids, hearing aid fitting, audiometry, tympanometry, hearing loss screening and diagnosis, ear trauma, and ear infections.

3.4 Tertiary Healthcare: Referral and Teaching Hospitals

At the tertiary healthcare level, referral and teaching hospitals will be providing specialized treatment, Surgery, and rehabilitation therapy for ear and hearing impairments.

All patient cases that are complicated or that are identified as having an ear problem that either requires surgery, hearing aids, or rehabilitative therapy will be referred to the ENT services and Audiologist at the referral level. The referral level may be the provincial hospitals (under renovation and upgrading) or referral hospitals, but ENT units need to be created in most hospitals.

The supply, prescription, and provision of hearing aids may be made at this level, according to the regulations, guidelines, and protocols to be established. As for the district level, linkages and coordination will be made with rehabilitation centers for integrated and holistic care. Speech therapy and hearing therapy may be provided by Audiologists at the referral level.

Basic equipment for EHC services in provincial and referral hospitals comprises at least: otoscopes, diagnostic tools, hearing assessment machines, equipment to remove foreign bodies, head lights, designated rooms, special rooms, theatres, specialized surgical equipment, hearing aids, hearing screening machines, speech therapy rehabilitation, etc. A comprehensive list of the clinical and surgical equipment for EHC services in referral hospitals is annexed to the NEHCP.

3.5 Training and Development of the EHC Workforce

The Human Resources for Health (HRH) is the cornerstone of any health system. In developing countries, there is generally a chronic shortage of health staff. They are expensive to train, their training takes a long time, they have a high turnover, while their equitable deployment retention mechanisms are always challenging.

For the EHC, the specific shortage of ear and hearing care providers is much more serious and concerns all categories, for example: ENT specialists, otologists, audiologists, hearing instrument specialists, speech therapists, teachers for the deaf, and sign language interpreters. Not only is there an inadequate number of ear and hearing care providers, but countries also do not have the capacity to train more staff, while the available personnel are only deployed in urban areas.

Countries should ensure the availability of Human Resources in the field of hearing by establishing training programs and/or strengthening training institutions for health professionals, and ensuring the retention of trained professionals by offering suitable career-development opportunities.

The objective of the training and development of the HRH is to avail enough skilled personnel who are capable of providing quality services. In addition, the HRH should also: (1) sensitize and train the primary healthcare staff and inform them about the prevention, promotion, early identification and rehabilitation of all types of ear diseases that lead to hearing impairment and deafness; (2) make the personnel aware of the existing facilities available for deafness, in order to facilitate appropriate referrals; and (3) sensitize the healthcare personnel regarding their specific role in the field of ear and hearing care, namely, advocacy and public awareness.

The priority categories of Ear and Hearing Care health staff to be trained include: ENT specialists/Otologists, Audiologists, Hearing Instrument Specialists, Speech therapists, ENT Nurses, Teachers for the deaf, Sign language interpreters, and Hearing Aid technicians.

In accordance with the Human Resources for Health Policy (MoH, 2014), activities to ensure the training, development, and deployment of Human Resources for Health in charge of Ear and Hearing Care are as follows:

- To develop training curricula for EHC cadres according to the ENT packages defined for different levels of healthcare and strengthen the national capacity to train EHC health professionals.
- To put in place a Continuing Professional Development (CPD) program for ENT health professionals
- To establish partnerships between private training institutions and introduce innovative teaching and learning capacities
- Using short courses and workshops or seminars to train teachers in mainstream schools and Community Health Workers on early detection of ear diseases and hearing impairment for prompt referral of identified cases.
- Using short courses to train teachers in mainstream schools and Community Health Workers in Deafness and Rwanda Sign Language to enable them to understand and communicate with persons with hearing loss.

Table 4: Baselines and Targets for EHC staff training

Output/Outcome indicator	Baseline 2018	Target 2020	Target 2024
Number of ENT specialists produced/deployed	4	8	18
Number of Audiologists produced/deployed	0	10	20
Number of Hearing aid technicians produced	0	5	15
Number of Hearing instrument specialists	0	12	24
Number of Teachers for deaf trained	NA	8	20
Number of Nurses trained in EHC	17	90	180
Number of Speech and Language Specialists	0	5	10
Number of CHWs trained in basic EHC	0	All	All

4. RESULTS CHAIN FOR THE NEHCP

Table 5: Results Chain for the NEHCP

Output	Indicator	Baseline	Source of data	Targets		Activities	Key stakeholders
				2020	2024		
Outcome 1: The leadership and governance of efforts for Ear and Hearing Care in Rwanda strengthened							
Legal and policy frameworks for ear diseases and hearing loss prevention and care enforced and fully implemented	ENT guidelines reviewed and adapted to healthcare system	**0**	Annual reports	100%	100%	• Review ENT guidelines and adapt them to the existing structure of healthcare provision from the community to referral level.	MoH, RBC, ROHNSS
Outcome 2: EHC service delivery scaled up and institutional capacity for sustainable EHC service delivery developed							
Ear and Hearing Care Services decentralized and integrated into the Rwandan healthcare system.							
EHC services decentralized and integrated across the Rwandan healthcare system	% of HFs with operational EHC services in HCs, DHs, PHs, and RHs/planned	TBD	Annual reports	**50%**	**100%**	Operationalize the community EHC package Create EHC services in HCs Create clinical ENT and audiology services in DHs Create EHC clinical, surgery and audiology services in PHs and RHs	MoH, MINECOFIN
EHC minimum packages at different levels of the Rwanda healthcare system redefined and operationalized;	Idem					• Define EHC packages and include them in the Public Health Facilities healthcare packages	MoH RBC, MINEDUC DPs
Availability of and accessibility to medical products,	Number of hearing aids and distributed/planned	TBD	Annual reports	TBD	TBD	• Include EHC medicines on the essential medicine list, and on the list of	MoH RBC MINECOFIN,

commodities and devices for ear and hearing care services improved						medical packages covered by health insurance.	DPs
EHC procedures and devices are available, accessible and utilized	Percentage of HFs implementing EHC norms and standards at different levels/planned	0%	Annual reports	50%	100%	• Redefine and ensure the implementation of norms and standards for EHC at different levels of healthcare	MoH, MINECOFIN
Accessibility to existing ear and hearing care facilities and services improved	Percentage of HFs with signals to identify EHC services	**0%**	Annual reports	50%	100%	• Integrate EHC in the normal healthcare delivery • Put signals to identify EHC services in health facilities	MoH NCPWs NUDOR
Infrastructure and equipment for EHC services delivery improved in quantity and quality.							
Adequate equipment and infrastructure for EHC are available and utilized at all levels	Percentage ofHFs fully equipped with minimum standard materials and equipment at each levelplan	TBD	Annual reports HMIS	50%	100%	• The existence of EHC packages of activities for each level of healthcare. • Availability and deployment of skilled health workforce for EHC at each level • Ear and hearing care integrated in the national health system • Sustainable availability and accessibility of EHC medicines and hearing devices • Ear and Hearing Care integrated in the health financing system (health insurance)	MoH RBC MINECOFIN, DPs MIFOTRA
	Number of EHC staff deployed in EHC services/planned	TBD	Annual reports	TBD	TBD		
	Number of Districts with a centre	TBD	Annual reports	TBD	TBD		

	forrehabilitation of Deaf People					• Availability of hearing screening at designated levels of care • Existence of functional supply and distribution of hearing aids and assistive listening devices • Engagement of the private Sector to provide EHC services • Increased number and capacity of centers dedicated for the rehabilitation of deaf persons	
EHC minimum packages defined at different levels of the Rwanda healthcare system;	-	-	-	-	-	• Review EHC packages and include them in the Public Health Facilities healthcare packages	MoH
EHC medicines integrated in the essential medicines list, and in the packages of medical products covered by health insurance	Number of medicines, commodities and hearing aids included in the list of essential medicines	TBD	Annual reports	50%	100%	• To include EHC medicines, consumables, commodities and hearing aids in the national Logistics Management Information System(LMIS).	MoH RBC MINECOFIN
Required and skilled workforce, who provide EHC services at all levels, is available							
Availability of trained and skilled EHC personnel at all levels	Number of trained and skilled EHC personnel at all levels:		Annual Reports			• Strengthen training programs for ENT specialists, audiologists,	MoH MINEDUC UR DPs

	ENT specialists	4		8	18	hearing aid technicians, as well as speech and language pathologists in the UR; • Organize in-services training on EHC for public and private health facilities.	RMC NNM
	Audiologists	0		10	20		
	Hearing Aid Technicians	0		5	15		
	Hearing Instrument Specialists	0		12	24		
	Speech Language Specialists	0		5	10		
	Teachers for the Deaf	NA		8	20		
	EHC nurses	17		90	180		
	CHWs	0		TBD	TBD		
Monitoring, evaluation, and research in areas of EHC are regularly conducted							
Health Facility data about EHC are routinely and properly collected and tracked	Percentage of HFs reporting on EHC cases at all levels/HFs providing EHC services	0%	Annual reports HMIS reports	100%	100%	• Organize knowledge management activities related to EHC on a periodic basis • Produce quarterly and annual reports on ENT/EHC health service delivery, which are fully integrated into the national HMIS reports. • Include EHC medicines, consumables, commodities and hearing aids in the national Logistic Management Information System(LMIS).	MoH RBC HFs

EHC indicators are properly defined and integrated in the Rwanda Health Management Information system;	Number of EHC indicators	0	Annual reports	100%	100%	• Define EHC indicators and integrate them in the HMIS • Include EHC in the DHS and other population surveys	MoH RBC HFs
Mechanisms to track data on children or other people in the rehabilitation centers are established;	Number of school screenings organized	0	Annual reports	TBD	TBD	• Organize regular school screening in schools, rehabilitation centres and the community	MoH MINEDUC HFs Districts
Research on EHC is conducted in Rwanda.	Number of research papers on EHC published/planned	TBD	Annual reports	TBD	TBD	Integrate EHC in the National Health Research Agenda	MoH RBC DPs
Outcome 3: Public awareness of EHC is raised							
Public awareness of EHC services across the board is raised, and knowledge, attitudes and practices about risk factors for ear and hearing loss are improved	Number of IEC/BCC materials produced Number of information campaigns organized	TBD TBD	Annual Reports Annual reports	TBD TBD	TBD TBD	• Avail IEC/BCC tools to improve population and health staff awareness about ear and hearing care issues and prevention measures • Increase information and awareness about ear and hearing problems in the public, health professionals, decision makers and in workplaces • Educate the general population and the community on existing mechanisms to prevent ear diseases and hearing loss	MoH RBC MIFOTRA

						• Advocate for institutional collaboration for effective prioritization of Ear and Hearing Care.	
Level of compliance with laws, policies, and regulations for minimizing risk factors of hearing loss or accidents.	-	-	-	-	-	• Educate the general population and the community on existing laws, policies and regulations for minimizing risk factors for hearing loss or accidents.	MoH RBC MIFOTRA

5. COORDINATION MECHANISMS

The mechanisms to coordinate the implementation of NEHCP will be the same put in place to coordinate the implementation of HSSP4. Coordinating structures will be mainly:

a. Health Sector Working Group (HSWG) constituted of representatives of MOH and affiliated institutions, Development Partners (DPs), and Private Sector and Civil Society. Its role is to improve the coordination of activities and harmonization of procedures of both GoR and DPs in order to increase effectiveness and efficiency of aid in the health sector and to ensure better alignment of DPs to HSSP, with an enshrined principle of mutual accountability, as provided in the Health Sector Policy (2015).

b. Disease Prevention and Control Technical Working Group: It is one of the 3 Technical Working Groups (TWG) composing HSWG, where technical and policy issues are discussed by MoH staff and representatives of Development Partners, NGOs, FBOs and CSOs working in the concerned area. TWG operates under the authority of the HSWG.

c. National and International Cooperation: Implementation of the National Ear and Hearing Care Plan will need external financial and technical assistance to achieve its objectives. Multilateral, bilateral, and non-governmental cooperation is based on mutual agreement between the government and the donor country or organization.

d. At the district level, the monitoring of activities related to health service provision is assigned to the District Health Unit (DHU) and the overall coordination is ensured by the District Health Management Unit (DHMT) in collaboration with the Joint Action Development Forum, JADF.

6. RISK ANALYSIS AND RISK MITIGATION

In general, the implementation of strategic plans is often associated with potential risks, which are adverse events occurring within a program, strategy, or action; therefore, an analysis is made to identify potential underlying uncertainty of a given course of action and refers to the probability of a project's success or failure and possible consequences. Risk analysts will minimize future negative unforeseen effects and plan for their mitigation.

For the National Ear and Hearing Care Plan, a qualitative risk analysis was made using FMEA (Failure Mode and Effect Analysis), a qualitative method mostly used to identify and eliminate faults or deviations in a system before they cause problems. The results may include the causes of failure, effect, frequency, severity, probability, and recommended actions displayed in a table (Karin Alverbro, 2010).

Table 6: NEHCP Risk Identification and Mitigation

Risk identification	Likelihood	Consequences	Estimation	Mitigation measures
1. Financial Risk				
High cost of devices and medical products for hearing impairment rehabilitation.	3	3	High	• Increase domestic budget allocations to the programs; • Attract private investors in health • Adopt strategies to mobilize more external funds
2. Service Delivery Risk				
Shortage of skilled EHC providers at all levels	3	3	High	• Intensive training of EHC providers • Equitable deployment
Absence of EHC services at primary and secondary levels	3	3	High	• Creation of EHC services at primary, and secondary level • Strengthen EHC services at tertiary level • Integrate EHC in the treatment guidelines

Other risks are common with those mentioned in the 4th Health Sector Strategic Plan (quality of care, managerial, decentralization, resources remaining mostly off-budget), with similar likelihood, consequences and mitigation measures.

7. COSTING AND BUDGETING

The One Health Tool is designed to support national strategic health planning and costing in low- and middle-income countries. It facilitates the assessment of resource needs and costs associated with key strategic activities with a focus on integrated planning and strengthening health systems.

The process of costing for the National Ear and Hearing Care Plan as a subsector plan was conducted using "inputs based costing methodology." The ingredient costing method is based on the idea that every program uses inputs with identifiable costs. Key ingredients and costs are identified, and a cost per unit of effectiveness is calculated. Interventions are described, indicating the resources needed to deliver corresponding outputs. The methodology is recommended for the costing of health services in lower delivery levels of developing countries. It uses the costing of "package of services" for different interventions while identifying the resource gap and determining "the value of these gaps" and considers identifying the level of inputs to produce the required services.

The costing exercise was performed by a team of consultants and ENT specialists. The proposed cost was submitted to the participants in the consultative workshop organized to collect all inputs to the draft of NEHCP. First, a review of all the outcome and output indicators previously developed by the consultant was conducted by the workshop participants. Then, indicators were validated and activities developed based on the outcomes. Estimation of cost for each activity was done, guided by a standardized framework involving three sets of assumptions: quantity, frequency, and unit cost variables.

However, according to the tool, it was advised to consider the application of five guidance frameworks for costing exercises: (1) Identify resources used to produce the services being costed. (2) Estimate the quantity of each input used. (3) Assign a monetary value to each unit of input and compute the total cost of the input. (4) Allocate the costs to the activities in which they are used. (5) Use measures of service output to calculate average costs. As there are major EHC actions planned in HSSP4 (2018-2024), no major Costing Assumptions were considered (origin of funds, resource allocation to health, investment and recurrent costs, GDP, etc.). The calculation was made in USD as inflation was not considered, and the majority of funds are expected to be external.

The estimation of costs needed to deliver the package of health interventions identified in the NEHCP for the period 2018 to 2024 included the following:

- The costs of the intervention related to service delivery are prioritized in the NEHCP for each level of service delivery.
- Costs related to health system strengthening: Human Resources, Infrastructure, Governance, Information Systems, and Logistics.
- The program support (training) required to improve the quality of EHC services

The quantity of services required was estimated using the coverage planned within the NEHCP (baselines and targets) for each intervention prioritized.
Human Resources

Table 7: Overall costs of NEHCP (2018-2024), USD

Level of EHC	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	Total
Community	170,000	175,000	177,500	177,500	175,000	165,000	**1,045,000**
Health Centers	122,160	194,160	194,160	194,160	194,160	122.160	**1,024,160**
District Hospitals	423,725	423,725	423,725	338,980	152,986	338,980	**2,288,115**
Provincial Hospitals	798,799	798,799	798,799	798,799	798,799	798,799	**3,793,995**
Referral Hospitals	1,614,380	1,614,380	3,228,760	3,228,760	3,228,760	0	**12,915,040**
Central level	224,000	1,341,000	1,650,500	1,978,500	2,126,494	1,396,739	**9,370,349**
Grand Total	3,353,064	4,547,064	6,473,444	6,716,699	6,676,199	2,669,640	**30,436,659**

Table 8: Summary Expenditures by Healthcare Level(USD)

Institutional capacity development	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	Total
Infrastructure	2,907,064	2,957,064	4,571,444	4,486,699	4,486,699	499,140	19,908,659
Training	152,000	792,000	724,000	922,000	884,000	900,000	4,374,000
Service delivery	115,000	115,000	117,500	117,500	115,000	110,000	690,000
Medicines, Commodities, HDs	0	600,000	950,000	1,100,000	1,100,000	1,050,000	4,800,000
M&E, HIS, Research	75,000	10,000	30,000	10,000	10,000	30,000	165,000
Governance	39,000	48,000	48,000	48,000	48,000	48,000	279,000
Logistics	65,000	25,000	32,500	32,500	32,500	32,500	220,000
Grand Total	3,353,064	4,547,064	6,473,444	6,716,699	6,676,199	2,669,640	30,436,659

Table 9: Summary of Cost for Health System Strengthening (USD)

Input category	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	Total
Institutional Capacity and Service Delivery							
A. Infrastructure: creation and renovation of EHC units (USD)							
EHC equipment in HCs (30 HCs/year)	50,160	50,160	50,160	50,160	50,160	50,160	300,960
EHC Clinical Unit in DHs (5 DHs/Year)	232,725	232,725	232,725	186,180	186.180	186,180	1,256,715
EHC Clinical Unit in PHs (1 PH/Year)	136,299	136,299	136,299	136,299	136,299	0	681,495
EHC Clinical Unit in RHs (all)	256,230	256,230	512,460	512,460	512,460	0	2,049,840
EHC Surgery Unit in PHs (1 PH/Year)	462,650	462,650	462,650	462,650	462,650	0	2,313,250
EHC Surgery Unit in RHs (1 RH/Year)	1,117,950	1,117,950	2,235,900	2,235,900	2,235,900	0	8,943,600

Theatre in DHs	0	0	0	0	0	0	0
Theatre in PHs	0	0	0	0	0	0	0
Theatre in RHs	0	0	0	0	0	0	0
Audiology in DHs	138,000	138,000	138,000	110,400	110,400	110,400	745,200
Audiology in PHs	149,450	149,450	149,450	149,450	149,450	0	747,250
Audiology in RHs	229,800	229,800	459,600	459,600	459,600	0	1,838,400
Office equip DHs	53,000	53,000	53,000	42,400	42,400	42,400	286,200
Office equip PHs	10,400	10,400	10,400	10,400	10,400	0	52,000
Office equip RHs	10,400	10,400	20,800	20,800	20,800	0	83,200
Maintenance	10,000	60,000	60,000	60,000	60,000	60,000	310,000
Strengthening of Centers for Deaf	50,000	50,000	50,000	50,000	50,000	50,000	300,000
TOTAL	*2,907,064*	*2,957,064*	*4,571,444*	*4,486,699*	*4,486,699*	*499,140*	*19,908, 110*
B. Human Resources							
Salaries							
Pre-service training:							
Training of ENT surgeons: 5/year	0	200,000	220,000	250,000	300,000	300,000	1,270,000
Audiologists: 4/year	0	140,000	180,000	220,000	260,000	220,000	1,020,000
Speech language Therapist (10)	0	80,000	80,000	80,000	80,000	80,000	400,000
Hearing Aid Technicians: 8/2Year	0	64,000	0	64,000	0	64,000	192,000
Hearing Instrument Specialist: 8/2 years	0	6,4000	0	64,000	0	64,000	192,000
In-service training							
CPD program	0	20,000	20,000	20,000	20,000	20,000	100,000
Develop e-learning program on EHC	5,000	5,000	5,000	5,000	5,000	5,000	30,000
GPs	20,000	20,000	20,000	20,000	20,000	20,000	120,000
EHC Nurses: 30/year	72,000	144,000	144,000	144,000	144,000	72,000	720,000
Deaf Teachers	20,000	20,000	20,000	20,000	20,000	20,000	120,000

CHWs	20,000	20,000	20,000	20,000	20,000	20,000	120,000
Participation in int'l meetings (3 meetings)	15,000	15,000	15,000	15,000	15,000	15,000	90,000
TOTAL	*152,000*	*792,000*	*724,000*	*922,000*	*884,000*	*900,000*	*4,374,000*
C. Medicines, Commodities and hearing devices							
Medicines, commodities for all levels	0	200,000	250,000	300,000	300,000	200,000	1,250,000
Surgical consumables PHs	0	100,000	150,000	200,000	250,000	300,000	1,000,000
Surgical consumables RHs	0	150,000	200,000	250,000	300,000	300,000	1,200,000
Hearing devices		100,000	300,000	300,000	200,000	200,000	1,100,000
Maintenance of hearing aids	0	50,000	50,000	50,000	50,000	50,000	250,000
TOTAL	*0*	*600,000*	*950,000*	*1,100,000*	*1,100,000*	*1,050,000*	*4,800,000*
D. Service Delivery							
Review EHC Package of services	5,000	0	0	0	0	0	5,000
Review norms and standards	5,000	0	0	0	0	0	5,000
Review EHC treatment guidelines	30,000	0	0	0	0	0	30,000
Develop & integrate referral guidelines	15,000	0	0	0	0	0	15,000
Create EHC Telemedicine	10,000	10,000	10,000	10,000	10,000	10,000	60,000
Integrate EHC in Accreditation program	0	50,000	50,000	50,000	50,000	50,000	250,000
EHC School screening	10,000	10,000	10,000	10,000	10,000	10,000	60,000
EHC Outreach visits	10,000	10,000	10,000	10,000	10,000	10,000	60,000
EHC IEC/BCC material (RHCC)	20,000	25,000	27,500	27,500	25,000	20,000	145,000
EHC broadcast	5,000	5,000	5,000	5,000	5,000	5,000	30,000
Int'l EHC Day	5,000	5,000	5,000	5,000	5,000	,5000	30,000
EHC Radio talks	0	0	0	0	0	0	0
EHC TV shows	0	0	0	0	0	0	0
TOTAL	*115,000*	*115,000*	*117,500*	*117,500*	*115,000*	*110,000*	*690,000*
M&E, Health Information, and Research							

Workshop to select EHC indicators	5,000	0	0	0	0	0	5,000
Mid-Term Review	0	0	20,000	0	0	0	20,000
End-Term Evaluation	0	0	0	0	0	20,000	20,000
EHC Baseline study on EHC diseases	60,000	0	0	0	0	0	60,000
Support to Research activities	10,000	10,000	10,000	10,000	10,000	10,000	60,000
Total HIS	*75,000*	*10,000*	*30,000*	*10,000*	*10,000*	*30,000*	*165,000*
Governance and Leadership							
Governance activities	20,000	20,000	20,000	20,000	20,000	20,000	120,000
Salary Focal Person	9,000	18,000	18,000	18,000	18,000	18,000	99,000
Administrative costs + meetings	10,000	10,000	10,000	10,000	10,000	10,000	60,000
Total	*39,000*	*48,000*	*48,000*	*48,000*	*48,000*	*48,000*	*279,000*
Logistics							
Vehicle for supervision	50000	0	0	0	0	0	50,000
Running costs vehicle	5,000	10,000	12,500	12,500	12,500	12,500	65,000
Transport	10,000	15,000	20,000	20,000	20,000	20,000	105,000
TOTAL	*65,000*	*25,000*	*32,500*	*32,500*	*32,500*	*32,500*	*220,000*
GRAND TOTAL	3,353,064	4,547,064	6,473,444	6,716,699	6,676,199	2,669,640	30,436,659

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ANNEX 6:

List of ENT equipment at each level of healthcare service delivery *(Adapted from: National Ear, Nose and Throat Health Strategic Plan 2017-2021, Zambia)*

Proposed EHC Equipment at the Health Center Level

Item	Quantity	Unit Price	Total Cost
Otoscope Heine Beta 2,5 V K 180	1	$200	$200
50 reusable Otoscope tips for Heine Beta K 180	1	$200	$200
Ear syringe	1	S60	$60
Nasal specula	5	S40	$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
Metal tongue depressor	10	$6	$60
TOTAL			**$1672**

ENT Clinical Equipment at District Hospital Level

Item	Quantity	Unit Price	Total Cost
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	S60	$120
Nasal specula	5	S40	$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	$1200
Dry heat sterilizer Type 75	1	$600	$600
0° Endoscope	1	$2000	$2000
30° Endoscope	1	$2000	$2000
90° Endoscope model 8707DA	1	$2000	$2000
Flexible Endoscope model 11101RP	1	$6000	$6000
Surgical stool (Swivel stool) Ecco-Pedes, soft cast..	1	$450	$450
ENT units modula with suction 4 cold light sources H	1	$28000	S28000
TOTAL			**$46,545**

ENT Surgical Equipment at District Hospital Level

Item	**Quantity**	**Unit Price**	**Total Cost**
Microscope Kaps SOM 62 with Coobservation tube monocular	1	$14	$14
Headlight KS70	1	$500	$500
0° Endoscope	1	$2000	$2000
30° Endoscope	1	$2000	$2000
90° Endoscope model 8707DA	1	$2000	$2000
Flexible Endoscope model 11101RP	1	$6000	$6000
Light source	1	$3000	$3000
Drill machine Chirurgie motor system MD 10	1	$5000	$5000
Suction pump AC30 portable mains and battery	1	$650	$650
ENT theatre stool Akrus AK 445 Height adjustable heater	1	$2500	$2500
Diathermy Erbotom VIO 50	1	$5000	$5000
Adenotonsillectomy surgical set	3	$5000	$15000

FESS surgical set	1	$14,000	$14000
Tracheostomy surgical set	2	$3500	$7000
Laryngoscopy surgical set adult	1	$14,000	$14000
Laryngoscopy surgical set child	1	$14,000	$14000
Rigid oesophagoscopy surgical set adult	1	$25000	$25000
Rigid oesophagoscopy surgical set child	1	$18000	$18000
Rigid bronchoscopy surgical set adult	1	$18000	$18000
Rigid bronchoscopy surgical set child	1	$18000	$18000
Tympanoplasty surgical set	2	$5000	$10000
Grommet surgical set	2	$1000	$2000
Mastoidectomy surgical set	1	$4000	$4000
head and neck set surgical set	1	$4000	$4000
Telepac X with Telepack X LED endoscopic video unit	2	$13000	$26000
TOTAL			**$220,164**

Furniture and Office Equipment In Secondary Level Institutions

Item	Quantity	Unit Price	Total Cost
Desk	2	$400	$800
Chair	6	$60	$360
Cabinet	1	$350	$350
PC	2	$600	$1200
Printer	1	$300	$300
Scanner	1	$200	$200
Laptop	2	$500	$1000
TOTAL			**$4210**

Proposed EHC Clinical Equipment in Provincial Hospital

Item	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	$1200
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	$1200
Ear syringes	4	$60	$240
Microcrocodile forceps delicate 6mm	20	$120	$2400

Kidney dishes	8	$8	$64
Dry heat sterilizer Type 75	1	$500	$500
0° Endoscope	2	$2000	$4000
30° Endoscope	2	$2000	$4000
90° Endoscope model 8707DA	2	$2000	$4000
Flexible Endoscope model 11101RP	2	$6000	$12000
Surgical stool (Swivel stool) Ecco-Pedes, soft castor	2	$500	$1000
ENT units modula with suction 4 cold light sourcesH	2	$28000	$56000
Telepac X with Telepack X LED endoscopic video unit	2	$13000	$26000
Videostroboscope	1	$20000	$20000
TOTAL			**$136,299**

Furniture and Office Equipment, Provincial and Referral Hospitals

Item	**Quantity**	**Unit Price**	**Total Cost**
Desk	2	$400	$800
Chair	6	$60	$360
Cabinet	1	$350	$350
PC	2	$600	$1200
Printer	1	$300	$300
Scanner	1	$200	$200
Laptop	2	$500	$1000
TOTAL			**$4210**

EHC Clinical Equipment in National Referral Hospitals

Item	**Quantity**	**Unit Price**	**Total Cost**
Otoscopes Heine Beta 2,5 V K 180	5	$400	$2000
Bajonet forceps	50	$12	$600
Nasal specula	50	$40	$2000
Tongue depressor (metal)	50	$6	$300
Ear wax hooks	100	$10	$1000
Cotton wool holder	50	$6	$300
Suction tips	100	$11	$1100
Suction connectors	10	$15	$150
Ear curettes	50	$15	$750
Laryngeal mirrors	25	$20	$500
Punch biopsy forceps	25	$50	$1250
Children laryngeal mirrors	25	$20	$500
Adult laryngeal mirrors	20	$20	$400
Myringotomy knifes	20	$60	$1200
Rosen micro sharp needles	20	$35	$700

Ear biopsy forceps	40	$150	$6000
Ear syringes	6	$60	$360
Microcrocodile forceps delicate 6mm	100	$120	$12000
Kidney dishes	15	$8	$120
Dry heat sterilizer Type 75	6	$500	$3000
0° Endoscope	6	$2000	$12000
30° Endoscope	6	$2000	$12000
90° Endoscope model 8707DA	6	$2000	$12000
Flexible Endoscope model 11101RP	0	$6000	$0
Surgical stool (Swivel stool) Ecco-Pedes, soft castor	5	$500	$2500
ENT units modula with suction 4 cold light sourcesH	5	$28000	$140000
Telepac X with Telepack X LED endoscopic video unit	2	$13000	$26000
Videostroboscope	1	$20000	$20000
TOTAL			**$256,230**

Furniture and Office Equipment in tertiary level institutions

Item	**Quantity**	**Unit Price**	**Total Cost**
Desk	5	$400	$2000
Chair	15	$60	$900
Cabinet	5	$350	$1750
PC	5	$600	$3000
Printer	1	$300	$300
Scanner	1	$200	$200
Laptop	5	$500	$2500
TOTAL			**$10650**

Surgical Equipment at the Provincial Hospital Level

Item	**Quantity**	**Unit Price**	**Total Cost**
0° Endoscope	1	$3000	$3000
30° Endoscope	1	$3000	$3000
70° Endoscope	1	$3000	$3000
90° Endoscope model 8707DA	1	$3000	$3000
Flexible Endoscope model 11101RP	1	$6000	$6000
Telepac X with Telepack X LED endoscopic video unit	1	$13000	$13000
Drill machine Chirurgie motor system MD 10	1	$5000	$5000
Suction pump AC30 portable mains and battery	1	$650	$650
ENT theatre stool Akrus AK 445 Height adjustable head	1	$2500	$2500
Surgical stool (Swivel stool) Ecco-Pedes, soft castors	1	$500	$500

Diathermy Erbotom VIO 200	1	$8000	$8000
Co2 Laser CO2 Laser UNILAS 10600	1	$60000	$60000
Microscope with 2 binocular OPMI VARIO 700	1	$150000	$150000
Headlight KS70	2	$500	$1000
Adenotonsillectomy surgical set	5	$5000	$25000
FESS surgical set	2	$14000	$28000
Laryngoscopy surgical set adult	1	$14000	$14000
Laryngoscopy surgical set child	1	$14000	$14000
Rigid oesophagoscopy surgical set adult	1	$25000	$25000
Rigid oesophagoscopy surgical set child	1	$18000	$18000
Rigid bronchoscopy surgical set adult	2	$18000	$36000
Rigid bronchoscopy surgical set child	1	$18000	$18000
Tympanoplasty surgical set	3	$5000	$15000
Grommet surgical set	5	$1000	$5000
Mastoidectomy surgical set	1	$4000	$4000
Head and neck set surgical set	1	$4000	$4000
IPC Console 1898001 with Indigo high speed drill,	1	$50000	$50000
Facial nerve monitor	1	$30000	$30000
TOTAL			**$462.650**

Surgical Equipment at the Referral Hospital Level

Item	**Quantity**	**Unit Price**	**Total Cost**
0° Endoscope	3	$3000	$9000
30° Endoscope	3	$3000	$9000
70° Endoscope	3	$3000	$9000
90° Endoscope model 8707DA	3	$3000	$9000
Flexible Endoscope model 11101RP	3	$6000	$18000
Telepac X with Telepack X LED endoscopic video unit	2	$13000	$26000
Drill machine Chirurgie motor system MD 10	1	$5000	$5000
Suction pump AC30 portable mains and battery	3	$650	$1950
ENT theatre stool Akrus AK 445 Height adjustable head	3	$2500	$7500
Surgical stool (Swivel stool) Ecco-Pedes, soft castors	3	$500	$1500
Diathermy Erbotom VIO 200	3	$8000	$24000
Co2 Laser CO2 Laser UNILAS 10600	2	$60000	$120000
Microscope with 2 binocular OPMI VARIO 700	2	$150000	$300000
Headlight KS70	4	$500	$2000
Adenotonsillectomy surgical set	8	$5000	$40000
FESS surgical set	3	$14000	$42000
Tracheostomy surgical set	4	$3500	$14000
Laryngoscopy surgical set adult	2	$14000	$28000
Laryngoscopy surgical set child	2	$14000	$28000
Rigid oesophagoscopy surgical set adult	2	$25000	$50000
Rigid oesophagoscopy surgical set child	3	$18000	$54000
Rigid bronchoscopy surgical set adult	3	$18000	$54000
Rigid bronchoscopy surgical set child	4	$18000	$72000

Grommet surgical set	8	$1000	$8000
Mastoidectomy surgical set	2	$4000	$8000
Head and neck set surgical set	2	$4000	$8000
IPC Console 1898001 with Indigo high speed drill,	1	$50000	$50000
Facial nerve monitor	2	$30000	$60000
TOTAL			**$1,117,950**

Audiology Equipment at the Health Center Level

Item	**Quantity**	**Unit Price**	**Total Cost**
Screening Audiometer	1	$3000	$3000
Warble Tone generator	1	$2000	$2000
Screening OAE	1	$7000	$7000
Consumables			
Tympanometry Tips	5	$150	$750
OAE tips	5	$150	$750
TOTAL			**$13500**

Audiology Equipment at the District Hospital Level

Item	**Quantity**	**Unit Price**	**Total Cost**
Warble Tone generator	1	$2000	$2000
Screening Audiometer	1	$3000	$3000
Sound Proof diagnostic Audiometer	1	$7000	$7000
Tympanometer	1	$7000	$7000
Screening OAE	1	$4000	$4000
Hearing aid maintenance station	1	$3000	$3000
Screening Audiometer	1	$3000	$3000
Consumables			
Tympanometry Tips	5	$150	$750
OAE tips	5	$150	$750
TOTAL			**$27500**

Audiology Equipment at the Provincial Hospital level

Item	**Quantity**	**Unit Price**	**Total Cost**
Diagnostic Audiometer	2	$7000	$14000
Diagnostic Tympanometer	1	$4000	$4000
Screening Tympanometer	2	$7000	$14000
Screening OAE	2	$4000	$8000
ABR/ASSR/OAE	1	$3000	$3000
Video Nystagmography	1	$25000	$25000
Sound proof booth 3mx3m	1	$10000	$10000
Hearing aid Verification unit	1	$18000	$18000
Visual Reinforcement for Audiometer	1	$7500	$7500
NOAH software	1	$1200	$1200
Programing Computer	1	$600	$600

Printer	1	$500	$500
Hearing aid maintenance station	1	$3000	$3000
Warble Tone generator	2	$2000	$4000
Hearing aid programmer	1	$1200	$1200
Consumables			
Tympanometry Tips	7	$150	$1050
OAE tips	7	$150	$1050
Neuroprep/conducting paste	5	$100	$500
Insert phone tips	7	$150	$1050
ABR/ASSR/OAE electrodes	7	$500	$3500
Drill bits and burrs for workstation	7	$200	$1400
TOTAL			**$149,450**

Audiology Equipment at the Referral Hospital Level

Item	**Quantity**	**Unit Price**	**Total Cost**
Diagnostic Audiometer	2	$7000	$14000
Diagnostic Tympanometer	4	$4000	$16000
Screening Tympanometer	2	$7000	$14000
Screening OAE	4	$4000	$16000
ABR/ASSR/OAE	1	$30000	$30000
Video Nystagmography	2	$25000	$50000
Sound proof booth 3mx3m	2	$10000	$20000
Hearing aid Verification unit	2	$18000	$36000
Video Visual Reinforcement for Audiometer	1	$7500	$7500
NOAH software	1	$1200	$1200
Programming Computer	2	$600	$1200
Printer	2	$500	$1000
Hearing aid maintenance station	1	$3000	$3000
Warble Tone generator	3	$2000	$6000
Hearing aid programmer	2	$1200	$2400
Consumables			
Tympanometry Tips	10	$150	$1500
OAE tips	10	$150	$1500
Neuroprep/conducting paste	10	$100	$1000
Insert phone tips	10	$150	$1500
ABR/ASSR/OAE electrodes	10	$500	$5000
Drill bits and burrs for workstation	5	$200	$1000
TOTAL			**$229,800**