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St. Paul's Hospital Millennium Medical College

Assessment of Ear, Nose and Throat (ENT) Health Care service Availability and Readiness in Primary, Secondary and Tertiary Health Care Centers in Addis Ababa.

By: Bizuayehu Girma (MD)

A Research Report submitted to department of Otorhinolaryngology, Head and Neck Surgery as a partial fulfillment for specialty certificate of

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Advisors: Dr. Alene Meshesha (MD, Assistant professor of HNS & ORL).

Mr. Aman Yesuf (Assistant Professor).

Abstract

Background : Ear, Nose and Throat (ENT) surgery, also called Otorhinolaryngology, is a surgical specialty concerned with the diagnosis, evaluation and management of head, neck, ear, nose and throat diseases [1]. Services being given in ENT range from simple diagnostic tests to advanced diagnostic and therapeutic procedures. The status of ENT service in Ethiopia is not well known and there are no researches so far done to show ENT health and health care service. But studies done in 2009 on survey of ENT service in sub-Saharan Africa in which Ethiopia is included has shown an alarming paucity of the services.

Objective : To assess ENT health care service availability and Readiness in primary, Secondary and Tertiary health Care Centers in Addis Ababa.

Method: A cross-sectional study design was used to conduct study on 31 governmental health institutions. All of 13 hospitals are included due to their small number and importance. Health centers are selected by simple random sampling. Data were collected using face to face interview questionnaire between April 15, 2019 to May 30, 2019 period. Descriptive statistics of percentages and frequency distributions of study variables was carried out using tables. Ethical clearance was obtained from Institutional review board of SPHMMC after the proposal was reviewed and approved

Result: Percentages of Health institutions offering ENT Services were 22.6%. All of these services were available in the Hospitals. None of the health facilities had ENT treatment Guideline, trained nurses, Audiologists. In 87.8% of Health centers, ENT problems were managed by Clinical nurses and Health officers who don't have additional ENT training course. Head and Neck subspecialty service was available in only one referral hospital. Speech therapy service was being given in only one General hospital. None of the health centers had all diagnostic ENT OPD equipment. Most of the hospitals who offer ENT service had diagnostic equipment in their OPD but surgical equipment was inadequate.

Conclusion and Recommendation: The result of this study has shown the presence of inadequate ENT service provision and most of ENT problems were managed by Non-ENT specialists. Most of Hospitals who offer ENT service had lack of trained health professionals, Treatment Guideline, Audiology tests, adequate surgical equipment, and subspecialty services. Hence, Responsible bodies should act to strengthen ENT health care delivery by training staffs, preparing guideline, and availing diagnostic and surgical equipment

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List of Abbreviation

ENT: Ear, Nose and Throat.

FMHACA: Food, Medicine and Health Care Administration Control Authority.

HIV: Human immunodeficiency virus.

ORL: Otorhinolaryngology.

TB: Tuberculosis.

SARA: Service Availability and Readiness.

SSA: Sub-Saharan Africa.

UK: United Kingdom.

WHO: World Health Organization.

1. Introduction.

1.1 Background

Ear, Nose and Throat (ENT) surgery, also called Otorhinolaryngology, is the surgical specialty concerned with the diagnosis, evaluation and management of head, neck, ear, nose and throat diseases[1]. ENT encompasses a vast disease spectrum, much of which is treatable through maneuvers and medical managements but equally, surgical intervention is often indicated.

Diseases affecting ENT regions impair hearing ability, breathing, swallowing and voice production and are the most common reason for a visit to a doctor in both rural and urban communities[2].

Services being given in ENT range from simple diagnostic tests to advanced diagnostic and therapeutic procedure. These include treating Ear, Nose and Throat disorders as outpatient, hearing screening and testing, and simple to advanced diagnostic tests, minor and major surgical procedure [1]

Recent decades have seen the discipline expand to include subspecialties like head and neck surgery, neuro-otology, anterior and lateral skull base surgery, allergology and pediatrics [3].

ENT disease prevalence, risk factors and treatment vary between developed and developing countries. Health provision, particularly surgery, in developing countries is poor and their healthcare systems are unstable.[4] .Technological advances provide ENT surgery with novel diagnostic and treatment opportunities, however new technology is inaccessible to developing countries which further contributes to the great difference in ENT practice between the developed and developing world[5,6].

The delivery of better ENT service is highly reliant on the accessibility and functional level of infrastructure, equipment, and supplies. Moreover, to provide the necessary ENT health care, the basic requirements must be available constantly, which requires an efficient, predictable and flexible supply chain [3].

An inclusive package of ENT health care services is a compulsory complement to primary care service delivery in offering health promotion, disease prevention, cure, palliation, and rehabilitation [5].

The status of ENT service in Ethiopia is not well known and there are no researches so far done to show ENT health and health care service on this field. But studies done in 2009 on survey of ENT service in sub-Saharan Africa in which Ethiopia is included has shown an alarming paucity of the services and there is a large gap between higher technology, expensive health care in high-income countries and lower technology, low-cost practice in low-income countries[3].

1.2 Statement of the problem

Hearing loss and Head Neck Cancer are major ENT health crisis in a developing country [7]. There are 360 million people in the world with disabling hearing loss [8] (i.e. 5.3% of the world's population), including 32 million children. Hearing disability ranks third on the list of non-fatal disabling conditions in low- and middle-income countries. Chronic ear infections, meningitis, rubella, noise and use of ototoxic medications are the main causes, and these can be readily addressed through known public health measures.

The developing world also harbors a majority of cancer patients. Two thirds of the global burden of Head and Neck Cancer occurs in Lower Middle income countries, and the Indian subcontinent alone is responsible for one third of lip and oral cavity cancers [9].

ENT services including Ear and Hearing care service in Ethiopia is limited. There is no government initiative working toward service improvement, training and equipping the available centers.

There are very few ENT surgeons practicing in the country and fewer still involved in teaching and training. The service is available as unit in 14 government hospitals (7 tertiary hospitals and 7 general hospitals, Only 6 of them are outside of Addis Ababa. Even this service has shortage of specialist, equipment and surgical facility.

International standards recommend a minimum of 2 ENT surgeons per 1000,000 people. Hence, Ethiopia needs about 200 ENT –which is tenfold to the current number. The gap is partially addressed in Ethiopia by task-sharing and broader scopes of practice of many healthcare providers especially pediatricians, on children with ENT problems, head and neck disorders with general surgeons and plastic surgeons. However the existing gap remains large.

The surgical procedures performed are very limited even basic hearing restoring surgeries like tympanoplasties and mastoidectomies are not being performed routinely in these available centers [3] Head and Neck Surgery unit is not well developed in most of these centers though the prevalence of Head and neck cancer seems high.

The other problem is Basic ENT health care is not integrated in the primary health care and adequate training is not being given for primary health care workers. The training that is being given for undergraduate medical students is not enough and practical to manage basic ENT problems in most of medical schools despite 20-40% general practitioner visit are ENT cases [11].

Developing world ENT services are hampered by economic constraints, meager health budgets, poor infrastructure (including unreliable electricity supply) and a shortage of trained medical staffs [10]. In addition, ENT service funding has to compete with the budgetary demands of life-threatening infectious diseases such as tuberculosis (TB) and human immunodeficiency virus infection (HIV). Consequently, the way in which ENT is practiced in developing countries differs markedly from the high-technology, high-cost practices of the developed world [11].

1.3 Significance of the study.

Ethiopia is known for Inadequate and substandard health coverage and most of the countries health institutions and doctors are in the capital city. ENT Health care service in developing country has shortage of trained health professionals, facilities and equipment necessary for giving basic health care.

In Ethiopia, there are no researches done to show the status of ENT Health Care service even in the capital city, though most of the rural people with ENT problems are being referred to here. So this study:

- will be used as a baseline for future studies done locally and globally.
- Used to know the gap in ENT health care service delivery at different health care levels in Addis Ababa.
- Help Clinical service directors and Government and Nongovernment organizations to plan and promote effective and targeted support for this service.

2. Literature Review

2.1 Service Availability

Although Africa as a continent possibly represents the worst case scenario, there are many parts of the world where ENT services are virtually non-existent [11].

Sub-Saharan Africa (SSA) has extreme shortages of otolaryngologists, speech pathologists and audiologists, a lack of training opportunities, and a paucity of otolaryngology services [12,13]. The population of SSA was 800 million in 2007; the United Nations predicts a population of 1.5 to 2 billion by 2050[14]. The inadequacy of services will be aggravated by this rapid population growth.

2.2 Service Readiness

In 2009, Fagan and Jacobs conducted an e-mail-based survey to assess the availability of ENT, audiology and speech therapy services and training facilities in 18 sub-Saharan African countries including Ethiopia[5]. They calculated the ratio of ENT surgeons per 100,000 population for each country, UK has 1 ENT Surgeon per 100,000 population, Ethiopia has 0.014 ENT Surgeons per 100,000 population. Malawi had 0.01 ENT Surgeon per 100,000 population, South Africa had 0.417 ENT Surgeons per 100,000 population, while nine of the 18 countries assessed had 10 or fewer ENT surgeons.

Countries like Ethiopia, Ghana and Tanzania had no Audiologist and Kenya has 0.012 Audiologist per 100,000 populations, South Africa has 490 Audiologists which is 1.021 per 100,000 populations. The majority of patients did not have access to even the most basic otological surgical procedures, such as myringotomy with grommet insertion and tympanoplasty. Mastoid surgery for mastoiditis was not available in four countries, and it was quite possible for patients to die from treatable ear infections.

Operating microscopes, otology drills and modern imaging equipment and endoscopes were not available in many countries, and in some countries mastoidectomy was still performed with a hammer and gouge.

The current state of ENT, audiology, and speech therapy services and training opportunities in sub-Saharan Africa including Ethiopia did not show much progress compared to 2009[13].

In south Africa, most of ENT problems are managed by Non ENT specialist.70% of 44 million south African people who utilize public health sector are serviced by less than 35 full-time ENT specialists [15].In South Africa (SA), where it is very apparent that there are economic barriers to diagnosis and treatment, there is co-existence of the developing and developed world. Health budgets, poor infrastructure and shortage of medical staff are some of the challenges regularly encountered.[11] Furthermore, there are individual clinicians and dedicated units who strive for the best outcomes by pioneering ground-breaking surgeries, regardless of limitations in resources – including head and neck cancer units using free flaps, endoscopic skull-base surgery using neuro-navigation and cochlear implant programs, to name a few.

A country of more than 100 million people, Ethiopia has 28 otolaryngologist [16] This is fewer than the 30 otolaryngologists currently on staff at the University of Pittsburgh in the United States.

The American Academy of Otolaryngology—Head and Neck Surgery and its members have shown continuing commitment to improving global otolaryngology care through humanitarian and international outreach programs. These efforts, based on a surgical mission model, have produced only modest improvements in otolaryngology care in Ethiopia [17].

3. Objectives.

3.1 General objectives:

-To assess ENT health care service availability and Readiness in primary, Secondary and Tertiary health Care Centers in Addis Ababa.

3.2 Specific Objectives

-To assess Availability of ENT Health care service in primary, Secondary and Tertiary health Care Centers in Addis Ababa.

-To assess the readiness of Health care institutions to provide ENT health care service.

4. Methods and Materials

4.1 Study Area and Period

This study was conducted in the primary, secondary and Tertiary health care centers in Addis Ababa.

Addis Ababa is the capital city of Ethiopia. Its population is around 3.238 million according to the 2015 census. There are around 100 Health centers and 13 hospitals (8 General hospitals and 5 tertiary hospitals). This study was conducted from April 1, 2019 to May 30, 2019.

4.2 Study Design

Cross-sectional study design was used.

4.3. Population

4.3.1 Source Population.

-All Governmental Health institutions in Addis Ababa.

4.3.2 Study population.

-Selected Governmental primary, secondary and Tertiary health care centers in Addis Ababa.

4.3.3 Study Unit.

-Health center, General and Tertiary hospital were study units of this study.

4.3.4 Inclusion Criteria and Exclusion criteria.

Exclusion Criteria.

-Private Health institutions.

4.4 Variables.

Dependent variables

- Service availability.
- Service Readiness.

Independent Variables.

- Level of health institution.
- Health professionals (ENT surgeon, Audiologist, Trained Nurses...)
- ENT Training.
- Treatment Guideline (available/not available).
- ENT Equipment (Diagnostic and Surgical).
- ENT Surgical Procedures.

4.5 Sample size Determination:

$$n = [(z^2 \cdot p \cdot q) + ME^2] / [ME^2 + z^2 \cdot p \cdot q / N]$$

Where

n= sample size

z= the square of the normal deviate at the required confidence level (3.84 is the square of the normal deviate (1.96) needed to provide an estimate at the 95% level of confidence)

p=50 % (Since The proportion of Health Facilities with ENT service is unknown)

q = 1-p

ME = margin of error (15%)

N= Total number of Facilities (Health centers, general and Tertiary hospital in Addis Ababa).

$$n = [(1.96)^2 \cdot 0.5 \cdot 0.5 + (.15)^2] / [(.15)^2 + (1.96)^2 \cdot 0.5 \cdot 0.5 / 113]$$

$$n=31$$

4.6 Sampling technique.

A simple random sampling method was used to select samples out of 100 primary health care health centers and all of (13) general and Tertiary hospitals were included in the research.

4.7 Data Collection Procedure.

Data was collected by face to face interview from clinical service director by data collectors after giving them training on the contents of the questionnaires.

4.8. Operational Definition

-Service Availability: refers to physical presence of the delivery of services, encompassing the health infrastructure, core health personnel and service utilization. This doesn't not include geographic barriers, travel time and user behavior, which require more complex input data.(WHO,SARA,2013).

-Service Readiness: is the ability of health facilities to offer a specific service and the capacity to provide that service measured through selected tracer items that include trained staffs, guidelines, equipment, diagnostic capacity and medicines.(WHO,SARA,2013).

4.9. Data Analysis

Data was checked for completeness and consistency. Data entry and cleaning was performed by using SPSS version 23.Descriptive statistics of percentages and frequency distributions of study variables was carried out using tables.

4.10. Ethical Consideration.

Ethical clearance was obtained from Institutional review board of SPHMMC after the proposal was reviewed and approved. A formal letter of permission and collaboration was submitted to the clinical service director of health institution under the study.

4.11. Dissemination of results

After being finalized, the final report will be submitted to the Otorhinolaryngology, Head and Neck surgery Department, Academic and Research vice Provost and the Research directorate office. After approval, the final hard copy along with the soft copy will be stored in the Academics archive to be used for further reference. The paper will also be presented to scientific meetings and will be published in a peer review journal.

5.Result.

-All health institutions included in this study responded the questionnaire making the response rate of this study is 100%.

5.2. ENT service Availability.

Health institutions offering Specific ENT Service were 7(22.6%).All of this services were available in the hospitals,3 were referral hospitals and 4 were General hospitals.ENT problems in other hospitals were managed by General physicians in general outpatient clinic and those who need further evaluation were referred to this Centers(**Table 1**).

Table 1: Percentages of health facilities with ENT service in Addis Ababa, April 15 to May 30, 2019.

ENT Service	Frequency	Percentage
Total Number of health institutions with ENT service	7	22.6
Number of General hospitals with ENT service.	4	12.9
Number of tertiary hospitals with ENT service	3	9.7

5.3 ENT service Readiness

5.3.1 Guidelines and Staff.

-Number of health centers with ENT trained health professionals were 4(22.2%). In 14(87.8%) of Health centers ENT problems were managed by Clinical nurses and Health officers who don't have additional ENT training course.

-There was no treatment guideline in all surveyed health facilities.

-None of the health facilities had ENT trained nurses and Audiologists. Head and Neck subspecialty service was available in only one referral hospital. Speech therapy service was being given in only one General hospital (**Table 2**).

Table 2 Health professionals in General and Tertiary hospitals offering ENT Service, in Addis Ababa , April 15 to May 30, 2019.

Name of hospital	No.of General ENT Surgeon.	Otologist	Head and Neck surgeon	Pediatric ENT Surgeon	ENT trained Nurses	Audiologist	Audiology technician	Speech Therapist
Black Lion	3	1	0	0	0	0	1	0
Saint paul	4	1	1	0	0	0	1	0
Yekatit	4	0	0	0	0	0	1	1
Menelik	2	0	0	0	0	0	0	0
Ras Desta	2	0	0	0	0	0	0	0
Torhayeloch	1	0	0	0	0	0	0	0
Police	1	0	0	0	0	0	0	0

5.3.2. Equipment

- None of the health centers had all basic ENT OPD equipment.
- Almost all health centers 16 (88.9%) had Otoscope in their OPD.
- The second commonly available Basic ENT OPD equipment was Headlight.
- None of the health centers had loop currete used to remove ENT foreign body (**Table 3**).

Table 3 Availability of ENT OPD equipment in the health center, in Addis Ababa, April 15 to May 30, 2019

ENT OPD equipment	Number of Health centers with Basic ENT OPD equipment.	%
Otoscope	16	88.9
Tuning fork	2	11.1
Nasal Speculum	2	11.1
Laryngeal mirror	2	11.1
Loop currete	0	0
Head light	7	38.9
Ear syringe	4	22.2

- Almost all hospitals had otoscope 12 (92%).
- Fourty to Fifty percent of hospitals had Ear syringe, loop currete, Laryngeal mirror, Biopsy forceps, Head light, Suction machine and Suction tips.
- The most commonly available Surgical set equipment was Minor surgical set and adenotonsillectomy set (in 53.8% of hospitals).The least available ENT surgical equipment's were Laryngoscope set and rigid bronchoscope (Table 4).

Table 4 : ENT Equipment in General and Tertiary Hospitals, in Addis Ababa, April15 to May 30, 2019

ENT Equipment	Number of hospitals	%
Otoscope	12	92
Tuning fork	7	53.8
Ear syringe	6	46.2
Loop currete	6	46.2
Laryngeal mirror	7	53.8
Flexible laryngoscope	4	30.8
Biopsy forceps	7	53.8
Magille's forceps	5	38.5
Alligator forceps	5	38.5
Suction machine	7	53.8
Suction tips	7	53.8
Head light	7	53.8
Surgical instrument		
Minor surgical set	7	53.8
Laryngoscope set	3	23.1
Tracheostomy set	4	30.8
Adeno tonsillectomy set	7	53.8
Tympanoplasty set	6	46.2
Mastoidectomy set	5	38.5
Myringotomy set	5	38.5
Drill machine	4	30.8
Operating Microscope	4	30.8
Septoplasty set	5	38.5
Sinus surgery set	5	38.5
Rigid Bronchoscope	3	23.1

5.3.3 Specific Services.

-ENT health education was being offered in 11(35.5%) of health institutions. Fifty percent of the Health centers give ENT health education on very specific ENT health problems. Among hospitals Providing ENT service, ENT health education was being given in 3 hospitals.

-Hospitals who offer audiology test service were only 2(15.1%), this include pure tone audiometer and Tympanometry.

-Adenotonsillectomy, Caldwell Luc and External Ethmoidectomy were commonly offered surgical services.

-Thirty one percent of Hospitals offer Ear Surgical Service, Tympanoplasty and Mastoidectomy being the commonly performed surgeries. The least available surgical services were Functional endoscopic sinus surgery and Head and Neck Oncologic Surgery (Table 5).

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Table 5 Services being given in General and Tertiary hospitals, in Addis Ababa , April15 to May 30, 2019

ENT service	Number of Hospital	%
Outpatient service	7	53.8
Inpatient service	6	46.2
Audiology Test	2	15.1
Surgery		
Minor surgery	7	53.8
Ear Surgey	4	30.8
Tympanoplasty	4	30.8
Mastoidectomy	4	30.8
Ventilation Tube insertion	3	23.1
Cochlear implant	0	0
Head and Neck oncologic surgery	2	15.1
Adenotonsillectomy	6	46.2
Endoscopic sinus surgery	2	2
Caldwel Luc	6	46.2
External Ethmoidectomy	6	46.2

6. Discussion.

Ethiopia has three- tier health care delivery system which is connected to each other by a referral system. In Addis Ababa Health institutions offering ENT Service were 22.6%.All of this services were available in hospitals,3 were referral hospitals and 4 were General hospitals. ENT problems in other hospitals were managed by General physicians in general outpatient clinic and those who need further evaluation were referred to these Centers. This finding was comparable to south Africa where most of ENT problems were managed by Non- ENT specialist (15).

This service was not adequate as these hospitals receive referral from all Health centers and other hospitals in the country where ENT service is not available.

Although ENT is an old discipline, the service didn't expand and Quality ENT service is not available in most of middle income and low income countries (4). When we see service readiness in terms of staff, from 18 Health centers only 4 health centers had trained health professional on some of ENT problems and in 87.8% of Health centers ENT problems were managed by Clinical nurses and Health officers who don't have additional ENT training course. Among Health facilities who offer Specific ENT service, Head and Neck subspecialty service was available in only one referral hospital. Speech therapy service is being given in only one General hospital and none of the health facilities have ENT trained nurse and Audiologist. This result was comparable to most of Sub-Saharan Africa ENT services (5).

The availability of Basic ENT OPD equipment used to diagnose common ENT problems was not adequate in most of health institutions. Hospitals that have ENT services were more likely to have Basic ENT OPD equipment used to diagnose common ENT problems.

Availability of Equipment used to diagnose and treat laryngeal or/and airway problems were low. Among hospitals that offer ENT service only 3 hospitals have Laryngoscope and Rigid bronchoscope.

As provision of quality health service includes both preventive and curative services, giving health education as part of the service is important. In contrary this result showed low ENT health education in hospitals that offer ENT service.

Although there was no study showing the prevalence of hearing loss in Addis Ababa, Hearing disability ranks third on the list of non-fatal disabling conditions in low- and middle-income countries(8). The result of this study showed very low hearing test service; only 2(15.1%) hospitals provide basic audiology tests. This was comparable to most of sub-Saharan Africa countries excluding South Africa where there was relatively high number of audiologists and Hearing test services (5).

-The burden of Ear disease in hospitals offering ENT service seems high compared to other diseases though there was no published study showing the prevalence. Most of patients with ear infection need Surgeries but this service was available in only 30.8% of Hospitals, Tympanoplasty and Mastoidectomy being commonly performed surgeries.

In this study Head and Neck oncologic surgery was the least service available in Hospitals that give ENT service. This is due to lack of Head and Neck Surgeon in almost all this hospitals. Vorobiof and Abratt reported that 21 African countries do not have radiation therapy facilities (18). Hence, reliance in these countries has to be placed on a purely surgical approach to cancers of the head and neck. This problem is aggravated in Ethiopia by presence of only one radiation center.

7. Limitations.

- It didn't address the accessibility of available services and didn't compare with the magnitude of the problem.
- There is no ENT standard of care indicators that the study used to compare the results.
- There is no clear definition set by FMHACA between Referral and Tertiary hospital.
- Lack of adequate Local and global Literatures.
- The result of this study represent only Addis Ababa region. It didn't address Availability of ENT service outside Addis Ababa region which have limited health coverage compared to Addis Ababa region.
- It didn't include private health care centers.

8. Conclusion and Recommendations.

8.1. Conclusion.

-The result of this study has shown the presence of inadequate ENT service provision and most of ENT problems are managed by Non-ENT specialists. Most of Hospitals who offer ENT service have lack of trained health professionals, Treatment Guidelines, Audiology tests, Basic ENT Surgical equipment, and subspecialty services. Comprehensive surgical service is being given relatively in Referral hospitals.

8.2. Recommendation.

- Further studies should be done to compare the gap of this service with the magnitude of the problem and nationally representative researches should be done for the future.
- Responsible bodies should act to strengthen ENT health care delivery by training staffs, preparing guideline, and availing diagnostic and surgical equipment.

References

1. NHS Careers. Otorhinolaryngology (ear, nose and throat surgery, ENT) *Health Careers*. Available from: <https://www.healthcareers.nhs.uk/explore-roles/surgery/ear-nose-throat-surgery>.
2. Lingamdenne Paul Emerson,¹ Anand Job,¹ and Vinod Abraham². A Model for provision of ENT Health Care Service at Primary and Secondary Hospital Level in Developing Country, Biomed international Research, 2013.
3. Fagan JJ, Jacobs M. Survey of ENT services in Africa: need for a comprehensive intervention. *Global Health Action* 2009;2:e1–7.
4. Chao TE, Mandigo M, Opoku-Anane J, Maine R. Systematic review of laparoscopic surgery in low- and middle-income countries: benefits, challenges, and strategies. *Surgical endoscopy*. 2016 Jan;30(1):1-10. doi: 10.1007/s00464-015-4201-
5. World Health Organization. World Health Report: Global Public Health Threats in the 21st Century. WHO; 2013.
6. American Academy of Otolaryngology. Otolaryngology in Global Health. *American Academy of Otolaryngology - Head and Neck Surgery*. 2017. Available from: <http://www.entnet.org/content/otolaryngology-global-health>.
7. Shah Shankar P* and Chetri ST. Challenges of otorhinolaryngology in developing countries, *journal of Ear, Nose and Throat disease*, 2018.
8. World Health Organization. Deafness and hearing loss. Geneva: WHO, 2013. <http://www.who.int/media Centre/factsheets/fs300/en/index>.
9. Gupta B, Johnson NW, Kumar N. Global Epidemiology of Head and Neck Cancers, A continuing challenge *Oncology*. 206.91.13-23.

10. Clamp PJ, Gunasegaram S, Pothier DD, Saunders MW. ENT in general practice: Training, experience and referral rates. *J. Laryngol Otol* 2007;121(6):580-583. [<http://dx.doi.org/10.1017/S0022215106003495>]
11. Fagan JJ. Developing world ENT: a global responsibility. *J Laryngol Otol*. 2012; 126:544–547.
12. Fagan JJ, Work force, training and diseases in Africa, *Otolaryngol Clin N Am* - (2018) —<https://doi.org/10.1016/j.otc.2018.01.009>2018
13. Mulwafu W, Ensink R, Kuper H, et al. Survey of ENT services in Sub-Saharan Africa: little progress between 2009 and 2015. *Global Health Action* 2017. <https://doi.org/10.1080/16549716>.
14. “World population prospects - population division - United Nations”. 2015. Available at: [Esa.un.org](http://esa.un.org).
15. HPCSA. Register. <http://iregister.hpcsa.co.za/RegisterSearch.aspx>
16. Coggins R. Society for middle ear disease hosts Ethiopian scholar. *Eye and Ear Foundation Sight and Sound Journal*. 2017. https://issuu.com/eyearfoundationofpittsburgh/docs/fall_2017_s_s_digital.
17. Isaacson G, Drum ET, Cohen MS. Surgical missions to developing countries: ethical conflicts. *Otolaryngol Head Neck Surg*. 2010; 143:476-479.
18. Vorobiof DA, Abratt R. The cancer burden in Africa. *S Afr Med J* 2007; 97: 937, 939.

Appendix I Questionnaire

Health Institution Identification

Name of Health Institution	
Location of Health Institution City ➤ Sub city ➤ Woreda ➤ Kebele	
Type of Health Institution	Health Center ☐ Primary Hospital ☐ General Hospital ☒ Tertiary Hospital ☐

1. Is there ENT HEALTH CARE SERVICE?

✓ Tick the box YES ☐ NO ☐

If YES, Skip question No.2,3,4 and 5.

If No, Skip question No.8

2.If the answer for the above Question is NO, who will manage patients who come with common ENT problems like wax impaction, otitis media, hearing problem, Foreign body, Allergic rhinitis, rhinosinusitis and voice change at clinic?

3. Is there health professional who took ENT Health Care training in addition to routine medical school course?

YES ☐ NO ☐

4..If the answer for the above question is YES, what is their number.

1) One . 2) Two and more than two.

5. Which of the following Basic ENT instruments are available at OPD? Tick in the box.

1. .Otoscope. ☐

2. .Tuning fork. ☐

3. .Nasal Speculum. ☐

4. .Laryngeal Mirror. ☐

5. .Loop curate ☐

6. Head light ☐

7. Ear syringe ☐

6. Is there ENT TREATMENT GUIDELINE?

YES ☐

NO ☐

7. Does ENT HEALTH is included in Health Education?

YES ☐

NO ☐

8. The following table will assess health care Service availability, health professionals, and Equipment., Please go through each questions in the the first column and tick the box in the second column.

NO	SERVICE	RESULT		SKIP
		YES	NO	
1	Outpatient Service			
2	Inpatient Service			No, Skip to Question No.4.
3	Number of Beds			
4	Audiologic Test Specify the types			
5	Surgery			No, skip to Question No.21
6	Minor Surgery			
7	Major Surgery			No, skip to QUESTION No. 20
8	Ear Surgery			
9	Ventilation tube insertion.			
10	Tympanoplasty			
11	Middle ear ossicular(prosthesis)surgery			
12	Mastoidectomy.for mastoiditis			
13	Mastoidectomy for cholesteatoma			
14	Bone anchored hearing aid			
15	Cochlear implant			

16	Head and Neck oncologic Surgery.			
17	Adenotonsillectomy			
18	Calwell Luc			
19	Endoscopic sinus surgery			
20	External ethmoidectomies			
Health professionals				
21	ENT Surgeon			
22	Number of ENT surgeon.			
23	Otologist			
24	Head and Neck Surgeon			
25	Pediatric ENT Surgeon			
26	ENT Trained Nurses.			
27	Audiologist			
28	Audiology technician Mention training level			
29	Speech Therapist			
ENT Health Care unit Facility and Equipment				
30	Number of Outpatient clinic			
31	Number of Inpatient Bed.			
32	Minor Surgical room			
33	Number of Major Surgical OR Table			
34	Basic OPD INSTRUMENT			
35	Otoscope			
36	Number of otoscope			
37				

	Nasal Speculum			
38	Number of nasal speculum			
39	Laryngeal Mirror Number of Laryngeal Mirror			
40	Flexible Laryngoscope Number of flexible laryngoscope			
41	Ear Syringe Number of Ear Syringe			
42	Loop Currate Number of Loop currate			
43	Biopsy Forceps Number of Biopsy forceps			
44	Alligator Forceps Number of Alligator forceps			
45	Magill's Forceps Number of Magill's forceps			
46	Suction Machine Number			
47	Suction Tips Number			
48	Head light Number			
49	Surgical Instruments			
50	Minor surgical set Number			
51	Adeno tonsillectomy Set Number			
52	Myringotomy Set Number			
53	Laryngoscopy Set Adult Number			
54	Laryngoscope Surgical Set Pediatric Number			
55	Laryngoscope Surgical Set adult Number			
56	Tympanoplasty Set Number			
57	Mastoidectomy Set			

	Number			
58	Drill Machine Number			
60	Operating Microscope Number			
61	Head and Neck Surgical Set Number			
62	SINUS Surgery Set Number			
63	Septoplasty Set Number			
64	Tracheostomy Surgical Set Number			
65	Rigid Bronchoscope Number			

