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ANALYSIS OF OTORHINOLARYNGOLOGY PRACTICES-CHALLENGES OF SPECIALISTS AND FACILTIES-IN SUB-SAHARAN AFRICA

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ABSTRACT

Background: More than 95% of the population in sub-Saharan Africa (S.S.A.) does not have ready access to safe, affordable surgical care, and there is a desperate need for E.N.T. (ear, nose, and throat), audiology, and speech therapy services. Therefore, from an international outlook, the most significant challenge confronting hearing and cancer care delivery is not high-technology and high-cost medicine but the lack of access to even the most elementary E.N.T. care **Materials and Methods:** A literature search for studies on the analysis of trends and outcomes of otorhinolaryngology practices in sub-Saharan Africa was performed using Google Scholar search database, PubMed, Medline, and ScienceDirect. The bibliographies of included studies were also searched for additional references. About 95 articles were identified. Twenty-one articles were considered suitable for the review. **Results:** The whole residents of the 22 countries illustrated in a study reviewed were 720,500,000; this symbolizes 75% of the population of sub-Saharan Africa. Among the 22 countries that were tested, 847 ENT surgeons, 580 audiologists, 906 speech therapists, 264 ENT clinical officers, and 320 oncologists were reported. When data have combined the sample, the regional ratio was 1.2 million people per E.N.T. surgeon, 0.8 million people per audiologist, and 1.3 million people per speech therapist. **Conclusion:** Basic E.N.T. and airway-related interventions are possible in most countries that responded; life-saving procedures such as tracheostomy (and tracheostomy tubes), bronchoscopy, and balloon dilatation were not readily available in all countries. Access to hearing screening was very poor in most countries, highlighting the undocumented burden of disease of hearing loss in Africa and other LMICs, estimated at 5% of the world's population.

INTRODUCTION

Hearing Impairment In Sub-Saharan Africa

Hearing impairment is more dominant in sub-Saharan Africa than in other parts of the globe.[1] It can become increasingly typical over the future decades as the residents continue to age, given that hearing impairment is most predominant in elder age groups. Similarly, the age-specific prevalence of hearing impairment may also rise for diverse causes.[2]

Hearing Loss And Global Burden Of Disease(G.B.D)

The preponderance of hearing loss is evaluated annually through the Global Burden of Disease (G.B.D.) study, a systematic overview of the prevalence of 369 diseases and injuries.

This G.B.D. Estimations are accompanied by predictions of hearing loss prevalence until 2050, providing a complete view of current and future disease trends. We found that 1.57 billion people (95% uncertainty interval 1.51–1.64) had hearing loss in 2019, contributing to 43.45 million (29.68–61.80) years lived with a disability as the third largest cause of disability in G.B.D. Despite the stable age-standardized prevalence, the global hearing loss is projected to increase by 56.1% (47.3–65.2) in the next 30 years.[3]

In the coming decade, H.I.V. and tuberculosis will become more chronic conditions, thanks to the scaling up of antiretroviral therapy (A.R.T.) and other treatments, and so the burden of chronic suppurative otitis media (CSOM) and associated hearing loss will likely increase dramatically.[5]

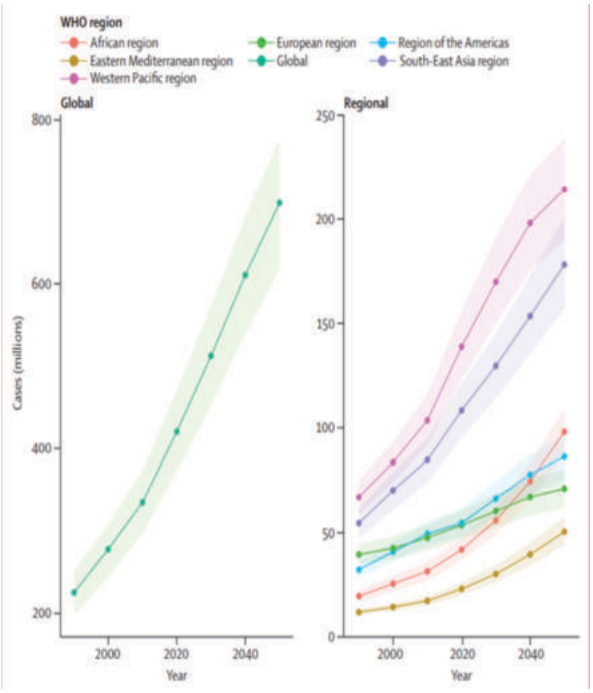


Fig 1. Prevalence Of Hearing Loss, 1990-2019, With Forecasts To 2050, By Who Region.[4]

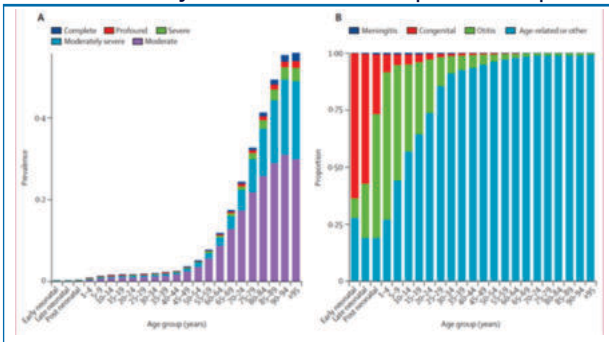


Figure 2. prevalence Of Hearing Loss 35 Db Or Greater By Age, Severity, And Cause: Prevalence Of Hearing Loss 35 Db Or Greater By Age And Severity (A) And Proportion Of Individuals With Hearing Loss By Age And Cause For All Severities (B).[4]

It is likewise anticipated that 70% of cancers will occur in developing countries by 2030, including those relating to ear, nose, and throat (E.N.T.). Consequently, there is a great and growing demand for E.N.T. services in sub-Saharan Africa.[5]

Lack Of Elementary Care In Sub-Saharan Africa

More than 95% of the population in sub-Saharan Africa (S.S.A.) does not have ready access to safe, affordable surgical care, and there is a desperate need for E.N.T. (ear, nose, and throat), audiology, and speech therapy services. Therefore, from an international outlook, the most significant challenge confronting hearing and cancer care delivery is not high-technology and high-cost medicine but the lack of access to even the most elementary E.N.T. care.[6]

Comparison Of 2009 And 2015 Ent Services In Sub-Saharan Africa

A 2009 survey of E.N.T., audiology, speech therapy services and training opportunities were conducted in 18 sub-Saharan African countries. It documented that the availability of services was extremely poor. The distribution of services was very discriminatory, and training possibilities were defined.[7] Consequently, people will not be able to access the services they require and so will have hearing loss that may have been prevented and is now untreated, with consequent negative impacts on quality of life, mental health, and economic productivity.

Twenty E.N.T. surgeons and two audiologists from 22 sub-Saharan countries responded to the survey, 73% of the response rate. Fifteen countries reacted in both 2009 and 2015, and 22 countries could compare progress in these countries.



Figure 3. Twenty-two Countries Participated In This Study.[8]

Data Collection From 22 Countries

The whole residents of the 22 countries illustrated in the study were 720,500,000; this symbolizes 75% of the population of sub-Saharan Africa. Among the 22 countries that were tested, 847 ENT surgeons, 580 audiologists, 906 speech therapists, 264 ENT clinical officers, and 320 oncologists were reported. When data have combined the sample, the regional ratio was 1.2 million people per E.N.T. surgeon, 0.8 million people per audiologist, and 1.3 million people per speech therapist.

Comparison Of Data Collected From 15 Countries

Data collected from 15 countries that responded in 2009 and 2015 are compared, the total number of E.N.T. surgeons had increased from 442 to 634, representing a 43% increase, the total number of audiologists had increased from 511 to 524, representing a 2.5% increase, and speech therapists had raised from 1164 to 1514, describing a 30% increase.

Table I.comparison Of Total No Of ENT Surgeons, Audiologists, And Speech Therapists Per Country In 2009 And 2015.[8]

	ENT surgeons		Audiology		Speech therapy	
	2009	2015	2009	2015	2009	2015
Burundi	*	6	*	10	*	0
Cameroon	*	35	*	0	*	25
D.R.C	25	18	0	3	0	3
Ethiopia	11	22	0	1	0	1
Ghana	15	27	6	13	2	6
Guinea Conakry	*	6	*	6	*	1
Kenya	40	76	4	7	3	16
Lesotho	2	2	0	2	0	1
Madagascar	16	15	2	10	4	1
Malawi	1	2	0	3	0	0
Mali	*	15	*	0	*	2
Nigeria	70	140	5	13	3	4
Rwanda	*	8	*	4	*	1
S. Africa	200	246	490	444	1144	1470
Senegal	25	15	1	3	2	4
Sudan	*	105	*	5	*	2
Swaziland	2	3	1	5	1	3
Tanzania	11	18	0	1	2	3
Togo	*	8	*	0	*	25
Uganda	16	35	1	15	2	0
Zambia	2	7	1	1	0	1
Zimbabwe	6	8	0	3	1	1

Impacts Of Increased Population

However, an increased population (23%) in the countries analyzed between 2009 and 2015, from 486 million to 599 million people. When this population is considered, when calculating the numbers of E.N.T. surgeons, audiologists, and speech therapists per 100,000 people, it was found that in four countries (D.R.C., Lesotho, Madagascar, Senegal), there had been a decline in the number of E.N.T. surgeons per 100,000 people between 2009 and 2015. while in Ghana, Kenya, and Zambia, there had been an increase in the numbers of E.N.T.s, audiologists, and speech therapists per 100,000 people. There remains a severe shortfall of E.N.T. surgeons,

audiologists, and speech therapists across all countries compared to the U.K.

Training Programs Initiated Since 2009

New training programs have been introduced in six countries since the 2009 study. In three countries (Rwanda, Zimbabwe, and Ethiopia), new E.N.T. training programs represent the only training programs in the respective countries. The two studies introduced one new audiology in Ghana and one speech therapy in Kenya. However, there has been a small change in the numbers of new E.N.T. surgeons, audiologists, and speech therapists preparing annually. Five countries (Malawi, Kenya, Mali, Togo, and Cameroon) reported having training programs for E.N.T. clinical officers.

Table II. Training Programs[8]

Countries	Number of medical schools		ENT training				Audiology training programmes		Speech training programmes	
			Training programmes		New ENTs p.a					
	2009	2015	2009	2015	2009	2015	2009	2015	2009	2015
Burundi	*	3	*	1	*	1	*	–	*	–
Cameroon	*	4	*	1	*	5	*	–	*	–
D.R.C	4	6	1	1	1	2	–	–	–	–
Ethiopia	6	9	–	1	–	4	–	–	–	–
Ghana	3	4	2	2	1–2	2	–	Yes	–	–
Guinea Conakry	*	3	*	3	*	5	*	–	*	–
Kenya	2	6	1	1	4	1	Yes	Yes	–	Yes
Lesotho	–	1	–	–	–	–	–	–	–	–
Madagascar	2	6	1	1	0	1	–	–	–	–
Malawi	1	1	0	1	0	0	–	–	–	–
Mali	*	3	*	1	*	4	*	–	*	–
Nigeria	36	58	19	37	4	5	–	–	–	–
Rwanda	*	2	*	1	*	2	*	–	–	–
S. Africa	8	9	8	9	6	6	Yes	Yes	Yes	Yes
Senegal	2	5	1	1	5	4	–	–	–	–
Sudan	*	95	*	0	*	10	*	–	–	–
Swaziland	–	–	–	–	–	–	–	–	–	–
Tanzania	5	4	2	2	2	3	–	–	–	–
Togo	*	1	*	1	*	?	*	–	*	Yes
Uganda	3	3	1	2	1–3	4	–	–	–	–
Zambia	1	3	–	–	–	–	–	–	–	–
Zimbabwe	1	1	–	1	–	2	–	–	–	–

This Survey illustrates the poor state of E.N.T., audiology, and speech therapy services in state hospitals in the 22 African countries polled. Only three countries (Malawi, Burundi, and Ethiopia) provide E.N.T. services free in state hospitals. Sinus and rhinologic surgery had 66% availability, Audiology and otologic surgery had 87% availability. Head and neck oncologic surgery had 75%availability. A big need in E.N.T. practice appears to be equipment for otologic surgery and basic equipment. The availability of modern medical equipment remains problematic, with 68% reporting availability.[8]

Availability of services outside major cities was a problem in 2009 and remained a concern in 2015. In 2015, all the respondents reported that E.N.T. services outside the capital city were poor. In 2009, the availability of services outside the capital was mostly poor, with some countries reporting it as good or excellent.

Respondents cited lack of basic equipment as the most frequent limitation in providing E.N.T. services. Still, they also cited poor E.N.T. training facilities, audiological rehabilitation, awareness of the burden of E.N.T. pathology, and human resources management as among the top limitations encountered in daily practice.

Surgeons in sub-Saharan Africa face different challenges than those in developed countries: extreme shortages of otolaryngologists, speech pathologists, and audiologists; lack of training opportunities; and a scarcity of otolaryngology services aggravated by population growth and aging.[9]

Ent Services In Zambia (2019-2020)

Ailments of the ear, nose, and throat (E.N.T.) are common and are a major cause of morbidity and mortality. In many low-income countries like Zambia, the high E.N.T. disease burden has not received the required resources for treatment. We investigated E.N.T. service provision in hospitals in Zambia by documenting the profile of hospitals offering E.N.T. services and examining the country's E.N.T. services.

Of the 109 hospitals approached to participate in the study, 61 responded. This represented 5 of Third Level Hospitals (T.L.H.), 17of Second Level Hospitals (S.L.H.), and 35of First Level Hospitals (F.L.H.) countrywide. Of the participating hospitals, four were unclassified. Three were F.L.H., 2 were S.L.H., and three were T.L.H. had an E.N.T. examination room within this sample.

The data revealed that there were 4 E.N.T. surgeons, 1 Audiologist, and no Speech Therapists across the country. Zambia's E.N.T. services were deficient at all levels of hospital care. There were deficiencies in infrastructure, human resources, and equipment in hospitals. Critical intervention is required with the current burden of disease.[10]

Lack Of Surgical Skills In Zambia

A single interviewer visited 103of 108 surgical hospitals in Zambia and conducted 495 interviews. An average of 68% of the 32 emergency and essential surgical procedures was available (range 32%-100%). Lack of surgical skill was the primary reason for referral in 72% of procedure types. Minimum pediatric surgical safety criteria were met by 14% of hospitals. The primary limitation to providing pediatric surgical care in Zambia is the lack of surgical skills. Minimum safety standards were met by 14% of hospitals. Efforts to improve pediatric surgery should prioritize teaching surgical skills to expand access and provide safety training, equipment, and supplies to increase safety.[11]

Lack Of Pediatric Expertise In Sub-Saharan Africa

Children constitute 50% of Africa'spopulation. Despite some progress over the last decade, Sub-Saharan Africa has the highest under-five mortality rates globally, [12] and there are insufficient health care providers with pediatric expertise.[13] Although many projects prioritize infectious diseases and malnutrition, there is little focus on pediatric surgical conditions, which constitute a large burden in low- and middle-income countries (LMIC).[14] Therefore, improving children's surgical services is essential to improving pediatric health in such countries.

Africa has a shortage of pediatric surgeons, surgical subspecialists, and a lack of post-qualification subspecialist training opportunities.[15]Many specialists remain concentrated in capital cities or emigrate. There is no information about Africa's pediatric ear, nose & throat (E.N.T.) services. E.N.T. services in Sub-Saharan Africa are known to be very inadequate.[7]

A study in 2009 reported a lack of availability of basic equipment, a severe shortage of E.N.T. surgeons, audiologists, and speech pathologists, and a lack of training opportunities. A subsequent study in 2017 reported little progress over the 8-year interval between the two audits.

Availability Of Pediatric ENT Services In Sub-Saharan Africa

The study aimed to determine the availability of pediatric ENT services in Africa. Twelve out of 23 African nations reacted to the survey, giving a response rate of 52%. Seven countries had responses by both E.N.T. and pediatric surgery, four countries had only E.N.T. surgeons completing the

Survey, and one country had only pediatric surgeons completing the Survey.

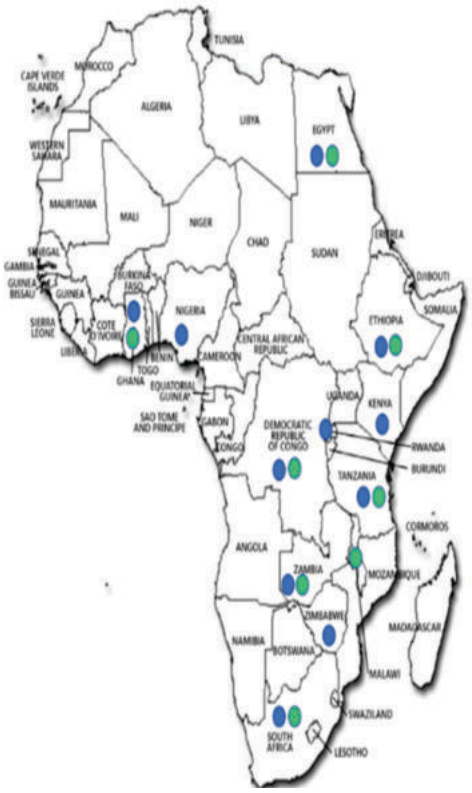


Figure4. Twelve Countries That Participated In The Study.[11] Blue Indicates ENT Surgeons, And Green Indicates Pediatric Surgeons.

In all 11 countries, the total number of E.N.T. surgeons reported per country was less than 50% compared to the U.K. For 8 of the 11 countries, the number of E.N.T. surgeons per country was < 6% of the U.K. Similar findings were documented for audiologists and speech therapists. The average number of E.N.T. surgeons per country was found to be 8.8 per 100,000 people. The average number of audiologists per country was 130.6 per 100,000 people. The average number of speech therapists per country was 75.3 per 100,000 people.

Table III. Comparison Of The Total Number Of ENT Surgeons, Audiologists, And Speech Therapists, Per 100,000 People.[11]

	Population (million)	ENT surgeons		% of UK coverage	Audiology		Speech therapists	
		Number	Per 100,000		Number	Per 100,000	Number	Per 100,000
DRC	78.74	22	0.027	1.2	1	0.001	0	0.0
Egypt*	95.69	1,000	1.045	46.5	990	1.035	600	0.627
Ethiopia	102.4	25	0.024	1.1	1	0.001	2	0.002
Ghana*	28.21	16	0.057	2.5	7	0.025	4	0.014
Kenya*	48.46	80	0.165	7.3	8	0.017	6	0.012
Nigeria	186	230	0.124	5.5	15	0.008	5	0.003
Rwanda*	11.92	12	0.101	4.5	2	0.017	1	0.008
South Africa*	55.91	250	0.447	19.9	400	0.715	200	0.358
Tanzania	55.57	30	0.054	2.4	6	0.011	10	0.018
Zambia	16.59	5	0.030	1.3	1	0.006	0	0.0
Zimbabwe	16.15	10	0.062	2.8	6	0.037	4	0.025
UK	65.64	1476	2.249	100	2,373	3.615	13,098	19.954

Medical schools with general E.N.T. training programs, E.N.T. subspecialist training programs, and pediatric surgery training programs are listed below.

Table IV. ENT And Pediatric Training Programs.[11]

	General ENT and ENT subspecialist training programmes					Paediatric surgery training programmes	
	Medical schools	Head & neck	Rhinology	Paediatric	Otology	Medical schools	Subspecialty
DRC	1	No	No	No	No	0	No
Egypt*	9	Yes	Yes	Yes	Yes	20	No
Ethiopia	2	No	No	No	No	1	No
Ghana*	2	No	No	No	No	2	No
Kenya	1	No	No	No	No	#	#
Malawi	1	No	No	No	No	1	No
Nigeria	17	No	No	No	No	#	#
Rwanda	1	No	No	No	No	1	No
South Africa*	8	Yes	Yes	Yes	No	8	No
Tanzania	1	No	No	No	No	5	No
Zambia	1	No	No	No	No	1	No
Zimbabwe	1	No	No	No	No	#	#
UK	20	Yes	Yes	Yes	Yes	12	Yes

Hearing-related services, Approximately 73% (8/11 countries) reported good or excellent results for access to the following: ventilation tubes/grommets, operating microscopes, otology drills, C.T. scanning, and tympanoplasty. The neonatal hearing screening had a 73% (8/11 countries)availability response. Cochlear implantations had 73% availability. Hearing assessments were not or poorly available in schools in 90% (10/11 countries). Boneanchoredhearingaids had 90% availability. Middle ear prosthesis had 100% availability.

TableV. Availability Of Hearing-Related ENT Services.[11]

Hearing-related services in hospital	Nil	Poor	Good	Excellent
Neonatal hearing screening	7	1	3	0
Auditory brainstem reflexes	4	3	2	2
Oto-acoustic emission	3	3	3	2
Hearing screening in schools	6	4	1	0
Access to hearing aids	2	5	4	0
Access to ventilation tubes/grommets	0	3	6	2
Access to tympanoplasty	0	3	5	3
Access to mastoidectomy for cholesteatoma	0	4	4	3
Access to mastoidectomy for mastoiditis	0	4	4	3
Cochlear implantations	7	1	1	2
Bone anchored hearing aids	6	4	1	0
Middle ear prosthesis	7	4	0	0
Access to operating microscopes	0	2	7	2
Access to operating endoscopes	1	4	5	1
Access to otology drill	1	2	7	1
Access to CT scanning	0	3	3	5
Access to MRI scanning	2	3	2	4

Basic E.N.T. ear and airway-related interventions are possible in most countries that responded; life-saving procedures such as tracheostomy (and tracheostomy tubes), bronchoscopy, and balloon dilatation were not readily available in all countries. Access to hearing screening was very poor in most countries, highlighting the undocumented burden of disease of hearing loss in Africa and other LMICs, estimated at 5% of the world's population.

ENT Services In 2020 And The Constraints

On 11 March 2020, the World Health Organization declared

the current COVID-19 outbreak a public health emergency of global concern and, ultimately, pandemic. Anecdotal reports indicated a changing ENT landscape initiated by the pandemic and subsequent lockdown. There have been reports of a decrease in clinic attendees and surgical procedures performed in clinics throughout the world. Centers throughout the world initiated telemedicine during the lockdown period.

The monthly patient attendances at the outpatient clinics were fairly consistent in the pre-lockdown phase, with 31–35 patients seen/day. During the immediate period after lockdown, the patient attendance dropped drastically to 10 patients/day.

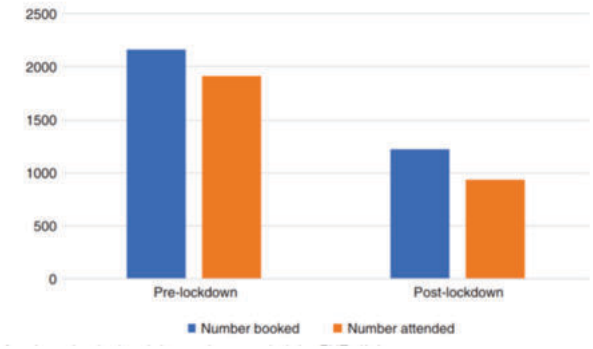


Figure 5. Number Of Patients Booked And Those Who Attended The ENT Clinic.[17]

The COVID-19 pandemic has resulted in the disruption of ENT and head and neck services worldwide. The head and neck region has one of the highest concentrations of virus particles. Thus there has been a trend to postpone all elective surgery and reschedule out-patient clinics wherever possible.

The study illustrates that there is still an ongoing need for specialist medical and surgical services despite a lockdown period. Healthcare systems need to be tailored to manage all patients so that care is not shifted from vulnerable groups and solely focused on COVID-19 patients.

Outreach Programs

The lack of pediatric E.N.T. and surgery services in Africa presents an opportunity for outreach programs from developed countries to develop and support such facilities in Africa. Most countries have access to functioning pediatric facilities where such subspecialist services can be established, with increased provisions for specialist training in Africa. As pediatric E.N.T. and surgery have common needs in terms of equipment like endoscopes and camera stacks, as well as I.C.U. and pediatric anesthesia, collaborative development of these two surgical

Many people, associations, and institutions are already engaged in outreach activities in S.S.A. such outreach projects are making tolerable clinical and teaching capabilities. Outreach by E.N.T. surgeons from developed countries is essential to address the critical lack of access to E.N.T. care in S.S.A. Outreach should be based on mutual respect, shared values, aspirations, internationally accepted best practices, and a desire to create durable and sustainable impact.

CONCLUSION

To address inequality of access to E.N.T. care and to work toward achieving the hearing-related goals outlined by the 17th World Health Assembly, there must be a significant and sustained investment in the education and training of surgeons, audiologists, speech therapists, clinical officers, anesthetists, and specialized nurses engaged in E.N.T. in S.S.A. and other developing countries.

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