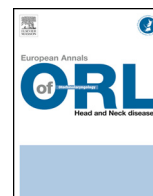




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# What is the availability of services for paediatric ENT surgery and paediatric surgery in Africa?



S. Peer<sup>a,b,\*</sup>, I. Vial<sup>a,c</sup>, A. Numanoglu<sup>a,d</sup>, J.J. Fagan<sup>b</sup>

<sup>a</sup> Red Cross War Memorial Children's Hospital, Cape Town, South Africa

<sup>b</sup> Division of Otorhinolaryngology, Head & Neck Surgery, University of Cape Town, Cape Town, South Africa

<sup>c</sup> Division of Paediatric Surgery, Erasmus University Medical Centre-Sophia Children's Hospital, Rotterdam, The Netherlands

<sup>d</sup> Division of Paediatric Surgery, University of Cape Town, Cape Town, South Africa

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## ABSTRACT

**Background:** Children constitute 50% of Africa's population. Sub-Saharan Africa has the highest under-five mortality rates in the world. This study is the first to document the availability of paediatric ENT and paediatric surgery services in Africa.

**Objective:** To determine the availability of paediatric ENT services in Africa, as well as that of paediatric surgery that would complement paediatric ENT.

**Method:** A descriptive observational study in the form of an online questionnaire was distributed by email to known ENT and paediatric surgeons based in Africa.

**Results:** Surgeons from twelve of 23 African countries responded to the survey. Seven countries had both ENT and paediatric surgery responses. In 8 of the 11 countries, the number of ENT surgeons per country was < 6% of that of the UK, with 1 ENT surgeon per 414,000 people and 1 paediatric surgeon per 1,181,151 people. Ten of 11 countries reported hearing assessments in schools were poor/unavailable. Seventy-three percent responded positively for access to rigid laryngoscopes, bronchoscopes, cameras and fibre optic cables, tracheostomy, anaesthesia and nurse practitioners. Access was reported as poor/unavailable for balloon dilators 73% (8/11 countries); CPAP machines 73% (8/11) and sleep studies 82% (9/11 countries). Flexible endoscopes were available in 50% (4/8 countries), 75% (6/8 countries) had access to a camera, monitor and stack. Thirty-eight percent (3/9 countries) reported no ENT specialists with paediatric training.

**Conclusions:** There is a great shortage of paediatric ENT and paediatric surgery services in Africa. More regional training opportunities and health infrastructure for these surgical specialties are needed. Collaborative development of paediatric ENT, surgery and anaesthesia should be considered to improve ENT-related child health in Africa.

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## 1. Introduction

Children constitute 50% of Africa's population. Despite some progress over the last decade, Sub-Saharan Africa has the highest under-five mortality rates in the world [1], and there are insufficient health care providers with paediatric expertise [2]. Although many projects prioritize infectious diseases and malnutrition, there is very little focus on paediatric surgical conditions, which constitute a large burden in low- and middle-income countries (LMIC)

[3]. Improving children's surgical services is therefore an essential component to improving paediatric health in such countries [3].

In Africa, paediatric surgery and other surgical specialties lack dedicated paediatric services and facilities [4–6]. Egypt has 9 children's hospitals for its > 30 million children, and in South Africa in 2006, 3 of its 4 paediatric state hospitals were shut down for financial reasons [5]. Africa has a shortage of paediatric surgeons and surgical subspecialists as well as a lack of post-qualification subspecialist training opportunities [4–7] and many specialists remain concentrated in capital cities or emigrate [8].

There is no information about the availability of paediatric ear, nose & throat (ENT) services in Africa. ENT services in Sub-Saharan Africa are known to be very inadequate [9,10]. A study in 2009 reported a lack of availability of basic equipment, and a severe shortage of ENT surgeons, audiologists and speech pathologists and

\* Corresponding author at: Red Cross War Memorial Children's Hospital, Otolaryngology, Head & Neck Surgery, University of Cape Town, H-53, Old Main Building, Groote Schuur Hospital, Observatory, Cape Town, 7925 South Africa.  
 E-mail address: [Shazia.Peer@uct.ac.za](mailto:Shazia.Peer@uct.ac.za) (S. Peer).

a lack of training opportunities [9]. A subsequent study in 2017 reported little progress over the 8-year interval between the two audits [7,10].

## 2. Objectives

The aim of this study was to determine the availability of paediatric ENT services in Africa, as well as that of paediatric surgery services that could complement paediatric ENT services.

## 3. Methods

This was a descriptive observational study in the form of an online questionnaire [11]. Participants were recruited from existing specialist databases of African ENT and paediatric surgery societies. Only ENT specialists and paediatric surgeons with a minimum of 2 years' specialist experience and who were permanently based in an African state health care centre were included. Specialists in private practice only, were excluded.

The questionnaire was emailed to 282 ENT specialists and 300 paediatric surgeons from 23 countries. The survey remained open for 3 weeks. Non-responders were emailed a second time and permitted a second 3-week period to respond. Multiple survey responses from the same country were compared. Any inconsistencies were clarified with participants.

Survey questions included the following: country demographics, availability of services and training, and A) health systems; B) theatre facilities; C) intensive care units (ICU); D) equipment and E) training and education. Answers were rated as follows: nil: absent services; poor: less than half of population had access to care; good: most but not all had access to care; excellent: almost all had access to care.

**Table 1**  
Number of respondents per country.

Country	ENT surgeons	Paediatric surgeons
DRC	2	1
Egypt	4	3
Ethiopia	2	1
Ghana	3	2
Kenya	1	–
Malawi	–	1
Nigeria	2	–
Rwanda	2	–
South Africa	8	6
Tanzania	1	1
Zambia	1	1
Zimbabwe	2	–

ENT: ear, nose & throat; DRC: Democratic Republic of Congo.

**Table 2**  
Comparison of total number of ENT surgeons, audiologists and speech therapists, per 100,000 people.

	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 <sup>a</sup>	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 <sup>a</sup>	28.21	16	0.057	2.5	7	0.025	4	0.014
Kenya <sup>a</sup>	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 <sup>a</sup>	11.92	12	0.101	4.5	2	0.017	1	0.008
South Africa <sup>a</sup>	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

ENT: ear, nose & throat; DRC: Democratic Republic of Congo; UK: United Kingdom.

<sup>a</sup> Mean.

The data were analysed using SPSS version 21 using descriptive statistics. Categorical variables were represented by frequency and ratios.

## 4. Results

Twelve of 23 African countries responded to the survey, giving a response rate of 52%. Seven countries had responses by both ENT and paediatric surgery, 4 countries had only ENT surgeons completing the survey and one country had only paediatric surgeons completing the survey (Fig. 1). Table 1 lists the number of respondents per country for ENT and paediatric surgeons.

The total number of ENT surgeons, audiologists and speech therapists per country when compared to the United Kingdom (UK) is listed in Table 2. In all 11 countries the total number of ENT surgeons reported per country was less 50% when compared to the UK. For 8 of the 11 countries, the number of ENT surgeons per country per 100,000 people was <6% of that of the UK. Similar findings were documented for audiologists and speech therapists (Table 1). The average number of ENT surgeons per country was found to be 8.8 per 100,000 people (range: 5–1000). The average number of audiologists per country was found to be 130.6 per 100,000 people (range: 1–990). The average number of speech therapists per country was found to be 75.3 per 100,000 people (range: 0–600). The regional ratio of the 11 countries was found to be 1 ENT surgeon per 414,071 people; 1 audiologist per 484,091 people and 1 speech therapist per 836,105 people.

Table 3 presents the total number of paediatric surgeons per country and compares them to the UK. The total number of paediatric surgeons in 7 of the 8 countries was less than 20% of that

**Table 3**  
Comparison of paediatric surgeons/100,000 people.

	Population (million)	Paediatric surgeons		% of UK coverage
		Number	Per 100,000	
DRC	78.74	0	0.0	0
Ethiopia	102.4	9	0.009	1.7
Egypt	95.69	300	0.314	61.0
Ghana	28.21	10	0.035	6.8
Malawi	18.09	4	0.02	3.9
South Africa <sup>a</sup>	55.91	50	0.089	17.3
Tanzania	55.57	5	0.009	1.7
Zambia	16.59	4	0.024	4.7
UK	65.64	338	0.515	100

DRC: Democratic Republic of Congo; UK: United Kingdom.

<sup>a</sup> Mean.

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