


BMJ Open Availability of rehabilitation services for communication disorders in Sri Lanka: a cross-sectional survey

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ABSTRACT

Objectives To describe the rehabilitation services available for communication disorders in Sri Lanka and to estimate the adequacy of the services in provinces and districts of the country.

Setting The study considered government and private institutions, which provide rehabilitation services for communication disorders in Sri Lanka.

Participants Institutions providing services of speech–language pathologists, audiologists and audiology technicians in Sri Lanka.

Primary and secondary outcome measures We investigated the number of government hospitals and private institutions, which provide speech–language pathology and audiology services in Sri Lanka as the primary outcome measure. A number of speech–language pathologists, audiologists and audiology technicians working in the institutions were obtained from records and institution-based inquiries to identify the adequacy of the services in the country as the secondary outcome measure.

Results Of the 647 government hospitals that provide free healthcare services in the country, 45 and 33 hospitals had speech and language therapy and audiology units, respectively. Government hospitals do not have audiologists but only have audiology technicians. The number of speech and language therapists and audiology technicians in the government sector per 100 000 population in the country was 0.44 and 0.18, respectively. There were wide variations in specialist to population ratio between districts. 77 private centres provide speech therapy services in 15 out of the 25 districts; 36 private centres provide audiological evaluations in 9 districts.

Conclusions The number of specialist speech and language therapists and audiologists is not sufficient to provide adequate rehabilitation services for communications disorder for the Sri Lankan population. Not recruiting audiologists to the government sector affects the management of hearing impairment in the affected.

INTRODUCTION

A reliable estimate of the global prevalence of communication disorders, in which the ability to receive, send, process, and grasp ideas

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ Different data sources were used to identify institutions in the whole country to capture all data points.
- ⇒ GPS coordinates of all institutions were obtained for mapping.
- ⇒ A repeat survey was carried out once the country opened up after the COVID-19 pandemic.
- ⇒ We were unable to cross-check the reliability of the responses of the interviewees.

or verbal, non-verbal, and graphic symbol systems is impaired, is unknown. These disorders present as developmental or acquired functional disorders of speech, language or hearing, either individually or in combination; acquired disorders are secondary to another disability or it may be the primary cause of another disability.¹ Speech–language therapists/pathologists are primarily involved with persons having communication disorders affecting speech, language, cognitive, social communication and swallowing disorder² while audiologists are concerned with disorders of hearing and balance.³

Communication difficulties restrict people's right to communication, a basic human right. Delays in diagnosis of communication disorders may lead to poor mental health, and social and emotional issues. Social functioning is identified as a key factor for people to participate in social activities. Graydon *et al*⁴ have highlighted four areas that hearing impairment impacts on individuals; education, employment and financial, physical health and, socialisation and mental health. The cost associated with hearing impairment is a burden to society; the costs include educational costs, healthcare costs, educational support, costs due to productivity loss and social costs due to stigma due to the hearing impairment.⁴

The WHO estimates that over 5% of the world's population (430 million) require treatment for disabling hearing loss. WHO estimates that over 700 million people (1 in every 10) will have a hearing impairment by 2050.⁵ Fifty per cent of hearing impairment in people throughout the world is preventable. Some reports indicate that there will be 190.5 million people with communication disorders by 2025 in low-income and middle-income countries.⁶ In Australia, 28%–49% of the people with disabilities have an impairment in communication.^{7–9} In terms of Disability Adjusted Life Years (DALYs), communication disorders are a major health burden in the community.¹⁰

Limited studies have been done on communication and hearing disorders in Sri Lanka. A recent study conducted in the Gampaha district of Sri Lanka estimated the prevalence of hearing impairment among school-going students to be 5.5%.¹¹ Prevalence of moderate to severe hearing impairment in Sri Lanka was estimated to be 8.8% in 2004 based on population surveys using the WHO protocol.¹² Speech therapy as a treatment mode was started around 1920,¹³ along with the establishment of the American Speech Correction Association in 1925 which later became the American Speech-Language-Hearing Association (ASHA); Robert West is considered the founder father of speech pathology.¹⁴ Similarly, audiology as a specialty emerged in the early years of the 20th century, initially as a branch of experimental psychology when studying auditory perception. University programmes on audiology were first started in the Midwestern USA.¹³

In Sri Lanka, speech therapy was started as a profession in 1991, long after the initiation of the profession.¹⁵ The first university programme to train speech therapists was initiated in 1998 as a collaboration between the Ministry of Health, Sri Lanka, and Sri Lankan and British academics at the University of Kelaniya.¹⁶ Initially, it was started as a 2-year diploma programme but was later upgraded to a 4-year degree programme in 2008,¹⁷ conforming to level 6 of the Sri Lanka Qualification Framework of the University Grants Commission.¹⁸ Audiology technicians were trained by the Ministry of Health, Sri Lanka as a diploma programme prior to the commencement of the 4-year bachelor's degree programme at the Faculty of Medicine, University of Kelaniya in 2008.

Currently, speech pathology services in Sri Lanka are sparse and are primarily based on clinical behavioural interventions with very limited instrumentation interventions being done due to lack of facilities. Audiology services are very basic and limited in the public sector; there is limited provision of hearing aids and cochlear implants. In the private sector, more advanced equipment and services are available. In addition, we feel that the general public are still unaware of the availability of rehabilitation services for communication disorders in the country.

The purpose of this study was to describe and quantify the speech and language therapy/pathology and

audiology services available in Sri Lanka in comparison to services provided by selected countries.

METHODOLOGY

Study setting

Sri Lanka is an island nation in the Indian Ocean situated south east of the southern tip of India. It comprises a population of approximately 22.1 million with a land mass of 61 860 km².¹⁹

The Sri Lankan health system consists of allopathic, Ayurveda, Siddha, Unani and several other systems. Of them, allopathic care is prominent. Similar to many other countries, the Sri Lankan health services are delivered by both the state and the private sectors. The health services provided by the government are free-of-charge including consultation, investigations, treatment and both inpatient and outpatient care encompassing promotive, preventive, curative and rehabilitative aspects. The Sri Lankan healthcare system has been internationally acclaimed as one providing good healthcare at low cost based on the excellent health indices achieved.

Data capture

This cross-sectional study was carried out in 2019. The number of government hospitals and private institutions which provide speech–language pathology and audiology services in Sri Lanka was the primary outcome of interest. The number of speech–language pathologists, audiologists and audiology technicians working in the institutions was used to assess the adequacy of the services in the country as the secondary outcome measure. Information on government hospitals was obtained from the Annual Health Bulletin.²⁰ The number of government hospitals which provides speech therapy and audiology services and the number of speech therapists and audiology technicians in respective districts were obtained from the Annual Health Bulletin.²⁰ Information on government registered institutions providing care to 2–5 years old was obtained from the Children's secretariat of the Ministry of Women and Child affairs and institutions providing services for all ages were obtained from the Ministry of Health. Some of these institutions providing services for 2–5 years old also provide care for adults with disabilities.

All institutions, both in the public sector and the private sector, that were identified by different methods were selected for the survey. All institutions were contacted by research assistants and the spectrum of services provided were obtained using a checklist that was developed for this purpose (online supplemental file 1). The Global Positioning System (GPS) coordinates of the respective institutions were collected for mapping purposes; locations of government hospitals were identified using Quantum Geographic Information System (QGIS). The population of each district in 2019 was obtained from the Economic and Social Statistics of Sri Lanka—2019, which is an annual publication of the Central Bank of Sri Lanka.²¹ A repeat telephone survey of all the institutions was

conducted in November 2022 to check if the institutions providing specialised services are functional following the COVID-19 pandemic and the current economic crisis the country is facing.

Data analysis

A descriptive analysis was performed to showcase all the data related to speech therapy and audiological services in Sri Lanka. Based on the numbers of professionals available for speech therapy and audiology services in the government sector, the number of speech therapists and audiology technicians per 100 000 population by district was calculated. QGIS was used to map the locations of the institutions providing specialist services. Based on the most recent statistics available, the number of speech therapists/pathologists per 100 000 population in selected countries was compared.

We describe our study in line with Strengthening the reporting of observational studies in epidemiology checklist²² (online supplemental file 2).

Patient and public involvement

Members of the public were not involved in the design, concept and conduct of this study. The findings of the study have been shared with stakeholders in the Ministry of Health and PLAN Sri Lanka.

RESULTS

Speech therapy and audiology services in the government sector

The number of speech therapists and audiologists and/or audiological technicians working in the government sector in 2019 by district is shown in [table 1](#). In 2019, there were 647 hospitals providing inpatient care; 45 of these hospitals provided speech therapy services with 97 therapists. One hospital had a speech therapy unit without a speech therapist. 43.3% of the therapists were working in the western province including the Colombo district in which the capital city of Colombo is located.

Thirty-three hospitals had an audiology unit. Seven hospitals of the 33 were not having an audiology technician ([table 1](#)). The map displaying institutions with speech therapy units and audiology units are shown in [figures 1 and 2](#), respectively. Online supplemental table 1 gives the addresses and locations of government institutions providing speech therapy and audiology services.

Speech therapy and audiology services in the private sector

Thirty-one private centres provide speech therapy services in 9 out of the 25 districts (Colombo, Gampaha, Kalutara, Kandy, Vavuniya, Hambantota, Galle, Matara and Monaragala). Three private centres provide audiological evaluations in three districts (Colombo, Gampaha and Batticaloa).

Speech-language therapists/pathologists work in private hospitals, private schools, other unregistered therapy centres and do home visits. The exact number of

speech therapists working in the private sector is difficult to estimate as reliable data are not available.

As government hospitals do not recruit audiologists, the majority of the audiologists in Sri Lanka work in the private sector including private hospitals and private therapy centres. Data on the number of registered speech therapists, audiologists and audiology technicians are not published by the Sri Lanka Medical Council, the regulatory authority for medical practice in the country.

The speech therapy and audiology services provided by the private sector were affected by the COVID-19 pandemic and the economic crisis the country is currently facing; five institutions were not contactable, three were closed with the COVID-19 pandemic, one closed due to the economic crisis and one institution is not functioning due to a lack of a speech specialist (online supplemental table 2).

Adequacy of speech therapy and audiology services in Sri Lanka

The number of speech therapists and professionals providing audiological services in the government sector per 100 000 population varies between districts ([table 1](#)). As reliable data for the private sector are not available, the overall specialist therapist to population ratio was not calculated.

As expected with better infrastructure, Colombo district had the highest number of speech therapists per 100 000 population (1.23 per 100 000 population) ([table 1](#)). There were no speech therapists in the whole of the Nuwara Eliya and Mullaitivu districts, the former having a large percentage of plantation workers and the latter being a war-affected district.

Like for speech-language therapists/pathologists, the number of audiology technicians in the government sector per 100 000 population was highest in the Colombo district (0.45). There were no audiology technicians in the Nuwara Eliya, Matale, Ampara, Trincomalee, Jaffna, Mannar, Kilinochchi, Vavuniya and Mullaitivu districts.

Discussion

Limited speech and language therapy/pathology are available in most districts of Sri Lanka and spectrum of services vary widely. In the government sector, the services provided are likely to be uniform in institutions that provided such services as the entry requirement for the professionals is the same; however, facilities available in different hospitals may differ, thus impacting on the services provided. Our findings also indicate a wide variation in the availability of speech and language therapy/pathology and audiology services between districts in Sri Lanka ranging from 1.23 speech therapists per 100 000 population in the Colombo district to 0 in the Mullaitivu district; likewise for audiology services it ranges from 0.45 per 100 000 population in the Colombo district to 0 in 9 of the 25 districts. Major cities and urban areas with more facilities, and where probably a more educated and

Table 1 Government and other (private) institutions providing SLT and audiology services by district in Sri Lanka

Province	District	Population 2019 ²¹	SLT			Audiology			No per 100 000 population in government sector ²⁰	No per 100 000 population in government sector ²⁰
			No of institutions ²⁰			No of institutions				
			Government hospitals	Other institutions	Government hospitals	Government hospitals	Other institutions	Government hospitals		
Central	Kandy	1 476 000	4	5	4	0	0	0	0.75	0.34
	Nuwara Eliya	768 000	1	1	0	0	0	0	0	0
	Matale	522 000	1	1	1	0	0	0	0.19	0
North Central	Anuradhapura	937 000	1	1	0	1	1	0	0.21	0.11
	Polonnaruwa	440 000	1	2	1	0	0	0	0.45	0.23
North Western	Kurunegala	1 719 000	3	0	2	5	5	0	0.23	0.06
	Puttalam	832 000	1	0	1	0	0	0	0.24	0.12
Western	Colombo	2 448 000	6	37	5	14	14	0	1.23	0.45
	Gampaha	2 417 000	5	12	3	7	7	0	0.41	0.08
	Kalutara	1 284 000	1	4	1	0	0	0	0.16	0.31
Eastern	Ampara	728 000	4	0	2	0	0	0	0.41	0
	Trincormalee	426 000	1	0	1	0	0	0	0.23	0
	Batticaloa	575 000	2	0	1	1	1	0	0.35	0.35
Northern	Jaffna	617 000	1	1	2	2	2	0	0.16	0
	Mannar	111 000	1	0	0	0	0	0	0.9	0
	Kiilinochchi	129 000	1	0	1	0	0	0	0.78	0
Southern	Vavuniya	189 000	1	1	0	0	0	0	0.53	0
	Mullaitivu	97 000	0	0	0	0	0	0	0	0
	Hambantota	661 000	1	2	1	1	1	0.3	0.45	0.3
Sabaragamuwa	Galle	1 130 000	2	5	1	2	2	0	0.71	0.27
	Matara	863 000	1	3	1	3	3	0	0.35	0.12
	Ratnapura	1 171 000	2	1	2	0	0	0	0.34	0.17
Uva	Kegalle	887 000	1	0	1	0	0	0	0.23	0.11
	Badulla	880 000	2	0	1	0	0	0	0.23	0.23
	Moneragala	496 000	1	1	1	0	0	0	0.2	0.2
Total		21 803 000	45	77	33	36	36	0.44	0.18	

SLT, speech and language therapists.

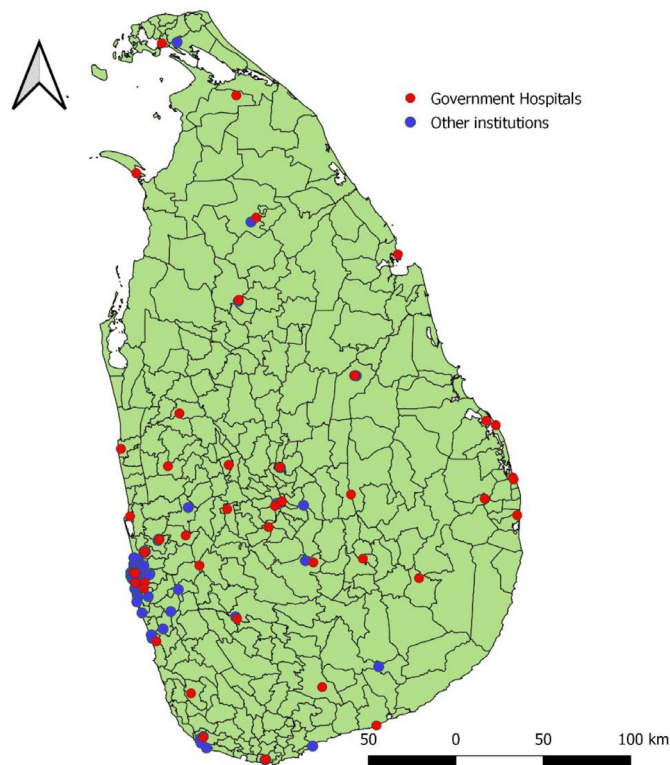


Figure 1 Map of institutions providing speech and language therapy services in Sri Lanka.

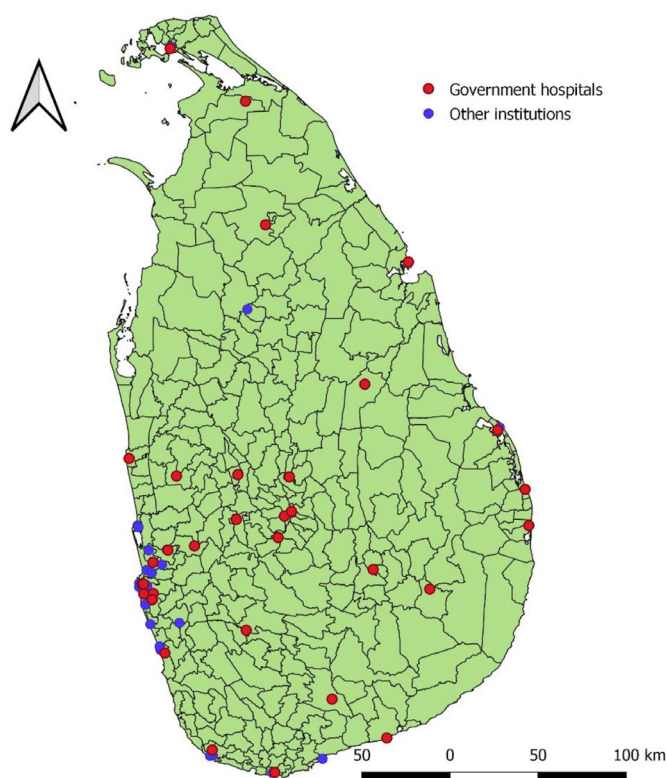


Figure 2 Map of institutions providing audiology services in Sri Lanka.

affordable population resides, have a better specialist therapist to population ratio.

The demand for speech therapy and audiology services in Sri Lanka exceeds the supply. However, it is difficult to estimate the unmet need of speech therapy and audiology services. The World Report on Disability reports a disability prevalence of 12.9% in Sri Lanka during 2002–2004, based on the findings of the World Health Survey.²³ The census of Population and Housing in Sri Lanka carried out in 2001, which excluded the North and the East of the country due to the separatist war at the time, reported a disability prevalence of 1.6%; this is considered a gross underestimate. The same census reported that among the disabled, 26.7% had a hearing or speaking impairment.²⁴

In Scotland, it was estimated that 10% of children have communication difficulties.²⁵ In 1989, Enderby and Davies estimated that 26 speech pathologists per 100 000 population are needed to provide services at that point in time; the exponential growth of the professions since then and the expansion of services requires many more specialist therapists currently.²⁶ The ability to make more subtle diagnoses and offer more services contributes to the demand of services. **Table 2** presents data on the availability of speech–language therapists/pathologists in selected countries. Even by Enderby and Davies²⁶ estimated number of 26 speech–language therapists/pathologists per 100 000 population being the standard in 1989, only the USA and the UK has satisfied this requirement in 2021.

Speech therapy and audiology services are lacking in many countries, and even if present, it is probably inadequate and at a very basic level in most countries.²⁷ Speech therapy and audiology services are not considered essential services in most countries. Enderby and Davies also question the evaluation of the effectiveness of these services²⁶; since their observation, in recent times, there have been many peer-reviewed publications that

Table 2 Comparison of speech language therapists/pathologists per 100 000 population in selected countries

Country	No of speech–language therapists/pathologists per 100 000 population
SL (2019)	0.44*
Australia (2011) ⁴¹	23.7
USA (2021) ⁴²	57.7
UK ⁴³	35.9
India (2017) ⁴⁴	0.17
Malaysia (2018) ⁴⁵	0.95
Singapore (2019) ⁴⁶	12.57
New Zealand ⁴⁷	18.97
South Africa (2018) ⁴⁸	1.88

*Since the total number of speech therapists in Sri Lanka are unknown, the number per 100 000 population was calculated based on the number of professionals in the government sector.



have assessed and compared different treatment modalities globally some of which have shown demonstrable benefits.

In Sri Lanka, a Bachelor's degree in speech–language therapy/pathology or audiology is a requirement to be registered as a practitioner by the Sri Lanka Medical Council, the regulatory body for clinical practice in the country. Graduates from Sri Lankan and foreign universities, mainly from India, work in the field. Some foreign graduates who have a degree in both SLT and audiology specialties have the ability to work in both fields. Prior to commencing a diploma and a degree programme in Sri Lanka in 1998, all speech therapy and audiology services were dependent on foreign graduates. The diploma programme in speech and language therapy previously conducted by the Department of Disability Studies of the Faculty of Medicine, University of Kelaniya was a 2-year full-time course; four batches of trainees completed the diploma programme. Prior to the commencement of the bachelor's degree programme in 2008, an interim external 2-year diploma-to-degree upgrade programme was conducted. The bachelor's degree programme in speech and hearing sciences, which commenced in 2008, by the same department is a 4-year honours degree programme where students can major in either speech and language therapy or audiology. There is a lateral entry option to the degree programme that also accepts students with a diploma for upgrade to a degree over a 2-year period for speech and language therapists and 3 years for audiology technicians to become audiologists; both categories should have 5 years of experience working in the government sector. Graduates of this course are eligible for registration as a specialist therapist by the Sri Lanka Medical Council. Some of the graduates have already completed master's and doctoral degree programmes in leading universities in Sri Lanka and globally. In addition, there are a few academies and institutions in the private sector that provide certificate courses in audiology that include a training of about 1 year.

The requirements to practise speech therapy/pathology differ by country. In the USA, regardless of the undergraduate degree, one has to have a master's degree in speech pathology with a certificate of clinical competence issued by the ASHA. In Australia, a recognised 4–5 years bachelor's degree or a 2–3 years master's degree in speech pathology following a bachelor's degree in an aligned field, accredited by Speech Pathology Australia, is required to practise as a speech pathologist.²⁸ In the UK, a degree in speech and language therapy that is approved by the Health and Care Professions Council and the Royal College of Speech and Language Therapists is required; there is also a 2-year fast-track postgraduate course in speech and language therapy after completing a relevant degree.²⁹ In Canada, the minimum educational requirement for speech–language pathologists is a master's degree in speech–language pathology.³⁰ In India, an undergraduate and/or postgraduate degree in the field of speech, language and hearing is required to either

practise as a speech–language therapist or an audiologist.³¹ In Sri Lanka, an undergraduate or master's degree in speech and language therapy which is recognised by the Sri Lanka Medical Council is required to practise as a speech and language therapist.³²

In USA, one must receive a doctoral degree; doctor of audiology (AuD), PhD or combination AuD/PhD degree to be an audiologist. For the bachelor's degree, they may choose a related degree programme such as communication disorders or sound engineering, to prepare them for the required 3-year or 4-year audiology programme.³³ In Australia, a relevant bachelor's degree and a 2-year master's level audiology programme and 1-year clinical internship has to be completed to become an audiologist.³⁴ To become an audiologist in the UK, a 3-year training scheme, the National Health Service Practitioner Training Programme in healthcare science (audiology) should be completed.³⁵ Canada requires a master's degree in audiology to practise as an audiologist,³⁶ and the qualifications needed for New Zealand is similar to that of Canada.³⁷

Sri Lanka has an excellent primary healthcare service that originated almost 100 years ago in 1926.³⁸ This service has primarily focused on maternal and child health that has resulted in Sri Lanka attaining excellent health indices such as low infant mortality rates and maternal mortality ratios, very high immunisation uptake and a high life expectancy at low cost; however, now other areas such as non-communicable diseases are also included. For children, services are provided through infant care, child care and school health services by the field Public Health Midwife of the area. In Sri Lanka, infants are not screened routinely for communication disorders and most often are first suspected by caregivers and then referred for specialised care. During the school health inspection that is routinely conducted in years 1, 4, 7 and 10, speech and hearing is informally assessed during conversation with the child.³⁹ Only some schools have trained teachers for special education streams primarily due to the dearth of such professionals in the country.

In Sri Lanka, the government sector has no cadre for audiologists; the Ministry of Health recruits audiology technicians after receiving a basic training of 2 years. The audiology technicians work under the direction of an otorhinolaryngologist; the technician only provides audiometric assessments (pure tone audiometry, hearing tests, etc) which are interpreted by the otorhinolaryngologist and used for subsequent management of the patient. On the other hand, speech therapists have independence in the management of the client once a referral is made. In 2019, audiology technicians in the government sector were absorbed into the grade of professions supplementary to medicine having a higher salary scale on par with speech therapists. The salary scales of these professionals in the private sector are much more attractive than in the government sector, which may be a reason for the poor provision of services in governments institutions in most parts of the country.

The exact number of speech therapists and audiologists in Sri Lanka is unknown. The Annual Health Bulletin, Sri Lanka, reports the number of speech therapists working under the government sector. Although our estimates of the number of professionals to population is probably an underestimate as only those in the government sector were considered, it is still likely that the number of therapists is not sufficient to provide the services for the Sri Lankan population.

The role of an audiology technician is not the same as audiologists. Audiologists are responsible for diagnosing and treating people with hearing disorders while the audiology technicians are responsible for conducting tests based on the instructions of ear, nose and throat (ENT) surgeons and the findings are interpreted by ENT surgeons. Therefore, it is clear that the role of an audiologist is lacking in the government health sector, an essential need to manage a person with a hearing disorder. As a result of not recruiting audiologists to the government sector, the audiologists in the country work in academia, the private sector and the ones who wish to be employed in a government job, having job security to a great extent, even work in positions unrelated to their training such as development officers in government institutions.

The COVID-19 pandemic and the economic crisis the country is currently facing has resulted in the closure of five institutions that were contacted; it is likely that the five institutions that could not be contacted may have closed. The COVID-19 pandemic and the economic crisis is likely to have affected accessibility of these services given strict lockdowns, transport restrictions and the affordability of clients given the 80% depreciation of the Sri Lankan rupee in March 2021 and rising inflation that peaked to over 70% in August 2021.

Information on services rendered by the institutions was obtained through a questionnaire. Not being able to physically verify if some of the services were rendered is a limitation of the study. The reliability of the services provided by institutions post-COVID-19 is questionable as we could not verify any of the information that was provided through telephone interviews due to transport restrictions. It is possible that our coverage of institutions providing speech and language therapy/pathology and audiology services may not have been complete as it is likely that some institutions not registered with the Children's secretariat of the Ministry of Women and Child affairs and the Ministry of Health may not have been captured. It is also possible that new institutions may have opened after 2019; our survey was based on institutions operating in 2019.

Our analyses reveal that there is an acute shortage of speech–language therapists/pathologists and audiologists not only in Sri Lanka but even in more affluent countries. The 2030 Agenda for Sustainable Development⁴⁰ calls for a substantial increase in healthcare financing with the recruitment, development, training and retention of the health workforce especially for people with disabilities with a view to achieving universal health coverage. This

exemplifies the role of allied health professionals and professions supplementary to medicine. While the goal is laudable, it is unlikely to be met by most countries whatever category they are classified in, that is, low-income, lower-middle-income, upper-middle-income or even high-income countries.

Twitter Rajitha Wickremasinghe @I do not have an account

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Contributors AVC and RW contributed to the conceptualisation, developing the methodology, supervising data collection, data curation, writing original draft, reviewing and editing draft, visualisation and project administration. RW is responsible for the overall content of this manuscript as guarantor. TUM contributed to data curation, mapping, writing original draft, reviewing and editing draft. KMNP and NM contributed to conceptualisation, and review and editing the draft. DT and MKRRP contributed in conceptualisation, funding acquisition, project administration, supervision and providing resources. ET, CS, MNN, RMM and ADKA contributed to data curation. SPS contributed in conceptualisation, methodology, writing the original draft, reviewing and editing the draft, visualisation and providing supervision.

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Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

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