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A situational analysis of rehabilitation policy and systems in Brazil

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ABSTRACT

Multiple health system components, supported by good policy, are needed for the provision of quality rehabilitation care. This study used the Missing Billion Health System Framework to structure a situational analysis of publicly funded rehabilitation services within the Unified Health System in Brazil, focusing on: governance, leadership, health financing, data and evidence, autonomy and awareness, affordability, human resources, health facilities, and assistive technology. We reviewed online policy documents, Health Information System data and published literature and conducted semi-structured interviews with 87 people with disabilities and 57 health and rehabilitation providers in São Paulo, Santos, Brasília, and Arcoverde. The situational analysis showed that the Brazilian policy framework is broadly supportive of rehabilitation provision, and a defined leadership structure assists rehabilitation provision at the national, state, and municipality level. However, there are challenges to rehabilitation service provision including insufficient funding and service availability, and inadequate numbers of rehabilitation professionals, with variation by cadre and region. For service users with disabilities, key challenges to accessing rehabilitation include high costs of transport, communication and information barriers, and long wait times. Available data indicate high-need and low coverage for rehabilitation, although there is a gap in reliable data on service need. In conclusion, this situational analysis highlighted rehabilitation programme and policy strengths in Brazil that could be replicated in other settings, such as the supportive policy and leadership structure. However, there are gaps to be addressed, including geographic inequalities in the availability of rehabilitation professionals and barriers to access for service users.

1. Introduction

Approximately 2.4 billion people globally have health conditions that could benefit from rehabilitation (Cieza et al., 2021). Rehabilitation is defined as "a set of interventions designed to optimize functioning and reduce disability in individuals with health conditions, in interaction with their environment" (World Health Organisation and World Bank, 2011). Rehabilitation includes specialized medical care, physiotherapy, occupational therapy, speech and language therapy, audiology, orthosis and prosthesis, and mental health services, among others. Assistive products (AP) are often offered through rehabilitation services, including hearing aids, wheelchairs, prostheses, and visual aids.

Abbreviations: AP, Assistive products; WHO, World Health Organization; SUS, Sistema Único de Saúde Unified Health System; STARS, Systematic Assessment of Rehabilitation Situation; LMIC, Low- and Middle-Income Countries.

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Rehabilitation can result in a range of benefits to individuals, including better functioning and health, and improved opportunities for work, education and social engagement (World Health Organisation, 2022a). Provision of timely rehabilitation further has the potential to provide cost savings to the health system (Turner-Stokes et al., 2016). Rehabilitation is therefore rightly recognised as an integral part of Universal Health Coverage (World Health Organisation, 2022b).

However, large unmet needs for rehabilitation remain, particularly in Low- and Middle-Income Countries (LMIC) (World Health Organisation, 2017a; Danemayer et al., 2022). Rehabilitation is often not effectively prioritised or funded within health systems, resulting in the limited availability, functioning and coordination of rehabilitation services and referral pathways (World Health Organisation, 2017a). Rehabilitation workforce shortages is another key challenge in many settings, and countries with the highest need typically have the lowest rehabilitation provider to population ratios (World Health Organisation, 2017a; Gupta et al., 2011). Services are often limited in number, and concentrated in urban areas, creating geographical accessibility barriers (Magaqa et al., 2021). Furthermore, people with disabilities, many of who may benefit from rehabilitation and AT, can face additional challenges including physical inaccessibility of buildings and transport, communication and attitudinal barriers. Financial barriers are also common; people with disabilities often have higher need for rehabilitation and incur additional costs in seeking these services (e.g. accessible transport, payment for a companion to travel with), and yet often have lower capacity to pay as they are more likely to be living in poverty.

Global efforts are underway to scale up the availability and quality of rehabilitation services, including through the World Health Organization's (WHO) initiative *Rehabilitation 2030: A Call for Action* (World Health Organisation, 2017a). However, as called for in this WHO initiative, more evidence and actions are needed to improve rehabilitation policy and systems. The variation in the availability and organisation of rehabilitation services across the globe provides the opportunity to identify good practices to replicate, as well as pitfalls to avoid. Brazil provides a potentially informative case study. It has a universal public healthcare called Unified Health System (*Sistema Único de Saúde, SUS*) (Constitution of the Federative Republic of Brazil, 1988), which has evolved over the last three decades to provide needs-based, comprehensive care, including rehabilitation (Brazilian Inclusion Law of the People with Disability, 2015; Brazilian Law on the National Coordination for the Integration of the Person with Disability, 1989; Brazilian National Policy for the Integration of the Person with Disability, 1999). Rehabilitation services in Brazil are offered at three levels of the healthcare system (Table 1). At the primary level, Family Health Teams are expected to provide guidance on functioning and AP use, community-based rehabilitation interventions, and referrals to secondary and tertiary rehabilitation services. At the secondary level, specialized health and rehabilitation professionals offer impairment-specific interventions, including AP provision, at dedicated rehabilitation facilities. In- and outpatient services are available at the tertiary rehabilitation level, where more intensive or specialist services or AP are provided. In addition to health centers directly managed by the municipal, state or federal administration, SUS also finances private for-profit and not-for-profit centres that are contracted to provide services at the secondary or tertiary care level. Despite this structure, evidence suggests gaps and barriers in the provision of rehabilitation services in Brazil (da Cunha et al., 2022). However, rehabilitation within the health system in Brazil has not been systematically or comprehensively assessed.

Situational analyses can be useful for studying complex areas of health service provision, such as rehabilitation, providing insight into the current status of different interacting components and identifying areas for action to improve care (Murphy et al., 2019). Use of a health system framework can help to structure such an analysis. Health system frameworks often focus on the supply of services, such as the availability of human resources, health facilities and specialized services as well as system components (e.g. policy) (World Health Organisation, 2017b). These components may form a hierarchy, as underlying system failures (e.g. poor governance, lack of leadership, insufficient health financing, and lack of data and evidence) drive issues with supply at the service delivery level. Furthermore, "demand" side factors – barriers facing people seeking rehabilitation – are also critical. Strengthening access to rehabilitation therefore requires coordinated action across all these different system components. The Missing Billion Inclusive Health Systems Framework (herein referred to as the Missing Billion Framework) (Fig. 1) (Missing Billion Initiative and Clinton Access Health Initiative, 2022) was developed as a comprehensive framework for assessing disability-inclusion within the health system. It focuses on nine elements, including at the system (governance, leadership, health financing, data and evidence) and service delivery levels (autonomy and awareness, affordability, human resources, health facilities, and assistive technology). Hannah et al. (2024) this framework was developed through literature review and interviews with key stakeholders. It has been pilot tested for assessing disability inclusion in health systems, but has not previously been applied to a rehabilitation system. This framework may be helpful for structuring a situational analysis describing the status of different health system components, that are needed for effective rehabilitation provision.

This paper presents a situational analysis of the publicly financed rehabilitation system in Brazil structured by the Missing Billion framework. We aimed to describe the rehabilitation system and, explore the perspectives of service users and providers to identify key strengths and weaknesses across nine health system components (governance, leadership, health financing, data and evidence, autonomy and awareness, affordability, human resources, health facilities, and assistive technology).

Table 1
Description of the key rehabilitation-related activities at each level of care.

Level of care	Description of activities
Primary Care	Community health agents and family health teams (which may include rehabilitation professionals, such as physical, occupational and speech therapists, as well as nutritionists, psychologists, social workers and physical fitness professionals, with number and type of professionals depending on local needs and programmes) cover 2–4000 individuals within a geographic area. Responsibilities include: • Early identification and referral of people with rehabilitation needs to secondary/tertiary care • Primary and secondary prevention of impairments and poor health outcomes • Community-based rehabilitation strategies • Guidance on assistive products use
Secondary Care	• Specialized health and rehabilitation professionals offer impairment-specific interventions, including assistive products provision, including maintenance, repairs, and follow-up. • Specialized, outpatient rehabilitation care operates as a referrals-based service, enabling comprehensive, intensive, and individualized interventions, including the provision of assistive products, based on multidisciplinary needs assessments, as well as coordinated care and cross-sector activities. • Services have a local or regional coverage, and receive persons referred from either primary or tertiary care.
Tertiary Care	In- and outpatient tertiary rehabilitation services offer: • Impairment-specific services to people who require more intensive and frequent rehabilitation treatment, specialized care, and high-cost interventions. • Assistive products provision and technology-intensive interventions, workforce training and research activities.

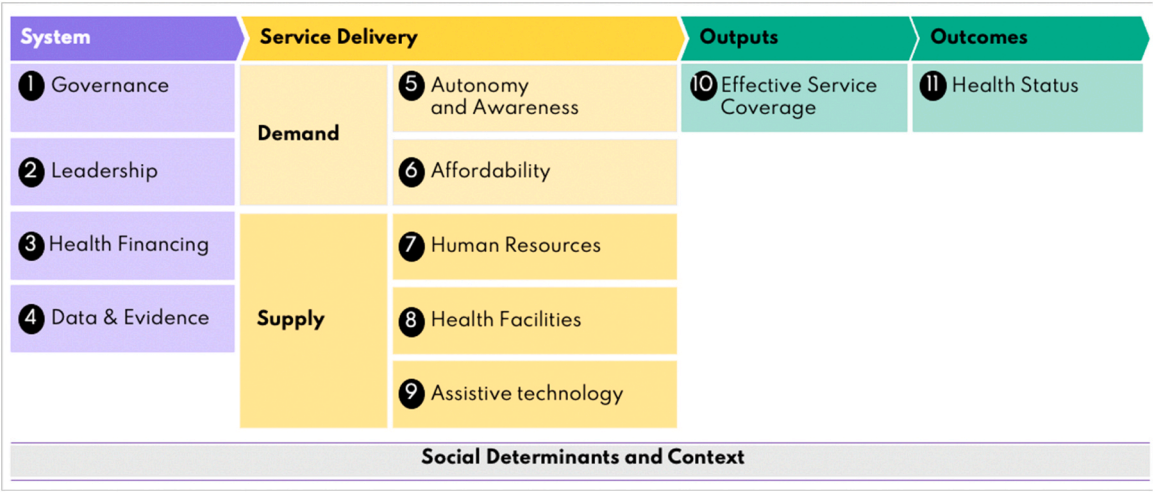

Fig. 1. Rehabilitation System Framework, adapted from Missing Billion Disability-Inclusive Health System Framework (Missing Billion Initiative and Clinton Access Health Initiative, 2022).

2. Methods

2.1. Study overview

We focused on the nine health system components in the Missing Billion framework (Fig. 1) (Missing Billion Initiative and Clinton Access Health Initiative, 2022) to structure data collection and analysis for the situational analysis. We used the WHO Systematic Assessment of Rehabilitation Situation (STARS) tool Template for Rehabilitation Information Collection (TRIC) (Kleinitz et al., 2022) to guide data collection, although we did not follow the full four-phase WHO-STARS process. The TRIC includes standardised questions to assess the rehabilitation situation across different areas. We used the TRIC questions to guide the data collection on the system and service provider components.

2.2. Data sources

We used multiple sources of data and information to build a comprehensive understanding of the rehabilitation system. Two of the authors are public health and rehabilitation professionals in Brazil and they were therefore able to provide the details on organisation and leadership structure described in this paper.

We undertook an online search of key health and disability policy documents between November 2021- February 2022 and reviewed key legislation relating to rehabilitation (Governance component). The review of identified policy documents was guided by the leadership and governance section of the WHO Template for Rehabilitation Information Collection. This includes questions on whether and how rehabilitation is included in national health policy, legislation frameworks and health plans as well as on the presence of dedicated rehabilitation policies.

Descriptive secondary analysis was undertaken of publically available data from the Brazilian Health Information Systems, including the National Health Facilities Registry, Inpatient Information System and Outpatient Information System. Specifically, for the health financing component, using data on health services funds allocation from the In- and Outpatient Information Systems, we conducted a descriptive analysis of the annual expenditure on interventions carried out by rehabilitation professionals (at secondary and tertiary levels of care) and assistive products (AP) in 2019. To gain insight into the human resource situation, we used data available from the In- and Outpatient Information Systems and the National Health Facilities Registry to describe the density of rehabilitation professionals (of various specialties) in different geographic regions. These data were also used to describe the coverage of AP provision in different administrative health regions. We selected data from 2019 as being more representative, rather than data from 2020 to 2023 which would have reflected the impact of the COVID-19 pandemic on health and rehabilitation services supply, financing, and expenditure.

As part of a wider study on disability inclusion in the health system we also undertook semi-structured interviews between 2020 and 2021 in São Paulo (São Paulo state), Santos (São Paulo state), Brasília (Distrito Federal) and Arcoverde (Pernambuco state) with 57 healthcare professionals (including rehabilitation providers) and healthcare facility managers, and 87 people with disabilities. These localities include rural, semi-rural and urban settings in three different regions of the country, in Southeast, Centre-West and North-eastern Brazil. Participants with disabilities were initially identified through study adverts placed in 15 primary healthcare centres and then through snowball sampling, whereby participants were asked to share information about the study with other people they knew who might be eligible. Organisations of Persons with Disabilities (OPDs) in the study areas also supported with recruitment by sharing information about the study to eligible people. Participants with disabilities were eligible to take part if they: a) were 18 years of age or older; b) reported having a lot of difficulty or more in one or more of the domains included in the Washington Group short set of questions on functioning (i.e. walking, seeing, hearing, communicating, understanding, self-care) (Washington Group on Disability Statistics, 2019). They were selected to ensure representation of males and females, different disability types (based on the Washington Group questions) and age groups (less than 60, 60 years and above). For service providers, we contacted managers of health facilities from primary level care, specialized rehabilitation care at secondary level, and hospitals at secondary and tertiary level at each of the four study localities. Managers were asked to recommend health and rehabilitation staff to invite to take part in the study. Participant characteristics are presented in Table 2.

Interviews were semi-structured using interview guides to explore provision of and access to general health (primary care and hospitals) and rehabilitation services. Interviews with people with disabilities covered the following areas: experience of service access and use (physical accessibility, cost, experience of healthcare providers, enablers/what worked well, barriers/what was difficult, how well needs were met), reasons for seeking services, awareness of different services and what would help make it easier to access services. Interviews with service providers covered their perspectives on disability and the availability, accessibility and functioning of health and rehabilitation services.

Table 2
Characteristics of participants included in the qualitative interviews.

	Number
PEOPLE WITH DISABILITIES	**Total: 87**
Sex	
Female	50
Male	37
Location (state)	
Arcoverde (Pernambuco)	16
Brasilia (Distrito Federal)	25
Santos (São Paulo)	22
São Paulo (São Paulo)	24
Age	
< 60	71
> 60	16
Type of disability	
Hearing	5
Intellectual	6
Multiple	15
Physical	49
Visual	12
HEALTH PROFESSIONAL	Total 87
Location (state)	
Arcoverde (Pernambuco)	15
Brasília (Distrito Federal)	13
Santos (São Paulo)	16
São Paulo (São Paulo)	13
Profession group	
Manager	12
Rehabilitation/health professional	45
Level of care	
Primary care	24
Rehabilitation center	18
Hospital	15

Interviews were conducted remotely (via Zoom or telephone calls where phone numbers were provided by the participant), due to COVID-19 restrictions, by experienced local researchers, as well as two of the co-authors. A total of eight researchers collected data, two of whom have a disability themselves; one has a visual impairment and the other has a physical impairment. Interviewers were trained in conducting qualitative data collection with people with disabilities, with researchers experienced in this field. Steps taken to ensure accessibility of the interviews included the availability of sign-language interpreters, providing verbal explanations of consent forms where required, using clear, direct communication, offering regular breaks during the interviews and appropriate language. Caregivers (paid or unpaid) remained present, and participated, during interviews with people with severe communication difficulties. However, all efforts were made to direct questions to the person with disabilities and to ensure their experiences were heard.

Interviews were audio-recorded and transcribed verbatim. Interviews with health professionals were translated into English and data were analysed by one co-author from Brazil (based in UK) and two from the UK. Interviews with people with disabilities were analysed in Portuguese by two Brazilian co-authors. For this paper, we analysed the interview data that specifically related to rehabilitation access through both specialized services and primary health care. Data were managed using Nvivo 12. Codes were primarily developed deductively using a framework approach to map the access experiences of people with disabilities guided by the Missing Billion Framework (Fig. 1). The transcribed interviews were analysed using Bardin's thematic cores of meaning approach (Análise de Conteúdo, 1977) to identify deductive categories of access according to the nine components of the Missing Billion Framework. Additionally, some inductive categories emerged and these were retained. We also paid attention to geographical variations in the qualitative data (i.e., between the three states/federal district that participants were recruited from), and in the results we reflect on differences by location where they were evident.

Different data sources were relevant for different framework components. Where multiple sources were included we adopted a convergence approach to triangulation, whereby qualitative and quantitative data were collected and analysed and presented separately, then compared and interpreted together.

2.3. Ethical considerations

Ethical approval was granted by the ethics committees at the authors' institutes: the University of Sao Paulo Medical School General Hospital, the Sao Paulo and Santos Municipal Health Department, Oswaldo Cruz Foundation (Fiocruz) Pernambucu,Oswaldo Cruz Foundation (Fiocruz) Brasilia and the London School of Hygiene & Tropical Medicne. Informed written or audio-recorded verbal consent was obtained from all interviewees. People with intellectual disabilities were offered simplified versions of information sheets and consent forms and caregivers (paid or unpaid) remained present during the consent process. Capacity to consent was judged by the researcher conducting the interview who was trained in this. For people who were considered to lack capacity to consent, a primary caregiver was consulted to gain their perspective on whether or not the person would wish to take part. Interviews were only conducted if both the caregiver and study participant agreed.

3. Results

3.1. Systems level functioning

3.1.1. Governance

Table 3 highlights seven policy frameworks in Brazil that address rehabilitation provision. In-line with the UNCRPD, several national policies relating to people with disabilities emphasize the right to access quality rehabilitation (see Table 2) (Living Without Limits Plan, 2011; Care Network for People with Disabilities, 2012). For example, the 2015 "Brazilian Inclusion Law" (Brazilian Inclusion Law of the People with Disability, 2015) states the right to rehabilitation for people with disabilities, specifying that multidisciplinary services should be available close to where people live. More recently, the National Health Plan 2020–2023 (Brazilian National Health Plan, 2022) created specific rehabilitation targets by 2023, such as increasing coverage of rehabilitation services for all impairment types to 50 % and neonatal hearing screening to 70 %, and delivering a total of 10 million APs by 2023 (Brazilian National Health Plan, 2022). This strategy also aimed to reduce regional inequalities within the country.

3.1.2. Leadership

In terms of leadership, the General Coordination for the Health of People with Disabilities at the Ministry of Health is a statutory body responsible for implementing the National Health Policy for People with Disabilities. This statutory body leads the implementation, financing, monitoring, and evaluation of rehabilitation policies, programs, and services, including AP provision. It also liaises with other bodies, such as the Ministry of Education or the National Social Security Institute, which play a subsidiary role. There are also state and municipal counterparts. There is an emphasis on social participation; civil society organisations are part of consultative and deliberative government bodies, disability-related groups are among user groups represented within the National Health Council (Brazilian National Health Council, 2022) and health-related issues are frequently discussed at meetings of the National Disability Rights Council (comprised of government and non-government organisations) (National Council on the Rights of the People with Disability, 2022). However, frequent changes in the Ministry of Health leadership and national and international macro-political decisions over the last decade have presented challenges to the functioning of these positions and the implementation of the National Health Policy for People with Disabilities. Administrations of different political leanings have approached this policy differently, either reiterating or

Table 3
Key policies and laws relevant to provision of rehabilitation in Brazil.

Law/Policy	Key content relevant to rehabilitation
2002 National Health Policy for Persons with Disabilities (PNSPCD) https://bvsms.saude.gov.br/bvs/saudelegis/gm/2002/prt1060_05_06_2002.html, accessed 5 August 2021.	• Rehabilitation of people with disabilities to encourage inclusion, the protection of their health and the effective participation in society. Promotes participation, collaboration and action of government and non-governmental organisations.
2011 Living Without Limits Plan/ Decree 7612 http://www.planalto.gov.br/ccivil_03/_ato2011-2014/2011/decreto/d7612.htm, accessed 5 August 2021.	• Promotes access to education, health, social inclusion, and accessibility for people with disabilities. • Rehabilitation specific aims include to: expand the health care network for people with disabilities; improve the standard and quality of health care facilities, including rehabilitation facilities; promote access, development and innovation in assistive technology. • Commits implementing bodies to make available their policies, programmes actions, budgets and results.
2012 Care Network for People with Disabilities within SUS' Ministerial Ordinance 793 and Ministerial Ordinance 835 Brazil. 2012. Portaria Nº 835. Brasília (DF): Ministério da Saúde; Gabinete do Ministro. https://bvsms.saude.gov.br/bvs/saudelegis/gm/2012/prt0835_25_04_2012.html, accessed 5 August 2021. Brazil. 2012. Portaria Nº 793. Brasília (DF): Ministério da Saúde; Gabinete do Ministro. https://bvsms.saude.gov.br/bvs/saudelegis/gm/2012/prt0793_24_04_2012.html, accessed 5 August 2021	• Establishes the Care Network for People with disabilities, across primary care, specialized care in disability rehabilitation and tertiary/emergency care. • Guided by rights based, person centered principles to expand access and improve care. • Rehabilitation specific commitments/ objectives include: rehabilitation centres to have a qualified multidisciplinary team (physician, physical therapist, speech therapist, occupational therapist, social worker and nurse) and administrative team; physical facilities must comply with accessibility standards; expansion of assistive product provision (specifically orthoses, prostheses); financial incentives for the construction, renovation or expansion of physical location and orthopaedic workshop services.
2015 Brazilian Inclusion Law/ Law 13,146 http://www.planalto.gov.br/ccivil_03/_ato2015-2018/2015/lei/l13146.htm, accessed 5 August 2021.	• Comprehensive health care for people with disabilities is ensured at all levels of complexity guaranteeing universal and equal access. • Right to rehabilitation for people with disabilities includes: multidisciplinary assessment of needs; network of services at different levels of complexity; services close to home (including rural areas) respecting the Health Care Networks; accessible facilities; guaranteed access to assistive technology.
2017 National primary healthcare policy (PNAB) / Ministerial Ordinance 2436 https://bvsms.saude.gov.br/bvs/saudelegis/gm/2017/prt2436_22_09_2017.html, accessed 5 August 2021.	• Ensures adequate infrastructure and good conditions for the operation of Primary Healthcare facilities, guaranteeing space, furniture, and equipment, as well as accessibility for people with disabilities, in accordance with current regulations.
National Health Plan 2020−23 https://bvsms.saude.gov.br/bvs/publicacoes/plano_nacional_saude_2020_2023.pdf Accessed 5th August 2021	• Created specific rehabilitation targets, including increasing: the coverage of rehabilitation services (for all types of impairment and neonatal hearing screening coverage) and provision of assistive products for mobility, vision, and hearing. Aims to reduce regional inequalities within the country.

weakening the roles played by each stakeholder, including government bodies, civil society organizations and service providers (Lyra et al., 2022). According to a recent policy analysis, it was initially developed and implemented with strong social participation and government commitment and continuity was assured by different administrations up to 2014, albeit with varying service delivery policies and economic incentives for implementation. Enforced fiscal austerity of more recent administrations, alongside weakening of social policies, has curtailed its implementation (Lyra et al., 2022).

From the qualitative interviews, rehabilitation professionals reported that they had received government guidelines on how to best support people with disabilities in their services and reported, very occasional, inspections by government ministries to assess guideline adherence. Rehabilitation services can also develop their own protocols and guidelines, to suit their context and needs. However, despite the supportive policy frameworks, these were poorly disseminated and not well known by health and rehabilitation staff. Most interviewees perceived political support for rehabilitation to be lacking, reflected in limited funding and service availability.

3.1.3. *Health financing*

SUS is funded by tax revenues and contributions from federal, state, and municipal administrations. Financing, implementation and management occur in a tripartite model, with baseline funding and further requirements defined at municipal, state and federal levels. From 2000 to 2014, there were increases in total health expenditure (7.0–8.3 % of gross domestic product) (Massuda et al., 2018) However, since 2015, public health expenditure has declined in real terms (Massuda et al., 2018) with increasing financing concerns exacerbated by inefficiencies in the use of resources (Organisation for Economic Co-operation and Development Reviews of Health Systems: Brazil, 2021)and the 20-year freeze in health spending (Brazilian Constitutional Amendment, 2016).

Primary healthcare financing schemes cover community-level rehabilitation services. Secondary and tertiary health–related rehabilitation provision is financed, at an administration's discretion, especially by state and federal funds. Rehabilitation facilities that are directly managed by the public administration and private for-profit and not-for-profit organizations receive the same public funding, but are managed differently. There are also specific incentive mechanisms for investment in rehabilitation and additional funds for strategic actions (e.g. National Health Plan). Rehabilitation services compete for funding with other healthcare services, with municipal and state administrations setting the priorities (Ministry of Health, 2017).

Data on total expenditure on rehabilitation were not available. At the secondary level, in 2019, approximately USD 134.3 million was invested for the operation of 248 Specialized Rehabilitation Centres (*Centro Especializado em Reabilitação, CER*), and USD 6.5 million for 45 Orthopaedic Workshops (providing APs for people with physical impairments). Table 3 presents the 2019 annual expenditure on all interventions carried out by rehabilitation professionals and on AP (Brazilian In- and Outpatient Information Systems, 2022). Most rehabilitation expenditure is at secondary inpatient level (61 %). Hearing aids were the largest AP cost (51 %). Estimates, based on Ministry of Health data, suggest that approximately 1.05 % of total government health expenditure was related to rehabilitation at the secondary and tertiary level, and 0.36 % to APs (Ribeiro et al., 2021).

Interviews with rehabilitation professionals highlighted a lack of funding and investment in rehabilitation services (including on materials and staff training), limiting service delivery. They also felt their salaries were relatively low compared to other health professionals and for their qualification levels. For some, this reflected a lack of political support for rehabilitation. Participants reported additional fundraising activities carried out by some not-for-profit, private rehabilitation providers to support service provision (e.g. with businesses, Non-Governmental Organisations, politicians and the community). Incentives are reported to be in place to promote donations, to support these providers, including a reduction in income tax. Such mechanisms are not available for rehabilitation services directly managed by the public administration

3.1.4. Data and evidence

National survey data on rehabilitation needs and coverage are lacking. Routine health information system data (e.g. the Outpatient Information System) are limited to rehabilitation and AP use; they do not show population level coverage or need. The data that are available suggest high levels of need. For example, the WHO rehabilitation needs calculator estimates 70 million (one in three people) people in Brazil could benefit from rehabilitation (World Health Organisation, 2022c), which is consistent with global need levels (World Health Organisation, 2022c). Despite this high need, coverage of rehabilitation appears low. A 2013 study indicated that only 9.2 % of the Brazilians with disabilities have used rehabilitation services (Medeiros et al., 2021). The 2019 National Health Survey estimated that approximately half of rehabilitation users accessed the public system (51 %) while most of the remainder used private services (45 %) (Ministry of Health Brazil, 2019).

3.2. Service delivery

3.2.1. Demand side: Autonomy, awareness and affordability

According to our interviews, there is limited information for people with disabilities about available rehabilitation services and how to seek them. For some, this limited their ability to access needed services. According to some interviewees, unless a person proactively seeks information, they are unlikely to know what is available to them:

> "I have been a wheelchair user for eight years. I've never [been visited by] a health agent here in my house to ask about the rehabilitation process or to what I am in need [of]. I need to search for myself." (Rehabilitation service user, physical impairment)

The interviews with people with disabilities indicated some variation in awareness and autonomy between the different locations. For example, in Pernambuco, service users reported inconsistent awareness about available services and were often dependent on external advice from neighbours or acquaintances. In the state of São Paulo, participants reported varied awareness of available services, with some patients being unaware of their eligibility for certain services for a long time, resulting in delays in accessing these services. Patients in Brasília generally demonstrated higher levels of awareness, which appeared to be largely due to better access to a comprehensive and structured rehabilitation network.

Some service users considered rehabilitation beneficial. Others had expectations and misconceptions that rehabilitation could 'cure' their impairment and did not see value in the goal of rehabilitation to maximise functioning.

> "I started doing [rehabilitation] at [name of rehabilitation centre], but it was to help me adapt at home and I didn't want that. So, I got really nervous because the doctors said that I won't see anymore and that I have to adapt. Then I said, 'No, what I already know is enough, I don't want to learn anymore.'" (Primary healthcare user, visual impairment)

Rehabilitation professionals said that these perceptions often made outreach and service uptake difficult. The interview data indicated that this issue may be particularly challenging for children, who have less autonomy and whose continuity of care can be influenced by caregiver's education and expectations. For example, one rehabilitation professional described needing to manage expectations of a mother who told her daughter she "*just had to pray that her arm will get better*".

Service providers recommended improving awareness about available rehabilitation services, their purpose, and their benefit through health departments, mayoral messaging, radio, social media and networks, and via support groups. Putting service users and their families at the centre of care plans and decision making was considered key for promoting autonomy and service uptake:

> "Putting the family in an active role; I think this is very enabling. I think it's difficult for us to engage this person, for her to understand the role of rehabilitation, and I think that there needs to be something less unilateral, you know, less professional-based […] The one who knows the patient is the patient herself. It's her that knows her history and knows about her difficulties." (Psychologist)

In terms of affordability, within SUS, all residents in Brazil can access free, comprehensive services. However, high costs of transport were reported as a challenge. Around 25 % of Brazilians are additionally covered by voluntary private health insurance. Some who are able, reported paying privately for rehabilitation/AP services.

3.2.2. Supply side: Human resources

Data presented in Table 5 (from the National Health Facilities Registry, 2019) shows that the number of available rehabilitation professionals varies by type and by region (Brazilian National Health Facilities Registry). Physiotherapists were most widely available across all regions, followed by speech therapists, occupational therapists and ophthalmologists (Brazilian National Health Facilities Registry). There were no registered speech and language physicians and few

Table 4
Annual expenditure on a) interventions carried out by rehabilitation professionals* and b) assistive products provided in 2019 (in USD)** (Brazilian In- and Outpatient Information Systems, 2022).

Interventions carried out by rehabilitation professionals	Costs (in USD$)	% of total cost
Outpatient - Secondary level	435,541,500	33 %
Outpatient - Tertiary level	12,461,000	1 %
Inpatient - Secondary level	807,677,000	61 %
Inpatient - Tertiary level	64,466,000	5 %
Total	1,320,146,000	100 %
Assistive products provided		
Mobility aids	26,145,000	30 %
Orthopaedic aids	15,420,000	18 %
Hearing aids	44,876,000	51 %
Vision aids	1,322,000	2 %
Total	87,763,000	100 %

Data source: Brazilian In- and Outpatient Information Systems. Available at: https://datasus.saude.gov.br/informacoes-de-saude-tabnet/ (accessed November 2021); * = Costs include health promotion and prevention, diagnostic exams, and clinical/therapeutic interventions. They exclude health surveillance, surgeries, drugs and medication, labour and birth, nephrology, dental, nuclear medicine, radio, and chemotherapy, mental health interventions, and assistive products provision; ** = 1 BRL = 0.2538 USD (average exchange rate in 2019)

Table 5
Number of rehabilitation workers per 100,000 inhabitants by region (Brazilian National Health Facilities Registry).Data are presented for all professionals and for those working within the public healthcare system in 2019.

	Health professionals per 100,000 population											
	Southeast		South		Centre-West		Northeast		North		Brazil (national)	
	All	SUS only	All	SUS only	All	SUS only	All	SUS only	All	SUS only	All	SUS only
Physical impairment related												
PRM Physician*	0.31	0.18	0.22	0.13	0.19	0.14	0.06	0.03	0.04	0.02	0.19	0.11
Orthopaedist*	0.53	0.39	0.23	0.18	0.81	0.78	0.25	0.24	0.26	0.26	0.41	0.34
Occupational Therapist*	5.93	4.77	4.81	3.91	3.63	3.03	3.91	3.32	2.84	2.41	4.77	3.91
Physical therapist*	45.09	25.76	45.73	26.91	38.71	25.73	33.79	25.88	22.43	17.33	39.6	25.22
Rehabilitation technician**	0.10	0.08	0.08	0.04	0.03	0.03	0.10	0.06	0.08	0.07	0.09	0.06
Orthotics and prosthetics technician /Orthopaedic technician**	0.53	0.39	0.23	0.18	0.81	0.78	0.25	0.24	0.26	0.26	0.41	0.34
Hearing impairment related												
Speech and voice physician*	0	0	0	0	0	0	0	0	0	0	0	0
ENT physician*	3.29	1.42	2.39	1.01	2.76	1.25	1.60	0.98	1.04	0.69	2.46	1.16
Speech therapist*	13.37	7.86	12.49	7.87	10.35	6.59	8.01	5.92	6.14	4.49	10.91	6.94
Visual impairment related												
Ophthalmologist*	8.37	4.09	6.27	3.09	7.11	3.8	4.54	2.81	2.72	1.67	6.43	3.36
Orthoptist*	0.12	0.05	0.03	0.02	0.06	0.01	0.02	0.01	0	0	0.07	0.03
Optics and optometry technician**	0.09	0.04	0.26	0.1	0.1	0.07	0.06	0.03	0.04	0.02	0.10	0.04
Optical lab technician**	0.01	0	0	0	0.08	0	0.01	0.01	0.01	0.01	0.01	0
Other/general												
Neurologist*	5.02	3.06	4.71	3.41	3.65	2.25	2.20	1.70	1.30	0.98	3.77	2.49
Total by training level												
*Graduate	82.04	47.57	76.88	46.52	67.26	43.58	54.38	40.88	36.77	27.84	68.61	43.55
**Technical/Diploma	0.72	0.51	0.58	0.33	1.02	0.88	0.42	0.34	0.39	0.35	0.61	0.45

Data source: Brazilian National Health Facilities Registry. Available at: https://datasus.saude.gov.br/cnes-recursos-humanos-a-partir-de-agosto-de-2007-ocupacoes-classificadas-pela-cbo-2002 Accessed 10th November 2021; SUS: *Sistema Único de Saúde* - Unified Health System; PRM: Physical and Rehabilitation Medicine; ENT: Ear, Nose and Throat.

technical/diploma level rehabilitation professionals (Brazilian National Health Facilities Registry). Human resource availability is higher in the wealthier South and South-East states than in the poorer regions of the country. It is difficult to assess whether these workforce numbers are sufficient to meet need, as there are no specific targets. However, most service providers we interviewed highlighted insufficient numbers of rehabilitation specialists across Brazil as a challenge; some reported being the only rehabilitation professional in their district and most identified a need to train and recruit more staff.

According to the interviews, rehabilitation professionals are highly trained and qualified with on-going training and development opportunities, including time and support to participate in external courses (e.g. Masters and doctorate programmes) and groups (e.g. steering committees and municipality meetings). These opportunities made rehabilitation professionals feel valued, as well as providing the opportunity to gain qualifications that would increase their salary. In general, service users reported confidence in rehabilitation professionals and their skillset.

The rehabilitation professionals interviewed had received training on disability as part of their graduate qualifications, although this was often not included for mental health professionals. Most appeared to have good knowledge about disability rights and multidimensional aspects of health access, although nearly all described disability from a medical model perspective; focusing on bodily functioning, rather than environmental factors that shape the experience of disability, as demonstrated in the quote:

> "There is also a very large professional gap. There are few professionals who are interested and there are many professionals who look at the person with a disability just for the pathology, forgetting the rest. He looks at the scarred body but forgets about the rest." (Psychologist)

3.2.3. Supply side: Health facilities and resources

Specialized Rehabilitation centres which provide interdisciplinary care through multi-disciplinary teams (e.g. integrating social care, community services, livelihoods training, education support and other services) were highlighted by rehabilitation professionals as a good practice model, providing a holistic approach to improving functioning and quality of life. As of September 2019, there were 228 *Centros Especializados em Reabilitação, CER (*Specialized Rehabilitation Centres) in Brazil. Interviewees called to scale up these centres and for rehabilitation centres to strengthen partnerships with existing programmes providing wider services/support.

Rehabilitation professionals frequently described inadequate or insufficient materials, resources and space to meet demand. Obtaining new resources was reported to be a slow, bureaucratic process. Some staff resorted to buying equipment/materials themselves and one documented all required resources to advocate for additional funding with the Department of Health. This was particularly evident in the interviews with rehabilitation professionals in Pernambuco and São Paulo state. While facilities in Brasilia face resource constraints, the interviewees indicated that in general resources were more readily available.

Interviewees told us that most rehabilitation services were physically accessible; for example, they had ramps, wide doorways and clear markings. However, there were key gaps, including lack of braille materials and sign language interpreters. Communication with people with severe hearing impairment relies mostly on gestures and written notes, which was reported as difficult and risked misdiagnosis, or via relatives, which can be challenging due to competing time commitments (e.g. work). Primary and tertiary health care facilities, where rehabilitation services are sometimes provided, are often inaccessible, which is consistent with a 2021 national accessibility survey (Pinto et al., 2021). For example, some buildings were physically inaccessible:

> "The accessibility of community healthcare facilities is horrible because they are old. Sometimes you cannot even get through the doctor's office's door on a wheelchair. There are never ramps." (Rehabilitation service user, physical impairment)

Some service users also reported difficulties engaging in teleconsultations (remote online support) and printing materials (e.g. home exercises) at home due to insufficient internet and computer equipment.

According to both people with disabilities and rehabilitation professionals interviewed, travel to rehabilitation services was a key challenge for service users, particularly in São Paulo and Pernambuco. For some, particularly with mobility impairments, transport options were inaccessible. Distances were often long (e.g. >100 km) meaning travel was expensive, time consuming (incurring productivity loses for service users and their families/carers) and tiring, which negatively impacted their engagement in rehabilitation activities.

> "To go to [Name of rehabilitation centre] today, they have already travelled 300-odd kilometres. We know it is tiring. We know especially how exhausted children get, and how they often don't respond well to therapies, after waking up early. I think the view is to have more services closer to patients, you know? I think this is something that needs improvement." (Occupational therapist)

Challenges with transport were particularly evident for service users in São Paulo, due to the long distances to rehabilitation centres, and in Pernambuco, transportation was reported as a major barrier to accessing on-going rehabilitation needs. In contrast transport was not reported as a major issue in Brasilia.

There are some schemes, provided by the municipality or public sector organisations, to provide transport, but these are reportedly scarce. To overcome transport barriers, participants suggested more home visits (especially for low-intensity rehabilitation support), increasing the number of rehabilitation facilities and integrating rehabilitation services further into primary care.

As well as the facilities themselves, the wider environment was reported to be often inaccessible (e.g. poorly paved or uneven pavements and roads) which limits access to rehabilitation services and utilisation of AP provided.

> "I got tired of going on home visits where all of the equipment we gave to the patient were just left on top of a cupboard. The orthosis, the cane, the walker, the chair […] he had learned to tilt the wheelchair, to ride an escalator, to use the chair to climb a curb. He had learned everything, but after he returned home he couldn't even go out his front door, because the place where he lived was inaccessible. This is the handicap of our society, that limits the inclusion of people with disabilities. It's us, the society." (Physiotherapist)

Another key issue reported by most respondents was that waiting times for rehabilitation services were too long, with several reports of one to three year waits. This has negative consequences on functioning, quality of life and, for young children, their development.

> "For hearing aids […] there is a wait list of almost two years. And for rehabilitation, the wait list is very difficult […] Sometimes it is three years waiting. For wheelchairs, the waiting time is a little less, eight or nine months, but rehabilitation is also in the range of one year […] There are children who have been waiting for three years without [access to] a speech therapist." (Rehabilitation Unit Manager)

Reasons given for long waiting times included high service demand (e.g. one facility may provide services for several municipalities), insufficient staff numbers and inadequate screening processes, resulting in people being on a waitlist who do not need rehabilitation.

> "The big knot is the number of professionals. It would be very good if there were more, if there was another CER (specialized rehabilitation centre) in the area. I think they would achieve more because disabled people would have much faster access with higher quality of care." (Rehabilitation Unit Manager)

The referral processes also influenced wait times. According to national policies and strategies (Care Network for People with Disabilities, 2012), referrals should be made from primary health care to specialist rehabilitation outpatient care and, after discharge, back to primary care. However, this is the responsibility of the individual municipalities and states and the system is inconsistent across the country. According to our interview data, referral patterns seemed to vary by state; for example, in Brasilia, all service users interviewed had sought rehabilitation services directly, rather than via referral from primary care. Available referral systems were reported to work well overall, but sometimes with very long delays in communication to the patients. Some were said to get lost in the system. The referral process was perceived to work best when structured screening systems were in place.

Referral from rehabilitation to other specialist services (such as surgery) was reported optimal when strong relationships existed between the two institutions. The limited number of specialist facilities for more intensive support added to long-waiting times and some patients reported back to the rehabilitation centre having never received the additional specialist support. As a result, some people sought private health services.

> "For example, take a child with tympanic perforation at the age of three, often they need to have surgery and they will only get it as a teenager… because there's a very long waiting list, right? So, in this era that we are living in, if the patient has the resources, he does it privately." (Speech and language therapist)

3.2.4. *Supply side: Assistive technology*

The yearly supply of AP in Brazil has been generally increasing since 2008 (Ministry of Health Brazil, 2022). Publicly available data show 6.4 million AP were provided nationally between 2008 and 2018, and the 2020–2023 National Health Plan has a target of achieving 10 million products delivered by 2023 (Ministry of Health Brazil, 2022). Data also suggest variation by type of AP; with provision of mobility aids, orthotics and prosthetics, and hearing aids improving in most areas, however, this trend was not evident for visual aids. Furthermore, as Table 6 shows the national pattern conceals marked regional variation as the two southern, better-resourced regions in the country performed better in most cases, in terms of provision of AP. The data in Table 6 also highlights that, overall, most (>70 %) of administrative health regions in Brazil lack services to provide AP, particularly for visual aids (88 %) (Brazilian Outpatient Information System, 2022). National population level data on AP need and use (as opposed to provision) is lacking.

Service users interviewed generally reflected positively about assistive technology access through SUS, although this varied slightly by location and some people recalled long wait times or that some AP were not available, requiring them to pay privately instead. Challenges with the lack of availability of AP were more commonly reported by service users from Pernambuco. In São Paulo, assistive technology is more available but service users reported long waits or complex referral processes. Service users in Brasília, on the other hand, reported better access to AP. Many users and rehabilitation professionals recommended strengthening the integration of AP provision into rehabilitation services, rather than having to refer onto other specialized facilities, to reduce wait times.

4. Discussion

There have been improvements in Brazil's public health system as a whole in recent decades, despite many challenges (Castro et al., 2019), including better provision and organisation of rehabilitation services. Our study found that the rehabilitation system is supported by good governance and a supportive leadership structure. Services appear to be well-structured with rehabilitation provided at the primary, secondary and tertiary level, and with motivated staff who have access to continuing professional development opportunities. Caetano et al. (2018) note that the expansion of rehabilitation services has accelerated since 2012, underpinned by strengthening of rehabilitation teams at primary level, prioritization of secondary level specialised services and

Table 6
Number of administrative health regions that provide Assistive Products in Brazil between 2017 and 2019 (Brazilian Outpatient Information System, 2022).

	Total administrative health regions	Administrative health regions providing mobility aids		Administrative health regions providing orthotics and prosthetics		Administrative health regions providing hearing aids		Administrative health regions providing visual aids	
	N	n	%	n	%	n	%	n	%
South	68	37	54 %	32	47 %	26	38 %	23	34 %
Southeast	164	59	36 %	62	38 %	39	24 %	16	10 %
Centre-west	46	9	20 %	6	13 %	6	13 %	5	11 %
North	45	10	22 %	8	18 %	8	18 %	2	4 %
Northeast	133	24	18 %	18	14 %	25	19 %	9	7 %
Brazil	456	139	30 %	126	28 %	104	23 %	55	12 %

Data source: Brazilian Outpatient Information System.
Available at: https://datasus.saude.gov.br/acesso-a-informacao/producao-ambulatorial-sia-sus/ Accessed 10th November 2021

targeted funding for rehabilitation services (Caetano et al., 2018). Thus, the Brazilian system appears to have made progress in overcoming some challenges identified in other settings, such as lack of provision of rehabilitation at the primary level (Al Imam et al., 2021). However, our study also highlighted a number of key challenges to service delivery including insufficient numbers of rehabilitation professionals as well as accessibility, transport and financial barriers limiting access to services for people with disabilities.

Our analysis highlighted some disconnect between the supportive governance and leadership and the reality for service provision. Although health financing mechanisms exist, chronic underfunding was a key issue for the rehabilitation workforce who also perceived this underinvestment as reflecting limited political support. Data suggest that approximately 1 % of total government health expenditure was related to rehabilitation at the secondary and tertiary level, and 0.36 % to APs. Given that one in three people are likely to need rehabilitation/AP (Cieza et al., 2021), this funding level is unlikely to adequately meet need. Greater investment in rehabilitation is needed, which is challenging given the funding freezes and long term impact of the COVID-19 pandemic. Innovative approaches should therefore be considered for improving the availability and distribution of rehabilitation services. Strategies may include improving the capacity of the primary healthcare system to attend to more basic rehabilitation needs, as recommended by WHO (World Health Organisation, 2018), and expanding public-private partnerships, whilst better integrating these partnerships into the system. Inclusion of rehabilitation targets within pay-for-performance financial incentives may also be helpful (Kovacs et al., 2021).

Based on both secondary data and interviews with service providers, our analysis indicates that there are insufficient numbers of rehabilitation providers, particularly in poorer areas. This aligns with other literature in Brazil (Dos Santos Sixel et al., 2024). However, our analysis was at aggregate level (all rehabilitation workers in the public health care system) which may have masked some variations by healthcare level; for example, Dos Santos Sixel et al. (2024) found highest density of rehabilitation professionals in the Northeast region which they attribute to the more comprehensive and well-distributed Family health, and Extended Family Health Teams in this region (Dos Santos Sixel et al., 2024). A shortage and geographic variation in rehabilitation workforce has also been demonstrated globally (World Health Organisation, 2017a), in Bangladesh (Al Imam et al., 2021), South Africa (Magaqa et al., 2021), Indonesia (Nugraha et al., 2018), and Peru (Fuhs et al., 2018). Overall, our findings point to a need for greater investment in the rehabilitation workforce training and retention. Research findings in Canada suggests that, in underserved areas, retention measures such as professional development opportunities and improved staff support and communication may be beneficial (Jesus et al., 2017).

For those seeking rehabilitation services, inaccessibility of facilities, transport and the wider environment (due to long travel distances) was another key challenge. While physical accessibility of rehabilitation facilitaties was found to be reasonable, our findings showed that communication and information barriers exist. This concurs with previous research in Brazil showing that accessibility of primary health care facilities was particularly poor for people with vision and hearing impairments (da Cunha et al., 2022; Pinto et al., 2021). For example, a qualitative study in Pernambuco found that the absence of handrails and tactile floors hindered healthcare access for people with vision impairments (Análise de Conteúdo., 1977). There is an urgent need to improve facility accessibility, particularly addressing communication barriers, to ensure people with disabilities can exercise their right to access rehabilitation. One way to achieve this is through regular health facility audits to monitor and enforce accessibility standards (Kuper et al., 2024). Additionally, there is need to strengthen guidance and training for staff on providing disability-inclusive services (Kuper et al., 2024).

The principal of universal access underpins the public healthcare system in Brazil. However, our study indicates that high cost of transport to rehabilitation services (due to long travel distances) is a key challenge for people with disabilities. This aligns with previous research in Brazil (Fernandes et al., 2022), and elsewhere (Reichenberger et al., 2024), that transport costs are a substantial barrier to healthcare access for people with disabilities, particularly because they are, on average, poorer. While some healthcare centres in Brazil provide transportation, findings in our study align with previous research in Brazil that these are limited and unreliable (Santos Sales et al., 2013). Enhancing the availability and integration of rehabilitation into primary care is needed to reduce travel distances. Additionally, alternative delivery modes, such as tele-rehabilitation, may be important for reducing transport related barriers to care (Nizeyimana et al., 2022). Further research is needed in this area in Brazil, particularly considering concerns about inequities in digital access (as evident in our study) (Nizeyimana et al., 2022).

Our findings on limited awareness about rehabilitation have also been found elsewhere (Boggs et al., 2021; Mactaggart et al., 2016). Raising awareness through different channels and ensuring patient choice and autonomy in decision making about their care were strategies suggested by service providers that deserve further attention.

Finally, our analysis highlights the lack of data on met and unmet need for different types of rehabilitation services and AT in Brazil. These data are critical for guiding action and monitoring progress in different settings. There is growing interest in methodological approaches for collecting population level data on rehabilitation and AT need (Boggs et al., 2022). Self-reported need alone is quick and simple to collect but may be unreliable (Boggs et al., 2022). Population surveys that combine self-report and clinical assessments may generate more accurate data to inform service planning (Boggs et al., 2022). These are costly, but may be feasible to conduct every 5–10 years. Brazil should also capitalise on the availability of the national health information system to collect better routine data on need and coverage of rehabilitation (Barreto et al., 2021).

4.1. Strengths and limitations

Our findings make an important contribution; drawing on different sources of data we provide a comprehensive overview of the

rehabilitation system in Brazil and highlight key strengths as well as need and opportunities for action. Few comparable national situational analyses exist on rehabilitation services, although the value and feasibility of undertaking these assessments was shown in a pilot study by WHO, conducted across seven countries (Kleinitz et al., 2021). Strengths of this study include the use of a structured health system framework and the inclusion of multiple sources of data, including interviews with healthcare professionals and people with disabilities.

In terms of limitations, we did not conduct an exhaustive literature or policy review, and therefore cannot rule out that relevant documents were missed. Furthermore, there was no formal collaboration with the Ministry of Health which may have resulted in relevant knowledge, information and data being missed. However, the findings we present, can be used to inform a future situational analysis using the formal STARS assessment, led by the Ministry of Health (Kleinitz et al., 2022). Key policies were reviewed for content on rehabilitation. However, we did not conduct a detailed critical policy analysis; future studies could consider use of content analysis frameworks, such as the Equiframe tool (Scherer et al., 2021), for more in-depth assessment of the level of engagement and guidance provided. Further, the focus of this situational analysis was placed on rehabilitation within the public health sector and did not fully investigate private services, mental health services or non-health-related rehabilitation services (e.g. education). Most people with disabilities, included in the qualitative interviews, were recruited via health centres and health professionals. Therefore, they may not be representative, for example, of people in the community who have poorer access to those services. Further, interviews were conducted remotely due to the COVID-19 pandemic. This may have placed some limitations on rapport with participants, as well as difficulties controlling the interview environment; for example, some interviews were held in people's work places and disruptions occurred. However, interviews were conducted by experienced interviewers, including interviewers with disabilities. The research team included rehabilitation professionals in Brazil, as well as UK-based researchers and we acknowledge that our identities and experiences may have influenced our analysis and interpretation of the data. To limit this, qualitative data were independently analysed by at least two people followed by team discussions to reach consensus. In terms of the secondary data sources; there is no common approach for quality assessment of Health Information System data registries. The Brazilian Ministry of Health routinely checks it's consistency, however a formal and regular national level quality assurance policy is lacking.

In conclusion, a situational analysis of the rehabilitation system in Brazil highlighted key programme and policy strengths that could be replicated in other settings, as well as gaps and challenges that need to be addressed to strengthen rehabilitation provision and access. Strategies to strengthen rehabilitation across the health system, should be developed in consultation with people needing rehabilitation, including people with disabilities.

CRediT authorship contribution statement

Vinicius Delgado Ramos: Formal analysis, Funding acquisition, Supervision, Writing – original draft, Writing – review & editing. **Sarah Polack:** Methodology, Supervision, Writing – original draft. **Loveday Penn-Kekana:** Methodology, Supervision, Writing – review & editing. **Indyara de Araujo Morais:** Formal analysis, Methodology, Writing – review & editing. **Veronika Reichenberger:** Data curation, Formal analysis, Investigation, Methodology, Writing – review & editing. **Nathaniel Scherer:** Formal analysis, Writing – review & editing. **Hannah Kuper:** Conceptualization, Funding acquisition, Supervision, Writing – review & editing. **Christina May Moran de Brito:** Conceptualization, Funding acquisition, Writing – original draft, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Data Availability

The qualitative data underlying this article cannot be shared publicly because permission from this was not obtained from study participants. These data will be shared on reasonable request to the corresponding author. The quantitative data included in this article are already in the public domain.

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