

Informal health education for individuals with disabilities: focusing on the Museum of Life Fiocruz

ABSTRACT

Science museums can play a relevant role in promoting health education in non-formal educational spaces, especially when they incorporate strategies focused on accessibility and inclusion of diverse audiences. This study analyzes the accessibility strategies developed by the Museu da Vida Fiocruz (MVF) in Brazil, using as a reference the “Accessibility Indicators in Museums and Science Centers”, which encompass the physical, attitudinal, and communicational dimensions of accessibility. This is a qualitative case study, based on on-site observation, document analysis, and semi-structured interviews with members of the museum's management. The results indicate that the museum presents relevant initiatives in the three dimensions analyzed, including institutional practices focused on inclusion, accessible educational resources, and communication strategies with diverse audiences. However, architectural, communicational, and exhibition-related barriers were also identified that still limit the full participation of people with disabilities in certain museum experiences. The analysis shows that promoting accessibility in museums is an ongoing institutional process involving organizational transformations, educational practices, and communicational strategies.

KEYWORDS: Educational Inclusion; Health Education; Non-Formal Education; Education of People with Disabilities.

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Educação não-formal em saúde para pessoas com deficiência: um foco no Museu da Vida Fiocruz

RESUMO

Museus de ciência podem desempenhar papel relevante na promoção da educação em saúde em espaços de educação não-formal, especialmente quando incorporam estratégias voltadas à acessibilidade e à inclusão de diferentes públicos. Este estudo analisa as estratégias de acessibilidade desenvolvidas pelo Museu da Vida Fiocruz (MVF), no Brasil, tomando como referência os Indicadores de Acessibilidade em Museus e Centros de Ciências, que contemplam as dimensões física, atitudinal e comunicacional da acessibilidade. Trata-se de um estudo de caso qualitativo, baseado em observação in loco, análise documental e entrevistas semiestruturadas com integrantes da gestão do museu. Os resultados indicam que o museu apresenta iniciativas relevantes nas três dimensões analisadas, incluindo práticas institucionais voltadas à inclusão, recursos de mediação acessível e estratégias de comunicação com públicos diversos. Entretanto, também foram identificadas barreiras arquitetônicas, comunicacionais e expográficas que ainda limitam a participação plena de pessoas com deficiência em determinadas experiências museais. A análise evidencia que a promoção da acessibilidade em museus constitui um processo institucional contínuo, que envolve transformações organizacionais, práticas educativas e estratégias comunicacionais.

PALAVRAS-CHAVE: Inclusão educacional; Educação para a Saúde; Educação Não-Formal; Educação das Pessoas com Deficiência.

INTRODUCTION

In contexts marked by social and educational inequalities, access to health information becomes inaccessible to certain groups, such as people with disabilities (PWD). Beyond having lower levels of educational training, PWD also face additional barriers to accessing health-related information, which may affect their autonomy and social participation (WHO, 2022). During the COVID-19 pandemic, for example, these populations encountered further difficulties in accessing health-related informational and educational content (WHO, 2022; IDA, 2025). In this context, developing inclusive health education initiatives for PWD is an urgent priority.

Despite being traditionally associated with formal education, health education also takes place in non-formal educational settings, such as science museums (Rocha et al., 2010). These spaces, which articulate public communication of science, lifelong learning, and social engagement (Falk & Dierking, 2016), play an important role in fostering knowledge across different dimensions of health, such as historical, environmental, and political (Rocha et al., 2010; Köptcke, 2014).

However, regarding accessibility and the inclusion of PWD, science museums still face significant challenges. Architectural, communicational, and attitudinal barriers may limit their participation in museum experiences, restricting access to the learning processes offered by these institutions (Norberto Rocha et al., 2020; Costa et al., 2021; Caetano, 2024; Heck, Ferraro & Arieta, 2022; Vicente & Norberto Rocha, 2024). From this perspective, accessibility in museums requires the revision of all institutional practices in order to embrace diversity in forms of participation within these spaces (Reich, 2014; Vicente & Norberto Rocha, 2025). In this scenario, it is essential to understand how science museums have been transforming their institutional structures to expand the participation of PWD in health education processes.

Although the number of studies on accessibility in science museums has been increasing, investigations that examine this issue from an organizational perspective in concrete institutional contexts remain limited. Such analyses can contribute to a broader understanding of the challenges and opportunities involved in promoting inclusion in non-formal health education settings. Among the institutions that have invested in this agenda is the Museu da Vida Fiocruz (MVF), a science and health museum affiliated with the Oswaldo Cruz Foundation (Fiocruz). Since 2014, the institution has reviewed long-standing institutional practices and developed new strategies aimed at the inclusion of PWD.

In this scenario, this study aims to analyze the accessibility strategies developed by the Museu da Vida Fiocruz, using the theoretical-methodological framework “Accessibility Indicators for Museums and Science Centers” (Norberto Rocha et al., 2020). It seeks to understand how institutional initiatives, educational resources, and museum practices contribute to expanding the conditions for the participation of PWD in non-formal health education processes.

ACCESSIBILITY AND INCLUSION FOR PEOPLE WITH DISABILITIES

The discussion on accessibility and the inclusion of PWD has become established over recent decades as an interdisciplinary field that brings together

human rights, public policy, education, and culture. An important milestone in this process was the United Nations Convention on the Rights of Persons with Disabilities (CRPD), adopted in 2006 and ratified in Brazil through Decree Nº 6.949 of August 25th 2009.

According to the CRPD, disability should be understood as an evolving concept resulting from the interaction between PWD and barriers present in the physical, communicational, and social environment, which may limit their full and effective participation in society (UN, 2006). This approach is consistent with the social model of disability, according to which the limitations experienced by PWD arise not from individual conditions but mainly from the structural and cultural barriers embedded in society (Martins, 2015).

Accessibility therefore emerges as a central principle for ensuring rights and promoting social participation. The CRPD itself establishes that States Parties should adopt appropriate measures to ensure that PWD have access, on an equal basis with others, to the physical environment, information, communication, and services available to the general public (UN, 2006). In this sense, accessibility extends beyond architectural adaptations to encompass communicational, technological, educational, and cultural dimensions.

Several authors have emphasized that promoting accessibility is directly linked to building more inclusive societies, in which the diversity of bodies, forms of perception, and modes of participation is recognized as an integral part of social life (Shakespeare, 2014; Koppers, 2014; Campbell, 2009). In this regard, recent studies have problematized institutional practices that, even without explicit intent, reproduce forms of exclusion based on ableism, understood as a set of values and practices that privilege certain standards of physical and cognitive functioning over other ways of being (Campbell, 2009; Sandell, 2007).

Thus, promoting accessibility entails not only removing physical barriers but also transforming institutional practices, discourses, and social structures that limit the participation of PWD in different spheres of social life, including health education settings.

INCLUSIVE EDUCATION IN MUSEUMS

The discussion on inclusion and accessibility in museums is closely linked to understanding these institutions as educational environments. Within the field of museum education, numerous studies have emphasized that learning in these settings occurs through the interaction between visitors, exhibitions, and broader sociocultural contexts, resulting in complex and situated educational experiences (Falk & Dierking, 2016).

Over the past decades, the inclusion of diverse audiences has become a central theme in discussions about the social role of museums. International studies have highlighted that science museums often reproduce existing social inequalities, limiting the participation of historically marginalized groups, including PWD, racialized populations, and socioeconomically vulnerable groups. In this regard, authors such as Dawson (2014) argue that promoting inclusion in non-formal educational settings requires broader institutional transformations involving curatorial practices, mediation strategies, and public engagement.

A growing body of scholars has examined how museums and science centers can develop strategies to expand the participation of historically marginalized audiences, including PWD. However, these studies have shown that architectural, communicational, and attitudinal barriers continue to significantly limit the access of PWD to museum experiences (Norberto Rocha et al., 2020; Carmo, 2021; Fernandes & Norberto Rocha, 2022; Heck et al., 2025). Critical disability studies have also highlighted the presence of ableist practices across different social institutions, including educational and cultural settings, where certain physical and cognitive standards are regarded as normative (Campbell, 2009).

From this perspective, recent studies have emphasized that inclusion in museums should not be understood merely as the adaptation of physical spaces, but rather as a broader process of institutional transformation (Vicente & Norberto Rocha, 2025). This involves rethinking curatorial practices, communication strategies, educational mediation approaches, and the ways in which visitors participate in shaping museum experiences.

One of the frameworks developed to analyze these dimensions is the Accessibility Indicators for Museums and Science Centers, proposed by Norberto Rocha et al. (2020). This analytical framework organizes accessibility into three main dimensions: physical accessibility, attitudinal accessibility, and communicational accessibility (Table 1).

Table 1

Accessibility Indicators for Museums and Science Centers

Indicador	Atributo
Physical Accessibility	1a Physical access, accommodation, and use of space
	1b Design and use of objects
Attitudinal Accessibility	2a Inclusive practices, reception, and visitor support
	2b Institutional policy
Communicational Accessibility	3a Communication (internal and external) and visitor signalization
	3b Offering of diverse media, equipment, resources, and related

Source: Norberto Rocha et al. (2020).

Physical accessibility involves both urban planning and architectural aspects, reception, circulation, and accommodation, from arrival at the museum as well as the use of its internal spaces. Communicational accessibility involves ensuring effective communication between audiences and the museum, both within and beyond its physical premises. Attitudinal accessibility involves strategies aimed at removing social barriers associated with stereotypes and ableist attitudes and behaviors. It is reflected in the museum's institutional policies, including initiatives that prioritize accessibility and inclusion, staff training and professional development, the hiring of PWD, pricing policies, budgeting and funding, the establishment of partnerships, and the continuous evaluation of accessibility initiatives.

Although these dimensions can be analyzed separately, they operate interdependently in shaping more inclusive museum experiences. From this perspective, an integrated analysis of these dimensions provides a more comprehensive understanding of how cultural institutions can promote meaningful conditions for the participation of diverse audiences. By drawing on this framework, the present study seeks not only to identify existing accessibility resources but also to understand how these dimensions are manifested and articulated in the day-to-day functioning of a non-formal health education institution.

THE MUSEUM OF LIFE FIOCRUZ (MVF)

The Museu da Vida Fiocruz (MVF) is a public science and health museum located on the campus of the Oswaldo Cruz Foundation (Fiocruz) in the Manguinhos neighborhood of Rio de Janeiro, Brazil. The museum is part of the Casa de Oswaldo Cruz (COC), the Fiocruz technical-scientific unit responsible for preserving the institution's historical heritage, promoting public engagement with science, and advancing health education. Its mission is to "stimulate interest in and promote public dialogue on science, technology, health, and their historical processes, with the aim of fostering citizenship and improving quality of life" (Fiocruz, 2023, p. 20). Its educational policy also recognizes the promotion of health and quality of life as one of the cross-cutting principles guiding the institution's educational activities (Fiocruz, 2021).

The MVF develops exhibitions, hands-on activities, guided visits, and theatrical performances designed for diverse audiences. A central element of its educational approach is the role of museum educators, who engage visitors in dialogue to support knowledge construction. The museum has a decentralized spatial configuration, with multiple facilities distributed across the Manguinhos campus. The visitor circuit includes exhibition spaces, scientific experimentation environments, educational mediation areas, and venues dedicated to cultural activities. These include the Reception Center, the Science Park, the Pyramid, the Moorish Castle, the Stable – which houses the long-term exhibition Life and Health: (In)visible Relationships – and the Virginia Schall Science Tent. During the period in which the study was conducted, some facilities were temporarily closed to visitors, including the Butterfly House, the Temporary Exhibitions Gallery, and part of the exhibition spaces in the Moorish Castle. The institution's libraries were not included within the scope of the study. The museum also operates a traveling outreach initiative, *Ciência Móvel: Art and Science on Wheels*, which was not included in the present research.

The selection of the MVF as the object of this study is justified by its relevance in the field of health education and by the range of initiatives implemented over the past decade to promote accessibility and the inclusion of PWD in its spaces and educational activities. These characteristics make the museum a particularly relevant setting for examining how institutional practices, structures, and strategies contribute to promoting accessibility in non-formal health education environments.

METHODOLOGY

This qualitative case study aimed to analyze the accessibility strategies developed by the Museu da Vida Fiocruz (MVF) using the theoretical-methodological framework “Accessibility Indicators for Museums and Science Centers” (Norberto Rocha et al., 2020). A case study approach was adopted because it enables an in-depth examination of organizational processes, institutional practices, and situated sociocultural dynamics. The unit of analysis comprised the set of accessibility practices, resources, and policies implemented by the museum. Data were collected between March and August 2025 through three complementary strategies: on-site observation, document analysis, and semi-structured interviews.

On-site observation: A systematic technical visit to the MVF was conducted by the first author to identify accessibility resources, strategies, and potential barriers across the museum's different facilities. The observation was guided by the indicators proposed by Norberto Rocha et al. (2020), covering conditions of access and circulation, the design and usability of exhibition components, accessible communication resources, visitor reception strategies, signage, and other accessibility-related aspects. Field notes and photographic documentation were produced to support the subsequent analysis.

Document analysis: Institutional documents produced by Fiocruz, the COC, and the museum itself were analyzed, including the museum plan, the educational policy, institutional accessibility reports, documents related to the inclusion of PWD, and content available through the institution's communication channels. Secondary sources were also consulted when necessary. The analysis focused on identifying institutional guidelines, programs, and initiatives aimed at promoting accessibility and inclusion.

Semi-structured interviews: Two semi-structured interviews were conducted with members of the museum's leadership team: the Director of the Museu da Vida Fiocruz (DirMVF) and the Coordinator of the Fiocruz Office for Equity, Diversity, Inclusion, and Affirmative Policies (CoordCedipa), also former coordinator of the museum's education department. Participants were selected due to their strategic roles in the development and implementation of accessibility policies. The interviews explored the history of accessibility initiatives, institutional policies, challenges associated with implementing accessible practices, and future perspectives for expanding inclusion. After transcription, the interview data were analyzed qualitatively. Excerpts from participants' statements were edited solely to improve textual clarity, without altering their original meaning.

Data were analyzed using thematic analysis guided by predefined analytical categories based on the Accessibility Indicators for Museums and Science Centers (Norberto Rocha et al., 2020). Data from the three sources were organized into an analytical matrix structured around the three dimensions proposed by the framework. Each dimension was examined according to its corresponding attributes. The use of predefined analytical categories enabled the interpretation process to be structured systematically, contributing to analytical transparency, the traceability of empirical evidence, and consistency in data interpretation. Triangulation across the three data sources – integrating information from on-site observation, document analysis, and interviews – was employed to validate

findings identified through different methods, deepen the understanding of institutional accessibility practices, and compare observations made in the physical environment with institutional narratives and official documents. This procedure sought to enhance the interpretive robustness of the analysis by reducing potential biases associated with relying on a single data source.

This article is part of the research activities of the Accessible Museums and Science Centers Research Group and derives from the first author's master's research, supervised by the second author. The study is part of the project "Science Communication: Access, Accessibility, and the Experiences of Diverse Audiences", which was approved by the Research Ethics Committee of the Joaquim Venâncio Polytechnic School of Health (EPSJV), Fiocruz, under CAAE Nº 47557021.0.0000.5241.

Data collection focused on the institutional analysis of accessibility practices and structures, not including direct data from visitors with disabilities. Consequently, the findings reflect the institutional perspective and the conditions of the museum. Furthermore, because the study focused on a single museum institution, the findings cannot be generalized to other science museums or science communication institutions. Nevertheless, the in-depth analysis of this case provides analytical insights that may be relevant to other museums and non-formal health education institutions seeking to implement inclusive practices for PWD. Accordingly, the findings should be understood as analytical and context-specific, contributing to a better understanding of accessibility processes and strategies rather than supporting statistical generalizations.

RESULTS

In the following sections, we present the research findings related to the three accessibility indicators – physical, attitudinal, and communicational accessibility – as proposed by Norberto Rocha et al. (2020).

PHYSICAL ACCESSIBILITY

Physical access, accommodation, and use of space

The MVF has three possible forms of entry/physical access, depending on where visitors come from and the means of transportation used: two entrances on Avenida Brasil, near the Reception Center, and one on Rua Leopoldo Bulhões, approximately 1 kilometer from the museum's Reception Center. In addition to the distance itself posing physical barriers for visitors with reduced mobility, this route is also affected by communication barriers and barriers to access to public transportation in the city of Rio de Janeiro, resulting in difficulties for audiences who use the Leopoldo Bulhões entrance.

Because it is a decentralized museum, the distance between its different facilities may constitute a barrier for people with reduced mobility. The train, offered free of charge to visitors, may represent a possible solution. It includes two reserved spaces for wheelchair users – a recent feature introduced with the new

version of the vehicle, which replaced the previous train in November 2024 (Museu da Vida Fiocruz, 2024). The presence of this resource demonstrates an institutional strategy to compensate for barriers imposed by the museum's own spatial configuration, characterized by its decentralized structure and the distance between different exhibition spaces. In this sense, internal mobility solutions become important elements for reducing obstacles to the circulation of visitors with reduced mobility.

The MVF Auditorium appears to comply with accessibility legislation. It has access ramps, seats reserved for people with obesity, designated spaces for wheelchair users, and an accessible restroom. According to information obtained through the interview with CoordCedipa, these features resulted from a one-year renovation process.

The Tent presents barriers for people with reduced mobility. Although it has an access ramp, which appears to comply with Brazilian technical standards (ABNT) (2020), it does not have reserved spaces for wheelchair users. In addition, the route to the restrooms does not allow wheelchair passage, and the space does not have accessible restrooms. During the interview, the DirMVF stated that the museum has plans to implement adaptations, but faces challenges regarding the transfer of funds from the COC.

Additionally, the DirMVF also recognizes that the limitations imposed by historical heritage preservation and architectural restrictions represent a challenge for accessibility in spaces such as the Moorish Castle. To access its facilities, the Castle has both a staircase and an elevator. However, the elevator presents barriers:

For example, at the Castle we have an elevator that has a series of operational restrictions and spends considerable periods under maintenance. So, the elevator becomes inaccessible during part of the year and has limited dimensions that cannot accommodate all types of wheelchairs. For example, the wheelchair used by our new staff member does not fit inside the Castle. So, the museum currently has a smaller wheelchair, and people have to be transferred to it in order to enter the Castle, access its facilities, or work there. We all know that this practice is highly discouraged, as a person should not be removed from the mobility equipment they use and transferred to another wheelchair – due to all the associated safety concerns – that does not provide the same level of comfort. However, this is a barrier imposed by historical preservation issues (DirMVF).

As pointed out by the interviewee, during the researcher's technical visit, the elevator was undergoing maintenance. In addition, we observed that the Castle does not have an accessible restroom. This case highlights a recurring tension in museums located in historic buildings, where the preservation of architectural heritage may limit the implementation of broader structural adaptations. Thus, promoting accessibility in these contexts often depends on intermediate or adaptive solutions, which may not completely eliminate existing barriers.

One of the strategies implemented to adapt historic buildings was the "Manguinhos Historic Architectural Complex Requalification Plan," initiated by Fiocruz in 2014 to improve accessibility in these historic buildings while addressing existing physical barriers (COC, 2014). One of the first buildings completed within the plan was the Stable, which opened to visitors in 2022 (Museu da Vida, 2022). The building has a large circulation area; however, it presents level differences between access points and different spaces. As a solution, the exhibition entrance

and access to the various areas include ramps and handrails. The exhibition located in the Stable, “Life and Health: (In)visible Relationships”, also presents significant physical accessibility features. Costa et al. (2023), when discussing the exhibition development process, stated that reconciling building preservation with accessibility requirements represented a challenge for the curators. Despite this challenge, they reported that the exhibition complies with The Brazilian ABNT NBR 9050 standards, including:

corridors with a minimum width of 90 cm and turning areas with at least 150 cm of free space; tables, countertops, and interactive exhibits with a maximum height ranging from 80 to 100 cm and designed to allow frontal approach by wheelchair users (Figure 2), as well as benches for visitor rest located at various points throughout the exhibition. Although the building’s ceiling height exceeds 7 meters, the maximum height of the modular panels does not exceed 2.5 meters (Costa et al, 2023, p.11).

Design and use of objects

At the Stable, we also identified stools designed to raise visitors of short stature and enable them to interact with activities on the countertops, such as the microscope activity.

The historical objects displayed in the memory space no longer present these interactive characteristics, as they are placed inside showcases, limiting interaction and access, particularly for people with visual disabilities. In contrast, this aspect is not predominant – Costa et al. (2023, p. 12) explain:

Whenever possible, tactile resources were incorporated into the production of models and sculptures in order to make them accessible to all visitors. These resources were also used in the creation of relief pieces that, although intended for audiences with visual disabilities, proved to be appealing to sighted visitors as well.

Although these resources are not systematically implemented throughout the entire exhibition, several initiatives across different modules can be identified as strategies to ensure engagement with the exhibition. These include replicas of fungal and bacterial cultures, created with crochet materials and placed in Petri dishes; plush replicas of microorganisms; a scenographic horse in the historical module; and a microscope. Among these, we highlight the microscope, as its own design may still prevent interaction by wheelchair users. To reduce this barrier and enable the use of the microscope, a screen was installed near the object to display what is seen through the microscope lenses.

The same strategy was applied at the Pyramid, where one of the six microscopes has a projection system displayed on a nearby television. The Pyramid also includes several tactile and interactive models in its experimentation room, supported by countertops that allow wheelchair users to approach them. However, the space also contains activities that maintain vision as the primary reference, such as the dark chamber and insects displayed in entomological boxes. The Pyramid also has wide circulation areas, level flooring, an accessible restroom, and an entrance with double doors that open outward.

On the other hand, The Science Park contains a variety of activities that are purely visual and/or interactive but require different sensory references for understanding scientific phenomena. In the first case, examples include the

pinwheel activity, a large windmill, the model of the Sun's interior, and 13 of the 30 panels in the Garden of Codes. In the second case, examples include the Sound Mirrors, two parabolic antennas positioned at a distance from each other to demonstrate sound transmission; the Cell, which allows visitors to climb a replica of a giant cell; and the Human Battery activity, in which visitors rotate a system and generate electricity that lights up a bulb. Among these, we highlight the large sculptures representing ear anatomy and the olfactory system, which, although visual and available for tactile exploration, do not allow complete tactile examination due to their size, potentially maintaining accessibility barriers.

Overall, the data indicate that the Museu da Vida Fiocruz has made significant progress in incorporating principles of physical accessibility across different exhibition spaces, particularly in newer or renovated structures. At the same time, limitations remain, associated both with the architectural characteristics of historic buildings and with the heterogeneity of adaptations implemented throughout the museum's headquarters. This scenario demonstrates that the construction of physically accessible environments is a gradual institutional process involving the reconciliation of heritage preservation, exhibition planning, and the inclusion of diverse audiences.

ATTITUDINAL ACCESSIBILITY

Inclusive practices, reception, and visitor support

The MVF operates from Tuesday to Saturday, from 9:00 a.m. to 4:30 p.m., and admission is free of charge. It provides priority lines for PWD and their companions, as well as for groups that include autistic individuals. The same applies to the train. The vehicle offers priority and preferential service, respectively, for people with Autism Spectrum Disorder (ASD) and PWD, each accompanied by one companion. This information became available on the museum's website in May 2025 (Museu da Vida Fiocruz, 2025). The MVF also provides Wi-Fi access to visitors throughout its facilities.

Since 2018, the museum has had a protocol for scheduling and providing services to audiences with disabilities (COC, 2017). During the research period, scheduling was carried out through an online platform. The platform includes the following questions: "Does the group include people with disabilities?", "Which ones?", and "How many people in the group have disabilities?"

Institutional policy

The MVF has an institutional accessibility policy (Fiocruz, 2019), the Fiocruz Policy for Accessibility and Inclusion of People with Disabilities, established in 2019. This policy was developed by the Fiocruz Committee for Accessibility and Inclusion of People with Disabilities, created in 2017 and active during the period of this research, with MVF staff members among its participants.

In addition to the Committee, the MVF receives support from two Fiocruz and COC bodies dedicated to accessibility and inclusion issues: the Coordination for

Equity, Diversity, Inclusion, and Affirmative Policies (Cedipa), an organizational structure within the Fiocruz Presidency; and the COC Accessibility Forum, created in December 2022 (COC, 2022), which also includes MVF staff members in its composition. According to CoordCedipa, the Forum was created following the discontinuation of the MVF Accessibility Working Group, based on a request from the COC director to expand discussions on accessibility throughout COC.

The MVF has incorporated accessibility and inclusion as part of its institutional culture. These values are present both in its strategic planning and in institutional documents from COC and the museum, such as the educational policy (Fiocruz, 2021), the museum strategy for 2023-2026 (Fiocruz, 2023), and the COC four-year plan (Fiocruz, 2023). The first document identifies accessibility as one of the principles and foundations of educational practice (Fiocruz, 2021). In the second, accessibility is established as a cross-cutting pillar throughout the planning process. As a result, accessibility is addressed through different programs and also has its own dedicated program, which includes four areas of action: team training, development of educational initiatives, research activities, and the establishment of intra- and interinstitutional partnerships (Fiocruz, 2023). In addition, accessibility is included in the museum's Vision statement:

Vision To be an **accessible and inclusive** science museum, recognized as a reference in the field of public health, contributing to the dialogical construction of a fair, healthy, and sustainable society (Fiocruz, 2023, p. 20, emphasis added).

The presence of accessibility in strategic documents and institutional guidelines suggests that the issue has been progressively incorporated as a structuring axis of the museum's actions. This institutionalization tends to support the continuity of inclusive initiatives over time by integrating accessibility into both planning processes and educational and management practices. Finally, the COC plan establishes ten goals that "aim to increase accessibility in science communication activities and ensure greater diversity of actors" (COC, 2023, p. 18), involving the MVF either as the responsible unit or as a collaborator.

Accessibility issues are also included in the MVF budget. According to the DirMVF, these resources are allocated to fellowships, the acquisition of materials, the contracting of services, or consultancy support. She provides the following example:

If you look at the event schedule from the past three to four years, the museum is the only Fiocruz unit that provides Brazilian Sign Language (Libras) interpreters at all of its events. Other event organizers want to know whether there will be deaf audiences attending or not; for us, it is a non-negotiable requirement. There is an event; we immediately include it in the budget, in the planning, and in the production process. There must be two Libras interpreters (DirMVF).

During the interview, the DirMVF also mentioned the approval of resources for the construction of a self-regulation room, which will be located at the main building and whose implementation began in 2025.

The museum has a coordinator for an accessibility-focused project developed within the scope of Fiocruz's Inova call for proposals. The MVF also demonstrates strong representation and protagonism of PWD. This resulted from the hiring, by COC, of 24 professionals with disabilities to work in different areas, with the

majority assigned to the MVF (COC, 2025). As a result, some professionals work both in visitor services and in providing accessibility training.

The MVF provides training for its staff on accessibility and inclusion, delivered by three professionals with disabilities: one blind person, one deaf person, and one neurodivergent person. In addition to this work, they also provide consultancy activities for other museum spaces and for COC. Since 2019, the museum has also offered a Libras course for its employees. With the inclusion of deaf museum educators in each space, the teams in each area also receive Libras training provided by these educators. This aspect is also evident in the communication materials promoting inclusive activities on social media, in which professionals with disabilities are presented as protagonists.

The DirMVF highlighted how the inclusion of professionals with disabilities in the museum team has affected the institution's internal procedures:

[The accessibility coordinator] has already alerted us: 'Look, we need you to send this PowerPoint presentation in advance because I will forward it to blind professionals so that AI can provide a preliminary reading of the images and texts, allowing them to become familiar with the content being presented in the PowerPoint, which they otherwise would not have access to.' Therefore, we need to reorganize our schedules in order to complete these presentations beforehand and make them available in advance (DirMVF).

In addition, the museum has partnerships with the Benjamin Constant Institute (educational institution for blind students) and the National Institute for Deaf Education (INES), while also engaging in the dissemination and promotion of the accessibility agenda.

The museum has provided accessibility and inclusion training for its educators and professionals from different institutional sectors since 2017 (Fiocruz, 2022), as well as developing awareness-raising events on the topic. Among the most recent initiatives related to and promoting inclusion, the following can be highlighted: the organization of Inclusive September since 2023 (Museu da Vida Fiocruz, 2023), featuring awareness-raising activities and the protagonism of PWD; the promotion of the activity Games in Libras, conducted by one of the deaf educators, with the aim of teaching Libras to participants through playful activities. First offered during the museum's anniversary celebration, the game became a monthly activity starting in July 2025; and, in August 2025, the museum premiered a new theatrical performance "Quem é todo mundo?" (Who is Everyone?), whose cast is composed of PWD, addressing inclusion for children.

The museum has not yet conducted audience research involving visitors with disabilities. This situation is not exclusive to the MVF but is also recurrent in other museum settings, as pointed out by Andrade (2024). This aspect highlights an important limitation of the institutional initiatives identified. Although the museum presents several actions aimed at promoting inclusion, the absence of systematic studies on the experiences of visitors with disabilities makes it difficult to assess, in greater depth, the impact of these strategies on visitors' experiences. Incorporating this perspective may represent an important step toward improving the institution's accessibility policies.

COMMUNICATIONAL ACCESSIBILITY

Communication (internal and external) and visitor signalization

The museum's external communication, including informational content, museum operations, and activity promotion, is carried out through its website, social media platforms, and museum application.

The MVF website includes a Libras translation feature (VLibras), which may facilitate interpretation for users of sign language. However, it does not provide tools for adjusting contrast and font size, which may significantly affect interaction for people with visual disabilities. The website offers informational content to help visitors plan their arrival. This content includes detailed information on how to reach each entrance based on the transportation method used, a map that allows visitors to identify the best route to the museum, and other information regarding access to the Fiocruz campus. Conversely, the website does not have a dedicated page providing specific accessibility information about the Fiocruz campus or the museum.

These elements indicate that the museum's digital communication presents relevant accessibility initiatives, such as the incorporation of Libras translation, but still lacks a more systematic provision of resources aimed at different user profiles. In this regard, expanding digital accessibility tools may contribute to making visit planning more inclusive from the earliest stages of interaction with the museum.

Information about accessibility features available in museum activities is provided through monthly program articles, in which the accessibility resources offered are described in detail. An example is the post announcing the program for the museum's 26th anniversary, which indicated that 15 of the 20 activities included Libras interpreters (Santos, 2025).

The same information is shared through the MVF app. Launched in 2023 (Cannabrava, 2023), the MVF app contains information about museum spaces, supported by videos with Libras translation, provides three specific visitor routes, and also includes the museum's program schedule for the period. The app is available for Android and iOS, and users do not need to be connected to the internet to navigate it. At the launch of the application (Cannabrava, 2023), it was stated that "[i]n the future, the app will enable an even richer interaction by providing resources such as an audio guide, audio description, additional predefined routes, and even the possibility of evaluating the visitor experience"; however, these resources were not yet available during this research.

The MVF also uses social media to promote activities and educational content. Based on an initial exploration of Instagram, it was possible to identify a lack of systematic implementation of accessibility resources in digital content. In other words, not all content includes Alt Text and/or Libras translation. Nevertheless, content specifically focused on visitors with disabilities was identified. For example, invitation videos for the monthly Libras visits conducted by deaf educators, with support from Portuguese-Libras interpreters, are shared on the museum's social media platforms in Libras with a voice-over version. Announcements for accessibility workshops and Inclusive September were also bilingual and included subtitles. The lack of standardization in the adoption of

these resources suggests that accessibility on social media still depends on specific initiatives associated with particular content rather than on a systematic communication policy focused on digital inclusion.

Regarding internal communication, the Fiocruz campus has limited signage indicating the museum spaces and guiding visitors along the routes to them. One identified solution was the map available through the application; however, we consider that physical signage within the space remains essential. Furthermore, except for the Stable, the MVF does not have tactile maps of its spaces or exhibitions.

The implementation of tactile paving throughout the museum is also inconsistent. The routes from the main entrance to the Reception Center, the Science Park, and the Moorish Castle include tactile paving paths that guide visitors with visual disabilities. However, other areas do not have this resource, such as the route between the Castle and the Stable and between the Science Park and the Science Tent. The same applies within the Science Park and the Reception Center, which may reduce the autonomy of visitors with visual disabilities when accessing the museum. This finding indicates that, although the museum has implemented relevant initiatives for spatial orientation among these audiences, these resources have been only partially implemented across the different areas of the complex. This pattern suggests that physical accessibility adaptations have been progressively incorporated but remain unevenly distributed among museum environments, potentially generating different experiences of circulation and autonomy for visitors.

Due to its principle of human interaction, spaces such as the Pyramid and the Moorish Castle contain limited textual content. Therefore, the reception provided by museum educators is essential for visitors' engagement with exhibition content. During data collection, the researcher observed a school group visit in which no students with identified disabilities were present. In the observed case, at the Pyramid, the reception process was conducted by all educators, with and without disabilities, who introduced themselves using their names and Libras signs. Subsequently, parts of the visit were conducted in both Portuguese and Libras.

At the Stable, the main text panels have backlight illumination, facilitating reading. However, contrast may represent a challenge. In addition, the curators reported that one challenge faced was the variation in lighting conditions throughout the year (Costa et al., 2023), which may represent a barrier for people with visual disabilities. At the Science Park, some activities include explanatory panels about scientific phenomena, with textual content available in Portuguese.

Offering of diverse media, equipment, resources, and related

In addition to human interaction, there are also accessibility resources designed to ensure visitors' autonomy. According to Costa et al. (2023), these include:

tactile map, Braille text, an audio description button – which can be listened to using headphones attached to the furniture – and a tablet with Libras videos. These totems also contain notebooks with the exhibition text in English and Spanish, as well as communication boards (p.11).

During the technical visit, we observed that the tablets were not functioning. However, their content could be accessed through QR codes.

Some activities, although interactive, also require other sensory references, such as vision, which constitutes a barrier for visitors with visual disabilities. The exhibition, however, included some solutions to address this issue. One example is the Food activity in the Microworld, which allows visitors to select foods, scan them with a code reader, and learn about their importance for the human microbiota through a screen presentation. In this case, the screen included a QR code that provided access to a website with accessible versions: “Portuguese with audio description” and “Portuguese with Libras.” The same strategy was observed in another activity in the Macroworld focused on the social determinants of health. In the Macroworld, some panels addressing myths and facts about vaccination included Braille labels. In another case, an activity conducted on an interactive screen, involving a historical comparison of health data in the city of Rio de Janeiro, included a set of tactile maps for use by visitors with visual disabilities.

No accessibility resources were identified in the Pyramid and the Science Park. The archaeological site located in the park, although it has a tactile model of the area, presents exhibition content based on Portuguese-language texts and objects displayed inside glass cases, creating barriers for people with different disabilities. At the Reception Center, there is a tactile version of the mosaic mural, made available upon request, allowing exploration by visitors with visual disabilities.

All lectures include Libras interpretation, even when no deaf audience has been confirmed, as pointed out by the DirMVF. Regarding theatrical performances, during the period of this research, the premiere of the play *Quem é todo mundo?* represented a milestone in the systematic implementation of accessible resources. All performances of the play in 2025 are simultaneously presented in Portuguese and Libras and also include audio description. Before this, during the data collection period, we identified only performances with Libras interpretation and audio description during the museum’s 26th anniversary event (Santos, 2025).

DISCUSSION

Considering the three accessibility dimensions proposed by Norberto Rocha et al. (2020), the findings of this study indicate that all three are present at the MVF, although in a fragmented and heterogeneous manner and with different levels of consolidation.

Regarding physical accessibility, relevant aspects include access to the museum and circulation within its surroundings. On the one hand, the restoration works involving historical heritage and other strategies, such as the train, reduce barriers to internal circulation within the Fiocruz campus and the museum area; on the other hand, the multiplicity of entrances and the distance between them and the museum, as well as between the museum’s different facilities, represent barriers that must be considered. Issues related to physical access to museums have been identified in previous studies as factors that directly influence the visitation experience and the possibility of spontaneous participation by these audiences (Fernandes & Norberto Rocha, 2022; Carmo, 2021; Vicente & Norberto Rocha, 2024). Furthermore, the cases of the Moorish Castle and the Science Tent

highlight challenges related to architectural adaptation: the first involves the adaptation of historic heritage sites that require modifications to meet contemporary accessibility demands; the second involves the need for accessibility adaptations to become an institutional priority to ensure dedicated funding.

Also regarding physical accessibility, the results indicate that a significant proportion of the strategies adopted by the MVF are associated with interactivity and the manipulation of exhibition objects. This is a strategy frequently adopted by contemporary science museums as a means of mediating between visitors and scientific content (Falk & Dierking, 2016), and studies with visitors with disabilities in Brazilian science museums (Fernandes & Norberto Rocha, 2022; Heck et al., 2025) indicate that interactive resources can promote engagement and expand possibilities for understanding scientific phenomena. However, the data collected at the MVF reveal barriers in modules and activities described as interactive, either due to their lack of systematic implementation throughout all museum activities or within the same exhibition, or due to their dependence on sensory references beyond touch. Moreover, purely visual modules without possibilities for tactile exploration remain present. At the Stable, for example, historical objects displayed in showcases remain inaccessible to visitors with visual disabilities. This pattern is not specific to the MVF – Fernandes and Norberto Rocha (2022) identified a similar tendency in two other science museums in Rio de Janeiro. As highlighted by Heck et al. (2025), the construction of genuinely inclusive experiences depends on the adoption of multisensory strategies and exhibition design processes that consider different forms of interaction with scientific knowledge.

The persistence of this pattern, even in an institution with a consolidated accessibility policy, suggests that the issue does not lie in the absence of inclusive intentions, but rather in something more structural: exhibition design in science museums has historically been organized around vision as the privileged sense, and the incorporation of other sensory references often occurs as a later addition rather than as a principle guiding the design process. The most illustrative example from the data concerns the microscopes at the Stable and the Pyramid. Faced with the accessibility barrier represented by this equipment, the museum adopted a functional solution: a screen installed near the object displays what is seen through the microscope lenses. This represents an operationally viable response to a concrete barrier; however, it is necessary to distinguish between what this solution offers and what the original experience provides. A visitor without a disability uses the microscope, whereas a visitor who accesses the content through the screen watches a projection of what another visitor sees through the microscope – the experience is not equivalent; it is a substitute. Although this distinction does not invalidate the solution adopted to reduce a barrier, it demonstrates that subsequent adaptations, regardless of how well implemented they may be, tend to provide access to content without providing access to the experience. In science museums, where investigative experiences are often themselves the educational content, this difference has pedagogical implications that cannot be overlooked.

This tension between equivalent access and substitute access relates to a broader issue that critical disability literature has identified as the tendency of institutions to provide adapted participation rather than full participation (Campbell, 2009). When exhibition design is based on an implicit model of the visitor – one who sees, moves without restrictions, and interacts with equipment calibrated for certain bodily configurations – the resulting accessibility is

necessarily corrective: it attempts to compensate, for certain visitors, for what the original design failed to consider. The result is that these visitors access a modified version of the experience, while the original experience remains the norm. This pattern, identified by Campbell (2009) as an expression of institutional ableism, does not require discriminatory intent in order to be reproduced – it persists precisely because standard exhibition design in science museums is rarely questioned regarding its sensory and bodily assumptions. The analysis of the MVF illustrates how this pattern operates even in institutions with genuine institutional commitment to accessibility: adaptive resources exist and represent real advances, but they coexist with an exhibition principle that continues to privilege certain modes of perception and interaction. Overcoming this pattern would require not only adding accessibility resources to existing exhibitions but also rethinking the criteria that guide the conception of new exhibitions and activities from their earliest stages – what constitute, as argued by Vicente and Norberto Rocha (2025), a broader process of institutional transformation, or “organizational change” (Reich, 2014), that extends beyond the physical dimension of accessibility.

Among the dimensions analyzed, attitudinal accessibility proved particularly significant in the case of the MVF. The presence of institutional policies focused on inclusion, expressed in strategic planning documents, combined with the implementation of welcoming practices and the active participation of professionals with disabilities within the museum team, indicates a consistent institutional effort to incorporate accessibility as an organizational principle. The existence of institutional structures dedicated to this issue, such as the Fiocruz Committee for Accessibility and Inclusion of People with Disabilities, together with the recognition of accessibility as a transversal pillar in institutional documents and the existence of dedicated funding, constitutes an institutional framework that goes beyond isolated initiatives. In addition, we identified initiatives within the museum in which inclusive practices are considered from the conception stage, through initial project development, to subsequent educational actions. This aligns with Dawson (2014), who identifies this approach as fundamental for the inclusion of audiences historically excluded from these spaces.

Studies on inclusion in museums have emphasized that changes of this nature are essential for creating more accessible environments, since inclusion depends not only on physical adaptations but also on transformations in organizational cultures and professional practices (Reich, 2014; Vicente & Norberto Rocha, 2025). In this sense, the MVF case illustrates how explicit institutional commitment can create conditions for inclusive practices to be disseminated more systematically, reducing dependence on isolated initiatives or on specific professionals or departments.

A relevant aspect of attitudinal accessibility that was found to reverberate across several organizational practices was the hiring of PWD. The internal reorganization of schedules to ensure that presentations are sent in advance to PWD, for example, illustrates not only an operational change but also reveals a barrier that existed prior to the hiring process and only became operationally visible – and therefore open to intervention – when it began to affect a member of the team itself. This finding suggests that the presence of PWD in institutional teams functions as a mechanism for continuous auditing of organizational barriers, generating unforeseen demands and process reorganizations that no external assessment would be able to produce with the same regularity and specificity.

Furthermore, the presence of these professionals in visitor services directly influences the health education processes promoted by the museum. The presence of educators with disabilities and the use of Libras in interactions with visitors contribute to expanding representation and fostering an institutional culture that is more sensitive to issues of inclusion. This moment not only represents the protagonism and representation of PWD but also promotes visitor awareness of the inclusion agenda. Such practices demonstrate that accessibility in museums is not limited to structural or technological adaptations but also involves relational and pedagogical dimensions of the museum experience.

Beyond this, when a deaf educator conducts a mediated visit in Libras within the museum spaces, they are not merely providing reception or representing diversity: they are making scientific health content accessible to visitors who would otherwise have limited access to this knowledge, as commonly occurs in health information contexts (WHO, 2022). This point aligns with Dawson (2014), who argues that the linguistic needs of audiences must be considered within inclusion processes. In this sense, incorporating professionals with disabilities into the museum's educational team is not merely an employment equity measure – it is a condition that expands the museum's capacity to fulfill its mission of promoting health and citizenship among audiences historically underrepresented in these spaces.

However, the data also demonstrate that the strength of an institutional accessibility policy does not, by itself, guarantee the elimination of barriers in the institution's everyday practices. This tension – between what policies state and what practices actually produce – became evident through the persistence of other physical and communication barriers, such as the case of the elevator in the Moorish Castle. This finding should not be interpreted as a contradiction or an isolated management failure, but rather as evidence of a broader structural issue: accessibility policies operate on different scales and timelines from the material conditions of the spaces they seek to transform. Budgetary resources, restrictions imposed by heritage preservation requirements, and dependence on external bodies for funding allocation, as indicated by the DirMVF, constitute a set of constraints that no institutional policy, regardless of how robust it may be, can immediately resolve. This gap between institutional intention and concrete conditions is recognized in the literature on inclusion in non-formal education settings, which has shown that institutional initiatives may coexist with exhibition and communication practices that continue to privilege certain audience profiles (Dawson, 2014). The analysis of the MVF advances this discussion by demonstrating that such coexistence does not necessarily result from institutional inconsistency but may reflect a mismatch between different rates of change within the same organization: institutional culture may transform more rapidly than physical infrastructure.

This observation aligns with Trescher's (2018) perspective, according to which the construction of inclusive environments depends less on the complete elimination of barriers and more on an ongoing institutional commitment to their identification and mitigation. The MVF case provides a concrete example of this dynamic: the director's own recognition of the elevator's limitations and the mention of planned adaptations that are still pending suggest that the barrier is known and remains on the institutional agenda – which differs from a barrier that is ignored or normalized. Nevertheless, from the perspective of a visitor with a

disability who arrives at the Castle and finds the elevator unavailable, the practical outcome remains the same: exclusion from the experience. This reinforces the need for institutional commitment to accessibility to be translated not only into documents and organizational structures but also into monitoring and response mechanisms that operate on the same temporal scale as visitors' needs.

Regarding communicational accessibility, the study identified barriers such as limited signage, as well as different strategies aimed at expanding access to information, including digital resources and accessible educational initiatives. However, some considerations must be made. First, although the accessibility resources installed in the Stable have accessibility potential, their lack of operation means that they continue to create barriers to information access for audiences who wish to use these resources. In this sense, the development of an app with content designed for visitation also represents, in principle, a promising strategy for expanding visitor autonomy – especially in a museum with a decentralized spatial configuration, where prior orientation to the visitor route has a direct impact on the experience of audiences with different disabilities. However, the data reveal a tension: at the launch of the app in 2023, the institution announced that, in the future, it would offer resources such as an audio guide, audio description, and the possibility of evaluating the visitor experience. In 2025, at the time of data collection for this research, these resources were still unavailable. This two-year interval between announcement and implementation is not, in itself, unusual in the development of digital products. Furthermore, reliance on personal devices to access informational content about museum spaces also involves the issue of unequal distribution of digital capital among the audiences that the museum seeks to include. These findings align with Heck (2024), who warns that mobile technologies can expand possibilities for access to information but may also create new barriers when they assume the availability of technological infrastructure. In this sense, the adoption of digital solutions needs to be accompanied by complementary strategies for accessible communication within exhibition spaces themselves.

Another relevant point concerns the museum's institutional communication. The absence of systematic accessibility resources in content made available on the website and social media platforms indicates that the inclusive culture identified in the museum's educational sector may not be equally disseminated across all institutional areas. This result suggests that promoting accessibility involves not only creating specific initiatives but also incorporating inclusive practices into different dimensions of institutional communication.

The issue of communicational accessibility is particularly relevant when considering the role of museums as spaces for health education. The circulation of accessible scientific information constitutes a central element in strengthening citizens' informational autonomy regarding health-related issues. Thus, the absence of accessibility resources may limit certain audiences' access to educational and informational content produced by the museum, reproducing inequalities in access to scientific knowledge.

Taken together, the three dimensions analyzed demonstrate that the promotion of accessibility at the MVF constitutes an institutional process under construction, characterized by significant advances and persistent tensions that are not distributed uniformly across the institution's spaces, dimensions, and

temporalities. This heterogeneity is consistent with Reich (2014), who describes the promotion of accessibility in science museums as a gradual process marked by advances, limitations, and continuous reconfigurations. This scenario not only requires ongoing adjustments to museum practices and inclusion strategies adopted by the MVF but also demands analytical tools capable of evaluating this process.

Within the context of health education, the limitations identified acquire particular relevance. When PWD face barriers during their museum experience, their participation in learning processes that are central to the construction of health knowledge in non-formal education environments may be restricted. Therefore, despite notable advances, such as the hiring of PWD for visitor services, the persistence of other barriers, including physical barriers, limits the educational processes available to PWD, since accessibility dimensions are interdependent. In contexts marked by inequalities in access to scientific information and educational resources, initiatives that expand the participation of historically marginalized audiences in science communication spaces can contribute to strengthening learning processes, public engagement, and social participation in health-related issues.

FINAL CONSIDERATIONS

Science museums can contribute to expanding public access to health-related knowledge. However, for these educational processes to occur equitably, it is necessary to ensure effective conditions for participation among diverse audiences.

Although this study did not directly include the perspectives of visitors with disabilities, the analysis of the institutional structures of the MVF made it possible to identify factors that facilitate (or limit) their participation in non-formal health education settings.

The results demonstrate that accessibility at the MVF is configured heterogeneously, reflecting the architectural, historical, and organizational characteristics of the different spaces that comprise the museum. This finding suggests that accessibility management in institutions with complex and decentralized structures requires specific strategies for each environment rather than the adoption of uniform solutions throughout the entire visitor circuit.

The research also revealed existing tensions between heritage preservation and accessibility in museums located in historic buildings. In this context, promoting accessibility extends beyond the scope of institutional management and depends on coordination among different stakeholders and regulatory frameworks involved in the preservation and use of these spaces.

Another relevant finding concerns the role of accessible human interaction through the presence of PWD within museum teams. In addition to expanding possibilities for inclusion and access to health information, their participation contributes to making visible organizational barriers that were previously normalized, fostering processes of institutional transformation that extend beyond the implementation of specific accessibility resources.

By analyzing accessibility in a science museum dedicated to health education, this study contributes to discussions on inclusion in non-formal education settings and to understanding how the physical, attitudinal, and communication dimensions of accessibility interact in the construction of educational experiences. The findings reinforce that accessibility is a fundamental condition for the democratization of health education and indicate that its strengthening depends not only on technical resources but also on institutional policies, educational practices, and continuous processes of organizational change. Future studies may incorporate the perceptions of visitors with disabilities to better understand the impact of these initiatives on museum experiences.

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