

Paving the way to Public Health and Education of the Brazilian Deaf Population: A 25-Year Research and Development Milestone

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ABSTRACT

This editorial highlights a 25-year research and development milestone dedicated to bridging the gap in healthcare and educational accessibility for the Brazilian deaf population through systematic linguistic assessment and specialized resources. Central to this effort is the development of a comprehensive bibliographical and technological framework, including several **Trilingual Illustrated Encyclopedic Dictionaries of Brazilian Sign Language (Libras)**, a 12-volume **Libras Encyclopedia**, and several **Handbooks of Medicine and Health in Libras**. These tools, supported by the **BuscaSigno** computerized retrieval system for quadriplegic deaf patients, empower deaf individuals and healthcare professionals by providing a scientific basis for communication in clinical and pedagogical settings. Furthermore, the editorial discusses the **Linguistic Development Assessment Program**, a battery of eleven standardized, validated instruments designed to monitor competencies in Brazilian Sign Language (Libras), alphabetic reading, and spelling and speechreading. Drawing on epidemiological data from over 9,500 students, which reveals that 95% of deaf children are born to hearing parents, the text advocates for evidence-based public policies that prioritize **bilingual education** as a fundamental requirement for cognitive development and equitable health outcomes. By integrating high-level lexicography with rigorous psychometric standards, Brazil offers a robust model for the social and linguistic inclusion of deaf citizens, ensuring their right to health and education is upheld through scientific innovation.

Keywords: Brazilian sign language (Libras); Public health; Linguistic assessment; Bilingual education; healthcare accessibility; Medical lexicography; Deaf education

INTRODUCTION

The primary source for demographic data on the Brazilian deaf population is the Brazilian Institute of Geography and Statistics (IBGE). The 2010 Census utilized a self-attribution criterion for hearing difficulty across three levels: 1) Some difficulty: 7,574,797 people (3.971%); 2) Great difficulty:

1,799,855 people (0.944%); 3. Total difficulty/Deafness: 347,481 people (0.182%). Therefore, 9,722,133 individuals (5.097% of the total population) reported some degree of hearing impairment. A 2018 revision by IBGE modified the classification criteria to include only those with "great difficulty" or "total difficulty" (Levels 2 and 3). Under this revised metric, the population of deaf or hard-of-hearing individuals was adjusted to 2,147,336, representing 1.126% of the 2010 population. Applying the revised 1.126% prevalence to the 2022 population (203,062,512 inhabitants), it is estimated that approximately 2,286,483 Brazilians are current or potential users of Brazilian Sign Language (Libras). Furthermore, considering the network of interlocutors—including family, teachers, and interpreters—the potential number of Brazilians communicating through sign language may reach 30 million (15% of the population).^[1]

The integration of the deaf population into the socioeconomic fabric of a nation requires a robust framework that bridges the gap between language development, educational policy, and healthcare accessibility. In Brazil, this challenge is underscored by epidemiological data revealing that approximately 95% of deaf children are born to hearing parents who typically lack knowledge of Libras. This demographic reality creates a state of linguistic vulnerability, where the school environment—specifically bilingual institutions—becomes the primary locus for first-language (L1) acquisition. Over the past 25 years, a systematic program has been dedicated to evaluating the linguistic development of Brazilian deaf students from elementary school through higher education, resulting in a comprehensive compendium of bibliographical and technological resources designed to optimize both educational and medical outcomes.^[1]

Technological and bibliographical innovation in Libras

The cornerstone of these efforts is the lexicographic documentation of Libras, which provided the scientific foundation for its institutional recognition through federal legislation (Law 10.436/2002 and Decree 5.626/2005). Key resources include several **Trilingual Illustrated Encyclopedic Dictionaries of Libras**^[2-6] and the multi-volume **Encyclopedia of Libras**,^[7-14] which include specialized content for **Medicine and Health**. Specifically, the **Libras Primer in Medicine and Health**¹⁵ and the **Libras Handbook in Medicine and Health**^[12] were developed to facilitate effective communication between deaf patients and healthcare professionals, ensuring that medical care is not hindered by linguistic barriers.

Furthermore, technological advancements like the **BuscaSigno** system for the communication of quadriplegic deaf patients have revolutionized sign communication.^[16-18] This computerized tool allows users to retrieve and use signs based on their sublexical structure—handshape, location, movement, and facial expression—rather than relying on alphabetical order in Portuguese. By using Libras as its own metalanguage, *BuscaSigno* supports the cognitive autonomy of signers and provides a deep understanding of the language's morphic and iconic structure.

A Systematic battery for language assessment

To ensure evidence-based interventions, a battery of eleven validated and standardized instruments—the **Linguistic Development Assessment Program**—was created to track the development of crucial competencies. These tools assess:

- a) **Libras Comprehension:** Receptive vocabulary and sign recognition and articulation.^[19-21]
- b) **Alphabetic Reading and Writing:** Word recognition, sentence comprehension, and orthographic/semantic accuracy.^[22-24]
- c) **Speechreading (Visual and Tactile Orofacial Reading):** The ability to decode spoken Portuguese by the deaf and the deafblind.^[25-28]

This assessment framework allows for a precise "information processing" analysis of a multitude of reading and spelling errors caused by similarities in either visual or tactile properties of either sign units or speech units that underlie reading comprehension and spelling production in the deaf and deafblind populations. Such precision is vital for clinical and educational diagnosis, helping to identify whether a student is operating at a logographic, alphabetic, or orthographic stage of literacy.

Epidemiological insights and public policy

Research involving over 9,500 students across 14 Brazilian states has provided a definitive baseline for public policy. A critical finding is the interaction between student characteristics and educational settings: **deaf students** with **congenital hearing loss** (whose L1 is Libras) thrive in **bilingual schools** where Libras is the medium of instruction. Conversely, **hard-of-hearing students** (whose L1 is Portuguese, often supported by cochlear implants or hearing aids) perform better in **mainstreamed/inclusive schools**.^[1,28-30]

This evidence has been instrumental in shifting national policies, advocating for the preservation and expansion of bilingual schools rather than their closure. Early immersion in Libras is not only a cultural right but a cognitive necessity. It serves as a metalinguistic anchor that facilitates the acquisition of Portuguese as a second language (L2) and improves speechreading capabilities.

CONCLUSION

Towards a comprehensive public health approach

The resources developed in Brazil represent a world-class model for the linguistic and social inclusion of the deaf population. By combining high-level lexicography, sophisticated language assessment batteries, and specialized health-related materials, we have created a pathway for the deaf citizen to navigate the complexities of both education and healthcare with dignity. Future developments must continue to refine these instruments, incorporating new variables such as the degree of visual-articulatory similarity to enhance the sensitivity of language tests. Ultimately, treating the deaf population through a lens that respects their unique biological and linguistic constitution is the only way to achieve true equity in public health and education.

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