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Applying the World Report on Disability to children’s communication

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ABSTRACT

Purpose The World Report on Disability is an important milestone in the recognition of people with disabilities; however, the Report acknowledges that people with communication difficulties may be underrepresented in estimates of disability. Consequently, this paper applies the nine recommendations from the World Report on Disability to supporting children’s communication skills.

Method Australia is similar to most Minority World countries since it places high regard on articulate and literate communication. Recent large-scale Australian studies of children with speech, language, and communication needs were reviewed to determine prevalence, impact, and associated environmental and personal factors. Studies of met and unmet need were reviewed and discussed in relation to legislation and policies.

Results Recent years have seen improvements in the collection of and access to disability data about children’s communication, including the involvement of children in research about the impact of communication difficulties on their lives. The prevalence of speech and language impairment in children is high and is associated with poorer educational and social outcomes at school-age. Significant unmet need for services was noted, and there were differences in health, education, and disability policies regarding access to services.

Conclusions Updated legislation, policies, and practices are needed to more effectively support access to services to support children’s communication across health, education, and disability sectors.
Implications for rehabilitation

- There is a high prevalence of speech and language impairment in Australian children.
- Childhood speech and language impairment (and associated communication disability) can impact educational, social, behavioural and occupational outcomes throughout life.
- Many Australian children do not have sufficient access to targeted services (including speech-language pathology) to ameliorate the impact of their communication disability.
- Formulation of a national strategy to support children’s communication is required.
INTRODUCTION

The World Report on Disability [1] represents an important milestone in international recognition and understanding of requirements to support people with disabilities to fully participate in society. The Report concludes with nine cross-cutting recommendations to reduce disabling barriers faced by people with disabilities. According to the World Report on Disability [1], approximately 15% of the world’s population “live with some form of disability” (p. 261). However, the authors of the Report acknowledge that “people with…communication difficulties, and other impairments may not be included in these estimates [of disability], despite encountering difficulties in daily life” (p. 22). Recently, the International Journal of Speech-Language Pathology published a special issue on the implications of the World Report on Disability for responding to communication disability in under-served populations [2]. Within the special issue, authors applied the World Report on Disability to people with communication disabilities in countries such as Ghana [3], Uganda [4], Brazil [5], Bolivia [6], India [7], Malaysia [8], Viet Nam [9] and Indigenous Australian children [10]. The current paper applies the nine recommendations from the World Report on Disability to all Australian children who have speech, language and communication needs. Recent years have seen improvements in the collection of, and access to, disability data for these children, including the involvement of children in research about the impact of communication difficulties on their lives. A number of large-scale studies have been conducted to enable: understanding of contextual factors that influence the lives of children and their families; demonstrates the need for timely and holistic intervention; and reveals the lack of services available for children with communication difficulties and the limitations of legislation and policies affecting service access. Thus, this paper presents progress that has been made in the field of childhood communication towards
meeting the World Report on Disability’s recommendations relating to improved research, but also highlights the crucial need to update disability policies and service access in order to enable progress towards meeting recommendations for improved services.

**Communication disability**

Disability is a “complex multidimensional experience” [1] (p. 21) and its application to children’s communication is similarly complex. The term *disability* encompasses impairments of Body Functions or Structures that may be associated with restricted Activities and Participation [11]. The physical, social, and attitudinal environment surrounding an individual contains barriers or facilitators to functioning, thereby impacting on the degree of disability experienced. According to Hartley and Wirz [12], disability may be regarded as a breakdown between individuals and the environment in which they exist. Following this definition, Hartley [13] notes that people with communication disability are “a population whose ability to communicate is affected by their response to an impairment and/or social and contextual factors which interrelate with each other and with the person themselves, resulting in impaired communication skills” (p. 277).

When considering children’s communication, it is helpful to use the International Classification of Functioning, Disability and Health: Children and Youth version (ICF-CY; [11, 14]). For the purposes of this paper, the focus is on children’s difficulty with verbal communication (and does not consider sign or written communication). The ICF-CY indicates difficulty with producing messages (d330-d349), understanding messages produced by others (d310-d329), conversations (d350) and discussions (d355). Related impairments of Body Functions relevant to communication identify difficulty with voice (b310), articulation (b320), fluency (b330), receptive language (b16700) and/or expressive language (b16710). For the
majority of children, there are no associated Body Structure impairments [15, 16]; however, for some children, impairments of the oral structures (s320) such as those associated with cleft palate, or aural structures (s250 and s260) such as the cochlea, may contribute to difficulties communicating [17].

Within the ICF-CY, Environmental Factors external to the individual can be “a positive or negative influence on the individual’s interaction and performance in society” [18](p. 68). These include the physical settings in which the individual exists and the people with whom they interact within those settings. Environmental factors also include organisations and services that individuals may utilise, as well as laws and regulations governing the use of such services. The environmental factors most likely to act as barriers or facilitators to communication are those related to support and relationships (e310-399), attitudes (e410-499), and services, systems and policies (e510-599) [19]. For younger children, the attitudes and support provided by family and those in the home environment is particularly important, but for older children, there is usually a broader environmental influence, including school and other community contexts [11, 20].

**Communication disability in relation to speech and language impairment**

This paper reports on children in Australia, a country that is similar to most of the Minority World in that it places high regard on articulate and literate communication [21]. The emphasis on communication-based employment in Minority World countries has been linked to high rates of unemployment for people with unintelligible speech; for example, 75.6% in the US, with an estimated associated cost to the economy between 2.5 and 3% of US Gross National Product [22]. Much of the research that is described in this paper has focussed on impairment, specifically documenting prevalence, impact, and services for children with speech and language impairment. However, many children with a speech and language impairment experience
communication disability when they interact within their environment that demands articulate and literate communication.

Children with speech and language impairment may experience different levels of disability due to the demands of the environment in which they live. Within Minority World countries, it is argued that the ability to communicate effectively through speech and literacy is a fundamental requirement; thus, many children in Minority World countries who have speech and language impairment experience communication disability. For example, within the US, the definition of children with a disability includes those with speech and language impairment “that adversely affects a child’s educational performance” [23] (p. 12). There has been an extensive body of literature that has indicated the association between speech and language impairment and adverse impacts on their educational and social development and outcomes. For example, an international systematic review [24] of the prevalence and natural history of speech and/or language impairment suggested: “speech and language development is intimately related to all aspects of educational and social development” (p. 2). Another international systematic review [25] examined 57 studies of individuals with a history of speech impairment according to the Activities and Participation component of the ICF-CY and identified Activities that have been found to be limited by speech impairment including: learning to read (d140) / reading (d166), learning to write (d145) / writing (d170), focussing attention (d160)/ thinking (d163), calculating (d172), speaking (d330), writing messages (d345), conversation (d350), mobility (d4), self care (d5), relating with persons in authority (d7400), informal relationships with friends (d7500), informal relationships with peers (d7504), parent-child relationships (d7600), sibling relationships (d7602), school education (d820), and acquiring, keeping and terminating a job (d845). Within the literature there is strong support for the “critical age hypothesis” [26, 27]
which suggests that if children’s speech and language difficulties persist until the time that they are beginning to read, then they are highly likely to have reading difficulties.

The extent and severity of children’s communication disability can be determined by examining the way speech and language impairment limits everyday life activities and restricts participation in life situations, particularly related to educational and social opportunities. The potential impact of speech and language impairment on Australian children’s functioning and participation has been examined using data from the Longitudinal Study of Australian Children-Kindergarten cohort (LSAC-K), a population-based study of approximately 5,000 children [28, 29], the Sound Effects Study reporting parents’ s and speech-language pathologists’ application of the ICF-CY to children with speech impairment [30], as well as in smaller qualitative studies that have included the perspectives of the children with speech and language impairment (described below under Recommendation 4). Harrison et al. [29] examined the impact of speech and language impairment in the LSAC-K cohort when the children were 6- to 7-years-old (n = 3,632). Teachers reported greater difficulties with literacy, numeracy, and approaches to learning (e.g., being organised, eagerness to learn) for children identified with concerns about their expressive communication skills in early childhood (4 to 5 years), in comparison to children with no such history [29]. The effects of speech and language status when 4- to 5-years-old on literacy, numeracy, and approaches to learning outcomes when 6- to 7-years-old were similar in magnitude to the effect of family socio-economic factors, after controlling for child characteristics (age, sex, language other than English spoken at home, Indigenous status). The second study that examined the impact of speech and language impairment in the LSAC-K study was undertaken by McCormack et al. [28] when the children were 7- to 9-years-old (n = 4,329). The children’s Activities and Participation outcomes were examined across five ICF-CY
domains: learning and applying knowledge, general tasks and demands, communication, interpersonal interactions and relationships, and major life areas. Data were gained via report from parents, teachers, and the children themselves, as well as via direct assessment of the child. The majority of children identified in early childhood by parent concern about their expressive communication skills ($n = 1,041$) were found to be performing within the normal range of outcomes measured age when they were 7- to 9-years-old; however, for each of the measures, the proportion of children with a history of communication impairment who performed outside the normal range was higher than the proportion of children with no such history. The greatest areas of difficulty for children identified with communication impairment at 4 to 5 years were outcomes related to learning and applying knowledge. Nearly a third of these children were reported by their teachers to have limitations with language and literacy (30.6%), mathematical thinking (28.4%), and approaches to learning (30.7%). Furthermore, limitations in other domains were also identified for children with communication impairment at 4 to 5 years, including: completing tasks and handling demands, informal social relationships with friends/peers, and school education/school life, receptive vocabulary, interactions with peers, and interactions with teachers. The children themselves were more likely to report bullying, less enjoyment of school, and poorer peer relationships than their peers. These outcomes were found over and above the effects of sex, age, Indigenous status, language background, and socioeconomic position. These analyses of LSAC-K data provide strong evidence that difficulty with speech and language in early childhood can be associated with limitations to children’s life activities and communication disability into their middle years of school, as identified by parents, teachers, and the children themselves.
The impact of speech impairment also has been explored from the perspective of parents and speech-language pathologists [30]. A 32-item questionnaire based on six ICF-CY Activity and Participation domains was completed by 86 parents of 4- to 5-year-old children in the Sound Effects Study whose children had difficulty “talking and making speech sounds” as well as by an independent sample of 205 speech-language pathologists [31]. Five areas were identified by the parents with moderate to high internal reliability: verbal communication (e.g., conversation d350, speaking d330), interpersonal interactions (e.g., relating with strangers d730), basic learning (e.g., copying d130), advanced learning (e.g., learning to read/write d140/5), applied learning and general tasks (e.g., handling stress d2401). In addition to these five areas, the speech-language pathologists identified a sixth area: non-verbal communication (d315). Both groups indicated that verbal communication and advanced learning were impacted the most by the presence of speech impairment. These studies demonstrate that children in Minority World countries who have speech and language impairment experience communication disability.

**Applying the nine recommendations of the World Report on Disability to Australian children’s communication**

The following sections of this paper apply the nine recommendations of the World Report on Disability to Australian children with speech and language impairment, and/or communication disability. The ensuing discussion provides further evidence that speech and language development is intimately related to other areas of development and later outcomes, particularly in educational and social domains [24]. Ensuring the provision of early intervention, and provision of appropriate intervention beyond early childhood, are necessary to limit the impact of speech and language impairment and subsequent communication disability.

*Recommendation 1: “Enable access to all mainstream systems and services”*
As outlined above, Australian data reflect findings from other Minority World countries that underline the importance of considering the barriers to educational and social opportunities for children with speech and language impairment and communication disability. Inclusive learning environments and targeted interventions are required to support children’s ability to be articulate and literate so as to fully participate in current and future educational and social opportunities, as well as future occupational opportunities. Communication Access [32] is a recent Australian program to support children and adults with complex communication needs (e.g., who use augmentative and alternative communication) to access mainstream services and systems. This initiative aims to support people to communicate effectively in order to participate in their communities. Communication Access assessors use 30 criteria to consider whether services and businesses meet minimum standards of communication accessibility. To date, no such access initiative has been implemented in Australia for children who can use speech and language, but have difficulty communicating.

Australian professionals have begun to consider population-based prevention programs to reduce the impact of communication disability and increase access. In a keynote address to the Speech Pathology Australia National Conference, Snow [33] encouraged speech-language pathologists to be conversant with public health discourse, particularly with respect to the preventative role speech-language pathologists can play in child safety and mental health. She advocated that the complex needs of at-risk children can be supported by population-based as well as individualised interventions. Two studies that have examined the effectiveness of population-based interventions, however, have to date provided little support to this view. Wake et al. [34] conducted a large-scale prevention program for 301 children that investigated the effectiveness of a low intensity parent group program, Let’s Learn Language, for “slow to talk
toddler's aim at reducing the likelihood of speech and language impairment. A clustered randomized controlled trial was undertaken and while the program was considered to be both “feasible and acceptable” it did not significantly improve the children’s language or behaviour at age 2 or 3 years. The authors concluded: “The societal cost of language delay makes further rigorous research into effective prevention and intervention an imperative” (p. d4741). Another Australian population-based prevention program, the Early Home Learning Study (EHLS) [35], is currently being tested using a clustered randomized controlled trial with over 700 vulnerable families. The program aims to work with families on multiple levels: child, parent and community; for example, parents are encouraged to use five child-focused interactional skills: “tuning in, following the child’s lead, listening and talking, teachable moments, and being warm and gentle”. Preliminary findings demonstrate a high rate of attendance, retention and satisfaction of the families. The conclusion from these studies is that, to date, there is no strong Australian evidence for the success of universal prevention programs for reducing speech, language, and communication difficulties. The current evidence (provided below in the discussion of Recommendation 2) indicates that speech and language skills improve with individualised interventions provided by professionals such as speech-language pathologists.

**Recommendation 2: “Invest in specific programmes and services for people with disabilities”**

Many children with speech and language impairment and associated communication disability require access to specific rehabilitation services. Speech-language pathologists utilise a wide range of assessments and interventions for identifying specific areas of strength and difficulty, and for facilitating efficient and effective changes in children’s communication skills. Typically speech-language pathologists aim to enable children to achieve the age-appropriate
speech and language skills necessary for their full participation in society, via targeted interventions.

A range of individual and small group interventions for children with speech and language impairment or stuttering are available (for overviews see [36-38]). Many of these interventions have been shown to be effective through: international meta-analyses [39], Australian randomized controlled trials [40-42], Australian controlled studies without randomization [43–47], Australian case studies [45, 48], and other studies undertaken in Australia and throughout the world. Research into the effectiveness of speech and language interventions has highlighted the importance of ‘dosage’; that is, adequate amounts of intervention must be delivered for the intervention to be effective [49, 50]. An international meta-analysis of interventions for children with developmental speech and language delays/disorders of unknown origin [51] reported that at least 8 weeks of therapy was a potential factor for achieving good clinical outcomes, although for children with complex communication needs, greater time is required. In an international review of 134 intervention studies, Baker and McLeod [36] found that children with speech impairment who did not have associated Body Structure impairments (i.e., without hearing loss or cleft palate) needed an average of 20 hours of intervention, with most studies describing interventions that were provided two to three times per week. In a community-based randomised controlled trial in the UK, Glogowska et al. [52] found that small amounts of speech therapy for children with language impairment (6 hours or less) were no more effective than receipt of no intervention. To date, the optimal amount of intervention has not been researched within Australia, with the exception of studies of children who stutter. Rousseau et al. [53], for example, have shown that a median of 16 clinic visits (range 6–40) is required for children to complete stage 1 of the Lidcombe Program of early
stuttering intervention. However, for children in remote areas of Australia, a randomized controlled trial of the Lidcombe Program delivered by low-tech telehealth took almost three times more time and resources than traditional face-to-face delivery [54].

**Recommendation 3: “Adopt a national policy and legislation”**

Adoption of a national disability strategy and plan of action is important for all people with disabilities since inadequate policies and standards are disabling barriers. Although Australia is an affluent nation with universal access to healthcare, Australian children with speech and language impairment and communication disability are invisible in most legislation and policy [55]. In 2010, a review of Australian health, education, and disability policy and legislation was conducted and described the fragmentation between national and state education, health and disability sectors with respect to children with speech and language impairment [55]. The authors of the review concluded: “Australian allied health, education, and disability service providers are often left to interpret ambiguous policies to make a case for service delivery to such children.” This is in contrast to legislation and policy in the US [56] and UK [57] that specifically name children with speech, language, and communication needs as requiring provision of specialist services in schools. Australian children’s access to services is compounded by lack of Australian policy and legislation, divided ministerial responsibility between education, health and disability, and the workforce shortages of speech-language pathologists in Australia. Recently Speech Pathology Australia has been lobbying the national government for inclusion of people with speech, language and communication needs within the National Disability Insurance Scheme [58]. Similarly, Speech Pathology Australia has been lobbying to increase data collection and services for children with speech and language impairment and communication disability in education [58].
**Recommendation 4: “Involve people with disabilities”**

Recent understandings of the experiences of speech and language impairment and communication disability has drawn on the insights of children and young people with speech, language, and communication needs through interviews, drawings, and other child-friendly methods [59]. For example, the perspectives of 4- to 5-year-old children with speech sound disorder were gathered within the Sound Effects Study [60] of 124 children identified with speech sound disorder on clinical assessment. Children were asked to choose a face (😊,😊,😊, O, ?) to show how they felt about their talking and most of the children indicated that they were happy about their talking. Next the children were asked to draw a picture of themselves talking to someone. Within the drawings a number of children emphasized body parts, particularly the listener’s ear closest to themselves (see Figure 1). After interviewing the children, the large ears were interpreted to indicate the importance children placed on their listeners’ skills in interpreting their unintelligible speech. In the next stage of the Sound Effects Study, 34 interviews were conducted with 13 4- to 5-year-old children and 21 significant others (family members and teachers) to understand the experience of living with childhood speech impairment, and of accessing and participating in speech-language pathology services [61]. Parents and children identified three problems of living with speech impairment: (1) a “speaking problem” (2) a “listening problem”, and (3) a “frustration problem” when communication was unsuccessful. Similar to [60], the children often identified that it was the listener’s problem and not their own difficulty speaking that caused communication breakdown. The participants posed a number of long and short term solutions to improve the listener’s understanding (e.g., using gestures, repetition) as well as to improve the child’s speech accuracy (e.g., home practice, speech-language pathology).
Contextual factors influencing the lives of school-aged children with speech impairment have also been explored in another study [20]. Thirty-four interviews were undertaken with six school-aged children, their siblings, friends, parents, grandparents, and teachers. Supportive contexts (such as home) were facilitative where children could be themselves and participate in typical childhoods; whereas, most public contexts (including school) were disempowering barriers and these children indicated that they frequently were frustrated, embarrassed, and withdrawn.

The impact of childhood speech impairment was also examined in interviews with two young men (who had speech and language impairments as children) and their mothers [62]. The interviews were framed around the domains of the ICF [63]. A phenomenological analysis revealed that the quality of life was affected for the young men, their mothers, and their broader families as they “battled” to live with and know more about their speech impairment as well as to find appropriate support. Their speech impairment had manifested as communication disability for most of their lives.

Recommendation 5: “Improve human resource capacity”

Speech-language pathologists (also called speech pathologists or speech and language therapists) are specialists in childhood speech and language impairment and communication disability. Speech-language pathologists work closely with teachers, psychologists, doctors, audiologists, dentists, and other health, education, and disability specialists to support children’s ability to communicate and participate fully in society. World-wide there is a critical shortage of speech-language pathologists [64-66]. In Australia there has been a recent increase in the ability to fill available speech-language pathology positions in four of the eight states and territories;
however, there are still recruitment shortages in other parts of the country, particularly in rural and regional areas [67].

Recommendation 5 of the World Report on Disability relating to improving human resource capacity is inextricably linked to whether people who need services actually can access them. Evidence of the need to increase human resource capacity in Australia is highlighted in the Australian studies of population, community, and clinical samples that have considered whether or not children identified with speech and language impairment can access appropriate services (including speech-language pathology). Studies consistently reveal unmet need. In LSAC-K [68], parents and teachers indicated that 14.5% of 4- to 5-year-old children had accessed speech-language pathology services, but a further 2.2% needed but could not access services. McLeod and McKinnon [69] examined 14,500 5- to 18-year-old Australian school children in the state of New South Wales, where speech-language pathologists are not employed in schools. While communication disorder was the second most prevalent area of learning need (13.04% of all students in wave 1 of data collection), they found that the majority (62.4%) of students who were identified as having a communication disorder received no involvement from outside agencies (i.e., speech-language pathologists and other professionals). These students with communication disorders were unlikely to have an individualised education plan (IEP) in place (16.8%), in contrast with students who had an intellectual disability (89.1% had an IEP), vision impairment (45.5% had an IEP), hearing loss (40.2% had an IEP) and physical/medical disabilities (35.1% had an IEP). Furthermore in the Sound Effects Study [70], conducted with 4- to 5-year-old Australian children diagnosed with speech impairment, only 31.2% previously had a speech-language pathology assessment, and only 26.6% had received speech-language pathology intervention. Parents of 6.4% had been unable to access speech-language pathology services, and
the remaining 62.4% had not attempted to access speech-language pathology services. In
subsequent interviews, some parents indicated that they were waiting for confirmation of a
problem by their child’s teacher, or others.

Recently a clinical survey of 194 children from across Australia [71] found that the most
common waiting time for initial assessment was 2-6 months (23%); however, 15% waited for
more than 1 year. The most common waiting time for intervention was 1 month (47%); however,
10% waited for more than 1 year. The participants consistently described “a lack of available,
frequent, or local services, long waiting times, cut-off ages for eligibility, discharge processes,
and an inability to afford private services” (p. 338). The authors of this qualitative and
quantitative study concluded that “session type, frequency, and length were incongruent with
both research recommendations and parents’ wishes” (p. 338).

The issue of access to services is compounded within Australia due to the size of the
population relative to the size of the continent. Wilson et al. [72] found that children with
communication disability living in rural and remote Australia did not have universal access to
local, frequent, or quality services. Subsequently, Verdon and colleagues [73] mapped access to
paediatric speech-language pathology services in the two most populated states in Australia
(New South Wales and Victoria). It was found that 50 kilometres was the critical maximum
distance after which families were unable or unwilling to travel for weekly sessions with a
speech-language pathologist; and 98.6% of localities in these states were identified as under
serviced.

Universal access to services for Australian children with communication disability
currently is not a reality. The following quote from Speech Pathology Australia in 2007 [74] still
holds true today:
The speech pathology services available to Australian children to remediate speech and language disorders are inadequate and inconsistent. Service availability differs from state to state. Within states, the level of service available may be dependent on the age of the child and/or the school the child attends.

Additional service delivery options are currently being explored within Australia including integrated services within early childhood settings [75], collaborative consultation models with teachers, group therapy, parent training programs, and employment of therapy assistants. Recently McAllister and colleagues [76] recommended the reconceptualization of the speech-language pathology profession to include “public health communication disability workers and mid-tier workers, who could work alongside more traditional speech-language pathologists” (p. 118) to provide services for people with communication disability in Australia and across the world.

**Recommendation 6: “Provide adequate funding and improve affordability”**

The costs of inaction, inadequate or ineffective intervention are significant for children with speech, language, and communication needs and their families, teachers, future employers, and society at large. To date, no cost-benefit studies have been undertaken in Australia; however, Speech Pathology Australia has provided information for the National Inquiry into the Social and Economic Impact of Communication and Swallowing Impairment [77] calling for cost-benefit studies to be undertaken. In the UK Clegg and Henderson compared the long-term cost of education provision and welfare benefits (e.g., unemployment, housing, and disability benefits) for people with childhood language impairment compared with their typically developing siblings. Over a 1-year period, there was a 500% difference between the costs for health services between the two groups. In the US, the cost of achieving functional outcomes in speech intervention was estimated more than a decade ago to range from US$2,000 to $11,325 per child, depending on the severity of the impairment [78]. There have been recent calls for intervention
studies to include cost-effectiveness analyses [79]. Researchers have argued that the cost of intervention is likely to be a small amount in comparison to the school-based remedial assistance required by many children with speech and language impairment who go on to develop literacy problems [80], and an insignificant amount in comparison to cost of a lifetime of unemployment and social welfare [22].

**Recommendation 7: “Increase public awareness and understanding”**

Communication disability is invisible compared with many physical disabilities. Consequently, the prevalence and impact of childhood communication disability is not widely recognised. To address the need for greater public awareness of communication disability Speech Pathology Australia is lobbying with other national professional associations to launch the International Communication Project. Successful campaigns will build on the Hello Campaign in the UK that was held as part of the 2011 National Year of Children with Speech, Language and Communication Needs (http://www.hello.org.uk/), and the annual Better Speech and Hearing Month sponsored by the American Speech-Language-Hearing Association each May (http://www.asha.org/bhsm/).

There is Australian evidence that public and professional awareness and understanding of childhood communication disability needs to be increased. For example, in the Sound Effects Study [70], 62.4% of families who reported concern about their 4- to 5-year-old child’s ability to “talk and make speech sounds” had *never* accessed speech-language pathology services for their children. Furthermore, interviews with a subset of parents in this study revealed that when their children started school it became apparent that these children should have accessed specialist services during preschool. One reason parents believed services were not needed during the preschool years was that teachers, family, and friends had not signalled concern. Parents
expected that preschool teachers would confirm their own concerns or suspicions about their child’s communication difficulties. When this did not happen parents typically did not seek services, only to realise when children started school that early intervention should have been recommended. Similar findings have been reported for parents who seek information from GPs. Short et al.’s [81] investigation of how Australian GPs identify and manage speech and language impairments in children aged 0-5 years of age indicated that one-quarter would not refer such children to speech-language pathologists. GPs said they would initially refer them to other professionals such as paediatricians.

Speech-language pathologists need to build the capacity of others to identify, refer and manage children with speech, language, and communication needs. Teachers and general practitioners need targeted information in their university education and continuing professional development. Indeed, McLeod and McKinnon [82] found that teachers indicated that presence of a communication disorder was the most predictive indicator of students requiring a high level of support at school (compared with eight other areas of learning need, including intellectual disability, vision impairment etc). Speech-language pathologists and other professionals (e.g., teachers) need time and opportunities to educate parents and grandparents about their children's speech and language and how to assist them.

**Recommendation 8: “Improve disability data collection”**

As the authors of the World Report on Disability suggest, “A lack of rigorous and comparable data on disability and evidence on programmes that work often impedes understanding and action” [1] (p. 263). Given that children with speech and language impairment and communication disability may be under-represented in the World Report on Disability
prevalence figures, it is important to ensure that specific studies of children’s communication
skills are considered when prevalence data are estimated.

An international systematic review of prevalence studies in 2000 concluded: speech and
language impairment “is a high prevalence condition” [83] (p. 179) and indicated that prevalence
of speech and/or language impairment ranged from a low of 2.0 to a high of 24.6%, depending on
the nature of the impairment and the type of assessment measure. Since that review, there have
been multiple studies reporting prevalence data for childhood speech and language impairment,
including a number of large-scale studies conducted in Australia. Some of these studies have
specifically considered speech and language acquisition (e.g., Early Language in Victoria Study
(ELVS: [84]), whereas others have addressed speech and language acquisition as part of a
broader program of research into child development (e.g., LSAC-K [85], the Randomly
Ascertained Sample of Children born in Australia’s Largest State (RASCALS: [86]), and the
national collection of the Australian Early Development Index (AEDI: [87])). These recent
studies, along with older studies of the prevalence of speech and language impairment in
Australia, are summarized in the Appendix. These 14 studies report prevalence figures for
speech and language impairment in Australian children from 0.12% to 41.2%, depending on the
different definitions (communication, speech, language, stuttering), different informants (e.g.,
parents, teachers, speech-language pathologists), and different methods (reported concern, direct
assessment) to identify speech and language impairment. In the main, however, most of these
studies demonstrate that speech and language impairment is highly prevalent (between 12-25%)
in Australian children. For instance, within LSAC-K 25.2% of parents of 4- to 5-year-old
children had concerns about how their child “talked and made speech sounds” and 9.5% had
concerns about how their child understood language compared to teachers who reported that
22.3% of children were less competent than others in their expressive speech and language ability and 16.9% were less competent than others in their receptive language ability (ability to understand) [68].

A number of studies compared parent report of speech and language concern with direct assessment [88-90]. For example, the Sound Effects Study [89] of 143 preschool children identified with concerns, investigated the consistency between parent concern with formal communication assessment. The majority of the children identified by parents with concerns about how they “talked and made speech sounds” (86.7%) achieved a standard score at least one standard deviation below the mean on the Diagnostic Evaluation of Articulation and Phonology [91] (a standardized measure of children’s speech skill) and were ascertained as having a speech impairment. Most were classified as having mild-moderate (53.1%) or moderate-severe (28.0%) speech impairment. Co-occurring language impairment (e.g., using incorrect grammar) and pre-literacy impairment (e.g., difficulty recognising sounds and letters) was often noted. These results indicate that parental concern is highly correlated with formal identification of speech impairment by speech-language pathologists using a standardised measure. Other research has similarly found parent report to be as reliable and valid as a test of language skills in children [92, 93]. Therefore, parental concern about children’s communication skills is a valid means of identifying impairment.

The World Report on Disability [1] calls for “…comparable data on disability…” (p. 263). Comparative prevalence data for Australian children with speech and language impairment and other learning needs (including other disabilities) were reported by McLeod and McKinnon [69] for over 14,500 school-children aged 5-18 years across two waves of data collection in the state of New South Wales (NSW). “Communication disorder” (13.04% in wave 1; 12.40% in
wave 2) was the second most prevalent learning need after specific learning difficulty (17.93%; 19.10%). Following these two areas, other learning needs were: English as a second or other language (9.16%; 5.80%), behavioural/emotional difficulty (8.16%; 6.10%), early achieveer/advanced learner (7.30%; 5.50%), physical/medical disability (1.52%; 1.40%), intellectual disability (1.38%; 1.20%), hearing impairment (0.96%; 0.80%), and visual impairment (0.16%; 0.30%). Results across the reports for 14,533 children from kindergarten to year 12 (wave 2), the presence of a communication disorder was the most important predictive factor of teachers’ recommendation that primary or secondary students required a high level of support at school [82]. Such reports demonstrate the link between speech and language impairment and communication disability.

**Recommendation 9: “Strengthen and support research on disability”**

Within the field of childhood communication, recent years have seen an improvement in disability data collection. There is now a significant body of research focused on the level of impaired speech and language skills, and a growing body of research investigating links between speech and language impairment and limitations to life activities and participation. Some researchers have examined environmental and personal factors that influence children’s communication functioning and disability. A systematic review undertaken by the US Preventative Services Task Force in 2006 [94, 95] examined risk and protective factors associated with speech and language impairment in early childhood across 16 studies. Nelson et al. [94] concluded: “The most consistently reported risk factors include a family history of speech and language delay, male gender, and perinatal factors...” (p. e302); however, they indicated that few studies had examined a wide range of factors. Since that time, risk and protective factors for speech and language impairment have been examined in studies based on
three large-scale Australian cohorts (ELVS, RASCALS, LSAC-K) based on bioecological models that include the effects of child health and psychosocial characteristics as well as parental, family, and neighbourhood variables [86, 96-101].

In the RASCALS and ELVS research, risk and protective factors for language impairment were examined for children aged 2 years and younger [86, 97-101]. Both found strong support for biological factors influencing early communication outcomes. Zubrick et al.’s examination of [86] predictors of late language emergence in 1,766 2-year-old children in the RASCALS study identified five risk factors: being male, perinatal factors (e.g., lower birthweight), lower scores on the Ages and Stages Questionnaire [102] (e.g., gross motor, fine motor skills), family history of late language emergence, and the presence of siblings. Reilly et al. [99] examined parent-reported language and communication outcomes for 1,720 2-year-old children in the ELVS and identified being male, family history, older maternal age, low maternal education, birth order, and non-English-speaking background as risk factors; however, these accounted for only 7.0% of the variance. Additionally, Reilly et al. [100] examined risk and protective factors for the onset of stuttering between 2 and 3 years of age in the ELVS study. Factors that were associated with stuttering onset were being male, being born a twin, having higher vocabulary scores at 2 years of age, and high maternal education; but again, these only accounted for small amount (3.7%) of the variance.

Risk and protective factors for speech and language impairment at preschool-age were examined by Harrison and McLeod [103] for 4,983 4- to 5-year-old children in the LSAC-K. Thirty one child, parent, family and community factors were tested as predictors of four measures of speech and language impairment using multivariate logistic regression. Significant risk factors for speech and language concern were: being male, having ongoing hearing
problems, and having a reactive temperament. Protective factors were: maternal wellbeing, and
having a persistent and sociable temperament. Factors identified both as risk and protective for
different outcome measures were: having older siblings (risk for expressive language concern,
protective for receptive language skills), parents speaking languages other than English
(protective for expressive language concern, risk for English receptive language scores), and
home learning support (risk for attendance at speech therapy, protective for English receptive
language scores). These factors relate both to personal and environmental factors as described in
the ICF-CY.

To summarize across the ELVS, RASCALS and LSAC-K studies, the presence of speech
and language impairment, or stuttering was associated most consistently with biological factors
(e.g., being male, low birthweight, having a more difficult temperament, and being genetically
predisposed through family history), but also with the family environment.

**Summary and Conclusions: The way forward**

Speech and language impairment is highly prevalent amongst Australian children and
predicts poorer educational and social outcomes at school-age and beyond. Despite the high
prevalence and impact, there are inadequate services. Hartley [13](p. 277) states, “Services for
people who have impaired communication do not have a high priority on the health agenda ...
because services operate from a theoretical framework that focuses on the impairment rather than
disability, and on changing the individual, rather than changing the context within which they
exist”. Australia needs to do more to re-envision and support access to services and early
identification of communication difficulties (e.g., integrated services), including changing
societal environmental factors that currently act as barriers to functioning. The World Report on
Disability offers many recommendations for addressing the barriers for children with disabilities
including the need to address system-wide problems, such as divided ministerial responsibility, lack of legislation and policy, targets and plans, and inadequate resources. Additionally, there is a need to address barriers at an organisation level, such as inadequate training and support for teachers, recognition and addressing individual differences (including individualized education plans), provision of additional supports to create an optimal environment that “will assist children in learning and achieving their potential” [1](p. 220). The data presented in the current paper suggests a need for (1) the formulation of a national strategy and plan for children with speech, language, and communication needs, (2) the provision of adequate funding to enable access to the appropriate dosage of specific programmes and services, and finally (3) increased public awareness and understanding of childhood speech and language impairment and communication disability, its impact on children’s lives, and the economic impact if not managed early and appropriately.

Declaration of Interest

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References


### Appendix. Australian studies of prevalence of speech and language impairment organized according to the age of the participants and domain

<table>
<thead>
<tr>
<th>Study + Cohort acronym</th>
<th>Domain</th>
<th>N</th>
<th>Age</th>
<th>Informant</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taylor, Maguire, &amp; Zubrick (2011)[104]: LSAC-B</td>
<td>Language</td>
<td>5,107</td>
<td>9 months</td>
<td>Parent</td>
<td>17.8%</td>
</tr>
<tr>
<td>Reilly, Bavin et al. (2009)[84]: ELVS</td>
<td>Language</td>
<td>1,911</td>
<td>1-2 years</td>
<td>Parent</td>
<td>19.7%</td>
</tr>
<tr>
<td>Zubrick et al. (2007)[86]: RASCALS</td>
<td>Language</td>
<td>1,766</td>
<td>2 years</td>
<td>Parent</td>
<td>13.4%</td>
</tr>
<tr>
<td>Reilly, Onslow et al., (2009)[100]: ELVS</td>
<td>Stuttering</td>
<td>1,619</td>
<td>2-3 years</td>
<td>Parent + SLP</td>
<td>8.5%</td>
</tr>
<tr>
<td>McLeod &amp; Harrison (2009)[68]: LSAC-K</td>
<td>Speech and language</td>
<td>4,983</td>
<td>4-5 years</td>
<td>Parent + Teacher</td>
<td>24.5%</td>
</tr>
<tr>
<td>CCCH (2009)[105]: AEDI</td>
<td>Language and literacy</td>
<td>261,203</td>
<td>4-5 years</td>
<td>Teacher</td>
<td>8.9%* + 14.0% b</td>
</tr>
<tr>
<td>CCCH (2009)[105]: AEDI</td>
<td>Communication</td>
<td>261,203</td>
<td>4-5 years</td>
<td>Teacher</td>
<td>9.2%* + 15.8% b</td>
</tr>
<tr>
<td>Jessup et al. (2008)[106]</td>
<td>Speech and language</td>
<td>308</td>
<td>5-6 years</td>
<td>Assessment</td>
<td>41.2%</td>
</tr>
<tr>
<td>Taylor, Maguire, &amp; Zubrick (2011)[104]: LSAC-K</td>
<td>Language (receptive)</td>
<td>4,317</td>
<td>6-7 years</td>
<td>Assessment</td>
<td>19.6%</td>
</tr>
<tr>
<td>Taylor, Maguire, &amp; Zubrick (2011)[104]: LSAC (K cohort)</td>
<td>Language (receptive)</td>
<td>4,317</td>
<td>8-9 years</td>
<td>Assessment</td>
<td>15.0%</td>
</tr>
<tr>
<td>McKinnon et al. (2007)[107]</td>
<td>Speech, voice, stuttering</td>
<td>10,425</td>
<td>5-12 years</td>
<td>Teacher + SLP</td>
<td>0.12-1.06%</td>
</tr>
<tr>
<td>Study</td>
<td>Domain</td>
<td>Sample Size</td>
<td>Age</td>
<td>Source</td>
<td>Prevalence</td>
</tr>
<tr>
<td>------------------------------</td>
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<tr>
<td>Harasty &amp; Reed (1994)[108]</td>
<td>Communication</td>
<td>437</td>
<td>5-12 years</td>
<td>Assessment</td>
<td>28.8 - 37.6%</td>
</tr>
<tr>
<td>Keating et al. (2001)[109]</td>
<td>Talking, speech, stuttering</td>
<td>12,388</td>
<td>0-14 years</td>
<td>Parent</td>
<td>1.7%</td>
</tr>
<tr>
<td>McLeod &amp; McKinnon (2007) [69]: wave 1</td>
<td>Communication</td>
<td>14,514</td>
<td>5-18 years</td>
<td>Teacher +</td>
<td>13.0%</td>
</tr>
<tr>
<td>McLeod &amp; McKinnon (2007) [69]: wave 2</td>
<td>Communication</td>
<td>14,533</td>
<td>5-18 years</td>
<td>Teacher +</td>
<td>12.4%</td>
</tr>
</tbody>
</table>

LSAC-B = Longitudinal Study of Australian Children - Birth cohort, LSAC-K = Longitudinal Study of Australian Children - Kindergarten cohort, ELVS = Early Language in Victoria Study, RASCALS = Randomly Ascertained Sample of Children born in Australia’s Largest State, CCCH = Centre for Community Child Health and Telethon Institute for Child Health Research, AEDI = Australian Early Development Index, SLP = speech-language pathologist confirmation. Note. Some studies, particularly Taylor et al. (2011) also reported prevalence figures for additional measures.

a Developmentally vulnerable, b Developmentally at risk
Figure 1. Drawings created by 4- to 5-year-old children with speech impairment in response to being asked to draw themselves talking to someone. These examples are of drawings that accentuated the listener’s ears, and many of these examples also demonstrate the listener or speaker leaning towards the other, possibly to facilitate understanding of the spoken message.