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SCIENCE

# Access to Speech-language Therapy Services in Aotearoa New Zealand for Children at 54 months of Age

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***Disclaimer***

The views and interpretations in this report are those of the researchers and not the Ministry of Social Development.

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# Executive Summary

Mothers and other caregivers play a central role in identifying communication needs of their children, but they may not recognise their child's challenges or act on their concerns. Mother's expectations of child speech and language development across the early years impacts how responsive they are to their child's difficulties. An Australian study identified two out of three families did not attempt to access speech-language therapies despite their pre-school child's identifiable speech concerns (McAllister et al., 2011). Mothers expected others, such as early childhood educators and health professionals, to alert them to their child's speech impairment. The predominant barrier to accessing services was the belief that therapy was unnecessary and the child would outgrow the challenges.

These previous findings provide preliminary evidence of the role of communities to promote mothers understanding of communication skills, increase awareness of communication challenges and their likely trajectories. Two major aspects of child and family life critical to life-long wellbeing not yet addressed using the Growing Up in New Zealand dataset are concerns for children's speech development and families success in accessing speech and language support services. Our research aimed to address this gap.

We explored maternal concern for speech and language using data collected through the Growing Up in New Zealand study. Our first aim was to examine the characteristics of maternal concern. We examined the prevalence and level of maternal concern. Our second aim was to characterise those families who received support for their concerns.

Our results indicate that among the GUiNZ whānau, mothers were concerned about communication skills in 16% of their two-year old children but only 25% of concerned mothers had sought or received professional advice for speech or language. At 4 and a half years, mothers had concerns about 13% of children and 56% of those children had received some intervention for communication.

Mothers are more concerned about children's speech than language, this is even the case when likely prevalence is taken into consideration, probably because intelligibility is more salient and

easier for mothers to describe than language difficulties. Mothers are broadly aware of expressive language skills that children acquire such as word combining, and can accurately identify their children's skills but have less knowledge of the ages of acquisition. Some mothers do not express concerns or seek support despite recognisable difficulties.

Mothers can offer valuable insights about their children, but in many cases their level of concern about speech, language and communication needs (SLCN) did not align with a professional view. Whilst the Speech-language Therapist (SLT) has a more nuanced understanding of children's speech and language and the impact on future communication skills and needs, it is the mothers who most frequently raise the first concerns about their child's communication.

A slight majority (56%) of children with mothers who had speech or language concerns received speech and language services at some point. However, disparities existed by ethnicity, gender, age, level of maternal concern and specific area of concern. SLTs were the most frequently reported speech and language services received.

Mothers with concerns spanning across years should be encouraged to seek advice and support from SLT. Despite enduring concern, some mothers did not seek or were not able to access services. Educators and health professionals can take on this role and mothers expect them to do so. Public health messaging should include both skills and age ranges for expected speech and language acquisition. Additionally, educating the public of the impact of speech, language and communication skills on children's futures is needed. Increased awareness regarding lifelong influences of communication challenges will aid in prevention, early detection and intervention.

# Introduction

Leaders in the disability community developed the *Enabling Good Lives* approach with the intent of shifting power and authority from government to disabled people and their families (Whaikaha, n.d.). The framework seeks to invest early in families and whānau to support them; to be aspirational for their disabled child; to build community and natural supports; and to support disabled children to become independent, rather than waiting for a crisis before support is available.

The *New Zealand Child and Youth Wellbeing Strategy* aims for children to have what they need, learn and develop, be accepted, respected and connected (Department of the Prime Minister and Cabinet, 2019). Within the strategy, communication is an essential, human need as well as a basic human right. Children communicate to satisfy needs, develop key social and emotion skills and realise aspirations (Di Sante & Potvin, 2022). If children have significant ongoing difficulty with talking or understanding words, their wellbeing can be seriously impacted, with decreased academic performance (Alt et al., 2014), peer relationships (Laws et al., 2012), and stress-coping abilities (Law & Stringer, 2013). Despite the apparent ease with which language develops for many children, large cohort studies show language impairments in around 10% of children internationally with overrepresentation of different minority ethnic groups according to the setting (Lindsay & Strand, 2016). Mothers are key figures to supporting a child's language development and are generally the first to identify language difficulties (Rannard et al., 2005; Skeat et al., 2010). However, research has identified that many language-impaired children are not accessing services as needs are unmet or not recognised (Magnusson et al., 2016). Understanding maternal access to speech-language therapy (SLT) services is crucial to increasing the wellbeing of children with communication challenges.

Cultural, political, and geographical differences, as well as different methods of research, mean results of such studies are specific to the sampled population (Bylund et al., 2023), so it is difficult to generalize international research to New Zealand (NZ). Regarding prevalence, household interviews in the United States (US) found approximately 8% of children aged 3-17 years have a speech or auditory difficulty (Black et al., 2015). In the United Kingdom, 10% of children are identified with Speech, Language and Communication Needs (SLCN) (Public Health England, 2020).

The prevalence figures can underpin service and resource planning, yet there is little data for New Zealand (NZ).

Using Growing Up in New Zealand (GUiNZ) data, Mulderry et al. (2024) identified 16% of mothers reported a concern about their child's communication at 24 months of age, and 13% reported concerns at 54 months of age. Despite this prevalence of concern, only 56% of the 54-month children for whom there were concerns received treatment or intervention. The New Zealand Disability Survey (Statistics New Zealand, 2014) reported that "having difficulty speaking" (and being understood) because of a long-term condition or medical problem affected three percent of the total NZ population. In children under 14 years old, boys (five percent) had a higher rate than girls (two percent). The questions asked were unlikely to capture the number of children who have no diagnosis and/or no related medical problems and therefore are likely to be an underestimate. The survey report did not discriminate between preschool and school-age children, but for children under 14 years old, learning, psychological/psychiatric, and speaking (broadly construed) were the three most reported areas of difficulty. Low rates reported in NZ, compared to other countries may be confounded by factors including the way disability is reported, cultural and bilingual perspectives on communication, and limited public health information.

## Child Language Develops over Time

Communication processes refer to creating sounds for speech (phonology), understanding the meaning of words (semantics), combining words in a systematic order to form sentences (syntax), using language appropriately according to the social situation (pragmatics), and understanding the internal structure of words (morphology) (Bishop et al., 2017). From birth, typically, infants are responding to others' communication and develop their own communication intent which becomes more sophisticated with the emergence of words at around one year and sentences at two years. Into adolescence children are still developing language and communication skills which include nuanced understanding and expression of non-verbal, visual and written communication as well as spoken language.

## Language Impairments in Childhood Impact on their Future

Some children face challenges in these communication processes which are not typically experienced by their age-matched peers. Children with pervasive long-term language challenges that impact their abilities to participate in daily life are considered to have Developmental Language Disorder (DLD) (Bishop et al., 2017). Children can also have language difficulties related to other conditions they have such as hearing loss, autism, and intellectual disability. The impacts of language and communication difficulties can be compounded by inequitable public systems such as health and education, as well as societal pressures around oral and written literacy.

A Systematic Review of 15 longitudinal studies indicated children with DLD have difficulties that persist into adulthood with young adults leaving education earlier and with fewer or lower level qualifications (Dubois et al., 2020). Young adults with DLD can have increased challenges in searching for employment, longer periods of unemployment and risk of lower income in the long term. Financial independence is a challenge, compounded by higher levels of early mothering and difficulties establishing and maintaining friendships. Therefore, it is essential to support children's language development not only for their social and emotional wellbeing but also for ensuring language competence in the future.

## Mothers' Role in Supporting their Child's Language and Communication Development

Mothers have a crucial role in supporting children's language development. Generally, mothers are the primary caregiver for their children, central in supporting their child's growth. Mothers are likely to be the first to raise concerns about a child's language skills (Rannard et al., 2005; Skeat et al., 2014). Speech-language therapy (SLT) services are recommended for mothers of children with speech, language, or communication (SLC) difficulties. The New Zealand Speech Language Therapist's Association (New Zealand Speech-language Therapists' Association, n.d.) recommends mothers with concerns about their child's speech and language development seek

assistance from their general practitioner (GP), early childhood education staff, and school teachers, or directly approach a local service.

SLT services are designed to work with the child directly to improve communication skills, or work with the family to give them skills to support the child's speech or language development (Ebbels et al., 2019). For example, services could include training mothers to use behavioural techniques to improve the child's fluency of speech, learning alternative means of communication e.g., sign language, or providing general support for mothers and children to implement communication solutions in daily life (Glover et al., 2015). Research has demonstrated the effectiveness of SLT services for improving children's language performance (Darcy Mahoney et al., 2020; Ebbels, 2014; Ebbels et al., 2017).

Mothers can access SLT services through diverse means. In New Zealand, the Well Child Tamariki Ora programme, typically accessed after maternity care ends, provides free health checks for their children between the ages 6 weeks to 5 years old (Whaikaha, n.d.). The programme consists of periodic checks with a trained nurse who can make referrals to appropriate services, including SLT within the Ministry of Health, if there are concerns about the child's development. The NZ Ministry of Education also employs speech-language therapists in early intervention teams to work with children along with their families and teachers to support children with SLC needs (Ministry of Education, n.d.). The programme's primary target are children between the ages 3 to 8 years, and mothers can apply through their child's school.

International research has found that mothers identify problems, raise concerns, and make judgements on their child's SLC development before reaching SLT services (Glogowska & Campbell, 2004; Rannard et al., 2005). To correctly recognise children's difficulties and express concerns, however, mothers require knowledge of typical developmental ages and stages. A cohort of US mothers who scored higher on a test of expectations and knowledge about child development were found more likely to respond to cues and foster their child's growth (Leung & Suskind, 2020). Prior research identified mothers assumed that their child would eventually speak, mentioning that they took the child's normal language development for granted (Glogowska & Campbell, 2004). Thus, the

perceptions mothers have of SLC development may contribute to their responses to their child's SLC needs.

## The Unique Context of NZ

NZ has a unique cultural, social, and political background that shapes the experiences of individuals accessing SLT services. Being a bicultural country, the NZ state recognises the indigenous Māori, and European/Pākehā groups. However, NZ's society is also multicultural with a high level of immigration from Pacific and Asian countries such as India, Philippines and China (Stats NZ/ Tatauranga Aotearoa, 2023). NZ has been largely shaped by the history of te Tiriti o Waitangi. During NZ's period of colonisation, an agreement te Tiriti O Waitangi was established in 1840 between Aotearoa Māori and the British Crown based on distribution, ownership, and power of land and government (Brewer & Andrews, 2016). However, discussions of te Tiriti reveal mistranslations of the document and there has been a longstanding failure on the part of the Crown to adhere to the agreement, contributing to disparities of health and socioeconomic outcomes for Māori (Graham & Masters-Awatere, 2020). In NZ, health care services have historically not facilitated access for Māori (Irurzun-Lopez et al., 2021) and they continue to experience more negative health outcomes than other groups (Bécares et al., 2013). The SLT training curriculum of accredited University programmes in NZ teaches students the importance of integrating te Tiriti principles into clinical practice, yet cultural competency of SLT professionals was identified as an issue in experiences by Māori (Brewer & Andrews, 2016). Thus, the long history of colonisation in NZ will shape the experiences of SLT services for Māori.

## Which Mothers are Successfully Accessing SLT Services?

We propose that successful access to SLT services is the result of a process of maternal awareness of expected language development, comparison against developmental norms leading to raising of concern, seeking of potential help-services, referral to and acceptance by services. At each point in the process, information-seeking behaviours might be assumed by service providers. International literature has identified several antecedents to Health-information seeking by adults. Typically, studies focus on adults seeking information about themselves or about a known health

problem. Chang and Huang (2020) used meta-analysis to identify two groups of possible antecedents of adults seeking health-information – *Personal*, including Health Status, Self-efficacy, Health Literacy and Emotional Response, and *Contextual*, including, Subjective Norms, Availability and Credibility. When seeking information about their own health, health status and health literacy were less predictive than subjective norms, self-efficacy and availability. Findings indicated that adults used health-seeking behaviours in ways that aligned with the opinions of other critical individuals in their lives. The authors highlight how information-avoidance is also an active behaviour that a substantial proportion of adults might use to diminish or maintain anxiety and fear about health challenges at acceptable levels.

Longitudinal data from Australia indicated significant predictors of maternal access to speech-language therapy (SLT) services, such as socioeconomic status, age and gender of the child, and maternal level of education (Skeat et al., 2010; Trembath et al., 2021).

Access to SLT services is related to the health system maintained by a country and finding significant predictors is dependent upon the research context. NZ mothers can access publicly funded SLT services through various providers such as the Ministry of Health, the Ministry of Education, and the Accident Compensation Corporation (ACC) based on the child's age and needs (New Zealand Speech-language Therapists' Association, n.d.). Privately funded providers are also available. Economic and societal factors in NZ differ from other countries, and those identified in international studies cannot always be generalized to the NZ context. Further investigations to determine predictors can allow us to better understand how to support mothers and children in meeting their therapy needs and providing equitable access to SLT services in NZ.

## Characteristics of Children Referred for SLT Services

### Age of Child

Previous analysis of Growing Up in New Zealand (GUiNZ) data found that 13% of mothers expressed concerns about the language development of their four-year-old children, which decreased to 6% among mothers of eight-year-old children (Morton et al., 2017; Morton et al., 2018). Historic clinical advice suggested that a proportion of speech and language problems self-resolve by age three

years (Bamford et al., 1998; Whitehurst & Fischel, 1994), however, this is now contested, especially with communication difficulties that do not become apparent until after two years of age. McKean et al. (2017) concluded that by 4-years-old, greater stability was apparent in children's language levels and individual differences are established. Reduced concerns for older children suggest that some children are successfully accessing services at a young age and others develop their language skills sufficiently between 4 and 8 years of age. As children move through school, social and educational tasks become more sophisticated and complex, which may reveal difficulties that were previously hidden or not of concern previously, such as the play-context of early childhood education. Alternatively, as children move towards adolescence, their language skills become more sophisticated and mothers may not recognise more subtle challenges suggestive of language impairment in older children (Karasinski, 2013).

## Gender of the Child

Across numerous diagnoses and learning challenges, boys are referred to support services more commonly than girls. It is generally acknowledged that sex differences in the prevalence of language disorder are minor, but present: 1:1.22 female:male (Helland et al., 2018; Lange & Zaretsky, 2021). Whilst language challenges are more commonly diagnosed in boys, there are reports of a lower rate of referral for girls to SLT services than could be expected (McGregor, 2020; Morgan et al., 2017; Skeat et al., 2010). In the Early Language in Victoria Study (ELVS, (Skeat et al., 2010)) which followed a cohort of 1911 families at multiple time points, mothers of girls were less likely to seek help or advice at ages 2, 3, and 4 years, with reduced odds ranging from 34% to 56%. Similar results were indicated in a study using the ELVS data on service utilisation between children of 4 to 5 years old; girls had reduced odds of receiving speech pathology treatment as well as any other professional help (Skeat et al., 2014).

## Child's Communication Skills

According to well-established milestones for English-speakers, at age two children should have an average vocabulary of 50 words (Dosman et al., 2022). The GUiNZ cohort scored on average at the 50$^{th}$ centile with boys and girls scoring similarly. With 47% of the 24-month cohort identified as

bi- or multi-lingual, the English vocabulary score is likely to represent an incomplete picture of the full vocabulary of many children in this cohort (Mulderry et al., 2024).

Common developmental milestones suggest English-speaking children at two years are expected to use two-word phrases, such as, “more cookie” (Dosman et al., 2022). Research in the USA found that all 2 year old typically-developing children combined words “at least some of the time” (McGregor et al., 2005, p. 573) p. 573). Nearly two thirds of GUiNZ mothers reported that their child was often combining words at two-years, leaving a substantial number of children not meeting this expected milestone (Mulderry et al., 2024).

It is well-established that between 48-60 months, children are expected to be 100% intelligible to strangers in connected speech (Coplan & Gleason, 1988; Dosman et al., 2022). For a majority of the GUiNZ cohort this was a strength (Mulderry et al., 2024). However, nearly one fifth of children were identified by their mothers or an interviewer as never, rarely, or only sometimes understandable to an unfamiliar adult at 54 months of age. Recent research has questioned this established milestone for intelligibility and suggests a more accurate milestone of 62-87 months for connected speech to be 100% intelligible to strangers (Hustad et al., 2021). They suggest that between 46-61 months children are only 75% intelligible. If ‘never, rarely, or sometimes’ are interpreted as <75% intelligible, then data from GUiNZ cohort indicates higher levels of unintelligibility compared to Australian data (McLeod & McKinnon, 2007).

## Mother Characteristics

### Ethnicity

Currently, SLT practice in NZ is largely built on Western ideologies of health and wellbeing (Eustace et al., 2024). Within the child-rearing practices of Māori and Pacific Peoples, there may be less trust in or knowledge of Western biomedical understandings of speech, language and communication, and more reliance on trusted indigenous sources of knowledge (Abel et al., 2001).

Despite the apparent ease with which language develops for many children, large cohort studies show language impairments in around 10% of children internationally with overrepresentation of different minority ethnic groups according to the setting (Lindsay & Strand, 2016). Numerous

studies indicate that within Western societies, families from non-dominant ethnicities are less likely to seek and receive intervention (McGregor, 2020). Research in the USA has identified disparities among ethnic groups, with Hispanic and Black children more likely to have unmet therapy needs compared to other racial groups (Davidson et al., 2022; Magnusson et al., 2016).

## Maternal Concern

Maternal concern depends on an understanding of children's age-appropriate speech, language and communication milestones. Previous research identified GUiNZ mothers were knowledgeable of their children's expressive communication abilities, but many mothers did not report concern when their child was delayed in their communication development (Mulderry et al., 2024). Previous analysis of GUiNZ data indicated that in comparison to mothers, interviewers more frequently rated children at 54 months old as never or rarely understandable, possibly because mothers are experienced listeners of their child's speech, and mothers witness their children communicate with other adults on numerous occasions, not just at a single event (Mulderry et al., 2024). Mothers who reported their child was only sometimes intelligible at 54 months old, largely did not report concerns about their speech and language development. There was a higher proportion of mothers reporting concerns for children who were sometimes or often combining words at two years old, than for children who were not yet combining words. At 54 months of age, 464 of the children whose mothers did not report concerns scored in the lowest decile for receptive vocabulary (Mulderry et al., 2024).

Studies of maternal help-seeking more broadly have identified multiple components that together determine the help-seeking process, including: problem recognition, severity, functional impairment, and caregiver stress (Jackson et al., 2023). Mothers may underestimate communication delay as a cause for concern due to limited awareness of connections between typical speech and language milestones and future academic achievement and occupational attainment (McAllister et al., 2011; McCormack et al., 2011; Rannard et al., 2005). Despite being able to identify speech and language delay in their children, Australian research suggests mothers may assume that children will outgrow it. Amongst 109 children, 62.4% of families did not attempt to access speech-language

therapies despite identifiable speech or language concerns (McAllister et al., 2011). The predominant barrier to accessing services was the belief that therapy was unnecessary and that others would make them aware of their child's speech impairment if it was important.

## Maternal Education

Maternal education level may be a significant predictor of mothers accessing SLT services. Research commonly refers to maternal education level within a hierarchy of qualifications e.g., tertiary education achieved in schooling. Maternal and paternal education are often distinguished from each other, with maternal education reported more often in literature. However, there is evidence that paternal education is also a significant predictor of accessing SLT services (Skeat et al., 2010). Wittke and Spaulding (2018) compared two groups of preschoolers. Preschoolers in both groups had DLD, but despite similar severity of presentation, the children receiving intervention had mothers who were better educated, with a large effect.

A potential reason that maternal education levels significantly influence access to SLT services may be associations with knowledge of language development. Having knowledge of typical child language development should allow mothers to identify their child’s language impairments or difficulty and be more aware of SLT services as an intervention (Skeat et al., 2010). A study conducted in NZ found that higher levels of maternal education were associated with mother’s accuracy and amount of knowledge regarding their child’s language development (Gibson et al., 2022).

Mothers with higher levels of education not only have greater knowledge but also demonstrate greater competence in supporting their child's language acquisition. Numerous studies have emphasised that natural language input – quality and quantity of mothers’ interactions with their child in everyday life – influences a child's language development (Alper et al., 2021; Levickis et al., 2023; Levickis et al., 2018). Natural language input can refer to the frequency of interactions between mother and child and the use of appropriate talking styles such as child-directed speech (Sultana et al., 2020). In NZ, high levels of maternal education were associated with increased conversational turns between adult and child, and higher quality language strategies, such as open-ended questions, used

by adults (Sultana et al., 2020). Typically all language used around the child, not just the mother's language, was of higher quality. Such findings suggest that NZ mothers with high education levels can identify and actively engage in behaviours to support their child's language development. By leveraging their knowledge and competence, these mothers may be more proactive in seeking out interventions such as SLT services. In turn, services may be more likely to respond positively to mothers with higher levels of education who are more able to describe their concerns and advocate for their child.

## Information-seeking

Health-information seeking behaviour has been the subject of study for over 40 years and yet the research has paid little attention to mothers seeking information about their child's development as a proactive behaviour. Whether or not mothers seek information and advice on their children's language development is likely to influence their access to SLT services. Skeat et al. (2010) found that mothers exhibit more help-seeking behaviours, if they had greater concerns about their child's language development, although a substantial number of mothers did not seek help even though their children had evident communication challenges.

Enabling Good Lives (Whaikaha, n.d.) envisions that children and their families will have greater control and choice over their supports and make more use of universally available supports. This requires organisations and systems to make it easier for people to find information and access services. Knowing when or how to access SLT services is not necessarily common knowledge. Mothers need to be able to identify communication challenges in children and understand their needs for intervention. Research in the UK and NZ has found that mothers try to educate themselves to support their child's SLC needs and seek advice from other professionals in their process of reaching SLT services (Glogowska & Campbell, 2004; Newbury et al., 2020; Rannard et al., 2005).

Information-seeking typically involves actively searching for and acquiring specific information, rather than simply stumbling upon it passively (Chang & Huang, 2020). However, passive access to information can still occur incidentally while actively seeking information (Lapham

et al., 1999). To our knowledge, no studies have yet considered information-seeking behaviours as factors in successful maternal access to SLT services.

### *Health professionals*

Studies indicate that health professionals are salient sources of health information for mothers. In NZ, health professionals were the most regularly sought source of information on child language development amongst caregivers (Gibson et al., 2022). In a study in the US, researchers surveyed 543 mothers from paediatric practices in southeast Michigan to understand the extent to which they followed advice from different child health sources (Moseley et al., 2011). They found that paediatrician advice was the most followed, followed by maternal advice, while information from other sources such as the internet, television, and newspapers were sought but not consistently followed. However, specialists who manage SLC difficulties are primarily SLTs, and other health professionals have variable levels of knowledge of language impairments. Health practitioners may rely on the possibility of spontaneous recovery when mothers express concern with language development. Rannard et al. (2005) found that in one quarter of children with severe language impairments, maternal concerns were dismissed by health professionals. Hence it is not clear whether mothers who utilise them as a resource are more likely to access services for their children.

Abel et al. (2001) investigated and compared infant care practices and beliefs among Māori, Tongan, Samoan, Cook Islands, Niuean, and Pākehā caregivers in NZ. Using focus groups of 150 participants, the authors explore social norms and personal opinions of mothering practises. There were differing views on seeking help from health professionals across cultural groups, where Pacific and Māori individuals tended to rely more on family support. In NZ, many current practises and health services, including SLT services, are largely built on Western frameworks of health (Eustace et al., 2024). As a result, many Māori and Pacific families may feel restricted in utilising these services as they do not attend to their cultural needs.

Different groups, including Māori, may face barriers in seeking advice. In an interview about their experiences with clinicians, Māori reported facing discrimination from staff, such as microaggressions and cold, distant attitudes (Graham & Masters-Awatere, 2020). Māori also reported

the inability of health workers to build rapport and understand their concerns in the context of "Hauora" – a Māori perspective of understanding health (Graham & Masters-Awatere, 2020). The experience of poor rapport (relationship)-building was also reported by Pacific Peoples, where they experienced a disconnect with primary health care providers (St George & Cole, 2013). If there are disparities across families experiences with health professionals due to prejudice such as racism, it may be harder for some individuals to get valid, helpful information about their child's language development.

### *Education professionals*

Seeking help from education professionals may also influence maternal access to SLT services. There is currently a large gap in research on maternal information-seeking from education professionals, despite Gibson et al. (2022) finding them as one of the most sought sources of information on child language development by NZ mothers. Child participation in Early Education is a protective factor against language difficulties (Collisson et al., 2016) and NZ has a high rate of participation in early childhood education (San San Kyaw et al., 2020). Mothers are recommended to approach educators if they are concerned about their child's SLC development, as they can help mothers make referrals to SLT services (New Zealand Speech-language Therapists' Association, n.d.) and are likely able to share any concerns or observations made about the child's SLC development in school settings. Seeking assistance from education professionals, particularly within NZ's system, would theoretically increase chances of accessing SLT services, but research is needed to explore this claim in more detail. In Gibson et al.'s (2022) study, NZ mothers were also highly reliant on education professionals such as early child educators. Further, mothers who had concerns often expected teachers to identify communication challenges and were more likely to access services if their concerns were confirmed by others. Unfortunately, international and local reports from mothers suggest both education and health professionals may respond inappropriately to maternal concerns. Teachers may provide in-class communication supports but not suggest referral to speech-language services (Girolamo et al., 2022). Teachers are in proximity with children in a setting where there are vast opportunities to observe a child's language development. Therefore, approaching educational

professionals may be particularly useful for mothers in identifying language impairments, which will inform the need to access SLT services.

#### *Internet*

Information seeking through the internet can diversify the resources that mothers use to learn about their child's language development. Although using social media runs the risk of personal exposure in accessing information, other internet sources can provide anonymous, asynchronous information that mothers can access in their own time, at their convenience which can reduce embarrassment and shame (Lupton, 2021). Unfortunately, the internet is also associated with overload, misinformation and increased health anxiety (Bawden & Robinson, 2008). Many mothers seek web sources to obtain information about their child's health and development. Gibson et al. (2022) study of NZ mothers found that approximately half the participants had sought information on child language development, with the internet being the second most used source after health professionals. Kubb and Foran (2020) conducted a systematic review of studies about mothers' online health information seeking (OHIS). The samples were largely highly educated mothers seeking information about general health rather than disability. The review found worldwide use of online health-related information for their children, with rates of prevalence ranging from 52% to 98%. Studies found that a majority of mothers described online information as helpful and used it to better understand and manage their child's health.

## Contextual Characteristics

### Socioeconomic Deprivation

Although the definition of socioeconomic deprivation can vary, it generally refers to the limited access individuals have to essential resources within their wider society or community (Chenoweth & Stehlik, 2004; Tapera et al., 2017; Wakefield & Poland, 2005). Despite limited access to resources, families in socially-disadvantaged environments can provide quality language input for their children (Levickis et al., 2023; Rowe, 2017). Prior research indicated the majority of GUiNZ families in disadvantaged environments provided high levels of home literacy activities at 24 months (San San Kyaw et al., 2020). However, on average, lower socio-economic status (SES) predicts lower

language skills. Factors that might lead to this relate to mother education and income (Rowe, 2017). Higher levels of education provide mothers with skills to seek out knowledge and often they seek support from non-family members. Greater income can provide a lifestyle that has less stress, where basic needs are adequately met, allowing for time to talk with their children as well as seek out information about child development.

Mothers who are socioeconomically disadvantaged may be unaware of SLT-related services. A study in England found that mothers residing in the 30% of the most economically deprived areas were unaware and had uncertainties about SLT-related interventions (Levickis et al., 2020). Mothers who are socioeconomically deprived may show limited knowledge in child language development and seek advice from family members living in similar environments rather than health professionals (Rowe, 2017). A longitudinal study in Australia found that for children at 4 years old, rates of accessing SLT services decreased by 42% for socioeconomically disadvantaged mothers (Skeat et al., 2010). The study measured economic disadvantage through a construct known as the Socio-Economic Indexes for Areas (SEIFA). Like socioeconomic deprivation, this rates individuals' ability to access essential resources. However, in NZ primary care enrolment rates are increasing moreso for the most deprived areas than for those in the middle-lower end suggesting the positive impact of targeted schemes in enhancing access of the most deprived areas (Irurzun-Lopez et al., 2021).

Given that 40% of Māori lived in the most deprived areas in the country, the previous findings on socioeconomic deprivation suggest that Māori whānau may be less likely to gain access to SLT services for their children (Nelson et al., 2018). The NZ Index of Deprivation (NZDep) is a construct of socioeconomic deprivation in NZ that measures the level of deprivation across small geographical areas (Atkinson et al., 2020). Using this measurement, a study found that higher density of Māori in deprived areas was associated with poor health outcomes (Bécares et al., 2013). This is consistent with the impacts of colonisation (Moewaka Barnes & McCreanor, 2019).

# The Current Study

A lack of research data, limited long-term planning, and the current purchasing model for disability support services has contributed to limited focus and investment in early diagnosis and intervention or SLCN. Our exploratory research aims to characterise mothers who successfully access services for their children. Whilst we categorize factors across child, mothers and family, and context to help organize related factors, we fully acknowledge the interrelatedness of these sociodemographic factors (Davidson et al., 2022).

To find characteristics specific to a NZ context, we analysed data from the longitudinal GUiNZ study. First, we characterised the cohort. Based on exploring international literature, variables from the longitudinal study were selected with the aim of measuring effects of child and mother characteristics, and methods of information-seeking (health professionals, early childhood educators, the internet).

# Methods

## Data Source

The data in this report were collected as part of the Growing Up in New Zealand (GUiNZ) prospective longitudinal study. A total of 6,822 pregnant women with an estimated delivery date between April 2009 and March 2010 were recruited from the Auckland, Counties Manukau, and Waikato District Health Board regions. The data set is representative of the broader New Zealand population in terms of ethnic and socio-economic make-up with mothers and their partners recruited antenatally and contact anticipated up to the age of 21 years (see Morton et al., 2012, for the cohort profile). We looked at data from a cross-section of mother and child information from the GUiNZ study. In this report, we use data collected across three study waves, corresponding to the following child ages: Antenatal, 2 years (24-months) and 4.5 years (54-months). For the current study, data were available for N = 5241- 6321 participants depending on the variable and data collection wave.

## Ethics

Researchers met all obligations to gain approval from GUiNZ Data Access Committee for use of the data. Data access approval granted, reference:22DA001461. Ethical approval for the GUiNZ study was granted by the NZ Ministry of Health Northern Y Regional Health and Disability Ethics Committee. Written informed consent was completed with each woman at enrolment.

## Data Collection Waves

The overarching GUiNZ study design and conceptual framework are available at https://www.growingup.co.nz/study-design We included cross-sectional data for the cohort at Antenatal, 24-months and 54-months in this exploratory analysis. About three quarters of mothers (76%, n = 5241) completed every cross-sectional data wave by age eight (Morton et al., 2020). Data included measures of expressive and receptive communication skills, whether 'speech' had been raised as a concern and whether intervention was sought and received. 'Speech' is the term used in the study to encompass all speech, language and communication. Tools included mother-report items, interviewer ratings, and evidence-based speech and language assessments. There was variation in how data were collected between data waves.

## Measures

This is an exploratory, descriptive study of maternal access to services for support with their child's speech and language development. The main study outcome was whether children had ever received services for their speech or language needs at 54 months of age. Mothers who reported concern, at 24 or 54 months, for their child's speech were asked follow-up questions regarding seeking and receiving intervention including the types of intervention. The number of valid responses for each analysis excludes missing cases (participants who did not have recorded responses) and participants who responded to "don't know" or "refer not to say". The number of excluded participants are recorded as "missing data" under each analysis.

### Dependent Variables

At 24 months, mothers who reported concerns were asked: *Have you sought or received any professional advice or treatment for speech/ understanding?* Responses were 'yes' or 'no'. The

wording of this question does not allow us to distinguish between those who sought advice but did not get it, and those who sought and received advice. It also does not distinguish between advice and intervention. No follow-up questions were asked at this data wave. This question was therefore interpreted as 'have you sought professional advice?' in our analysis.

At 54 months, mothers who reported concerns were asked: *Has {name} received treatment or intervention for his speech?* And if 'yes': *What type of treatment or intervention have {name} received for his speech?* Available options included: Medication, Surgery, Physiotherapy, Occupational Therapy, Hearing Aids, Grommets, Speech-language Therapy, Waiting list for an appointment and Other. Multiple responses were possible.

**Maternal Concern**

Mothers were asked about treatment and intervention only if they expressed there were concerns about any aspect of their child's development. At 24 months mothers were asked about specific communication concerns. Response options were 'yes' or 'no' (See Table 1).

Table 1. *Reports of concern regarding speech at 24 months and 54 months*

| Child Age | Question | Sub-question |
|---|---|---|
| 24-months | Do you feel any concerns about your child's speech or hearing, such as: | Doesn't understand others when they speak<br>Doesn't understand you when you speak<br>Difficulty finding words<br>Difficulty putting words together<br>Reluctant to speak<br>Speech not clear to family<br>Speech not clear to others<br>Stutters, stammers or lisps<br>Voice sounds unusual<br>Other |
| 54-months | Have any of the following been raised as possible areas of concern for {name}: | Hearing<br>Vision<br>Speech<br>Autism Spectrum Disorder<br>Learning Difficulties<br>Behaviour<br>Movement<br>Growth<br>Other |

At 54 months, mothers were asked about a range of developmental concerns with response options ‘yes’ or ‘no’. Concern may have been raised by themselves or others, such as friends, family, health or education professionals. These responses across areas of concern were aggregated to derive the number of mothers with any type of concern (coded as 1="yes", 2="no").

**Ethnicity**

Mothers self-declared prioritised ethnicity was reported antenatally, and was categorised as NZ European, NZ Māori, Pacific Peoples, Asian, MELAA (Middle Eastern, Latin American, or African), or Other. Multiple ethnic affiliations were allowed. People can, and increasingly do, identify with more than one ethnic group. Mothers were asked to indicate all the ethnicities they identified with. Under the Total Response ethnicity approach, people can appear more than once, so ethnic group totals would add to more than 100 percent of participants. ‘Self-Prioritised ethnicity’ meant that mothers allocated themselves to a single ethnic group, even if they identified with more than one ethnicity. It should be noted that this tends to under-represent Pacific peoples.

**Maternal age group at child’s birth**

Mothers were grouped into three age categories as cell counts for youngest and oldest mothers were low.

**Highest level of Maternal Education at child’s birth**

At the antenatal study wave mothers selected their highest completed qualification from: No secondary school qualification, Secondary school/NCEA 1-4, Diploma/Trade certificate/NCEA 5-6, Bachelors degree, or Higher degree. Due to low cell counts, qualifications were aggregated into three groups: Up to NCEA Level 4, Diploma/ Trade Certificate or NCEA 5-6, and Undergraduate degree or higher.

**Child Age**

The 24 month and 54 month data waves were used as indicators of age of the child. Typically questions were asked relative to ‘now’, ‘the past four weeks’ and ‘past 6 months’.

**Child Gender**

Maternal declared gender of the child at 24 months.

**Socioeconomic Deprivation**

Socioeconomic deprivation was measured with the New Zealand Index of Deprivation (NZDep; Atkinson et al., 2019) at each study wave. This measure assigned levels of deprivation to small geographic areas, displayed as a decile system. NZDep2013 is an updated version of the NZDep2006 index of socioeconomic deprivation. NZDep2013 combines census data relating to income, home ownership, employment, qualifications, family structure, housing, access to transport and communications. A decile of 1 represents areas with the least deprivation whereas a decile of 10 represents areas with the most deprivation.

**Level of Concern**

Amongst those who were reported concerns at 24 months (n=1026), mothers were asked how concerned they were about their child's speech. Possible responses were: very concerned, somewhat concerned, a little concerned, not at all concerned. This question was not repeated at 54 months.

**Communication Skills**

Mothers reported on five items of children's communication skills at 54 months. Two items were rated on a scale of Never, Rarely, Sometimes or Often: *How often does your child try out new words?* And: *How often is your child understandable when speaking to adults other than you or other family members?* The other items were rated on 4-point scales appropriate to the question: *Which of the following best describes your child's pattern of asking questions?* ("Never or rarely asks adults questions" to "Often askes adults interesting or long questions"); *Which of the following best describes your child's ability to communicate personal experiences in a clear and logical way?* ("very tentative, only offers a few words" to "Tells experiences in a way that is nearly always complete, logical and understandable"); *Which of the following best describes your child's ability to communicate when they are not first understood?* ("Never continues trying" to "Will work hard to be understood").

**Information-seeking behaviours**

Mothers were asked about information-seeking behaviours at all data waves regarding different aspects of parenting such as infant diet, school enrolment and immunisation. At 54 months mothers were asked: *Who first raised concern about speech?* Possible answers included GP/ Family doctor, Medical Specialist, Family Practice Nurse, Friend, Teacher and Myself.

## Analysis

In this exploratory study, descriptive statistics based on responses reported by mothers across the years were used to calculate the numbers of mothers reporting SLC concerns, and those who have accessed services such as speech-language therapy. Data were analysed using IBM SPSS statistical software (version 28) to generate descriptive statistics. Pearson's chi-square tests were run using SPSS to examine associations between services received and child, family and contextual characteristics with significance set at $p < 0.05$. Missing data includes those who were not present, did not respond or refused to respond.

# Results

Among the total cohort of 6156 children during the 54-month data collection wave, 6152 mothers had recorded responses as to whether someone raised a developmental concern about their child and specified these concerns. About a third of the children (*N*= 2236, 36.35%) had mothers who identified a raised concern about their development and were asked follow-on questions (Table 2.)

Table 2. *Descriptive statistics of types of concern raised for children at 54 months of age*

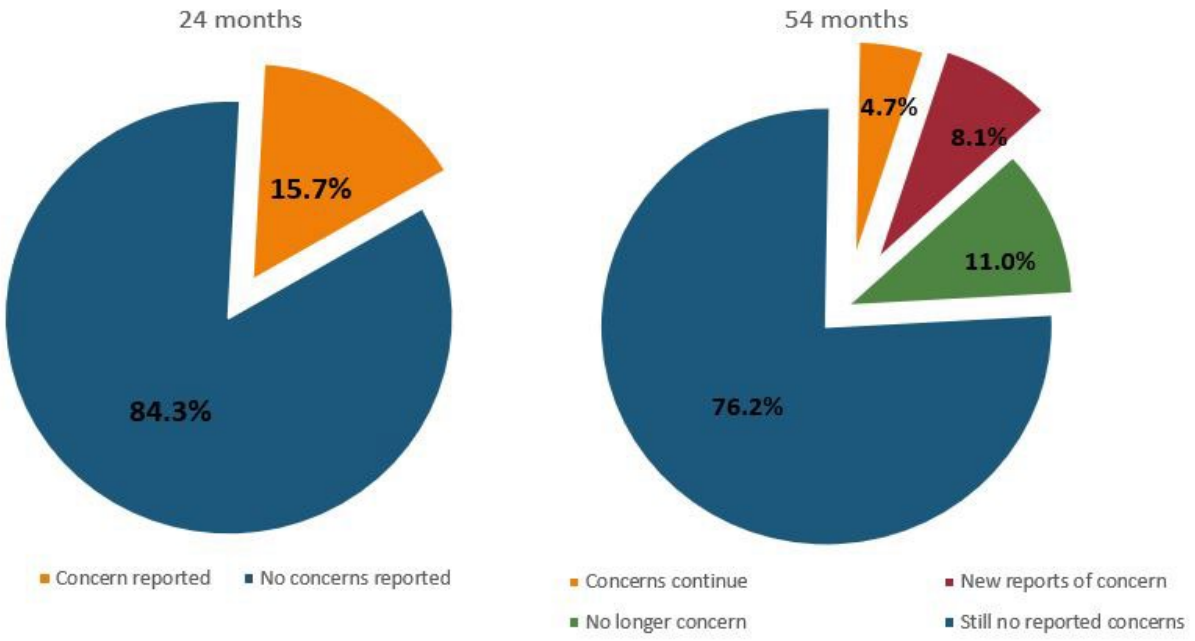
| | Frequency (%) | SLT received (%) |
|---|---|---|
| Developmental concern raised | | |
| Yes | 2236 (36.35) | 358 (16.0) |
| No | 3916 (63.65) | |
| Type of concern raised (multiple options allowed) | | |
| Speech | 776 | 338 (43.6) |
| Hearing | 832 | 30 (3.6) |
| Behaviour | 411 | 14 (3.4) |
| Autism Spectrum Disorder | 113 | 28 (24.7) |
| Learning Difficulty | 205 | 51 (24.9) |
| Other | 278 | <10[1] |

*Note*. [1]cell counts fewer than 10 are reported as <10 due to data restrictions.

**Maternal concern**

Mothers were asked about concerns for their child's development, including speech at 24 and 54 months. Figure 1 shows the prevalence of reported concern at the two time points (N=6152). Overall, the frequency of concern decreased slightly from 15.7% to 12.8%. For those who initially did not report any concerns, 8.1% did report concerns by 54 months. Across the two time points, 29.9% of mothers who reported concerns at 24 months, were also concerned at 54 months. At 54 months, 4.7% (n=284) of mothers had reported concerns at both time points.

Figure 1. *Mothers report of concern for speech at 24 and 54 months.*

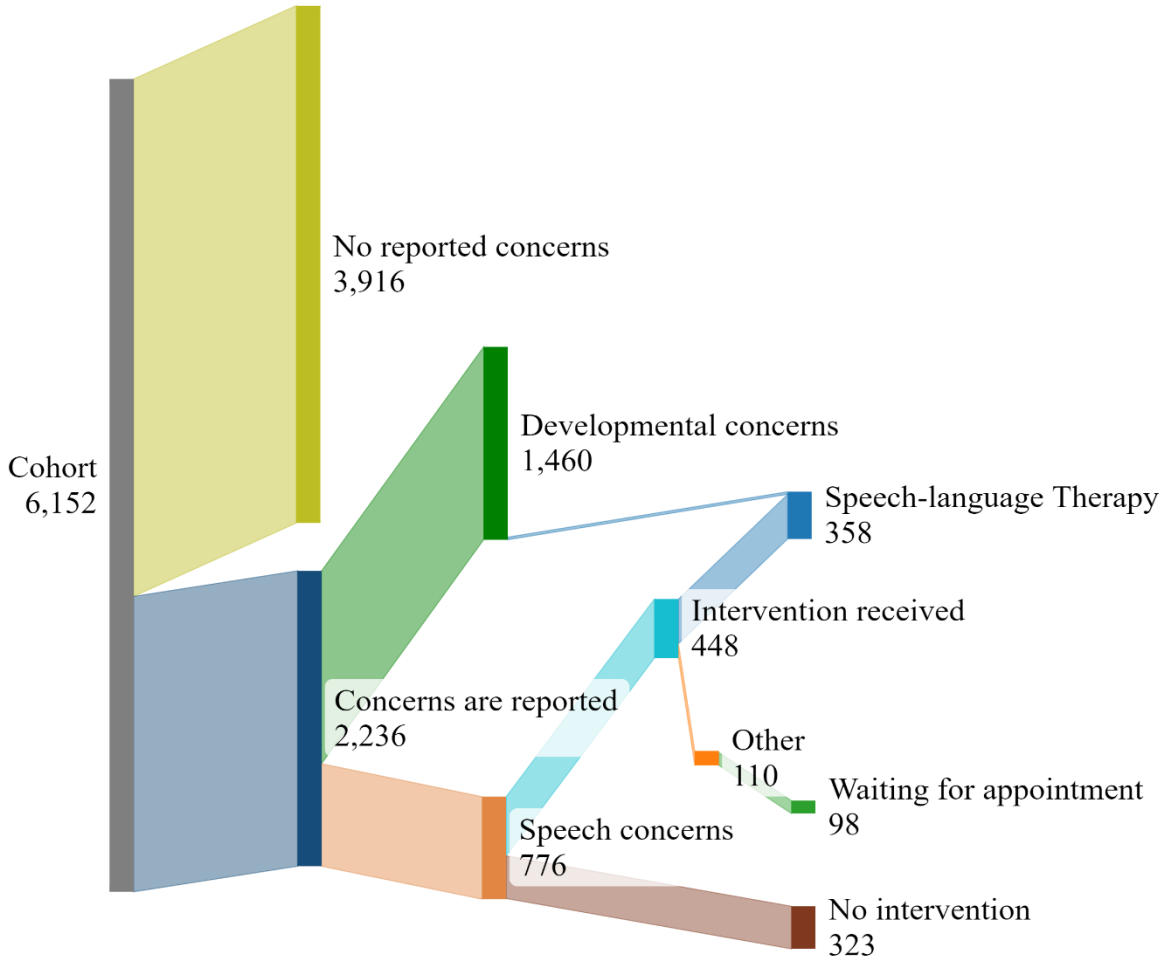



Overwhelmingly, the concerns were first raised by mothers in most cases (66%) then teachers and caregivers (14.3%). Health and Medical professionals including the Family Doctor (2.1%), and Plunket/ Practise nurse (4.9%) were less frequently the first to raise concern.

At 54 months age, of 776 mothers who expressed concern about their child's speech, 338 (46.2%) had received SLT intervention to some extent (See Figure 2). Other interventions such as grommets, surgery were mentioned by a small number of mothers and 98 mothers (12.6%) were waiting for an appointment for their child (unknown service). Forty-one percent of mothers did not receive any intervention for their child, despite reported concerns. Twenty mothers who did not report

concern about speech, but expressed concern about other aspects of development, also accessed SLT for their child.

Figure 2. *Sankey plot showing pathways of reported concern about speech through to receiving intervention for speech for children at 54 months of age.*




*Note:* Numbers indicate cases.

**Socio-demographic variables**

Among the GUiNZ families, mothers reported concerns about communication skills in 16% of their two-year old children and 25% of concerned mothers had sought advice for speech or understanding. At 54 months, mothers reported concerns about 13% of children and 56% of those children had received some intervention for communication.

Table 3 provides a summary of the chi-square analyses conducted between selected sociodemographic variables in our current study and the receipt of SLT at the child's age of 54 months, both for speech concerns and across any developmental concern.

Table 3. *Associations between sociodemographic variables and children receiving Speech-language Therapy at 54 months of age*

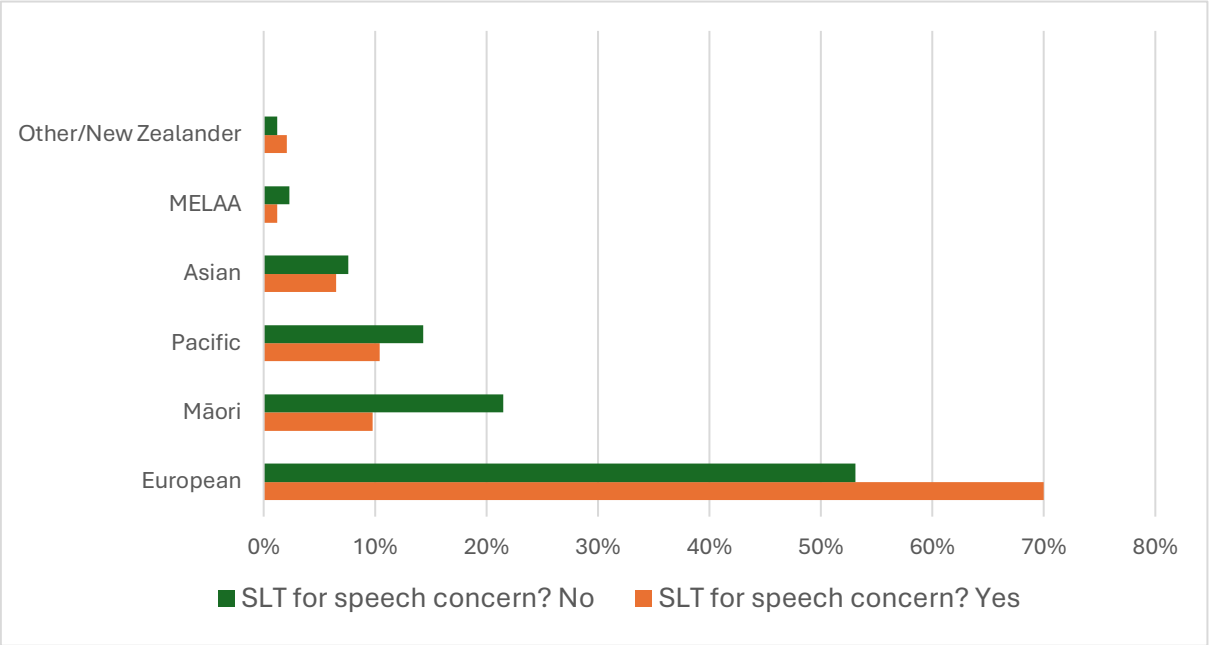
| Variable | SLT receipt for reported speech concerns (N=771) | | | SLT receipt for any reported developmental concern (N=2232) | | |
|---|---|---|---|---|---|---|
| | Yes | No | $\chi 2$ | Yes | No | $\chi 2$ |
| | n (%) | | | n (%) | | |
| Child's gender | | | .2 | | | 12.5** |
| Boy | 223 (65.9) | 279 (64.4) | | 235 (65.5) | 1041 (55.5) | |
| Girl | 115 (34.0) | 154 (35.6) | | 123 (34.4) | 833 (44.5) | |
| Maternal Education | | | 2.85 | | | 2.29 |
| No secondary school | 19 (5.7) | 30 (7.1) | | 19 (5.3) | 128 (6.8) | |
| Secondary school | 68 (20.6) | 100 (23.6) | | 73 (20.4) | 414 (22.1) | |
| Diploma/trade certificate/NCEA 5-6 | 103 (31.2) | 133 (31.4) | | 109 (30.4) | 560 (29.9) | |
| Bachelor's degree | 76 (23.0) | 95 (22.4) | | 82 (22.9) | 432 (23.1) | |
| Higher degree | 64 (19.4) | 66 (15.6) | | 66 (18.4) | 306 (16.3) | |
| Missing data | <10[1] | <10 | | <10 | 34 | |
| Maternal age (group) | | | 3.19 | | | 2.42 |
| <24 years | 61 (18) | 94 (21.7) | | 65 (18.2) | 377 (20.1) | |
| 25-34 years | 177 (52.4) | 233 (53.8) | | 190 (53.1) | 1028 (54.9) | |
| >=35 years | 100 (29.6) | 106 (24.5) | | 103 (28.8) | 468 (25.0) | |
| Missing Data | | | | | <10 | |
| Socioeconomic deprivation | | | | | | |
| NZDep Index 2006, antenatal | | | 14.44** | | | 4.56 |
| <=3 Low | 107 (31.7) | 90 (20.8) | | 108 (30.2) | 473 (25.2) | |
| 4-7 medium | 126 (37.3) | 162 (37.5) | | 135 (37.7) | 711 (37.9) | |
| 8-10 high | 105 (31.1) | 180 (41.7) | | 115 (32.1) | 688 (36.7) | |
| Missing data | | <10 | | | <10 | |
| NZDep Index 2006, 24 months | | | 8.57* | | | 3.86 |
| <=3 Low | 102 (31.8) | 111 (26.7) | | 102 (28.5) | 477 (25.5) | |
| 4-7 medium | 129 (40.2) | 145 (34.9) | | 137 (38.3) | 692 (36.9) | |
| 8-10 high | 90 (28) | 159 (38.3) | | 102 (28.5) | 635 (33.9) | |
| Missing data | 17 | 18 | | 17 | 70 | |
| NZDep Index 2013, 54 months | | | 22.52** | | | 15.66** |
| <=3 Low | 131 (41.6) | 110 (26.6) | | 131 (36.6) | 525 (28.0) | |
| 4-7 medium | 103 (32.7) | 139 (33.7) | | 115 (32.1) | 639 (34.1) | |
| 8-10 high | 81 (25.7) | 164 (39.7) | | 89 (24.9) | 637 (34.0) | |
| Missing data | 23 | 20 | | 23 | 73 | |
| Mother's self-prioritised ethnicity | | | 29.76** | | | 11.4* |
| European/Pākehā | 236 (70) | 230 (53.1) | | 242 (67.6) | 1113 (59.4) | |
| Māori | 33 (9.8) | 93 (21.5) | | 38 (10.6) | 288 (15.4) | |
| Pacific | 35 (10.4) | 62 (14.3) | | 40 (11.2) | 226 (12.1) | |
| Asian | 22 (6.5) | 33 (7.6) | | 26 (7.3) | 190 (10.1) | |
| MELAA | <10 | 10 (2.3) | | 4 (1.1) | 27 (1.4) | |
| Other/ New Zealander | <10 | <10 | | <10 | 28 (1.5) | |
| Missing data | <10 | | | <10 | <10 | |

*Note:* *$p$<.05. **p<.001. [1]cell counts fewer than 10 are reported as <10 due to data access restrictions.

Maternal education up to the time of the child's birth was associated with seeking advice at 54 months. For children described as largely unintelligible, mothers with higher than NCEA level 4 qualifications received intervention for their child more frequently than those mothers with lower NCEA qualifications *(n=2170, $\chi 2$=53.026(2),p<.001)*. For children described as never or rarely asking questions, a similar pattern was found with mothers at NCEA level 4 or lower not accessing services for their children, when other mothers did access services *(n=2170, $\chi 2$=47.999(2),p<.001).* There was a significant association between receipt of SLT for speech concerns and the mother's calculated decile of socioeconomic deprivation collected during the antenatal data wave ($\chi 2$= 14.44, $p$<.001), and when the child was 24 months old ($\chi 2$= 8.57, $p$<.05) and 54 months old ($\chi 2$= 22.52, $p$<.001).

Self-prioritised Ethnicity was significantly associated with children receiving SLT treatment for reported speech concerns at 54 months (*N=770. $\chi 2$=29.763(5),p<.001).* Figure 3 shows the distribution of maternal ethnic groups for those mothers receiving or not receiving SLT for their child. Maternal age at the child's birth was not associated with seeking or receiving SLT services at 54 months.

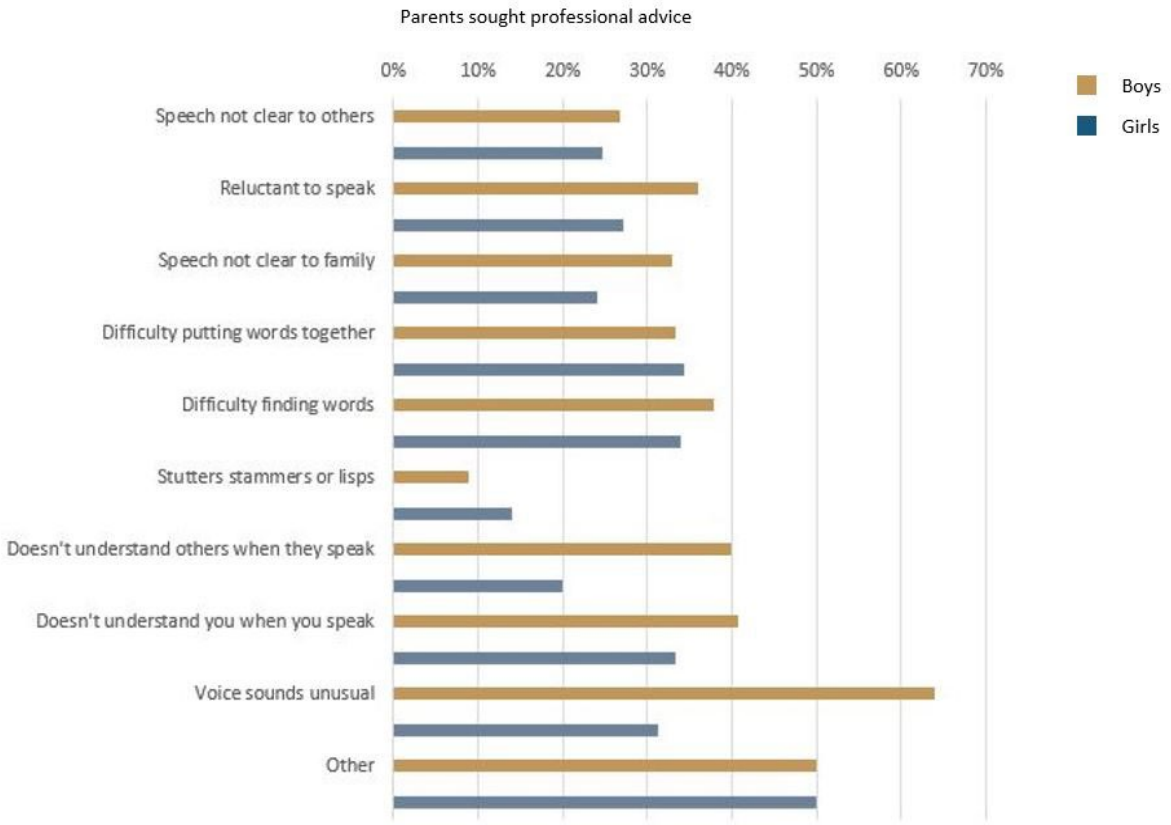
Figure 3. *Distribution of Mothers' ethnic group within Receiving or Not Receiving SLT treatment for reported concerns about child's speech at child's age of 54 months.*



**Specific communication concerns**

At 24 months old, mothers were asked if they had specific concerns about their child's speech. For all specific concerns mothers selected, except for boys with unusual voice, mothers were more likely to report not seeking professional advice for their child's speech. Figure 4 presents the reports of seeking professional advice for speech compared with mothers' reports of concern for boys and girls.

Figure 4. *Mothers seeking professional advice about specific concerns for boys' and girls' communication at 24 months old.*




*Note:* Multiple responses were possible (n=1026 respondents, 1784 responses).

**Level of Concern**

At age 24 months, 1026 mothers reported specific concerns about their child's speech and language skills. The level of concern was varied, with the majority of mothers being a little concerned (Fig 5.). Level of concern was similar for boys and girls with boys being slightly of more concern than girls. Level of concern was significantly related to the seeking of advice or treatment at 24

months *n=1026, χ2=89.731(3) p<.001.* However, even amongst those mothers who were very concerned about their child's speech, only half reported seeking or receiving professional advice or treatment by 24 months of age (Fig. 6).

Figure 5. *Levels of concern about their child's speech for boys and girls at 24 months of age.*

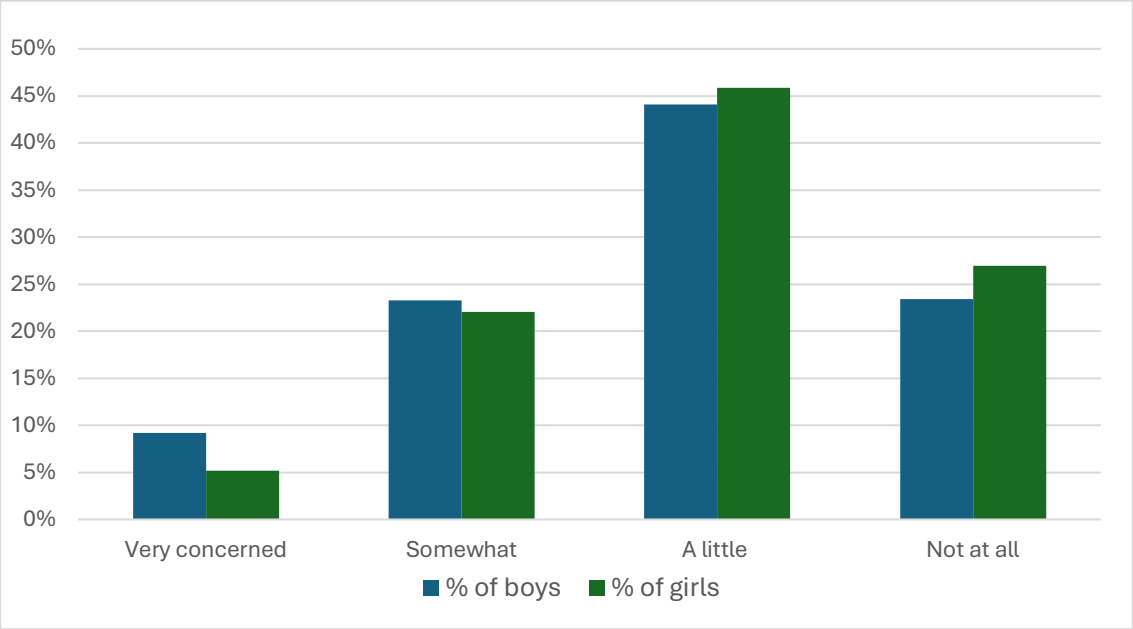
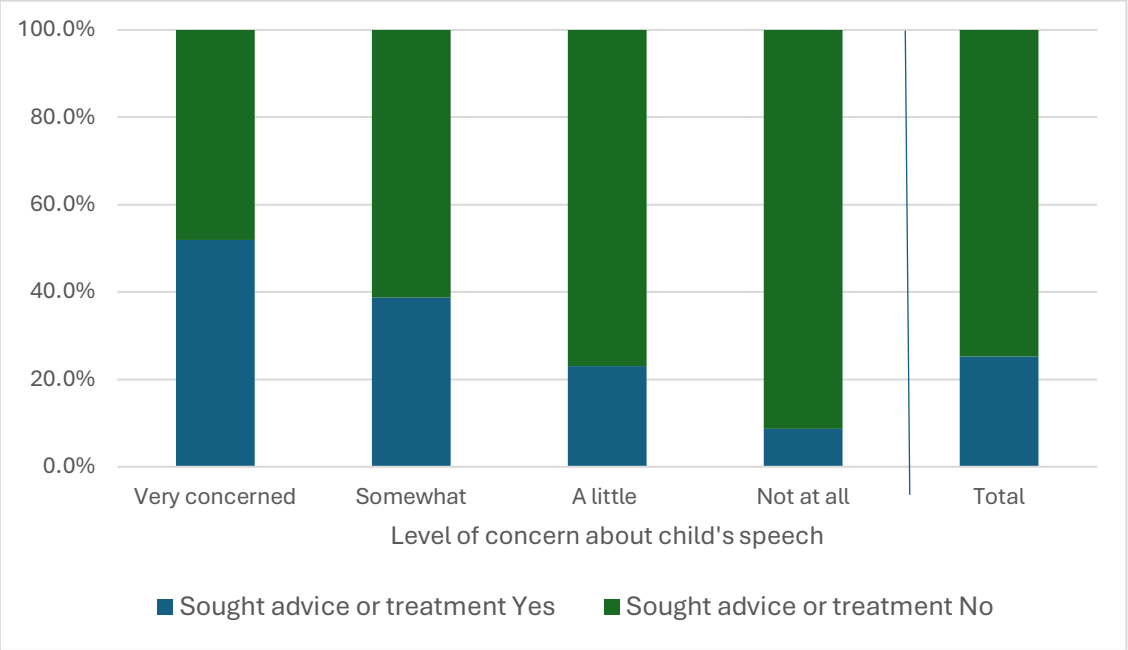



Figure 6. *Advice and treatment sought by mothers with level of concern for speech at 24 months old.*

**Communication Skills**



Data suggests that some children with language skill difficulties at 54 months were receiving intervention. For example, 708 children were described as only offering limited tentative descriptions and 23.7% of those were getting intervention (*N=2205, χ2=56.605(2)p<.001*).

Regarding intelligibility to family and strangers at 54 months, 40 children received intervention for speech and 31 children did not, despite all being rated as never or rarely intelligible to other adults by their mothers. Only 28% of children rated as sometimes intelligible to others received any SLT at 54 months (*N=2213*, *χ2=209.158(2)p<.001).*

## Discussion

NZ mothers report accessing SLT services more often for younger, but not very young children. Among the GUiNZ families, mothers reported concerns about speech for 16% of their two-year old children compared with 13% of children at 54 months, but 56% of 54 month old children had received some intervention for communication compared with 25% of 24 month old children. Skeat et al. (2014) proposed that mothers report greater concern regarding language difficulties as children get towards school age, with more mothers reporting concerns at 4 years than in previous years. At this age, speech production concerns may be more evident compared with less obvious broad language challenges. It is likely that mothers are more able to notice speech and language problems when the child has a reasonable amount of language they can use, but it is difficult to understand, or at a point where the child is considerably different in the amount of talking they do compared to their peers. At younger age e.g. 2 years old, more subtle language challenges such as not yet word-combining, are less likely to be raised as of concern.

There is known discrepancy in the receipt of services for communication challenges between boys and girls and our results are consistent with this at a ratio of 1:1.7 girls to boys (Wallentin, 2020). Our findings indicate that for many communication concerns, at 24 months, mothers accessed advice more frequently for boys than girls, despite similar levels of concerns. There is considerable literature indicating that boys are more likely to have language challenges that result in undesirable behaviour, and that girls have language challenges that are more often missed due to comparative emotional and

behavioural strengths (McGregor, 2020; Records & Tomblin, 1994). Some literature indicates differences in the communication skills of girls and boys. Girls use more ‘um’ pauses which could indicate linguistically more sophisticated thinking (Parish-Morris et al., 2017). They are known to use more vibrant gestures and are therefore able to express their point more clearly than boys (McKeon, 2020). Girls are also known to engage in longer more complex and engaging interactions even with known language challenges (Paolizzi et al., 2022).

When examining gender differences between mothers’ and fathers’ emotion talk, both mothers and fathers tend to talk more frequently with their daughters about emotions to elaborate more on emotions such as sadness and fear (Fivush & Buckner, 2000) than with their sons. A recent meta-analysis suggests that frequency of mother-child emotion talk is not gendered (Aznar & Tenenbaum, 2019), however when differences do emerge, regardless of the context, they are always in the direction of mothers being more elaborative with girls.

Boys generally exhibit higher rates of various developmental disorders compared to girls, and the trend extends to speech-language disabilities (Bourke et al., 2021; Kramer, 2000). However, the comparable maternal help-seeking behaviours for boys and girls may not solely be due to boys being more predisposed to language issues. Research suggests that mothers have differing mothering beliefs and practises for boys and girls (Mesman & Groeneveld, 2018), as well as expectations for language, where they expect girls to achieve higher (Ozturk et al., 2015). This could lead to mothers believing that boys comparatively need greater support, and more careful surveillance of boys’ development, increasing the chances of identifying potential SLC difficulties, although there is no clear evidence to indicate that this is the case.

Māori, Pacific, Asian and MELAA families were less likely to receive services despite their concerns. This is consistent with other large cohort studies internationally showing different minority ethnic groups are under-served according to the setting (Lof & Watson, 2008). Recent research suggests that for Māori and Pacific families living in New Zealand, many grandmothers care for their grandchildren from birth to the age of 3 years– a critical period for language development (Tapera et al., 2017). Within the child-rearing practices of Māori and Pacific groups, there may be less trust in or knowledge of Western biomedical understandings of speech, language and communication, and more

reliance on trusted indigenous sources of knowledge (Abel et al., 2001). Individuals from communities with strong intergenerational ties that have a common practice of seeking support from grandmothers or other whānau members, such as Pacific and Māori communities, may be less likely to access SLT services. Currently, SLT practice in NZ is largely built on Western ideologies of health and wellbeing (Eustace et al., 2024). As a result, the guidance provided by grandmothers and other families may not align with the Western-oriented interventions offered by SLT services, contributing to the lower utilisation of such services by Māori and Pacific families. Māori whanau report challenges accessing public services for their children with speech and language concerns (Faithfull et al., 2020). This qualitative study found experiences for Māori were largely characterized by families' self-advocacy and persistence during the referral process to ensure their concerns were heard.

Maternal concern is related to an understanding of children's development in relation to age-appropriate speech, language and communication milestones and New Zealand mothers can describe their children's communication abilities. GUiNZ mothers reported more concerns about children's speech than language, this is even the case when likely prevalence is taken into consideration. Our analysis found level of maternal education was not a particular characteristic of mothers accessing SLT services overall, however, like Davidson et al., (2022) we identified that for children rated as largely unintelligible at 54 months or rarely asking questions, mothers with NCEA level 4 education or less were less frequently accessing SLT services. Davidson et al. (2022) identified maternal education as a predictor of accessing services for speech concerns, but not for language. Previous studies have used a measure of highest level of education in the family, rather than limiting it to maternal education and it would be of value to include this measure in future studies (Davidson et al., 2022). Prior research identified mothers assumed that their child would eventually speak, mentioning that they took the child's normal language development for granted (Glogowska & Campbell, 2004). If the child did not present an explicit need for medical attention, mothers did not tend to seek professional help. Marshall et al., (2017) noted that mothers themselves would intervene by asking children to imitate them, trying to facilitate language learning, before seeing a specialist.

This is consistent with the findings of Johnston & Burke (2020) in regard to Problem Recognition. Mothers who understand child speech and language sufficiently to identify a problem

and explain it to someone else, are more likely to seek help and therefore be referred to services. Describing a skill a child can do, does not equate to identifying a problem, being able to explain the concern and acting on that concern. This is evident in later GUiNZ data, at 54-months old, children are expected to be largely intelligible to familiar and unfamiliar adults. When comparing mothers' concerns about speech with their own estimations of their child's intelligibility, mothers who reported their child was only sometimes intelligible largely did not report concerns, and 35% of mothers whose children was never or rarely intelligible did not report concerns (Mulderry et al., 2024). It is concerning that only slightly more than half of the children in the cohort described as largely unintelligible had received any SLT intervention at any point.

At all time points, socioeconomic deprivation was a characteristic of accessing SLT services. Children in the lowest deciles are much less likely to have received treatment or intervention at 54 months than those in the middle deciles. Whilst socioeconomic deprivation is a known risk factor for poor language development, social and community support for the mothers is a protective factor that should be further explored (Short et al., 2019).

Extant literature reports that the internet has become the primary source of health-related information for many people (Coughler et al., 2020; Tonsaker et al., 2014). Given that a vast majority of mothers identified a speech concern themselves first, it is possible that they used internet sources to determine this, but it is not captured in this data set. Kubb and Foran (2020) review also found that mothers searched the web before going to see the doctor to prepare for the appointment and after the doctor's visit to address unanswered questions. Mothers turned to the Internet both before (45%) and after (27%) visits to child health care services to seek further information (Chlebowski et al., 2018). Overall, extant literature suggests that many, but not all, mothers use online sources to prepare and follow up with doctor appointments for their children. There is little report of online health-information seeking for allied health appointments.

There are major concerns regarding the reliability of online information. Using the principles established by the Health on The Net (HON) foundation- a framework identifying online information endorsed by the United Nations. Examining 54 websites for children who are late to talk, Readability fell within the standard range. The largest proportion of websites were American, written by SLTs

with the most common topics being milestones, strategies, and red flags. There were ambiguities seen in terminology and misinformation usually related to risk factors and causes (Coughler et al., 2020).

The internet can provide information to mothers on when and how to access SLT services and gain answers on general inquiries about their child's language development. A large-scale survey exposed disparities in internet access across New Zealand (Grimes & White, 2019). Common reports suggest 94% of people in NZ use the internet daily, yet those in social housing and disabled people are particularly disadvantaged with respect to internet access (69% and 83% respectively had access). Results revealed that Māori and Pacific Peoples were less likely to have internet access than other ethnic groups.

Studies of maternal help-seeking more broadly have identified multiple components that together determine the help-seeking process, including: problem recognition, severity, functional impairment, and caregiver stress (Jackson et al., 2023). Problem recognition has been studied in relation to child mental health and suggests that mothers are more likely to seek help if they believe the problem has an organic origin, rather than being temperament or environmentally caused. Evidence-based, accurate information for mothers on the origins and causes of speech and language challenges may not be easily accessible, and thus might lead to greater variability and inaccuracy in how mothers understand and importantly – explain -- any concerns they have about their child (Coughler et al., 2020; Johnston & Burke, 2020). Greater maternal stress about or because of behaviours led to more help-seeking (Johnson, 2014).

We have identified that European mothers of male children, with lower socioeconomic deprivation are more likely to seek advice and access SLT services at 54 months. Mothers with lower levels of education and higher socioeconomic deprivation were more often not accessing services despite describing their children's communication skills at concerning levels. Education Professionals were valued for their information at 24 months, and family doctors were more likely to be considered helpful, if the child had received SLT service. This may indicate that the family are able to access effective and efficient professionals.

## Strengths, Limitations, and Future Directions

To our knowledge, this is the first prospective cohort study to investigate mothers accessing services for their child's speech, language and communication needs and to characterise those mothers who successfully access SLT. The Growing Up in New Zealand (GUiNZ) study allows a wide range of potential confounders such as maternal education and ethnicity to be considered. The sample was ethnically and socioeconomically diverse. Descriptive, univariable analyses were carried out and are exploratory in nature. Multi-variable analyses are required to identify any associations hold when all variables are taken into account and what the strength of these associations are (i.e. the odds ratios).

GUiNZ data has a significant number of non-participant mothers with missing data, who were more likely to live in areas of high deprivation when their child was in preschool, not have obtained any formal educational qualifications, and identify as Māori, Pacific, or Asian rather than Pākehā/NZ European (Morton et al., 2018). Ethnicity and deprivation status have predictive effects for language acquisition of NZ children due to a complex array of factors (Reese et al., 2018). Future work could explore whether reported ethnicity influences the outcomes if it is self-prioritised or total response.

Systemic and structural barriers and facilitators to SLT services were not collected in any data waves and although not discussed in detail here, are likely to be a significant factor in people successfully accessing services. Factors such as social group membership should also be considered in future analysis.

The choice to explore speech, language and communication at a population-level using gross quantitative measures comes at the expense of capturing the complexity and meaning behind family experiences. Further capturing the voices of families would inform effective resource allocation, acknowledging the considerable knowledge they possess about their children (Davies et al., 2017). Given the broad ambition of the GUiNZ study to capture the general status of health and development (Morton et al., 2020), opportunities to capture detailed communication abilities were compromised. All measures relied on mother report of speech which may or may not have captured language or broader communication concerns, depending on individual interpretation of the questions and recall about specific difficulties within a wide-ranging and lengthy interview.

## Implications

Early Intervention for language and communication difficulties relies on early recognition of a child's challenges. Over a third of mothers of 54-month olds who reported concerns about their child's speech, also reported concerns earlier at 24 months. Even if recognition of children's communication skills happens, mothers may struggle to identify and describe specific challenges their child has which may delay or completely hinder their search for support and advice. Maternal reports of concerns are not always consistent with the child's communication skills and needs which can lead to late or no referral to services for support. Consistently girls are under identified and mothers report fewer concerns. Education for parents, and professionals on expectations of nearly 100% intelligibility at 4-and a half years old, and the significance of children asking questions would be beneficial. Particularly Early Childhood Educators and health professionals are in a position to take on this role of listening to children, encouraging them to speak and to ask questions.

Implementation of the Child and Youth Wellbeing strategy and Enabling Good Lives, both depend on recognition of differences, identification of need and capacity to support families and children. Public and professional messaging about communication development is currently insufficient in raising awareness and in offering information to support referral. Although Well Child Tāmariki Ora visits, including the Before School Check, have a dual role of developmental surveillance and parent education, reports indicate parents are unhappy with the process and the focus is on checking development rather than educating families (Loo, 2017). Particularly, mothers could be helped to further understand their child's communication skills such that they can describe their concerns more specifically.

Rates of SLCN are high, although poorly reported in NZ. This study provides nationally representative population-based estimates for access to speech and language services separately for boys and girls at 24 and 54 months of age. A slight majority (56%) of children with speech or language concerns received speech and language services at some point before 54 months of age. Many children did not receive services for their reported speech concerns. However, disparities existed by ethnicity, gender, level of maternal education and socioeconomic deprivation and specific area of concern. SLTs were the most frequently reported speech and language services. This study is a

start in identifying child, maternal and contextual factors that lead to successful access to speech and language services. Our findings are limited by the available data, which highlights the need for updated and improved population-based surveys on communication needs to better understand the current state of speech and language service provision for children in New Zealand

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