



## Article

# Evaluating the Accessibility and Inclusiveness of Community Playgrounds in Australia for Children with Disabilities

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**Abstract:** Play is vital to the wellbeing of children, but playgrounds can be inaccessible to children with disabilities and limit their physical and social participation. This study evaluated the accessibility/inclusivity of twenty-five free-entry playgrounds in two Australian states and investigated whether location, construction age, and regional socioeconomic status affected accessibility/inclusivity. The New South Wales Government's Everyone Can Play: Playspace Evaluation Checklist was used as the assessment tool with a maximum score of 156 points. Playground scores ranged from 29% to 96% of available points. The average score for destination playgrounds was significantly higher ( $78.0\% \pm 16.6\%$ ) than that for neighborhood playgrounds ( $54.5\% \pm 20.7\%$ ). Modern playgrounds generally scored higher than older playgrounds. Regional socioeconomic status did not correlate with playground score. The audit tool inadequately addresses the needs of children with disability, allocating just 24 points (15.4%) to features they need and mostly considering mobility impairment. More inclusive audit tools that capture the needs of a wide range of impairment should be developed. Main areas for improving playground accessibility include wayfinding, layout, signage (including braille, auditory, and pictorial information), and sensory and cognitive play opportunities. These findings are useful for stakeholders involved in the design, provision, and maintenance of community playgrounds.

**Keywords:** disability; playground; accessibility; children; park



**Citation:** Glass, C.; Flemmer, C. Evaluating the Accessibility and Inclusiveness of Community Playgrounds in Australia for Children with Disabilities. *Disabilities* **2024**, *4*, 996–1005. <https://doi.org/10.3390/disabilities4040061>

Academic Editors: Patsie Frawley and Reinie Cordier

Received: 12 August 2024

Revised: 6 November 2024

Accepted: 19 November 2024

Published: 22 November 2024



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## 1. Introduction

Play is recognized as a fundamental right of all children, including those with disabilities [1,2] and fosters their social, physical, emotional, and cognitive development [3]. However, several studies have shown that children with disabilities face barriers when visiting playgrounds and this limits their participation in play [4,5]. Difficulties include inaccessible paths and non-inclusive playground equipment [6,7], and these lead to feelings of isolation and exclusion [8]. In Australia, there is legislation making it unlawful to discriminate against anyone because of their disability, and this includes access to public places such as playgrounds [9]. There are standards setting out the minimum requirements for accessible playgrounds [10–12] and these are implemented by local municipalities [13]. At the state level, there is also a range of voluntary guidelines for creating inclusive playgrounds [14–16].

An “accessible” playground must provide movement through the environment, access to play equipment, and provision of equipment that can be used by visitors with widely varying abilities [17–19]. An “inclusive” playground is one which goes beyond physical access and promotes the participation and sense of community of children with a range of different abilities [6]. This is achieved through the provision of both physical and sensory play equipment, escape areas for recovery from over-stimulation, shaded areas, and trained staff [6,7]. Most of the recent assessments of playground accessibility and inclusivity are qualitative, using observations [5,8,20–22], visitor interviews [5,8,18,20,23–28], and surveys [27,29]. The studies

have considered the perspectives of children [5,8,20,23,25,26], caregivers [5,18,23,24,26–29], and local authorities or other community stakeholders [5,26–28] and assessed 3 to 21 playgrounds in the USA, Canada, Italy, the United Kingdom, Ireland, New Zealand, Brazil, China, Malaysia, and Turkey. Comparison between the studies is not possible because each assessment used a different auditing tool or metric, including bespoke auditing tools, an advocacy tool, and local government guidelines [30]. Table 1 summarizes the main barriers in playgrounds, categorized as relating to “accessibility” or “inclusivity”.

**Table 1.** Playground accessibility and inclusivity barriers for children with disabilities.

Barrier	Barrier Type	References
Playground surface	Accessibility	[6,8,22,31–34]
Paths in the playground	Accessibility	[32,33]
Paths from parking to playground	Accessibility	[8,22]
Inadequate accessible parking	Accessibility	[22,33,35]
Non-inclusive play equipment	Inclusivity	[6,8,31–34,36,37]
Non-inclusive signage and boundaries	Inclusivity	[6,21]
Lack of sensory play activities	Inclusivity	[8,22,33,36,38,39]

A few studies have shown the influence of two aspects of playground location on accessibility and inclusivity. The first is whether the playground is categorized as a “destination” playground (meaning one which families choose to travel to) or as a “neighborhood” playground. Destination playgrounds are larger and more likely to have accessible features such as accessible parking, drinking fountains, and toilets, as well as inclusive play equipment [8,21,33]. The second aspect is the socioeconomic status of the community near the playground. In general, playgrounds in poorer regions have been found to be less accessible and have less variety and less inclusivity in the equipment [8,33,38]. Children living in these areas are also less likely to have the resources to visit more accessible and inclusive playgrounds located elsewhere [8].

A review of the literature failed to find any recent studies on the accessibility of playgrounds in Australia. Studies in other countries only consider a small number of playgrounds and few studies investigate the effect of playground characteristics on accessibility and inclusivity. These three research gaps are addressed here. The aim of this work is to use observation-based on-site audit assessment to evaluate the quantitative accessibility and inclusivity score of 25 free-entry case study playgrounds in two Australian states (Victoria and New South Wales) and to determine whether park characteristics affect this score. The research questions are as follows:

- What is the quantitative accessibility and inclusivity audit score of the case study playgrounds?
- Do playground characteristics such as playground age, location, and regional socioeconomic status affect the accessibility and inclusivity score for the case study playgrounds?

An important limitation of the research is that it assesses the accessibility and inclusivity of the playgrounds only through the application of an audit tool. Audit tools fail to capture the experience of playground usability, particularly by children with disabilities. The findings of the research presented here need to be supplemented with research on users’ perspectives in order to move towards playgrounds that are genuinely satisfying for children with different types of disability.

## 2. Materials and Methods

To assess accessibility and inclusivity of playgrounds, researchers commonly apply an auditing tool to specific case study playgrounds [21,22,33] or interview children with disabilities (and/or their caregivers) on their opinions of playgrounds in general [23,25]. This research uses the audit tool method but acknowledges that omitting the input of the perspective of children with disabilities is a limitation. The optimal assessment should include both audits and experiential input from children and families on specific playgrounds, as was carried out in [8].

The research involved three steps: a literature review, selection of the auditing tool, and selection and analysis of case study playgrounds. A description of each step follows.

### 2.1. Literature Review Method

The Scopus and Google Scholar search engines identified 1601 documents with the following search parameters:

- Keywords and Boolean operators: “play” OR “playspace” OR “playground” OR “park” AND “access” OR “inclus\*” OR “universal AND design” AND “disability” OR “disabled” AND “audit” OR “evaluat\*” OR “checklist” OR “tool”.
- Articles written in English.
- Articles published between 2012 to 2024.

The abstracts were reviewed and filtered down to 291 articles on playground assessment, the underlying principles of Universal Design, accessibility and inclusivity, and relevant auditing tools. A detailed review of these articles identified 43 manuscripts for inclusion in this work.

### 2.2. Auditing Tool Selection Method

A review of international auditing tools for assessing playground accessibility and inclusivity [40] identified two Australian auditing tools with the broadest evaluation that best met the design for inclusion recommendations made by [7]. The tools were the South Australia Inclusive Play checklist [14] and the New South Wales Everyone Can Play checklist [15]. Of these, the Everyone Can Play: Playspace Evaluation checklist was chosen because it is the most modern and the simplest to use (it does not require the auditor to have an in-depth knowledge of the accessibility standards) and because it provides recommendations for improving inclusive play. The tool awards points, up to a maximum of 156, for three aspects:

- “Can I get there?” This has 20 components assessing location, layout, signage, and access and is worth a total of 40 points;
- “Can I play?” This has 34 components assessing play experience, wayfinding, access, equipment, and surfacing and is worth a total of 68 points;
- “Can I stay?” This has 24 components assessing safety, facilities, and landscape and is worth a total of 48 points.

The detailed components of the Everyone Can Play: Playspace Evaluation checklist are available in [15].

### 2.3. Playground Selection, Audit Method and Data Analysis

The 25 case study playgrounds were selected from eight municipal areas in the states of Victoria and New South Wales (NSW), Australia, using the following five criteria: having a variety of play equipment; outdoors; free entry to the public (not on school grounds); either destination or neighborhood; and located within a convenient distance from the researcher. The process of conducting audit assessments of the playground met Massey University’s criteria for low-risk research involving humans and Low Risk Notification ID 4000028004 authorized the data collection. On-site audit assessments were conducted by the researcher over a period of three months, from September to November 2023. Observations at each playground were used to complete the Everyone Can Play: Playspace Evaluation checklist. Each sub-item on the checklist has a three-level rating score with two points awarded for features not requiring change, one point awarded for features that could be improved, and zero points for features that must be changed/are not present. The total points were summed to obtain a quantitative assessment of accessibility and inclusivity of each playground.

#### 2.4. Playground Characteristics Data Collection

The playground characteristics (age, socioeconomic region, and classification as destination or neighborhood) were determined from several sources that are summarized in Table 2.

**Table 2.** Playground characteristics and source of data.

Characteristic	Data Source
Renovation or construction year <sup>1</sup>	Internet municipal websites, personal communications <sup>2</sup>
Socioeconomic region	The Australian Bureau of Statistics Index of Relative Socioeconomic Disadvantage (IRSD) [41]
Destination or neighborhood	The Department of Health and Aged Care Rural, Remote and Metropolitan Area (RRMA) classification tool [42] for metropolitan, rural, or remote area, and Google Maps <sup>3</sup>

<sup>1</sup> The year of the most recent renovation or the year the playground opened to the public. <sup>2</sup> Data on one playground were not available and were estimated by the auditor from the appearance of the playground. <sup>3</sup> RRMA classification of 1 or 2 indicates “Metropolitan” district but does not reflect population growth since the 1991 Census, so Google Maps satellite view was used for the final determination of whether the playground should be designated a destination or neighborhood playground.

### 3. Results

Detailed playground evaluations and areas for improvement for each of the 25 playgrounds are available in [30].

#### 3.1. Playground Age and Audit Results for the 25 Playgrounds

The audit assessment results of the Everyone Can Play: Playspace Evaluation Checklist for all 25 playgrounds show that playground audit scores ranged from 29% to 96% (Table 3). Table 3 also shows the designation of the playground (either destination or neighborhood), and the age of the playground, expressed as the year of the most recent renovation or the year of the playground opening.

**Table 3.** Playground location, designation, age, and ranking by audit score.

Rank	Name, Location, Designation	Year	Audit	
			Score	%
1	Bairnsdale (East Gippsland) Playground, Bairnsdale VIC 3875 (D)	2013	149	96
2	Belvoir Park Playground, Wodonga VIC 3690 (D)	2023	144	92
3	Lions Park, Bermagui NSW 2546 (D)	2021	142	91
4	Taylor Square Playground, Tathra NSW 2550 (D)	2019	142	91
5	JL Murphy Reserve Playground, Port Melbourne VIC 3207 (D)	2020	135	87
6	McNish ‘Dinosaur Park’ Reserve, Yarraville VIC 3013 (N)	2022	132	85
7	Donald McLean Playground, Spotswood VIC 3015 (D)	2023	130	83
8	Bombala Playground, Bombala NSW 2632 (D)	2018	130	83
9	Macalister River Park Playspace, Maffra VIC 3860 (D)	2007	126	81
10	Buckingham Reserve Playground, Port Melbourne VIC 3207 (N)	2020	117	75
11	Maclean Reserve, Williamstown VIC 3016 (N)	2022	113	72
12	Armstrong Reserve Playground, Newport VIC 3015 (N)	2020	113	72
13	Nijong Ninja Park, Cooma NSW 2630 (D)	2018	107	69
14	Cooma Centennial Park, Cooma NSW 2630 (D)	2019	105	67
15	Fort Gellibrand Playground, Williamstown VIC 3016 (N)	2005	101	66
16	Mick Baum Park Playground, Cann River VIC 3890 (D)	2010 *	82	53
17	Huon Park Playground, Huon Creek VIC 3691 (N)	2022	82	53
18	Coongulla Community Centre Reserve, Coongulla VIC 3860 (N)	2013	77	49
19	Mappin Reserve, Seddon VIC 3011 (N)	2016	71	46
20	Commonwealth Reserve Playground, Williamstown VIC 3016 (D)	2009	68	44
21	Yarraville Gardens Playground, Yarraville VIC 3013 (N)	2014	60	38
22	Burgoyne Reserve Playground, Williamstown VIC 3016 (N)	2014	60	38
23	David Bayne Park Playground, Wodonga VIC 3690 (N)	1994	46	29
24	Clough Street Reserve, Williamstown VIC 3016 (N)	2010	45	29
25	Charles Bates Reserve, Williamstown VIC 3016 (N)	2007	45	29

D: destination; N: neighborhood; \* estimated by the auditor from the appearance of the playground.

The mean and standard deviation audit scores in each of the three categories (“Can I get there?”, “Can I play?”, and “Can I stay?”) for the twenty-five playgrounds are shown in Table 4.

**Table 4.** Mean and standard deviation audit scores for the 25 playgrounds.

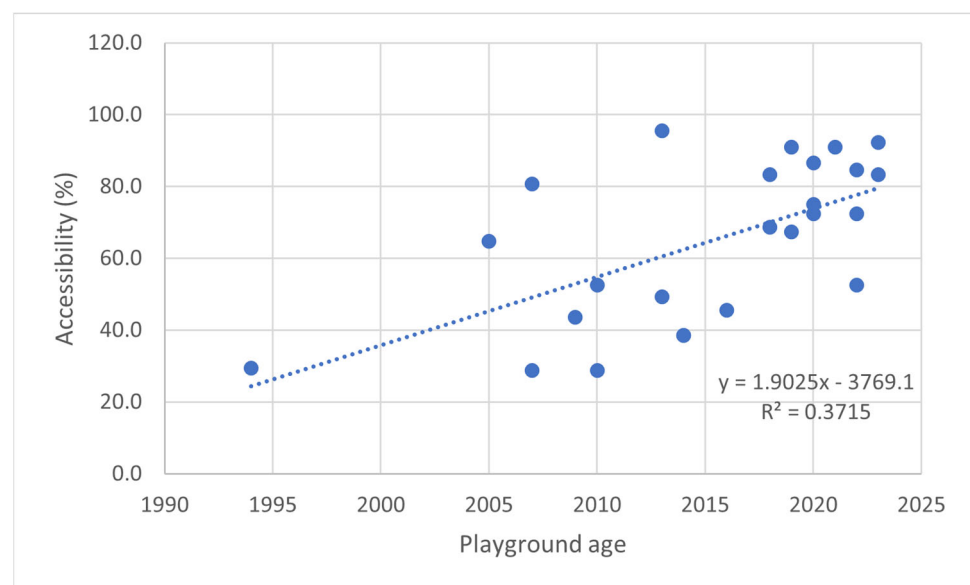
Category	Mean Points (%)	Standard Deviation Points (%)
Can I get there?	26.4 (65.9%)	6.6 (16.5%)
Can I play?	39.6 (58.3%)	18.0 (26.5%)
Can I stay?	34.8 (72.5%)	11.4 (23.9%)
Total	100.9 (64.7%)	34.4 (22.1%)

The 12 destination playgrounds have considerably higher audit scores (mean audit score of 78.0% ± 16.6%) than the 13 neighborhood playgrounds (54.5% ± 20.7%), largely because destination playgrounds earn more points for amenities than neighborhood playgrounds. These findings agree with other studies [8,33].

The five playgrounds located in NSW had higher audit scores (mean audit score of 80.3% ± 11.7%) than the twenty playgrounds in Victoria (60.8% ± 22.5%) but the sample sizes are small, so this finding is not statistically significant. Although all Australian playgrounds must meet the country’s mandatory accessibility requirements, the states have different playground guidelines. The Everyone Can Play auditing tool is based on NSW guidelines that were updated in 2023, whilst the guideline in Victoria was published in 2007 [15,16]. The Victoria guideline should be updated.

### 3.2. Effect of Playground Age on Accessibility

Figure 1 shows the variation in audit score (expressed as a percentage) with playground age (the year of the most recent renovation or the year of the original construction).



**Figure 1.** Variation in accessibility with playground age.

As expected, there is a weak linear correlation between the accessibility/inclusivity audit score and the playground age; more modern playgrounds have higher scores. Most playgrounds renovated or constructed after 2018 achieve more than 50% of the audit points. There are, however, two exceptions; one playground constructed in 2013 had the highest audit score (96%) and one playground constructed in 2022 had a significantly lower audit score (53%) than its age warranted.

### 3.3. The Effect of Socioeconomic Region on Playground Accessibility Score

A total of 14 of the playgrounds were located in advantaged socioeconomic regions (defined as IRSD 6–10), while 11 playgrounds were located in disadvantaged socioeconomic regions (IRSD 1–5). The audit score of playgrounds in advantaged regions was considerably lower ( $58.2\% \pm 21.1\%$ ) compared with that of playgrounds in disadvantaged regions ( $72.8\% \pm 21.5\%$ ). When destination playgrounds were excluded, the audit score of playgrounds in advantaged neighborhood playgrounds was  $54.7\% \pm 20.0\%$ , which was very similar to that for neighborhood playgrounds in disadvantaged regions ( $53.2\% \pm 25.9\%$ ). The findings suggest that the accessibility/inclusivity audit score is not related to the socioeconomic index of the region. These results do not agree with the published research finding that playgrounds in poor areas are generally less accessible and inclusive than those in wealthy areas [8,33].

### 3.4. Playground Features That Should Be Improved

Five features on the audit checklist received significantly low scores. These are shown on Table 5 together with the number of the 25 playgrounds earning any points for those features.

**Table 5.** Low-scoring audit features and number of playgrounds earning points for each feature.

Feature	Playgrounds
The play space has signage or a map to aid navigation	5
Pictographs and braille are provided on key instructional and safety signage	3
There is a map at the play space entry to assist with navigation and decision-making	0
Maps follow the points listed for inclusive signage <sup>1</sup>	0
There is directional signage along activity trails	2

<sup>1</sup> Easy to read, located at a height for all users to see.

The results show that playgrounds can significantly improve their accessibility and inclusiveness by focusing on wayfinding, layout, and signage features.

The audits showed that the worst feature of the playground equipment was the lack of provision of a ramp for elevated play equipment, making it unusable for those with mobility impairment. Just 5 of the 25 playgrounds earned any points for this aspect.

## 4. Discussion

Twenty-five playgrounds in Victoria and New South Wales were assessed using the Everyone Can Play auditing tool and ranked according to their accessibility/inclusion score (Table 3). Playground scores ranged from 29% to 96%. The 12 destination playgrounds were considerably more accessible (mean score of  $78.0\% \pm 16.6\%$ ) than the 13 neighborhood playgrounds ( $54.5\% \pm 20.7\%$ ), largely because destination playgrounds had higher scores for amenities than neighborhood playgrounds. These findings agree with other studies [8,33].

In general, the more recently the playground had been renovated or constructed, the better its audit score. Shi et al. (2023) found a similar moderate correlation between inclusivity and playground renovation date [21]. Other published studies have not investigated this relationship, possibly because playground age/renovation date is difficult to ascertain [22]. However, the finding seems valid since accessibility and inclusivity standards improve over time. The positive correlation between age and audit score was not strong, and two playgrounds were outliers in the trend. A 2013 playground had the highest audit score (96%) in the sample, despite being older than fifteen other playgrounds. Further, a 2022 playground had a significantly lower audit score (53%) than its age warranted, highlighting the need to consider accessibility and inclusivity in the design stage of new playgrounds.

There were mixed findings on the effect of regional socioeconomic status on playground accessibility. When all twenty-five playgrounds were considered, audit scores were better in poorer regions than in wealthier regions, in direct contrast to the findings

of others [8,33]. When destination playgrounds were excluded, the audit scores of the neighborhood playgrounds were similar across all socioeconomic regions. A larger sample size is needed to test whether this finding is true for most Australian playgrounds.

An examination of the component audit scores show that accessibility can be significantly improved through better wayfinding, layout, and signage features, as well as by the provision of a ramp for elevated play equipment, for those with mobility impairment. Similar findings are reported by others [6,7,22]. Two-thirds of the case study playgrounds provided good surface treatment for visitors with mobility impairment, and this is another area where researchers have recommended improvement [6,8,22,31–34]. A closer scrutiny of the audit tool shows that it evaluates playground accessibility for all visitors, not specifically those with disability. In fact, relatively few points are allocated to features for people with disability; just 15.4% of the measured features address their needs and these are detailed in Table 6.

**Table 6.** Allocation of points in the audit tool for features that accommodate visitors with disability.

Category	Feature	Points (%)
Can I get there? (40 points)	Accessible car parking; pictographs and braille are provided on key instructional and safety signage; access gates can be operated by an adult using a wheelchair or mobility device.	6 (15.0%)
Can I play? (68 points)	There are multiple opportunities for people with limited mobility. There is an appropriate color contrast between the paths and the play surfaces. The orientation path conforms to relevant Australian access standards. Elevated equipment pieces include a ramped access point for people of various ages with limited mobility. There is an accessible edge or point of access (flush or ramped) from the circulation path to the majority of play surfaces. All accessible equipment pieces have an accessible surface treatment to enable ease of use. Path surfaces provide sensory play opportunities through materiality or texture features.	14 (20.6%)
Can I stay? (48 points)	There is enough clearance space adjacent to the seat to park a pram, wheelchair, or mobility device without blocking the circulation space or path. There is an accessible toilet nearby that includes changing facilities for babies, children, and adults.	4 (8.3%)
All categories (156 points)		24 (15.4%)

Further scrutiny of the 15.4% mark allocation for features specifically accommodating visitors with disability shows that the focus of the features relates to accessibility and not to inclusivity. There are just three inclusivity features, namely: pictographs and braille provided on key instructional and safety signage, appropriate color contrast between the paths, and play surfaces and path surfaces that provide sensory play opportunities through materiality or texture features. This is just 6 points or 3.8% of the total score and highlights the inadequacy of the tool as a metric for the accessibility and inclusivity of the playgrounds.

It is clear that greater efforts can be made to provide playgrounds that consider the needs of children with disabilities. The features that do accommodate visitors with disabilities are primarily focused on those with mobility impairment, with little provision for those with vision and cognitive impairment. Other researchers have shown that few playgrounds provide adequate facilities for children with autism spectrum disorders [22,39].

Some recommendations for more inclusive accessibility include [6,21,22] the following:

- Providing large, flat open spaces arranged in a simple, visually calming layout.
- Replacing wood chips, grass, and sand with rubber floor surfacing that is even and padded.

- Using lighting, color contrast, and ground markers with contrast and texture to signal changes in path height and boundaries to play equipment.
- Replacing stairs with ramps.
- Lowering the height differential of curb cuts.
- Avoiding flashing lights and minimizing noise sources.
- Using multiple modes of communicating information, such as audio messages, pictorial signage, braille, and large text signage.
- Providing more accessible parking spaces.

Designing inclusive playgrounds is challenging because the many different types of disability place different, and sometimes conflicting requirements, on the design. Visitors with vision impairment require color contrast and lighting and texture changes to indicate path and equipment boundaries, but these features can be challenging for people with seizures and autism spectrum disorders [6,39]. There is also the perception that the more playground design addresses the needs of those with disability, the less friendly the playground becomes for those who are able-bodied. However, there is evidence showing that incorporating the principles of Universal Design in playgrounds improves the experience of all users and increases the visitor numbers [43].

Aside from the limitations of the audit tool (discussed above), there are three limitations of the research. Firstly, twenty-five playgrounds in two Australian states is a relatively small sample size. Secondly, the playground selection excluded school playgrounds, indoor playgrounds, and playgrounds with an entry fee. Finally, the auditor was an able-bodied adult, without the lived experience of a person with disability. Absolute validation of accessibility and inclusivity of playgrounds can only be determined using the experiential data of children with a range of disabilities using the playgrounds.

## 5. Conclusions

The aim of this work was to evaluate the accessibility and inclusivity of Australian playgrounds for children with disability and explore the effect of playground age, location, and regional socioeconomic status on accessibility and inclusivity. Twenty-five free-entry playgrounds in the two Australian states of Victoria and New South Wales were assessed using the New South Wales Government's Everyone Can Play audit tool and their audit scores ranged from 29% to 96%. Newer playgrounds were found to have higher scores than older playgrounds and, in common with other studies, we found that destination playground audit scores were higher than neighborhood playground scores. The playgrounds were most lacking in wayfinding, layout, and signage features and in the provision of ramps for elevated play equipment. Most playgrounds provided some features for visitors with mobility impairments but ignored the needs of people with vision and cognitive impairment. Braille signage, audio messages, pictorial instructions, and more opportunities for sensory and cognitive play should be provided in the design of new playgrounds. The audit tool itself is heavily focused on features for able-bodied people; it allocates just 15.4% of the score to features that specifically address the needs of people with disability and these features primarily related to accessibility, particularly for visitors with mobility impairment. Only 3.8% of the score is allocated to inclusivity features, namely signage in braille and pictographs, color contrast playground markings, and sensory play opportunities. More inclusive audit tools that capture the needs of people with a wide range of impairment need to be developed. The input from children with disabilities and their caregivers will be critical in ensuring that the audit tools reflect the true usability of playgrounds.

The findings of this research can help local authorities involved in the provision of playgrounds to understand the needs of people with a wide range of disabilities so that future playgrounds are more inclusive and help the most vulnerable to enjoy their right to play. Despite the United Nations resolutions, few of the signatory countries have mandatory legislation to protect children's right to play, and greater efforts need to be made to address this shortcoming.

**Author Contributions:** Conceptualization, C.G. and C.F.; methodology, C.G.; software, C.G. and C.F.; validation, C.G. and C.F.; formal analysis, C.G. and C.F.; investigation, C.G. and C.F.; resources, C.G. and C.F.; data curation, C.G. and C.F.; writing—original draft preparation, C.F.; writing—review and editing, C.F. and C.G.; supervision, C.F.; project administration, C.F. All authors have read and agreed to the published version of the manuscript.

**Funding:** This research received no external funding.

**Institutional Review Board Statement:** The study was conducted in accordance with the Massey University Code of Ethical Conduct for Research and received Low Risk Notification ID 4000028004 dated 25 August 2023 from the Research Ethics Chair’s Committee of the Massey University.

**Informed Consent Statement:** Not applicable.

**Data Availability Statement:** The data supporting the reported results can be requested from the corresponding author.

**Conflicts of Interest:** The authors state that there were no conflicts of interest in this research.

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