



Deserts and oases:
How accessible is
childcare in Australia?

March 2022



About us

The Mitchell Institute for Education and Health Policy at Victoria University is one of the country's leading education and health policy think tanks and trusted thought leaders. Our focus is on improving our education and health systems so more Australians can engage with and benefit from these services, supporting a healthier, fairer and more productive society.

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Foreword

No Australian child should be left stranded in a childcare desert

The evidence is overwhelming on the impact of good quality early learning in fuelling children's development and giving them a great start in life.

The size of a child's brain reaches 90 per cent of an adult's by the age of five. These early years are critical for lifelong learning and well-being. Talking, reading, playing and singing with babies and toddlers is vital in shaping thinking and emotional patterns for life and influencing learning, relationships and resilience.

That's why this Australian-first analysis of childcare accessibility mapped against children aged 0 to 4 years is so critical – and its findings are stark.

This new research reveals where in Australia the demand for space in early childhood education and care (ECEC) outpaces local capacity to provide services, where 'childcare deserts' are found.

It shows us childcare deserts are disproportionately located in rural and regional areas and where there are higher proportions of children and families on lower income or below the poverty line.

Early learning can be a great equaliser for children, helping them start formal learning on an equal par with other children.

High quality early learning has a big impact on children from disadvantaged backgrounds as the education they receive provides the stimulation and development trigger that may not be readily available at home or surrounds.

Children and families in these areas are among the most likely to benefit from early learning, yet structural problems in the system have abandoned them without the access they need.

This is not just a report, it is a call to action for political leaders and our community.

We should insist on policies that will make Australia the greatest place in the world to grow up, and the greatest place in the world to be a parent.

Australia needs universally accessible high-quality and affordable early learning for every child, regardless of their postcode or family circumstances.



Jay Weatherill
CEO- Thrive by Five

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Part I: Executive Summary

Access to quality childcare is increasingly critical to Australian children, families and the economy. There are many anecdotal reports of families having difficulty finding appropriate childcare services, especially in regional Australia and some parts of our major cities. However, there is a lack of evidence exploring the nature and extent of the problem.

This report aims to help to fill this evidence gap by examining access to childcare in Australia. In this report, we are focussing on one type of childcare - centre-based day care, which is subsidised by the Commonwealth Child Care Subsidy (CCS) and is the service most used by children and families.

We measured the supply of childcare in almost every part of the country and compared this to the potential demand – the number of children who living in each neighbourhoods. We used spatial measurement techniques that enabled us to determine the relative accessibility of childcare in Australia and to determine where there are childcare deserts and oases.

Our analysis shows that where you live matters. Families in regional areas are the most at risk of suffering from poor access. There are also concerning correlations between access to childcare and socio-economic status.

Our analysis highlights that Australia needs new policy approaches to ensure that all Australian families can access the benefits of high quality childcare.

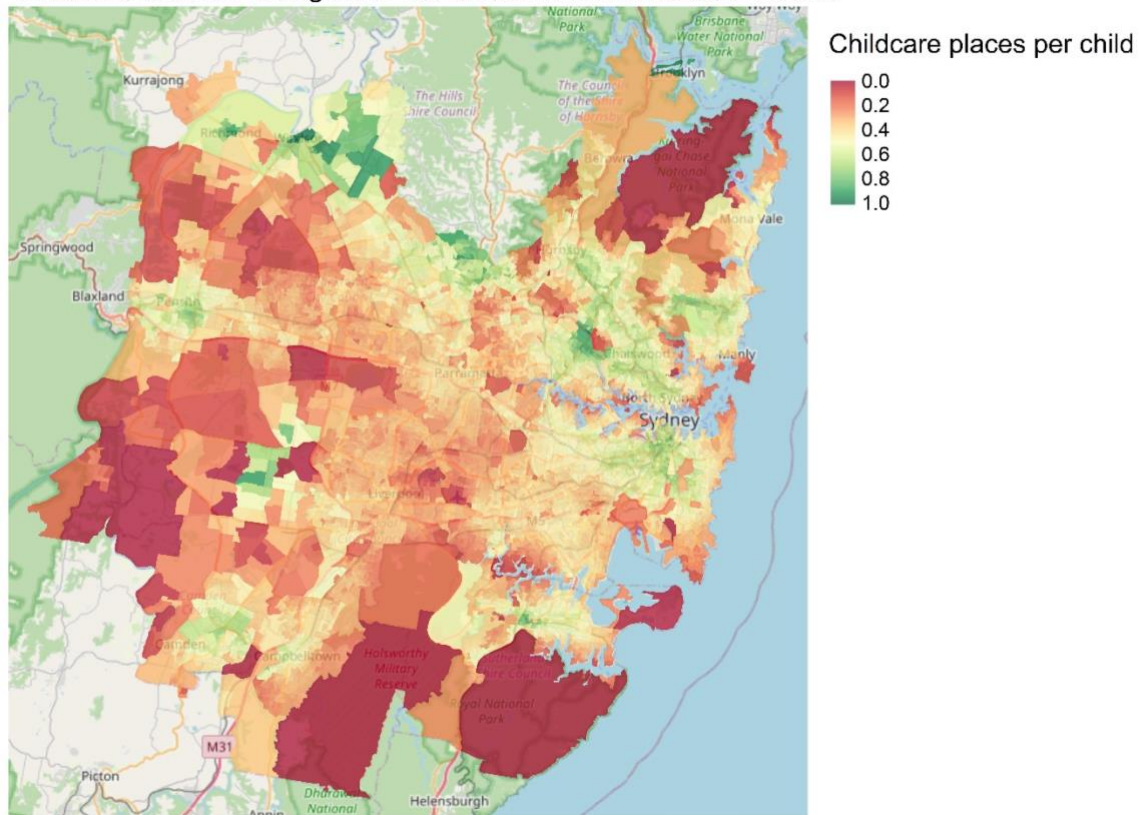
What did we find?

Our analysis shows that when it comes to childcare access, where you live matters. We found that about 9 million Australians, or 35.2% of the population, live in neighbourhoods we classify as a 'childcare desert'. A childcare desert is a term that comes from the early learning research literature and refers to areas where childcare is most scarce. The definition of a childcare desert is a populated area where there are less than 0.333 childcare places per child, or more than three children per one childcare place. About 568,700 children aged 0 to 4 years, or 36.5% of children in this age group, live in neighbourhoods we classify as a childcare desert.

Figure 1 below shows childcare accessibility for Sydney. Areas in yellow and green indicate higher levels of childcare accessibility. The areas in green we describe as 'childcare oases'. These are located in the centre of Sydney and in the more affluent areas in Sydney's east, inner west and north. There are also patches of green in suburban areas. These areas can be similar to neighbouring regions in terms of socio-economic status but have lower levels of culturally and linguistically diverse populations.

Figure 1: Childcare accessibility for selected areas of Sydney

Childcare deserts. Orange and red areas indicate childcare deserts



Areas of orange and red on this map indicate childcare deserts – where there are less than 0.333 childcare places per child, or more than three children per place. These are often in suburban and outer suburban regions. Compared to childcare 'oases' they generally have a greater relative disadvantage or a higher proportion of culturally and linguistically diverse populations.

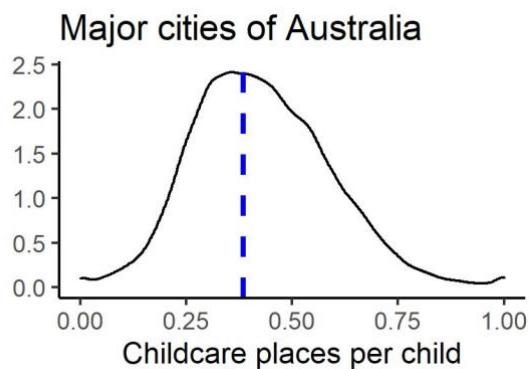
Childcare accessibility varies by region

The pattern for Sydney shown in the above map is typical for Australia's major cities. Families in regional and remote areas, however, are the most at risk of suffering from poor access to childcare.

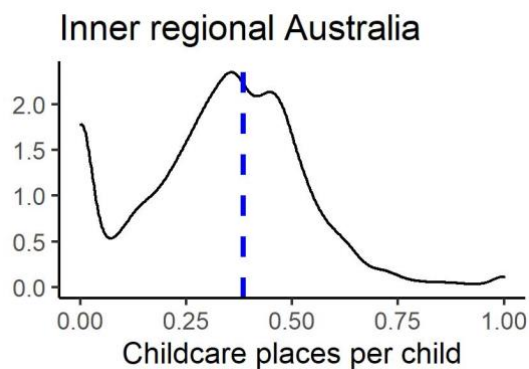
Figure 2 below shows several smoothed density estimates (which is a smoothed version of a histogram) of the ratio of available childcare places per child. The figure displays neighbourhoods in different areas of Australia, from major cities to very remote areas. The higher the line, the more regions with the number of childcare places per child. The national median of 0.38 childcare places per child also appears as a dashed blue line.

Next to each figure is an overview of what the shape of the line indicates about childcare accessibility for that region of Australia.

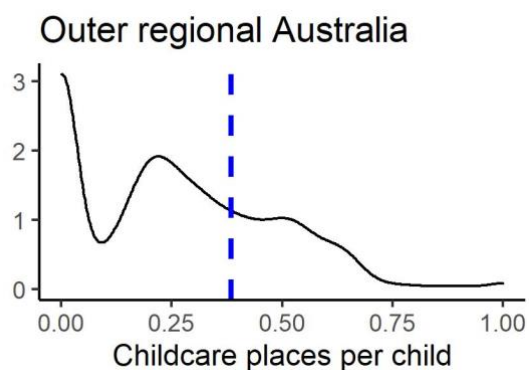
Figure 2: Smoothed density estimates of childcare places per child in Australian neighbourhoods by remoteness area



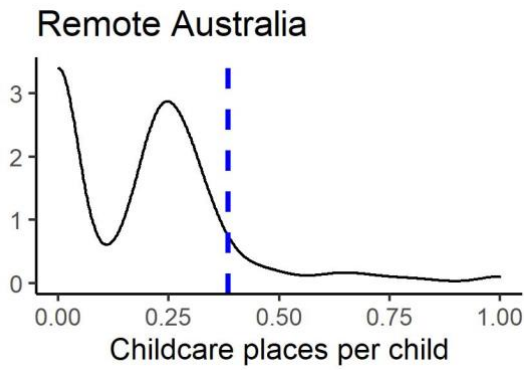
In major cities of Australia, there are very few neighbourhoods where there is no childcare supply. Accessibility gradually increases and peaks at around the national median before falling. The median for major cities of Australia is 0.42 childcare places per child. The line rises slightly at 1 childcare place per child indicating areas with very high levels of childcare supply. About 28.8% of the population live in areas classified as childcare deserts.



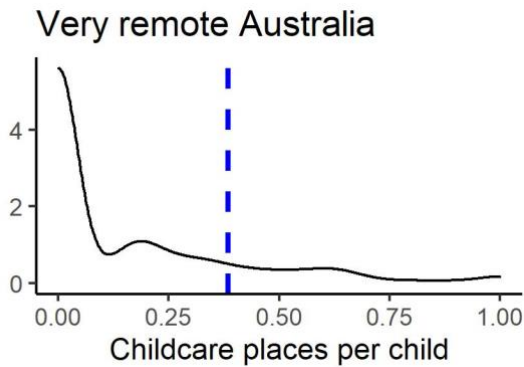
Inner regional Australia has a similar distribution of childcare accessibility to major cities with some important exceptions. First, the height of the line at the start indicates there are many areas where there is no childcare supply. Second, the median for inner regional Australia is less than major cities, at 0.35 childcare places per child. 44.6% of the population live in a childcare desert.



There are many areas where there is no childcare supply in outer regional Australia. Overall, childcare is scarcer in outer regional areas than nationally, and the median is 0.24 childcare places per child. However, outer regional areas have the highest proportion of neighbourhoods above 0.4 childcare places per child. This suggests that overall accessibility is low, but there are some parts of outer regional Australia with relatively high levels of childcare supply. 61.3% of the population live in a childcare desert.



Remote Australia has many areas with no childcare supply. Most of the line is either close to zero or below the national median, indicating there are few neighbourhoods with high levels of childcare supply. The median for remote Australia is 0.21 childcare places per child. At 85.3%, remote Australia has the highest proportion of the population living in a childcare desert

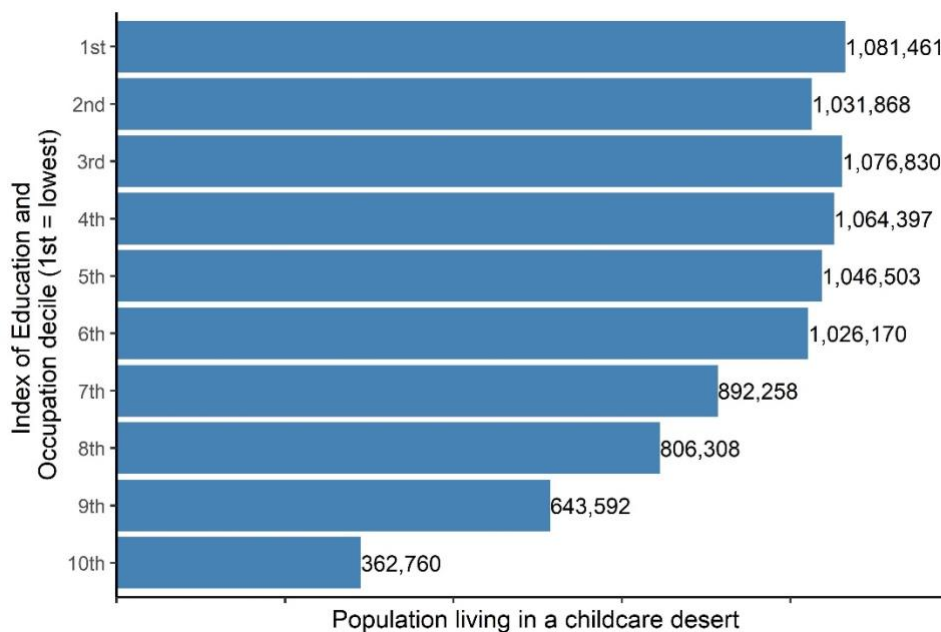


Childcare is scarce in very remote Australia. A majority of locations have no childcare supply – the median is 0 childcare places per child. 77.8% of the population live in a childcare desert.

More disadvantaged areas have lower levels of childcare accessibility

This research also shows that there are concerning correlations between access to childcare and socio-economic status. Figure 3 below shows the total population living in a childcare desert by the Index of Education and Occupation (IEO) decile. The IEO is one of the socio-economic indices used by the Australian Bureau of Statistics (ABS).

Figure 3: Population living in a childcare desert by Index of Education and Occupation decile



This figure shows that about 1 million people in each of the 1st to 6th IEO decile live in a childcare desert. This is about 40% to 47% of the total population in these deciles. The more advantaged areas have fewer people living in childcare deserts. In the 10th decile, the most advantaged parts of the country, about 363,000 or 13% of the population live in a childcare desert.

Implications of the research

Our research shows Australia's early learning system may not be fully meeting its aims. Current settings result in the low provision or an absence of provision in many areas. Regional and remote areas are especially at risk. About one million Australians have no access to childcare at all. The population centres most likely not to have any childcare accessible within a twenty-minute drive are towns with a population under 1,500.

When examining the relationship between cost and relative access, we found that areas with the highest fees also generally have the highest levels of childcare accessibility. This suggests that providers are not only establishing services where there are greater levels of demand, but where they are likely to make greater profits.

There is also an association between the accessibility of childcare and female workforce participation. Female parents with a child aged under 5 years who live in a childcare desert have lower levels of workforce participation.

While lower levels of female workforce participation in an area will affect demand for childcare, it may also be that difficulty in accessing childcare leads to parents and carers choosing not to participate in the workforce while their children are young.

One of the many functions of ECEC is to enable greater workforce participation. However, it is not clear that the current approach is fully supporting this aim.

There is an immense body of evidence highlighting the value of quality early learning. Our research suggests that in terms of access, Australia is not fully able to take advantage of this evidence base.

There is a need for new approaches to ensure all families have access to the early learning and care that they need to help children thrive.

Part II: Introduction and background

Childcare plays a major role in the lives of many children and families, so easy access to it is a critical issue. Childcare operates very differently from other parts of the education system and faces a unique set of challenges - the cost to families, availability of places, and retention of staff have been ongoing, prominent issues (Noble & Hurley, 2021). The coronavirus pandemic has meant the system has teetered on the brink of collapse – twice – requiring special government support packages.

While childcare can take different forms (such as family day care or outside school hours care), this report focuses on centre-based day care. This is because centre-based day care caters to very young children (aged 0-5) who are the focus of this report, and is by far the most accessed service type, providing education and care to almost one million children every year (DESE, 2019). In this report, we use the term childcare to refer to centre-based day care services that are covered by the Commonwealth Child Care Subsidy (CCS). When discussing the wider sector, we use the term Early Childhood Education and Care, or ECEC.

Although the usage figures demonstrate that many children benefit from centre-based day care, our research aimed to identify the extent to which this form of childcare is available locally, across the different states, cities and regions of Australia, and how availability varies by socioeconomic composition of the locality.

Early learning has a host of benefits for children, as well as for their families. Despite an established evidence base on the importance of the early years of every child's life to their ongoing development, the early learning sector faces a unique set of challenges. The cost to families, quality of provision, and retention of staff have been ongoing issues (Noble & Hurley, 2021).

Easy access to childcare services is also an important issue for many Australians, yet it is relatively under-researched.

Our research aims to help fill this gap by identifying the extent to which childcare is available locally, across different states, cities and regions of Australia, and how accessibility varies by the socio-economic composition of the locality.

Our research questions included:

- Which areas in Australia have the highest and lowest levels of access to childcare?
- Are there differences in accessibility in regional and remote Australia?
- What are the socio-economic dimensions of access to childcare?
- How does access to childcare affect workforce participation, especially female workforce participation?
- How does access to childcare compare with other parts of Australia's education system such as schools?

What do we mean by childcare?

What is most commonly thought of as childcare is centre-based day care, which provides education and care services to non-school aged children at specialised centres. Families whose children attend centre-based day care are supported by the Commonwealth Child Care

Subsidy (CCS), which is paid to childcare centres on behalf of families, who pay the difference between the subsidy and the fees charged by centres – known as the gap fee.

Services that provide education and care to young children that are funded by the CCS include:

- centre-based day care (full-day programs for children aged from birth to school age)
- family day care (full-day programs in educators' homes)
- outside school hours care (before-school, after-school and school holiday care for children aged between 5-12).

ECEC also includes preschool, which is not funded by the CCS.

In this report, we focus on one part of the ECEC sector – centre-based day care. This is because it is the largest part of the sector and the most accessed service type, providing education and care to almost one million children every year (DESE, 2019). Centre-based day care is also the largest service type covered by the Australian government's Child Care Subsidy (CCS).

What is the policy background to childcare?

While the childcare sector has grown substantially over the past three decades, services have existed in Australia for more than 100 years when not-for-profit organisations offered childcare to families in need. Unlike schooling, childcare was traditionally not viewed as a government responsibility. Government involvement in childcare has increased over time, primarily as a response to parental labour force participation.

Unlike the school sector (where schools normally cannot receive government funding if they are for-profit), private childcare providers can be for-profit and receive government support. About 50% of childcare providers are private for-profit and 35% are private not-for-profit. A further 11% are managed by state or local governments and 4% by non-government schools (ACECQA, 2022).

In terms of funding, there has been a gradual shift from the funding of the supply of childcare to the funding of demand, along with many changes to eligibility for subsidies. The most recent major reform has been to streamline two separate subsidies (the Child Care Rebate and Child Care Benefit) into a single, means-tested, and activity-tested payment. This began in 2018 and is now called the Child Care Subsidy. The means-tested element of the Child Care Subsidy means that families who earn less receive a greater subsidy.

The Australian government uses ‘activity tests’ to calculate the number of hours of subsidised childcare a family is entitled to each fortnight. Activities include paid work, volunteering, undertaking an approved course of education or study, an internship or training, or actively looking for work. Families must meet other requirements to be eligible for the CCS, such as caring for their child for a minimum number of hours per week, child immunisation requirements, and making a co-contribution to fees at an approved childcare service.

Who is responsible for ensuring access to childcare?

According to the Oxford Dictionary, for something to be accessible, it needs to be ‘easy to obtain or use and ... easily understood.’

It is widely acknowledged that Australia’s childcare system is not well understood by the public or always easy to use. Nor is it universally accessible for all families in terms of affordability, proximity, and availability of places without waiting lists or variable hours of operation.

As a recent report by the Centre for Policy Development (2021, p. 10) describes ECEC as:

“... difficult, expensive, and confusing for everyone to navigate. The range of services available for parents to choose from often does not reflect what would best meet the needs of children and families. In fact, it’s misleading to call this collection of services a “system” at all since the parts rarely connect well.”

In terms of access, individual providers largely determine the availability of childcare. Providers decide where they will operate and what fees to charge. This differs from school policy where there is an obligation for governments to provide universal access and there is more central planning.

Government policy focuses on establishing the rules and governance of the system and encouraging a mixture of providers to deliver services. The Australian Children's Education and Care Quality Authority (ACECQA), is the national body, with federal, state and territory

governance arrangements, responsible for guiding the implementation and management of the national system. There are some policies directed at ensuring that there is the provision of services in regional areas, particularly in Indigenous communities, and in some instances, local governments provide childcare. But it is largely childcare operators who to select where to operate.

How has the research literature explored childcare accessibility?

Access to childcare has been the subject of some exploration within the research literature. A focus of the research has been on equitable access which is defined as all families “with reasonable effort and affordability, can enrol their child in an arrangement that supports the child’s development and meets the parents’ needs” (Friese et al., 2017, p. 5). Research focusing on the provision of childcare in Europe has highlighted how geographical factors affect families’ decisions when it comes to finding childcare that is either close to their home or work (McLean, Naumann, & Koslowski, 2017). Factors include proximity, access to suitable transport, and the suitability of the provider in relation to the families’ work patterns and budget. Other factors such as the number of places available, cost, and quality, may have a geographical component if there is a need to travel further to access appropriate facilities (Langford, Higgs, & Dallimore, 2019).

Several studies have plotted access to childcare facilities, usually through the lens of availability and equity or affordability. There are some conflicting findings about the availability of childcare services in relation to median family incomes, or socio-economic status of communities, which could possibly be attributed to targeted policies. For example, Davis, Lee, and Sojourner (2019) found that low-income families in Minnesota have greater access to early learning services than mid- and high-income families. Whereas in another American study, Sandstrom et al. (2018) predicted the amount of additional subsidised childcare places needed for low-income families in four areas in the states of New York and Illinois by using census data. Their results show that there is limited childcare provision in many communities that have a high number of families eligible for childcare subsidies.

Kawabata (2011) identified a disparity between the supply and demand of childcare in Tokyo. Where access was limited, it was because no childcare services were within the boundary, providers did not cater to the age group (finding childcare for 0-2 year-olds was particularly challenging) or there was excess demand (more children than places). Chiuri (2000) found that childcare in Italy lacks the flexibility to meet the needs of full-time working parents (specifically mothers). Findings from Compton and Pollak (2014) reflect the difficulty families face to find suitable childcare when mothers return to work and the flow-on impact on labour supply. Their analysis showed that married women whose mothers or mothers-in-law could provide childcare were more likely to be working. These results highlight the challenges families face to find childcare that is accessible and available, and is consistent with the observation that policy is usually set at a national or regional level but the experience of variation is felt at the community level (Azuma, DeBaryshe, Gauci, & Stern, 2020).

Seminal research undertaken by the Centre for American Progress mapped the availability of childcare in eight US states, finding that 42% of children under five years old live in an area classified as a childcare desert (Malik & Hamm, 2017). The authors defined a desert as more than 50 children under the age of five (and their families) residing within a postal/ZIP code where there are no childcare services, or childcare provision is so limited that there is a ratio of more than 3 children for each childcare place (Malik & Hamm, 2017; Malik, Hamm, Adamu, & Morrissey, 2016). Almost half (48%) of the postal/ZIP codes that were analysed were found to be childcare deserts, indicating a significant issue for governments, families, and workforce participation. When focusing on the quality of childcare provision, as determined by each of

the eight state's quality rating and improvement systems, only 16% of childcare services were in the top tier of quality. This finding alludes to the complexity of childcare accessibility – not only is there a lack of childcare in many regions, finding quality services is incredibly challenging. Rural localities face the most severe childcare shortage with 54% of rural postage/ZIP codes classified as childcare deserts. Of these, around two-thirds have a total absence of childcare providers. Interestingly, this is in spite of rural and non-rural postage/ZIP codes having approximately the same number of children under the age of five within their boundaries, showing that population alone may not determine access. In a more recent publication, researchers have been able to account for arbitrary administrative limitations, such as postal/ZIP codes and allow weighting to preference childcare that is closer.

Part III: How did we undertake the research?

To measure the spatial accessibility of childcare services across Australia, we used an extended two-step floating catchment area method (E2SFCA).

Floating catchment areas essentially measure the supply and demand of services based on the number and capacity of a service (supply or potential supply) and the population using these services (demand or potential demand).

Researchers have used floating catchment area approaches to measure spatial accessibility of a range of services, such as healthcare provision, access to parks, and access to childcare (Davis et al., 2019; Gao, Jaffrelot, & Deguen, 2021; Hu, Song, Li, & Lu, 2020). Floating catchment areas have strengths compared to other area-based measures, which can be limited to analysing data using arbitrary boundaries, such as suburbs or local government areas.

For instance, a popular area-based measure of spatial access to childcare typically measures access using the ratio of the total capacity of providers in an area divided by the estimated number of children in that area. These boundaries may not accurately affect accessibility as experienced by a family. An example would be a household where there is a childcare centre on the opposite side of the road that is also in a different local government region. Measures based on local government areas would exclude the facility across the road when measuring the number of childcare places available to the household, potentially misrepresenting the level of accessibility.

Instead, the approach taken in this report establishes a 'floating catchment area' based on a set of parameters, such as distance or driving time. This means the definition of accessibility more accurately reflects household access to childcare and overcomes limits caused by using artificial boundaries.

In our study, we adapt the approach taken by Davis et al. (2019) who use the parameter of 20 minutes of travel time between households and childcare locations to determine accessibility.

For regional areas, we use the measure of 20 minutes travel time to determine accessibility. For metropolitan areas, however, we use the measure of 10 minutes driving time to more accurately account for traffic conditions, which are not reflected in the calculations by the software we used¹.

In order to undertake the analysis, we needed to determine the location and capacity of childcare centres (potential supply) and the location and population of children aged under five (potential demand) who would use childcare.

Table 1 below outlines the steps used to calculate the supply and demand parameters.

¹ The software used calculates travel time when there is no traffic. This may lead to inaccurate measures of accessibility in metropolitan areas as normal traffic conditions significantly increase travel times.

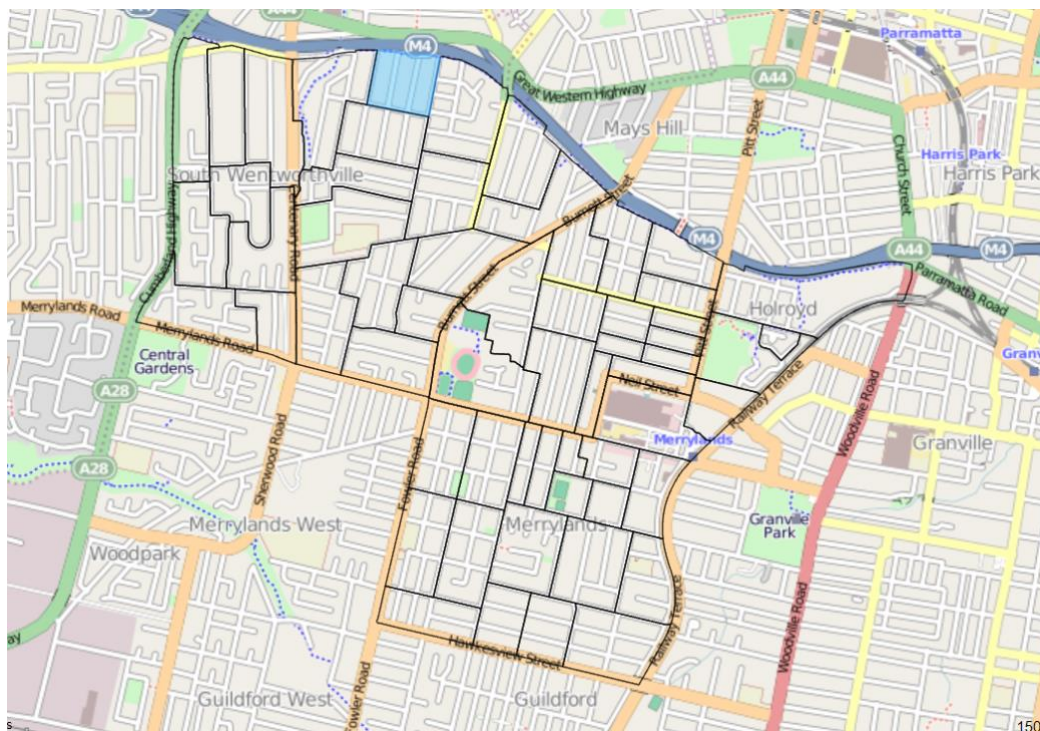
Table 1: Overview of process to determine potential supply and potential demand for two-step floating catchment area

Calculating supply (number of available childcare places)	Calculating potential demand (number of children)
<ol style="list-style-type: none"> 1. Use ACECQA register to determine the number and capacity of approved ECEC facilities. 2. Select ECEC services that offer centre-based day care. 3. Determine services that are open less than 8 hours a day and 5 days a week and adjust the number of approved places (for instance, services open 4 hours a day five times a week would have their capacity multiplied by 0.5). 5. Use registered address to determine longitude and latitude of service. 	<ol style="list-style-type: none"> 1. Use ABS census data to determine the number of children aged 0 to 4 years living in a neighbourhood (SA1 regions). 2. Calculate the proportion of SA2 population living in each neighbourhood. 3. Adjust for preschool enrolments by determining the number of 3 and 4-year-olds in each SA2 enrolled in non-centre-based day care services, then subtracting these enrolments pro-rata. 4. Apportion 2020 SA2 0 to 4-year-old population to neighbourhood. 5. Use SA1 centroids to determine the longitude and latitude of neighbourhoods.

All locations were geocoded to determine their longitude and latitude. We then calculated the travel time between the neighbourhood and centre-based day care locations.

For neighbourhoods, we used the centroid of the SA1 region as the origin point. For instance, the figure below shows the suburb of Merrylands in Sydney. This suburb consists of 60 SA1 regions as outlined in black. The centre point of each of these SA1 regions formed the origin points and the location of the childcare service in Greater Sydney were the destination points.

Figure 4: Neighbourhoods (SA1) of Merrylands, NSW



We then constructed a matrix of travel time using the osrm package in r.

There are about 57,000 SA1 regions in Australia and more than 8,700 childcare centres, which would result in a matrix of almost 500 million possible results. To make the calculations more efficient, we calculated states and territories individually. We also calculated Greater Sydney as a separate area from New South Wales because of the larger number of neighbourhoods and childcare centres. Border communities were included in the calculations for NSW, the ACT, Queensland and Victoria.

Once travel times were obtained, we then used the SpatialAcc package in r to calculate the overall accessibility of each neighbourhood.

There were about 603,000 total approved childcare places across Australia and 1.55 million children aged 0 to 4 years old. When this is adjusted to account for centres that are open less than forty hours per week and for children who attend preschool, the potential supply of childcare is about 602,000 and the potential demand is 1.52 million children. This results in a ratio of about 0.396 childcare places per child. The extended two-step floating catchment area method essentially apportions this ratio across neighbourhoods.

The first step of the two-step floating catchment process involved calculating a weighted capacity to population ratio for every childcare service. For every service, all neighbourhoods within a ten-minute drive for metropolitan areas and a twenty-minute drive for regional areas were identified. We used an exponential decay function so that neighbourhoods closer to the service received more weighting. For instance, in regional areas, a neighbourhood within a five-minute drive of a service had a 50% greater weighting than neighbourhoods that were twenty minutes away. The number of approved places for each service was divided by the sum of the weighted total number of children to obtain a capacity-to-nearby child population ratio for every provider.

The second step of the two-step floating catchment process involves determining the quantity of supply for each neighbourhood. This is done by identifying all services within the catchment area around the neighbourhood. The same weighting was applied so that a childcare service within a five-minute drive of a neighbourhood had a 50% greater weighting than services that were twenty minutes away in regional areas, and in metropolitan areas, a childcare service 2.5 minutes away received 50% more weighting than a childcare service 10 minutes away.

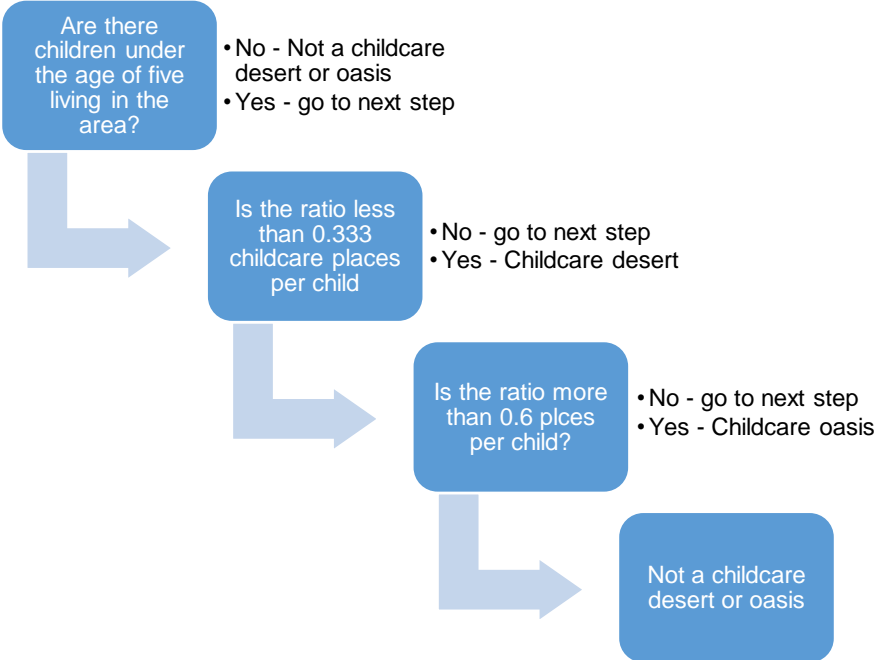
The result of the analysis is a score for each neighbourhood that is a ratio of available childcare places per child. For instance, a score of 0.5 suggests that for that neighbourhood there were 0.5 childcare places available per child, or two children per available childcare place.

We used this figure to determine whether a region was a childcare desert or a childcare oasis. The working definition for a childcare desert is where there are fewer than 0.333 childcare places per child. This follows established definitions used elsewhere in the literature for a childcare desert (Davis et al., 2019).

The working definition for a childcare oasis is where there are more than 0.6 childcare places per child. We chose this definition because 0.6 places per child would enable three full days of childcare per child (where each full place of childcare is the equivalent of five days, 0.6 is the equivalent of three full days). Three full days of childcare appears elsewhere in policy proposals that support universal access to childcare (Centre for Policy Development, 2021).

A flow chart outlining the process used to determine whether a region was desert or oasis is below.

Figure 5: Flow chart to determine childcare deserts and oases of neighbourhoods



Accounting for preschool

A complicating factor in calculating childcare accessibility is that most children will be attending preschool in either the year or two years before school. This can have an impact on the potential supply of childcare (as some services may offer childcare and preschool) and potential demand for childcare services (as some children may require less childcare as they will be attending preschool).

Our approach can account for children attending preschool in a centre-based day care provider because these services appear on the national register and, consequently, the calculation of potential supply includes these approved places. However, many children may attend a stand-alone preschool or a preschool at a school.

To account for children attending preschool in non-centre-based day care services, we used information from the national collection on preschool enrolments. We identified the number and location of children aged three and four years enrolled in a stand-alone preschool. We then adjusted the potential demand to account for the time where children would be attending a stand-alone preschool.

For instance, if a region had 100 three and four year olds enrolled in a stand-alone preschool, this would equate to approximately 30 full-time equivalents (100 children x 0.3 of the week enrolled in preschool = 30 full-time equivalents) and the potential demand is adjusted to 70.

Limitations

All research has limitations that may affect the interpretation of results.

To determine accessibility, the methodology uses driving time distance and not time by walking or public transport. Driving time relies on the accuracy of information from OpenStreetMap, which is a free editable geographic database. We calculate supply based on data from ACECQA and services not listed on the national register are not included. The data we used is from December 2021 and our findings will not reflect changes after this date. We exclude family day care and in-home care from our analysis, which may affect calculations of supply. We also exclude informal care, which includes unpaid care usually provided by relatives, such as grandparents, or friends and neighbours. We exclude five year olds from calculations of demand, although some five year olds will not yet be at school and may be using centre-based childcare services. Our methodology calculates accessibility based on where a family lives and not where they work, although some families may choose childcare services closer to work. ABS data shows that about 16% of families chose a childcare service because it was close to our on the way to work (ABS, 2018).

Despite these limitations, we believe the approach provides a strong methodological grounding to illustrate the relative scarcity of childcare by neighbourhood and to make valid comparisons across Australia.

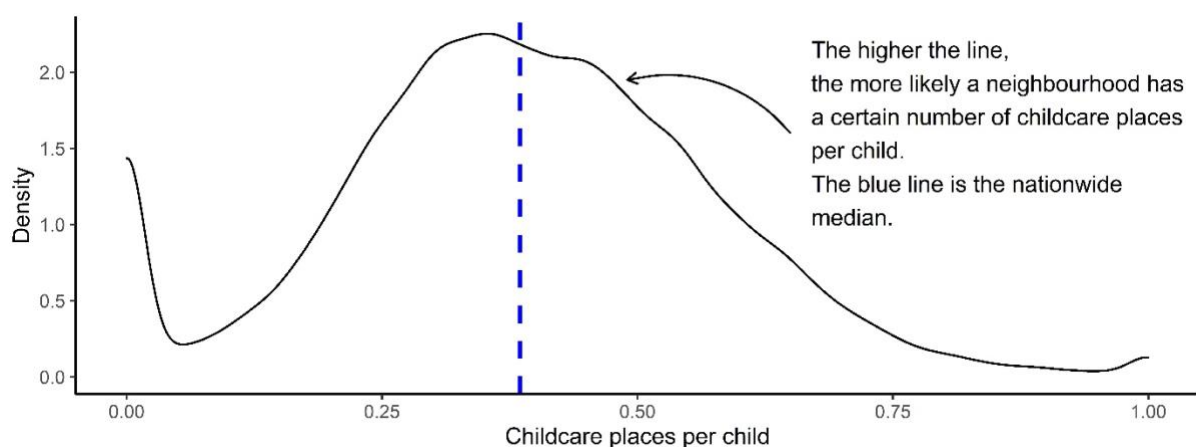
Part IV: Results and findings

How accessible is childcare in Australia?

Our findings show that where Australian families live plays a major role in access to childcare.

Figure 6 below shows a density estimate, which is a smoothed version of a histogram, of the ratio of available childcare places per child for more than 57,000 neighbourhoods in Australia. The higher the line, the more regions with the number of childcare places per child. This figure also highlights the median, which appears as a dashed blue line.

Figure 6: Smoothed density estimate of childcare places per child in Australian neighbourhoods



There are a large number of regions, about 3,600, that have no childcare places available per child. Many of these regions are located in regional and remote Australia.

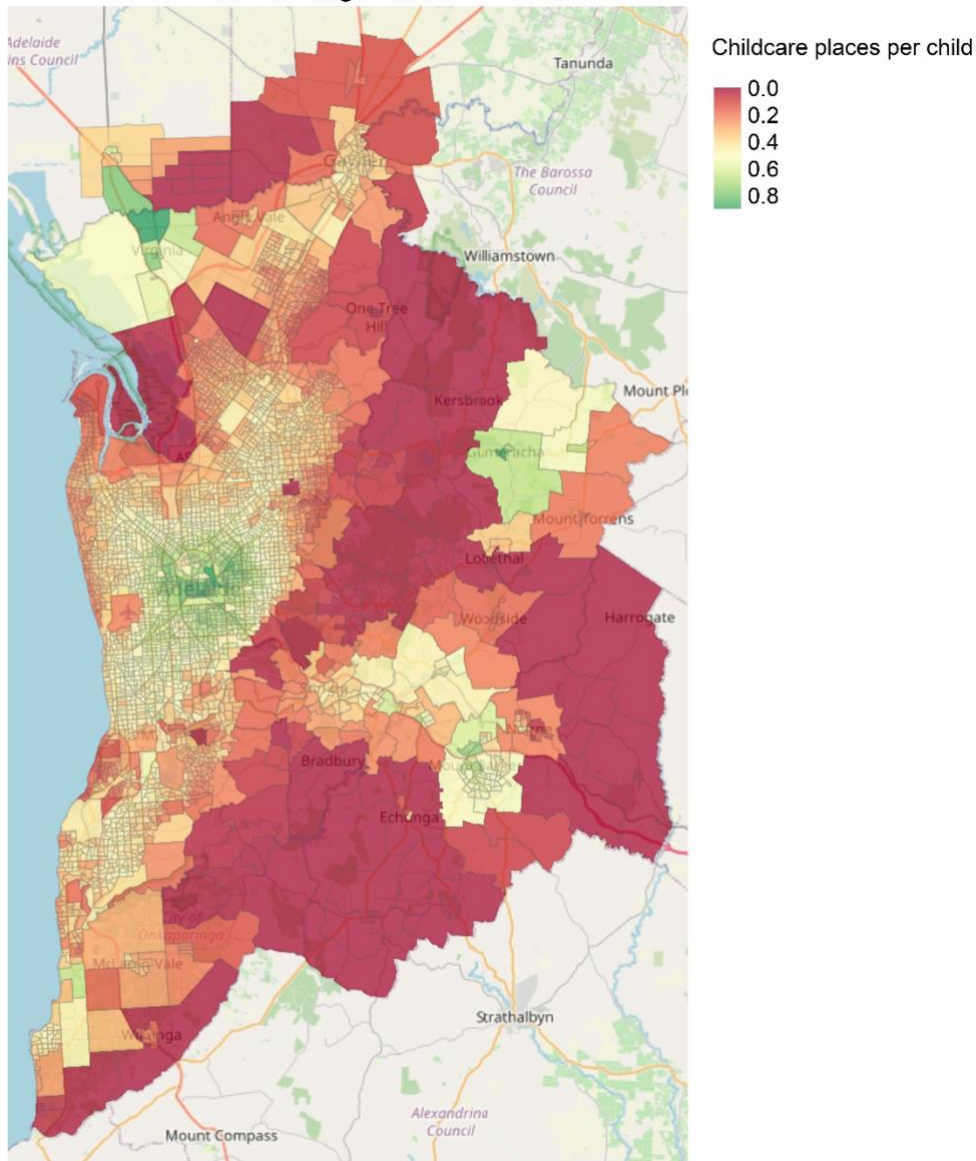
The figure shows that the accessibility score peaks at about 0.37 childcare places per child before gradually falling. The median score is 0.385 childcare places per child.

Our method means every neighbourhood in Australia receives an accessibility score of childcare places per child and this makes it possible to represent these scores on a map.

Figure 7 below shows the results of mapping the neighbourhoods of Greater Adelaide. The areas highlighted in red and darker orange are areas of lower childcare accessibility - regions we classify as deserts. The areas of green have the greatest childcare accessibility scores and are neighbourhoods we classify as childcare oases.

Figure 7: Childcare accessibility of Greater Adelaide

Childcare deserts. Orange and red areas indicate childcare deserts

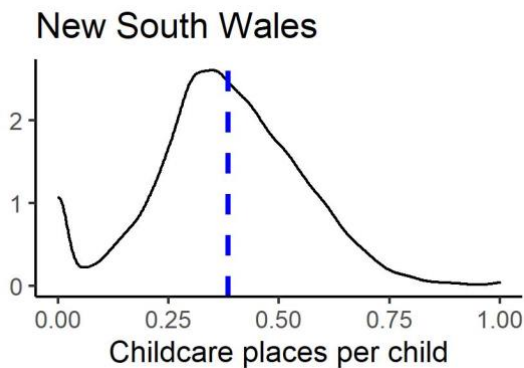


The pattern shown in the above figure of Greater Adelaide is typical of childcare accessibility in Australia's major cities. The centre of cities, close to central business districts, have the greatest accessibility, indicated on the map in green. There are pockets of green elsewhere in the city indicating neighbourhoods with relatively high childcare access. The orange and red areas indicate childcare deserts and are located throughout the city. Some outer regions appear as dark red and are areas where there is very little or no childcare available. These areas also often have fewer people living in them.

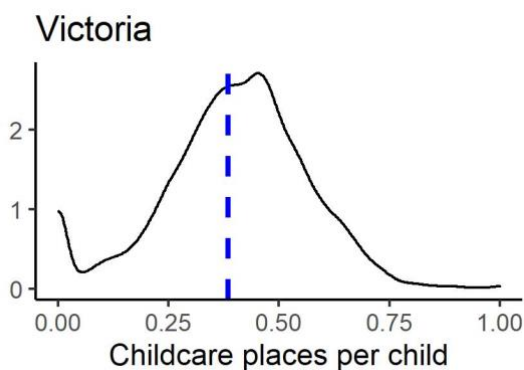
How does childcare accessibility compare between states and territories?

Our analysis shows that states and territories have a different profile of childcare accessibility. To explore these differences, the figures below show a density estimate of childcare places per child for each state and territory, similar to Figure 6. The shape of the curve helps illustrate the distribution of accessibility across neighbourhoods in each state and territory and makes it possible to make comparisons. The national median appears on each plot as a dashed line to allow a better comparison. Curves that peak to the left of the blue line indicate overall accessibility lower than the national median, and curves that peak to the right of the blue line indicate overall accessibility higher than the national median.

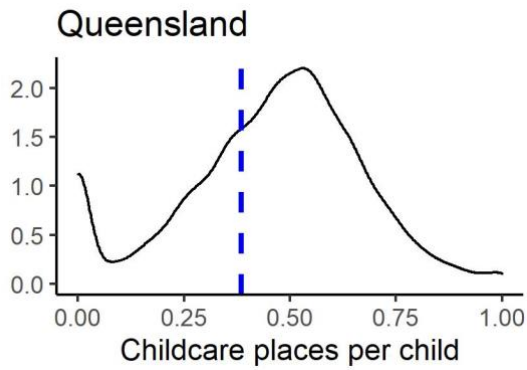
Figure 8: Smoothed density function of childcare places per child by state and territory



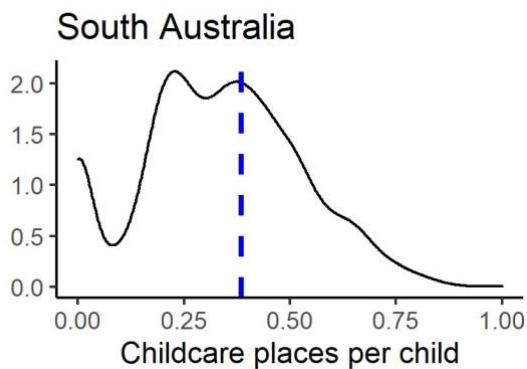
New South Wales has slightly lower childcare accessibility than the rest of Australia with a median of 0.37 childcare places per child. The shape of the density plot is similar to the Australia wide figure shown in Figure 6 suggesting a similar distribution of accessibility across neighbourhoods.



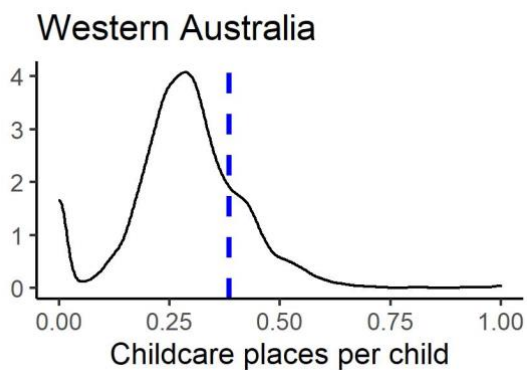
The peak above the national median shows that Victoria has a greater level of childcare accessibility. The Victorian median is 0.41 childcare places per child. The shape of the density plot is similar to the Australia wide figure suggesting a similar distribution of accessibility across neighbourhoods.



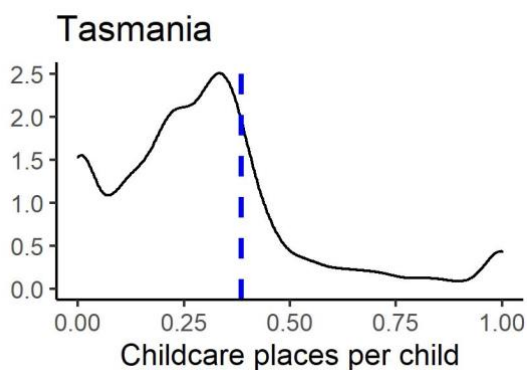
In this figure, the peak is above the national median and helps to illustrate how Queensland has some of the highest levels of childcare accessibility in the country. The Queensland median is 0.48 childcare places per child, well above the national median.



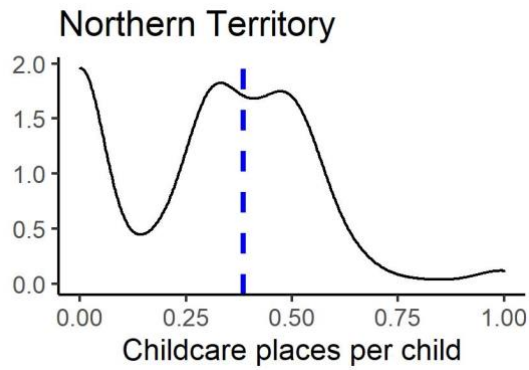
South Australia has two peaks suggesting accessibility clustering around 0.2 childcare places per child and another around the national median. The median in South Australian neighbourhoods is 0.34 childcare places per child, below the national median.



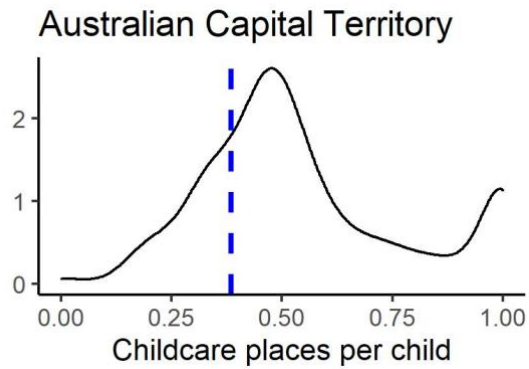
Western Australia has the lowest overall childcare accessibility, with a peak below the national median. The peak is also higher than other states and territories (indicated by the different y-axis scale) suggesting greater clustering of neighbourhoods around the Western Australian median of 0.28 children per childcare place.



Tasmania has relatively low levels of childcare accessibility with the peak occurring below the national median. The shape of the curve suggests Tasmania has a higher number of neighbourhoods compared to other states and territories in the range of 0.05 to 0.2 childcare places per child.



The peak at 0 shows that many regions in the Northern Territory do not have any childcare supply. This may be due to the high number of remote and very remote locations in the Northern Territory. The median for the Northern Territory is 0.32 childcare places per child, below the national median.



Like Queensland, the ACT has some of the highest levels of childcare accessibility in the country. There are very few neighbourhoods with no supply of childcare and the ACT has the highest proportion of neighbourhoods with 1 childcare place per child.

Where are Australia’s childcare deserts?

Our analysis shows that about 9 million Australians, or 35.2% of the population, live in neighbourhoods we classify as a childcare desert. About 568,700 children aged 0 to 4 years, or 36.5% of children in this age group, live in neighbourhoods we classify as a childcare desert. These are populated areas where there are less than 0.333 childcare places per child or more than one childcare place per three children. There are deserts in all states and territories, and in all capital cities.

Table 2 below shows the composition of the population living in childcare deserts by their remoteness area. There are five remoteness areas: major cities, inner regional, outer regional, remote, and very remote. About 59.0% of people living in childcare deserts, or 5.36 million, are located in major Australian cities. Inner regional areas comprise 22.4% of people, or 2.03 million, living in childcare deserts and outer regional areas comprise 14.0% of people, or 1.26 million. The remaining proportion of the population living in childcare deserts are in remote and very remote areas of Australia as outlined in the table below.

Table 2: Composition of the population living in a childcare desert by remoteness area

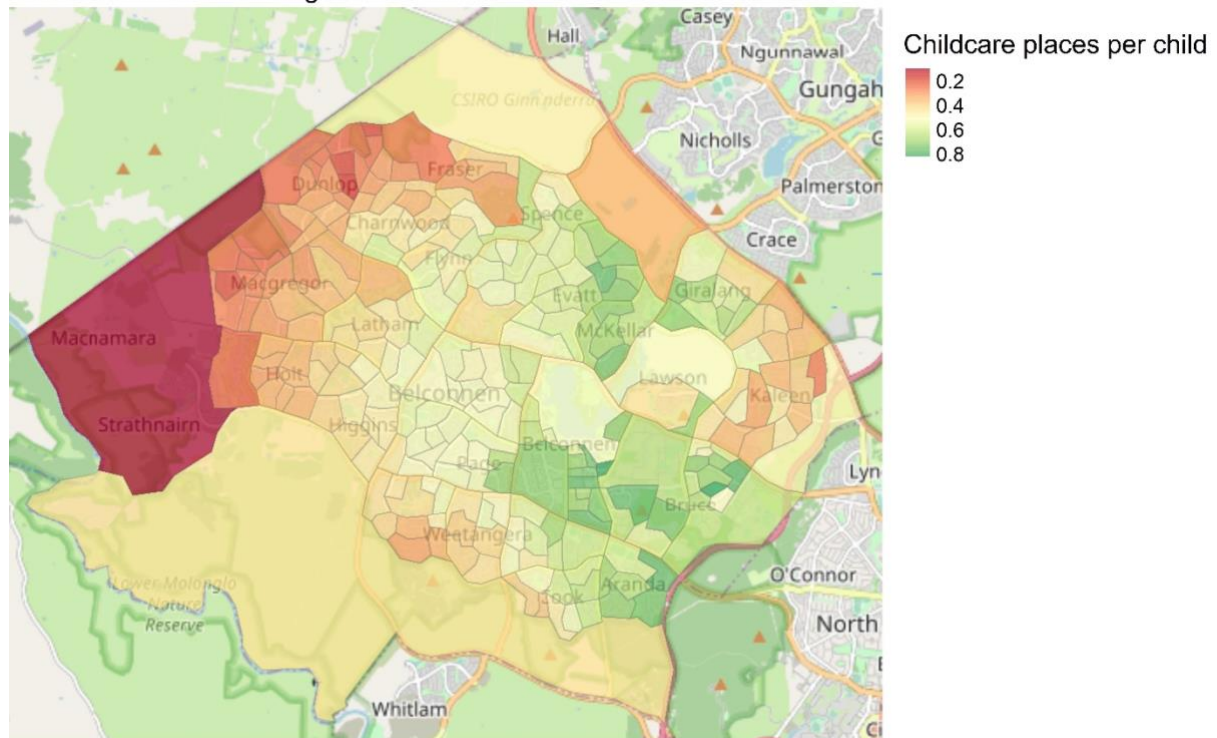
Regional area	Population	Proportion of deserts	Proportion of regional area as desert
Major cities	5,360,547	59.0%	28.8%
Inner regional	2,028,944	22.4%	44.6%
Outer regional	1,264,269	14.0%	61.3%
Remote	248,451	2.7%	85.3%
Very Remote	152,738	1.7%	77.8%
Total	9,054,949	100.00%	35.3%

As most Australians live in major cities, it is also important to explore the proportion of the population in different regions who live in childcare deserts. While regional and remote areas make up less than 50% of childcare deserts, people in regional and remote areas are more likely to live in a childcare desert, with 44.6% and 61.3% of people living in inner regional and outer regional areas respectively located in childcare deserts. Australians living in remote and very remote regions are highly likely to be living in a childcare desert. This table helps highlight the regional disparities in access to childcare. Comparatively, major cities in Australia have greater access to childcare than other parts of Australia.

It is also important to highlight the different meanings of a desert in metropolitan areas versus regional areas. The figure below shows the results of the analysis for the Belconnen region (SA3) in Canberra. The ACT has some of the highest average levels of childcare accessibility in Australia.

Figure 9: Childcare accessibility in Belconnen, ACT (SA3)

Childcare deserts. Orange and red areas indicate childcare deserts

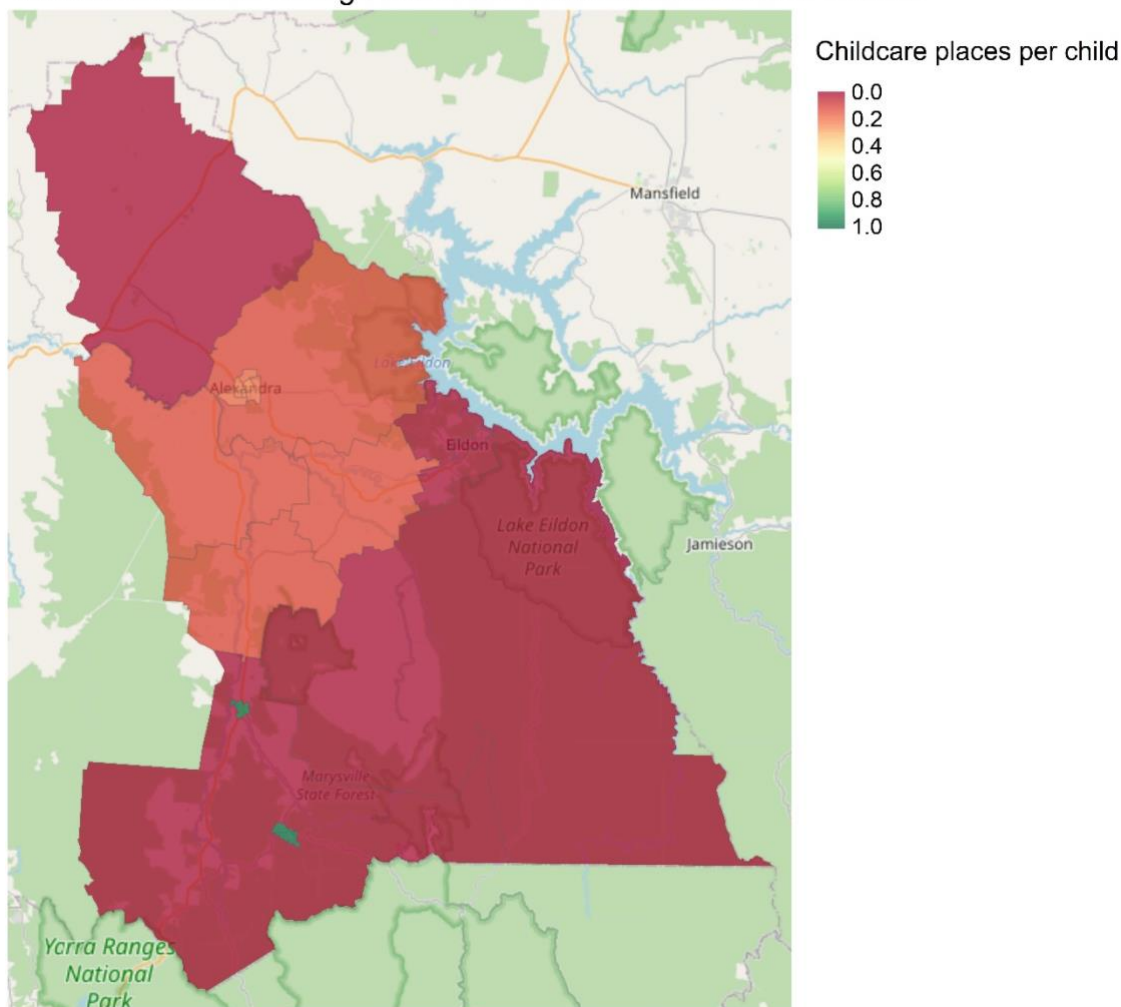


Some parts of the suburbs of Fraser, Dunlop and McGregor, on the left of the map, meet our definition of a childcare desert. Families living in these suburbs can still access childcare, but they may have to travel further or may face more competition for available places than families living closer to the centre of Canberra.

In rural and regional areas, however, a childcare desert can have a different meaning. The figure below shows the childcare accessibility for the region (SA2) of Alexandra in Victoria. This region also includes the townships of Buxton and Marysville, which appear in green at the bottom of the figure and are about a 30-minute drive from Alexandra.

Figure 10: Childcare accessibility in Alexandra, Victoria (SA2)

Childcare deserts. Orange and red areas indicate childcare deserts



This figure shows that the town of Alexandra meets the definition of a childcare desert. There is one childcare centre located in Alexandra, with 29 approved places. Families are highly reliant on this service and if there are no available places at the childcare centre, families do not have the option of selecting another local provider. The next nearest provider is located in Marysville or Yea, which are about a half-hour drive from Alexandra.

While metropolitan and regional neighbourhoods can have similar accessibility scores, the lack of childcare can have different consequences. In major cities, childcare deserts indicate relatively low levels of spatial accessibility to childcare, but there are more possibilities to access childcare. In regional Australia, childcare deserts also indicate relatively low levels of spatial accessibility to childcare, but with fewer options if there are no vacancies at local providers.

Where are Australia’s childcare oases?

As shown in Table 3, our analysis shows about 3.3 million Australians, or 12.7%, live in an area we classify as a childcare oasis. About 174,000 children aged 0 to 4 years, or 11% of children in this age group, live in areas we classify as childcare oases.

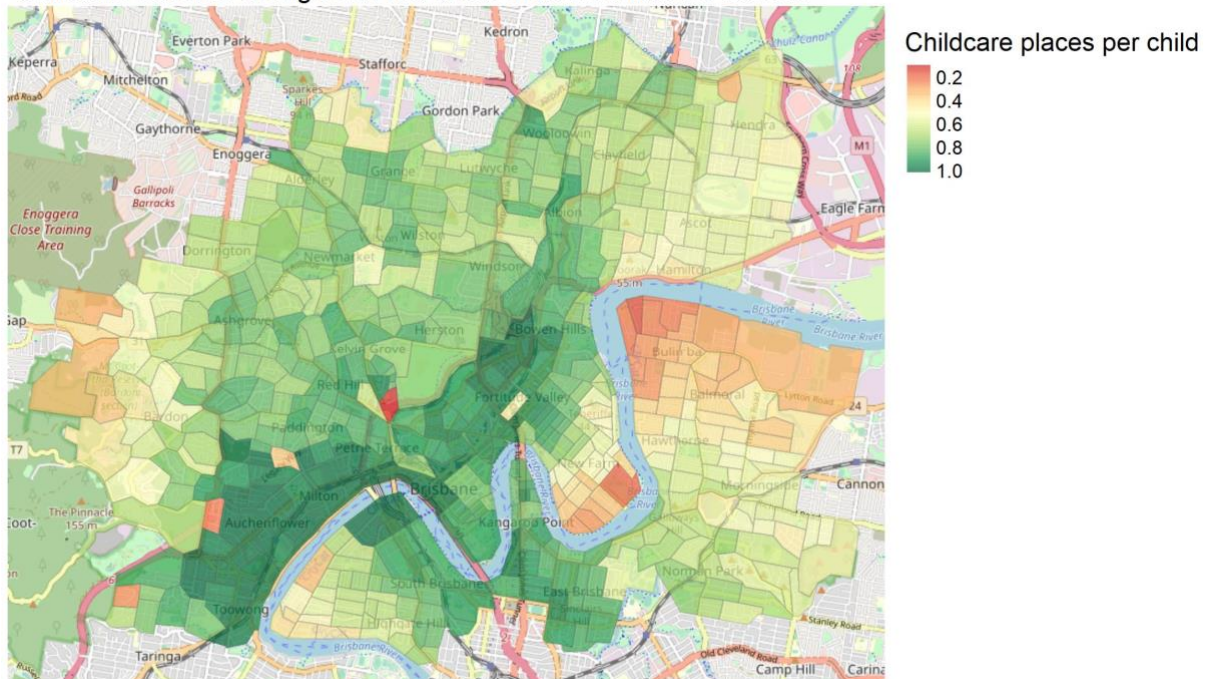
Table 3: Composition of the population living in a childcare oasis by remoteness area

Regional area	Population	Proportion of oases	Proportion of region as oasis
Major cities	2,799,055	85.5%	15.1%
Inner regional	293,898	9.0%	6.5%
Outer regional	156,277	4.8%	7.6%
Remote	13,560	0.4%	4.7%
Very Remote	12,325	0.4%	6.3%
Total	3,275,115	100.0%	12.7%

A childcare oasis is somewhere where there is a relatively high level of access to childcare (we use the definition of 0.6 childcare places per child). Our methodology calculates accessibility based on where families live and not where they work. However, many families may choose to use child care close to their employer. Consequently, a childcare oasis is often located in regions with a large number of jobs. For instance, the figure below shows the childcare accessibility for the region (SA4) of Brisbane – Inner City. The areas of green indicate a childcare oasis.

Figure 11: Accessibility of childcare for Brisbane – Inner City

Childcare deserts. Orange and red areas indicate childcare deserts



As this map shows, the centre of the city around the Brisbane CBD has relatively high childcare accessibility. The pockets of orange in the east of the city, in New Farm and Bulimba, are areas where there are relatively lower levels of access to childcare. These areas can have lower childcare accessibility than nearby areas because there are fewer centre-based day care providers they can reach within a ten-minute drive.

The centres of major cities are not the only locations of childcare oases. As Table 3 above shows, many regional areas are in a childcare oasis. These regional locations can be major service and employment hubs for regional and remote communities. The existence of a childcare oasis in some of these locations illustrates the variability of services available in regional areas. While some small towns may have a plentiful supply, others can be lacking.

What are the socio-economic dimensions of childcare accessibility?

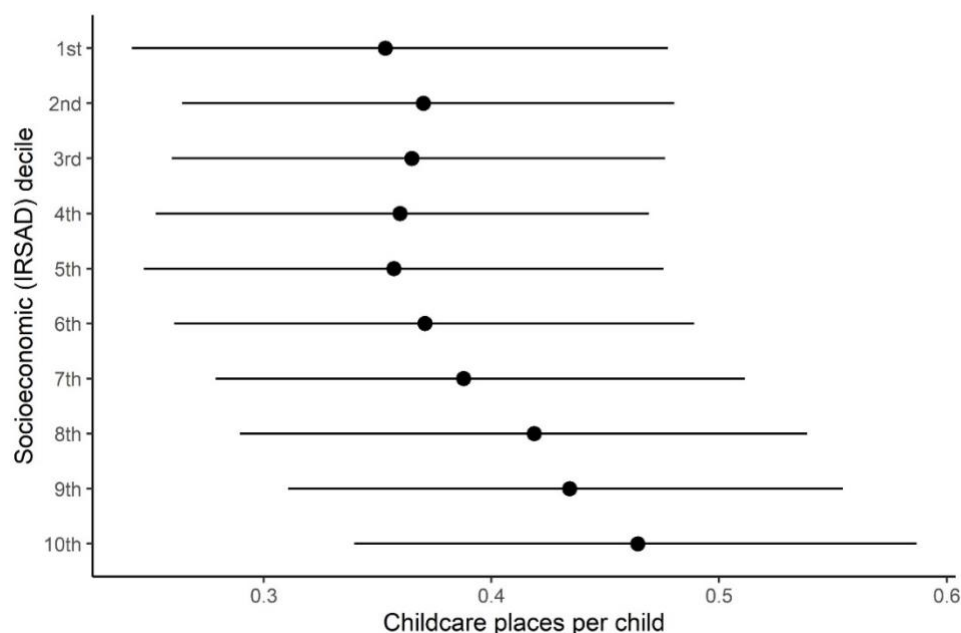
Childcare access by socio-economic status is an important area of exploration. Researchers in other countries have noted a correlation between lower socio-economic areas and lower childcare availability (Davis et al., 2019). Areas of higher socio-economic advantage also often have higher levels of access to employment, transport, and other services such as healthcare.

To explore this issue, we examined the relationship between childcare access, neighbourhoods and the Index of Relative Socio-Economic Advantage and Disadvantage (IRSAD). IRSAD is a measure created by the Australian Bureau of Statistics (ABS) that summarises information about the economic and social conditions of people and households within an area, including both relative advantage and disadvantage measures. Measures used in the compilation of the scores include variables relating to level of education, income, labour force status, disability, home ownership and the number of bedrooms in a house.

We matched neighbourhoods to their IRSAD decile, where 1 indicates the decile with the highest disadvantage and lowest advantage, and 10 indicates the decile with the lowest disadvantage and the highest advantage. We then calculated the median for each IRSAD decile.

The results of the analysis appear in Figure 12 below. In this figure, the median for each decile appears as a dot and the lines represent a range from the 25th to 75th percentile of childcare places per child for each decile group.

Figure 12: Childcare places per child by socio-economic (IRSAD) decile



This figure shows that for neighbourhoods in the first to the sixth decile, there are relatively lower levels of childcare accessibility, with the median childcare accessibility at around 0.35 places per child for IRSAD deciles 1 through to 6.

But from the seventh decile upwards, the top 40%, as the IRSAD deciles increase so does the median number of childcare places available per child. In the 10th decile, the average number of childcare places per child is 0.46. This suggests that it is the most advantaged neighbourhoods in Australia that have the greatest childcare access.

This is an important finding, especially in the context of Australia's ECEC policy. The main subsidy families receive, the CCS, is weighted so that families who earn less receive the greatest level of subsidies.²

This figure shows that access to childcare works the other way – it is the more advantaged areas that have the best access.

This could be due to many factors. For instance, there may be lower levels of parental and carer employment in lower socio-economic areas that lead to lower demand for childcare services. Nonetheless, it does suggest that families in lower socio-economic neighbourhoods have lower access to childcare than those living in more advantaged neighbourhoods.

This is particularly concerning because there is a huge body of evidence that shows positive early childhood experiences lead to positive outcomes. High-quality early childhood education and care at an early age enables children, particularly from disadvantaged backgrounds, to succeed later in life. Figure 12 suggests that, overall, it is the children and families who would benefit most from high-quality childcare who have the least access.

² As previous Mitchell Institute research has shown though, while there are greater subsidies to those families who earn less, those families often can afford childcare the least (Noble & Hurley, 2021).

What is regional access to childcare like and how does this compare to schools?

This next section compares the overall impact on accessibility in regional areas due to different policy approaches, with a focus on comparing accessibility to schools and childcare in regional settings.

To do this, we calculated the driving time between all Australian schools and childcare facilities. We identified those schools where there are no childcare services within a twenty-minute drive.

This helps identify where there are communities that may be large enough to support a school but do not have a childcare service.

We found there were 976 schools where there was childcare within a twenty-minute drive. There were eight childcare centres where there was no school in a twenty-minute drive.

Many regional schools have very low enrolment numbers, and the existence of a school may not suggest possible demand for childcare services. For further analysis, we excluded non-government schools, primary schools with an enrolment below 50 students, and combined schools (schools that provide both primary and secondary education) with an enrolment below 100 students.

We identified 247 schools (131 primary schools and 116 combined schools) that met this definition.

For many regional towns, Australia’s policy approach results in a complete absence of provision. These are not thin markets but rather an absence of a market as the current policy settings mean it is not economically feasible for providers to operate in these areas.

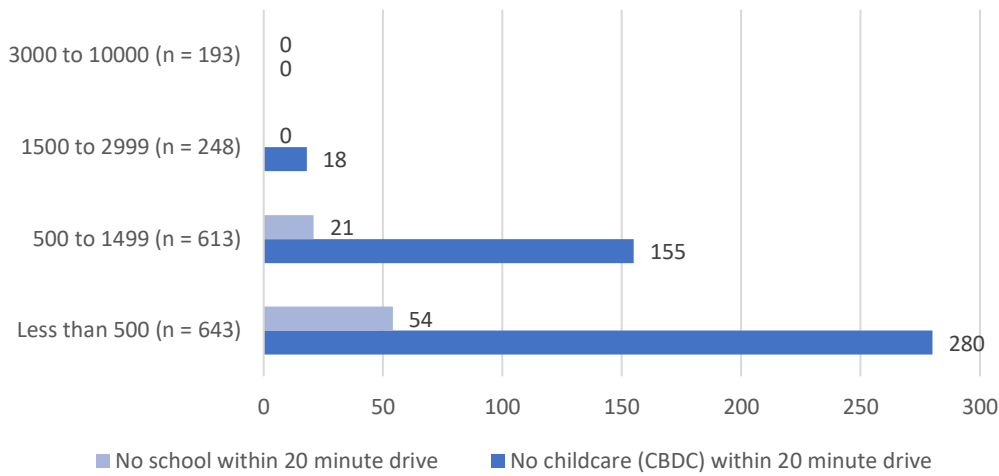
To identify these towns, we used data from the ABS that listed about 1,700 small towns in Australia with populations ranging from 30 to 10,000 people. We broke these towns into four groups as shown in Table 4.

Table 4: Number of towns by population in Australia

Group	Population of township (residents)	Number of Australian towns within the group
1	Less than 500	643
2	500 - 1,499	613
3	1,500 - 2,999	248
4	3,000 - 10,000.	193

We then identified the number of towns in each category that did not have a childcare centre or school within a 20-minute drive. Figure 13 below shows the results.

Figure 13: Number of towns by population with no childcare and schools within twenty-minute drive



Our analysis finds that smaller towns are much more likely to have a school than a childcare centre. About 360 towns with a population under 1,500 do not have centre-based day care but do have a school. The large majority of towns with a population above 1,500 have centre-based day care and all of these towns have a school within a twenty-minute drive.

Figure 13 helps highlight the level of the population where the current childcare policy results in variable access. Whereas schools benefit from central planning to ensure universal access, the current policy settings means that many towns with a population under 1,500 lack childcare services. Further research may be required to understand the need in these small towns, and the policies that would assist in providing appropriate access to ECEC services.

Part V: Discussion and conclusion

What are the policy implications?

The findings in this report highlight that the provision of childcare in Australia is unequal. Regional and remote areas are most likely to be childcare deserts and there are significant pockets of childcare deserts in all our major cities. Our most disadvantaged communities have the least access to childcare.

These findings present governments with serious policy challenges, some of which are discussed below.

Current childcare policy settings result in thin markets and an absence of provision in regional areas

Thin markets is a term used in a variety of ways to describe situations where there are deficiencies in a service, which is largely delivered by non-government providers, such as not enough providers or a lack of a diversity of providers to meet demand. For instance, there is research showing how parts of the NDIS suffer from thin markets (Reeders et al., 2019).

Our research shows there are many parts of Australia that suffer from a lack of access to childcare due to thin markets. Regional and remote areas suffer the most. A population of less than 1,500 seems to be the threshold for when smaller towns are most at risk of suffering from an absence of childcare provision.

In a recent report, the Centre for Policy Development outlined a possible route for reimagining an ECEC system that is support families and children from birth through to the early years of schooling (Centre for Policy Development, 2021). Central to its call for policy reform is a guarantee for young children in Australia, as exists in the public health and education systems. A well-defined guarantee would determine roles and lines of responsibility for state and federal governments and should reorient ECEC to centre on children. The report proposes that families be able to access three days of free (or low cost) ECEC, with more days available at a minimal cost for all children between birth and school age, complementing pre-school and proposed measures for increased and shared paternity leave (Centre for Policy Development, 2021). Modelling an early childhood guarantee would enable governments to predict the need for services where they are currently lacking and respond accordingly, with the potential to respond to areas most in need initially.

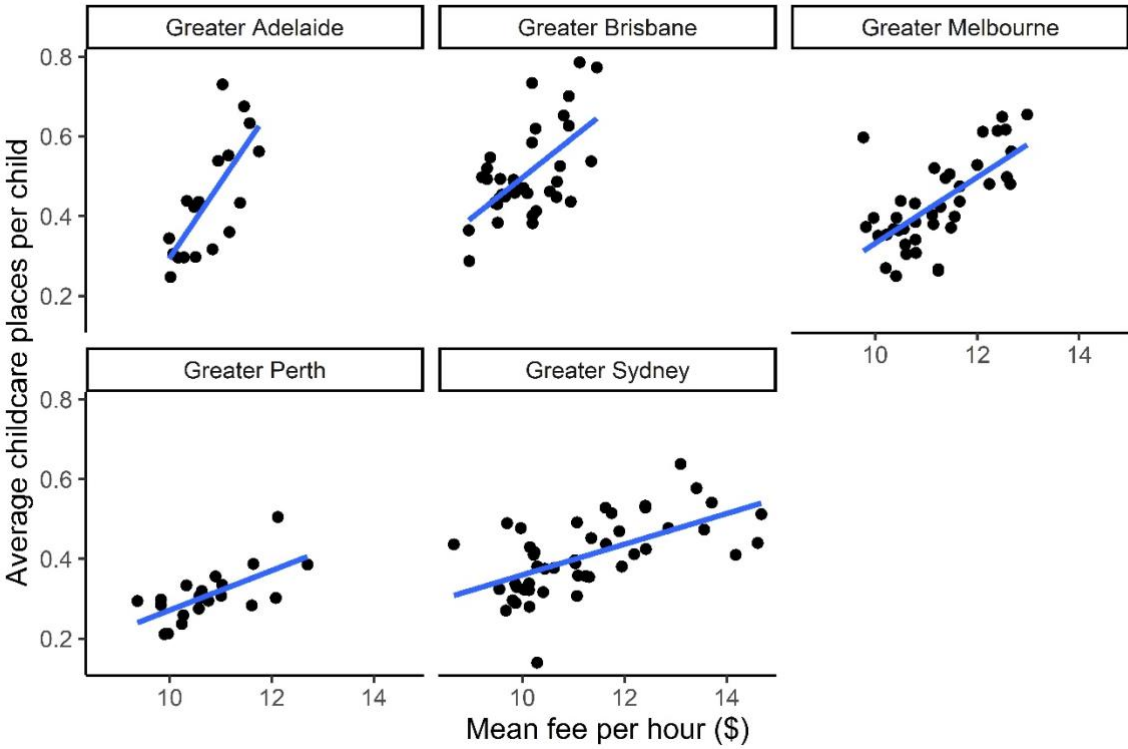
Disproportionate access for lower socio-economic groups

There is strong evidence that families from more disadvantaged backgrounds benefit the most from high-quality early childhood education and care. Heckman (2021), the US Nobel Prize winning economist, writes that the "...highest rate of return in early childhood development comes from investing as early as possible, from birth through age five, in disadvantaged families". In an American study focusing on disadvantaged children, Heckman (2008) found that the rate of return (the return per dollar of cost) on high-quality early childhood education and care to be 7 to 10 %.

Yet our research shows that it is the most disadvantaged that have the lowest accessibility to childcare. Part of the reason for this may be the underlying principles of the childcare system that encourage providers to establish services where there is the lower risk and the greater reward. One way of illustrating this is to explore the correlation between price and accessibility.

Figure 14 shows the relationship between the median cost per hour of childcare and the average childcare places per child in the five major capital cities with a population over 1 million people. Each dot is an SA3 region and represents a population of between 30,000 to 180,000 people. The horizontal axis shows the mean fee per hour and the vertical axis shows the average childcare places per child in each SA3 region. The blue line shows the trend.

Figure 14: Average childcare places per child and mean fee per hour (\$) by SA3 in the five largest cities in Australia



This figure highlights how areas, where there is greater supply of childcare, are also areas where providers charge higher fees. Often these areas of higher supply and higher fees are also areas of greater advantage. For instance, in Greater Melbourne, the area with both the highest fees per hour and the highest average number of childcare places per child is Stonnington – West. This area includes some of Melbourne’s most affluent suburbs such as Toorak, South Yarra and Armadale.

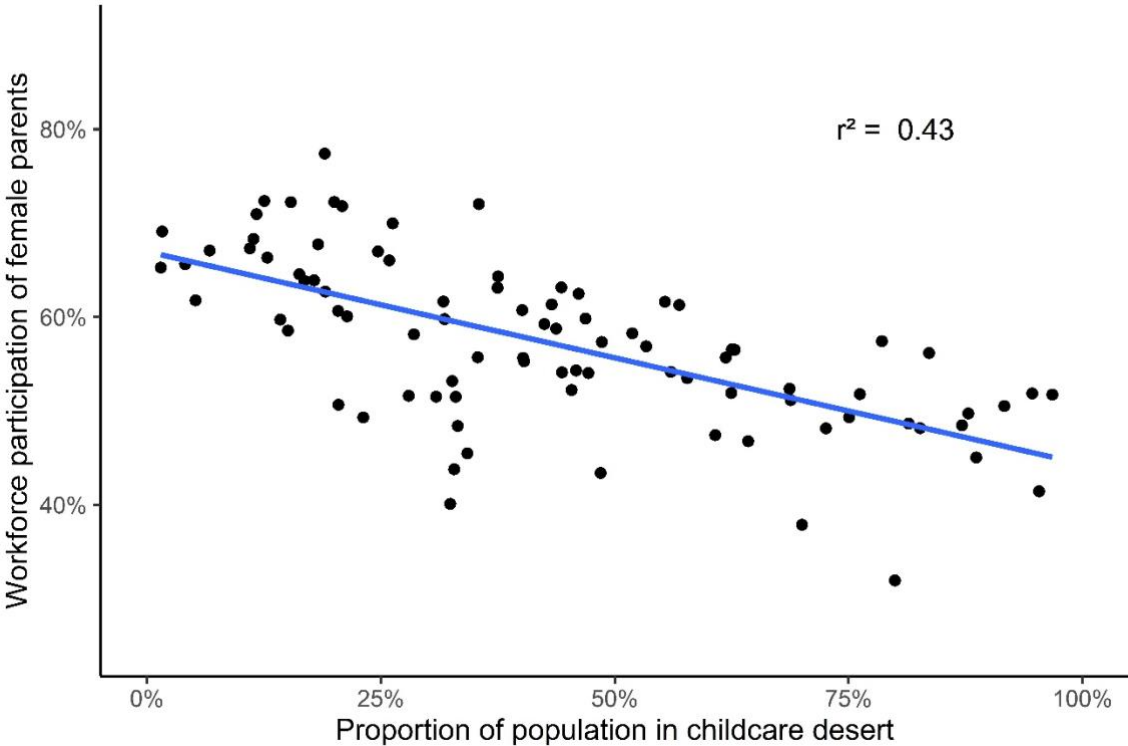
This figure suggests that there is an incentive for providers to operate in advantaged areas where they can charge higher fees, even if there is greater competition. This leaves more disadvantaged areas with lower levels of childcare accessibility. As a consequence, Australia is not fully capitalising on the long-term benefits to children from more disadvantaged backgrounds of high-quality early learning.

There is further research needed on the link between access and female workforce participation

One of the many functions of ECEC is to enable greater workforce participation. However, it is not clear that the current approach is fully supporting this aim.

The figure below explores the relationship between childcare deserts and levels of workforce participation. This figure shows the proportion of the population living in childcare deserts in 88 regions (SA4) across Australia. Also shown is the workforce participation of female parents who have at least one child aged under five in the household.

Figure 15: Percentage of SA4 region population living in a childcare desert and workforce participation of female parents with a child in the household aged under five



This figure shows there is a correlation between the accessibility of childcare and female workforce participation. Regions where more people live in a childcare desert also have lower levels of workforce participation for females who have a child aged under five in the household.

The reasons for this association are complex. Lower levels of female workforce participation in an area will affect demand for childcare. It may also be that difficulty in accessing childcare can lead to parents and carers choosing not to participate in the workforce while their children are young.

The interaction between demand and supply of childcare will affect families and carers differently. There is a need for further research to understand how access to childcare is influencing workforce participation and the decisions parents and carers are making, especially females, regarding employment. This is particularly important in terms of understanding barriers that some may experience based on location and lower access to childcare.

Conclusion

Access to quality childcare has enormous impacts on the current and future lives of Australians. Yet our research shows that current policy settings mean that where Australians live still plays a significant role in whether they can access this crucial service.

While there are neighbourhoods that may have enough supply to meet demand, many Australians will have difficulty finding the childcare service that is right for them. In many regional areas, there is no access at all.

It does not have to be like this. More than a hundred years ago, Australia built a school system that still operates today. In regional areas, these schools are crucial parts of communities. The policy settings for the school and preschool sectors show that universal access to childcare does not have to be an unattainable dream.

There is a large body of research showing the huge returns to investment in ECEC. For instance, recent research from Victoria University showed that investment in the ECEC sector can largely pay for itself through increased tax receipts from greater female workforce participation (Dixon, 2020).

Australians deserve an ECEC system that includes universal access to childcare and supports families in whatever decision they make that they see is best for them. Most importantly, children need a system that meets their needs so that they can have the best start in life, regardless of where they live or the income of their parents.

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