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Be You is a Mental Health in Education Initiative delivered by Beyond Blue in partnership with Early Childhood Australia and headspace.

With delivery partners

Early Childhood Australia
A voice for young children

headspace
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Be You engagement with vulnerable children and families: Participation and possibilities

Prepared for Early Childhood Australia

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Executive summary

Be You has tremendous potential to achieve impact on the lives of vulnerable children and families, by building the capacity of early childhood educators to promote mental health and wellbeing. To help realise this potential, Be You is investigating ways to improve its reach and engagement to early childhood education and care (ECEC) services that work with vulnerable children and families. This report was prepared for Early Childhood Australia (ECA) by Victoria University (Mitchell Institute, and Centre for International Research on Education Systems), to support this investigation.

This research informing this report had four main components:

- A literature review exploring definitions of vulnerability, and how they relate to Be You
- Construction of a vulnerability index for early childhood services, to assist prioritisation
- Mapping of service participation in Be You, focused on services in vulnerable communities
- Focus groups on potential strategies to improve Be You's impact on vulnerable communities.

Detailed findings from the literature review have been provided to ECA in a separate document. This report combines summarised findings from the literature review with the results of quantitative analysis of vulnerability and its relationship to Be You participation (using the vulnerability index created for this project); and insights from two focus groups with Be You leaders and consultants.

Key findings and recommendations

Vulnerability has many definitions, each creating different imperatives for Be You's work. Most definitions of vulnerability include the presence of risk factors, and absence of protective factors. However, the risks and protective factors vary across research literature and data, with parent mental health emerging as one of the strongest predictors of child mental illness. The Be You team also defined 'vulnerability' in many different ways in relation to their practice, including sometimes recognising that an admission of vulnerability can itself be a source of strength.

Be You may benefit from continuing to engage critically with the concept of vulnerability. There is clear capacity for thoughtful, reflective understandings of vulnerability in the Be You team. Ongoing critical reflection on vulnerable services and their communities may help the team to calibrate support. The vulnerability index created in this study also gives Be You a tool to explore vulnerability in future research; either by using the index itself, or by exploring its component variables.

Services in vulnerable communities participate less in Be You, but service capability matters more. Based on the literature, the project identified two attributes of ECEC services that Be You needs to consider: the vulnerability of the service's community, and the capability of the service itself. While the vulnerability of the service community has some influence on whether a service participates in Be You, the capability of the service (based on its National Quality Standard rating) emerged as an even stronger predictor. Services most likely to participate in Be You presently are those with higher quality ratings, serving the most affluent communities, creating a 'double advantage' for children. Services with lower quality ratings are less likely to participate, across all types of communities.

Be You may benefit from explicitly focusing on educator vulnerability. Where service quality is lower, and challenges in the community are greater, educators may need particular support to see themselves as capable of learning, and of making a difference to child and family mental health. While Be You already includes content to help educators build resilience and wellbeing, there may be other strategies worth pursuing, to address the barriers that prevent educators accessing this content in the first place. Peer support from other Be You educators may be a valuable resource.

Participation differences are also evident across types of ECEC services, and across jurisdictions and geographic locations. Types of participation vary too, with different rates of participation in online modules compared to events, and across different domains within modules. While limitations on data make it hard to describe participation patterns with precision, it is clear that there is no 'one size fits all' model of Be You participation. The relatively high proportion of family day care services, following a deliberate strategy to engage them, suggests that a targeted approach to participation can be effective in assisting particular types of ECEC services to join Be You's learning community.

Be You may benefit from explicitly promoting diverse models of success, given the wide range of participation pathways evident across different services. It is especially important that Be You promotes participation pathways that feel achievable for services with lower quality ratings, rather than promoting an 'ideal' of success that may alienate services experiencing significant challenges. Insights from the Be You team suggested that even small signs of progress are worth celebrating, where services are starting from a lower base. Linking Be You participation to Quality Improvement Plans is another way that Be You can contribute to overall service quality improvement.

A relatively small number of ECEC services are located in highly vulnerable communities, according to the vulnerability index developed for this project, and these services are currently less likely to participate in Be You. The vulnerability index also showed the many potential factors that can define vulnerability within a community, including situational factors such as unemployment or social housing, along with child- and family-level factors such as feelings of distress. The index was created from a selection of these indicators, to find the most efficient, accurate way of representing them in data. In the lived experience of communities, however, all these multiple factors may be present.

Be You may benefit from a tailored approach to curriculum for these communities, which takes into account their multiple challenges, as well as their strengths. The challenges faced in these communities cannot be tackled through Be You alone, and Be You may be best positioned as an enhancement to other supports that communities receive already. This may sometimes include using Be You tools and ideas in the work of other practitioners serving those communities, or actively building partnerships with other agencies to create integrated models of support. This community-specific approach is also relevant to newly-vulnerable or disaster-affected communities.

This project also showed that vulnerability can take many different forms, not only in the high levels of vulnerability that warrant a tailored, community-level approach. This study was unable to explore variations in the vulnerability of ECEC services that might exist *within* communities, as data was mostly only available at community (local government area) level. Diverse forms of vulnerability, both within services and among the children and families that they serve, may surface in a variety of ways across all ECEC services that engage with Be You. The unique Be You model, with its emphasis on expert consultant support, is well-suited to responding to these diverse opportunities and needs.

Be You many benefit from a more purposeful approach to case management, to respond directly to different forms of vulnerability evident amongst ECEC services. This may require consultant support to be reprioritised, to focus on services at risk of dropping out or under-participating, rather than on those that express greatest demand for consultants' time. Development of specialisations among consultants to respond to different forms of vulnerability may also help to reach and retain the services where Be You is likely to have greatest impact. Most importantly, tailored consultant support must go beyond getting services on board, and must ensure that services remain engaged and equipped to see genuine impact from Be You on their educators, children and community.

Introduction

Be You is the national mental health in education initiative delivered by Beyond Blue, in collaboration with Early Childhood Australia (ECA) and headspace. Be You equips educators to support the mental health and wellbeing of children and young people from birth to 18 years, providing an end-to-end approach for early learning services, primary schools, and secondary schools across Australia. Be You supports early learning services and schools to develop a positive, inclusive and resilient learning community where every child, young person, educator and family can achieve their best possible mental health. It builds the capacity of educators by providing a range of professional learning resources and events, which build on what services are already doing. ECA delivers Be You to multiple early childhood service types, including school age care, long day care, pre-school and family day care.

Over the years, over 4,500 early childhood education and care (ECEC) services have registered to participate in the Be You initiative. These services testify to the strong potential of the Be You initiative to make a positive difference for a large proportion of young Australians' mental health. However, the disruptions caused by the COVID-19 pandemic required review and adjustment of planned approaches for expanding participation and reaching a broad range of educators and services. In particular, established promotion and outreach activities connected to on-site conference attendance needed to be replaced by other online approaches.

ECA decided to use the shifting circumstances of engagement with services and stakeholders as an opportunity for strategic planning. In particular, ECA aims to focus future communication, recruitment and engagement efforts where these can make the greatest difference, especially to support children and young people who have experiences of vulnerability or disadvantage.

To build an evidence base for strategic planning, ECA sought to gain a more detailed understanding of existing patterns of participation in Be You among vulnerable communities, in order to identify strategies to increase uptake and engagement. To this end, ECA commissioned the Mitchell Institute (MI) and the Centre for International Research on Education Systems (CIRES) at Victoria University to:

1. Map the early childhood sector and the characteristics of services.
2. Develop a typology for assessing the vulnerability of services and service populations.
3. Identify strategies for increasing the uptake of Be You in high impact communities.
4. Inform the delivery of Be You – including the amount of support provided to participating services.

The research to deliver on these tasks involved a combination of desktop research, quantitative analysis, and a short qualitative investigation involving focus groups with Be You staff. Details of the methods used at each of these stages are outlined in the next section. This report brings together the findings from all stages of the project, to answer three key questions implicit in the project design:

- How can vulnerability most usefully be defined, to inform Be You's strategic planning?
- How well is Be You currently reaching vulnerable services and their communities?
- What else could Be You do, to increase uptake where it can have greatest impact?

The key findings in this report are accompanied by two other research outputs: the *Snapshot literature review to inform ECEC vulnerability mapping for Be You* report submitted to ECA in 2020;

and an Excel file containing the vulnerability index of ECEC services and communities, to facilitate further analysis.

The project team would like to thank the Be You team and members of the Project Reference Group for their engagement in the research, and thoughtful consideration of these key questions. This report is not prescriptive in its recommendations, recognising that there is strong capability within Be You to determine a path forward, based on this and other evidence emerging through the Be You evaluation. This project revealed a firm commitment within Be You and its key stakeholders to making a difference for vulnerable communities, providing grounds for optimism that greater impact will be achieved.

Methodology

The project used a combination of methods to investigate vulnerability from three angles: in existing research; in quantitative data; and in the lived experience of Be You leaders and consultants. This combination of methods and perspectives, devised by ECA, was well-suited to the multi-faceted nature of the research questions, and Be You's interest in building a diverse evidence base. It also addressed the need for the project to speak to various audiences within and outside the Be You team.

In applying these methods and analysing findings, the researchers were cognisant of contemporary thinking about organisational change, which increasingly emphasises the need to engage with complexity, rather than simply 'solve problems' (Clark 2018, n.p.). This line of thinking is highly relevant to engaging with vulnerability, as vulnerability itself is a complex and multi-faceted construct. Be You is also a complex initiative, with multiple levels of accountability, and a high level of flexibility and responsiveness (and therefore variability) in how it engages with ECEC services.

In navigating complexity, managing 'polarities' in an important task (Clark 2018, n.p.), especially when organisations are pulled between opposing but equally valuable courses of action. To avoid paralysis or indecision, organisations must recognise the trade-offs involved in tactical choices (by doing one thing, you cannot do another), and deliberately name and navigate these trade-offs in setting their strategic direction. Most organisations are in constant motion between multiple polarities, and the 'right' balance between them may change over time, as organisations recalibrate their priorities.

By initiating this project, Be You signalled that it is navigating an important polarity: the tension between its aspiration to provide a universal service benefitting all children and families, and an aspiration to improve its reach to the most vulnerable. As will be shown in the findings, this is far more complex than simply taking a more targeted approach. In all phases, this project aimed to generate insights that would help Be You to navigate this polarity, and calibrate its effort towards achieving its goal.

Literature review

The objective of the literature review was to develop a working definition of vulnerability, and to identify key risk and protective factors. This would inform development of a tool to assess vulnerability among ECEC services and their communities. It involved a rapid review of around 100 reports and studies, of which 60 were selected to summarise in an evidence table (provided in the literature review report). The evidence table synthesised findings to inform the project's conceptual framework, and to draw out risk factors (or variables) for which data was publicly available, or could readily be accessed.

The literature on vulnerability in relation to children, families and communities is extensive. To maximise the relevance of the literature review to the project, the review focused on vulnerability and risk and protective factors in relation to ECEC services and professionals; and the diversity of children and families who access services. It also briefly examined the literature on links between vulnerability and mental health, again focusing on early childhood and the parents of young children.

The review focused primarily on literature published since 2010, including academic and grey literature, given the relevance and volume of grey literature available. Earlier literature deemed substantially relevant was also included. Literature focusing on more than one issue of direct relevance to the project was prioritised. International peer-reviewed studies were included, but grey literature was excluded where it was focused primarily on non-Australian populations.

Results from the literature review, including the evidence table, can be found in the separate report. This report uses selected findings from the review to frame findings from later stages of the project.

Quantitative mapping

The quantitative mapping phase involved two steps: mapping trends in Be You participation for ECEC services in general; and then specifically exploring participation by vulnerable communities using a new vulnerability index created for this project. This would enable Be You to compare their overall success in reaching Australian ECEC services, with their success in reaching those who are vulnerable.

The general mapping of participation used the National Register of ECEC services from the Australian Children's Education and Care Quality Authority (ACECQA) to determine how well Be You services represent the diversity of the sector. Service attributes examined included service type, community socio-economic status (SES), geographic location, and National Quality Standard (NQS) ratings.

To examine vulnerability in service communities, the ideal data would be direct information on families and children participating in individual services. As this data is not available, it was necessary to use data on the level of vulnerability in the community in which the service is located. Most children and families use ECEC services in their local community (Cloney, Cleveland, Hattie, & Tayler, 2016), so the level of vulnerability in a community can be expected to be similar to the vulnerability among families using an ECEC service. While this method does conceal within-community differences (for example if vulnerable families are concentred in a particular ECEC service), it could also be argued that all services in a community will be affected by the prevalence of vulnerability, regardless of who enrols.

Local Government Area (LGA) was the best unit of reference to define service community, as it has the best available data on community demographics and factors associated with vulnerability. Details of the process for matching services with LGAs is provided in Appendix 1. This matching also enabled the vulnerability index to be applied to services, as it was also developed at community (LGA) level.

Construction of the vulnerability index was a major part of the quantitative mapping, and provides a durable resource for ECA to use in future analysis of service vulnerability. The method for constructing the index drew on the established approach used by the Australian Bureau of Statistics (ABS) to construct the Socio-Economic Indexes for Areas (SEIFA) (see ABS, 2018). The steps comprise:

- Creating/computing candidate indicators for the vulnerability index
- Merging all indicators into a single file

- Standardising and rescaling the data for analysis
- Cleaning the data (cases and variables)
- Conducting preliminary analysis to narrow the range of variables used for the index
- Imputing values for cases/variables with missing values
- Re-standardising the index and performing the index construction.

This process is detailed further in the section on defining vulnerability, as it offered valuable insights into which factors can be used to describe vulnerability empirically, and how they relate to one another. The technical aspects of the vulnerability index development are explained in Appendix 2, along with instructions for using vulnerability index data files that have been supplied to ECA.

Qualitative exploration

Strategies for engaging vulnerable services and their communities were derived from two focus groups with Be You staff. The first focus group involved four Be You consultants, and one staff member involved in service recruitment. The second focus group involved four Be You leaders or managers. Each focus group was 1.5 hours long, and was semi-structured around the three research questions (above). Insights from focus groups were synthesised with relevant reflections shared with the research team during Be You Project Reference Group meetings, and other background information.

1. Defining vulnerable children, families and communities

The first task in the project was defining vulnerability, for children, families and communities. As an initial working definition, the project defined vulnerability as: *the likelihood of harm from exposure to risk, where individual risk factors overlap and interact (with the potential to increase or reduce vulnerability), and which can be mitigated by strengthening protective factors*. This definition conceptualises vulnerability as both multidimensional and dynamic. It recognises that:

- vulnerability refers to the likelihood of **harm** from exposure to **risk;**
- vulnerability is a **scale** with multiple levels, rather than a categorical (yes/no) construct;
- vulnerability is usefully conceived as **changeable**, not a permanent state of being;
- individual **risk factors interact with each other**, and can exacerbate or mitigate vulnerability;
- reducing vulnerability can be achieved by strengthening **protective factors**; and
- vulnerability identifies risk, but it **does not predict outcomes**.

While valuable in encapsulating the complexity of vulnerability, this broad definition still left many unanswered questions about what the relevant risk factors and protective factors entailed. These were explored through the literature review, and quantitative development of the vulnerability index.

Defining vulnerability in literature

The literature review confirmed that definitions of vulnerability vary enormously across sectors and even within disciplines. In general, some combination of risk factors and protective factors (any factor that mitigates or reduces risk of vulnerability [Andershed & Andershed, 2015]) was used to inform each definition, with the focus varying depending on the researchers' specific interests.

The largest body of evidence concerned social vulnerability within families**,** exploring a range of interrelated factors relating to both parents and children. This body of evidence is also continually developing (Bayer et al, 2012; Baxter et al, 2013). Fewer studies focus on vulnerability and mental

health in young people, and even fewer focus specifically on early childhood (Andershed & Andershed, 2015; Welsh et al, 2015). In this, the Australian evidence base is particularly limited (Welsh et al, 2015).

Findings that helped inform the definition of vulnerability used in this study included:

- **Many risk factors contributing to vulnerability have been identified for children and youth**, including specifically relating to mental health. Many of these are supported by international research. These include: the presence of domestic abuse; poverty; substance abuse by parents; harsh discipline; maternal stress; single parent households; parental unemployment; Aboriginal and Torres Strait Islander (ATSI) or culturally and linguistically diverse (CALD) background; rural/remote location; violent crime rates in the community; housing insecurity; disability; primary carer mental health problems; and experience of natural disasters and other major shocks (Baxter et al, 2013; Coulton et al, 2007; Mechanic & Tanner, 2007; Parkinson et al, 2017; Stith et al, 2009).
- **Child mental health is affected by the mental health of parents and families.** International and Australian research demonstrates a range of parental risk factors for increased family vulnerability, including include presence of domestic abuse, poor emotional wellbeing and substance misuse (Akehurst, 2015). Predictors of vulnerability among children are harsh discipline, maternal stress, having no older siblings, single parenthood and maternal substance misuse (Bayer et al, 2012). Factors are often inter-related; for example, parental unemployment affects child mental health in part because it also affects the mental health of parents (Baxter et al 2013).
- **Poor maternal mental health and depression is particularly associated with increased vulnerability for children** (Stith et al 2009, Wall-Wieler et al, 2020). Australian research supports these findings, and specifically examines possible links between socio-economic status, parental mental health and children's vulnerability to mental health problems (Johnson et al, 2019).
- **Sociocultural factors might matter more than community socio-economic status.** While child outcomes are associated with the socioeconomic resources of their communities (Lamb et al., 2020), other factors may also contribute to their level of risk. ATSI and CALD children report poorer wellbeing and higher rates of mental illness. Children in rural and remote communities reporting the poorest social and emotional functioning and the highest rates of mental illness (Welsh, 2015).

These findings signalled the risk factors that would need to be identified, in order to assess the level of vulnerability among families and communities (which are aggregates of the families within them). Identifying risk factors is not a wholly reliable indicator of community vulnerability, as it can overlook sudden changes or mitigating factors. Communities not previously considered vulnerable can become so quickly, in the wake of extreme weather events or job loss, placing new demands on services that may be ill-equipped to respond (Noble et al, 2020). Communities experiencing persistent disadvantage, environmental disasters and other sudden shocks are also at increased risk of poor mental health and other damaging outcomes (Mechanic & Tanner, 2007; North & Pfefferbaum, 2013).

Defining vulnerability in ECEC services

The level of vulnerability in an ECEC service could also be conceptualised as the aggregate vulnerability of the children and families that it serves. However, this simplistic view of service

vulnerability overlooks two important additional considerations. Firstly, ECEC services can exhibit their own vulnerabilities, independently of the vulnerability present in their communities, especially if educators face pressures such as job stress or insecurity (as occurred in 2020 during the height of the pandemic).

Secondly, ECEC services can be *both protective and risk factors* in the vulnerability of children and families. Best practices in supporting young children's mental health and wellbeing are associated with improved socioemotional development (Blewitt et al., 2021; Murano, Sawyer, & Lipnevich, 2020). As well as acting as a protective factor in and of themselves, ECEC services can help children and families build protective factors and resilience (Jordan & Kennedy, 2019; Tseng et al, 2019). Conversely, poor-quality ECEC services can themselves be risk factors, as children can be adversely affected by stress in both home and caregiving environments (Harvard University Center on the Developing Child, 2016).

This finding has significant implications for Be You, as it works to build ECEC services' capacity to support the mental health of children and families. It suggests that service quality should be a key consideration in prioritising support, as lower-quality services may in fact contribute to vulnerability within their communities; or at best, miss the opportunity to contribute as a protective factor. In this report, service quality is conceptualised as service *capability*, to move beyond a normative or static view of how the service is operating, and instead consider its potential or capacity to have an impact.

Integrating indicators of vulnerability with ECEC services' capacity to respond to it, the literature review developed a quadrant-based typology, classifying communities and services as:

- Low vulnerability, high capability;
- Low vulnerability, low capability;
- High vulnerability, high capability; and
- High vulnerability, low capability.

This typology is reflected in the application of the vulnerability index, discussed later in this report.

Defining vulnerability in data

The snapshot literature review highlighted the multiple dimensions of vulnerability relevant to the Be You initiative, with a particular focus on those most relevant to mental health and resilience. The next step was operationalising these in available quantitative data, to enable a vulnerability index to be constructed. This would enable ECEC services to be ranked according to their total vulnerability score.

Risk factors from the literature were grouped into child, family and community-level indicators:

- **Children:** the personal characteristics and risk factors likely to impact on healthy mental health development. These include social, emotional and physical wellbeing and skills; English language skills; disability; Indigenous status; and participation in ECEC (including preschool).
- **Families:** the risk factors, or protective resources, experienced in children's families These include factors such as parental unemployment; parental employment type; level of maternal education; housing; financial stress; health and wellbeing.
- **Communities:** the collective risk factors, or protective resources, present in a given location. These include factors such as socioeconomic status and disaster resilience.

These dimensions of vulnerability were used as a starting point to identify data sources and variables that could be used to construct the vulnerability index. The selection of variables involved back-and-forth movement between the desired constructs and actual available data, as is common in any quantitative research that involves pre-existing data being applied to a new purpose (Smith, 2008).

As noted above, LGA was the geographic reference unit for which the greatest selection of data was available. While some variables could be generated at a more precise geographical level than LGA, a shift to a smaller reference unit would have rendered some key variables unusable. The use of LGA is therefore a compromise between precision and coverage; and even so, some reference variables had large numbers of missing values, as the number of people living in LGAs varies significantly.

A total of 30 'candidate' indicators were initially identified in available data as representing aspects of vulnerability, as it was conceptualised based on the literature review. These are listed in Table 1. The 14 indicators that are bolded and shaded were retained in the final vulnerability index, as the best possible representation of all the possible risk and protective factors in available data. This set of indicators is used to derive the vulnerability scores for ECEC services used later in this report. As the index was constructed at LGA level, all ECEC services in each LGA have the same vulnerability score.

The process of selecting variables for inclusion involved a complex combination of technical, logical and analytical considerations. Variables were not only selected for their relevance to aspects of vulnerability identified in the literature review, but also based on the quality of available data (to maximise the number of ECEC services that could be allocated a vulnerability score); the reliability of the data collection methods (to prioritise variables with the most robust methods); and the extent to which variables correlated with one another (to prevent effectively measuring the same thing twice).

The details of this decision-making can be found in Appendix 2. The rigour with which this process was undertaken should give ECA confidence that the final set of variables selected represents an optimum combination. This still would not prevent ECA or other researchers looking at a different subset of indicators, if they have interest in a particular aspect of vulnerability; say, child mental health. Where a specific interest exists, trade-offs between relevance and data quality might yield different priorities.

Table 1 Candidate indicators for construction of vulnerability index for Be You, by vulnerability category

Vulnerability	Indicator	Data source
Community vulnerability	**Ratio of ECEC workers to resident population aged 0-8**	ABS Census 2016
	% ECEC workers who speak English not well or not at all	ABS Census 2016
	% ECEC workers who did not complete Year 12	ABS Census 2016
	% relative low-income earners among early childhood (pre-primary school) teachers and child carers	ABS Census 2016
	% ECEC workers with a bachelor's degree or above as their highest qualification (flipped, as low % indicates higher vulnerability)	ABS Census 2016
	Australian Natural Disaster Resilience Index score	BNHCRC 2020
Family vulnerability	% employed persons aged 20-49 working as managers or professionals	ABS Census 2016
	% persons living in social housing	PHIDU 2016
	% low-income households under financial stress from mortgage or rent	PHIDU 2016
	% people aged 18 years and over who had government support as	PHIDU 2014

	their main source of income in the last 2 years (modelled estimates)	
	% people aged 18 years and over who are able to get support in times of crisis from persons outside the household (modelled estimates)	PHIDU 2014
	% people aged 15 years and over with fair or poor self-assessed health (K10) (modelled estimates)	PHIDU 2017-18
	% people aged 18 years and over with high or very high psychological distress, based on the Kessler 10 Scale (modelled estimates)	PHIDU 2017-18
	% children up to 8 years of age in jobless families	ABS Census 2016
	% children up to 8 years of age with mothers not in the labour force	ABS Census 2016
	% children up to 8 years of age whose mothers had low educational attainment	ABS Census 2016
	% children up to 8 years of age with parents with limited English	ABS Census 2016
Children vulnerability	**% children aged 0-8 with a need for assistance with core activities**	ABS Census 2016
	% children aged 4-8 who speak English not well or not at all	ABS Census 2016
	% children aged 0-8 who are Indigenous	ABS Census 2016
	% children aged 3-6 enrolled in a preschool program	ABS Preschool Education 2016
	% foundation children assessed by teacher as developmentally vulnerable in 2 or more domains	AEDC Census 2018
	% foundation children assessed by teacher as having an impairment or condition	AEDC Census 2018
	% foundation children reported as attending a pre-school or kindergarten program in the year before entering school	AEDC Census 2018
Children vulnerability: mental health	% foundation children assessed by teacher as unhappy, sad or depressed	AEDC Census 2018
	% foundation children assessed by teacher as appearing worried	AEDC Census 2018
	% foundation children assessed by teacher as crying a lot	AEDC Census 2018
	% foundation children assessed by teacher as nervous, highly strung or tense	AEDC Census 2018
	Average emotional maturity sub-domain 2 (anxious and fearful) score of foundation children, as assessed by teacher	AEDC Census 2018
	% foundation children assessed by teacher as developmentally vulnerable in the emotional maturity sub-domain 2 (anxious and fearful)	AEDC Census 2018

Relationships between variables in the index

In constructing indexes, principal component analysis is often used to test the relationship between variables, and how much of total variance in a construct of interest they explain. If an index does not explain a substantial proportion of variance, it is probably missing important variables (although few indexes can explain variance completely). For example, if an index was developed to explain the height of children, it might explain some of the variance if it included the child's gender and the heights of each of their parents, but would explain even more if it also included the child's age.

The principal component analysis suggested that the selected variables explain 44 per cent of the variance in vulnerability among ECEC services. While that may not seem to be a high proportion, it is similar to the amount of variance explained by ABS indexes of vulnerability (ABS, 2018), and therefore should give confidence in the robustness of the index. Higher values in social and educational research are relatively rare, as indexes often aim to explain variance in complex, multi-faceted attributes.

The other insight from principal component analysis is that it shows how strongly each factor relates to the construct it is supposed to represent ('factor loadings'). The factor loadings shown in

Table 2 ranged from 0.434 to 0.911, showing that some factors are strongly related to the construct (for example, '% children up to 8 years of age in jobless families' is a very strong predictor of overall family vulnerability, whereas others have weaker relationships (the percentage of children who attended a preschool program is a relatively weak indicator of child vulnerability, which may reflect the difficulty of obtaining this information accurately through the AEDC survey completed by primary teachers). Indicators with weaker relationships are important to retain, as they provide distinctive information.

Further information about how the relationships between variables were used to determine which indicators to include in the index is provided in Appendix 3, to further affirm the index's robustness.

Table 2 Mean factor loadings of input indicators contributing to the construction of the vulnerability index (averaged across five datasets with imputed values)

Vulnerability	Indicator	Variable loading
Community vulnerability	% ECEC workers who did not complete Year 12	0.707
	Ratio of ECEC workers to resident population aged 0-8	0.487
	% ECEC workers with a bachelor's degree or above as their highest qualification (flipped)	0.645
	Australian Natural Disaster Resilience Index score	0.721
Family vulnerability	% persons living in social housing	0.541
	% people aged 18 years and over who are able to get support in times of crisis from persons outside the household (modelled estimates)	0.415
	% children up to 8 years of age in jobless families	0.911
	% children up to 8 years of age with mothers not in the labour force	0.690
	% children up to 8 years of age whose mothers had low educational attainment	0.897
Children vulnerability	% children aged 0-8 with a need for assistance with core activities	0.514
	% children aged 0-8 who are Indigenous	0.683
	% foundation children assessed by teacher as developmentally vulnerable in 2 or more domains	0.805
	% foundation children reported as attending a pre-school or kindergarten program in the year before entering school	0.434
Children vulnerability: mental health	Average emotional maturity sub-domain 2 (anxious and fearful) score of foundation children, as assessed by teacher	0.591

Relationship with existing indexes

Another key test of the validity of the vulnerability index is whether it describes anything new, or whether it simply replicates existing indexes. A number of indexes of community vulnerability already exist in Australia, with the four SEIFA indexes most commonly used in educational research:

- The Index of Relative Socio-Economic Disadvantage (IRSD)
- The Index of Relative Socio-Economic Advantage and Disadvantage (IRSAD)

- The Index of Education and Occupation (IEO)
- The Index of Economic Resources (IER)

The SEIFA indexes are developed by the Australian Bureau of Statistics to rank the relative levels of socio-economic advantage and disadvantage across areas within Australia. Six categories of input variables are used to construct these indexes: income variables, education variables, employment variables, occupation variables, housing variables, and other miscellaneous variables. These indexes are reported by the ABS at five different levels of geographical granularity, including LGAs.

To test the distinctiveness of the vulnerability index, bivariate correlation coefficients between the different SEIFA indexes and the vulnerability index were examined. Results are shown in Table 3.

Table 3 Bivariate correlations between vulnerability index scores and ABS SEIFA index scores

		Vulnerability index	**SEIFA indexes**			
			IRSD	IRSAD	IER	IEO
Vulnerability index		--				
SEIFA indexes	IRSD	-0.932	--			
	IRSAD	-0.910	0.956	--		
	IER	-0.862	0.946	0.847	--	
	IEO	-0.757	0.739	0.885	0.550	--

The correlation between vulnerability index scores and SEIFA index scores is strongest with IRSD, while it is weakest with the IEO. The fact that the strongest correlation coefficient exceeds 0.9 indicates that the vulnerability index is a robust instrument to capture disadvantage, at least at the LGA level. At the same time, the fact that correlation coefficients between vulnerability index scores and SEIFA index scores are not perfect (1.0 would indicate a perfect correlation) suggests that the vulnerability index may capture specific dimensions of vulnerability not captured in SEIFA indexes. This is especially true regarding children's socioemotional development and mental health risks and vulnerabilities.

Relationships between mental health vulnerability and community socio-economic status

The most important variables to be considered for the Be You vulnerability index, as distinct from mainstream indexes of vulnerability like SEIFA, were related to parent and child mental health. Among the 'candidate' indicators (see Table 1), two mental health variables were given special consideration:

- the estimated proportion of adults with high or very high psychological distress (based on modelled estimates)
- the average emotional maturity sub-domain score of children in the AEDC census, which relates to anxiety and fearfulness.

The first candidate indicator (adults with high psychological distress) was ultimately removed from the index, as it correlated strongly (>0.8) with two other indicators included in the final variable list: (1) the proportion of children living in jobless families, and (2) the proportion of children with mothers not in the labour force. As Table 4 shows, the statistical association between the estimated

proportion of people with high psychological distress and the overall vulnerability index score in a given LGA is also strong (>0.75), suggesting that the social conditions that affect adults' psychological distress are likely to be reasonably well captured with the other indicators retained to construct the vulnerability index. This variable was also strongly correlated with ABS indexes of vulnerability (IRSD, IRSAD and IEO), further confirming that it would be duplicative to include it alongside other variables.

The second candidate indicator (average emotional maturity score of children relating to anxiety and fearfulness) *was* retained in the final list of variables, and used to compute the vulnerability index. Unlike the measure of psychological distress for adults in a community, this child-level indicator did not have such a strong relationship with either the overall vulnerability score, or the ABS indexes of vulnerability (see Table 4). This suggests that it is measuring a distinctive and valuable construct.

The weak correlation between this variable and the ABS indexes implies that children's anxiety and fearfulness is less likely to be shaped primarily by SES, and may instead reflect other factors that are not well-captured in the vulnerability index. The limits of available research into child mental health (see above) meant that other factors shaping child mental health could not be readily identified for inclusion in the index. Investigation of these factors would be a worthwhile subject for future research.

Table 4 Bivariate correlations between mental health candidate indicators and socioeconomic disadvantage and vulnerability indexes (weighted)

	Share of people with high psychological distress (modelled estimates) (%)	Average emotional maturity sub-domain 2 score of foundation children in AEDC census
IRSD score	-0.826	-0.453
IRSAD score	-0.818	-0.549
IER score	-0.480	-0.382
IEO score	-0.820	-0.489
Vulnerability index score	**0.751**	**0.592**

Defining vulnerability in practice

The final approach to defining vulnerability came through the focus groups with Be You leaders and consultants. Although Be You staff initially indicated that they shared a common understanding of vulnerability, their personal definitions in fact revealed richly diverse perspectives. They included:

- **The widely-accepted definition of vulnerability as the presence of risk factors.** Examples includes children and families with life conditions that put hardship on them; living in poverty;

not feeling a sense of belonging; not having relationships in community that support them; experiencing domestic violence; living in an isolated area; or from a minority culture or linguistic background.

- **A subjective view of vulnerability**, which recognised that people might define and experience vulnerability in different ways. This in part depends on the protective factors in their lives.
- **A universal view of vulnerability**, encompassing everyone who does not have what they need to 'live the best version of their life'. The relevance and responsiveness of services was important to this idea, as simply having services available does not guarantee relevance or cultural safety.
- **A structural view of vulnerability**, which defines it as created by the systems and structures within society, with poverty being a major contributing factor. This view aligns with findings in the data (above), about adult mental health being strongly correlated with community disadvantage.
- **A positive view of vulnerability**, drawing on contemporary psychological perspectives that actively encourage embracing vulnerability as an attribute of authenticity and self-understanding.

The implications of these diverse definitions for practice and strategic planning are both challenging and inspiring. The definitions above are challenging because they mean that targeting 'vulnerable' children and families could mean focusing on specific groups, or could include everyone ('everyone is vulnerable in some way'). As vulnerability is not a permanent state, they may also mean targeting different children, families and communities at different times; or perhaps prioritising newly vulnerable communites that are not receiving support already. Yet despite these practical challenges, the diverse definitions also provide inspiration for shaping the future of Be You, as they show that the team is highly capable of engaging with vulnerability in sophisticated, critically reflective ways.

2. ECEC sector mapping of participation in Be You

One of the four main objectives of the project was to map the ECEC sector with respect to Be You participation. Understanding general patterns of participation in Be You is important for pursuing the primary research questions, in relation to participation of vulnerable services and communities. Without this prior analysis, there is a risk that analysis of participation by vulnerable services misses other factors that influence the likelihood of participation, independent of the level of vulnerability.

The secondary research questions investigated in the sector mapping were:

- Does the cohort of participating services reflect the diversity of the sector overall?
- Are there some service characteristics that are under or over represented in Be You?

To answer these questions, the project team combined information on ECEC services in Australia with information on their local communities and data on Be You engagement (see Appendix 3). Be You engagement data was merged into service-level data to define four categories of participation:

- Be You events
- Be You online learning modules
- Be You online learning modules and events
- Neither Be You online learning modules nor Be You events

Analytically, this can be considered as a continuum of participation, ranging from the lowest level of participation for services participating neither in Be You modules nor in Be You events to the highest level of participation characterised as participating in both types of Be You activities. These categories were applied at the service level, meaning that differences between individual educators' participation patterns are not recorded. Limitations in this approach are discussed in Appendix 3.

Overall participation trends

Australia-wide, around one in four ECEC services in the ACECQA National Register (26.3 per cent) have had some form of engagement with Be You. This represents over 4,200 services and indicates that Be You has reached a significant proportion of the early childhood education and care community.

The most common type of engagement in Be You is participation in professional learning modules, with close to 3,000 services (18.2 per cent) having commenced at least one of the Be You modules. By contrast, around 1,300 services have been involved in one or more Be You events (8.1 per cent of the cohort). Among services participating in Be You events, three in four (75.9 per cent) have also commenced or completed Be You online learning modules. This suggests that involving services in Be You events can help to foster their engagement with the online learning modules as well. As data is captured based on individual engagement, rather than whole-of-service activity, it is not clear whether the figures show evidence of learning communities being created within early childhood services. Further data collection would be needed to identify which combinations of modules and events are most effective in bringing educators together to implement a 'whole learning community' approach.

The national pattern of engagement in the Be You initiative is not evenly distributed across states and territories. Table 5 presents the level of participation across Australian jurisdictions. In the Australian Capital Territory (ACT) and Tasmania, the rate of participation exceeds 35 per cent and is significantly higher than in other states and territories and Australia as a whole. By contrast, in South

Australia, Western Australia and the Northern Territory, fewer than one in five services are engaged in the Be You initiative, significantly below the Australian average.

Table 5 Proportion of ECEC services participating in Be You initiative, by state and participation type (%, 2020)

	Be You modules	Be You events	Be You modules and events	Total participation
ACT	29.8	1.7	5.5	37.0
TAS	29.1	0.9	5.8	35.9
NSW	19.1	1.9	7.8	28.9
VIC	18.1	2.3	7.4	27.9
QLD	18.7	2.4	5.1	26.2
SA	15.3	0.8	1.6	17.8
WA	12.4	1.4	2.0	15.8
NT	7.7	0.5	1.8	10.0
AUS (N)	2,954	316	993	4,263
AUS (%)	**18.2**	**1.9**	**6.1**	**26.3**

Table 5 also indicates the forms of participation most responsible for uneven patterns of engagement across states and territories. Absolute gaps in participation rates tend to be larger with respect to Be You modules, with participation in modules among ACT services 22.1 percentage points higher than in the Northern Territory (29.8 per cent versus 7.7 per cent). On the other hand, participation in Be You events – whether by itself, or combined with participation in modules – is 7.5 percentage points higher in Victoria than in the Northern Territory (9.8 per cent versus 2.3 per cent). This suggests that preferred modes of engagement for services may differ geographically, and that different strategies and sequences of participation may be effective across jurisdictions. ACT, Tasmania and South Australia have high proportions of services doing modules only (over 80 per cent of total participation), whereas around one-quarter of participation in NSW and Victoria involves both modules and events.

One possible reason for these differences is that states and territories differ in their relative representation of ECEC service types (see Table 6). For instance, outside school hours care (OSHC) services make up a large share of the ECEC sector in Tasmania and Western Australia, while the Northern Territory, South Australia and Victoria have a large proportion of preschools. Meanwhile, long day care centres are comparatively over-represented in New South Wales (NSW), Western Australia and Tasmania.

Table 6 Share of different services types, by jurisdictions (December 2020)

	FDC	LDC	PS	OSHC	TOTAL	N
ACT	2.2	45.9	24.5	27.5	100.0	364
NSW	2.9	58.5	13.5	25.1	100.0	5,616
NT	1.4	40.0	33.6	25.0	100.0	220
QLD	3.8	54.7	16.8	24.8	100.0	3,061
SA	1.1	34.6	33.5	30.9	100.0	1,222
TAS	4.5	57.0	0.0	38.6	100.0	223
VIC	3.7	39.3	27.5	29.4	100.0	4,299

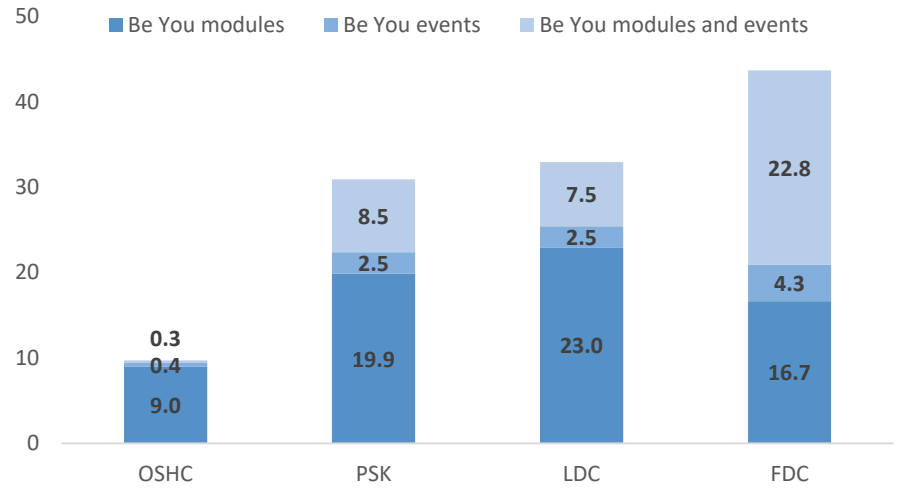
WA	3.0	58.4	1.8	36.7	100.0	1,249
AUS	3.1	50.4	18.8	27.7	100.0	16,254

Note: the table excludes services classified as 'Other' in the ACECQA database.

Source: adapted from ACECQA NQF Online Snapshot (December 2020).

To determine whether the uneven representation of different service types may affect participation rates across jurisdictions, Figure 1 reports Be You participation rates by service type.

Figure 1 Proportion of ECEC services participating in Be You initiative, by service type and participation type



(%, 2020)

Figure 1 shows that variation in levels of engagement in Be You is more pronounced across service types than across jurisdictions. Over four in ten family day care services have participated in some Be You activities, while the rate is below one in ten among OSHC services. Participation is comparable among preschools (30.9 per cent) and long day care services (32.9 per cent). Planning for recruitment strategies involving representative bodies of services other than family day care services may therefore prove effective for ECA, to expand participation across services and jurisdictions. The strategies that Be You has already used to engage family day care could potentially be replicated.

Figure 1 also reveals contrasts in the ways different types of services participate in Be You. Variations are not very significant for Be You online learning modules, since across service types, over 90 per cent of services engaging with Be You commence or complete these modules (even though the absolute participation rate is significantly higher in family day care services than in all other services). It is with respect to Be You events that differences are most significant: over six in ten family day care services involved in Be You have participated in Be You events, but only 7.4 per cent of OSHC services have done so. Irrespective of these differences, however, there is scope for improving participation in both Be You modules and events, especially among OSHC services.

Modes and levels of participation

Be You data provides further detail about specific types of participation in Be You events and learning modules. Regarding Be You events, it is possible to explore the number of staff participating

across services. Regarding Be You online learning modules, it is possible to explore both the breadth of modules different services have participated in, and the completion rate for these different modules.

Be You events

Levels of engagement in Be You events can vary from service to service (as well as from event to event). Services may have more than one educator participating, and they may also participate in more than one event. Services with anything more than a sporadic and unique participation in Be You events may thus be considered to have had a deeper engagement with the Be You initiative.

So far, service type has emerged as the key determinant of Be You participation, but does it also affect modes and levels of participation? Be You service engagement records show both registration for events (i.e. planned engagement) and participation (i.e. actual engagement). This allows both these indicators to be explored for different service types, and an attendance rate to be calculated. The following analysis focuses specifically on services with at least one registration for any Be You event. It is thus based on the sub-sample of services participating in Be You events (with or without also engaging with the Be You modules), which represents around eight per cent of services Australia-wide.

Engagement in Be You events can be measured as the number of staff registering and attending Be You events within a given service. Caveats about service identification in the Be You database (see Appendix 3) apply to this analysis. Multiple participations can occur in a single event (i.e. different staff participating) or across events (i.e. the same or different staff participating). Table 7 reports the average number of staff registering and participating in Be You events across service types.

Table 7 Levels of service registration and participation in Be You events, by service type (staff numbers, 2020)

	Registered for Be You events	Attended Be You events	Attendance rate (%)
LDC	2.04	1.04	51.0
OSHC	1.73	1.09	63.0
PS	2.21	1.39	62.9
FDC	5.62	3.27	58.2
All services	2.38	1.32	55.5

The first column shows a striking difference in the number of educators registering for Be You events in family day care (5.62), compared to other service types (closer to two educators per service). In relation to attendance, most services typically have only one staff attending Be You events, except for family day care services where three staff typically attend (both through multi-staff and multi-event participation). This may reflect the fact that family day care services often have many educators working in isolation with small groups of children, so staff may register individually, rather than one educator going on behalf of a team. It may also reflect Be You's successful family day care engagement.

The last column – the attendance rate – also shows differences by service type. Long day care services are the least likely to attend events for which they have registered (51.0 per cent), below the average attendance rate across all services of 56 per cent. This suggests that increased engagement with Be You can occur not only through expanded recruitment and outreach, but also

through improving actual attendance among services registering for events, especially for educators in long day care. Advice from the Project Reference Group indicates that Be You has already undertaken significant work to improve attendance, and attendance rates have shown an increase relative to initial levels.

The registration and attendance figures are also complicated by the possibility of watching recorded events online. Many event registrations reportedly include a request to be notified about recordings, suggesting that educators may register for events with the intention of viewing them in their own time. While there is currently no way of capturing how many educators do watch the recordings, this could be a valuable option for participation that bridges the gap between live events and modules.

Be You online learning modules

While only a minority of services engaged in Be You have had staff attending Be You events, over nine in 10 Be You services (close to 4,000) have had at least one educator commence one of Be You's online learning modules. Different modules and domains show uneven levels of participation (Table 8):

- At the domain level, participation levels are comparable for Early Support, Family Partnerships and Learning Resilience, with over 2,000 services participating in each case.
- By contrast, participation is lower for Responding Together, with at least 20 per cent fewer services than in these three domains
- Participation is higher for the Mentally Healthy Communities domain, with an additional 35 per cent of services compared to the second most popular Be You domain.

By matching the number of educators participating in different domains within the same service, it was confirmed that similar numbers of staff within any given service participate in each domain. That is, the profile of participation in a service tends to be similar across domains, rather than services choosing one or two domains, and maximising staff participation in those domains rather than others.

Table 8 Number of services with at least one commencement for Be You modules (13) and domains (5) (2020)

Domain	Module	Services (N)
Early Support	Inquire	1,717
	Notice	2,010
	Provide	1,677
	Total	2,131
Family Partnerships	Assist	1,912
	Partner	2,206
	Total	2,283
Learning Resilience	Affirm	2,038
	Embed	1,732
	Empower	1,714
	Total	2,183
Mentally Healthy Communities	Connect	2,358
	Include	2,089

	Understand	2,901
	Total	3,097
Responding Together	Recognise	1,598
	Respond	1,488
	Total	1,661

Variations in levels of participation are also evident at the module level within each domain:

- The gap between service reach of the different modules is relatively limited in the Responding Together domain, with a difference of around 100 services (i.e. 1,598 for 'Recognise' versus 1,488 for 'Respond'). In part, this may be due to the low levels of overall participation in this domain.
- Within each of the Early Support, Family Partnerships and Learning Resilience domains, the gap between the most and least popular modules is similar at around 300 services.
- For the Mentally Healthy Communities, the gap is greater than 800 services between the 'Understand' module (2,901 services reached) and the 'Include' module (2,089 services reached).

These findings indicate that early childhood service participation could be supported across domains and modules, but especially in those that attract fewer services (especially Responding Together).

Just as registration for Be You events does not guarantee participation (see above), commencement of a Be You online module does not guarantee completion. Table 9 calculates an overall completion rate for Be You modules (ratio of commencements to completions), reported at the domain level:

Table 9 Average number of staff participating in Be You modules among services engaging in Be You online learning (2020)

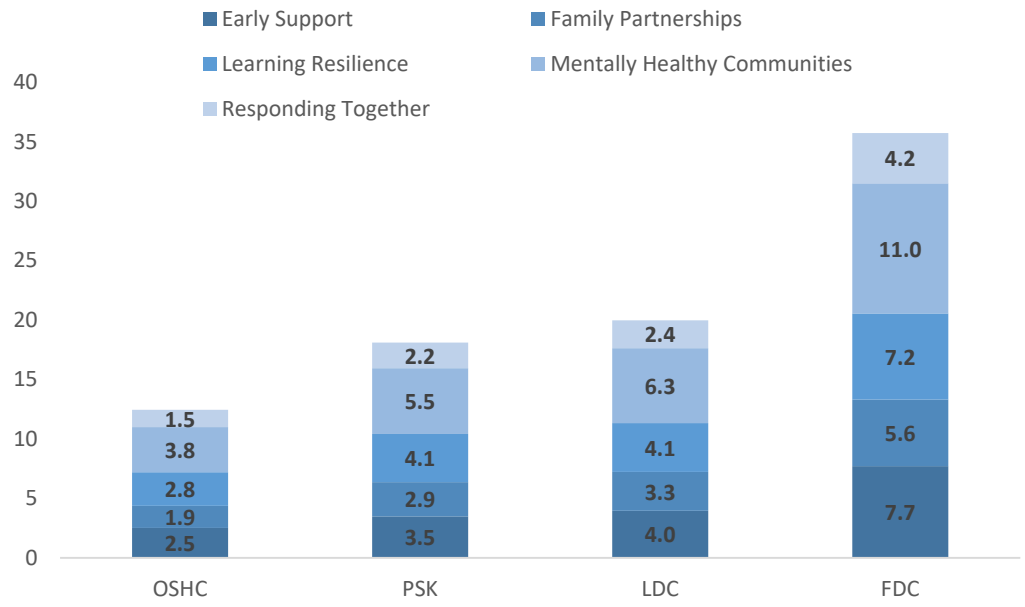
	Early Support (3)	**Family Partnerships (2)**	**Learning Resilience (3)**	**Mentally Healthy Communities (3)**	**Responding Together (2)**
Participants per service (n)	3.87	3.16	4.11	6.09	2.30
Completions per service (n)	3.69	2.96	3.88	5.54	2.22
Completion rate (%)	84.3	84.0	82.6	74.6	91.5

There are significant variations in levels of engagement with different modules in Be You professional learning domains, even among domains with the same number of modules. In the average Be You service, more staff participate in the Family Partnerships than in the Responding Together modules. Similarly, levels of participation per service are comparable in the Early Support and Learning Resilience domains, but significantly higher in the Mentally Healthy Communities domain.

Completion rates range from 75 per cent in the Mentally Healthy Communities domain to 92 per cent in the Responding Together domain. In any given domain, at least three in four staff commencing a Be You online module complete it, and the cross-domain average completion rate exceeds 80 per cent. This is significantly higher than the attendance rate at Be You events and may reflect the greater ease with which commencement can lead to completion in the Be You online professional learning suite.

Figure 2 disaggregates participation in the domains by service type, to test whether all service types exhibit the same preferences. This also removes distortion in the data arising from the fact that ECEC service types differ in size (long day care and OSHC services are larger than preschools, for example). This figure shows two striking findings: firstly, that preferences for domains are similar across services. Secondly, it shows that long day care and OSHC services may under-participate relative to their size, as proportional participation would have yielded much higher participation than is seen in preschool.

Figure 2 Average number of participants (commencements) across Be You domains, by service type (2020)



The variation in participation trends across service types, as well as jurisdictions, is indicative of the complexity of the ECEC sector, and the diverse needs of educators, services and communities. While Be You's flexible approach already accommodates this diversity to some extent, there may be scope to be more intentional in tailoring participation pathways to particular service types, to reflect their specific barriers and opportunities. Many factors could inform the design of these strategies, including the profile of the workforce (different types of ECEC services have different qualifications profiles); policy settings (some service types, particularly preschools, can access different types of government support); and the different ways that services connect with their community (for example, school age care services often have close connections with the school in which they are located). Working with services to understand these opportunities would be a valuable topic for future Be You research.

Participation trends related to vulnerability: individual factors

So far, the analysis has focused on general participation trends, or participation by service type. While valuable to Be You for understanding participation patterns more generally, they do not directly address the key question of how well Be You is achieving impact in vulnerable communities. Where these results have greatest relevance to vulnerability is in hinting at some of the specific vulnerabilities that might arise for educators who participate in Be You from different service types. The low attendance rate at Be You events for long day care, for example, may reflect industrial arrangements that make it difficult for many educators to attend professional learning. Further research would be needed to verify whether this is the case, but the stark difference here is a valuable reminder that services can generate vulnerability for educators through their own structures and practices.

This section explores participation trends associated with factors that contribute to vulnerability. It begins by examining three risk factors available in the Be You service data – community socio-economic status, geographic location, and the level of quality (or capability) in the service – then tests whether these trends from individual factors are replicated when the vulnerability index is used for the analysis. It concludes by examining community vulnerability and service capability together, providing an integrated categorisation of services to help Be You prioritise its recruitment and support.

Participation differences by community socio-economic status

In the literature review and development of the vulnerability index, community socio-economic status (SES) emerged as a strong predictor of overall vulnerability in a community. The participation analysis therefore specifically explored differences in participation based on the SES of a service's LGA. The SES measures were three of the ABS scales discussed above – IRSD, IEO and IRSAD – divided into quintiles. Results of the analysis are shown in Table 10, for each of these three nationally-recognised scales.Table 10 Proportion of services participating in Be You, by socioeconomic status (SES) of the local government area (%, 2020)

Table 10 Proportion of services participating in Be You, by socioeconomic status (SES) of the local government area (%, 2020)

	Lowest SES quintile	2nd SES quintile	3rd SES quintile	4th SES quintile	Highest SES quintile
IRSD	23.2	22.3	29.6	26.6	26.6
IEO	23.3	24.1	27.6	26.2	26.8
IRSAD	23.7	25.3	25.3	27.4	26.5

Table 10 shows a consistent pattern: services located in the first and second (least wealthy) quintiles tend to have a lower participation rate than services located in the third to fifth quintiles. However, between the third and fifth quintiles, no clear pattern is evident. This suggests that a relative lack of participation may be more related to the limiting impact of local community's socioeconomic disadvantage than fostered by a local community's socioeconomic advantage. At the same time, the gap between highest-participating and lowest-participating quintiles is relatively small, ranging from 7.2 percentage points for the IRSD indicator (between quintiles 2 and 3) to 3.7 percentage points for

the IRSAD indicator (between quintiles 1 and 4). This suggests that other factors, as explored elsewhere in this report, may be more decisive in explaining participation in Be You than SES.

The picture changes when participation differences based on SES are analysed separately for different types of ECEC services (Table 11). Among preschools, services in wealthier (higher-SES) communities are 15 percentage points more likely to participate in Be You. For family day care services, the reverse is true, as services located in lower-SES communities tend to participate more than those found in higher-SES communities; although caution should be used in interpreting this finding, given that family day care services can cover a wide geographic area. For both OSHC and long day care, the relationship between participation and community SES is not evident, suggesting that Be You is achieving a good spread of participation across different communities for those two types of ECEC services.

Table 11 Proportion of services participating in Be You, by service type and LGA socioeconomic status (IRSAD) (%, 2020)

	LDC	OSHC	PS	FDC	Total
Lowest SES quintile	32.0	6.5	20.7	50.0	23.9
2nd SES quintile	31.9	11.6	24.4	45.5	25.3
3rd SES quintile	29.7	8.9	30.4	40.6	25.5
4th SES quintile	34.6	10.1	33.3	45.8	27.5
Highest SES quintile	33.5	9.8	35.2	42.2	26.7
Total	32.9	9.7	30.9	43.7	26.4

Note: the results shown in this table may differ slightly from the results presented earlier as they only include services with valid service type, LGA SES and Be You participation information.

Participation differences by geographic location

Rural and remote communities may also be seen as more vulnerable than those in major cities. Table 12 explores Be You participation rates by service remoteness, based on the ABS national index.

Table 12 Proportion of ECEC services participating in Be You initiative, by remoteness and participation type (%, 2020)

	Be You modules	Be You events	Be You modules and events	Total participation
Major Cities	18.3	1.9	6.2	26.4
Inner Regional	20.3	2.3	6.8	29.5
Outer Regional	15.4	1.7	5.4	22.5
Remote	10.7	0.9	0.9	12.6
Very Remote	6.1	2.4	1.2	9.8
AUS (%)	**18.2**	**1.9**	**6.1**	**26.3**

Australia-wide, participation in Be You is highest for services located in inner regional areas (29.5 per cent), followed by those in major cities (26.4 per cent) and outer regional areas (22.5 per cent). By contrast, fewer than one in eight services from remote and very remote parts of Australia (taken together) have engaged with Be You. This confirms the relative lack of engagement from those services; potentially compounding other limitations in educational opportunity in these communities, which are reflected in differences in child wellbeing and emotional development (Lamb et al., 2020).

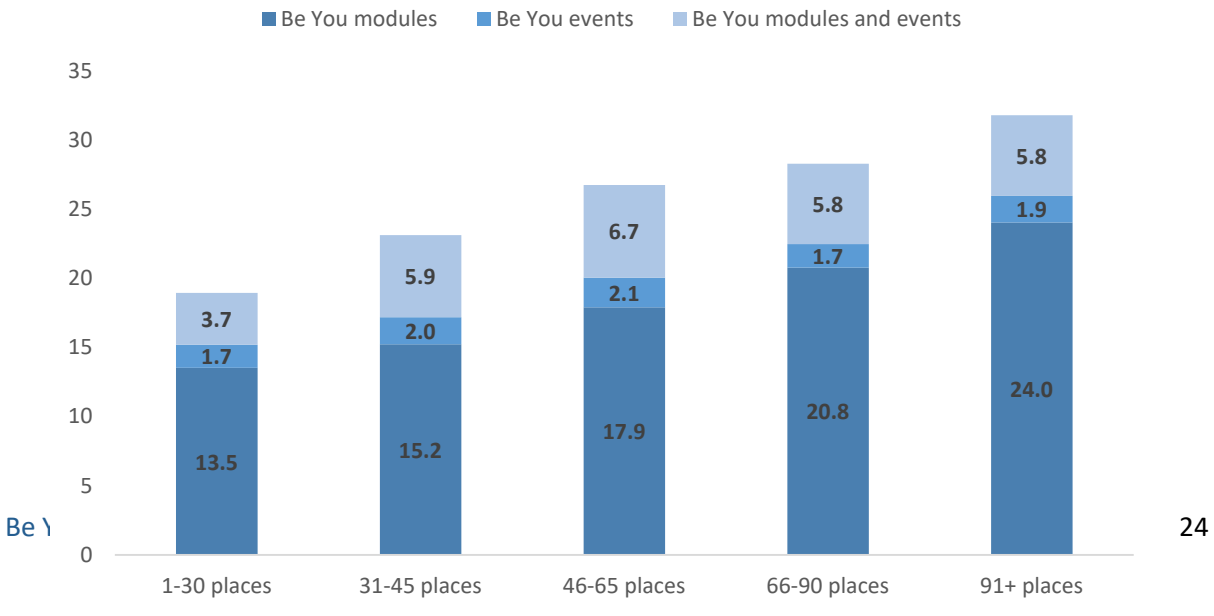
Geographic differences are evident to an even great extent in participation in Be You events (Table 13). Regional and city services have more staff registering and attending events than services in remote and very remote locations. The attendance rate is particularly low for remote services, with just one in three registered staff attending. This discrepancy warrants further investigation by Be You, as it suggests a gap between educators' desired participation and what they can actually achieve.

Table 13 Levels of service registration and participation in Be You events, by service location and overall NQS rating (staff numbers, 2020)

	Registered for Be You events	Attended Be You events	Attendance rate (%)
Major Cities	2.47	1.36	55.1
Inner Regional	2.08	1.15	55.3
Outer Regional	2.46	1.37	55.7
Remote	1.88	0.63	33.5
Very Remote	1.57	0.86	54.8

Services located in remote and very remote areas also tend to have fewer staff participating in Be You modules than staff in Australian regional centres and cities, consistent across Be You domains. Given that geographic location should not present a barrier to engaging with online modules, this difference may be related to the smaller size of services outside metropolitan or regional centres. Unsurprisingly, services with more places (and therefore more educators) were found to be more likely to participate in Be You, and to have higher numbers of staff attending Be You events. This is shown in Figure 3.

Figure 3 Proportion of ECEC services participating in Be You initiative, by service size and participation type (%, 2020)



Note: service size information is not available for family day care services.

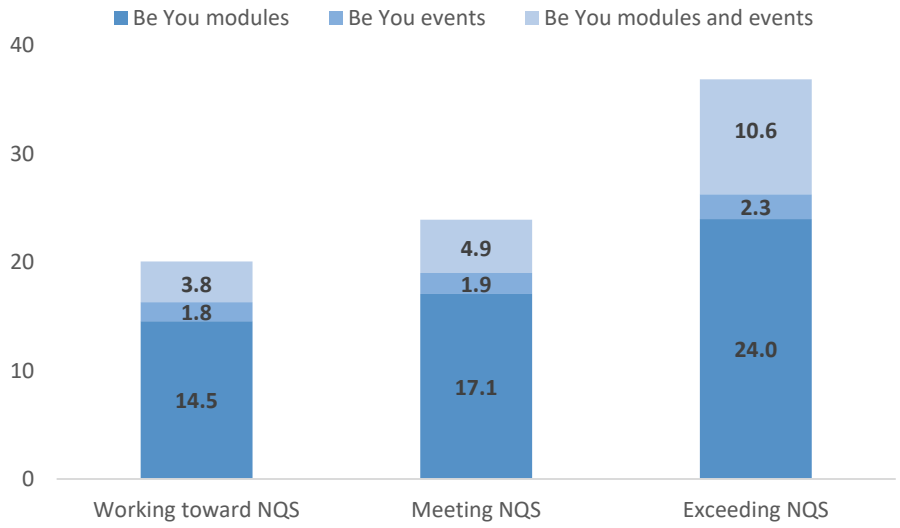
A relatively linear relationship exists between the number of places a service can offer, and participation in Be You, as Figure 3 shows. While fewer than one in five small services (1-30 places) have had some engagement in Be You, the rate increases steadily to one in four for medium-size services (46-65 places) and reaches over three in 10 for large services (91+ places). The increase is largely driven by improved engagement with Be You modules, which rises from 13.5 per cent among small services to 24 per cent among large services (participation in Be You events and combined events-modules participation is fairly consistent across service sizes, except for the smallest services).

The relationship between rural and regional location, and service size, illustrates the compounded vulnerability that services may experience in engaging with Be You – as well as the interaction between community-level and service-level vulnerability. Rural and regional communities may experience a range of risk factors, and the smaller size of many of the ECEC services serving them can reduce the opportunity that educators can have to access professional learning initiatives like Be You. Even if online access is easy, difficulties may arise arranging time for professional learning, if there are limited other educators around to provide cover and support. Professionally isolated educators may also have fewer opportunities to 'bounce' new ideas around with colleagues, and may therefore gain particular benefit for opportunities for collegial professional learning through online learning communities.

Participation by service quality

Service ratings against the National Quality Standard (NQS) were identified in the literature review as another factor contributing to vulnerability; as well as to the extent to which ECEC services can fulfil their potential as protective factors for vulnerable children and families. Prior research suggests that a 'virtuous cycle' exists between quality and professional learning more generally, as higher-quality services are more likely to participate in high-quality professional learning (Egert, Fukkink, & Eckhardt, 2018). Examining Be You participation rates by services' overall NQS ratings confirms this (Figure 4).

Figure 4 Proportion of ECEC services participating in Be You initiative, by service rating and participation type



(%, 2020)

Note: services' five overall ratings categories were recoded into three categories, in line with the most recent approach to service rating adopted by ACECQA.

Figure 4 shows that just one in five services that are Working Towards NQS have had some involvement in Be You, while the corresponding rates are 23.9 per cent among services meeting the NQS and 36.9 per cent among those exceeding it. In other words, services rated as Exceeding NQS are 84 per cent more likely to participate in Be You than are services rated Working Towards NQS, and 54 per cent more likely to engage than those rated Meeting NQS. This striking finding may cause Be You to consider how well it is helping services to improve, as opposed to reinforcing existing strengths.

One hypothesis might be that the large proportion of Be You services who have achieved Exceeding NQS rating have done so because Be You has been part of a process of continuous improvement. If that were true, it might be expected that services participating in Be You would be disproportionately represented among services that have improved their rating over time. However, analysis of services that had been rated more than once (close to 10,000) showed that there was no difference in the improvement trajectories of services that participated in Be You, and those who did not. This may be due to many services participating in Be You already being rated at the highest NQS level.

Figure 5 Rating change category of ECEC services, by participation in Be You (%, 2020)

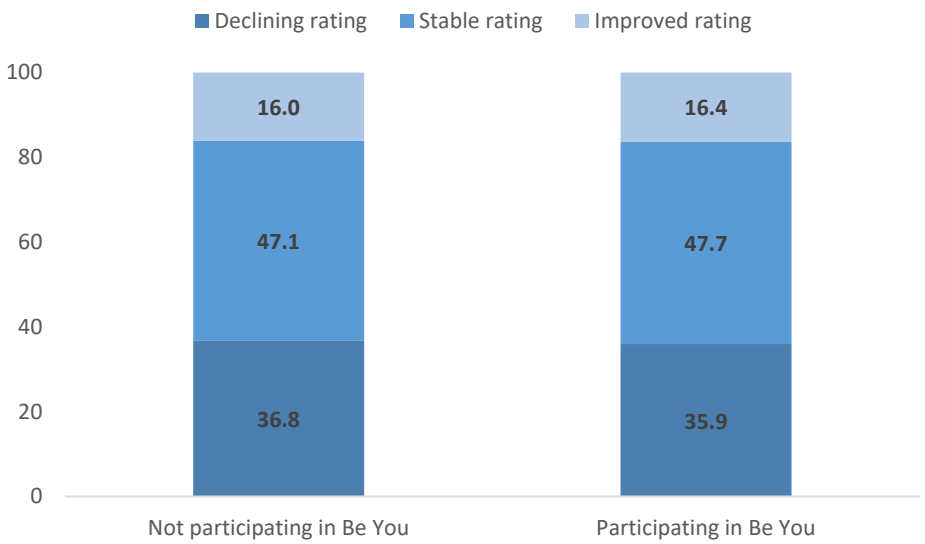


Table 14 breaks down the analysis by service type, and type of Be You participation. It reveals that the trend for higher-rated services to participate in Be You holds across all service types. The gap between participation rates for highest-quality (Exceeding NQS) and lowest-quality (Working

Towards NQS) services is larger among long day care services (18.2 points) and family day care services (35.5 points), compared to preschools (13.3 points) and OSHC services (7.2 points). This finding is of some concern, given that family day care has a far higher proportion of services rated Working Towards NQS than centre-based services (the latest ACECQA data shows 47.4 per cent not meeting the NQS for family day care, compared to 15.4 per cent for centre-based services). It suggests that Be You's success in reaching family day care services has been heavily concentrated amongst the most capable.

Table 14 Proportion of services participating in Be You, by service type, service rating and participation type (%, 2020)

		Neither Be You modules nor Be You events	Be You modules	Be You events	Be You modules and events
LDC	Exceeding	56.7	27.9	2.7	12.6
	Meeting	68.5	22.5	2.4	6.5
	Working Towards	74.9	18.1	2.5	4.5
OSHC	Exceeding	82.8	15.4	1.0	0.7
	Meeting	91.3	8.1	0.3	0.3
	Working Towards	90.1	9.4	0.3	0.2
PS	Exceeding	65.2	22.0	2.2	10.6
	Meeting	72.8	17.9	3.3	6.0
	Working Towards	78.6	15.5	1.8	4.2
FDC	Exceeding	30.5	28.8	1.7	39.0
	Meeting	42.4	17.6	6.7	33.3
	Working Towards	66.0	15.6	3.8	14.6
All services	Exceeding	63.2	24.0	2.3	10.6
	Meeting	76.1	17.1	1.9	4.9
	Working Towards	79.9	14.6	1.8	3.8

Differences in participation flow through to specific Be You activities. The proportion of services participating in Be You events increases with service rating, except for family day care services. For instance, among preschools participating in Be You (all types of participation considered), 27.8 per cent of those rated Working Towards NQS have participated in Be You events, while 36.7 per cent of those rated Exceeding NQS have done so. Services rated Exceeding NQS are also notably more likely to attend once they register for an event (59 per cent attendance rate, versus 52 to 53 per cent for other services), even if numbers of staff registering and attending are similar across NQS ratings.

The seven quality areas of the NQS can be used to explore the specific attributes that make highly-rated services more likely to participate in Be You. Across the seven quality areas, the proportion of services rated Exceeding NQS is 12.2 percentage points higher on average among those engaged in Be You, and the connection between higher quality and participation is consistent across all quality areas. The quality area with the largest gap is *Quality Area 6: Collaborative partnerships with families and communities*, at 16.8 percentage points. This finding seems logical, as that quality area concerns the service's ability to form partnerships and work in transdisciplinary ways, including with allied health. It is plausible that services who connect to external initiatives (like Be You), and see

themselves as having a role in supporting children's mental health, will be more likely to excel in this area.

Table 15 NQS quality area ratings of ECEC services, by Be You participation status (%, 2020)

	Not participating in Be You			Participating in Be You		
	Working Towards	Meeting	Exceeding	Working Towards	Meeting	Exceeding
QA1: Educational program and practice	13.8	62.0	24.2	8.8	55.3	35.9
QA2: Children's health and safety	12.3	70.8	17.0	7.8	66.7	25.5
QA3: Physical environment	8.3	71.1	20.6	4.6	62.5	32.9
QA4: Staffing arrangements	5.5	70.9	23.5	3.2	60.6	36.2
QA5: Relationships with children	4.1	65.6	30.3	3.0	56.0	41.0
QA6: Collaborative partnerships with families and communities	5.3	64.2	30.4	2.6	50.3	47.2
QA7: Governance and leadership	13.2	63.8	23.0	7.5	56.5	36.0

An initial exploration of the interaction between service quality, community vulnerability and Be You participation was conducted by jointly considering service rating and community SES. Table 16 reveals that the difference in Be You participation rates is consistent across community SES quintiles: in each quintile, services rated Meeting NQS are more likely to participate than those rated Working Towards NQS, and services rated Exceeding NQS are more likely to than those rated Meeting NQS.

Reading the table vertically (columns) shows no strong SES gradient for services rated Working Towards or Meeting NQS. Around one in five services rated Working Towards NQS participates in all except the wealthiest communities, where the proportion is slightly lower (18.6 per cent). In contrast, services rated Exceeding NQS are notably less likely to participate in the lowest-SES communities.

Table 16 Proportion of services participating in Be You, by service rating and LGA socioeconomic status (IRSAD)
(%, 2020)

	Working Towards	Meeting	Exceeding
Lowest SES quintile	21.2	23.8	27.8
2nd SES quintile	20.6	22.8	35.2
3rd SES quintile	20.9	24.3	37.8
4th SES quintile	21.0	26.1	35.3
Highest SES quintile	18.6	22.5	39.1
Total	20.1	23.9	36.9

These findings suggest that service quality (as assessed against the NQS) is a strong predictor of participation in Be You, and has a stronger effect on the likelihood of participation than the socio-economic status of the community. Returning to the four quadrants of *community vulnerability* and *service capability* identified following the literature review (see above), this suggests that services' level of capability (or quality) is an important factor in determining whether educators access Be You, and gain the skills and knowledge to assist them to support mental health for children and families.

Participation trends related to vulnerability: vulnerability index

The analysis so far has shown how some of the factors related to service and community vulnerability affect the likelihood of participation in Be You. The purpose of developing the vulnerability index (described above) was to create a single composite indicator of vulnerability, which would bring the multiple dimensions of vulnerability together. Using the vulnerability index to examine participation trends helps give a single 'point of truth' about Be You's current reach to vulnerable communities. It also indicates whether the composite index provides different results from other individual measures of vulnerability (such as community SES), and therefore measures something distinctive and valuable.

Applying the vulnerability index to ECEC services

The first step in this analysis was assigning a vulnerability score to all ECEC services in Australia. This involved first computing raw vulnerability index scores (including negative and positive scores and with a weighted mean of 0), then rescaling them to range from 0 to 100. Low index scores represent a low level of vulnerability at the LGA level, and high scores indicates a high level of vulnerability.

As shown in Table 17, ECEC services are unevenly distributed across communities experiencing different levels of vulnerability. Close to seven in 10 ECEC services (68.8 per cent) are found in communities experiencing comparatively lower levels of community vulnerability (deciles 1 to 5 on the vulnerability index). However, this does not mean that ECEC services are absent from vulnerable communities. Around 2,000 services are located in communities with relatively high levels of vulnerability (top three deciles), and close to 850 services are found in areas with high levels of community vulnerability (top two deciles). This highlights the value of the vulnerability index to identify services for which engagement in Be You may have a significant positive impact.

Table 17 Distribution of ECEC services across communities, by vulnerability index decile

Vulnerability index decile	ECEC services (N)	ECEC services (%)
1	2,814	17.4
2	3,017	18.6
3	1,734	10.7
4	1,413	8.7
5	2,154	13.3
6	1,751	10.8
7	1,311	8.1
8	1,153	7.1
9	551	3.4
10	292	1.8
Total	**16,190**	**100.0**

The information conveyed using the vulnerability index is consistent, although not identical, with the results obtained using other indicators of community socioeconomic advantage and disadvantage. Table 18 shows the distribution of ECEC services across local communities defined by different levels of socio-economic disadvantage or vulnerability. The first four indicators (IRSD, IRSAD, IER and IEO) are the Socio-Economic Indexes for Areas (SEIFA) scales described earlier in this report. For this table, the vulnerability index (VI) deciles have been flipped to align the direction of the scale with the SEIFA indexes, whereby the most vulnerable communities are represented by the lowest deciles.

Table 18 Distribution of ECEC services across deciles of community vulnerability, by indicator type (%)

Decile	IRSD	IRSAD	IER	IEO	VI (flipped)
1	1.8	1.4	2.1	2.5	1.8
2	4.2	5.0	6.4	6.3	3.4
3	6.5	3.6	9.1	5.3	7.1
4	7.1	4.3	5.8	5.5	8.1
5	5.4	8.7	7.4	6.9	10.8
6	10.8	8.9	10.0	16.3	13.3
7	13.7	12.2	9.1	6.4	8.7
8	12.2	15.0	20.8	10.3	10.7
9	17.4	13.9	15.5	19.4	18.6
10	20.8	27.0	13.8	21.0	17.4
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Table 18 shows that the vulnerability index yields the lowest proportion of services for the most vulnerable communities (bottom two deciles). This suggests that it is most precise in identifying the most disadvantaged communities, which may be the highest priorities for Be You support. Its overall distribution is similar to IRSD, with an average difference of 1.7 percentage points between the proportion of services in each decile (the next closest is IEO, with an average difference of 2.63). As IRSD is focused on disadvantage, rather than considering both disadvantage *and* advantage (IRSAD), it suggests that the vulnerability index is most effectively measuring risk factors, rather than protective factors. This is appropriate, given that Be You's priority is identifying communities in greatest need.

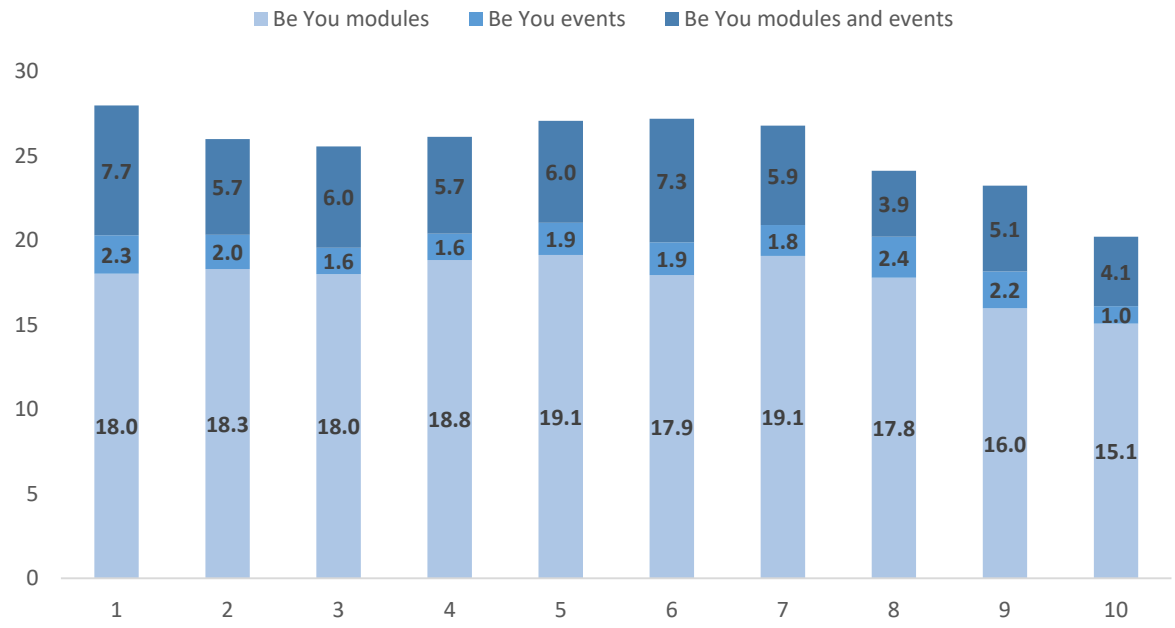
Participation by community vulnerability

Once all services had been allocated a vulnerability score, it became possible to explore patterns of engagement in Be You using the vulnerability index. Figure 6 shows that ECEC services are unequally likely to participate in Be You based on the level of vulnerability of the local communities they serve. The Be You engagement rate varies from 20.2 per cent of services in the most vulnerable communities (tenth decile) to 28.0 per cent of services in the least vulnerable communities (first decile).

A notable feature of this graph is that differences in participation rates are relatively marginal between the first and seventh deciles. In fact, participation rates exceed 25 per cent across all deciles except the three categories of local communities with the highest levels of vulnerability (deciles eight to ten). It is only for services in the most vulnerable communities that Be You participation becomes significantly less likely. Recalling that a relatively small number of services fall

into this category, this suggests that there is a distinctive group of services who are missing out on Be You participation, and that an intensive focus on these services might be most effective in improving Be You's reach.

Figure 6 Proportion of ECEC services participating in Be You, by level of vulnerability in local community and type of engagement (%)



This finding suggests that the vulnerability index is a 'sharper tool' for identifying communities that might benefit from an increase in Be You participation, than measures of community SES alone. The sharp drop-off in participation in the most vulnerable communities shown in Figure 6 is more marked than the relatively small variation in participation shown by comparison using mainstream SES measures (see above – the relatively variance would also have held if deciles, not quintiles, were used). Further analysis would be possible, to enable ECA to identify exactly which components of the vulnerability index contribute most to its distinctive value, and to better understand how its results compare to analysis using individual indicators of child, family and community vulnerability alone.

Participation by community vulnerability and service capability

The final analysis combined the measure of community vulnerability with a measure of service capability, to explore the complete typology of services identified in the literature review (see above):

- Low vulnerability, high capability;
- Low vulnerability, low capability;
- High vulnerability, high capability; and
- High vulnerability, low capability.

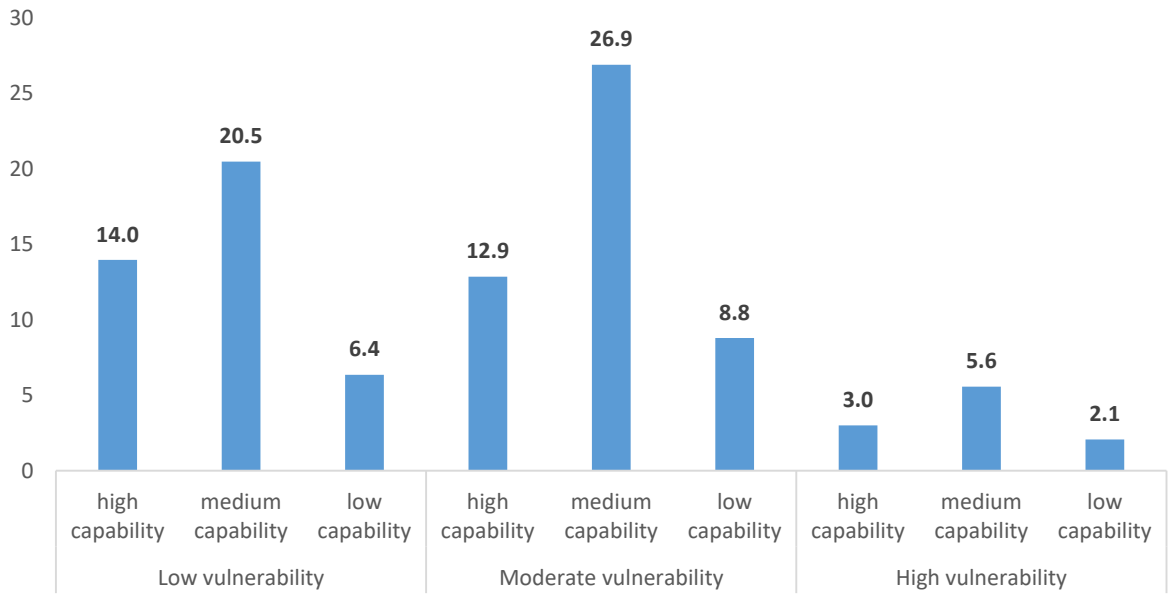
NQS ratings were considered to be the best available measure of service capability, and had already been shown to have a strong influence on the likelihood of services participating in Be You (see above).

The first step in this analysis was exploring how different NQS ratings are distributed across services in communities with different levels of vulnerability. Communities were grouped into three broad

levels of vulnerability: low, moderate and high (see Appendix 2 for method). This resulted in 48.6 per cent of services located in moderate vulnerability communities, 40.8 per cent in low vulnerability communities, and 10.6 per cent serving highly vulnerable communities. Low, medium and high capability scores simply reflect NQS ratings: Working Towards, Meeting and Exceeding NQS respectively. Figure 7 shows how service capability was distributed for each level of vulnerability.

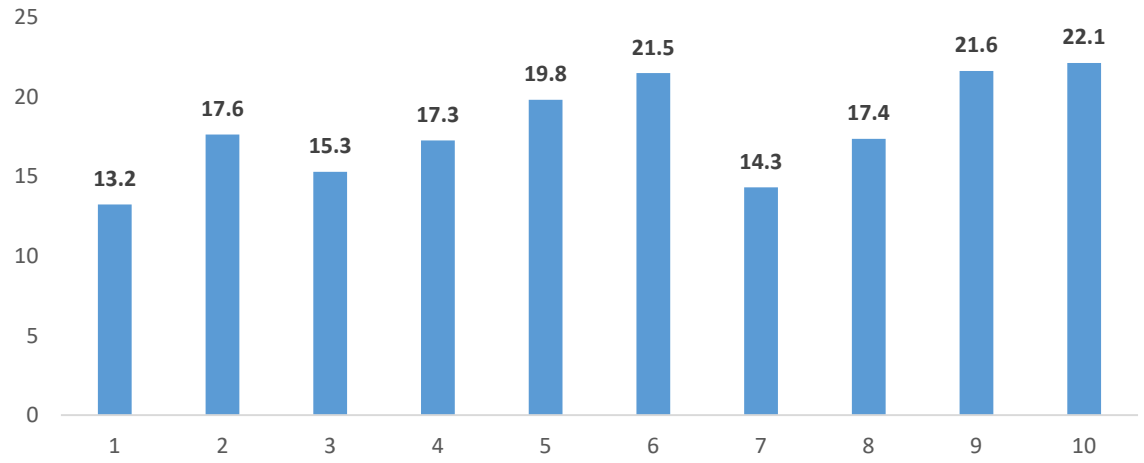
The vast majority of ECEC services fell into the four lowest-risk categories: high (14 per cent) or medium (20.5 per cent) capability services in communities with low vulnerability; or high (12.9 per cent) or medium (26.9 per cent) capability services in communities with moderate vulnerability. This suggests that Be You's current approach, which one Reference Group member described as 'focused on the middle', is probably appropriate to reach the majority of ECEC services. At the same time, over one in ten ECEC services serve high-vulnerability communities, and high-capability services are relatively rare within this group (only 3 per cent of services overall). Even in communities with low or moderate vulnerability, a sizeable proportion of services (6.4 and 8.8 per cent) have limited capability.

Figure 8 ECEC services' distribution across community vulnerability categories and overall NQS ratings (%)



Another way of examining the intersection between community vulnerability and service capability is to analyse the proportion of services rated Working Towards NQS across deciles of community vulnerability levels. This is important for identifying services with the lowest levels of capability, which may be the highest priority for Be You to target. Results are shown in Figure 9.

Figure 9 Proportion of ECEC services rated as Working Towards NQS, by deciles of community vulnerability (%)

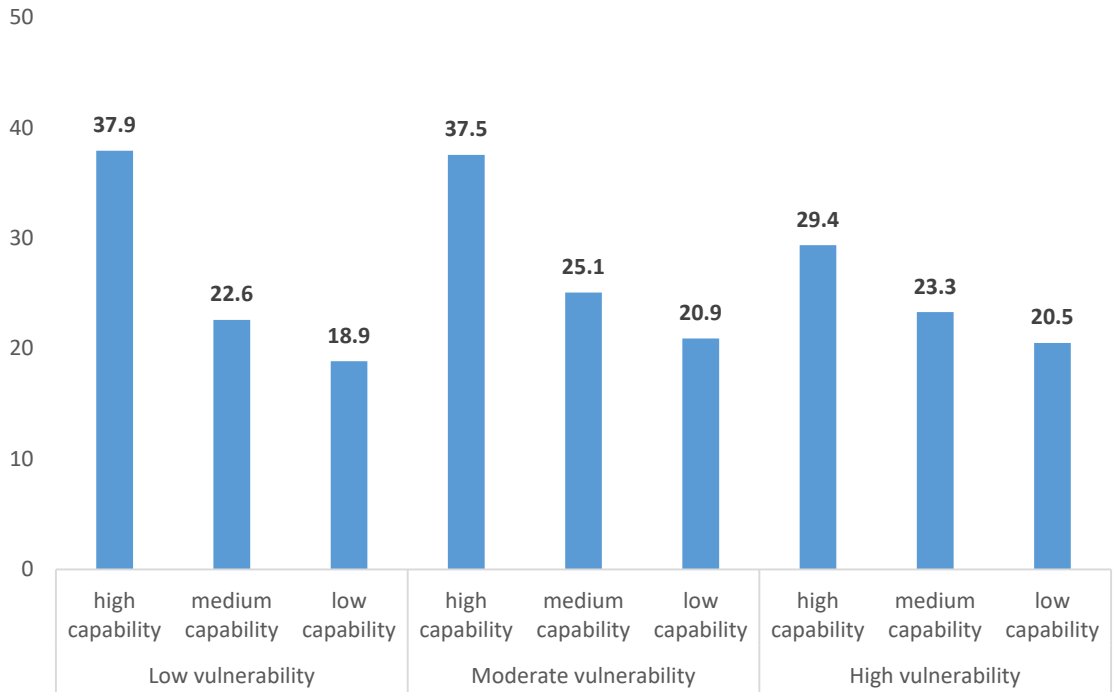


This analysis shows that the distribution of services rated Working Towards NQS across communities with different levels of vulnerability is not linear – however, some broad patterns do emerge. Across the five deciles with the lowest levels of community vulnerability, fewer than one in five ECEC services are rated as Working Towards NQS. By contrast, over one in five ECEC services from the top two deciles of highest community vulnerability do not meet the NQS. The average proportion of services not yet meeting the NQS standards is 15.4 per cent across communities from the three lowest deciles of vulnerability, while it is 19.2 per cent across communities from the three highest deciles of vulnerability. This suggests that high community vulnerability and low service capability are likely to co-exist – compounding the risk factors for children and families within those communities.

The final analysis investigates how the typology of community vulnerability and service capability relates to participation in Be You. Figure 10 shows the results, and indicates two striking findings:

- Higher-capability services are more likely to participate in Be You than lower-capability services, irrespective of the level of vulnerablity in their community.
- In the most vulnerable communities, the participation gap between higher-capability and lower-capability services is narrowest, meaning that even capable services in those communites are less likely to participate in Be You than their equally capable counterpart services located elsewhere.

Figure 11 Be You participation rate, by ECEC service capability and vulnerability index decile of services' local community (%)



These findings signal a double disadvantage for the most vulnerable communities, in their likelihood of benefitting of from Be You: not only are they less likely to be served by high-quality services, but even the most capable services in those communities are less likely to engage in Be You. The also signal the importance of Be You continuing to engage with services in communities across all levels of community vulnerability, as children attending lower-capability services in these communities are least likely to benefit from the impact of Be You participation.

The interaction between community vulnerability, service capability and Be You participation has profound implications for how well Be You is reaching children and families, given that lower service quality may itself be a risk factor that contributes to child and family vulnerability. If Be You continues to disproportionately reach the services most capable of benefitting from the initiative, then children in less capable services will miss out on the protective effects of Be You, as well as experiencing the risks associated with lower-quality ECEC provision. This risk is present even in communities with lower levels of vulnerability overall – especially if the lowest-capability services in these communities attract families with fewest resources to support children's mental health and wellbeing in the home.

The key message from this analysis is clear: both community vulnerability *and* service capability (quality) should be considered, in Be You's strategic planning to improve its impact on vulnerable children, families and communities. This insight poses challenges for the Be You team, as different strategies may be needed to engage a service with low levels of capability (such as weak structures to enable participation in professional learning); as opposed to a service working in a community with high levels of vulnerability. Where both high vulnerability and low capability are present, then an intensive combination of supports may be necessary, to support the service to engage in the initiative, at the same as supporting the educators to address the needs of their communities. At the same time, this intensive support would yield double dividends, in not only reaching vulnerable

children and families, but building the capability of services to foster mental health and wellbeing into the future.

3. Strategies for increasing Be You's impact in vulnerable communities

The ultimate value of this analysis will be derived from the steps that Be You takes next, to improve its reach to vulnerable children and families. Moving from analysis to action is no easy task, and the research team acknowledges the challenge facing the Be You leadership and delivery team, in bringing this aspiration to life. Be You is in a phase of self-analysis and reflection, and open to reviewing whichever aspects of its model might most usefully be mobilised to extend its reach to services in vulnerable communities. This section aims to offer insights to support this self-analysis and planning.

The process of synthesising information always involves some interpretation, and the views in this section reflect the researchers' understanding of how Be You might approach the task of engaging with vulnerability more purposefully. The hope is that this 'outsider' view is a valuable stimulus for discussions within Be You, and that it does justice to both strengths and opportunities within Be You's current practice. Throughout the project, researchers were struck by the level of commitment evident amongst Be You staff and Reference Group members to the initiative's aims. This strength of purpose will itself be an invaluable resource in enabling Be You to continue to grow and deepen its impact.

Given the diversity in how vulnerability was defined (noted earlier in this report) it is unsurprising that focus group participants also differed widely in their views of how well Be You is currently reaching vulnerable children, families and communities. Taken together, their responses signal that this is an important area in which Be You already invests considerable effort; but that there is some way to go before its full potential impact is achieved. The focus groups also affirmed how important reponsiveness to vulnerability is for the Be You team; not only in offering strategies to address vulnerability, but being champions and advocates for vulnerable children and families.

Making vulnerability visible and valued

Despite the shared commitment among Be You staff to helping vulnerable children and families, there appears to be scope for vulnerability to be more visible in the day-to-day work of the initiative. Unless services chose to share information, consultants often did not have a sense of whether the services they were supporting were engaged with highly vulnerable children and families, or the level of vulnerability among the educators. This limited their ability to tailor their responses and support.

One simple but effective strategy may be to make space for collaborative reflection on how well educators and learning communities working with vulnerable children and families are being served by Be You, and enable consultants, leaders and other staff to challenge one another's assumptions and test new ideas. This project has revealed a strong capacity for such reflection within the Be You team, and the capacity to develop creative responses. Just as happens in early childhood services, the intense work involved in delivering learning can crowd out opportunities to reflect on questions like 'who are we reaching?' and 'what hidden assumptions do we hold?' Modelling this kind of

reflective practice within Be You – as occurs to some extent already – can better equip consultants and leaders to help early childhood services to do the same.

Shining a light on vulnerability does not mean focusing on problems or deficits. A striking reflection from one focus group was that vulnerability can be an opportunity, and that recognising it can be the starting point for a journey to greater resilience and wellbeing. This may involve the Be You team challenging one another to reframe their definitions of successful participation in the Be You initiative, and consider how a vulnerable service (or educator) might experience success, as discussed below.

Promoting diverse models of success

Vulnerability must be visible and valued externally, as well as internally. As in any learning initiative, Be You must take care that successful learning is defined relative to a starting point, not to an ideal or norm. When learners (of any age) feel that they do not conform to the 'ideal learner' in a particular setting, it affects their motivation and can create a downward spiral. In contrast, recognition of any successful learning, however small, creates a 'virtuous cycle' of positive self-reinforcement.

Focus groups yielded examples of what 'successful Be You participation' might look like in services working with vulnerable communities, which may differ from services with less vulnerability:

- One service was unable to support positive behaviour for a young children experiencing severe anxiety. Participation in Be You helped the educators develop support strategies, as well as to make a successful referral to an early childhood intervention service.
- Another service wanted to improve parental engagement, so they began with the small step of saying hello to all families at drop-off. They attributed this idea to their participation in Be You.
- In another community, another local professional (a perinatal nurse) was using the Be You BETLS tool in her work. This shows that Be You can have an impact in both direct and indirect ways.

These cases demonstrate some of the ways in which successful participation in Be You might have distinctive characteristics, for services located in vulnerable communities. These are listed below:

- **Change may require a move from reactive to proactive thinking.** Services working with vulnerable children and families might face specific mental health challenges that are best addressed by connecting them with other professionals. Successful participation in Be You means moving beyond these immediate concerns, and building capacity to cope with challenges in the future. Vulnerable services may also be experiencing deep challenges in educators' practice or relationships with families, which will take many small steps to address. In focus groups, some consultants mentioned connecting Be You to the service's Quality Improvement Plan (QIP), so that it becomes part of the service's ongoing quality improvement, with clear goals and outcomes. The QIP process is an asset for Australian ECEC services, which Be You should support where possible.
- **Change may require an admission of vulnerability.** High-performing services may engage in learning for continuous improvement, rather than to address a specific concern. In contrast, services experiencing vulnerability (either their own, or their community's) might need to begin the learning process by confronting a challenge: to take a step back, before moving forward. Be You can support services to confront challenges without judgement, and encourage them to

recognise strengths. This may include challenges they face in engaging with professional learning.

- **Change may require multiple overlapping processes.** In the second service example above, the reason for the service's view that Be You had contributed to its learning was not clear to the Be You team. Just as vulnerabilities have multiple causes, they may also have multiple overlapping responses. The impact of Be You for services facing multiple challenges may be difficult to isolate.

There are many ways in which Be You can ensure that diverse pathways to success are visible and valued. One focus group discussed the possibility of showcasing different kinds of success in Be You promotional materials; not just in showing demographic diversity, but showing how services with different starting points (and levels of vulnerability) can achieve in different ways. Different ways of capturing evidence of success may also need to be devised, including methods that capture the wider impact of Be You on educators that do not participate directly, but still learn from their colleagues.

A second (and important) strategy may be to shift how success in Be You is monitored and measured. Consultants described how they set 'achievable' goals for services, which often involved completion of specific modules or workshops. These metrics also appear to dominate Be You's data collection on its impact. Developing more nuanced, qualitative measures of success, to describe progress relative to a starting point (including heightened awareness of learning needs), might help services and other stakeholders to recognise success in highly vulnerable services. This mirrors the 'learning stories' commonly used for assessment in early childhood services – but applied to services themselves.

Supporting vulnerable educators

Be You cannot reach vulnerable children and families without first reaching educators. While the relationship between educator vulnerability and community vulnerability cannot be assumed, there are factors to suggest that educators working with vulnerable communities may themselves require additional support. Educators in socio-economically disadvantaged communities are more likely to be early school leavers, and to earn lower income for their level of qualification (Jackson, 2018). They may also be experiencing a higher level of challenge in their day-to-day practice with children.

Expanding Be You's reach into vulnerable communities may therefore require explicit engagement with educator vulnerability, which in turn equips educators to engage with vulnerable children. While Be You already contains valuable learning to support educators' own wellbeing and resilience, highly vulnerable educators may lack confidence in engaging with materials, or may easily disengage. There may be scope for different approaches to addressing non-participation (or 'dropping out'), which are focused on building confidence and capability as learners, as part of educators' own resilience.

Trust is an essential precursor of readiness to learn, and one consultant emphasised how services in vulnerable communities can be especially wary of initiatives that claim to be supporting them. While that consultant had worked in the vulnerable community she was supporting – 'I'm one of you guys' – this kind of relationship is rarely possible, and other trust-buildling strategies may be needed. Be You could consider strategies for building a learning community where educators feel empowered and supported, irrespective of their level of engagement in the initiative, perhaps through peer-to-peer connections. Educators who may not feel confident enough as learners to engage with consultants or learning materials may be more receptive to engagement from a peer in similar

circumstances. This strategy will depend on the resources Be You chooses to invest in building communities of practice.

Community-centred curriculum

Educators can achieve greatest impact with Be You if the learning is relevant to the strengths and challenges of their communities. Be You already offers a wide range of content, and flexible options for how services and educators engage. While this study did not directly analyse the relevance of Be You's content to vulnerable communities, the focus groups indicated potential for more explicit learning resources to help educators explore and respond to vulnerability in their community.

Be You can also actively design community-centred curriculum, through targeted engagement with vulnerable communities. To some extent, this happens already, as Be You actively recruits and supports services in communities facing heightened vulnerability from natural disasters, giving thought to the resources that will be most valuable to them. This same approach could be used in other communities experiencing vulnerability, including longer-term risk factors such as child poverty.

Be You curriculum could be adapted a number of ways, for services in vulnerable communities:

- Tailoring curriculum to directly address challenges in a community could help bring local services together around shared priorities, and strengthen local communities of practice. In focus groups, service clusters emerged as a valuable way to maximise learning. While it appeared that clusters were often built around a single provider, it may be possible to create them within communities.
- Even without tailored content, it may be possible to structure Be You participation in a way that meets service needs. In focus groups, consultants mentioned that clearly defined, achievable pathways through Be You content can help engage services who struggle to find their own path.
- The role that Be You itself plays in a local area is another aspect of community-centred delivery. One consultant described working collaboratively with other local initiatives, to ensure that Be You fitted within an integrated plan to empower the community. Willingness to align with exisitng local initiatives could yield benefits for Be You uptake in vulnerable communities. The example of the perinatal nurse above demonstrates what transdisciplinary partnerships might achieve.

Of course, the best strategy for creating community-centred learning experiences is to co-create them with community representatives. Be You could consider engaging in design of tailored local programs for clusters of services, as part of local Early Years Plans (potentailly connected to the AEDC process).

Purposeful case management

Be You involves a unique combination of self-directed learning (both for individuals and for whole service communities), and invaluable support from the consultant team. Consultants proudly identified the individualised support they provided to services as 'our difference', so this asset of the initiative should be kept in focus as a key lever for addressing vulnerability. Yet in focus groups, it did not appear that vulnerability was a guiding principle in how consultants apportioned their support, which was more often responsive to services' inquiries. While there is merit in the team's commitment to 'treating everyone as vulnerable', or 'treating everyone the same', this risks allocating large portions of consultants' time to highly-engaged services; especially as large caseloads (around 200 services each) restrict their capacity for proactive follow-up.

A more purposeful approach to case management may help Be You retain services in vulnerable communities, once they have made contact with the initiative. Considerations in this include:

- Developing skills among consultants to escalate their support for services where vulnerability is detected (in the service or the community), including building local knowledge and empathy. If Be You chooses to escalate support, it would also be important for consultants themselves to have appropriate mental health safeguards – as such conversations may be challenging for them.
- Identifying 'triggers' or escalation points that signal the need for additional resources to be allocated to a service. These may range from critical incidents, to child outcomes data (such as AEDC) indicating high levels of vulnerability in the service community. The vulnerability index in this study may be useful for assigning a vulnerabilty score to services, which flags the possibility of additional support. Of course, services could choose to decline additional support if not desired.
- Providing more alternatives to online engagement, which may involve thinking differently about what Be You participation could entail. Over-the-phone support, or connection into Be You clusters or networks, could potentially occur independently of engagement with online content. Another option would be to enhance the technological support available to Be You participants who struggle to engage online; or to investigate partnerships with widely-used online platforms.
- Adjusting recruitment and retention targets, to reflect the fact that very vulnerable services may require significant effort to retain, but have potential to significantly benefit children and families. Consultants who successfully retain, support and achieve outcomes (however described) with a vulnerable service should be recognised, alongside those who retain high numbers of services.

Conclusion

This report has shown that analysing Be You's impact through the lens of vulnerability yields valuable insights, as well as many important questions about Be You's operations into the future. This report is not prescriptive about future directions for Be You, recognising that this research was undertaken at the same time as a broader evaluation of Be You's impact and practices. Instead, it is intended to deepen and broaden the Be You's team's thinking about vulnerability, so that future directions reflect the best possible choices among a well-understood set of alternatives.

One of the key insights from this study is the strong influence of service quality or capability on the likelihood of Be You participation. Service capability is therefore a critical mediating factor, in the ability of Be You to reach the children and families who attend ECEC services. To reach more vulnerable children, Be You may need to engage explicitly with service capability, as a precursor for participation, learning and impact. Integrating Be You participation within service Quality Improvement Plans may be a valuable strategy for boosting service capability in holistic ways.

The project's focus on both service capability and community vulnerability also calls attention to the services that Be You could aim to reach, in locations not classified as vulnerable at community level. Where low service capability and low community vulnerability co-exist, there is a particular risk that those children and families who are vulnerable will fall through the cracks, as their communities are less likely to be targeted for additional support. Be You must therefore continue its efforts to engage services across all communities, with an eye to services with lower quality ratings. Be You must also

ensure that its recruitment strategies and support for services promote models of success that are achievable, including for services where engagement in professional learning is itself a struggle.

The suite of possible strategies in the final section offers a frame for conversations about how Be You can reorient towards tackling vulnerability over time. Each of the strategies is intended to be iterated and developed gradually, and Be You is encouraged to adopt a 'try, test and learn' approach to shifting its focus. Wherever possible, vulnerable communities and the services that work with them (across the capability spectrum) should be engaged in co-designing how Be You reorients its work to meet their needs. The researchers acknowledge that this voice is missing from this study.

Monitoring the success of these strategies will be another challenge for Be You to engage with creatively. A whole-organisation reorientation towards achieving impact in vulnerable communities would take some time to yield effects on child and family outcomes, so it will be important to chart changes occurring along the way in Be You's own processes and practices. It will be also be important that diverse models of success for services in different communities are recognised in Be You's monitoring and evaluation, including models that integrate Be You with other initiatives. By remaining open to diverse 'success stories', Be You can heighten its responsiveness to the diversity of contexts for Australian ECEC services, and the interaction of families, services and communities.

A final point concerns one Be You leader's comment: that Be You can be an advocate for children, families and communities experiencing vulnerability in relation to mental health. In this project, Be You appeared to be an organisation that is engaging deeply and thoughtfully with its aspiration to address vulnerability, and that applies a uniquely flexible, service-centred approach to professional development. Be You may consider whether other organisations and initiatives exist that can share its journey, and act as critical friends and change partners as new ways of working emerge. In this way, Be You may leverage its own evidence-based insights to improve service systems more broadly.

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Appendix 1: Method for allocating services to communities (LGAs)

The national ACECQA service database contains address and postcode information but no LGA variable. Accordingly, matching addresses and postcodes to LGAs was required to have local community information available at the service level.

Four complementary methods were used to identify the LGA of all services listed in the ACECQA database:

1. Using a geolocation software to identify the latitude and longitude of services based on their address, and attributing an LGA to the services based on their geographical coordinates;
2. Using a correspondence system between postcodes and LGAs to identify the LGA services belong to;
3. Using an online geolocation system to identify the latitude and longitude of services based on their address, and attributing an LGA to the services based on their geographical coordinates; and
4. Manually identifying the latitude and longitude of services based on their address, and attributing an LGA to the services based on their geographical coordinates.

Step 1: Software geocoding

As of December 1, 2020, the ACECQA list of services contained 16,223 services. First, services without any geographical information were removed from the list. This concerned four services: SE-00005302, SE-00010134, SE-40014065, SE-40019091, for a total of 16,119 remaining services.

Software geocoding was then used as a first step for its versatility and ability to generate exact coordinates (as opposed to LGA matching alone). The QGIS software was used, relying on OpenStreetMap for coordinates identification. A total of 11,573 services could be coded using this method; around 71.3 per cent of services. Based on the availability of LGA boundaries in an ABS-issued geopackage file, the coordinates of these services could be assigned a unique LGA.

Step 2: Correspondence tables

The next step used to identify the LGA of services that could not be precisely located using software geocoding was to use geographical correspondence tables. The use of a postcode-LGA correspondence system is less precise as it relies on geographical areas rather than addresses, so this introduces a degree of uncertainty in matching postcodes to LGAs. The match is also not perfect (i.e. some postcodes map onto more than one LGA), so it is important to set thresholds to define a minimum level of LGA-postcode overlap to have a reasonable degree of confidence in the outcome.

A further complication is that the only postcode-LGA correspondence file available from the ABS applies to the 2011 geographical classifications, while LGA data uses 2016 or more recent geographical classifications. This means current ACECQA service postcodes had to be matched to 2011 postcodes, these 2011 postcodes matched to 2011 LGAs, and 2011 LGAs matched to 2016 LGAs. At each step in the process, some uncertainty is introduced and some data loss occurs due to imperfect matching.

To identify services' LGA based on their postcode, we have used a geographical concordance method based on 3 ABS correspondence tables:

- Postal Areas 2011 to Postal Areas 2016 correspondence ('postcode file')
- Postcode 2011 to Local Government Area 2011 correspondence ('postcode-LGA file')

- Local Government Areas 2011 to Local Government Areas 2016 correspondence ('LGA file')

We used a 90 per cent match cut-off for each of the files, i.e. for the 2011-2016 matches (for the postcode and LGA files) and for the 2011 postcode-LGA match. This means that the correspondence between the geographical units had to represent a geographical overlap of at least 90 per cent.

Based on this rule, we applied the following 3 step method:

- One-to-one match of 2011 postcodes between postcode file and postcode-LGA file (in postcode-LGA file)
- One-to-many match of 2011 LGAs between LGA file and postcode-LGA file (in postcode-LGA file)
- Exclusion of records missing either or both of 2016 LGA and 2016 postcode.

This generated a total of 1,742 2016 postcodes to which a 2016 LGA could be matched with a reasonable degree of confidence. Of these, five 2016 postcodes were paired with two different 2011 postcodes each:

2016 postcodes	2011 postcodes	2011 postcode retained for ECEC service LGA identification
3216	3216, 3217	3216
4220	4219, 4220	4220
4227	4227, 4229	4227
4814	4813, 4814	4814
5000	5000, 5005	5000

After deleting these five dual-assigned records, we obtained 1,737 unique 2016 postcodes to which a 2016 LGA could be matched with a reasonable degree of confidence out of a total of 2,671 unique 2016 postcodes Australia-wide (i.e. 65 per cent of all postcodes).

Tested with the overall list of ACECQA services, this method could be used to allocate an LGA to 12,866 (i.e. 79.3 per cent) of the 16,219 records with addresses included in the ACECQA list of services. Applied only to the 4,646 services whose coordinates could not be identified using software-based geocoding, this method could attribute an LGA to 3,611 services (i.e. 77.7 per cent of remaining services, or 22.3 per cent of all services). This left a total of 1,035 services without an LGA.

Step 3: Online geocoding

An online batch geocoding tool (https://geocode.localfocus.nl/) was then used to seek to identify the latitude and longitude of the 1,035 remaining services. This geocoding tool returns three categories of results: coordinates provided with 'success' (for accurate and single-match geocoding), coordinates provided with a degree of 'doubt' (for uncertain geocoding, including due to multiple pairs of coordinates being returned for a given address), and 'failure' if the tool could not identify the latitude and longitude of the supplied address.

This geocoding method returned 333 'success' coordinates identification (32.2 per cent of the 1,035 services with missing LGA information), 702 'doubt' coordinates identification, and no failed coordinates identification. For the 702 services with geocoded results categorised as 'doubt', a degree of uncertainty about the accuracy of geocoding thus remains. The latitude and longitude generated through this process for all services were then entered in a geocoding software to identify the LGA they belong to.

Step 4: Error checks and manual geo(re)coding

To check for possible errors, all the services whose LGA was identified using latitude and longitude coordinates (in both the geolocation software (step 1) and the online geocoding tool (step 3)) had their ACECQA-supplied State compared to their geolocation-produced State identifier. Three services showed a discrepancy and had their geocoordinates manually recoded using Google Maps. Their LGA was then updated through the geolocation software.

Services' LGA was then checked for missing values. One service had no LGA information; its geocoordinates were manually recoded using Google Maps, and its LGA then updated through the geolocation software.

This left 700 services with valid geocoordinates and a valid LGA but a 'doubt' flag generated through the online geocoding process. A five per cent random sample of these services (35 services) was selected to check for the accuracy of online coding for services with a 'doubt' flag. Their latitude and longitude were manually geocoded based on a Google Maps search of their service name and address. These coordinates were then used to allocate services an LGA using the geocoding software. The LGA generated from online geocoding and the one produced through manual geocoding
were then compared.

For three of the 35 services (8.6 per cent), the two LGAs did not match. Upscaled to the 700 services with a doubt flag, this means that around 60 services may have been allocated a wrong LGA. This represents fewer than 0.4 per cent of all services.

Finally, we returned to the four services without any address information excluded at the start to manually code their geolocation based on the service name and website information. All four could be allocated an LGA, completing the identification of an LGA for all 16,223 services.

Appendix 2: Method for constructing and using the vulnerability index

Analysis of the distribution of engagement in Be You among ECEC services has revealed uneven patterns of participation across types of services and communities. The fact that participation is not randomly distributed suggests that approaches to increase participation specifically among disadvantaged communities could be particularly beneficial to the mental health development opportunities of children in vulnerable circumstances. To facilitate the implementation of such strategies, constructing a tool to allow them to be appropriately targeted is important.

The second objective of the project has been to develop a typology for assessing the vulnerability of services and service populations. This is needed to answer the following research questions:

- What is the spectrum of vulnerabilities impacting early learning services and their communities?
- How are 'low' to 'high' vulnerability cohorts distributed across service types?
- Are services with more vulnerability populations more or less likely to engage in Be You?
- What are the links between vulnerability and service quality ratings?

Answering the second, third and fourth questions needs a way of identifying levels of vulnerability across communities. In turn, doing so requires an understanding of the different dimensions or aspects of vulnerability likely to impact children's mental health across services, as specified in the first question.

Indicator merging, standardisation and rescaling

The individual indicators used to construct the vulnerability index could be accessed in three ways: using published information or tables (e.g. PHIDU file for several variables), constructing them using publicly accessible tools (e.g. ABS TableBuilder Pro for some Australian Census 2016 variables), and submitting applications to use restricted-access data (e.g. the ABS DataLab). Of the 29 variables considered for the vulnerability index, 17 could be accessed from public sources and 12 were constructed in the ABS DataLab (four from the 2016 Australian Census and eight from the 2018 AEDC census).

The ABS DataLab has specific output clearance rules that define the conditions under which data can be exported from the DataLab for use by researchers. One such rule is described as the 'rule of 10', which states that each cell or statistic (i.e. each LGA in the case of this project) should have at least 10 (unweighted) contributors. For instance, for the 'percentage of foundation children assessed by teacher as nervous, highly strung or tense' variable, if fewer than 10 children met this criterion in a given LGA, the LGA value would be removed. This led to a number of candidate variables having a large proportion of missing values and made it necessary to remove some of these variables from the construction of the vulnerability index, as discussed below.

Files for individual variables were checked for LGA duplicates. No duplicates were identified in the PHIDU, ABS (Census 2016, Preschool Education, SEIFA) and AEDC files. Eighteen LGA duplicates were found in the disaster resilience index file, based on the aggregation method used to convert lower-level geographical units into LGAs, and the state-by-state reporting of disaster resilience index

values. For the nine pairs of duplicates, the unweighted average of the 2 disaster index scores has been used as the LGA score.

Once the 29 candidate variables had been constructed in separate files, they were merged into a single file for data cleaning. Where possible, merging was based on LGA codes (e.g. for the AEDC data); merging was based on LGA names where LGA codes were not available (e.g. PHIDU data).

In preparation for the principal component analysis, the 29 candidate variables were standardised to a mean of 0 and a standard deviation of 1 (the distributions were not normalised). Once standardised, a number of variables had to be rescaled to ensure that, across all candidate variables, an increase in score represents a (predicted) increase in vulnerability. Additive inversion was used to rescale the following seven variables:

- % ECEC workers with a bachelor's degree or above as their highest qualification
- Australian Natural Disaster Resilience Index score
- % employed persons aged 20-49 working as managers or professionals
- % people aged 18 years and over who are able to get support in times of crisis from persons outside the household (modelled estimates)
- % children aged 3-6 enrolled in a preschool program
- % foundation children reported as attending a preschool program in the year before entering school
- Average emotional maturity sub-domain 2 (anxious and fearful) score of foundation children, as assessed by teacher

Conceptually, across all 29 candidate variables, a lower value was expected to indicate a lower level of vulnerability, while a higher value would indicate heightened risks of vulnerability.

Data cleaning: cases

To facilitate future comparisons with the SEIFA indexes of socio-economic advantage and disadvantage, data preparation for the Be You vulnerability index started from a file with the score of Australia's LGAs for the four SEIFA indexes. This base file included 545 LGAs with valid LGA codes, names and SEIFA scores (i.e. at least one valid SEIFA score per LGA). After adding the 29 candidate indicators to the SEIFA file, a total of 601 LGAs were listed. This extended list was then cleaned to remove duplicates, LGAs with valid names but missing codes, LGAs with valid codes but missing names, and other cases with insufficient data. The following LGA cases were removed from the file:

- Valid LGA codes, missing LGA names, missing data on all variables: 9 cases
- 'Unknown cell adjustment' LGA names, missing LGA code and data on all variables: 8 cases
- 'No usual address' LGA names, missing LGA code and data on most variables: 9 cases
- 'Migratory – Offshore – Shipping' LGA names, missing LGA code and data on most variables: 9 cases
- Duplicate LGAs initially matched with LGA name but with inconsistent naming convention (data manually merged into correct LGA): 15 cases
- Valid LGA names, missing LGA code and missing data on most variables (including SEIFA scores): 6 cases
- Valid LGA names and codes but missing SEIFA and most other data: 1 case

After concluding this first step of the data cleaning process, the file included 544 LGAs with valid LGA codes, LGA names and SEIFA scores. The next data cleaning step was to identify LGAs with missing values on most of the 29 candidate indicators for the construction of the vulnerability index. A total of 62 LGAs met this criterion. The number of ECEC services located in these 62 LGAs was 33, making

it possible to remove them from the vulnerability index construction file without significant loss of service coverage. This leaves 482 LGAs susceptible to receive a vulnerability index score.

Data cleaning: variables

The 29 candidate indicators were then screened to identify the number and distribution of missing values across variables. Since the construction of composite indexes is sensitive to missing values (OECD, 2008), this is an important step in the data preparation process. Seven such variables had at least 40 per cent of missing values and were thus removed from the index construction. An eighth variable (the percentage of children rated as emotionally vulnerable in the anxiety and fearfulness developmental sub-domain in the AEDC census) had over 25 per cent of missing values and was derived from another candidate variable (the average emotional development score given by teachers to foundation students in the AEDC census). Accordingly, this variable was removed as well.

Table 19 Candidate indicators removed from vulnerability index construction due to high proportion of missing values

Vulnerability	Indicator	Data source
Community vulnerability	% ECEC workers who speak English not well or not at all	ABS Census 2016
Family vulnerability	% children up to 8 years of age with parents with limited English	ABS Census 2016
Children vulnerability	% foundation children assessed by teacher as having an impairment or condition	AEDC Census 2018
Children vulnerability: mental health	% foundation children assessed by teacher as unhappy, sad or depressed	AEDC Census 2018
	% foundation children assessed by teacher as appearing worried	AEDC Census 2018
	% foundation children assessed by teacher as crying a lot	AEDC Census 2018
	% foundation children assessed by teacher as nervous, highly strung or tense	AEDC Census 2018
	% foundation children assessed by teacher as developmentally vulnerable in the emotional maturity sub-domain 2 (anxious and fearful)	AEDC Census 2018

The list of variables removed at this stage of the data preparation process is shown in Table 19. The category of vulnerability most concerned by indicator deletion is the one relating specifically to children's mental health, leaving only one candidate indicator in this category. Given the importance of this vulnerability category to the overall purpose of the index, it has been retained at this stage. Among the remaining 21 variables, the highest rate of missing values is 13.3 per cent.

At this stage, an additional candidate indicator relevant to community vulnerability could be added to compensate for the removal of the one relating to ECEC workers' spoken English skills. Alongside the already included indicators relating to the capability levels of the ECEC workforce in different LGAs (e.g. the share of ECEC workers with at least a bachelor's degree qualification), a new variable measuring the number of early childhood educators and carers working in an LGA relative to the number of children aged 0 to 8 was deemed relevant. Conceptually, this variable can be considered as an aspect of the educational resources available to communities for early years education. Its statistical relevance for the vulnerability index is assessed in the next stages of the construction process.

The next step in the data preparation process was to remove highly correlated variables to ensure that no specific aspects of vulnerability had a disproportionate weight in the vulnerability index. Following the approach used by the ABS to construct SEIFA indexes, all bivariate correlations between pairs of variables among the 22 remaining candidate variables with a correlation coefficient greater than 0.8 (i.e. a very strong correlation) were examined. A total of 10 variables were involved in the 10 pairs of correlations higher than 0.8. The results are shown in Table 20.

Table 20 Pairs of highly correlated variables among candidate indicators for the vulnerability index (weighted)

First variable	**Second variable**	**Bivariate correlation***
% of children whose mothers had low educational attainment	% of workers employed as managers or professionals	0.843
% of Indigenous children	% persons living in social housing	0.830
% of people with fair or poor self-assessed health (modelled estimates)	% of adults with government support as their main source of income (modelled estimates)	0.816
% of people with high psychological distress (modelled estimates)	% of adults with government support as their main source of income (modelled estimates)	0.801
% of children in jobless families	% of adults with government support as their main source of income (modelled estimates)	0.831
% of children in jobless families	% of people with fair or poor self-assessed health (modelled estimates)	0.852
% of children in jobless families	% of people with high psychological distress (modelled estimates)	0.815
% of children with mothers not in the labour force	% of people with high psychological distress (modelled estimates)	0.807
% of children with mothers not in the labour force	% of children in jobless families	0.819
% of children whose mothers had low educational attainment	% of children in jobless families	0.815

Note: reported bivariate correlations are weighted by the resident population aged 0-8 to account for the significant difference in the number of children in different LGAs.

In the construction of SEIFA indexes, the ABS considered removing a variable if it was highly correlated with another variable and if the two variables were conceptually similar (or significantly overlapping), with some additional discretion involved in the process based on a range of other considerations. For the present analysis, five main criteria were used to decide on retaining or removing variables among highly correlated pairs:

- A variable could be removed only if it had some conceptual overlap with a retained variable with respect to vulnerability;
- When one of the variables was more specifically about children while the other was more about parents and families, the former was generally retained;

- When a given variable (e.g. '% of children in jobless families') was highly correlated with several other variables, parsimony was used in seeking to retain the single variable, even if their conceptual overlap was not perfect;
- When variables were modelled as opposed to observed estimates, the ones based on actual observations were preferentially retained; and
- Where possible, variables with fewer missing values were retained.

Based on these criteria, the following four variables were removed from the vulnerability index construction:

- % of adults with government support as their main source of income (modelled estimates)
- % of people with fair or poor self-assessed health (modelled estimates)
- % of people with high psychological distress (modelled estimates)
- % of workers employed as managers or professionals (flipped)

After removing these four variables relating to family vulnerability, a total of 18 candidate variables remained for the construction of the vulnerability index: five relating to community vulnerability, six relating to family vulnerability, six relating to children's vulnerability, and one relating specifically to the 'mental health' dimension of children's vulnerability.

Exploratory principal component analysis (PCA) was then conducted on the 18 candidate variables to determine how much of the total variance in the dataset could be explained by the first factor extracted from the analysis, as well as to identify any input variable negatively or weakly correlated with this first factor. As done in the previous step, the analysis was conducted by weighting the results of each LGA by its resident population aged 0-8 to account for difference in LGA sizes.

Following the approach used by the ABS to construct SEIFA indexes, starting with the full (18 variable) analysis, the weakest-loading variable was removed after each analysis until the correlation coefficient threshold of 0.3 for the input variable most weakly correlated with the first factor is reached.
The results are shown in Table 21.

Table 21 Successive exploratory principal component analyses conducted to determine suitable number of candidate variables to retain for vulnerability index construction

Candidate variables included in PCA (N)	% of total variance explained by first extracted factor	Correlation coefficient of candidate variable with lowest correlation with first extracted factor
18	37.1	-0.508
17	37.8	-0.169
16	40.0	0.122
15	42.6	0.210
14	**45.4**	**0.402**
13	46.9	0.399
12	49.7	0.492

A minimum loading of 0.3 for each candidate variable was first achieved using the 14-variable analysis. The 13-variable PCA did not do much better than the 14-variable one in explaining the variance across LGAs, and it did not raise the weakest correlation coefficient between input variable

and first factor. The robustness of the vulnerability index would be enhanced using the 12-variable PCA compared to the 13-variable one. However, the variable removed was the attendance rate in preschool. Past research (Lamb et al., 2020) tells us that this is an important dimension of educational disadvantage in the early years, hence this 12-variable index may miss some key aspect of vulnerability. Accordingly, the most suitable list of input variables with no correlation coefficient between input variables and first factor inferior to 0.3 is the 14-variable one. This appears to be the most comprehensive yet parsimonious model to capture vulnerability with respect to educational opportunities and mental health in the early years.

The four variables removed through this exploratory PCA analysis phase were (in order):

- % relative low-income earners among early childhood (pre-primary school) teachers and child carers
- % low-income households under financial stress from mortgage or rent
- % children aged 3-6 enrolled in a preschool program (flipped)
- % children aged 4-8 who speak English not well or not at all

This left a total of 14 variables with binary correlation coefficients greater than 0.4 to construct the vulnerability index for Be You.

Missing data

To permit the computation of vulnerability index scores for all the eligible LGAs, a complete dataset with no missing values is required. To achieve this, multiple imputation has been used to attribute results where they were missing; this is a standard approach in the construction of composite scales and indexes (OECD, 2008). Multiple imputation replaces missing values with a range of plausible values based, in the approach used here, on estimations produced with a regression model. This creates multiple versions of a complete dataset. In the present case, multiple imputation was used to construct five datasets, as is common in educational research (e.g. PISA). The analysis required to compute the vulnerability index scores is then conducted of each of the datasets before the results are pooled to generate a single score or result.

Of the 14 final input indicators, 10 had at least one missing value. The variable with the highest proportion of missing values was the Australian Natural Disaster Resilience Index score, with 12.7 per cent (see Table 22). A total of 110 LGAs had at least one missing value, and 2.7 per cent of all values in the dataset (i.e. 181 observations) were missing.

Table 22 Missing values across 14 input variables for vulnerability index construction

	Missing		Valid
	N	%	N
Australian Natural Disaster Resilience Index score (flipped)	61	12.7	421
% people aged 18 years and over who are able to get support in times of crisis from persons outside the household (modelled estimates) (flipped)	58	12.0	424
% foundation children assessed by teacher as developmentally vulnerable in 2 or more domains	20	4.1	462
% ECEC workers with a bachelor's degree or above as their highest qualification (flipped)	15	3.1	467
% ECEC workers who did not complete Year 12	12	2.5	470

% children up to 8 years of age in jobless families	7	1.5	475
Average emotional maturity sub-domain 2 (anxious and fearful) score of foundation children, as assessed by teacher (flipped)	3	0.6	479
% foundation children reported as attending a pre-school or kindergarten program in the year before entering school (flipped)	3	0.6	479
% children up to 8 years of age whose mothers had low educational attainment	1	0.2	481
% persons living in social housing	1	0.2	481

Multiple imputation produced a complete dataset, with little change in the mean values for each variable (no more than 2.1 per cent of a standard deviation for any variable) compared to the original dataset with missing values.

From vulnerability index score to vulnerability index typology

The vulnerability index has been computed at the Local Government Area (LGA) level. It conveys information on the prevalence of community vulnerability in a given location.

Consistent with the ABS approach to reporting SEIFA indexes of community socioeconomic status, the vulnerability index scores were divided into deciles of equal size (47-49 LGAs per decile due to rounding). The distribution of vulnerability index scores was also categorised into four quartiles of 120 to 121 LGAs each. For the vulnerability index deciles and quartiles as well as for the vulnerability index scores, a lower value indicates a relative lack of vulnerability, while a higher value indicates greater vulnerability.

Once the three vulnerability index reporting scales (scores, deciles and quartiles) had been computed, the vulnerability index scores were allocated to ECEC services based on their location. All ECEC services in the same LGA were attributed the same score estimating the vulnerability levels in the local community.

Based on the findings of the literature review, which identified the importance of capturing both risk factors and protective factors to understand the circumstances of ECEC services, a nine-category typology was then developed to simultaneously capture the levels of vulnerability in the communities served by services and their own capability. The vulnerability index quartiles and ACECQA overall service ratings were brought together into the following typology:

- Low vulnerability, high capability
- Low vulnerability, medium capability
- Low vulnerability, low capability
- Moderate vulnerability, high capability
- Moderate vulnerability, medium capability
- Moderate vulnerability, low capability
- High vulnerability, high capability
- High vulnerability, medium capability
- High vulnerability, low capability

Low, moderate and high vulnerability are defined as the first, second/third, and fourth vulnerability index quartiles, respectively. Low, medium and high capability are defined as 'working toward', 'meeting' and 'exceeding' the NQS standards in overall rating, respectively.

Vulnerability index: 'ReadMe' user guide

The main purpose of the vulnerability index is to allow ECA to assess the vulnerability of services and service populations in order to identify strategies for increasing the uptake of Be You in high impact communities and inform the delivery of Be You (and to use in other research). To this end, the delivery of a service-level file with searchable features relating to Be You participation and local community vulnerability is most useful. This is the main role of the Excel file supplied alongside this report.

The vulnerability index is provided alongside this report as Excel files for ease of use. The vulnerability index is supplied in two formats: (1) as an LGA file (i.e. the geographical unit at which the vulnerability index was constructed), and (2) as an ECEC service-level file, in which all services located in a given LGA are allocated the vulnerability index score of their local community. It is anticipated that this second format may be the most useful for Early Childhood Australia.

The LGA file contains information on 545 LGAs, including 482 with a valid vulnerability index score. The file contains six variables: the ABS identification codes and names of Australia's LGAs, two variables on the resident population in each LGA (i.e. the total resident population and the resident population aged 0 to 8 years), and the three vulnerability index reporting scales (i.e. score, decile and quartile). Across Australia's LGAs, the higher the score (or decile/quartile), the higher the level of community vulnerability. An additional sheet containing the ABS SEIFA indexes of community socio-economic disadvantage is also provided for reference.

The service file contains information on 16,223 services with valid a ACECQA service approval number and listed in the ACECQA database of services (as of December 2020), plus an additional 983 services with valid service approval numbers but not included in the ACECQA database (some of which may have participated in Be You modules and/or events). By default, services with no valid record in the ACECQA database of Australian ECEC services are 'filtered out' of the data sheet.

The service-level files includes 15 variables containing the following type of information:

- Location: state, remoteness, and LGA name;
- Identification: service approval number and name, Be You organisation ID and name, and provider approval number and name;
- ACECQA database status (included ('Yes') or absent ('No');
- Community vulnerability and service capability: vulnerability index values (score, decile and quartile), vulnerability/capability service typology, and overall NQS rating
- Service type (OHSC, LDC, PS, and FDC); and
- Be You: registration status, engagement status (yes/no), and detailed engagement status (i.e. type of engagement).

As with the LGA-level file, an additional sheet containing the ABS SEIFA indicators of community socio-economic disadvantage is included as an appendix for reference.

For both LGA-level and service-level vulnerability index files, filters have been enabled to allow ECA to identify subgroups or categories (e.g. services in a specific state or location, communities with a

given level of vulnerability, specific types of services, or services with or without a history of Be You participation). Several filters can be used simultaneously to identify specific cohorts of services.

Appendix 3: Method for mapping Be You participation

With respect to data on service engagement in the Be You initiative, ECA provided the project team with four data files:

- An Engagement file (6 variables)
- An Organisation file (13 variables)
- A Registration file (6 variables)
- A Progression file (9 variables)

The Engagement file is the underlying system used to flag services that are active in the ECA database. The number of services marked as active (18,308) matches all the services included in the Organisation file (18,307). Accordingly, the Engagement file was not used directly for the analysis, which was primarily conducted on the data contained in the Organisation file.

The Organisation file is a service-level file with descriptive information about ECEC services (e.g. service type, state etc.) and a single 'BeYouEngagementStatus' variable that indicates whether the service has registered for the Be You initiative or not. This is the main source of service-level information in the Be You database. However, one of its limitations is that it does not capture different modalities or levels of engagement. Services engaging with Be You on a long-term basis and involving most of their staff are categorised in the same way as services in which a single staff member has commenced (but not complete) one online professional learning module. Accordingly, this service-level information must be supplement with more detailed information on Be You participation to characterise service participation in a more qualitative manner.

This can be done using the Registration and Progression files. The Registration file is ECA's event-level Be You data. Each entry is a participant from a given service to one of Be You's events. For most records in the file, a service ID is associated with the participant, so that Registration data can be linked to the Organisation file. Finally, the Progression file tracks participation in Be You's online professional learning modules. Each entry corresponds to a participant in a module, and for most records, participants can be linked to their service using their service ID. Modules are grouped into domains as follows:

Table 23 Be You online learning domains (5) and modules (13)

Early Support	Family Partnerships	Learning Resilience	Mentally Healthy Communities	Responding Together
Inquire	Assist	Affirm	Connect	Recognise
Notice	Partner	Embed	Include	Respond
Provide		Empower	Understand	

It must be acknowledged as a data limitation that the linking of individual participation and services is not systematic and universal. For instance, educators may register individually and may not enter their service details as an organisation, meaning that their participation would not be captured in service-level analysis. Similarly, groups of educators from one service may log in together using a single registration, leading to multiple participations being recorded as a single participation. Given that the ECEC sector mapping analysis is conducted at the service level, these data limitations must be borne in mind in interpreting the results. In particular, a margin of error is likely to be built into the reporting of Be You participation.