Living well in the ACT region: exploring the wellbeing of ACT residents in 2019-20

Part 3: Exploring vulnerability and resilience

December 2020

Jacki Schirmer[1,2]

[1]Health Research Institute, Faculty of Health
[2]Centre for Change Governance, Institute for Governance and Policy Analysis
University of Canberra

UNIVERSITY OF CANBERRA

Contents

Tables

Executive summary

A common question asked when considering the impacts of events such as economic downturn, or natural disasters such as bushfire, is 'which groups are more vulnerable?' and 'which are more resilient' to these events. This report considers how data collected in the *Living well* survey could be drawn on to explore overall vulnerability and resilience, using the different measures examined in Parts 1 and 2 of the report.

There is no single definition of vulnerability, and it is typically defined in relation to something: for example, assessing whether a person is vulnerable to experiencing loss of their home if they experience financial stress, or vulnerable to experiencing loss of property in a storm. In this report, which examines overall wellbeing and quality of life, we defined vulnerability as *being at higher risk of experiencing loss of wellbeing/specific aspects of wellbeing when experiencing stressful/challenging events.* This definition is based around the central concept of wellbeing that forms the focus of this report, and also focuses on vulnerability as being a function of capacity to cope with and adapt to a shock or challenge that a person experiences. A less vulnerable person will be able to cope with a stressful or challenging events in ways that overall reduce the impacts of that shock or challenge on their wellbeing, and that enable rapid recovery of wellbeing after the shock/challenge. A more vulnerable person will be less able to protect their wellbeing when a shock/challenge occurs, more likely to experience a large loss of wellbeing, and less able to recover wellbeing after the shock/challenge occurs.

When considering vulnerability, caution is needed. Labelling particular groups as 'vulnerable' can lead to the inappropriate assumption that membership of this group automatically equates to vulnerability. Vulnerability should be understood as a person being at higher risk of having a lack of access to resources such as finances or social support, but not as a person lacking strengths; and no person should be assumed to be vulnerable simply by their membership of a particular demographic group, or the types of risks they are exposed to. To reduce the risk of defining vulnerability in ways that stigmatise, measures of vulnerability in this report are measured in ways that draw on people's self-reporting of their experiences, and examines multiple dimensions of vulnerability rather than assuming there is a single type of vulnerability.

Four types of 'generalised' vulnerability – meaning vulnerability to difficulty irrespective of the specific form of challenge experienced – were examined: overall vulnerability, measuring using the Personal Wellbeing Index; health, mental health, and standard of living. In addition, two specific measures of vulnerability were examined, focused on vulnerability to experiencing negative (i) financial and (ii) social impacts associated with COVID-19 related restrictions.

When these six dimensions of vulnerability were examined and compared, it was identified that there is large variation in the types of vulnerability different groups are at greater and lesser risk of. Table E1 summarises vulnerability risks identified for a number of groups, and identifies three groups with higher than average risk across all six aspects of vulnerability: single parents, renters, and those who were unemployed. Other groups with higher than typical risk of experiencing negative outcomes across multiple aspects of vulnerability included those aged 18-29, those identifying as LGBTIQA+, those living with moderate or severe disability, and carers with high caring obligations.

A key limitation of the data in Table E1 it focuses on areas where there is higher risk of negative outcomes, and does not also identify areas of strength and higher than average resilience. Developing a more holistic measure of resilience in future can help address this. Resilience can be defined many ways, but here is broadly defined as *the ability of a person, household or community to successfully adapt to adversity and to capitalise on opportunities*.

Table E1 Types of vulnerability by group

✔ = growing vulnerability/high COVID vulnerability ✔ = continuing vulnerability/moderate COVID vulnerability ✔ = emerging vulnerability	General vulnerability (2020)				COVID-19 vulnerability (2020)	
	Personal wellbeing	Health	Mental health	Standard of living	Financial	Social support
Female	✔		✔			
Male						✔
Aged 18-29			✔	✔	✔	
Aged 30-49	✔		✔			✔
Aged 50-64						
Aged 65+						
Main language at home - English						
Main language at home - not English			✔		✔	
Not LGBTIQA+						
LGBTIQA+	✔	✔	✔	✔		✔
Lived in ACT 5 year or less			✔			✔
Single parent with children	✔	✔	✔	✔	✔	✔
Couple, children at home						
Couple, no children at home						
Sole person household	✔					
No children aged 0-24 in household						
One or more children aged 0-17 in household	✔					✔
One or more children aged 0-4 in household						✔
One or more children aged 5-14 in household	✔		✔			✔
One or more children aged 15-17 in household	✔			✔		✔
One or more children aged 18-24 in household	✔		✔		✔	
No disability						
Disability – mild						
Disability – moderate/severe	✔	✔	✔	✔		
Not a carer						✔
Carer	✔	✔	✔			
Carer with < 15 hours per week caring obligations	✔			✔		
Carer with 15 or more hours per week caring obligations	✔	✔	✔	✔		✔
Freestanding house						
Townhouse			✔			
Unit/apartment	✔		✔			✔
Home owned outright						
Home has mortgage						
Home rented	✔	✔	✔	✔	✔	✔
Employed						
Unemployed and looking for work	✔	✔	✔	✔	✔	✔

Measuring resilience can provide a strengths-based approach that is in some ways preferable to focusing on labelling some groups as vulnerable. We recommend examining resilience through examining the extent and type of exposure people have to different impacts from events such as COVID-19, something done in Part 2 of this report, examining vulnerability, and examining access to resilience resources. Different approaches to understanding resilience have in common the idea that

to be resilient relies on having access to some resources that can be used to support positive adaptation whether it is material resources in the form of financial capital, or psychological resources in the form of access to social networks. These 'resilience resources' can include financial, human, social, institutional, physical and natural resources. Many of these resources are already present in the indicators that form part of the ACT Wellbeing Framework: effective measurement of resilience resources over time is likely to be able to draw on the measures developed for these indicators.

Overall, the exploration of vulnerability and resilience suggests that, firstly, it is important to ensure multiple dimensions of vulnerability and resilience are examined. Examining resilience and vulnerability as multi-dimensional concepts is both likely to provide more targeted insight that can inform identification of areas where intervention and action may be needed, and also reduces the risk of stigmatising particular groups by labelling them as 'vulnerable'. Ideally, resilience should be examined by identifying (i) exposure, meaning the types of challenges a person has experienced over a given period of time, (ii) risk of being vulnerable to experience negative impacts on different aspects of quality of life when exposed to challenges, with multiple dimensions of vulnerability examined, and (iii) access to different types of resilience resources that can be drawn on to assist in coping with and adapting to challenges, as well as taking advantage of opportunities.

1.0 Introduction

Parts 1 and 2 of this report examined measures of wellbeing in the ACT. For several measures, change in quality of life between was examined between late 2019 and Apr-May 2020. In addition, the impacts ACT residents reporting experiencing as a result of the 2019-20 bushfire season, January 2020 hailstorm and COVID-19 were examined.

A common question asked when considering the impacts of events such as economic downturn, or natural disasters such as bushfire, is 'which groups are more vulnerable?'. This question can be interpreted in multiple ways, but generally refers to which people are at higher risk of experiencing negative impacts to some aspect of their quality of life – such as their household finances, physical health, mental health, social connection, or other aspects – when challenges such as economic downturn or disasters occur. Conversely, many seek to understand how to increase resilience to these events, which is often defined as building capacity to successfully maintain wellbeing and quality of life during and after experience of challenges. Vulnerability and resilience are closely related concepts: resilience is sometimes conceptualised as being a function of the extent to which people are 'exposed' to challenged combined with their capacity to cope with and adapt to them, while vulnerability is often defined as being partly or wholly a function of a person's adaptive capacity (see for example Smit and Wandel 2006, Cutter et al. 2008).

This third part of the report considers how data collected in the *Living well* survey could be drawn on to explore overall vulnerability and resilience, using the different measures examined in Parts 1 and 2 of the report. First, the concept of vulnerability is reviewed, and approaches to assessing vulnerability identified. This is followed by exploring the utility of three measures of 'generalised' vulnerability, meaning overall vulnerability to experiencing negative impacts when challenges occur, and two measures of 'specific' vulnerability, in this case vulnerability to impacts of COVID-19. Following this, potential approaches to tracking resilience of the ACT population over time are briefly examined, as well as recommendations for reporting vulnerability and resilience more generally.

This report does not provide a comprehensive overview of the concepts of vulnerability or resilience, but instead focuses on identifying and exploring possible use of *Living well* survey data to measure and report vulnerability, and its potential use in future to examine resilience. Parts 1 and 2 of this report should be referred to for details of the methods used to collect data.

2.0 Vulnerability in the ACT

This section examines the concept of vulnerability and challenges of attempting to assess vulnerability. It them explores which of the socio-demographic groups compared throughout this report (those of different age, gender, housing type, cultural background, caring responsibilities, etc) are likely to be more vulnerable to the impacts of COVID-19 and other stresses. This is done using a risk-based approach, in which groups in which a higher proportion of people have low levels of key resources known to be important to coping and adapting to challenges are considered more vulnerable – meaning, at higher risk of poor outcomes.

2.1 Understanding and measuring vulnerability

2.1.1 Defining vulnerability

There is no single definition of vulnerability, and there is ongoing debate about what makes a person 'vulnerable' (see for example Ruof 2004). A focus on understanding vulnerability in multiple literatures has resulted in a situation in which 'the concept of vulnerability has infused numerous disciplines and sectors, resulting in an array of alternative and competing definitions and approaches' (Sumner and Mallett 2011).

Vulnerability is typically defined in relation to something: for example, assessing whether a person is vulnerable to experiencing loss of their home if they experience financial stress, or vulnerable to experiencing loss of property in a storm. There are many examples of assessments that examine this type of 'specified' vulnerability to specific types of events or outcomes. For example, discussing vulnerability to disasters, Wingate et al. (2007) discuss the many characteristics that may predict higher vulnerability to disasters:

> *Vulnerable populations can be defined broadly to include those who are not able to access and use the standard resources offered in disaster preparedness and planning, response and recovery. Age, class, race, poverty, language, and a host of other social, cultural, economic and psychological factors may be relevant depending on the nature of the emergency. (p. 422)*

A general definition of vulnerability that reflects elements common to most disciplines and uses of the term is that 'vulnerability is … the risk that a "system" (such as a household, community, country) would be negatively affected by 'specific perturbations that impinge on the system' (Gallopin 2006, cited in Sumner and Mallet 2011). This suggests two critical elements to define: what is considered the 'negative effect' and what is meant by 'specific perturbations'.

In this report, which examines overall wellbeing and quality of life, we defined vulnerability as *being at higher risk of experiencing loss of wellbeing/specific aspects of wellbeing when experiencing stressful/challenging events.* This definition is based around the central concept of wellbeing that forms the focus of this report, and also focuses on vulnerability as being a function of capacity to cope with and adapt to a shock or challenge that a person experiences. A less vulnerable person will be able to cope with a stressful or challenging events in ways that overall reduce the impacts of that shock or challenge on their wellbeing, and that enable rapid recovery of wellbeing after the shock/challenge. A more vulnerable person will be less able to protect their wellbeing when a shock/challenge occurs, more likely to experience a large loss of wellbeing, and less able to recover wellbeing after the shock/challenge occurs.

Vulnerability is often presented as being somewhat the inverse of resilience, in that resilience is broadly defined as having access to resources that enable a person to cope with challenges and take advantage of opportunities, while vulnerability is related to lacking those resources and thus being at higher risk of experiencing loss during challenging times, or less able to achieve benefits by capitalising on opportunities. This has been challenged by some, based on the multi-dimensional nature of vulnerability and resilience: a person may be vulnerable in some respects, while having high resilience in other aspects of their life. For example, a person may be at high risk of experiencing social isolation, indicating high vulnerability to any events that further reduce ability to connect to others socially, while having high financial resilience in the form of a high level of income and savings.

2.1.2 Problems and pitfalls of labelling people as 'vulnerable' and the importance of a risk-based approach

When considering vulnerability, caution is needed. Labelling particular groups as 'vulnerable' can lead to the inappropriate assumption that membership of this group automatically equates to vulnerability. However, most measures of vulnerability are based on risk: this means that they are identifying whether those belonging to a particular group have higher risk of vulnerability, in the form of a higher than typical proportion of the group experiencing conditions known to be associated with greater likelihood of experiencing negative impacts to their quality of life. Similarly, groups not labelled as being as higher risk of vulnerability do not have a complete absence of vulnerability: rather, a smaller proportion of people in that group have the characteristics or conditions associated with a measure of vulnerability.

For example, if 21% of all ACT adults have low wellbeing, and 39% of single parents, it is appropriate to say that single parents are at higher risk of low wellbeing, and at higher risk of wellbeing-related vulnerability. It should equally be recognised that despite this higher vulnerability, the majority of single parents do not have low wellbeing, and should not be presented as such.

Identifying a group as vulnerable also risks that group being viewed as victims, helpless or stigmatised. This is an inappropriate interpretation of vulnerability. People who experience vulnerability typically also develop many strategies for coping with that successfully (Hoogeveen et al. 2004), and often have significant strengths that are used to compensate (where possible) for the challenges being experienced. The strengths vulnerable groups are able to build represent areas that can be further supported to help reduce vulnerability.

Vulnerability should therefore be understood as a person being at higher risk of having a lack of access to resources such as finances or social support, but not as a person lacking strength. While vulnerability analysis highlights those groups who experience greater challenges and difficulties than others, it should also seek to identify how best to understand strengths of those groups, and to use information to help enable vulnerable groups to identify the actions that are most appropriate to assist them in building capacity to cope with and overcome challenges and difficulties.

No person should be assumed to be vulnerable simply by their membership of a particular demographic group, or the types of risks they are exposed to (e.g. Hoogeveen et al. 2004). This is consistent with the emerging strengths-based approach, which emphasises that assuming membership of a group equates to disadvantage is, in and of itself, a labelling that stigmatises that group and may label them as 'other' (Sumner and Mallett 2013, Pulla 2012). Similarly, being exposed to a risk (such as loss of a job) does not in and of itself indicate vulnerability (Hoogeveen et al. 2004). To use the example of exposure to job loss, people who lose employment cannot automatically be classified as vulnerable: some people who become unemployed will experience substantial negative impacts from losing employment, whereas others may be in a financial and social position where loss of employment does not have significant negative impacts, and may even have positive impacts on their quality of life.

To reduce the risk of defining vulnerability in ways that stigmatise, measures of vulnerability in this report are measured in ways that draw on people's self-reporting of their experiences, meaning it is based on the area where they identify they experience challenges. The report also examines multiple dimensions of vulnerability rather than assuming there is a single type of vulnerability, recognising that rather than being a single, global 'characteristic' of a person, vulnerability can manifest in multiple ways and 'individuals and households experience multiple, interacting and sometimes compound vulnerabilities' (Sumner and Mallett 2011, p 1).

We follow the view that to understand vulnerability it is important to move beyond assumption that membership of a specific group equates to vulnerability, and to instead identify the specific intersections of vulnerability that emerge when examining known dimensions of vulnerability and their rate of occurrence amongst different groups (see for example Fordham 1999). This approach tries to balance concerns about labelling groups while also rejecting the 'sometimes spurious egalitarianism which attempts to treat everyone the same' (Fordham 1999, p. 15). Handmer (2003) pointed out that 'The fact that we are all, in one way or another, vulnerable, is of limited value' to those who are seeking to understand how best to support vulnerable people or groups. Assuming everyone is the same risks disadvantaging those groups at higher risk of vulnerability, by reducing ability to ensure their voices and needs are heard and resources directed to them. Equally, assuming groups are 'automatically' vulnerable is problematic and an evidence-based approach should be used to identify which groups are at higher risk of vulnerability.

2.1.3 Measuring vulnerability – generalised and specific measures

A wide range of indicators are often used to measure vulnerability. Traditional vulnerability measurement has focused on measuring access to material resources such as access to income, skills, capital etc, with the assumption that 'assets and entitlements represent the resources that can be mobilised and managed when an individual or a system is confronted with a threat' (Sumner and Mallet 2011, p. 20). Increasingly, a wider range of important resources beyond the material have been recognised as being critical to vulnerability. Key amongst these is the access a person has to resources as a consequence of their social status, social connections and wellbeing – what Sumner and Mallet (2013) term 'relational wellbeing' and 'subjective wellbeing', which incorporate a person's access to positive health and outlook that supports adaptation (part of subjective wellbeing), to social connection, and access to support and resources from other people and institutions.

As there is a broad literature on the attributes that might be measured, and a limited number of measures that can be used from the *Living well* survey, we did not comprehensively review the literature on types of vulnerability measures. Instead, we identified measures likely to give common insight into dimensions of vulnerability that are commonly examined, namely (i) health, (ii) wellbeing and mental health, (iii) financial status and standard of living, and (iv) social connection (Sumner and Mallet 2011, 2013). We identified potential measures for each of these.

We explored six potential measures of vulnerability that draw on data from the *Living well* survey. Four of these can be considered 'generalised' measures of vulnerability to poor wellbeing, which were examined in relation to the events of 2019-20 by exploring how they changed between 2019 and 2020. The remaining two were specific measures of vulnerability to COVID-19, and measured only in the second *Living well* survey:

- Generalised vulnerability – overall. This is an overall measure that uses the Personal Wellbeing Index as a measure of general vulnerability.

- Generalised vulnerability – health. This uses the overall health measure to examined health-related vulnerability.

- Generalised vulnerability – mental health. This uses the Kessler 6 psychological distress measure to examined mental health-related vulnerability.

- Generalised vulnerability – standard of living. This examines satisfaction with standard of living as a longer-term measure of change in access to financial and other resources needed to maintain quality of life.

- Specific vulnerability to COVID-19 – financial. This examines financial vulnerability to COVID-19 using measures from the 2020 survey, as of Apr/May 2020.

- Specific vulnerability to COVID-19 – social. This examines initial ability to access social support during early stages of COVID-19 (as of Apr/May 2020), providing insight into which groups were experiencing greater vulnerability in the form of lack of access to social support resources.

The next sections examine each of these dimensions of vulnerability in turn, describing the measure, followed by identifying how patterns of vulnerability risk varied between groups in the final part of this section. It is assumed that greater intersection of vulnerabilities indicates higher overall vulnerability, an approach consistent with Sumner and Mallet's (2011) call for recognition of the intersectionality and cumulative risk aspects of vulnerability.

2.2 Generalised vulnerability – overall

Overall generalised vulnerability was assessed using the Personal Wellbeing Index. This was used as a 'global' measure of vulnerability, as the measure asks people their level of satisfaction with multiple dimensions of their life, each relevant to understanding vulnerability – health, standard of living, relationships, community, safety, security and what a person is achieving in life.

First, a detailed table was developed (Table 1) that examined whether a group was *meaningfully* and *statistically* more likely to report *low personal wellbeing* in (i) 2019 and (ii) 2020. Meaningful was defined as the proportion with low wellbeing being at least 5 points higher than the ACT average of 20.7% in 2019, and 28.4% in 2020. Statistically significant was defined as the group being significantly more likely than the ACT average to have a low PWI score, based on the 95% confidence interval for proportions. The *change* in the proportion with low wellbeing was then assessed: between 2019 and 2020, the proportion reporting low wellbeing rose by 7.7%: meaningful and statistically significant change was assessed using the same criteria as that use to identify whether a group had a higher proportion of people with low wellbeing than typical in each period.

Examining which groups were at greater risk of low wellbeing in 2019 versus 2020, and which experienced the highest increase in rates of low wellbeing, highlighted differing patterns of vulnerability (Table 1). Some groups were already at high risk of low wellbeing, and that risk increased between 2019 and 2020. These were labelled as 'growing vulnerability). Others were already at high risk of low wellbeing, but did not experience a significant increase in this risk between 2019 and 2020 (continuing vulnerability). Finally, some were not at higher risk of low wellbeing in 2019 but were in 2020 – these were considered to indicate emerging vulnerability. Different groups had higher risk of experiencing these different types of vulnerability:

- Growing vulnerability (vulnerable in 2019, and vulnerability increased significantly 2019-20):
  - LGBTIQA+
  - Single parents
  - Children aged 15-17 in household
  - Carers with lower levels of caring obligation
  - Renters.
- Continuing vulnerability (vulnerable in 2019, vulnerability did not increase significantly 2019-20 or was not significantly higher than average in 2020)
  - Sole person household
  - Carer with 15 or more hours of caring obligations
  - Those living with moderate or severe disability
  - Unemployed
- Emerging vulnerability (not vulnerable in 2019, vulnerability increased significantly 2019 to 2020): Almost all groups experienced a significant increase in vulnerability between 2019 and 2020. Of this large number of groups, the following both had a significant increase in the proportion reporting low wellbeing *and* were significantly above the average in 2020:
  - Females
  - Aged 30-49
  - Children aged 0-17 in household
  - Children aged 5-14 in household
  - Children aged 18-24 in household
  - Living in a unit/apartment
  - Inner South (likely due to high concentration of people living in units/apartments).

Table 1 Generalised vulnerability – overall (personal wellbeing)

Bold with yellow highlighting indicates the group was statistically significantly more likely to report this than the ACT average. Yellow highlighting indicates the proportion reporting this was at least 5% more than the average for the ACT, but the difference was *not* statistically significant (in most cases likely due to the small sample size of the group). *Italics* indicate groups for which small sample sizes mean findings should be interpreted with caution.	2019	2019-2020	2020
	% reporting low wellbeing	Change in % reporting low wellbeing	% reporting low wellbeing
Adult residents of ACT (n=3013, 1572)	20.7%	**7.7%**	28.4%
Female (n=1556, 961)	21.3%	**11.6%**	**32.9%**
Male (n=1371, 598)	20.1%	3.4%	23.5%
Aged 18-29 (n=159, 181)	18.0%	11.7%	29.8%
Aged 30-49 (n=657, 420)	22.5%	**11.7%**	**34.2%**
Aged 50-64 (n=860, 438)	23.9%	2.3%	26.3%
Aged 65+ (n=1237, 521)	16.4%	2.4%	18.8%
Main language at home - English (n=2631, 1428)	22.2%	**7.4%**	29.6%
Main language at home - not English (n=305, 143)	15.2%	9.0%	24.2%
Not LGBTIQA+ (n=2596, 1434)	19.0%	**6.8%**	25.8%
LGBTIQA+ (n=113, 87)	**34.8%**	**21.0%**	**55.8%**
Lived in ACT 5 year or less (n=226, 157)	17.0%	12.3%	29.3%
Single parent with children (n=120, 97)	**38.9%**	**21.6%**	**60.5%**
Couple, children at home (n=781, 534)	17.8%	**11.9%**	29.7%
Couple, no children at home (n=1231, 637)	14.9%	3.3%	18.2%
Sole person household (n=605, 321)	**29.0%**	5.4%	34.4%
No children aged 0-24 in household (n=1656, 742)	21.1%	1.3%	22.3%
One or more children aged 0-17 in household (n=651, 409)	21.5%	**14.9%**	**36.4%**
One or more children aged 0-4 in household (n=238, 132)	18.0%	10.0%	28.0%
One or more children aged 5-14 in household (n=408, 257)	21.9%	**16.2%**	**38.2%**
One or more children aged 15-17 in household (n=186, 124)	**24.6%**	**26.2%**	**50.8%**
One or more children aged 18-24 in household (n=272, 128)	17.4%	**16.2%**	**33.6%**
No disability (n=1538, 653)	14.3%	8.1%	22.4%
Disability – mild (n=542, 235)	17.4%	4.1%	21.5%
Disability – moderate/severe (n=924, 375)	**39.5%**	1.7%	**41.2%**
Not a carer (n=2566, 1330)	**19.4%**	**7.3%**	26.8%
Carer (n=425, 273)	**29.5%**	7.1%	**36.6%**
Carer with < 15 hours per week caring obligations (n=194, 120)	17.3%	**29.6%**	**46.9%**
Carer with 15 + per week caring obligations, or varied/hard to say hours (n=228, 151)	**38.4%**	-8.6%	29.9%
Freestanding house (n=2286, 1170)	21.1%	**5.7%**	26.8%
Townhouse (n=337, 207)	18.8%	7.6%	26.4%
Unit/apartment (n=228, 141)	19.7%	**24.1%**	**43.7%**
Home owned outright (n=1597, 699)	16.2%	-0.1%	16.1%
Home has mortgage (n=901, 533)	18.9%	**8.8%**	27.7%
Home rented (n=358, 259)	**29.2%**	**11.1%**	**40.3%**
Employed (n=1455, 952)	18.9%	**12.8%**	31.6%
Unemployed and looking for work (n=69, 64)	**49.4%**	-26.5%	*22.8%*
Belconnen East (n=191, 102)	27.0%	6.9%	33.9%
Gungahlin (n=384, 213)	20.7%	7.1%	27.8%
Inner Belconnen (n=334, 209)	24.3%	-1.5%	22.8%
Inner North (n=161, 82)	10.4%	7.3%	17.7%
Inner South (n=177, 87)	21.9%	11.5%	**33.3%**
North (n=214, 113)	14.3%	**22.5%**	**36.8%**
Outer Belconnen (n=300, 174)	18.0%	**16.0%**	34.0%
Tuggeranong North (n=343, 165)	21.6%	1.1%	22.7%
Tuggeranong South (n=350, 173)	27.4%	5.6%	33.0%
Weston Creek & Molonglo (n=261, 124)	28.6%	3.9%	32.5%
Woden Valley (n=298, 129)	14.1%	**10.5%**	24.6%

2.3 Generalised vulnerability - health

To assess health-related vulnerability, the 'overall health' measure reported in Part 1 of this report was used. This measure asks a person to self-identify whether their health overall is excellent, very good, good, fair or poor. This measure was used as overall health is an important indicator of both physical and mental health , and reflects changes in both of these (see Part 1 for further description of this measure.

First, a detailed table (Table 2) was developed that examined whether a group was *meaningfully* and *statistically* more likely to report poor/fair health in (i) 2019 and (ii) 2020. Meaningful was defined as the proportion of people reporting poor/fair health being at least 5% higher than the ACT average of 20.5% in 2019, and 27.8% in 2020, and meaningful change as a change 5% or more different to the growth of 7.3% in the proportion reporting poor/fair health between 2019 and 2020. Statistically significant was defined as the group having a significantly higher proportion of people reporting fair/poor health compared to the ACT average, based on 95% confidence interval for a proportion.

Overall, this resulted in identification of the following three types of vulnerable groups (Table 2):

- Growing vulnerability (vulnerable in 2019, and vulnerability increased significantly 2019-20):
    - Carers with more than 15 hours of caring obligations a week
    - Those living with moderate or severe disability
    - Those living in Weston Creek and Molonglo

- Continuing vulnerability (vulnerable in 2019, vulnerability did not increase significantly 2019-20 or was not significantly higher than average in 2020)
    - LGBTIQA+
    - Unemployed

- Emerging vulnerability (not vulnerable in 2019, vulnerability increased significantly 2019 to 2020): Almost all groups experienced a significant increase in vulnerability, with the exception of those aged 65 and older (and associated categories of those who owned their home outright and had no children at home), LGBTIQA+ (who were already vulnerable), and those who were not carers. Of this large number of groups, the following both had a significant increase in the proportion reporting poor/fair health *and* were significantly above the average in 2020:
    - Single parents
    - Carers
    - Renters

Table 2 Generalised vulnerability - health

Bold with yellow highlighting indicates the group was statistically significantly more likely to report this than the ACT average. Yellow highlighting indicates the proportion reporting this was at least 5% more than the average for the ACT, but the difference was *not* statistically significant (in most cases likely due to the small sample size of the group). *Italics* indicate groups for which small sample sizes mean findings should be interpreted with caution.	2019 % reporting poor/fair health	2019-2020 Change in % reporting fair/ poor health	2020 % reporting poor/fair health
Adult residents of ACT (n=3168, 1631)	20.5%	**7.3%**	27.8%
Female (n=1624, 973)	22.0%	**7.5%**	29.5%
Male (n=1405, 609)	18.9%	**6.5%**	25.4%
Aged 18-29 (n=161, 173)	20.0%	10.9%	30.9%
Aged 30-49 (n=663, 419)	18.0%	**9.9%**	27.9%
Aged 50-64 (n=876, 453)	22.3%	**8.9%**	31.2%
Aged 65+ (n=1314, 541)	23.8%	-5.0%	18.8%
Main language at home - English (n=2721, 1419)	20.6%	**7.7%**	28.3%
Main language at home - not English (n=315, 135)	20.0%	4.8%	24.8%
Not LGBTIQA+ (n=2664, 1414)	19.2%	**7.6%**	26.8%
LGBTIQA+ (n=114, 85)	**34.9%**	-2.3%	*32.6%*
Lived in ACT 5 year or less (n=223, 148)	21.7%	5.7%	27.4%
Single parent (n=124, 90)	20.3%	**32.1%**	**52.4%**
Couple, children at home (n=781, 470)	17.2%	**11.0%**	28.2%
Couple, no children at home (n=1266, 624)	19.8%	-1.3%	18.6%
Sole person household (n=654, 309)	**27.4%**	2.4%	29.8%
No children aged 0-24 in household (n=1697, 763)	19.4%	2.4%	21.8%
One or more children aged 0-17 in household (n=658, 394)	17.3%	**8.1%**	25.4%
One or more children aged 0-4 in household (n=236, 128)	12.8%	9.8%	22.6%
One or more children aged 5-14 in household (n=412, 246)	19.2%	5.7%	24.9%
One or more children aged 15-17 in household (n=189, 119)	18.0%	9.3%	27.3%
One or more children aged 18-24 in household (n=274, 127)	21.7%	1.6%	23.3%
No disability (n=1538, 653)	11.7%	4.1%	15.8%
Disability – mild (n=542, 235)	22.6%	1.2%	23.8%
Disability – moderate/severe (n=924, 375)	**41.1%**	**8.4%**	**49.5%**
Not a carer (n=2639, 1307)	19.8%	**5.2%**	25.0%
Carer (n=440, 275)	24.7%	**15.0%**	**39.7%**
Carer with < 15 hours per week caring obligations (n=204, 119)	18.9%	10.7%	29.6%
Carer with 15+ hours per week caring obligations (n=232, 154)	**28.5%**	**16.9%**	**45.4%**
Freestanding house (n=2357, 1156)	19.5%	**7.1%**	26.7%
Townhouse (n=347, 205)	23.2%	2.0%	25.3%
Unit/apartment (n=239, 135)	21.3%	5.4%	26.7%
Home owned outright (n=1687, 715)	22.4%	-6.1%	16.3%
Home has mortgage (n=907, 512)	18.3%	**8.2%**	26.6%
Home rented (n=359, 255)	24.1%	**12.5%**	**36.6%**
Employed (n=1466, 839)	18.5%	**7.3%**	25.8%
Unemployed and looking for work (n=67, 60)	*25.5%*	*7.1%*	*32.6%*
Belconnen East (n=198, 108)	16.0%	**15.6%**	31.6%
Gungahlin (n=394, 219)	16.4%	7.3%	23.8%
Inner Belconnen (n=352, 216)	19.1%	5.2%	24.3%
Inner North (n=167, 83)	**30.2%**	1.1%	31.2%
Inner South (n=190, 89)	*14.5%*	*4.6%*	*19.1%*
North (n=222, 116)	18.6%	4.1%	22.7%
Outer Belconnen (n=319, 177)	19.2%	5.2%	24.4%
Tuggeranong North (n=362, 178)	**26.2%**	4.5%	30.7%
Tuggeranong South (n=375, 180)	20.1%	**15.9%**	36.0%
Weston Creek & Molonglo (n=273, 135)	**27.2%**	11.3%	**38.5%**
Woden Valley (n=315, 129)	19.6%	2.6%	22.2%

2.4 Generalised vulnerability – mental health

To assess mental health-related vulnerability, the K6 psychological distress measure was used. This measure is described in detail in Part 1 of this report, and was used as there are clear thresholds established in previous research regarding the scores that can be considered to represent moderate or high levels of distress.

First, a detailed table was developed that examined whether the proportion of a group reporting moderate or high distress in (i) 2019 and (ii) 2020, or the increase in this proportion between the two periods, was meaningfully and statistically significant (Table 3). Incidence of both moderate and high distress were both examined as moderate distress is recognised as indicating potential higher vulnerability to experiencing negative impacts related to poor mental health, while high distress indicates a high likelihood of already experiencing substantial negative impacts on day to day life as a result of the distress being experienced. It is important to recognise that many of those experiencing moderate distress will be able to function highly productively and successfully day to day – the distress they report does, however, indicate a vulnerability in which further stress or challenges may more readily 'tip' that person to a poorer state of mental health that does impact their day-to-day functioning.

Meaningful was defined as the proportion of people reporting moderate/high distress being at least 5% higher than the ACT average of 20.5% in 2019, and 27.8% in 2020, or having growth in the proportion more than 5% greater than the average rise of 7.3% between 2019 and 2020. Statistically significant was defined as the group having a significantly higher proportion of people reporting moderate/high distress compared to the ACT average, based on 95% confidence interval for proportions.

Overall, this resulted in identification of the following three types of vulnerable groups (Table 3):

- Growing vulnerability (vulnerable in 2019, and vulnerability increased significantly 2019-20):
  - Aged 18-29
  - LGBTIQA+
  - Single parent
  - Carer with 15+ hours a week of caring obligations
  - Those living with moderate or severe disability
  - Those living in units/apartments
  - Renters
  - Unemployed
  - Inner South
  - Those who have lived in the ACT for a shorter period of time (5 years or less)
- Continuing vulnerability (vulnerable in 2019, vulnerability did not increase significantly 2019-20 or was not significantly higher than average in 2020)
  - Those with children aged 18-24 living in household, although rates of distress were only a small amount above the average, despite this being statistically significant
- Emerging vulnerability (not vulnerable in 2019, vulnerability increased significantly 2019 to 2020):
  - Females (a much higher increase in distress than reported by men)
  - Aged 30-49
  - Main language at home not English
  - Children aged 5-14 living in household
  - Carers (all types)
  - Those living in townhouses.

Table 3 Generalised vulnerability – mental health

	2019	2019-20	2020
Bold with yellow highlighting indicates the group was statistically significantly more likely to report this than the ACT average. Yellow highlighting indicates the proportion reporting this was at least 5% more than the average for the ACT, but the difference was *not* statistically significant (in most cases likely due to the small sample size of the group). *Italics* indicate groups for which small sample sizes mean findings should be interpreted with caution.	**% reporting moderate/ high distress**	**Change in % moderate/ high distress**	**% moderate/ high distress**
Adult residents of ACT (n=3134, 1631)	30.4%	**16.2%**	46.5%
Female (n=1631, 998)	32.2%	**19.1%**	51.3%
Male (n=1421, 615)	28.4%	**12.8%**	41.2%
Aged 18-29 (n=163, 184)	**43.1%**	**24.7%**	**67.8%**
Aged 30-49 (n=669, 429)	34.1%	**19.3%**	**53.3%**
Aged 50-64 (n=884, 459)	24.2%	**11.7%**	35.9%
Aged 65+ (n=1320, 543)	16.4%	3.6%	20.0%
Main language at home - English (n=2739, 1475)	30.2%	**13.8%**	44.0%
Main language at home - not English (n=323, 149)	30.6%	**28.3%**	**58.9%**
Not LGBTIQA+ (n=2688, 1479)	28.2%	**16.1%**	44.3%
LGBTIQA+ (n=115, 91)	*52.4%*	*15.5%*	*67.9%*
Lived in ACT 5 year or less (n=229, 161)	36.1%	**24.2%**	**60.3%**
Single parent with children (n=126, 104)	**49.0%**	14.2%	**63.2%**
Couple, children at home (n=792, 547)	28.3%	**21.3%**	49.7%
Couple, no children at home (n=1275, 660)	25.6%	**6.5%**	32.2%
Sole person household (n=656, 341)	32.3%	6.3%	38.7%
No children aged 0-24 in household (n=1710, 770)	28.7%	-0.9%	27.8%
One or more children aged 0-17 in household (n=664, 422)	30.1%	**20.3%**	50.5%
One or more children aged 0-4 in household (n=242, 137)	32.7%	12.5%	45.2%
One or more children aged 5-14 in household (n=415, 265)	31.0%	**26.9%**	**57.9%**
One or more children aged 15-17 in household (n=191, 126)	23.4%	**24.0%**	47.4%
One or more children aged 18-24 in household (n=282, 133)	**36.8%**	13.6%	50.4%
No disability (n=1538, 653)	24.7%	18.6%	43.3%
Disability – mild (n=542, 235)	31.9%	4.0%	35.9%
Disability – moderate/severe (n=924, 375)	**43.6%**	**16.0%**	**59.6%**
Not a carer (n=2671, 1374)	29.9%	**14.5%**	44.5%
Carer (n=442, 287)	33.8%	**23.1%**	**56.9%**
Carer with < 15 hours per week caring obligations (n=203, 125)	22.0%	**26.3%**	48.4%
Carer with 15 or more hours per week caring obligations (n=234, 159)	**42.9%**	**19.1%**	**62.0%**
Freestanding house (n=2386, 1205)	26.3%	**14.2%**	40.5%
Townhouse (n=347, 219)	32.3%	**23.5%**	**55.8%**
Unit/apartment (n=237, 143)	**46.0%**	13.4%	**59.4%**
Home owned outright (n=1691, 725)	19.9%	1.5%	21.3%
Home has mortgage (n=922, 548)	29.4%	**13.9%**	43.4%
Home rented (n=363, 268)	**39.0%**	**29.1%**	**68.0%**
Employed (n=1496, 977)	30.9%	**15.8%**	46.8%
Unemployed and looking for work (n=71, 68)	*56.2%*	*31.8%*	*88.0%*
Belconnen East (n=199, 106)	24.4%	8.0%	32.4%
Gungahlin (n=391, 220)	23.3%	**21.7%**	44.9%
Inner Belconnen (n=344, 217)	**36.8%**	**14.9%**	51.8%
Inner North (n=166, 84)	*40.9%*	*13.0%*	*53.9%*
Inner South (n=188, 89)	*39.3%*	*19.6%*	*58.8%*
North (n=221, 116)	32.1%	**21.8%**	54.0%
Outer Belconnen (n=314, 180)	30.6%	7.7%	38.2%
Tuggeranong North (n=357, 179)	26.8%	**13.4%**	40.1%
Tuggeranong South (n=369, 178)	32.0%	**21.7%**	53.7%
Weston Creek & Molonglo (n=271, 133)	17.8%	**27.1%**	45.0%
Woden Valley (n=313, 128)	31.4%	6.6%	38.0%

2.5 Generalised vulnerability – standard of living

Many vulnerability assessments consider financial status or having access to a reasonable standard of living to be an important dimension of vulnerability. A person's standard of living can be a useful global measure of financial vulnerability, as those with a low standard of living are often likely to be experiencing financial stress. However, this measure can also to some extent reflect issues such as the suitability and crowding of a person's home, meaning it may be affected by factors other than financial vulnerability as well as by changes in finances.

Standard of living was assessed by examining one of the sub-measures of the Personal Wellbeing Index, which asks a person how satisfied they are with their standard of living. This means that this measure also forms part of the overall vulnerability measure, where it forms one of seven sub-components of the PWI.

This measure is likely to be better for measuring longer-term vulnerability than some other measures which may show short-term changes that do not have a substantial impact on a person's longer term ability to maintain a standard of living that is of good quality. However, this measure may take some time to change even after a person has lost income, meaning that it is not as sensitive as others to measuring whether vulnerability is changing due to COVID-19. For this reason, and because changes in standard of living can result from factors other than change in financial status (such as a number of people moving into a small home, reducing comfort levels for all), a COVID-19 specific measure of financial vulnerability was also examined (see Section 3.6).

A detailed table was developed that examined whether a group was *meaningfully* and *statistically* more likely to report low satisfaction with their standard of living in (i) 2019 and (ii) 2020 (Table 4). Meaningful was defined as the proportion of people reporting low satisfaction being at least 5% higher than the ACT average of 16.6% in 2019, and 18.6% in 2020, or growing by 5% or more than the average of 2.1% between the two periods. Statistically significant was defined as the group having a significantly higher proportion of people reporting low satisfaction compared to the ACT average, based on 95% confidence interval for the proportion.

Overall, this resulted in identification of the following three types of vulnerable groups (Table 4):

- Growing vulnerability (vulnerable in 2019, and vulnerability increased significantly 2019-20):
    - Single parents
    - Those living with moderate or severe disability
    - Those identifying at LGBTIQA+ (although findings are tentative)
    - Renters
    - Unemployed
- Continuing vulnerability (vulnerable in 2019, vulnerability did not increase significantly 2019-20 or was not significantly higher than average in 2020)
    - Carers with 15+ hours a week of caring obligations
    - Inner Belconnen
    - Weston Creek & Molonglo
- Emerging vulnerability (not vulnerable in 2019, vulnerability increased significantly 2019 to 2020):
    - Aged 18-29
    - Children aged 15-17 in household
    - Carer with < 15 hours per week caring obligations
    - Belconnen East, Inner North and possibly Tuggeranong South.

Table 4 Generalised vulnerability – standard of living

Bold with yellow highlighting indicates the group was statistically significantly more likely to report this than the ACT average. Yellow highlighting indicates the proportion reporting this was at least 5% more than the average for the ACT, but the difference was *not* statistically significant (in most cases likely due to the small sample size of the group). *Italics* indicate groups for which small sample sizes mean findings should be interpreted with caution.	2019 % reporting low standard of living	2019-2020 Change in % reporting low standard of living	2020 % reporting low standard of living
Adult residents of ACT (n=3013, 1572)	16.6%	2.1%	18.6%
Female (n=1556, 961)	15.5%	3.2%	18.7%
Male (n=1371, 598)	17.7%	0.5%	18.2%
Aged 18-29 (n=159, 181)	20.4%	6.2%	**26.6%**
Aged 30-49 (n=657, 420)	17.3%	0.7%	18.0%
Aged 50-64 (n=860, 438)	16.9%	1.4%	18.4%
Aged 65+ (n=1237, 521)	10.6%	-1.4%	9.1%
Main language at home - English (n=2631, 1428)	16.1%	1.0%	17.1%
Main language at home - not English (n=305, 143)	18.0%	6.7%	24.7%
Not LGBTIQA+ (n=2596, 1434)	15.9%	1.3%	17.2%
LGBTIQA+ (n=113, 87)	*22.4%*	*4.9%*	*27.3%*
Lived in ACT 5 year or less (n=226, 157)	17.1%	9.6%	**26.7%**
Single parent with children (n=120, 97)	***29.5%***	*19.9%*	***49.4%***
Couple, children at home (n=781, 534)	16.3%	-2.2%	14.1%
Couple, no children at home (n=1231, 637)	10.5%	-3.6%	7.0%
Sole person household (n=605, 321)	19.3%	-1.4%	17.9%
No children aged 0-24 in household (n=1656, 742)	19.9%	0.8%	20.7%
One or more children aged 0-17 in household (n=651, 409)	14.7%	-2.4%	12.3%
One or more children aged 0-4 in household (n=238, 132)	16.1%	-0.4%	15.7%
One or more children aged 5-14 in household (n=408, 257)	21.1%	-0.3%	20.7%
One or more children aged 15-17 in household (n=186, 124)	17.8%	11.0%	**28.8%**
One or more children aged 18-24 in household (n=272, 128)	20.0%	-2.6%	17.4%
No disability (n=1538, 653)	13.8%	-1.4%	12.4%
Disability – mild (n=542, 235)	12.8%	0.2%	13.0%
Disability – moderate/severe (n=924, 375)	**25.6%**	**6.8%**	**32.4%**
Not a carer (n=2566, 1330)	16.3%	1.2%	17.5%
Carer (n=425, 273)	17.6%	5.8%	23.4%
Carer with < 15 hours per week caring obligations (n=194, 120)	7.8%	**19.2%**	**27.0%**
Carer with 15 + per week caring obligations, or varied/hard to say hours (n=228, 151)	**25.5%**	-4.1%	21.4%
Freestanding house (n=2286, 1170)	16.7%	-0.5%	16.3%
Townhouse (n=337, 207)	13.8%	-0.6%	13.2%
Unit/apartment (n=228, 141)	17.1%	5.2%	22.3%
Home owned outright (n=1597, 699)	8.9%	-1.8%	7.1%
Home has mortgage (n=901, 533)	14.7%	-1.1%	13.6%
Home rented (n=358, 259)	**26.0%**	8.2%	**34.3%**
Employed (n=1455, 952)	15.8%	2.0%	17.8%
Unemployed and looking for work (n=69, 64)	***30.4%***	*4.6%*	***35.0%***
Belconnen East (n=191, 102)	*11.0%*	***15.9%***	***26.9%***
Gungahlin (n=384, 213)	17.2%	-1.0%	16.3%
Inner Belconnen (n=334, 209)	**25.7%**	-8.5%	17.2%
Inner North (n=161, 82)	*9.4%*	***22.1%***	***31.6%***
Inner South (n=177, 87)	*12.2%*	*3.0%*	*15.2%*
North (n=214, 113)	12.3%	2.3%	14.5%
Outer Belconnen (n=300, 174)	15.4%	-0.8%	14.6%
Tuggeranong North (n=343, 165)	15.4%	-4.8%	10.6%
Tuggeranong South (n=350, 173)	21.1%	3.1%	24.2%
Weston Creek & Molonglo (n=261, 124)	**24.8%**	-2.4%	22.4%
Woden Valley (n=298, 129)	11.4%	3.5%	14.9%

2.6 Specific vulnerability – financial vulnerability to impacts of COVID-19

COVID-19 presents multiple challenges to the financial wellbeing of many households.

To examine this, three of the questions asked in the second survey (2020) were examined; each is also described in Part 2 of this report:

- How has COVID-19/coronavirus impacted your household income? Response options were: decreased, stayed about the same, increased.

- I'm worried about having enough money to cover basic household expenses in the next weeks or months due to COVID-19 (responses were measured 7-point agree-disagree scale)

- COVID-19 is likely to cause me or my household financial problems in the longer term (beyond the next month or two) (7-point agree-disagree scale)

As these measures were only examined at a single point in time, it was not possible to identify change in vulnerability, but was possible to identify those groups who have higher financial vulnerability than others. A table was developed (Table 5) that examined whether a group was *meaningfully* and *statistically* more likely to report (i) their household income having decreased due to COVID-19, (ii) agreeing that they were worry about having enough money for basic household expenses in the next weeks or months, and (iii) agreeing that COVID-19 was likely to cause their household financial problems in the longer term. Meaningful was defined as the proportion of people reporting financial problems being at least 5% higher than the ACT average in 2020. Statistically significant was defined as the group having a significantly higher proportion of people reporting financial problems compared to the ACT average, based on 95% confidence interval for proportions.

The following groups were more likely to report all three of a decrease in income, difficulty covering household expenses and likely longer-term financial problems (Table 5):

- Those aged 18-29

- Those born overseas in non-English speaking countries and whose main language at home is not English

- Those who have lived in the ACT for 5 years or less

- Renters

- Those who are unemployed

- Those living in Inner Belconnen and North Canberra.

In addition to these group, some reported other more specific vulnerability, but were not vulnerable for all three aspects of financial vulnerability:

- Single parents – while not more likely to have experienced a decrease in income than others, single parents were more likely to be worried about being able to cover future household expenses

- Those with children aged 18-24 in the household were more likely than average to report a decline in income (potentially reflecting some of those children losing work, consistent with the decrease in income amongst those aged 18-29 years), but were not more concerned than typical about being able to cover household expenses in future

- Carers were somewhat more likely to be worried about ability to cover future household expenses, but not significantly so

- Those living in Tuggeranong South and Weston Creek & Molonglo had some higher levels of financial vulnerability, but none were statistically significant, and these were not consistent across all three aspects of financial vulnerability.

Table 5 Specific vulnerability – financial impacts of COVID-19

	2020 % reporting household income had decreased due to COVID-19	2020 % worried about covering basic household expenses in next weeks/ months	2020 % reporting COVID-19 likely to cause longer-term financial problems
Adult residents of ACT (n=1572)	33.6%	24.8%	36.3%
Female (n=961)	34.9%	23.1%	35.6%
Male (n=598)	32.4%	26.9%	37.1%
Aged 18-29 (n=181)	**51.1%**	**36.2%**	**47.2%**
Aged 30-49 (n=420)	32.5%	26.8%	36.2%
Aged 50-64 (n=438)	29.2%	21.5%	36.6%
Aged 65+ (n=521)	20.2%	10.8%	22.4%
Main language at home - English (n=1428)	28.1%	21.7%	33.3%
Main language at home - not English (n=143)	**58.5%**	**39.0%**	**50.5%**
Not LGBTIQA+ (n=1434)	33.7%	24.8%	36.7%
LGBTIQA+ (n=87)	31.2%	26.8%	30.6%
Lived in ACT 5 year or less (n=157)	**57.4%**	**48.9%**	**62.4%**
Single parent with children (n=97)	33.5%	**46.4%**	46.6%
Couple, children at home (n=534)	35.0%	23.9%	37.7%
Couple, no children at home (n=637)	23.2%	13.6%	23.7%
Sole person household (n=321)	19.2%	21.0%	29.1%
No children aged 0-24 in household (n=742)	21.1%	14.1%	24.9%
One or more children aged 0-17 in household (n=409)	35.0%	26.0%	36.9%
One or more children aged 0-4 in household (n=132)	39.3%	25.6%	39.0%
One or more children aged 5-14 in household (n=257)	33.2%	29.4%	40.8%
One or more children aged 15-17 in household (n=124)	36.9%	24.7%	31.3%
One or more children aged 18-24 in household (n=128)	**45.9%**	28.0%	38.1%
No disability (n=653)	39.0%	13.2%	38.7%
Disability – mild (n=235)	21.1%	14.2%	23.1%
Disability – moderate/severe (n=375)	28.6%	11.2%	40.1%
Not a carer (n=1330)	34.7%	24.0%	35.7%
Carer (n=273)	29.8%	30.5%	40.8%
Carer with < 15 hours per week caring obligations (n=120)	31.4%	28.6%	41.6%
Carer with 15 + per week caring obligations, or varied/hard to say hours (n=151)	28.4%	31.7%	40.2%
Freestanding house (n=1170)	30.8%	21.3%	34.0%
Townhouse (n=207)	36.2%	23.7%	36.8%
Unit/apartment (n=141)	37.0%	32.3%	36.5%
Home owned outright (n=699)	19.4%	8.9%	22.1%
Home has mortgage (n=533)	36.1%	20.3%	32.9%
Home rented (n=259)	**44.4%**	**46.8%**	**56.7%**
Employed (n=952)	34.9%	26.1%	37.1%
Unemployed and looking for work (n=64)	**73.6%**	**60.2%**	**71.4%**
Belconnen East (n=102)	29.1%	23.9%	39.8%
Gungahlin (n=213)	34.0%	16.5%	35.2%
Inner Belconnen (n=209)	**44.4%**	**45.8%**	**49.9%**
Inner North (n=82)	36.2%	28.3%	39.6%
Inner South (n=87)	38.8%	13.3%	22.2%
North (n=113)	**48.1%**	**41.4%**	**56.2%**
Outer Belconnen (n=174)	26.9%	15.4%	26.8%
Tuggeranong North (n=165)	22.5%	14.1%	31.9%
Tuggeranong South (n=173)	27.7%	31.5%	38.4%
Weston Creek & Molonglo (n=124)	38.5%	32.1%	35.0%
Woden Valley (n=129)	28.8%	15.2%	25.0%

Bold with yellow highlighting indicates the group was statistically significantly more likely to report this than the ACT average. Yellow highlighting indicates the proportion reporting this was at least 5% more than the average for the ACT, but the difference was *not* statistically significant (in most cases likely due to the small sample size of the group). *Italics* indicate groups for which small sample sizes mean findings should be interpreted with caution.

2.7 Specific vulnerability – vulnerability to loss of social support and social connection during COVID-19 social distancing restrictions

The social distancing restrictions enacted to reduce spread of COVID-19 present challenges to accessing social support and social connection for many people. Poor access to support and social connection are important and well recognised dimensions of vulnerability: it was therefore considered important to include a measure of vulnerability that considered ability to access support and social connection.

To examine this, two of the questions asked in the Apr-May 2020 *Living well* survey were examined:

- I have good access to support from family or friends if I need it during COVID-19

- I'm feeling more isolated or alone than usual due to COVID-19.

As these measures were only examined at a single point in time, it was not possible to identify change in vulnerability, but was possible to identify those groups who have risk of experiencing loss of social connection and low access to social support than others. A table was developed (Table 6) that examined whether a group was *meaningfully* and *statistically* more likely to report (i) having good access to support or (ii) feeling isolated or lonely. Meaningful was defined as the proportion of people reporting lack of support or isolation being at least 5% higher than the ACT average in 2020. Statistically significant was defined as the group having a significantly higher proportion of people reporting lack of support or isolation compared to the ACT average, based on 95% confidence interval for proportions.

The following groups were *both* less likely to have access to support if they needed it *and* more likely to report feeling more isolated and alone (Table 6):

- Single parents

- Living in the ACT for less than 5 years

- Renters

- Carers with 15 hours or more a week of caring obligations

The following groups were less likely to have access to support from family or friends if they needed it during COVID-19, but not more likely to report feeling more isolated or alone than usual than the ACT average:

- Those aged 30-49

- Possibly those whose main language at home is not English, although the difference was not statistically significant

- Those with children aged 0-17 in the household

- Those living in units/apartments

- Those living in Gungahlin and the North

The following groups were more likely to report feeling more isolated or alone than usual, but reported similar levels of access to support from family and friends to the ACT average:

- Males

- LGBTIQA+

- Carers of all types

- Those living with moderate or severe disability

- Unemployed

- Those living in Inner Belconnen and Inner North.

Table 6 Specific vulnerability – access to social support and social connection during COVID-19

	2020 I have good access to support from family or friends if I need it during COVID-19 - Agree (%)	2020 I'm feeling more isolated or alone than usual due to COVID-19 - Agree (%)
Bold with yellow highlighting indicates the group was statistically significantly more likely to report this than the ACT average. Yellow highlighting indicates the proportion reporting this was at least 5% poorer than the ACT, but the difference was *not* statistically significant (in most cases likely due to the small sample size of the group). *Italics* indicate groups for which small sample sizes mean findings should be interpreted with caution.		
Adult residents of ACT (n=1572)	67.0%	52.1%
Female (n=961)	67.5%	53.5%
Male (n=598)	66.5%	50.6%
Aged 18-29 (n=181)	69.4%	**67.6%**
Aged 30-49 (n=420)	**59.1%**	53.0%
Aged 50-64 (n=438)	65.0%	45.1%
Aged 65+ (n=521)	79.1%	38.9%
Main language at home - English (n=1428)	68.4%	51.4%
Main language at home - not English (n=143)	60.2%	56.4%
Not LGBTIQA+ (n=1434)	67.2%	51.3%
LGBTIQA+ (n=87)	66.6%	**63.1%**
Lived in ACT 5 year or less (n=157)	**54.6%**	**62.6%**
Single parent with children (n=97)	**45.9%**	58.5%
Couple, children at home (n=534)	64.3%	49.8%
Couple, no children at home (n=637)	75.0%	40.4%
Sole person household (n=321)	70.1%	57.7%
No children aged 0-24 in household (n=742)	73.4%	42.7%
One or more children aged 0-17 in household (n=409)	**59.7%**	51.7%
One or more children aged 0-4 in household (n=132)	**54.5%**	49.0%
One or more children aged 5-14 in household (n=257)	**57.8%**	55.5%
One or more children aged 15-17 in household (n=124)	62.0%	52.1%
One or more children aged 18-24 in household (n=128)	70.8%	54.1%
No disability (n=653)	67.3%	46.1%
Disability – mild (n=235)	76.6%	52.2%
Disability – moderate/severe (n=375)	62.5%	**61.1%**
Not a carer (n=1330)	67.8%	51.0%
Carer (n=273)	63.0%	57.6%
Carer with < 15 hours per week caring obligations (n=120)	66.0%	53.7%
Carer with 15 + per week caring obligations, or varied/hard to say hours (n=151)	61.3%	**60.7%**
Freestanding house (n=1170)	67.6%	51.5%
Townhouse (n=207)	62.1%	50.1%
Unit/apartment (n=141)	**56.6%**	51.2%
Home owned outright (n=699)	76.3%	41.3%
Home has mortgage (n=533)	66.1%	48.4%
Home rented (n=259)	**52.1%**	**63.3%**
Employed (n=952)	64.3%	50.5%
Unemployed and looking for work (n=64)	63.0%	**79.4%**
Belconnen East (n=102)	68.4%	42.9%
Gungahlin (n=213)	**56.0%**	51.1%
Inner Belconnen (n=209)	72.5%	**60.7%**
Inner North (n=82)	77.1%	**65.0%**
Inner South (n=87)	66.2%	49.8%
North (n=113)	**42.4%**	55.4%
Outer Belconnen (n=174)	62.7%	48.2%
Tuggeranong North (n=165)	75.3%	58.5%
Tuggeranong South (n=173)	67.4%	49.5%
Weston Creek & Molonglo (n=124)	81.3%	48.3%
Woden Valley (n=129)	71.6%	39.4%

2.8 Dimensions of vulnerability experienced by different groups

Comparing the risk groups have of experiencing different aspects of vulnerability can provide a more holistic understanding of vulnerability and overall risk of vulnerability amongst different groups of ACT residents. The types of vulnerability different groups were at higher risk of are compared in Table 7. This highlights that for most groups, there are areas of higher risk, and others where there is not high vulnerability. In other words, the types of vulnerability different groups are at risk of vary substantially, reflecting that vulnerability is multi-dimensional.

Three groups had higher than average risk of vulnerability for all six aspects of vulnerability:

- Single parents

- Renters

- Those who were unemployed and looking for work.

These three groups are likely to be at particularly high risk of experiencing multiple threats to wellbeing, including negative impacts to finances, social connection and support, and health. This highlights a need to ensure coordinated support that considers more than one type of vulnerability. Other groups with higher than typical risk of experiencing negative outcomes across multiple aspects of vulnerability included those aged 18-29, identifying as LGBTIQA+, living with moderate or severe disability, and carers with high caring obligations.

Groups not identified as being at higher risk for any of the six dimensions of vulnerability examined were those aged 50 and older, those whose main language at home was English, couples who co-habited and had no children aged under 25 living in the home, those with no or mild disability, those living in a freestanding house, and those living in some regions such as Woden Valley. Importantly, this does not mean there is no vulnerability amongst these groups. Instead, it means these groups are *not at higher risk than the average ACT adult.* For example: 33% of ACT adults reported experiencing some loss of household income due to COVID-19. This means that there may be up to one-third of people in some of the groups listed here who have experienced income loss.

A key limitation of data shown in Table 7 is that it focuses on areas where there is higher risk of negative outcomes, and does not also identify areas of strength and higher than average resilience. Future work should work to produce a more holistic assessment that better recognises both vulnerabilities and strengths of different groups. The next section considers how resilience measurement could be further addressed in analysis of data from future *Living well* surveys, which can assist in achieving a more balanced assessment of both vulnerabilities and strengths and assets.

Table 7 Types of vulnerability by group

Legend:
- ✔ = growing vulnerability/high COVID vulnerability (red)
- ✔ = continuing vulnerability/moderate COVID vulnerability (orange)
- ✔ = emerging vulnerability (black)

	General vulnerability (2020)				COVID-19 vulnerability (2020)	
	Personal wellbeing	Health	Mental health	Standard of living	Financial	Social support
Female	✔(black)		✔(black)			
Male						✔(orange)
Aged 18-29			✔(red)	✔(black)	✔(red)	
Aged 30-49	✔(black)		✔(black)			✔(orange)
Aged 50-64						
Aged 65+						
Main language at home - English						
Main language at home - not English			✔(black)		✔(red)	
Not LGBTIQA+						
LGBTIQA+	✔(red)	✔(orange)	✔(red)	✔(red)		✔(orange)
Lived in ACT 5 year or less			✔(red)			✔(red)
Single parent with children	✔(red)	✔(black)	✔(red)	✔(red)	✔(orange)	✔(red)
Couple, children at home						
Couple, no children at home						
Sole person household	✔(orange)					
No children aged 0-24 in household						
One or more children aged 0-17 in household	✔(black)					✔(orange)
One or more children aged 0-4 in household						✔(orange)
One or more children aged 5-14 in household	✔(black)		✔(black)			✔(orange)
One or more children aged 15-17 in household	✔(red)			✔(black)		✔(orange)
One or more children aged 18-24 in household	✔(black)		✔(orange)		✔(orange)	
No disability						
Disability – mild						
Disability – moderate/severe	✔(orange)	✔(red)	✔(red)	✔(red)		
Not a carer						✔(orange)
Carer	✔(red)	✔(black)	✔(black)			
Carer with < 15 hours per week caring obligations	✔(black)			✔(black)		
Carer with 15 or more hours per week caring obligations	✔(orange)	✔(red)	✔(red)	✔(orange)		✔(red)
Freestanding house						
Townhouse			✔(black)			
Unit/apartment	✔(black)		✔(red)			✔(orange)
Home owned outright						
Home has mortgage						
Home rented	✔(red)	✔(black)	✔(red)	✔(red)	✔(red)	✔(red)
Employed						
Unemployed and looking for work	✔(orange)	✔(orange)	✔(red)	✔(red)	✔(red)	✔(orange)
Belconnen East				✔(black)		
Gungahlin						✔(orange)
Inner Belconnen				✔(orange)	✔(red)	✔(orange)
Inner North				✔(black)		✔(orange)
Inner South	✔(black)		✔(red)			
North					✔(red)	✔(orange)
Outer Belconnen						
Tuggeranong North						
Tuggeranong South				✔(grey)		
Weston Creek & Molonglo			✔(red)	✔(orange)		
Woden Valley						

3.0 Tracking resilience in the ACT

Resilience can be defined many ways, but here is broadly defined as *the ability of a person, household or community to successfully adapt to adversity and to capitalise on opportunities*. Our definition is based on that recommended by Schirmer and Hanigan (2017) based on a review of core resilience concepts and literature. Similar to vulnerability, resilience can be examined in 'general' – a person's access to overall resilience resources that may be drawn on to assist in adapting to a wide range of changing circumstances – or in relation to specific circumstances. Specified resilience seeks to understand the extent to which a person or community is resilient to specific types of change. For example, Schirmer and Yabsley (2018) developed measures examining specific resilience to the anticipated impacts of climate change in the ACT. In contrast, 'generalised resilience' seeks to understand overall capacity to adapt to change irrespective of the type of adversity or opportunity a person/household/community experiences (see Walker et al. 2009, Carpenter et al. 2012, Berkes and Ross 2013).

Measuring resilience is sometimes presented as a strengths-based approach that is in some ways preferable to labelling some groups as vulnerable:

> '… it is suggested that the issue of 'vulnerability' should be turned around and approached positively as resilience or as the capacity to cope with or adapt to change' (Handmer 2003).

More recently, however, resilience and vulnerability have not been viewed as simple inverse states, but instead as concepts that are related and complementary: a person can have high risk of vulnerability (experiencing loss in the short-term in response to shocks) while also having aspects of high resilience (being able to adapt to and recover from that loss). Some attempt to distinguish the two by identifying vulnerability as being more related to propensity to experience loss when faced with a shock/challenge, while resilience is presented as having access to resources that enable coping, adaptation, recovery and/or transformation in response to those shocks/challenges. In reality, there is considerable overlap in the factors considered to indicate higher risk of loss and greater ability to cope/adapt/recover/transform. In this report, rather than attempting to fully distinguish vulnerability and resilience, we consider them complementary and partially overlapping concepts.

Worldwide, there is a large and growing literature examining how to define and measure resilience. This literature has emerged from multiple disciplines, and these have often used somewhat different terminology and conceptualisation when thinking about resilience. In particular, as reviewed in detail in Schirmer and Hanigan (2017):

- The *psychological resilience resources* approach argues that a person's resilience depends on their ability to access and draw on key psychological, social and community resources that facilitate successful adaptation to difficult times and positive outcomes. Examples of psychological resilience resources are having high 'self-efficacy' (confidence in being able to achieve desired outcomes in life), and good access to social networks (e.g. Burns and Anstey 2010). This approach tends to focus on social and psychological resources more than access to material resources such as financial reserves.

- The *socio-ecological system* approach, and to some extent the *disaster resilience* literature, often conceptualise resilience as a function of the extent to which a person, household or community is (i) exposed to change, for example through experiencing changing climate, markets, or pest/disease outbreak; and (ii) vulnerable to the effects of that change, with vulnerability differing depending on a person's (a) sensitivity to the change they are experiencing, and (b) their capacity to adapt successfully to that change (see for example Adger et al. 2005, Gallopin 2006, Smit and Wandel 2006, Mumby et al. 2014, Jacobs et al. 2015).

- Overlapping with the *socio-ecological systems* approach, the *adaptive capacity* approach has emerged from both the socio-ecological systems field and sustainable livelihoods work (e.g. Robeyns 2005, Nelson et al. 2005, Kokic et al. 2006). This approach argues that resilience is principally dependent on a person's capacity to adapt to change, which in turn depends on their access to 'capital' such as financial, human, social, physical and natural resources. People, households and communities draw on this capital to provide the resources they need to implement actions that enable them to adapt to challenging circumstances and/or opportunities.

These different approaches have some core aspects in common. All to some degree rely on the idea that to be resilient relies on having access to some resources that can be used to support that adaptation – whether it is material resources in the form of financial capital, or psychological resources in the form of access to social networks. From this point on, we refer to these as 'resilience resources' (they could equally be labelled as the resources that build adaptive capacity, and many approaches label these resilience resources as aspects of adaptive capacity).

Some also consider resilience to be a function of the stresses a person is exposed to (exposure). This is particularly true of the socio-ecological systems approach, which seeks to understand how resilient people, households and communities are to climate change, or to specific events such as natural disasters. In this report, that would involve measuring exposure to different types of stress resulting from events such as bushfire, hailstorm or COVID-19 – which was explored in Part 2 of this report. The findings reported in Part 2 show quite high variability in exposure to the effects of these events – risk of experiencing higher caring responsibilities (e.g. home schooling), job loss, or social isolation varied substantially between different groups. This points to the relevance of examining relative levels of exposure as part of understanding resilience.

The socio-ecological and disaster resilience approaches also have an emphasis on understanding what is sometimes labelled sensitivity to exposure, and in other frameworks labelled vulnerability (still others view vulnerability as a function of sensitivity and adaptive capacity). Broadly, this means identifying how sensitive a person, household or community is to the exposure they have. This concept can best be understood as whether two people who have the same type/level of exposure to a problem differ in their risk of experiencing negative impacts from that exposure.

One example that can be used to demonstrate this is job loss, also referred to earlier in this report. A person who has no savings and is the sole income earner for a household, and who lacks access to social support that might provide temporary loans or a place to live, is highly likely to experience negative impacts if they lose their job. A person who is nearing retirement, has substantial savings, owns their home outright, and lives in a household where others earn a substantial proportion of household income, is likely to experience fewer negative impacts, or those negative impacts will be smaller. Another example would be that of bushfire smoke exposure. Two people exposed to the same amounts of smoke may have very differing levels of impact: a person with a pre-existing health condition such as asthma is at higher risk of experiencing negative health impacts than a person with no pre-existing health conditions.

Given the sometimes blurry conceptualisation of sensitivity versus vulnerability, we recommend that resilience should be examined through identifying:

- Exposure to impacts: Who is most exposed to the effects of events such as COVID-19 – and who is relatively insulated from some types of impacts? As there can be many types of exposure (for example, exposure to the actual virus or risk of exposure to the virus; risk of experiencing loss of income due to the virus; risk of increased responsibilities or demands; risk of increased danger in the home; risk of loss of social contact, to name a few) it is important to measure the range of exposures experienced by different groups

- 'Vulnerability' to impacts: In the short term, who is at most risk of experiencing negative impacts when exposed to different effects of COVID-19?

- Access to resilience resources (adaptive capacity): What level of access is there to the different resources that can be used to support the process of coping with and adapting to change? Is the overall level of these resources declining, staying stable, or increasing over time? Are the resilience resources a person has access to the ones most important to coping with and adapting to exposure, particularly given their level of vulnerability/sensitivity?

These three things together can be used to understand and track change in resilience. In this report, only the first two – exposure to impacts, which many of the measures in Part 2 of this report examine, and vulnerability, which was examined to some extent in this report through examining short-term change in key areas. Longer-term, it is important to add to this through also monitoring how access to resilience resources is changing. This has the additional benefit of being a strengths-based approach that enables identification of the strengths, assets and capabilities different groups have access to, rather than focusing primarily on their vulnerability.

For example, in this report some people were found to be more likely to report experiencing social isolation as an impact of COVID-19 than others. What was not identified as part of this was whether those people will be able to draw on a range of resilience resources to adapt and restore their access to social connection, or whether there may be a longer-term reduction in social connection indicative of long-term loss of access to this type of resilience resource.

The types of resilience resources commonly examined when seeking to identify longer-term access to, use of, and change in access to resilience resources include (see amongst others Plummer and Armitage 2007, Preston and Stafford-Smith 2009, Brown et al. 2010, Nelson et al. 2010, Schirmer et al 2016):

- **Financial resources** (economic resources): the monetary and non-monetary resources that a person has access to, which they can use to maintain their standard of living, cope with unexpected expenses, and more generally support their basic needs and quality of life. Wellbeing measures in Part 1 of this report that examine access to financial resources, including those examining income, overall household financial position, can be used as measures of access to financial resources. So can other measures, such as experience of financial stress events, and ability to access funding if experiencing a sudden large expense.
- **Human resources** (health, education, psychological resources): commonly labelled 'human capital', this means an individual person's skills and resources, including their health, education/skills, and psychological outlook. Several measures presented in Part 1 of this report examined aspects of human resources, in particular access to good health. There is scope to also measure those aspects of psychological outlook considered particularly relevant to understanding adaptive capacity, namely concepts that measure levels of optimism, mastery and self-efficacy.
- **Social resources:** Often referred to using terms including social capital, social connections, social cohesion, social support, sense of belonging, there are in reality a plurality of social resources a person may or may not have access to. In general, having good access to social connections and networks that can provide support, knowledge and access to broader resources forms the core of social resources. The measures of belonging and social connection in Part 1 of this report provide some examples of measures that can be used: in addition to these, a resilience-focused approach might also include indicators of more specific access to social support.
- **Institutional resources:** Governance systems that enable fair and equitable treatment of citizens, good leadership, low level of corruption and inclusive decision making, and effective decision making and leadership, are important to successful adaptation. The 'voice and

perspective' indicator in the ACT Wellbeing Framework is an example of an indicator that may use measures of access to institutional resources that provide insight into adaptive capacity.

- **Physical resources** (infrastructure, services, built environment): Good access to services such as education, health services, transport, telecommunications, liveable buildings, and others are important to adaptive capacity. Multiple measures in Part 1 of this report provide insight into access to a range of physical resources: additional measures could also be developed.
- **Natural resources** (environmental health, natural resources): Often called 'natural capital', this refers to having access to a healthy environment and natural resources, which provide a range of support from essential ecosystem services (clean air and water, productive landscapes for supplying food) to recreation and exercise opportunity and nature connection that supports human wellbeing. The measures examined in Part 1 of this report focused more on nature connection: a wide range of other indicators of environmental health can be used, from a range of sources.

Overall, many of the resources examined as part of assessing adaptive capacity are already included in the indicators that form part of the ACT Wellbeing Framework (ACT Government 2020). As measures are developed further for the framework, attention should be given to ensuring the measures selected for each indicator are suitable for examining longer-term resilience, as well as providing insight into shorter-term wellbeing.

4.0 Conclusions

Overall, the brief exploration of vulnerability and resilience in this report suggests that, firstly, it is important to ensure multiple dimensions of vulnerability and resilience are examined. There was substantial difference in the types of vulnerability different groups were at greater or lesser risk of, highlighting that a unidimensional measure of vulnerability may not provide sufficient detail to be useful in and of itself (although it may be highly useful for identifying those at higher risk of multiple types of vulnerability).

Examining resilience and vulnerability as multi-dimensional concepts is likely to provide more targeted insight that can inform identification of areas where intervention and action may be needed. Examining multiple dimensions of both resilience and vulnerability, as well as examining both, can also reduce the risk of stigmatising particular groups by labelling them as 'vulnerable' without also examining their strengths in the form of access to resilience resources.

Ideally, resilience should be examined by identifying three different components:

(i)   exposure, meaning the types of challenges a person has experienced over a given period of time

(ii)   risk of being vulnerable to experience negative impacts on different aspects of quality of life when exposed to challenges, with multiple dimensions of vulnerability examined, and

(iii)   access to different types of resilience resources that can be drawn on to assist in coping with and adapting to challenges, as well as taking advantage of opportunities.

Future development of measures for indicators in the ACT Wellbeing Framework should consider how best to ensure measures can be used to understand both vulnerability and resilience, and whether measures of exposure may also be needed in some circumstances to add value to the understanding of wellbeing and how and why it is changing in the ACT.

5.0 References

ACT Government (2020). ACT Wellbeing Framework. Chief Minister, Treasury and Economic Development Directorate, ACT Government, Canberra. URL: http://www.act.gov.au/wellbeing.

Adger, W. N., Hughes, T. P., Folke, C., Carpenter, S. R., & Rockström, J. (2005). Social-ecological resilience to coastal disasters. *Science*, *309*(5737), 1036-1039.

Berkes, F., & Ross, H. (2013). Community resilience: toward an integrated approach. *Society & Natural Resources*, *26*(1), 5-20.

Brown, P. R., Nelson, R., Jacobs, B., Kokic, P., Tracey, J., Ahmed, M., & DeVoil, P. (2010). Enabling natural resource managers to self-assess their adaptive capacity. *Agricultural Systems*, *103*(8), 562-568.

Burns, R. A., & Anstey, K. J. (2010). The Connor–Davidson Resilience Scale (CD-RISC): Testing the invariance of a uni-dimensional resilience measure that is independent of positive and negative affect. *Personality and Individual Differences*, *48*(5), 527-531.

Carpenter, S.R., Arrow, K.J., Barrett, S., Biggs, R., Brock, W.A., Crépin, A.S., Engström, G., Folke, C., Hughes, T.P., Kautsky, N. and Li, C.Z., 2012. General resilience to cope with extreme events. *Sustainability*, *4*(12), pp.3248-3259.

Cutter, S. L., L. Barnes, M. Berry, C. Burton, E. Evans, E. Tate and J. Webb (2008). A place-based model for understanding community resilience to natural disasters. *Global Environmental Change* 18(4): 598-606.

Fordham, M. (1999). Balancing resilience and vulnerability. *International journal of mass emergencies and disasters*, *17*(1), 15-36.

Gallopín, G. C. (2006). Linkages between vulnerability, resilience, and adaptive capacity. *Global environmental change*, *16*(3), 293-303.

Handmer, J. (2003). We are all vulnerable. *Australian Journal of Emergency Management, The*, *18*(3), 55.

Hoogeveen, J., Tesliuc, E., Vakis, R., & Dercon, S. (2004). A guide to the analysis of risk, vulnerability and vulnerable groups. *Washington, DC, USA: The World Bank*.

Jacobs, B., Nelson, R., Kuruppu, N., & Leith, P. (2015). An adaptive capacity guide book: Assessing, building and evaluating the capacity of communities to adapt in a changing climate. *Southern Slopes Climate Change Adaptation Research Partnership (SCARP), University of Technology Sydney and University of Tasmania. Hobart, Tasmania. ISBN: 9781862958272*.

Kokic, P., Davidson, A. & Boero Rodriguez, V. (2006). *Australia's Grains Industry: Factors Influencing Productivity Growth: ABARE Research Report*. ABARE Research Report 06.22 prepared for the Grains Research; Development Corporation, Canberra, Australia.

Mayunga, J.S. (2007). Understanding and Applying the Concept of Community Disaster Resilience : A capital-based approach. *Landscape Architecture*, (July), 22–28.

Mumby, P. J., Chollett, I., Bozec, Y. M., & Wolff, N. H. (2014). Ecological resilience, robustness and vulnerability: how do these concepts benefit ecosystem management?. *Current Opinion in Environmental Sustainability*, *7*, 22-27.

Nelson, R., Kokic, P., Crimp, S., Martin, P., Meinke, H., Howden, S.M., de Voil, P. and Nidumolu, U., (2010). The vulnerability of Australian rural communities to climate variability and change: Part II—Integrating impacts with adaptive capacity. *Environmental Science & Policy*, *13*(1), pp.18-27.

Nelson, R., Kokic, P., Elliston, L. & King, J. (2005). Structural adjustment. *Australian Commodities*, 12(1), 171–179.

Plummer, R., & Armitage, D. (2007). A resilience-based framework for evaluating adaptive co-management: linking ecology, economics and society in a complex world. *Ecological economics*, *61*(1), 62-74.

Preston, B. L., & Stafford-Smith, M. (2009). *Framing vulnerability and adaptive capacity assessment: Discussion paper*. Australia: CSIRO Climate Adaptation National Research Flagship.

Pulla, V. (2012). What are strengths based practices all about. *Papers in strengths based practice*, 1-18.

Ruof, M. C. (2004). Vulnerability, vulnerable populations, and policy. *Kennedy Institute of Ethics Journal*, *14*(4), 411-425.

Schirmer, J. & Hanigan, I. (2017). Understanding the resilience of NSW farmers: findings from the 2015 Regional Wellbeing Survey. Report produced by the University of Canberra for the Rural Resilience Program, NSW Department of Primary Industries. URL: https://www.canberra.edu.au/research/institutes/health-research-institute/files/regional-wellbeing-survey/reports/2015-reports/Resilience-of-NSW-farmers_2015RWS.pdf

Schirmer, J., & Yabsley, B. (2018). Living well with a changing climate. Report prepared for the ACT Government. University of Canberra, Canberra. URL: https://www.environment.act.gov.au/__data/assets/pdf_file/0019/1316521/Longitudinal-Survey-ACT-Resilience-to-Climate-Change-Report.pdf

Schirmer, J., Yabsley, B., Mylek, M. & Peel, D. (2016). *Wellbeing, Resilience and Liveability in Regional Australia: the 2015 Regional Wellbeing Survey*. University of Canberra. http://www.regionalwellbeing.org.au

Smit, B., & Wandel, J. (2006). Adaptation, adaptive capacity and vulnerability. *Global environmental change*, *16*(3), 282-292.

Sumner, A., & Mallet, R. (2011). *Snakes and ladders, buffers and passports: rethinking poverty, vulnerability and wellbeing* (No. 83). Working paper.

Sumner, A., & Mallet, R. (2013). Capturing multidimensionality: what does a human wellbeing conceptual framework add to the analysis of vulnerability?. *Social indicators research*, *113*(2), 671-690.

Walker, B. H., Abel, N., Anderies, J. M., & Ryan, P. (2009). Resilience, adaptability, and transformability in the Goulburn-Broken Catchment, Australia. *Ecology and Society*, *14*(1), 12.

Wingate, M. S., Perry, E. C., Campbell, P. H., David, P., & Weist, E. M. (2007). Identifying and protecting vulnerable populations in public health emergencies: addressing gaps in education and training. *Public Health Reports*, *122*(3), 422-426.