

AUGUST 2021

# **THE NDIS IN VICTORIA ARE THERE INEQUITIES IN PARTICIPANTS' PLAN SIZE AND SPENDING?**

---

**Quantitative Report**



Melbourne  
Disability  
Institute

## Acknowledgements

This project was commissioned by the Victorian Department of Health and Human Services and implemented by researchers from the Melbourne Disability Institute (MDI) and Melbourne School of Population and Global Health (MSPGH), The University of Melbourne, in collaboration with Indigenous Research Consultant, Jody Barney. We would like to thank the many participants who shared their experiences with us as part of this project. We would also like to acknowledge the ongoing support of our advisory committee members.

MDI and the University of Melbourne is situated on the land of the Woiwurrung (Wurundjeri) people of the Kulin nation and conducts its activities on Aboriginal land. This land has never been ceded and the impacts of colonisation are ongoing. MDI acknowledges Traditional Custodians' continual care for country, the importance of Indigenous sustainability practice and knowledge, and the Woiwurrung and Boon Wurrung's ongoing contributions to the life of this city and this region. MDI pays respects to Elders past, present and emerging.

## Report authors

Dr George Disney, Quantitative Lead,  
Research Fellow, MDI and MSPGH  
Yi Yang, Research Fellow, MDI and MSPGH  
Peter Summers, Research Assistant, MDI and MSPGH  
Professor Anne Kavanagh, Chair Disability and Health, MSPGH  
Professor Bruce Bonyhady, Director MDI  
Kirsten Deane, General Manager, MDI

**Suggested citation:** Disney G., Yang Y., Summers P., Kavanagh A., Bonyhady B., Deane K. (2021) *The NDIS in Victoria: are there inequities in participants' plan size and spending?* Melbourne Disability Institute, University of Melbourne.

**ISBN:** 978 0 7340 5681 8

## About the Melbourne Disability Institute

The Melbourne Disability Institute (MDI) is an interdisciplinary research institute that was established by the University of Melbourne in 2018 to build a collaborative and translational disability research program. The MDI research program aims to capitalise on national reforms and active partnerships with the disability sector to deliver evidence for transformation.

## Contact Information

### Melbourne Disability Institute

Telephone: +61 3 8344 2818  
Email: [md-i@unimelb.edu.au](mailto:md-i@unimelb.edu.au)  
Web: [disability.unimelb.edu.au](http://disability.unimelb.edu.au)  
Twitter: [@mdi\\_unimelb](https://twitter.com/mdi_unimelb)

# Table of Contents

<b>EXECUTIVE SUMMARY .....</b>	<b>1</b>
<b>PART 1   INTRODUCTION, RATIONALE AND RESEARCH AIMS .....</b>	<b>5</b>
1.1 INTRODUCTION .....	5
1.2 BACKGROUND .....	7
1.3 SUMMARY OF RELEVANT QUALITATIVE FINDINGS.....	8
1.3.1 <i>Inequities for First Nations and Culturally and Linguistically diverse participants (Research Aim 1)....</i>	<i>8</i>
1.3.2 <i>Participants in regional and remote Victoria (Research Aims 1 and 2).....</i>	<i>8</i>
1.3.3 <i>Participants with prior experience of disability services (Research aim 3).....</i>	<i>9</i>
1.3.4 <i>The impact of capital supports on broader utilisation (Research aim 4) .....</i>	<i>9</i>
1.4 DATA AVAILABLE .....	10
1.4.1 <i>NDIA tailored dataset .....</i>	<i>10</i>
1.4.2 <i>Victorian disability services data (pre-NDIS data).....</i>	<i>10</i>
1.4.3 <i>Data storage and security.....</i>	<i>11</i>
1.5 STUDY OUTCOME – PLAN SIZE AND PLAN SPENDING .....	12
1.5.1 <i>Limitations of utilisation as a measure .....</i>	<i>12</i>
1.6 RESEARCH QUESTIONS .....	13
1.7 SUMMARY .....	16
<b>PART 2   CAUSAL METHODS .....</b>	<b>17</b>
2.1 CAUSAL METHODS .....	17
2.1.1 <i>Combining data and subject matter knowledge.....</i>	<i>17</i>
2.1.2 <i>Categories of causes .....</i>	<i>18</i>
2.1.3 <i>Modelling hypothetical interventions .....</i>	<i>19</i>
2.2 CAUSAL DIAGRAMS .....	20
2.2.1 <i>Inequities in plan size and spending for First Nations, CALD and participants living in regional and remote Victoria.....</i>	<i>21</i>
2.2.2 <i>Hypothetical plan and support coordination equity interventions for participants with psychosocial disability in regional and remote Victoria (Part 5).....</i>	<i>23</i>
2.2.3 <i>Part 6 – does prior experience of disability services impact subsequent NDIS plan 1 spending?.....</i>	<i>26</i>
2.2.4 <i>Part 7 – Impact of spending assistive technology supports on subsequent spending of core supports .....</i>	<i>28</i>
2.3 STATISTICAL METHODS – MAIN CAUSAL EFFECTS ( $A \rightarrow Y$ ) AND HYPOTHETICAL INTERVENTIONS ( $A \rightarrow M \rightarrow Y$ ) .....	31
2.4 SUMMARY .....	33
<b>PART 3   DESCRIPTIVE ANALYSIS AND CAUSAL PROFILES .....</b>	<b>34</b>
3.1 OVERALL DESCRIPTION .....	34
3.1.1 <i>Participant characteristics .....</i>	<i>34</i>
3.1.2 <i>Plan size and spending distribution change by support class .....</i>	<i>35</i>
3.2 CAUSAL PROFILES FOR OUR TARGET POPULATIONS.....	37
3.2.1 <i>First Nations, CALD and participants in regional and remote Victoria (Research Aim 1).....</i>	<i>37</i>
3.2.2 <i>Adults with psychosocial disability – regional and remote inequities (Research Aim 2).....</i>	<i>41</i>
3.2.3 <i>Experience of state disability services (Research Aim 3).....</i>	<i>42</i>
3.2.4 <i>Impact of assistive technology (Research Aim 4).....</i>	<i>46</i>
3.3 SUMMARY .....	47
<b>PART 4   FIRST NATIONS, CALD AND REGIONAL AND REMOTE INEQUITIES IN PLAN SIZE AND SPENDING ....</b>	<b>48</b>
4.1 MODELLING RESULTS – CORE SUPPORTS.....	49
4.1.1 <i>Inequities in core plan size and spending for First Nations participants.....</i>	<i>49</i>
4.1.2 <i>Inequities in core plan size and spending for CALD participants.....</i>	<i>50</i>
4.1.3 <i>Inequities in core plan size and spending for participants in regional and remote areas.....</i>	<i>51</i>

4.2 MODELLING RESULTS – CAPACITY BUILDING SUPPORTS .....	53
4.2.1 <i>Inequities in capacity building plan size and spending for First Nations participants</i> .....	53
4.2.2 <i>Inequities in capacity building plan size and spending for CALD participants</i> .....	55
4.2.3 <i>Inequities in capacity building plan size and spending for participants in regional and remote Victoria</i> .....	57
4.3 SUMMARY OF RESULTS .....	58
<b>PART 5   ADULTS WITH PSYCHOSOCIAL DISABILITY – MODELLING REGIONAL AND REMOTE INEQUITIES IN PLAN SIZE AND SPENDING .....</b>	<b>60</b>
5.1 MODELLING RESULTS.....	62
5.1.1 <i>Core supports</i> .....	62
5.1.2 <i>Capacity building supports</i> .....	64
5.2 SUMMARY OF RESULTS .....	66
<b>PART 6   DOES PRIOR EXPERIENCE OF STATE DISABILITY SERVICES IMPACT SUBSEQUENT NDIS SERVICE USE? .....</b>	<b>67</b>
6.1 MODELLING RESULTS – IMPACT OF PREVIOUSLY RECEIVING STATE DISABILITY SERVICES .....	69
6.1.1 <i>Adults with psychosocial disability – core supports</i> .....	69
6.1.2 <i>Adults with intellectual disability – core supports</i> .....	71
6.1.3 <i>Adults with cerebral palsy – core supports</i> .....	72
6.2 MODELLING RESULTS – IMPACT OF PREVIOUSLY RECEIVING INDIVIDUALISED SUPPORT PACKAGES .....	75
6.2.1 <i>Core supports</i> .....	75
6.2.2 <i>Capacity building supports</i> .....	77
6.3 SUMMARY OF FINDINGS .....	78
<b>PART 7   DOES USE OF ASSISTIVE TECHNOLOGY IMPACT SUBSEQUENT USE OF CORE SUPPORTS? .....</b>	<b>79</b>
7.1 MODELLING RESULTS – IMPACT OF ASSISTIVE TECHNOLOGY ON ‘CORE – ASSISTANCE WITH DAILY LIFE’ PLAN SIZE AND SPENDING .....	80
7.2 LIMITATIONS .....	81
7.3 SUMMARY OF RESULTS .....	81
<b>PART 8   SUMMARY.....</b>	<b>82</b>
8.1 SUMMARY OF FINDINGS .....	82

## Executive Summary

### Background

The National Disability Insurance Scheme (NDIS) Utilisation Project – Victoria, commissioned by the Victorian Department of Health and Human Services (DHHS), and now managed by the new Department of Families, Fairness and Housing (DFFH) aims to better understand how and why NDIS plan utilisation may vary between Victorian NDIS participants. It has two components; qualitative and quantitative.

This report summarises the findings from the quantitative component of the overall project. It aims to identify if there are inequities in plan size and spending, focusing on NDIS participants who are recognised as more likely to experience challenges navigating the scheme and accessing supports.

### Aims

Aligning with and drawing on the findings of the qualitative report, the quantitative report had four main aims:

- 1) Estimate inequities in plan size and spending for **First Nations, Culturally and Linguistically Diverse and Regional and Remote participants**
- 2) Model a range of hypothetical plan and support coordination equity interventions for **participants with psychosocial disability in regional and remote Victoria**, assessing if they would overcome existing spending inequities
- 3) Estimate if **prior experience of State disability services impacts** plan size and spending in participants' first plans
- 4) Estimate whether **use of assistive technology impacts** subsequent use of core supports

### Data

We used a custom extract of NDIS participants' data, provided to the Victorian government by the NDIA. We used this data to estimate if there are inequities in plan size and spending for key participant groups. The data we used covers the period 1 July 2016 – 30 June 2020.

### Plan size and spending

We analysed plan size and spending separately. While utilisation can be a useful summary measure of the proportion of plans that are spent, drivers of plan size and spending may be different.

Furthermore, plan size inequities may be different to spending inequities. Putting them together in one summary measure may mask inequities in plan size and/or spending.

Instead of analysing utilisation directly, a much simpler and meaningful approach is to reconstruct participants actual experiences as they progress through the scheme. To do this we use statistical models that estimate plan size and then spending, reflecting the temporal ordering and experience of participants.

### Methods

To date, published government quantitative analysis does not take into account demographic (e.g., age) and disability (e.g., severity, disability group [i.e. intellectual disability]) differences between geographic areas or key groups, where equity is a concern. For example, differences in plan size in rural areas could be driven by differences in the age profile or service needs of individuals in those



areas. Our quantitative analysis does. It is carefully constructed, and uses appropriate statistical modelling techniques, so that our equity results compare ‘like with like’<sup>1</sup>.

## Key findings

All results detailed below are outputs from our statistical modelling, that ensures comparisons between groups compare “like with like”.

### First Nations, CALD and regional and remote inequities in plan size and spending

We found that there is not inequity in plan size for First Nations and CALD participants. In fact both populations tend to receive larger plans. For example (in financial year 2019/20), average core support plan sizes are \$7,100 higher among First Nations participants (\$66,600), than non-First Nations participants (\$59,500)

While there is not an inequity in core plan spending for the CALD population (spending is \$6,600 higher in the CALD population (\$38,800) compared to the non-CALD population (\$32,200)), higher plans do not translate into higher spending for First Nations participants (\$34,500) in comparison to non-First Nations (\$32,700) participants.<sup>2</sup>

As such, our results show that the hypothesis that disadvantage for the CALD and First Nations populations leads to smaller plans does not hold. Rather the challenge is with plan spending.

This is further reinforced by our modelling of a hypothetical intervention where government equalises the plan size distributions of First Nations and non-First Nations participants. We find that if First Nations and non-First Nations participants received the same distribution of plan sizes, spending would still be lower for First Nations participants. This suggest that First Nations participants need support to access the services in their plans. We found similar patterns (larger plans, lower spending and barriers to using supports) for First Nations’ capacity building supports.

We found there are regional and remote inequities in plan size and spending, comparing participants who live in regional and remote Victoria to participants who live in major cities.<sup>3</sup> Mean core support plan sizes are \$3,300 smaller in regional and remote Victoria (\$57,300) in comparison major cities (\$60,600). Spending on core supports are \$4,700 lower in regional and remote Victoria (\$29,500) in comparison to core plan spending in major cities (\$34,200).

Our modelling suggests that if government removed inequities in plan size (i.e., increased regional and remote plan sizes to the level people typically receive in major cities), spending would still be lower in regional and remote areas.

Our findings for capacity building supports are similar – people in regional and remote areas receive smaller plans, spend less and face particular barriers to spending.

---

<sup>1</sup> Dependent on the exact group we analysed, we controlled / adjusted for age, disability group, disability severity, socioeconomic status (for urban/rural analysis), First Nations status (for Cultural and Linguistically Diverse analysis), Cultural and Linguistically Diverse status (for First Nations analysis), entry (i.e. previously State, Commonwealth or new users), previously lived in Shared Supported Accommodation and how long people have been in the scheme

<sup>2</sup> Because of the statistical uncertainty in our estimates, we cannot conclude that spending is dissimilar among First Nations participants in comparison to non-First Nations participants.

<sup>3</sup> Participants were grouped in this manner to avoid issues with small numbers. Disaggregating the data further would have led to statistically unstable and imprecise estimates.

## Modelling equity scenarios for participants with psychosocial disability in regional and remote Victoria

Using our causal methods, we found that core support plan sizes are larger in regional and remote Victoria compared to major cities, whereas capacity building plan sizes are smaller for adults with a psychosocial disability.

Spending of core supports is similar in regional and remote Victoria, in comparison to major cities, for adults with psychosocial disability.

Our modelling of hypothetical interventions suggests that there are barriers to spending core supports for participants in regional and remote Victoria. It also suggests that interventions on support coordination that remove geographical differences in the planned amount and use of support coordination, would have a modest impact on spending for participants with psychosocial disability in regional and remote Victoria. However, we also found that this increase in core spending would be balanced by barriers to spending in regional and remote areas. Government could consider targeted interventions that both support participants and aim to remove broader barriers to spending. In future, this type of modelling, that assesses the effectiveness of plan and support coordination policy interventions alone and in combination could be expanded and applied to other disability groups.

## Impact of prior experience of State disability services

We analysed the impact of having previously received State disability services on plan size and spending in participants first plans. We found that its impact varied by disability group.

For example, plan size and spending was similar for adults with psychosocial disability who had previously used State services compared to those who had not. Whereas, after controlling for important demographic and disability disabilities, there were substantive differences in both plan size and spending for adults with intellectual disability and cerebral palsy.

We also modelled what would happen to spending if plan sizes were set to the typical level of people who had no experience of State disability services. Under this scenario of equalising plan sizes, spending was still higher for previous users of State disability services. This suggests that the higher level of spending for this group is not only attributable to larger plan sizes. It could be due to greater experience of navigating disability services.

We also modelled the impact of previously receiving Individualised Support Packages. We found that, for young adults with intellectual disability, with experience of ISP had, on average, core support plan sizes \$27,500 larger than people who did not have experience of ISPs. plan size and spending of core supports.

This suggests that people without prior experience of individualised disability supports and systems may require a greater level of support to navigate the NDIS. More research is required to understand why there are such large differences between plan size and spending for people who have experience of ISPs, and what an appropriate policy response to help support participants navigate the NDIS might be.

## Impact of utilising assistive technology supports on subsequent core spending, people with cerebral palsy

We attempted to model the impact of using assistive technology on subsequent core support. We focused on participants with cerebral palsy as this is a large enough disability group to enable detailed quantitative analysis, and a substantial number of participants have assistive technology in their plans.

However, there was considerable uncertainty in our findings. We were also concerned that, given the complexity in using assistive technology (e.g., gathering evidence, receiving a consultation from an occupational therapist), people who were able to use it may also be people who are more readily able to use other supports (e.g. they have greater informal supports). Future quantitative research, on the interaction and impact of assistive technology on subsequent capacity of individuals to use their plans more effectively, needs to take into account and/or capture the informal support and advocacy of participants. This will help us understand the role of informal support networks and where participants may require more support from government and the NDIA to use their plans effectively. Quantitatively this may require linkage of NDIS to further population data sources, such as the census to capture more information on the context in which participants live.

That said, it is clear that using capital supports is a major challenge, with the vast majority of participants unable to spend any of their planned assistive technology.

### **Future research**

The methods used in the quantitative analysis, that carefully control for co-occurring factors that drive plan size and spending, are an important contribution to our understanding of inequities in the NDIS. To our knowledge, current published research does not do this. Future research should continue to carefully construct analyses so quantitative statements regarding equity in the scheme are comparing 'like with like'.

Further qualitative and quantitative research is also required to ensure the best possible evidence is at hand when government is designing policy responses targeted at inequities in the scheme. For example, we have highlighted key inequities and barriers to spending for First Nations participants and shown that prior experience with the State system does lead to people being able to access services more readily. However, currently it is not clear where (and how) exactly government should concentrate their efforts to support participants use the services they need.

Finally, we need to develop a much better understanding on the link between the NDIS and broader life outcomes (e.g., employment, wellbeing and health). To achieve this quantitatively, it is essential that government and researchers are able to access linked NDIS, health and administrative data such as the National Disability Data Asset.



## Part 1 | Introduction, rationale and research aims

### 1.1 Introduction

The National Disability Insurance Scheme (NDIS) Utilisation Project – Victoria, aims to understand how and why NDIS plan utilisation may vary between Victorian NDIS participants.

This report - the quantitative component – focuses on whether there are inequities in plan size and spending in key groups across the state. Current published evidence does provide some detail on potential inequities. For example, presenting plan spending according to an area-based socio-economic index.<sup>4</sup>

However, to our knowledge, none of the published evidence controls for or takes into account demographic (e.g., age) and disability (e.g., severity, disability group [i.e. intellectual disability]) differences between areas or key groups, where equity is a concern. For example, differences in plan size and/or spending in regional and remote areas could be driven by differences in the age profile or service needs of individuals in those areas.

In this report we aim to carefully design our analysis to move beyond simple description of patterns in the data, toward being able to isolate specific drivers and causes of plan and spend inequity.

Given the qualitative component was largely complete when the quantitative data was available for analysis, we use findings from the qualitative report to help prioritise specific groups and drivers of inequity. We focus on four key research aims related to the qualitative findings for which there is quantitative data available.

Please note these four aims are just part of the wide-ranging and detailed qualitative findings. Our selection is not a judgement on their importance. Rather, they are questions we can feasibly answer using quantitative data and methods.

The four main research aims are to:

- 1) Estimate inequities in plan size and spending for:
  - a. **First Nations,**
  - b. **Culturally and Linguistically Diverse**
  - c. **Regional and Remote participants**
- 2) Model a range of hypothetical plan and support coordination equity interventions for **participants with psychosocial disability in regional and remote Victoria**, assessing if they would overcome existing spending inequities
- 3) Estimate if **prior experience of State disability services impacts** plan size and spending in participants' first plans
- 4) Estimate whether **use of assistive technology impacts** subsequent use of core supports

To address these research aims there are two key methodological issues worth outlining upfront that are pertinent to the quantitative methods and data at hand.

Firstly, **throughout this report we focus on one inequity / driver of plan size and spending at a time.** While it is clear that drivers of NDIS plans and service use are wide ranging and interlinked, the quantitative methods applied focus on isolating specific causes.

---

<sup>4</sup> NDIA (2021) National Disability Insurance Scheme. Personalised Budgets. Proposal for a new NDIS budget model. Technical information paper. Accessed at: <https://www.ndis.gov.au/about-us/improving-ndis/plan-flexibility-and-budget-planning>

For example, research aim 1, when focusing on First Nations participants, compares plan size and spending for First Nations participants (in comparisons to non-First Nations participants). However, to ensure we are comparing “like with like” we will carefully and appropriately take into account other important drivers of plan size and spending (full methodological details outlined in section 2).

Having quantified the inequity (or driver) of interest, where possible we will then go to illustrate how the inequity could be modified (full methodological details outlined in section 2). However, it is also important to note that this extra analysis also focuses on one cause at a time.

Secondly, **throughout this project we focus on analysing plan size and spending separately with plan spending the final outcome of interest.** While utilisation is a good summary measure of the proportion of planned budget used, drivers of plan size and spending may be different, and plan size inequities may be different to spending inequities. Furthermore, combining a measure of plans and spending into one summary may mask an inequity in planning or spending.

To detail the background and rationale, research questions, methods and results this report has eight parts.

**‘Part 1 Introduction, rationale and research aims’** details how the findings from the qualitative project informed our selection of:

- Inequities (First Nations, CALD, regional and remote),
- Drivers (‘prior experience of disability services’ and ‘use of assistive technology’) and
- Population groups (all participants, adults with psychosocial disability, intellectual disability, and cerebral palsy)

We also introduce the quantitative data available and specify the exact research questions we will answer to address the four aims detailed above.

**‘Part 2 Methods’** details how we use causal concepts, causal methods and causal diagrams to design our analysis. We also detail the statistical methods we apply, in non-technical terms. By the end of this part the reader should understand the rationale behind our analytical choices and be able to interpret the results presented later in the report.

**‘Part 3 Descriptive analysis’** provides a high-level overview of the participant characteristics, plan size and spending. Importantly we also detail the “causal profile” of the analytic sample (i.e., the participants included in the analysis) for each of the four research aims.

**Parts 4 – 7** are the main results chapters on First Nations, CALD and regional and remote inequities in plan size and spending (Part 4), modelling of policy interventions to close regional and remote inequities for adults with psychosocial disability (Part 5), the impact of prior experience of state disability services (Part 6) and the impact of using planned assistive technology on subsequent core spending (Part 7).

**‘Part 8 Summary’** summarises the strengths and limitations of our research, what we found and where next for research on inequities in NDIS service use.

## 1.2 Background

The NDIS is the largest social policy reform since Medicare. It aims to place people with disability at the centre of decision making. Individualised support budgets (i.e., plans) are set with participants, who then go to purchase supports in a marketplace (i.e., plan spending). The scheme is jointly funded and governed by Federal and State and Territory governments. It was launched across Australia from July 2016 and fully rolled out by the end of 2020.

In financial year 2019/20 68% of planned supports were spent by participants in Victoria<sup>5</sup>. Given the individualised nature of the scheme and reliance on a well-functioning market, there is a danger that social gradients and inequities could be emerging. To our knowledge a published breakdown of these potential inequities in Victoria (e.g., comparing First Nations and non-First Nations participants) is lacking.

We do know that utilisation of planned supports in Victoria increases by plan number (45% in plan 1, compared to 63% by plan 4), and is higher for participants who live in Supported Independent Living (SIL) accommodation (80% in comparison to 58% who do not live in SIL) for the period 1 July 2020 to 31 December 2020<sup>6</sup>. Utilisation of plans is lower in areas where the population is classified as less than 5,000 (58%) and remote areas (41%) than regional and major cities (63%) in Victoria<sup>7</sup>

There is concern that certain cohorts are finding it difficult to navigate the NDIS. For example, the Productivity Commission raised concern that First Nations participants, CALD, people who live in regional and remote areas could face poorer outcomes as they are more likely to be affected by “underutilisation”<sup>8</sup>. However, the Productivity Commission’s report does not go on to quantify the inequities they refer to.

There is some published evidence on potential inequities at the national level – for example the analysis of plan spending by socio-economic deciles mentioned in section 1.1. However, this analysis is descriptive and does not isolate whether it is the socio-economic status of participants driving differential plan spending or co-occurring characteristics (e.g., age, disability severity).

Overall, there is a gap in knowledge, with regard to whether there are inequities in NDIS plans and spending. This report aims to start to fill this gap by focussing on the four research aims outlined in section 1.1.

The next section details a brief summary of the qualitative findings that helped motivated the selection of the four research aims detailed above.

---

<sup>5</sup> COAG Disability Reform Council. NDIS Quarterly Report to Disability Ministers. 2021. National Disability Insurance Agency (page 250)

<sup>6</sup> COAG Disability Reform Council. NDIS Quarterly Report to Disability Ministers. 2021. National Disability Insurance Agency (page 251)

<sup>7</sup> COAG Disability Reform Council. NDIS Quarterly Report to Disability Ministers. 2021. National Disability Insurance Agency (page 252)

<sup>8</sup> Productivity Commission 2017, *National Disability Insurance Scheme (NDIS) Costs*, Study Report, Canberra (page 36)

### 1.3 Summary of relevant qualitative findings

A full articulation of the qualitative findings can be found in the qualitative report<sup>9</sup>. Below we outline a brief summary of the qualitative findings we drew on to inform our selection of our four main research aims.

#### 1.3.1 Inequities for First Nations and Culturally and Linguistically diverse participants (Research Aim 1)

A range of evidence was presented highlighting reasons for First Nations participants being unable to effectively utilise NDIS plans. For example:

- There are challenges in navigating a scheme not designed with First Nations peoples in mind
- Participants described inconsistencies in cultural competencies and knowledge of staff, and that there was not sufficient support to help people understand how they could manage their plans.
- Limited trust and fear in systems meant participants often delayed engagement with the scheme.

The qualitative report highlighted that Culturally and Linguistically diverse participants have a wide ranging understanding and experience of disability, rights and systems. For example:

- Different cultural understandings and experience of disability influence how individuals and families navigate the NDIS
- While there was evidence of limited access to culturally sensitive and language specific information to help participants use their plans, when support was available, the NDIS had played a critical role in raising awareness of disability and provided new opportunities to access services and supports

While this research aim focuses two groups - First Nations and Culturally and Linguistically diverse participants – and the evidence on the specific challenges they face, the qualitative report also details specific facilitators and barriers to plan utilisation for all participants across the entire cohort. Where possible, and within quantitative data constraints, it will be vital to appropriately control for these other drivers that could confound our understanding of First Nations and CALD inequities.

#### 1.3.2 Participants in regional and remote Victoria (Research Aims 1 and 2)

Geographical and regional availability of supports was a key barrier to utilisation the qualitative project identified. For example:

- Availabilities of services and supports decreased the further away participants lived from Metro Melbourne. This led to delays in direct plan utilisation, as services were not available for use
- Some service providers charged for additional hours to cover travel time and expenses. These costs could mask under-use of services in the quantitative data

---

<sup>9</sup> The NDIS Utilisation Project – Victoria: Summary of qualitative findings report, 2021, Melbourne Disability Institute.

- Also navigating some of the regional barriers to plan utilisation could be addressed if participants had better access to skilled and independent support coordination. However, like other supports, these were difficult to come by in regional areas

Given the barriers identified accessing services in regional and remote Victoria, in part 1 we estimate inequities in plan size and spending for all participants in regional and remote Victoria (in comparison to participants who live in major cities).

The qualitative project also found that there were significant challenges associated with the transition of State and Federal mental health programmes across to the NDIS and these challenges continued to impact participants with psychosocial disability. Given this challenging transition of people with psychosocial disability into the scheme, **we have chosen to focus our analysis of modelling policy interventions in part 2 on regional and remote inequalities on participants with psychosocial disability.** We assess the extent to which barriers to spending and use of support coordination impact participants' spending inequities in regional and remote areas access services.

### **1.3.3 Participants with prior experience of disability services (Research aim 3)**

Experience with pre-NDIS systems and services was identified as a key facilitator, in the qualitative project, of effective utilisation across participants. For example:

- Participants with experience of pre-existing systems were more likely to be able to use their experience to more effectively navigate the NDIS
- Many were already accessing well-established disability services. These participants were more readily able to start utilising their plans when they accessed the scheme
- For people with less experience, and fewer links to services, utilisation generally improved the longer participants remained in the scheme. Time was required to identify and access the services needed

Given experience of services differs according to disability, we look at a range of disability groups, and assess if experience of prior services is more important for given disability groups. Specifically, we focus on participants with psychosocial disability, intellectual disability and cerebral palsy. We choose these three groups as there is a range of average plan sizes between these groups, and each disability group may have different service need.

### **1.3.4 The impact of capital supports on broader utilisation (Research aim 4)**

The qualitative project found that participants faced numerous barriers to using capital supports such as home modifications and assistive technology. The use of these supports also impacted the use of other supports. For example:

- Use of assistive technology and/or home modifications was required for participants to support their disability needs and improve their independence. Further plan utilisation was enabled when these needs were met.
- Delays in access to equipment and home modifications. This was a particular problem for participants with physical and/or complex disabilities. Sometimes delayed access to required capital supports led to deteriorations in functioning and independence, which led to subsequent underutilisation of plans.

Given the above qualitative evidence on the impact of capital supports on other supports, we look at what happens to plan spending of core supports after people use their capital supports. Specifically,

we focus on the impact of utilising assistive technology on subsequent plan spending for participants with cerebral palsy.

## 1.4 Data available

For this project there are two sources of data available.

- An NDIA tailored dataset, provided by NDIA to the Victorian Government.
- Data held by the Victorian Government on services accessed prior to the NDIS.

In this section we outline a broad overview of the data available and describe what it can be used for in this project. We detail how the data is structured and how we securely store it for analysis.

### 1.4.1 NDIA tailored dataset

The Victorian government provided the quantitative research team with individual-level information on NDIS users, their plans and spending on services. This tailored dataset was provided by the NDIA to the Victorian government.

The data extracted by NDIA covers plans and payments up to 31 July 2020. As such, given there is likely to be lags in the recording of spending on services in the data we limit our study period to 1 July 2016 to 30 June 2020, which also has the advantage of lining up with the end of the 2019/20 financial year. We only include plans that started after 1 July 2016 and are completed by 30 June 2020.

We make the following restrictions and exclusions for all analysis:

- Trial plans are excluded, but participants who were part of a trial site are included in the sample. For participant who had trial plans, their first plan is deemed to be their first completed plan that starts after 1 July 2016.
- Analysis is restricted to eligible and active participants. For example, observations from participants who have left scheme, for whatever reason, are excluded from all analysis.
- Plans that last less than 30 days are excluded.

The exclusions made here determine the overall study cohort. We make further exclusions for each analysis dependent on the research questions specified. These are detailed in part 2 and at the beginning of each results section in a summary box.

As well as plan and payment data there is detailed socio-demographic and disability information for each individual. We are able to use this information to construct the groups of interest to address the four research aims outlined in section 1.1.

### 1.4.2 Victorian disability services data (pre-NDIS data)

We have been provided with individual-level data. The main variables of interest relate to the most recent pre-NDIS service individuals received. For each service type we have access to one data point – a date, after which an individual did not receive a given State disability service. This information can therefore be used to build an understanding of people's service use immediately prior to entering the NDIS.

The pre-NDIS data can be joined with the NDIA custom data based on a common ID variable in both data sets. Given we establish the study cohort based on the criteria set out for the exclusions made in the NDIA above, this automatically filters out people who previously received disability services from the Victorian government but who are not enrolled in the NDIS for whatever reason.



### **1.4.3 Data storage and security**

The NDIA tailored dataset and the Victorian data are deidentified in that they do not include participant names and addresses. That said, both datasets are highly detailed, and contain individual records of people's NDIS plans, the services they used and socio-demographic details. To ensure this data is analysed securely, for this project, it is stored on the Sax Institute's secure virtual data lab platform.

Only results based on 15 or more participants observations are released. Project analysts use statistical programming code to automatically suppress results based on less than 15 observations. These results are marked by "< 15", in results tables – for example if a proportion of participants in a five year age group for a given analysis is based on 10 observations, this cell in the results table will be marked "< 15".

## 1.5 Study outcome – plan size and plan spending

In this report our main outcomes of interest are plan size and plan spending. We have chosen to focus core and capacity building supports as our main outcomes, drilling down into specific categories within those support classes.

### 1.5.1 Limitations of utilisation as a measure

Plan utilisation, in published research and reports, has been calculated by dividing average spending in a group by average plan size in the same group. In effect this summary statistic sums up all spending and divides it by the sum of plan sizes. This is an appropriate measure if you are interested in understanding, at an average level, how much of the budget allocated to participants is being spent.

However, utilisation is not the main focus of this report, and is not necessarily an appropriate outcome for the kind of analysis we conduct in this report. It is complex, as a given individual's total utilisation is a composite measure of the proportion of the multiple planned supports they use.

There are also many ways in which utilisation - a proportion with two moving parts (plans and spending) - could go up or down and be systematically higher or lower for different individuals. People's plan size could increase or decrease, thereby changing the total amount of supports available to each individual. Some supports may be more readily accessed and used (for example core supports are typically used at a higher rate than capacity building supports, which could, for example, be constrained by shortages of allied health professionals) thereby changing the number and amount of services that are used. Or both – plans and services used – could change at the same time.

Isolating what is driving utilisation is therefore very hard. Furthermore combining plan size and spending into one summary measure could mask inequities in one of plan size or spending. A much simpler and meaningful analysis attempts to reconstruct participants actual experiences as they progress through the scheme. To do this one has to analyse / estimate plan size first, before estimating spending. This also has the advantage of reflecting the actual experience participants have when they progress through the scheme (planning comes before spending).

**In this report we use statistical models that estimate plan size and (then) spending, reflecting the temporal ordering for participants.**

That said, while utilisation is not a perfect measure, it is a useful summary statistic. Where possible we calculate utilisation and it is used as a complementary measure.

## 1.6 Research questions

In this report there are four main research aims. Below, for the four research aims we detail each of the research questions we answer.

### **Research aim 1 – First Nations, CALD and regional and remote inequities**

In Part 4 we examine inequities in plan size and spending for First Nations, CALD and participants who live in regional and remote Victoria. We answer three research questions:

- Are there inequities in plan size?
- Are there inequities in spending?
  - Comparisons were made between First Nations and non-First Nations participants, CALD and non-CALD participants, and participants who live in regional and remote Victoria in comparison to people who live in major cities
- How much of the inequities in spending are due to spending barriers?
  - We do this by specifying a hypothetical intervention that equalises the distribution of plan sizes across our comparator groups of interest (e.g., CALD and non-CALD respectively).
  - We have specified our analysis on spending barriers in this way to attempt to mimic an intervention that removes systematic differences in the planning process. It will illustrate the extent to which plan-side interventions may need to be balanced by interventions on the spending side.

### **Research aim 2 – hypothetical plan and support coordination equity interventions for participants with psychosocial disability in regional and remote Victoria**

In Part 5 we examine whether there are regional and remote inequities in plan size and spending for adults with psychosocial disability. We then go to assess if a range of hypothetical policy interventions could close inequities in spending.

We answer three research questions:

- Are there inequities in plan size?
- Are there inequities in spending?
- How do the following hypothetical interventions impact spending in regional and remote Victoria:
  - Equalising the distribution of plan sizes across regional and remote Victoria and major cities
  - Ensuring that, among those funded for support coordination, people in regional and remote Victoria had the same average amount of support coordination in their plans as their counterparts in major cities
  - Ensuring that, among those funded for support coordination, people in regional and remote Victoria had the same chance to use at least 80% of their support coordination as their counterparts in major cities

- All of the above interventions (equalising: plan size, support coordination plan size and 80% support coordination usage)

### **Research aim 3 – Prior experience of State disability services**

In Part 6 we examine whether prior experience of State disability services impacts plan size and spending in participants' first plans. We use two different approaches to do this.

**1) We look at participants who previously received State disability services**, and compare them to people who did not. We do this for three different disability groups – 1) adults with psychosocial disability, 2) adults with intellectual disability and 3) adults with cerebral palsy. We choose to focus on these three exemplar groups, as our explorative analysis showed there are large variations in the relationship between previously receiving State disability services and plan size and spending by disability group. Looking at all participants would mask this heterogeneity.

**2) We look at participants who previously used State Individualised Support Packages**, and compare them to people who did not. To ensure we isolate the impact of ISPs we focus on a specific target population of young adults with intellectual disability, who all previously received some form of State disability service and did not live in Shared Supported Accommodation (SSA).

We excluded non-State participants as they were never eligible for receipt of ISP. And focussed on a tight group (young adults with intellectual disability, not in SSA) as we wanted the target population to be relatively similar, apart from the fact that a portion received ISP. Constructing the target population like this helps us get closer to identifying the direct impact of ISP on plan 1 size and spending.

For the State v. non-State and ISP v. non-ISP analyses we answer the following three research questions:

- What is the impact of previously receiving State disability services on plan size in participants' first completed plans?
- What is the impact of previously receiving State disability services on plan spending in participants' first completed plans?
- How much are differences in spending, according to prior experience, due to barriers to spending
  - We do this by specifying a hypothetical intervention that equalises the distribution of plan sizes across prior State and non-State participants and across prior ISP and non-ISP participants

### **Research aim 4 – Impact of assistive technology on subsequent service use**

In Part 7 we examine whether use of assistive technology impacts subsequent use of core supports. We answer two research questions:

- Does being able to utilise assistive technology support (at least 80%), within a year of needing it, impact core daily activity supports in the subsequent plan?
- Does being able to utilise assistive technology support (at least 80%), within a year of needing it, lead to changes in the following intermediate outcomes?
  - Assistive technology plan size in the subsequent plan

- Core daily activity plan size in the subsequent plan
- Assistive technology spending in the subsequent plan

## 1.7 Summary

There is a gap in our knowledge with regard to what whether differences in plan size and spending identified in current published reports and research are, in fact, inequities. Current findings do not take into account demographic (e.g., age) and disability (e.g. severity, disability group [such as intellectual disability]) differences between areas or key groups where equity is a concern.

This report aims to plug this gap, using carefully constructed and controlled analyses to isolate specific causal effects. This gap in knowledge, combined with the findings of the parallel qualitative component of this project, has motivated our four research aims detailed in section 1.1.

Part 2 details the concepts that our causal analysis is based on, our causal assumptions that we make explicit through the use of causal diagrams, and a general account of the statistical methods that we use.



## Part 2 | Causal Methods

Part 2 of the report details the causal methods and statistical tools we apply to estimate the following ‘main causal effects’ of interest. Each of these causal effects directly align with the four research aims outlined in section 1.1

- **Research Aim 1:** Plan size and spending inequities for First Nations, CALD and participants in regional and remote Victoria (results in Part 4)
- **Research Aim 2:** Whether a series of hypothetical interventions on plan size and support coordination can close regional and remote inequities in spending for participants with psychosocial disability (results in Part 5)
- **Research Aim 3:** Prior experience of State disability services and its impact on plan spending, focussing on participants with psychosocial disability, intellectual disability and cerebral palsy (results in Part 6). We compare:
  - Prior recipients of State disability services to people who did not receive State services
  - Prior recipients of Individualised Support Packages (ISP) to people who did not receive ISPs
- **Research Aim 4:** Use of assistive technology and its subsequent effect on plan size and spending of core supports, focussing on participants with cerebral palsy who were funded for assistive technology (results in Part 7)

### 2.1 Causal methods

The results we present in Parts 4-7 are generated using ‘causal methods’. We are using causal methods to help us isolate inequities in and drivers of plan size and spending identified by the qualitative project.

Our main outcomes of interest in the causal analysis are plan size and spending. To produce meaningful evidence on inequities in and drivers of plan size and spending it is important we have a methodology that can help us disentangle specific causes of interest, focussing on one cause at a time.

**Consequently, the overarching aim of each causal analysis we present in this report is to isolate pre-specified ‘main causal effects’.** In this section (2.1) we outline key concepts we use in our application of causal methods.

#### 2.1.1 Combining data and subject matter knowledge

Data alone cannot tell us what is driving plan size and spending. Descriptive analysis is really valuable and a pre-requisite for any causal analysis – it describes the main patterns in the data, and to an extent helps construct our causal assumptions. However, it does not tell us what is driving plan spending. For example, differences in plan spending in the regional and remote population (in comparison to the population in major cities) could be due to the different socio-demographics of the rural population.

As such, simply describing patterns in the data or fitting statistical models that include all known predictors of an outcome (e.g., plan spending) does not establish cause and effect. In fact, if interpreted causally, such analysis could lead to spurious conclusions.

To identify causal effects, the patterns we observe in the data have to be combined with existing (or assumed) knowledge based on subject matter expertise. This allows us to carefully construct a quantitative analysis that isolates, pre-specified, particular causes of plan size and spending.

This subject matter expertise is drawn from sources such as qualitative evidence (e.g., the qualitative component of this project), existing literature (e.g., NDIA Quarterly Reports) and the knowledge of the research team.

### **2.1.2 Categories of causes**

A key criterion for identifying a causal effect is determining the temporal ordering of causes. In short, the effect (e.g., plan spending) should follow the cause (e.g., barriers experienced in regional and remote areas).

In this project, all causes, that we either model directly or control for, need to precede our outcomes – plan size and spending, in a given period of time or for a particular plan. Importantly, it is essential that none of the effects are caused by our outcome. This “reverse causation” will lead to biased results.

With that in mind, we split causes for each particular research question into the following three categories. How variables are classified into each category is strongly influenced by the temporal ordering of causes and our qualitative expert knowledge. Putting variables into each category is the basis for our causal modelling and will largely determine the statistical tools used for each research question.

Each of the categories of causes below are causal concepts and cannot be identified through statistical methods alone. After defining each category of cause, in section 2.2, we detail which specific variables are assigned to each category for each of analysis presented in Parts 4 – 7.

#### **1) Main causal effect**

This is the main inequality or causal effect we wish to isolate. In this project, and often in population research of this kind, some of the causal effects we are estimating cannot be intervened on directly. For example, it is not plausible to intervene or change the remoteness measure assigned to a participant. In that context we argue, that through isolating the effect of remoteness on plan spending, we are quantifying potential barriers people who live in remote areas may face in using their plans.

That said, the main causal effect - use of assistive technology - estimated in Part 7 can be intervened on by making assistive technology more readily accessible.

Importantly, throughout this project, we do not specify *how* government could increase use of capital supports or remove barriers in rural areas. Rather, we simply estimate *what would happen* to plan spending if use of capital supports was increased or plans were equally distributed across rural areas and major cities, for example.

#### **2) Confounders (variables we control for)**

There are variables that either precede or co-exist with the main causal effect and become entangled with the effect we wish to identify. To isolate the main causal effect, we need to remove (or equalise / control for) the effect of confounders on our outcome (plan spending), for each level of the main causal effect (e.g. CALD v non-CALD participants).

In other words, confounders are variables for which we wish to control for. If we do not control for these confounders, our results could be biased, will not capture the “main causal effects” fully and could lead us to make incorrect conclusions about what is driving plan spending.

A simple example – we know the First Nations population has a younger age profile than the rest of the population. We also know that age is related to service need, and therefore plan size and spending. An unadjusted analysis showing differences in plan spending between First Nations participants in comparison to non-First Nations participants, could therefore be driven by differences in age profiles, rather than barriers in spending.

Importantly, if a variable is caused by the main causal effect, it should *not* be treated as a confounder, and should not be controlled for in statistical models. This is one reason why *just* using statistical models, with all predictors of plan spending included, could lead us to make spurious causal conclusions. Carefully designing causal analysis is vital.

### **3) Mediators (variables we can specify hypothetical interventions for)**

Moving along the temporal sequencing, variables caused by the main causal effect (and potentially the confounders) are known as mediators. Mediators occurs after the main causal effect, and confounders but, importantly, cause (and therefore occur before) our outcome (e.g., plan spending).

Intervening on a mediator represents a potential policy option for government to mitigate the impact of the main causal effect (e.g., inequities experienced by First Nations participants). This is particularly important for main causal effects where a direct intervention is not plausible (for example intervening on an individual’s remoteness classification).

A simple example – in analysis of barriers to spending in rural areas, NDIS participant plans are mediators. With ‘rurality’ as the main causal effect, it is plausible that people living outside of major cities have different service needs than people living in major cities. This could cause individuals’ plans outside of major cities to be different. As mentioned in section 1.5.1, it is also clear that an individual’s plan, to a large extent, determines what an individual goes on to spend. In this example a simple causal diagram is “Rurality → Plans → Spending” (more on causal diagrams in section 2.2).

#### **2.1.3 Modelling hypothetical interventions**

As mentioned above, intervening on mediators *could* represent a potential policy option for government. In our causal analysis we can then estimate what would happen to spending inequities if government intervened on individuals’ mediator values.

The methods we use in this report model the impact of a hypothetical intervention that “shifts the distribution of mediator values”. As mentioned in section 2.1.2 we do not model how these hypothetical interventions could be achieved, rather what would happen if they were achieved.

Revisiting the “Rurality → Plans → Spending” example. If living in rural areas leads to people getting systematically smaller (or larger) plans, we can estimate what would happen to spending if this systematic difference was removed, and people living in rural areas received the range of plan sizes people living in major cities received. (Note carefully, this analysis would also take into account confounding factors).

## 2.2 Causal diagrams

In this next section, for each of the four research aims, we specify which variables are included in each category of cause outlined above. Through doing this we detail the causal assumptions that our analysis is based on, via the use of causal diagrams.

Causal diagrams are one of two key technical components of causal inference research. The diagrams express what we know, or assume to know, about the subject of interest. (The other key component, counterfactual notation, which resembles algebra and details what we want to know, is outlined for each of the four causal analyses in *Appendix 2 – Technical Appendix*.)<sup>10</sup>

These diagrams explicitly illustrate the assumed causal relationships relevant to our research questions and are the essence of our study design. They are simply a series of nodes, linked by arrows, that summarise our existing knowledge. Broadly they can be read left to right. Reflecting our assumed temporal ordering of causes, nodes on the left occur prior to nodes on the right. The nodes represent quantities of interest, and the arrows represent known or assumed causal relationships.

They show, and help us decide, which variables we need to control for (confounders), and which variables are candidates for hypothetical interventions (mediators). For each diagram we briefly outline our rationale for each of the assumed causal relationships shown.

In each diagram we specify nodes for the categories of causes we detailed in the previous section (2.1):

- Main causal effect (**A**)
- Confounders (**C**)
- Mediators (**M**)
- Outcome (**Y**)
- Unmeasured factors (**U**)

---

<sup>10</sup> For an introduction to causal inference see: Pearl J & Mackenzie D (2019). *The Book of Why. The New Science of Cause and Effect*.

### 2.2.1 Inequities in plan size and spending for First Nations, CALD and participants living in regional and remote Victoria

Figure 2.1 below details a simplified causal diagram for estimating inequities in plan size and spending for First Nations and CALD participants (in comparison to non-First Nations and non-CALD participants, respectively) and for participants who live in regional and remote Victoria (in comparison to people who live in major cities). The bolded nodes and arrows represent causal effects we wish to quantify, and the greyed-out nodes and arrows represent confounders we wish to control for.

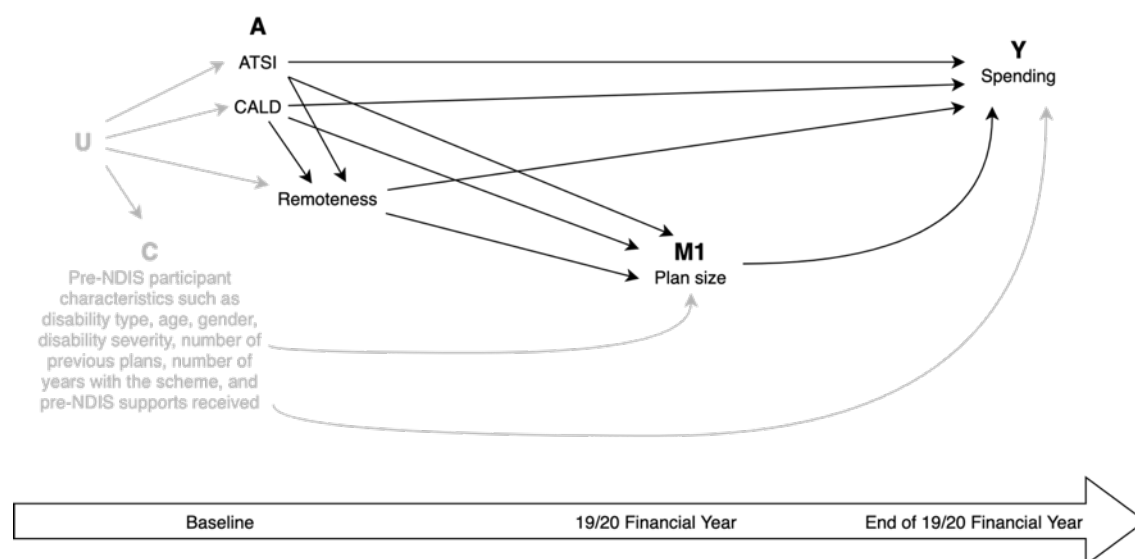


Figure 2.1 – Causal diagram detailing assumed causal relationships for First Nations, CALD and regional and remote inequality analyses. ATSI denotes Aboriginal and Torres Strait Islander (i.e., First Nations).

#### Target population

- All active and eligible participants with a plan effective at least in the first half of the 2019/20 financial year.

#### Main causal effects (A)

For this analysis we have two main causal effects of interest. We have placed both causal effects on the same causal diagram, but we estimate them separately.

- **First Nations People:** we split the target population up into two groups - people who identify as Aboriginal or as Torres Strait Islander (ATSI) and people who do not.
- **CALD:** we split the target population up into two groups – CALD and non-CALD. In the data the CALD population is defined as: language spoken at home is not English and/or born overseas in countries other than those classified by the ABS as "main English-speaking countries" (Australia, Canada, Republic of Ireland, New Zealand, South Africa, United Kingdom (England, Scotland, Wales, Northern Ireland) and United States of America).

- **Regional and remote Victoria:** we split the target population up into two groups – those who live in regional and remote Victoria and those who live in major cities. This is identified in the data using the Modified Monash Model of remoteness<sup>11</sup>.

Estimating both  $A \rightarrow M$  and  $A \rightarrow Y$ , controlling for  $C$ , allows us to answer the main research questions in Part 4 – *are there inequities in plan size and spending for First Nations / CALD / participants who live in regional and remote Victoria in comparison to non-First Nations / non CALD / participants who live in major cities respectively?*

#### **Confounders (C, variables we control for)**

- Demographics – CALD (when  $A = \text{ATSI}$  and  $A = \text{regional}$ ), ATSI (when  $A = \text{CALD}$  and  $A = \text{regional}$ ), SES (when  $A = \text{regional}$ ), age, gender
- Disability information – disability group (e.g., ‘psychosocial disability’), normalised severity score
- Experience – entry type (i.e., State, Commonwealth or new user), plan number, years into the scheme
- Other supports – ever lived in shared supported accommodation, participant in NDIS trial, young person in residential aged care

We assume each of these variables are “set” on entry to the scheme and before the period of time (financial year 2019/20) that we capture our outcomes (plan size and spending). They therefore need to be controlled for.

That said, we do not include SES and an indicator for rurality as confounders in the First Nations and CALD analyses, as they do not cause an individuals’ First Nations’ or CALD status and therefore do not meet our definition of a confounder.

#### **Mediators (M, variables we specify hypothetical interventions for)**

- Plan size of the specific support class or category that we are modelling

Figure 3.1 shows plan size occurs after / is caused by our main causal effect, and therefore need to be treated as a mediator, and not controlled for.

As such, estimating  $A \rightarrow M \rightarrow Y$  (i.e., treating  $M$  as something we intervene on) controlling for  $C$ , allows us to answer the follow-up research question in Part 4 – *how much of the inequities in spending are due to spending barriers?* We do this by specifying a hypothetical intervention that equalises the distribution of plan sizes across our comparator groups of interest (e.g., CALD and non-CALD respectively).

This part of the analysis will provide evidence on whether the First Nations, CALD and regional and remote participant groups face particular barriers spending their plans, that are not attributable to any differences in plan size.

---

<sup>11</sup> We used the Modified Monash Model (MMM) data on remoteness provided in the NDIA Research Data. For full details on MMM see: “[22](https://www.health.gov.au/health-topics/health-workforce/health-workforce-classifications/modified-monash-model#:~:text=The%20Modified%20Monash%20Model%20(MMM)%20is%20how%20we%20define%20whether,MM%207%20is%20very%20remote.”</a>”</p>
</div>
<div data-bbox=)



### 2.2.2 Hypothetical plan and support coordination equity interventions for participants with psychosocial disability in regional and remote Victoria (Part 5)

Figure 3.2 below details a simplified causal diagram for the comparison of plan size and spending for participants with psychosocial disability in regional and remote Victoria with major cities in Victoria. The bolded nodes and arrows detail the quantities we wish to estimate, and the greyed-out nodes and arrows represent the confounders we wish to control for.

#### Target population

- Adults (aged 19 - 64) with psychosocial disability with a plan effective at least in the first half of the 2019/20 financial year.

#### Main causal effect (A)

- *People who live in regional and remote areas of Victoria:* We split the population up into two groups – people who live in regional and remote Victoria and people who live in the major cities of Victoria. This is identified in the data using the Modified Monash Model of remoteness<sup>12</sup>.

Estimating **A → M1** (i.e., plan size) and **A → Y**, controlling for **C**, allows us to answer the main research question in Part 5 – *are there inequities in plan size and spending for people in regional and remote Victoria in comparison to major cities in Victoria?*

#### Confounders (C - variables we control for)

- Demographics – SES, CALD, ATSI, age, gender
- Disability information – normalised severity score
- Experience – entry type (i.e., State, Commonwealth or new user), plan number, years into the scheme
- Other supports – ever lived in shared supported accommodation, participant in NDIS trial, young person in residential aged care

We assume each of these variables are “set” on entry to the scheme and before the period of time (financial year 2019/20) that we capture our outcomes (plan size and spending) in. They therefore need to be controlled for.

In this analysis we include SES as a confounder. Our rationale is that the socio-economic status of the area someone lives in, co-occurs with the remoteness indicator and it makes no sense to argue it causes the remoteness indicator. We choose, therefore, to control for SES and therefore remove its effect on spending for the main causal effect – regional and remote in comparison to major cities.

---

<sup>12</sup> We used the Modified Monash Model (MMM) data on remoteness provided in the NDIA Research Data. For full details on MMM see: “[23](https://www.health.gov.au/health-topics/health-workforce/health-workforce-classifications/modified-monash-model#:~:text=The%20Modified%20Monash%20Model%20(MMM)%20is%20how%20we%20define%20whether,MM%207%20is%20very%20remote.”</a>”</p></div><div data-bbox=)

## Mediators (M - variables we specify hypothetical interventions for)

Having estimated the effect of  $A \rightarrow M1$  and  $A \rightarrow Y$  we now turn our attention to the mediating variables:

- **M1 – Plan size** of the corresponding outcome of interest (e.g., for capacity building spending, the corresponding M1 would be capacity building plan size)
- **M2 – Plan size of support coordination** among those funded for support coordination
- **M3 – Use of support coordination** among those funded for support coordination
- **M4 – Plan management option**

Each of these variables are assumed to be caused by “remoteness” and the barriers faced by participants who live outside of major cities. While we assume remoteness impacts spending directly (the specific  $A \rightarrow Y$  arrow), we also assume remoteness impacts other factors that go on to impact spending (the  $A \rightarrow M \rightarrow Y$  arrows).

Through hypothetical interventions, that shift the distribution of values of **M1-M3** from what we observe regional Victoria to what we observe in major cities, we can quantify the extent to which inequities in spending between regional and remote Victoria and major cities could be modified.

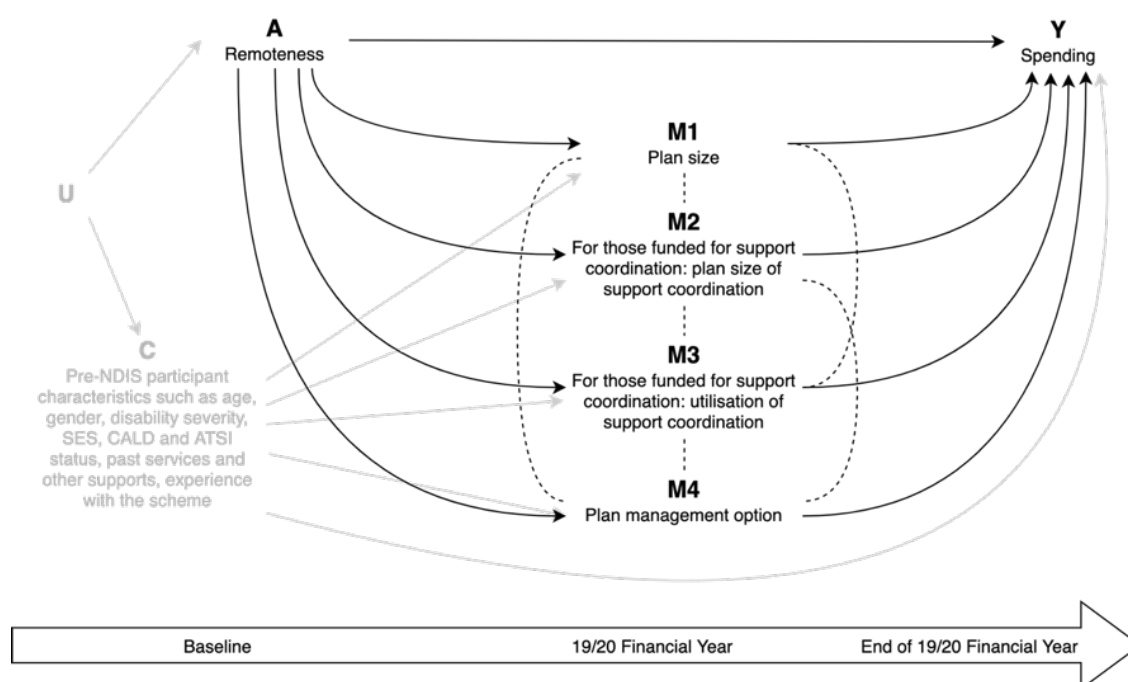


Figure 2.2 – Causal diagram detailing assumed causal relationships for Regional / Remote inequality analyses.

For example, for an intervention on plan size (M1) we give the population of people in regional Victoria the distribution of plan sizes they would have if they lived in major cities. We argue this is a feasible intervention goal, but do not specify how this could be achieved as there is no information in the data at hand that could help us model this.

Please note, we do not specify an intervention for **M4** plan management option. We were unsure where in the temporal ordering it should sit, and also, we do not have data on what part of individuals' plans are managed in specific ways (i.e. agency or self-managed). However, we chose to

include it in the analysis in a way that helps with the prediction of our outcome and avoids it confounding the other  $\mathbf{M} \rightarrow \mathbf{Y}$  relationships. For full details see *Appendix 2 – Technical Appendix*.

### 2.2.3 Part 6 – does prior experience of disability services impact subsequent NDIS plan 1 spending?

In this part of the report, we look at two broad categories of experience.

The first is a broad description of the disability services NDIS participants were receiving in the old system. We break people up into two groups – people who were previously State participants and non-State participants (i.e., New / Commonwealth participants). The second is whether participants were using Individualised Support Packages (ISPs) prior to joining the scheme.

As such we have split the text below up into two chunks:

#### 1. State v. non-State entry

##### Target population: State v non-State entry

- Adults (aged 19 - 64)
- We then split the population into three disability groups
  - Psychosocial disability
  - Intellectual disability
  - Cerebral palsy

##### Main causal effect: State v non-State entry (A)

- *People who previously received State disability services:* We split the population up into two groups – people who previously used State disability services and those who did not (i.e. Commonwealth services or new service users).

Estimating  $A \rightarrow M$  and  $A \rightarrow Y$ , controlling for  $C$ , allows us to answer the main research question in Part 6 (entry) – *What is the impact on plan size and plans spending of previous experience of State disability services?*

##### Confounders: State v non-State entry (C - variables we control for)

- Demographics – SES, CALD, ATSI, age, gender, remoteness
- Disability information – normalised severity score, we also control for disability group by running three separate analyses on the following groups: psychosocial disability, intellectual disability, and cerebral palsy
- Other supports – ever lived in shared supported accommodation

Please note we do not control for the financial year people entered the scheme, as this could be caused by entry type; occurring after  $A$ , it does not satisfy our definition of confounding.

##### Mediators: State v non-State entry (variables we specify hypothetical interventions for)

- Plan size of the specific support class or category that we are modelling

Figure 3.3 shows plan size occurs after / is caused by our main causal effect, and therefore need to be treated as a mediator, and not controlled for.

As such, estimating  $A \rightarrow M \rightarrow Y$  (i.e., treating  $M$  as something we intervene on) controlling for  $C$ , allows us to answer the follow-up research question in Part 6 (entry) – *would there be inequalities in plan 1 spending for non-State entrants if there were no systematic differences in plan sizes according to prior experience of disability services?*

This part of the analysis will provide evidence on whether non-State entrants face particular barriers spending their plans, that are not attributable to any differences in plan size.

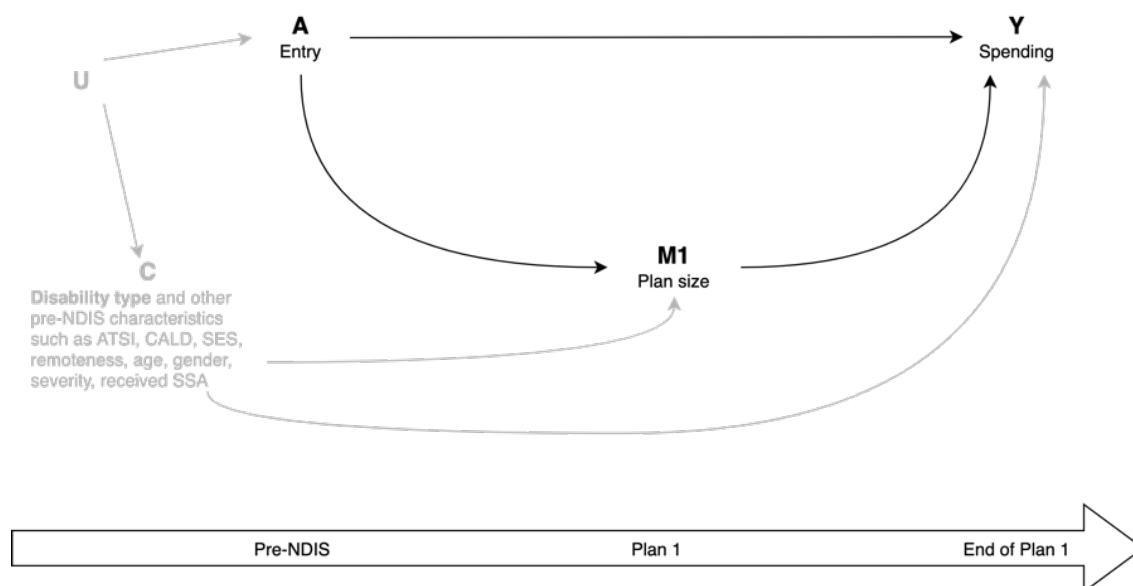


Figure 2.3 – Causal diagram detailing assumed causal relationships for the effect of Entry (State v non-State) inequality analyses.

## 2. Individualised Support Packages (ISP)

### Target population: ISP

- Young adults (aged 19 - 34)
- Intellectual disability
- State entry
- Not previously (or currently) in Shared Supported Accommodation

We excluded non-State participants as they were never eligible for receipt of ISP. And focussed on a tight group (young adults with intellectual disability, not in SSA) as we wanted the target population to be relatively similar, apart from the fact that a portion received ISP. Constructing the target population like this helps us get closer to identifying the direct impact of ISP on plan 1 size and spending (i.e., it helps remove confounding).

### Main causal effect: ISP (A)

- *People who previously received Individualised Support Packages (ISP from the state government).* We split the target population (detailed above) into two groups – people who received ISP and those who did not.

Estimating  $A \rightarrow M$  and  $A \rightarrow Y$ , controlling for **C**, allows us to answer the main research question in Part 6 (ISP) – *What is the impact on plan size and spending of previous experience of Individualised Support Packages?*

### Confounders: ISP (C - variables we control for)

- Demographics – SES, CALD, ATSI, age, gender, remoteness
- Disability – normalised disability score, and restrict to people with intellectual disability
- Experience – financial year when plan 1 started

### Mediators: ISP (variables we specify hypothetical interventions for)

- Plan size of the specific support class or category that we are modelling

Figure 3.4 shows plan size occurs after / is caused by our main causal effect, and therefore need to be treated as a mediator, and not controlled for.

As such, estimating  $A \rightarrow M \rightarrow Y$  (i.e., treating  $M$  as something we intervene on) controlling for  $C$ , allows us to answer the follow-up research question in Part 6 (ISP) – *would there be inequalities in plan 1 spending for people with experience of managing ISPs if there were no systematic differences in plan sizes according to prior experience of ISPs?*

This part of the analysis will provide evidence on whether people without experience of ISP entrants face particular barriers spending their plans, that are not attributable to differences in plan size.

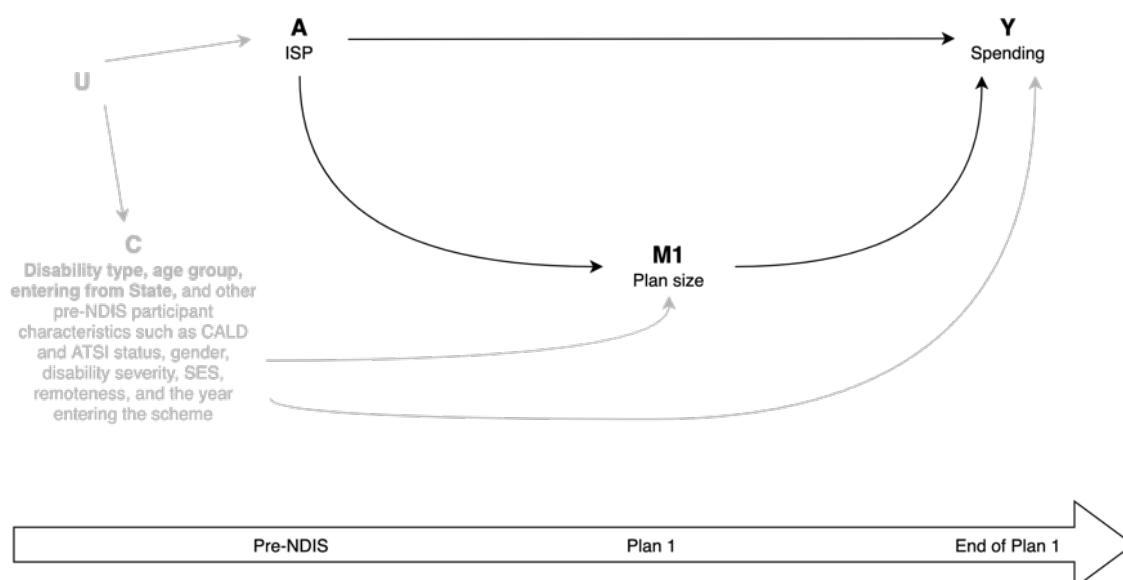


Figure 2.4 – Causal diagram detailing assumed causal relationships for the effect of ISP on plan 1 spending analysis.

## 2.2.4 Part 7 – Impact of spending assistive technology supports on subsequent spending of core supports

### Target populations

- Participants with cerebral palsy
- Funded for assistive technology
- Completed yearlong plan with assistive technology, with a subsequent completed plan lasting at least 6 months

### **Main causal effect (A)**

- *People who were able to use 80% of their planned assistive technology within a year:* We split the target population (detailed above) into two groups – people who used 80% of their assistive technology and those who did not (i.e., either utilised less than 80% or nothing)

Estimating  $A \rightarrow M$  and  $A \rightarrow Y$ , controlling for  $C$ , allows us to answer the main research question in Part 7 – *Does being able to use assistive technology supports within a year of needing them, impact plan size and spending of core daily activity supports in the following plan?*

### **Confounders (C - variables we control for)**

- Demographics – SES, age, gender (we cannot include CALD and ATSI due to small sample size problems)
- Disability information – normalised severity score
- Experience – entry type (i.e., State, Commonwealth or new user), financial year  $A$  starts in
- Previous supports – plan size of assistive technology and core daily activity (both in first yearlong plan)

Figure 3.5 details our assumed causal relationships. You can see the extra set of confounders (**C2**) related to plan size of assistive technology and core daily activities. In effect controlling for these variables gives all participants the same plan size distribution of

### **Mediators (M)**

We have included the following mediators in our analysis. However, due to time restraints on the project, we were unable to model hypothetical interventions for them. We, however, have left them in the analysis to a) help with prediction of the main causal effect, and b) allow efficient expansion of this model in future research with DFFH.

- **M1 – Assistive technology plan size in the subsequent plan**
- **M2 – Plan size of core daily activity in the subsequent plan**
- **M3 – Assistive technology spending in the subsequent plan**

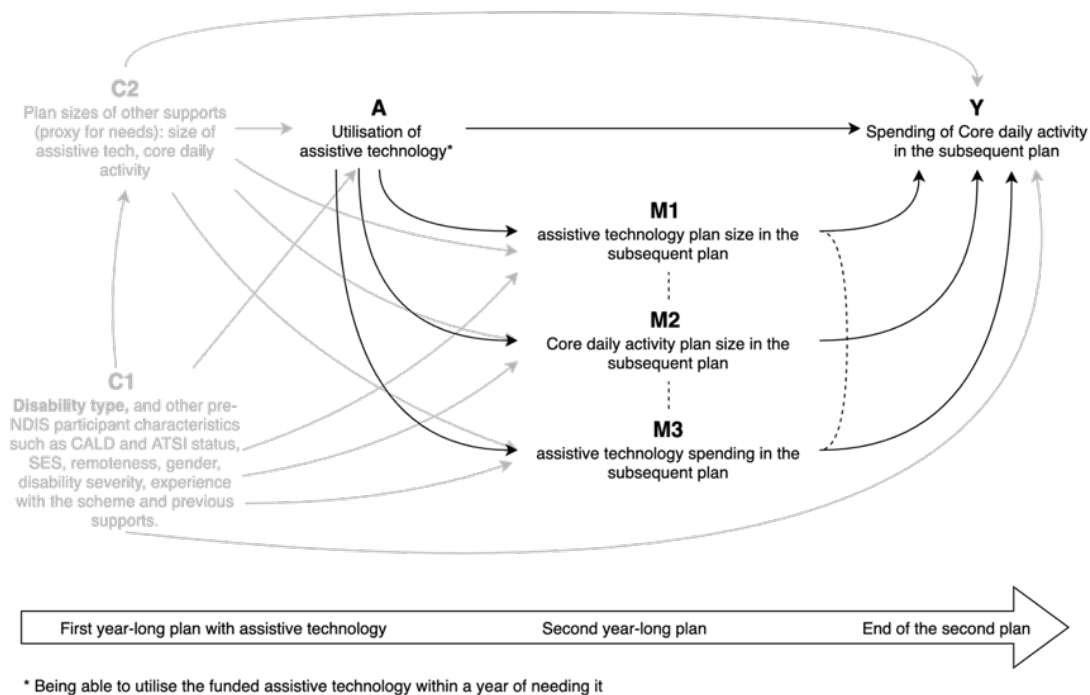


Figure 2.4 – Causal diagram detailing assumed causal relationships for the effect of assistive technology use of core supports.



## 2.3 Statistical methods – main causal effects ( $A \rightarrow Y$ ) and hypothetical interventions ( $A \rightarrow M \rightarrow Y$ )

In this section we detail how we convert our causal assumptions, detailed in the causal diagrams (section 2.2), into appropriate statistical models. Given we apply the same modelling approach in parts 4 – 7 we detail our statistical modelling in general terms here. For full technical details of the statistical modelling applied Parts 4 -7 please refer to *Appendix 2 – Technical Appendix*.

For each causal analysis in parts 4-7 we go through the following steps.

### **Step 1: Describe the causal profile of the target population**

The target population refers to the overall restrictions to the data that have been made before conducting analysis. For example, for the analysis which looks at plan size and spend inequities for First Nations and CALD participants respectively, the target population is all adults with disability, whereas for the regional and remote analysis the target population is adults with a psychosocial disability.

The target population for each analysis is specified above and at the beginning of each respective results section.

As detailed in section 2.1 and then as displayed in our causal diagrams in section 2.2, we classify the variables used in our causal analysis into 1) confounders, 2) mediators and 3) outcomes. Before conducting any causal modelling, we first describe the three categories of variables according to the two levels of our causal effects.

We describe the causal profiles for each target population for the four main research aims in Part 3 of this report.

### **Step 2: Fit statistical models for the mediators**

As outlined in section 2.1, specifying the temporal ordering of causes is central to any causal analysis. It is helpful to think about our statistical modelling in this way. The causal diagrams (section 2.2) show that our mediators occur after the main causal effect (**A**). As such, for analysis where we are interested in the impact of mediators on our main causal effect, we first need to fit a statistical model for each mediator.

Each model captures the effect of the main causal effect and confounders on our mediators. This helps us estimate  $A \rightarrow M$  when **M** is plan spending. These models are also later used to generate our hypothetical (mediator) interventions.

### **Step 3: Fit a statistical model for plan spending**

Referring to the causal diagrams in section 2.2, our model for plan spending (**Y**) needs to include all causes that temporally precede it (i.e., the main causal effect (**A**), the confounders (**C**) and mediators (**M**)).

### **Step 4: Conduct counterfactual prediction of spending for the main causal effect**

To isolate the impact of our main causal effect on plan size ( $A \rightarrow M$ ) and spending ( $A \rightarrow Y$ ) we need to control for our confounders **C**. We achieve this by equalising the confounder distribution for both levels of our main causal effect. For example, when considering the causal effect of regional and

remote areas on plan spending, we control for confounding by giving regional and remote areas the same confounder profile (e.g., age profile) as major cities.

With regard to research questions for which we model the impact of hypothetical interventions on mediators, the mediators are included in this model in a way that removes confounding between mediators and outcomes but does not remove the effect of the mediators themselves. This avoids biasing our main causal effect, as we keep the temporal ordering intact and do not control for something that occurs after our main causal effect.

#### **Step 5: Conduct counterfactual prediction of spending under the hypothetical mediator interventions**

To isolate the impact of our hypothetical interventions on plan spending ( $M \rightarrow Y$ ), we again need to control for confounders **C**. We achieve this in the same as above – through equalising confounder distributions for **M** with regard to **A**.

To identify the impact of the hypothetical intervention, we then estimate what would happen to spending if we shift the distribution of **M** to a hypothetical value. For example, in Part 4 we estimate what would happen to plan spending, for First Nations participants, if they had the plan size distribution of non-First Nations participants. This sounds complicated, but is simply a comparison of the following two quantities:

- Spending by First Nations participants, if they had the plan size of non-First Nations participants
- Spending by non-First Nations Participants, with the plan size of non-First Nations participants

## 2.4 Summary

In this section we have detailed our general approach to causal modelling. The key messages are:

- Causal effects cannot be identified by data alone. Data needs to be combined with subject matter expertise and defensible assumptions
- It is vital to focus on one causal effect at a time, and to use methods that isolate one cause at a time
- Temporal ordering is key, and we can use our three categories of causes to help with this – main causal effects, confounders and mediators
- We use causal diagrams to make our choice of categories of causes and causal assumptions for each research question explicit
- Statistical methods need to be designed with all the above in mind
- Full technical details for all causal modelling can be found in Appendix 2 – Technical Appendix

In Part 3 we describe the causal profile of each of the target populations we have outlined in this Part 2. This descriptive analysis will highlight the confounder differences our causal modelling in Parts 4 – 7 will carefully control for.

## Part 3 | Descriptive analysis and causal profiles

There are two sections to the results presented in this part of the report. We first provide a description of overall study sample we use. In particular we pick out key participant, plan and spending characteristics.

We second describe each of the target populations we analyse to address our four main research aims - First Nations, CALD and regional inequities; regional inequities for people with psychosocial disability; the impact of prior disability service experience on subsequent NDIS service use; and the impact of capital spending on subsequent core support spending.

We highlight where there are differences in the causal profile for each level of our main causal effects (e.g., regional, and remote Victoria in comparison to major cities) of interest.

### 3.1 Overall description

In this section we describe participant, plan size and plan spending characteristics, focussing on the most recent financial year for which we have data (2019/2020). Full results are detailed in table A1.1, in *Appendix 1 – Descriptive Results* where participant characteristics are described for each financial year from 2016/17 to 2019/20.

To ensure participants were in the scheme for a long enough period to have started using services, participants who entered the scheme in the second half of a financial year were excluded from this analysis. This aligns with the restrictions made to our analytic samples for Parts 4 and 5.

#### 3.1.1 Participant characteristics

In financial year 2019/20, there are 88,361 active participants who have been in the scheme for at least 6 months. There are 42,105 participants aged 18 and under, 48% of scheme participants. The adult population gets increases from younger to older five-year age groups, with 7% of participants aged 19-24 in comparison to 12% aged 55-64.

The largest disability groups are people with autism (25,784 participants, 29%), people with intellectual disability (18,363 participants, 21%) and people with psychosocial disability (11,069, 13%).

There are 2273 active First Nations people (3% of all participants in the sample) and 9,548 CALD participants (11% of all participants in the sample).

With regard to participants prior experience with disability services, 55,014 people (62% of all participants) previously received State disability services, 7,796 (9% of all participants) received Commonwealth services and 25,551 (29% of all participants) are new users of disability services. There are 5,104 (6%) who participated in an NDIS trial.

16,284 participants (18% of all participants) are agency managed, a larger proportion (30,002 participants, 34%) are partly plan managed and there are 21,439 (24%) who are self-managed.

### 3.1.2 Plan size and spending distribution change by support class

Figures 3.1, 3.2 and 3.3 below show how the distributions of plan size and spend change over time for core, capacity building and capital support classes. The x-axis represents the dollar amount planned or spent respectively. To enable comparisons, we have placed each financial year on the same scale in respect of the y-axis, as the number of people who are enrolled in the scheme increases over time.

The distribution of plan size and spending for core supports, has a right skew (see figure 3.1). There is not a substantive change in the distribution of core plans or spending over time – for example, the median core plan size increases from \$14,526 in 2016/17 to \$16,492 in 2019/20. It is worth noting there are a lot of moving parts here – as people enrol in the scheme the profile of participants has changed. Also, prices change over time.

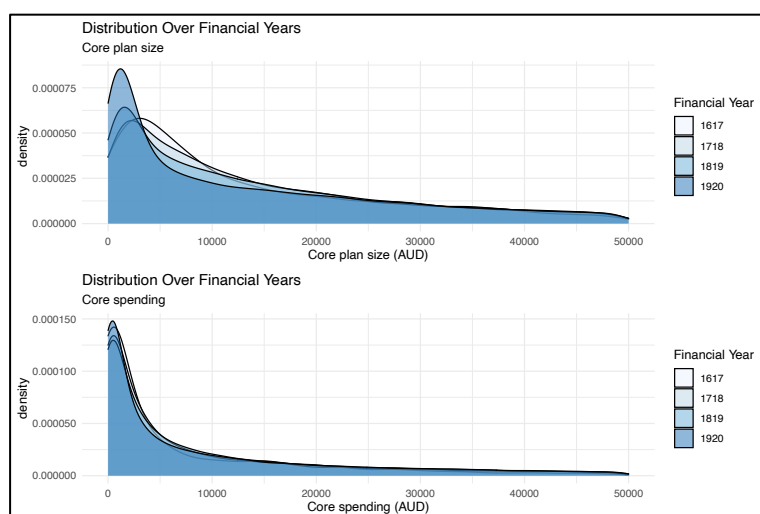


Figure 3.1: Changes in plan size and spending distributions (Core supports) over four financial years.

The distribution of capacity building plans (figure 3.2) is different to core plans. There is less of a right skew, with plans more evenly distributed around the median. The distribution of plans also shifts to the right (i.e., increases) over time. This reflects the median capacity building plan increasing from \$2,691 in 2016/17 to \$6,744 in 2019/20. Again, this plot is simply descriptive and should be interpreted with caution. With regard to capacity building spending, the shape of the distribution has more of a right skew.

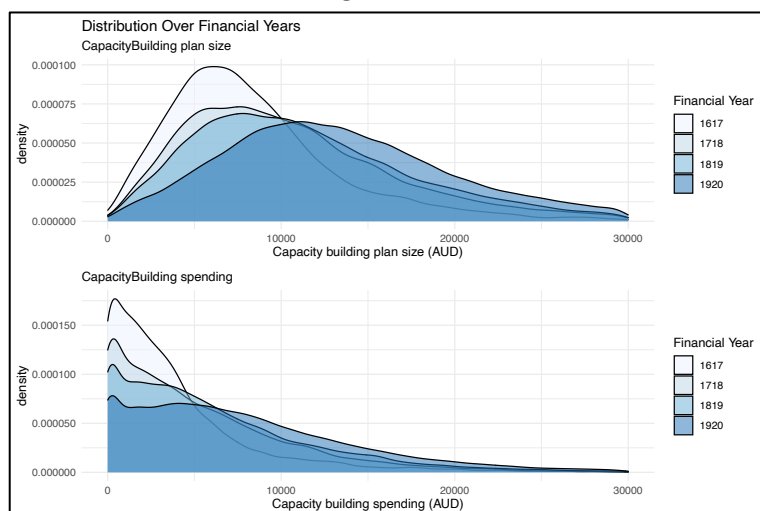


Figure 3.2: Changes in plan size and spending distributions (Capacity building supports) over four financial years

The key story from capital supports is the large peak around zero for spending (figure 3.3). For example, 2019/20 the median spending is only \$295 (with a median plan value of \$4,877) and in earlier financial years the median capital spend is \$0 (i.e., at least half of participants were not spending any of their capital supports).

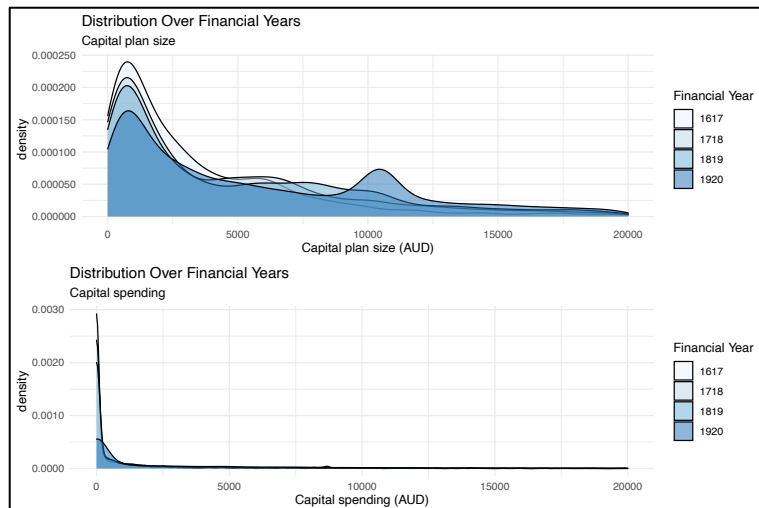


Figure 3.3: Changes in plan size and spending distributions (Capital supports) over four financial years

## 3.2 Causal profiles for our target populations

As detailed in section 2.3, a key step to conducting our causal analysis is describing the causal profile of the target population (i.e., the study sample). In practice this means describing the following for each level of the main causal effect (e.g., First Nations in comparison to non-First Nations) for each research aim:

- Confounders – variables we control for
  - For example, we will describe the age distribution in regional and remote Victoria in comparison to major cities
- Mediators – variables we specify hypothetical interventions for
  - For example, we will describe the distribution of support coordination plan size and spending in regional and remote Victoria in comparison to major cities, for people with psychosocial disability
- Outcomes – the variable that we are modelling
  - For example, we will describe the distribution of core support spending in regional and remote Victoria in comparison to major cities

We do this for each of the four research aims detailed in section 1.1.

Please note we do not detail in the text the descriptive statistics calculated. Rather, we describe the main qualitative differences in confounders, mediators and outcomes for each main causal effect. For a full account of the descriptive statistics for each analysis please refer to *Appendix 3 – Causal Profiles*.

### 3.2.1 First Nations, CALD and participants in regional and remote Victoria (Research Aim 1)

All descriptive results detailed in this causal profile are unadjusted. Below we detail the main differences in confounder distributions, mediator and outcome distribution for First Nations, CALD and regional and remote inequities respectively.

For descriptive tables see tables A3.1 and A3.1a in *Appendix 3 – Causal Profiles*.

#### First Nations participants (compared to non-First Nations participants)

In our analytic sample, there are 2,273 First Nations participants and 86,088 non-First Nations participants. The small sample size of First Nations participants mean that some differences could be due to small numbers. Consequently, we focus on differences where we have more data (e.g. age, disability group).

- On average the First Nations population is slightly younger.
- The distribution of disability groups is relatively similar, with a slightly higher proportion of First Nations participants with developmental delay (12.2%, in comparison to 7% in non-First Nations people) and with intellectual disability (27%, in comparison to 20% in non-First Nations people).

Figure 3.4 below shows plan size and spending for ‘core – assistance with daily life’ for people who spend at least some of this support category. The y-axis is the count of participants, and the x-axis the dollar amount planned or spent, bars with less than 10 observations have been suppressed. Please note we have truncated the x-axis at \$30,000.

Overall plan size and spending is “right skewed”, which means most participants have relatively small plans and spend low amounts, with a “tail” of large plans and spenders.

First Nations participants (\$14,745) have a lower median plan size than non-First Nations participants (\$17,752); and a lower levels of median spending (\$6,696 in comparison to \$8,271 for non-First Nations).

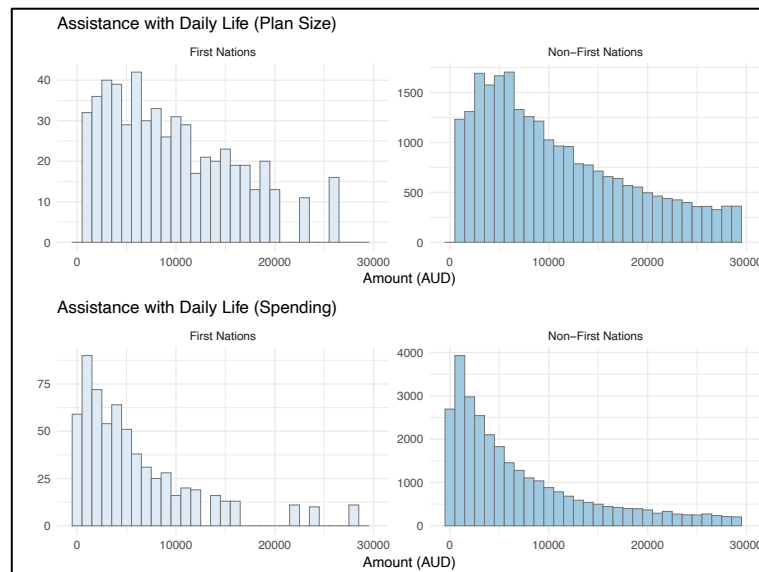


Figure 3.4: Comparison of First Nations and non-First Nations ‘Core – assistance with daily life’ plan size and spending



Figure 3.5 below shows plan size and spending for ‘capacity building – improved daily living’ for people who spent at least some of this support category. There is a relatively tight distribution of plan sizes for both First Nations and non-First Nations participants.

Median plan sizes are similar for First Nations (\$9,463) and non-First Nations (\$9,488) participants.

The distribution of spending is more right skewed, with a tighter bunching at lower values and a longer tail. Median spending for First Nations participants is lower (\$4,201) than non-First Nations participants (\$4,753).



Figure 3.5: Comparison of First Nations and non-First Nations ‘Capacity building – improved daily living’ plan size and spending

### CALD participants (in comparison to non-CALD participants)

In our target population, there are 3,853 CALD participants and 78,813 non-CALD participants.

- There are proportionately fewer children in the CALD population (16% aged 7 – 14) in comparison to the non-CALD population (22% aged 7-14), but more older people (17% aged 55-64 in the CALD population in comparison to 12% in the non-CALD population).
- There are proportionately less people with autism in the CALD population (22% in comparison to 30% in the non-CALD population) and intellectual disability (16% in comparison to 21% in the non-CALD population).
- The CALD population is less likely to have previously received State services (57% in comparison to 63% in the non-CALD population)

Figures 3.6 and 3.7 below shows plan size and spending for ‘core – assistance with daily life’ and ‘capacity building improved daily living’ for people who spend at least some of these support categories. The plan size and spending distributions for the CALD and non-CALD populations are similar for both support categories.

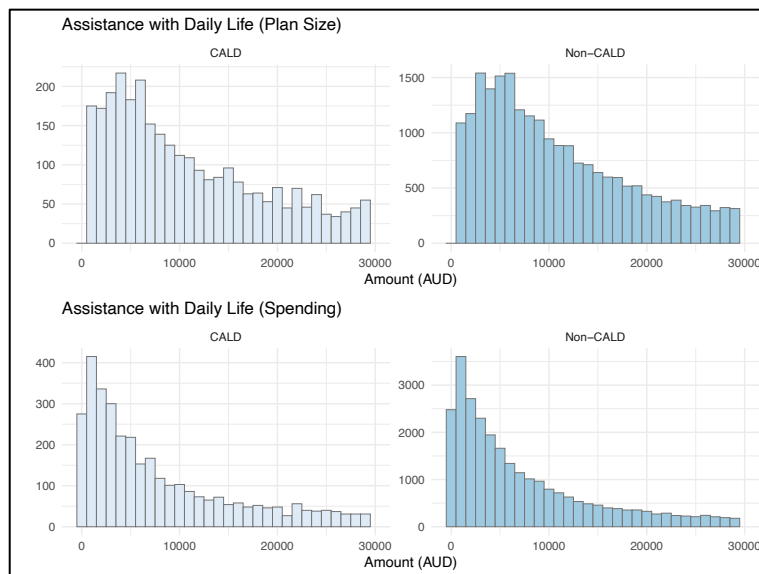


Figure 3.6: Comparison of CALD and non-CALD 'Core – assistance with daily life' plan size and spending

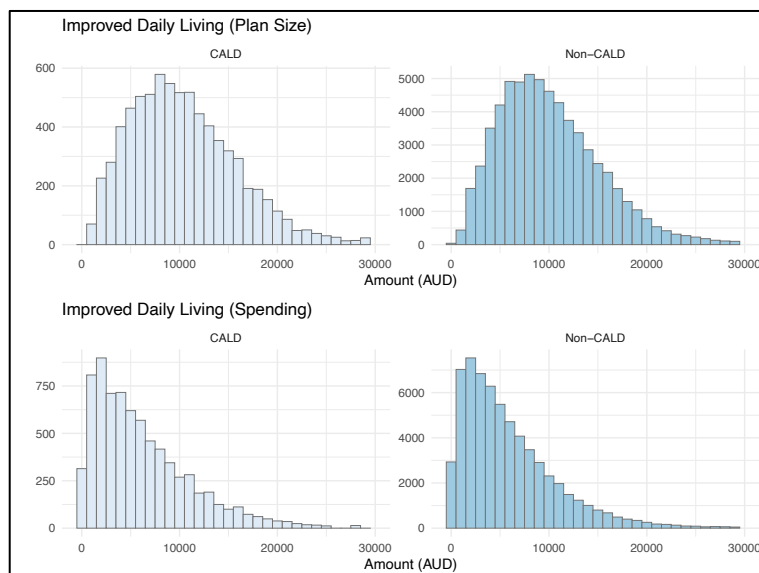


Figure 3.7: Comparison of First Nations and non-First Nations 'Capacity building – improved daily living' plan size and spending

### Regional and remote participants (in comparison to major cities)

In our target population there are 26,203 participants who live in regional and remote Victoria and 62,158 who live in major cities.

- There are a higher proportion of First Nations participants in regional and remote Victorian (4.4%) than in major cities (1.8%).
- There are a lower proportion of CALD participants in regional and remote Victoria (2.7%) than in major cities (14.2%)
- The proportion of people with severe disability (normalised severity score 11 to 15) is lower in regional and remote Victoria (27%) than in major cities (33%).

The distribution of plan size is similar in regional and remote Victoria and major cities. For example, the median core support plan size in regional and remote areas is \$23,226 in comparison to \$23,240.

There are differences in the spending distribution, however, with a median core spending amount in regional and remote Victoria of \$12,000 compared to \$14,440 in major cities.

### **3.2.2 Adults with psychosocial disability – regional and remote inequities (Research Aim 2)**

All descriptive results detailed in this causal profile are unadjusted. Below we detail the main differences in confounder, mediator and outcome distributions for regional and remote (in comparison to major cities) inequities for adults with psychosocial disability.

For full descriptive tables see tables A3.2 and A3.2a – A3.2d in *Appendix 3 – Causal Profiles*.

In our target population there are 3,106 adults with psychosocial disability who live in regional and remote Victoria and 7,835 who live in major cities.

- The age distribution is similar in regional and remote areas in comparison to major cities
- There are a higher proportion of First Nations participants in regional and remote Victoria. Whereas there is a much lower proportion of CALD participants in regional and remote Victoria (4%) in comparison to major cities (16%).
- The proportion of people with severe disability (normalised severity score 11 to 15) is lower in regional and remote Victoria (22%) than in major cities (32%).
- Participants in remote and regional Victoria are less likely to have support coordination in their plans, and a lower proportion manage to use 80% of their planned support coordination.

### 3.2.3 Experience of state disability services (Research Aim 3)

This research aim has two main parts. The first looks at differences in plan size and spending in the first plan for people who previously received State services in comparison to those who did not. The second part looks at the impact of have received Individual Support Package prior to entering the NDIS.

All results presented in this section are unadjusted, and all plan and spending results are for the first completed plan after an individual enters the scheme.

For full descriptive tables see tables A3.3, A3.3a and A3.3b in *Appendix 3 – Causal Profiles*.

#### State entry – adults with psychosocial disability

In our target population there are 6,940 participants with psychosocial disability who previously received state services, and 1,774 who did not.

There is not a substantive difference in the distribution of confounders for State entrants in comparison to non-State entrants.

The distributions of plan sizes and spending are similar for State entrants and non-State entrants (Figures 3.8 and 3.9). Median plan sizes are slightly higher for State entrants (\$7,943, \$9,382, respectively, for 'Core- assistance with daily life' and 'Core – assistance with social & community participation) than non-State entrants (\$6,926, \$8,469, respectively). Median spending is similar for the two groups.

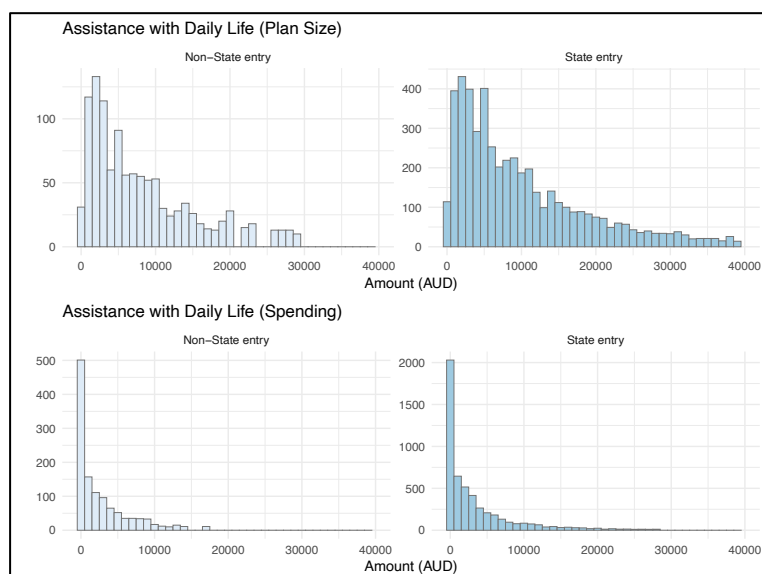


Figure 3.8: Comparison of State entry and non-State 'Core – assistance with daily life' plan size and spending' (adults with psychosocial disability)

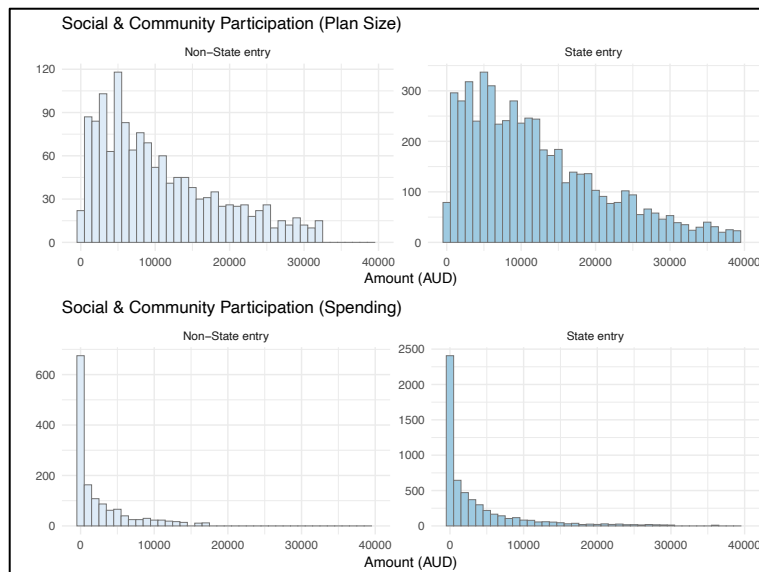


Figure 3.9: Comparison of State entry and non-State 'Core – assistance with social & community participation' (adults with psychosocial disability)

### State entry – adults with intellectual disability

In our target population, there are 9,918 adults with intellectual disability, 8,171 of them previously received state services (i.e., State entry), and 1,747 did not.

- There are proportionately fewer younger adults (25-44) in the State entrants.
- State entrants are less likely to be CALD or living in lower SES areas.
- Proportion of people with severe disability (normalised severity score 11 to 15) is higher in the State entry group.
- Higher proportion of the State entrants entered the scheme early, in Financial Year 2016/17.
- Very few participants from the non-State entry group (i.e., new or Commonwealth entry) received pre-NDIS supports for Shared Supported Accommodation and Individual Support Packages.

Figures 3.10 and 3.11 below show plan size and spending for 'Core – assistance with daily life' for people adults with intellectual disability and 'Core – assistance with social & community participation'.

The median plan size of 'Core – assistance with daily life' is higher for adults with intellectual disability from State entry (\$24,554) than non-State entry (\$5,170). The distribution of spending is right-skewed in both groups, with spikes at zero-spending. The median spending is higher for the State entry group (\$1,879) than the non-State entry group (\$250).

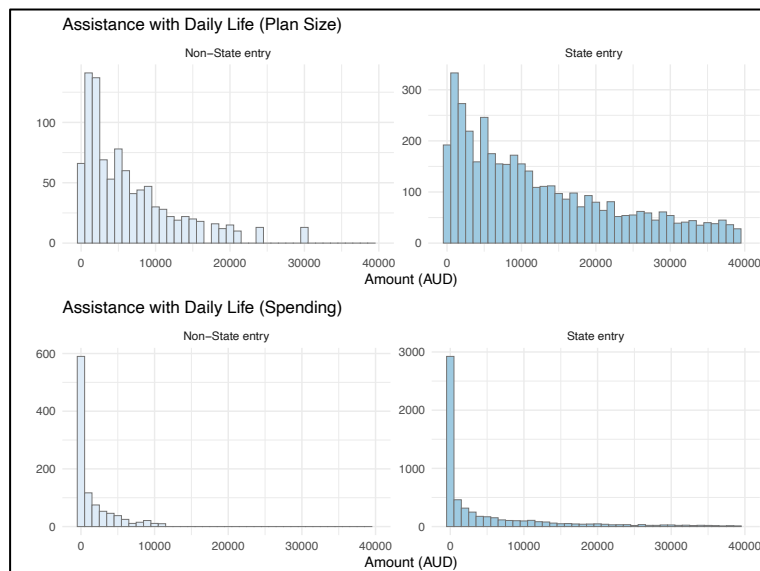


Figure 3.10: Comparison of State entry and non-State 'Core – assistance with daily life' plan size and spending' (adults with intellectual disability)

The median plan size of 'Core – assistance with social & community participation' is higher for adults with intellectual disability from State entry (\$27,085) than non-State entry (\$7,246). Plan size distribution in the non-State group is more right skewed, with few participants receiving plans larger than \$20,000. State entrants are more likely to receive larger plans. Spending distributions in both groups are right-skewed, but the State entry group has higher proportion of people who spent more than \$10,000, therefore, the median spending is higher (\$15,138) than the non-State entry group (\$0).

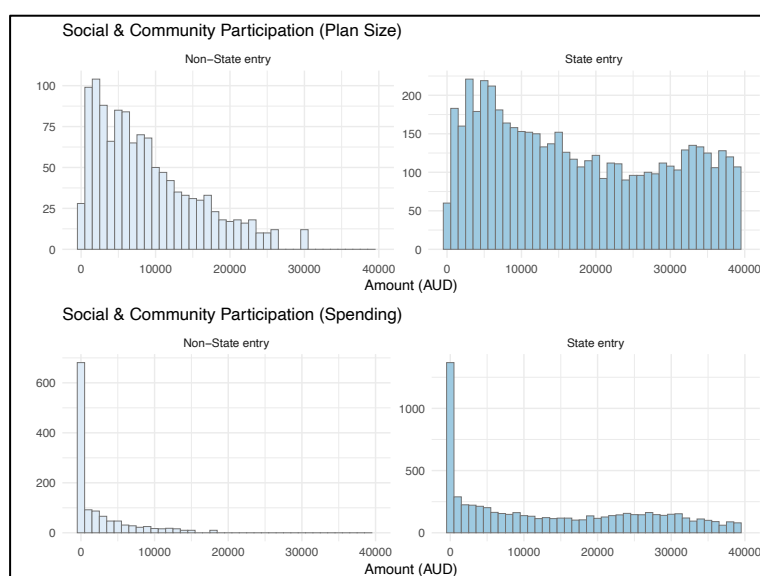


Figure 3.11: Comparison of State entry and non-State 'Core – assistance with social & community participation' (adults with intellectual disability)

### **State entry – adults with cerebral palsy**

In our target population there are 1,487 adults with cerebral palsy who previously received State services and 241 who did not.

- State entrants with cerebral palsy have a higher disability severity score than non-State entrants.
- State entry participants are less likely to be CALD.
- Very few participants from the non-State entry group received pre-NDIS supports for Shared Supported Accommodation and Individual Support Packages.

Figures comparing plan size and spending distributions between State and non-State entry are not shown because of the small number of adults with cerebral palsy. The distributions of plan size and spending are similar to those for adults with intellectual disability. Median plan sizes of both 'Core – assistance with daily life' and 'Core – assistance with social & community participation' are higher for State entry participants (\$67,393, and \$32,357, respectively) than non-State entry participants (\$6,911, and \$6,833, respectively). Median spending is also higher in the State entry group (\$17,239, and \$18,036, respectively, for assistance with daily life and assistance with social & community participation) compared with the non-State entry group (\$1,067, and \$0, respectively). There are spikes at zero-spending in both groups.

### **Individualised Support Packages (ISP) – young adults with intellectual disability**

In our target population (18-34 years, with intellectual disability who previously used State disability services) there are 2,375 people who had an ISP and 977 who did not.

- The proportion of people with severe disability (normalised severity score 11 to 15) is higher for people who received ISP (44%) than for those who did not (19%).
- The proportion of ISP recipients who live in major cities is slightly lower (33%) than for people who did not receive ISPs (40%).

The median core plan size for people who received ISP is \$46,297 in comparison to \$15,977 for people who did not receive ISP. There are also large differences in core spending – median spending for people who received ISP in plan 1 is \$25,304 in comparison to \$3,954 for people who did not receive ISP.

### **3.2.4 Impact of assistive technology (Research Aim 4)**

In our target population (people with cerebral palsy, funded for assistive technology and has 'Core – assistance with daily life' in the following plan), there are 537 people who utilised at least 80% of the funded assistive technology, and 1,061 who did not.

- The higher utilisation group is slightly younger than the lower utilisation group in general.
- Participants in the higher utilisation group entered the scheme more recently, with higher proportion entered the scheme in 2018/19 and 2019/20 financial years.
- Distribution of other confounders in the two groups are similar.

The group of participants who utilised at least 80% of assistive technology in the first plan has larger plan size for 'Core – assistance with daily life' in the subsequent plan (median is \$29,245) than the lower utilisation group (\$25,783). They also spend more (median is \$9,399) compared with the lower utilisation group (\$8,475).



### 3.3 Summary

This part of the report has provided a high-level description of the NDIS participants in Victoria who are included in our study sample and analysis.

It goes on to provide a more detailed description of each target population we analyse to address the four main research aims of this report. This descriptive analysis is structured specifically for the causal questions and effects we are trying to isolate.

Importantly we have illustrated that there are some key differences in the causal profiles for different levels of the main causal effects we are estimating (e.g. First Nations in comparison to non-First Nations). These differences are carefully controlled for in Parts 4-7 using the statistical modelling techniques we detailed in section 2.3.

The results presented in Parts 4 – 7 are adjusted for the confounding factors we specify in Part 2 and have described in this part of the report.

## Part 4 | First Nations, CALD and regional and remote inequities in plan size and spending

**Summary of part 4 – First Nations, Culturally and Linguistically Diverse (CALD) and regional and remote inequities**

**Target population:** all active participants in Financial Year 2019/20.

**Main causal effects:** controlling for confounders, are there inequities in plan size and plan spending comparing

- First Nations participants' in comparison to non-First Nations participants
- CALD participants' in comparison to non-CALD participants
- Participants in regional and remote areas in comparison to participants in major cities

**Hypothetical interventions:** controlling for confounders, how much of inequities in spending are due to spending barriers. We do this by specifying a hypothetical intervention that equalises the distribution of plans size across

1. First Nations and non-First Nations participants
2. CALD and non-CALD participants
3. Regional and remote participants and participants in major cities

### Results core

- Core support plan sizes are:
  - larger among First Nations participants (compared to non-First Nations)
  - larger among CALD participants (compared to non-CALD)
  - smaller in regional and remote Victoria (compared to major cities)
- Core spending is:
  - similar among First Nations participants (compared to non-First Nations)
  - higher among CALD participants (compared to non-CALD participants)
  - lower in regional and remote Victoria (compared to major cities)
- Our intervention to equalise plan sizes suggests that there are barriers to core spending for First Nations participants and participants in regional and remote Victoria but not for CALD participants

**Results for capacity building** supports largely follow a similar pattern, full results detailed in the main body of this part of the report.

All results presented below control for the confounders specified in the causal profiles (see section 3.3.1). As a reminder, our models take into account demographic the model equalises the distribution of confounders between First Nations, CALD and regional and remote participants and their respective comparator populations. In other words, the impact on plan spending of differences in confounder distributions is “blocked” to ensure our comparisons are “like for like”.

For each of the results we present the mean estimate rounded to the nearest \$100. For full results, including the 95% confidence intervals, please refer to the tables placed within the text. The confidence interval gives us an indication of the uncertainty around our estimate.

## 4.1 Modelling results – core supports

We begin by looking at inequities in core supports. In the main body of the text we pick out findings for overall core supports. In the results tables we also include our findings for the core support category “assistance with daily life”.

### 4.1.1 Inequities in core plan size and spending for First Nations participants

In this section we present estimated inequalities in core plan size and spending for First Nations participants (see tables 4.1). Our model estimates, after adjusting for confounders, that:

- Average core support plan sizes are \$7,100 higher among First Nations participants (\$66,600) than non-First Nations participants (\$59,500)
- However, this does not translate into higher spending - core support spending is similar among First Nations (\$34,500) and non-First Nations (\$33,000) participants.<sup>13</sup>
- With a combination of larger plans, but similar spending, First Nations participants have a utilisation rate of 52% in comparison to 55% for non-First Nations participants.
- Our modelling of an intervention that equalised plan sizes across First Nations and non-First Nations participants suggests there are additional barriers to spending experienced by First Nations participants.

In summary, First Nations participants receive larger plans. However, this is not translating into higher spending. Our modelling also suggests that First Nations participants experience particular barriers to spending. These results show that the hypothesis that disadvantage leads to smaller plans, does not hold. Rather, the challenge is with plan spending.

---

<sup>13</sup> Because of the statistical uncertainty in our estimates, we cannot conclude that spending is dissimilar among First Nations participants in comparison to non-First Nations participants.

Table 4.1. Core plan size, spending, and utilisation inequalities comparing ATSI with non-ATSI participants (all participants)

	Core supports	Core category "Assistance with Daily Life"
	Estimate (95% CI)	Estimate (95% CI)
Plan size non-ATSI (\$)	59509 (58746, 60272)	49649 (48761, 50538)
Plan size ATSI (\$)	66572 (61247, 71897)	53489 (45105, 61872)
<b>Plan size difference (\$)</b>	7063 (1712, 12414)	3839 (-4599, 12278)
Spending non-ATSI (\$)	32695 (32142, 33249)	31285 (30549, 32021)
Spending ATSI (\$)	34520 (30732, 38307)	28548 (23067, 34029)
<b>Spending difference (\$)</b>	1824 (-2008, 5657)	-2737 (-8316, 2843)
Utilisation non-ATSI (%)	0.55 (0.54, 0.55)	0.63 (0.62, 0.64)
Utilisation ATSI (%)	0.52 (0.49, 0.55)	0.53 (0.47, 0.59)
<b>Utilisation difference (%)</b>	-0.03 (-0.06, 0.00)	-0.10 (-0.16, -0.04)
Had ATSI received non-ATSI's plan size		
Spending (ATSI)	30914 (29066, 32761)	26869 (23901, 29837)
Utilisation (ATSI)	0.52 (0.49, 0.55)	0.54 (0.48, 0.60)
Effect of equalising plan size <sup>^</sup>	3606 (848, 6365)	1679 (-2001, 5359)
Difference in spending not due to plan size difference <sup>#</sup>	-1782 (-3616, 52)	-4416 (-7412, -1419)

<sup>^</sup> ATSI spending minus spending had ATSI received non-ATSI's plan size.

<sup>#</sup> Spending had ATSI received non-ATSI plan size minus spending of non-ATSI.

#### 4.1.2 Inequities in core plan size and spending for CALD participants

In this section we present estimated inequalities in core plan size and spending for CALD participants (see tables 4.2). Our model estimates, after adjusting for confounders, that:

- Average core support plan sizes are \$3,100 higher among CALD (\$62,400) than non-CALD participants (\$59,400)
- This does translate into higher spending – Culturally and Linguistically Diverse participants spend \$6,600 more on core supports than non-Culturally and Linguistically Diverse participants.
- With a combination of larger plans and higher spending, CALD participants have a utilisation rate of 62% in comparison to 54% for non-CALD participants.
- Our modelling of an intervention that equalised plan sizes across CALD and non-CALD participants suggests that CALD participants do not face greater barriers to plan spending than non-CALD participants.

In summary, CALD participants are receiving larger core plans. This does translate into higher spending. Our modelling, where we equalise plan sizes across CALD and non-CALD groups, suggests that CALD participants do not face greater barriers to plan spending than non-CALD participants.

*Table 4.2 Plan size, spending, and utilisation inequalities comparing CALD with non-CALD participants (all participants)*

	Core supports	Core category "Assistance with Daily Life"
	Estimate (95% CI)	Estimate (95% CI)
Plan size non-CALD (\$)	59364 (58596, 60132)	49752 (48863, 50640)
Plan size CALD (\$)	62438 (60694, 64182)	49371 (47337, 51406)
<b>Plan size difference (\$)</b>	3074 (1352, 4796)	-380 (-2327, 1567)
Spending non-CALD (\$)	32187 (31646, 32729)	31043 (30311, 31774)
Spending CALD (\$)	38821 (37102, 40541)	32487 (30323, 34651)
<b>Spending difference (\$)</b>	6634 (4982, 8286)	1445 (-743, 3632)
Utilisation non-CALD (%)	0.54 (0.54, 0.55)	0.62 (0.61, 0.63)
Utilisation CALD (%)	0.62 (0.60, 0.64)	0.66 (0.63, 0.69)
<b>Utilisation difference (%)</b>	0.08 (0.06, 0.10)	0.03 (0.00, 0.07)
Had CALD received non-CALD's plan size		
Spending (CALD)	37000 (35765, 38234)	32556 (30890, 34223)
Utilisation (CALD)	0.62 (0.61, 0.64)	0.65 (0.62, 0.69)
Effect of equalising plan size <sup>^</sup>	1821 (779, 2863)	-69 (-1125, 987)
Difference in spending not due to plan size difference <sup>#</sup>	4813 (3721, 5905)	1514 (-163, 3191)

<sup>^</sup> CALD spending minus spending had CALD received non-CALD's plan size.

<sup>#</sup> Spending had CALD received non-CALD plan size minus spending of non-CALD.

### 4.1.3 Inequities in core plan size and spending for participants in regional and remote areas

In this section we present estimated inequalities in core plan size and spending for participants (see table 4.3). Our model estimates, after adjusting for confounders, that:

- Mean core support plan sizes are \$3,300 smaller in regional and remote Victoria (\$57,300) in comparison major cities (\$60,600)
- Mean spending on core supports is \$4,700 lower in regional and remote Victoria (\$29,500) in comparison to core plan spending in major cities (\$34,200)

- With a combination of smaller plans and lower spending, participants in regional and remote Victoria have a core utilisation rate of 51% in comparison to 56% for participants in major cities.
- Our modelling suggests that if plan sizes were equalised across regional and remote Victoria and major cities, spending would still be lower in regional and remote areas.

In summary, participants in regional and remote Victoria receive smaller core plans and spend less. Under a hypothetical intervention where plan sizes were equalised across regional and remote Victoria and major cities, spending would still be lower in regional and remote Victoria due to barriers regional and remote participants experience.

*Table 4.3 Core plan size, spending, and utilisation inequalities comparing regional and remote areas with major cities (all participants)*

	Core supports	Core category “Assistance with Daily Life”
	Estimate (95% CI)	Estimate (95% CI)
Plan size major cities (\$)	60682 (59731, 61633)	50561 (49575, 51546)
Plan size regional and remote areas (\$)	57337 (56181, 58492)	47546 (46103, 48990)
<b>Plan size difference (\$)</b>	-3345 (-4622, -2069)	-3014 (-4626, -1402)
Spending major cities (\$)	34219 (33544, 34893)	32271 (31446, 33095)
Spending regional and remote areas (\$)	29495 (28712, 30279)	28731 (27459, 30003)
<b>Spending difference (\$)</b>	-4723 (-5619, -3828)	-3540 (-5003, -2076)
Utilisation major cities (%)	56 (56, 57)	64 (63, 65)
Utilisation regional and remote areas (%)	51 (51, 52)	60 (59, 62)
<b>Utilisation difference (%)</b>	-5 (-6, -4)	-3 (-5, -1)
Had regional and remote areas received major cities’ plan size		
Spending	31102 (30384, 31821)	30281 (29243, 31319)
Utilisation	51 (50, 52)	60 (58, 62)
Effect of equalising plan size <sup>^</sup>	-1607 (-2232, -982)	-1550 (-2394, -707)
Difference in spending not due to plan size difference <sup>#</sup>	-3116 (-3690, -2543)	-1989 (-3051, -928)

<sup>^</sup> Regional and remote areas spending minus spending had regional and remote areas received major cities’ plan size.

<sup>#</sup> Spending had regional and remote areas received major cities plan size minus spending of major cities.

## 4.2 Modelling results – capacity building supports

We now look at inequities in capacity building supports. Again, in the main body of the text we pick out findings for overall capacity building supports. In the results tables we also include our findings for the capacity building support category “improved daily living”.

### 4.2.1 Inequities in capacity building plan size and spending for First Nations participants

In this section we present estimated inequalities in capacity building plan size and spending for First Nations participants (see table 4.4). Our model estimates, after adjusting for confounders, that:

- Average capacity building plan sizes are \$800 higher among First Nations participants (\$16,500) than non-First Nations participants (\$15,800)
- However, this does not translate into higher spending – capacity building spending is \$400 lower among First Nations (\$8,800) and non-First Nations (\$9,200) participants.
- With a combination of larger plans, but lower spending, First Nations participants have a utilisation rate of 53% in comparison to 58% for non-First Nations participants.
- Our modelling of an intervention that equalised plan sizes across First Nations and non-First Nations participants suggests there are additional barriers to spending experienced by First Nations participants.

In summary, First Nations participants receive larger plans. However, capacity building spending is lower among First Nations participants. Our modelling also suggests that First Nations participants experience particular barriers to spending. These results show that the hypothesis that disadvantage leads to smaller plans, does not hold. Rather, the challenge is with plan spending.

*Table 4.4 Plan size, spending, and utilisation inequalities comparing ATSI with non-ATSI participants (all participants)*

	Capacity building supports	Capacity building category
		"Improved Daily Living"
	Estimate (95% CI)	Estimate (95% CI)
Plan size non-ATSI (\$)	15765 (15685, 15846)	10670 (10610, 10729)
Plan size ATSI (\$)	16528 (16084, 16971)	10247 (9933, 10562)
<b>Plan size difference (\$)</b>	762 (312, 1212)	-422 (-736, -109)
Spending non-ATSI (\$)	9167 (9101, 9232)	6124 (6079, 6170)
Spending ATSI (\$)	8760 (8422, 9098)	5438 (5178, 5698)
<b>Spending difference (\$)</b>	-407 (-754, -60)	-686 (-948, -425)
Utilisation non-ATSI (%)	0.58 (0.58, 0.58)	0.57 (0.57, 0.58)
Utilisation ATSI (%)	0.53 (0.52, 0.54)	0.53 (0.51, 0.55)
<b>Utilisation difference (%)</b>	-0.05 (-0.07, -0.04)	-0.04 (-0.06, -0.03)
Had ATSI received non-ATSI's plan size		
Spending (ATSI)	8367 (8154, 8581)	5642 (5459, 5824)
Utilisation (ATSI)	0.53 (0.52, 0.54)	0.53 (0.51, 0.55)
Effect of equalising plan size <sup>^</sup>	392 (156, 628)	-204 (-355, -52)
Difference in spending not due to plan size difference <sup>#</sup>	-799 (-1019, -579)	-483 (-666, -299)

<sup>^</sup> ATSI spending minus spending had ATSI received non-ATSI's plan size.

<sup>#</sup> Spending had ATSI received non-ATSI plan size minus spending of non-ATSI.



#### **4.2.2 Inequities in capacity building plan size and spending for CALD participants**

In this section we present estimated inequalities in capacity building plan size and spending for CALD participants (see table 4.5). Our model estimates, after adjusting for confounders, that:

- Average capacity building plan sizes are \$600 higher among CALD participants (\$16,300) than non-CALD participants (\$15,700)
- This does translate into higher spending – capacity building spending is \$700 higher among CALD (\$9,800) and non-CALD (\$9,100) participants.
- With a combination of larger plans, but higher spending, CALD participants have a utilisation rate of 60% in comparison to 58% for non-CALD participants.
- Our modelling of an intervention that equalised plan sizes across CALD and non-CALD participants suggests that CALD participants do not face additional barriers to spending in comparison to non-CALD participants.

In summary, CALD participants receive larger plans and spend higher amounts in comparison to non-CALD participants. Our modelling also suggests that CALD participants do not experience particular barriers to spending in comparison to non-CALD participants. These results show that the hypothesis that disadvantage leads to smaller plans, does not hold.

Table 4.5: Plan size, spending, and utilisation inequalities comparing CALD with non-CALD participants (all participants)

	Capacity building supports	Capacity building category "Improved Daily Living"
	Estimate (95% CI)	Estimate (95% CI)
Plan size non-CALD (\$)	15726 (15646, 15806)	10600 (10538, 10662)
Plan size CALD (\$)	16296 (16054, 16538)	11164 (11018, 11309)
<b>Plan size difference (\$)</b>	570 (327, 814)	564 (411, 716)
Spending non-CALD (\$)	9085 (9019, 9150)	6041 (5994, 6088)
Spending CALD (\$)	9813 (9627, 9998)	6688 (6563, 6812)
<b>Spending difference (\$)</b>	728 (535, 921)	646 (517, 775)
Utilisation non-CALD (%)	0.58 (0.58, 0.58)	0.57 (0.57, 0.57)
Utilisation CALD (%)	0.60 (0.59, 0.61)	0.60 (0.59, 0.61)
<b>Utilisation difference (%)</b>	0.02 (0.02, 0.03)	0.03 (0.02, 0.04)
Had CALD received non-CALD's plan size		
Spending (CALD)	9477 (9355, 9600)	6371 (6283, 6459)
Utilisation (CALD)	0.60 (0.60, 0.61)	0.60 (0.59, 0.61)
Effect of equalising plan size <sup>^</sup>	335 (193, 478)	317 (230, 404)
Effect not due to plan size difference <sup>#</sup>	393 (268, 518)	329 (242, 417)

<sup>^</sup> CALD spending minus spending had CALD received non-CALD's plan size.

<sup>#</sup> Spending had CALD received non-CALD plan size minus spending of non-CALD.

### **4.2.3 Inequities in capacity building plan size and spending for participants in regional and remote Victoria**

In this section we present estimated inequalities in capacity building plan size and spending for participants who live in regional and remote Victoria (see table 4.6). Our model estimates, after adjusting for confounders, that:

- Average capacity building plan sizes are \$2600 lower among participants in regional and remote area (\$14,000) compared to people in major cities (\$16,500)
- Spending is also lower in regional and remote Victoria - capacity building spending is \$2100 lower in regional and remote Victoria (\$7,700) compared to in major cities (\$9,800).
- With a combination of smaller plans and lower spending, participants in regional and remote Victoria have a utilisation rate of 55% in comparison to 59% for participants in major cities.
- Our modelling of an intervention that equalised plan sizes across regional areas and major cities suggests there are additional barriers to spending experienced by participants in regional and remote areas.

In summary, capacity building plans and spending is lower in regional and remote areas. Our modelling also suggests that participants in regional and remote areas experience particular barriers to spending. Potentially there are inequities on both the plan and spending side of the NDIS in regional and remote areas.

Table 4.6 Capacity building plan size, spending, and utilisation inequalities comparing regional and remote areas with major cities (all participants)

	Capacity building supports	Capacity building category “Improved Daily Living”
	Estimate (95% CI)	Estimate (95% CI)
Plan size major cities (\$)	16531 (16438, 16623)	11124 (11061, 11188)
Plan size regional and remote areas (\$)	13978 (13851, 14104)	9456 (9364, 9549)
<b>Plan size difference (\$)</b>	-2553 (-2705, -2402)	-1668 (-1778, -1559)
Spending major cities (\$)	9791 (9718, 9864)	6548 (6495, 6602)
Spending regional and remote areas (\$)	7656 (7558, 7755)	4976 (4911, 5040)
<b>Spending difference (\$)</b>	-2135 (-2253, -2017)	-1573 (-1657, -1488)
Utilisation major cities (%)	59 (59, 60)	59 (59, 59)
Utilisation regional and remote areas (%)	55 (54, 55)	53 (52, 53)
<b>Utilisation difference (%)</b>	-4 (-5, -4)	-6 (-7, -6)
Had regional and remote areas received major cities’ plan size		
Spending (\$)	9004 (8898, 9111)	5740 (5661, 5819)
Utilisation (%)	54 (54, 55)	52 (51, 52)
Effect of equalising plan size (\$) ^	-1348 (-1434, -1262)	-764 (-822, -706)
Difference in spending not due to plan size difference (\$) #	-787 (-892, -681)	-809 (-892, -726)

^ Regional and remote areas spending minus spending had regional and remote areas received major cities’ plan size.

# Spending had regional and remote areas received major cities plan size minus spending of major cities.

### 4.3 Summary of results

There are some key differences in the causal profile between the First Nations population (in comparison to non-First Nation), CALD population (in comparison to non-CALD) and regional and remote population (in comparison to participants in major cities) that needed to be taken into account in our analysis.

We used the causal diagrams and methods detailed in section 3 to inform how we ensured our comparisons were ‘like for like’. After blocking the effect of these confounders, we found that First Nations and CALD participants get larger core and capacity building plans. For First Nations participants this does not necessarily translate to higher spending, and our modelling found there are particular barriers to spending that First Nations participants face.

Both plan size and spending is lower in regional and remote Victoria, in comparison to major cities. We also found particular barriers to spending when plans are equally distributed across the state. This suggest there are inequities in both the plan and spending sides of the equation. Support for

participants in regional and remote areas needs to be directed at both planning and spending to reduce inequities.

## Part 5 | Adults with psychosocial disability – modelling regional and remote inequities in plan size and spending

### SUMMARY OF PART 5 – REGIONAL AND REMOTE INEQUITIES

**Target population:** all active participants with psychosocial disability in Financial Year 2019/20.

**Main causal effects:** controlling for confounders, are there inequities plan size and plan spending comparing

- Participants in regional and remote Victoria in comparison to participants in major cities

**Hypothetical interventions:** controlling for confounders, would the following hypothetical interventions increase spending in regional and remote Victoria:

1. Equalise the distribution of plan sizes across regional and remote Victoria to the distribution in major cities
2. Ensure that, among those funded for support coordination, people in regional and remote Victoria had the same average amount of support coordination in their plans as their counterparts in major cities
3. Ensure, among those funded for support coordination, people in regional and remote Victoria had the same chance to use at least 80% of their support coordination as their counterparts in major cities
4. All of the above interventions (equalising: plan size, support coordination plan size and 80% support coordination usage)

#### Results core:

- Core support plan sizes are larger in regional and remote Victoria
- Core support spending is similar
- Intervention 1 suggests there are barriers to spending core supports for participants in regional and remote Victoria
- Intervention 2 suggests equalising the plan size of support coordination across Victoria would have a modest impact on core plan spending
- Intervention 3 suggests that providing regional and remote participants with the same opportunity to use 80% of their funded support coordination would have a modest impact core spending
- Intervention 4 suggests that the benefits of equalising opportunities to use 80% of support coordination across the state would be balanced by barriers to spending in regional and remote areas. Government could consider targeted regional and remote interventions that simultaneously support participants and remove barriers to spending.

#### Results capacity building:

- Capacity building plan sizes are smaller in regional and remote Victoria
- Capacity building support spending is lower in regional and remote Victoria

- Intervention 1 suggests that, even though spending would increase, there are still barriers to spending for participants in regional and remote Victoria
- Intervention 2 suggests equalising the plan size of support coordination across Victoria would have a small impact on capacity building spending
- Intervention 3 suggests that providing regional and remote participants with the same opportunity to use 80% of their funded support coordination would lead to a modest increase in capacity building spending
- Intervention 4 suggests that implementing interventions 1-3 jointly would achieve highest improvement in spending in regional and remote Victoria. However, the joint intervention of equalising capacity building plan size, support coordination plan size, and high support coordination usage would not lead to much further improvement in spending than equalising capacity building plan size alone. Government could consider the cost-benefit of implementing the interventions jointly.

## 5.1 Modelling Results

All modelling results control for the confounders specified in the causal profiles (see section 3.3.2). As a reminder, the model equalises the distribution of confounders between regional and remote Victoria and major cities. In other words, the impact on plan size and spending of differences in confounder distributions is “blocked” to ensure our comparisons are “like for like”.

For each of the results we present the mean estimate rounded to the nearest \$100 in the main text. In the tables we present the unrounded mean estimate and the 95% confidence interval in brackets. The confidence interval gives us an indication of the uncertainty around our estimate.

### 5.1.1 Core supports

In this section we detail the results from our modelling of core supports. We outline the results for all core supports (i.e., the left-hand column of table 5.1 below) and the core category – assistance with daily life.

*Table 5.1 – Core support plan size and spending inequities comparing participants in regional and remote Victoria to participants in major cities (adults with psychosocial disability)*

	Core supports	Core category “Assistance with Daily Life”
	Estimate (95% CI)	Estimate (95% CI)
Plan size major cities (\$)	32169 (31464, 32874)	16634 (15893, 17374)
Plan size regional & remote areas (\$)	35841 (34545, 37137)	17932 (16790, 19074)
<b>Plan size difference (\$)</b>	3672 (2285, 5059)	1298 (61, 2536)
Spending major cities (\$)	16117 (15642, 16592)	9114 (8659, 9569)
Spending regional & remote areas (\$)	16771 (15830, 17712)	9217 (8402, 10032)
<b>Spending difference (\$)</b>	654 (-384, 1691)	103 (-846, 1052)
Utilisation major cities (%)	50 (49, 51)	55 (52, 57)
Utilisation regional & remote areas (%)	47 (45, 49)	51 (48, 55)
<b>Utilisation difference (%)</b>	-3 (-5, -1)	-3 (-7, 1)
Spending in regional and remote areas under hypothetical scenarios		
Equalising the distribution of plan sizes	15173 (14512, 15834)	8882 (8304, 9461)
Equalising support coordination plan size among those funded for it	16924 (15986, 17863)	9490 (8686, 10293)
Equalising 80% support coordination usage	17206 (16233, 18179)	9419 (8581, 10258)
All the above	15589 (14909, 16268)	9140 (8552, 9728)



### **Core plan sizes are larger in regional and remote Victoria (in comparison to major cities) for adults with psychosocial disability.**

Our model estimates, after controlling for confounders, core plan sizes are \$3700 higher in regional and remote Victoria (\$35,800) than in major cities (\$32,200).

Plans are also larger in the specific core category “assistance with daily life”.

### **Core spending is similar in regional and remote Victoria (in comparison to major cities) for adults with psychosocial disability**

Our model estimates, after controlling for confounding, that the difference in spending for core supports is \$700. However, with a confidence interval with both negative and positive values, spending of core supports is not dissimilar in regional and remote Victoria in comparison to major cities, for participants with psychosocial disability.

### **Impact of hypothetical intervention 1 – equalising regional and remote core plan sizes to the distribution in major cities**

If regional and remote participants with psychosocial disability received the plan size distribution of that participants in major cities receive, expected core plan spending would be \$15,200 in comparison to \$16,100 in major cities. The intervention would also have a similar effect for the core category – “assistance with daily life”.

These results, under the intervention of equalising plan sizes across Victoria, people in regional and remote areas with psychosocial disability would still face spending barriers for their core supports.

### **Impact of hypothetical intervention 2 – ensuring, among those funded for support coordination, people in regional and remote Victoria had the same amount planned for support coordination as their counterparts in major cities**

Equalising planned support coordination may not lead to a substantive increase of core support spending, among people living in Regional and Remote Victoria. Our estimate shows a \$100 increase, but with confidence intervals overlapping negative and positive values we cannot reject the null hypothesis of “no effect”.

### **Impact of hypothetical intervention 3 – ensuring, among those funded for support coordination, people in regional and remote Victoria had the same chance to use at least 80% of their support coordination as their counterparts in major cities**

Providing equal opportunities to utilise 80% of support coordination across the state would lead to an increase in core spending of \$400 for participants in regional and remote Victoria.

### **Impact of hypothetical joint intervention – hypothetical interventions 1-3**

If hypothetical interventions 1 to 3 were implemented jointly, expected core plan spending would be \$500 lower in regional and remote areas than major cities. The modest increase gained through increasing the plan size and spending of support coordination in regional and remote areas to the levels experienced in major cities, is balanced by the spending barriers people with psychosocial disability in regional and remote areas face.

### 5.1.2 Capacity building supports

In this section we detail the results from our modelling of capacity building supports. We briefly outline the results for all capacity building supports (i.e. the left-hand column of table 5.2 below) first.

*Table 5.2 – Capacity building plan size and spending inequities comparing participants in regional and remote Victoria to participants in major cities (adults with psychosocial disability)*

	Capacity building supports	Capacity building category “Improved daily living”
	Estimate (95% CI)	Estimate (95% CI)
Plan size major cities (\$)	11518 (11341, 11694)	7196 (7063, 7330)
Plan size regional & remote areas (\$)	9475 (9218, 9733)	6121 (5953, 6289)
<b>Plan size difference (\$)</b>	<b>-2043 (-2362, -1723)</b>	<b>-1075 (-1285, -865)</b>
Spending major cities (\$)	5407 (5284, 5530)	3847 (3751, 3944)
Spending regional & remote areas (\$)	4179 (4028, 4331)	2991 (2879, 3104)
<b>Spending difference (\$)</b>	<b>-1227 (-1418, -1037)</b>	<b>-856 (-1005, -707)</b>
Utilisation major cities (%)	47 (46, 48)	53 (52, 55)
Utilisation regional & remote areas (%)	44 (43, 46)	49 (47, 51)
<b>Utilisation difference (%)</b>	<b>-3 (-5, -1)</b>	<b>-5 (-7, -3)</b>
Spending in regional and remote areas under hypothetical scenarios		
Equalising the distribution of plan sizes	4788 (4605, 4971)	3328 (3193, 3464)
Equalising support coordination plan size among those funded for it	4185 (4034, 4336)	3001 (2888, 3113)
Equalising 80% support coordination usage	4253 (4100, 4405)	3026 (2913, 3140)
All the above	4886 (4705, 5067)	3388 (3252, 3524)

**Capacity building plan sizes are smaller in regional and remote Victoria (in comparison to major cities) for adults with psychosocial disability.**

Our model estimates, after controlling for confounders, that capacity building plan sizes are \$2000 smaller in regional and remote Victoria (\$9,500) than in major cities (\$11,500). Plans are also smaller in the specific capacity building category ‘improved daily living’.

### **Capacity building spending is lower in regional and remote Victoria (in comparison to major cities) for adults with psychosocial disability**

Our model estimates, after controlling for confounding, that spending is \$1,200 lower in regional and remote Victoria (\$4,200) than in major cities (\$5,400).

### **Impact of hypothetical intervention 1 – equalising regional and remote capacity building plan sizes to the distribution in major cities**

If adults with psychosocial disability in regional and remote areas received the plan size distribution of that participants in major cities receive, expected capacity building plan spending would be \$4,800 in comparison to \$5,400. The intervention would also have the same effect for the capacity building categories 'improved daily living'.

These results suggest adults in regional and remote Victoria with psychosocial disability face barriers to spending of capacity building supports.

### **Impact of hypothetical intervention 2 – ensuring, among those funded for support coordination, people in regional and remote Victoria had the same average planned support coordination as their counterparts in major cities**

Equalising planned support coordination would not help improve spending of capacity supports or spending of the category 'improved daily living'.

### **Impact of hypothetical intervention 3 – ensuring, among those funded for support coordination, people in regional and remote Victoria had the same chance to use at least 80% of their support coordination as their counterparts in major cities**

Providing equal opportunities to utilise 80% of support coordination across the state would lead to a small increase in spending of capacity building supports and spending of the 'improved daily living' category (less than \$100 for both categories).

### **Impact of hypothetical joint intervention – hypothetical interventions 1-3**

If hypothetical interventions 1 to 3 were implemented jointly, expected capacity building plan spending would be \$4,900. This means that equalising typical plan sizes and the planned amount and use of support coordination across Victoria would not remove inequities in spending for participants with psychosocial disability in regional and remote areas.

## 5.2 Summary of results

We used the causal diagrams and methods detailed in section 3 to inform comparisons between adults with psychosocial disability living in regional and remote Victoria with those living in major cities.

After blocking the effect of potential confounders listed in the causal profiles, we found that core support plan size is larger in regional and remote Victoria, while spending is similar in comparison to major cities. There are barriers in spending core supports for participants living in regional and remote Victoria. Intervening on support coordination plan size and usage have modest impacts on core support spending.

We also found that capacity building support plan size is smaller, and spending is lower in regional and remote Victoria in comparison to major cities. Equalising capacity building plan size will lead to small improvements in spending. However, intervening on support coordination plan size and usage would only have very small impacts on capacity building spending.

Our modelling found that under hypothetical scenarios that equalise typical plan sizes and the planned amount and use of support coordination across Victoria would not remove regional and remote inequities. Further modelling is required to estimate the level of plan side and spending side interventions that would be required to close regional and remote inequities in spending for people with psychosocial disability. Our results also suggest that simply equalising plans and support coordination support across the state will not be sufficient to remove inequities in service use. Rather, particular efforts focussed on regional and remote participants will be required.

## Part 6 | Does prior experience of State disability services impact subsequent NDIS service use?

### Summary of part 6 – impact of prior experience on NDIS service use

#### 1. Entry Type

**Target population:** three separate analyses looking at the first completed plan for adults (19-64 years old) with a) psychosocial disability, b) intellectual disability and c) cerebral palsy.

**Main causal effects:** controlling for confounders, are there inequities plan size and plan spending comparing

- Participants who previously received State disability services in comparison to those who did not

**Hypothetical interventions:** controlling for confounders, how much of inequities in spending are due to spending barriers. We estimate this through a hypothetical intervention that equalises the distribution of plan sizes across

- Participants who previously received State disability services in comparison to those who did not

**Results: core supports – ‘assistance with daily life’ and ‘assistance with social and community participation’**

- Psychosocial disability – core support plan sizes and spending are broadly similar for people who previously used State services (compared to those who did not).
- Intellectual disability – core support plan sizes and spending are higher for people who previously used State services (compared to those who did not).
- Cerebral palsy – core support plan sizes and spending are higher for people who previously used State services (compared to those who did not).
- Plan size hypothetical intervention - modelling suggests that people with intellectual disability and cerebral, who have prior State experience, are more readily able to access core supports.

#### 2. Individualised support packages

**Target population:** young adults (aged 19 – 34 years old), with intellectual disability who had all previously used State disability services and not lived in shared supported accommodation

**Main causal effect:** controlling for confounders are their inequities in plan size and spending comparing

- Participants who previously received Individualised Support Packages (ISP) in comparison to those who did not

**Hypothetical interventions:** controlling for confounders, how much of inequities in spending are due to spending barriers. We estimate this through a hypothetical intervention that equalises the distribution of plan sizes across people who did and did not receive ISP.

**Results:** our causal modelling, that aimed to isolate specific causal effects found

- Core plan size and spending is substantively higher for participants with prior ISP experience in comparison with participants who did not have ISP.
- Capacity building plan size is slightly lower for the group with prior ISP experience.

## 6.1 Modelling results – impact of previously receiving State disability services

All modelling results control for the confounders specified in the causal profiles detailed in section 3.3.3. As a reminder, the model equalises the distribution of confounders between participants who previously received State disability services and those who did not. In other words, the impact on plan size and spending of differences in confounder distributions is “blocked” to ensure our comparisons are “like for like”.

We present results for three target populations – adults with psychosocial disability, adults with intellectual disability and adults with cerebral palsy. For each of the results we present the mean estimate rounded to the nearest \$100. The unrounded estimates and 95% confidence intervals (in brackets) are presented in the tables and charts embedded in the text. The confidence interval gives us an indication of the uncertainty around our estimate.

In this part of the report, we focus on two specific core support categories – ‘assistance with daily life’ and ‘social and community participant’.

### 6.1.1 Adults with psychosocial disability – core supports

Table 6.1 details full results from the inequity modelling, and figure 6.1 compares unadjusted plan size and spending values to our model adjusted values. This gives the reader an impression of how much confounding there is.

*Table 6.1: Core support plan size and spending inequities comparing participants who previously received State disability services to those who did not (adults with psychosocial disability)*

Adults with psychosocial disability	Assistance with daily life	Social and community participation
	Estimate (95% CI)	Estimate (95% CI)
Plan size new/Commonwealth entry(\$)	15617 (14196, 17038)	12814 (12238, 13390)
Plan size State entry (\$)	16552 (15814, 17290)	13851 (13564, 14137)
<b>Plan size difference (\$)</b>	935 (-565, 2435)	1037 (400, 1674)
Spending new/Commonwealth entry (\$)	6419 (5330, 7509)	4003 (3647, 4359)
Spending State entry (\$)	6327 (5853, 6801)	4264 (4065, 4463)
<b>Spending difference (\$)</b>	-92 (-1196, 1012)	261 (-148, 669)
Utilisation new/Commonwealth entry (%)	41.1 (35.7, 46.5)	31.2 (28.9, 33.6)
Utilisation State entry (%)	38.2 (35.8, 40.6)	30.8 (29.6, 32.0)
<b>Utilisation difference (%)</b>	-2.9 (-8.2, 2.4)	-0.5 (-3.2, 2.2)
Spending difference due to plan size difference	-3152 (-3995, -2309)	-1880 (-2137, -1622)
Spending difference not due to plan size difference	3060 (2035, 4085)	2140 (1764, 2517)

*Adjusted for CALD and ATSI status, SES, remoteness, age, gender, normalised severity score, ever received SSA.*

Confounding does account for some of the observed differences in plan size and spending. For example, the observed difference in plan size for assistance with daily life (top left panel of figure 6.1) is almost all due to confounding.

This combination of plan size and spending means that utilisation is similar across people who previously used State services and those who did not.

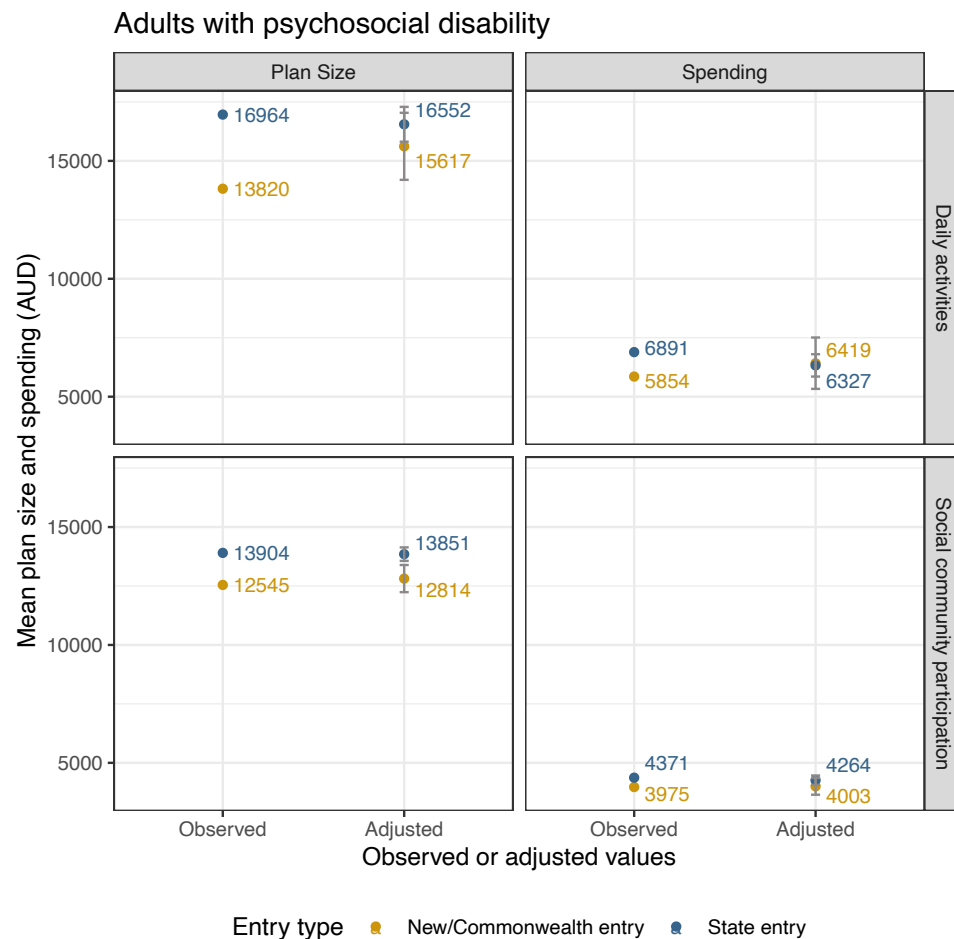


Figure 6.1 Comparing observed and adjusting mean plan size and spending in adults with psychosocial disability

Our model estimates that, after controlling for confounders, **people with psychosocial disability who previously accessed State services have slightly larger core plan sizes**. More so for social and community participation where the difference in plan size is \$1,000.

**Core spending on assistance with daily life and social and community participation supports, however, is similar.**



### 6.1.2 Adults with intellectual disability – core supports

Full results are presented in table 6.2 and figure 6.2 below.

Figure 6.2 shows the extent to which our model controls for confounding between people who previously received State services and those who did not. However, after blocking the effect of confounders, there is still a substantive difference in plan size and spending of the two core support categories for participants with intellectual disability.

Our model estimates, that after controlling for confounders, **people with intellectual disability who previously access State disability receive much larger core plan sizes**. For example, there is a \$27,000 difference in plan size of the “assistance with daily life” category.

*Table 6.2 Core support plan size and spending inequities comparing participants who previously received State disability services to those who did not (adults with intellectual disability)*

Adults with intellectual disability	Assistance with daily life	Social and community participation
	Estimate (95% CI)	Estimate (95% CI)
Plan size new/Commonwealth entry(\$)	29641 (26996, 32286)	14984 (14225, 15743)
Plan size State entry (\$)	56925 (55367, 58484)	28808 (28299, 29317)
<b>Plan size difference (\$)</b>	27284 (24632, 29936)	13824 (12953, 14694)
Spending new/Commonwealth entry (\$)	11310 (8903, 13717)	6163 (5496, 6831)
Spending State entry (\$)	23654 (22391, 24917)	17480 (17067, 17893)
<b>Spending difference (\$)</b>	12343 (9676, 15011)	11317 (10526, 12107)
Utilisation new/Commonwealth entry (%)	38.2 (30.8, 45.5)	41.1 (37.5, 44.7)
Utilisation State entry (%)	41.6 (39.6, 43.5)	60.7 (59.7, 61.6)
<b>Utilisation difference (%)</b>	3.4 (-4.3, 11.0)	19.5 (15.7, 23.4)
Spending difference due to plan size difference	4629 (3102, 6155)	5541 (4890, 6192)
Spending difference not due to plan size difference	7715 (5489, 9941)	5775 (5175, 6376)

*Adjusted for CALD and ATSI status, SES, remoteness, age, gender, normalised severity score, ever received SSA.*

**People with intellectual disability, who previously received State disability services, also have higher levels of core spending** (compared to people who did not receive State disability services before the NDIS). For example, they spend \$12,400 more on supports in the ‘assistance with daily life’ category than people who did not use State disability services prior to the NDIS.

This combination of higher plan and spending means that utilisation is higher for people with experience of State disability services.

Under our hypothetical intervention of equalising plan sizes, people with prior experience of State disability services would still spend \$7,700 more than people who did not previously use State

disability services. **This suggests that adults with intellectual disability, who have prior experience of using State services are more able to access services.**

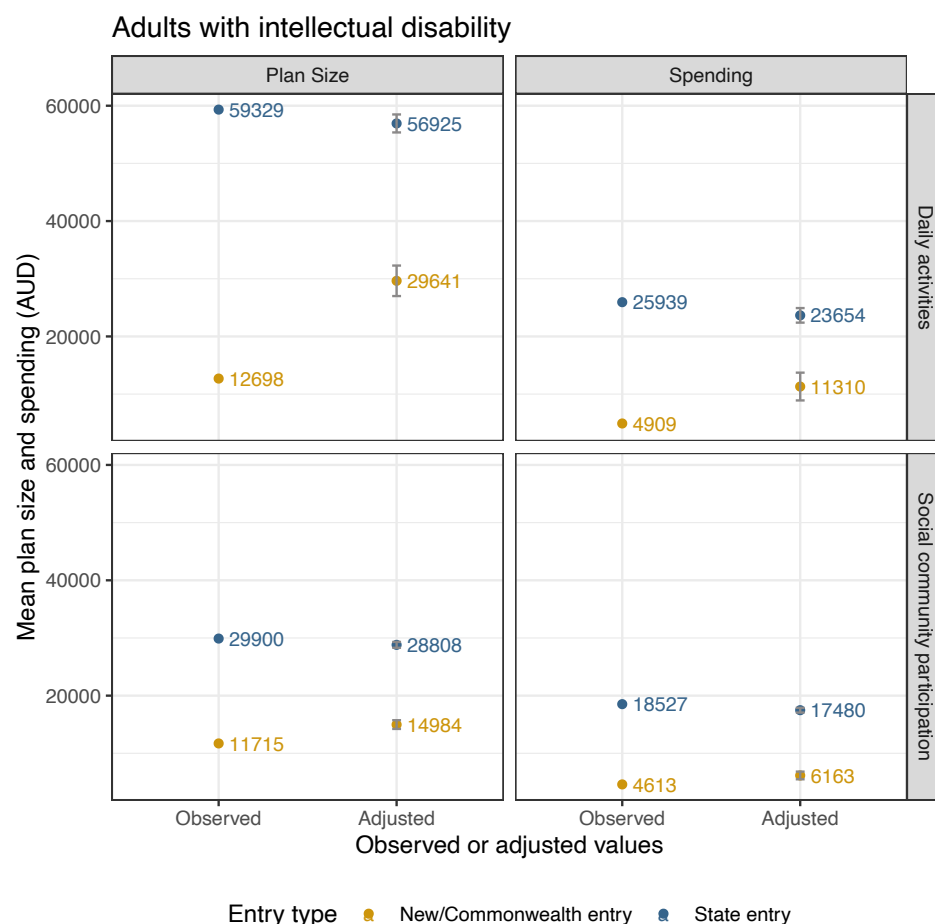


Figure 6.2 Comparing observed and adjusting mean plan size and spending in adults with intellectual disability

### 6.1.3 Adults with cerebral palsy – core supports

Full results are presented in table 6.3 and figure 6.3 below.

Figure 6.3 shows the extent to which our model controls for confounding between people who previously received State services and those who did not. However, after blocking the effect of confounders, there is still a substantive difference in plan size and spending of the two core support categories for participants with cerebral palsy.

Our model estimates, that after controlling for confounders, **people with cerebral palsy who previously access State disability services receive much higher core plan sizes.** For example, there is a \$34,900 difference in plan size of the ‘assistance with daily life’ category.

Table 6.3: Core support plan size and spending inequities comparing participants who previously received State disability services to those who did not (adults with cerebral palsy)

Adults with cerebral palsy	Assistance with daily life	Social and community participation
	Estimate (95% CI)	Estimate (95% CI)
Plan size new/Commonwealth entry(\$)	51265 (38904, 63626)	18992 (16045, 21939)
Plan size State entry (\$)	86145 (81682, 90608)	35730 (34403, 37058)
<b>Plan size difference (\$)</b>	<b>34880 (21637, 48123)</b>	<b>16738 (13571, 19905)</b>
Spending new/Commonwealth entry (\$)	21187 (13241, 29134)	6020 (4350, 7690)
Spending State entry (\$)	51838 (47534, 56141)	21090 (20082, 22097)
<b>Spending difference (\$)</b>	<b>30651 (21766, 39535)</b>	<b>15070 (13062, 17077)</b>
Utilisation new/Commonwealth entry (%)	41.3 (29.9, 52.7)	31.7 (23.8, 39.6)
Utilisation State entry (%)	60.2 (57.0, 63.4)	59.0 (57.2, 60.8)
<b>Utilisation difference (%)</b>	<b>18.8 (7.0, 30.6)</b>	<b>27.3 (19.0, 35.6)</b>
Spending difference due to plan size difference	14544 (4876, 24212)	7100 (4884, 9315)
Spending difference not due to plan size difference	16107 (8962, 23251)	7970 (6034, 9906)

*Adjusted for CALD and ATSI status, SES, remoteness, age, gender, normalised severity score, ever received SSA.*

**People with cerebral palsy, who previously received State disability services, also have a higher levels of core spending** (compared with people who did not receive State disability services before the NDIS). For example, they spend \$30,651 (\$21,766, \$39,535) more on supports in the ‘assistance with daily life’ category than people who did not use State disability services prior to the NDIS.

This combination of higher plan and spending means that utilisation is higher for people with experience of State disability services.

Under our hypothetical intervention of equalising plan sizes, people with prior experience of State disability services would still spend \$16,107 (95% CI: \$8,962, \$23,251) more than people who did not previously use State disability services. **This suggests that adults with cerebral palsy, who have prior experience of using State services are more able to access services.**

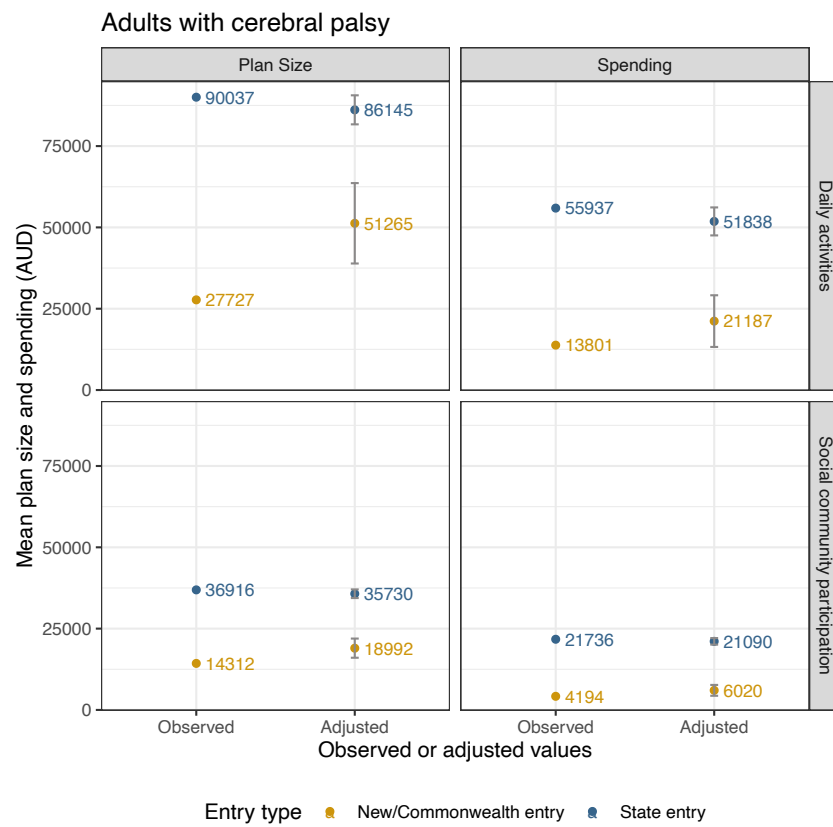


Figure 6.3 Comparing observed and adjusting mean plan size and spending in adults with cerebral palsy

## 6.2 Modelling results – impact of previously receiving Individualised Support Packages

All modelling results control for the confounders specified in the causal profiles detailed in section 3.3.3. As a reminder, the model equalises the distribution of confounders between participants who previously received Individualised Support Packages and those who did not. In other words, the impact on plan size and spending of differences in confounder distributions is “blocked” to ensure our comparisons are “like for like”.

We present results for a tightly defined target populations – young adults with intellectual disability who previously State disability services and do not live in shared supported accommodation. We present results rounded to the nearest \$100 in the main body of the text and unrounded estimates with 95% confidence interval in brackets in the tables. The confidence interval gives us an indication of the uncertainty around our estimate. In this part of the report, we look at both core and capacity building supports.

### 6.2.1 Core supports

Full results are presented in table 6.4 and figure 6.4 below. Figure 6.4 shows the extent to which our model controls for confounding between people who previously had ISP and those who did not. After blocking the effect of confounders, there is still a substantive difference in plan sizes and spending of core supports and the ‘assistance with daily life’ support category.

Our model estimates, that after controlling for confounding, **people who previously had ISP receive much larger core plan sizes**. For example, there is a \$27,500 difference in plan size of core supports.

*Table 6.4 Core support plan size and spending inequities comparing participants who previously received Individualised Support Packages to those who did not (young adults with intellectual disability)*

	Core	Core assistance with daily life
	Estimate (95% CI)	Estimate (95% CI)
Plan size no ISP (\$)	27083 (25400, 28765)	16609 (14751, 18467)
Plan size had ISP (\$)	54593 (52742, 56444)	27262 (25764, 28760)
<b>Plan size difference (\$)</b>	<b>27510 (25027, 29994)</b>	<b>10653 (8201, 13105)</b>
Spending no ISP (\$)	10417 (9458, 11376)	5260 (4258, 6261)
Spending had ISP (\$)	32041 (30681, 33401)	12777 (11635, 13920)
<b>Spending difference (\$)</b>	<b>21624 (20011, 23237)</b>	<b>7518 (5980, 9056)</b>
Utilisation no ISP (%)	38.5 (35.9, 41.1)	31.7 (26.8, 36.5)
Utilisation had ISP (%)	58.7 (57.4, 60.0)	46.9 (44.3, 49.4)
<b>Utilisation difference (%)</b>	<b>20.2 (17.4, 23.1)</b>	<b>15.2 (9.6, 20.8)</b>
Spending difference due to plan size difference	15353 (13733, 16973)	2345 (889, 3801)
Spending difference not due to plan size difference	6271 (5390, 7153)	5172 (3988, 6357)

*Adjusted for: CALD background, ATSI status, age, gender, SES, remoteness, normalised severity score, year of entry.*

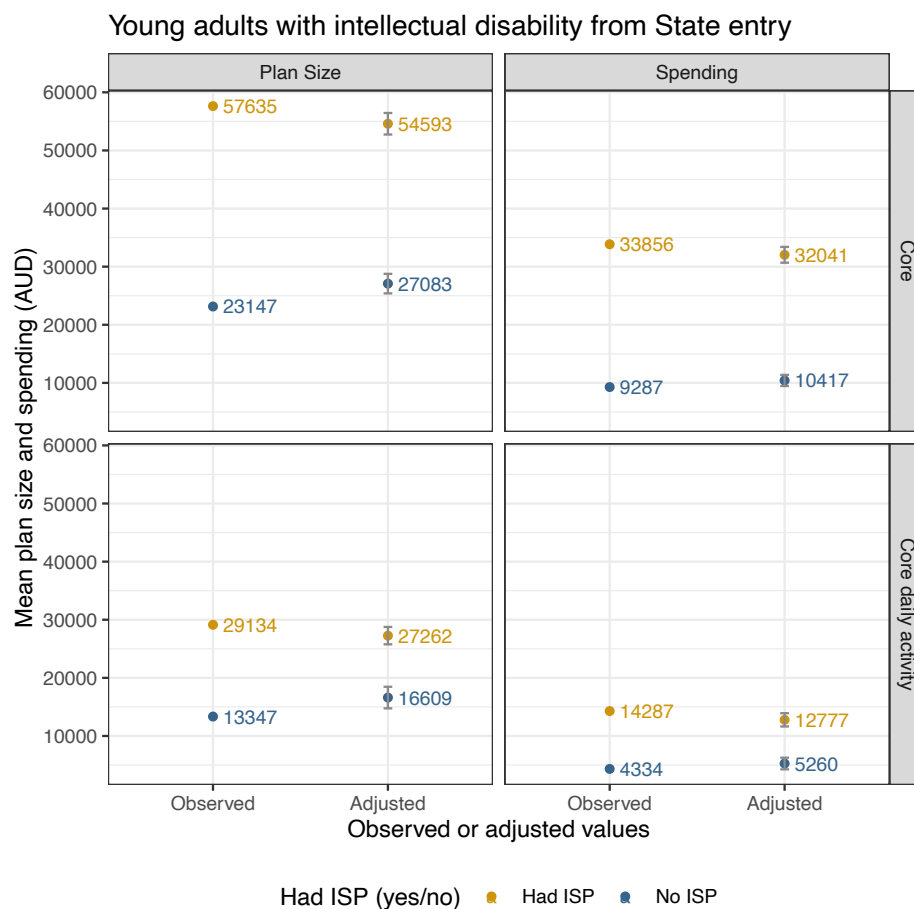


Figure 6.4: Comparing observed and adjusting mean plan size and spending (core and core daily activity supports)

People who previously had ISP also have higher levels of core spending (compared to people who did not receive ISP before the NDIS). For example, their spending is \$21,624 (95% CI: \$20,011, \$23,237) higher in the core support class.

The combination of higher plan size and spending means higher utilisation for people with ISP experience before NDIS.

Under the hypothetical intervention of equalising plan sizes, people with ISP experience would still spend more than people without ISP experience. **This suggests that people who had experience with ISP are more able to access NDIS services.**

## 6.2.2 Capacity building supports

Full results are presented in table 6.5 and figure 6.5 below.

Figure 6.5 shows the extent to which our model controls for confounding between people who previously had ISP and those who did not. It appears that the confounders did not affect the relationship between ISP experience and capacity building spending much in our target population. There is a modest difference in plan sizes and spending of capacity building supports.

Our model estimates, that after controlling for confounding, people who previously had ISP receive lower capacity building plan sizes. For example, there is a -\$1,800 difference in plan size for the capacity building support class. However, there is not a substantive difference in spending.

*Table 6.5 ISP and spending of the capacity building supports, and the “Improved Daily Living” category (capacity building daily activity) of the capacity building supports*

	Capacity building	Capacity building Improved Daily Living
	Estimate (95% CI)	Estimate (95% CI)
Plan size no ISP (\$)	13914 (13197, 14631)	5938 (5666, 6209)
Plan size had ISP (\$)	12164 (11753, 12575)	5713 (5522, 5905)
<b>Plan size difference (\$)</b>	-1750 (-2564, -936)	-224 (-554, 105)
Spending no ISP (\$)	5432 (5016, 5848)	1901 (1712, 2090)
Spending had ISP (\$)	5148 (4899, 5396)	1833 (1722, 1944)
<b>Spending difference (\$)</b>	-284 (-747, 179)	-68 (-283, 147)
Utilisation no ISP (%)	39.0 (36.7, 41.3)	32.0 (29.3, 34.7)
Utilisation had ISP (%)	42.3 (41.0, 43.7)	32.1 (30.4, 33.7)
<b>Utilisation difference (%)</b>	3.3 (0.7, 5.9)	0.1 (-3.1, 3.3)
Spending difference due to plan size difference	-2112 (-2525, -1698)	-1440 (-1595, -1285)
Spending difference not due to plan size difference	1827 (1417, 2238)	1372 (1145, 1599)

*Adjusted for: CALD background, ATSI status, age, gender, SES, remoteness, normalised severity score, year of entry.*

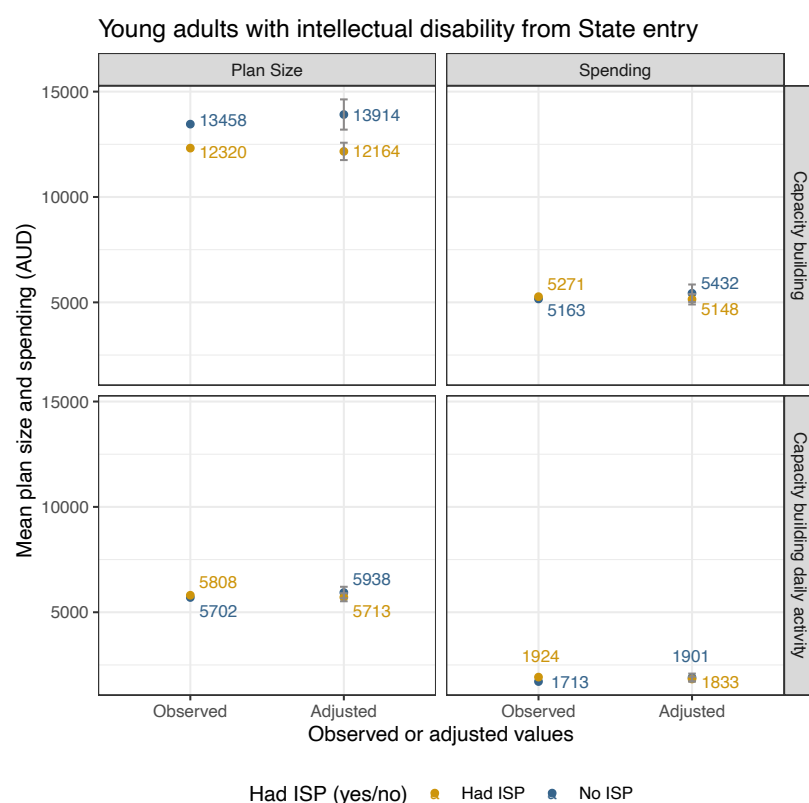


Figure 6.5: Comparing observed and adjusting mean plan size and spending (capacity building and capacity building daily activity supports)

### 6.3 Summary of findings

We used the causal diagrams and methods detailed in section 3 to inform comparisons between people with and without previous State and ISP experience in specific target populations.

We found that the impact on plan size and spending of entering the scheme from the State system varies according to disability group. For example, there were only small differences in plan size and spending for people with psychosocial disability, whereas experience of State services had a larger impact on plan size and spending for people with intellectual disability and cerebral palsy. More research is required to understand the support people who are new to disability services need in the planning process, and how barriers to spending can be removed.

After blocking the effects of potential confounders listed in the causal profiles, we also found that plan size and spending of core supports are substantively higher for people with ISP experience, in comparison with people without prior ISP experience. However, plan sizes of capacity building supports are slightly lower for the group with ISP experience, and spending is similar between the two groups. These results suggest that participants who have prior experience of using individualised disability services are more readily able to navigate the planning process and access services.

A potential limitation of these findings could be there are other factors, for which we do not have quantitative data to hand, that could explain differences between people who entered the scheme from the State system, and those who did not. For example, while we do have data on disability group and a severity score, we do not have comprehensive data on participants' needs, which could have influenced whether an individual was eligible for State services prior to the NDIS.



## Part 7 | Does use of assistive technology impact subsequent use of core supports?

### Summary of part 7 – impact of assistive technology on core supports

**Target population:** active participants with cerebral palsy who were funded for assistive technology

**Main causal effects:** controlling for confounders, are there differences in ‘core – assistance with daily life’ - plan size and plan spending comparing

- Participants who were able to utilise 80% of planned assistive technology supports within a year of needing them, in comparison to those who were unable to use 80% of their assistive technology

### Results core supports:

- Plan size – given the uncertainty in our estimates we are unable to say whether plan sizes and spending are dissimilar for people who use 80% of their assistive technology in comparison to those who do not

### Limitations:

- Given the complexity in utilising assistive technology (for example, gathering evidence and receiving a consultation from an occupational therapist), we are concerned there are unmeasured factors (e.g. informal supports) that confound our understanding of the impact of assistive technology

## 7.1 Modelling results – impact of assistive technology on ‘core – assistance with daily life’ plan size and spending

All modelling results control for the confounders specified in the causal profiles detailed in section 3.3.4. As a reminder, the model equalises the distribution of confounders between participants who used 80% of their assistive technology within a year of needing and those who did not. In other words, the impact on plan size and spending of differences in confounder distributions is “blocked” to ensure our comparisons are “like for like”.

For each of the results we present the mean estimate rounded to the nearest \$100. We display unrounded results and the 95% confidence interval in brackets in the tables embedded in the text. The confidence interval gives us an indication of the uncertainty around our estimate.

In this part of the report, we focus on the specific core category – “assistance with daily life”.

*Table 7.1 Impact of assistive technology utilisation (at least 80%) on the core category “Assistance with Daily Life” plan size and spending in the subsequent plan*

Participants with cerebral palsy	“Assistance with Daily Life” category of core supports in the subsequent plan
	Estimate (95% CI)
Plan size low assistive technology utilisation (\$)	47098 (43778, 50417)
Plan size high assistive technology utilisation (\$)	49168 (44690, 53645)
<b>Plan size difference (\$)</b>	<b>2070 (-3318, 7458)</b>
Spending low assistive technology utilisation (\$)	23873 (21561, 26186)
Spending high assistive technology utilisation (\$)	27536 (23879, 31194)
<b>Spending difference (\$)</b>	<b>3663 (-326, 7652)</b>

*Adjusted for: CALD background, ATSI status, SES, remoteness, age, gender, normalised severity score, entry type, year when plan started, plan size of assistive technology and core daily activity (as proxies for support needs).*

Participants who were able to utilise at least 80% of the funded assistive technology within a year appear to have larger plan for ‘assistance with daily life’ in the subsequent plan. However, with wide confidence intervals there is considerable statistical uncertainty associated with this analysis.

Spending of the ‘assistance with daily life’ support in the subsequent plan appears to be \$3,700 higher in comparison to participants utilised lower than 80% of assistive technology in the first plan. Again these results need to be interpreted with caution, due to the statistical uncertainty in our modelling.

## 7.2 Limitations

Our modelling attempts to isolate the impact of participants with cerebral palsy using 80% of their assistive technology. We carefully control for many potential confounders of our main causal effect (assistive technology → plan size and spending). However, because of the complexity of utilising assistive technology, we are concerned there are unmeasured factors that we have been unable to control for.

For example, obtaining approval for assistive technology is very time consuming. Supporting documentation from in-demand occupational therapists is often required. Following this, there may be a need for customisation and/or trialling of the technology and a further round of engagement with an occupational therapist.

As a result, it is possible that assistive technology spending could be a proxy for informal supports or a participant's resources. This could lead to a person being able to advocate for and then consequently spend additional core supports.

Future research on the interaction and impact of given NDIS supports on subsequent ability to use their plans more effectively, need to take into account and/or capture the informal support and advocacy of participants. This will help us understand the role of informal support networks and where participants may require more support from government and the NDIA to use their plans effectively. Quantitatively this may require linkage of NDIS to further population data sources, such as the census to capture more information on the context in which participants live.

## 7.3 Summary of results

We used the causal diagrams and methods detailed in section 3 to inform comparison of participants with cerebral palsy who had higher assistive technology utilisation with those with lower utilisation. After blocking the effect of potential confounders available in the data, we found that participants with higher assistive technology utilisation get larger 'assistance with daily life' support in the subsequent plan and spend more of this support in comparison to participants with lower assistive technology utilisation. However, the results need to be interpreted with caution, because the effect of 'informal supports' participants get cannot be ruled out with the data available.

## Part 8 | Summary

### 8.1 Summary of findings

Aligning with, and drawing from the findings in the Qualitative Report this project had four main aims:

- 1) Estimate inequities in plan size and spending for **First Nations, Culturally and Linguistically Diverse and Regional and Remote participants**
- 2) Model a range of hypothetical plan and support coordination equity interventions for **participants with psychosocial disability in regional and remote Victoria**, assessing if they would overcome existing spending inequities
- 3) Estimate if **prior experience of State disability services impacts** plan size and spending in participants' first plans
- 4) Estimate whether **use of assistive technology impacts** subsequent use of core supports

#### **Aim 1 - First Nations, CALD and regional and remote inequities in plan size and spending**

Using the causal methods outlined in Part 2 that carefully control for confounding factors, **we found that there is not inequity in plan size for First Nations and CALD participants**. In fact, both populations tend to receive larger plans.

While there is not an inequity in plan spending for the CALD population (spending is higher in the CALD population compared to the non-CALD population) there is an inequity in spending for First Nations participants.

As such, our results show that the hypothesis that disadvantage for the CALD and First Nations populations leads to smaller plans does not hold. Rather the challenge is with plan spending.

This is further reinforced by our modelling of a hypothetical intervention where government equalises the plan size distributions of First Nations and non-First Nations participants. We find that if First Nations and non-First Nations participants received the same distribution of plan sizes, spending would lower for First Nations participants. This suggest that participants need more supports to access the services in their plans.

For participants in regional and remote Victoria, there are inequities in plan size and spending. We also found that if plans in regional and remote areas were increased to the typical level received by participants in major cities, there would still be inequities in spending.

Our findings suggest that government should direct efforts to removing barriers to spending in regional and remote Victoria.

#### **Aim 2 - Hypothetical plan and support coordination equity interventions for participants with psychosocial disability in regional and remote Victoria**

Using our causal methods, we found that core support plan sizes are larger in regional and remote Victoria compared to major cities, whereas capacity building plan sizes are smaller for adults with a psychosocial disability.

Spending of core supports is similar in regional and remote Victoria, in comparison to major cities, for adults with psychosocial disability.

Our modelling found that under hypothetical scenarios that equalise typical plan sizes and the planned amount and use of support coordination across Victoria would not remove regional and remote inequities in spending. Further modelling is required to estimate the level of plan side and spending side interventions that would be required to close regional and remote inequities in spending for people with psychosocial disability.

Our results also suggest that simply equalising plans and support coordination support across the State would not be sufficient to remove inequities in service use. Rather, particular efforts focussed on regional and remote participants will be required.

### **Aim 3 - Impact of prior experience of State disability services**

We analysed the impact of having previously received State disability services on plan size and spending in participants first plans. We found that its impact varied by disability group.

For example, plan size and spending was similar for adults with psychosocial disability who had previously used State services compared to those who had not. Whereas, after controlling for confounding, there were substantive differences in both plan size and spending for adults with intellectual disability and cerebral palsy.

We also modelled what would happen to spending if plan sizes were set to the typical level of people who had no experience of State disability services. Spending was still higher for previous users of State disability services. This suggests that the higher level of spending for this group is not only attributable to larger plan sizes. It could be due to greater experience of navigating disability services.

We also modelled the impact of previously receiving Individualised Support Packages. We found that, for young adults with intellectual disability, with experience of ISP had larger plan size and spending of core supports. These results suggest participants with no prior experience of individualised disability services may need greater support navigating the planning process and being linked up with appropriate service providers.

A potential limitation of these findings could be there are other factors, for which we do not have quantitative data to hand, that could explain differences between people who entered the scheme from the State system, and those who did not. For example, while do we have data on disability group and a severity score, we do not have comprehensive data on participants' needs, which could have influenced whether an individual was eligible for State services prior to the NDIS. These results should be interpreted with this in mind.

### **Impact of utilising assistive technology supports on subsequent core spending, people with cerebral palsy**

We found that participants with higher assistive technology utilisation get larger 'assistance with daily life' support in the subsequent plan and spend more of this support in comparison to participants with lower assistive technology utilisation. However, the results need to be interpreted with caution. There is considerable statistical uncertainty. Furthermore, because of the complexity of utilising assistive technology, we are concerned there are unmeasured factors that we have been unable to control for.

For example, obtaining approval for assistive technology is very time consuming. Supporting documentation from in-demand occupational therapists is often required. Following this, there may be a need for customisation and/or trialling of the technology and a further round of engagement with an occupational therapist.

As a result, it is possible that assistive technology spending could be a proxy for informal supports or a participant's resources. This could lead to a person being able to advocate for and then consequently spend additional core supports.

Future research on the interaction and impact of given NDIS supports on subsequent ability to use their plans more effectively, need to take into account and/or capture the informal support and advocacy of participants. This will help us understand the role of informal support networks and where participants may require more support from government and the NDIA to use their plans effectively. Quantitatively this may require linkage of NDIS to further population data sources, such as the census to capture more information on the context in which participants live.

## **Conclusions**

Consistently, across our range of research aims that cover different inequities within the scheme, our carefully controlled analyses show that inequities arise in barriers to spending NDIS funds. There are not inequities in plan size for First Nations and CALD participants, rather the challenge is with spending.

People in regional and remote areas received smaller plans and spend less. Under a hypothetical scenario where plan sizes were equalised across the State, spending would still be lower in regional and remote areas. This suggests that support to remove spending barriers should be specifically focussed on regional and remote Victoria.

We modelled potential plan-side and support coordination interventions for participants with psychosocial disability in regional and remote areas. This modelling showed that spending can be supported by ensuring equitable use of support coordination across the State. But this modest benefit is again balanced by the spending barriers people with psychosocial disability face in regional and remote areas. To lift spending to the levels estimated in major cities, government would have to do more than equalising plan sizes and support coordination use across Victoria. Further research could focus on what combination of plan side and spending barrier interventions would be required to remove regional and remote inequities for people with psychosocial disability. Furthermore, this modelling could be expanded to different disability groups.

Participants without prior experience of State disability services tend to receive smaller plans and spend less. Again, modelling shows that new disability service users face particular barriers to spending. Further research is required to understand how exactly new users of services can be supported when they enter the scheme.

Finally, further research is required to understand the role of informal supports that enable use of supports for participants in the scheme. This would help inform future quantitative analysis that attempts to disentangle the impact of capital support use on other support categories.