Service use patterns at a high-volume homelessness service

A longitudinal analysis of six years of administrative data

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About the Unison Housing Research Lab

The Unison Housing Research Lab is a unique education and research collaboration between RMIT University and Unison Housing. The Lab is located in the Social and Global Studies Centre, one of two research centres in the School of Global, Urban and Social Studies (GUSS). The Lab was established in 2017 and is funded for five years to develop and implement a collaborative teaching program, and undertake innovative policy and practice-relevant housing research informed by the experiences of services users and providers.

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The aim of the Unison Housing Research Lab *Research Report* series is to develop a clearer understanding of who Unison works with, and identify areas where systems development is required. This series involves deep analysis of administrative data collected by Unison Housing to drive decision-making.

The Lab also produces a *Think Piece* series. This series critically examines theories and evidence that are influential in the areas of social housing and homelessness, and that are pertinent to Unison's mission, policies and practice.

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Executive Summary

This report uses longitudinal administrative data to examine service use patterns over a six-year period at Unison's Initial Assessment and Planning (IAP) service.

Unison's IAP service operates in Melbourne's west and provides a range of services to large numbers of 'at risk' and homeless households. Access to specialist support services occurs via IAP services.

Existing research, primarily from the US, suggests that patterns of shelter use vary and that an association exists between the characteristics of shelter users and the frequency of shelter use. No comparable work has been published in Australia.

We investigate two questions.

1   **What proportion of households are new to the IAP service each year, and does the proportion change over time?**

The report shows the proportion of households presenting to Unison for the first time is steadily declining each year. When we view the data by month there is much greater volatility but by June 2018 the proportion of new and return households was approaching parity. Without further data we can only speculate on whether the increasing number of return households is a positive or negative metric of service quality.

2   **Are different patterns of service use associated with different household characteristics?**

Over the six-year period we found four distinct patterns in the way households use the IAP service. A significant majority (67 per cent) of all the households used the IAP service just once – they had a single support period[1] in a single year and did not return. A smaller group, comprising 12 per cent of all households, had multiple support periods but only in one year. Overall, 79 per cent of households presented in one year only.

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1   A 'support period' is the period of time a client receives assistance from a Specialist Homelessness Service. It relates to the provision of a service and/or supported accommodation. Accessed at aihw.gov.au/about-our-data/our-data-collections/specialist-homelessness-services-collection

A smaller number of households returned over a longer period. There were two such groups. The first group were those who opened single support periods in multiple years. They accounted for 11 per cent of all the households. The final group, who returned in multiple years and had multiple support periods in those years, accounted for 10 per cent of all the households. While these two groups accounted for 21 per cent of service users they consumed nearly half of all the support periods (41 per cent) and support days (43 per cent).

Although patterns of service use varied between households, the association between household characteristics and the frequency of service use was weak. Indeed, in contrast to previous studies, **we found no evidence that a single attribute or set of attributes will predict whether households will return or not.**

Recommendations

Based on our findings Unison might consider implementing three changes to enhance service design and improve service outcomes.

1 First, Unison should trial a prioritisation approach based on past service use. Our findings provide strong evidence that this would be a more effective way of breaking the cycle of regular service use than existing approaches that typically prioritise clients with certain personal characteristics. By taking advantage of the rich historical information it holds on households who use the service regularly, Unison, in partnership with RMIT, can identify regular service users and then provide them with priority access to resources including financial assistance, transitional housing, Private Rental Assistance Program (PRAP) and transitional support.

2 Second, Unison should develop a specific service stream that prioritises single-parent households who regularly use the service. Given that single-parent households have low support needs, a rapid rehousing-style intervention would be the most suitable response for this group.

3 Third, Unison should explore a streamlined repeat access process for Housing Establishment Funds (HEF) and consider alternate service options in order to free up HEF resources for other groups.

Abbreviations
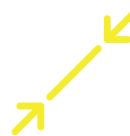
AIHW	Australian Institute of Health and Welfare
DHHS	Department of Health and Human Services
HEF	Housing Establishment Fund
IAP	Initial Assessment and Planning
PRAP	Private Rental Assistance Program
SHIP	Specialist Homelessness Information Platform
SHS	Specialist Homelessness Service

Introduction

Introduction

Numerous studies examine 'how many' and 'who' uses homelessness services. This has assisted policy makers and service providers to design targeted service interventions that meet the needs of different groups. However, these studies provide little information on patterns of service use over time. This is important information because patterns of homelessness service use vary. Some households might only use a service once. Others use services multiple times but over a relatively short period. Still others use homelessness services on multiple occasions over a long period. Establishing how much variation there is in service use patterns and why service use patterns vary is actionable information.

> *Policy makers and service providers can use this information to further enhance service design and improve service outcomes.*

In the past, administrative data collected by homelessness agencies in Australia could not adequately answer questions about service use patterns over time because data was limited to 12-month periods. However, in 2012 new computerised client management systems were introduced across Australia. These systems can track individual households over different years. This has opened new opportunities to systematically examine service utilisation patterns.

In this report, we examine patterns of service use at Unison's IAP service over a six-year period. We start by reviewing the relevant literature, and then present some standard information on Unison IAP service activity over the last six years. We then outline our overall research approach, which is followed by two empirical sections. In the first empirical section, we investigate the proportion of new clients that present to Unison's IAP service each year. In the second empirical section, we investigate the patterns of service use, before examining the association between levels of service use and household characteristics.

Background

In the 1990s, two researchers from the US were the first to recognise the potential of computerised client management systems to examine shelter use patterns. Their work was to have far-reaching consequences. Randall Kuhn and Dennis Culhane (1998) analysed administrative records maintained by shelter providers in New York and Philadelphia. Their dataset contained information on every new client who entered the shelter system over a three-year period,[1] as well as their entry and exit dates from the shelter system.

They identified three distinct groups based on their frequency and duration of shelter use. The first group they called the **'transitionally homeless'**, who only briefly entered then exited the shelter system. This group accounted for 80 per cent of shelter users. They were white, younger, and less likely to have mental health or drug problems. The **'episodically homeless'** accounted for 10 per cent of shelter users. They were less likely to be white and more likely to have medical, mental health, and substance use problems. The final group, the **'chronically homeless'**, also accounted for 10 per cent, and their physical and mental health was the poorest. They were also older and less likely to be white. Although the 'chronically homeless' accounted for only 10 per cent of shelter users, they consumed half the shelter days.

> *The importance of their work cannot be overstated. The recognition that a small group of homeless individuals not only used a disproportionate share of shelter days but were 'trapped' by a system designed to help them contributed to a major policy shift in the US (and worldwide) towards a Housing First approach (Johnson et al.; 2012, Pleace, 2011).*

Researchers subsequently built on Kuhn and Culhane's work using administrative records from homelessness services across the US. They used this approach to better understand associations between service utilisation patterns and their determinants, and between service outcomes and service use patterns in other jurisdictions, such as the criminal justice and health systems (Metraux et al., 2003; Goering et al., 2014). Furthermore, by linking administrative datasets, researchers identified the high costs of maintaining people in a state of homelessness (Culhane and Metraux; 2008, Ofstehage et al., 2011).

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1   In order to deal with left and right censoring issues, not all of the records in the administrative dataset were used in Kuhn and Culhane's analysis. The data were "processed to give all persons three years of exposure for shelter time, and to deal with problems of censoring of observations at both the beginning and end of the data collection period." (p. 213)

While researchers in the US and other countries regularly use longitudinal administrative data to drive service reform, few Australian researchers have. This is largely a result of the client management systems used by homelessness agencies in the past only collecting data over 12-month periods, so that each 12-month period could not be linked to previous or subsequent periods. In 2012, the situation changed when new client management systems were implemented across the country. Not only did these systems harmonise data collection procedures at homelessness agencies, they generated a unique ID for every household that presented at a homelessness service, meaning that households could be tracked over multiple years. Some welfare agencies use their own client management systems, but many use SHIP – Specialist Homelessness Information Platform. Regardless of what client management system an agency uses, each system must comply with and supply Specialist Homelessness Services collection data. For this report, we accessed Unison's IAP data through SHIP.[2]

The availability of longer-term data offers important opportunities to see more than the 'who' and 'how many' of homelessness service use. Yet, despite the capacity to track households there has been no published academic papers on patterns of Australian homelessness service use over time that we are aware of.

However, the Australian Institute of Health and Welfare (AIHW)[3], have started to take advantage of the longitudinal capacity of various client management systems. For instance, the AIHW analysed the number of new households presenting to Victorian homelessness services each year. They found the number of new clients was decreasing while the number of repeat clients was increasing, although why this occurred and what the implications might be were not canvassed (Australian Institute of Heallth and Welfare, 2017).

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2   For further information about SHIP see: www.aihw.gov.au/about-our-data/our-data-collections/specialist-homelessness-services-1/approved-client-management-systems
3   The AIHW are the data custodians of all Specialist Homelessness Services data.

A more detailed analysis by the AIHW (2019) examined service use patterns of people in short-term or emergency accommodation over a four-year period. They identified three cohorts. The smallest group were **'persistent users'** (14 per cent). These were clients that had at least one support period in each of the four years. **'Service cyclers'** (43 per cent) had at least two support periods over the four years, while **'transitory service users'** (43 per cent) had a single support period only. Like Kuhn and Culhane, the AIHW found that people with more complex needs used services more frequently. Unlike Kuhn and Culhane, they did not incorporate processing steps to minimise the effects of left censoring, which may bias their results towards underestimating the service frequency of some clients.[4]

While progress is being made, there is still much to do. In the US, the focus has been on shelter users, a response that we do not have in Australia. The AIHW reports are based on aggregated data from all Specialist Homelessness Services (SHS) across the country. This approach obscures important differences in the focus and role of different homelessness agencies. This is particularly relevant in Victoria because of the presence of both high-volume and specialist support agencies.

In Victoria there are over 130 homelessness agencies. The majority, about 80, are funded to provide 'specialist transitional support'. These agencies support people who are homeless, or 'at risk', by providing case management support and crisis, transitional and supportive housing. Transitional support agencies typically focus on specific cohorts such as young people, people leaving prison, women experiencing domestic violence and so forth, although there are 'generalist' support agencies as well.

In contrast to transitional support agencies, high-volume agencies – sometimes called Initial Assessment and Planning (IAP) services in Victoria – assist large numbers of 'at risk' and homeless households. IAPs are the front door to the homelessness service system in Victoria, which means that access to specialist support services occurs via them.

Unison's IAP service is the the front door for households seeking support in Melbourne's west, including parts of the CBD. For those that do not get access to transitional support agencies, which is a significant majority, high-volume agencies operate as a triage system.

> *Along with initial assessment of client housing and support needs, the core roles of an IAP service include information, advice, referrals, and emergency financial assistance for homeless people or households at risk of homelessness.*

4   It is important to note that it is not practicable to completely remove left censoring and right censoring bias for most real-world populations, short of a) having data on people for their entire lives, or b) having a topic confined to a specific historical context. However, left and right censoring can be exaggerated in some datasets and ignoring it can lead to misleading conclusions. The single-year dataset is the most extreme example. We have opted to follow Kuhn and Culhane's approach of excluding clients beginning in either or first or last year of the dataset, but the AIHW approach to only exclude clients beginning in the last year of the dataset, has other advantages. The common ground is in recognising that using the entirety of the administrative dataset is undesirable.

Due to high demand, most IAP services maintain a prioritisation list as a way of matching limited support resources to clients' needs, although there is no formally defined, consistent approach to assessment and prioritisation.

Several studies have examined 'who' uses high-volume services. Our earlier report[5] looked at who used Unison's IAP service, and the report also touched on patterns. While it found a general pattern of worsening circumstances as exposure to homelessness increases, we analysed data from a single year only (Johnson and Watson, 2018). As far as we can tell, there has been no systematic longitudinal analysis of service use patterns at high-volume services. In this report, we use six years of longitudinal data collected by Unison's IAP service to develop a better understanding of service use patterns over time. More specifically, this report addresses two questions:

1   **What proportion of households are new to the IAP service each year, and does the proportion change over time?**

2   **Are different patterns of service use associated with different household characteristics?**

Before we address our two research questions, the next section examines three measures of annual service activity commonly used by homelessness agencies – the number of unique households, the number of support periods, and the number of contacts. Following this summary of annual service activity, we then describe the approach we use to answer our research questions.

5   Johnson, G. and Watson J (2018) *'Diversity and complexity: Examining the characteristics of 'at risk' and homeless households in Melbourne's west'.* Melbourne: Unison Housing.

Patterns over time: The standard approach

Patterns over time:
The standard approach

Every three months, Unison's IAP service submits data captured in SHIP to the AIHW, which then produces quarterly and annual reports. These reports address standard questions about 'who' and 'how many' people use their IAP service.

The reports often run to 70 pages or more. The result can be described as a form of information overload, as the agency is tasked with trying to make sense of a large and complex set of findings that can seem to point in inconsistent directions. Information overload of this sort inhibits the ability to use data to deliver the best decision, or to effectively assess the impact of decisions. For an agency striving to become data-driven, the paradox is that Unison has too much data but not enough analysis. Further, the focus on 'who' and 'how many' is done at the expense of the question of 'how often', which means that Unison has little information about patterns of service utilisation over time. As we argue in the introduction, this sort of information is important.

In this section, we limit our analysis to **three measures** that provide a basic picture of annual service activity, and which provide the foundation for our subsequent analysis of service use patterns over time.

A key measure of service activity is how many unique households present to the service each year, irrespective of whether they have been to the service in previous years.

Table 1 shows that the **number of unique households** presenting to Unison's IAP service over the last six financial years remained relatively stable for the first five years but increased by just over 20 per cent in 2017-18. There are likely to be several factors that contributed to the increase. It may be that more people are experiencing housing stress. This seems a plausible explanation, but it is difficult to prove. We do know that the service changed its operational model in 2016 from an appointment-based approach to a drop-in model. The increase in the number of households likely reflects improved access.

Table 1: Number of unique households with active support periods[6] by financial year

Year	Unique households (N)	% change
2012-13	3,302	–
2013-14	3,038	-8.0
2014-15	3,104	2.2
2015-16	3,047	-1.8
2016-17	2,933	-3.7
2017-18[7]	3,537	20.6
TOTAL	**18,961**	**–**

A second measure of service activity is the **number of support periods**. Despite support periods being a less reliable measure than unique households, agencies are set 'support period' targets each year. While the value of setting support targets for high-volume agencies is questionable given the influence of exogeneous factors outside an agency's control, Table 2 shows that the number of support periods followed a similar pattern as that for unique households – there is little variation in the first five years and then a 23 percent increase in the last reporting period (2017-18).

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6   These totals are based on active support periods. This means that support periods are assigned to one or more financial years based on the start date and the end date, and whether any days of a given support period fall within a given financial year. Totals based on active support periods can potentially count support periods and their associated households in multiple years, and therefore will not always match totals based on either start date ('support period opened') or end date ('support period closed'). Totals in later sections of this research are based on the start date of the support periods ('support period opened'). This means that support periods can be assigned to only one financial year.
7   We match our data extraction process with data obtained from the SHIP SHS Statistical Profile reports. In 2013-14, SHIP reported 3,263 unique households; in 2014-15 SHIP reported 3,326 households; and in 2017-18 SHIP identified 3,539. We are unable to explain this anomaly at this stage.

Table 2: Number of active support periods by financial year

Year	Support periods (N)	% change
2012-13	4,257	-
2013-14	3,821	-10.2
2014-15	3,799	-0.6
2015-16	3,724	-2.0
2016-17	3,659	-1.7
2017-18	4,487	22.6
TOTAL	**23,747**	**-**

A third measure is the **number of contacts**. Contacts are the least reliable and most volatile measure of service activity and can reflect changes in demand but also changes in organisational practice. Table 3 highlights the volatility in contact data with large increases reported in 2013-14, 2016-17, and 2017-18.

Table 3: Number of contacts by financial year

Year	Contacts (N)	% change
2012-13	14,891	-
2013-14	18,434	23.8
2014-15	19,393	5.2
2015-16	18,008	-7.1
2016-17	20,858	15.8
2017-18	28,875	38.4
TOTAL	**120,459**	**-**

Considered in isolation, contact and support data do not say a great deal. However, if we look at the ratio of unique households to the number of support periods, and also the ratio of unique households to the number of contacts (Table 4), an interesting pattern emerges.

The ratio of unique households to support periods is relatively constant over the six years, with every household receiving 1.25 support periods on average. However, the ratio of unique households to contacts shows a consistent increase over the six years, particularly in the final two years. Indeed, in 2017-18 the average number of contacts per unique households is nearly twice that reported in 2012-13.

There are several possible reasons for this – staff may be recording contact information more assiduously, but it also might be that because support options are more limited and housing market conditions tighter, IAP staff have to do more for each household to secure any assistance, be it support, housing, or both.

Table 4: Ratio of unique households to active support periods, contacts, by financial year

Year	Unique households to active support period ratio	Unique households to contact ratio
2012-13	1.29	4.51
2013-14	1.26	6.07
2014-15	1.22	6.25
2015-16	1.22	5.91
2016-17	1.25	7.11
2017-18	1.27	8.16
AVERAGE	**1.25**	**6.34**

Despite the limitations with these three measures (households, support periods, and contacts), they provide important insights into the volume of service activity at Unison's IAP service. However, to develop an understanding of service utilisation patterns over time – that is, how often people come to the service – requires a more sophisticated treatment of the IAP dataset. This sort of information can be highly beneficial to agencies and policy makers, enabling them to develop more fine-grained responses to the households that present to their service.

> *Longitudinal administrative data presents a unique opportunity to better understand long-term patterns in service use, rather than the blinkered short-term view previously presented by single-year datasets.*

In the next section, we explain our treatment of Unison's IAP SHIP data.

Patterns over time: Harnessing the longitudinal potential of SHIP

Patterns over time: Harnessing the longitudinal potential of SHIP

Assembling a dataset that allows us to examine patterns of service utilisation is a complex activity. SHIP IAP data contains over 100 variables. Some variables relate to the characteristics of presenting households, some relate to a household's circumstances at the start of each support period, and some relate to the administrative details of the support period itself. Further, data can be organised by the start date of a support period, the dates when a support period is active, or the date when a support period was closed.

SHIP data is best understood as a series of transactional records collected at a point in time, with each record independent of others, but able to be linked together, when necessary, by a unique household ID.[8] We took an exploratory dimensional modelling approach,[9] given that the two questions we wanted to investigate each presented a different perspective on the same underlying data. We present the approach we use to answer each question separately.

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8   Only a limited amount of information on distinct clients is readily available via SHIP's reporting system. This is because data collection is based on support periods rather than distinct clients. Further information is available from the Australian Institute of Health and Welfare (AIHW), which produces state and national annual reports that contain data on the gender, household composition, age, labour force status, and place of birth of distinct clients.

9   By 'exploratory dimensional modelling', we refer to a combination of dimensional modelling (a technique associated with data warehouses, in which transactional data is built into different sets of facts and dimensions), and exploratory data analysis, in which different sets of perspectives of the same data are explored before delving into hypothesis testing.
Dimensional modelling: en.wikipedia.org/wiki/Dimensional_modeling
Exploratory data analysis: en.wikipedia.org/wiki/Exploratory_data_analysis

Question 1: New and repeat clients

Approach

This part of the analysis exploits the unique ID that SHIP allocates to each household, and also the timing of the start of each support period. We extracted all individual support periods opened in six financial years, commencing 1 July 2012 and finishing 30 June 2018. There were 23,487 unique support periods during these six years.[10]

However, some of the support periods opened in any given year are for households that are new to the service, and some are for households that have visited the Unison IAP service previously. In order to count the number new households over time we identified the first support period start date for each household. Any subsequent presentation to the service was classified as a 'return'. We then grouped transactions and counted the number of unique households for each combination of financial year and return status.

We used 2012-13 as our baseline year. It is important to note that we classify all households as "new" in 2012-13 but some of these households will likely have been to the service before the dataset began. Nonetheless, the approach we took with the available data enabled us to illustrate trends in new and repeat clients over time. We also repeated the process to categorise each support period as "new" or "repeat" within individual months, rather than financial years.

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10   This figure counts support periods only once, based on their start date. It does not count support periods for each financial year in which they are active, hence the slight difference in Table 2.

Findings and discussion: a numbers game?

We found that the percentage of new households declined in each successive financial year, from 81 per cent in 2013-14 to 70 per cent in 2017-18. This is shown in Table 5.

Table 5: Counts and percentages of new and returned unique households by financial year

Year	Total unique households this financial year	New households this financial year	Return households this financial year	% New households this financial year	% Return households this financial year
2012-13	3,302	3,302	-	100	-
2013-14	3,006	2,443	563	81	18
2014-15	3,065	2,325	740	76	24
2015-16	3,019	2,229	790	74	26
2016-17	2,884	2,037	847	71	29
2017-18	3,497	2,442	1,055	70	30
TOTAL	**18,773**	**14,778**	**3,995**	**-**	**-**

Without additional data, any interpretation of the wider implications of households returning, and whether this is a positive or negative metric of the quality of service provided, is speculative. However, what we can say with some confidence is that the declining percentages of new households evident in each successive year is, in part, just a "numbers game". We explain this next.

We know that over time the number of households that have used the service previously increases. In 2013-14, just over 3,300 households had been to the IAP service previously. The following year, the cumulative total number of households that had previously been to the service increases to over 6,300 households, and in 2014-15 to over 9,370.[11] Each year the pool of potential return households increases. So even if the chances of returning are small but constant, the number of households who return will continue to rise over time.

Using financial years to organise the analysis provides a sense of gradual change, but practitioners know that service activity is much more volatile. When we view the data by month this is exactly what we see.

In Figure 1, we can see shorter-term "spikes" or fluctuations in return households, but we also see, month upon month, an overriding trend towards new and return households approaching parity.

After November 2013, the percentage of new households by month never again exceeded 70 per cent. After September 2015, the percentage of new households by month rarely exceeded 60 per cent, and in the last month of the dataset, June 2018, it was 51 per cent. Given the expanding pool of people that have used the service previously, declining percentages of new households over time are, for all practical purposes, inevitable.[12] However, dropping *numbers* of new households over time are not inevitable, but the outcome of combining the relatively abstract numbers game of return households with the real-world phenomenon of carrying capacity.

What is **carrying capacity**? Carrying capacity can be thought of as how much can be done (or how many people can be seen) given the available resources. The IAP service does not have a prescribed limit on household numbers it can assist. However, the carrying capacity of any IAP service is constrained by the number of staff it has and the way its service delivery model is configured. This means there is a practical limit to the number of households that can open a support period in any given timeframe.

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11   When we refer to 'households that have used the service', we refer to cumulative totals of new unique households from preceding years. Each household is counted once, for the first year it appeared in the data. For 2013-14, the total households who had used the service before, was just the count of new unique households from 2012-13 (3,302). For 2014-15, there were 6,308 households that had used the service already: the new households from 2012-13 (3,302) plus the new households from 2013-14 (3,006). In 2015-16 the total was 9,373: 2012-13 (3,302) and 2013-14 (3,006) and 2014-15 (3,065).

12   Steady or increasing percentages of new households each year are not impossible but are highly improbable. This would require exponential growth in demand from new households each year: not just growth in numbers, but growth in the growth rate itself, enough to each year outweigh the expanding pool of preceding households.

Figure 1: Household percentages by month: new and returned
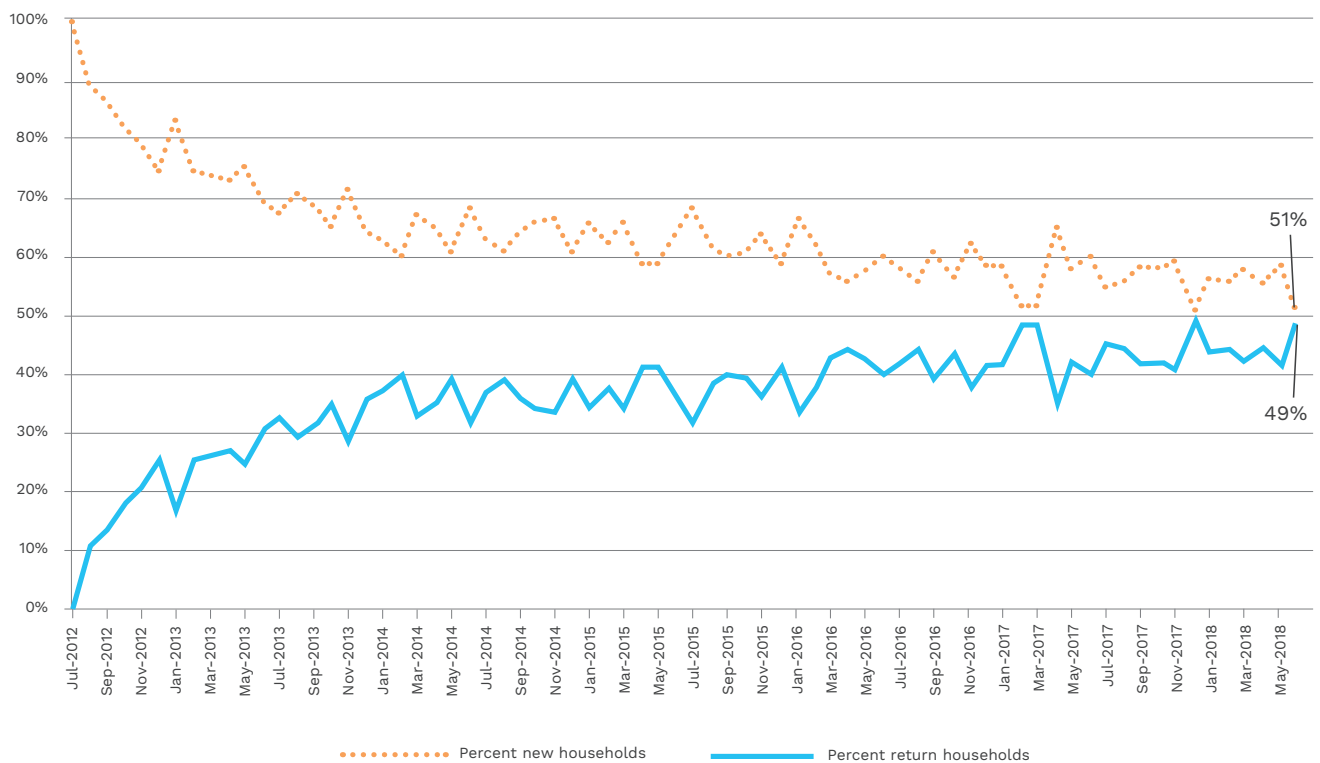
Given that the percentage of new households declines over time, if we combine this with a limited carrying capacity of the number of unique households that can have an open support period in a given timeframe, then we can expect to see the actual numbers, not just the proportion, of new households declining over time. This is exactly what can be seen in Table 5 (column 3), although the same effect can be seen in finer detail in Figure 2. While fluctuations are visible, the larger trend over the 72 months is the number of new households trending downwards.

Figure 2: Household counts by month: total, new and return

Legend: Total unique households — New unique households — Return unique households
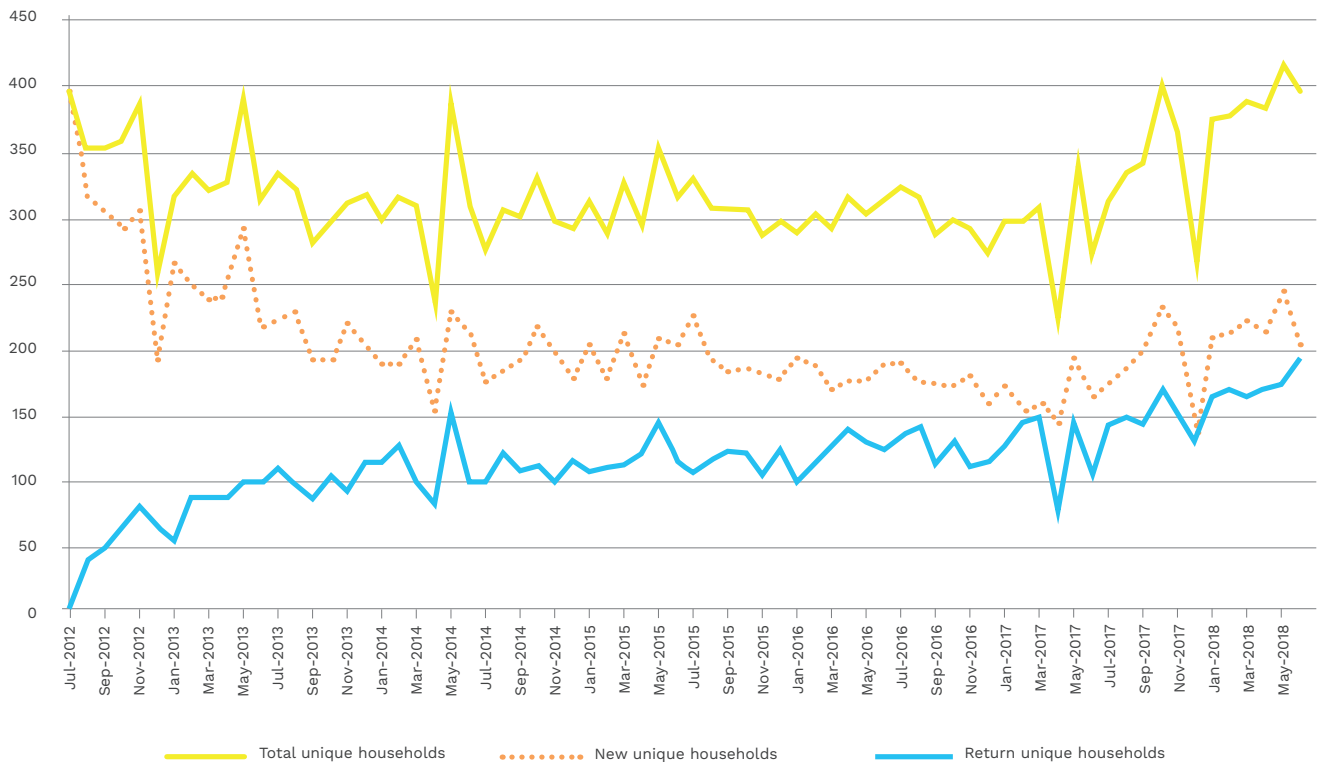
However, a change can be seen in mid-2017. After a low in April 2017, total unique household counts by month trended upward, reaching an all-time high of 415 households in May 2018. In step with this, the new household counts also increased. What happened?

In 2017, the carrying capacity of the IAP service increased. This occurred through a **change in the operational model** rather than an increase in staffing resources. The IAP increased access by changing from an appointment-based service, in which the number of appointments in any given week was fixed, to a drop-in service. This change has had a noticeable effect on the number of unique households opening support periods, and on the numbers of new households.

While improved access arrangements resulted in an increase in both new and return households, the new model still has a limited carrying capacity, albeit higher than the previous approach.

> *Short of restricting the ability of households to return to the service, the only way to increase new household numbers is through increasing the carrying capacity of the IAP service as a whole.*

As the existing model offers a high level of accessibility, then the only option to increase the carrying capacity is to increase staffing resources. With no change in staffing numbers, then new household *numbers*, as well as percentages, *will* decline each year.

One final point is worth noting before turning our attention to the second question. Despite the ever-increasing numbers of households who could return, by the final year of the dataset, **the number of households who did not return far outweighed the total of all households with a support period that year**.

Figure 3 shows yearly totals alongside cumulative totals of households who have ever had a support period. Here, we see that the cumulative total of households over the six-year period reached 14,778 by 2017-18. As expected, this matches the total number of unique households in the dataset (Table 5). But it was also 11,281 more households than had a support period in that year (3,497). Put another way, in the last year of the dataset, 76 per cent (11,281) of the households who *could have returned did not*. In the next section we look in greater detail at the patterns of household returns that this figure hints at.

Figure 3: Counts of unique households by financial year, with cumulative total
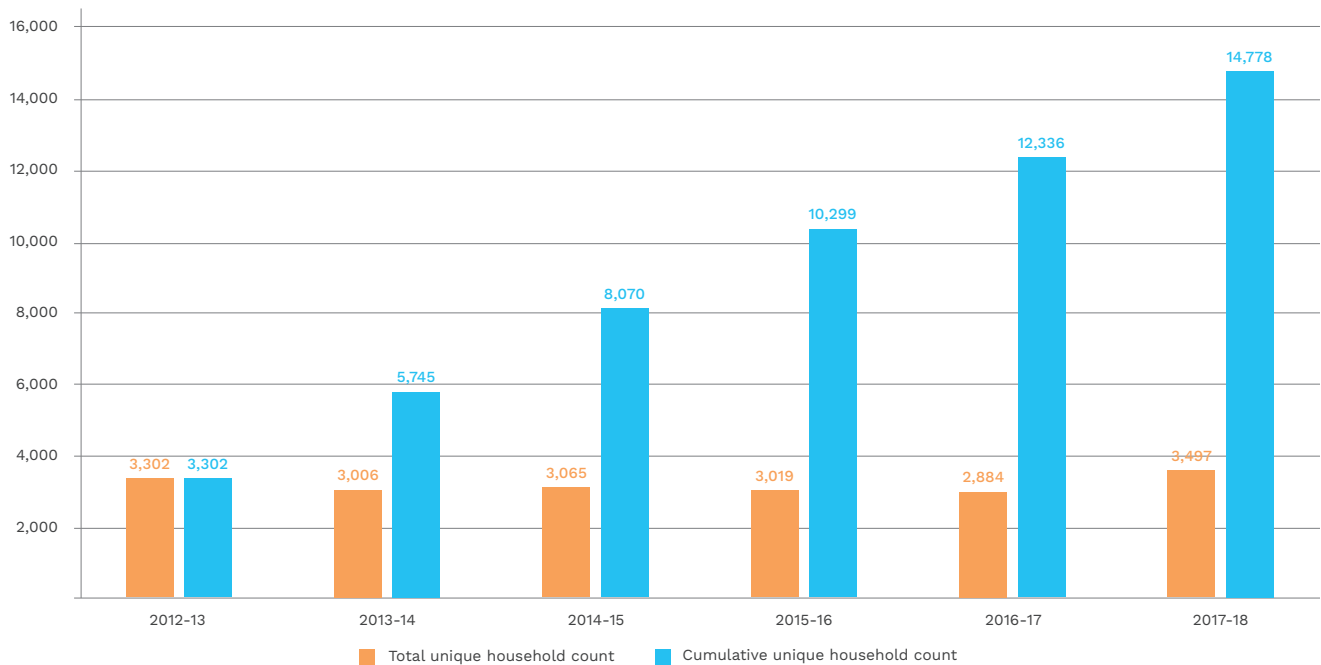
From the data in Figure 3, in combination with the data presented earlier, we can infer that some households return, but also that many do not - otherwise, there would be a great deal more households each year. What are the exact numbers of households who could have returned, but did not? And, is this mostly random, or are there differing characteristics between households who return and households who do not? We focus on these questions next.

Question 2: Characteristics of occasional and regular service users

In this section, we turn our attention to the second question – are the characteristics of regular service users different from those who use the service only occasionally? We look at the same underlying data as for Question 1, but from a different perspective. We first identify how many households return – whether in multiple support periods, in multiple years, or both. We then investigate whether the characteristics of households who return are different from those who do not return.[13]

Approach

For this question, we wanted to reduce the effect of left-censoring and right-censoring bias. While it is impossible to remove this bias entirely, it is possible to reduce it. Our approach was to remove all records for households with their first support period in the first financial year of the dataset (2012-13), as well as all records for households with their first support period in the last financial year of the dataset (2017-18). This is a comparable approach used by Kuhn and Culhane (1998) in their analysis of US shelter usage. It means that all households under consideration for this question could have at least two years in the Unison IAP dataset in which a return support period could appear. Excluding the households beginning in these two financial years reduced the dataset to 9,034 unique (unduplicated) households and 14,154 support periods.

For each household identifier, we counted the total support periods opened and the total unique financial years in which support periods were opened. This meant that each household identifier had a combination of both a financial year count (the number of different years they presented in) and a support period count (the total number of support periods provided overall). We then looked at the different combinations of financial year count and support period count, and counted the total households with each combination.

Some extra processing steps were necessary to compare household characteristics because the IAP SHIP data comprises transactional data at support period level, not at household level. Accordingly, we needed to combine data from support period records for every unique household. We built a script to count different characteristics captured in respective support periods for each unique household, thus organising support period level data into household level data.

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13   This is a somewhat more complicated question than quantifying returns in particular years or months, as there always remains the possibility that households may return at some point in the future, so this question ventures into less certain territory than for Question 1. However, we do have five full years and thousands of households with which to observe the rates at which households do return.

Some fields were handled with special consideration, the most critical being what we call "flag" fields. These are fields in which 0 or 1 values represent "no" or "yes" for respective characteristics. These flag fields often varied within households over time. Accordingly, for flag fields we incorporated two approaches to aggregating from support period to household level:

- If the household had this characteristic flagged at the **start** (in their first support period); and

- If the household **ever** had a support period with this characteristic flagged.

We then imported the dataset combining the number of times each household presented and the set of other household level characteristics into a statistics program (SPSS), and ran a bivariate Pearson's correlation test across all the available fields. This provided a simple test of the strength and direction of any linear relationships between patterns of service use and various household characteristics.

Four patterns of service use

We found four distinct patterns in the way households use the IAP service over the six-year period (Figure 4). A significant majority (67 per cent) of all the households used the IAP service just once – they had a single support period in a single year and did not return. A smaller group, comprising 12 per cent of all households had multiple support periods, but only in one year.

> *In total, households that presented in a single year accounted for 79 per cent of all households.*

While most households did not return, and a small number of households returned in the same year, a small number of households returned over a longer period. There were two such groups. The first group were those who opened single support periods in multiple years. They accounted for 11 per cent of all the households. The final group accounted for 10 per cent of all the households. This group opened multiple support periods in multiple years. **The two groups that returned in multiple years accounted for 21 per cent of all households.**

Figure 4: IAP service use frequency groups
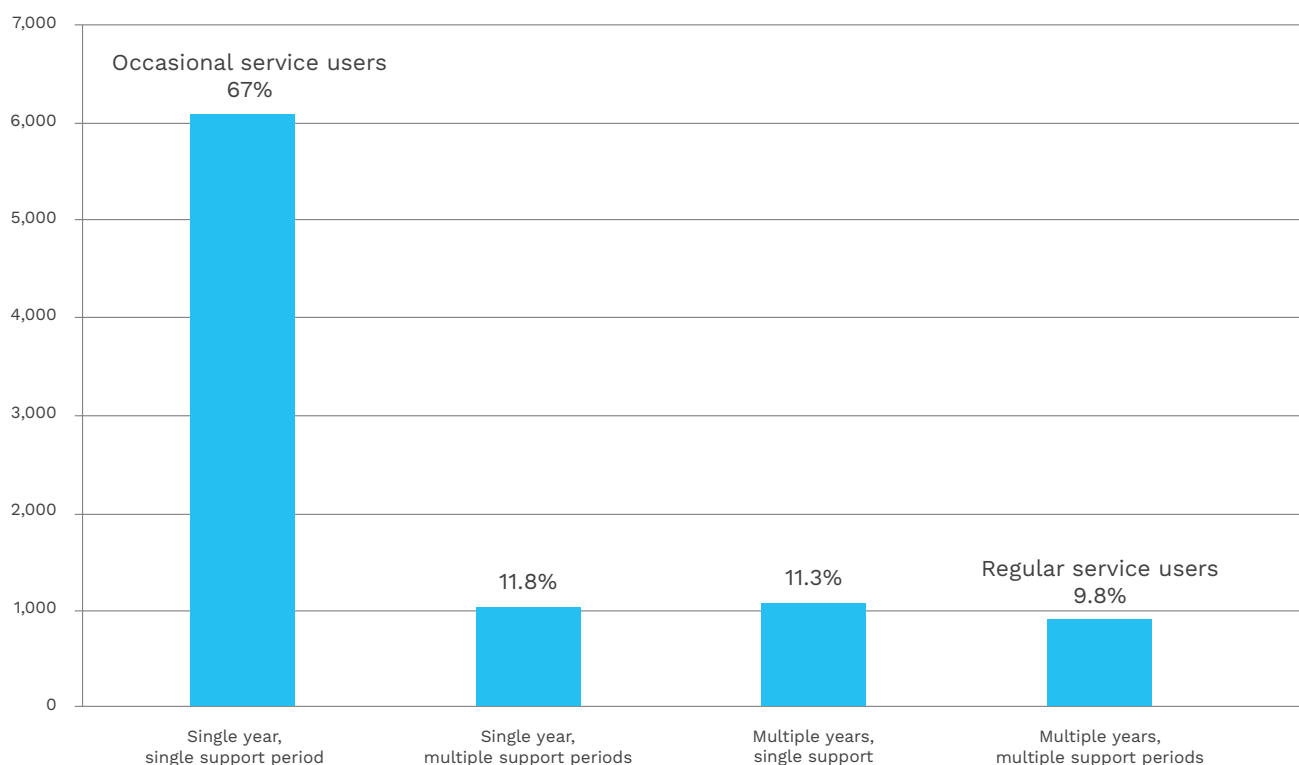
While all four groups are important to consider, we focus on the two groups at either end of the service-use continuum. Both groups offer particular perspectives to take into consideration. On the one hand, it is important not to overlook the characteristics of households that make up the clear majority of IAP service users – those households that use the service *only once and do not return*. We refer to this group as **'occasional users'**. On the other hand, the smaller group of households who return often, who we call **'regular users'**, are important to consider because they make up a large proportion of service use, and because their characteristics can tell us about areas in which IAP services have been more or less effective.

While occasional users accounted for two thirds of all service users, they consumed only 43 per cent of support periods and 41 per cent of support period days. In contrast, while just one in 10 service users were regular users, as a group, regular users consumed 25 per cent of support periods and 26 per cent of support period days. If we include every household that returned to the service in multiple years (whether once or many times in each year), just over one fifth (21 per cent) of service users consumed nearly half of all the support periods (41 per cent) and support days (43 per cent).

Despite the IAP being a high-volume triage service, there is a broad similarity between our findings and other studies of administrative datasets relating to homelessness, in terms of the split between **large number of households using small amounts of service time, and a smaller number of households using large amounts of service time.** Indeed, our results are not that dissimilar to what Kuhn and Culhane (1998) and others have found: the consumption of homelessness services is uneven with a pattern of approximately 80 per cent transitional or light users and 20 per cent frequent users (Benjamin and Andrade, 2015; Culhane, et al., 2007).
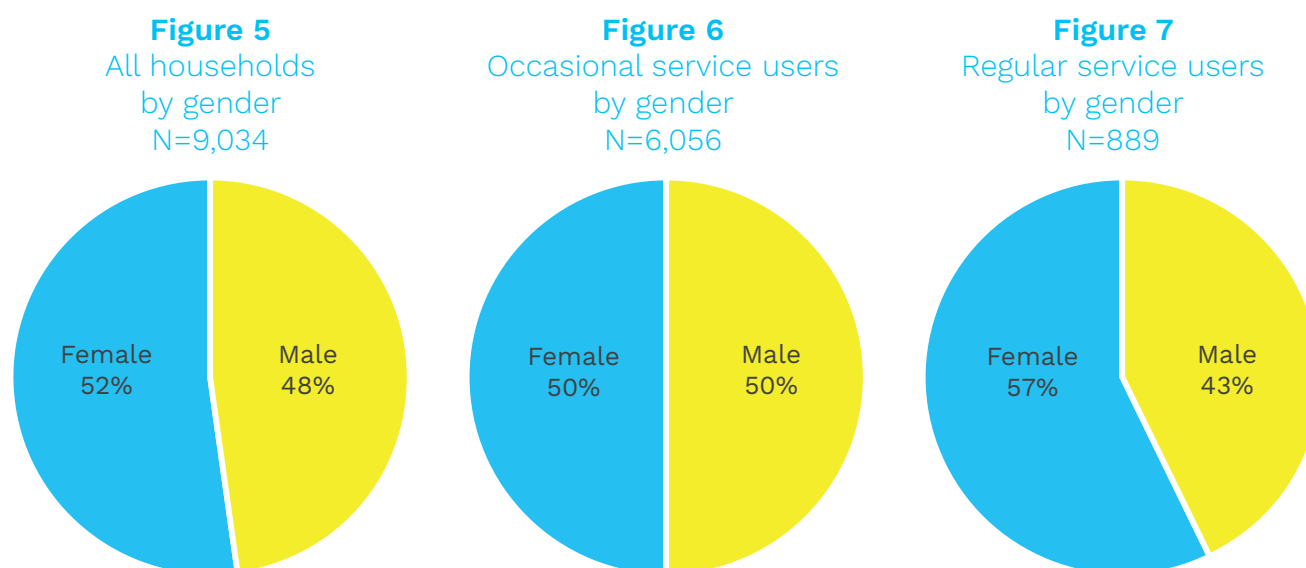
Comparing characteristics

Having identified different patterns of service use, the obvious question is **why do service use patterns vary between households?** This seemingly simple question is not easy to answer, but as a starting point we investigated whether the characteristics of households who used the service repeatedly (regular users) differed from those of households that used the service only once (occasional users).

Our assumption leading into this investigation, based on previous studies, was that the characteristics would differ significantly. More specifically, we expected to find that regular service users would be significantly more likely to have mental health or problematic substance use issues, and more likely to be single and male.

We analysed the data from several perspectives and the results challenged these expectations. The characteristics of those who used the IAP service regularly were similar to occasional service users. The data did not support our assumption that households with certain characteristics such as being male or single would be heavy service users.

For instance, single-person households were the largest living arrangement in the dataset (49 per cent), but single-person households accounted for a larger proportion of occasional service users (50 per cent) than regular users (46 per cent). Quite unexpectedly we found that, while just over one in five households were one-parent families (22 per cent), one-parent families returned at a disproportionately high rate compared to households with other living arrangements. One-parent households made up 20 per cent of occasional users and 29 per cent of regular users.

Likewise, for both male and female households (of any composition[14]), most households did not return. But when households did return, female households did so more often than male households (Figure 5, 6 and 7).

Figure 5
All households
by gender
N=9,034

Female
52%

Male
48%

Figure 6
Occasional service users
by gender
N=6,056

Female
50%

Male
50%

Figure 7
Regular service users
by gender
N=889

Female
57%

Male
43%

Similarly, our assumption that mental health issues and substance use issues would be strongly associated with regular service use proved unfounded. Although the statistical associations were positive they were only weakly significant.

It is worthwhile expanding on this. When we look at the proportion of people with certain characteristics (e.g. unemployed; with mental health issues; etc.), we observe a higher proportion among those who are regular service users – hence the weakly significant associations. For instance, Table 6 shows that 39 per cent of regular users have ever been flagged for mental health issues, more than three times the proportion observed among occasional users. The pattern is much the same across all the selected variables: among households who were flagged for any of these fields, the proportion that returned regularly was three to four times higher than among the occasional users.

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14   'Households' in the IAP system refers to the presenting unit needing assistance together: whether a single person, a single adult with children, a couple with children, etc.

Table 6: Ever flagged selected characteristics, differences between service use groups, %

Characteristics	Occasional N=6,056	Regular N=889
Housing affordability stress	23	74
Lack of family or community support	12	46
Mental health issues	12	39
Problematic alcohol or drug use	5	17
Unemployment	18	57

Based on the results in Table 6, it is tempting to draw the conclusion that there are significant differences in the characteristics of the two groups; and that these differences alone form a sufficient basis for targeting interventions to specific groups to reduce repeat service use. While it is true that there are differences between the groups, relying solely on the proportions of people with a certain attribute in each group **obscures the critical point that most people with the same attribute do not return**. The raw numbers demonstrate this. Returning to the mental health flag as an example: while the proportion of households flagged with mental illness who were regular users was much higher than occasional users, the **actual number of households** flagged with mental health issues who were occasional users is more than double the number of those who were regular users (748 vs 344). In short, many people with mental health issues use the service just once. The same pattern holds for every attribute which explains why the associations are either weakly significant or not significant at all.

Our results suggest that for the IAP service to use household characteristics to 'predict' who might come back would produce many false positives (e.g. falsely identifying someone with a mental health issue as a high risk of return) and result in inefficient use of scarce resources.

> *So, while it is true that some characteristics are found more often among regular service users than among occasional service users, the core point is that there is no single attribute or set of attributes with which to identify households that are likely to become regular service users.*

There are many combinations of characteristics that could render a household more likely to return to the IAP service, but it seems to be an illusory exercise to seek to identify "the" set of characteristics to predict return.

A drug problem, for example, will increase the chances of returning to the IAP service, and this presents a relatively neat, low-hanging-fruit explanation for not having suitable housing or the money to pay for it, and thus becoming a regular IAP service user. But focusing on this characteristic might give the impression that drugs alone can account for return service use; that without drugs, return use is unlikely. This can be a tempting take-home message, particularly for policy makers responding to urgent issues. Our research shows the clear majority of returning households have *never* been flagged for drug use, and that nearly half of the households flagged for drug use still do not return. The same is true of other characteristics, like mental health issues or lack of family support. From here, it might then be tempting to combine other characteristics, and add them together to arrive at a composite "silver bullet" of complex needs. But the natural laws of entropy[15] guarantee that ever more combinations will await.

Thus, we wish to emphasise that focusing on specific variations among service users can be useful, but only up to a point, and it should always be undertaken with some reference to the bigger picture.

> *In lieu of undertaking the complex task of building a full predictive model, using patterns of past service use to target specific households might be the more efficient way of reducing heavy service use and freeing up IAP resources.*

If there is no silver bullet, **what might Unison do to reduce heavy service user?** Unison's IAP service holds rich historical information. However, given limited resources and with over 800 regular users, Unison cannot target every regular service user. A more fine-grained analysis of regular users shows that even among regular users there is variation in service use and some consume many more service days than others (Table 7).

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15   See: jamesclear.com/entropy

Table 7: Distribution of support period day counts for regular service users (n=889)

Support period day count		Household count	% Regular users	Cumulative % of regular users
From	**To**			
0	20	424	47.7	47.7
21	40	243	27.3	75.0
41	60	117	13.2	88.2
61	80	61	6.9	95.1
81	120	40	4.5	99.6
121	150	4	0.4	100

Indeed, when we examined the number of support period days consumed by the top 10 per cent of regular users, we found that they accounted for nearly one third of all support period days – or, put another way, 90 households consumed over 7,600 support period days. Not only would prioritising the heaviest service users and working directly with them to break the cycle of heavy service use be a feasible approach, it could be progressively implemented with a long-term objective of reducing the number of regular service users to zero.

→ *A note on multiple year returns*

Our focus so far has been on the two groups at either end of the service use continuum. We noted earlier (Figure 4) that about 11 per cent of households return to the service in multiple years, but generally only once a year. **These households are different from regular service users because they return *sometimes* rather than *often*.**

This pattern of service use can be partly explained by policies dictating how the agency can use the Housing Establishment Fund (HEF). Currently access to HEF is limited to once every 12 months. This seems a reasonable way of rationing HEF to ensure the largest number of people can be assisted. However, an unintended consequence is that some households manage their housing costs by factoring in the possibility of accessing HEF each year.

This possibility was put forward by an IAP employee and provides an important qualitative context to quantitative patterns. Unfortunately, there is no field in the dataset that can confirm HEF funding was accessed, except for the free-text "referral details" field that occasionally mentions "HEF" or "housing establishment". But this prospective explanation is not inconsistent with the data.

The characteristics of this group who return sometimes are quite different from regular users. The housing affordability stress and financial difficulties flags appear more frequently and show a stronger association with this group than flags like mental health and problematic alcohol or other drug use, which are more often found among regular service users.

→ *A note about timing: Flag fields over time*

Some household characteristics change over time. The "flag" fields, in particular, often change for households in different support periods. This could be because the issues developed over time, or because more information was collected over time, or because identifying these flags early on helped to resolve them. Most likely, it is a combination of these factors.

Table 8 highlights differences in the proportion of flagged characteristics that were identified at the start compared to flagged characteristics ever identified.

Table 8: Proportion of "flag" fields at start or ever

Characteristics	Households flagged (ever)	Households flagged at start	% Households flagged at start vs ever
Domestic and family violence	1,134	899	79
Employment difficulties	511	295	58
Financial difficulties	5,286	4,402	83
Housing affordability stress	3,010	2,052	68
Housing crisis (e.g. eviction)	4,164	3,330	80
Lack of family and/or community support	1,646	1,043	63
Medical issues	1,234	867	70
Mental health issues	1,585	1,137	72
Problematic alcohol use	185	118	64
Problematic drug or substance use	558	378	68
Unemployment	2,318	1,643	71

For instance, there were 1,134 households flagged for domestic or family violence, and nearly 80 percent of these households (N=899) were flagged in the first support period. This is a higher rate than for many other flag fields, and higher than, for example, employment difficulties (58 per cent flagged at the start) or problematic alcohol use (64 per cent flagged at the start).

The different recording patterns between domestic violence and other flags fields prompts two possible interpretations. First, it emphasises the inherent challenges for workers undertaking an initial assessment in a high-volume, housing-focused service. Second, it highlights the thorny ethical issue of how much information can be reasonably obtained at first assessment, given that there is both a time cost and an emotional cost to asking and answering some questions.

Clearly, what an IAP worker can ask the first time that a household presents to a service is likely to be quite different from subsequent visits.

In the case of domestic violence, the present evidence suggests that there are benefits to erring on the side of 'yes', looking for signs early on and thus directing households to the right service. In other cases, the trade-off is not so clear: asking detailed personal questions about mental health, family history or drug use of a client who presents with a housing crisis, may not be helpful. Indeed, the question of initial assessment (and its corollary prioritisation) is a topical but complex issue. It is one that we intend to return to in the next report.

Future research: What to do with all this data?

Future research: What to do with all this data?

In common with other administrative datasets, the size and variety of the IAP dataset can be both a help and a hindrance. Applying an exploratory dimensional modelling approach to Unison's IAP dataset offers new insights that would otherwise be extremely difficult to arrive at. But there are literally thousands of potential combinations of characteristics that could be compared across households: at the very least, 113 fields add up to 12,769 different potential combinations, and even more if changes over time were to be taken into consideration.

In future reports, we will extend the analysis to include housing status fields, income types, and addresses, especially those relating to movement across suburbs. We will also look at the length of intervals and the timing between support periods. The inclusion of these areas into the analysis will provide deeper insights into patterns of service use, as well as insights into the more dynamic aspects of housing instability.

Administrative datasets are superficially similar to data collected specifically for research, but they differ on crucial points. The data tends to contain more fields, and more records. The data grows constantly, even if the time to analyse it does not. Data collection is a by-product of other important work, rather than the focus of all work. The positive side of this is that research questions are not decided so much in advance, and we can answer questions that we did not set out to answer at the start. On the other hand, it is common for large datasets of this kind to remain unexplored precisely because they are so large and imperfect that the possibilities are overwhelming.

This complexity points in **two complementary directions** for future work with the IAP dataset. It is, for all practical purposes, impossible for humans to rigorously test all the thousands of potentially significant combinations of fields in a dataset of this size. Often, the practical human response to such a plethora of possibilities is to zoom in on areas they are already interested in – at best this produces a blinkered view of complex data, at worse, a kind of confirmation bias. For data relating to people, especially those in disadvantaged settings, there is an ethical argument for applying machine learning: that is, letting software run through all the possibilities and look within areas that we would never have time to, rather than picking in advance the kinds of people to look at. A possible application for machine learning in the IAP context would be developing and testing a **predictive model for likelihood of return.**

> *Equally important to quantitative software driven data handling, is incorporating more qualitative data.*

Software is very well suited to carrying out the repetitive work that humans do not have time for. It is utterly unsuited to understanding the context of the data or knowing what the data cannot tell it. It is also ponderously slow at coming up with simple explanations. The people who collect the data can provide crucial context to what the digital systems can and cannot capture.

In the future, it will also be important to **incorporate a more detailed model to account for change over time**, comparable to that used for the Journeys Home project.[16] It may also be useful (albeit challenging) to include **linkages to other datasets**, such as Centrelink and other service providers.

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16   Journeys Home is a large, national wide longitudinal panel dataset that sampled at risk, vulnerable and homeless households. It is widely considered to be the best dataset available from which causal inferences of the causes and consequences of homelessness can be drawn.

Conclusion and recommendations

Conclusion

In this report we have made use of longitudinal administrative data to answer questions about patterns of service use at the Unison IAP service. Our research is one of the first to attempt this in a high-volume homelessness service. Our findings show that service use patterns at the IAP service are in some ways similar to what has been reported in other service interventions (e.g. shelter use in the US, as reported upon by Kuhn and Culhane, and broader Australian service use patterns reported upon by the AIHW). But the Unison IAP data also presents distinctive patterns.

With our first research question we sought to find out what proportion of households were new to the service each year, and if this was changing.

> *The evidence we presented is clear – the proportion of new households presenting to the service each year is declining.*

Changes in the proportions of new and return clients can be interpreted in several ways: an increase in the number of people returning to Unison might imply that breaking the cycle of social and economic disadvantage is becoming harder. On the other hand, an increase in the number of new clients might suggest that housing problems are affecting more people in the community. While each argument is plausible we do not have the data to confirm or refute either. However, what we show is that the trend pattern we observed is, in part, a function of the ever-increasing number of people who could return. A steady or increasing proportion of new households would only be possible with drastic growth in service demand from new households, or with the total inability of existing households to return to the service. With this basic numbers game in mind, we should not be alarmed by a long-term trend of declining proportions of new households each year, as this change can be indicative of the absence of wider change.

While declining proportions of new households are, for all practical purposes, an unavoidable exercise in probability, declining numbers of new households are not.

> *Critically, we drew attention to the point that the only way to increase new household numbers, short of restricting the ability of households to return, was to increase the carrying capacity of the IAP service.*

It is not clear how government allocates staffing resources to IAP services – anecdotal evidence suggests considerable disparities between agencies with respect to staffing levels and demand. But Unison is in a more precarious position than most.

Despite the housing affordability crisis, economic conditions for the last three decades or so have been relatively benign. However, a common view among forecasters is that an economic downturn is imminent.

> *A sudden surge in unemployment will have a profound effect on demand overall, particularly for Unison, whose IAP service covers many areas of relatively high socio-economic disadvantage. Without increased carrying capacity, Union's ability to respond equitably and efficiently is likely to be compromised.*

The report shows that while the proportion of new and repeat households presenting to the IAP service in any given month or year is now approaching parity, in the final year of the dataset the clear majority of households who could have returned did not. That is: although many households returned, many did not. We wanted to know why.

Using the data available to us through SHIP, we examined the characteristics of households who returned and households that did not return, to see if they differed in any other way. To do this we had to employ more complex data manipulation techniques, as well as recognising that identifying meaningful associations between characteristics and return service use patterns at the household level is considerably more complex than the issues canvassed in Question 1.

We learnt that households fall broadly into four groups of service use frequency, with the greatest contrast found between occasional service users (that is, households who did not return), and regular service users (households who returned in multiple support periods in multiple years). Looking further into these service use groups, we investigated whether other characteristics differed between these groups, that might provide some explanation for the variation in service use frequency.

> *We learnt that no single characteristic will predict single or repeat service use.*

That said, most households, indeed an overwhelming majority, do not come back to the IAP service. Certainly, agencies can put in place barriers that prevent people returning, but the accessibility of Unison's IAP is a core feature. However, it is also the case that the IAP service can, in most cases, only provide limited assistance. At best, the results signal accessibility of the IAP service and a willingness among different populations at risk of homelessness or experiencing homelessness to repeatedly seek support there; at worse they signal the inability to achieve meaningful outcomes.

Those households that do come back, the regular users, do have some distinctive characteristics, but not necessarily what we expected, nor are they statistically significant. Regular service users are likely to be single males, and they are likely to be flagged for having a mental health issues, problematic substance use issues, and lack of family or community support. This profile, broadly speaking, matches that of other studies of heavy service users. However, we also found that women were more likely to return, particularly single-parent families headed by women. We also found that occasional service users share many of the characteristics found among regular service users, and, given the much larger size of the occasional service user group, there were more households with these characteristics that did not return.

Our results are thus quite mixed. On the one hand, they confirm existing research which identifies an association between high service use and client complexity, but the association is only weakly significant. On the other hand, they show that many people with complex needs only use the service occasionally, and some apparently low-needs households present repeatedly to the service. On reflection, this is not entirely surprising: the IAP is a triage, housing-focused service. Its role it to provide immediate assistance and to direct people into the appropriate service streams. But demand for these streams always exceeds supply. No matter how exactly services are rationed this is the brutal reality for IAP services and the people who use them, for whom the true common denominator is not having suitable housing or the money to pay for it.

> *Our results provide no easy answers for those looking at ways of managing demand and increasing service effectiveness.*

That said, we believe there are a number of concrete actions that Unison can take. In the next section we present three recommendations.

Recommendations
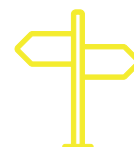
1 ▸ Breaking the cycle of regular service use

Reducing 'churn' in the homelessness service system, and effectively targeting resources, are persistent challenges for homelessness agencies despite being a clear and ongoing policy concern. To address both challenges, the Department of Health and Human Services (DHHS) should work with Unison to trial a prioritisation approach based on past service use. Our findings provide strong evidence that this would be a more effective way of breaking the cycle of regular service use than existing approaches that typically prioritise clients with certain personal characteristics. By taking advantage of the rich historical information it holds on households who use the service regularly, Unison, in partnership with RMIT, can identify regular service users and then provide them with priority access to resources including financial assistance, transitional housing, PRAP and transitional support.

2 ▸ Supporting single-parent families

Unison works with a lot of single-parent families, most of whom are headed by women. Many of these households return to the service on a regular basis. Building on the first recommendation, Unison should develop a specific service stream that prioritises this group. Single parents who regularly use the service typically have low support needs. Given these characteristics, a rapid rehousing style intervention would be the most suitable response.

3 Managing return use of HEF

For low income households, HEF is a valuable resource. Not surprisingly, some households see HEF as a legitimate way of providing periodic relief from their ongoing economic burden. Unison could explore alternative service responses aside from financial assistance and, where appropriate, put in place a process that streamlines repeat access to it. Such an approach would avoid clients and staff having to go through an unnecessarily detailed assessment and, where alternative service responses are available, could have the potential to free up HEF resources for other groups.

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