Health Service Utilization Among Apple Health Clients by Housing Status

Washington State, Calendar Year 2022

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Report prepared for Washington State Department of Commerce.

HOMELESSNESS IS A KEY ISSUE IN WASHINGTON STATE; in 2022 alone, over 200,000 Washingtonians experienced homelessness. Homelessness is associated with poor health outcomes, high use of emergency medical services, high hospitalization rates, and premature mortality (Ryus et al., 2023; Garrett et al., 2020). Given the complex and often reciprocal relationships between homelessness and health (Garcia et al., 2024), it is unclear if those experiencing homelessness would experience similar health outcomes even if they remained housed. In this report, we used administrative data to describe health service use among adults receiving medical assistance through Washington State's Apple Health program. We compare service utilization among clients who became homeless in 2022 ("newly homeless" hereafter) to housed clients and those who were also experiencing homelessness, but not newly so ("previously homeless" hereafter).

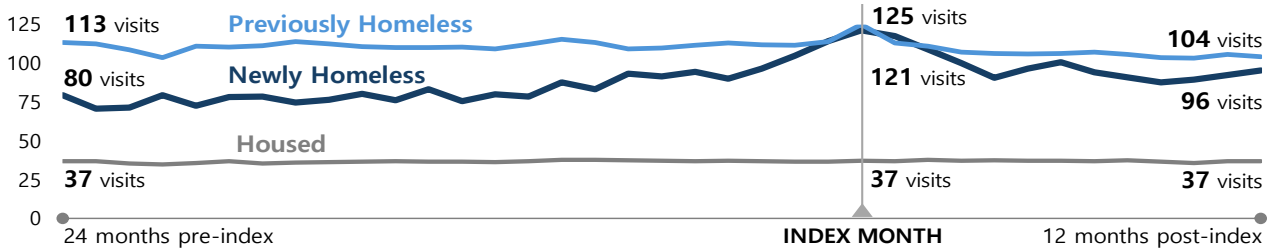
Key Findings

1. **Newly homeless Apple Health clients used health services at higher rates in the 2 years prior to entering homelessness than housed clients and at lower rates than previously homeless clients.** For example, 24 months before becoming homeless, newly homeless clients had an average of 80 Emergency Department visits per 1,000 member months (MM), compared to 37 per 1,000 MM for housed clients and 113 per 1,000 MM for previously homeless clients (Figure 1).
2. **Health service use for newly homeless clients peaked around the time they became homeless.** In the 12 months after becoming homeless, their rates of service use declined but stabilized at levels higher than the time before they became homeless.
3. **Clients who experienced homelessness in 2022 had poorer health in both 2021 and 2022 compared to housed clients, as indicated by higher rates of mental health and substance use disorders, injuries, and infectious diseases.**

FIGURE 1

Outpatient Emergency Department Visits Among Apple Health Clients by Housing Status

Rates per 1,000 member months standardized to the age and gender composition of newly homeless clients



NOTE: Index month represents the first month of homelessness in CY 2022 for newly homeless individuals. See methods for details.

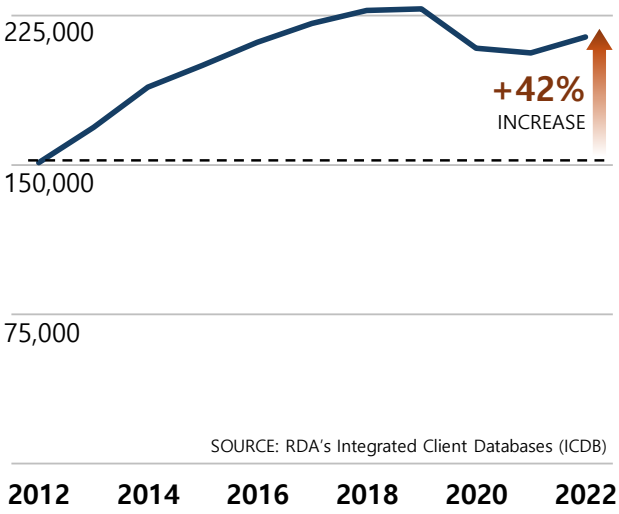
Background

The number of individuals experiencing homelessness in Washington increased by 42 percent over the past decade. Over 200,000 residents were homelessness in Calendar Year (CY) 2022 (Figure 2). Recognizing the growing need for housing services and the considerable individual, social, and monetary costs of homelessness (Garrett et al., 2020; Ryus et al., 2023), former Governor Inslee and the State Legislature increased funding for Washington's homeless crisis response network and implemented several programs to house individuals experiencing homelessness. These programs provide homelessness prevention services to individuals at risk of homelessness, divert individuals with behavioral health conditions from institutional settings (e.g., jail, state hospitals) to housing, and connect people to ongoing care and additional support services.[1]

FIGURE 2

Number of Individuals Experiencing Homelessness

Washington State, CYs 2012 – 2022



SOURCE: RDA's Integrated Client Databases (ICDB)

Although the intent of these programs is to improve the housing stability and wellbeing of participants while reducing total service costs, it is difficult to determine if housing services produce a positive net return on investment. This is because of the complex and often reciprocal relationships that exist between homelessness and an individual's health. For example, individuals with preexisting behavioral and physical health conditions are at greater risk of becoming homeless (Caton et al., 2005; Garcia et al., 2024) and increased use of emergency care and hospital services may coincide with, or even contribute to, the onset of homelessness (Kushel et al., 2023; Treglia et al., 2019). Once an individual becomes homeless, inadequate access to consistent primary care—coupled with heightened exposure to infectious disease in encampments and congregate settings, sleep deprivation, and exposure to the elements—increases the risk of developing additional long-term health conditions and results in a reliance on emergency medical services for healthcare (Feldman et al., 2017; Hwang et al., 2013; Ryus et al., 2023; Salit et al., 1998). This, in turn, makes it more difficult for individuals experiencing homelessness to find housing due to their complex care needs and may contribute to future housing instability even if they do become housed (Kushel et al., 2023).

The complex relationships between health, health service use, and housing status highlight the importance of **1) establishing patterns of health and medical service use over time among individuals experiencing homelessness; 2) capturing changes in service utilization that occur around the time an individual becomes homeless;** and **3) comparing health and service use over time among newly homeless populations to that of housed populations and those already experiencing homelessness.** Results from this report will be useful for evaluating interventions aimed at helping individuals struggling with health and/or homelessness. Focusing on the most effective interventions may help avert deterioration of conditions for these individuals and potentially reduce costs of care and improve health outcomes.

[1] A report by the William D. Ruckelshaus Center lists over 500 housing assistance programs serving Washingtonians experiencing homelessness. The list includes programs falling into the categories of emergency shelters, transitional housing, rapid rehousing, permanent supportive housing, and homelessness prevention. https://s3.wp.wsu.edu/uploads/sites/2180/2021/12/Pathways-to-Housing-Security-Report-FINAL.pdf.

Data and Methods

We used longitudinal data available in the Department of Social and Health Services Research and Data Analysis (DSHS RDA) Integrated Client Databases (ICDB) to better understand how health service utilization patterns among Apple Health beneficiaries experiencing homelessness differ from those of housed beneficiaries, particularly around the time that they became homeless. The study population included adult Apple Health clients ages 18 to 59[2] who were divided into three subpopulations based on their housing status in calendar years (CYs) 2019 through 2022:

- **Housed clients**, who had no indications of homelessness in CY 2022 or the prior 3 years;
- **Newly homeless clients**, who were identified as experiencing homelessness in CY 2022 and had not previously been identified as experiencing homelessness in the 3 years prior; and
- **Previously homeless clients**, who were identified as experiencing homelessness in CY 2022 and in at least one month in the prior 3 years.

We assigned all clients an **index month** which we used to describe health service utilization in a 37-month period (Figure 3). For clients who were newly homeless, the index month represents the month they first experienced homelessness in CY 2022. For housed clients, the index month was randomly assigned within the year. For previously homeless clients, the index month was randomly selected from the months they experienced homelessness in CY 2022[3].

FIGURE 3

Timeline Measures for Newly Homeless Apple Health Clients

Monthly measures in 24 months pre-index through 12 months post-index:

Rate of . . . .
- Outpatient ED visits
- Outpatient non-ED visits
- Hospitalizations
- Primary care visits

Any use of . . . .
- Inpatient SUD treatment
- Inpatient MH facility stays
- Outpatient SUD treatment
- Outpatient MH treatment

* For housed clients, index month in randomly assigned within CY 2022 and for previously homeless clients, index month was random among months in CY 2022 in which clients experienced homelessness.

To observe changes in medical service use over time, we restricted the CY 2022 Apple Health client population to those with at least 20 months of medical coverage in the 24 months prior to index and at least 10 months of coverage in the 12 months following their index month.[4] The final study population was comprised of 713,980 clients—619,976 housed, 12,464 newly homeless, and 81,540 previously homeless clients.[5]

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[2] We exclude clients under age 18 years and over 59 years because individuals in these age ranges are more likely to experience age-specific health conditions and/or be more likely to be diagnosed with some conditions than adults in the 18-to-59-year age range.

[3] Sixty-eight percent of previously homeless clients were identified as experiencing homelessness in all 12 months of CY 2022.

[4] Exploratory data analysis indicated that the percentage of individuals with medical coverage in the pre- and post-index periods varied considerably by housing subgroup. For more information, *see* the *Technical Notes* section of this report.

[5] While these restrictions had a large impact on our overall sample size, they did not appreciably affect the demographic composition of our study population. Housed clients in the restricted sample are slightly older on average than the wider housed population (35.3 versus 34.9 years of age). Also, a higher percentage of newly homeless clients in the restricted sample were female relative to the full sample (56 percent versus 49 percent). For previously homeless clients, a slightly lower proportion of the restricted sample were female than the full sample (42 percent versus 44 percent).

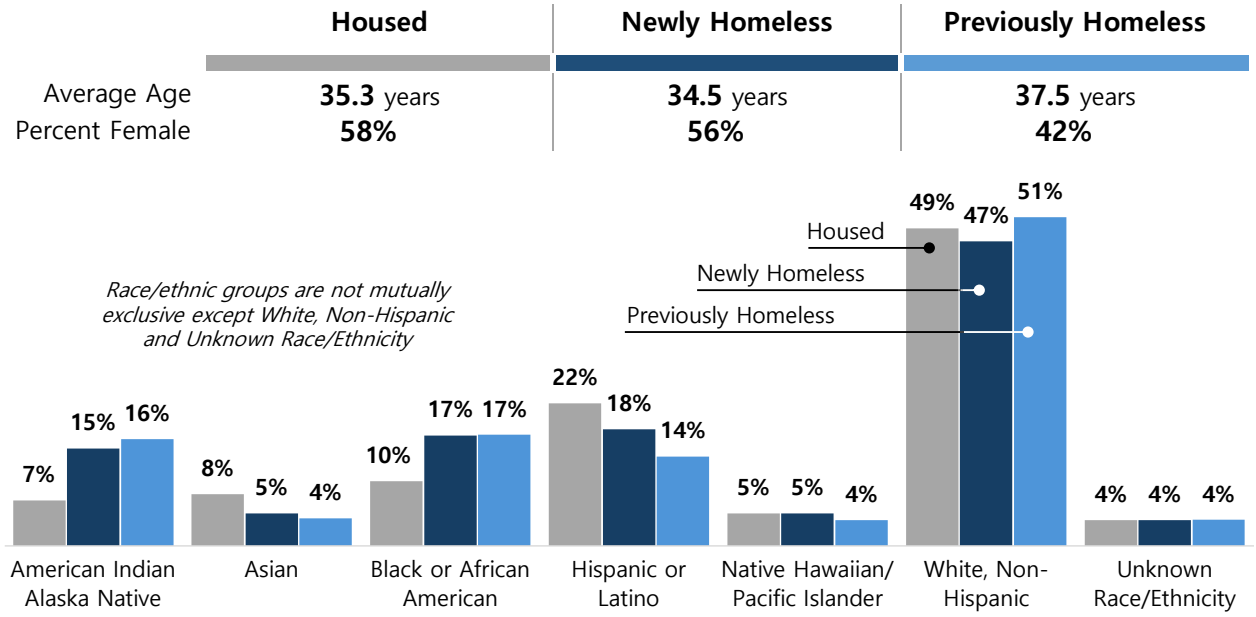
Baseline Client Characteristics

Social and Demographic Characteristics

Previously homeless clients were about 2 to 3 years older on average, and a lower percentage of them were female compared to housed and newly homeless clients (42 percent versus 58 and 56 percent, respectively). Also, as shown in Figure 4, **some race/ethnicity groups were overrepresented among Apple Health clients experiencing homelessness relative to housed clients**. American Indian and Alaskan Native clients made up between 15 to 16 percent of clients experiencing homelessness compared to 7 percent of housed clients. Similarly, 17 percent of newly and previously homeless clients were identified as Black or African American versus 10 percent of housed clients. These patterns were reversed for Hispanic or Latino and Asian American clients: a lower percentage of these groups were clients experiencing homelessness than housed. White, non-Hispanic and Native Hawaiian or Pacific Islander (NHPI) clients were more evenly distributed across the three subpopulations.

FIGURE 4

Social and Demographic Characteristics of Apple Health Clients by Housing Status



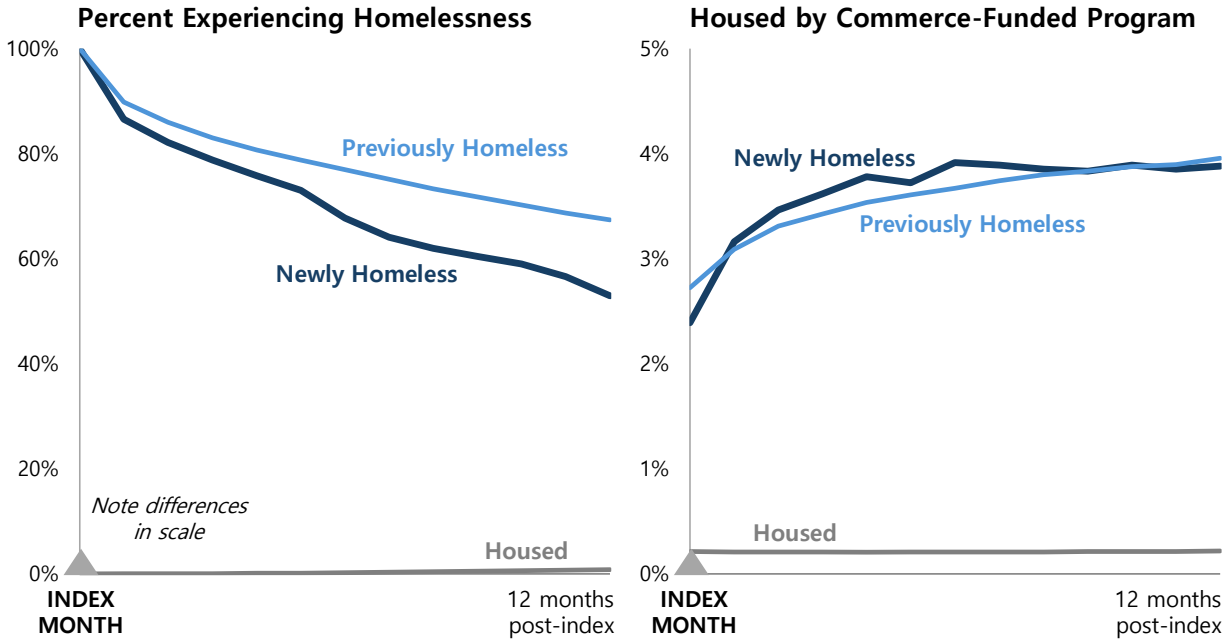
Homeless Trajectories

Slightly more than half of newly homeless clients remained homeless 12 months following their index month (Figure 5). Over two thirds of newly homeless clients were still identified as experiencing homelessness 6 months after index, and 53 percent remained so by the last month of the follow-up period. A higher proportion of previously homeless clients remained homeless at 12 months following index than those who were newly homeless (67 percent). By contrast, less than 1 percent of housed clients experienced homelessness at any point in the 12 months following their index month. Fewer than 5 percent of the clients who experienced homelessness—newly or previously—were housed through Commerce-funded permanent housing, permanent supportive housing, rapid housing, or transitional housing programs post index.[6] These rates were substantially higher than those observed among housed clients (Figure 5).

[6] The percentage of clients accessing rapid and transitional housing increased quickly—though rates remained low—for newly homeless Apple Health clients after their index month before levelling off at around 3 to 4 months later. In contrast, newly homeless clients housed through permanent housing increased steadily in the 12 months following index. Data not shown.

FIGURE 5

Changes in Percent Experiencing Homelessness and in Housing by Commerce-Funded Programs by Housing Status, Across 12 Months Post Index



Health Diagnoses in the 24 Months Prior to Index

Newly and previously homeless Apple Health clients were diagnosed with a mental health disorder at higher rates in CY 2021 - 2022 relative to housed clients (Figure 6). More than a third of newly homeless clients were diagnosed with a depressive (36 percent) or anxiety disorder (38 percent), which was higher than rates observed for previously homeless (28 percent and 30 percent, respectively) and housed clients (23 percent and 27 percent, respectively). Other diagnoses prevalent among newly and previously homeless clients include trauma/stress-related disorders (e.g., post-traumatic stress disorder; 19 to 23 percent), mania/bipolar disorders (10 percent), and schizophrenia and/or other psychotic disorders (8 to 10 percent), all of which were less common among housed clients. Overall, 53 percent of newly homeless clients were diagnosed with any mental health disorder compared to 45 percent of previously homeless and 37 percent of housed clients (data not shown).

Substance use disorder (SUD) diagnoses were more common among newly and previously homeless clients compared to housed clients (Figure 7). Rates of alcohol- (15 to 16 percent), cannabis- (15 to 16 percent), and sedative-related (2 percent) diagnoses were similar for newly and previously homeless clients. Opioid- and stimulant-related diagnoses rates were higher for previously homeless clients than newly homeless clients: 17 percent of newly homeless clients had a diagnosed opioid use disorder versus 26 percent of previously homeless clients, and 18 percent of newly homeless clients had a diagnosed stimulant use disorder compared to 28 percent of previously homeless clients. SUD diagnoses were much less prevalent among housed Apple Health clients than either group of clients experiencing homelessness, ranging from less than 1 percent (sedative-related disorders) to 5 percent (alcohol-related disorders). Overall, 36 percent of newly homeless clients had any diagnosed SUD, a rate between previously homeless clients (46 percent) and housed clients (11 percent; not shown).

FIGURE 6

Mental Health Disorder Diagnoses among Apple Health Clients by Housing Status

CY 2021 - 2022

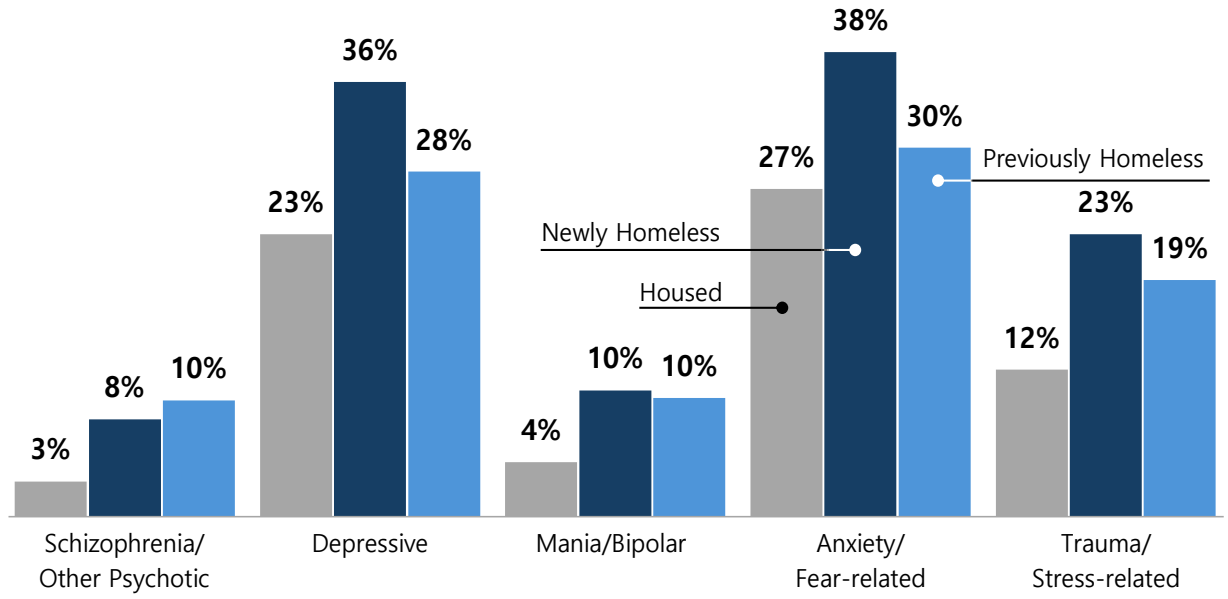
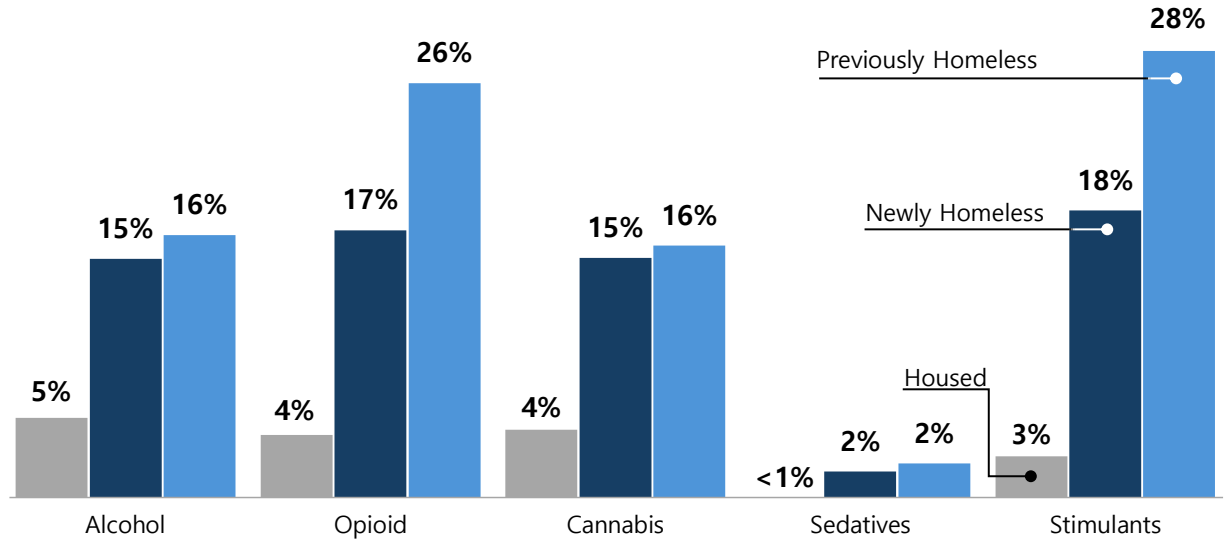


FIGURE 7

Substance Use Disorder Diagnoses among Apple Health Clients by Housing Status

CY 2021 - 2022



Eleven percent of all Apple Health clients were diagnosed with a co-occurring mental health and substance use disorder (data not shown). Housed clients had the lowest rates of co-occurring disorders (8 percent). In contrast, over a quarter of newly homeless (26 percent) and previously homeless (29 percent) clients had co-occurring mental health and substance use disorder diagnoses.

Apple Health clients experiencing homelessness—newly and previously—also experienced higher rates of accidents and injuries in CY 2021 - 2022 than housed clients (Figure 8). Fifty-three percent of newly homeless clients and 50 percent of previously homeless clients had an injury diagnosis in CY 2021 and 2022, compared to 39 percent of housed clients.

The rate of accidental injury diagnoses among newly homeless clients was two times higher than that of housed clients (26 percent for newly homeless clients versus 13 percent for housed clients), and assault-related injuries were five times higher among newly and previously homeless clients (5 percent) compared to housed clients (1 percent).

Finally, rates of infectious disease were highest in CY 2021 - 2022 among clients experiencing homelessness (Figure 9). Thirty-seven to 39 percent of clients experiencing homelessness were diagnosed with an infectious disease compared to 29 percent of housed clients. Diagnosis rates for Hepatitis, viral infections (including HIV), and sexually transmitted infections (STI, excluding HIV and Hepatitis) were also higher for newly and previously homeless clients than housed clients.

FIGURE 8

Accident/Injury Diagnoses among Apple Health Clients by Housing Status

CY 2021 - 2022

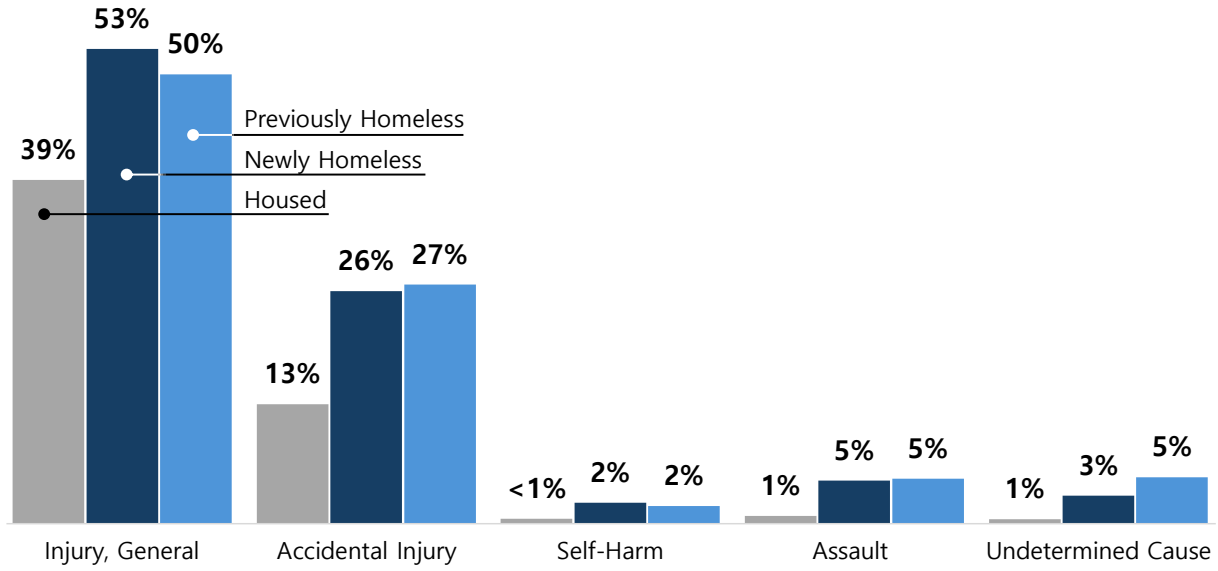
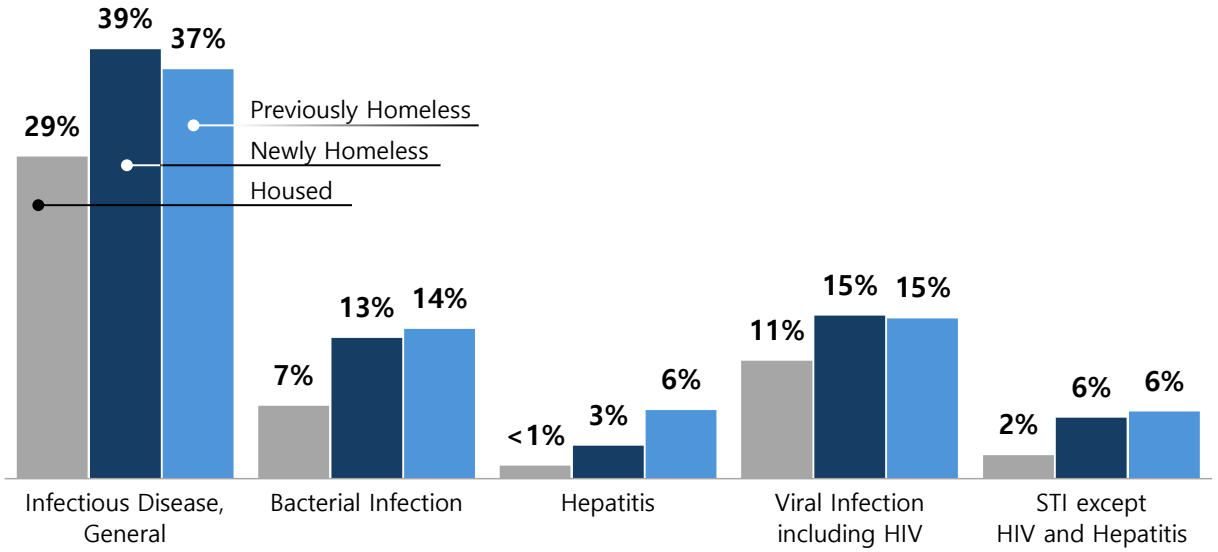


FIGURE 9

Infectious Disease Diagnoses among Apple Health Clients by Housing Status

CY 2021 – 2022



Health Service Utilization

In this section we describe health service utilization patterns for Apple Health clients over a 37-month period that includes the 24 months prior to index, the index month, and the 12 months after index. Rates of health service use among housed and previously homeless clients were adjusted to account for differences in the sex and age distribution of these groups relative to the newly homeless population.[7] Consequently, the adjusted service rates presented in Figures 10 and 11 for housed and previously homeless clients represent their service usage *if the age and sex composition of these two groups were similar to those of newly homeless clients.*

We identified two patterns in healthcare utilization trends among newly homeless clients. First, **newly homeless clients typically used healthcare services at a higher rate on average than housed clients in the two years prior to becoming homeless and, in most cases, at a lower rate than previously homeless clients.** The latter statement was not true for outpatient non-ED and primary care visits, where rates of use were similar in the pre-index period for newly and previously homeless clients, and outpatient mental health treatment service rates, which were higher for newly homeless clients than previously homeless clients throughout the study period. **In addition, service use among newly homeless individuals increased substantially in the 3 months before index and peaked around the month that an individual was identified as homeless.** Service utilization rates at index among newly homeless clients were 1.3 to 4 times the rates for housed clients; these differences were most pronounced for emergency healthcare services (e.g., outpatient ED visits, inpatient hospitalizations, etc.). **Newly homeless clients' use of medical services then declined over the 3 months after becoming homeless and stabilized at rates higher than the pre-index period.**

Second, **inpatient treatment and hospitalization rates were highest the month *before* being identified as newly homeless, while use of outpatient care typically peaked in the month that an individual became homeless.** As shown in Figures 10 and 11, this was true of treatment in both general medical and behavioral health inpatient facilities. This suggests that clients may have experienced some sort of behavioral or physical health crisis immediately before becoming homeless. However, we cannot determine if these events contributed to, or simply coincided with, the onset of an individual's homelessness span.

Measure-specific trends largely followed the patterns described above:

- **Outpatient ED Visits (Figure 10).** ED utilization rates for newly homeless clients increased steadily from an average of 84 visits per 1,000 member months (MMs) in the 24 months prior to index to a peak of 121 visits per 1,000 MMs in their index month. ED utilization then declined over the next 3 months to 93 visits per 1,000 MMs on average in the 4 to 12 months following index, which was closer to the rate among previously homeless clients than in the pre-index period.
- **Outpatient Non-ED Visits (Figure 10).** Like outpatient ED visits, outpatient non-ED visits increased among newly homeless clients in the month immediately prior to index and then peaked in the index month. Non-ED visits increased from 149 to 187 visits per 1,000 MMs at index for newly homeless clients. Rates then nearly returned to pre-index levels in the 12 months after these individuals became homeless.
- **Hospitalizations (Figure 10).** Hospitalizations in general medical settings for newly homeless clients averaged 12 visits per 1,000 MMs in the 24 months to 4 months prior to index, which was roughly 1.5 times the housed clients' hospitalization rate (8 visits/1,000 MMs). Hospitalizations among newly homeless clients peaked in the month immediately prior to index at around 29 visits

[7] Comparisons of the unadjusted rates produced results comparable to those presented here. Note that these adjustments do not account for the racial/ethnic disproportionalities identified earlier in this report. Future work could use more sophisticated modeling strategies to take these and other disproportionalities into account.

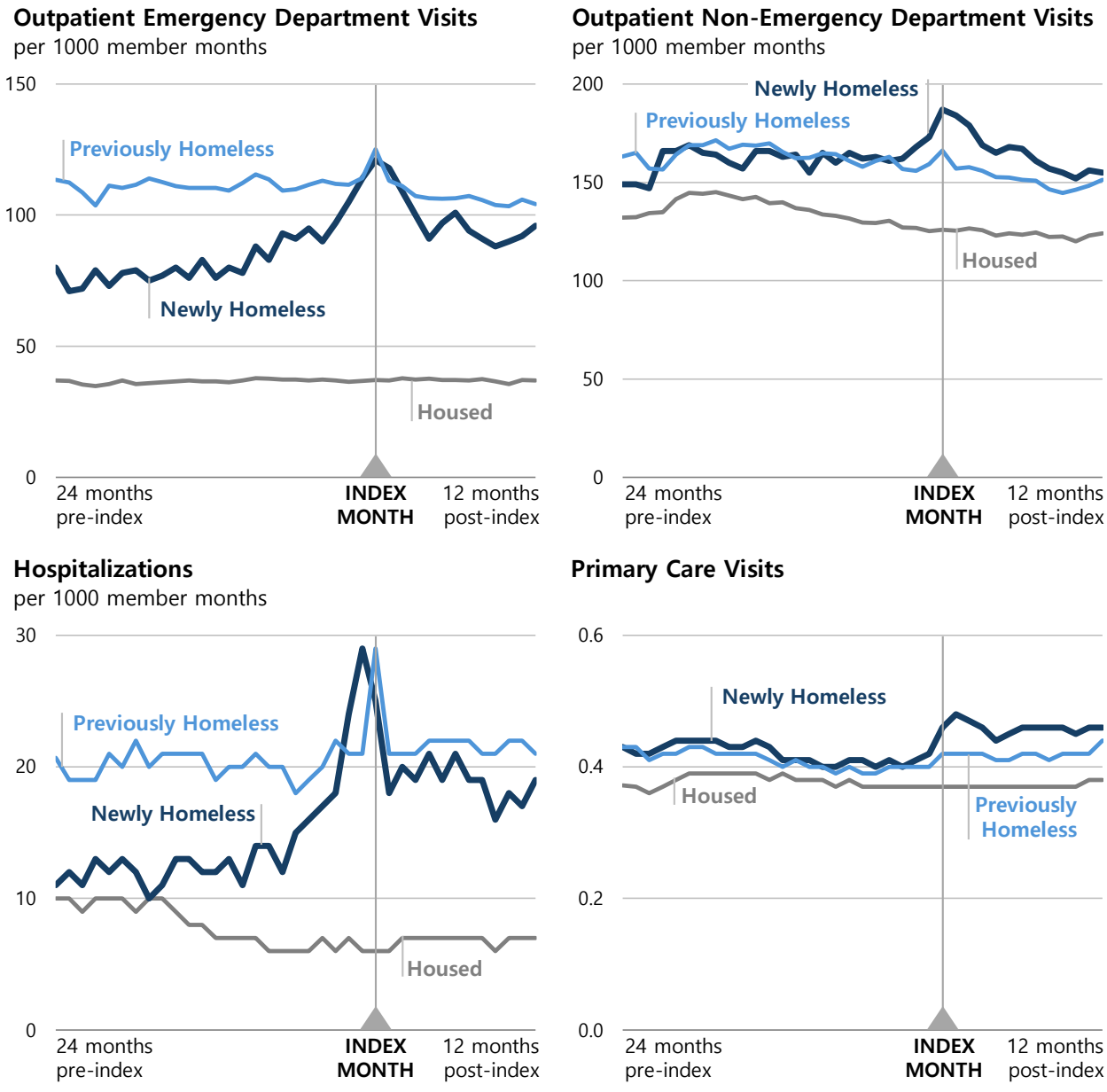
per 1,000 MMs. These rates declined to an average of 19 visits per 1,000 MMs in the 12 months after becoming homeless and were more similar to those of previously homeless clients than they were in the 24-month pre-index period.

- **Primary Care Visits (Figure 10).** The differences in the average number of primary care visits per month between the three housing groups were smaller than for other services. The average number of visits per month was the lowest for the housed clients. In contrast to our other medical utilization measures, primary care visit rates were highest among newly homeless clients in the month immediately *after* they became homeless.

FIGURE 10

Monthly Medical Service Use among Apple Health Clients by Housing Status

Rates standardized by age and gender composition of newly homeless clients

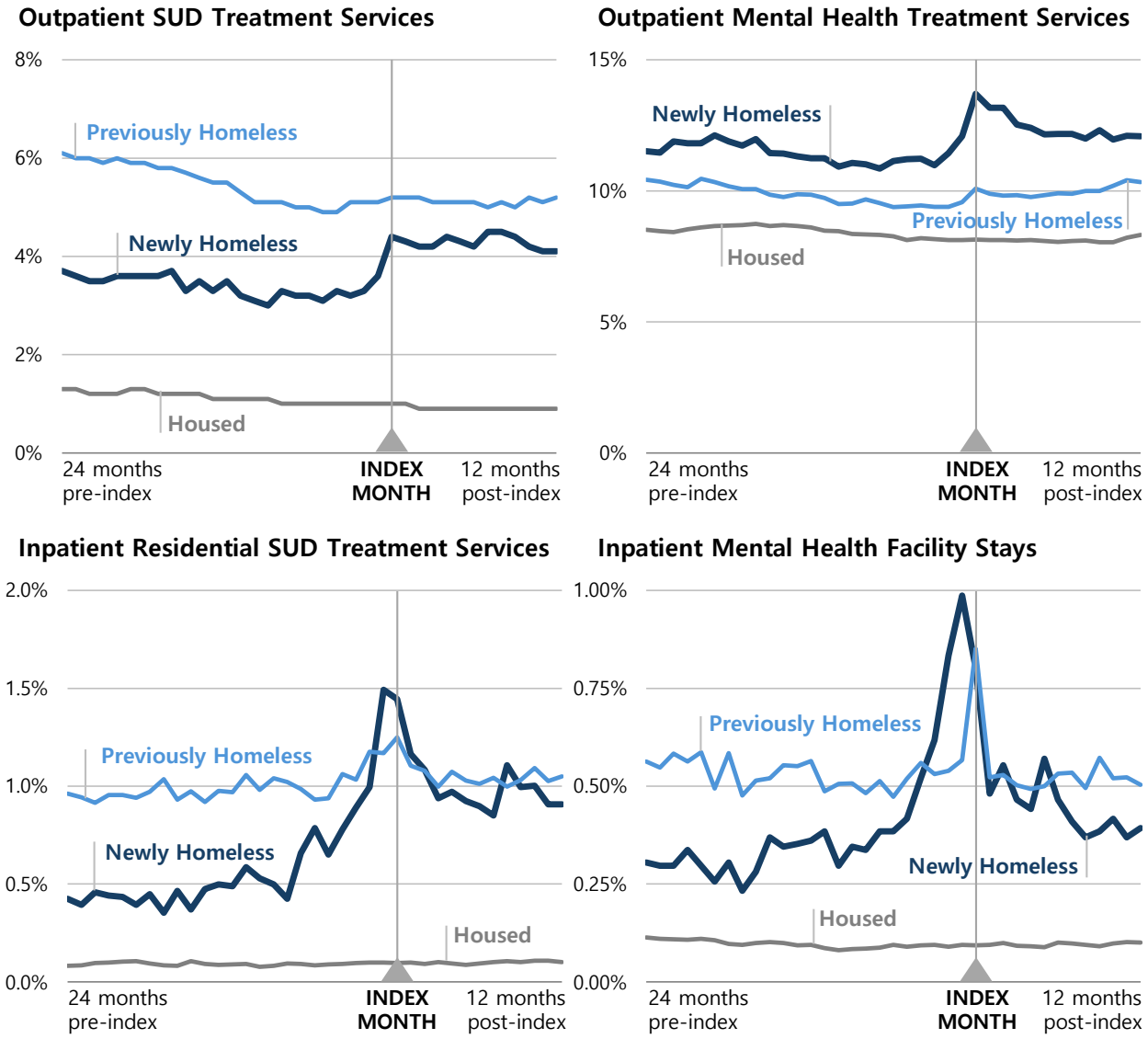


- **Outpatient SUD Treatment Services (Figure 11).** Previously homeless clients accessed outpatient SUD treatment services at higher rates compared to housed and newly homeless clients; however, **service** use rates declined among this population from 6 percent to 5 percent over the 37-month observation period. Outpatient SUD treatment rates also declined among housed clients, but at a slower rate. By contrast, outpatient SUD treatment rates *increased* slightly among newly homeless clients as of the month that they became homeless, stabilizing at rates higher than those observed in the pre-period.
- **Outpatient Mental Health Treatment Services (Figure 11).** On average, 11 percent of previously or newly homeless clients accessed mental health outpatient treatment services in a month compared to 8 percent of housed clients. Outpatient mental health treatment rates increased among newly homeless Apple Health clients by roughly 3 percentage points during their index month before returning to near pre-period utilization rates over the next 4 months.

FIGURE 11

Monthly Substance Use and Mental Health Disorder Service Use among Apple Health Clients by Housing Status

Rates standardized by age and gender composition of newly homeless clients



- **Inpatient Residential SUD Treatment Services (Figure 11).** Inpatient SUD treatment was relatively rare among the groups examined here. Housed Apple Health clients had the lowest average monthly rate of SUD inpatient treatment in the pre-period (0.1 percent), followed by newly homeless clients (0.6 percent), and previously homeless clients (1 percent). As was the case with hospitalizations in general medical settings, inpatient SUD treatment rates almost tripled over the 7 months prior to index, increasing rapidly before peaking at 1.5 percent in the month prior to index. Inpatient SUD treatment rates for newly homeless clients then declined in the 12 months after index to rates more similar to those observed among previously homeless clients.
- **Inpatient Mental Health Facility Stays (Figure 11).** Like inpatient SUD treatment, the percentage of housed Apple Health clients treated in an inpatient mental health facility was consistently lower on average than it was for newly and previously homeless clients in the 12 months prior to index. The percentage of newly homeless clients with a mental health inpatient stay increased over the 7 months prior to index to 1 percent in the month immediately prior to becoming homeless. These rates then declined following the index month to levels higher than in the pre-index period.

Discussion

Over the past several years, former Governor Inslee and the Washington State Legislature made significant investments in housing and homeless services to reduce homelessness, improve the well-being of individuals experiencing homelessness, and reduce use of costly health services among this population. Given the complex, reciprocal relationships between health, health service use, and homelessness, assessing the cost effectiveness of these services requires a baseline understanding of health service utilization among individuals experiencing homelessness in comparison to those who are housed. In this report, we described patterns of health service use among Washington State Apple Health clients who became newly homeless in CY 2022 compared to housed clients and those who were already experiencing homelessness.

Comparisons of housed Apple Health clients and those experiencing homelessness point to potential disproportionalities in who becomes—and remains—homeless. Compared to newly homeless and housed clients, previously homeless clients were older than newly homeless and housed Apple Health clients and a larger proportion were male. Compared to housed clients, a higher proportion of newly or previously homeless Apple Health clients were American Indian or Alaskan Native and Black or African American. Apple Health clients who experienced homelessness in 2022 had poorer health in both 2021 and 2022 compared to housed clients, as indicated by higher rates of mental health and substance use disorders, injuries, and infectious diseases.

We documented health service use in the 24 months prior to being identified as homeless through the 12 months following. Age- and sex-adjusted rates of health service use over the 37-month period consistently showed that housed clients had the lowest rates of service utilization compared to clients experiencing homelessness. Previously homeless clients had relatively higher rates of service use**. For clients identified as newly homeless in CY 2022, health service utilization rates in the time prior to homelessness were substantially higher than for housed clients.** Service use peaked among newly homeless clients around the month they were first identified as homeless (i.e., the index month) before declining slightly over the next 3 to 4 months. **Even though service utilization decreased over the post-index period for newly homeless individuals, service use rates were still generally higher than they were pre-index and were often similar to those observed for the previously homeless population.** Together these results suggest that primary care offices, hospitals and other medical settings are potentially important points of contact where individuals can be screened for and connected with services aimed at preventing or exiting homelessness.[8] Avoiding or reducing the time

[8] For example, the Screening, Brief Intervention, and Referral to Treatment (SBIRT) program identifies medical clients who may need housing supports.

that an individual experiences homelessness could minimize the negative health impacts of homelessness and thus potentially reduce use of more costly medical services.

In contrast to other services, inpatient treatments and hospitalization rates for newly homeless Apple Health clients peaked in the month *prior* to being identified as homeless. This is consistent with other work that shows that a significant proportion of youth and young adults exiting publicly funded inpatient mental health or substance use treatment experience homelessness in the 12 months following exit (Noel-Harrison et al., 2024). Together, these findings suggest that **the state may need to bolster efforts to connect individuals to housing supports[9] following exit from an inpatient facility to prevent future transitions into homelessness**.

Twelve months after being identified as homeless, 47 percent of newly homeless clients were no longer identifiable as experiencing homelessness, though only about 4 percent of these clients were identified as housed through a Commerce-funded program (permanent housing, permanent supportive housing, transitional housing or rapid housing). This suggests that most newly homeless clients who were no longer identified as experiencing homelessness at 12 months following index either (a) became housed through some other means, or (b) remained homeless but were not detectable as homeless due to lack of contact with certain services. The latter likely accounts for a relatively small proportion of clients due to how homelessness is measured in RDA's ICDB.

While these findings indicate that the onset of homelessness is associated with increased health service use, they may not be generalizable to all individuals experiencing homelessness in Washington State. This is because we are only able to observe the housing status of individuals who received some form of cash, food, housing, or medical assistance recorded in Washington State administrative data. Individuals experiencing homelessness who were unable to access these services are not included in these analyses. Similarly, we exclude individuals who may have just started accessing these services immediately prior to becoming homeless because of our focus on long-term Apple Health clients with relatively complete medical histories. Consequently, we may be overestimating the relationship between using health services and becoming homeless. In fact, some individuals we identify as newly homeless may have been previously experiencing homelessness but remained undetected until they made contact with a health or social service system that flagged them in their administrative data as experiencing homelessness.

Directions for Future Research

There are several lines of inquiry that could follow from this study:

- A more formal model building could be used to identify service utilization patterns that precede the onset of homelessness, thus flagging potential points of intervention.
- Future studies could consider the interplay of incarceration, long-term use of inpatient health services, Apple Health coverage, and housing with homelessness and health outcomes.
- Health service use is one of many outcomes affected by homelessness. Others include contact with the criminal legal system, loss of employment or income, mortality, and social service use. Future studies could explore how the onset of homelessness intersects with these other experiences.
- Among those identified as newly homeless, social-demographic characteristics and post-index outcomes (e.g., service use, diagnoses) could be compared for those who remain homeless and those who become re-housed.

[9] Examples of such efforts include ALTSA's Governor's Opportunities for Supportive Housing (GOSH) program, the Department of Commerce's Community Behavioral Health Rental Assistance Program, and HCA's Discharge Planner's Toolkit.

OVERVIEW AND STUDY POPULATION

Individuals were identified for inclusion in these analyses using information from DSHS-RDA's Integrated Client Databases (ICDB; details below in Data Sources and Measures). The study population comprises 713,980 Washington State resident Apple Health clients from CY 2022, ages 18 through 59, split into three groups: **housed** clients who were not identified as homeless in calendar year (CY) 2022 or the preceding 3 calendar years (n = 619,976); **newly homeless** clients who were identified as homeless in CY 2022 but not in the preceding 3 calendar years (12,464); and **previously homeless** clients who were identified as homeless in CY 2022 and in at least one month in the preceding 3 calendar years (n = 81,540).

Excluded from these analyses are 54,434 CY 2022 Apple Health Clients ages 18 through 59 who did not fall into any of these housing categories, i.e., Apple Health clients who were *not* identified as homeless in CY 2022 but *were* identified as homeless in the preceding 3 calendar years. Each client was assigned an index month in CY 2022. For newly homeless clients this month represents the first month they were identified as homeless. For housed clients, this month was randomly assigned within the year. Finally, for previously homeless clients, the index month was randomly selected from those months in which these clients experienced homelessness in CY 2022.

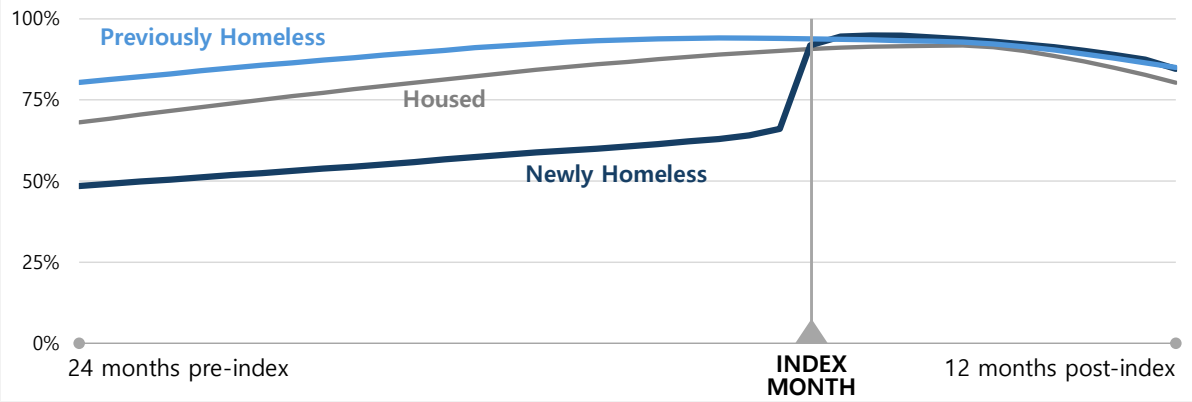
To be able to detect medical service use in each month, clients were required to have Apple Health coverage in that month. Among the 1,221,717 clients who had at least one month of Apple Health coverage in CY 2022, coverage over the timeline of interest varied by housing subgroup (Figure 12). Housed and previously homeless clients had relatively high rates of medical coverage throughout the period of interest with a peak around their index month. Previously homeless clients had higher rates of coverage in the 24 months prior to index than the housed clients.

In contrast, Apple Health coverage rates were relatively low among clients identified as newly homeless in CY 2022 in the 24 months prior to being identified as homeless, then increased rapidly around the month they were identified as homeless. In the 12 months following index, rates of coverage are similar for all three groups. This introduces the possibility that clients identified as 'newly homeless' were not, in fact, *newly* homeless, but rather were experiencing homelessness prior to their index month and were *identified* as homeless as a byproduct of enrolling in Apple Health. Because we needed to be able compare changes in service use and housing status over time, we restricted our analysis to individuals who had at least 20 months of Apple Health coverage in the 24 months prior to index month and 10 months of Apple Health coverage in the 12 months following the index month. This limited the sample to 62 percent of housed clients, 44 percent of newly homeless clients, and 72 percent of previously homeless clients.

FIGURE 12

Medical Coverage of Apple Health Clients by Housing Status Over Time

Clients With At Least 1 Month of Apple Health Coverage in CY 2022



NOTE: Figure shows unrestricted Apple Health clients from CY 2022. The study population was limited based on clients' numbers of months of Apple Health coverage.

AGE- AND SEX-ADJUSTED RATES

Direct standardization was used to adjust health service utilization rates for differences in the sex and age composition of housed and previously homeless clients (the adjusted populations) relative to the newly homeless population (the standard population). Within a given age and sex category, average service rates for the adjusted populations were multiplied by the percentage of individuals in this category in the standard population. These products were then summed to calculate a weighted average service utilization rate. These adjusted service rates for housed and previously homeless clients represent their rates *if the age and sex composition of the adjusted populations were similar to that of the standard population.* Table 1 shows the method used to calculate the adjusted rate of Outpatient ED visits per 1,000 member months for housed Apple Health clients in their index month using the standard population distribution.

TABLE 1

Direct Standardization Example: Adjusting the Rate of Outpatient ED Visits among Housed Apple Health Clients in the Index Month by Age-Sex Composition of the Newly Homeless Client Standard Population

Gender	Age	***Standard Population Distribution:*** **Newly homeless Clients**	***Adjusted Population:*** **Housed Clients**	
			Rate of Outpatient ED Visits, per 1,000 member months	Calculating Adjusted Rate of Outpatient ED Visits per 1,000 Member Months (Standard Population * Rate)
Female	18 – 24 years	15%	46	0.15 * 46 = **7**
	25 -34 years	11%	24	0.11 * 24 = **3**
	35 – 44 years	17%	46	0.17 * 46 = **8**
	45 – 54 years	11%	27	0.11 * 27 = **3**
	55 – 59 years	13%	45	0.13 * 45 = **6**
Male	18 – 24 years	10%	29	0.10 * 29 = **3**
	25 -34 years	8%	40	0.08 * 40 = **3**
	35 – 44 years	8%	29	0.08 * 29 = **2**
	45 – 54 years	3%	34	0.03 * 34 = **1**
	55 – 59 years	4%	27	0.04 * 27 = **1**
				ADJUSTED RATE = 37

NOTE: Numbers in this table have been rounded for simplification and thus may not match the body of the report.

DATA SOURCES AND MEASURES

Data used in this report came from the administrative data maintained in the Department of Social and Health Services' Integrated Client Databases (ICDB; Mancuso & Huber 2021). The ICDB integrates administrative data from several state data systems, including the state's Automated Client Eligibility System (ACES), ProviderOne Medicaid claims and encounters, and Washington's Homeless Management Information Systems (HMIS). The ICDB was explicitly designed to support evaluation of health and social service interventions in Washington State and has been widely used in evaluation studies published in peer-reviewed journals and for the production of performance and monitoring measures.

Demographics. Demographics including age (calculated as of the index month), race/ethnicity, and gender and were extracted from the ICDB. For a variety of reasons (e.g., self-reporting of multiple races, differences in race/ethnic categories reported across state systems over time, etc.), race/ethnicity categories are not mutually exclusive except for the White, non-Hispanic and Unknown categories. Currently, state data systems do not systematically collect information on all gender identities. Only male and female gender categories are provided in this report.

Medical Coverage. Apple Health and other medical coverage information was derived from eligibility codes recorded in ProviderOne.

Behavioral Health Indicators. Integrated administrative data from DSHS' ICDB, including ProviderOne were used to identify the presence of substance use disorders and/or mental illness based on diagnoses, prescriptions, and treatment records. In addition, drug- and alcohol-related arrest data maintained by the Washington State Patrol were also used to identify probable substance use issues and were included in the definition of treatment need for substance use disorders.

- **Mental Health Treatment Need:** A mental health treatment need was indicated for any individual who, in the 24 months prior to index, 1) was diagnosed with a condition that likely requires treatment from a mental health professional, including psychotic, mania/bipolar, depressive, anxiety, attention deficit and/or hyperactive, impulse control/conduct, trauma/stressor, somatoform, factitious, or eating disorder, select personality disorder, suicidal ideation or suicidal self-harm behavior, or other mental health conditions; 2) had an antipsychotic, antimania, antidepressant, antianxiety, or ADHD prescription filled; 3) received inpatient or outpatient mental health services; and/or 4) received behavioral rehabilitation services from the Department of Children, Youth, and Families.
- **Substance Use Disorder Treatment Need**: A substance use disorder (SUD) treatment need was indicated for any individual who, in the 24 months prior to index, 1) was diagnosed with an alcohol or drug use disorder (e.g., opioids, cannabis, sedatives, stimulants, etc.) or alcohol- or drug-use-related overdose/poisoning and/or self-harm; 2) had a prescription filled for medication for opioid or alcohol use disorder treatment; 3) received any SUD treatment services; and/or 4) was arrested for a substance-related offense (e.g., driving while under the influence, possession of unlawful substance, etc.).
- **Diagnosed Behavioral Health Disorders.** Mental health and substance use disorder diagnoses were identified using claim-level ICD-10 diagnosis data obtained from the Health Care Authority's ProviderOne Medicaid billing system and parallel records in other ICDB data sources. Specific diagnosis codes were grouped into families of related disorders based on similarities in their underlying pathology and symptoms.

Physical Health, Accident/Injury, and Infectious Disease Indicators. Physical health conditions, accidents/injuries, and infectious diseases were identified using Agency for Healthcare Research and Quality (AHRQ) Clinical Classifications Software Refined (CCSR) categories, which group ICD-10 diagnosis codes into clinically meaningful sets of related conditions. These categorizations were applied to ProviderOne claims and encounters data to estimate the prevalence of different families of related conditions among housed Medicaid beneficiaries and those experiencing homelessness in the month.

Emergency Department Use and Hospitalizations in General Medical Settings. Emergency department and hospitalizations in general medical settings were identified from Medicaid claims and encounters in ProviderOne. The data do not include complete claims information for individuals dually enrolled in Medicare or with third-party liability coverage.

Non-Emergency Hospital Services General Medical Settings. Outpatient services provided through a general medical setting, excluding those provided through the emergency department, were identified from Medicaid claims and encounters in ProviderOne. The data do not include complete claims information for individuals dually enrolled in Medicare or with third-party liability coverage.

Access to Preventative/Ambulatory Health Services (Primary Care). Preventative and/or ambulatory heath service visits were identified using Medicaid claims data from ProviderOne and Medicare claims data for individuals dually enrolled in Medicaid and Medicare. A claim was categorized as a preventative/ambulatory visit if its procedure code appeared in the "Ambulatory Visit" or "Other Ambulatory" Healthcare Effectiveness Data and Information Set (HEDIS) value sets. These data do not include claims information for individuals with third-party liability coverage.

Outpatient Behavioral Health Service Encounters. Service encounter records in ProviderOne and the Behavioral Health Data System were used to track outpatient mental health services. Specific service modalities were identified using the Division of Behavioral Health and Recovery's (DBHR) Service Encounter Reporting Instruction (SERI) categories and Healthcare Common Procedure Coding Systems (HCPCS) codes and/or Current Procedure Terminology (CPT) codes. Service encounter records in ProviderOne and the Behavioral Health Data System were used to track outpatient substance use disorder services.

Inpatient Behavioral Health Services. Information on client inpatient stays for mental health or substance use disorder treatment was obtained from ProviderOne, the Behavioral Health Data System (BHDS; HCA data system with mental health and substance use disorder records), and state hospital records. Inpatient service spans were transformed into monthly flags that indicated whether a client received inpatient treatment in any given month and year.

- SUD inpatient treatment services include any stays in an inpatient residential treatment facility as recorded in medical claims data; this excludes receipt of medically managed withdrawal services.
- Mental health inpatient treatment services include voluntary and involuntary treatment at an evaluation and treatment center, residential treatment facility stays, community psychiatric inpatient service receipt, Child Long-Term Inpatient (CLIP) service receipt, and stays at Eastern and Western State Hospitals.

Homeless Status. An individual was determined to be experiencing homelessness if they 1) were identified as homeless based on living arrangement, shelter, address, or WorkFirst participation information available in ACES; 2) received a housing service for homeless individuals that was recorded in HMIS; or 3) were identified as homeless based on ProviderOne medical claims and encounter data maintained by the Health Care Authority.

Housed through a Commerce-Funded Housing Program. An individual was considered housed through a Department of Commerce-funded program if they were enrolled in a permanent housing, permanent supportive housing, or rapid rehousing program and had a valid move-in date or were enrolled in a transitional housing program in the 12 months after index.

LIMITATIONS

A key limitation of this study is the restriction of the study population to Apple Health clients with a minimum number of months of medical coverage over the period of observation. This restriction was necessary for two main reasons: 1) health service use is only observable for Apple Health clients; and 2) clients who were first identified as homeless in the same month they newly enrolled in Apple Health may have been previously experiencing homelessness though we could not detect it with our data. Despite the necessity of this restriction, the clients who were excluded from the study were likely different than those included in terms of their medical needs, prior experiences of homelessness and social-demographic characteristics (some of which we described in this study). For example, people may be excluded if they were incarcerated or in long-term inpatient care, either of which may affect their Apple Health coverage.

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