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High Utilizers of Multiple Systems in Sonoma County

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Authors
Augustine, Elsa
White, Evan B

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High Utilizers of Multiple Systems in Sonoma County

ELSA AUGUSTINE and **EVAN WHITE**

CALIFORNIA POLICY LAB

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Executive Summary

We use a powerful new cross-domain dataset to identify Sonoma County's highest utilizers of multiple systems, a group of approximately 6,600 people.

The average high utilizer spent nearly two months each year in a publicly subsidized inpatient or residential setting, such as a jail, a hospital, or homeless shelter. They used at least $27,000 in state and county government services annually. Despite making up only 1% of the population, each year they accounted for an average of 28% of behavioral health costs, 52% of nights in housing or shelters for the homeless, and 26% of jail time in Sonoma County.

Six in ten high utilizers live in the county seat, Santa Rosa, a much higher proportion than the general population. They are three times as likely to identify as Black and much less likely to identify as Hispanic or Asian relative to the rest of Sonoma County.

Despite their intense use of services, high utilizers can be difficult for public servants to identify and serve effectively, because they are often not the highest users of any specific domain and information between systems is often siloed. In 2017, Sonoma County launched a working group to address this issue, and this report is intended to inform that working group and provide a better understanding of this population and their vulnerabilities.

Acknowledgements

Introduction

Counties across California report that a large bulk of government programs and services are used by a relatively small group of familiar faces. These individuals cycle in and out of hospitals, homeless shelters, behavioral health programs, and jails. Cycling is evidence that individual systems may be ineffective at serving the subset of individuals with multiple service needs. Yet coordination across agencies is rare. Staff usually have no visibility into their clients' utilization of programs besides their own, and few strategies exist to help clients with overlapping needs.

This issue is frequently framed in the context of the state's housing crisis, with more than 150,000 Californians experiencing homelessness and state and local governments falling short of a solution. As the COVID-19 pandemic spread through the United States in the early months of 2020, these challenges became more urgent, as it became evident that the same individuals who frequently cycle through different systems comprising the social safety net may also be the most vulnerable to the virus.

To better address this problem, in 2017 Sonoma County began an effort to identify the county's most vulnerable residents and improve services through better coordination across agencies. The project is called "ACCESS Sonoma County," which stands for Accessing Coordinated Care & Empowering Self-Sufficiency, and aims to coordinate care across the social safety net system for clients with complex needs, thereby "improving their health, well-being and economic stability."[1]

The county asked the California Policy Lab (CPL) to help shed light on this population by linking and analyzing data from several different county programs. The county and CPL integrated data on approximately 425,000 individuals for fiscal years 2014 through 2018. We integrated utilization records from health, mental health, substance abuse, housing, criminal justice, and human services systems.[2] In any given year we see utilization records for around half of the county's population. Santa Rosa residents, Hispanic individuals, younger adults (under 40), and residents of lower-income ZIP codes are overrepresented in our data in comparison to the county as a whole.[3] Before analysis, these data were anonymized to protect the personal information of individuals.

> **A "high utilizer" is any person whose combined utilization across systems is in the top 1% in a given year.**

This report focuses on the highest utilizers of Sonoma's multiple systems. We define a "high utilizer" as any person whose combined utilization across systems is in the top 1% in a given year.

To systematically identify high utilizers, CPL developed a measure of the prevalence and intensity of each individual's utilization in five domains: physical health, behavioral health (mental health and substance use), criminal justice, housing and homelessness, and human services (public assistance including Medicaid, food stamps, and cash welfare). We then aggregated those domain-specific scores into an overall utilization score.[4] High utilizers in one year may not be high utilizers in another year.

This report describes Sonoma's high utilizers from 2014 to 2018[5] and compares their demographic and service utilization profiles to those of the broader population.

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1   Access Sonoma County | Current Projects | Information Systems | County of Sonoma, http://sonomacounty.ca.gov/ISD/Projects/Access-Sonoma-County/.

2   See Appendix A for more details on the data sources. Importantly, these linked data do not include information on employment or income, though some information can be inferred by participation in various public assistance programs with strict eligibility requirements.

3   See Appendix A for information on demographics. See Appendix B for information on the data's representativeness.

4   See Appendix C for more details on the scoring methodology. We use the term "services" to encapsulate utilization from all systems, even though criminal justice or housing utilization is not generally called a "service."

5   Actual time period is fiscal years 2014–18, so July 2013–June 2018. Because utilization is scored for each individual year, some individuals are identified as high utilizers in more than one year. Statistics reported in this brief are at the person level unless otherwise noted. For example, we report on an individual's utilization trends for the entire time that they are present in the integrated data, up to five years total.

High utilizers have substantial needs

Almost 6,600 individuals were in the top 1% of utilizers in Sonoma County for one or more years between 2014 and 2018.[6]

These high utilizers used a wide array of county services. The average high utilizer spent 57 days in some sort of publicly subsidized inpatient or residential setting, such as a jail, a hospital, or homeless shelter.[7] In fact, 1 in 10 high utilizers spent over half the year in such settings.

Each year, high utilizers used…

57 days in subsidized stays

Over **$27,000** in services

52% of shelter and housing for the homeless

Over **25%** of jail beds and behavioral health costs

While our data have incomplete cost information, it is clear that the average high utilizer uses at least $27,000 in state and county government services each year.[8] This does not include the cost of public benefits, but does include nearly $15,000 in hospital costs, over $6,400 in mental health and substance use services, and approximately $2,000 each in jail, probation, and shelters/housing for the homeless.

Despite accounting for only 1% of the population, each year high utilizers accounted for an average of 28% of behavioral health costs, 52% of nights in housing or shelters for the homeless, and 26% of jail time in Sonoma County.

Figure 1 shows the average number of days high utilizers spent in different subsidized settings annually. Figure 2 shows the average annual costs of care for a high utilizer.

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6   We identified the top 1% in each year, but many were high utilizers in multiple years. This 5-year total is approximately 1.5% of the total 5-year study population.

7   This term encompasses a range of housing services provided to the homeless, including emergency shelter, transitional housing, and permanent supportive housing.

8   Some data systems include exact costs. Others include partial costs, from which we impute costs for the remainder. Other systems, like justice systems, did not include any cost information, so we estimate costs for various services, such as a day of probation or a day in jail. Various sources estimate these costs differently. We use estimates from Los Angeles County for the justice-related costs: Jail day = $96, jail booking = $287, probation month = $555. Los Angeles County Chief Executive Office, 2017. For the estimated costs of a night's stay in emergency shelter, we use estimates from Sacramento: $67/night. Social Finance, 2017.

HIGH UTILIZERS OF MULTIPLE SYSTEMS IN SONOMA COUNTY

FIGURE 1 High utilizers spent nearly two months annually in subsidized settings and three months on probation

2 DAYS SUBSTANCE USE INPATIENT CARE

3 DAYS HOSPITAL

20 DAYS JAILED

32 DAYS SHELTERED

95 DAYS PROBATION
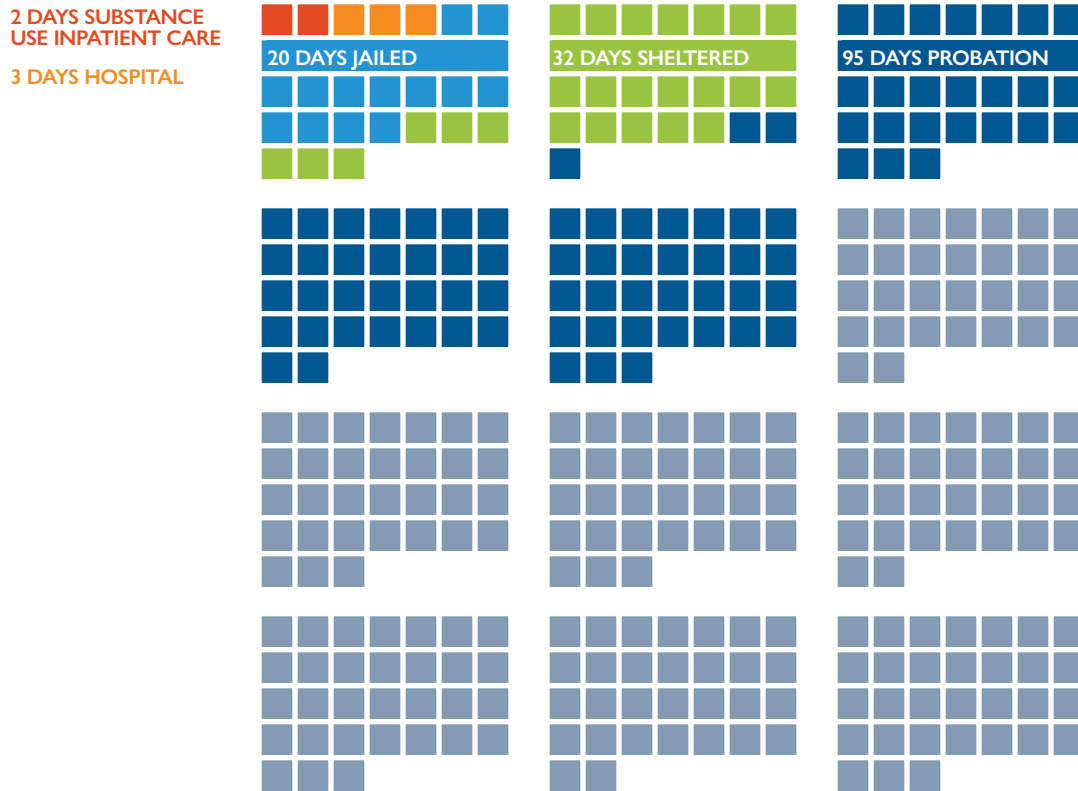
FIGURE 2 High utilizers generated high costs, especially in physical and behavioral health

Hospital costs $14,957

Behavioral Health $6,452

Shelter/housing for the homeless $2,119

Jail $1,940

Probation $1,757

Booking costs $149

Total $27,376
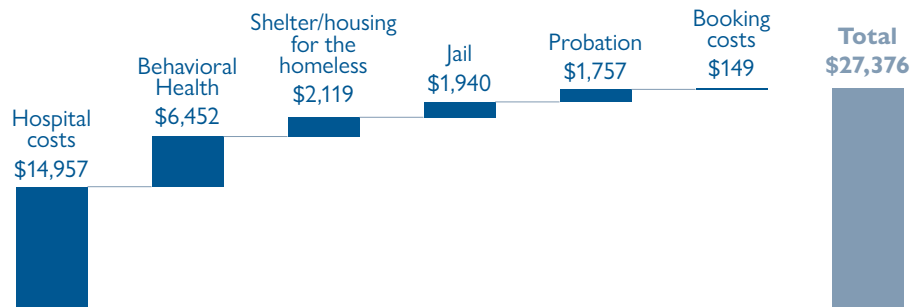
High utilizers accessed services across multiple domains, not just one. **Forty-five percent received services in at least four of the five domains.** In contrast, three-quarters of other individuals in our dataset received services in only one domain. Almost all high utilizers received public assistance like Medi-Cal, and two-thirds accessed physical health services at the hospital, while the same share also had contact with the criminal justice system (see Table 1). Around half of high utilizers sought treatment for substance abuse or experienced homelessness.

TABLE 1 High utilizers used many different systems

PRESENCE WITHIN EACH DOMAIN	HIGH UTILIZERS		ENTIRE STUDY POPULATION	
Physical Health: Care received in hospitals, including inpatient, emergency department visits, and ambulatory surgeries	4,223	64%	306,513	72%
Human Services: Enrollments in public assistance programs including Medi-Cal, CalFresh, CalWORKS, and General Relief	6,500	99%	160,982	38%
Criminal Justice: Jail bookings, case dispositions, sentences to incarceration, and probation supervision	4,126	63%	56,125	13%
Behavioral Health: **Substance Abuse:** In- and outpatient substance abuse services (from hospitals and county programs)	4,100	62%	20,217	5%
Mental Health: In- and outpatient mental health services (from hospitals and county programs)	2,750	42%	24,394	6%
Homelessness: Enrollment in county programs for the housing unstable or homeless, including emergency shelters, housing for the homeless, and homelessness-related services	3,178	48%	9,304	2%
Present in multiple domains	6,587	100%	108,358	25%
TOTAL	6,587	100%	425,531	100%

Demographic profile

High utilizers have different demographic characteristics than adults in the rest of the county (see Table 2). **High utilizers are ten years younger than the average adult in Sonoma, they are three times as likely to identify as Black, and are much less likely to identify as Hispanic or Asian and Pacific Islander American.**

The data do not yield many answers about why this might be, but it could relate to systemic racism that has contributed to poverty, poor health, and more interaction with the justice system among Black residents in Sonoma County and throughout the country. In Sonoma, 66% of Black high utilizers had contact with the criminal justice system, compared to 58% of non-Black high utilizers. They have 20% more jail bookings, spend 12 more days in jail and an additional two weeks on probation each year compared to the average high utilizer.[9]

9 These disparities in criminal justice contact are evident in the full study sample as well. Black individuals were more than twice as likely to have criminal justice involvement as the average person in the study data (26% of Black individuals had a record of criminal justice contact versus 12% on average). They also spent three times as much time in jail per year (an average of 7.0 days compared to 2.4 days) and were booked into jail twice as often as the average person in the study data (there were 0.16 jail bookings per year among Black individuals compared to 0.07 on average).

Conversely, Hispanic high utilizers used fewer services across all domains relative to the average high utilizer, except for their enrollment in public assistance programs, which was slightly higher.

One substantial difference between high utilizers and the countywide population is location — **high utilizers are much more likely to reside in Santa Rosa than the general population.** We can only speculate as to why this might be — it could be cause, consequence, or random chance. But one possible reason is that many county services are located in Santa Rosa. Another is that many individuals with needs just as high as the high utilizers identified in this report reside in other parts of Sonoma County, but are unable to access services and therefore are not identified in this type of analysis.

TABLE 2 High utilizers are more likely to be Black, young, and live in Santa Rosa than the countywide population

Demographics	HIGH UTILIZERS	ALL SONOMA COUNTY RESIDENTS
Asian/Pacific Islander	1.4%	5.3%
Black	3.6%	1.3%
Hispanic	15.3%	21.3%
Non-Hispanic White	58.8%	67.5%
Male	53.4%	48.1%
Average age	40.0	49.7
City in year of high use		
Santa Rosa	60.4%	35.8%
Petaluma	8.3%	12.2%
Rohnert Park	6.4%	8.8%
Sebastopol	2.7%	1.6%
Other Sonoma County cities[10]	15.1%	41.7%
Outside Sonoma County[11]	7.7%	-
Missing residence information	0.8%	-

Source for first column: U.S. Census Bureau QuickFacts: Sonoma County, California. Second column: 2018 ACS 1-year sample, restricted to individuals over age 18.

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10 A full list of study sample residence by city in Sonoma County is included in Appendix E.
11 The data include individuals who accessed services in Sonoma County but who lived outside the county. The majority of these people lived in adjacent counties.

Chronic high utilizers are the most vulnerable group

The majority of high utilizers (68%) experienced high utilization for just one year. We refer to them as **"episodic"** high utilizers.[12] In contrast, 32% of high utilizers experienced **"chronic"** high use that persisted over multiple consecutive years. A small group of 70 individuals (4% of chronic high utilizers) demonstrated high utilization continuously in all five years of the analysis period.

Both episodic and chronic high utilizers demonstrate similar, and higher than average, utilization trends leading up to their period of high use, as shown in Figure 3. However, chronic high utilizers have higher utilization peaks than episodic high utilizers and they continue to utilize services at a high intensity for multiple years.

FIGURE 3 Chronic high utilizers have similar utilization as episodic high utilizers before their first year of high use

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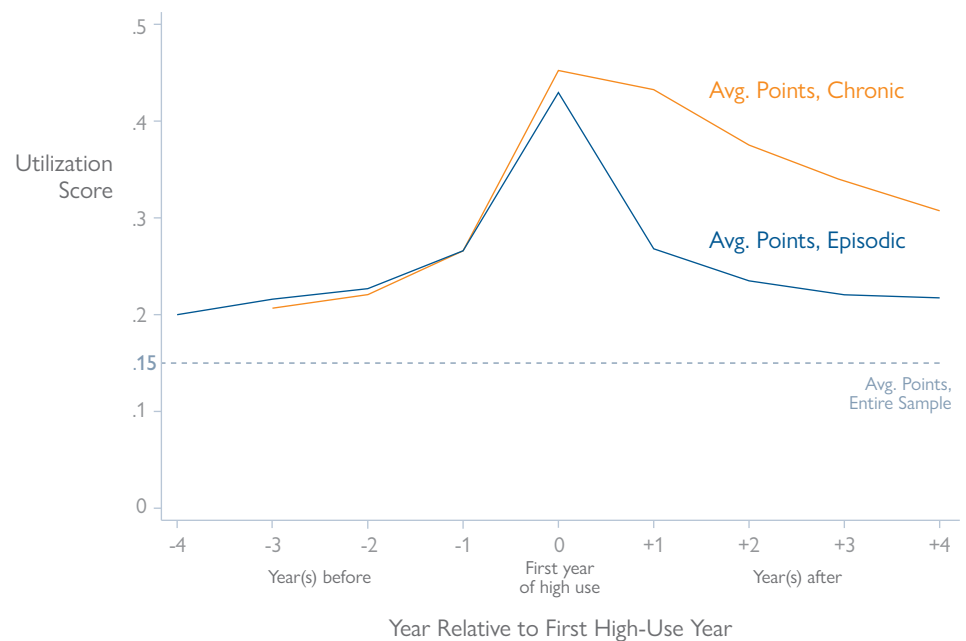
12 Eight percent of "episodic" high utilizers experience more than one episode of high utilization, but the episodes are not in consecutive years.

Unsurprisingly, chronic high utilizers experienced much higher utilization across all domains than episodic high utilizers. Average annual utilization was 40–65% higher on most measures. But chronic high utilizers were more likely to stay in shelters or housing for the homeless — they used 2.6 times as many days on average each year (Table 3).

TABLE 3 Utilization by chronic high utilizers is consistently higher than episodic high utilizers, especially in homeless housing

	CHRONIC (N = 1,722)	EPISODIC (N = 4,807)	REST OF THE STUDY SAMPLE (N = 419,080)
# of days in homeless housing	58	22	0.6
# of jail days	25	17	1.2
# of emergency dept. visits	2.0	1.4	0.7
Behavioral health costs	$9,578	$5,835	$528
% ever on General Assistance	55%	36%	1%

Note: All cells are annual averages except the final row, which is aggregated across the entire study period.

High utilizers of multiple systems are usually not the highest users of specific domains

The top 1% utilizers of *multiple* systems in Sonoma County are mostly distinct from the highest utilizers in any *given* domain. For example, residents that incur the highest hospital costs rarely also touch the homelessness or criminal justice systems.

That is significant because it makes multi-system high utilizers difficult to identify, which is important as the county looks to better serve these individuals. A county analyst looking at one data system might not be able to tell which individuals are "shared clients" that also access other county systems. This report is the first time the county has been able to identify and understand this population. The county expects to continue using these cross-domain data to provide insight into Sonoma's shared clients, and use coordinated case management systems to provide real-time answers for clinicians and case managers.

Multi-system high utilizers are difficult to identify by county staff because they are not usually the highest users of any one system.

In addition to identifying multi-system high utilizers, we also identified **"domain-specific high utilizers,"** which we define as the top 1% of utilizers in *each separate* domain. Because each domain serves a different number of people, the number of domain-specific high utilizers varies across domains.

Most high utilizers of the housing and behavioral health systems are also multi-system high utilizers (see Table 4). In contrast, only a third of criminal justice high utilizers are multi-system high utilizers, and only 16% of health high utilizers are. This suggests that at least part of the health high utilizer population is comprised of individuals who were extremely physically ill, but with relatively few multi-dimensional needs.[13] In contrast, the majority of housing and behavioral health high utilizers accessed services in at least one other domain, suggesting these individuals had a broader set of needs.

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13 Lack of utilization in a certain domain might also be an indication of a service gap, but the data does not allow us to interpret the absence of utilization.

		HIGH UTILIZERS OF…			
	HOMELESS-NESS (N=180)	BEHAVIORAL HEALTH (N=476)	CRIMINAL JUSTICE (N=871)	HUMAN SERVICES (N=999)	PHYSICAL HEALTH (N=3,847)
Homelessness	-	49%	27%	37%	8%
Behavioral Health	68%	-	50%	61%	44%
Criminal Justice	63%	68%	-	67%	6%
Human Services	84%	80%	74%	-	39%
Physical Health	41%	50%	1%	37%	-
Multi-system high utilizer	77%	77%	35%	53%	16%

…ARE PRESENT IN THIS DOMAIN…

Multi-system high utilizers do use a high amount of services, however, it is often much lower in a given domain than the utilization levels of domain-specific high utilizers (see Table 5). For example, the top 1% highest users of the health system spent an average of 17 days in the hospital annually, whereas the average among multi-system high utilizers was 5 days per year. In other words, the most intensive shared clients are usually not the most intensive in any given system.

AVERAGE ANNUAL UTILIZATION

	THE TOP 1% IN THE DOMAIN	MULTISYSTEM HIGH UTILIZERS PRESENT IN THE DOMAIN	ALL OTHERS PRESENT IN THE DOMAIN
Physical Health			
Hospital Days	17.1	5.2	2.3
ER visits	5.9	2.3	0.9
Hospital charges	$120,066	$24,171	$15,657
Behavioral Health			
Inpatient mental health days	1.6	0.8	0.9
Inpatient SUD days	5.9	2.3	0.6
Behavioral health costs	$22,523	$8,271	$5,107
Criminal Justice			
Jail bookings	1.2	0.9	0.4
Jail bed days	44.7	33.9	11.4
Estimated jail costs	$4,625	$3,508	$1,197
Probation supervision days	241.8	159.5	178.6
Homelessness			
Days sheltered/housed	117.0	65.7	42.2
Unique program enrollments	4.0	1.6	0.9
Estimated housing costs	$7,790	$4,372	$2,809

Note: See footnote 8 for an explanation of cost estimates. We do not include human services utilization in this table because the number of program enrollments is our only intensity measure and so there is much less variation between low and high utilizers.

Diagnoses of high utilizers

For the 97% of high utilizers that received services in the physical or behavioral health domains, we have information about the various health, mental health, or substance use issues they are confronting. These medical diagnoses help explain what underlying conditions may give rise to the intensive use of services and may provide insight into potential points of intervention.

Alcohol

Nearly 6 in 10 high utilizers (or 3,774 individuals) had issues with alcohol, which could include a hospital diagnosis related to alcohol or use of alcohol-related substance abuse services, like a sobriety clinic. Compared to other high utilizers, those with alcohol issues spent 27% more days in outpatient mental health settings (7.0 vs. 5.5) and received treatment for nearly three times as many unique diagnoses in the county mental health system in a given year (0.65 vs. 0.23). Despite this comparatively high incidence of mental health needs, that same group spent fewer days in inpatient psychiatric settings (0.52 vs. 0.62) and their annual hospital charges were 33% lower than other high utilizers ($10,100 vs. $15,000).

The alcohol-involved subgroup also experienced far more contact with the criminal justice system. They were 67% more likely to have some justice interaction than high utilizers without an alcohol diagnosis. When we focus just on those who interacted with the justice system, they had twice as many bookings (1.03 vs. 0.52), three times as many days on probation (192 vs. 85), and over twice as many total days incarcerated in jail (42 vs. 16) each year as justice-involved high utilizers without alcohol diagnoses.

Opioids and stimulants

Similar patterns of elevated justice involvement held true for high utilizers with a history of using other substances. Stimulants and opioids were the next most common substances used by high utilizers (28% and 21%, or 1,869 and 1,372 people, respectively).[14] Users of those substances showed much higher jail bookings, more days on probation, and more days incarcerated than justice-involved individuals who had no history with those substances.

However, the pattern of mental health utilization for users of opioids and stimulants was different from alcohol users. As compared to all other high utilizers, users of opioids and stimulants spent a similar number of days in outpatient mental health settings each year (between 5.7 and 5.9 vs. 5.5). But their inpatient mental health utilization was much lower: they spent around 70% less time in

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14 The "stimulants" diagnostic category includes diagnoses for amphetamine, cocaine, and other stimulant use disorders.

inpatient psychiatric facilities (each group spent approximately 0.18 days in such facilities, compared to 0.62 days per year among other high utilizers).

Mood disorders and schizophrenia

The most common mental health diagnoses among high utilizers were mood disorders (21%, 1,359 individuals) and disorders related to schizophrenia (11%, 698 individuals). Not surprisingly, both groups incurred substantially more behavioral health costs than the average high utilizer ($15,700 and $29,600, respectively, as compared to $6,500). Both groups also visited the emergency department more times than the average high utilizer (both groups visited an average of 2.4 times per year as compared to 1.5).

High utilizers with mood disorders spent slightly fewer days on average in shelter or housing for the homeless than the average high utilizer, whereas high utilizers with schizophrenia and related disorders spent 33% more days in such settings (31 and 42 days, respectively, as compared to 32) annually.

Both groups were less likely be booked into jail and both spent many fewer days on probation than the average high utilizer per year (51 and 64, respectively, as compared to 95). But the amount of time incarcerated was a different story. High utilizers with mood disorders spent around half as many days incarcerated in jail as the average high utilizer, while those with schizophrenia and related disorders spent four more days annually (11 and 24 days, respectively, as compared to an average of 20).

Co-occurring behavioral health disorders

Sonoma County's high utilizers had a high rate of co-occurring behavioral health diagnoses: 14% of high utilizers (or 895 people) received treatment for a mental health disorder in addition to a substance abuse disorder. The national average for co-occurring mental health and substance use disorders is estimated to be 3.7%.[15] Nearly all of the group with co-occurring behavioral health diagnoses (98%) had issues with alcohol and 52% had a mood disorder. The combination of those two conditions was the most common combination, representing 51% of all people who had co-occurring diagnoses. And among the group with alcohol and mood disorders, it was common to have other substance use disorders as well: 62% sought treatment for stimulants and 51% sought treatment for opioids.

Notably, this group with co-occurring behavioral health disorders had approximately twice as much contact with the justice system as other high utilizers. Each year, they were booked into jail twice as often (0.96 vs. 0.52), were incarcerated longer (34 days vs. 20) and were on probation longer (149 days vs. 95).

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15 Substance Abuse and Mental Health Services Administration, 2019.

HIGH UTILIZERS OF MULTIPLE SYSTEMS IN SONOMA COUNTY

Injuries and respiratory illnesses

The most common physical health conditions were related to injuries (30%, or 2,002 people) and respiratory illnesses (25%, or 1,617 people). It was also common for high utilizers to have both conditions — more than half of those with respiratory conditions had injuries as well. Those with either of these conditions had around 30% higher average behavioral health costs than other high utilizers (approximately $8,400 vs. approximately $6,500). They were also less likely to have a diagnosis related to alcohol abuse (42% vs. 67%). Moreover, those who sought care for injuries were nearly twice as likely to have a mood disorder (30% vs. 16%).

Typical profiles of high utilizers

The high utilizer population is complex and varied, but two groups had distinct patterns of utilization.

Group One: Justice-involved individuals with behavioral health issues and housing instability

One in four (25%) high utilizers had behavioral health needs, experienced housing instability, and also came into contact with the criminal justice system. These individuals were slightly more likely to be male (61%) than high utilizers generally.

This group of 1,584 individuals spent an average of eight weeks (56 days) each year in homeless housing. They stayed in emergency shelters an average of 0.90 times per year, with the duration of stay varying. One in five spent time in transitional housing over the five years, while 18% spent time in rapid rehousing and 9% lived in permanent supportive housing.

More than three-quarters (87%) of this group had a history of alcohol abuse. Many also had a dependence on other substances, including stimulants (55%), opioids (38%), and cannabis (16%).

Individuals in this group frequently came into contact with the criminal justice system during the study period. They were booked into jail once per year (1.06 average bookings per year) and spent over a month incarcerated in jail every year (41 days). However, very few of these individuals received any new criminal conviction in the five years (9%), suggesting that they may not always be prosecuted for their arrest charges.

Group Two: Individuals with serious medical conditions

Another 38% of high utilizers are those with serious or complex medical conditions. This group is largely distinct from Group One (only 194 of the 2,487 people in Group Two were also Group One). We define this group as any high utilizer who spent more than two days in the hospital per year on average. The mean age of this group was higher than other high utilizers (43 vs. 40), but only 3% were over 70 years old.

Not surprisingly, this group had much higher health care utilization than other high utilizers. On average, they incurred $39,800 in hospital charges annually, and visited the emergency department 3.4 times per year. They also had higher rates of every serious medical condition than did the rest of the high utilizer population. Around half suffered an injury or had a respiratory condition. At least 1 in 10 suffered from a cardiac condition or diabetes.

This group also had high behavioral health service utilization. They incurred $13,300 in behavioral health costs on average each year, as compared to $6,500 for all other high utilizers. They also visited both inpatient and outpatient mental health settings much more often than other high utilizers, averaging 1.7 days inpatient and 7.3 days outpatient per year, as compared to 0.6 days and 1.7 days, respectively.

In contrast, this group was less likely to experience housing instability or have interactions with the criminal justice system. They were 40% less likely to have stayed in an emergency shelter (26% vs. 42%) and were less than half as likely to interact with the justice system over the five-year period. Twenty-nine percent of this group had justice contact, as compared to 77% for all other high utilizers.

Regional differences

We were able to see residential location for over 99% of high utilizers, and used ZIP codes to group them into regions (North, West, Central, Southeast, and Southwest). These regions roughly correspond to supervisorial districts (4, 5, 3, 1, and 2, respectively), but ZIP codes do not exactly match the district or county borders, especially for the Central Region.[16]

FIGURE 4 Sonoma County's Supervisor Districts (outlined in black) roughly correspond to the analysis regions (colored zones)
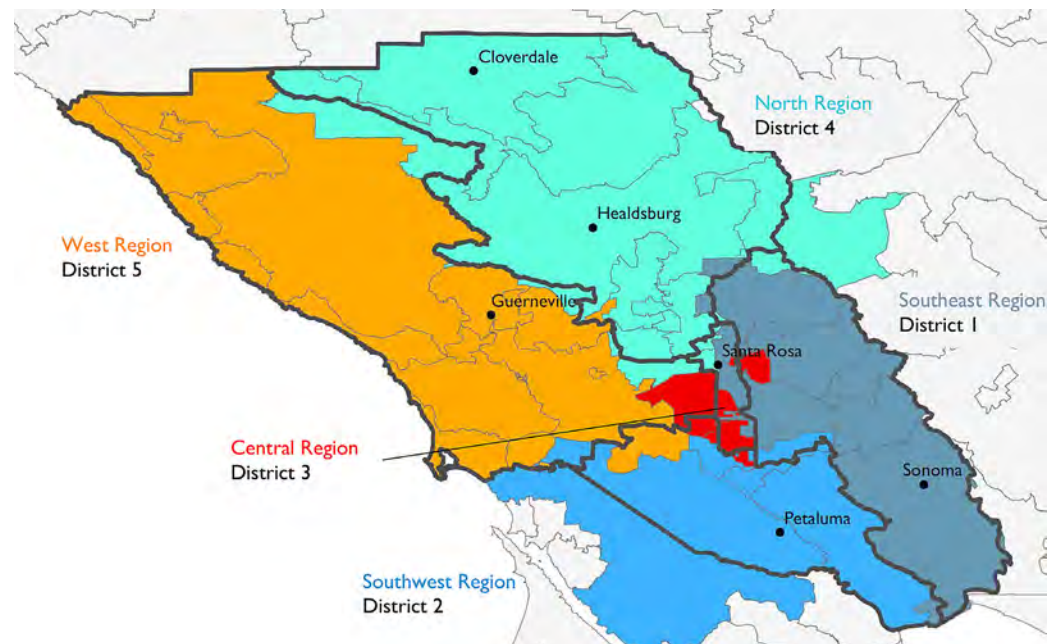
The Central and North regions each housed about 30% of the county's high utilizers, although they only accounted for 19% and 25% of the study sample, respectively. Another 17% and 10% of high utilizers came from the Southeast and Southwest regions, which corresponds roughly to their overall population in the study sample. Out-of-county residents comprised 7% of high utilizers and 17% of our entire study sample (with residence data missing for 1% and 3% of individuals, respectively).[17]

There was little regional variation among high utilizers in terms of presence in any given domain. However, there were some regional differences in the intensity of utilization. For example, high utilizers in the West, Southwest, and Southeast regions all had higher annual behavioral health charges (between $8,200 and $8,300) than high utilizers in the Central and North regions ($5,300).

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16 See Appendix D for a list of ZIP codes in each region.
17 The out-of-county individuals are mostly residents of neighboring counties. They are from Mendocino (14%), Lake (14%), and Marin (11%) Counties. San Francisco, Solano, Alameda, Napa, and Sacramento County residents each make up 4-5% of the out-of-county population.

Criminal justice utilization among high utilizers was highest in the Central region, and lowest in the Southwest region. For example, high utilizers in the Central region had 0.58 jail bookings on average each year, spent 106 days on probation, and spent 24 days incarcerated in jail annually. In the Southwest region, high utilizers had 0.47 jail bookings on average, spent 88 days on probation, and spent 16 days incarcerated each year. See Appendix F for other regional differences.

Conclusion

In Sonoma County, the top 1% highest utilizers of behavioral health, criminal justice, social safety net, physical health, and housing services are a small group of approximately 6,600 individuals with intense needs. This report begins to shed light on who they are and what their vulnerabilities are: from housing instability, to co-occurring behavioral health diagnoses, to cycling in and out of the criminal justice system. More striking than any one of these vulnerabilities, however, is the fact that many of Sonoma's high utilizers are experiencing intense needs simultaneously: struggling with a physical illness while living with a mental illness, cycling in and out of jail, and facing challenges accessing stable housing options.

High utilizers are often not the most intensive clients of any given system, but their service utilization across systems is intense and indicative of multidimensional needs that are difficult for any single department or agency to identify or address. This analysis begins to uncover utilization patterns across different county systems. Based on this, some potential strategies for intervention or provision of coordinated care to mitigate future high utilization could be:

1. Help stabilize clients in their first year of multi-system high use, to help them avoid becoming a chronic high utilizer.

2. Provide behavioral health care or more supportive housing to individuals repeatedly cycling through county jails. Importantly, this could include people who are frequently arrested or booked into jail, but not charged or convicted.

3. Increase focus on people enrolling in the county's General Assistance benefits, many of whom are chronic high utilizers. Individuals enrolling in General Assistance are likely a highly vulnerable group who may benefit from coordinated case management or other wrap-around services.

4. Provide more comprehensive care to behavioral health clients with multiple diagnoses, who are often experiencing homelessness or justice-involved.

While this report makes clearer who Sonoma County's highest utilizers are and what services they access, more work is needed to better understand different sub-groups and to uncover time trends in their utilization, which will provide important information for policymakers and practitioners working to better coordinate care for these individuals.

Appendices

Appendix A: Data Systems

Behavioral Health: Data on behavioral health services are provided by the Sonoma County Department of Health Services, which maintains records in the SWITS and Avatar systems on outpatient mental health treatment and in- and outpatient substance use disorder treatments. Additional data are provided by the Office of Statewide Health Planning and Development (OSHPD), which contains records of hospitalizations for behavioral health needs.

Housing: These data are provided by the Community Development Commission (CDC), Sonoma County's housing agency, which runs affordable housing programs, homelessness programs, coordinated entry systems, and more. The ACCESS Sonoma analysis is focused on homeless and housing unstable residents, and relies on data from the CDC's Homeless Management Information System (HMIS).

Human services: Sonoma County's Human Services Department (HSD) administers the county's public assistance programs. The CalWIN data system tracks applications, eligibility, and enrollment information for public assistance programs, including Medi-Cal, CalFresh, General Assistance, CalWORKs, and other programs. Other important human services, such as child welfare and aging services, are not included in this analysis.

Criminal justice: The Integrated Justice Systems (IJS) holds Sonoma's integrated criminal justice data. The files provided to CPL capture criminal justice activity — including jail bookings, charge filing, case dispositions, and sentencing. Probation data also comes from IJS. These data carry information on all individuals with probation terms in Sonoma County.

Physical health: Hospital utilization data is provided by OSHPD. We obtained data from 2013–2018, for all patients who we were able to match to individuals in the Sonoma County Master Index, as well as for all patients who received services at a hospital or center within Sonoma County. The emergency department data (EDD) includes encounters from emergency departments where patients had face-to-face contact with a provider. The ambulatory surgery data (ASD) includes encounters from general acute care hospitals and licensed freestanding Ambulatory Surgery Centers, during which at least one ambulatory surgery procedure is performed. It contains all the same information as the emergency department data. The patient discharge data (PDD) consists of records for each inpatient discharged from a California-licensed hospital.

Linking: Sonoma County's Information Systems Department (ISD), working with CPL, developed a flexible rules-based approach written in SQL to merge these datasets iteratively, creating a master index that uniquely identifies all individuals in any of the data and captures the different identifiers used for an individual across systems when they are in multiple systems. The fields used for these linkages are: date of birth, name, and Social Security Number (SSN). This dataset also specifies how a record from a given dataset matched to other records (e.g., an exact match on last name and SSN). All identifiers are removed from the data before being provided to CPL for analyses.

Demographics: Demographic data is available in all data systems. To arrive at one single demographic profile for each individual across data systems, we first identify modal values for all demographics (sex, race, ethnicity, age, and zip code of residence) within each data system, then combine modal values from all data systems. We load the systems in the following order to arrive at a final demographic profile: IJS, OSHPD, HMIS, Avatar, SWITS, Probation, and CalWIN.

Appendix B: Representativeness

To understand the representativeness of our data, we compared the study population in FY 2018 to Sonoma County data from the 2018 American Community Survey. Table 6 shows that our data is overrepresented in Santa Rosa, where we see utilization on nearly 6 in 10 residents.

TABLE 6 Santa Rosa residents are overrepresented in our sample

	2018 ACS	FY18 STUDY POPULATION	% OF TOTAL
Santa Rosa	147,291	87,339	59%
Petaluma, Rohnert Park, Cotati	102,313	39,787	39%
Other Sonoma County	151,369	54,778	36%
Total	400,973	181,904	45%

Table 7 compares demographics for our study population and shows overrepresentation of Hispanic and younger residents, and underrepresentation of Non-Hispanic White residents.

TABLE 7 Hispanic and younger residents are overrepresented in our sample

	2018 ACS	FY18 STUDY POPULATION
Asian/Pacific Islander	5%	4%
American Indian/Alaskan Native	1%	1%
Black	1%	2%
Hispanic	21%	28%
Non-Hispanic White	67%	58%
Multiracial	3%	0%
Other race/Multiracial	0%	8%
Under 20	3%	5%
Age 20–29	14%	19%
Age 30–39	17%	18%
Age 40–49	15%	14%
Age 50–59	17%	15%
Age 60–69	17%	14%
Age 70–79	11%	8%
Age 80–89	4%	5%
Age 90+	1%	1%
Mean age	50	47
Male	48%	48%

We also compared the study population in each ZIP code to the 2014 ACS population in that ZIP code, and found that our sample was comparatively overrepresented in lower-income ZIP codes. For example, we see 30% of the population in 94954 (Petaluma, median household income of $81,980) but we see 49% of the population of 95407 (Santa Rosa, median household income of $53,652). By weighting the median income in each ZIP code by the proportion of our sample in that ZIP code, we find that the median income of our study population is likely to be around $57,200, as compared to $65,800 for the county.

Appendix C: Scoring Utilization

The goal of the utilization score is to identify the individuals most intensely using services from the five domains identified (criminal justice, behavioral health, physical health, homelessness, and human services) in order to understand the size and profile of this population as well as their multi-dimensional needs.

The utilization score aggregates information on utilization in these five domains. To construct the utilization score, we first calculate a domain-specific score between 0 and 1 then aggregate these 5 scores into one multi-system utilization score, also ranging from 0 to 1.

Each individual present in the integrated county data in a given year is scored for their utilization within each domain in that year. The domain scores are aggregated into a single, weighted utilization score for the year. The high utilizers in a year are the individuals whose scores are in the 99th percentile of the overall utilization score. **Chronic high utilizers** are those who are identified as high utilizers in multiple consecutive years; **episodic high utilizers** experience an isolated year of high utilization.

The five domain-specific utilization scores were created using these measures:

1. **Criminal justice:** Jail bookings, convictions, sentences, and supervision by the Probation department.

2. **Behavioral health:** Frequency of services and service costs from Sonoma's behavioral health data systems (Avatar & SWITS) and the state hospital data (OSHPD's Emergency Department, Patient Discharge, and Ambulatory Services datasets).

3. **Physical health:** Emergency department use, inpatient hospital discharges, and ambulatory surgery from the state hospital data (OSHPD).

4. **Human services:** Enrollments in unique public assistance and benefit programs tracked in Sonoma County's CalWIN database.

5. **Housing and homelessness:** Frequency and number of enrollments in different housing programs and services captured in Sonoma County's HMIS data.

Appendix D: Regions

TABLE 8 ZIP codes in each region

SOUTHEAST	SOUTHWEST	CENTRAL	NORTH	WEST
95404	94931	94928	94515	94922
95409	94951	95402	95401	94923
95431	94952	95405	95403	94972
95442	94954	95407	95425	95412
95452		95408	95439	95419
95476			95441	95421
			95448	95430
			95492	95436
				95444
				95446
				95450
				95462
				95465
				95471
				95472
				95497

Appendix E: Sonoma County residence

High utilizers are twice as likely to live in Guerneville and Santa Rosa as the average individual in the sample data. They are less likely to live in Cloverdale or Windsor and half as likely to live in the City of Sonoma. Cells representing 10 people or fewer have been repressed to prevent re-identification.

TABLE 9. Share of high utilizers in each city

CITY	SHARE OF HIGH UTILIZERS (%)	SHARE OF ENTIRE STUDY SAMPLE (%)
Annapolis	-	0.04
Bodega	-	0.06
Bodega Bay	-	0.21
Boyes Hot Springs	-	0.14
Camp Meeker	-	0.06
Cazadero	0.17	0.25
Cloverdale	1.59	2.03
Cotati	1.46	1.45
Duncans Mills	-	0.03

table continued on next page

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TABLE 9. Share of high utilizers in each city (cont'd)

CITY	SHARE OF HIGH UTILIZERS (%)	SHARE OF ENTIRE STUDY SAMPLE (%)
El Verano	-	0.07
Eldridge	-	0.07
Forestville	0.82	0.98
Fulton	-	0.14
Geyserville	0.17	0.34
Glen Ellen	0.65	0.50
Graton	-	0.17
Guerneville	2.14	1.01
Healdsburg	2.08	2.97
Jenner	-	0.07
Kenwood	-	0.22
Monte Rio	0.27	0.24
Occidental	-	0.30
Penngrove	0.43	0.63
Petaluma	8.40	9.62
Rio Nido	-	0.10
Rohnert Park	6.85	6.98
Santa Rosa	57.87	37.96
Sebastopol	3.10	4.55
Sonoma	2.54	5.13
Stewarts Point	-	0.03
The Sea Ranch	-	0.07
Valley Ford	-	0.05
Villa Grande	-	0.02
Vineburg	-	0.03
Windsor	3.01	4.38

Appendix F: Regional utilization

TABLE 10. Characteristics and average annual utilization of high utilizers by region of residence

	SOUTHEAST (REGION 1)	SOUTHWEST (REGION 2)	CENTRAL (REGION 3)	NORTH (REGION 4)	WEST (REGION 5)
Sample					
# of high utilizers in region	1,095	671	1,856	1,974	450
% of all high utilizers in region	17%	10%	28%	30%	7%
% of entire study population in region	17%	12%	19%	25%	8%
Physical Health					
Hospital Days	3.4	3.3	3.1	3.1	3.4
ER visits	1.5	1.6	1.4	1.5	1.3
Hospital charges	$14,700	$16,300	$16,100	$13,600	$15,500
Behavioral Health					
Inpatient mental health days	0.7	0.6	0.5	0.6	0.8
Inpatient SUD days	1.6	3.3	2.2	1.6	1.2
Behavioral health costs	$8,300	$8,300	$5,300	$5,300	$8,200
Criminal Justice					
Jail bookings	0.51	0.47	0.58	0.50	0.51
Jail bed days	20.6	15.7	24.4	19.0	18.2
Estimated jail costs	$2,000	$1,500	$2,300	$1,800	$1,600
Homelessness					
Days sheltered/housed	28.8	34.3	32.9	31.1	31.8
Unique program enrollments	0.64	0.70	0.72	0.86	0.55
Estimated housing costs	$1,900	$2,300	$2,200	$2,100	$2,100
High utilizer demographics					
Asian/Pacific Islander	1%	1%	1%	2%	2%
Black	3%	2%	4%	4%	2%
Hispanic	15%	13%	17%	17%	9%
Non-Hispanic White	61%	64%	56%	56%	63%
Male	48%	53%	56%	54%	55%
Average age	39.5	41.7	39.3	40.3	40.5

Note: See footnote 8 for an explanation of cost estimates. We do not include human services utilization in this table because the number program enrollments is our only intensity measure and so there is much less variation between low and high utilizers.

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