

Home Not Found

The Cost Of Homelessness In Silicon Valley



**ECONOMIC
ROUNDTABLE**
Knowledge for the Greater Good

Daniel Flaming, Halil Toros and Patrick Burns
ECONOMIC ROUNDTABLE

Underwritten by Destination: Home and the County of Santa Clara

2015

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Design by Design Action Collective

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Acknowledgements

We would like to express our gratitude to the individuals who generously provided information, insights and support that made this study possible

Destination: Home Staff

Alejandra Herrera-Chavez
Jennifer Loving

Destination Home Board of Directors

Chris Block	John Sobrato
Frederick Ferrer	Erica Wood
Katherine Harasz	Louis Chicoine
Ted Wang	Gary Graves
Jan Bernstein Chargin	Ben Spero
Beau Goldie	

Santa Clara County Staff

Timothy Albritton	Raymunda Garcia	Martha Paine
Mandeep Baath	Laura Garnette	Dan Peddycord
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Hedy Farrales	Steve Monte	Jason Vega
Chris Ferry	Hung Nguyen	Martha Wapenski
Mary Fisher	Margaret Olaiya	Deane Wiley
Karen Fletcher	Leticia Ortiz	Bart Zisa

Housing Authority of the County of Santa Clara

Vanessa Cooper
Katherine Harasz
Louise Hofmeister
Myvan Khuu-Seeman

Santa Clara County Board of Supervisors

Cindy Chavez
Dave Cortese
Joe Simitian
Mike Wasserman
Ken Yeager

Community Technology Alliance

Jennifer Padgett
Michelle Ogburn
Jim O'Sullivan

The Health Trust

Frederick Ferrer
Todd Hansen

HomeBase

Jeff Ugai

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CHAPTER 1

Executive Summary

Purpose

This report identifies the characteristics of the most vulnerable, distressed and costly homeless residents of Santa Clara County to guide strategies for stabilizing their lives, improving their wellbeing and reducing public costs for their care.

Homelessness is marked by the absence of connections that are crucial for well-being, including connections to shelter, family, and health. These deficits are more severe and indelible among individuals experiencing persistent homelessness¹, for whom homelessness has become a way of life. The acute deprivation, desperation, and chaos inherent in their lives also destabilizes their communities. Individuals experiencing persistent homelessness, who have recurring health and justice system crises that bring them into hospitals and jails at high public cost, are the focus of this study.

The Study

This report analyzes comprehensive cross-sector information about the entire population of residents who experienced homelessness in Santa Clara County at any point during a six-year period – a total of 104,206 individuals. This information includes the demographic and medical attributes of each person, justice system history, services received, and the cost of those services.

Records for this population were linked across all justice system, health care, social service, nonprofit, and housing agencies. With information about over one hundred thousand people over the six years from 2007 to 2012, including detailed records from each service provider, **this is the largest and most comprehensive body of information that has been assembled in the United States to understand the public costs of homelessness.**

The Cost of Homelessness

Most costs for homeless residents are paid by the county, though these costs are partially offset by revenue from the state and federal government for health care, public assistance, and justice system agencies. Private hospitals also provide health care, paid for with public and private funds. Additional costs are paid by cities within the county, for example for police services. Other homeless services provided by nonprofit agencies are underwritten both by philanthropic grants and federal funding from HUD.

The Santa Clara County community spent \$520 million a year providing services for homeless residents over the six years covered by this study. Health care costs accounted for 53 percent of expenditures for homeless persons. Social welfare agencies including nonprofit service providers and county

1 The term *persistent* homelessness is used in place of *chronic* homelessness in this report because the study population includes individuals who were temporarily housed by friends and relatives, also described as ‘couch surfing.’ These individuals did not have a place of their own to live in but were able to avoid staying in a place not meant for human habitation. Persistently homeless individuals are those who were flagged in agency records as homeless for twelve or more months continuously or who had four or more stints of homelessness in a three-year interval.

Social Services accounted for 13 percent of expenditures. Justice system agencies accounted for 34 percent of expenditures, most of it for jail costs.

Homeless costs are heavily skewed toward a comparatively small number of frequent users of public and medical services. For example, for all county residents experiencing homelessness in 2012, the average annual cost per person was \$5,148. However, individuals with costs in the top 5% accounted for 47 percent of all costs and had average costs of over \$100,000 per year.

The highest cumulative public costs across all services are associated with individuals experiencing persistent homelessness. The share of persistently homeless residents in the combined ninth and tenth cost deciles is twice as large as the share of short-term homeless residents. **In a given year, there are approximately 2,800 persistently homeless residents of the county with average public costs of \$83,000 per year.**

However, persistent homelessness by itself is not associated with sufficiently high public costs to offset the cost of housing. The typical persistently homeless individual has costs averaging \$13,661 a year. **By prioritizing housing opportunities for the group of 2,800 persistently homeless individuals with the highest costs, it is possible to obtain savings that more than offset the cost of housing.**

A crucial issue is differentiating individuals whose high costs are the result of a one-time cost spike versus individuals with ongoing high costs. Roughly 70 percent of individuals in the top 5% have ongoing high costs and 30 percent have high costs that result from a one-time spike. Those with ongoing high costs are likely to have the greatest cost savings or cost avoidance when they are stabilized with permanently affordable housing and supportive services. An estimated 2,800 Santa Clara County residents are in the top 5% with continuing high costs.

Duration of Homelessness

The homeless population is dynamic, with many individuals making lasting exits after short episodes of homelessness, a smaller number of individuals cycling into and out of homelessness, and a very small number of individuals experiencing continuous, unremitting homelessness. From 2007 through 2012, 13 percent of the total county population of 104,206 people who experienced homelessness were persistently homeless during part or all of the six-years.

The predominant form of persistent homelessness was twelve or more months of continuous homelessness. This mode accounted for 84 percent of all experiences of persistent homelessness. The other 16 percent was the result of four or more stints of homelessness in a three-year period.

Public Services

Outpatient health care is the most frequently used service supporting over half of homeless residents. Over a quarter used the emergency room; 17 percent used mental health services;

14 percent were hospital inpatients; 13 percent used drug and alcohol rehabilitation services; and 6 percent used emergency psychiatric services.

A third of the study population had criminal justice system involvement over the six years of available data. Among this group, a third were charged with felonies, half with misdemeanors and a fifth with infractions. A third of the charges were for drug offenses.

Risk Factors for High Public Costs

Mental illness, substance abuse, incarceration history, and persistent homelessness all have a strong impact on public costs.

Some medical diagnoses are widely prevalent among homeless residents and also have a high cost profile. Mental health disorders are foremost among these, with 26 percent of homeless individuals diagnosed and 40 percent with the diagnosis having overall public costs in the top two deciles. Diseases of the circulatory system, which include heart disease, chronic hypertension, and rheumatic fever, are diagnosed in 11 percent of Santa Clara County homeless residents, 41 percent of whom have overall public costs in the 9th and 10th deciles.

The highest public costs for homeless residents are in the health care and jail systems. If a homeless individual experienced any of the following over a two-year period, they were more likely than not to be in the top 5%:

- 7 or more hospital inpatient days,
- 11 or more emergency room visits,
- 4 or more emergency psychiatric service visits.

Comparable benchmarks for jail stays over a two-year period include:

- 7 or more days in cell block 8A, the jail mental health facility,
- 10 or more days in cell block 2B or 2C, jail medical facilities,
- 300 or more days in general jail facilities.

Substance abuse and mental illness double the likelihood of being and staying in the top 5%, with odds two and a half times greater than average for people with both of these attributes.

Four-fifths of youth who age out of foster care have diagnosed mental disorders and 65 percent are involved with the justice system. Youth with both attributes are at high risk of having public costs in the top 5%. More effective support is needed to help foster youth achieve a successful transition into adulthood.

Among individuals with jail histories, a maximum security classification makes someone six times more likely to be in the ongoing top 5%.

Males have above average and females below average prospects of ongoing presence in the top 5%. However, gender breakouts for the county show equal numbers of males and females experiencing homelessness and more females experiencing persistent homelessness. This is very different from national data, which show two or three times as many males homeless

as females. This high rate of female homelessness should be investigated further.

Geography of Homelessness

The geographic distribution of homelessness corresponds roughly with the distribution of poverty in Santa Clara County. Homeless residents are concentrated at the center and south end of the county - in San Jose and Gilroy.

Services provided by nonprofit agencies appear to be unevenly distributed, with a below average level of services provided to homeless residents of Gilroy.

Death

Santa Clara County's homeless residents who died during the study period had a bifurcated cost profile. Almost a third were in the most expensive 10th Decile and a quarter of the top 5%. In contrast, a quarter were at the bottom of the cost distribution, in the lowest cost decile, despite being in the final stage of life. The latter group may include residents who were unsuccessful in accessing needed services.

Housed Individuals

The Housing 1000 Permanent Supportive Housing initiative was established by Destination: Home in 2011, in partnership with Santa Clara County, the City of San Jose and the Santa Clara County Continuum of Care, to provide supportive housing to homeless residents. This study captures public expenditure data on 469 individuals who were housed under this program. Half of homeless residents who were housed through this program were in the top fifth of the cost distribution for homeless persons, but only a fifth were in the top 5%.

Three quarters of the individuals housed by Housing 1000 remained housed, while one quarter exited housing. By strengthening post-housing supportive services, there is the potential that retention rates can be further improved.

For the 103 homeless residents in the tenth cost decile who were housed through Housing 1000 program, the estimated average annual pre-housing public cost was \$62,473. The estimated average post-housing cost was \$19,767, a reduction of \$42,706 annually.

Next Step

The purpose of this study is to develop a statistically validated portrait of the highest cost homeless residents of Santa Clara County. The descriptive factors that identify the highest continuing cost homeless persons can enable public institutions to provide housing and social services that will stabilize the neediest individuals and significantly reduce public costs. The next deliverable for this project is an operational screening tool for identifying homeless residents who have the highest public costs.

Conclusions and Recommendations

There are 2,800 people in the County who experience persistent homelessness and are the most frequent users of public services. For this group, the average annual public cost is \$83,000, which significantly exceeds the cost of permanent supportive housing. These vulnerable and acutely distressed individuals should be given priority access to housing that is permanently affordable to them with ongoing supportive services.

Access to the scarce inventory of deeply subsidized housing that is permanently affordable for homeless residents should be prioritized based on level of need among homeless persons as well as benefits that accrue to the public from housing high-cost, high-need individuals.

The cost saving benefits of housing for the public and improved wellbeing for the individual are achieved only while the individual remains in housing. There is potential to improve housing retention rates by strengthening post-housing supportive services.

Hospitals and jails, which are cost centers for serving homeless residents, should make systematic, pro-active efforts to assess and document the housing status of patients and inmates. This will make a significant contribution to the capability of the Santa Clara County community to identify homeless residents, understand homeless trends, and identify high-cost, persistently homeless residents who should be given priority access to housing.

A range of interventions other than permanent supportive housing are needed for other segments of the persistently homeless population. These include housing subsidies without supportive services for impoverished and disabled residents who are able to live independently, and coordinated, skilled efforts to qualify disabled, persistently homeless residents for Supplemental Security Insurance in order to provide them with adequate income maintenance.



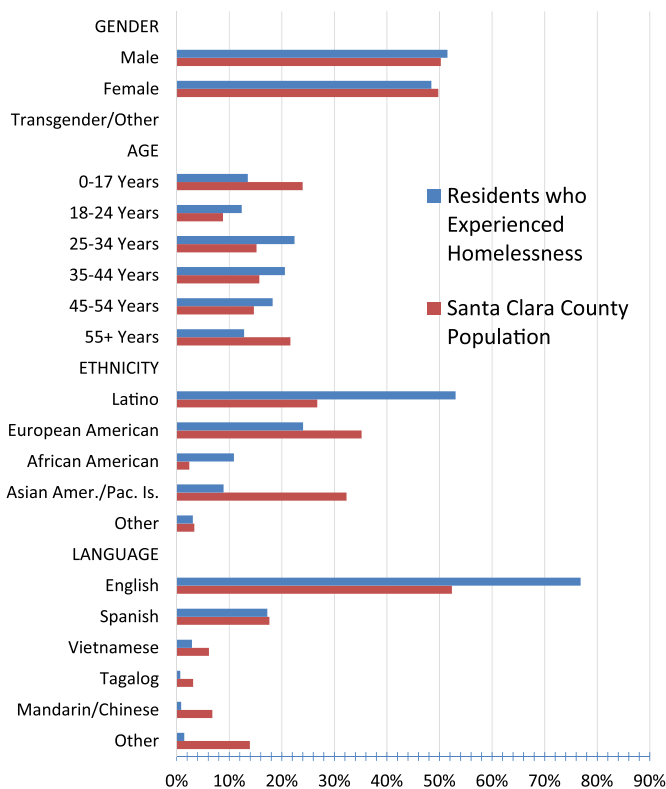
CHAPTER 2

Profile of Residents who Experienced Homelessness

Overview

This report builds on comprehensive cross-sector information about the entire population of Santa Clara County residents who experienced homelessness at any point over a six-year period – a total of 104,206 individuals. This information includes the demographic and medical attributes of each person, justice system history, services received, and the cost of those services. Records for this population were linked across all justice system, health care, social service, nonprofit, and housing agencies. With information about over one hundred thousand people over the six years from 2007 to 2012, and detailed records from each service provider, this is the largest and most comprehensive body of information that has been assembled in the United States to understand public costs of homelessness. Additional information about the record linkage process and statistical methods is provided in the Methods Appendix.

FIGURE 2.1:
Residents who Experienced Homelessness Compared to Total Santa Clara County Population



Sources: Linked Santa Clara County homeless records and American Community Survey 2008-2012 Public Use Microdata Sample

Demographics

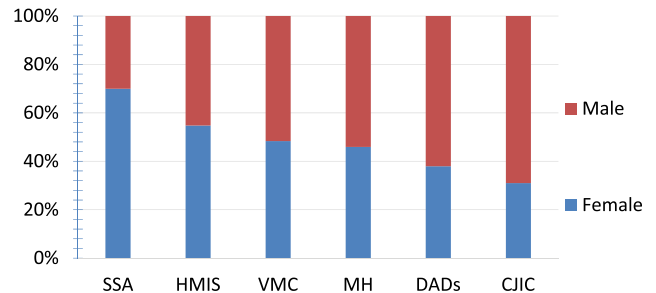
The population of 104,206 Santa Clara County residents who experienced homelessness in part or all of the six years from 2007 through 2012 looks much like the rest of the county, when broken out by gender - half male and half female, and half a percent who identify as transgender or other (Figure 2.1).

This pattern of equal numbers of male and female homeless is consistent across the records of Social Services, Mental Health, Valley Medical Center, and nonprofit agencies that share client data through the Homeless Management Information System, which, respectively, show 70, 46, 49, and 55 percent of homeless residents are female. However, this is very different from national data in HUD’s “2013 Annual Homeless Assessment Report to Congress,” which shows a two-to-one ratio of males to females among homeless adults.

Data in this report diverges from the county’s 2013 homeless census and survey, which reported a roughly two-to-one ratio of males to females. This issue should be investigated further.

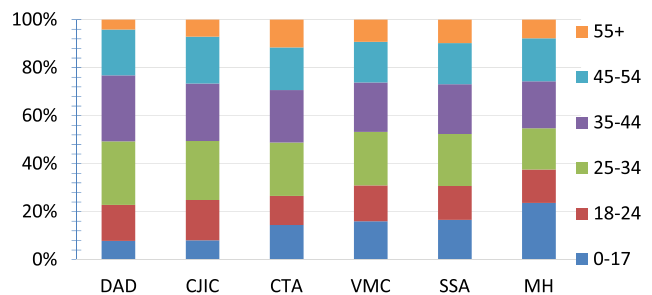
On other demographic measures, residents identified as homeless are more divergent. Residents 18 to 54 years of age are over-represented among individuals who experienced

FIGURE 2.2:
Gender Distribution of Agencies’ Caseloads



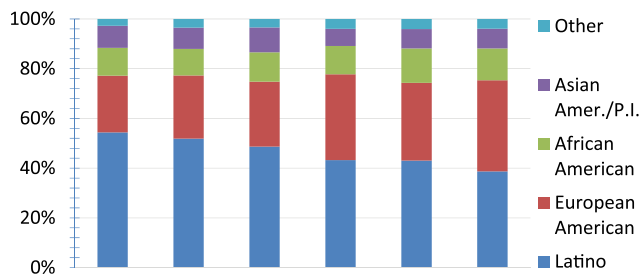
Source: Linked Santa Clara County homeless records for 2007 through 2012.

FIGURE 2.3:
Age Distribution of Agencies’ Caseloads



Source: Linked Santa Clara County homeless records for 2007 through 2012.

FIGURE 2.4:
Ethnic Distribution of Agencies' Caseloads



Source: Linked Santa Clara County homeless records for 2007 through 2012.

homelessness. Children 0 to 17 years of age are under-represented as are older adults 55 years of age or older.

Among ethnic groups, Latinos and African Americans are over-represented and every other ethnic group is under-represented.

Among language groups, English speakers are over-represented, Spanish speakers are at parity with the overall population, and Vietnamese, Tagalog, Mandarin and other Chinese language speakers are under-represented.

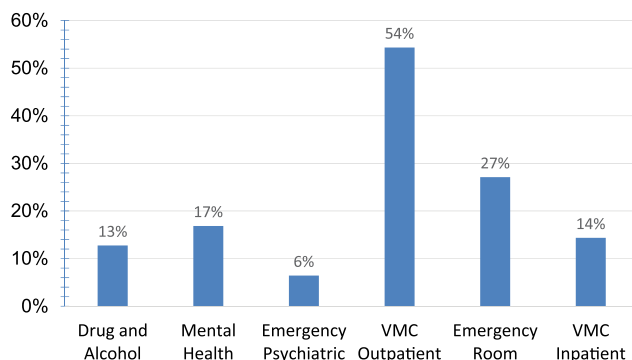
Profile of Agency Clients

Different agencies serving the homeless report divergent client profiles, as shown in *Figures 2.2 to 2.4*.

Seventy percent of the homeless clients served by the county Social Services Agency (SSA) are female, the highest proportion of any agency. In contrast, 69 percent of the homeless individuals who have contact with the criminal justice system (CJIC) are male (*Figure 2.2*).

The HUD-funded nonprofit agencies whose client data are collected by the Homeless Management Information System (HMIS), Valley Medical Center (VMC), and Mental Health (MH) all see roughly equal shares of males and females.

FIGURE 2.5:
Percent of Residents that Experienced Homelessness from 2007 to 2012 Using Different County Health Care System Services



Source: 104,206 linked homeless records for 2007 through 2012

Mental Health has the highest percent of children in its caseload. The Department of Alcohol and Drug Services (DADS) has the lowest percent of children. Nonprofits represented by HMIS have the highest percent of seniors in their caseloads (*Figure 2.3*).

Nonprofits (HMIS) have the highest percent of Latinos in their caseloads. Mental health has the highest percent of European Americans. The criminal justice system has the highest percent of African Americans. Social Services Agency has the highest percent of Asian Americans and Pacific Islanders in its caseload (*Figure 2.4*).

There appears to be an unusually high rate of persistent homelessness among female residents of the county. This should be investigated further.

Use of County Health Services

Outpatient health care is the service used by the most homeless residents. As can be seen in *Figure 2.5*, over half of the entire population of county residents who have experienced homelessness has received outpatient health care.

Over a quarter used the emergency room, 17 percent used mental health services, 14 percent were hospital inpatients, 13 percent used drug and alcohol rehabilitation services, and 6 percent used emergency psychiatric services.

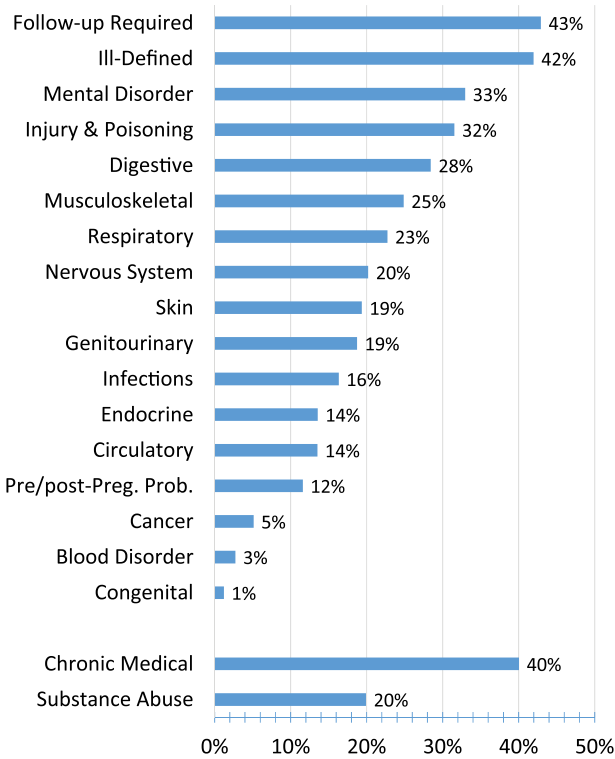
There are medical diagnoses in the records of over 80,000 individuals in the study population, frequently with multiple diagnoses per person. The high-level body system diagnoses shown in *Figure 2.6* identify frequent needs for ongoing medical attention as well as ill-defined conditions that are difficult to diagnose. The most frequent specific diagnosis is for mental disorders - a third of the study population has a diagnosed mental disorder.

Nearly a third received health care after being injured or poisoned. Roughly a quarter have digestive, musculoskeletal and respiratory disorders.

Forty percent have a chronic medical condition. And based on aggregated information from all records, including drug-related criminal charges, twenty percent have substance abuse problems. It is likely that this figure considerably understates the actual prevalence of drug and alcohol disorders.

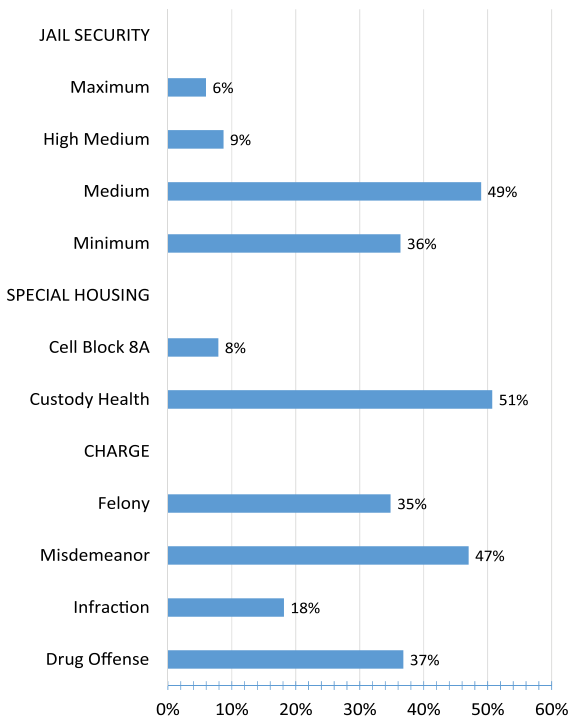
Additional information about medical diagnoses is provided in the Methods Appendix.

FIGURE 2.6:
Diagnostic Profile of Homeless Residents



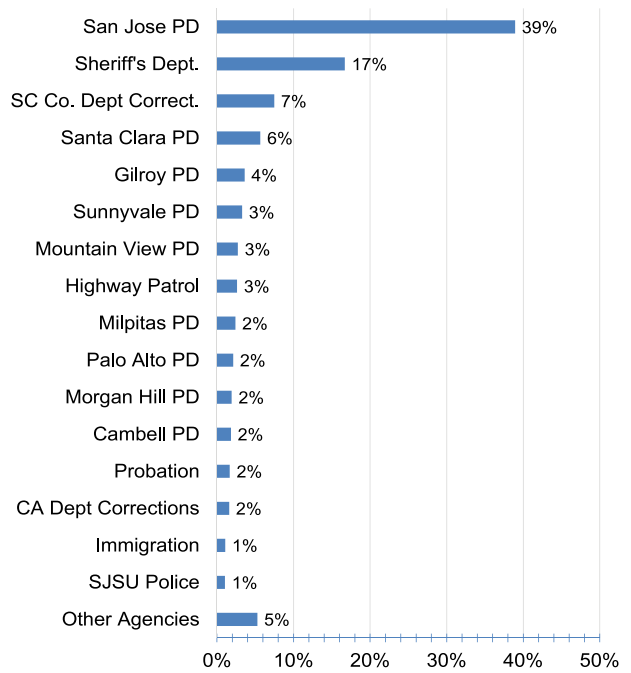
Source: 80,034 linked homeless records with medical diagnoses.

FIGURE 2.7:
Persons with Justice System Contact



Source: 33,329 linked records with justice system involvement.

FIGURE 2.8:
Jurisdictions Arresting Homeless Residents



Source: 33,329 linked records with justice system involvement.

Justice System Involvement

A third of the study population had criminal justice system involvement over the six years of available data. Among this group, a third were charged with felonies, half with misdemeanors and a fifth with infractions. A third of the charges were for drug offenses, as shown in *Figure 2.7*.

A third were incarcerated in minimum security facilities, half in medium security, 9 percent in high-medium security, and 6 percent in maximum security facilities.

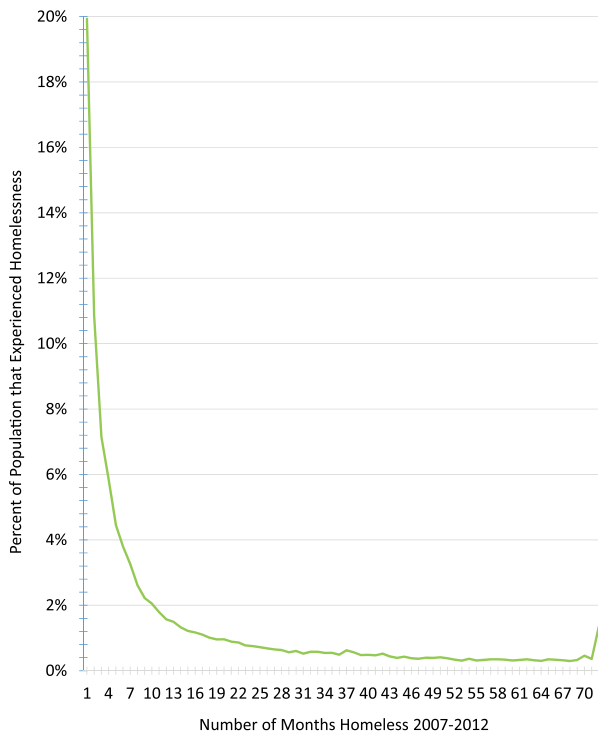
Eight percent were incarcerated in cell block 8A in the main jail, which houses individuals with serious mental disorders. Half received some type of medical care from Custody Health while incarcerated.

Seventy-three agencies with law enforcement authority within the county arrested homeless individuals. The largest share of homeless arrests occurred in San Jose – 39 percent, followed by the Sheriff's Department – 17 percent, as shown in *Figure 2.8*.

Duration of Homelessness

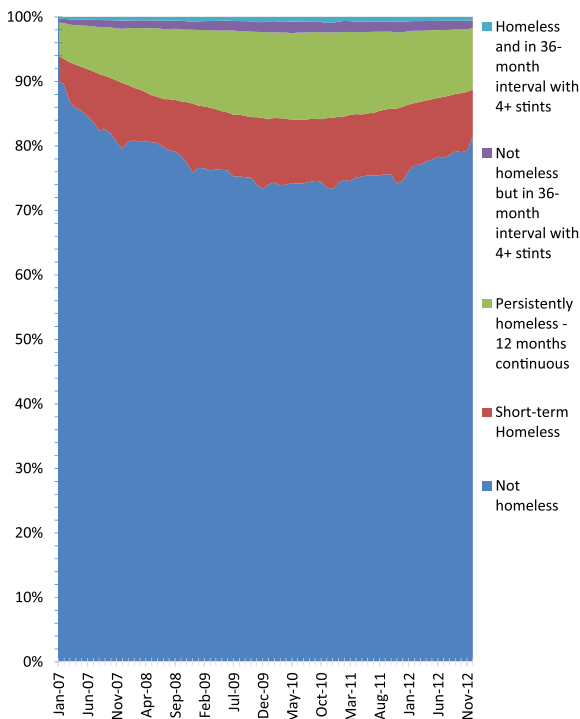
Most people who experience homelessness make a lasting exit, but for a small number it becomes a way of life. Out of the entire population that experienced homelessness from 2007 through 2012, a fifth of the total population was homeless for only one month, as shown in *Figure 2.9*. Another 32 percent were homeless for a total of two to six months over the six-year

FIGURE 2.9:
Number of Months Homeless 2007-2012



Source: 104,206 linked records of residents experiencing homelessness 2007-2012

FIGURE 2.10:
Monthly Homeless Status for the Population Experiencing Homelessness any Time During 2007 to 2012



Source: 104,206 linked records of residents experiencing homelessness 2007-2012.

period. Another 12 percent were homeless from seven to eleven months. Taking these three groups together, 64 percent, or nearly two-thirds of the study population were homeless for less than one year.

Thirteen percent of the population was homeless from 12 to 23 months – a total of at least one year but less than two years. Seven percent were homeless 24 to 35 months – At least two years but less than three.

The final 15 percent of the population was homeless for 36 or more months – half or more of the time window for the study.

Records available for this population show only 1.3 percent as being homeless all 72 months. Documentation of homeless episodes is incomplete in these records, and undoubtedly some stints of homelessness were longer than shown in client records and other stints were not recorded. Despite these limitations, the information we do have about duration of homelessness strongly indicates that the homeless population is dynamic, with many individuals making lasting exits after short episodes of homelessness, a smaller number of individuals cycling into and out of homelessness, and a very small number of individuals experiencing continuous, unremitting homelessness.

Monthly Profile of Homelessness

A month-by-month profile of the homeless population's status is shown in *Figure 2.10*.

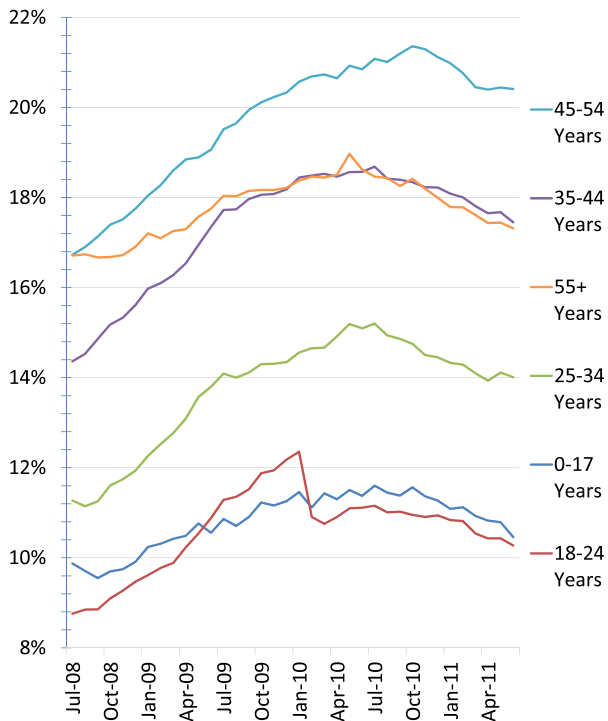
Our information shows that in an average month from 2007 through 2012, 13 percent of the total study population was persistently homeless. This time interval includes a severe recession, impacting rates of persistent homelessness, which peaked at 16 percent in mid-2010.

The predominant form of persistent homelessness was twelve or more months of continuous homelessness. This mode accounted for 84 percent of all experiences of persistent homelessness. People whose homeless stint was one of four or more stints in a 36-month interval accounted for another 5 percent of the persistently homeless population. And people who were not homeless in a particular month but were in a 36-month window when they experienced four or more stints of homelessness accounted for the final 11 percent of the persistently homeless population.

The share of the study population experiencing short-term homelessness averaged 9 percent in each month during the six-year time window. The share of the population experiencing these non-persistent homeless stints peaked at 11 percent in the end of 2009.

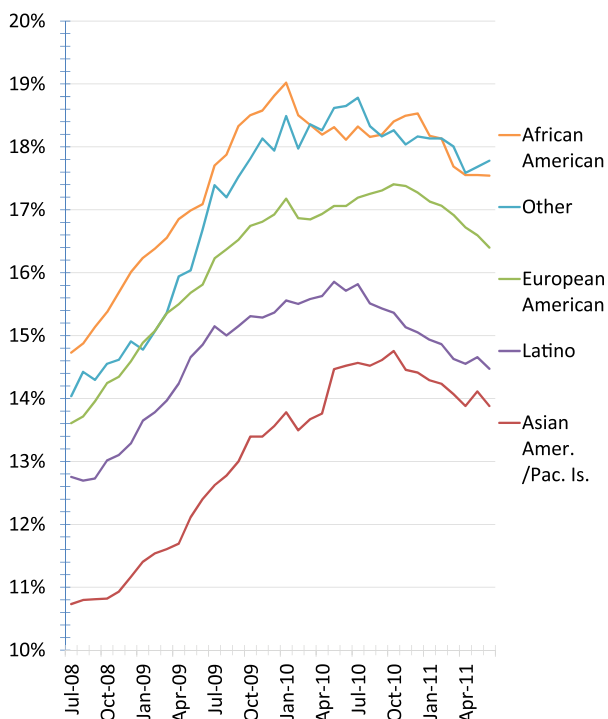
In an average month 22 percent of the study population were homeless. The peak months of homelessness were at the end of 2010 when 27 percent were homeless.

FIGURE 2.11:
Rate of Persistent Homelessness by Age



Source: records of 104,206 experiencing homelessness 2007-12.

FIGURE 2.12:
Rate of Persistent Homelessness by Ethnicity



Source: records of 104,206 experiencing homelessness 2007-12.

Attributes of Persistently Homeless Individuals

Monthly rates of persistent homelessness within the overall population of 104,206 individuals who experienced homelessness are shown broken out by age, ethnicity, jail security status and medical diagnosis in Figures 2.11 to 2.14. The time window for these charts is July 2008 through June 2011, which makes it possible to take into account the duration of homeless stints that began before this interval or extended after it. The risk of persistent homelessness varies more across age groups, incarceration types and medical conditions more than by ethnicity.

Among age groups within the population that experienced homelessness, the risk of persistent homelessness is lowest for individuals under 25 years of age. The rate of persistent homelessness is roughly twice as high for individuals 45 to 54 years of age, as shown in *Figure 2.11*. The rate of persistent homelessness increases with age up to 55 years, and then decreases. The decrease may be due to greater documentation of disabilities and improved access to Supplementary Security Income (SSI) benefits for older individuals.

Ethnicities show less variance. African Americans and European Americans had a rate of persistent homelessness averaging 16 percent a month, followed by Latinos with an average rate of 15 percent, as shown in *Figure 2.12*.

This rate was exceeded by the 17 percent average for “Other” ethnicities. Other is made up of several smaller groups including Native Americans and Alaskan Natives, individuals reporting two or more ethnicities, and individuals who identify themselves as Other.

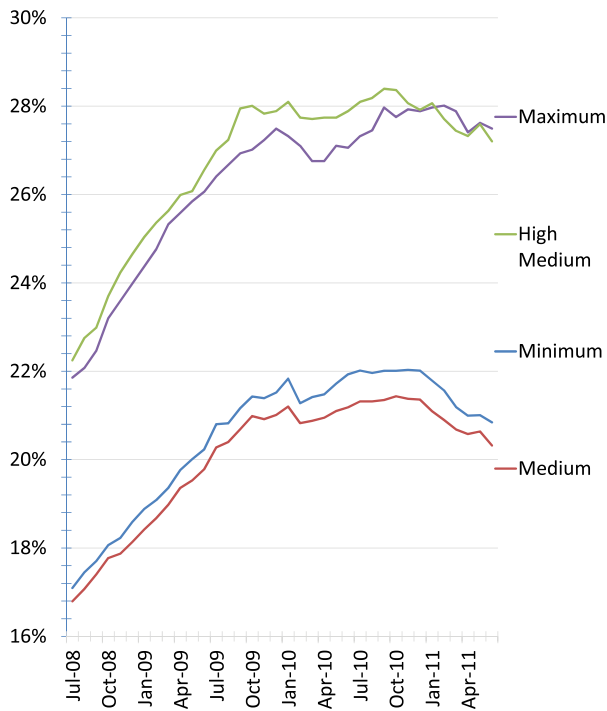
The lowest rate of persistent homelessness was among Asian Americans and Pacific Islanders, whose average rate was 13 percent a month.

Among homeless individuals with incarceration histories, the highest rates of persistent homelessness are among individuals with maximum and high medium security classification, averaging 26 and 27 percent a month, respectively, as shown in *Figure 2.13*.

Individuals with minimum and medium security classifications had significantly lower rates of persistent homelessness, averaging 21 and 20 percent a month, respectively.

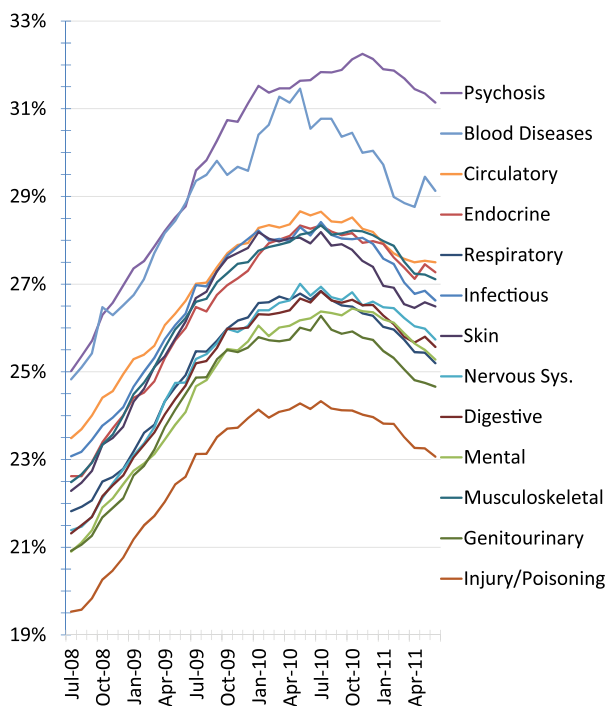
Monthly rates of persistent homelessness based on highly aggregated medical diagnoses, with all but “psychosis” at the most general body system level, are shown in *Figure 2.14*. The highest rate shown, for individuals with a psychosis, is 30 percent. This diagnostic group is a subset of the Mental Disorders body system, which also includes other less severe conditions such as neurotic and personality disorders, and has a lower overall monthly rate persistent homelessness of 25 percent. Within the category of psychoses, there is a much higher rate of persistent homelessness – 40 percent – for individuals diagnosed with schizophrenia.

FIGURE 2.13:
Rate of Persistent Homelessness by Jail Security Level



Source: 33,329 linked records with justice system involvement

FIGURE 2.14:
Rate of Persistent Homelessness by Diagnosis



Source: 80,034 homeless records with medical diagnoses.

The next highest rate of persistent homelessness is among individuals diagnosed with a disease of the blood or blood-forming organs, for example, sickle-cell anemia, with an average of 29 percent persistently homeless each month.

The mid-range group of circulatory, endocrine and metabolic, respiratory, infectious and parasitic, skin, nervous system, digestive, musculoskeletal, and genitourinary disorders had an average monthly rate of persistent homelessness of 26 percent.

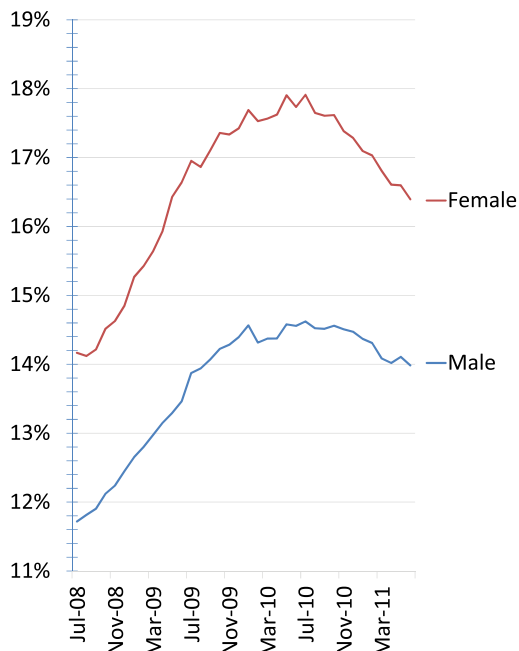
The lowest rate of persistent homelessness shown in Figure 2.14 is for individuals receiving medical care for injuries or poisoning. The rate of persistent homelessness among these individuals averaged 23 percent a month.

The rate of persistent homelessness is higher among females than males, as shown in *Figure 2.15*. Seventeen percent of females versus 14 percent of males were recorded as persistently homeless in an average month. Records from Social Services, Mental Health, Valley Medical Center, and Community Technology Alliance show more persistently homeless females than males – with females’ share reported, respectively, to be 53, 47, 52, and 54 percent.

The level of persistent homelessness among females in Santa Clara County is much higher than national estimates. SAMHSA, the federal Substance Abuse and Mental Health Services Administration, reports that 67 to 80 percent of persistently homeless individuals in the United States are males.

It is important to understand the unusually high rate of homelessness and persistent homelessness among females in Santa Clara County. This issue should be investigated further.

FIGURE 2.15:
Rate of Persistent Homelessness by Sex



Source: records of 104,206 homeless 2007-2012

Summary of Findings

Outpatient health care is used by over half of homeless residents – the most frequently used service. Over a quarter used the emergency room, 17 percent used mental health services, 14 percent were hospital inpatients, 13 percent used drug and alcohol rehabilitation services, and 6 percent used emergency psychiatric services.

A third of the study population had criminal justice system involvement over the six years of available data. Among this group, a third were charged with felonies, half with misdemeanors and a fifth with infractions. A third of the charges were for drug offenses.

There appears to be an unusually high rate of homelessness and persistent homelessness among female residents of the county. This finding should be investigated further.

Most people who experience homelessness make a lasting exit, but for a small number it becomes a way of life. Out of the entire population that experienced homelessness, nearly two-thirds was homeless for less than one year out of the six years.

In an average month, 13 percent of the total population included in the study (those who were homeless at some point between 2007 and 2012) was persistently homeless. Rates of persistent homelessness vary significantly by age, gender, ethnicity, mental wellbeing, and justice system history.



CHAPTER 3

Cost Profile

Overview

Over \$3.1 billion was spent in Santa Clara County providing services for homeless residents over the six years covered by this study, as shown in *Figure 3.1*. Costs averaged \$520 million a year.

A total of \$1.9 billion, or \$312 million a year, was spent on health care. Valley Medical Center and its network of clinics spent \$915 million on health care for homeless residents over six years, with another \$387 million spent by private hospitals. The County Mental Health department spent \$448 million, County Drug and Alcohol Services spent \$100 million, and \$25 million was spent on emergency medical transportation.

Social welfare agencies including nonprofit service providers and county Social Services spent \$463 million over six years. Justice system agencies spent \$786 million over six years, or \$196 million a year, most of it for jail costs.

Most costs for homeless residents are paid by the county, though these costs are partially offset by revenue transfers from state and federal government for health care, public assistance, and justice system agencies. Private hospitals also provide health care, paid for with public and private funds. Additional costs are paid by cities within the county, for example for police services.

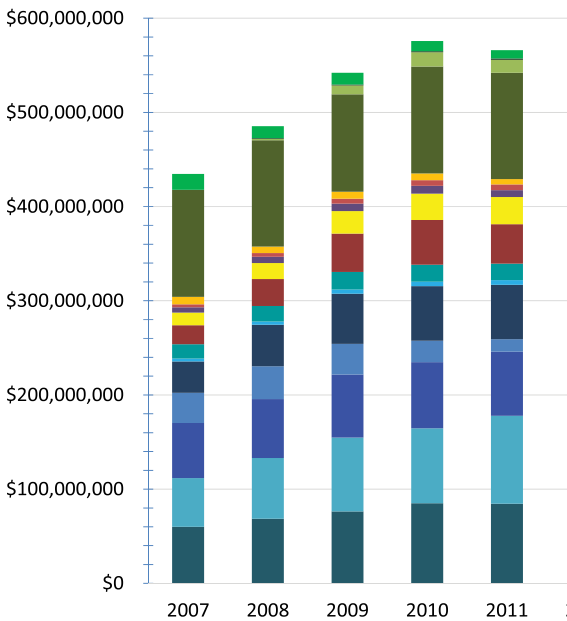
And homeless services provided by nonprofit agencies are underwritten both by philanthropic grants and federal funding from HUD.

Homeless costs are heavily skewed toward a comparatively small number of frequent users of public and medical services, as shown in *Figure 3.2*. For example, 80 percent of residents who experienced homelessness in 2012 received less than \$9,000 annually in benefits and services in that year. The average annual cost for all residents who were homeless at some point in 2012 was \$5,148. However, the most frequent users of public, medical and nonprofit services, the top 5%, had costs averaging over \$102,000 in 2012.

In 2012, the highest-cost 10 percent of residents experiencing homelessness that year accounted for 61 percent of all costs for these individuals, or \$300 million for the year. The top 5% accounted for 47 percent of all costs, or \$230 million for the year.

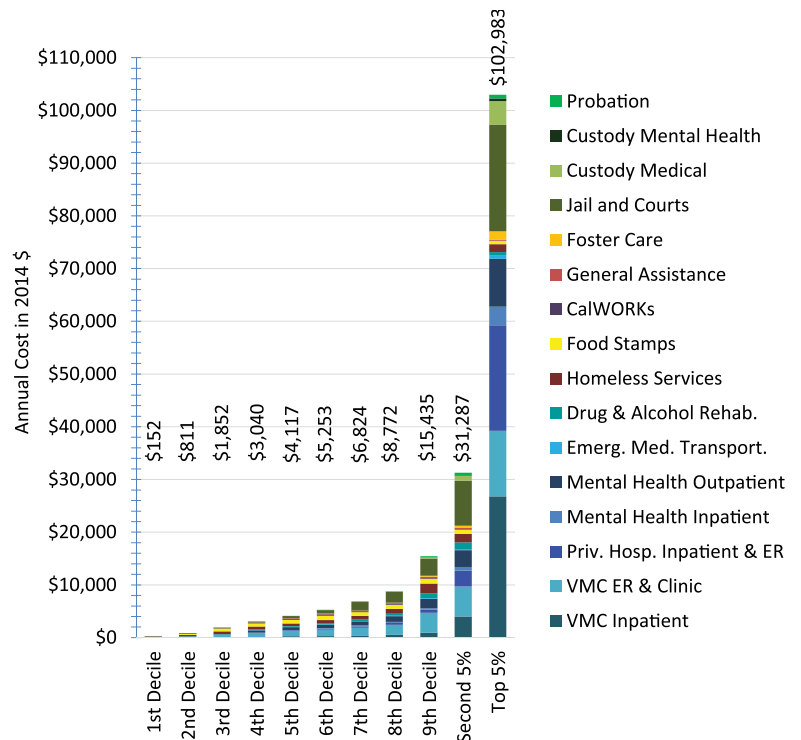
Public expenditures are most polarized when we look at a single year's data (*Figure 3.2*). When costs are averaged over multiple years, a larger share of the population will have had costly health care or justice system encounters, raising average costs for the lower deciles, and fewer people will have had costly health care or justice system encounters every year, so average costs for the

FIGURE 3.1:
Total Annual Cost for Homelessness
in Santa Clara County, 2007 to 2012



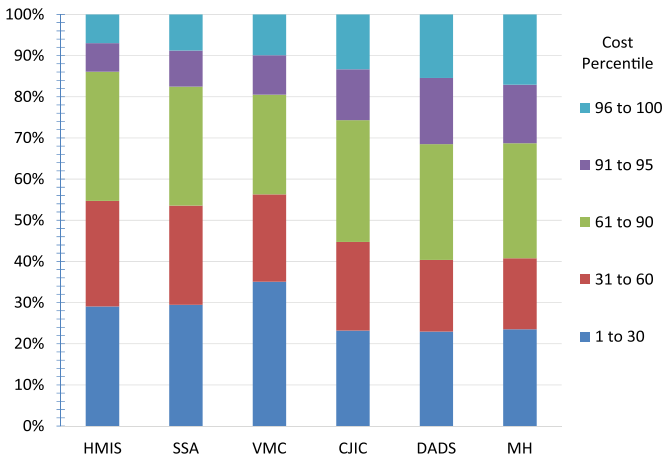
Source: 104,206 linked records of residents experiencing homelessness 2007-2012. Costs are for individuals who experienced homelessness at any point during the year: 36,466 in 2007, 41,916 in 2008, 48,880 in 2009, 51,299 in 2010, 50,580 in 2011, and 46,225 in 2012. Costs are shown in 2014 dollars.

FIGURE 3.2:
Annual Cost for Residents Homeless in 2012,
by Cost Decile and Top 5%



Source: Linked records for 46,255 individuals who experienced homelessness and had costs in 2012. Decile distribution is within this population of 46,255 individuals. Costs are shown in 2014 dollars.

FIGURE 3.3:
Residents Experiencing Homelessness
in 2012 by Cost Percentile and Agency



Source: The population shown is 46,225 residents with public costs who experienced homelessness in 2012. These residents are grouped in cost categories based on the cost distribution in the total study group population of 91,416 individuals with costs in 2012.

top 5% will decline. The statistical term for this leveling process is “regression to the mean,” which describes the tendency of peak events to taper off. Many of the problems that create high costs don’t happen every year, even for very sick people. Nevertheless, even when we look at multi-year data, the hockey stick profile shown in *Figure 3.2* remains recognizable, with costs highly concentrated in the top 5%.

The benefit of looking just at people who are homeless in a particular year, as we do in this chapter, is that it focuses attention on the public costs of individuals at the time of their homelessness. The drawback is that we lose information on longer-term trends related to costs for individuals falling in and out of homelessness.

Cost Distribution By Service Delivery Sector

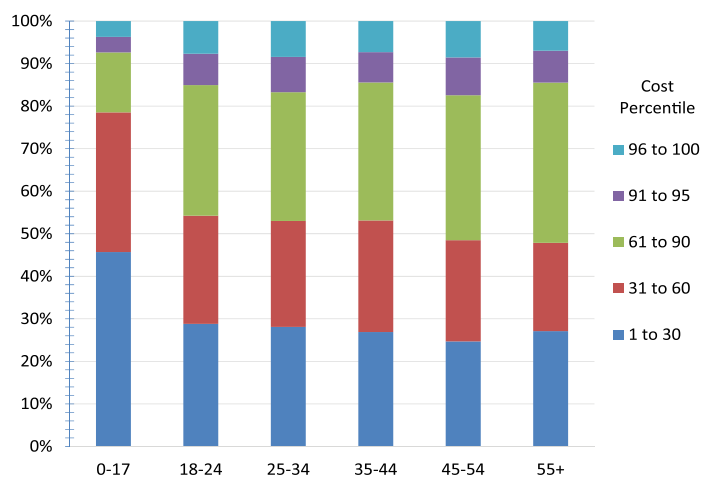
Linking data across Santa Clara County’s social service, health services and justice system agencies enables us to see the public cost profile of homeless residents served by service delivery sector (*Figure 3.3*). Each service delivery sector has a distinct client profile, resulting in different levels of service use and cost. The cost profile of clients seen by each service delivery sector who experienced homelessness in 2012 is displayed in *Figure 3.3*.

The population shown is individuals who experienced homelessness during the year, grouped in cost categories based on the cost distribution in the total study population of 91,416 individuals with costs in 2012. The reason for benchmarking costs against this larger population of vulnerable individuals, rather than just individuals who experienced homelessness in the year, is to avoid the excessively polarized cost profile seen in *Figure 3.2* that resulted from using a small time window (one

year) to looking at individuals when they are in crisis (homeless) and costs are more likely to have spiked.

- The Homeless Management Information System (HMIS) is a database external to Santa Clara County government. It collects information on all HUD-funded homeless service providers and their clients. This sector served 78 percent of residents identified as homeless in 2012. The large client base of these agencies included many individuals with modest service needs. As a result, nonprofit homeless service providers had the smallest share of individuals in the top 5% – 7 percent of homeless clients served by these agencies.
- The Santa Clara County Social Services Agency (SSA) is made up of the Departments of Aging and Adult Services, Employment and Benefit Services, and Family and Children’s Services. It served 69 percent of residents identified as homeless during the year and had the second smallest share of individuals in the top 5% – 9 percent of its homeless caseload.
- Santa Clara County Valley Medical Center (VMC) served 71 percent of residents identified as homeless during the year. Ten percent of homeless patients seen by VMC were in the top 5%.
- Criminal justice system agencies, whose data is captured by the Criminal Justice Information Control (CJIC) had contact with 38 percent of the residents identified as homeless during the year. Thirteen percent of these suspects, inmates and probationers were in the top 5%.
- The Santa Clara County Department of Drug and Alcohol Services (DADS) served 21 percent of residents identified as homeless during the year. Fifteen percent of DADS’ homeless clients were in the top 5%.

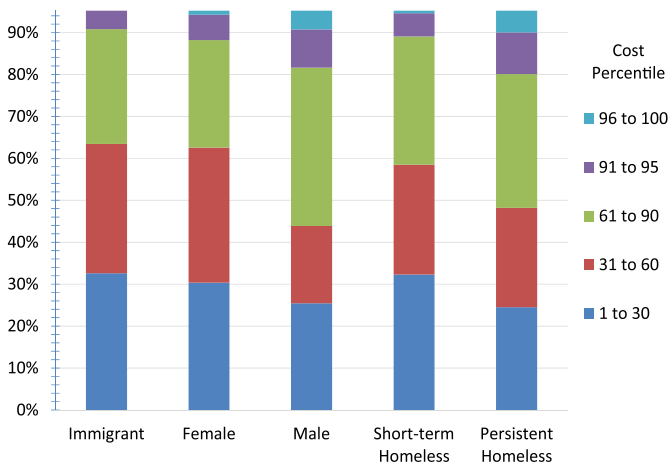
FIGURE 3.4:
Residents Experiencing Homelessness in 2012
by Cost Percentile and Age



Source: The population shown is 46,225 residents with public costs who experienced homelessness in 2012. These residents are grouped in cost categories based on the cost distribution in the total study group population of 91,416 individuals with costs in 2012.

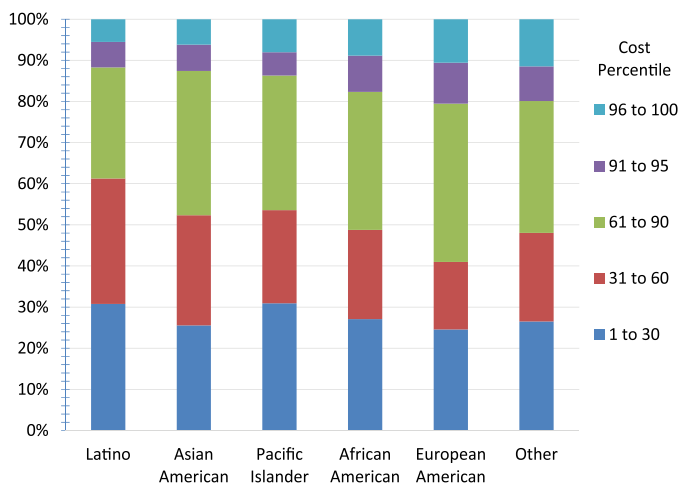
- The Santa Clara County Department of Mental Health (MH) serves residents diagnosed with mental illness, including in-reach into jails and hospitals. Its clients included 27 percent of individuals identified as homeless during the year. Seventeen percent of these clients were in the top 5% - the largest share of any service delivery sector.

FIGURE 3.5:
Residents Experiencing Homelessness in 2012 by Cost Percentile, Sex, Immigration, Homeless Status



Source: The population shown is 46,225 residents with public costs who experienced homelessness in 2012. These residents are grouped in cost categories based on the cost distribution in the total study group population of 91,416 individuals with costs in 2012.

FIGURE 3.6:
Residents Experiencing Homelessness in 2012 by Cost Percentile and Ethnicity



Source: The population shown is 46,225 residents with public costs who experienced homelessness in 2012. These residents are grouped in cost categories based on the cost distribution in the total study group population of 91,416 individuals with costs in 2012.

Cost Decile Distribution by Demographic Factors

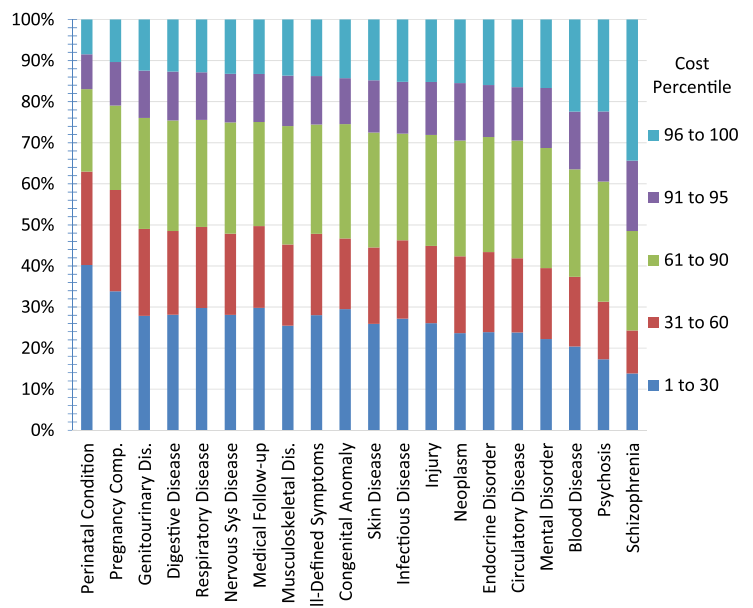
Age

Costs vary among demographic groups of homeless residents, including age groups (Figure 3.4). The share of homeless residents in the top 5% is smaller for younger homeless residents (4 percent for those age 0-17) and grows noticeably for older groups (9 percent for those age 45 to 54). The change in public costs from the 0-17 to the 18-24 group is noteworthy. The youngest cost group has the lowest cost profile of any age group, but with the shift to the 18 to 24 age group, the share of the group in the top 5% doubles to 8 percent. The increase in public costs between youth and young adults indicates increased use of health care and justice system services as individuals age into adulthood.

Sex and Immigration and Homeless Status

Males have a higher cost profile than females, as shown in Figure 3.5. Half again as many males are in the top 5% as females (9 vs. 6 percent). Immigrants experiencing homelessness have an especially low cost profile with only 4 percent in the top 5%. One factor may be lack of eligibility for some public services, reluctance to use other public services may be another factor, and there is a lower rate of justice system contact. The share of persistently homeless individuals in the top 5% is twice as large as the share of short-term homeless (10 vs. 5 percent).

FIGURE 3.7:
Residents Experiencing Homelessness in 2012 by Cost Percentile and Medical Diagnosis



Source: The population shown is 33,020 residents with public costs and a medical diagnosis who experienced homelessness in 2012. These residents are grouped in cost categories based on the cost distribution in the total study group population of 91,416 individuals with costs in 2012.

Ethnicity

The largest ethnic group among residents experiencing homelessness, Latinos, has the smallest share of members in the top 5% - 5.5 percent, as shown in *Figure 3.6*. All other ethnic groups have larger shares of homeless residents in the top 5%:

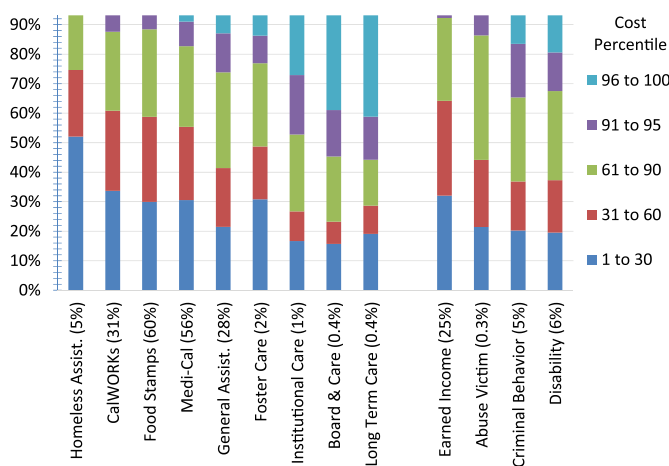
- Asian Americans: 6 percent
- Pacific Islanders: 8 percent
- African Americans: 9 percent
- European Americans: 11 percent
- Others: 11 percent

Cost Distribution by Medical Diagnosis

Health care services required to treat different medical diagnoses are the largest component of public costs for residents experiencing homelessness. The nationwide average household expenditure on healthcare related expenses is 7 percent of income. When health complications arise and are worsened by inadequate and irregular shelter, these costs can skyrocket.

Medical diagnoses were available for 72 percent of residents identified as homeless in 2012. *Figure 3.7* breaks out these residents into ICD-9 major medical diagnostic groups by cost percentiles. Information about the diagnostic codes for the labels used in *Figure 3.7* is provided in the Methods Appendix. Persons with multiple medical diagnoses appear in more than one column. Aside from “Pregnancy Complications,” 10 percent or more of

FIGURE 3.8:
Residents Experiencing Homelessness in 2012 by Cost Percentile for Social Services Agency Clients



Source: The population shown is 32,062 residents with public costs who experienced homelessness in 2012 and received assistance from the Social Services Agency. These residents are grouped in cost categories based on the cost distribution in the total study group population of 91,416 individuals with costs in 2012. The percent of the 46,225 residents identified as homeless in 2012 that are in each category is shown in parenthesis.

persons with each major medical diagnosis were in the top 5% of public costs, including one third of persons with diagnosed schizophrenia.

Some medical diagnoses are widely prevalent among homeless residents, as shown earlier in *Figure 2.6* and also are associated with high costs, as shown in *Figure 3.7*. For example, mental disorders are identified among 33 percent of residents who experienced homelessness and have a medical diagnosis, and 17 percent of residents who were homeless in 2012 and had this diagnosis were in the top 5%.

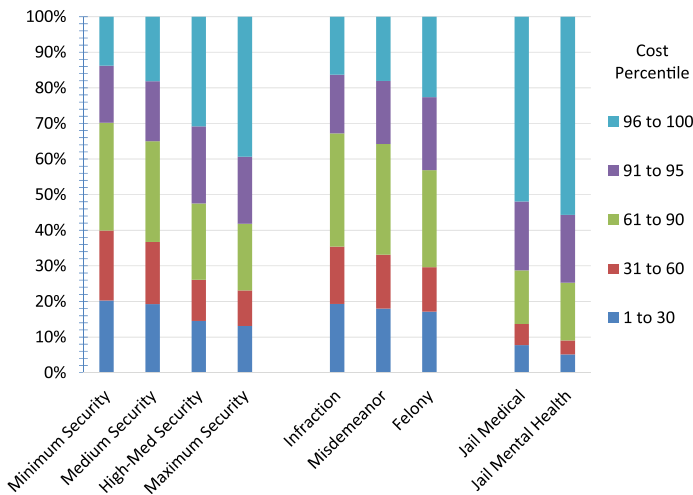
Diseases of the circulatory system, which include heart disease, chronic hypertension, and rheumatic fever, are found in 14 percent of the study population with medical diagnoses, and 16 percent of residents who were homeless in 2012 and had this diagnosis were in the top 5%.

Cost Distribution by Public Assistance Program Participation

Santa Clara County’s Social Services Agency operates a variety of targeted social safety net programs meant to offer temporary cash, nutrition and health insurance assistance to low-income residents, and served 69 percent of the residents identified as homeless in 2012. The recipients of benefits under each social service program and also broken out by four client descriptions are distributed by cost percentile in *Figure 3.8*. Among the 46,225 residents who were homeless in 2012:

- 5 percent received *homeless assistance* benefits and of these, 3 percent were in the top 5%
- 31 percent received *CalWORKs* (cash aid for families), and of these 6 percent were in the top 5%
- 60 percent received *Food Stamps* (often in combination with other benefits), and of these 6 percent were in the top 5%
- 56 percent received *Medi-Cal* (health insurance, often in combination with other benefits), and of these 9 percent were in the top 5%
- 28 percent received *General Assistance* (cash aid for indigent adults), and of these 13 percent were in the top 5%
- 2 percent were in *Foster Care*, and of these 14 percent were in the top 5%
- 1 percent were in *Institutional Care* (shelter, rehabilitation, or incarceration), and of these 27 percent were in the top 5%
- 0.4 percent were in *Board and Care*, and of these 39 percent were in the top 5%
- 0.4 percent were in *Long-term Care*, and of these 41 percent were in the top 5%
- 25 percent were identified as having *Earned Income*, and of these 3 percent were in the top 5%
- 0.3 percent were identified as *Abuse Victims*, and of these 6 percent were in the top 5%
- 5 percent were identified as having *Criminal Behavior*, and of these 17% were in the top 5%
- 6 percent were identified as having a *Disability*, and of these 19% were in the top 5%

FIGURE 3.9:
Residents Experiencing Homelessness in 2012 by Cost Percentile and Criminal Justice System Involvement



Source: The population shown is 17,793 residents with public costs who experienced homelessness in 2012 and were involved in the criminal justice system. These residents are grouped in cost categories based on the cost distribution in the total study group population of 91,416 individuals with costs in 2012.

Cost Distribution by Criminal Justice System Involvement

Individuals who experienced homelessness in 2012 and were involved with the criminal justice system, in most cases as jail inmates, are broken out by cost percentile as well as by three categories – jail security level, level of charge, and type of jail facility in *Figure 3.9*.

Higher levels of jail security correspond with more individuals being in the top 5%. Among individuals with the lowest security classification, minimum security, 14 percent were in the top 5%. Among individuals with the highest security classification, maximum security, 39 percent were in the top 5%.

Incarceration in jail medical or mental health facilities is associated with a majority of individuals being in the top 5%. Only 1 percent of the 46,225 residents identified as homeless in 2012 were housed in jail medical facilities, but 52 percent of these individuals were in the top 5%. Another 1 percent were housed in jail mental health facilities (cell block 8A), and 56 percent of these individuals were in the top 5%.

Summary of Findings

Public, healthcare and nonprofit organizations in Santa Clara County spent over \$3.1 billion providing services for residents in years when they experienced homelessness in the six years covered by this study. Costs averaged \$520 million a year. A total of \$1.9 billion, or \$312 million a year, was spent on health care. Justice system agencies spent \$786 million, or \$196 million a year, most of it for incarceration costs.

Funds used to pay for services provided to homeless residents came from county and city tax revenue, revenue transfers from state and federal government, private hospitals, and philanthropic support.

Homeless costs are heavily skewed toward a comparatively small number of frequent users of public and medical services. Looking just at residents who experienced homelessness in 2012, the top 5% accounted for 47 percent of all identified expenditures for homelessness.

Mental illness, substance abuse, incarceration history, and persistent homelessness all have a strong impact on public costs.



CHAPTER 4

High Cost Individuals

Overview

Paying for the cost of housing and supportive services through costs saved or avoided when frequent users are housed and stabilized requires having tools for identifying homeless individuals with continuing high public costs. These high public costs result from multiple problems. This chapter discusses personal, institutional and medical attributes associated with high public costs.

We use a two-year timeframe for analyzing costs in order to include more information about infrequent high-cost service episodes, and we focus on the population for whom we have a medical diagnosis and complete cost data from all agencies. This provides the best information for identifying high cost individuals.

TABLE 4.1
Average Annual Cost by Decile and Top 5%

Cost Group	Minimum	Maximum	Mean
Decile 1	\$1	\$544	\$200
Decile 2	\$545	\$1,458	\$967
Decile 3	\$1,459	\$2,414	\$1,922
Decile 4	\$2,415	\$3,353	\$2,856
Decile 5	\$3,354	\$4,314	\$3,833
Decile 6	\$4,315	\$5,431	\$4,845
Decile 7	\$5,432	\$6,956	\$6,139
Decile 8	\$6,958	\$8,727	\$7,822
Decile 9	\$8,728	\$16,040	\$11,978
Decile 10	\$16,042	\$817,318	\$45,993
2nd 5%	\$16,042	\$34,305	\$22,974
Top 5%	\$34,332	\$817,318	\$81,211

Source: Decile ranking based on average annual cost in 2011 and 2012, adjusted to 2014 dollars, for 96,991 individuals in the study population who had costs in 2011 and 2012. Dollar amounts for individuals in each decile are from 50,687 individuals for whom complete cost data is available from all agencies, with a medical diagnosis, and had some level of public cost in 2011 and 2012.

Cost Range for Each Decile and Top 5%

Many individuals experiencing homelessness receive few public services and have low public costs. Average annual costs in 2011 and 2012 were under \$10,000 for over 80 percent of the data rich subset of individuals in the study population shown in Table 4.1.

Costs for the 10th decile range upward from \$16,040, with an annual average of \$45,933. When we split the 10th decile into higher and lower cost halves, we see that a cost range of \$16,040 to \$34,305 for the lower 5%, and a range of \$34,332 upward, with an average of \$81,211, for the top 5%.

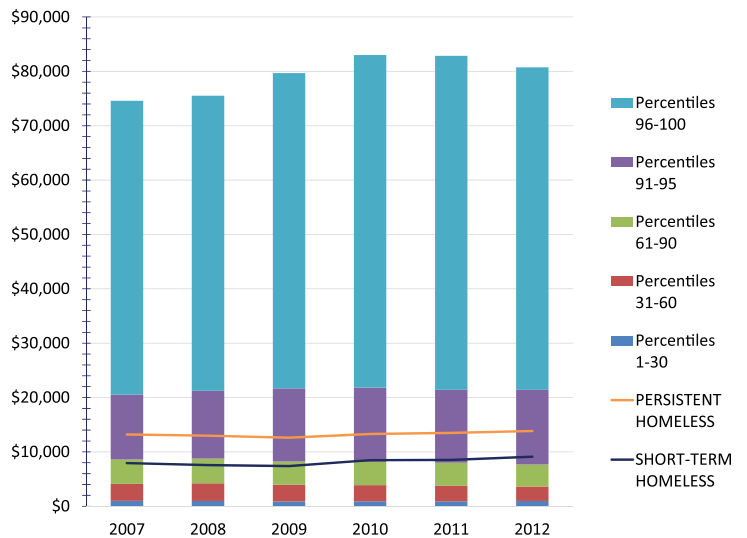
One of the purposes of this cost analysis is to identify the population for whom cost savings will more than offset the cost of housing and supportive services, if they are housed and stabilized. Given this objective, this chapter focuses on attributes of the top 5%

Persistent Homelessness

Persistently homeless individuals have costs that typically are 55 percent higher than cost for non-persistently homeless individuals, as can be seen in Figure 4.1. In 2011 and 2012, persistently homeless individuals had costs averaging \$13,661 vs. \$8,824 for non-persistently homeless individuals. These average costs put the typical non-persistently homeless individual in the ninth cost decile and the typical persistently homeless individuals at the bottom of the tenth cost decile.

While significant, the savings from housing the typical persistently homeless individual are not sufficient to offset the cost of housing. To obtain savings that offset the cost of housing it is necessary to target individuals at the top of the tenth decile, that is, the top 5% of costs. Annual costs in the top 5% are over \$50,000 higher than costs at the bottom of the tenth decile.

FIGURE 4.1:
Annual Cost for Homeless Residents by Decile and Persistent vs. Short-term Homeless Status



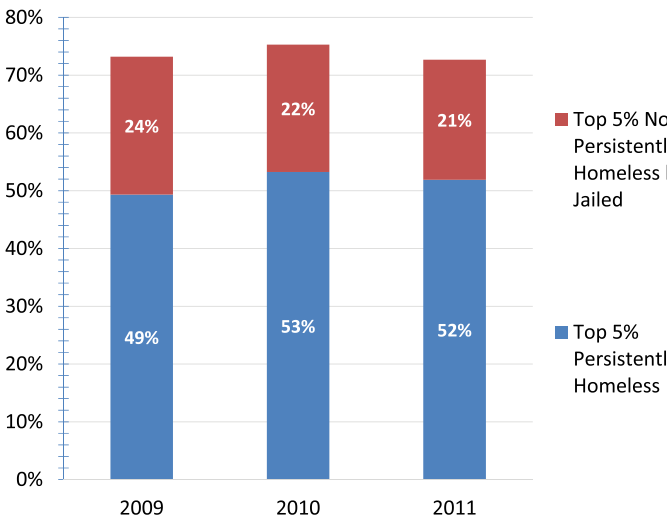
Source: Individuals out of the 104,206 homeless study group participants who had costs each year, grouped into deciles based on costs each year, as well as by whether or not they experienced persistent homelessness in the year. An average of 94,223 study group members had costs each year. Costs are in 2014 dollars.

Persistent Homelessness among Top 5%

Roughly half of individuals with the highest 5% of costs are readily identifiable as persistently homeless, as can be seen in *Figure 4.2*.

However, roughly another quarter were off the streets and incarcerated in jail facilities for at least part of the year. Although individuals may enter and leave jail homeless, the justice system data base does not flag homeless status, so their unhoused condition is not recorded, making persistent homelessness difficult to determine.

FIGURE 4.2:
Persistent Homelessness among Top 5%



Source: Study population members in each year's highest 5% cost group.

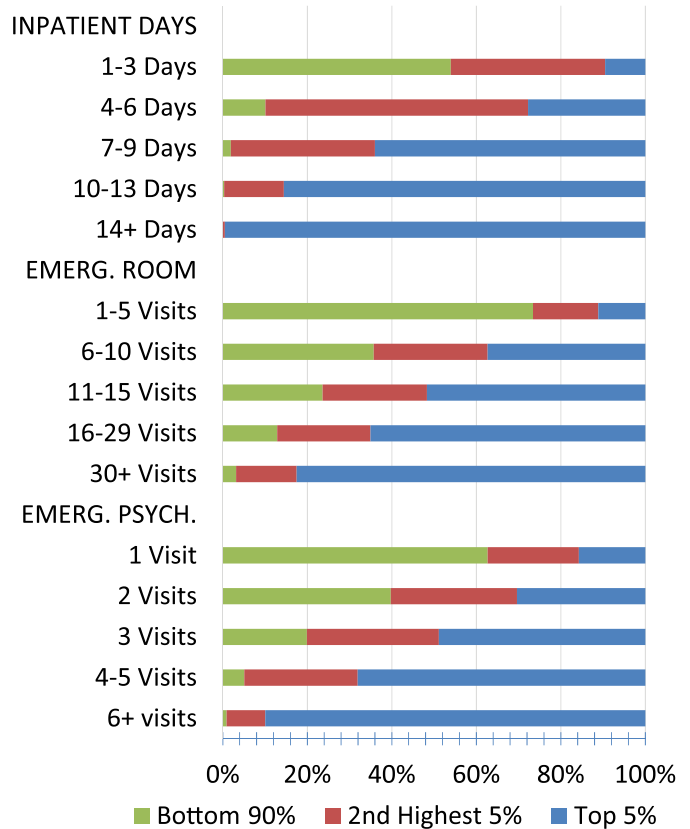
It is likely that individuals with the highest 5% of costs also move in and out of other institutional care settings during the course of the year without being documented as homeless. The data system used by Valley Medical Center provided only partial documentation of homelessness, so homeless individuals who are hospitalized or in respite care might well not be recorded as homeless.

In addition, homeless individuals who are admitted to private hospitals, admitted to a state psychiatric facility, or incarcerated by the state correctional system would not be documented as homeless in county data systems.

Because of these data gaps, the homeless and persistently homeless status of individuals in the top 5% often is not self-evident and requires collecting and analyzing individual housing histories.

A multi-year time frame provides the most useful and reliable information for assessing homelessness and service use. The problems that result in persistent homelessness and frequent

FIGURE 4.3:
Percent in Top 5% Based on VMC Hospital Use



Source: See Table 4.1 for description of data sample.

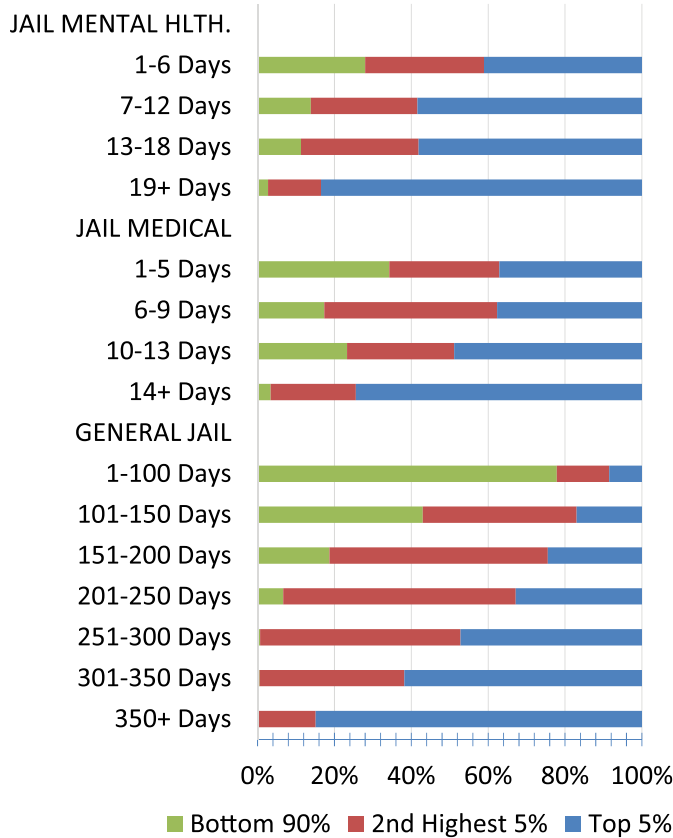
use of public services are often structural conditions in people's lives – some combination of mental illness, trauma, debilitating health conditions, addiction, lack of qualifications or opportunities for employment, extreme poverty, and absence of sustaining personal connections. These problems are drivers for a person's life trajectory and continue to affect public costs even in months when the individual isn't documented as being homeless.

Service Use Benchmarks for Top 5%

Using the available study data, the most straightforward way of identifying individuals in the top 5% of costs is based on service use. The more complex and difficult challenge is identifying underlying factors that lead to high service use. The two major cost centers for homeless residents are health care and jail. Benchmarks for hospital use over a two-year period that demarcate groups in which a majority of individuals are in the top 5% are shown in *Figure 4.3* and include:

- 7 or more hospital inpatient days
- 11 or more emergency room visits
- 4 or more emergency psychiatric service visits

FIGURE 4.4:
Percent in Top 5% Based on Jail Stays



Source: See Table 4.1 for description of data sample.

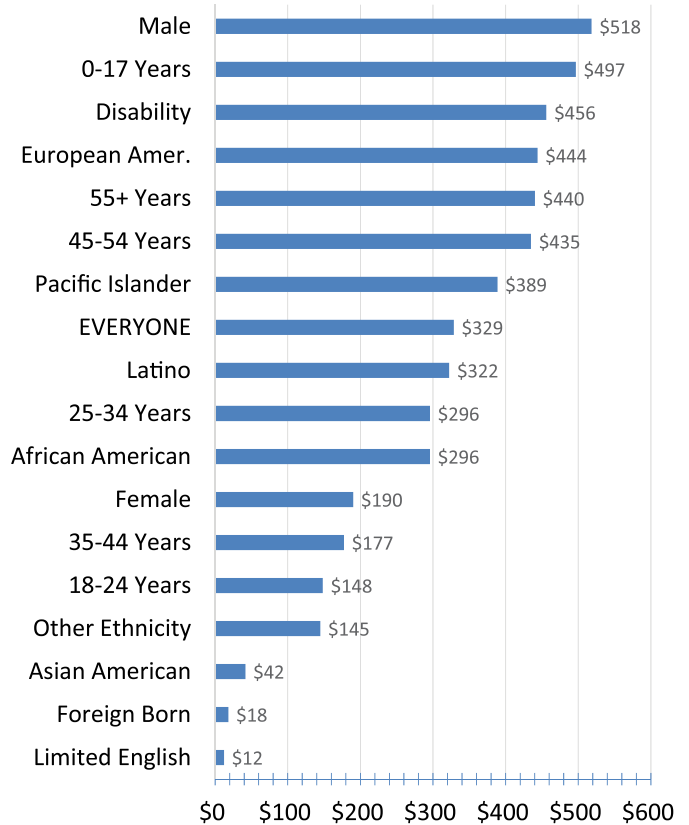
Comparable benchmarks for jail stays over a two-year period are shown in *Figure 4.4* and include:

- 7 or more days in cell block 8A, the jail mental health facility
- 10 or more days in cell block 2B or 2C, jail medical facilities
- 300 or more days in general jail facilities

Annual Cost Based on Individual Attributes

Individuals in the top 5% of costs are frequent users of health care and justice system services because of recurring crises in their lives that are addressed in those settings. Often these crises emerge out of multiple problems rather than a single stand-alone issue. But looking at costs on a factor-by-factor basis identifies the pieces of this puzzle. In this section we look at annual cost change from 2007 to 2012, and average annual costs in 2011 and 2012 for individuals broken out by demographic attributes, institutional links and medical diagnoses that were recorded anytime from 2007 through 2012. Costs of the total homeless study population are compared and contrasted with the 10th decile and top 5% groups to identify predictors of these higher cost groups.

FIGURE 4.5:
Average Annual Change in Cost 2007-2012 based on Demographics (2014 dollars)



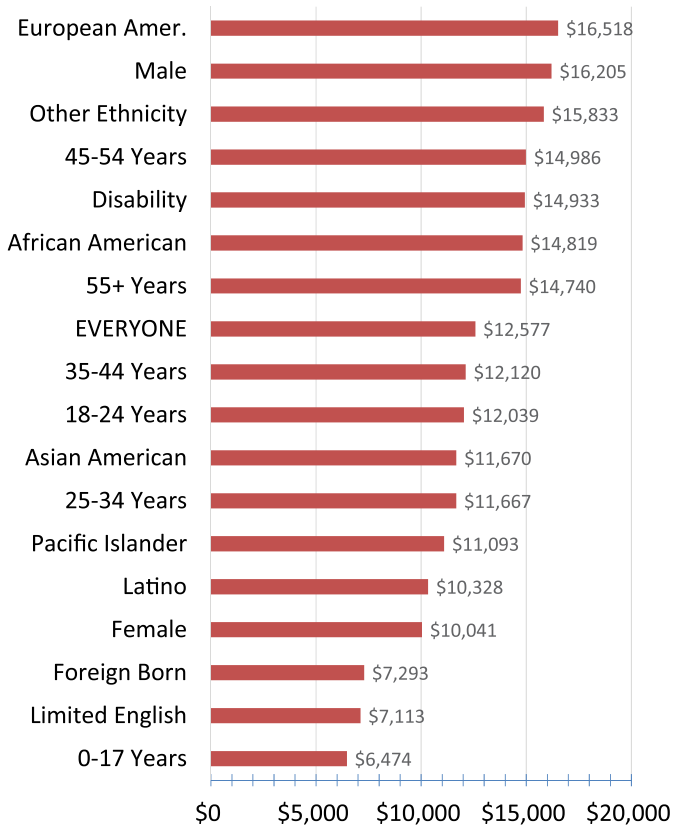
Source: See Table 4.1 for description of data sample.

The most reliable half of the records from the study population were used for the analyses in this chapter in order to provide the most accurate calibration of the comparative effects on cost of different individual attributes. These are individuals for whom complete cost data from all agencies is available, who had a medical diagnosis, and had some level of public cost in 2011 and 2012. These individuals were visible in the human service delivery system, which also indicates that individuals with minimal levels of service use are somewhat under-represented in this sample. The cost profile for this sample of records is slightly higher than for the overall study population, but typical for the population of ongoing county clients with the attributes analyzed, and very accurate for individuals in the top 5%.

The typical annual change in cost from 2007 to 2012 for users of county services with different *demographic* attributes is shown in *Figure 4.5*. As a benchmark for comparison, costs for everyone in this subset of the study population increased an average of \$329 a year.

Costs for males increased more than two and a half times as much as for females (\$518 vs. \$190). Among age groups, costs increased most for children 0-17, least for young adults 18-24, and increased progressively for each older age group.

FIGURE 4.6:
Average Annual Cost 2011-12 based on *Demographics*
(2014 dollars)



Source: See Table 4.1 for description of data sample.

Among ethnic groups, costs increased the most for European Americans and the least for Asian Americans. Individuals who were foreign born or had limited English ability had the lowest cost increases. Individuals with disabilities had among the highest cost increases.

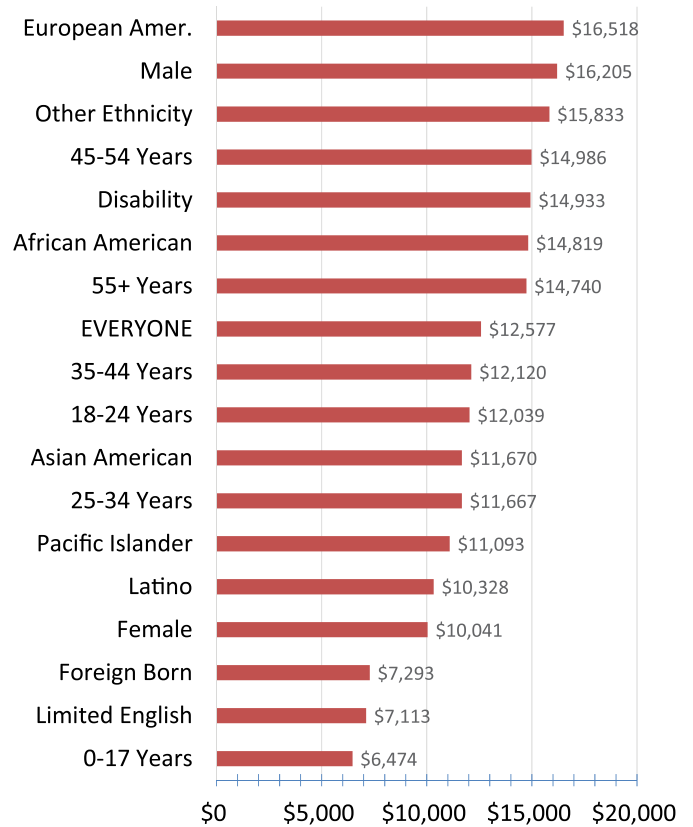
Average annual costs in 2011 and 2012 have a hierarchy similar to that of cost increases, as shown in *Figure 4.6*. Average costs for everyone in this population subset were \$12,577 a year. European Americans and males were highest with costs over \$16,000. Females and individuals who are foreign born or have limited English ability had among the lowest costs.

Even though children had the largest annual cost increases, they had the lowest total costs. There is a rough correspondence between cost and age, with the highest costs for individuals 45-54 years old, followed by individuals 55 or older.

Typical annual cost change based on individuals' *institutional links*, shown in *Figure 4.7*, are much larger than increases based on demographic factors because institutional services are synonymous with costs.

The highest rate of annual cost increase is for individuals who have been jail medical or mental health inmates - \$6,799 and \$5,910, respectively. Inmates with a maximum security

FIGURE 4.7:
Average Annual Cost 2011-12 based on *Demographics*
(2014 dollars)



Source: See Table 4.1 for description of data sample.

classification also have large increases - \$2,799.

The third highest rate of increase is for foster youth - \$4,651, followed by individuals who have been Valley Medical Center inpatients - \$4,278. Individuals who received emergency psychiatric services also have large cost increases - \$2,693.

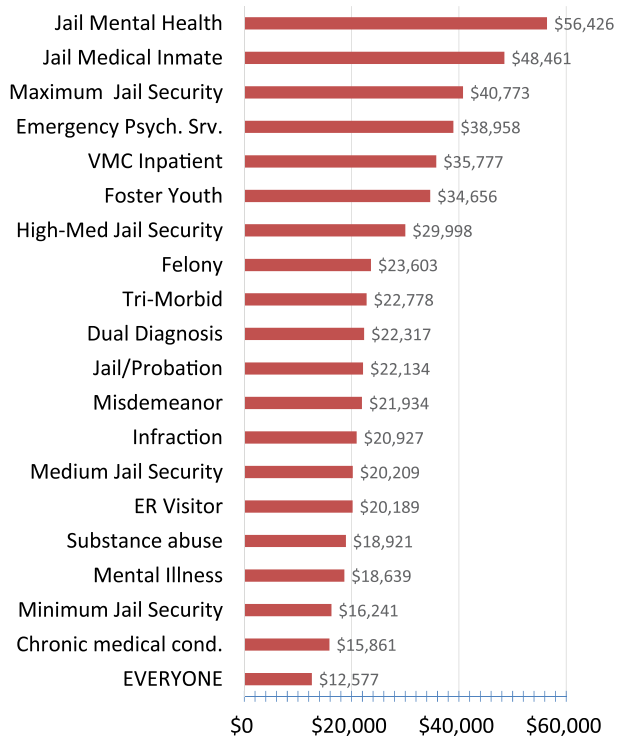
At the other end of the spectrum, costs for individuals whose justice system involvement has not been for anything more serious than an infraction decrease by \$57 a year.

The annual cost ranking shown in *Figure 4.8* is similar to the ranking for cost increases. Jail mental health incarceration stands out with the highest annual cost - \$56,426. Next is jail medical inmates - \$48,461.

Jail inmates with maximum security classifications are next (\$40,773), followed by recipients of emergency psychiatric services (\$38,958), followed by VMC hospital inpatients (\$35,777).

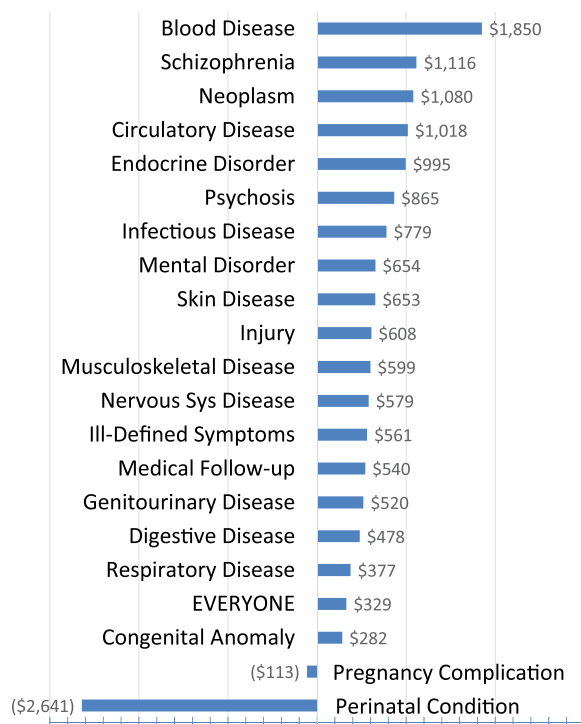
Individuals who have a symptom typically associated with institutional links such as substance abuse, mental illness or a chronic medical condition, but are not users of expensive jail or hospital care have average annual costs ranging from 15 to 22 thousand dollars a year.

FIGURE 4.8:
Average Annual Cost 2011-12 based on *Institutional Links* (2014 dollars)



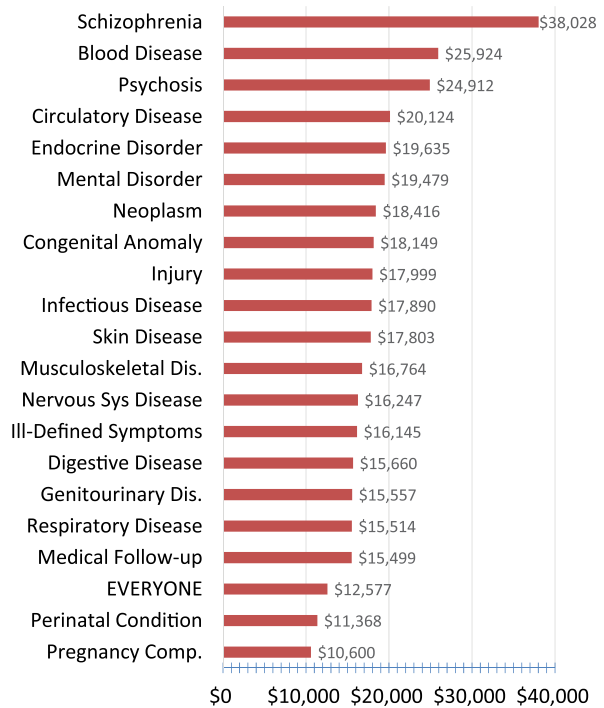
Source: See Table 4.1 for description of data sample.

FIGURE 4.9:
Average Annual Cost Change 2007-2012 based on *Medical Diagnosis* (2014 dollars)



Source: See Table 4.1 for description of data sample.

FIGURE 4.10:
Average Annual Cost 2011-12 based on *Medical Diagnosis* (2014 dollars)



Source: See Table 4.1 for description of data sample.

Individuals charged with felonies were in the middle range of both cost increases and annual costs - \$995 and \$23,603, respectively.

Typical annual cost change based on individuals' *medical diagnosis* are shown in *Figure 4.9*. All are highly aggregated diagnoses at the body system level except for schizophrenia, which is a type of psychosis, which is a subgroup within the body system category of mental disorders.

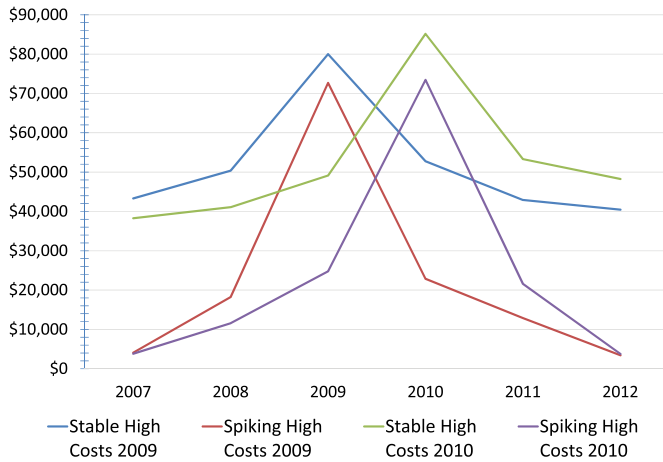
The largest increase is for blood diseases, which most frequently are some type of anemia (\$1,850), followed by schizophrenia (\$1,116), followed by neoplasm (\$1,080), followed by circulatory disease, which most often is hypertension (\$1,018), followed by endocrine, metabolic and immunity disorders, which most often is diabetes (\$995).

Problems during pregnancy and immediately before and after child birth often represent one-time cost spikes followed by declining costs.

The highest annual costs for any medical diagnosis are for schizophrenia (\$38,028), as shown in *Figure 4.10*. Next is blood disease (\$25,924), followed by psychosis (\$24,912), and circulatory disease (\$20,124).

Patients with a perinatal condition or pregnancy complication have annual costs that are less than the overall average for this population.

FIGURE 4.11:
Annual Cost for Individuals in the Top 5% by Cost Trajectory

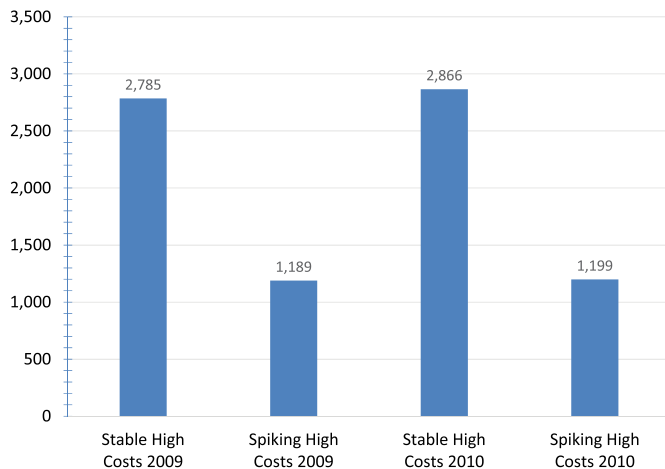


Source: Linked records for individuals in the top 5% in 2009 and 2010, out of the total study group population with costs in each year.

Stable High Costs in Top 5% vs. Cost Spikes Followed by Descending Costs

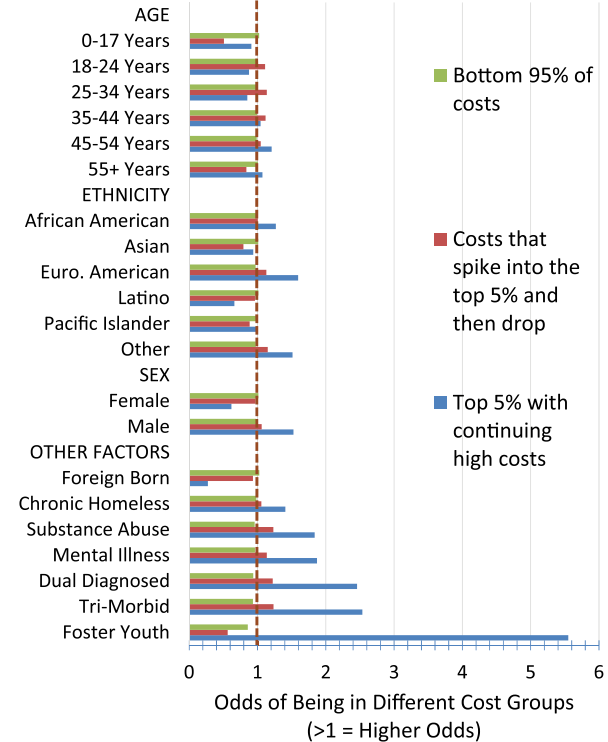
Within the profiles of average costs for different groups among the homeless study population discussed above there are diverse cost trajectories. Some individuals incur increasing costs as problems worsen, and costs decrease for others as problems diminish. The greatest cost savings can be achieved by identifying individuals in the top 5% who are likely to have continuing high costs if they are not housed.

FIGURE 4.12:
Annual Number of Individuals in the Top 5% by Cost Trajectory



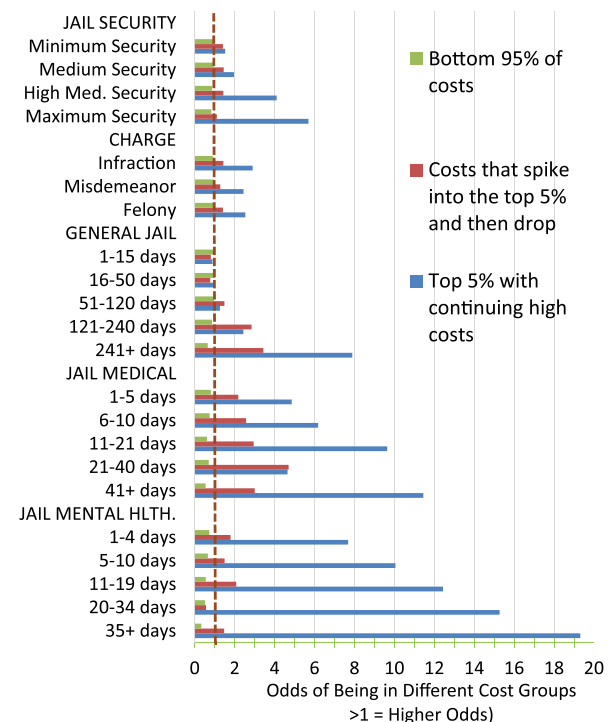
Source: Linked records for individuals in the top 5% in 2009 and 2010, out of the total study group population with costs in each year.

FIGURE 4.13:
Odds Compared to All Homeless of Being in Different Cost Groups based on Individual Attributes



Source: 33,582 persons with complete cost data from all departments who were in Santa Clara County all years 2007-2012.

FIGURE 4.14:
Odds Compared to the All Homeless of Being in Different Cost Groups based on Jail History



Source: 33,582 persons with complete cost data from all departments who were in Santa Clara County all years 2007-2012.

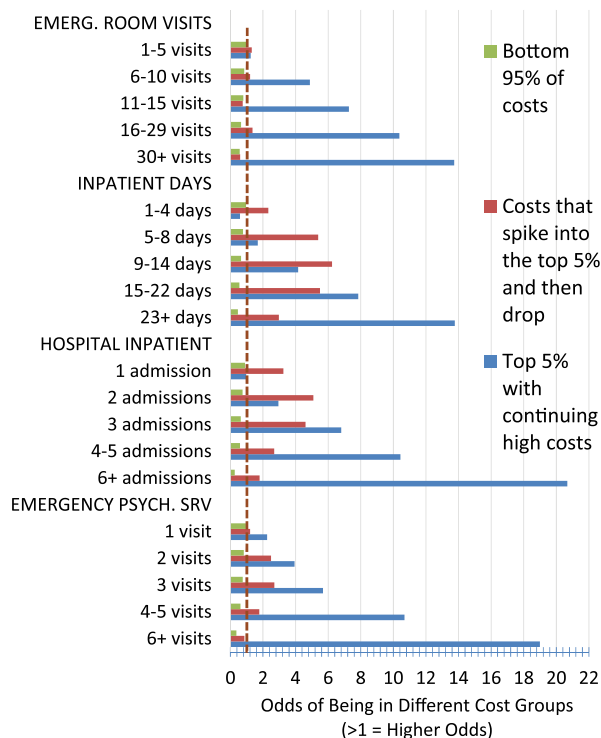
Two different cost patterns are seen in *Figure 4.11*, which shows two different cost trajectories within the group of individuals in the top 5% in 2009, as well as the group in the top 5% in 2010. The overall pattern for both groups is increasing costs that built to a spike in one of the years and then decreased. However within each top 5% cohort, one group began with average costs over \$40,000, spiked and then had costs that declined but stayed above \$40,000. The other group began with much lower costs, under \$10,000, built to a spike in the \$70,000 range and then had costs that declined to below \$10,000.

Figure 4.12 shows the size of these groups. There were roughly 2,800 people each year with continuing high costs and 1,200 with costs that fell very low.

Factors that Differentiate People who Stay from People who Leave the Top 5%

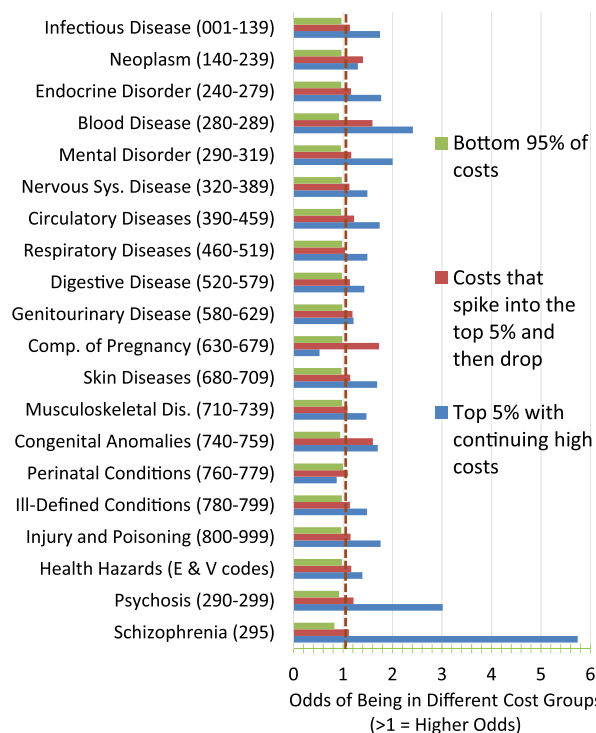
The remainder of this chapter discusses factors that differentiate individuals in the top 5% with continuing high costs from other homeless residents. Throughout this discussion it is important to remember that it is usually a combination of factors rather than just a single factor that puts an individual in the top 5% with continuing high costs.

FIGURE 4.15:
Odds Compared to All Homeless of Being in Different Cost Groups Based on VMC Hospital Services



Source: 33,582 persons with complete cost data from all departments who were in Santa Clara County all years 2007-2012.

FIGURE 4.16:
Odds Compared to All Homeless of Being in Different Cost Groups Based on Medical Diagnosis



Source: 33,582 persons with complete cost data from all departments who were in Santa Clara County all years 2007-2012.

The following four figures show the odds for different groups, compared to the overall homeless population, of having three different cost outcomes: 1) being in the bottom 95 percent of costs, 2) having costs that spike into, and then drop out of, the top 5%, and 3) being in the top 5% with continuing high costs. Odds greater than one indicate an above average probability.

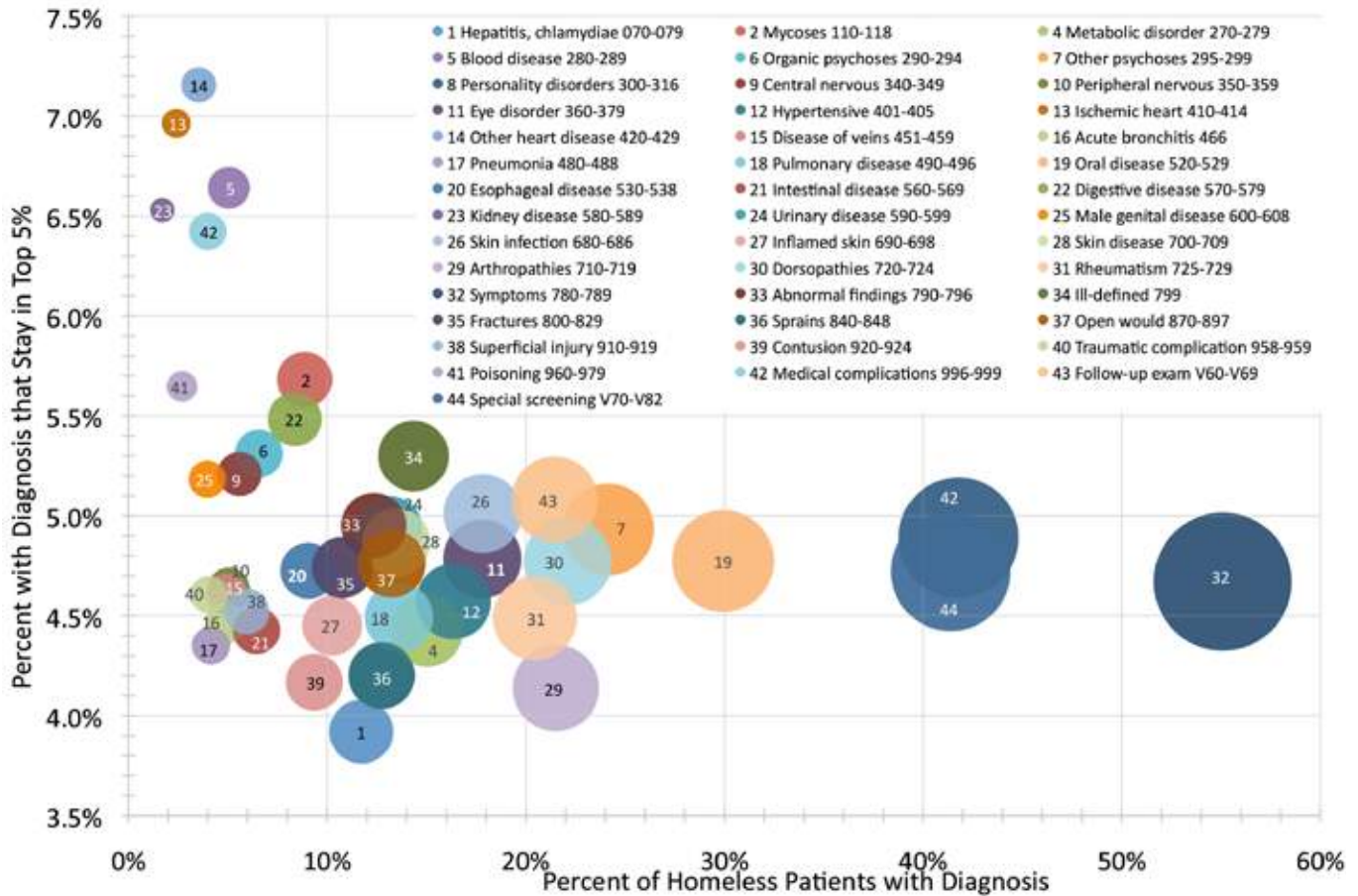
Among ethnic groups shown in *Figure 4.13*, European Americans have the highest likelihood of ongoing presence in the top 5%, followed by the Other ethnicity group. Males have above average and females below average prospects of ongoing presence in the top 5%.

Substance abuse and mental illness double the likelihood of being and staying in the top 5%, with odds two and a half times greater than average for people with both of these attributes. Foster youth are more than five times as likely to enter and stay in the top 5%.

Among individuals with jail histories, a maximum security classification makes someone 6 times as likely to be in the ongoing top 5%, over 40 days being housed in a jail medical facility makes it 12 times more likely, and being housed in the jail mental health facility for 35 or more days makes it 19 times as likely, as shown in *Figure 4.14*.

Odds ratios for patients cared for at VMC hospital are shown in *Figure 4.15*. Over 15 emergency room visits in a two-year

FIGURE 4.17:
Medical Diagnoses of Patients More Likely to Stay in Top 5%



Source: 33,582 persons with complete cost data from all departments who were in Santa Clara County all years 2007-2012.

interval makes a patient 10 times more likely, and over 30 visits 14 times more likely to enter and stay in the top 5%. Fifteen or more inpatient days makes this outcome 8 times more likely and 23 or more days makes it 14 times more likely. Four or more inpatient admissions makes it 10 times more likely and 6 or more admissions makes it 20 times more likely.

Similar odds result from using emergency psychiatric services. Four or more visits make staying in the top 5% 10 times more likely and 6 or more visits makes it 19 times more likely.

Odds ratios for medical diagnoses are shown in *Figure 4.16*. The numbers in parenthesis are ICD-9 diagnostic codes. Individuals diagnosed with schizophrenia are almost 6 times more likely to enter and stay in the top 5%, individuals with a psychosis are 3 times more likely, and individuals with any mental disorder as well as individuals with a blood disease are twice as likely.

Overall, most diagnoses at the body system level produce slightly elevated odds for the top 5%.

More detailed diagnoses are shown in *Figure 4.17*, which displays three types of information – the percent of homeless patients with each diagnosis, the percent of individuals with

each diagnosis who have ongoing presence in the top 5%, and the size of the group with each diagnosis.

Four to 5 percent of individuals with most diagnoses enter and stay in the top 5%. Several medical conditions that affect smaller groups have higher risks. Seven percent of individuals with ischemic heart disease stay in the top 5%, as is the case with 6.5 percent of people who have blood disease, kidney disease and complications from medical treatment.

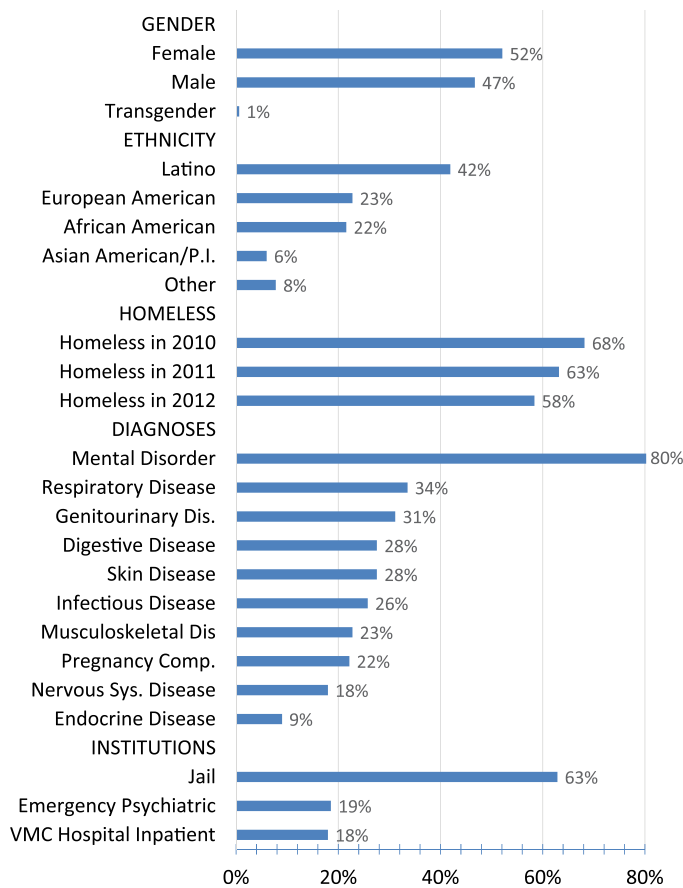
Foster Youth

The study population includes 167 youth who aged out of the foster care system in 2007 to 2009, making it possible to see three years of outcome information after they had transitioned to independence.² All of these youth had been in the foster care system at least two years before aging out; the average duration of care for all 167 youth was 58 months.

A profile of these youth is shown in *Figure 4.18*. The youth

² During nearly all of the data window, foster care ended when youth became eighteen years old. With the approval of AB 12 and subsequently AB 212, California opted to extend assistance up to the age of 19 in 2012, age 20 in 2013, and age 21 in 2014.

FIGURE 4.18:
Profile of 167 Youth Aging Out of Foster Care from 2007 to 2009



Source: 167 youth in the study population who received foster care through their 18th year and aged out of the system from 2007 to 2009 after receiving foster care for two or more years.

were divided almost equally between females and males. Over two-fifths were Latino, European Americans and African Americans each made up over a fifth, six percent were Asian American or Pacific Islander, and eight percent were Other.

Over half of the youth experienced homelessness in each year after they transitioned to independence. The rate of homelessness was highest in 2010, reaching 68 percent, indicating that the first year of independence was especially difficult.

Eighty percent of the youth had a medically diagnosed mental disorder, including 76 percent with a neurotic or personality disorder, 48 percent with adjustment reactions, 37 percent with a psychosis, 35 percent with episodic mood disorders, 34 percent with depression, 28 percent with emotional disturbances specific to childhood, 25 percent with anxiety disorders, and 22 percent with drug or alcohol substance abuse disorders (many had multiple diagnoses).

A third had respiratory disorders, including acute upper respiratory infections and asthma.

Nearly a third had genitourinary disorders – 54 percent of females and 6 percent of males. These are disorders of the urinary and genital organs and do not include venereal diseases.

Their institutional encounters included jail for 63 percent, emergency psychiatric services for 19 percent and inpatient hospitalization at VMC for 18 percent.

Youth who had a diagnosed mental disorder and were involved with the justice system had high post-foster care costs, especially if they were males, as shown in Figure 4.19.

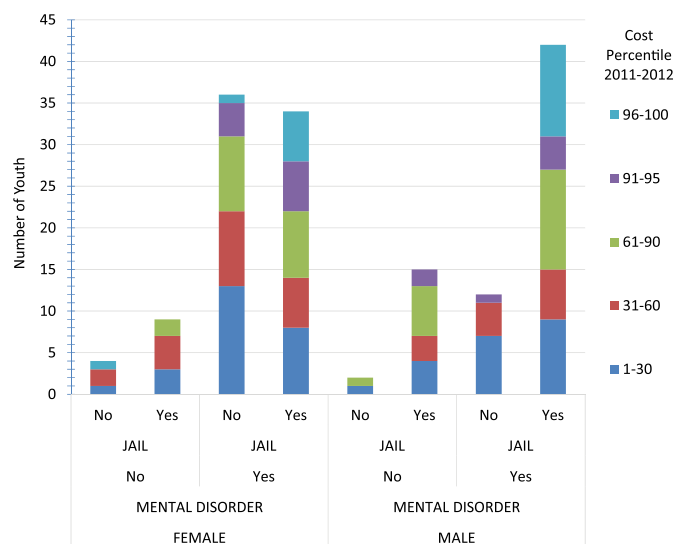
Among the 154 youth who were in the county in 2011 or 2012, 124, or 81 percent, had a diagnosed mental disorder. This included 76 percent of the 71 males and 84 percent of the 83 females.

In addition, 100, or 65 percent, had been involved with the criminal justice system. This included 80 percent of males and 52 percent of females.

Among this group of youth who had emancipated from foster care, 12 percent had costs in the top 5% in 2011 and 2012, and another 11 percent had costs in the next highest 5 percent, for a total of 23 percent in the highest cost decile.

Seventeen of the 19 youth who had costs in the top 5% had both a diagnosed mental disorder and were involved with the justice system. This included 18 percent of females and 26 percent of males with both attributes.

FIGURE 4.19:
Public Costs in 2011 to 2012 based on Gender, Mental Health and Justice System Involvement for 167 Youth Aging Out of Foster Care in 2007 to 2009



Source: 154 youth who had public costs in Santa Clara County in 2011 or 2012 out of 167 youth in the study population who received foster care through their 18th year and aged out of the system from 2007 to 2009 after receiving foster care for two or more years.

Summary of Findings

High public costs typically result from a combination of problems rather than a single problem.

Persistent homelessness by itself is not associated with a sufficiently high level of public costs to offset the cost of housing.

Many individuals in the top 5% are not readily identifiable as persistently homeless because of time spent in institutional care.

Foster youth face multiple challenges as they transition into adulthood, including prevalent mental disorders, high rates of justice system involvement, and frequent exposure to homelessness. Youth with mental disorders who are involved in the justice system are at high risk of having public costs in the top 5%. More effective support is needed to help foster youth achieve a successful transition into adulthood.

A crucial issue is differentiating individuals in the top 5% whose high costs are the result of a one-time cost spike versus individuals with ongoing high costs. Roughly 70 percent of individuals in the top 5% have ongoing high costs and 30 percent have high costs that are a one-time spike. Those with ongoing high costs are likely to have the greatest cost savings or cost avoidance when they are stabilized with permanently affordable housing and supportive services.



CHAPTER 5

Geography of Homelessness

Overview

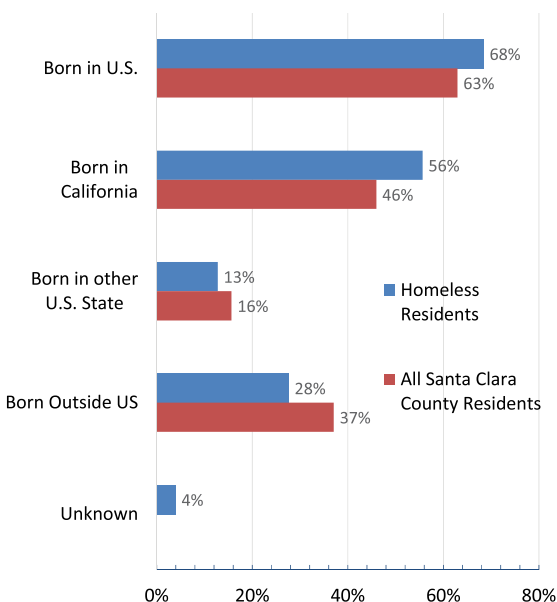
The geographic distribution of homelessness corresponds roughly with the distribution of poverty in Santa Clara County. Poverty is the precursor to homelessness, with the passage into homelessness often linked to a major dislocating circumstance such as mental illness, addiction, incarceration, or domestic violence. This chapter reports on the geographic distribution of homeless clients served by different agencies.

Birthplace of Homeless

Members of the homeless study population have a common characteristic – they resided in Santa Clara County sometime during the 2007-2012 study window. But where they were born, grew up, worked and started families are thousands of different stories. Their length of time without a home varies from just a few weeks to long-term persistent homelessness, as do their sleeping places: local shelters, couch surfing with friends or relatives, encamped along Coyote Creek, county jails, or emergency room lobbies.

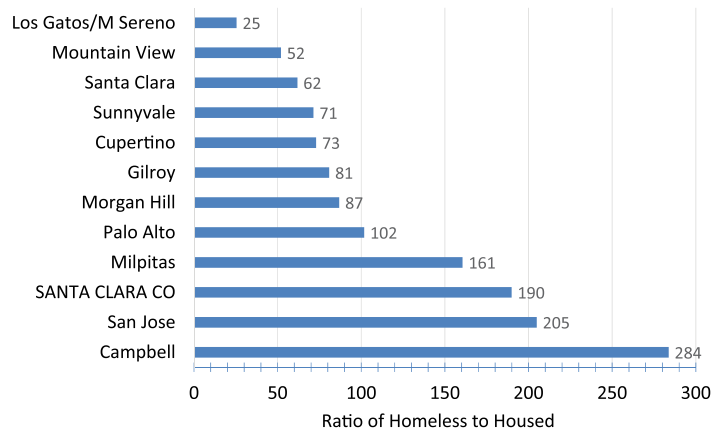
They are as diverse as the overall Santa Clara County population, with some born in other counties, states and nations. While 54 percent of Santa Clara County residents were born out of state, the county's homeless population is more likely to be home-grown, comprised of 56 percent native Californians, as shown in Figure 5.1. Only 28 percent of the homeless study population were born outside the U.S., compared to 37 percent of Santa Clara County residents overall.

FIGURE 5.1:
Place of Birth for Homeless Residents and All Residents of Santa Clara County



Source: 81,516 linked records with Social Services Agency data and American Community Survey 2009-2013 Table B05002.

FIGURE 5.2:
Ratio of Nonprofit Agency Homeless Clients to Homeless Persons Housed by HACSC



Source: 81,516 linked records with Social Services Agency data and American Community Survey 2009-2013 Table B05002.

Valley Medical Center

Santa Clara County Valley Medical Center (VMC) and affiliated facilities provided health care for 68 percent of the study population, 67 percent as outpatients and 18 percent as inpatients.

Over the six-year time window of this study, unduplicated homeless *outpatients* throughout the county represented 2.9 percent of the total county population and 28 percent of the population living at or below the federal poverty level.

Unduplicated homeless *inpatients* represented 1.2 percent of the total county population and 11 percent of its population living at or below the federal poverty level.

Total VMC health care costs over six years for homeless residents from each zip code are mapped in *Figure 5.3*. Health care costs are highest, above \$60 million per zip code in San Jose and Gilroy.

Mental Health

Mental health service providers are highly concentrated in the greater San Jose area, however the highest concentration of homeless mental health clients is in the Gilroy area, as can be seen in the map in *Figure 5.4*.

Social Services

The highest population density of homeless social service recipients is in Gilroy, as shown in the map in *Figure 5.5*. The next greatest concentration is in central San Jose.

Criminal Justice System

Homeless individuals who have been incarcerated represent 2.1 percent of the county population, with the highest level of representation in Gilroy, followed by San Jose, as shown in *Figure 5.6*.

Nonprofit Service Providers

Clients of nonprofit homeless services providers who share their data through the Homeless Management Information System (HMIS) are most strongly represented in San Jose. There are smaller absolute numbers of homeless residents but they make up a comparatively large share of the population in outlying lower-income communities such as Gilroy, Santa Clara and Campbell, as can be seen in the map in *Figure 5.7*.

Homeless clients served by nonprofits represent 5.5 percent of San Jose’s population and 3.9 percent of the county’s population, but only 2.6 percent of Gilroy’s population.

Homeless Individuals Housed by the Housing Authority of the County of Santa Clara

The ratio of homeless residents served by nonprofit agencies to homeless persons provided housing by the Housing Authority of the County of Santa Clara (HACSC) is shown in *Figure 5.2*.

These ratios provide a starting point for examining access to housing subsidies for homeless residents in different communities. Assuming that the distribution of HMIS clients represents the overall distribution of homelessness in Santa Clara County, an above-average ratio of HMIS clients to persons housed indicates below-average access to housing.

The data used to compute the ratios has two limitations. First, nonprofit services are not evenly distributed across homeless residents in different cities and, second, HACSC records are limited to residents who agreed to sign a release of information about themselves.

Although this data is imprecise, it may indicate uneven access to affordable housing for homeless residents, with 284 homeless residents per housed resident in Campbell compared to 81 homeless residents per housed resident in Gilroy.

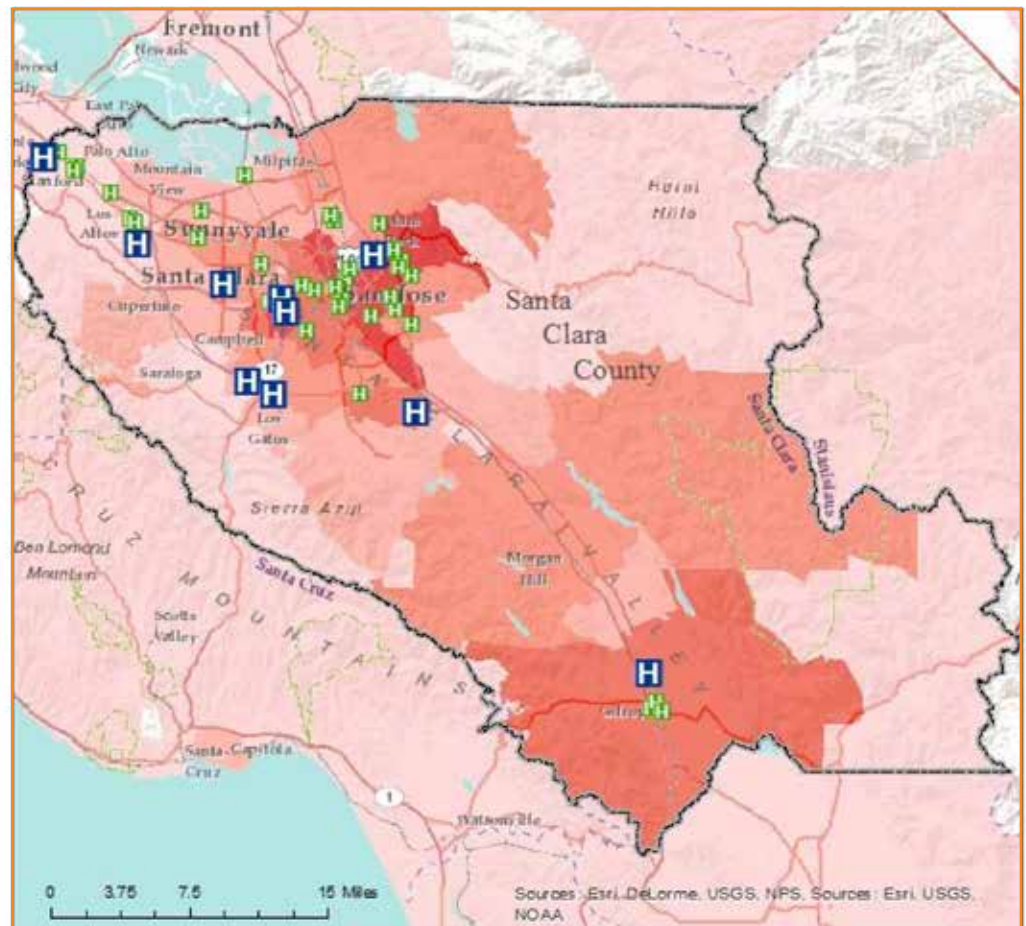
Summary of Findings

The geographic distribution of homelessness corresponds roughly with the distribution of poverty in Santa Clara County. Homeless residents are concentrated in Gilroy and San Jose.

Highest costs for homeless medical services are reported in San Jose, followed by Gilroy. Not surprisingly the cost distribution for mental health services follows this same pattern.

Although the data on supportive housing is limited, it indicates a more favorable ratio of homeless to housed residents in San Jose and Campbell than in the overall county. The ratio of homeless-to-housed is surprisingly lower in Gilroy, where a high percent of

FIGURE 5.3:
Map of Valley Medical Center Service Costs by Zip Code where Homeless Patients Resided

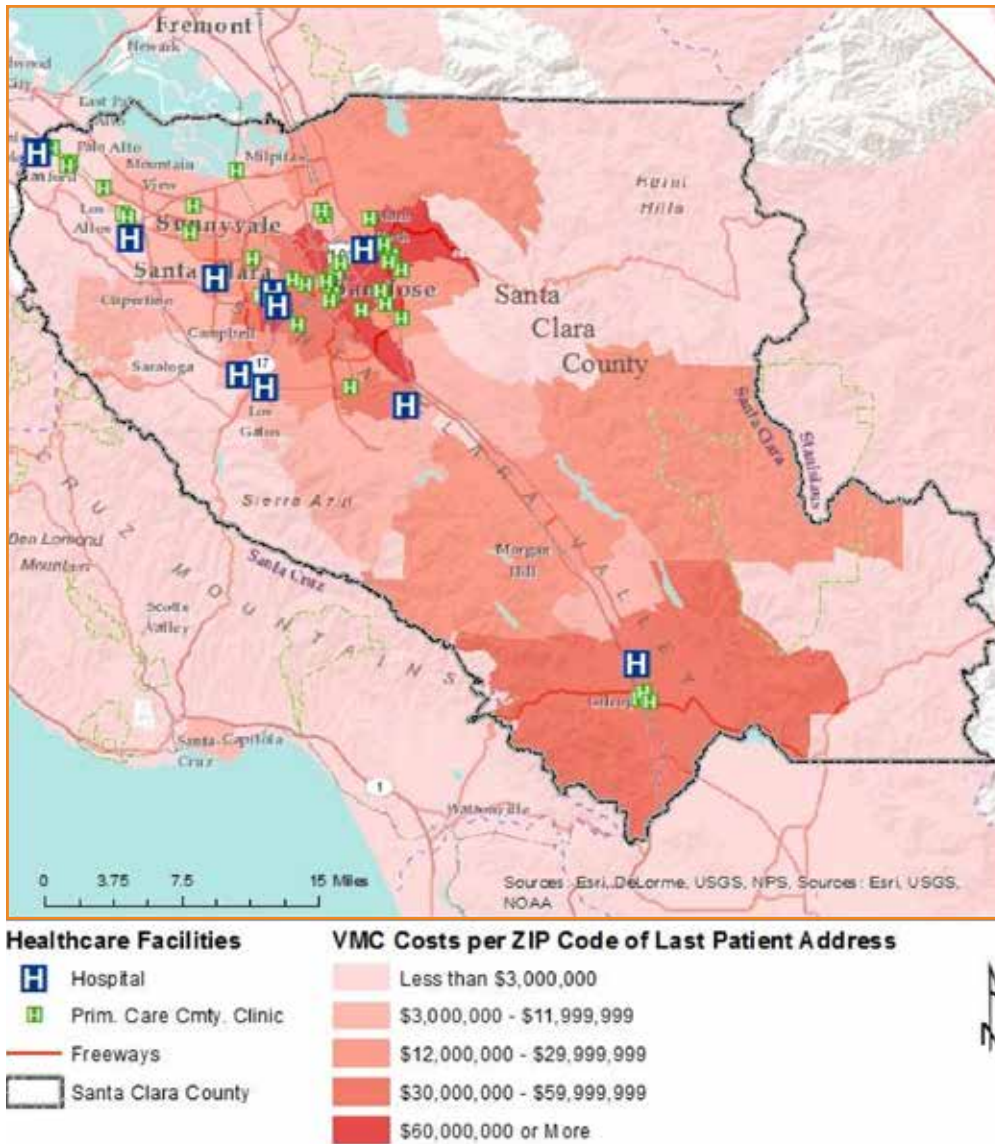


Source: Economic Roundtable analysis; Office of Supportive Housing, County of Santa Clara, 2005-2012 Data Linkage Project; California’s Office of Statewide Health Planning and Development (OSHPD) Healthcare Information Division, Facility Listings for December 2014

residents are homeless. A caveat about this finding is that it may result from inadequate data about housed residents.

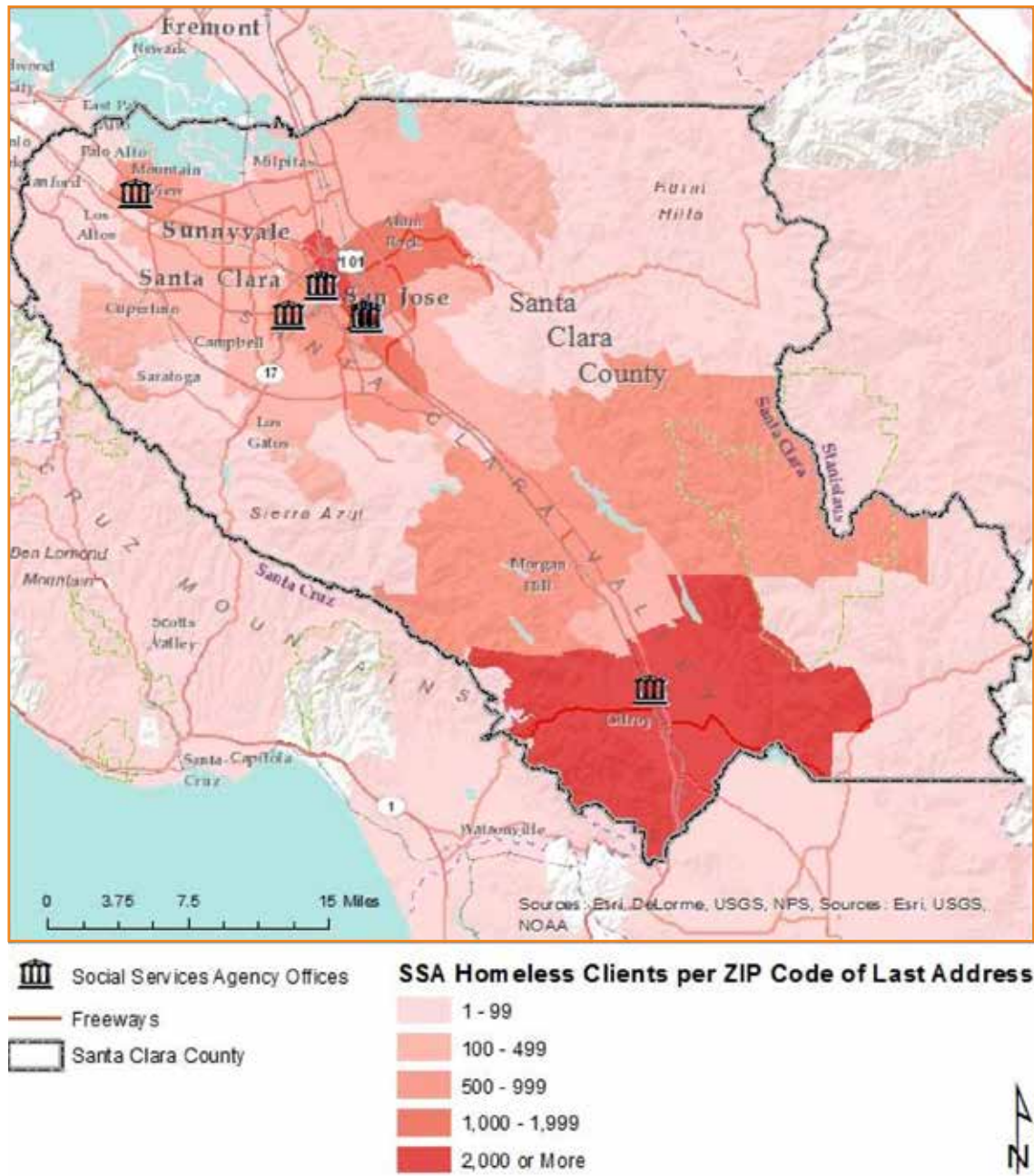
Services provided by nonprofit agencies appear to be unevenly distributed, with a below average level of services provided to homeless residents of Gilroy.

FIGURE 5.4:
Map of Mental Health Department Homeless Clients by Last Known Zip Code



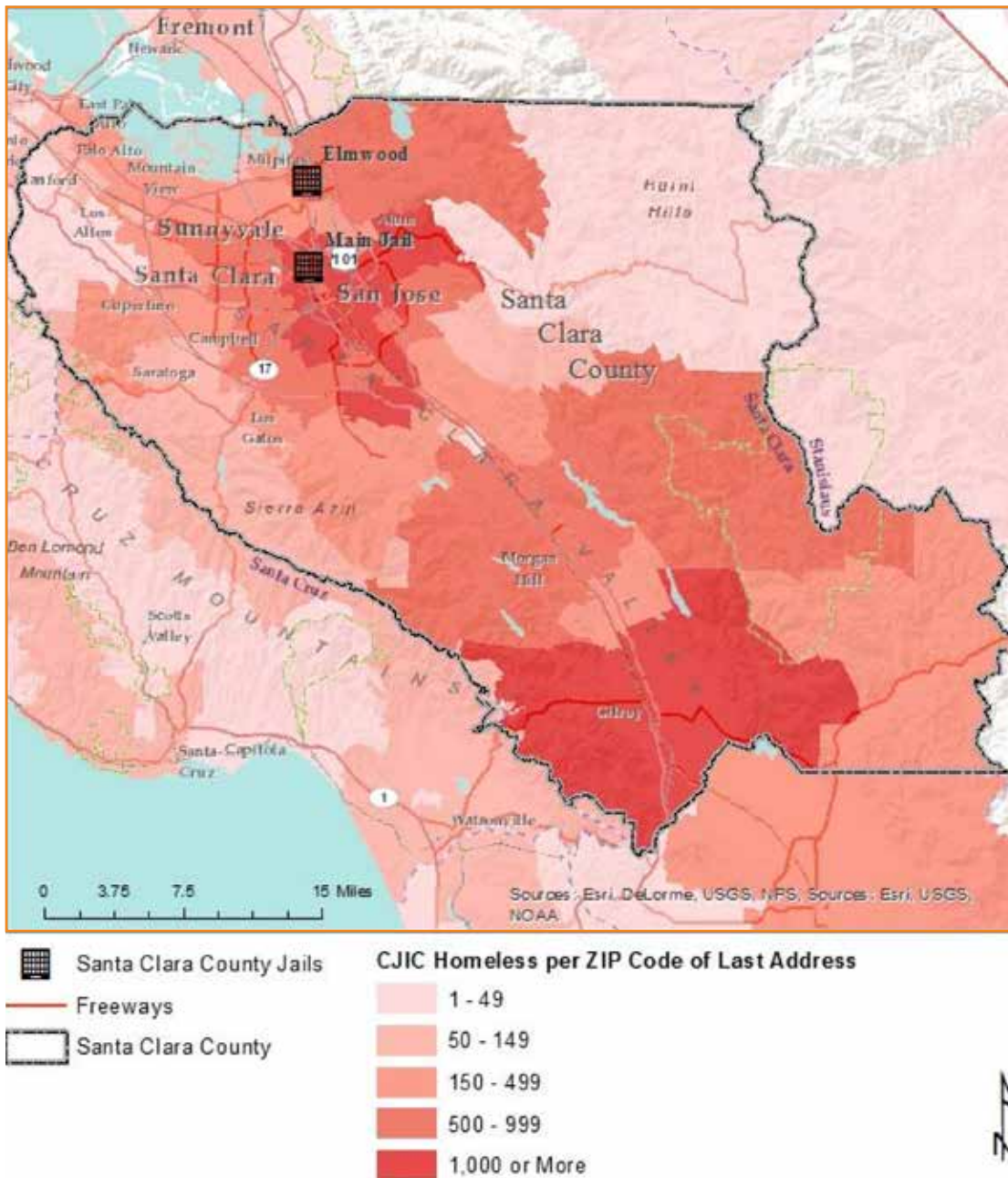
Source: Economic Roundtable analysis; Office of Supportive Housing, County of Santa Clara, 2005-2012 Data Linkage Project; Santa Clara Department of Mental Health datasets for Mode 5 (Inpatient), Mode 10 (Day Treatment), Mode 15 (Outpatient) covering 2006 to 2012.

FIGURE 5.5:
Map of Homeless Social Services Agency Recipients by Last Known Zip Code



Source: Economic Roundtable analysis; Office of Supportive Housing, County of Santa Clara, 2005-2012 Data Linkage Project; County of Santa Clara Social Services Agency (SSA) datasets for homeless study population.

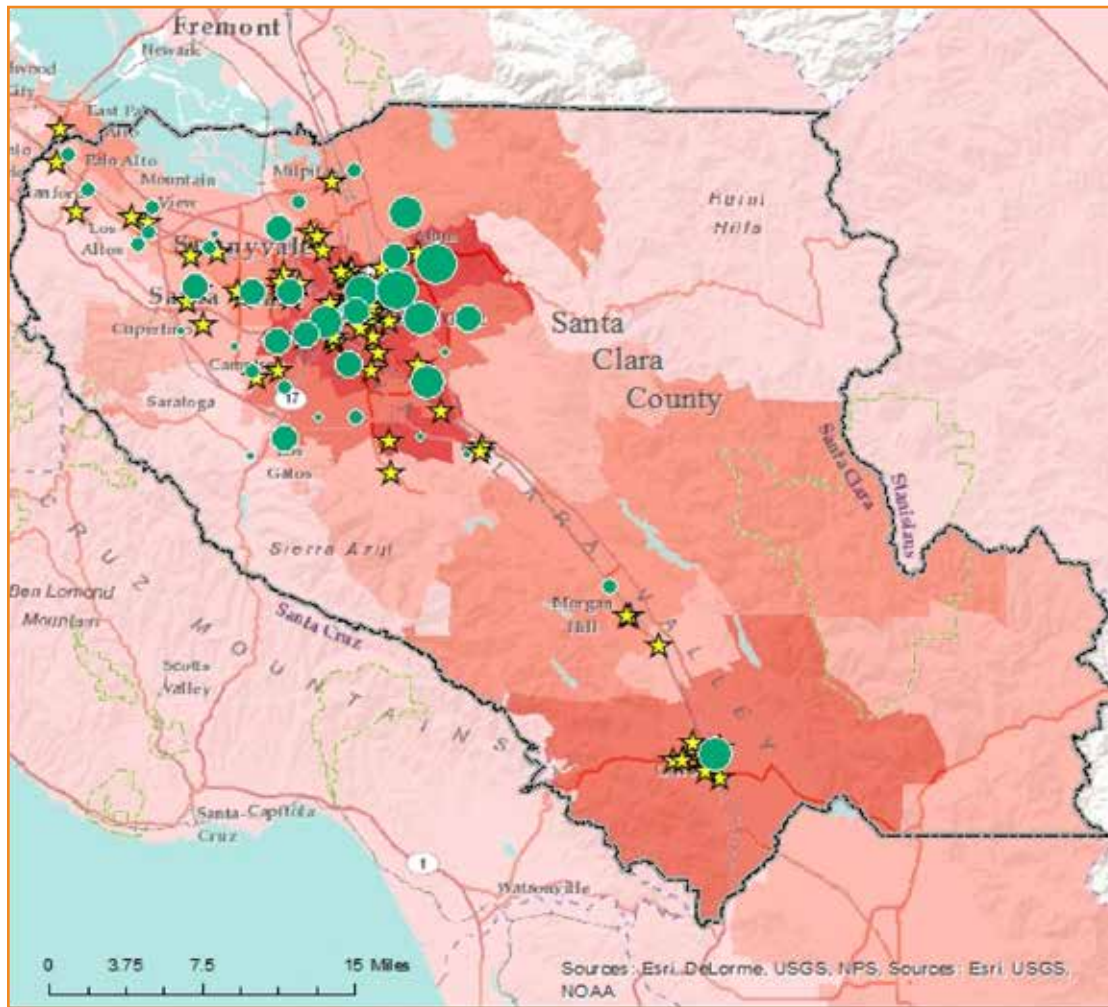
FIGURE 5.6:
Map of Homeless Jail Inmates by Last Known Zip Code



Source: Economic Roundtable analysis; Office of Supportive Housing, County of Santa Clara, 2005-2012 Data Linkage Project; County of Santa Clara Sheriff Office, Criminal Justice Information Control (CJIC) datasets for homeless study population.

FIGURE 5.7:

\Map Santa Clara Co. *Housing Authority Residents and Homeless Nonprofit Agency Clients*



Housing Authority: Housed Clients

- 1 - 3
- 4 - 7
- 8 - 13
- 14 - 23
- 24 - 31

HMIS Clients per ZIP Code of Last Address

- 1 - 99
- 100 - 299
- 300 - 749
- 750 - 1,499
- 1,500 or More

★ Homeless Shelters



Source: Economic Roundtable analysis; Office of Supportive Housing, County of Santa Clara, 2005-2012 Data Linkage Project; Housing Authority of the County of Santa Clara datasets for placements 2006 to 2012. Homeless Management Information System (HMIS) dataset 2006 to 2012.



CHAPTER 6

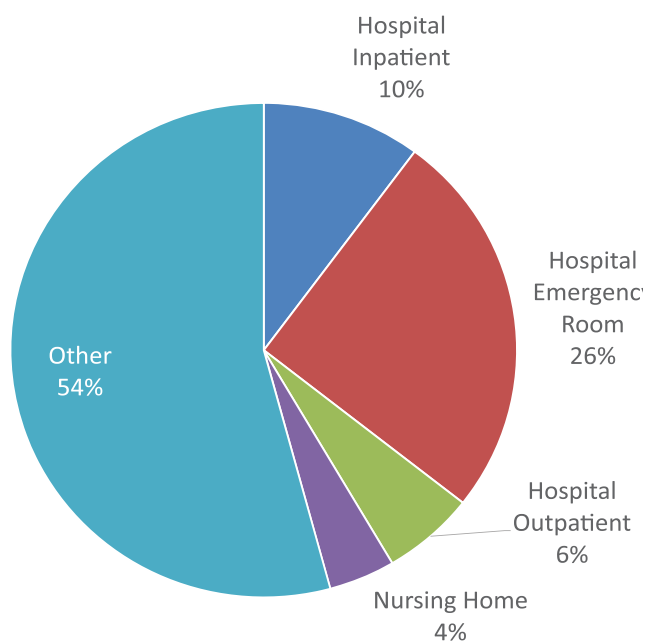
Deaths

Overview

Persons in the Santa Clara Homeless Study Population who died during the 2007 to 2012 study window number at least 511, or just under half of one percent. The county's deceased homeless were more often persistently homeless than the overall study population, 45 percent versus 34 percent, respectively.

European American males were over-represented among the deceased. They tended to be older than other homeless residents, notably with higher instances of disability and diagnosed health problems. Their justice system records reveal higher likelihood of serious criminal offenses, and lower likelihood of lower security levels in county jails. Their public cost profile is split, with a quarter in the highest cost, top 5% and another quarter in the lowest-cost, first decile.

FIGURE 6.1:
Place of Death of Deceased Homeless Residents



Source: Public Health Death Records, Santa Clara County Coroner's Office

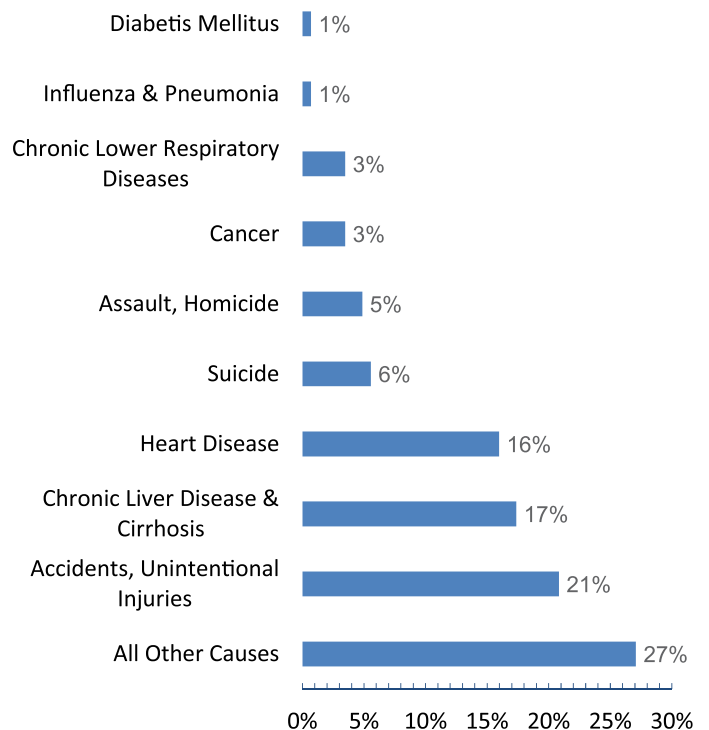
Place of Death

Where recorded, these deaths often occurred in county health facilities (Figure 6.1). But a majority died outside of any institutional setting, quite possibly on the street.

Cause of Death

The causes of death among homeless individuals vary (Figure 6.2), with accidental injuries the most common (21 percent), followed by Liver Diseases – often resulting from alcohol abuse (17 percent), and Heart Diseases (16 percent).

FIGURE 6.2:
Cause of Death of Deceased Homeless Residents



Source: Santa Clara County Coroner's Office.

Demographics

Santa Clara County's older homeless residents have higher morbidity. Sixty-three percent of the deceased in the homeless population were age 55 or greater, while persons in that age group represent only 17 percent of the homeless population as a whole (Figure 6.3).

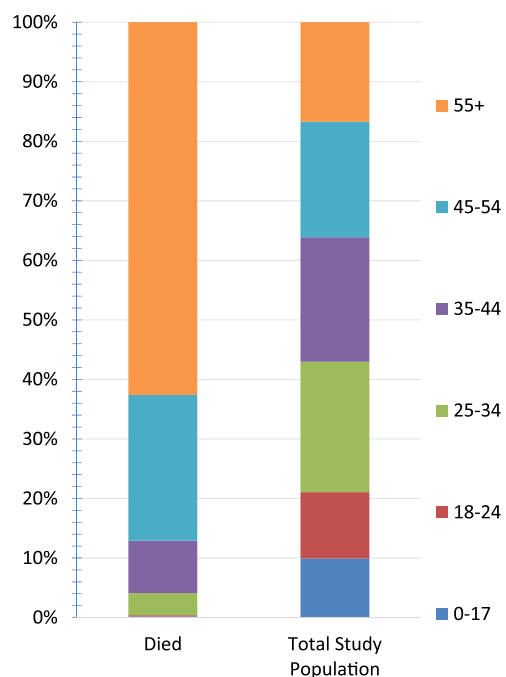
Males are over represented, comprising two-thirds of deceased homeless residents compared to just 51 percent of the overall homeless population.

European Americans are over-represented among the deceased, comprising 45 percent of those who died, compared to 24 percent in the overall homeless population (Figure 6.4). Latinos are under-represented, comprising 29 percent of the deceased but 53 percent of the overall homeless population.

Health Diagnoses

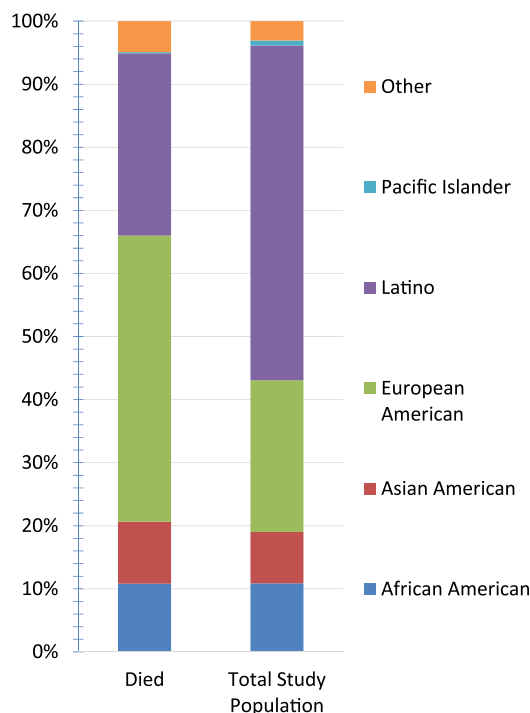
Santa Clara County's deceased homeless residents often had multiple diagnosed health problems that contributed to their deaths. They were more often disabled, 77 percent compared to 45 percent in the overall homeless study population, and also had higher incidence of substance abuse, 45 percent compared to 20 percent. Other health related characteristics of deceased homeless residents of Santa Clara County are shown in Table 6.1.

FIGURE 6.3:
Age at Death of Deceased Homeless Residents



Source: Santa Clara County Coroner's Office compared to the study population of 104,206.

FIGURE 6.4:
Ethnicity of Deceased Homeless Residents



Source: Santa Clara County Coroner's Office compared to the study population of 104,206.

TABLE 6.1
Comparative Health Diagnoses among Deceased and Overall Homeless Study Population

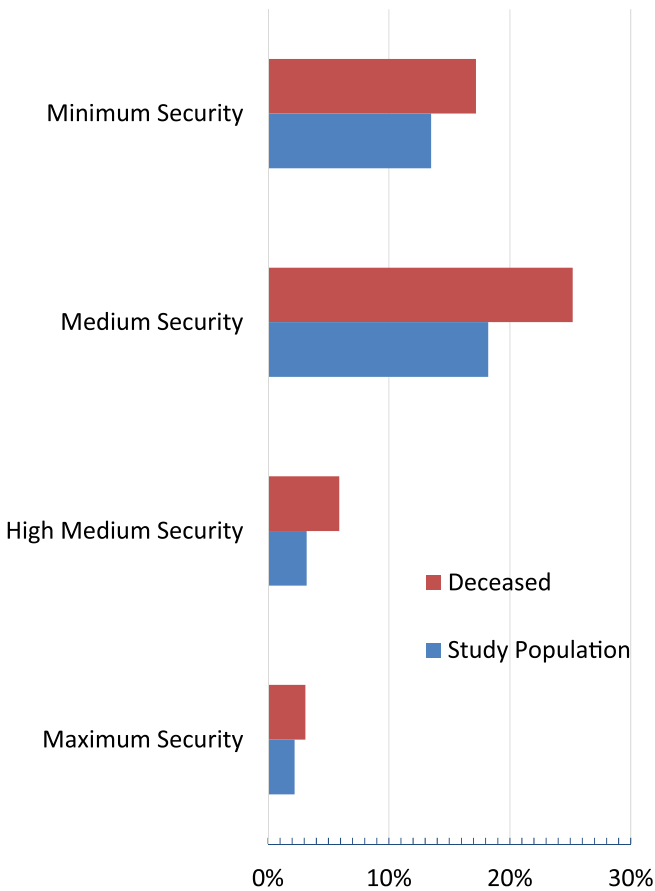
International Classification of Diseases (ICD)	Deceased	Study Population
Infectious and Parasitic Diseases (ICD-9 Codes 001-139)	36%	12%
Neoplasms (140-239)	20%	4%
Endocrine, Nutritional, Metabolic Diseases, and Immunity Disorders (240-279)	26%	10%
Diseases of the Blood and Blood-Forming Organs (280-289)	12%	2%
Mental Disorders (290-319)	50%	25%
Psychosis (290-299)	31%	13%
Schizophrenia (295)	7%	4%
Diseases of the Nervous System and Sense Organs (320-389)	33%	15%
Diseases of the Circulatory System (390-459)	43%	10%
Diseases of the Respiratory System (460-519)	38%	17%
Diseases of the Digestive System (520-579)	45%	22%
Diseases of the Genitourinary System (580-629)	26%	14%
Diseases of the Skin and Subcutaneous Tissue (680-709)	35%	15%
Diseases of the Musculoskeletal System and Connective Tissue (710-739)	44%	19%
Congenital Anomalies (740-759)	2%	1%
Symptoms, Signs, and Ill-Defined Conditions (780-799)	63%	32%
Injury and Poisoning (800-999)	46%	24%
Factors Influencing Health Status and Contact w/Health Services (E & V codes)	46%	33%

Source: Economic Roundtable analysis; Public Health Death Records, Santa Clara County Coroner's Office, dataset exported October 3, 2013, compared to the study population of 104,206. Notes: The categories in this table follow the International Statistical Classification of Diseases and Related Health Problems (ICD) version 9. Percentages reflect within-group occurrences.

Justice System

Criminal Justice Information Control (CJIC) records reveal that 22 percent of Santa Clara County’s deceased homeless residents served time in county jail, 6 percent in state prison or some other justice system facility or program. They had a higher occurrence of infraction, misdemeanor and felony charges than the homeless study population as a whole, and a greater share of them appeared in each of the four security levels of the county jail system than the overall study population (*Figure 6.5*).

FIGURE 6.5:
Jail Security Level of Deceased Homeless



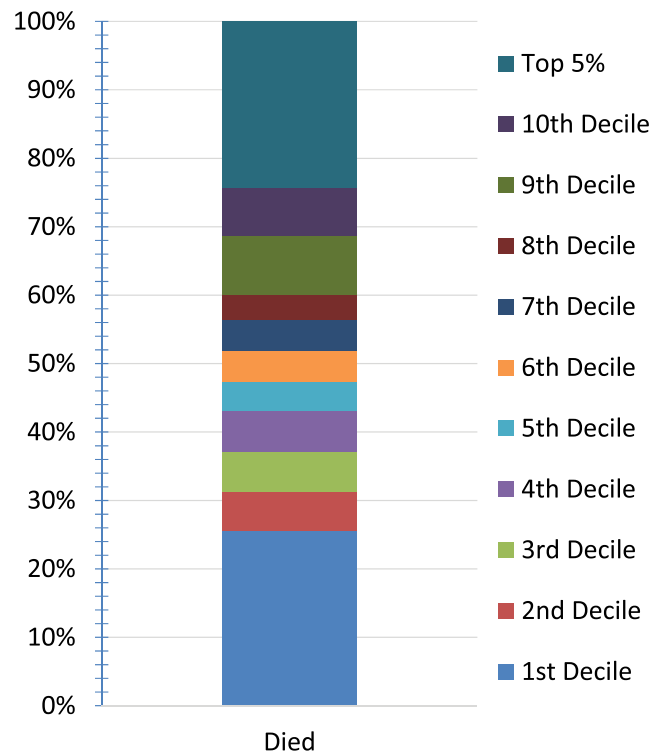
Source: Economic Roundtable analysis; Public Health Death Records, Santa Clara County Coroner’s Office.

Public Costs by Decile

Broken out by cost deciles, Santa Clara County’s deceased homeless residents were skewed toward upper cost groups compared to the overall population (*Figure 6.6*). While 26 percent were in the first, lowest cost decile, 31 percent were in the most expensive 10th Decile, and 24 percent were in the top 5 percentile.

This suggests that the county’s deceased homeless residents include two different cost profiles. Those in the 10th cost decile

FIGURE 6.6:
Cost Decile of Deceased Homeless Residents



Source: Economic Roundtable analysis; Public Health Death Records, Santa Clara County Coroner’s Office.

were intensive users of public social services, health care and the justice system, reflecting ongoing crises in their lives. The other group used minimal public services despite being in the final stage of life. The latter group may include residents who were unsuccessful in accessing needed economic, health and mental health support. Interestingly, those in the 10th cost decile were not predominantly older residents.

Summary of Findings

Where recorded, homeless deaths often occurred in county health facilities, but a majority died outside of any institutional setting, quite possibly without shelter at the end of their lives.

The causes of death among homeless individuals vary, with accidental injuries the most common, followed by liver diseases – often resulting from alcohol abuse and heart diseases.

Santa Clara County’s 55 and older homeless residents have significantly higher morbidity rates than the homeless population as a whole.

European Americans are over-represented among the deceased, who tended to be older, with higher incidence of substance abuse and disability than the overall population. Most had multiple diagnosed medical conditions. Their justice system

records reveal higher likelihood of serious criminal offenses. Latinos are under-represented relative to their percent of the overall homeless population.

Broken out by cost deciles, Santa Clara County's deceased homeless residents had a bifurcated cost profile. Almost a third were in the most expensive 10th Decile and a quarter in the top 5%. In contrast, a quarter were at the bottom of the cost distribution, in the 1st decile, despite being in the final stage of life. The latter group may include residents who were unsuccessful in accessing needed services.



CHAPTER 7

Housed Residents

Overview

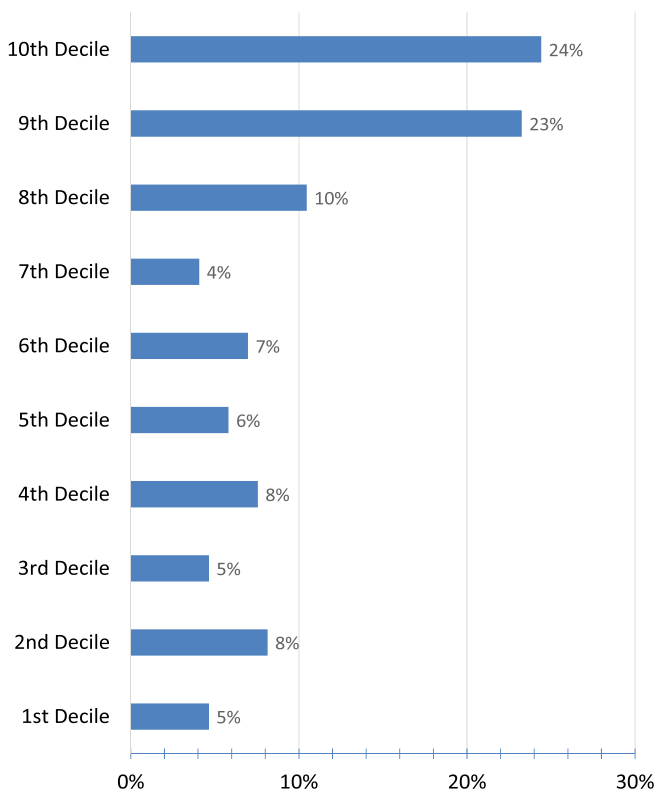
A primary purpose for this study is to support the Housing 1000 initiative in prioritizing access to housing for homeless residents. In this chapter we look at the population that was housed before the Housing 1000 initiative was launched, as well as during the start-up phase of Housing 1000. We look at housing retention, which is crucial for achieving the cost savings that result from housing and stabilizing individuals whose lives have been marked by instability and crises. We also estimate post-housing public costs for individuals who have been housed.

Profile of Housed Persons

The study population with linked records of residents who experienced homelessness includes 172 individuals who were housed by the Housing Authority of the County of Santa Clara (HACSC) and nonprofit service providers receiving HUD and local government funding who shared client data with HMIS. The cost profile of these individuals before they were housed is shown in *Figure 7.1*.

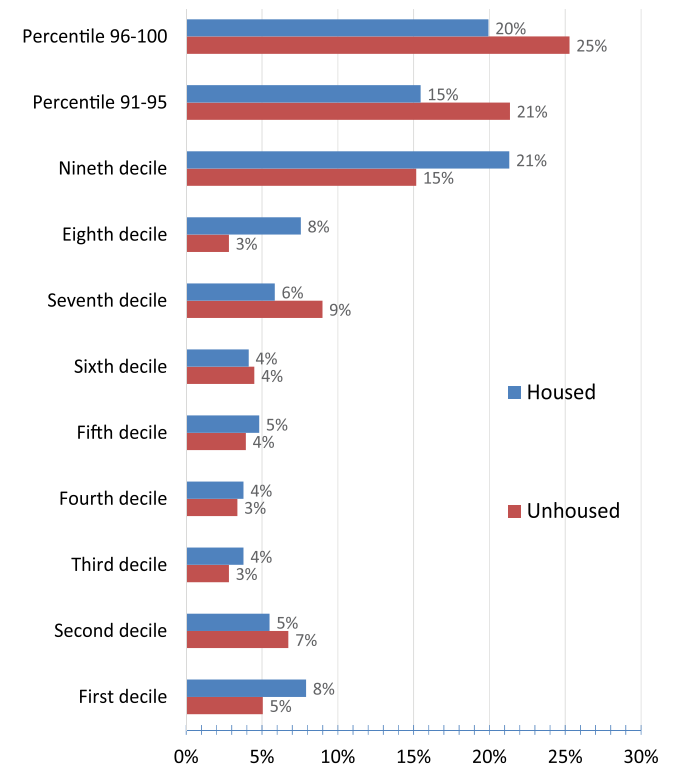
The consistent pattern in housing these clients is that the Housing Authority provided housing subsidy vouchers and

FIGURE 7.1:
Pre-housing Cost Decile Distribution of Housing Authority and Nonprofit Clients Placed in Permanent Supportive Housings



Source: HACSC and HMIS records for 172 housed persons who were part of the study population.

FIGURE 7.2:
Pre-housing Cost Distribution of Housed and Unhoused Housing 1000 Enrollees



Source: Linked records for 469 persons enrolled in Housing 1000 for whom cost data for the most recent year was available, 291 were housed and 179 unhoused. Cost deciles are based on costs in 2011, the year prior to being housed for most persons.

the nonprofit service providers offered housing placement and support services. This created permanent supportive housing, which is housing that is permanently affordable with on-site supportive services such as case management.

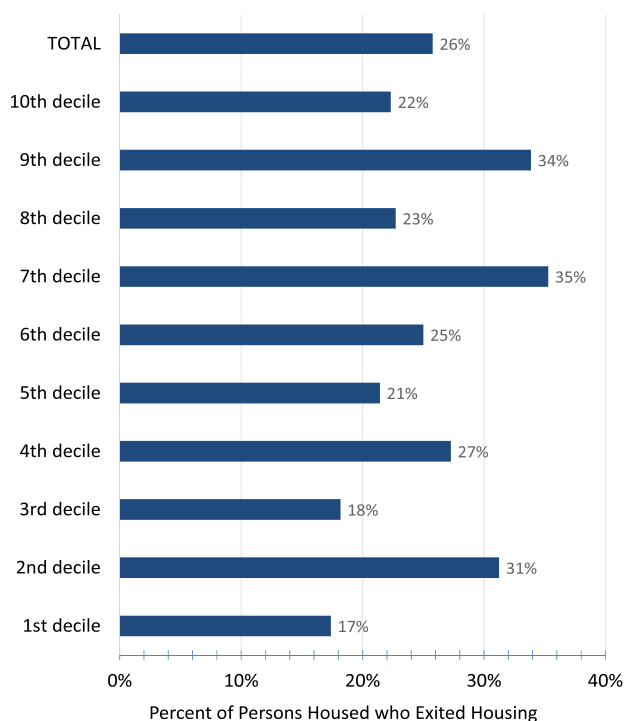
Out of 172 persons with cost data who were housed during 2008-2012, 24 percent were in the 10th cost decile in the year preceding housing. Another 23 percent were in the ninth decile, for a total of nearly half that were in the top fifth of the cost distribution.

The number of tenth decile residents with both pre- and post-housing cost data and housing stay of at least a year is too small to produce reliable estimates of post-housing cost reductions for high utilizers of services, using only data from Santa Clara County.

The study population includes 469 enrollees in the Housing 1000 initiative to house chronically homeless residents. Within the study data window, 291 of these individuals had been housed and 178 were enrolled but not yet housed. The cost distribution for both groups of individuals in the year preceding housing is shown in *Figure 7.2*.

The cost profile of individuals who had been housed is very much like that shown in *Figure 7.1*, of Housing Authority and

FIGURE 7.3:
Housing Exit Rate for Housing 1000 Tenants



Source: Linked records for 291 persons housed by Housing 1000. Housing status is as of January 2015. Cost deciles are based on costs in 2011, the year prior to being housed for most persons.

nonprofit agency clients in permanent supportive housing. Half of this sample of individuals housed by Housing 1000 were in the top fifth of the cost distribution, a third were in the tenth decile, and a fifth were in the top 5%.

Individuals who remained unhoused had a somewhat higher cost profile – 46 percent were in the tenth decile and a quarter in the top 5%.

This cost distribution reflects successful targeting of chronically homeless residents, however, a much higher share of housing needs to be provided for the top 5% to achieve cost saving that will offset the cost of housing.

Housing Retention

Retaining tenants in housing is the prerequisite for achieving the cost savings that result from stabilizing individuals who have been frequent users of costly public services, as well as for amortizing the high one-time costs for navigating individuals with complex problems into permanent supportive housing.

The housing status as of January 2015 for the study population housed by Housing 1000 is shown in Figure 7.3. Twenty-six percent of the individuals who had been housed subsequently left their housing. The average length of stay before exiting was 258 days.

Individuals in permanent supportive housing are leasing their apartments and are subject to tenant requirements similar to those for other renters. These include paying their share of the rent on time (the portion not covered by the rent subsidy – typically about 30 percent of the individual’s income), being a good neighbor to other tenants, and not damaging the apartment. Complying with these standards is a difficult transition for many high-cost, chronically homeless individuals. Often these individuals have a mental disorder; some are angry; some are impulsive; and many have limited if any experience living in and caring for conventional housing.

Effective supportive service workers are crucial to client success. They build trusting, empathic relationships and frequent ongoing contact with the client. Using a “whatever it takes” approach to meet the client where she or he is, they provide fully integrated comprehensive health, mental health and substance use treatment and housing to achieve overall wellbeing. The result is improved housing stability and health, and reduced use of emergency services

Effective, skilled supportive service providers are able to achieve a 90 percent retention rate at 6 months after individuals are placed in housing. Such strengthened supportive housing services will make it possible for Santa Clara County to achieve greater benefits for the public as well as for housed individuals through improved housing retention.

Estimates of Change in Service Utilization and Cost after Individuals are Housed

The 2007 to 2012 data window for this study provides extensive information about costs for individuals experiencing homeless, but very little information about post-housing costs for frequent users of public services. To provide estimates of cost savings for individuals with the highest public costs we drew on cost studies carried out by the Economic Roundtable in Los Angeles County, which had access to extensive pre- and post-housing cost data.³

The procedure for estimating cost savings is described in the Methods Appendix. Briefly, it entailed three steps: 1) aligning people in similar pre-housing cost groups in Los Angeles and Santa Clara counties, 2) using long-term cost data from Santa Clara County to factor in substantial reductions in the costs for 10th decile residents to offset one-time cost spikes (see Table 7.1 for the cost reductions applied to costs reported for each agency), and 3) applying agency-by-agency rate of Los Angeles County cost reduction to costs for the counterpart agencies in Santa Clara County. Reductions in actual reported costs for homeless residents made in the second step and shown in Table

³ The original cost study, *Where We Sleep: The Costs of Housing and Homelessness in Los Angeles*, was released in 2009. A more recent report evaluated pre- and post-housing costs for individuals placed in permanent supportive housing through the 10th Decile Project that is underway in Los Angeles. The report is titled, *Getting Home: Outcomes from Housing High Cost Homeless Hospital Patients*. Table 9 on page 55 of this report summarizes post-housing changes in costs. Both reports are available on the Economic Roundtable web site: www.economicrt.org.

TABLE 7.1

Reductions Applied to Tenth Decile Costs Reported for Each Agency to Offset Cost Spikes and Reflect Probable Long-term Pre-Housing Costs

Agency	Cost Reduction
VMC Health Care	40.4%
Private Hospitals	51.7%
Mental Health	19.3%
DADS	23.1%
Paramedics	8.1%
HUD-funded Nonprofits	26.2%
Food Stamps	1.4%
General Assistance	11.9%
Jail	36.3%
Probation	62.5%

7.1 to reflect probable long-term costs rather than short-term cost spikes make these estimates of cost savings quite conservative.

After subtracting the cost reductions shown in Table 7.1, the estimated average annual pre-housing public cost for the 103 homeless residents in the tenth cost decile who were housed by Housing 1000 was \$62,473. The estimated average post-housing cost was \$19,767. The estimated annual cost reduction for those who remained housed was \$42,706. These costs and cost changes, which do not include the cost of housing, are shown in Figure 7.4.

It is important to note that the average cost of \$62,473 for tenth decile residents is the result of very high upper end costs. The bottom of the tenth decile cost range is close to thirty thousand dollars. It is only in the top half of the tenth decile, or the top 5%, that cost reductions as a result of housing are likely to be sufficient to offset the cost of housing.

The estimated reductions in public costs after tenth decile residents are housed include:

VMC Health Care: 47 percent decrease from reduced emergency room and inpatient costs

Private Hospitals: 61 percent decrease from reduced emergency room and inpatient costs

Mental Health: 67 percent decrease because of reduced inpatient treatment.

Paramedics: 76 percent decrease from reduced emergency medical episodes

Alcohol and Drug Services (DADS): 98 percent decrease from reduced justice system encounters

Nonprofit homeless agencies: 100 percent decrease because homeless services are no longer needed

General Assistance: 79 percent decrease because many individuals become enrolled in SSI, which provides higher benefits

Food Stamps: 91 percent decrease because individuals receiving SSI are not eligible for Food Stamps

Jail: 100 percent decrease because as long as individuals are housed they are not in jail

Probation: 72 percent decrease from reduced justice system encounters

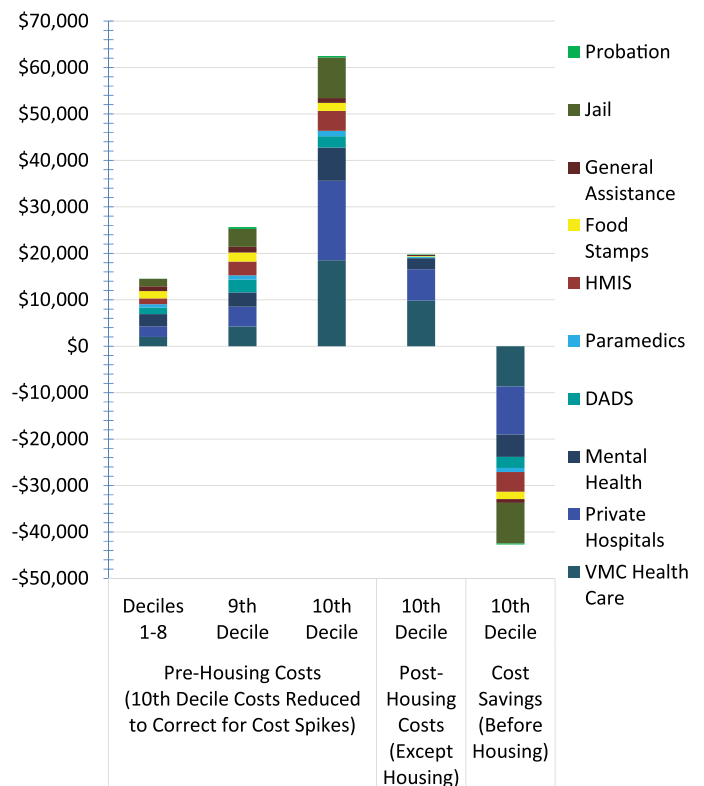
Summary of Findings

Half of homeless residents who have been housed have been in the top fifth of the cost distribution for homeless persons, but only a fifth were in the top 5%.

A quarter of the individuals housed by Housing 1000 have exited their housing. Retention rates can be improved by strengthening post-housing supportive services.

The estimated average annual pre-housing public cost for 103 homeless residents in the tenth cost decile who were housed by Housing 1000 was \$62,473. The estimated average post-housing cost was \$19,767. The estimated annual cost reduction for those who remained housed was \$42,706.

FIGURE 7.4: **Estimated Average Annual Cost Before and After Housing for Tenth Decile Housing 1000 Tenants**



Source: Linked records for 291 persons housed by Housing 1000. Housing status is as of January 2015. Cost deciles are based on costs in 2011, the year prior to being housed for most persons.



METHODS APPENDIX

Identifying Homeless Residents and Linking their Records

Overview

Records of Santa Clara County residents who have experienced homelessness were linked in two stages. In the first stage, each organization that was able to identify homeless clients contributed identifying information (Social Security Number, Agency ID number, demographic information) that was compiled to create a universal ID spine with identifying information for 137,273 residents. The organizations providing these identifying records were: the Homeless Management Information System (HMIS) on behalf of nonprofit service providers, Valley Medical Center, Social Services Agency, Mental Health, and Drug and Alcohol Services (DADS).

In the second stage, the complete universal ID spine was sent to each county department that serves homeless residents and the HMIS administrator to link all of the service records for each client that was in their database.

Even before the records were linked, it was anticipated that there would be three types of problems that would have to be managed in analyzing the data: 1) some persons in the combined ID spine would have no record of services because there was not adequate identifying information to match them with agency service records; 2) some individuals would have had only minimal contact with service providers, making it difficult to know whether they had been in Santa Clara County during the entire time window of the study; 3) some individuals would have sparse information in agency records about episodes of homelessness, making it difficult to understand their history of homelessness.

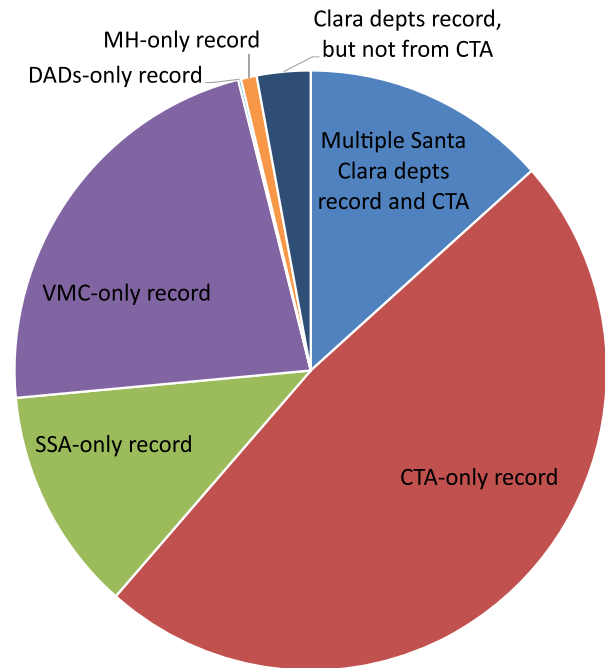
Linking Records

The HMIS system administrator identified the largest unique share (48 percent) of Santa Clara residents who experienced homelessness, and co-identified another 13 percent (*Figure A.1*). The next largest shares were identified from the record systems of the Valley Medical Center, 23 percent, and the Social Services Agency, 12 percent. The Departments of Drug and Alcohol Services and Mental Health captured very few records of people experiencing homelessness, and the remaining three percent came from multiple departments but not the HMIS system. Santa Clara County staff de-identified these linked datasets before sharing them with the Economic Roundtable in order to protect the privacy of these residents, but included basic demographic information such as gender, age range, race, ethnicity, and primary language.

The second step in the record linkage process was merging these separate departmental lists of persons known to experience homelessness, and then going back to a broader set of Santa Clara County agencies and requesting extensive data about client attributes and the dates, locations, types and costs of public services they provided.

- Sheriff’s Office Criminal Justice Information Control (CJIC) system
- Homeless Management Information System (HMIS)

FIGURE A1:
Data Sources for ID Spine of Homeless Residents



Source: Santa Clara records for 137,273 persons who experienced homelessness 2005-2012.

- Custody Health Services
- Alcohol and Drug Services (DADS)
- Emergency Medical Services Agency (EMS)
- Housing Authority of the County of Santa Clara (HACSC)
- Mental Health (DMH)
- Social Services Agency (SSA)
- Valley Medical Center (VMC)

This second step ensured that if an individual was known by one department to have experienced homelessness (such as the Valley Medical Center), the record linkage process went back and obtained service records and public costs data for that person from all the other sources listed above, even if they had not flagged the person as homeless in their own records.

The immense volume of service records and public costs data coming back from each agency – sometimes hundreds of rows per person and adding up to almost 25 million records – provides extremely rich detail about the thousands of persons who experienced homelessness in Santa Clara County between 2005 and 2012 (*Table A.1*).

Thus, the two-step process carried out by staff of Santa Clara County enabled this study of public costs, where each individual’s disparate information was connected using a common “Final Universal ID” that linked their information within and across the data siloes of multiple agencies.

TABLE A.1
Total Service Records for Persons Who Experienced Homelessness in Santa Clara County, by Contributing Department or Entity

Department of Agency	Total Service Records
Valley Medical Center	12,015,854
HMIS	5,326,274
Mental Health	2,910,128
Sheriff CJIC	1,681,971
Social Services	1,334,863
Drug & Alcohol Svcs.	1,111,136
Custody Health	452,199
Paramedics	35,642
Housing Authority	369
Total	24,868,436

Source: Records for 137,273 persons who experienced homelessness 2005-2012. Note: this table includes persons who were later excluded from the study population.

Flagging when Residents were Documented as Homeless

To determine what months these residents were or were not homeless during the seven year span, we relied upon key fields of information in the 24.8 million service records. We flagged persons as homeless when date-specific service records were found in departmental or agency data files:

CJIC: The Santa Clara County Sheriff’s Office’s Criminal Justice Information Control (system did not track whether or not inmates were homeless either upon entering or exiting jail. This applies to administrative records covering booking, court appearances, sentencing, incarceration in jail facilities, and probation supervision.

HMIS: The Homeless Management Information System collects data on all publicly-contracted homeless service providers and their clients in the county. We used date-specific service records from three of their databases as indicators of homelessness:

1. Services
2. Program Participation
3. Assessment

Custody Health: Santa Clara County’s Custody Health Services unit provides health and mental health services to those serving time at the Elmwood and Main Jail facilities, but like the jails, does not record whether or not inmates receiving their care were homeless.

DADS: The Santa Clara Department of Drug and Alcohol Services did not directly obtain information about when

its clients were homeless. However, staff compared clients’ home address captured in DADS records to the list of known homeless shelters, and used the dates of those services as an indicator of homelessness.

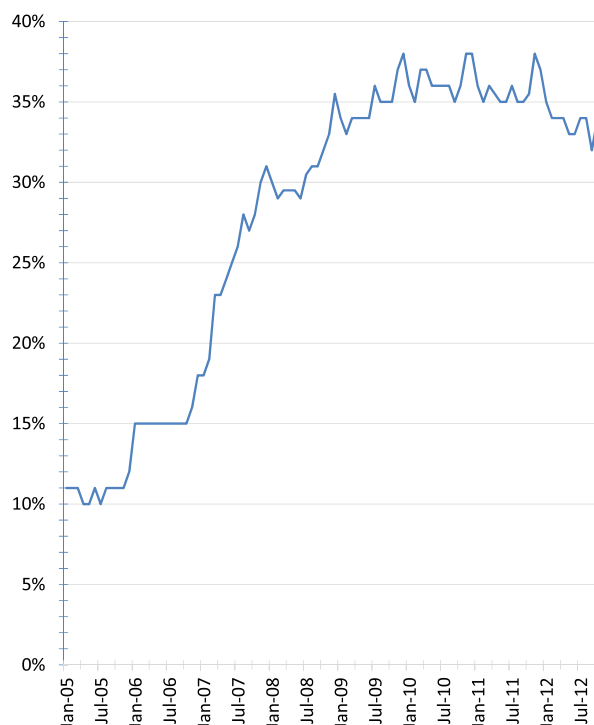
Paramedics: The Santa Clara County Emergency Medical Services Agency (EMS) did not record whether or not its patients were experiencing homelessness.

HACSC: The Housing Authority of the County of Santa Clara (HACSC) provided records of formerly homeless persons who were receiving housing subsidies and who agreed to have their de-identified records released. All HACSC tenants were counted as homeless up until they were housed.

MH: The Santa Clara County Department of Mental Health did not record whether or not its patients were experiencing homelessness.

SSA: The Santa Clara County Social Services Agency – made up of the Departments of Aging and Adult Services, Employment and Benefit Services, and Family and Children’s Services – actively asks most its clients if they are experiencing homelessness. SSA does not use HUD’s definition of homelessness in that clients who do not have a place of their own to sleep in, but are ‘couch surfing’ with friends or relatives, are counted as homeless. We used date-specific service records from four of the 30 database tables shared by SSA as indicators of homelessness.

FIGURE A2:
Study Population with a Homeless Flag in the Month as a Percent of the Population Receiving a Service in the Month, 2005 to 2012



Source: Records for 137,273 residents of Santa Clara County identified as homeless 2005-2007.

VMC: Santa Clara Valley Medical Center has very rich data on patients' health diagnoses, health services and their costs. There records also contained several indicators of homelessness.

- Hospital Service Code (7-digit numeric) identifies homeless patients
- Some VMC Hospital Services (HospSvc, 3-digit Alpha) identified the patient as homeless.
- Shelter Address – If a patient identified their home address as a known homeless shelter in Santa Clara County, we used this as an indicator of homelessness. There were 96 shelter addresses shared by county staff.
- Other elements of VMC patient addresses that indicated homelessness were specific zip code flags and patient address cities that were listed as 'homeless' or 'transient.'

Study Population

The population frame for the study is made of 137,273 persons who were identified as homeless by at least one of the agencies that provided data. The final size of the study population is 104,206 after dropping 33,067 records (24 percent of the spine population), as explained below.

Study population members who had a homeless flag in any agency record in a given month as a percent of everyone in the study population receiving a county service that month are shown in *Figure A.2*. The vertical axis shows the percent of persons receiving a service who had a homeless flag. The horizontal axis shows the eight-year data window. The chart shows that in 2005 and 2006 (months 1-24), the share of the service-receiving population with a homeless flag is very low (11-18 percent), suggesting that homeless flags are not reliable during this period. Hence, we only used the 2007-2012 data (72 months) dropping those records that met two criteria: (1) no homeless flags were recorded before January 2007 and (2) no service was provided in the 2007-2012 period. The final study population after removing records appearing only in 2005 or 2006 and removing duplicate records is 104,206.

Demarcating Homeless Episodes

The homeless ID spine was built based on homeless flags derived primarily from records of four source agencies - HMIS, Social Services Agency (SSA), Valley Medical Center (VMC), and Drug and Alcohol Services (DADS). Separate homeless arrays for 72 months (2007-2012) were generated for these agencies where the code "1" in a given month indicated that at least one homeless flag was recorded for the person during that month. In addition for each array, we generated pre- and post-homeless flags to be used in demarcating homeless windows. The pre-homeless flag indicated whether homeless flags were recorded before 2007, that is, in 2005 or 2006. The post homeless flag indicated whether homeless flags were recorded in 2013 (some agencies provided partial data for 2013). Eighteen

TABLE A.2
Distribution of Study Population by Service Agency

Source Agency	Number	Percent
HMIS=1	82,834	78.9%
HMIS=0	22,107	21.1%
DADS=1	13,263	12.6%
DADS=0	91,678	87.4%
SSA=1	4,637	4.4%
SSA=0	100,304	95.6%
VMC=1	70,816	67.5%
VMC=0	34,125	32.5%
Single Source	48,559	46%
Total	104,941	100%

Source: Records for 104,941 persons who experienced homelessness 2007-2012. This table includes 735 records that were subsequently determined to be duplicative and removed. 1 = number of persons identified by agency, 0 = number of persons not identified by agency.

percent of the population had a pre-homeless flag and 23 percent had a post-homeless flag.

The HMIS data array was formed based on data collected from three HMIS files—services, participation and assessment. A total of 83,704 persons were identified as receiving homeless services between 2005 and 2013. The SSA data array was formed from SSA Homeless Assistance file and 4,839 persons were identified as homeless. The VMC data array was formed from inpatient, outpatient and no shelter address files. A total of 82,512 persons were identified as having experienced homelessness between 2005 and 2013. Finally the DADS data array was generated from the DADS service file and 15,285 persons were identified as homeless.

These arrays were joined with the preliminary study population of 104,941 records to create an integrated array of documented homeless intervals. The distribution of persons by service source is shown in *Table A.2*.

Homeless Window

The homeless array covered 72 months. We made several conservative adjustments to the array as described below.

Many individuals records showed numerous holes where no homeless flag was recorded when previous and subsequent months had homeless flags. If there was no flag in a month or two consecutive months, but there were flags before and after those months, then these no-flag months were converted to flag months as follows:

1 1 . 1 1 → 1 1 1 1 1 1 or 1 1 . . 1 1 → 1 1 1 1 1 1

After imputing homeless intervals to fill one- or two-month

TABLE A.3
Distribution of Study Population by Single or Multiple Identifying Agencies

Source Agency	Number	Percent
HMIS-only	29,551	35.7%
HMIS + others	53,283	64.3%
DADs-only	318	2.4%
DADs + others	12,945	97.6%
SSA-only	771	16.6%
SSA + others	3,866	83.4%
VMC-only	16,973	24%
VMC + others	53,843	76%
Single Source	48,559	46.3%
Multiple Sources	56,382	53.7%

Source: Records for 104,941 persons who experienced homelessness 2007-2012. This table includes 735 records that were subsequently removed.

gaps, we identified the homeless start and end dates during the study period of 6 years. Homeless start date is the first month when a person was identified as homeless during these six years based on the four source files. Homeless end date is the last month when a person identified as homeless during these six years based on the four source files. The homeless window is defined as the period between the homeless start and end dates.

Next based on pre- and post-homeless exposures, we adjusted the homeless window as follows: if there was a pre-homeless flag, as defined earlier and either the homeless start date was during 2007 or the pre-homelessness duration was six months or more, then the homeless start date was moved to January 2007, the first month of the study period. If there was a post-homeless flag, then the homeless end date was moved to December 2012, the last month of the study period.

Linkage Findings

Homelessness by Source Agencies

While studying the patterns of linkages across different agencies, we noticed some anomalies that required closer attention. We observed that linkage results are influenced by the type of source agency as well as whether there was just one or multiple agencies identifying a person as homeless.

In *Table A.3* we show how the populations identified by each agency are split between single and multiple identifying agencies. In *Table A.3* we observe that there are two significant groups—HMIS-only and VMC-only groups that form the single-source group. The linkage properties of these two groups are significantly different as will be described later.

Linkage Rates by Agency

In *Table A.4* we tabulate the linkage rates of the homeless spine by five service agencies—CJIC, DADS, MH, SSA and VMC. Overall the match rate is 86 percent, which means that 86 percent of the homeless spine was matched against at least one agency other than the source agency for the ID spine. There are about 15,000 records that were not matched to any additional agency. All of these records are HMIS-only records that needed to be assessed to determine why they could not be linked to any agency file. For example, if these individuals were destitute, why didn't they receive Food Stamps?

TABLE A.4
Match Rates by Agency for all Records based on Identifying Agency for ID Spine

Linked Agency	Matched Records	Match Rate
CJIC	33,540	32%
DADs	13,263	12.6%
Mental Health	22,589	21.5%
SSA	63,907	60.9%
VMC	70,816	67.5%
Matched no Additional Agency	15,088	14.4%
Matched at least one Additional Agency	89,853	85.6%
Total	104,941	100%

Source: Records for 104,941 persons who experienced homelessness 2007-2012. This table includes 735 records that were subsequently determined to be duplicative and removed.

TABLE A.5
Match Rates by Agency for HMIS-only Records

Linked Agency	Matched Records	Match Rate
CJIC	3,830	13%
DADS	0	0%
Mental Health	2,041	6.9%
SSA	12,836	43.4%
VMC	0	0%
Matched no Agency	14,846	50.2%
Matched at least one Agency	14,705	49.8%
Total	29,551	100%

Match rates for all agencies look reasonable with the exception of the CJIC data. Based match rates found in Los Angeles, the 32 percent rate shown in *Table A.4* is low and is likely the result of poor identifier information in the data set that would require sophisticated matching algorithms that were not available to county staff to produce complete matches between CJIC records and the records of other agencies.

Linkage Rates by Agency Contributing Record to ID Spine

In *Table A.5* we tabulate the linkage rates for HMIS-only records. Overall the match rate is almost 50 percent. Agency service delivery match rates are much lower than the rates for the spine. Two agency match rates are 0 percent for DADS and VMC, and only 13 percent for CJIC. These findings show a severe problem with the record linkage of HMIS-only records. As noted earlier, those records that could not be linked to any agency are all HMIS-only records - almost 15,000 persons. Two possibilities that would explain this problem are (1) the identifying information in these records is inaccurate, or (2) these records were not part of the spine that was sent to DADS and VMC for matching.

TABLE A.6
Match Rates by Agency for HMIS, Multiple-Source Records

Linked Agency	Matched Records	Match Rate
CJIC	18,912	35.5%
DADS	10,200	19.1%
Mental Health	15,923	29.9%
SSA	41,743	78.3%
VMC	50,797	95.3%
Total	53,283	100%

In *Table A.6* we show the linkage rates for HMIS records that had at least one additional agency referring the person to the ID spine. The overall match rate is 100 percent, showing that every record was matched against at least one agency, which is mainly due to the fact that VMC's match rate is 95 percent - VMC is the other source agency for most of the HMIS records that were matched by another agency. Match rates for CJIC are lower than for other agencies.

In *Table A.7* we tabulate the linkage rates for VMC-only records. VMC-only records have two groups. One small group of 5,454 persons was only linked to VMC so that this group is not shown in the table. The remaining 11,519 persons are tabulated for four other agencies.

The match rate for DADS is 0 percent. The CJIC match rate is much higher than the overall population and the SSA match rate is much lower. Two possibilities would explain the problem of a DADS linkage rate of 0 percent: (1) Even though multiple agencies referred these individuals to the ID spine, only HMIS

TABLE A.7
Match Rates by Agency for VMC-only Records

Linked Agency	Matched Records	Match Rate
CJIC	8,052	69.9%
DADS	0	0%
Mental Health	2,973	25.8%
SSA	5,669	49.2%
Total	11,519	100%

TABLE A.8
Match Rates by Agency for VMC, Multiple-Source Records

Linked Agency	Matched Records	Match Rate
CJIC	20,050	37.2%
DADS	11,500	21.4%
Mental Health	16,434	30.5%
SSA	41,632	77.3%
Total	53,843	100%

TABLE A.9
Match Rates by Agency for DADS Multiple-Source Records

Linked Agency	Matched Records	Match Rate
CJIC	9,426	72.8%
Mental Health	5,537	42.8%
SSA	11,062	88.5%
VMC	11,500	88.8%

identifiers were used in the spine sent to DADS, or (2) these records were not part of the spine that was sent to DADS for matching.

For records originating from the VMC-only group, there is a high linkage rate with CJIC (*Table A.7*, 70 percent). However, when the record was placed in the spine by VMC and another agency there is a low linkage rate with CJIC (*Table A.8*, 37 percent). This anomaly suggests that most likely VMC identifiers were not used when the ID spine was sent to CJIC to be linked with their records. Instead the HMIS identifiers were used.

In *Table A.8* we tabulate the linkage rates for VMC multiple source records. The overall match rate is 100 percent and the results are very similar to the HMIS multiple-source records.

VMC is not shown since the match rate is 100 percent by definition. Match rates for CJIC are lower than expected.

Table A.9 we tabulate the linkage rates for DADS multiple source records. The overall match rate is 100 percent since DADS is a source agency and omitted from the table. Match rates for all agencies are much higher than general population including CJIC. There do not appear to be problems in the linkages with DADS records.

SSA source records are not shown since the group is small and match rates do not point out any anomalies.

Cross Linkage Rates between different Agencies by Homelessness Source Type

We show the cross-agency linkage rates for HMIS population in Tables A.10 and A.11. Table A.10 confirms that there are no anomalies in match rates across different agencies for persons identified as homeless based on HMIS and multiple sources. However, Table A.11 shows that for HMIS-only records, no linkage was conducted for DADS and VMC agencies. Match rates between these two agencies and all other agencies are all 0 percent. Moreover, match rates for the remaining agencies are very low. This is a serious problem that needed to be corrected. Since to rematch these records and produce better results was not an option we estimated service usage rates for the HMIS-only group to correct for missing information. As mentioned earlier, there is a similar problem with the VMC-only records.

TABLE A.10
Cross agency match rates by agency for HMIS-only Records

HMIS Multiple Source Match Rates	CJIC	DADS	MH	SSA	VMC
CJIC		0%	24%	65%	0%
DADS	0%		0%	0%	0%
Mental Health	13%	0%		68%	0%
SSA	19%	0%	11%		0%
VMC	0%	0%	0%	0%	

Source: 29,551 records with HMIS as the only referral source for the ID spine

Linkage Rates by ID Numbers

We had one final observation regarding the linkage patterns by studying the distribution of ID numbers of the study population. These show peculiar patterns in terms of match rates to different agencies. The majority of the ID numbers are in a number range below 1,000,000 — almost 61 percent. A quarter of the IDs are between 1,000,000 and 100,000,000 and the remaining 14 percent are greater than 999,000,000.

We show the match rates of these three groups by agency in Table A.12. IDs > 999 million yielded very few matches with CJIC or Mental Health. Ninety percent of these records did

TABLE A.11
Cross- Agency Match Rates by Agency for Persons Referred by HMIS and At Least One Other Agency

HMIS Multiple Source Match Rates	CJIC	DADS	MH	SSA	VMC
CJIC		39%	42%	85%	94%
DADS	72%		45%	90%	86%
Mental Health	49%	29%		83%	97%
SSA	38%	22%	31%		94%
VMC	35%	17%	30%	78%	

Source: 53,283 records referred by HMIS and at least one other agency to the ID spine

not link to any agency. These are almost exclusively HMIS source records. IDs 1-100 million did not match against SSA. IDs < 1 million look fine with the exception that the SSA match rate is 100 percent. These findings raise two possibilities: (1) the records with ID numbers >99 million were not sent to all of the agencies for matching, or (2) these records have defective IDs and could not be matched with other accurately identified records.

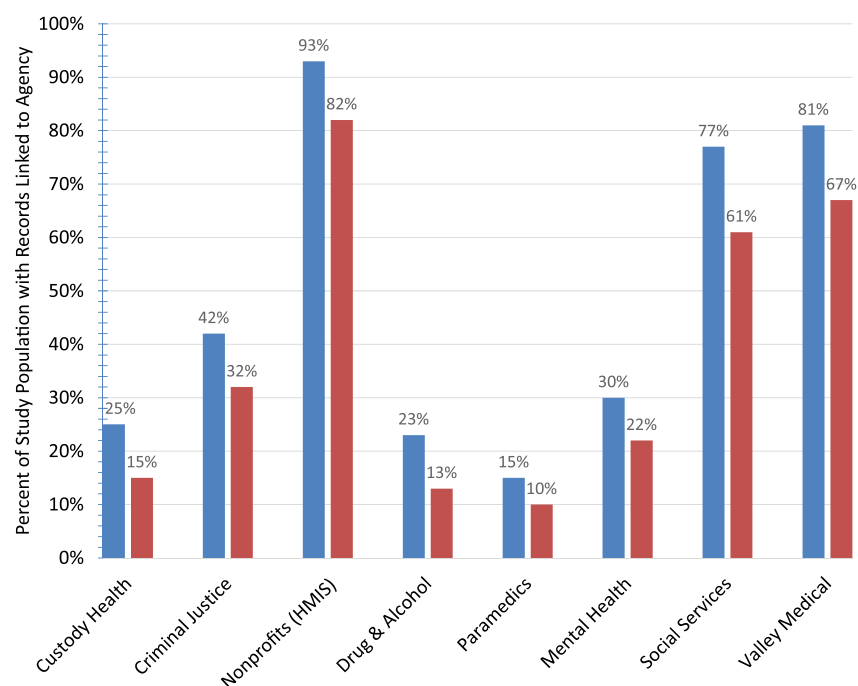
Imputation of Service Utilization

After observing several anomalies with the match rates of HMIS-only and VMC-only groups, we applied an imputation methodology to estimate the service utilization of these persons. The objective of the imputation is to estimate the service utilization for each agency if the record was linked at the same rate as for other records similar to this record. Similarity was determined based on gender, ethnicity and age. The imputation methodology is summarized below using DADS records as an example. A similar method was applied to all agencies.

As we showed above in Table A.3, roughly 56,000 records were linked to more than one agency database. The service utilization of this group is used to impute the service utilization of the remaining approximately 48,000 persons who were linked only to a single agency—most likely the source agency being HMIS-only and VMC-only groups. Then we used the agency linkage indicators—DADS in our example to derive match rates by different strata as described below.

We built the frequency distribution of age to derive age groupings so that differences in linkage rates are captured. For example, for the DADS data we derived 5 age brackets—less than 18, 18-27, 28-54, 55-64 and 65 and over. We used 5 ethnicity groups—African American, Asian, Latino, Other and European American. Together with gender, we ended up with 60 different match rates through the combination of these 3 strata. These match rates were used as weights in the next steps. For example, 18-24 year old male Latinos had a weight of .15 reflecting the DADS match rate of persons with good linkage records and same strata. This process generated separate datasets for each agency with imputing weights.

FIGURE A3:
Adjusted Linkage Rates by the Imputation Process



Source: Records for 104,941 persons who experienced homelessness 2007-2012. Note: this table includes 735 records that were subsequently determined to be duplicative or erroneous and were removed from the final data set.

TABLE A.12:
Match Rates by Agency and ID Numbers

Linked Agency	IDs < 1 mil		IDs 1-100 mil		IDs > 999 mil	
	Number	Rate	Number	Rate	Number	Rate
CJIC	23,251	36.4%	9,521	35.9%	768	5.3%
DADS	11,309	17.7%	1,850	7%	104	.7%
Mental Health	17,364	27.2%	4,480	16.9%	745	5.1%
SSA	63,899	100%	8	0%	0	0%
VMC	47,295	74%	23,521	88.8%	0	0%
Matched no Agency	0	0%	1,940	7.3%	13,148	90.4%
Source = HMIS	54,573	85.4%	14,260	53.8%	14,001	96.3%
Total	63,900	100%	26,498	100%	14,543	100%

TABLE A.13:
ICD-9 Medical Diagnostic Categories

ICD-9 CODES	DISEASES AND RELATED HEALTH PROBLEMS	REPORT LABEL
001–139	infectious and parasitic diseases	Infections
140–239	neoplasms	Cancer
240–279	endocrine, nutritional and metabolic diseases, and immunity disorders	Endocrine
280–289	diseases of the blood and blood-forming organs	Blood Disorder
290–319	mental disorders	Mental Disorder
320–359	diseases of the nervous system	Nervous System
360–389	diseases of the sense organs	Circulatory
390–459	diseases of the circulatory system	Respiratory
460–519	diseases of the respiratory system	Digestive
520–579	diseases of the digestive system	Genitourinary
580–629	diseases of the genitourinary system	Infections
630–679	complications of pregnancy, childbirth, and the puerperium	Pre/post-pregnancy problem
760–779	certain conditions originating in the perinatal period	
680–709	diseases of the skin and subcutaneous tissue	Skin
710–739	diseases of the musculoskeletal system and connective tissue	Musculoskeletal
740–759	congenital anomalies	Congenital
780–799	symptoms, signs, and ill-defined conditions	Ill-Defined
800–999	injury and poisoning	Injury & Poisoning
E and V Codes	external causes of injury and supplemental classification	Follow-up Required

Source: Centers for Medicare and Medicaid Services
<http://www.cms.gov/medicare-coverage-database/staticpages/icd-9-code-lookup.aspx>

Then we selected approximately 13,000 IDs that were matched to the DADS database and derived their annual costs using the DADS source file. A person may have up to 6 records—one for each year of the study window. We dropped persons with no costs and ended up with almost 12,000 persons and computed their average costs per service by dividing their total six-year costs into six annual totals.

Then we get the distribution of observations by strata for these 12,000 persons for every year.

In parallel, we joined the 48,000 group—with bad linkage rates with average annual costs of the 12,000 matched group as well as with the distribution of their observations by strata. The joined dataset included multiple records for each ID with a bad linkage rate by year. Some years would be missing if no matched person is observed from the good linked group with a particular combination of strata. For each ID, the dataset also included average cost for the strata combination of that ID, the imputation weight as described earlier and the total number of observations for the same strata combination in the good linked group.

The final imputed cost is computed as follows. First we derive the annual weight from the good linked group. This weight shows the expected percent of record linkages. For example, if in 2007, we observe 50 IDs among the 18-24 year old male Latinos with good linked records and if the total number of this group is 200, we apply the 0.25 as the annual weight for that group. This means that, any ID from the imputed group with these strata has a 25 percent chance of receiving services in 2007. Then we multiply the annual weight by the imputed weight, say 0.40 to derive the final weight of 0.10. The final weight shows that 1 out of 10 male Latinos 18 to 24 year of age is expected to be linked in 2007. Finally, we multiply the final weight with the average cost to estimate the imputed annual cost for this ID in 2007.

The final match rates after the imputation process are shown in *Figure A.3*. Red bars show the original match rates reflecting the problems discussed earlier. Blue bars show the match rates after the imputation process. Match rates increased for all agencies, but by differing amounts.

ICD-9 Medical Diagnostic Codes

The study population included 80,034 individuals with one or more medical diagnoses that were identified using ICD-9 codes. This is the official classification system for assigning codes to diagnoses and procedures associated with hospital utilization in the United States. There are roughly 17,000 ICD-9 codes. This is a dynamic classification system that is revised often. During the data window for this study, the highest level of code aggregation fell within the categories shown in *Table A.13*. Diagnostic information in this report is largely presented at this highly aggregated level. The condensed diagnostic labels used in the report are shown along with the formal classification terminology in *Table A.13*.



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315 W 9th St, Los Angeles, CA 90015
(213) 892-8104 | economicrt.org