MAY 2022

Technical Appendix: Serious Mental Illness among People who are Unsheltered in Los Angeles

COLIN CAPRARA, DEAN OBERMARK, ROBERT SANTILLANO, and **JANEY ROUNTREE**

SUMMARY

This document provides additional details about the data and methods used in the "Serious Mental Illness among People who are Unsheltered in Los Angeles" policy brief. The brief is based on homeless services data that are linked to LA County Department of Mental Health (DMH) and LA County Department of Health Services (DHS) service data. These linked records are used to estimate the number of individuals who had a service visit for serious mental illness ("SMI") from DMH or DHS in the five years prior to their street outreach enrollment. Further, by SMI service experience, we use these data to show the number of street outreach participants who were subsequently enrolled in an interim or permanent housing program within one year. Finally, we break down these subsequent interim or permanent housing enrollments by race and ethnicity.

DATA SOURCE INFORMATION

Los Angeles Homeless Services Authority HMIS Data

The Los Angeles Homeless Services Authority (LAHSA) provided the Homeless Management Information System (HMIS) data used to define the sample in our brief through a formal data sharing agreement between LAHSA and CPL. Homeless services are geographically organized by Continuums of Care (CoCs) across the country, and an HMIS is the local system used to collect participant-level data on homeless services for those who are at risk of, or who are already experiencing, homelessness. Although the HMIS in Los Angeles' CoC covers the vast majority of homeless services, as noted in the brief, it does not cover all available homeless programs. For example, domestic or intimate partner violence programs may not participate in the HMIS to protect participants' information. Further, programs that do not rely on LAHSA funding are not required to participate in the HMIS, and this may also decrease coverage.

This brief uses data elements found in the following standardized HMIS extract files: Client, Enrollment, Disabilities, and Services. The client file provides basic demographic information on the individuals in our study sample. The enrollment file is used to define the sample based on the entry date of each participants' initial street outreach enrollment. This file also allows us to observe interim and permanent housing enrollments that occurred in the following 12 months of the initial street outreach enrollment. The disabilities file provides self-reported mental health and substance use concerns. The services file provides additional information on services and other activities that occur during program enrollments, which we use to help ensure that rapid re-housing program enrollments involve an actual move-in to a housing unit.

Department of Mental Health and Department of Health Services Data

DMH and DHS participate in the Los Angeles County InfoHub (previously known as the Enterprise Linkages Project or ELP), an integrated individual-level database of service records that includes HMIS data from LAHSA. CPL accesses an extracted version of this database through a data sharing agreement with the LA County Chief Executive Office. Prior to their secure transmission to CPL, records in the InfoHub (and ELP) are uniquely linked across agencies using personally-identifiable information, and are then de-identified.

DMH and DHS service records were used to classify street outreach participants into different SMI categories for the study. First, we used service records with diagnosis codes that represent the following diagnoses to define SMI: bipolar disorder, major depressive disorder, other psychotic or delusional disorder (a category composed of delusional disorder, brief psychotic disorder, other psychotic disorder, unspecified psychosis not due to a substance or known physiological condition, unspecified paranoid state, and shared psychotic disorder), schizoaffective disorder, schizophrenia, and schizotypal disorder. Using these diagnoses and associated codes to categorize SMI was informed by CPL affiliate researchers in the David Geffen School of Medicine at UCLA, as well as psychiatrists with the UCLA-DMH Public Mental Health Partnership, and later refined with input from staff and leadership at DMH. The PSD group is composed of participants with service visits involving other psychotic or delusional disorder, schizoaffective disorder, schizophrenia, schizotypal disorder, and any other SMI diagnosis involving psychotic symptoms or features (e.g., bipolar disorder with psychotic symptoms). The Other SMI group is composed of participants with service visits involving bipolar disorder (without psychotic symptoms), episodic mood disorder (without psychotic symptoms), major depressive disorder (without psychotic symptoms), or manic episode (without psychotic symptoms). The No SMI group is composed of participants without any service visits involving an SMI diagnosis. Participants in this group either have no DMH or DHS visits or have visits that do not involve an SMI diagnosis.

Los Angeles Point-In-Time Count Data

We use publicly reported and researcher-provided statistics from the annual Point-in-Time Count (PIT Count) and

Point-in-Time Count Demographic Survey (PIT Survey). The public counts of the unsheltered population come from the 2020 Los Angeles CoC, which are available on the LAHSA website. In addition, we use statistics provided by Patricia St. Clair, USC Schaeffer Center, and Benjamin Henwood, USC School of Social Work on the standard errors for each of the count estimates. This allows us to compare the demographic characteristics between our street outreach sample and the PIT estimates using a simulation approach.

Los Angeles Housing Inventory Count Data

Housing Inventory Count (HIC) data from the Department of Housing and Urban Development (HUD) is used to provide context about the scarcity of housing resources in Los Angeles' CoC. The HIC is the housing inventory equivalent of the PIT Count and gives an estimate of beds available for people experiencing homelessness by project and project type, as well as their occupancy, at a single point in time for CoCs across the United States. To calculate an approximate occupancy rate, we divide the sum of LA CoC program-level PIT Counts by the sum of program-level total beds. We include seasonal beds because such beds could partially constitute beds available in interim or permanent housing programs that are included in our broader analysis. Excluding seasonal beds results in slightly higher occupancy rates.

Missing Values in HMIS Variable

Missing values are common in LA's HMIS data. Missingness can occur either as true missingness (no value entered in the HMIS or available in extracted HMIS data) or uninformative entries (e.g., "client doesn't know", "client refused", or "data not collected"). Appendix Table 1 provides the rates of missingness for the key demographic and health status variables used in the study along with summative measures of missingness for the study population.

Data Linking and Pre-Processing

The policy brief makes use of three overlapping data sources: the LAHSA HMIS (recent and historical homeless service system records), the InfoHub (an integrated version of the LAHSA HMIS, as well as more recent DMH and DHS records), and the ELP (historical DMH and DHS records). These sources resolve entities differently. Since we define our sample using HMIS records stored in the InfoHub and an anonymized HMIS personal identifier, the HMIS serves as the

base for our linked data set. In combining these data sources, we join the LAHSA HMIS and InfoHub HMIS version using a shared anonymized HMIS personal identifier. We separately join the LAHSA HMIS and ELP using encrypted personal identifiers and a multi-step join algorithm originally produced by CEO staff.

METHODS

Defining the Sample and Sample Period

We define our study sample to include all participants who enrolled in HMIS street outreach programs during the 2019-2020 Fiscal Year (July 1st, 2019, to June 30th, 2020). All participants with a street outreach enrollment during that period are included. For participants with multiple enrollments during the sample period, we index our analyses to their first enrollment.

Defining the Interim or Permanent Housing Program Outcome and Outcome Period

We examine interim and permanent housing enrollments subsequent to participants' first street outreach enrollment in the sample period. From the date of each participant's first street outreach enrollment, we establish a 365 day outcome period (i.e., approximately 12 months) in which an interim or permanent housing program enrollment may occur. We use subsequent enrollments in HMIS to define the outcome because program exit data (e.g., Destination at Exit) is not collected for all street outreach participants. Interim or permanent housing program outcome categories are defined using HMIS project types as follows:

- **interim housing** is composed of emergency shelter, day shelter, safe haven, and transitional housing.

- **rapid re-housing** is composed of the single rapid re-housing HMIS project type.

- **permanent supportive housing** is composed of permanent supportive housing (disability required for entry), housing with services (no disability required for entry), or housing only.

If a participant has enrollments in multiple interim or permanent housing program categories, we define their outcome using a supersession rule where permanent supportive housing supersedes rapid re-housing and rapid re-housing supersedes interim housing. Therefore, our outcome variable is a mutually exclusive categorical variable composed of the above three interim or permanent housing categories and an additional category representing no interim or permanent housing enrollment during the outcome period.

Simulation

Appendix Table 2 compares demographics of our sample of street outreach participants and the 2020 PIT Count estimates. For the brief, we conduct a simulation analysis that uses the standard errors from the PIT Count to produce 95% confidence intervals for available demographics of the unsheltered population. Our simulation randomly draws 1,000 independent samples for each demographic characteristic. Each simulated draw is based on a normal distribution centered at the PIT count estimate with variance based on the associated standard error. We generate sample summary characteristics—such as the proportion of the sample that is Male—for each draw and create two-tailed 95% confidence intervals using the resulting 2.5 and 97.5 percentiles of each summary characteristic across all simulated samples. Finally, we compare the resulting 95% confidence interval for each PIT Count demographic to the same for the street outreach sample.

Appendix Table 2 also displays statistically significant differences from our simulation analysis. It is important to note that the time frame of street outreach program enrollments used in the brief (July 1, 2019 through June 30, 2020) and the PIT Count and Survey are different, which limits their comparability. Specifically, because the PIT Count and Survey are conducted between December and March, any seasonal changes in the composition of the unsheltered population may not be fully reflected in the street outreach participants enrolled throughout the fiscal year. One could repeat the simulation analysis and limit the street outreach program sample to those who entered street outreach in months when the PIT Survey is in the field, as well as those who continued to be served by street outreach in those months, but challenges with that approach also exist due to high rates of missing exit data in street outreach programs. We prefer the broader approach with the understanding that any statistically significant differences between proportions of demographics may suggest seasonal compositional differences, which is an interesting result in itself.

Entropy Balancing

Our analysis of interim or permanent housing outcomes shows differences in enrollments by race and ethnicity. To explore how these differences may relate to other demographic or individual-level characteristics, we use entropy balancing to re-weight our focal groups (Black participants, Hispanic and/or Latino participants). Entropy balancing requires that all covariates used in the balancing procedure are complete (i.e., they have no missing values). Appendix Table 3 provides interim or permanent enrollment outcomes for the subgroups of White, Black, and Hispanic and/or Latino participants that have complete data across covariates used in entropy balancing.

TABLE A1: Rates of Missingness for HMIS Street Outreach Data

	COUNT	PERCENT
Gender	1,748	3.9%
Race	3,561	7.9%
Age	6,318	14%
Any Mental Health Concern	2,149	4.8%
Substance Use	3,242	7.2%
Complete Observations	34,481	77%
Missing Any	10,540	23%
Total Sample	**45,021**	

Notes: This table provides the count and percent of participants missing key demographic data analyzed in the study. Missingness means that the data is either truly missing or not observed as a result of non-response or collection error.

TABLE A2: Demographic Comparison of Street Outreach Participants and Unsheltered Individuals in 2019 PIT Count

	PERCENTAGE			COUNT		
	STREET OUTREACH	UNSHELTERED PIT	DIFFERENCE	STREET OUTREACH	UNSHELTERED PIT	DIFFERENCE
Gender						
Male	65%	73%	-7.6*	28,324	33,684	-5,360
Female	34%	27%	7.0*	14,517	12,216	2,301
Other	0.2%	0.4%	-0.2	85	190	-105
Race/Ethnicity						
Black	33%	28%	4.1*	13,482	13,085	397
Hispanic and/or Latino	33%	36%	-3.1*	13,779	16,726	-2,947
White	31%	30%	0.4	13,919	-1,242	-1,242
American Indian or Alaska Native	0.7%	1.4%	-0.7*	270	628	-358
Asian American	1.3%	1.3%	0	532	607	-75
Native Hawaiian or Pacific Islander	0.5%	0.3%	0.2	198	132	66
Multiracial or Other	1.3%	2.2%	-0.9*	522	993	-471
Age						
Under 18	1.0%	3.5%	-2.5*	397	1,628	-1,231
18-24	7.5%	5.2%	2.2*	2,892	2,409	483
25-54	65%	65%	0.0	25,197	30,003	-4,806
55-61	15%	15%	-0.5	5,780	7,111	-1,331
62+	11%	11%	0.7	4,437	4,939	-502
Total				**45,021**	**46,090**	

Notes: The total column for street outreach (column 4) includes some participants with missing data. For rates of missingness by demographic characteristic, please refer to Appendix Table 1. "*" denotes statistically significant differences according to our simulation analysis.

TABLE A3: Interim and Permanent Housing Enrollments by Racial and Ethnic Groups, with Re-weighting

	NO ENROLLMENT	INTERIM HOUSING	RAPID RE-HOUSING	PERMANENT SUPPORTIVE HOUSING	SAMPLE TOTAL
White Participants					
All White Participants	81%	16%	1.8%	1.3%	12,677
All White Participants with Complete Data	78%	18%	2.2%	1.6%	10,193
Black Participants					
All Black Participants	73%	21%	3.6%	2.1%	13,482
Black Participants with Complete Data	70%	23%	4.0%	2.3%	11,630
White Participants Re-weighted to Black Participants	76%	20%	2.4%	1.7%	10,193
Hispanic and/or Latino Participants					
All Hispanic and/or Latino Participants	81%	16%	2.1%	1.3%	13,779
Hispanic and/or Latino Participants with Complete Data	78%	18%	2.3%	1.4%	11,383
White Participants Re-weighted to Hispanic and/or Latino Participants	80%	17%	1.9%	1.4%	10,193

Notes: This table shows the results of re-weighting the sample of White participants to Black and Hispanic and/or Latino participants on gender, age, HMIS history, and self-reported mental health concerns and substance use disorder. Since individuals missing data on any of the variables used for re-weighting are excluded from the analysis, this table also shows the difference between all White, Black, and Hispanic and/or Latino participants and those without any missing demographic data (labeled "complete data" in the table).