

HEALTH CARE NEEDS AND UTILIZATION AMONG NEW YORKERS WITH CRIMINAL JUSTICE SYSTEM INVOLVEMENT



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Health Care Needs and Utilization Among New Yorkers With Criminal Justice System Involvement

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Introduction

People with a history of incarceration have high rates of physical and behavioral health conditions² as well as increased hospitalizations and emergency department visits.³ Recognizing the potential impact of this burden, New York City (NYC) is committed to connecting people with comprehensive, integrated, and trauma-informed community-based health and social services to improve health, well-being and criminal justice outcomes.

This report focuses on individuals with a history of incarceration in New York City jails (“jail contact”), while also noting that involvement with the criminal justice system can take many forms. These forms can include contact with police, arrest, court involvement, incarceration in jail or prison, probation or parole (community supervision), diversion to mental health or substance use treatment, or the indirect effects of justice involvement on family or friends.

In 2017, when NYC announced its commitment to close Rikers Island jail complex by 2027, the average NYC jail population was 9,400 people per day. Since then, NYC has reduced its average daily jail population to just under 5,000 people per day,⁴ bringing NYC closer to its goal of creating a smaller, safer and fairer justice system.⁵ Even as the jail population decreases, the proportion of people with serious mental illness (SMI) and other health conditions has increased.⁶ As NYC organizations continue to reduce the jail population, they will need to build strong and effective partnerships with community-based health and social services to help develop alternative strategies to break the link between justice involvement and poor health, increase access to effective jail diversion programs and effectively support people as they return to the community.

To further support these efforts, the NYC Department of Health and Mental Hygiene, the Mayor’s Office of Criminal Justice, and the New York University (NYU) Wagner Graduate School of Public Service partnered to describe the health, health care utilization patterns and health care costs of people involved in the NYC criminal justice system, with particular attention to those with frequent admissions to NYC jails. This research extends the existing literature about the health profile of individuals with a history of justice involvement by examining patterns of community-based health care utilization and costs.

This report’s analysis uses five years (2012-2016) of New York State (NYS) Medicaid and NYC Department of Correction (DOC) data. Using information in both datasets, this report considered the following groups (see Figure 1).

² Karberg and James, 2002; Steadman et al., 2009; MacDonald et al., 2015; Maruschak et al., 2016.

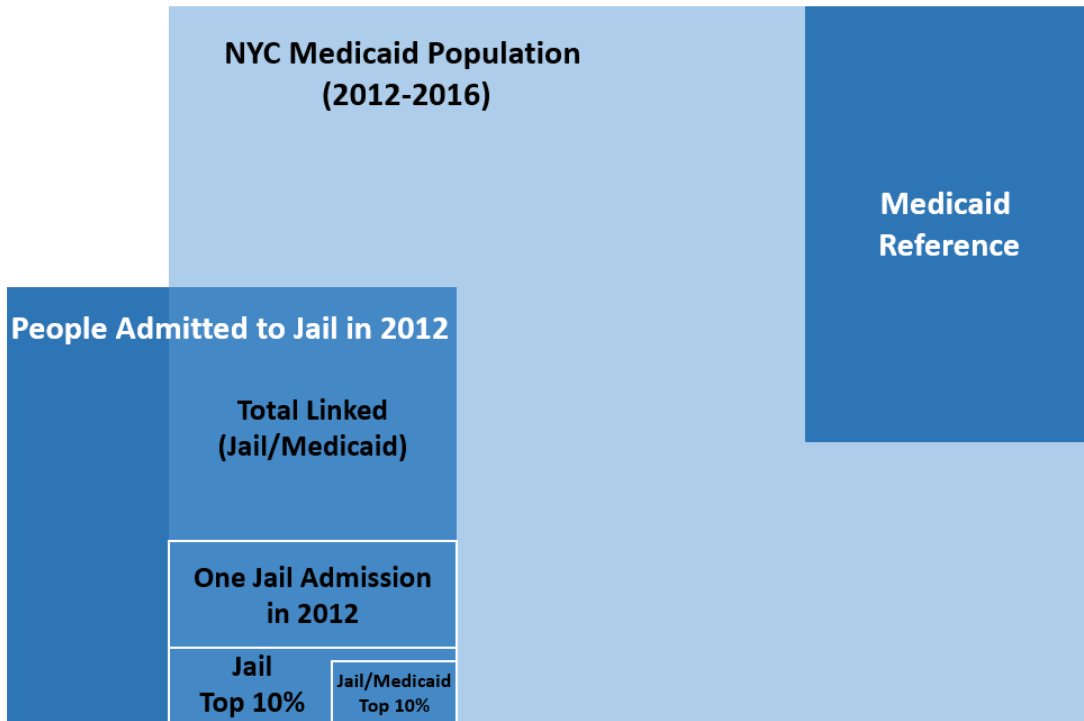
³ Frank et al., 2014; Wang et al., 2013.

⁴ Average of 4,973 people in jail during the week ending March 29, 2020.

⁵ The average daily jail population declined 19% from 2012 to 2016, the time period examined in this report.

⁶ From fiscal year 2017 to fiscal year 2018, the average daily population decreased from 9,500 to 8,896 (-6.4%) and the daily population with SMI increased from 979 to 1,272 (+29.9%).

Figure 1: Definition of Groups Considered



Note: Figure not proportional to actual sample sizes.

- **People Admitted to Jail in 2012 (Jail Total):** Individuals with at least one jail admission⁷ in 2012.
 - **Total Linked (Jail/Medicaid):** Individuals with at least one jail admission in 2012 and at least one month of Medicaid enrollment over the five-year study period.
 - **One Jail Admission in 2012 (One Jail Admission):** Individuals in the Jail/Medicaid group with only one jail admission in 2012 and no other jail admissions over the five-year study period.
 - **Top 10% Jail (Jail Top 10%):** Individuals in the Jail/Medicaid group who met the criteria for the top 10th percentile in terms of admissions to the NYC DOC (see Table 1).
 - ❖ **Top 10% Cross (Jail/Medicaid Top 10%):** Individuals in the Jail/Medicaid group that met the criteria for both the top 10th percentile for admissions to DOC and the top 10th percentile for admissions to the hospital or emergency department (see Table 1).
- **Medicaid Reference (Ref.):** NYC residents in the Medicaid database only, matched to individuals in the jail population by age (birth year), sex, race/ethnicity, Medicare status and number of months of Medicaid enrollment during the study period.

⁷ In this report, admissions to all NYC jails are included.

Table 1: What are the cutoff points for high utilization (Top 10%)?

Total Number Over Five Years	
NYC jail admissions ^a	6
Emergency department admissions ^b	9
Hospital admissions ^b	5

^a Based on the distribution of the number of jail admissions for the entire NYC DOC population in 2012.

^b Based on the distribution of NYS hospital admissions or emergency department visits for the total linked (Jail/Medicaid) population in 2012.

Beneficiaries who qualify for both Medicare and Medicaid (dually eligible) were included in all analyses examining patterns of jail contact; individuals who were dually eligible were excluded from analyses of health conditions and health care utilization patterns, as they tend to be older and generally in poorer health. Examples of those who are dually eligible include individuals with low income who are ages 65 and older, and younger persons with low income who have end-stage renal disease or disability.

Table 2: What are the demographic characteristics of the populations explored?^a

NYC Jail/NYS Medicaid Cross-System Utilizers (Linked Population)					
	People Admitted to Jail in 2012 (Jail Total)	Total Linked (Jail/Medicaid)	One Jail Admission in 2012	Top 10% Jail (Jail Top 10%)	Top 10% Cross (Jail/Medicaid Top 10%) ^b
Population (N)	60,925	46,428	16,490	6,572	2,561
Percent Male	89%	89%	85%	90%	87%
Average Age at Index (years)	34	35	35	35	38
Percent Black	54%	57%	53%	60%	55%
Percent Latino/a	33%	31%	33%	28%	29%
Percent White	9%	9%	10%	8%	13%

^a All demographic information comes from the NYC DOC data.

^b Data analyses for the Top 10% Cross (Jail/Medicaid Top 10%) population appear at the end of the report (Page 15).

Fifty-five percent of the total linked (Jail/Medicaid) population also met the criteria for the top 10th percentile for high Medicaid utilization, defined as being in the top 10th percentile for Medicaid utilization in the matched Medicaid reference population (0.2 hospital admissions per year or 0.8 emergency department visits per year).

For additional information about methods, please consult the **Technical Appendix** at the end of this report.

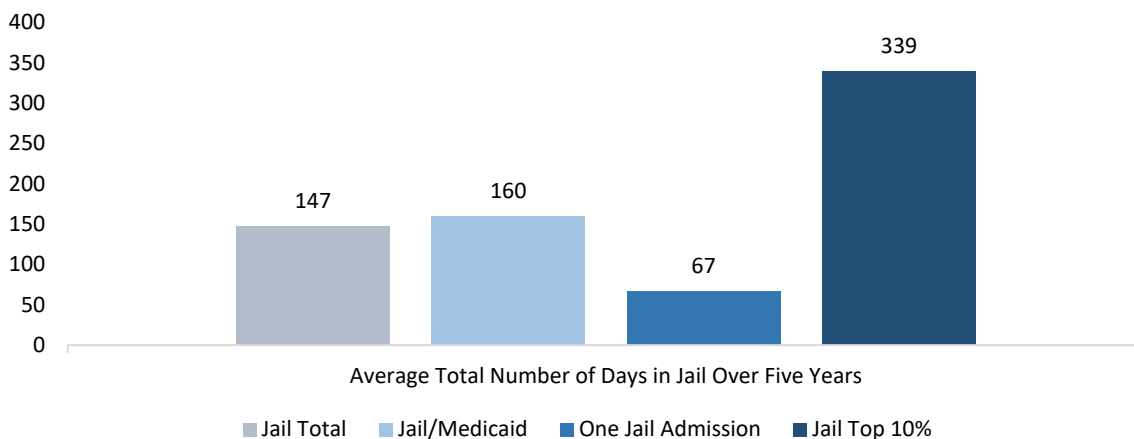
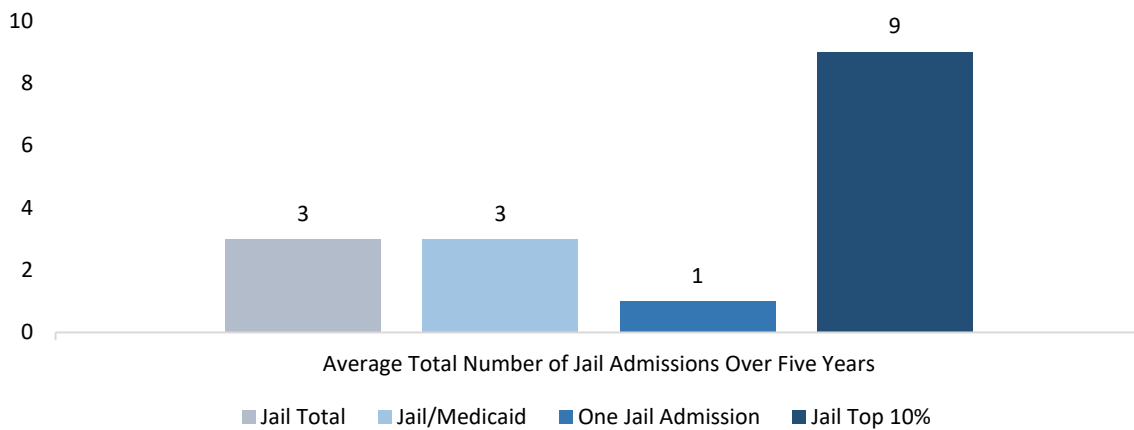
Patterns of Jail Contact

Table 3 and Figures 2 and 3 illustrate patterns of jail contact for four populations: (1) Jail Total; (2) Jail/Medicaid; (3) One Jail Admission; and (4) Jail Top 10%. People in the top 10% of jail admissions are more likely to be incarcerated for relatively short stays and on lower-level charges, but because they are incarcerated so frequently over time, they end up spending months and years of their lives behind bars — on average spending 339 days in jail over five years.

Table 3: Jail Length of Stay (LOS) in Days

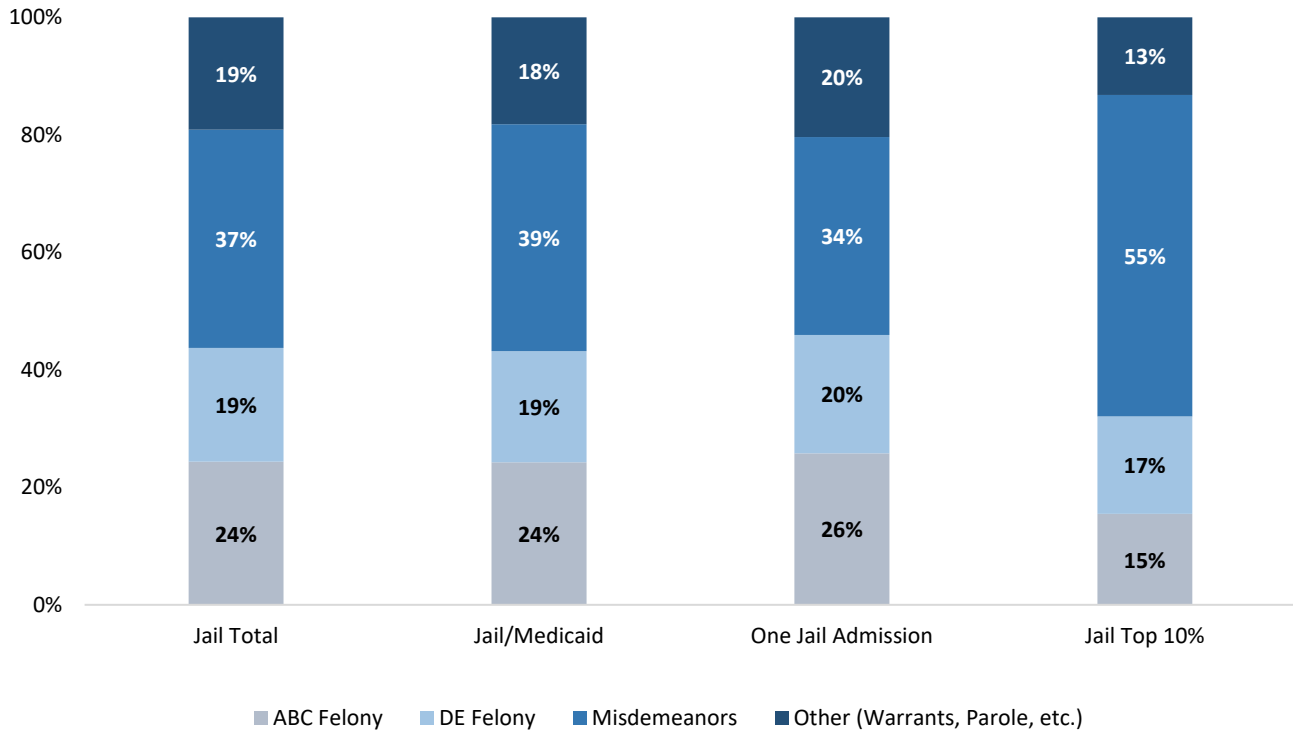
	People Admitted to Jail in 2012 (Jail Total)	Total Linked (Jail/Medicaid)	One Jail Admission in 2012	Top 10% Jail (Jail Top 10%)
Average LOS per admission	53	51	67	38
Median LOS per admission	12	12	7	12

Figure 2: Over five years, the 6,572 people in the top 10th percentile for jail admissions went to jail 62,712 times.



Note: “Total days in jail over five years” does not refer to consecutive days in jail. Similarly, time not in jail does not always mean time in the community because people could be in other systems such as shelters or prisons.

Figure 3: Individuals with more frequent jail contact are more likely to be incarcerated on low-level charges.



Health Conditions and Health Care Utilization Patterns

Health conditions and health care utilization patterns and costs were derived using NYS Medicaid data. Figures 4 through 15 and Table 4 describe physical health, behavioral health (including both mental health conditions and substance use disorders), co-occurring chronic physical and behavioral health conditions, and health care utilization patterns and costs for four populations: (1) Medicaid Reference (no jail; n=46,428); (2) Jail/Medicaid (n=46,428); (3) One Jail Admission (n=16,490); and (4) Jail Top 10% (n=6,572).

Using cardiovascular disease as an example, a single jail admission (One Jail Admission) is associated with a higher prevalence of cardiovascular disease as compared to a matched Medicaid reference population with no jail contact (16% versus 12%). Groups with greater total (average) jail admissions (Jail/Medicaid and Jail Top 10%) have a higher prevalence of cardiovascular disease as compared to the group with only one jail admission (19% and 25%, respectively versus 16%). This pattern emerges consistently across health conditions and measures of health care utilization.

Figure 4: Any amount of jail contact is associated with a higher prevalence of chronic health conditions (such as asthma, diabetes, hypertension, etc.).

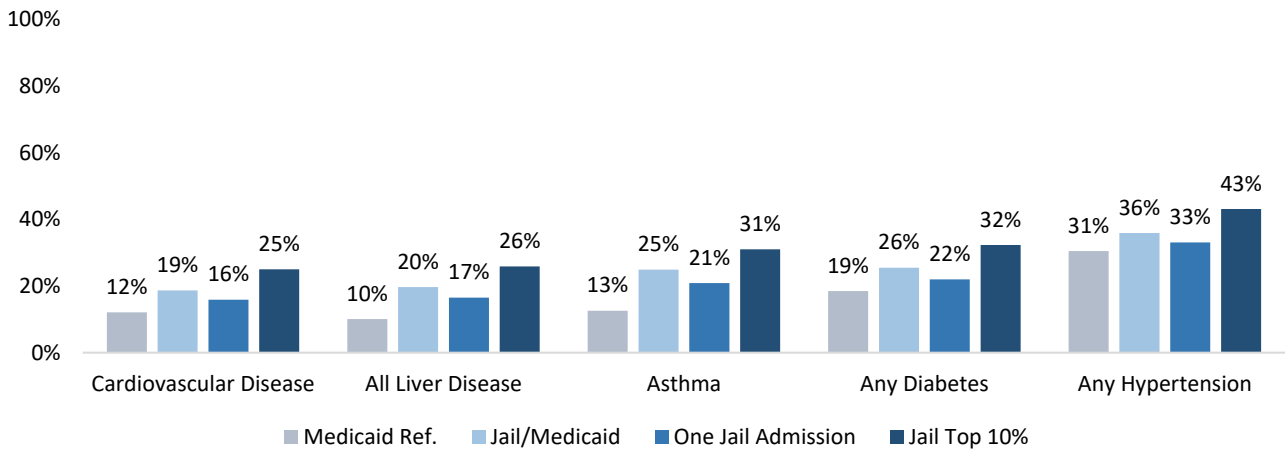
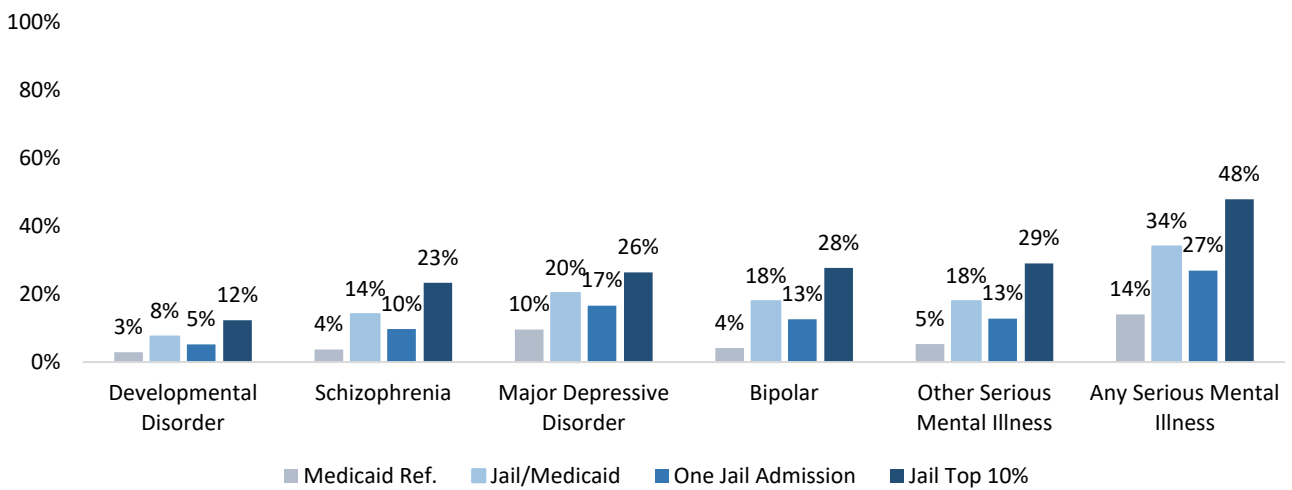
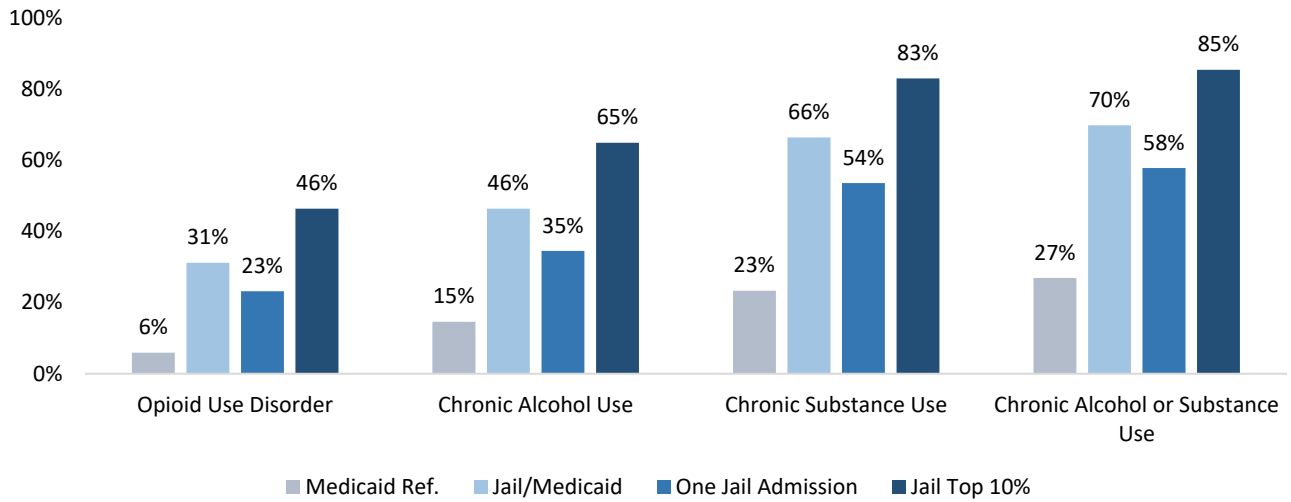


Figure 5: The prevalence of mental health conditions and developmental disabilities is higher among people with any jail contact.



Note: The “Developmental Disorder” category does not include disorders usually diagnosed in infancy, childhood or adolescence (e.g., autistic disorder, Asperger’s syndrome). The “Any Serious Mental Illness” category is an aggregate of the “Schizophrenia,” “Major Depressive Disorder,” “Bipolar,” and “Other Serious Mental Illness” categories; categories are not mutually exclusive.

Figure 6: People with any jail contact have much higher prevalence of alcohol and substance use conditions.



Note: The “Chronic Substance Use” category includes chronic opioid use disorders.

Figure 7: The prevalence of co-occurring chronic physical and behavioral health conditions is higher among people with jail contact.

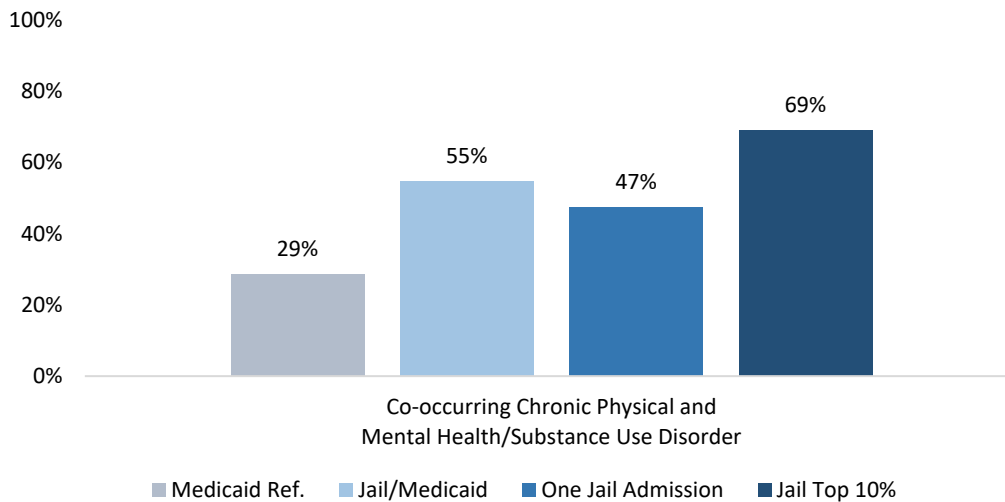
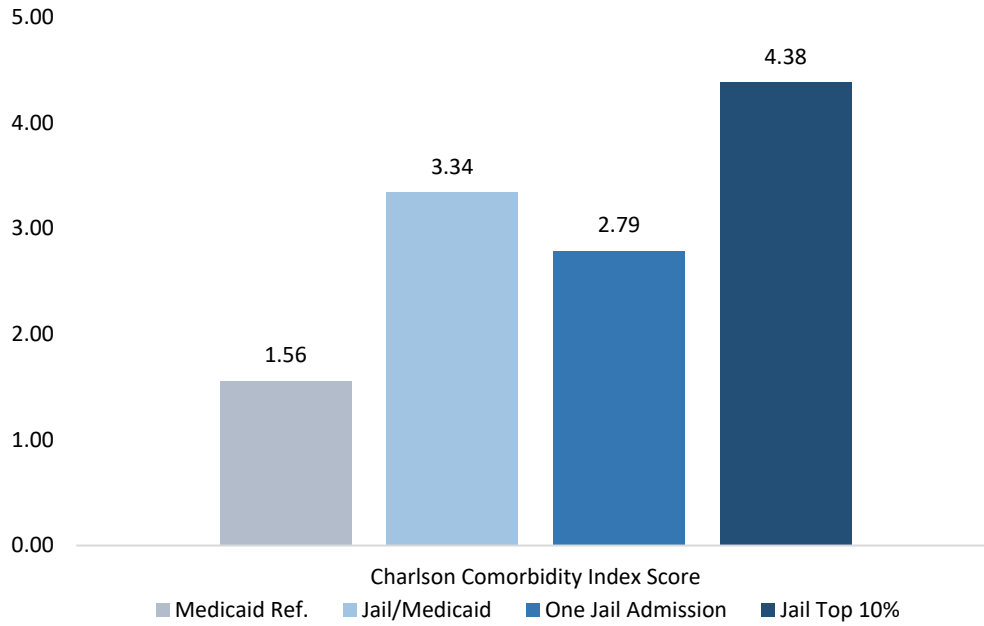


Figure 8: Jail contact is associated with increased risk of mortality or higher resource use.



Note: The Charlson Comorbidity Index (Charlson et al., 1987) uses 17 weighted chronic conditions to create a single index of how sick a patient is. A score of zero indicates no comorbidities. The higher the score, the more likely the predicted outcome will result in mortality or higher resource use (Manitoba Centre for Health Policy, 2019).

Figure 9: The presence of three or more co-occurring chronic physical conditions is greater among people with more frequent jail admissions.

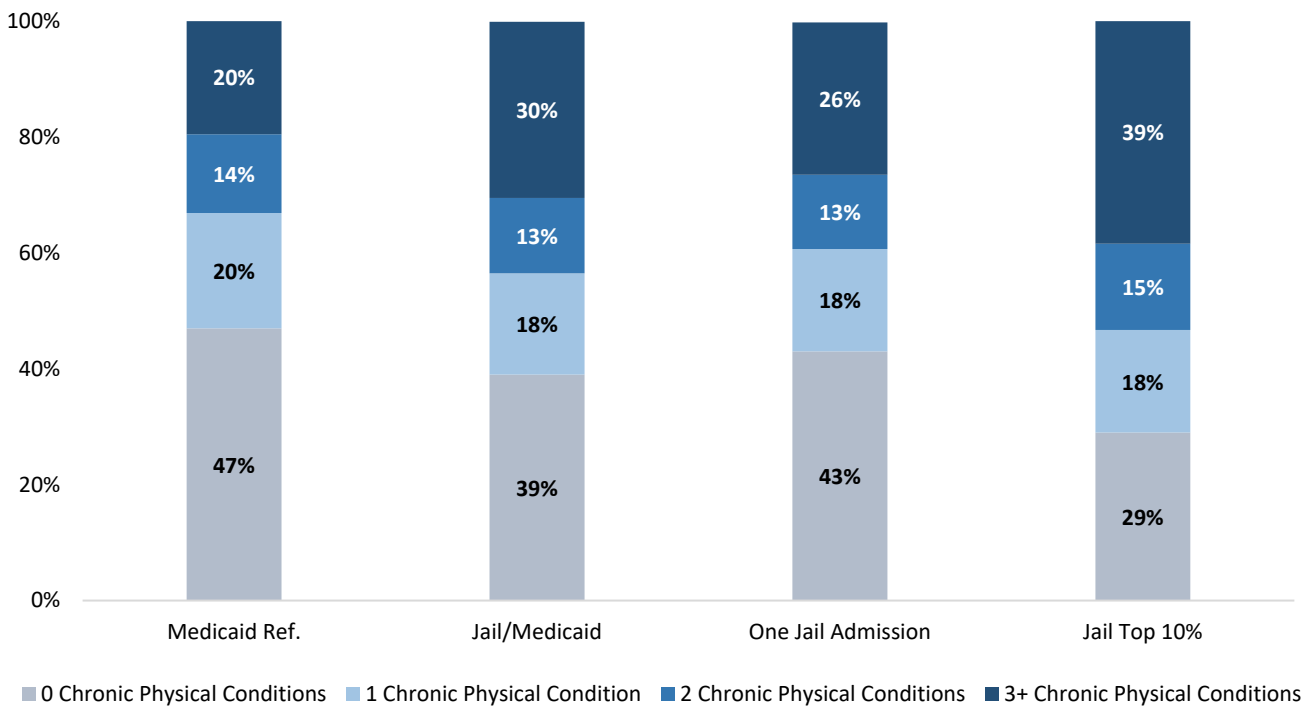


Figure 10: The mean (average) number of hospitalizations is higher among people with jail contact.

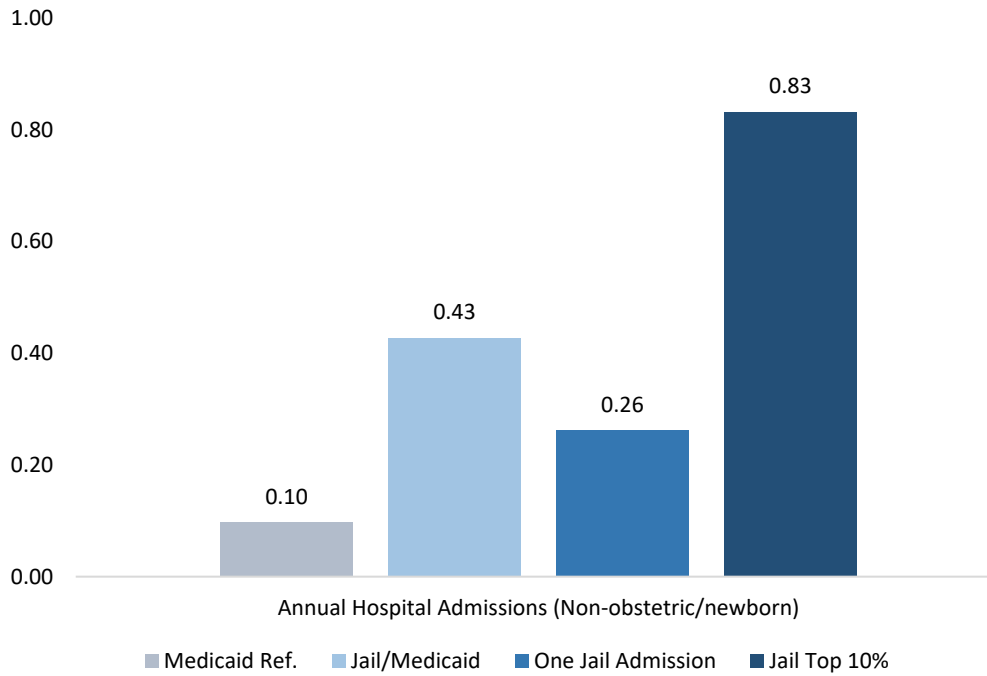


Table 4: Number of Annual Hospital Admissions

	Medicaid Reference	Total Linked (Jail/Medicaid)	One Jail Admission in 2012	Top 10% Jail (Jail Top 10%)	Top 10% Cross (Jail/Medicaid Top 10%)
Minimum	0	0	0	0	0
Median	0	0	0	0.2	1.2
Mean	0.1	0.43	0.26	0.83	1.96
Maximum ^a	1.6	5.8	4	8.8	13

^a The 99th percentile was used instead of the maximum given Health Insurance Portability and Accountability Act (HIPAA) regulations requiring data on less than 10 people to be reported in aggregate.

Figure 11: People with a history of jail contact are admitted to the hospital primarily for behavioral health-related conditions.

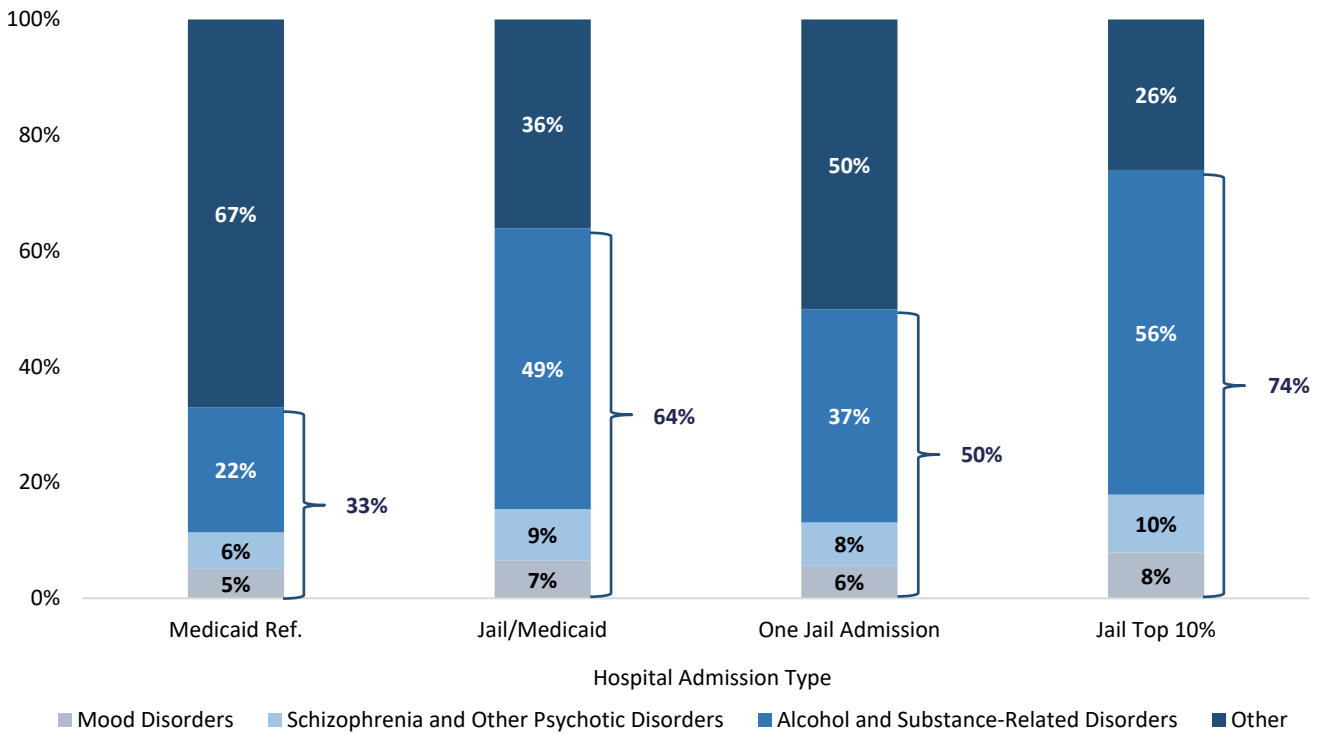


Figure 12: Emergency department utilization is higher among people with jail contact.

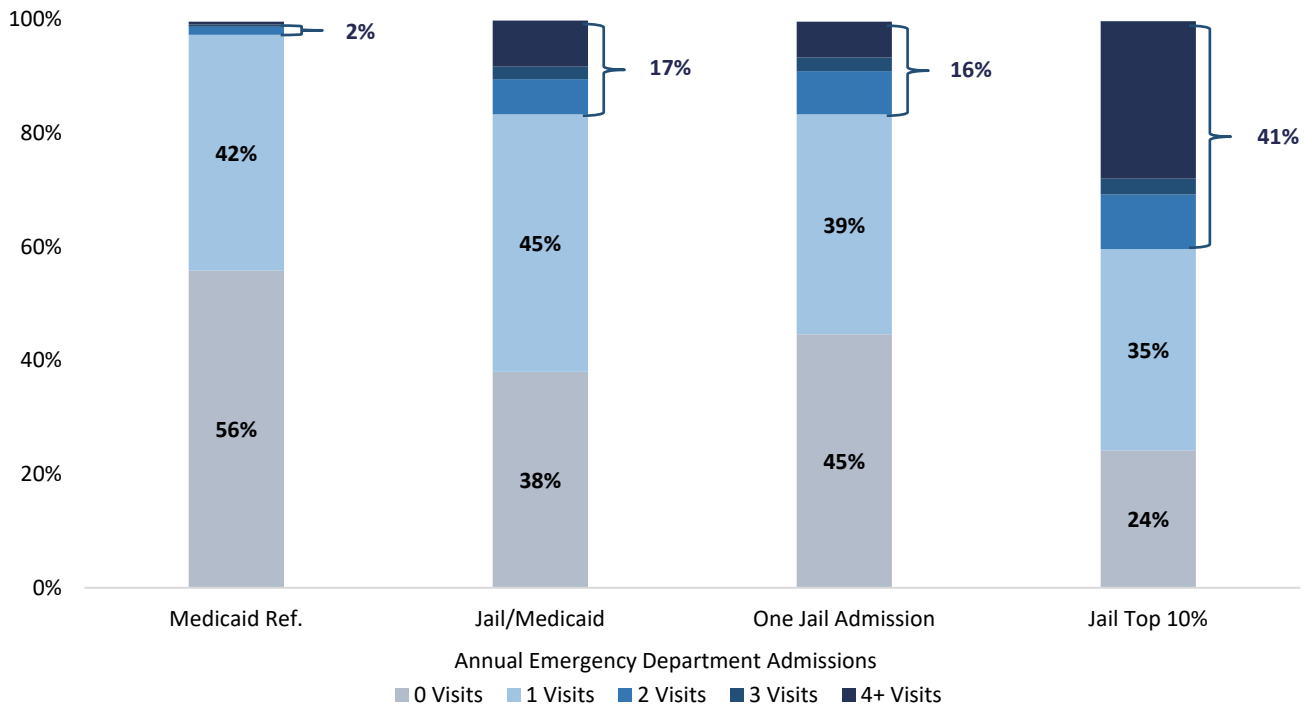
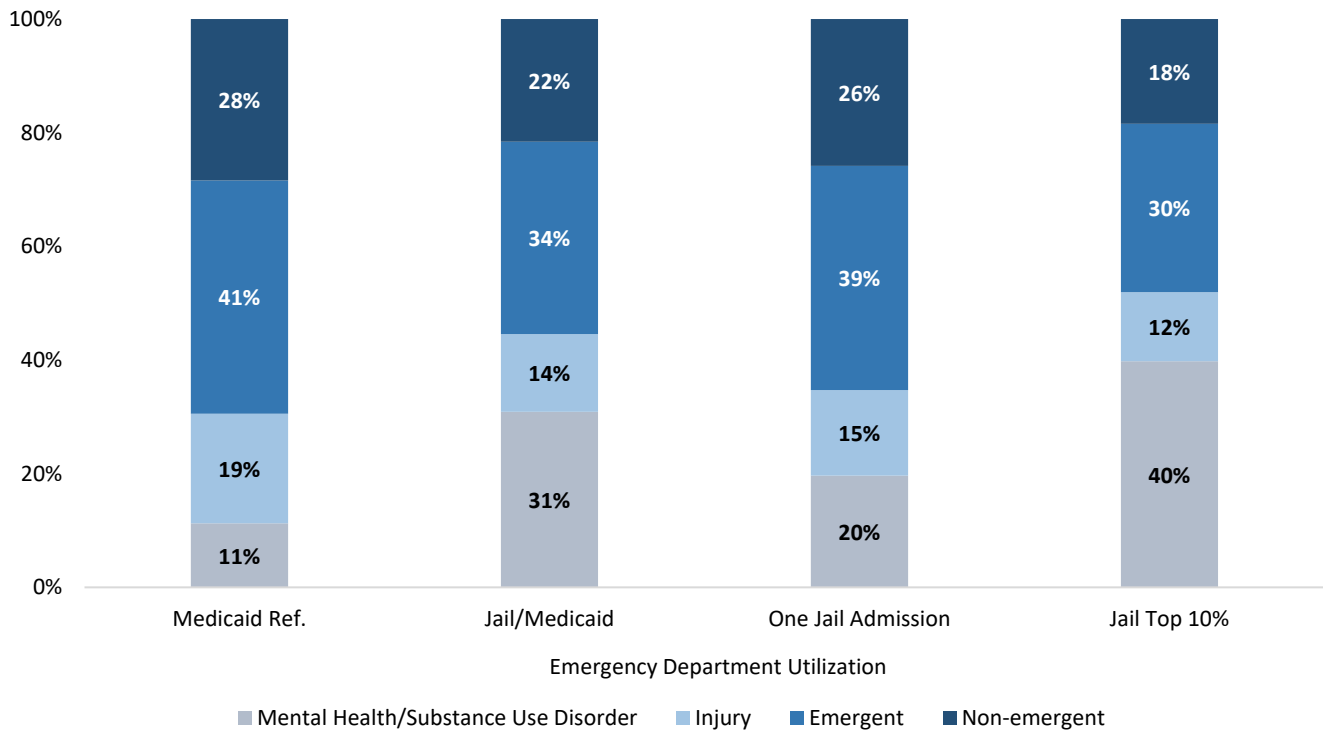


Figure 13: People with more than one jail admission are more likely to utilize the emergency department for substance use and mental health conditions.



Note: Emergency department utilization classifications are based on an algorithm developed by the NYU Center for Health and Public Service Research. Mental health, alcohol and substance use-related emergency department visits are collapsed into mental health/substance use disorder. For more information, visit wagner.nyu.edu/faculty/billings/nyued-background.

Figure 14: People with jail contact had Medicaid costs that were three to seven times greater, with inpatient costs largely driving these differences for people with the most frequent jail contact.

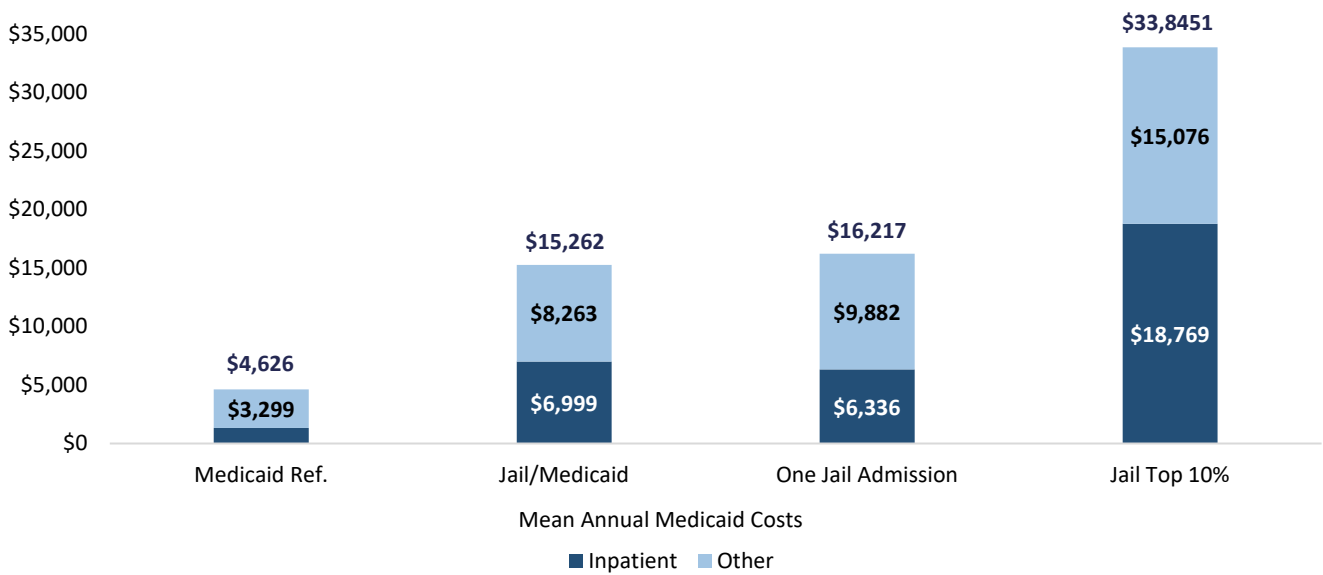
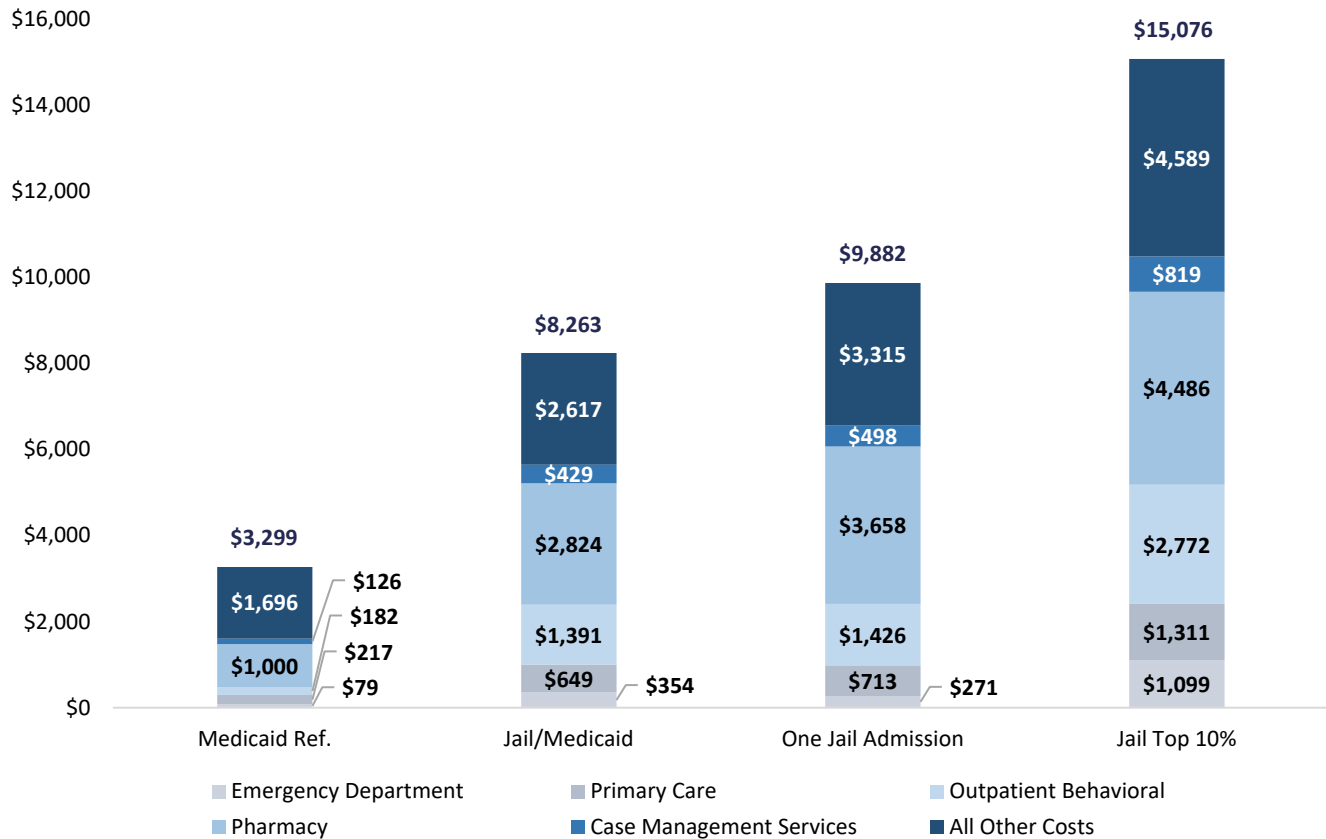


Figure 15: Within the "Other" costs in Figure 14, relatively little is spent on outpatient behavioral health, case management and primary care.



People With High Cross-System Utilization (Jail/Medicaid Top 10%)

Individuals in the Jail/Medicaid group who fall within the top 10th percentile for both jail admissions and Medicaid utilization have the highest prevalence of chronic disease (see Figure 16), mental illness and developmental disability (see Figure 17), alcohol and substance use conditions, and comorbidity as compared to the other populations included in this analysis.

By definition, this group has the highest jail contact and health care costs. However, the magnitude of that spending and the epidemiological profile of that group compared to the other groups is helpful context. The mean annual Medicaid costs for people with high rates of cross-system utilization is \$73,816, more than double the costs for the group of people with high jail utilization. Of these costs, \$44,508 (60%) is from inpatient costs, more than double the inpatient costs for the group of people with high jail utilization.

Figure 16: Prevalence of Chronic Disease Among Jail/Medicaid Top 10%

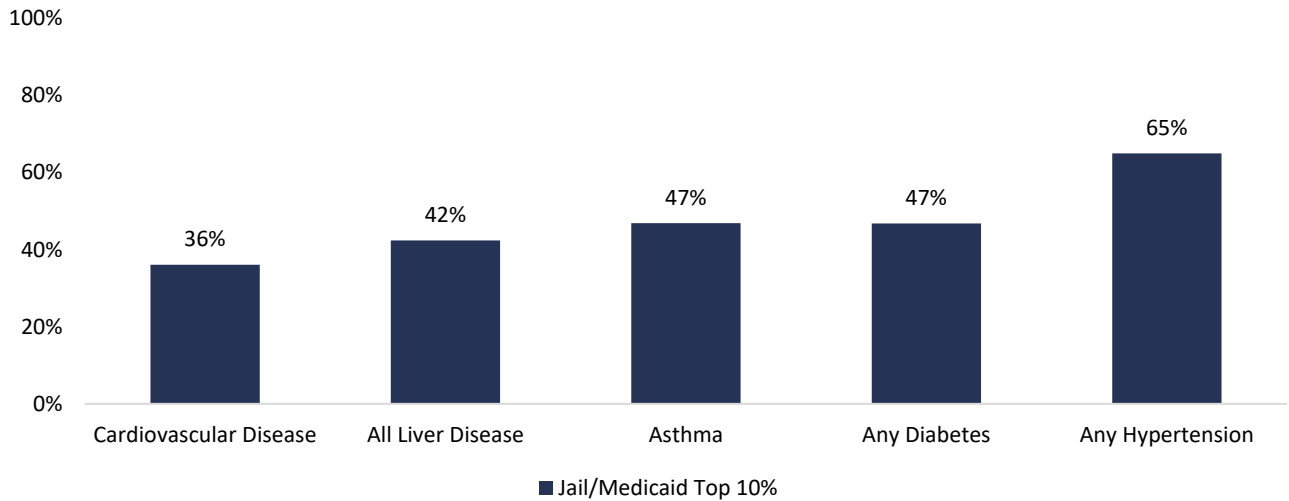
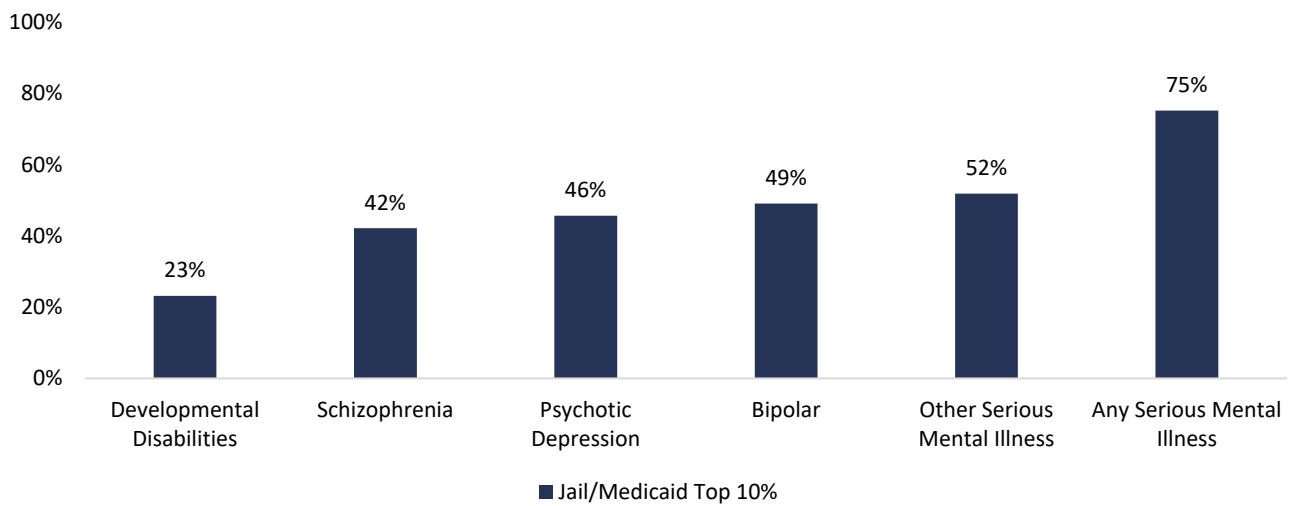


Figure 17: Prevalence of Mental Illness and Developmental Conditions Among Jail/Medicaid Top 10%



What This Analysis Contributes to the Field

This analysis represents the best, recent data to date about health conditions, health care utilization patterns, and costs to the health care system among New Yorkers with a history of incarceration living in the community.

- Individuals who have had any jail contact have a higher burden of disease, including chronic illness, multi-morbidity, mental health and substance use disorders, and greater health care utilization.
- People most frequently incarcerated face disproportionate burdens of mental and physical illness, as well as substance use disorders.

The prevalence of physical and mental health conditions was very high among people most frequently incarcerated in jail, yet only a small fraction of costs for this group were for outpatient primary care, behavioral health treatment, and case management that could help to address these needs and prevent hospitalization.

Policy Implications

Despite having Medicaid health care coverage at some point over the five-year study period, there are still barriers to preventative, primary care, and behavioral health care for New Yorkers with a history of incarceration living in the community.

These findings highlight the need for more effective health care engagement strategies for people with a history of incarceration. Specifically, preventative, primary care and behavioral health care services — particularly outpatient substance use services — that are tailored to the needs of this population could lead to more effective health care engagement, lowering of health care costs, and improved health and well-being for individuals who have had some contact with NYC jails.

The point of diversion from the criminal justice system and the period of reentry into the community after having been incarcerated represent key opportunities to engage people in voluntary community-based primary care, mental health care and social services to promote improved health and well-being in the longer term.

- People with a history of justice involvement (including those with frequent jail contact) represent a high-need and medically and socially complex population, who upon reentry may need robust resources to:
 - Treat mental health and substance use conditions
 - And secure housing and employment
- For diversion and reentry processes to be effective, health care engagement strategies should implement tailored, flexible approaches for addressing people's medical needs and social determinants of health, including trauma- and resilience-informed care, intensive case management services, the application of harm-reduction principles, strengthened clinical-social service linkages, and use of credible messengers such as community health workers and peer navigators.

Programmatic Initiatives

New Alternative to Incarcerations Programs

The Mayor's Office of Criminal Justice, in partnership with Brooklyn Justice Initiatives, Maimonides Medical Center, and the Center for Alternative Sentencing and Employment Services (CASES) is launching two novel pilot alternatives to incarceration programs for people with a frequent history of incarceration. Each of the programs will divert people away from jail and into community-based supports. The programs:

- Use the Critical Time Intervention model, an evidence-based, time-limited and focused case management approach that has been shown to improve housing stability, reduce hospitalizations and improve behavioral health outcomes.
- Pair a proportionate criminal justice mandate with longer-term service engagement in order to meaningfully support clients. Instead of a jail sentence, clients receive a short (three- to six-day) mandate and the option to receive longer-term post-mandate services on a voluntary basis (up to nine months).

NYC Health Justice Network

The NYC Health Justice Network is a new voluntary program from the NYC Department of Health and Mental Hygiene that connects people who are reentering the community following incarceration to higher quality primary care and reentry support services specifically tailored to their health and social needs. The goals of the program include:

- Building partnerships between community-based organizations that have experience working with people with justice involvement and primary care sites.
- Innovative participant engagement strategy that includes community health workers with lived experience in the justice system and application of trauma- and resilience-informed care principles in clinical and reentry support service settings, underpinned with a digital mobile community health record.

Technical Appendix

Data Sources

- New York State Medicaid fee-for-service claims and managed care encounter data (2006-2016) containing a range of personal identifiers, demographic information, eligibility information, and claims data, including type of service, service date, diagnoses, procedures and payments
- NYC DOC data (2007-2016) containing a range of personal identifiers, demographic information, admission and discharge dates, charge information, mental health (Brad H) designation and discharge status

Selecting Period for Analysis

The index sample was made up of individuals who were admitted to jail at least once in calendar year 2012. Medicaid claims looking forward from 2012 to 2016 were used in reporting health system outcomes and utilization.

Matching

We used a tiered-record linkage process for New York State Medicaid claims data and NYC DOC data that identified:

- Exact matches using individuals' first name, last name, date of birth and gender
- Fuzzy matches (cases in which small typographical or data entry errors led to highly likely but not perfect matches on name, gender and date of birth), resolved using COMPGED and SPEDIS procedures in SAS analytic software.

Rationale for Study Inclusion Criteria

- At least one jail admission in 2012 was required for Medicaid matching inclusion; individuals without a jail admission in 2012 were excluded from Medicaid matching and subsequent analysis
- Pre-2012 data were censored due to:
 - Shifts in the criminal justice system in NYC and the demographic profile of incarcerated people due to reform efforts that began during this time period
 - Need for recent data to inform forward-looking interventions

Defining High Jail and Medicaid Utilization

We examined the jail and health care system utilization distributions of two reference populations in 2012:

- Distribution of the number of jail admissions for the entire NYC DOC population in 2012
- Distribution of NYS hospital admissions or emergency department visits for the total linked (Jail/Medicaid) population in 2012

Distributions were then used to determine the number of jail admissions required to put an individual in the top 10% of all jail utilizers (at least six jail admissions over five years), in the top 10% of Medicaid health system utilizers (at least nine emergency department admissions or five hospital admissions over five years), and the top 10% of both systems.

Diagnostic Definitions

- Information about diagnostic definitions (based on individual ICD-9 and ICD-10 codes) can be found in the **Summary of Diagnostic Categories Used**
- Information about emergency department categories based on the NYU algorithm can be found here: wagner.nyu.edu/faculty/billings/nyued-background

Summary of Diagnostic Categories Used

Diagnostic categories are based on Agency for Healthcare Research and Quality (AHRQ) Clinical Classifications Software (CCS) categories. CCS is a tool for clustering patient diagnoses and procedures into a manageable number of clinically meaningful categories. CCS collapses diagnosis and procedure codes from the *International Classification of Diseases, 9th and 10th Revisions* (ICD-9 and ICD-10) ^{8,9}.

The Chronic Condition Indicator (CCI), a tool developed as part of the Healthcare Cost and Utilization Project (HCUP), categorizes all ICD-9 and ICD-10 diagnosis codes as chronic or not chronic^{10,11}. A chronic condition is defined as a condition that lasts 12 months or longer and meets one or both of the following tests: (a) it places limitations on self-care, independent living, and social interactions; (b) it results in the need for ongoing intervention with medical products, services, and special equipment. E Codes, or external cause of injury codes, are not classified, because all injuries are assumed to be acute.

In this report, conditions were labelled as chronic if the ICD-9 and ICD-10 codes underlying the CCS diagnostic categories were flagged as chronic with the CCI chronic flag (= 1) (see table below and crosswalks for more detailed information on specific ICD codes, CCS categories, descriptions, and CCI chronic flags).

Emergency department (ED) categories are based on NYU ED algorithms - [link](#)

Diagnostic categories in this report	CCS category label/description	CCS code	CCI Chronic Flag label, if applicable
Cardiovascular Disease	Acute myocardial infarction; Coronary atherosclerosis and other heart disease	100; 101	Dx_CAD
	Congestive heart failure, nonhypertensive	108	DX_CHF
	Cardiac dysrhythmias; Cardiac arrest and ventricular fibrillation	106; 107	DX_arrhythmias
	Peripheral and visceral atherosclerosis; Aortic, peripheral, and visceral artery aneurysms; Aortic and peripheral arterial embolism or thrombosis; Other circulatory disease	114; 115; 116; 117	DX_othervasc
	Heart valve disorders; Peri-, endo-, and myocarditis, cardiomyopathy (except that caused by tuberculosis or sexually transmitted disease); Pulmonary heart disease; Other and ill-defined heart disease; Conduction disorders	96; 97; 103; 104; 105	DX_othcardiovasc
All Liver Disease	Hepatitis; Other liver diseases	6; 151	DX_AllLiverDisease

⁸ Clinical Classifications Software (CCS) for ICD-9-CM Fact Sheet. Available at: <https://www.hcup-us.ahrq.gov/toolsoftware/ccs/ccsfactsheet.jsp>.

⁹ Clinical Classifications Software (CCS) for ICD-10-PCS (beta version). Available at: <https://www.hcup-us.ahrq.gov/toolsoftware/ccs10/ccs10.jsp>.

¹⁰ Chronic Condition Indicator (CCI) for ICD-9-CM. Available at: <https://www.hcup-us.ahrq.gov/toolsoftware/chronic/chronic.jsp>.

¹¹ Beta Chronic Condition Indicator (CCI) for ICD-10-CM. Available at: https://www.hcup-us.ahrq.gov/toolsoftware/chronic_icd10/chronic_icd10.jsp.

Asthma	Asthma	128	DX_Asthma
Any Diabetes	Diabetes mellitus without complications; Diabetes mellitus with complications	49; 50	DX_AnyDiabetes
Any Hypertension	Essential (primary) hypertension; Hypertension with complications and secondary hypertension	98; 99	DX_AnyHypertension
Diagnostic categories in this report	CCS category label/description	CCS code	CCI Chronic Flag label, if applicable
Developmental Disorder	Developmental disorders	654	
Schizophrenia	Schizophrenia and other psychotic disorders (schizophrenia- and schizoaffective-specific codes)	659	DX_Schiz
Major Depressive Disorder	Mood disorders (major depressive disorder-specific codes)	657	DX_DeprPsychosis
Bipolar	Mood disorders (bipolar-specific codes)	657	DX_BiPolar
Other Serious Mental Illness	Mood disorders (manic disorder-specific codes); Schizophrenia and other psychotic disorders (paranoia and psychosis-specific codes)	657; 659	DX_OtherSeriousMH
Any Serious Mental Illness	Mood disorders (major depressive disorder-, bipolar- and manic disorder- specific codes); Schizophrenia and other psychotic disorders (schizophrenia-, schizoaffective-, paranoia- and psychosis-specific codes)	657; 659	DX_AnySMI
Opioid Use Disorder	ICD-9 and ICD-10 codes were used to define this category		
Chronic Alcohol Use	Alcohol-related disorders	660	DX_ChronicAlc
Chronic Substance Use	Substance-related disorders (comprises various substances, including opioids)	661	DX_ChronicSubst

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