



## **Time trend analysis of drug injection reported at substance use disorder treatment admission in New York State, 2002-2022**

### **PURPOSE OF THIS BULLETIN**

This bulletin presents data from 2002 to 2022 on drug injection reported by individuals who were admitted to substance use disorder (SUD) treatment in New York State (NYS). Specifically, this bulletin examines annual changes in drug injection reported at SUD treatment admission by race and ethnicity, birth cohort, NYS region (New York City [NYC] compared to the Rest of State [ROS]), and type of drugs used.

### **KEY TAKEAWAYS**

- Across the 2002 to 2022 analysis period, drug injection reported at SUD treatment admission was highest in 2016; in 2016, drug injection was reported by 31,581 individuals, approximately one-third of individuals admitted to treatment in that year.
- In 2022, the number of individuals reporting drug injection decreased to 14,903 comprising approximately one-fourth of individuals admitted to treatment in that year.
- The proportion of individuals reporting drug injection at admission increased significantly in the ROS and not in NYC.
- Opioid use was common among individuals who injected drugs; in each year of the 2002 to 2022 analysis period, more than 90% of individuals who reported drug injection reported using opioids.
- State-level trends in drug injection reported at admission to SUD treatment in NYS generally reflect national and state-level trends in population-level drug use epidemiology. This suggests that the NYS SUD treatment system is accessible and is utilized by the population of people who use drugs.

### **DRUG INJECTION TRENDS ACROSS THE FOUR WAVES OF THE OVERDOSE EPIDEMIC**

Public health research has identified four waves of the overdose epidemic: the first wave (beginning in 1999) defined by a rise of prescription opioid-related overdose deaths; the second wave (beginning in 2010) defined by a rise in heroin-related overdose deaths; the third wave (beginning in 2013) defined by a rise in synthetic opioid-related overdose deaths such as fentanyl and fentanyl analogues; and the fourth wave (beginning in 2019) defined by a rise in synthetic opioid-related overdose deaths involving synthetic opioids as well as cocaine and synthetic stimulants, such as methamphetamine (Table 1).<sup>1</sup>

Prior data indicate an interplay between the waves of the overdose epidemic and trends in substance use at the population-level. For example, data demonstrate an association between the 2010 OxyContin<sup>®</sup> reformulation and the shift from prescription opioids to heroin.<sup>2-4</sup> Marking the beginning of the second wave of the overdose epidemic in 2010, this population-level shift to heroin was also associated with a rise in the prevalence of drug injection and in injection-related hepatitis C virus infection transmission.<sup>5,6</sup>

**Table 1: Four Waves of the Overdose Epidemic**

Wave	Initial Year	Characterized by increases in ...
First Wave	1999	• Prescription opioid-related overdose death (i.e., natural and semi-synthetics)
Second Wave	2010	• Heroin-related overdose death; • Drug injection prevalence
Third Wave	2013	• Synthetic opioid-related overdose death (i.e., fentanyl and fentanyl analogues)
Fourth Wave	2019	• Synthetic opioid-related overdose deaths also including stimulant-and-polysubstance-use-involved overdose death; • Drug injection-related harm

We have categorized waves defining them by a single starting year as per the Centers for Disease Control and Surveillance classification.<sup>1</sup> Discrete time periods (with non-overlapping start and end dates) are not recommended given that residual impacts from prior waves occur into the time frames of subsequent waves.

### DATA ELEMENTS AND DEFINITIONS

**OASAS SUD treatment admission** data from all SUD treatment admissions in NYS from 2002 to 2022 were included in these analyses. Individuals could report up to three substances used at SUD treatment admission, including routes of use for each substance.

**The unit of analysis was unique individuals** reporting any drug injection for primary, secondary, or tertiary substances reported at admission. If individuals reported more than one drug injected, they were only counted once. For individuals who had more than one SUD treatment admission in a calendar year, we used the last admission per individual per year to ensure unduplicated data. Regional comparisons used the zip code of individuals' residence at admission.

**Prevalence** refers to the prevalence of substance use or drug injection among the in-SUD-treatment population (not the general population).

**Statistical significance tests** were conducted to compare the year-to-year changes or between-group differences (such as differences by birth cohort) using Chi-square tests; significance level was set at  $\alpha=0.05$ .

**Drug categories included in analyses** were opioids, cocaine, and psychostimulants ('other stimulants') because they were the most common substances reported by drug injection.

**Opioids:** naturally occurring, semi-synthetic, or synthetic substances that act on opioid receptors in the brain. Food and Drug Administration (FDA)-approved indication for opioids is for pain. The main substances within this category included in these analyses are prescription opioids, heroin, and illegally manufactured fentanyl and its analogues.

**Cocaine:** an organic stimulant derived from the leaves of the coca plant that stimulates the central nervous system. FDA-approved indications of cocaine are primarily as a local anesthetic. The main substances within this category included in these analyses are cocaine hydrochloride ('cocaine') and its derivatives ('crack cocaine').

**Other stimulants:** synthetically produced substances that stimulate the central nervous system. FDA-approved indications for other stimulants include the treatment of narcolepsy and attention deficit hyperactivity disorder. The main substances included in these analyses are methamphetamine, amphetamine, methylenedioxymethamphetamine (MDMA), and misuse of prescription medications including dextroamphetamine and methylphenidate.

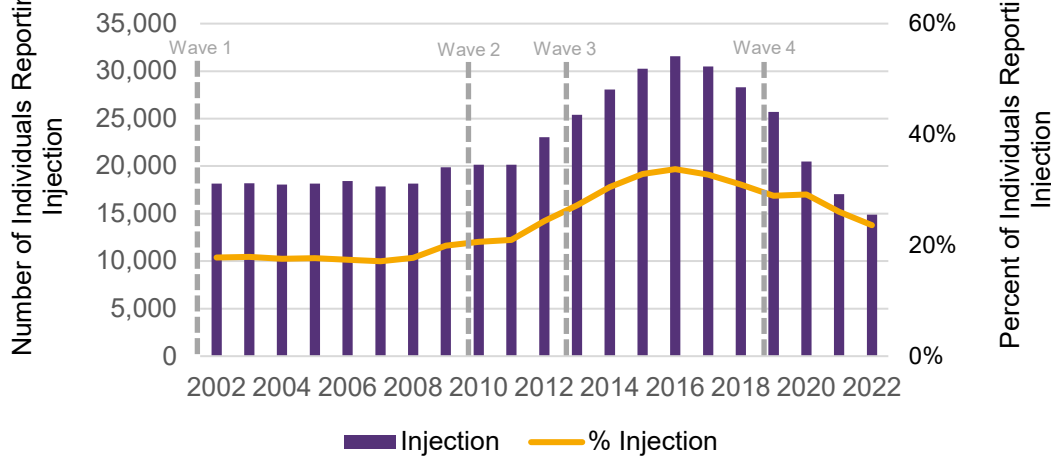
**'Drug' and 'substances'** are used in a context-specific manner. *Substance* is a broad term that includes alcohol and all other drugs. Hence, when we use the term *substance* use disorder and treatment, it includes use disorders related to alcohol and other drugs. *Drugs* is a term that refers to a range of drugs but does not include alcohol. As described above, these analyses focus on injection of opioids, cocaine, and other stimulants.

**Misuse** refers to the misuse of prescription medications.



## Drug Injection Patterns in NYS

Figure 1. Individuals Reporting Drug Injection at SUD Treatment Admission, 2002-2022



In NYS, changes in substance use patterns across the waves of the overdose epidemic were observed among individuals entering SUD treatment. In 2002, 18,156 individuals reported drug injection at SUD treatment admission, representing 17.8% of individuals who were admitted to treatment in that year (Figure 1).

As fentanyl began saturating the unregulated drug supply in the mid-2010s,<sup>7</sup> reported drug injection peaked in

2016, then significantly decreased. In 2016, 31,581 individuals reported drug injection, representing 33.7% of individuals who were admitted to treatment in that year. By 2022, the number of individuals reporting drug injection decreased to 14,903 individuals, 23.6% of individuals admitted to treatment.

### Drug Injection Patterns by Race and Ethnicity

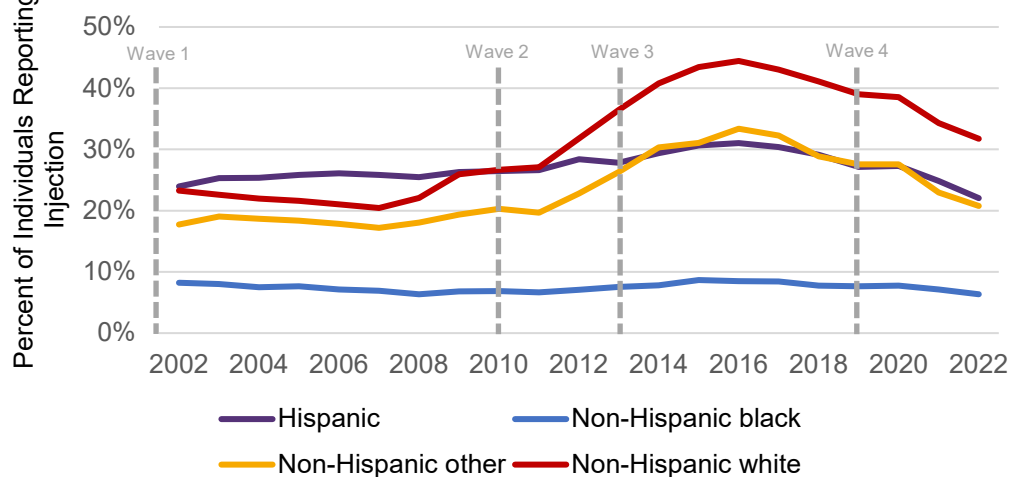
Examining drug injection by race and ethnicity demonstrates the differential impact of the opioid crisis on subgroups of the population across the waves of the overdose epidemic.<sup>8,9</sup> In 2002, among non-Hispanic white individuals, 23.3% reported drug injection; among non-Hispanic black individuals, 8.2% reported drug injection, among Hispanic individuals, 24% reported drug injection; and among non-Hispanic other individuals, 17.7% reported drug injection (Figure 2).

In 2016, reported drug injection among non-Hispanic white individuals significantly increased to 44.5%; reported drug injection among non-Hispanic black individuals remained stable at 8.5%; reported drug injection among Hispanic individuals significantly increased to 31%; and reported drug injection among non-Hispanic individuals of other races significantly increased to 33.4%.

After 2016, across all races and ethnicities, the

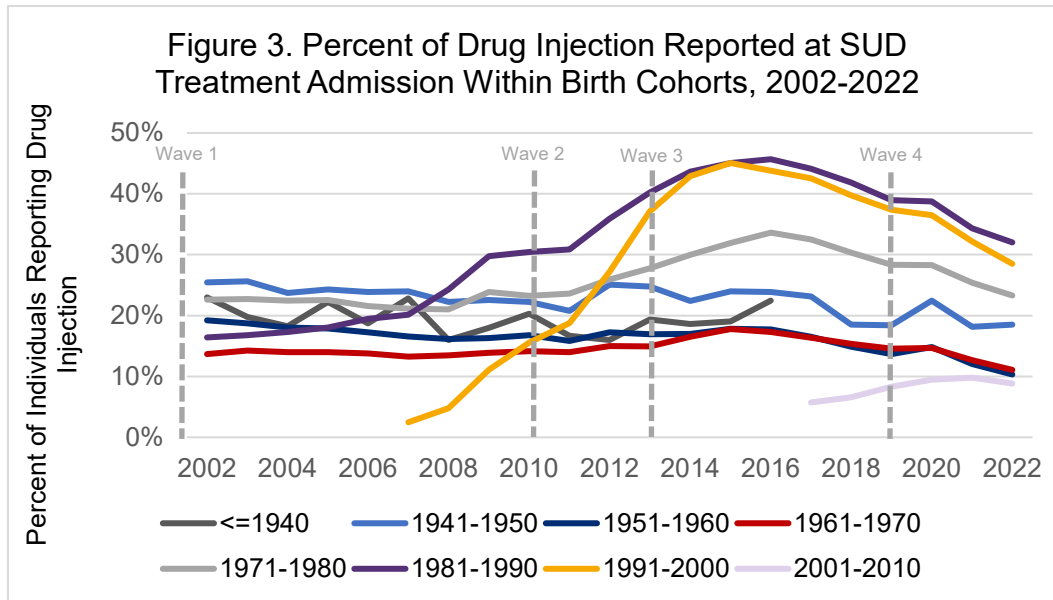
proportion of reported drug injection significantly decreased. By 2022, among non-Hispanic white individuals, reported drug injection decreased to 31.8%; among non-Hispanic black individuals, reported drug injection decreased to 6.3%; among Hispanic individuals, drug injection decreased to 22%; and among non-Hispanic individuals of other races, drug injection had decreased to 20.8%. These findings are consistent with national data suggesting drug injection among non-Hispanic white individuals was more prevalent than other races and ethnicities in the late 2010s.<sup>10,11</sup>

Figure 2. Percent of Drug Injection at SUD Treatment Admission Within Race and Ethnicity, 2002-2022



## Drug Injection Patterns by Birth Cohort

Examining annual changes in drug injection reported at SUD treatment admission by birth cohort suggests important demographic shifts occurred throughout the overdose epidemic. In 2002, the proportion of individuals in each birth cohort reporting drug injection was relatively similar, ranging between 15-25% (Figure 3).

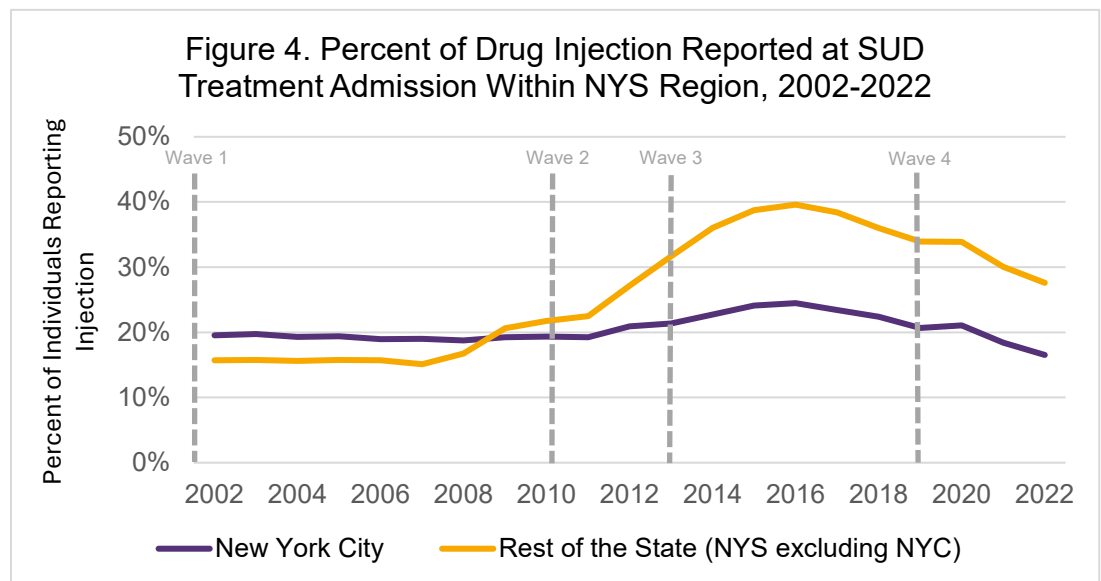


Cohorts with fewer than 10 unique individuals who reported drug injection at SUD treatment admissions in a year were omitted from the birth cohort analysis.

By 2016, while reported drug injection remained stable among other birth cohorts, it significantly increased among the birth cohorts of 1971-1980 and 1981-1990. As the 1991-2000 birth cohort aged and entered the in-SUD-treatment population in 2007, reported drug injection among the 1991-2000 birth cohort rapidly increased and peaked in 2015. In 2016, among the 1971-1980 birth cohort, 33.6% reported drug injection; among the 1981-1990 birth cohort, 45.7% reported drug injection; among the 1991-2000 birth cohort, 43.7% reported drug injection. By 2022, reported drug injection decreased to 23.3% among the 1971-1980 birth cohort, 32% among the 1981-1990 birth cohort, and 28.4% among the 1991-2000 birth cohort. Our findings are consistent with national population-level data indicating that both opioid use and drug injection increased significantly among young people (that is, those included in the 1981-1990 and 1991-2000 birth cohorts).<sup>6,12</sup>

## Drug Injection Patterns by NYS Region

The first wave of the overdose epidemic was characterized by an increase in opioid use disorder related to misuse of prescription opioids, later linked to subsequent heroin use and/or drug injection in the second wave.<sup>13,14</sup> Starting with the second wave, the proportion of individuals reporting drug injection at admission increased significantly in ROS and not in NYC (Figure 4).

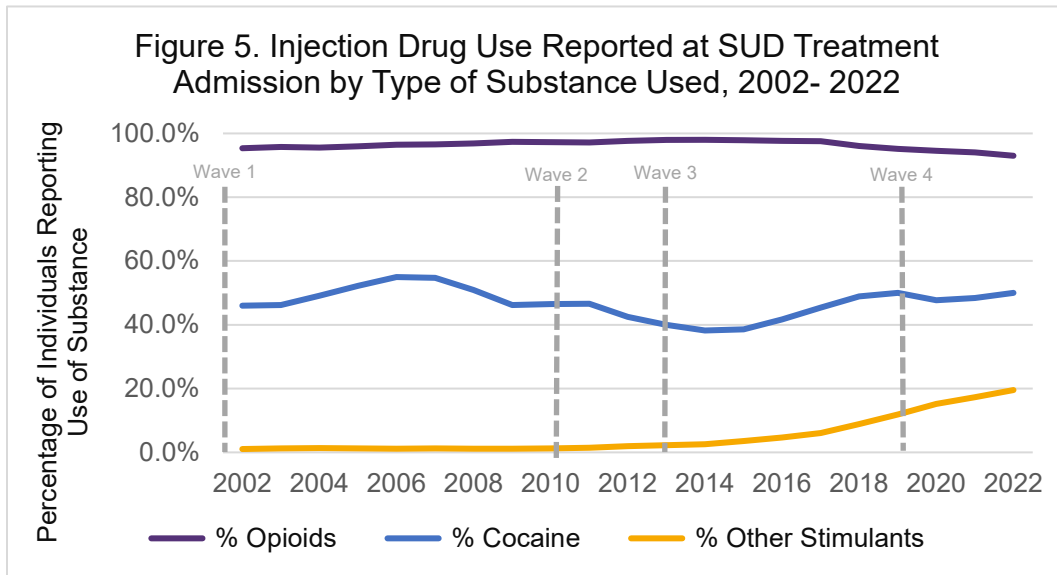


In 2016, 39.6% of individuals entering SUD treatment in ROS reported drug injection at admission, while in NYC, 24.5% of individuals entering SUD treatment reported drug injection. From 2016 to 2022, drug injection reported at SUD treatment admission in NYC decreased significantly from 24.5% to 16.5%. Similar significant decreases in drug injection reported at SUD treatment admission were identified in ROS, decreasing from 39.6% in 2016 to 27.6% in 2022. These data from NYS are consistent with national trends in drug injection.<sup>6,15,16</sup>



## Substance Types Among Individuals Reporting Drug Injection

We analyzed reported substance(s) of use among unique individuals who reported drug injection at SUD treatment admission. Opioids were consistently the most frequently reported substance among individuals who reported drug injection. Since 2002, more than 90% of individuals who reported drug injection at SUD treatment admission reported opioid use (Figure 5).



Substance categories reported by individuals are not mutually exclusive and so per cents do not add up to 100%, i.e., an individual can report using one, two, or three of these substances.

contributing to overdose death, polysubstance use involving synthetic opioids (e.g., fentanyl) is a more recent phenomenon, contributing to greater overdose death risk than the use of non-synthetic concurrent opioids and other substances.<sup>17,18</sup> Understanding polysubstance use within the in-SUD-treatment population in NYS is important in the context of emerging national data, suggesting there may be transitions within some populations away from drug injection to other routes of administration.<sup>16,19,20</sup>

### PUBLIC HEALTH SIGNIFICANCE

Trends in drug injection in the NYS SUD treatment system generally reflect national and state-level trends in drug use epidemiology. This suggests that the NYS OASAS treatment system is accessible to the population of people who use drugs. While drug use by any route confers overdose risk, use by drug injection confers additional risks. Monitoring the proportion of individuals entering drug treatment who report use by injection should guide policy and public health interventions to address use, use disorder, and harms related to the patterns and route of drug use that are prevalent at the time.

Providing lower threshold service delivery and embedding harm reduction into the SUD treatment system are important strategies to reduce the harms associated with drug injection. This includes distribution of naloxone, active linkages to sterile syringe service programs and other harm reduction programs, and access to drug checking such as fentanyl and xylazine test strips.<sup>21-28</sup> Using trends in substance use reported at admissions from in-SUD-treatment cohorts can be leveraged to better understand the potential health needs of patients entering SUD treatment to reduce substance use-related morbidity and mortality.

Cocaine and other stimulant use was common among individuals who reported drug injection. In 2002, among individuals who reported drug injection, 46% reported cocaine use. This proportion decreased to 41.7% in 2016 and increased to 50% in 2022. Among individuals who reported drug injection, 1% reported other stimulant use in 2002. This proportion increased to 4.6% in 2016 and increased again to 19.5% in 2022.

While polysubstance use is not a new phenomenon and has been a well-known factor



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