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UNIVERSITY OF HOUSTON

# 2021 HARRIS COUNTY HOMELESSNESS MORTALITY REPORT: ADDENDUM ON TOXICITY DEATHS

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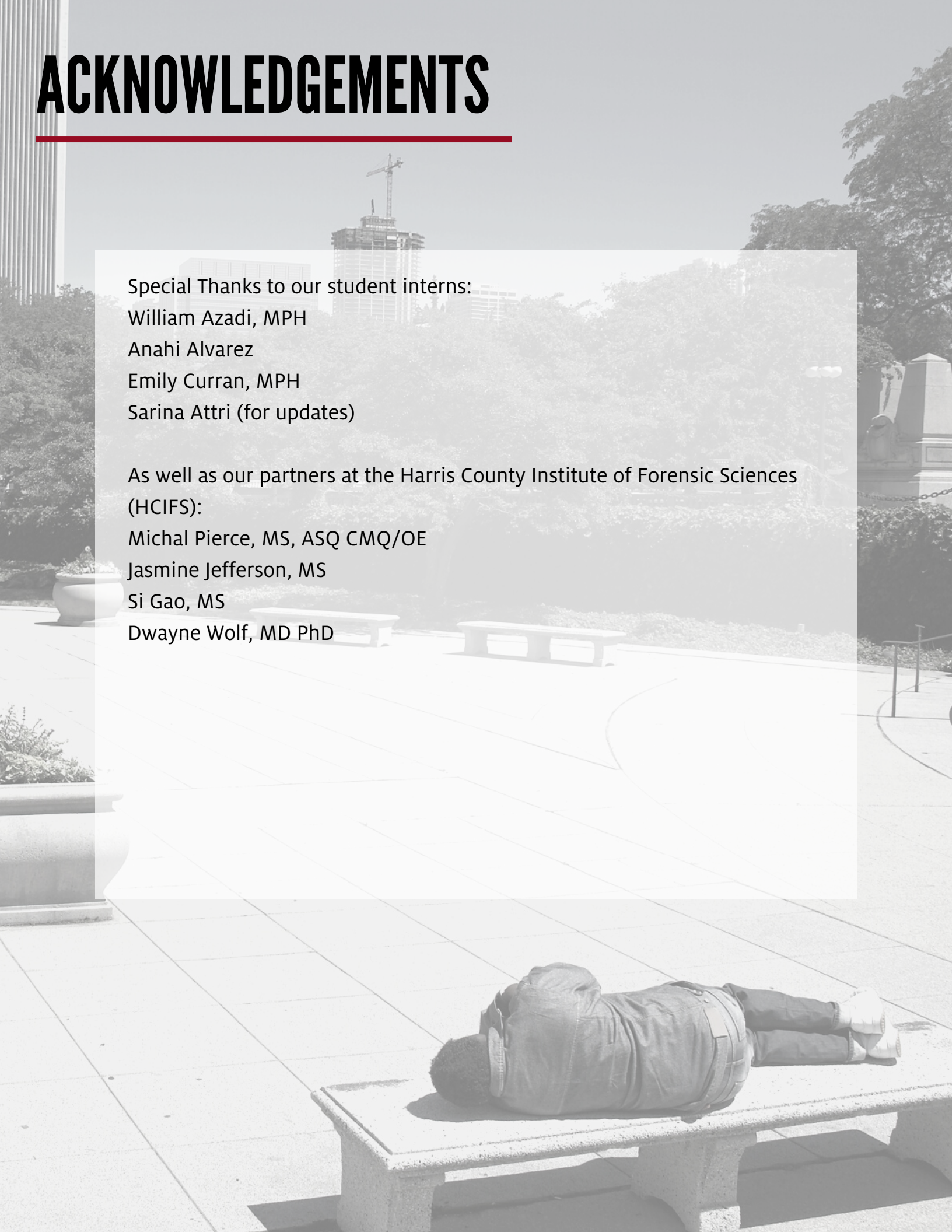
As well as our partners at the Harris County Institute of Forensic Sciences (HCIFS):

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# INTRODUCTION

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In the United States, drug overdose rates have risen sharply over the past two decades (NHCHC, 2017). One major reason for this trend has been the opioid epidemic that has begun to take a firm hold on citizens all over the country. Originally, prescription-based opioids were a majority of the opioids being used however, since 2013 there has been a sharp increase in the use of synthetic opioids such as fentanyl, which can be seen by an 11-fold increase in overdose deaths associated with this category (Fine et al. 2022).

Although the opioid epidemic is affecting communities all across America, both financially and in terms of excess mortality, there are some groups such as homeless individuals that are disproportionately affected. Homelessness is experienced by around 580,000 individuals in the US on any given night (HUD, 2023), although this figure is often thought to be an underestimate of the true number of individuals experiencing homelessness in America due to the transient nature of homelessness itself and the difficulty of identifying individuals in the unsheltered setting with an annual point-in-time measure.

Within this large and diverse group of individuals, deaths due to overdose is a leading cause of death; much higher when compared to mortality among average Americans. A cohort study following roughly 60,000 homeless individuals in the Boston area found that after standardizing for age and sex the overdose mortality rate was twelve times higher among homeless individuals in the cohort than the Massachusetts adult population (Fine et al. 2022). In addition, it was also found that among all of those who died from an overdose, opioids were responsible for 91% of mortalities within this cohort further emphasizing the large role that opioids can play in overdose deaths within this population and within the country (Fine et al. 2022).

Even when compared to populations that are more similar to themselves such as very low-income housed individuals, homeless individuals still have a higher rate of overdose. When comparing hospitalizations for homeless and low-income housed individuals from Florida, Maryland, Massachusetts, and New York it was found that individuals experiencing homelessness had a 6-fold adjusted relative risk overdose (Yamamoto et al 2019).

Some reasons why drug overdose rates among homeless individuals may be higher than the general population, and even low-income housed individuals, are: the availability of naloxone to reverse an overdose, the dual-criminalization of both homelessness and drug use, and constant movement (Doran et al. 2022). By criminalizing homelessness and drug use, many individuals are forced to have large stretches of abstinence, which subsequently increases the chance of overdose after reentry. In addition, many individuals may practice drug use alone, in isolation, or in hidden areas to avoid authorities but also increase the likelihood that they will not receive treatment if they experience an overdose. Lastly, regular displacement and relocation, possibly related to strict encampment policing and cleaning operations, may make it even more difficult to connect to resources and treatment (Barocas et al., 2023).

-Ben King, PhD MPH and William Azadi, MPH

# LIMITATIONS

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## LIMITATIONS

We need to offer some disclaimers up front. The numbers in this report are certain to reflect an undercount of the number of actual deaths occurring in homelessness in Harris County. Indeed, this draft has been updated since the original publication to reflect an adjudication process of records which yielded an additional 33 cases (n=82) from medical examiner records not originally flagged for homelessness. There are other data sources not (yet) incorporated which would otherwise increase the number of cases further.

Further, the reliance on medical examiner data means that we are examining a subset of the total deaths in the county overall - although it is expected that, at a minimum, the majority of deaths occurring in homelessness are seen by the ME's office (aka "HCIFS"). It also makes a limited attempt to compare drug usage in homeless populations to the non-homeless population seen by Harris County's medical examiner (medicolegal deaths). Those findings should be interpreted in the context of deaths in homelessness versus all other medicolegal deaths (not all deaths in the county).

This work relies on methods described in the National Health Care for the Homeless Council's Mortality Toolkit, but does not perfectly match or provide a comparison to other municipal communities implementing similar strategies.

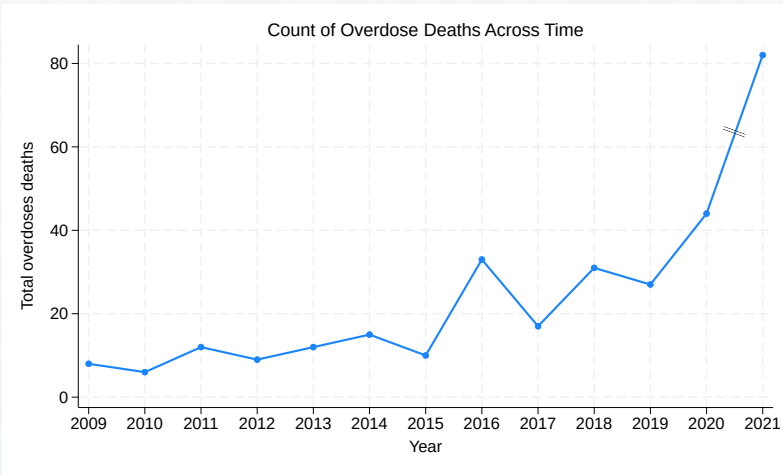
This report is paired with a set of recommendations, from case definitions to data standards, which we anticipate will continue to increase the sensitivity of detection methods, complicating the usefulness of this data longitudinally (i.e. compared to past and future years). Without naming prospective partners, this project will also seek to supplement this surveillance effort through additional community data sources.

Finally, a quick word of thanks to the HCIFS for their support of this analysis, including the adoption of a 10-year DUA. Thanks as well to the UH HEALTH Center for Addictions Research and Cancer Prevention for their support of this work through the Pilot Grant Program.

-Ben King, PhD MPH



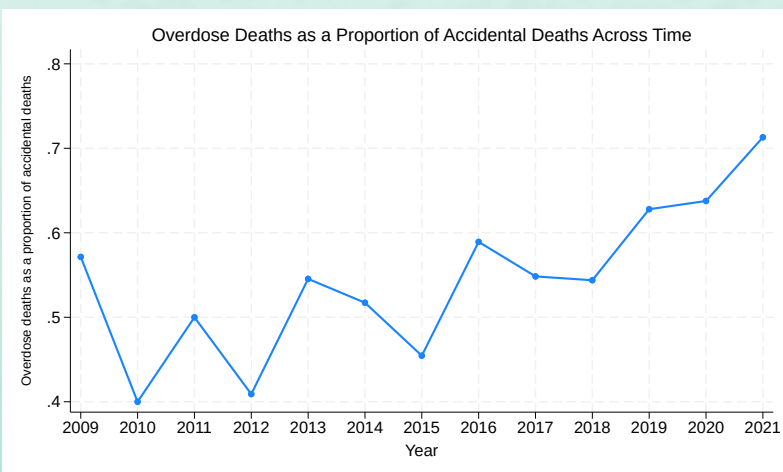
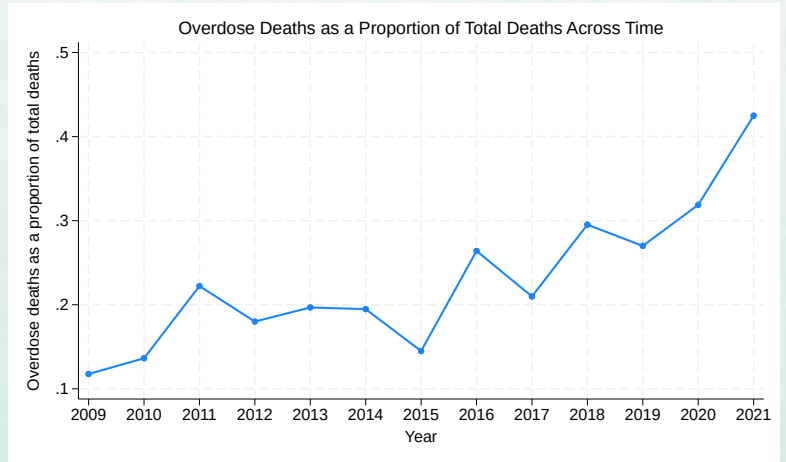
# SUBSTANCE TOXICITY MORTALITY ASSOCIATED WITH HOMELESSNESS



\*Methods changed between 2020 and 2021, resulting in improved case identification

From 2009-2021, the frequency of overdose deaths amongst individuals experiencing homelessness increased greatly, with a large spike in 2016 and an overall upward trend since 2009.

The proportion of overdose deaths over total deaths amongst homeless individuals has fluctuated over the years, with a recent (2017-2021) upward trend.



Finally, overdose deaths as a proportion of all accidental manners of death, from 2009-2015, fluctuated between 40% and 60%. Then, a slow rise in this proportion is observed, exceeding 70% by 2021.

# POLYSUBSTANCE MORTALITY

## Poly-substance Deaths

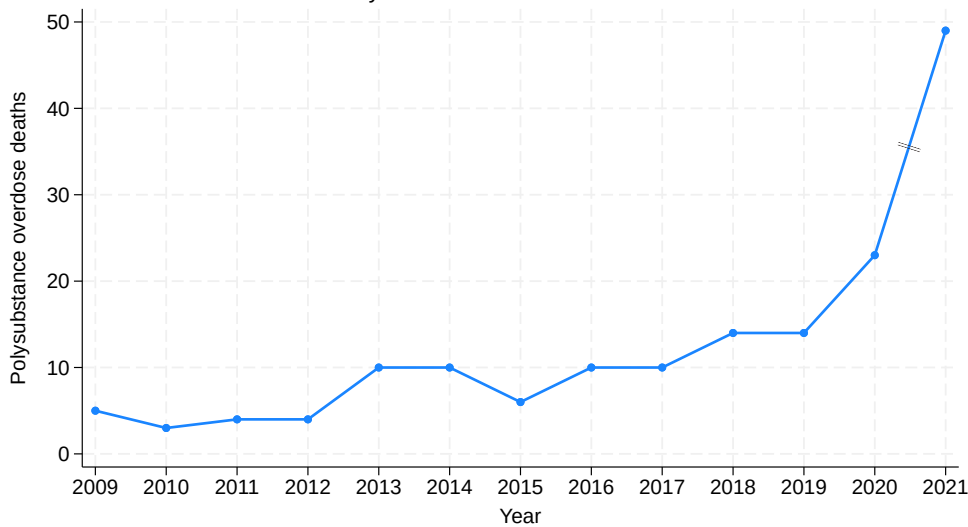
Poly-substance deaths are accidental deaths with multiple substances attributed as the cause. One common example includes the use of ethanol and cocaine products listed in the cause of death fields.\*

Demonstrated in the first figure, the counts of poly-substance toxicities have increased greatly from 2009-2021, but this is also in part due to increased mortality associated with homelessness over time, thereby rising with deaths seen per year.

The graph as a proportion of accidental deaths provides important perspective of the real proportion of poly-substance deaths in this community. Following a peak in 2013, the upward trend from 2018-2021 shows that poly-substance deaths are still on the rise.

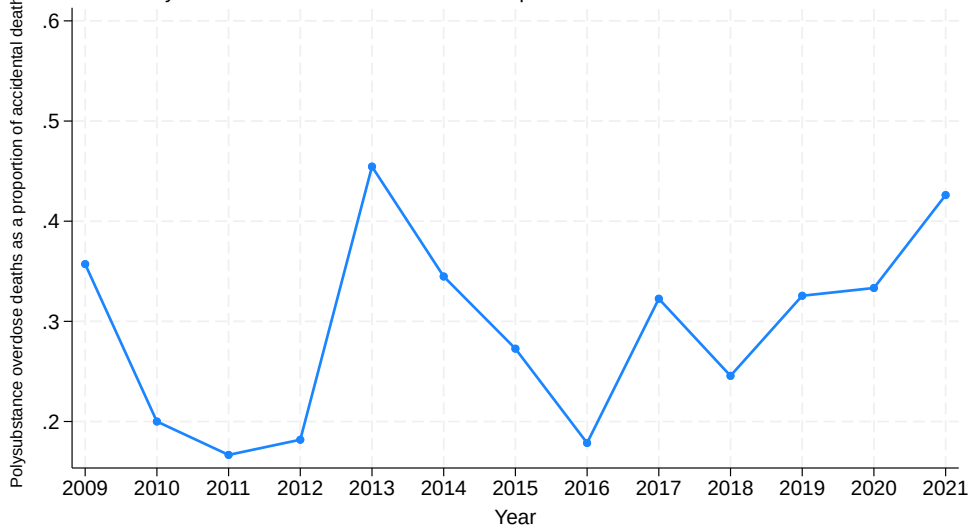
\*Fields identifying Cause A & B combined

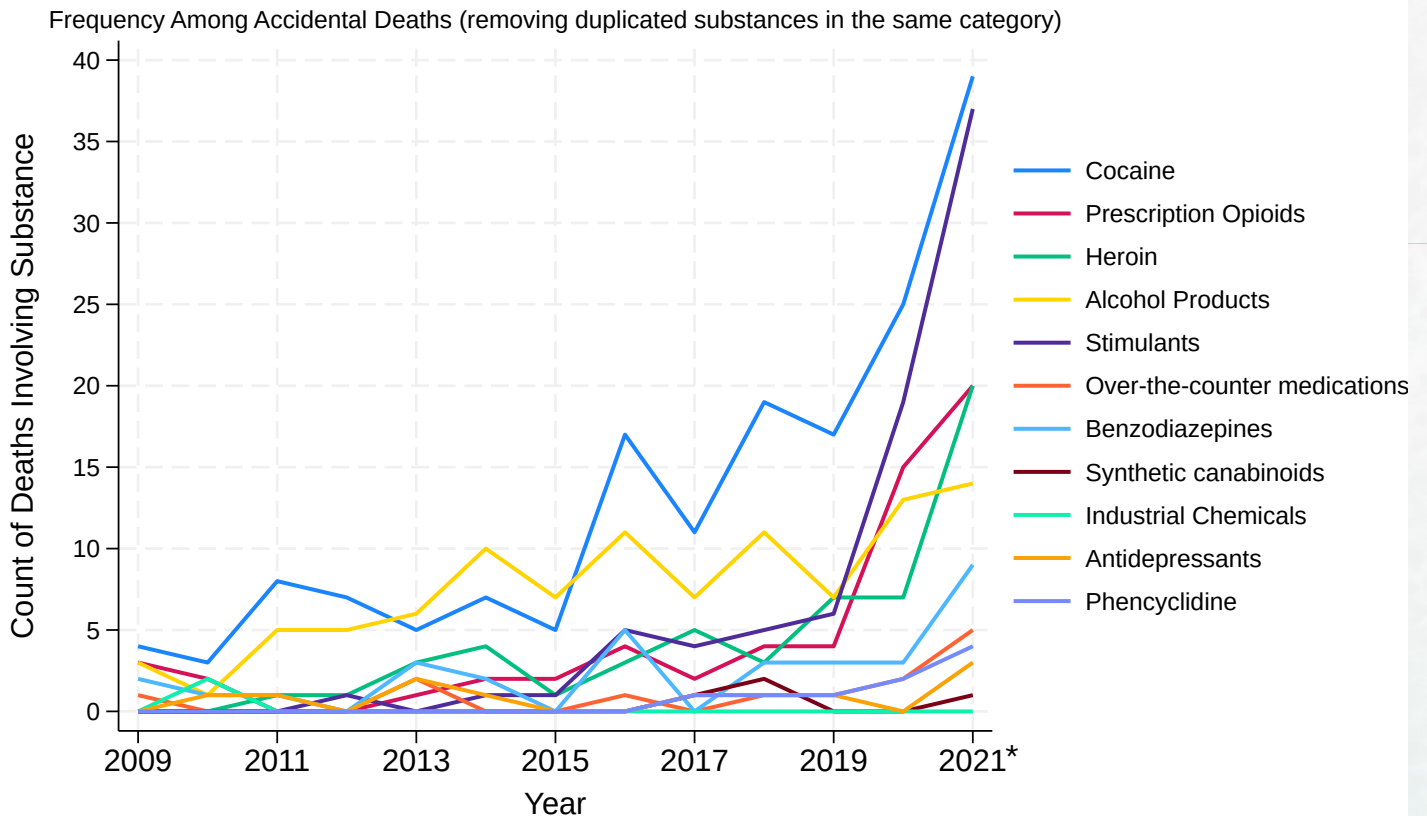
Count of Polysubstance Overdose Deaths Across Time



\*Methods changed between 2020 and 2021, resulting in improved case identification

Polysubstance Overdose Deaths as a Proportion of Accidental Deaths Across Time



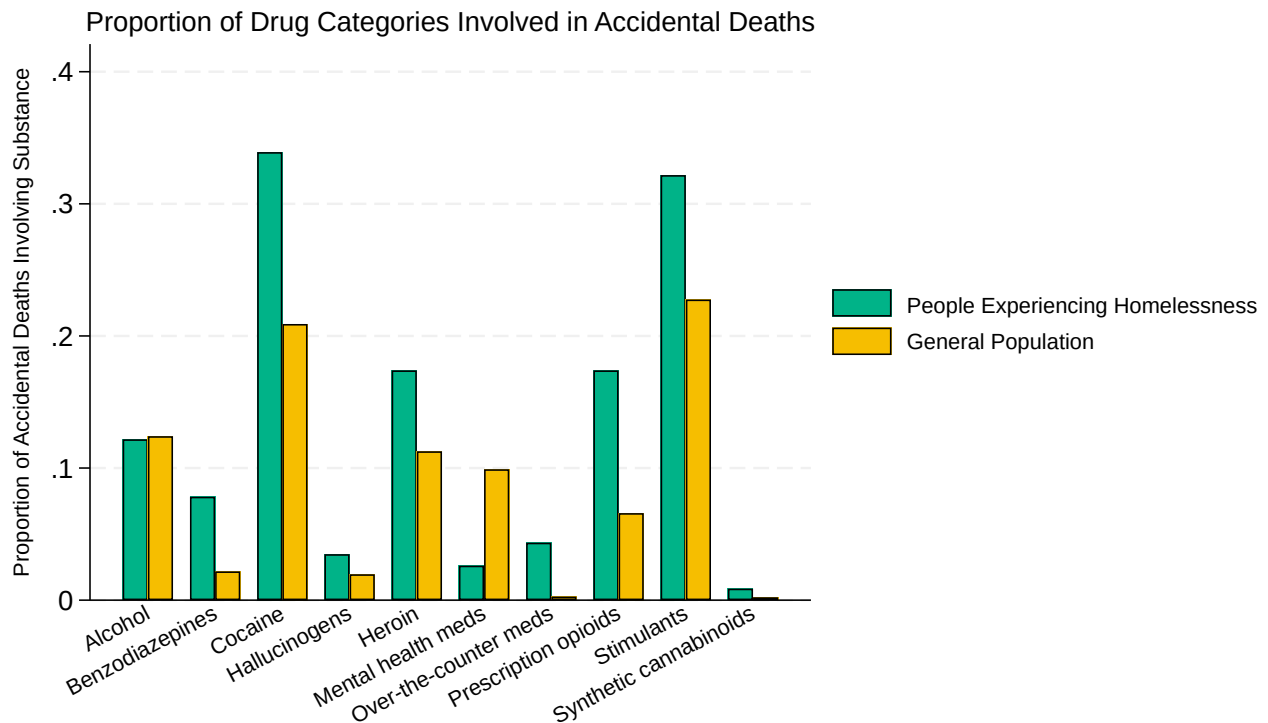


\*Methods changed between 2020 and 2021, resulting in improved case identification

## Drug Use over Time

Until 2019, cocaine and alcohol products dominated toxicity deaths as the two most attributed drug classes. In the years 2020-2021, prescription opioids, stimulants, and heroin (see below for a full description of each category) overtook alcohol products in their frequency of involvement in death. Cocaine has consistently remained high amongst drug use categories from 2009-2021. These trends may be explained by the overall increasing number of deaths over time. However, the increased involvement of these substances in death is still of great concern in terms of planning for treatment and prevention programs.

# DRUG CATEGORY COMPARISON



## Drug Categories and Accidental Deaths

Mortality data provided by the HCIFS (medical examiner) was analyzed to observe the frequency of acute toxicity that occurred among the housed ( $n=1,878$ ) and those associated with homelessness ( $n=113$ ) in 2021. Deaths that were caused by acute toxicities were identified by the mention of acute toxic effects of drugs in the 'Cause A' and 'Cause B' columns. There were 100 different drugs found in the data for the general population- alcohol and fentanyl were the most common single drugs- and there were 18 drugs identified in the data for the homeless population- cocaine was the most common. To simplify the data, drug categories were created to classify drugs based on drug type and function (next page).

PEH died more frequently from cocaine, stimulants, heroin, and synthetic cannabinoids than in housed medicolegal deaths. In addition, a higher frequency of accidental deaths due to alcohol, prescription opioids, benzodiazepines, inhalants, and mental health medications occurred among those housed. One interesting finding is that no acute toxicities due to mental health medication use occurred within PEH, which is a possible indication of the lack of mental health services available for this population or the greater availability of illicit substance categories.



## Drug Category

## Description

COCAINE

COCAINE, COCAETHYLENE, CHRONIC COCAINE

PRESCRIPTION OPIOIDS

OXYCODONE OXYMORPHONE HYDROCODONE HYDROMORPHONE FENTANYL MORPHINE PARAFENTANYL, ACETYL-FENTANYL, VALERYL FENTANYL, CARFENTANIL, MITRAGYNINE, 4-ANPP, METHOXYACETYLFENTANYL, TAPENTADOL, U-47700, METHADONE, TRAMADOL, CODEINE

HEROIN

HEROIN

ALCOHOL

ETHANOL, ALCOHOL, ISOPROPANOL, N-BUTANOL

STIMULANTS

AMPHETAMINE, METHAMPHETAMINE, PHENTERMINE

BENZODIAZEPINES

ALPRAZOLAM, CLONAZEPAM, LORAZEPAM, DIAZEPAM, CHLORDIAZEPOXIDE, TEMAZEPAM, MIDAZOLAM, TRIAZOLAM, FLURAZEPAM, CLORAZEPATE, OXAZEPAM, REMIMZAZOLAM, NORDIAZEPAM, ETIZOLAM, XANAX, FLUBROMAZOLAM FLUALPRAZOLAM

OVER-THE-COUNTER (OTC)  
MEDICATIONS

IBUPROFEN, DIPHENHYDRAMINE, ACETAMINOPHEN, METHORPHAN, CHLORPHENIRAMINE, DOXYLAMINE, PSEUDOEPHEDRINE, CHLORCYCLIZINE

HALLUCINOGENS

PHENCYCLIDINE, KETAMINE, LYSERGIC ACID DIETHYLAMIDE

SYNTHETIC CANNABINOIDS

5F-ADB, MDMB-4EN-PINACA

INHALANTS

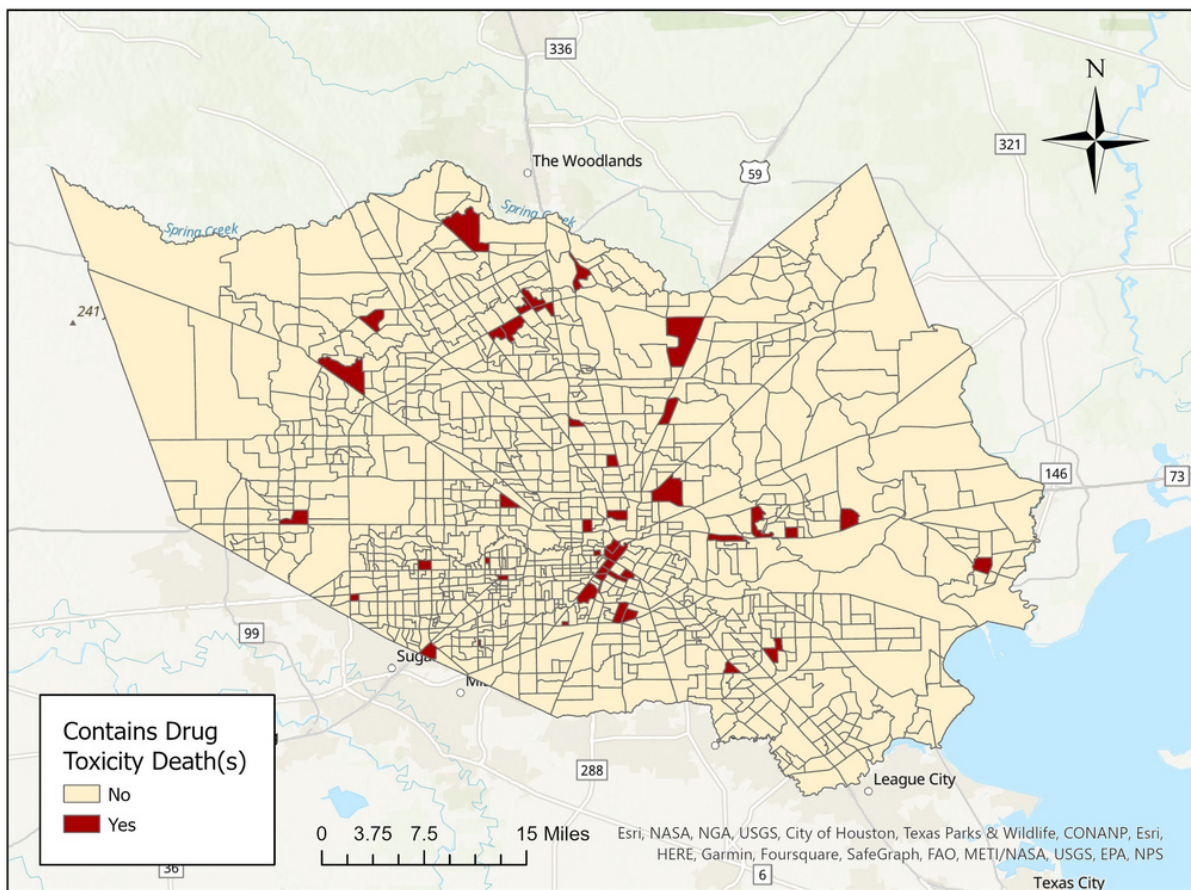
1,1-DIFLUOROETHANE, ISOBUTYL NITRITE, NITROUS OXIDE

MENTAL HEALTH MEDICATIONS

AMITRIPTYLINE, NORTRIPTYLINE, OLANZAPINE, CITALOPRAM, MIRTAZAPINE, AMITRIPTYLINE, MIRTAZAPINE, TRAZADONE, MEPROBAMATE, ZOLPIDEM, QUIETAPINE, SERTRALINE, HYDROXYZINE, ZOLPIDEM, BUPROPION, FLUOXETINE, DOXEPIN, DULEXETINE, PAROXETINE, ARIPIRAZOLE, VENLAFAXINE, CLOMIPRAMINE, IMIPRAMINE, NORTRIPTYLINE, RISPERIDONE

# 2020 FATAL OVERDOSE DISTRIBUTION BY CENSUS TRACT

Count of Fatal Overdoses Among People Experiencing Homelessness in 2020



The broad geographic distribution of toxicity deaths across the county in both 2020 and 2021 demonstrates the widespread burden of fatal overdose amongst homeless individuals throughout Harris County. It follows previously reported trends and supports the pervasive risk of mortality across the entire community.





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