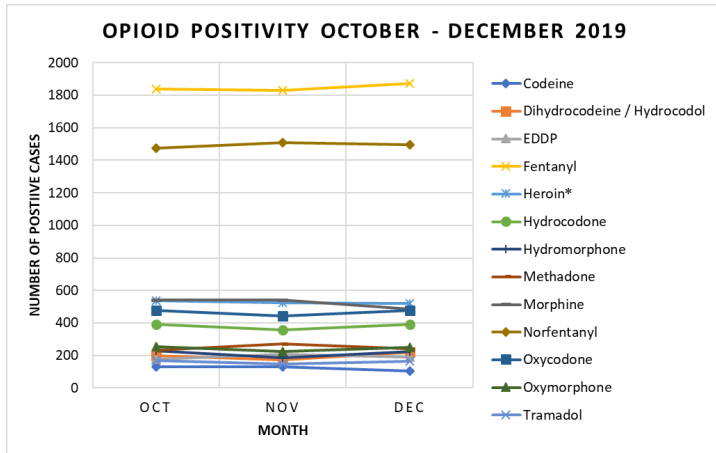**Purpose:** The objective of this report is to provide timely information regarding the status of opioids including novel opioids and fentanyl analog prevalence, positivity, and discovery within the United States.

Project Overview: There are many indicators, such as emergency room admissions, poison center calls, drug treatment admissions, drug possession and trafficking arrests, crime laboratory statistics, and medical examiner data, that the illicit use and abuse of both prescription opioids, such as morphine, fentanyl and oxycodone, and traditionally abused opioids, most notably heroin, are increasing. In addition, many novel opioid agonists have been identified over the last three years that are now contributing to the opioid death statistics at an increasing, but poorly documented, rate. In collaboration with NMS Labs, this project sought to use de-identified raw electronic high resolution mass spectrometry data from postmortem and driving under the influence of drugs (DUID) cases to develop trend reports and perform datamining of the raw data against a continually updated database of common opioids and emerging opioids. Data was processed against a library containing over 200 different opioids and/or fentanyl analogs.

Opioid Positivity

Between October and December 2019, there was a total of 19,837 cases positive for one or more routine opioid(s). Fentanyl accounted for the highest positivity with 5,539 cases, up slightly from 5,307 in the previous quarter. There were 1,581 positive heroin cases compared to 1,562 in quarter 3. The number of positive morphine cases continued to decreased from 1,650 in quarter 3 to 1,569 in quarter 4.
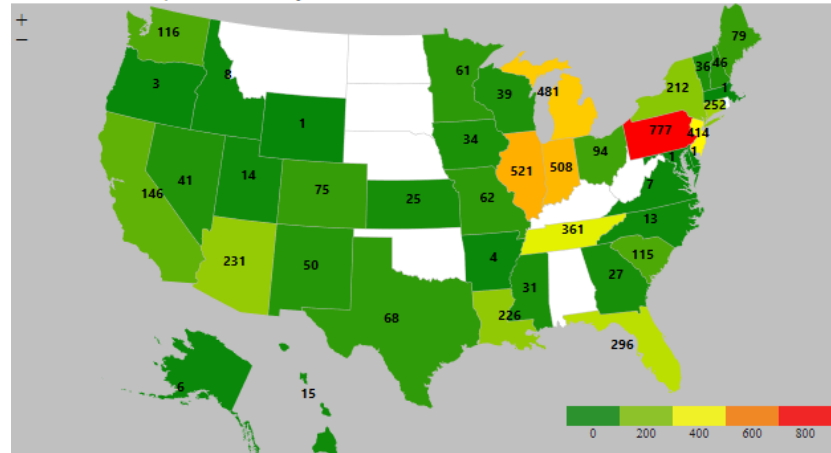
OPIOID POSITIVITY OCTOBER - DECEMBER 2019

Legend: Codeine, Dihydrocodeine / Hydrocodol, EDDP, Fentanyl, Heroin*, Hydrocodone, Hydromorphone, Methadone, Morphine, Norfentanyl, Oxycodone, Oxymorphone, Tramadol

*Heroin positivity determined by detecting 6-MAM in any fluid and morphine in the blood.

Fentanyl

Heat Map of Fentanyl Positive Cases October - December 2019

Data has not been normalized to account for testing volume. Geographical distribution may be limited by location of agencies submitting samples to NMS Labs and not necessarily representative of all jurisdictions.

Fentanyl Demographics (n= 5,539)

Sex	
Male	3,361
Female	1,334
Unknown	844
Age	
Average	40 (±13)
Median	41
Range	0-96

82% of cases were death investigations; 13% were law enforcement; 5% other

## Heroin

Heat Map of Heroin Positive Cases October - December 2019
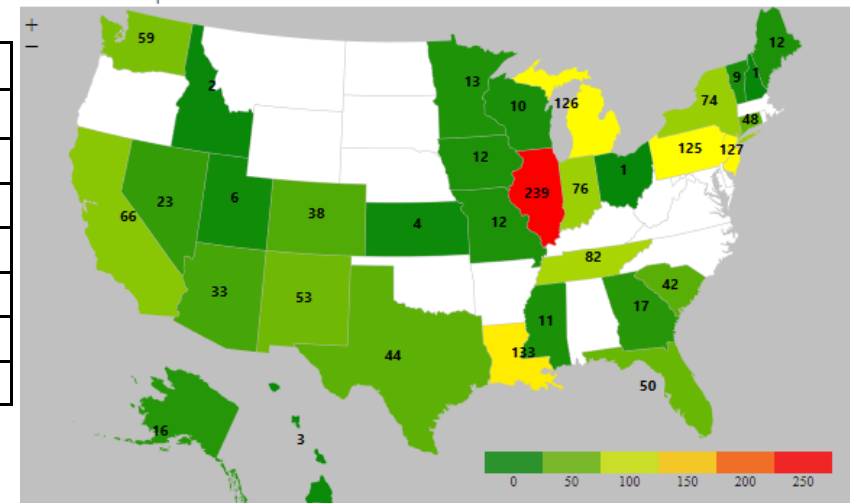
Data has not been normalized to account for testing volume. Geographical distribution may be limited by location of agencies submitting samples to NMS Labs and not necessarily representative of all jurisdictions.

Heroin Demographics (n= 1,581)

Sex	
Male	1,063
Female	371
Unknown	147
Age	
Average	41 (±12)
Median	41
Range	18-86

93% of cases were death investigations; 4% were law enforcement; 3% were other

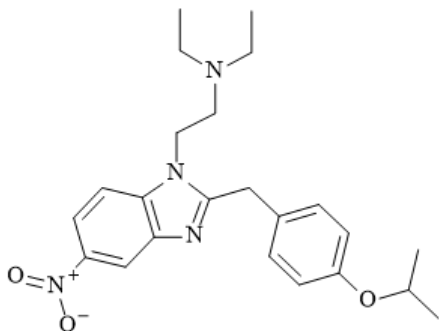NPS DISCOVERY   cfsre — Redefining Excellence in Forensic Science   NMS LABS

Novel Opioid Positivity

Between October and December 2019, novel opioid positivity continued to decline with a total of 145 cases positive for one or more novel opioid (Q3, n=201). Carfentanil accounted for the highest positivity with 57 cases, followed by valerylfentanyl with 47 cases and para-fluoroisobutyrylfentanyl (p-FIBF) with 11 cases. Of interest, five tianeptine cases were reported.

NOVEL OPIOID POSITIVITY OCTOBER - DECEMBER 2019

Novel Opioids

Heat Map of Novel Opioid Positive Cases October - December 2019

Data has not been normalized to account for testing volume. Geographical distribution may be limited by location of agencies submitting samples to NMS Labs and not necessarily representative of all jurisdictions.
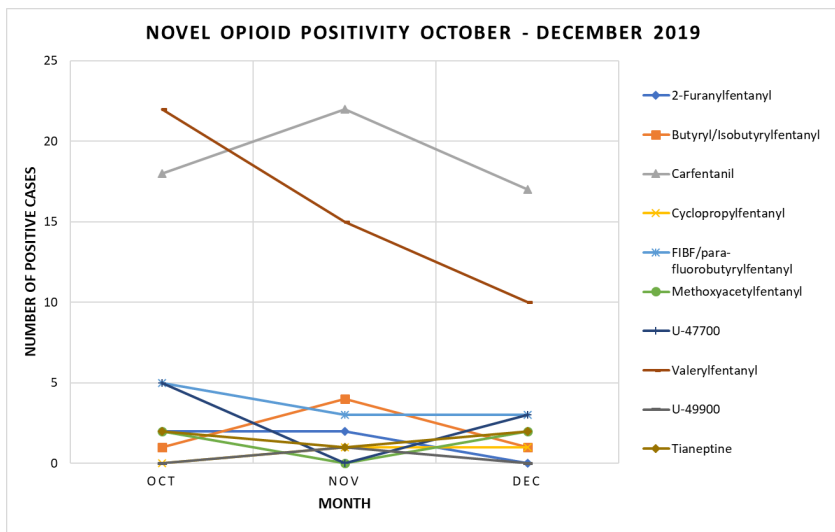
Isotonitazene

Initially identified in samples in August 2019, isotonitazene has been seen with increasing frequency in Q4.

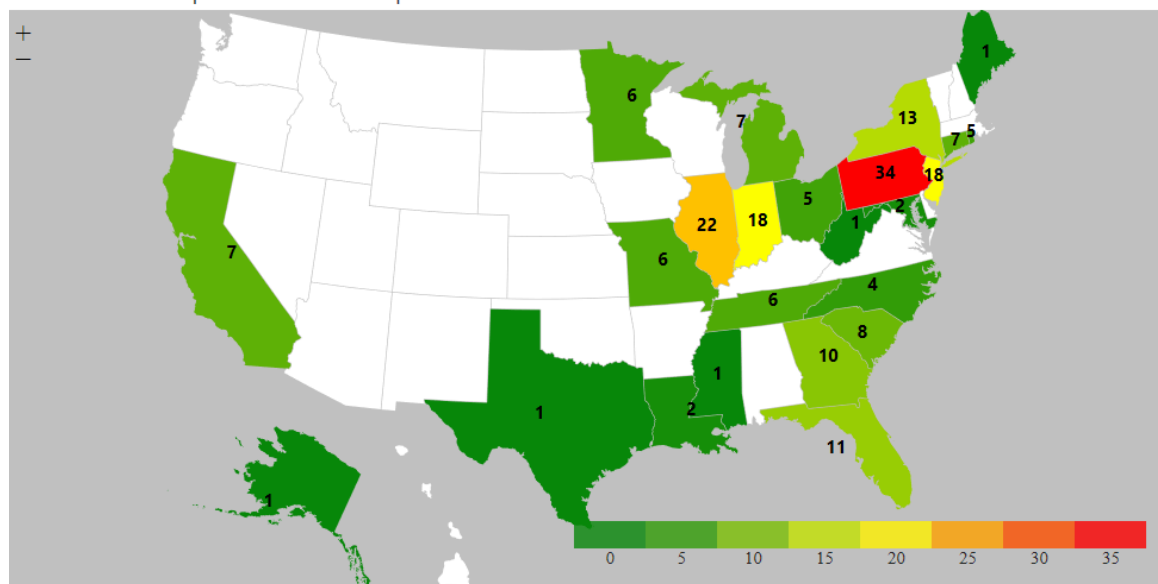For more information on this compound visit www.NPSDiscovery.org

Demographic Information for Top Three Novel Opioids

Carfentanil Demographics (n=57)

Sex	
Male	33
Female	9
Unknown	5
Age	
Average	35 (±14)
Median	44
Range	3-67

Valerylfentanyl Demographics (n=47)

Sex	
Male	33
Female	9
Unknown	5
Age	
Average	38 (±12)
Median	42
Range	18-77

p-FIBF Demographics (n=11)

Sex	
Male	10
Female	1
Unknown	N/A
Age	
Average	41 (±15)
Median	41
Range	23-66

76% of cases were death investigations; 18% were law enforcement; 6% were other