



MISSIONLISA
LEARNING INDICATORS OF SUBSTANCE ADDICTION

Opioid Crisis Intelligence Report

January 15, 2019

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This report includes information and intelligence derived from activity within the Mission LISA Ecosystem from December 10, 2018 through January 6, 2019. Information and intelligence deemed critical between the dates of January 7 and January 15, 2019 has also been included in this report. All other information and intelligence derived during the January 7 through January 15, 2019 period remains under analysis and will be included in the report dated: February 12, 2019. Lumina Analytics, LLC, proprietary Mission LISA Opioid Crisis Report - developed exclusively at private expense and provided solely for evaluation purposes.

Executive Summary

This month's report highlights content collected from December 10, 2018 to January 6, 2019, regarding the national opioid crisis. The report features:

- Trends in the increasing number of opioid-related overdose deaths in 2017, released by the CDC.
- HHS's recently released guidance on prescribing naloxone to individuals at risk of an opioid overdose.
- reSET-O, a new opioid treatment mobile application intended to increase treatment retention.
- The uptick in infective endocarditis amid the epidemic in North Carolina.



Fast Facts

- According to the recently released Mortality and Morbidity report by the Centers for Disease Control and Prevention (“CDC”), 47,600 of the 70,237 drug overdose deaths in 2017 involved opioids.¹
- The CDC Mortality and Morbidity report reveals that 59.8 percent of all opioid-related deaths in 2017 involved synthetic opioids, a 45.2 percent increase from the previous year.²
- According to preliminary data from the CDC, several states saw decreases in opioid overdose deaths in 2018, including New Hampshire, Ohio, Kentucky, and Rhode Island.³
- A 2017 study published by *The BMJ* indicates roughly 30 percent of opioid overdoses involved benzodiazepines.⁴
- A new study published by *The JAMA* shows that more than 50 percent of Americans with Hepatitis C reside in nine states – five of the nine states are also highly affected by the opioid epidemic.^{5,6}
- According to a 2017 paper⁷ by a Princeton University economist, opioid addiction has kept roughly 20 percent of men out of the workforce.⁸

¹ Center for Disease Control and Prevention. Morbidity and Mortality Weekly Report. (2018, December 29). Retrieved December 31, 2018, from https://www.cdc.gov/mmwr/volumes/67/wr/mm675152e1.htm?s_cid=mm675152e1_w

² Ibid.

³ Kamp, J. (2019, January 2). Deaths Level Off-and Even Decline-in Some Opioid Hotspots. Retrieved January 3, 2019, from <https://www.wsj.com/articles/deaths-level-off-and-even-decline-in-some-opioid-hotspots-11546088400>

⁴ Sun, E.C., Humphreys, K., Darnall, B.D., Baker, L.C., Mackey, S. (2017, March 14). Association between concurrent use of prescription opioids and benzodiazepines and overdose: retrospective analysis. *Bmj*. doi: <https://doi.org/10.1136/bmj.j760>

⁵ EurekAlert. (2018, December 21). How common is Hepatitis C infection in each US state? (2018, December 22). Retrieved December 31, 2018, from https://www.eurekalert.org/pub_releases/2018-12/jn-hci121918.php

⁶ Norton, A. (2018, December 21). Hepatitis C Cases Cluster in States Hit Hard by Opioids. Retrieved on December 31, 2018, from <https://www.usnews.com/news/health-news/articles/2018-12-21/hepatitis-c-cases-cluster-in-states-hit-hard-by-opioids>

⁷ The Brookings Institution. (2017). Where Have All the Workers Gone? An Inquiry into the Decline of the U.S. Labor Force Participation Rate [Pdf]. Retrieved from https://www.brookings.edu/wp-content/uploads/2017/09/1_krueger.pdf

⁸ Bolden-Barrett, V. (2018, November 19). Study: Opioid epidemic has cost Massachusetts economy \$9.7B. Retrieved November 21, 2018, from <https://www.hrdiver.com/news/study-opioid-epidemic-has-cost-massachusetts-economy-97b/542418/>

Current Events

- On December 10, 2018, the Food and Drug Administration (“FDA”) granted clearance to reSET-O, a digital therapeutic mobile application intended to increase retention rate for opioid addiction treatment.⁹
- On December 19, 2018, the Department of Health and Human Services (“HHS”) released a recommendation for co-prescribing naloxone with opioids to patients at high risk of opioid overdose.^{10,11}



⁹ Truong, K. (2018, December 20). Opioid addiction app from Novartis and Pear Therapeutics gets FDA nod. Retrieved December 27, 2018, from <https://medcitynews.com/2018/12/opioid-addiction-app-from-novartis-and-pear-therapeutics-gets-fda-nod/?rf=1>

¹⁰ Frieden, J. (2018, December 20). HHS Recommends Co-Prescribing Naloxone With Opioids. Retrieved December 31, 2018, from <https://www.medpagetoday.com/psychiatry/opioids/77062>

¹¹ Department of Health and Human Services. (2018, December 19). Naloxone: The Opioid Reversal Drug that Saves Lives. Retrieved on December 31, 2018, from <https://www.hhs.gov/opioids/sites/default/files/2018-12/naloxone-coprescribing-guidance.pdf>

Epidemic Tracking

Opioid Overdose Epidemic Escalates and Evolves

A new CDC report, released in December 2018, reveals that drug overdoses have resulted in 70,237 deaths in 2017. Specifically, 67.8 percent of all drug overdose deaths in 2017, or 47,600 deaths, were attributed to opioids. Furthermore, the nation has seen a 12 percent increase in opioid overdose deaths from 2016. The data highlights a growing crisis in need of greater efforts and resources to strengthen prevention, response, and treatment strategies.¹²

The CDC studied trends in state-level changes in age-adjusted overdose death rates from 2016 to 2017 for all opioids and opioid subcategories, including prescription opioids, heroin, and synthetic opioids. Death rates were categorized by demographics at both county urbanization and state levels. State-level analyses included 34 states and the District of Columbia

(“D.C.”) while deaths involving synthetic opioids were examined in 20 states.¹³

In the past year, the nation experienced a surge in synthetic opioid-involved overdoses. Notably, 28,466, or 59.8 percent of opioid-related overdose deaths in 2017, were attributed to synthetic opioids other than methadone, representing a 45.2 percent increase from 2016.¹⁴ This subcategory of opioids drove significant increases in death across all demographic categories, with the most significant increases in African Americans (60.7 percent) and American Indians/Alaska Natives (58.5 percent). In terms of gender and age groups, the highest death rate occurred among males aged 25–44 years (27.0 per 100,000). Geographically, synthetic opioid-related deaths increased across all urbanization levels. Specifically, 23 states and D.C. experienced significant increases in synthetic opioid overdose death rates. The largest increases took place in Arizona, North Carolina, and Oregon. Similarly, the highest rates occurred in West Virginia, Ohio, and New Hampshire.

While the number of deaths from synthetic opioids rose significantly between 2016 and 2017, the number of overdose deaths from prescription opioids and

¹² Scholl, L.; Seth, P.; Kariisa, M.; Wilson, N; Baldwin, G. Drug and Opioid-Involved Overdose Deaths — United States, 2013–2017. Retrieved on January 3, 2019 from https://www.cdc.gov/mmwr/volumes/67/wr/mm675152e1.htm?s_cid=mm675152e1_w

¹³ Ibid.

¹⁴ Ibid.

heroin remained stable but high. Demographically, prescription opioid-involved death rates decreased 13.2 percent in males aged 15–24 years but increased 10.5 percent among individuals aged 65 years and older. Rates remained stable across all racial groups, urbanization levels, and states, with the exception of Illinois, which saw a significant increase, and five states – Maine, Maryland, Oklahoma, Tennessee, and Washington, which experienced significant decreases. West Virginia, Maryland, and Utah saw the highest prescription opioid-related death rates in 2017.¹⁵

Between 2016 and 2017, heroin-involved overdose death rates declined in many of the studied groups. The largest declines were observed in the age group 15–24 years (15.0 percent) as well as in medium metro counties (6.1 percent). Heroin-related overdose death rate declined 3.2 percent among Caucasians. However, the rate significantly increased among individuals aged 65 years and older (16.7 percent) and individuals aged 55 to 64 years old (11.6 percent), and increased among African Americans (8.9 percent). Heroin-related overdose death rates remained stable in most states, with significant decreases in five states – Maryland,

Massachusetts, Minnesota, Missouri, and Ohio, and increases in three states – California, Illinois, and Virginia. Furthermore, D.C., West Virginia, and Connecticut experienced the highest heroin-involved overdose death rates in 2017.¹⁶

Overall, from 2016 to 2017, opioid-involved overdose deaths increased among both males and females aged 25 years and older, Caucasians, African Americans, and Hispanics, with the largest increase of 25.2 percent in African Americans. Geographically, the largest increases in opioid-related overdose death rates were seen in North Carolina, Ohio, and Maine.¹⁷

Though still premature from an analytical viewpoint, provisional data from 2018 indicate decreases in opioid overdose deaths and potential progress in addressing the epidemic in several states, including New Hampshire, Ohio, Kentucky, and Rhode Island.¹⁸

¹⁵ Ibid.

¹⁶ Ibid.

¹⁷ Ibid.

¹⁸ Kamp, J. (2019, January 2). Deaths Level Off-and Even Decline-in Some Opioid Hotspots. Retrieved January 3, 2019, from <https://www.wsj.com/articles/deaths-level-off-and-even-decline-in-some-opioid-hotspots-11546088400>

Treatment and Policy

HHS Releases Guidance on Prescribing Naloxone

On December 19, 2018, the U.S. HHS released guidance to healthcare providers, patients, and individuals caring for patients on the prescription, co-prescription, and education of naloxone as an overdose intervention to reduce opioid-related deaths.¹⁹

Naloxone is an FDA-approved medication designed to rapidly reverse the effects of opioids, such as slowed or stopped breathing during an overdose. If administered in a timely manner, the medication can be lifesaving and becomes a critical component in mitigating the opioid crisis. According to HHS Secretary, Alex Azar, “Promoting the targeted availability and distribution of overdose-reversing drugs is one of the five pillars of HHS’s comprehensive, science-based strategy for the

opioid epidemic.” He added, “This new guidance reflects our commitment to ensuring those who need overdose-reversing drugs have them and provides practical steps that clinicians, patients, and the public can take to reduce the risk of an overdose.”²⁰

The HHS guidance is consistent with CDC’s guideline for Prescribing Opioids for Chronic Pain²¹, and an advisory released in April 2018 by the U.S. Surgeon General, Dr. Jerome Adams, encouraging more individuals, including healthcare providers and individuals who are or know someone at risk for an opioid overdose, to obtain naloxone and receive training on administering the drug.²²

The guidance advises clinicians to strongly consider prescribing or co-prescribing naloxone and providing education about its use for patients prescribed opioids or patients at risk of an overdose who:

- Are receiving a dosage of 50 morphine milligram equivalents per day or more;

¹⁹ Naloxone: The Opioid Reversal Drug that Saves Lives. Retrieved on January 3, 2019 from <https://www.hhs.gov/opioids/sites/default/files/2018-12/naloxone-coprescribing-guidance.pdf>

²⁰ HHS recommends prescribing or co-prescribing naloxone to patients at high risk for an opioid overdose. Retrieved on January 3, 2019 from <https://www.hhs.gov/about/news/2018/12/19/hhs-recommends-prescribing-or-co-prescribing-naloxone-to-patients-at-high-risk-for-an-opioid-overdose.html>

²¹ Dowell D, Haegerich TM, Chou R. CDC Guideline for Prescribing Opioids for Chronic Pain — United States, 2016. *MMWR Recomm Rep* 2016;65(No. RR-1):1–49. DOI: <http://dx.doi.org/10.15585/mmwr.rr6501e1>

²² VADM Jerome Adams. Surgeon General’s Advisory on Naloxone and Opioid Overdose. Retrieved on January 3, 2019 from <https://www.surgeongeneral.gov/priorities/opioid-overdose-prevention/naloxone-advisory.html>

- Have respiratory conditions;
- Have been prescribed benzodiazepines;
- Suffer from a non-opioid substance use disorder or a mental health disorder;
- Use heroin or illicit synthetic opioids, or misuse prescription opioids;
- Use other illicit drugs, such as stimulants;
- Are receiving Medication-Assisted Treatment (“MAT”), including methadone, buprenorphine, and naltrexone; and
- Have a history of opioid misuse upon release from incarceration or other controlled settings, where tolerance to opioids has been lost.²³

HHS states that national data on patients, to whom clinicians should consider co-prescribing naloxone, indicates that less than one percent of these patients receive a naloxone prescription and therefore, presents a gap in response to the nation’s opioid epidemic.²⁴



²³ Naloxone: The Opioid Reversal Drug that Saves Lives. Retrieved on January 3, 2019 from <https://www.hhs.gov/opioids/sites/default/files/2018-12/naloxone-coprescribing-guidance.pdf>

²⁴ Ibid.

New Opioid Treatment Application Receives Clearance from FDA

On December 10, 2018, the U.S. FDA granted clearance to reSET-O, a mobile application (“app”) by Pear Therapeutics and Sandoz, a Novartis subsidiary. The reSET-O app aims to increase outpatient treatment program retention for patients with opioid use disorder (“OUD”).²⁵ It is the first FDA-approved prescription digital therapeutic for treating OUD, targeting patients receiving buprenorphine as treatment.²⁶

The mobile app provides innovative programs and exercises for “eliminating positive reinforcement for opioid use and enhancing positive reinforcement for sobriety.” According to Novartis, reSET-O consists of a 12-week interval therapy modeled on the Community Reinforcement Approach. Interactive lessons include cognitive behavioral therapy and skill-building exercises, delivered via text or audio. It also improves communication between doctors and patients by

enabling remote self-reporting on cravings, triggers, and adherence to the buprenorphine therapy.^{27,28}

As the epidemic continues to escalate, the FDA has prioritized reviewing therapeutic solutions for treating OUD. In 2017, reSET-O received an Expedited Access Pathway designation, which included an accelerated review of its regulatory submission.²⁹ The FDA’s clearance decision was partly based on a clinical trial sponsored by the National Institute on Drug Abuse (“NIDA”) which concluded the use of reSET-O “significantly improved retention in outpatient treatment when compared to a control group.”

High relapse rates and low retention rates present a significant gap in patient care. Currently, about 13 percent of outpatient facilities across the country offer MAT. The companies hope releasing reSET-O will help accelerate MAT adoption and use.³⁰

²⁵ Truong, K. (2018, December 20). Opioid addiction app from Novartis and Pear Therapeutics gets FDA nod. Retrieved December 27, 2018, from <https://medcitynews.com/2018/12/opioid-addiction-app-from-novartis-and-pear-therapeutics-gets-fda-nod/?rf=1>

²⁶ Sandoz Inc. and Pear Therapeutics Obtain FDA Clearance for reSET-O(TM) to Treat Opioid Use Disorder. (2018, December 10). Retrieved December 27, 2018, from <https://www.novartis.com/news/media-releases/sandoz-inc-and-pear-therapeutics-obtain-fda-clearance-reset-otm-treat-opioid-use-disorder>

²⁷ Ibid.

²⁸ Truong, K. (2018, December 20). Opioid addiction app from Novartis and Pear Therapeutics gets FDA nod. Retrieved December 27, 2018, from <https://medcitynews.com/2018/12/opioid-addiction-app-from-novartis-and-pear-therapeutics-gets-fda-nod/?rf=1>

²⁹ Ibid.

³⁰ Ibid.

Correlated Crisis

Uptick in Infective Endocarditis Amid the Opioid Epidemic

In 2017, the CDC reported that diagnoses for endocarditis combined with drug dependence had increased approximately twelvefold in North Carolina from 2010 to 2015.³¹ Infective endocarditis is a bacterial infection in the heart valves or in the inner lining of the heart chambers³² that may develop into intractable congestive heart failure and myocardial abscesses. The infection can lead to death if not treated in a timely manner.³³

North Carolina has experienced a higher opioid overdose death rate – 15.4 deaths per 100,000 persons, compared to the national rate of 13.3 deaths per 100,000 persons. In fact, the state’s opioid-related

mortality rate has nearly doubled from 8.1 deaths per 100,000 persons since 2010. Furthermore, from 2010 to 2016, the annual number of heroin-related deaths increased from 39 to 544, and the annual number of deaths related to synthetic opioids rose from 170 to 601.³⁴

According to a new study using the North Carolina Hospital Discharge Database released in December 2018, drug use-associated infective endocarditis and valve surgeries increased more than 12 times in the state as the opioid epidemic escalated from 2007 to 2017.³⁵ Annual infective endocarditis hospitalizations grew from 0.92 to 10.95 per 100,000 individuals in the state over the same time period. Additionally, valve surgery admissions grew from 0.10 to 1.38 per 100,000 persons per year.³⁶

The study included 22,825 adults hospitalized for infective endocarditis, of which 11 percent could be associated with the patient's drug use. During the last

³¹ Fleischauer AT, Ruhl L, Rhea S, Barnes E. Hospitalizations for Endocarditis and Associated Health Care Costs Among Persons with Diagnosed Drug Dependence — North Carolina, 2010–2015. Retrieved on December 18, 2018 from <https://www.cdc.gov/mmwr/volumes/66/wr/mm6622a1.htm>

³² Select Infective Endocarditis: Symptoms, Diagnosis, and Treatment. Retrieved on December 18, 2018 from <https://www.healthline.com/health/infectious-endocarditis>

³³ Infective Endocarditis. Retrieved on December 18, 2018 from <https://emedicine.medscape.com/article/216650-overview>

³⁴ North Carolina Opioid Summary National Institute on Drug Abuse. Retrieved on December 18, 2018 from <https://www.drugabuse.gov/drugs-abuse/opioids/opioid-summaries-by-state/north-carolina-opioid-summary>

³⁵ Schranz AJ, Fleischauer A, Chu VH, Wu L, Rosen DL. Trends in Drug Use–Associated Infective Endocarditis and Heart Valve Surgery, 2007 to 2017: A Study of Statewide Discharge Data. *Ann Intern Med*. [Epub ahead of print] doi: 10.7326/M18-2124

³⁶ Lou, N. (2018, June 12). Opioid Crisis Linked to Spike in Infective Endocarditis. Retrieved December 27, 2018, from <https://www.medpagetoday.com/publichealthpolicy/opioids/76669>

year of the study, 42 percent of all patients who underwent endocarditis valve surgeries in the state were drug users. The study concluded that the increase in drug use-associated infective endocarditis is "largely attributable to opioids" and "aligns with the growing number of deaths from heroin and synthetic narcotic use in North Carolina, which began an acute upward trajectory in 2014."³⁷

The study authors suggested that "a rational public health approach would prioritize funding of inpatient and outpatient drug use disorder treatment, harm reduction, and other activities to prevent infective endocarditis." Insights on the increasing number of patients with drug use-associated infective endocarditis should reshape "the scope, type, and financing of health care resources" used to effectively treat and prevent infective endocarditis.^{38,39}



³⁷ Ibid.

³⁸ Ibid.

³⁹ Schranz AJ, Fleischauer A, Chu VH, Wu L, Rosen DL. Trends in Drug Use-Associated Infective Endocarditis and Heart Valve Surgery, 2007 to 2017: A Study of Statewide Discharge Data. *Ann Intern Med.* [Epub ahead of print] doi: 10.7326/M18-2124

Appendix A: Mission LISA Overview

[Mission LISA](#) is a data aggregation project surrounding the opioid crisis in America. The objective of the project is to leverage publicly available data to fill knowledge gaps relevant to opioid addiction prevention, treatment, and interdiction. Intelligence developed through Mission LISA is used to publish recommendations for policy changes, addiction treatment pathways, and prescription protocols based on the most timely and relevant predictive indicators of addiction and mortality risk.

Early stage outcomes on addiction and mortality caused by prescription and illicit opioids are beginning to reveal the power laws, or distributions, of addiction and overdose—a defined set of variables and conditions that drive the crisis. These insights are used to direct policy and treatment recommendations published by the Mission LISA team and its advisory board. Analytics on nationwide treatment efficacy is another critical area of our research. More relevant and timely data increases transparency around government-funded treatment programs and is useful

for directing the allocation of funding and resources to programs with the highest historical rates of success.

Our research illuminates contradictions in policy and prescription protocols across physicians, hospitals, and insurers. Insights gained through this analysis yield data-driven policy recommendations and opportunities to enhance and streamline opioid addiction care and pain treatment. Through Mission LISA, we seek to alleviate the crisis nationally by lessening instances of opioid-induced overdose and addiction.



Appendix B: How to Read This Report

The Mission LISA Opioid Crisis Intelligence Report provides discussion and analysis of key data, events, and trends surrounding the national opioid epidemic. Analysis draws on data observed in Lumina's proprietary Mission LISA data systems and published across news media platforms over the past month. Our analysts capture data relevant to crisis prevention, addiction treatment, policy, and ongoing interdiction efforts from across the Internet to pinpoint critical developments in the national discussion.

Each report begins with an executive summary of its contents. The executive summary is followed by a commentary that describes current trends and analysis drawn from ongoing Mission LISA data aggregation and development.

The report is broken down by content category for expedited navigation. We summarize relevant articles to highlight important findings and insights and underline action items derived from new intelligence. The purpose of this report is to inform understanding

of the national crisis and provide recommendations for data-driven solutions to curb opioid-induced mortality and addiction.

