Resultant

Disrupting the Opioid Epidemic **with Data Analytics**

With a record high 33,000 US opioid related deaths in 2015—and numbers that are steadily increasing—it's a problem that isn't going away soon.

CONTENTS

The Current State of the **National Opioid Epidemic**

The use of prescription and non-prescription opioids—including Percocet, Vicodin, OxyCodone, OxyContin, and fentanyl—has reached epidemic proportions in the United States.[1] In 2015, deaths from heroin surpassed gun homicides, and overdose deaths were nearly equal to automobile accident deaths.[2] Ninety-one deaths per day are attributed to opioid overdoses, and those numbers may well be underestimated. "While my research cannot speak to what percent we are underestimating, we know we are missing cases. It does seem like it is almost an iceberg of an epidemic," says US Centers for Disease Control and Prevention Field Officer, Victoria Hall.[3]

WITH A RECORD HIGH 33,000 US OPIOID-RELATED DEATHS IN 2015—AND NUMBERS THAT ARE STEADILY INCREASING—IT'S A PROBLEM THAT ISN'T GOING AWAY SOON.

Significant efforts are being made across the nation to combat the epidemic, including primary prevention through educational initiatives, consistently supporting prescription drug monitoring programs, implementation of naloxone distribution programs, and aggressive law enforcement efforts.[4]

But in addition to national efforts, the opioid epidemic requires a local, collaborative effort among all affected resources—from hospitals to law enforcement to social services groups. It's a complex, multifaceted problem that's difficult to understand, and local collaboration helps everyone combat the problem with increased awareness, extended knowledge, and a unified approach. Technology is a key player in helping all involved better understand the issues and in measuring the success of local initiatives.

A Multifaceted Approach

Indiana alone reports a 500% increase in annual opioid overdoses since 1999. In response to the epidemic, the state recently applied for and received a Substance Abuse and Mental Health Services Administration (SAMHSA) grant to help fund initiatives to address the problem. In addition, Governor Eric Holcomb recently appointed Jim McClelland as Indiana's Drug Czar.

As the epidemic continues to grow exponentially, Indiana is also addressing the problem by engaging a governor's task force to bring together a variety of different local leaders—all of whom are directly affected by the opioid epidemic—including law enforcement officials, public health administrators, and emergency response and treatment professionals. The goal? To break down the information silos among agencies and systems in order to obtain a "big picture" view of the problem. With that information at hand, the State intends to implement a range of treatment and prevention options.

It remains challenging, however, to accurately determine which initiatives need to be implemented, which measures are producing results, and where more resources need to be allotted. Additionally, most of the current approaches to combating the epidemic are reactive versus proactive—meaning agencies are best equipped to respond to a crisis situation after it occurs. It's imperative, of course, to treat individuals who have already overdosed, but perhaps even more importantly, anticipating and preventing the overdose from happening in the first place is the most effective means of addressing the bigger issue. Measures including developing educational initiatives for both schools and communities, determining effective treatment center placement, establishing rehabilitation programs, identifying high-risk individuals, and instituting prescription drug monitoring programs are vital components of proactively combating the epidemic.

> "Indiana's new Drug Czar position will provide the urgent and concerted attention required to effectively reduce the impact drug addiction is having on families, individuals, and children."[5]
>
> **ERIC HOLCOMB**
> GOVERNOR, INDIANA

Harnessing the **Power of Data**

The place to begin? Data. It's messy, it's usually siloed, and everyone has it—typically in abundance. The key is to aggregate it, to derive understanding from it, and provide a comprehensive picture.

Take, for instance, the amount of opioid-related data available across city, county, and state agencies. There are records existing for legal and illegal drugs, addiction treatment, overdoses, pharmacy robberies, and deaths. But the data is complex, sometimes conflicting, and usually resides in multiple, unrelated places. It requires a comprehensive and analytical look at all the data to better understand the scope of the problem.

To address the issue of disparate data, the State of Indiana and Resultant developed the Management and Performance Hub (MPH)—a solution that combines data and sophisticated analytical techniques to help determine the underlying drivers of individual problems. MPH links all existing data, which ultimately creates a more comprehensive data set that can be used as a starting point for analysis and action.

Resultant and the State of Indiana have also worked together to create a system that brings both data and state leaders together to help identify the Key Performance Indicators (KPIs) driving the opioid epidemic. The leader panel is committed to helping figure out what data needs to be shared, how they can most effectively use it, and how to put recommendations into practice quickly.

The place to begin? Data.

How do you accurately determine...

- Which initiatives are likely to be most successful?
- Which programs are producing results?
- Where do more resources need to be allotted?

Innovative Technology That **Enables Educated Action**

County health professionals, agencies, and groups dedicated to combating the opioid epidemic typically collect large data sets. However, multiple issues with the data prevent it from being used to make holistic, well-informed policy decisions. Overcoming these barriers all start with the right foundation – a tool that aggregates data to enable interaction with the data. Once in place, the data can then produce insights that lend to combating the epidemic. With the right tool in place, it is then possible to transform data from messy, isolated, and stale into clean, integrated, and usable with the help of specific modules developed by Resultant. These modules include:

DATA MODULES:

- Person Matching and De-Duplication
- De-Duplication
- Overdose Classification
- Drug Name Clean-Up and Standardization
- Rate Smoothing
- Aberration Detection

RECORD LINKAGE TO JOIN DISPARATE DATASETS

A prescription for Fentanyl was filled for John Doe. Johnny Doe was treated in the ER for a drug overdose. A death certificate states John R. Doe, Jr. died of a drug overdose. Having the ability to understand these three records from three different databases all reference the same person enables more advanced and insightful analysis to be performed and previously undetectable connections and correlations to be found. Even when there are no common identifiers, identifiable fields are incomplete, last names are changed, numbers are transposed, or misspellings occur, Resultant's record linkage algorithm enables users to combine data from multiple systems to obtain a more complete and accurate view of the data.

DE-DUPLICATION

Has Jane Doe received prescriptions for opioids from more than one prescriber over the last three months? It seems like an easy question to answer, but often data quality issues or purposeful manipulations of identifying details (e.g., name, address, phone number, etc.) across systems make this answer very difficult to attain. The issue is compounded when the drug identifiers are also missing, altered, or incorrect. Resultant's de-duplication algorithm identifies database records that refer to the same individual or item, enabling more accurate analysis and aggregation.

OVERDOSE CLASSIFICATION

When a patient visits the emergency department, health care workers record his or her "chief complaint" in a few abbreviations, words, or sentences. This free-form text can contain medical shorthand, misspellings, and multiple different ways to indicate the same symptom. Resultant's algorithm classifies whether each emergency visit was related to a drug overdose or not, allowing the data to be used as part of an early warning system for drug overdoses.

DRUG NAME CLEAN-UP AND STANDARDIZATION

The Food and Drug Administration (FDA) currently tracks over 200,000 legal drugs. The Drug Enforcement Agency (DEA) also tracks a sizable number of illegal drugs. State forensics labs test many suspicious substances confiscated by law enforcement officers—both legal and illegal. And EMS responders might identify the drugs involved in a patient's overdose. In each of these scenarios, a drug may be identified by its brand name, generic name, chemical composition, or street name. The Resultant drug name standardization module helps create a common naming and classification system so drugs of interest can be more easily identified and more accurate aggregations and comparisons can be made.

RATE SMOOTHING

A small, rural county might list one overdose death in 2015 and three in 2016. But questions remain: based on the county logistics, is this a significant increase? Is it a red flag? The rate smoothing module helps equalize these types of rates to determine if the changes are significant and whether they require a closer examination. It also helps data scientists predict future expected rate changes as well.

ABERRATION DETECTION

Is there a county that has recently reported a significant increase in fentanyl overdoses? Is there an overdose outbreak occurring in an unexpected location? If so, authorities must be informed so they can provide increased coverage and awareness. The aberration detection module helps leaders identify patterns over spaces and time to enable others to take immediate and effective action. In addition, death classifications can often be misleading and/or incomplete. Aberration detection helps analysts determine whether or not a death—or a number of local deaths—attributed to cardiac arrest might have actually been an opioid overdose.

Resultant is committed to working with local leaders to develop strategies based on their unique needs and situations. The proprietary modules that are available enable county and state leaders to drill down into their most pressing problems and develop a data-driven solution.

Indiana
A State that Works

USE CASE: THE STATE OF INDIANA

Situation:

Currently, the State of Indiana has 13 active opioid treatment centers and were granted the ability to add five additional programs.

Challenge:

Determine where the treatment centers were most needed throughout the State.

Results:

By analyzing the data, the team identified:

1. Where the greatest need for treatment centers was
2. Which programs were over capacity
3. Where the five new centers would be most effective

Taking the **First Step**

Local agencies—from the Department of Health to the State Police to Social Services to drug courts, county hospitals and health departments, and other local health providers—have numerous questions about the opioid epidemic. Where are overdoses happening?

Which pharmacies are being robbed? Where are the most drugs being confiscated off the streets? Which health care clinics need to stock more Naloxone? Answers to these questions—which also help agencies develop communications and action plans—are found in the data.

As a prime example, the Indiana Department of Mental Health and Addiction (IDMHA) had thirteen active opioid addiction treatment centers across the state last year. They were granted an additional five locations, and the challenge was to determine the where the new centers were most needed. By analyzing their data with Resultant's solution, IDMHA was able to identify where the greatest need was, which current treatment centers were over capacity, and where the five new clinics would be most necessary… and most effective.

The first step, and often the most difficult, is to figure out where to get started. Our team is ready to help any county, city, or agency interested in exploring data-driven solutions by first honing in on their most pressing opioid-related issues. Then, our team can help assess which data sets can help them address their problem and analyze that relevant data to begin informing future decisions.

Perhaps the biggest challenge, however, is constraining the project scope in order to achieve success. Data can be overwhelming, and without a solid focus, it can quickly and easily become unmanageable. Resultant's strength is in its data experience. By cleaning, managing, and standardizing the appropriate data with its proprietary solutions, Resultant can help local leaders address their most pressing, unique opioid-related problems.

How to Get Started

1. Focus on your most pressing opioid related issues
2. Assess which data sets can help address the epidemic
3. Link data together to begin informing future decisions

TIP Constrain the scope of your first issue to ensure success.

[1] United States Drug Enforcement Administration

[2] "Inside a Killer Epidemic: A Look at America's Opioid Crisis;" New York Times; January 6, 2017

[3] "Opioid Epidemic May Be Underestimated, CDC Report Says;" Susan Scutti; CNN; April 25, 2017

[4] "What is the Federal Government Doing to Combat the Opioid Abuse Epidemic;" Nora D. Valkow; National Institute on Drug Abuse; May 1, 2015

[5] "New Indiana Governor Creates Drug Czar Position;" Christine Vestal; Stateline: The Pew Charitable Trusts; January 12, 2017

ABOUT RESULTANT

Our team believes solutions are more valuable, transformative, and meaningful when reached together. Through outcomes built on solutions rooted in data analytics, technology, and management consulting, Resultant serves as a true partner by solving problems with our clients, rather than for them.

DATA ANALYTICS

We help organizations understand their data landscape and solve problems by turning data into insight. While data can be dense, our team's empathetic approach to problem solving creates meaningful solutions with deep technical foundations.

Learn more about Resultant data analytics services.

VISIT **RESULTANT.COM.**