

Strength in Numbers

Leveraging the power of
cross sector collaboration
and data analytics
to combat the opioid
epidemic



Executive Summary

Not since the 1980s AIDS crisis has an epidemic killed Americans at such an alarming rate. Today, opioid addiction has evolved into a nationwide public health crisis. The economic toll is staggering, and so are the societal and emotional costs. Practical health policies and programs are needed to address this public health crisis.

State and local governments, the medical community, and educators are exploring innovative approaches to address the epidemic. However, there are many challenges involved in fighting the opioid epidemic, from lack of data and effective legislation to budget limitations. It will take the engagement of a broad range of stakeholders – including the support networks surrounding those suffering from opioid addiction—to meet these challenges. Success will require cross-sector collaboration, data-driven insights, and effective data governance.

We highlight the lessons learned from a major initiative by the Massachusetts Department of Public Health and offer a number of recommendations for addressing the crisis of opioid abuse that can be applied by any state or locality.

Opioid addiction in the United States

Our nation is facing a growing silent killer: Opioid addiction. Today, opioid overdoses are taking more American lives than car accidents. The rapid growth of opioid addiction poses an enormous risk to the US population, regardless of race, gender, age, and socioeconomic status. The economic costs are massive: According to a recent article in the *Journal of Population Health Management*, the opioid epidemic drains more than \$125 billion from the US economy each year.¹ That total includes an estimated \$73 billion in drug diversion – the cost of prescription drugs consumed by those without a prescription – and an estimated \$55 billion in healthcare, workplace, societal, and criminal justice system expenses.² The societal and emotional cost to communities and families is even greater. Every 19 minutes, an American dies from an opiate overdose. Those who survive live with an ongoing risk of relapse and can experience permanent brain changes that impact their lives forever. And the damage isn't limited to those who suffer from addiction; the opioid epidemic also affects the loved ones who support and depend on them.

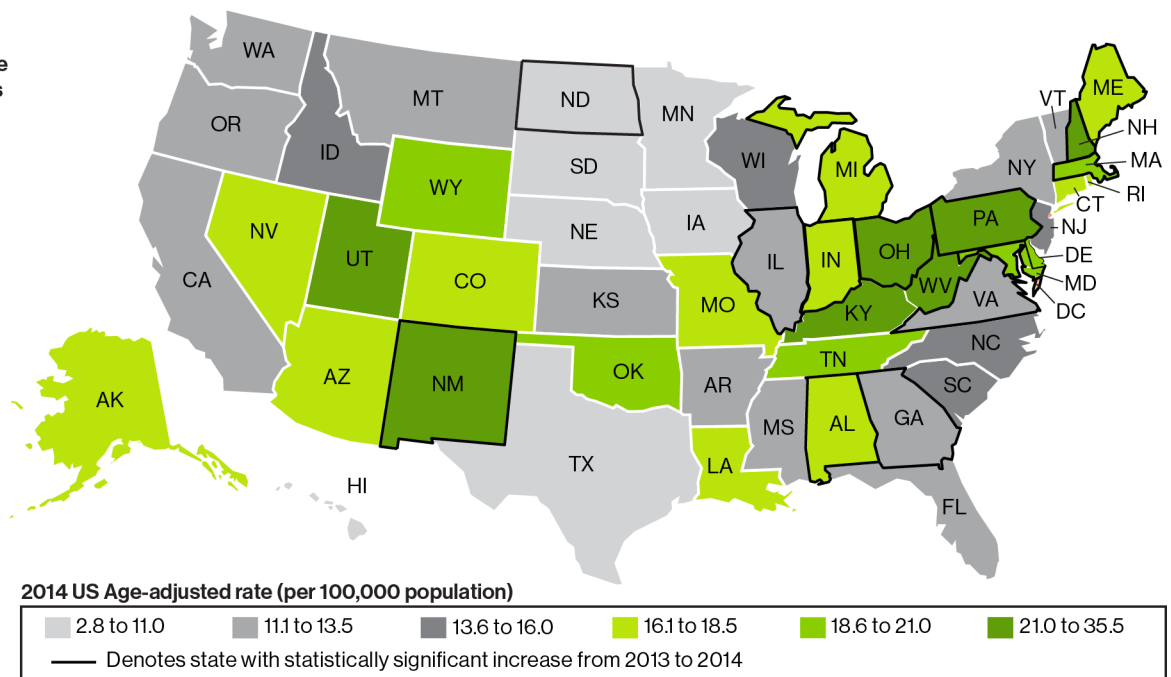
Most devastating is the impact on the youngest generation growing up in this environment: children who witness their parents' addiction, are abandoned, or born addicted. In a Huntington, West Virginia hospital, one in ten newborns endures withdrawal from some type of drug, if not multiple drugs. The hospital has had to open a separate unit for these suffering babies whose parents are mostly absent.³

Drug overdose deaths by state and drug overdose increase rate (2013-2014)

Statistically significant drug overdose death rate increase from 2013 to 2014, US states

State	Percent Change from 2013-2014
ND	125
NH	73.5
ME	27.3
NM	20.8
AL	19.7
MD	19.2
MA	18.8
OH	18.3

* Data from CDC

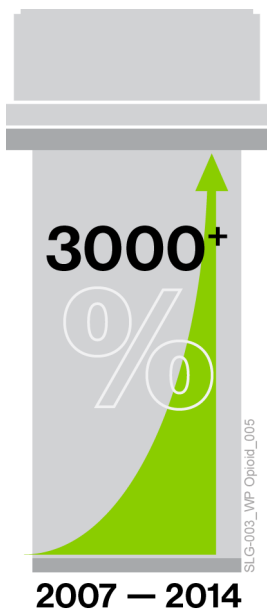


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¹ Janice L. Clarke et al, "The American Opioid Epidemic: Population Health Implications and Potential Solutions: Report from the National Stakeholder Panel," *Population Health Management*, Volume 19, March 2016. <http://online.liebertpub.com/doi/pdf/10.1089/pop.2015.0144>

² Ibid

³ <http://www.cnn.com/2016/09/16/health/huntington-heroin/index.html>



“According to a 2016 study, private insurance claims with an opioid dependence diagnosis rose more than 3000% from 2007 to 2014”

Alarming Statistics

Opioid addiction has spread widely across the country and has grown disproportionately within many Eastern states. Furthermore, yearly monitoring from the CDC shows that in a number of states the epidemic has grown at an alarming pace. In North Dakota and New Hampshire for example, overdose deaths increased by 125% and 73.5% respectively from 2013 to 2014. The heat map below shows drug overdose deaths by state and highlights areas with significant increase in overdose deaths.

Although there is no single reason why opioid addiction has spiraled out of control in the United States, one likely catalyst has been the dramatic rise in the number of pain medication prescriptions that began in the early 1990s. In 1991, 76 million prescriptions for painkillers were written by doctors, and by 2011 that number had nearly tripled, to 219 million. By 2012, 12 states had more opioid prescriptions than people.⁴ These legally obtained drugs are highly addictive and potentially dangerous. And as the number of prescriptions grew, so did the number of overdoses and the demand for the drugs.

The opioid crisis transcends legal, moral, and ethical debate, and urgently demands practical policy decisions that ensure effective solutions. According to a 2016 study⁵, private insurance claims with an opioid dependence diagnosis rose more than 3000% from 2007 to 2014. Without immediate action, substance abuse, and opioid addiction in particular, may well become one of the biggest public health crises in our nation's history.

Opioid addiction is a chronic and deadly disease that can be addressed through coordinated efforts. States must find ways to collaborate and innovate to develop effective solutions across government, policy, social services, health system, and other stakeholders.

Tackling the opioid crisis: Progress and challenges

Changes in public health policies have been proposed to control the opioid epidemic.

Some progress has been made in bringing stakeholders together to develop collaborative solutions. Recent examples related to the FDA illustrate collaborative approaches to policy change. The agency recently announced that it would begin to institute safety labeling changes for immediate-release opioids.⁶ These labels would feature warnings of the risks of misuse, abuse, addiction, and overdose, based on insights from the medical community. In addition, the FDA has required a shared Risk Evaluation and Management Strategy (REMS) program for manufacturers of many opioid drugs. The program includes elements designed to ensure safe use, including medical education, medical guides for caregivers, and patient counseling advice. And it helps to educate healthcare providers on the label changes on opioid prescription bottles, to ensure that providers understand the risks associated with the drugs.

Once policies are made and programs developed, they must be implemented. Given the complex and overarching nature of this epidemic, successful implementation is a major challenge. It requires time, discipline, and an effective means of monitoring the practical impact of policy. In the FDA example, changing drug labels and providing education won't immediately alter the entrenched behaviors of patients and healthcare providers. In addition, while the FDA may require reporting on training and other safety programs, it can be difficult to link clinical outcomes to policy changes without the right data and analytics expertise. The ability to monitor, analyze, and modify policies and programs will be a key capability to ensure that public health policies and programs evolve and adapt in sync with whatever public health challenge they are combating, including opioid addiction.

⁴ CDC Wide-ranging Online Data for Epidemiologic Research (WONDER). Atlanta, GA: CDC, National Center for Health Statistics, 2016. http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6450a3.htm?s_cid=mm6450a3_w

⁵ FAIR Health, Inc., "The Opioid Crisis among the Privately Insured," July 2016. <http://www.fairhealth.org/servlet/servlet.FileDownload?file=01532000001nwD2>

⁶ "FDA announces enhanced warnings for immediate-release opioid pain medications related to risks of misuse, abuse, addiction, overdose and death," FDA News Release, March 22, 2016. <http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm491739.htm>

Involving the right stakeholders who manage elements of the support network for addiction is critical to ensure effective development and implementation of policy. With broader engagement, there is a greater chance to catch potential flaws in a policy that could later pose challenges to implementation or the realization of the full value of the policy.

Policy design and implementation challenges

The efforts to combat opioid addiction that we have outlined are positive developments that demonstrate a widespread commitment to address the crisis. But the design and implementation of public health policies and programs have had significant challenges and limitations.

Policies do not have an efficient (much less continuous) feedback cycle, due to data collection limitations, lack of authority to make and enforce changes, budgetary considerations, and potential legislative intervention. As an example of how data limitations can combine with budget and enforcement issues to undermine efforts, consider the problem of “doctor shopping,” a practice whereby a patient seeks multiple concurrent opioid prescriptions from multiple prescribers over a short period of time. Healthcare providers could play a pivotal role in curbing this behavior, since they are the primary healthcare touchpoints for patients. But the research shows that providers are not always playing this critical role.

One tool commonly used to address the issue of opioid addiction is a prescription monitoring system, which provides a centralized, shared means for tracking prescriptions written for individual patients, helping to prevent patients from acquiring multiple prescriptions from multiple healthcare providers. While such systems are currently being used by 49 states, not all states mandate that doctors log patient prescriptions. And a recent study conducted by Brandeis University shows that when not required by law to do so, doctors log into these prescription databases only 14% of the time.⁷

This observed behavior highlights a potential flaw in policy. But mandating the use of prescription monitoring comes with its own challenges. It may require legislative or other government intervention (ensuring authority to require and enforce); budget allocations in cases where existing systems are simply not adequate for prescription monitoring requirements; and cross-functional collaboration and cooperation among government, healthcare, and other stakeholders. Even well designed and implemented programs and policies may fall short of their goals if these types of challenges are not proactively addressed.

The need for broad stakeholder engagement

Involving the right stakeholders who manage elements of the support network for addiction is critical to ensure effective development and implementation of policy. With broader engagement, there is a greater chance to catch potential flaws in a policy that could later pose challenges to implementation or the realization of the full value of the policy. Federal authorities can issue national mandates, but the health system and supporting agencies that serve as the primary patient contact points often operate at the state and local levels.

⁷ “Controlled Substance Prescribing Patterns — Prescription Behavior Surveillance System, Eight States, 2013,” Brandeis University and the Centers for Disease Control (CDC), October 16, 2015. http://www.cdc.gov/mmwr/preview/mmwrhtml/ss6409a1.htm?s_cid=ss6409a1_w

To further illustrate the need for broad stakeholder engagement, consider the prescription monitoring program example highlighted above. Policymakers may not be aware of the limitations and challenges that mandatory participation in a prescription monitoring program would create without systemic changes. State and local governments, which administer these programs, will need financial and technological support to ensure consistent access and performance. Providers will need to modify the process by which treatment is rendered to ensure not only that the prescription monitoring system is used during patient visits but that treatment plans and guidelines can adapt to the information provided by the prescription monitoring system. Healthcare payers will also be able to add value by modifying the incentives and reimbursement policies for providers, to motivate compliance with the system. Finally, ancillary and complementary healthcare and social services will need support to “close the loop” and engage patients who are at risk of, or exhibiting symptoms of, opioid abuse, based on provider findings from the prescription monitoring system.

None of these challenges is necessarily insurmountable, but, they all must be considered and addressed proactively during the development of policies such as a national mandate to use prescription monitoring systems. While the expectation of end-to-end involvement from all stakeholder groups for every policy or program is not realistic, it’s important to gain alignment and consensus on how best to implement the policy if the goals and value of the policy are to be fully realized, especially for state governments. For this reason, policymakers and program developers should aspire towards broader engagement.

Steps in the right direction

State governments have recognized that the public health crisis caused by opioid addiction is complex. It’s not enough to treat the overt symptoms of opioid abuse, whether acute overdoses or longer-term addiction. More holistic and innovative approaches are needed.

State governments have sought out new approaches to ensure that the right solutions are deployed, building on national efforts to address state challenges in delivering services and support for opioid abuse prevention and recovery. For example, Massachusetts established a seven day limit on first-time opioid prescriptions. New Hampshire sponsors the commission on Alcohol and Drug Abuse Prevention, Treatment, and Recovery. The commission is comprised mainly of representatives from state agencies and treatment professionals. Its responsibilities include developing a statewide plan for effective

prevention of drug abuse and a system of treatment and recovery services; collaboration between state agencies and communities; promoting treatment services; and identifying unmet needs for the prevention and treatment of drug abuse.

Based on the commission’s recommendations, a number of reforms have been enacted to attempt to alleviate the opioid crisis, including:

- Emergency and permanent prescribing rules, and the requirement that medical, nursing, and dental boards adopt new rules on prescribing set by the state
- Distribution of naloxone (which inhibits opioid intake) to fire departments, and training for first responders and the families and loved ones of opioid abusers, free of charge
- A “Good Samaritan” law, protecting a victim or witness from arrest or prosecution for possession or use of illegal drugs when reporting an emergency
- Crisis line, treatment locator, and regional access points for those in need of care

Other states have developed alternative approaches to address different aspects of the opioid epidemic. In another example, West Virginia has created an inter-professional task force looking to develop successful pain management guidelines for the entire state, which has included representatives from two insurance companies that cover 66% of the state’s population.^{8,9} Payers provide important and complementary perspectives on how to address opioid-related issues, for two reasons: First, payers have access to data that’s not always captured by the state’s continuously evolving drug monitoring programs, and this data can be used to generate insights into opioid addiction; Second, a long-term solution to the problem of opioid abuse must also take into account the costs and challenges likely to be faced by payers should approaches to both acute and chronic pain management undergo widespread changes. Involving these stakeholders early in the process will help to ensure that financial considerations and other constraints affecting payers, government, health systems and patients are addressed during the development of health policy.

Other states have applied this multidisciplinary approach and implemented similar kinds of programs as well. While the epidemic continues, collaboration ultimately will drive the kinds of innovation needed to address the epidemic fully. To that end, Massachusetts has piloted a collaborative approach to combatting this public health challenge. This work, described in more detail near the end of this paper, combines the strengths of government, academia, and industry to execute a comprehensive research effort to inform public policy and establish best practice for other states.

⁸ “WV Expert Pain Management Panel will create pain management guidelines,” West Virginia University, Robert C. Byrd Science Center. <http://www.hsc.wvu.edu/substance-abuse-prevention/community-outreach-initiatives/wv-expert-pain-management-panel-will-create-pain-management-guidelines/>

⁹ Harrison Jacobs, “The state hardest hit by the opioid crisis thinks it has a solution,” April 24, 2016. <http://www.businessinsider.com/west-virginias-solution-to-the-opioid-crisis-2016-4>

Success through innovation

Building on this cross-functional model, an approach to integrate cross-sector collaboration, data-driven insights, and effective data governance as fundamental parts of a program, will enhance the quality and effectiveness of the results of policy changes.

The State of Massachusetts followed this type of approach through a study to provide a deep view into the origins and critical tipping points to opioid addiction. Collaboration among state agencies, health and social services organizations, academia, and the private sector were seminal in advancing the ground-breaking use of data-driven insights from previously untapped data sources.

Why cross-sector collaboration is essential

A collaborative effort across government, industry, healthcare, academia, and social service organizations brings the unique capabilities and insights of each stakeholder into the development of solutions to the opioid epidemic. Drawing on specialized talent from different disciplines allows for a much more robust approach to addressing policy challenges and potentially leads to breakthrough solutions – especially when planned and governed effectively. Collaboration among agencies and organizations should be done laterally, and not simply through the coordination of high-level commissions. This collaboration should be supported and encouraged by leadership.

In the example of the opioid crisis, government has deep expertise in health policy and using data to develop policy, while healthcare and social services professionals bring invaluable insights into the delivery and impact of intervention. Industry can be used both as an innovation engine and a means to develop the solutions to bridge the gap between policy and implementation.

Collaborative efforts also accelerate and ease policy implementation, especially cross-sector implementation, because affected stakeholders have been engaged throughout the process. A collaborative approach builds stakeholder investment across the entire lifecycle right up through implementation, as practical input has already been gathered from the people who actually deliver the services and integrated in the design phase. As a result, what is proposed for implementation has been “approved” by the implementers. To maximize the value of this approach, during the course of collaboration, careful consideration must be made to ensure that the right stakeholders are represented and that the communication and collaboration process is efficient and effective.

How data-driven insights lead to better decisions

Effective policy decisions require data-driven insights. Such insights can be used to develop and test hypotheses that inform policy development, and to measure and analyze the real impact of policy after implementation. The use of analytics in the opioid crisis is particularly powerful because of this; policy can be designed based on data-driven insights, and it can be implemented through giving healthcare providers visibility into clinical data and insights.

At a policy level, data can uncover critical leverage points and drive effective solutions. If the goal is to change behavior, it is vital to understand the data behind the substance abuse and what is driving a record number of citizens to succumb to their addictions. What are the trends and behaviors that lead to addiction? What are trends and behaviors that lead to recovery? Who is at risk? Which treatments and services have had higher success rates? The power of data to answer such questions and find leverage points cannot be underestimated. With the proliferation of a wide range of sources, such as personal medical devices, social media, and electronic medical records, “big data” can transform public health decision-making.

At a clinical level, data can help healthcare providers to monitor the usage of prescription medication and flag early addiction signs so that a crisis can be prevented. Lack of a centralized medical records depository for providers and pharmacists prevents them from gaining a comprehensive view of a patients' prescription activity. This lack of coordinated care management contributes to opioid abuse and overdose death, as patients are able to combine opioids with contraindicated medications, or simply accumulate an excess supply for their own use or diversion. One analysis showed that the chance of a fatal opioid overdose increases by a factor of nearly seven for patients with three or more prescribing providers. Effective access and use of a prescription monitoring program by healthcare providers can mitigate the health risks associated with situations involving poly-prescribers and polysubstance abuse.



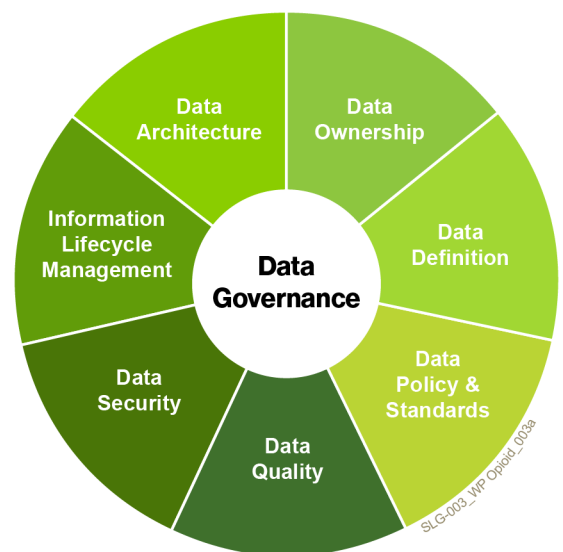
At a policy level, data can uncover critical leverage points and drive effective solutions. But access to data comes with responsibility, which is codified in privacy laws and governance policies for data. Strong controls related to privacy and governance are necessary to prevent misuse of information.

While in theory the use of data-driven insight shows a lot of promise, in reality data has not been used to its fullest potential due to legal, governance, privacy, and even technical constraints as well as evolving technology. In this area in particular, innovation is key, with industry providing new and better solutions to data management and analysis.

Wherever possible, data-driven insights should be considered during policy development to ensure that results can be measured and analyzed. These insights can then be used to update or change the program to ensure greater effectiveness.

How effective data governance can provide access while protecting privacy

Access to data comes with responsibility, which is codified in privacy laws and governance policies for data. Strong controls related to privacy and governance are necessary to prevent misuse of information. These controls become even more important if data sources from different agencies (with potentially different rules and regulations) are combined. Governance will play a pivotal role in this domain by defining which data can be used by which stakeholders and for which purposes. For example, data assembled for the purpose of quantifying the efficacy of a particular intervention should not be repurposed to also analyze another topic or intervention, as this would be out of compliance with effective governance controls and procedures. Furthermore, securely anonymizing data is vital for cross-sector collaboration, as it prevents accidental and intentional identification of individuals.



Recommendations

The key recommendations listed below enable the generation of effective, data-driven insights to support policy changes.



1 Accept Limitations

Government entities must demonstrate a willingness to collaborate with external stakeholders. Although public health issues, such as the opioid epidemic, can be tracked and monitored within government entities, the process can be more effective and efficient if specialists and experts from other groups are included. Further, isolated efforts may require excessive amounts of time and effort and may lead to unattainable or counterproductive decisions. Organizations should demonstrate a willingness to reach out to other constituents and enable an environment of collaboration across organizational boundaries.



2 Develop a Legal Framework

It is imperative to enable a motivated legal department to find ways to make progress towards success, rather than citing obstacles and barriers. Without the necessary legal support and direction, it will be impossible to conduct meaningful, deep analyses that align with laws and regulations designed to protect citizens and institutions. A legal framework should be established and implemented early in the process, to eliminate confusion and define the boundaries within which different teams and organizations operate. Legal departments across government agencies should work together to ensure that linked datasets meet the requirements of all applicable privacy laws and regulations.



3 Establish a Data Advisory and Governance Board

It is necessary to form a data advisory and governance board early in the process, to elevate and formalize the data access and aggregation process and to establish sound data governance and standardization procedures. This board should also work to enable collaboration across government entities, industry representatives, and academic constituents, in order to develop a responsive and comprehensive public health research agenda that aspires to advance public health knowledge and address emergent public health challenges as they arise.



4 Deploy Critical Information Assets

Long-term, robust, and reliable data must be captured across multiple agencies, programs, and domains. A fully integrated and sanitized data lake or warehouse should be established to facilitate anonymous linkage across a wide range of data sources. Another key action is the establishment of a robust technological infrastructure, with appropriate governance, to allow ever larger amounts of data to be accessed by an ever-larger community of collaborators. This would allow new data sources, potentially from new organizations, to be incorporated into the integrated data environment with the necessary privacy protections and analytic utility.



5 Collaborate Across and Leverage Capabilities to Overcome Obstacles

While skills exist and even overlap across groups and sectors, no single organization can address all issues. Organizations must be enabled to come together and work collaboratively. Major hubs, such as Boston, Massachusetts, which serve as home to academic, government, and industry entities, can allow for relationship building and increased collaboration. Decisions can be made faster. Issues can be raised and addressed quickly. Government is the cornerstone providing critical data and knowledge. Academic institutions provide expertise, but they need access to health data to apply their research. Industry provides domain knowledge and expertise in analytics approaches and capabilities, as well as support for process discipline and management. The confluence of each sector's contributions and needs facilitates a positive feedback loop, in which each collaborator enhances and refines subsequent collaboration in pursuit of improving public health. Technology and analysis of existing data can help develop an integrated model for opioid addiction. This model will be integral in identifying leverage points where interventions can be developed.



6 Understand the Obstacles to Change

While cross-sector collaboration may mitigate some implementation challenges, a flexible approach must consider the areas that may require more time and effort to change. For example, if a law is preventing elements of effective data governance, this should be identified early on so that a workaround or potential change in legislation can be socialized. Such obstacles are never insurmountable but often require a creative, disciplined, and patient approach.

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Case Study:

Massachusetts Department of Public Health: Enhanced collaboration and data-driven insights in action

Massachusetts has seen the number of opioid-related deaths in the state grow at an average annual rate of 27% over the last five years, with a record 1,531 of its residents fatally overdosing in 2015 alone.¹⁰ As a response, in 2015 the Massachusetts State Legislature passed Chapter 55, a law calling for an analysis of opioid-related deaths in the Commonwealth. In order to complete this report, representatives from 9 academic institutions, 4 private institutions, and 11 government agencies came together. They identified the highest priority questions¹¹ that could be answered from the linked databases, while developing an analytic plan for obtaining the answers to the selected questions. Specialist teams have worked concurrently to analyze and report findings, within a highly collaborative framework.

Throughout the project, individual privacy was at the forefront and was the prime consideration—even before an innovative virtual data warehouse was developed, which allowed linked data to be shared and analyzed. Legal departments across agencies worked together to ensure compliance with all express and implied privacy laws and regulations. The data infrastructure enabled multiple teams and organizations to collaborate, bound by all applicable laws and regulations.

The system infrastructure allowed for easy scaling of data assets across multiple projects; in this case, the data assets included prescription monitoring data, substance abuse treatment data, ambulance data, vital records, and toxicology reports, among others.

Additional client computers could connect to the virtual data warehouse for additional analytics bandwidth. A privacy layer in between data servers and client machines ensured that key protocols were met, such as secure authorization, no data-write access back to servers, automatic cell suppression, automatic deletion all of temporary work files, and full auditability/traceability of all data operations. The system allowed for data encryption while in transit and at rest, while data linkage would only happen “on the fly” and not at rest.

¹⁰ <http://www.mass.gov/eohhs/docs/dph/quality/drugcontrol/county-level-pmp/opioid-related-overdose-deaths-among-ma-residents-august-2016.pdf>

¹¹ <https://malegislature.gov/Laws/SessionLaws/Acts/2015/Chapter55>

Guidehouse's role on the MA Chapter 55 Opioid Study

Guidehouse's provided the Massachusetts Department of Public Health with expertise in analytics methodology, project management, and cross-team collaboration. We were able to work together with stakeholders to mobilize resources quickly, and allow thought leaders, analysts, and researchers from government, private industry, and academic institutions to establish an analytic research agenda to complement the legislatively mandated report. We facilitated working sessions and provided our analytics framework to enable the highest value research opportunities in an efficient and systematic manner. We helped the Department develop an analytic strategy to obtain answers for the selected research questions.

While the analytic work continues to evolve, important findings have already emerged that can shape the state's response in terms of policy and action.

A few highlights of the findings:¹²

- Based on the available data, opioid related fatalities were overwhelmingly associated with heroin and/or fentanyl. Given fentanyl's low prescription rate among overdose victims (decedents), we infer most fentanyl use is illicit. As a result, two conclusions can be drawn. First, that while legal prescriptions may contribute to public health risk, heroin and illegally acquired fentanyl are the primary culprits behind the recent increase in fatal overdoses. Second, that lifesaving interventions intended to reverse the onset of a potentially fatal overdose should be designed to target heroin and/or fentanyl, the latter of which may require additional doses of Narcan.
- Following a nonfatal overdose, patients receiving opioid agonist treatment (drugs, such as methadone or buprenorphine, which block the effects of opioids) are significantly less likely to die. Based on statistical evidence, strategies, programs, and policies intended to make these medications more accessible to combat opioid use disorders, especially after a nonfatal overdose, should be prioritized.
- Thanks to this novel research project, public health and policy can now be targeted more effectively than before. For example, despite the majority of opioid victims being male users of illegal substances, there was a statistically significant sub-population of women who were more likely to exhibit poly-prescriber (multiple prescribing physicians), poly-pharmacy (filling prescriptions at multiple locations), and poly-drug (multiple substances) behavioral patterns and have a prescription medication on their toxicology screening at death. Solutions like Prescription Drug Monitoring Systems plus bias awareness training can be leveraged to ensure that the concerns for this minority population are not missed as policy gears up to tackle the more visible male user of illegal drugs.
- The risk of an opioid overdose death following incarceration is 56 times higher than the risk for the general public. Medication-assisted therapy and overdose prevention services should be expanded in correctional facilities. Additionally, access to post-incarceration medical care and substance abuse prevention should be established prior to release, to ensure utilization and reduction of risk.

These data points and associated recommendations are based on real data and reflect real targets for which public health official can design policies.

¹² Massachusetts Department of Public Health, "Assessment of Massachusetts Opioid-Related Deaths: Preliminary Findings," July 2016.

Conclusion

The data-driven insights we have described in this paper represent a critical first step in the process of updating policies to deal with the opioid crisis. With these insights in mind, more effective policies can be enacted to address the opioid epidemic. Because the approaches we have described are cross-functional (i.e., involving social and health services), any collaboration previously established can be further leveraged to develop a comprehensive policy. Policy implementation should include both training and installation of mechanisms for monitoring and reporting, to measure the effectiveness of policy changes and inform adjustments to enhance policy effectiveness in the future.

The alarming growth and complex nature of opioid abuse make it clear that new and innovative approaches are needed. The collaborative nature of the Massachusetts Department of Public Health project, coupled with data-driven insights and important governance changes, confirms the power of a collaborative model to deal with dynamic health crises. Strength in numbers—a combined effort of government, health, social services, and industry, with the adoption of cutting edge data analytics—will be key to successfully addressing the opioid epidemic.

About Guidehouse

Following our recent merger with Navigant, we proudly serve both the public sector and commercial markets, with a focus on supporting client needs in Healthcare, Financial Services, Energy, Environment, National Security, and Aerospace & Defense. Our unwavering passion for excellence influences all aspects of our business from our core competencies of leadership, quality, and ethical behavior to our cutting-edge, customized solutions. Our Vision at Guidehouse is to earn a seat at the table for our clients' most complex issues, creating limitless value and meaningful impact for societies and our world. We are committed to partnering with our clients to address the overwhelming opioid epidemic as a critical part of our dedication to our communities and passion to help navigate our clients and communities into a more confident and healthier future.

For more information, please visit: www.guidehouse.com.