

Enabling Opioid Data Sharing in the Northern Shenandoah Valley Region

Madison Lahey
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Disclaimer

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Executive summary

The long-term threat of opioid and drug addiction makes data sharing among local and state agencies and non-governmental organizations a priority. While agencies and organizations may collect data that can elucidate trends in opioid use and help officials decide where to concentrate resources, organizations often collect data in silos. This analysis examines the fundamental institutional barriers to data sharing and offers strategies employed by states and localities to overcome these barriers. The Northern Shenandoah Valley region will serve as the pilot area for expanded data sharing strategies within Virginia; the Department of Criminal Justice Services, in partnership with the Northern Shenandoah Valley Substance Abuse Coalition, was awarded a grant in 2017 to address statewide data sharing efforts.

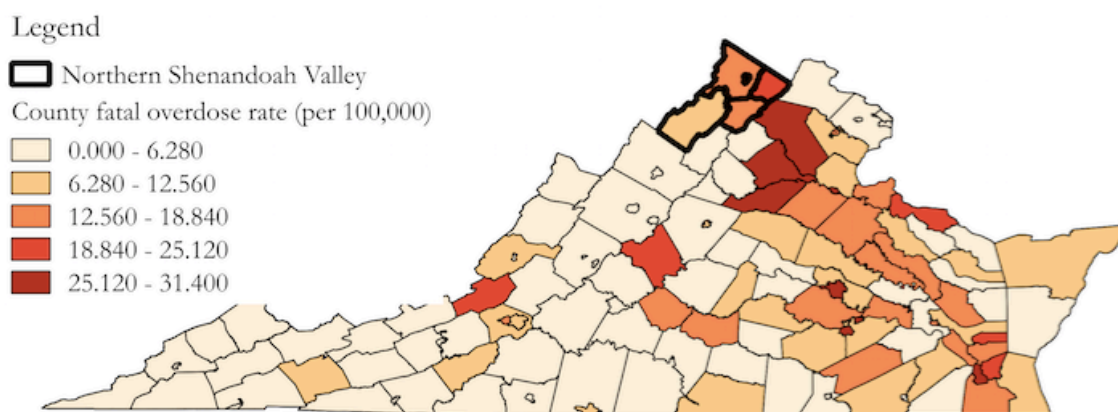
Due to federal privacy restrictions, this analysis centers on sharing trend-level or aggregate data between agencies. This type of data sharing is much easier to facilitate through interagency legal agreements and institutional solutions and can significantly reduce overdose deaths in a given locality. After evaluating several alternatives based on implementation cost, ability to reduce deaths, and ability to incorporate both new data sources and non-governmental organizations, this analysis recommends that the local officials form a Local Overdose Fatality Review Team (LOFRT) encompassing the Northern Shenandoah Valley region. This team will enable more systematic data sharing across agencies and organizations, and expand the efforts that the Northern Shenandoah Valley Substance Abuse Coalition has already undertaken.

Introduction: Stemming the opioid epidemic

The growing crisis of opioid addiction is well documented in the United States. The death toll is staggering and rapidly rising: opioids kill more Virginians than guns or car accidents, and though government, business, healthcare and nonprofit organizations have united to combat addiction the crisis has emerged as a long-term public policy problem. As the initial shock and crisis response of addiction fades, policymakers must consider long-term, sustainable responses to a generationally defining issue. These responses must include accurate, comprehensive, timely data sharing between agencies in public safety, health and social services fields.

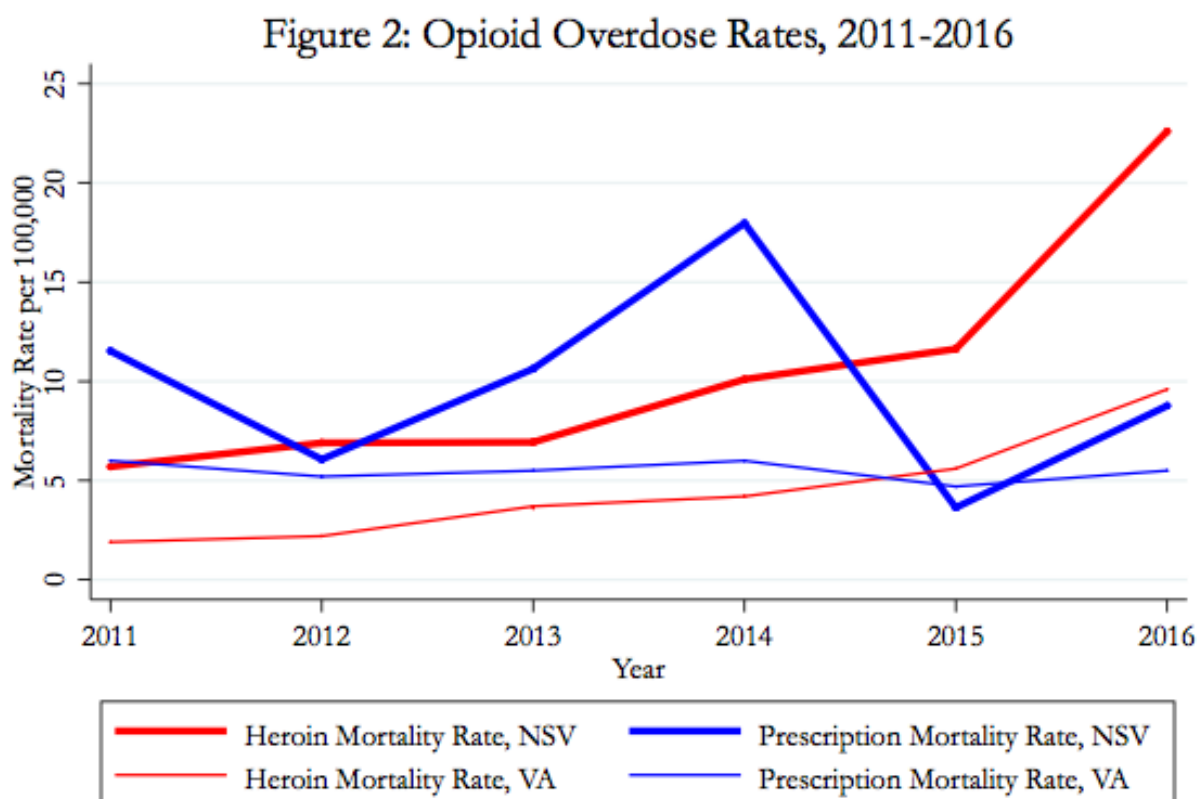
The Northern Shenandoah Valley (including the city of Winchester and the counties of Frederick, Clarke, Page, Warren and Shenandoah) has witnessed an exponential surge in opioid overdoses, opioid patient admissions and opioid-related crimes since 2010. According to the Northern Shenandoah Valley Substance Abuse Coalition (based in Winchester), drug-related arrests increased from around 600 to around 800 from 2012 to 2014 (Hazel et al., 2016). Opioid overdose deaths topped 30 for each year from 2014 to 2017 (in 2012 there was one opioid overdose death in the region). The intersection between opioid use and crime is especially prevalent in the Northern Shenandoah Valley region: in Northern Virginia, heroin and fentanyl use is relatively higher compared to prescription opioid use in southern Virginia. Thus, the opioid epidemic has caused increases in opioid-related crime and overdoses in the Northern Shenandoah Valley region since 2012 (Virginia Department of Health, 2018). Figure 1 shows the relatively high rate of fatal heroin overdoses in the Northern Shenandoah Valley region.

Figure 1: Heroin overdose rate by county, VA 2016



Source: Virginia Department of Health, 2016

Additionally, heroin use has increased dramatically in the Northern Shenandoah Valley region compared to the state's average trends. While fatal prescription overdoses in the region reflect relatively stable trends, the fatal heroin overdose rate rose drastically between 2014 and 2016.



This trend indicates that, beyond the prescription monitoring and restrictions that states and localities have enacted in the past five years, increased law enforcement and public health resources will be necessary to respond to growing illegal opioid use. Data sharing among agencies supports agencies as they work to place resources in the best areas to stem addiction and overdose.

Background

Key stakeholders

Timely, coordinated data collection facilitates a community response to the criminal and health implications of opioid abuse. Little formal infrastructure currently exists in the Northern Shenandoah Valley for such data collection and sharing. Data regarding opioid use spans multiple state agencies and non-governmental organizations. Relevant data that might help law enforcement locate “batches” of illegal fentanyl or heroin include time and location of overdoses, arrest and incarceration of residents, hospital admissions, and type and number of prescriptions. Different agencies are responsible for collecting overdoses (EMS/Office of the Chief Medical Examiner), arrests and incarceration (Virginia State police, Department of Corrections, local jails), and prescriptions (hospitals and the Department of Health Professions). At present, these agencies do not have a coordinated method for sharing crucial data that indicates opioid abuse, and some agencies lack standards to ensure timely data collection and monitoring.

In 2017, the Department of Criminal Justice Services (DCJS) received a Technology Innovation for Public Safety (TIPS) grant of over \$496,000 from the Department of Justice. DCJS will administer this grant in partnership with the Northern Shenandoah Valley Substance Abuse Coalition (NSVSAC) to develop a system of data sharing between government and non-government agencies. Considerations for this system include potential legal barriers (including privacy regulations like the federally mandated HIPAA regulations), financial and political concerns. The Coalition’s participants include law enforcement, health care, substance abuse treatment, youth advocate, faith-based and family stakeholders. DCJS and NSVSAC must develop a system for data sharing within the Northern Shenandoah Valley region in order to administer the TIPS grant.

Statewide data sharing developments: 2014-2018

State legislation surrounding the opioid crisis has focused on strengthening the Prescription Monitoring Program and expanding access to Naloxone among EMS, law enforcement and citizens. Legislation in the past four years has significantly altered guidelines for prescribing and reporting prescriptions of opiates. In 2016, the General Assembly placed more stringent requirements on opioid prescribers and their interaction with the electronic Prescription Monitoring Program (PMP) when they prescribe opiates. SB513 changed the requirement for prescribers to reference PMP when they prescribe a course of more than 90 days of opioids to more than 14 days of opioids. In 2017, HB1885 further reduced this requirement to include opioid prescriptions over 7 days of treatment (Hazel & Moran, 2017). This bill is designed to make prescribers aware of other prescriptions their patients might hold. Additionally, SB287 reduced the dispensing reporting time in PMP to 24 hours from 7 days after prescribing any opiates. Legislation in 2017 drastically expanded the PMP: SB1230/HB2165 mandated electronic prescribing for all opioid prescriptions by 2022

(ibid). These changes enhanced physicians' ability to know their patients' clinical histories and any other opioid medications they have.

Other alterations in the past three years affect the quality of information among the medical community regarding opioids. For instance, HB1841 in 2015 required every opiate dispenser to register with the PMP as of January 1, 2016. There had previously been a delay in registration for some dispensers. HB1738, also in 2015, required hospices to notify every pharmacy that had prescribed opioids to a patient upon the death of that patient to prevent false identity prescriptions (ibid).

Beyond the PMP, the General Assembly passed significant data sharing legislation in 2018. SB580 established a new Chief Data Officer position within the Secretary of Administration. The Chief Data Officer will oversee data sharing in the Commonwealth and develop guidelines for state agencies regarding data sharing, with a particular focus on the opioid addiction and overdose (Code of Virginia, §2.2-203.2:4). It is unclear how the Chief Data Officer will affect data sharing agreements within state and local stakeholders, but ideally sustained resources and personnel to data sharing will help improve coordination.

Ultimately, most coordinated data sharing legislation from the state centered on prescription opioid reporting guidelines. This data sharing has already reduced the number of prescriptions in Virginia; however, these efforts make little progress in addressing heroin and other illegal drug use.

Current approaches and challenges to opioid data sharing

The following section assesses the current status of opioid-related data sharing in academic literature and across states and localities. Academic literature answers the questions: What is effective in and what are the pitfalls of interagency data sharing related to opioid abuse? This question has several facets, including determining what types of data are best suited to help law enforcement agencies reduce opioid-related crime, what approaches states have taken to share data across agencies and with non-governmental sources, and what common legal barriers exist to such efforts.

Opioid data: what works?

There is some consensus surrounding what data is useful for identifying decision points and responding to the opioid crisis. Identifying this data is a crucial first step in data sharing. Indeed, a "Big Cauldron" of unsifted, meaningless data can actually hinder agencies' ability to make sense of all the information presented (Goldstein, n.d.). One natural hub of data is medical examiner data on overdose deaths. This data often includes demographic information, geographic location and toxicology reports that identify specific drugs involved in fatal overdoses (Jay, 2017). This data allows local law enforcement to track specific shipments of illegal drugs down to the neighborhood and respond to a spreading outbreak. However, medical examiner data is often released on a time lag and only represents a small percentage of opioid users: this must be supplemented by other datasets. Datasets that localities identify as useful include EMS and ED data (these sources are traditionally not integrated), National Poison center

data, naloxone distributions and prescription data (Massey, 2017; Northwest Ohio Opioid Addiction Treatment Planning Task Force, 2017; Cherico-Hsui et al., 2016).

Prescription monitoring data is the most widely used type of data to combat opioid overdoses by identifying within-state and interstate “doctor shopping.” Doctor shopping, or the practice of obtaining multiple prescriptions for opiates from multiple doctors, either within one state or across state borders, was identified as a driver of opioid addiction, overdoses and crime. Doctor shoppers traveled a median of almost 200 miles across state lines to fill prescriptions, a finding that prompted many states to increase the scope and frequency of prescription data collection. The next section discusses the Prescription Monitoring Program as a key data source and the original vehicle for interagency data sharing (Cepeda et al., 2013).

Initial data sharing: effectively using the Prescription Monitoring Program

The Prescription Monitoring Program (PMP) presents the lowest barrier to entry for opioid data sharing within state agencies and across state lines. All states have active Prescription Monitoring Programs as of the end of 2017 (Rosenbaum, 2017). From 1998 to 2017, states significantly strengthened the laws surrounding mandatory reporting and consultation of the PMP by prescribers and decreased the standard reporting time (Davis, Pierce & Dasgupta, 2014). The states with the most effective PMPs have timely reporting schedules (either within 24 hours or within one week), require all prescribers to register with and review the PMP before prescribing opioids, and cover Schedule II-V controlled substances in their reporting schemes (Greenwood-Ericksen et al., 2015). Virginia’s Prescription Monitoring Program guidelines meet some of these criteria: as of 2017, Virginia requires prescribers to report prescriptions of Schedule II-IV substances within 24 hours, and to consult the PMP before prescribing opioid courses of longer than 14 days (Virginia Department of Health Professions, 2017). Virginia’s PMP guidelines are stricter than the national average, and encourage prescription data collection.

Researchers have demonstrated that the PMP is a valuable tool to identify at-risk communities that require a response from law enforcement or health officials. As early as 2010, researchers identified a statistical practice to locate communities with high incidence of “questionable” prescription activity (Katz et al., 2010). Indeed, the PMP was initially designed to help law enforcement officials combat drug abuse (Hildebran et al., 2014). Current PMP users also express a desire to collaborate with law enforcement in order to more effectively respond to trends in PMP data (Rutkow et al., 2017). The PMP is the most developed example of how analysis of current data trends assists non-health agencies in placing resources efficiently.

Legal considerations

Federal law and individual data sharing

Several federal regulations govern individual data sharing in the healthcare and substance abuse arenas. The primary source of information sharing regulation originates in the Health Insurance Portability and Accountability Act (HIPAA) and is detailed in guidance by the Office for Civil Rights (OFCR). Broadly, current regulations

prohibit sharing individual health information to non-medical entities, except in specific cases such as medical emergencies and criminal investigations. These restrictions only apply to information directly linked to individuals' identities---criteria like name, entire zip code, birth date, telephone number, etc., all fall subject to these regulations. De-identified or anonymous information (number of admissions, time trends, vague demographic information, etc.) can be shared relatively freely (Office for Civil Rights, 2018). Barring a direct administrative request for individual information in one of the scenarios outlined above, individual health information cannot be linked with that individual's information from other agencies or organizations.

HIPAA's preeminence in data sharing has practical implications for the legal and political feasibility of data sharing. The legal consequences of HIPAA are clear: aggregate, trend-level data sharing will likely be appropriate across agencies; individual health information like overdose admission will not be. Put simply, a central database complete with a name search that can track a person's involvement with the health, correctional and treatment spheres is not possible. HIPAA is ubiquitous among healthcare providers, and the threat of violating HIPAA dissuades many providers from engaging in information sharing, even if conducted legally (Campanelli, personal communication, 2018). Thus, any data sharing efforts must be undertaken with 1) comprehensive explanation of the legal boundaries surrounding data sharing and 2) genuine buy-in from healthcare providers who may be justifiably concerned about HIPAA regulations.

Addressing legal considerations: MOUs and other approaches

There is some debate as to how agencies should collaborate when sharing data. Maryland's case makes a strong argument for codifying data agreements through unique memoranda of understanding (MOUs) between each agency. Maryland improved its opioid data sharing across health, social services and criminal agencies by designating one lead agency and drafting MOUs that specified the type, scope and confidentiality of data to be shared (Cherico-Hsui et al., 2016). After implementing its data sharing agreements, the state lead agency identified new trends, including an at-risk period of one week after incarcerated persons were released. Maryland's case provides evidence for centralizing data sharing under one authority and explicitly codifying agreements between agencies.

Other policymakers contend that reducing legal barriers to local data sharing is more important than constraining the terms of agreement with specific MOUs. In Indiana, local agencies improved interagency data sharing for a variety of health issues, including infant mortality, after an Executive Order allowed state data to be held and shared centrally (Newcombe, 2017). These loosening restrictions may enable the state to combine its PMP data with its broader Drug Dashboard for smoother use (Eidam, 2017). In Indiana's case, MOUs constrain data sharing unnecessarily while centrally housing data promotes data sharing.

Ultimately, internal agency policies can prove more stringent than public health data sharing laws. New York, one of the leading states on health-related data sharing, found that agencies often had outdated, stringent policies that limited data sharing efforts

beyond public health laws (Gasner, Fuld, Drobnik & Varma, 2014). New York policymakers recommend an in-depth legal and policy review before any technological changes are made; once put in place, data systems are difficult to alter.

Technological and institutional considerations

While some states and localities promote data sharing through interagency requests and direct transfer of data, others developed comprehensive datasets or statewide databases designed to be shared across multiple agencies. Indiana's example of a single, state-run database is one case of the latter approach. As of 2017, the state of Ohio planned to construct a data warehouse at Ohio State University so that state agencies or court systems could access family substance abuse data, including incarceration and foster placement information (Young, 2017). Massachusetts's Department of Public Health, in conjunction with other health, criminal justice and law enforcement agencies, leveraged a data warehouse in order to store and simultaneously analyze 10 opioid-related datasets and distribute trends quickly to multiple state agencies (James & Welch, 2016).

Researchers generally concur that the technological barriers to data sharing have been greatly reduced since the 1990s: the institutional barriers often remain, and approaches to data sharing vary widely with differing success. A study of local government surveys and interviews regarding GIS data sharing indicated that common concerns were misuse of data and breaches in confidentiality of data. These concerns are likely magnified in public health and safety data sharing. Even in cases of mandatory data sharing, these concern affected compliance with regulations (Harvey & Tulloch, 2006). Indeed, the same study demonstrated a vast range of data sharing agreements across agencies, from an internal policy of open intra-government data sharing to a policy of only sharing required information (ibid). This study did not examine data sharing beyond government entities, which poses even more complications.

In the public health arena, researchers have identified several factors that influence state and local agencies' abilities to effectively share data. In a compilation of public health records data sharing studies, researchers found that data sharing issues tended to fall along three dimensions: *heterogeneity*, *distribution*, and *autonomy* (Vest, Kirk & Issel, 2012). Heterogeneity refers to the variety of information technologies and systems (IT/IS): if local agencies used multiple types of IS, data sharing integration was more difficult. Distribution issues involve the number of data sources: if stakeholders are too numerous or difficult to identify, data sharing is impeded. Autonomy issues include jurisdictional and regulatory authority for data sharing. If authority is centralized in a state agency, data gaps are less common than if authority is decentralized among multiple local agencies (Vest & Issel, 2017). Some localities engage in regionalization, or forming collaborative partnerships with neighboring localities, to develop one centralized authority and reduce data gaps (ibid). On average, agencies that identified a central authority for data sharing and utilized a consistent information system to distribute data integrated data more effectively across agencies.

Best practices from successful states

Several states and localities exemplify best practices for opioid-related data sharing, including Maryland and regions within Ohio and West Virginia. Maryland developed a coordinated response to the opioid crisis, and localities within Ohio and West Virginia have successfully engaged stakeholders in lasting collaboration and data sharing.

Cabell County, West Virginia combatted an imminent opioid crisis in August, 2016 by engaging multiple stakeholders in rapid data sharing across state agencies (Massey, 2017). Local officials used EMS data, ED information, naloxone distribution reports from police agencies, and the National Poison Data System to track and respond to the outbreak (ibid). No legal mandate compelled this data sharing; indeed, ED medical records and EMS records required HIPPA clearance to be linked (Joel Massey, personal communication, February 5, 2018). According to a West Virginia health official, personal networking by a well-connected Health Officer facilitated most of the immediate data sharing in this instance (ibid). For Cabell County, collaborative interpersonal relationships proved crucial to timely, effective data sharing.

Maryland chose to formalize its statewide data sharing, both through the MOUs discussed previously and the formation of Local Overdose Fatality Review Teams (LORFTs) that mandated stakeholder involvement to identify trends in overdoses (Rebbert-Franklin et al., 2016). These LORFTs performed in-depth reviews of overdose cases that united data from hospitals, social services and law enforcement representatives; the in-person contact from representatives facilitated interagency information sharing and allowed the teams to make intervention recommendations that were then dispersed to individual agencies (ibid). The Northwest Ohio Healthcare Emergency Management Coalition took a similar approach of regular, in-person stakeholder meetings. A standing committee of the coalition meets monthly to exchange opioid-related data to limit overdose outbreaks, and the broader coalition meets three times per year (Northwest Ohio Opioid Addiction Treatment Planning Task Force, 2017).

Status of data sharing in the Northern Shenandoah Valley

Northern Shenandoah Valley Substance Abuse Coalition (NSVSAC) members engage in formal and informal data sharing to further agencies' work individually and collaboratively. This data sharing takes several forms, including:

- Weekly to semi-weekly written or verbal reports between the Virginia State Police and the Executive Director of the Coalition. These reports include relevant aggregate trends in drug-related arrests and overdoses. Because this information is de-identified and presented in aggregate form, there are no legal barriers to sharing these trends. This data informs the Coalition Director of where resources are most necessary---both geographically within the region and along the spectrum of treatment and recovery (Schiavone, personal communication, 2018).
- Formal requests between Coalition members and agencies. In some cases, members of the Coalition hold positions that they can use to request specific data in a timely manner. For instance, a judge may request trend data from local

social services departments. While this data sharing is not legally limited to the judge and the social services department, the official relationship and trust between parties can hasten certain requests (Cummings, personal communication, 2018).

- General awareness of services across silos. While not strictly included in “data sharing,” practices like nurses alerting patients to the existence of treatment and recovery services significantly impacts those patients’ ability to receive treatment. Sustained contact across agencies and non-governmental organizations increases the possibility of resources and information reaching a person who comes into contact with any one of those groups.
- Individual information sharing in highly specialized cases like Drug Treatment Court. The city of Winchester started a Drug Treatment Court in 2016 (Hazel et al., 2016). This highly intensive incarceration alternative links a team of counselors, judges, surveillance officers, forensic analysts and others to support and monitor program participants. All of the (approximately one dozen) participants are closely monitored---their whereabouts, drug testing results, job status, family and medical circumstances are all shared openly among the support team. This specific data sharing arrangement is unique in that it involved sharing identifiable personal information, albeit among a group of authorized personnel. In this circumstance, individual consent by the program participants is a necessary condition of entry to the program.

Trust is an integral component of data sharing, even when mandated by law. Sharing resources and information can certainly be mandated, but interagency networks and trust facilitate this process. NSVSAC’s experience demonstrates that some data sharing will naturally occur, particularly during times of community crisis.

A note on data sharing variation within NSVSAC:

Data sharing across agencies varies significantly in the Northern Shenandoah Valley. Some agencies maintain timely, collaborative interagency data sharing. Local police departments in participating counties share arrest and dispatch information (including crime type, date, location, history and demographic information) almost instantaneously. This agreement is formalized in a Memorandum of Understanding between the police departments of Frederick, Page, Warren and Clarke counties, the city of Winchester police department, the Virginia State Police, the Department of Criminal Justice Services and NSVSAC (Schiafone, personal communication, 2018). Local social services departments and privately run halfway houses occupy the opposite end of the data sharing spectrum. Each department or organization runs independently with little collaboration or standardized data collection. Thus, any policy intervention should standardize data collection and sharing.

Alternatives

Option 1: Hire a Chief Data Officer to analyze data trends and maintain an open data portal for the region.

Some cities have turned to formal data analysts to interpret the trends they see within agencies and to unite information across agencies. These analysts take on many titles, but a common title is Chief Data Officer. The city of Cincinnati's Chief Data Officer, Brandon Crowley, worked within the Office of Performance and Data Analytics to create an open data portal for the city (Crowley & Brooks, 2016). This data portal contains information on EMS and fire dispatches, police stops and citations and a variety of health indicators and is openly accessible to citizens of Cincinnati. Two of the most frequently used data sources are the snowplow tracker and heroin overdose sites (ibid). The latitude and longitude of overdose calls are skewed to protect anonymity. This allows residents and city officials to track "hotspots," or areas with rapidly spiking overdoses. This "hotspotting" allows EMS, police and healthcare providers to anticipate areas of high need (Newcombe, 2017).

Implementing an open data portal requires expertise within agencies, legal and data analytics personnel potentially outside agencies, and a software platform that can incorporate multiple data sources. Expertise within agencies can simply mean identifying agency representatives responsible for collecting different types of data (dispatch calls, hospital admissions, social services caseloads, etc.) and sending it to the Chief Data Officer and their team. Legal personnel and data analysts may exist in a separate office or agency; these experts are responsible for aligning shared data with privacy laws and organizing it in a useful way for the public (Crowley, 2017).

Multiple private companies offer software platforms for state and local governments. Cincinnati uses Socrata, which several local governments in Virginia also use for their open government or budget portals (Socrata, 2018). Private companies often offer start-up and maintenance packages designed for government use. Additionally, the High Intensity Drug Trafficking Areas program maintains OD Map, a mapping application designed for first responders and local agencies that tracks overdose deaths. This application is free for state and local agencies and has some of the components of an open data portal; however, it is limited to drug overdose deaths and does not have the flexibility to move to other spheres.

Lastly, an open data portal is predicated on an engaged public and data that is both useful and interesting to the public. A brief overview of open data portals in early stages suggests that much of the data they contain is only useful to a niche group of citizens or is not updated often enough for timely analysis. Of course, an issue like opioid overdose will naturally attract an interested population; however, the existence of a data portal does not ensure timely, consistent updating. The agency and data personnel are essential for making this option effective.

Option 2: In partnership with the Northern Shenandoah Valley Substance Abuse Coalition, form a Local Overdose Fatality Review Team similar to those employed by Maryland that meets monthly (this option may extend into a regular data sharing council that meets monthly to exchange non-fatal opioid-related data).

This issue applies to a local region and may require a local solution. In-person stakeholder meetings allow data sharing across agencies and encourage stakeholder groups to identify trends in opioid overdoses. These teams require regular in-person meetings by agency and non-agency representatives. These meetings could be integrated into the Coalition's standing work. Other states that have established Local Overdose Fatality Review Teams (LOFRTs) engage healthcare providers, state and local law enforcement, social services, faith-based organizations, forensic examiners, correctional officers, social services workers and others in their teams. Team composition varies based on the needs of the localities and/or states.

An increasing number of states have adopted LOFRTs as a method to bring representatives from disparate agencies together consistently with one united goal. As of 2017, six states had established some form of LOFRTs or overdose review panels (Davis, 2017). Typically established by state legislation or executive order, LOFRTs may be statewide or under local jurisdiction. More populous states like Maryland opted for state guidance to encourage county or city-level LOFRTs; states like West Virginia maintain one comprehensive team for the entire state (ibid).

While some state LOFRTs have extremely specific missions (for instance, Pennsylvania's panel investigates only methadone-related deaths and incidents), others expanded to review non-opioid drug overdose deaths (Davis, 2017). For instance, Rhode Island's Drug Overdose Evaluation Team investigated multiple cocaine overdose incidents in response to a rise in cocaine overdoses in 2017 (Rhode Island Department of Health, 2017). This flexibility may signal a long-term focus on addiction crises more generally rather than the opioid epidemic specifically.

LOFRTs rely on consistent in-person meetings with agency representatives who are willing, if not eager, to share data with their counterparts. Meeting frequency may vary, but most LOFRTs meet at least once a month, potentially more often. LOFRT staff are responsible for coordinating data collection and sharing among agencies (generally prompted by a Memorandum of Understanding between agencies), organizing meetings and following up on any data requests presented at the meetings (Baltimore City Health Department, 2016).

Option 3: Designate a central agency authority and draft data use agreements with all cooperating agencies; house all data collection and coordinating efforts within this agency.

This option is modeled after New York City's RxStat program and is in many ways an escalated, ongoing version of LOFRTs. In 2012, RxStat was formed to combat rising prescription opioid misuse in New York City (Heller et al., 2014). Now the program

brings together over 25 local, state and federal agencies to review trends in the drug overdoses and crime within the city (Annesse, Schapiro & McShane, 2017). Representatives meet as a full group quarterly but conduct multiple smaller meetings outside of full group meetings. Unlike LOFRTs, the RxStat program focuses on fatal overdoses, crime trends, pharmacy orders and general youth and adult drug behaviors.

The public health department serves as the central coordinating agency, and the RxStat Technical Assistance Manual recommends that the public health department serve as the coordinating agency in most circumstances, as public health actors tend to hold the most critical data for tracking and responding to drug overdoses (Heller et al., 2014). This coordinating agency actively collects and houses all data collected by various partner agencies; the coordinating agency is home to both data analysis and project management in some senses. All participating agencies have individual data use agreements or MOUs with the coordinating agency, a system that allows for timely data collection. The RxStat program also offers guidance for agencies on how to clean and organize their data so it can be used across silos.

RxStat has evolved from a data collection initiative to a multi-disciplinary task force with real legislative and community weight. Its participants note that the recommendations one agency makes are deemed more powerful when multiple agencies lobby for state legislative changes. Additionally, RxStat coordinators attribute much of the program's success to the growing trust that agency representatives develop outside of quarterly full group meetings. Most of the initiatives and responses that decrease drug overdoses occur outside of those meetings (Heller, 2014). This program is successful on a large scale due to the commitment of the members involved.

Evaluation criteria

Cost

The cost of any data sharing initiative is an important component: whether in the form of technology investment, personnel time or hiring new staff members, cost will be a significant criterion in selecting a solution. Cost estimates in this analysis include salaries of any newly hired positions, man-hours calculated by wage in the case of recurring meetings, investment in any software platform or technology and the time necessary to develop data sharing agreements. Other states and localities provide a starting point for costs estimates; however, in many cases there are significant gaps between the existing personnel in larger states and cities and the Northern Shenandoah Valley. This is particularly true for data analysts and legal personnel. Where populous cities may have an entire department or office dedicated to data analysts, the Northern Shenandoah Valley would need to hire additional staff to replicate this structure. Thus, the cost estimates for some options may be significantly higher than the startup costs for programs in larger cities.

Ability to reduce deaths

Ability to reduce deaths serves as a proxy for effectiveness in this analysis. Ability to reduce deaths is not a direct measure of the effectiveness of data sharing, but to the extent that improved data sharing increases communities' ability to respond to drug overdose crises, deaths reduced can measure this improvement.

Measures of effectiveness have been transferred, when possible, from analogous state or local programs. Using effectiveness estimates from other states or localities assumes that the population of the Northern Shenandoah Valley region is similar to that of the compared state. It also assumes that, even given the informal, ongoing data sharing efforts in the Northern Shenandoah Valley, a similar improvement in the overdose death rate would occur. Thus, all estimates of death rate reduction should be taken as benchmarks rather than guarantees.

Incorporation of non-governmental partnerships

The Northern Shenandoah Valley Coalition heavily engages both governmental and nongovernmental stakeholders. The proposed interventions allow various levels of involvement by non-governmental entities due to legal and resource constraints. If non-governmental organizations like faith-based organizations and non-profits cannot engage in data sharing, the intervention's reach will be limited.

The assessment of whether non-governmental actors can participate in a data sharing arrangement is taken from state and local precedent. If no states or localities that use a given data sharing strategy engage non-governmental organizations, this may be a sign that the strategy tends to limit extra-governmental involvement. Another indication of low non-governmental partnerships is a flat data sharing arrangement: that is, if only local or state or federal data is shared, rather than multilevel data sharing. Such an

arrangement indicates limited involvement and communication with organizations outside one level of government.

Flexibility in integrating new data sources

Any solution must anticipate change and new developments in data availability and what types of data might be useful in responding to drug overdose and crime. The more rigid the intervention is, the less future adaptation it offers at a low cost. In the past year, the Northern Shenandoah Valley experienced a dip in opioid-related deaths and a rise in cocaine overdoses (Cummings, 2018). This rise may signal a resurgence of cocaine use due to legal restrictions around prescription opioids, or may be a temporary fluctuation in overdose rates. Either way, data sharing arrangements are best served when they can integrate new information and trends rapidly. A too-narrow focus on one particular problem (in this case opioid overdoses and crime) may create new data sharing challenges in the future.

A note for implementation: sustainability, legal barriers

Sustainability is important for any data sharing arrangement. However, institutional factors drive the sustainability of any data sharing. One theme that arose in literature and from practitioner experience is the need for buy-in across stakeholders for permanent data sharing. Thus, the agency and non-governmental actors that participate in data sharing determine any arrangement's sustainability. Policy changes can facilitate data sharing, but the personal networks and agency investment sustain permanence. Additionally, legal barriers to sharing aggregate data were found to be minimal; states and cities use MOUs and patient consent agreements to maintain privacy. These two criteria are integral for implementation but have little impact on determining whether a particular policy option should be adopted.

Evaluation of Alternatives

Option 1: Hire a Chief Data Officer to analyze data trends and maintain an open data portal for the region.

Cost: high

Salaries for data analysts and legal guidance drive the cost of creating and maintaining an open data portal for the region. While other localities and states that have data portals integrated this initiative into preexisting departments of data analysis or performance management, the Northern Shenandoah Valley does not have a similar set of analysts on hand. The cost of hiring a Chief Data Officer, data analysts and one lawyer are embedded in the cost of this option. Other cities' and states' experiences indicate that the bulk of data cleaning and organization can occur within agencies after the open portal is established, but that external data analysts are necessary to standardize all data formats, check agencies' organization and integrate data sources into the portal (Crowley, 2017).

The total annual cost of implementing an open data portal would be **\$356,000**. This includes salaries for the Chief Data Officer and two data analysts, one lawyer with data privacy expertise and the cost of contracting a private company to create a data portal.

Ability to reduce deaths/effectiveness: unclear

An open data portal has an unclear ability to reduce overdose deaths, largely because open data may catalyze other public and community responses that might not be anticipated prior to data sharing. One example is quick response teams in Ohio; quick response teams (QRTs) are teams of three that follow up EMS overdose callers to explain treatment options. QRTs are certainly facilitated by open data sharing and have reduced overdose rates by up to 35% in some localities (Dykes, 2017). However, this decrease cannot be solely attributed to the existence of an open data portal. The effect of this data sharing strategy remains unclear.

Incorporation of non-governmental partnerships: low

Historically, non-governmental partners play a minimal role in open data portal models. Non-governmental organizations participate in open portals in an asymmetric way: they are recipients of data but do not share data reciprocally. This can be helpful for organizations that want to know where to best put their resources, as in Cincinnati where a halfway house uses drug overdose hotspots to inform where to train civilians to use Narcan (Walinchus, 2017). However, non-governmental organizations do not contribute to data collection and typically are not included in open portal strategies. No specific prohibition exists against integrating outside partnerships, but this option lends itself to more asymmetric and less collaborative data sharing.

Flexibility in integrating new data sources: moderate

Should new data sources or focus areas appear for the region, it would be relatively easy to integrate these into a preexisting open data portal. If non-opioid drug overdoses rise or a new treatment program begins in the region, data analysts would need some time to collect, standardize and input the new dataset. However, once the infrastructure and

collection process is in place, new data sources could be included in the preexisting portal.

Option 2: In partnership with the Northern Shenandoah Valley Substance Abuse Coalition, form a Local Overdose Fatality Review Team similar to those employed by Maryland that meets monthly.

Cost: moderate

This option's cost is almost entirely composed of staff time spent on monthly meetings and data collection outside of meetings. LOFRTs bring together agency representatives without any new staff positions. Thus, the cost of implementing these teams is the time spent by the 20-25 representatives in monthly meetings, measured in hourly wages. Assuming an 8-hour meeting once per month for 20 representatives, the total cost of this option is **\$153,640**.

Ability to reduce deaths/effectiveness: moderate

LOFRT effectiveness depends on the recommendations of the team and whether those recommendations are carried out. Of the LOFRTs started specifically in response to the opioid epidemic, few were the sole impetus for opioid policy reforms in their counties or cities. However, Cecil County, Maryland, offers one case study of how LOFRTs might lead to overdose-reducing action. One of the three pilot LOFRTs in Maryland was located in Cecil County in 2014; most of the county's responses to the opioid epidemic are directly attributed to recommendations made by LOFRTs after nine months of reviews from 2014-2015 (Rebbert-Franklin et al., 2016). These recommendations included improving access to treatment information, expanding Narcan training and coordinating outpatient care across providers---policies that provided successful, albeit similar to those other localities would adopt (ibid). In 2016, Cecil County experienced an 18% rise in heroin overdose deaths compared to an over 50% increase in the rest of the Maryland Eastern Shore; the county's prescription overdose deaths actually decreased, compared to an over 50% increase in the region (Maryland Department of Mental Health and Hygiene, 2017). This case study indicates that LOFRTs may have at least a moderate ability to reduce deaths.

Incorporation of non-governmental partnerships: high

LOFRTs in other states do include non-governmental representatives, particularly substance abuse treatment providers (Cherico-Hsui et al., 2016). Even if agencies and non-governmental organizations do not engage in perfectly reciprocal data sharing, by using an in-person meeting strategy all stakeholders can provide insight into quantitative and anecdotal trends in their areas of expertise. Incorporating non-governmental stakeholders requires an MOU with the organizations each member represents. This strategy can be extended to both new state and local agencies and extra-governmental sources.

Flexibility in integrating new data sources: high

Similar to the integration of non-governmental partnerships, integrating new data sources when necessary involves designating a representative to speak to data and drafting an MOU with that representative. A LOFRT coordinator or staffer can

efficiently handle this process. At its core, a LOFRT is a formalized method of community engagement; given consistent structure and motivation, multiple partners and data sources may be added as necessary.

Option 3: Designate a central agency authority and draft data use agreements with all cooperating agencies; house all data collection and coordinating efforts within this agency.

Cost: high

The cost of Option 3 mimics Option 1 in that it requires hiring data analysts and fulltime staff members. The coordinating agency in particular must house a team of data analysts that can organize data from multiple agencies. Given the extreme population differences between New York City and the Northern Shenandoah Valley region, it is difficult to estimate exactly how many additional staff would be needed to carry out this strategy; however, this option is vastly more expensive than the other two.

Ability to reduce deaths/effectiveness: high

As with all data sharing strategies, the ability to reduce deaths depends on the actions taken once data is shared. However, the ongoing nature of the central agency model may yield strong results in reducing overdose deaths. After the RxStat program started in New York City, agency representatives quickly identified Staten Island as one of the most prevalent regions for overdose deaths. Concerted policy efforts like increasing treatment options and Narcan access as a result of data sharing decreased overdose deaths in Staten Island by 29%.

Incorporation of non-governmental partnerships: moderate

To date, non-governmental partners have not been incorporated into RxStat. However, the coordinators and agency representatives within RxStat would like to integrate organizations outside of state, local and federal government in the future (Heller, 2014). The MOU framework can be modified to include non-governmental partners. In a region like the Northern Shenandoah Valley, such organizations might be integrated from the outset.

Flexibility in integrating new data sources: moderate

Identifying and incorporating new data sources depends entirely on the representatives involved and their willingness to join an ongoing workgroup. Beyond the legal process of creating new MOUs with the central coordinating agency, new data sources could be integrated into this data sharing strategy.

Table 1 shows an evaluation matrix of data sharing alternatives and criteria.

Table 1: Evaluation Matrix of Data Sharing Alternatives and Criteria				
	Cost	Ability to reduce deaths	Non-governmental partnerships	Flexibility
Option 1: Hire Chief Data Officer, investing in mapping technology	High; requires personnel/technology investment	Unclear, but likely high; timely response to epidemics	Low; does not typically integrate non-governmental partnerships	Moderate; can integrate new types of data/drugs as necessary
Option 2: Form Local Overdose Fatality Review Teams	Low; few to no additional personnel, bimonthly/monthly stakeholder meetings	Moderate; more reactive approach to epidemic-level overdoses due to time lag	High; depends on discretion of local teams	High; follows model for overdose reviews of other conditions
Option 3: Designate a central authority and draft MOUs with cooperating organizations	High; requires consistent grant/national funding for new staff and resource needs	High; Staten Island deaths reduced 29% since adoption of RxStat program in NY	Moderate; MOUs can be drafted to include non-governmental organizations, but have not been historically	Moderate; revisiting MOUs and incorporating new partners allows flexibility

Recommendation

Option 2: In partnership with the Northern Shenandoah Valley Substance Abuse Coalition, form a Local Overdose Fatality Review Team similar to those employed by Maryland that meets monthly.

Option 2 performs highly on most of the evaluative criteria and the easiest to integrate into the Northern Shenandoah Valley's preexisting stakeholder engagement. Additionally, LOFRTs are the only data sharing strategy considered that has been implemented in rural areas similar to the Northern Shenandoah Valley. The success in Cecil County, Maryland is the closest comparison available to the region. LOFRTs promote institutional trust and consistent contact, which will expand on the strategies the Coalition already employs. This option should standardize data sharing and bring in less engaged stakeholders in the region.

Implementation

Short-term

Coalition members should identify every crucial stakeholder and data source for the inaugural LOFRT meetings, and begin to draft MOUs between participating agencies and organizations. The Coalition, supported by funding from the TIPS grant, may also seek to hire a LOFRT coordinator for the region. This individual would be associated with one central agency, possibly a medical center from one of the participating localities, and be responsible for organizing and facilitating meetings and following up with data requests. Once data sources have been identified and MOUs created, participating members should begin meeting monthly to review selected fatality cases. Maryland maintains a guidance document for LOFRTs to run their meetings in a standardized way so that all information is covered.

Long-term

Should this model prove successful in the Northern Shenandoah Valley region, it may be expanded to other regions of Virginia. State agencies may choose to take an active role in this process, or the Governor may issue an executive order encouraging localities to form their own LOFRTs. However, this data sharing strategy engages state agencies but puts most of the organizing power in the hands of local organizations.

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