Using Data and Evaluation in Policy Development, Implementation, and Monitoring

Building Successful Policies to Reduce Prescription Opioid Misuse

With limited resources and many possible interventions to choose from, policymakers must make difficult and uncertain decisions about which interventions are best for their jurisdictions. Increasingly, policymakers are incorporating data and evaluation into policy and program development, design and implementation to improve outcomes more effectively. This approach allows policymakers to make more-informed decisions about which interventions are likely to be effective, track performance, determine whether preliminary outcomes are consistent with long-term goals and adjust programmatic elements to ensure long-term success.

This issue brief provides guidance for governors and other state leaders on how to incorporate data and evaluation into policy development, implementation, and monitoring. It explains each of the five steps for this process (listed below) in the context of reducing prescription opioid misuse, though the same principles apply to other areas.

Steps for Using Data and Evaluation in Policy

1. Create a logic model
2. Identify data sources for each step of the logic model
3. Collect the data
4. Analyze the data to identify and solve implementation challenges
5. Make data analysis an ongoing part of the policy process

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Before Step 1, Use Data to Understand the Problem

To develop effective interventions, policymakers must accurately understand the problem they seek to address. Data, rather than anecdotes or assumptions, should be the basis for that understanding.

One of the most important ways that states can collect and use data to address prescription opioid misuse is to identify very specific, highly impacted populations and regions. States can frame their data collection around such questions as who, or where, are the people at most risk of developing addiction with prescription opioids? Are certain populations more likely to develop addictions to particular drugs? How easily can residents access treatment in different parts of the state? Are practitioners prescribing opioids at a higher rate in certain areas? Where are the gaps in the services that address the problem?

Though obtaining data to map patterns and subpopulations often requires intensive effort, it enables policymakers to focus interventions where they are most needed. For instance, data may show an especially large problem with a given subpopulation (for example, exceptional rates of oxycodone abuse among white suburban men ages 18 to 24) or significant weaknesses in substance control efforts (for example, higher levels of doctor-shopping for oxycodone than for other prescription drugs).

By focusing on more specific populations or locations, policymakers can gain a more nuanced understanding of the problem, develop more-targeted solutions, and invest resources where they are likely to produce greater benefits than a broad-brush public policy approach would. Even if an intervention misses some of this smaller target population (for example, not reaching every white suburban doctor-shopping man ages 18 to 24), it is still more likely to achieve a greater effect on a larger number of the target population than an indiscriminate intervention will.

Though original data collection and examination can provide a more accurate understanding of the problem, many existing resources are available to aid in this effort. Some sources are publicly available, others are for official use only, and even more can be obtained only by request through state agencies or other entities. The following resources are examples of the different data resources available for developing a state-specific understanding of prescription opioid misuse:

- *State agency administrative and reporting data*
  - Prescription drug monitoring programs (PDMPs)
  - Morbidity and mortality data from medical examiners
  - Medicaid and other claims data
  - Behavioral health data
  - Emergency department and hospitalization data
- *Federal agency data and surveys*
  - National Survey on Drug Use and Health (NSDUH)
  - National Epidemiologic Survey on Alcohol and Related Conditions (NESARC)
  - Drug Enforcement Administration's Automation of Reports and Consolidated Orders System (ARCOS)
- *Third-party data collections*
  - Researched Abuse, Diversion and Addiction-Related Surveillance System (RADARS)
  - Addiction Severity Index-Multimedia Version 1 (ASI-MV1)
  - Prescription Behavior Surveillance System (PBSS)

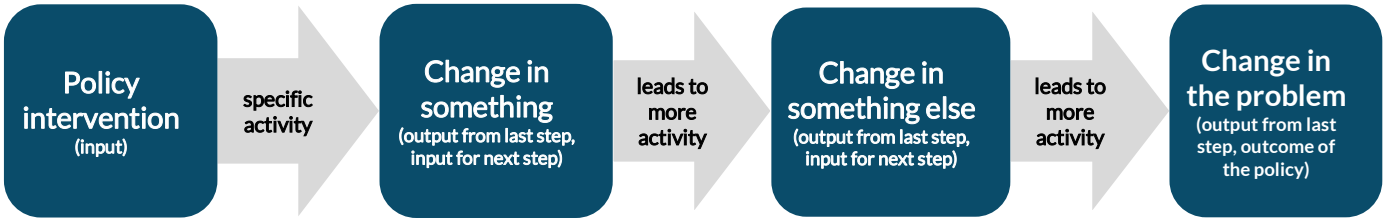
Drawing from as many sources as possible can provide a more complete picture of the problem. Once policymakers better understand the nature of the problem, they can develop more targeted solutions. States can then use the data sources to monitor and evaluate policy implementation.

Step 1. Create a Logic Model

A logic model is a visual representation of how a given intervention intends to solve a specific problem. It shows how inputs (e.g., policy interventions) are expected to lead to outputs (e.g., immediate consequences of the policy intervention), and how outputs are connected to outcomes (e.g., changes in the underlying problem). The resulting "causal chain" depicted by the logic model is a clear road map for how the policy will solve the problem. This road map is the basis for evaluating whether a policy is having its intended effect, as well as a guide for improving the policy.

The figure below illustrates the basic structure of a logic model. The policy intervention, or input, initiates a series of events that should lead to the desired change. The change in the problem, or outcome, is the result of the initial intervention and any subsequent changes.

The Basic Structure of a Logic Model for Policy



The table on page 4 shows the main components of logic models for several policy interventions included in NGA's *Six Strategies for Reducing Prescription Opioid Misuse*.

To be effective, a logic model must eliminate any gaps between steps. Often referred to as "black boxes," such gaps indicate missing knowledge about how one action leads to another, making it difficult to know whether the policy is directly responsible for subsequent results.

A completed logic model clarifies how a policy is expected to address a problem. The model also identifies elements that need to be measured (for example, the types of data that need to be collected) in order to understand how the policy is affecting the problem.

A Logic Model Is the First Step, Even if the Policy Is Already Implemented

A fully developed logic model is the core of any good evaluation effort. Such a model ensures coherent, explicit connections between the policy and the desired results. Understanding those connections is critical to initial policy development. Even if a logic model was not incorporated into initial policy development, **one must still be created** to monitor performance.

Components of Logic Models for Several Policy Solutions

Policy solution	Activities (that can be verified)	Changes in something (that can be measured)	Changes in something else (that can be measured)	Changes in the problem (that can be measured)
Ensure proper disposal of prescription opioids	Install prescription drug drop boxes in police stations or other locations to increase access to and convenience of safe disposal	• Number of prescription drug drop boxes through-out state, in each region • Pounds (tons) of unused prescription drugs collected • Pounds (tons) of prescription drugs safely destroyed	• Fewer prescription drugs available for nonmedical use • Greater access to safe disposal options throughout state • Reduced presence of prescription drugs in water and soil due to improper disposal • Enhanced awareness of the risks of keeping prescription drugs in the home	• Reduced drug diversion, particularly from private homes of friends and family • Reduced misuse, abuse and overdose from prescription drugs
Promote public awareness	• Launch evidence-based public awareness campaigns: • For example, public service announcement (PSA), PSA contest, school program, online information clearinghouse or social media campaign • Conduct targeted campaign for highest-risk populations • Partner with organizations and nonprofits who do relevant work in order to expand reach for dissemination and to ensure efforts are coordinated	Materials produced: • Number of PSAs, brochures, and other materials. produced • Number of submissions to a PSA contest • Number of schools participating in programs • Number of views or hits on a website • Number of shares, comments, Facebook likes and retweets on a social media initiative Collaboration: • Number of organizations included • Number of meetings held with partner organizations to help disseminate	• Increased public awareness of the dangers of prescription opioid misuse and ways to handle prescription drugs to prevent abuse and diversion	• Reduced prescription opioid misuse and misuse • Reduced diversion of prescription drugs, particularly through private homes, family and friends (most common source in most states) • Reduced availability of prescription drugs for illicit use
Educate providers	Develop trainings for prescribers and incentivize participation • Potential topics: pain management, responsible opioid prescribing and recognizing and addressing doctor-shopping • Incentivize: Laws or licensing board requirements linking continuing medical education to licensure and renewal • Engage prescribers in training (counter the mindset that "this is just a box to check off")	• Passage of law(s) incentivizing or compelling regular training for prescribers • Number, frequency, and geographic availability of prescriber training on topics related to prescription opioid misuse reduction • Number of prescribers who have received training	• Increased provider awareness of safe prescribing practices, avoiding over-prescription and recognizing potential abuse or misuse	• Reduction in over-prescription and other inappropriate prescribing practices • Increased identification and addressing of at-risk patients • Reduced doctor-shopping • Reduced availability of prescription drugs for misuse

Four Steps to Developing a Logic Model

1. Identify each element of the policy or strategic action plan intended to lead to a change in the prescription drug problem.
2. Identify the immediate outcome that should happen or change as a direct result of the policy.

   For example, if the policy element is "funding for more prescription drug take-back events," the immediate outcome that should emerge is not the rate of prescription opioid misuse; it is not even a change in the amount of prescription drugs collected. The immediate outcome affected by the policy is the number of prescription drug take-back events.
3. Identify how each link in the model is expected to change

   For example, if more prescription drug take-back events are held, the logical expectation is that the amount of prescription drugs collected would increase.
4. Continue identifying the anticipated causal links until the model shows how the chain connects to the targeted problem.

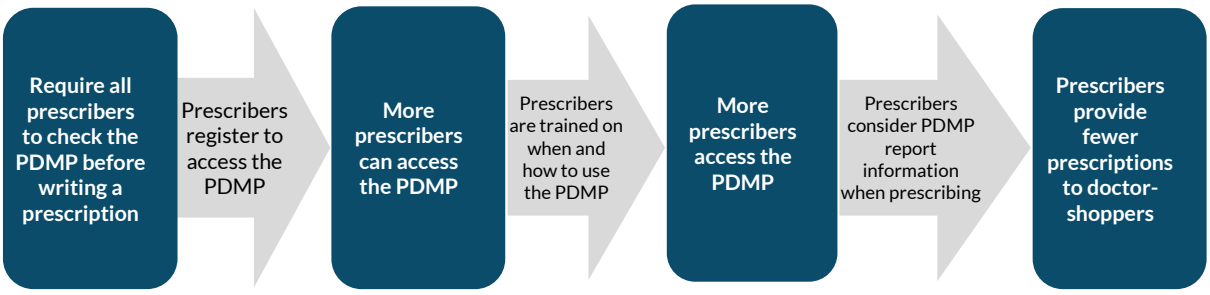
Further information on creating logic models can be found in various sources, including the Centers for Disease Control, the Pell Institute, and the University of Wisconsin.

Step 2. Identify Data Sources for Each Step of the Logic Model

In addition to showing the anticipated causal connection between the policy and the desired results, the logic model identifies each step in implementation that must be measured to monitor and improve the policy's performance. Each step of the logic model represents a change that must be measured in order to assess the policy's effect.

Conveniently, the same data used to identify the problem can be used to measure any changes in the targeted problem. Similarly, the steps of the logic model should identify the types of data required to measure whether the policy is performing as intended.

Example Logic Model for a Prescription Drug Monitoring Program Policy



In the example above, data can be collected for each step in the logic model between the policy and the intended outcome. The first activity (prescribers register to access the PDMP) can be confirmed and its output can be measured by reviewing the number of prescribers registered.

Data Sources for Common Elements of Prescription Drug Policy Logic Models

Data source	Information type	Useful for	How to access
National Survey on Drug Use and Health	Information about tobacco, alcohol and illicit drug usage and mental health information	Evaluating trends in overall illicit prescription drug use	http://www.samhsa.gov/data/population-data-nsduh/reports?tab=33
National Survey on Substance Abuse Treatment Systems	Information from substance abuse facilities	Mapping treatment availability	http://www.icpsr.umich.edu/icpsrweb/SAMHDA/series/58
Single State Authority data (licensing authority for substance abuse treatment facilities)	Operational substance abuse facilities; information specifically about opiate-specific treatment options, target population, location	Mapping treatment availability (by geographic areas and target population) using list of currently licensed substance abuse treatment facilities (as well as those that offer opioid-specific treatment)	Contact respective Single State Authority; http://www.samhsa.gov/sites/default/files/ssadirectory.pdf
Medicaid and other prescription claims data	Total number of patients enrolled in patient review and restriction programs, also called "lock-in" programs, per year; location and demo-graphics of lock-in enrollees; total number of prescription claims; prescription claims for opioids; prescription claims for naloxone	Identifying target populations and areas via number of lock-ins implemented Tracking trends in dispensing of alternatives to narcotics, such as synthetic narcotics (believed to be less addictive), marijuana, antidepressants prescribed for pain	Contact state Medicaid agency. http://www.nga.org/files/live/sites/NGA/files/pdf/MedicaidStateRequirementsAndOptionsChart.pdf
Emergency department and hospitalization data	Aggregate data about hospital visits due to prescription drug overdose; mortality; hospitalization; usage rates for alternative pain management procedures (including acupuncture, nerve blocks, radiofrequency ablation, transcutaneous electrical nerve stimulation, trigger point injection, pain pacemakers, spinal drug pumps, surgery to reduce pain)	Serving as a proxy to assess and track abuse Assessing and tracking effect of prescription opioid misuse on hospitals Tracking changes in use of alternative pain management procedures	Process varies by state
Prescription drug monitoring programs (de-identified data)	Detailed prescription, patient and prescriber information, includes information about distribution or density of prescribers and patients, population-based prescription rates at state and local level, mean daily opioid dosage, multiple provider episodes (MPEs) or alerts (per 100,000 residents), percentage of total number of prescriptions involved in MPEs	Tracking opioid prescribing rates • Identifying areas with highest opioid prescribing rates to target for provider education • Identifying areas where opioids are most accessible • Tracking number of MPEs or alerts (issued when patient flags as potential misuser/ doctor-shopper) • Tracking naloxone (opioid antagonist) prescribing rates	Contact state prescription drug monitoring program

Data source	Information type	Useful for	How to access
Morbidity and mortality data from the National Vital Statistics System	Overall drug-induced deaths; can also sort by gender, age, race and ethnicity	Providing information about the proportion of overdoses linked to prescription drugs, may provide a rough estimate of trends in abuse and mortality	State agencies may request customized data files and access data to construct tabulations through several web-based systems: http://www.cdc.gov/nchs/nvss/dvs_data_release.htm
State licensing boards' lists of licensed prescribers	List and location of licensed prescribers	Mapping access to prescription drugs by geographic area	Contact respective state licensing boards, possibly including medical, pharmacy, dental
Patient, provider, and public surveys	Varies	Surveys can be designed and disseminated to obtain specific information. If conducted regularly and scientifically, they may be useful for tracking trends. Some examples: • Prescriber surveys can be used to assess implementation issues • Public (or youth-specific) surveys can assess common sources of prescription drugs, ease of access to prescription drugs, perception of use (e.g., the Kentucky Health Issues Poll asked respondents whether they had a family or close friend who abuses prescription drugs) • Patient surveys could ask about the number of prescribers used and disposal practices/awareness of disposal practices.	A number of surveys exist. Two examples: • Kentucky Health Issues Poll • Arkansas Prevention Needs Assessment Survey
DEA's Automation of Reports and Consolidated Orders System (ARCOS)	Monitors the flow of DEA-controlled substances from point of manufacture to distribution and sales channels; reports give federal and state government investigators information that can be used to identify the diversion of controlled substances into illicit channels of distribution	Identifying channels of illicit drug distribution and diversion; tracking changes in channels over time Identifying and tracking changes in distribution rates for specific types of drugs	Check to see whether state agencies are already enrolled. If not, enrollment information may be found here: http://www.deadiversion.usdoj.gov/arcos/#background
Prescription Behavior Surveillance System	Not yet operational but will create interstate public health surveillance using de-identified, longitudinal data and reports from state PDMPs, including patient characteristics and provider characteristics		http://www.pdmpexcellence.org/content/prescription-behavior-surveillance-system-0

The next activity (prescribers are trained on when and how to use the PDMP) can be confirmed and its output can be measured by reviewing PDMP use records. The third activity (prescribers consider PDMP report information when prescribing) is more difficult to confirm, but an evaluator could assess this through surveys, interviews or focus groups. The final outcome (prescribers provide fewer prescriptions to doctor-shoppers) can and should be measured in the same manner as during problem identification.

That example demonstrates how each link in the logic model can be measured through different types of data, including some that may already be routinely collected and some that may need to be collected just for this purpose. The previous table provides examples, descriptions, and access instructions for new and existing data sources that will frequently be useful for many steps in prescription opioid misuse policy logic models.

If data and creation of a logic model were incorporated into the policy development process, then much of the work in step two is already completed, since most (or all) of the necessary data sources will have been identified and collected.

Again, incorporating data into policy development from the outset is not required for using data later to implement and improve policy. However, it is more efficient and beneficial to incorporate those efforts early on as a way to guide policy development. In addition, beginning to identify and collect data early on will enable policymakers to establish a foundation for future implementation and policy evaluation.

Three Criteria for Selecting Data Sources

Assessing the value of data and recognizing its limitations are important to understanding what they measure, as well as what they do not measure. In order of importance, here are three criteria to evaluate the value of your data.

1. **Consistency.** If a data source does not measure exactly the same thing from one time to the next, it will be unclear whether fluctuations reflect actual changes or just changes in the way the data are measured. As long as the data are consistently measured, you will at least know if trends are going up or down, even if the numbers are not sufficiently accurate or precise to know how much prescription opioid misuse is occurring.
2. **Accuracy.** Data that represent the actual amount of prescription opioid misuse can help determine the broad scope of the problem, allow for comparisons with other states, and provide a general sense of the size of any changes. To accurately represent the problem, consistent measurements are critical.
3. **Precision.** When data can provide a specific measure of prescription opioid misuse, you could develop ma ore advanced understanding and recognize smaller derivations. For example, reporting a prescription opioid misuse rate of 4.08 percent is more precise than a rate somewhere between 2 and 6 percent. Greater precision allows for more sophisticated analyses. However, that added precision is meaningless if the specific number is not also consistently measured and accurate.

It is also important to recognize that collecting better data often requires more time and resources, especially with original data collection efforts like surveys and interviews. The advanced understanding gained by collecting highly precise data may not always justify the required effort. In some cases, you may prefer to collect consistent and accurate data quickly rather than slow down the process in order to get more precise data.

Step 3. Collect the Data

Once the best data sources for each component of the logic model have been identified, it is necessary to begin collecting those data. Ideally, the data should include at least one year of information before implementation of the policy to establish the baseline. Without such a baseline, it will be difficult to accurately assess the size of any change.

Once the baseline is established, three considerations are important when developing a system for regular data collection:

1. Allocate resources for staff time to collect and prepare the data, even if the data are routinely collected for other purposes. Capitalizing on existing data sources can sometimes require a significant departure from routine workflows.

2. Make the data collection process as systematic as possible, rather than relying on an ad hoc approach.

3. For any original data collection effort, identify and minimize the collateral consequences of the collection process. For example, consider whether the burden of completing a survey about a public service is so great that people would rather forgo the service than spend the time completing the survey or sharing the requested information.

Data collection can be difficult. Even when the data are already being collected as part of routine agency operations, it takes time and careful attention to make them available for other purposes. An unfunded mandate for data, even if it seems like a simple request, can place a large burden on an agency's information technology personnel. This can be a larger concern with health-related data, which are frequently subject to state and federal data protections that make them difficult to prepare and provide. The challenges can be still greater for original data collection efforts.

It is also important to recognize that data can be retrieved for analysis in two ways. An ad hoc or "just this one time" approach requires the same amount of effort to retrieve the data and prepare it for analysis, each and every time. A systematic approach requires more initial effort than an ad hoc approach to create procedures for how the data are retrieved and prepared for analysis, but well-crafted procedures can require much less effort each subsequent time.

Both approaches require the same steps and produce the same results. However, the systematic approach offers a more efficient way to enable ongoing measurement that can help assess and improve the policy or program while increasing timeliness and reducing the burden on agencies.

Data Collection Sometimes Affects Program Performance

Measuring prescription opioid misuse requires finding the right balance between your data needs and the resources you have to collect and analyze. Take, for example, prescription drug take-back events. Weighing the drugs taken back would provide a consistent metric of the amount of drugs collected, but it falls short of measuring the share or type of drugs being disposed of. More precise measures might involve cataloging the type and quantity of drugs collected, but these measures would be labor-intensive and logistically challenging (and currently not permitted by law). Moreover, public knowledge of such a cataloging effort might discourage people from participating in the program. The optimal balance for each state may differ, but keep in mind the potential collateral consequences of data collection when selecting output and outcome measures for each part of your logic model.

Step 4. Analyze the Data to Identify and Solve Implementation Challenges

The policy is unlikely to perform as expected the first time. Monitoring performance throughout policy implementation and operation allows for necessary corrections.

Changes should flow from the policy intervention at one end of the logic model. If the policy is performing as expected, the changes should be visible through each step through to the outcome the policy was designed to achieve. If a policy is not performing as anticipated, the data on each step of the logic model can help identify where any breakdowns are occurring.

If data from the rudimentary logic model presented in step 2 show more prescribers are accessing the PDMP reports, but the number of prescriptions provided to doctor-shoppers is staying the same, then the model indicates a breakdown is likely occurring in how prescribers are considering the information in the PDMP reports. After examining the nature of the breakdown, policymakers can either modify the policy to improve how prescribers consider the information or find a different approach to achieve that objective. If those modifications are successful, the data should indicate a change.

Policymakers can continue this monitoring and revision approach until the changes caused by the policy can be tracked along the data on each of the components of the logic model to the intended outcome.

Data Dashboards

Various tools can be used to analyze and present collected data. Data dashboards are a popular option for monitoring such data. The dashboards provide a centralized analysis and user-friendly presentation of the data to guide ongoing decisionmaking and policy revisions.

Step 5. Make Data Analysis an Ongoing Part of the Policy Process

Social circumstances are not static; they respond to changes in the environment. During implementation, the same problem—or a different version of the same problem—may change in such a way that the initial intervention is no longer effective. Therefore, it is important to make evaluation a regular, ongoing, and iterative part of policymaking; it allows policymakers to troubleshoot and adjust their approaches as necessary.

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