

# Using Logic Models to Address Opioid Use Disorder

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## Introduction

Millions of people are impacted by substance use disorders (SUD) each year with 2.5 million individuals in the U.S. struggling specifically with opioid use disorder (OUD) (Substance Abuse and Mental Health Services Administration [SAMHSA], 2024; Robinson et al., n.d.). Drug overdoses remain a leading cause of death among adults, of which opioids and synthetic opioids risen steadily in the last several years (Spencer et al., 2023). In 2021, the New York State Dept. of Health (NYDOH) reported 5,017 opioid-related overdoses, which represented a significant 18.5% increase compared to 2020 (NYDOH, 2023). Based on data from the Office of the Medical Examiner, Monroe County experienced 333 deaths in 2022, accounting for a quarter of all cases investigated by the office of the medical examiner (Office of the Medical Examiner, 2022).

The opioid crisis continues to devastate communities as reflected in the rising numbers of overdose-related deaths. In response to this ongoing public health emergency, states and local governments have begun distributing settlement funds as a result of opioid-related lawsuits to invest into methods reducing opioid-related deaths, OUD prevention, treatment, and harm-reduction (National Academy for State Health Policy, 2024). Before policymakers can design effective prevention and intervention efforts, it is important to fully understand the problem (National Governors Association [NGA], n.d.). Collecting data from as many sources as possible allows policymakers to identify the most pressing needs and develop targeted programs.

The objective of this document provides a clear understanding of the components and structure of logic models as they are applied to addressing the complex public health

challenges brought by the opioid epidemic. The paper also aims to offer practical insights through real-world examples illustrating the process of designing, implementing, and evaluating logic models for effectiveness. Practitioners can find value in this paper because logic models serve as visual tools simplifying complicated initiatives, using it as a step-by-step guide can make it easier to communicate the vision to stakeholders in order to secure funding and gain support.

## What Is a Logic Model?

Logic models are visual tools that help illustrate the relationships between a program's resources, activities, and intended outcomes, providing a structured way to understand how the problem will be addressed (W.K. Kellogg Foundation, 2004; NGA, n.d.). Developing a logic model is a core component of strategic planning, it helps to identify how program activities mitigate risks and lead to expected results (Education Development Center [EDC], 2017). At its core, the logic model serves as a conceptualized roadmap for what the program does, how it operates, and the outcomes it aims to achieve (W.K. Kellogg Foundation, 2004; NGA, n.d.). The plan includes the human, financial, and organizational/community resources that are available, also called *inputs*. What the program does with these resources through specific processes, tools, and technologies to achieve its objectives are the *program activities*. Results come in varying stages; outputs are the immediate products of the program activities. *Outcomes* are the changes in participants' behaviors or knowledge over time, and *impacts* are the changes occurring in communities or systems over the long-term.

Logic models are critical to program design and planning. The purpose is to visualize a roadmap for stakeholders that shows a clear chain of reasoning-- *if* actions are taken, *then* a

result will follow (W.K. Kellogg Foundation, 2004; McNaughton, Thomas, Havery, n.d.). The model identifies key variables affecting the program and helps anticipate the data and resources needed to reach goals. Additionally, it serves as a guide for tracking progress at critical points in the project timeline. Lastly, the model illustrates the program's operations in a digestible format to facilitate a shared understanding among all who are involved with the project.

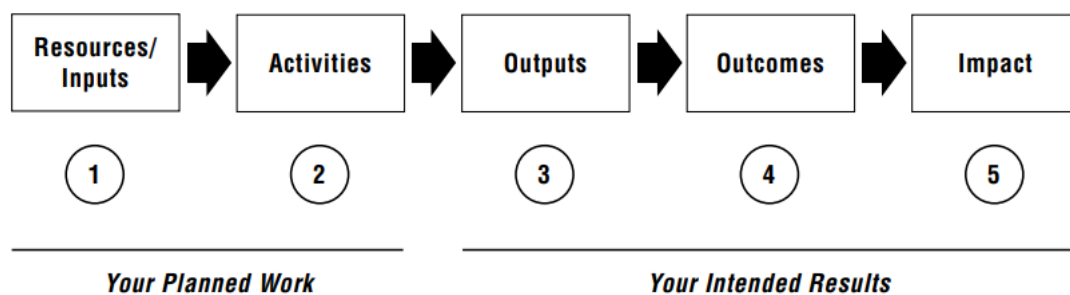
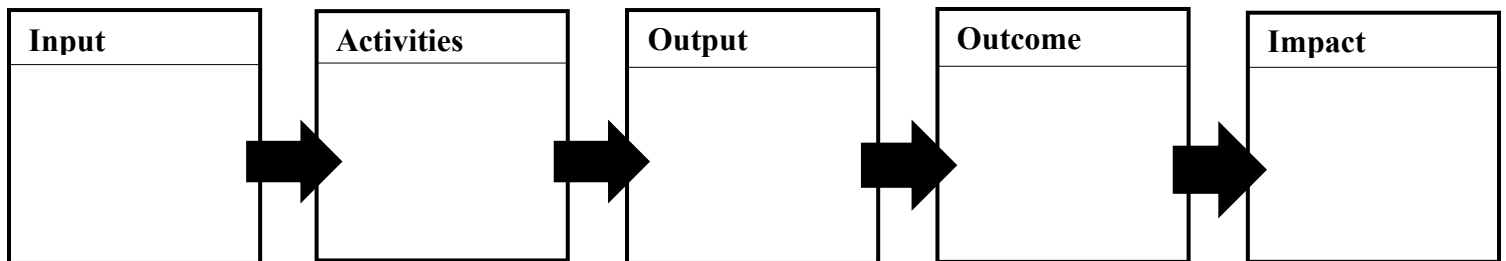


Figure 1 The Basic Logic Model (W.K. Kellogg, 2004)

## Building a Logic Model

The effectiveness of a program relies on how well its underlying theory is constructed (W.K. Kellogg, 2004). The theory should include a clear problem statement that explains what the program is addressing (W.K. Kellogg, 2004). A strong theory provides a clear framework that connects program activities to its intended outcomes. Therefore, building a logic model begins with establishing the problem to address and identifying desired outcomes to solve it. By determining the short- and long-term outcomes first, the program can be designed with methods to periodically gather the data required to measure progress and catch problems early on. Lastly, outcomes and impacts from a program should adhere to the SMART criteria; Specific, Measurable, Action-Oriented, Realistic, and Timed.

The following is a basic framework of a simple logic model, presented as a hypothetical example throughout this paper to demonstrate its application to an opioid response program. For clarity, each section includes one or two specific examples to illustrate the use of the logic model, but logic models are flexible tools and can encompass multiple activities, outputs, and outcomes to fit opioid-related initiatives.



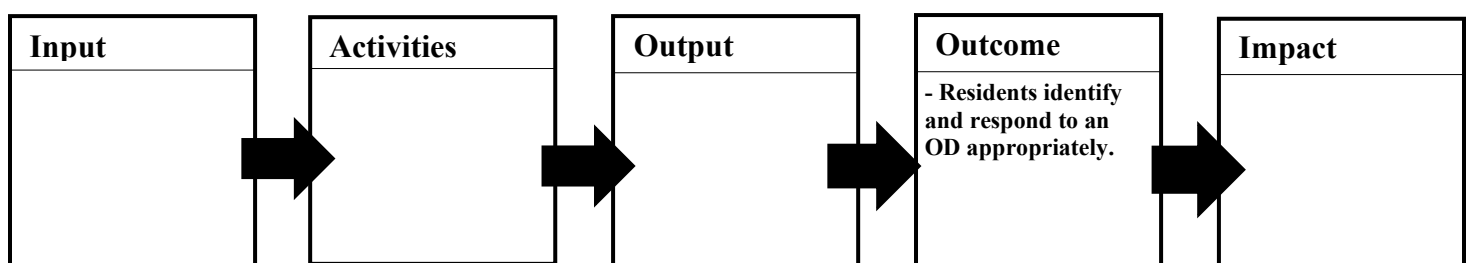
*Figure 2*

Logic models begin by succinctly explaining the problems to be addressed by a given program or initiative (W.K. Kellogg, 2004). A well-designed problem statement will exhibit the program's long-term effectiveness and indicate how the program will function for what it intends to achieve. To illustrate an application of the logic model within the context of the opioid epidemic, a potential problem statement could be:

[There is a] higher number of opioid-related overdose deaths in our community than in other communities in our state. Contributing factors identified through this process include the following: lack of knowledge among opioid users, friends, and family members about how to identify and reverse opioid-related overdoses (EDC, 2017, p. 2).

With the problem identified, we can begin developing the example logic model by setting outcomes targeted at addressing it. Short-term outcomes are changes in knowledge, behaviors, and attitudes among program participants that result from program activities (W.K. Kellogg, 2004). These changes are typically observed within the first three years and should directly reflect the problem statement, demonstrating how they contribute to addressing the identified issue. They are important as early indicators whether the program is progressing toward its long-term goals and impacts.

Using the example model, one short-term goal would be increasing the percentage of community residents who are knowledgeable and confident in identifying an opioid-related overdose and taking appropriate steps to assist (EDC, 2017). This outcome could be measured using pre- and post-program surveys assessing participants' ability to recognize overdose symptoms and understanding of emergency response procedures. This approach would track improvements in participants' ability to respond to opioid overdoses, providing early indications of the program's effectiveness.



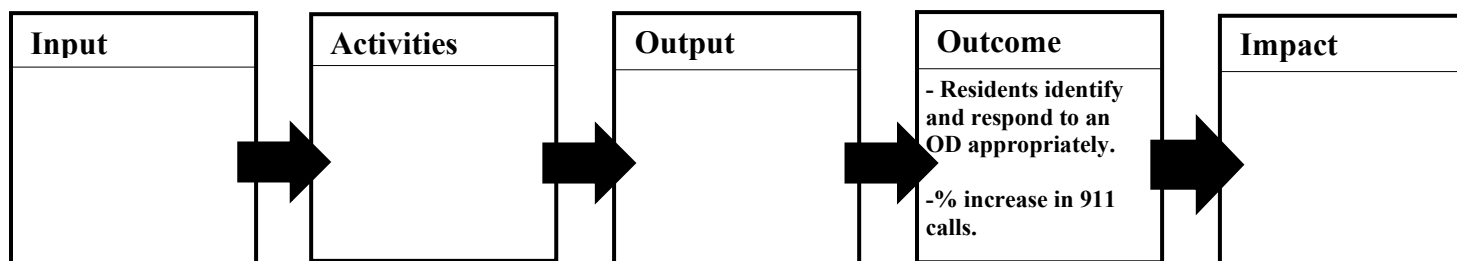
*Figure 3*

Expanding on short-term outcomes, long-term outcomes similarly reflect changes in attitudes, knowledge, and behaviors, but are typically achieved over a longer period, usually four to six years (W.K. Kellogg, 2004). These outcomes serve as critical milestones between short-term

results and overall impact, helping to confirm the program is still progressing as intended.

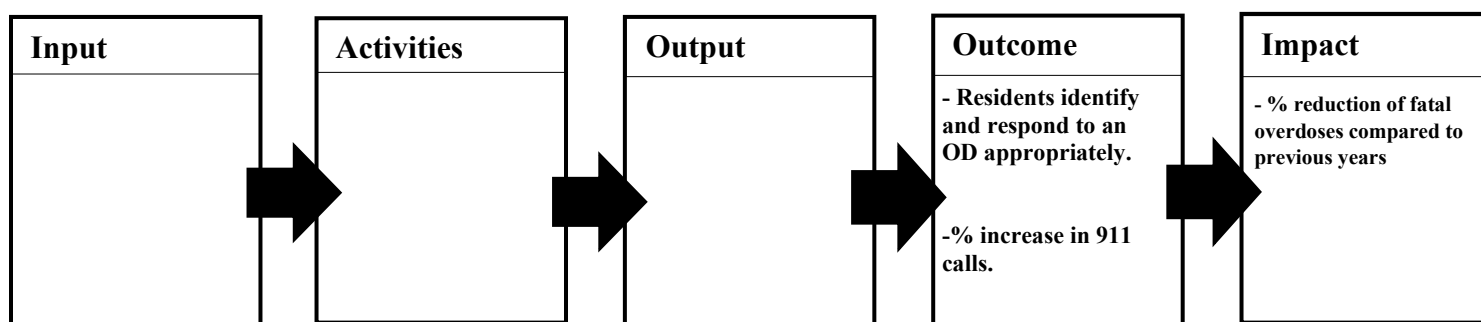
Like short-term outcomes, long-term outcomes should align with the problem statement to demonstrate continued progress towards the intended impact of the program.

In the example, long-term outcomes can be observed as a percent increase in the number of reported overdoses resulting from 911 calls (EDC, 2017). This outcome could be measured by tracking 911 call records to compare the number of calls before and after the program's implementation and against data from previous years. Here, the short-term goal of increasing community education leads to residents being more aware in recognizing and responding to an overdose appropriately. As more people identify overdoses and seek help, the volume of 911 calls increases, enabling overdose victims to receive immediate assistance and reduce the risk of fatal outcomes.



*Figure 4*

Lastly, impact of the program is evaluated; these are the organizational and systemic level changes expected to result from program activities, typically observed after seven years (W.K. Kellogg, 2004). Impacts represent the broader social changes the program aims to create overtime. An impact for this opioid project would see a decrease in the numbers of fatal opioid overdoses compared to previous years, directly addressing the established problem statement (EDC, 2017).



*Figure 5*

Understanding the desired outcomes of a project helps to focus the process of identifying the necessary resources and activities to achieve those goals (W.K. Kellogg, 2004). The next step in developing the logic model is to identify the inputs needed to make the program effective. Inputs can include any resource like staff, funding, existing organizations and collaborating partner organizations, community resources, as well as resources like facilities, equipment, software, etc. Inputs are critical to establish as they provide the foundation and support necessary for operating the program efficiently and directly influence the likelihood of achieving the desired results.

Using the example model, inputs could include settlement/grant money and a wide range of stakeholders from both public and private sectors, such as, law enforcement, emergency services, and healthcare organizations (EDC, 2017). Additional inputs could be technology, as each stakeholder brings its own data systems and software to support activities. If the short-term outcomes are intended to raise awareness and educate participants, inputs can be used towards developing program activities to reach this outcome by using funds, staff, and technology.



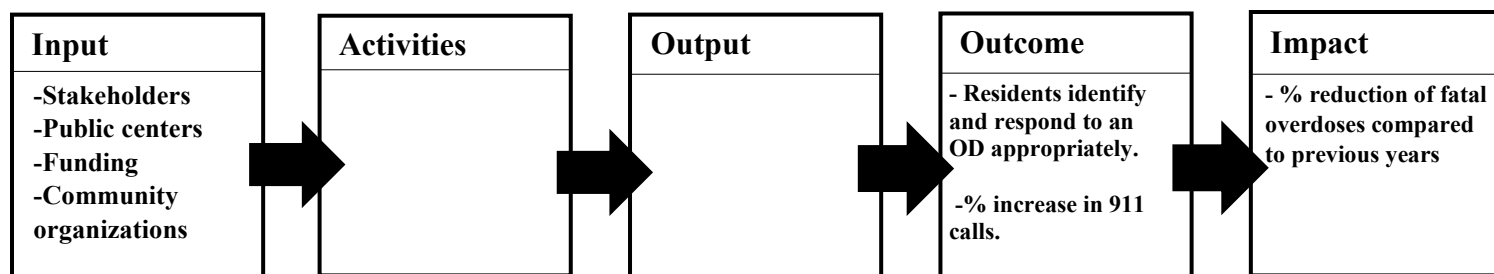


Figure 6

Program activities demonstrate how these resources are employed through technology, events, and actions as part of the program implementation (W.K. Kellogg, 2004). Activities are the tailored actions and interventions essential for achieving the program outcomes. They serve as the core representation of the program, encompassing all strategies directed at reaching its goals. In other words, the activities are the "doing" or the "how" part of the program, the processes and actions that form the foundation. The program's existence depends on these activities, as all results derive from them; without activities, the program remains theoretical and lacks any measurable outcomes.

For the example model, a potential key activity could be an educational campaign distributed to the community. This campaign could include social media interventions as well as in-person or live online educational classes on opioids and opioid overdoses (EDC, 2017). These efforts aim to reach opioid users, family members, and friends to educate them on proper protocols when experiencing an overdose. The effectiveness of these activities can be measured through tracking various metrics such as 'likes', 'shares', 'comments', 'clicks', and 'views' for online content. In-person and virtual class participation can be tracked through attendance, and pre- and post-surveys can measure changes in knowledge and confidence among participants.

Outputs represent the direct product from program activities and reflect whether the program was delivered to the intended audience (W. K. Kellogg, 2004). The outputs provide insight into the progress of the activities; for example, tracking metrics like 'clicks' and 'shares' helps confirm that the activities are reaching target audiences and signals progress towards achieving short-term outcomes. If the activities are the "how", then the outcomes would be the "what". They are the measurable evidence signifying that the activities occurred and reached the intended audience.

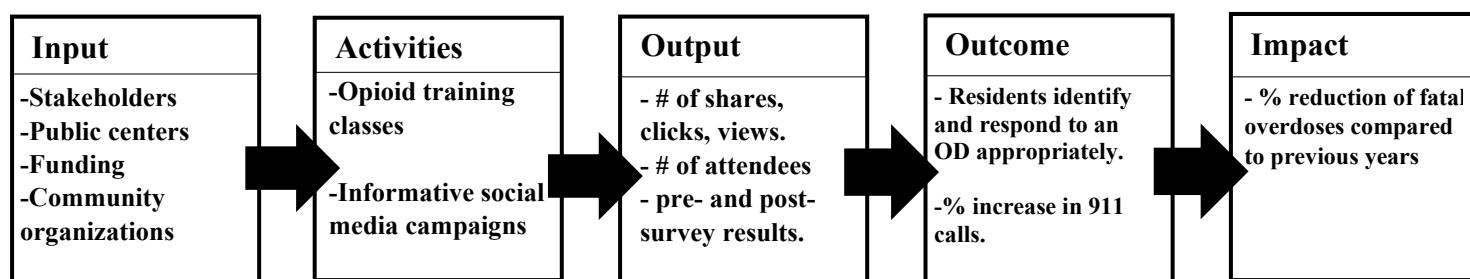


Figure 7

## Case Study

Rural communities across the U.S. have faced societal and financial burdens as a result of the opioid epidemic, compounded by a lack of behavioral health services, risk reduction services, medication-assisted treatment and other programs usually offered in more populous areas of the country (Shaver, 2020). Indiana, in particular, has seen a 500% increase in fatal opioid overdoses over the past 20 years and an estimated \$43.3 billion in economic damages. The public health impact from Opioid Use Disorder (OUD) in Indiana has caused the largest human immunodeficiency virus (HIV) outbreak, alongside high rates of Hepatitis B and Hepatitis C infections, within the state.

In response, Indiana's state government focused on developing and enhancing local, regional, and state resources to facilitate better information sharing (Shaver, 2020). A comprehensive review of the state's opioid-related legislation, regulations, guidelines, strategic plans, and initiatives was conducted to ensure that government OUD policies were aligned with current best practice standards. The review used a logic model to examine the roles of stakeholders within healthcare, public health, social services, and government organizations in addition to their activities aimed at reducing opioid use.

The model outlined key assumptions and expectations, identifying inputs as healthcare, public health, social services, and government organizations (Shaver, 2020). Program activities were categorized into best practice domains, each focusing on vital areas contributing to addressing the crisis. Regulatory targets were prescribed, ensuring that healthcare providers followed safe prescribing protocols to prevent misuse. Medical and behavioral health practices were other activities focused on the integration of medical treatment and mental health support for comprehensive care directed at individuals struggling with OUD. Prevention and education initiatives played a role in raising awareness within the community and helping people understand the risks of misuse and become knowledgeable on prevention strategies.

The review revealed that in five counties, opioid dispensation rates exceeded the median by 246 prescriptions per 1,000 people (Shaver, 2020). These counties also had limited access to OUD informed treatment information, maternal and infant OUD care, and syringe service programs. However, the prevention and education stakeholders reported that all counties promoted local health information campaigns and plans for prevention programs primarily targeted towards adolescents. Emergency response stakeholders found that Naloxone

access remained consistent and laws protecting individuals from charges related to drug possession have reduced stigma, encouraging people to seek help.

Outcomes from the logic model described the formation of community coalitions enhancing appropriate prevention, treatment, and after care for OUD (Shaver, 2020). Grant initiatives at the federal and state level included development of a comprehensive opioid recovery center and a community behavioral health center. Additionally, improved Naloxone accessibility helped to reduce overdose deaths in the region. Overall, the reviewed counties all demonstrated stability in OUD related overdoses, further improvements in best practice domains are possible through continued coordination between state and local governments.

## Conclusion

The opioid crisis has undeniably devastated communities across the U.S with fatal overdoses rising at an alarming rate throughout the years. Addressing the epidemic requires a comprehensive approach and logic models serve as a valuable tool in understanding the resources available to determine intervention programs to reach desired and effective results. By visualizing the structured framework of a program, logic models allow for stakeholders to align resources, measure progress, and track short-term and long-term outcomes. These practices enable data-driven decision-making and support coordinated efforts between government and community organizations.

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