

Assessing and Incorporating Intervention Effectiveness in Systems Models of the Opioids Crisis

Virtual Workshop
October 20 - 22, 2020

Discussion Guide

Meeting Background and Session Objectives

The U.S. Food & Drug Administration (FDA), National Institute on Drug Abuse (NIDA), and Centers for Disease Control and Prevention (CDC), all within the U.S. Department of Health and Human Services (HHS), are each working to leverage systems modeling approaches to understand the complexities of the opioids crisis and the potential impacts of policy intervention options.

In April 2019, these HHS partners convened a kick-off interagency meeting to support coordination and facilitate multi-stakeholder dialogue on these modeling efforts, particularly concerning data needs. Since the HHS interagency meeting, federal and partner modeling teams have taken steps to refine systems models of the opioids crisis to support a real-time public health response.¹ These modeling efforts complement one another and accommodate the input of health, population parameter, and policy intervention data. Continued collaboration across HHS and partner modeling teams, substance use experts, and policymakers will support the implementation of well-informed and effective policies to address the evolving crisis.

The Duke-Margolis Center for Health Policy, through a cooperative agreement with the U.S. Food & Drug Administration, is convening this meeting to facilitate a multi-stakeholder discussion about approaches to refining systems models of the opioids crisis and next steps for adapting the models to accommodate a range of policy interventions. Discussion at the meeting will focus on the current status of opioids systems models as well as outstanding data issues and limitations. Stakeholders will also discuss how policy interventions can be integrated into the systems models and how modeling efforts and associated research on policy interventions can best support decision-making.

Session 1—Overview of HHS Opioids Systems Modeling Projects: Where Are We and Where Are We Going?

Systems-level models of the opioids crisis help decision-makers understand the trajectory of the crisis as well as the outcomes and unintended consequences of potential policy interventions on the opioids system.¹ Existing models take several approaches to crisis simulation, including agent-based and population-based approaches, and consider several types of data from different sources. Data commonly considered across the systems models include—

- **Opioid Use Disorder Data**—including epidemiology and natural history data related to opioid use disorder
- **Demographic Data**—including data on individual characteristics (in the case of agent-based modeling) and data related to social and environmental factors contributing to opioid use, misuse, and abuse
- **Supply and Outcomes Data**—including prescribing data, illicit opioid supply data, opioid use data, and treatment and relapse data

¹ The agenda for the 2019 kick-off meeting is included in the Supplementary Document of the paper— Data Needs in Opioid Systems Modeling: Challenges and Future Directions—provided to participants of the 2020 meeting.

At the 2019 HHS interagency meeting, the modeling teams identified several data limitations, including lack of data related to opioid use patterns, obstructing the development of systems models that can measure and incorporate the impact of intervention effectiveness. This session will feature presentations from each of the HHS modeling teams on the status of existing systems models and anticipated model capabilities. Discussion in this session will focus on model design and the potential applications for each of the models in supporting policy analysis.

Discussion Question:

1. What approaches can the HHS modeling teams take to ensure that the systems models are aligned and complementary?

Session 2—Data Elements and Research Opportunities to Enhance Systems Models

Systems models of the opioids crisis are impacted by data availability, quality, and interoperability and effective simulation of the crisis depends on the models' ability to integrate imperfect, diffuse, and evolving data. As HHS modelers work to refine the systems models, data gaps persist. For example, issues associated with non-standardized data collection and reporting practices² and lags in data availability³ are commonly cited as impediments to model refinement. These data gaps impact the utility of the models in estimating the trajectory of the crisis and supporting the implementation of high-impact policy interventions on the opioids system.

Discussion in this session will focus on the identification of outstanding data limitations as well as the prioritization of common data needs across the modeling teams. Participants will also discuss the characteristics of improved or ideal data and how these data may be reasonably obtained.

Discussion Questions:

1. What approaches should stakeholders take to increase the availability of standard definitions for key variables across data sources?
2. What data limitations must stakeholders address first to enable the development of representative systems models? Further, what types of data are essential to the development of trustworthy models of the crisis?
3. What novel data sources should HHS and partner organizations consider integrating into existing systems models to increase model validity and reliability?
4. How has the COVID-19 public health crisis impacted the quality and availability of data for model integration?
5. Can HHS and partner organizations repurpose or repackage existing data from other sources to inform modeling efforts? If yes, which sources?

Session 3—Defining Policy Interventions for Systems Model Analysis

Systems models can be used to analyze and simulate the effects of policy interventions implemented to address different components of the opioids crisis. For example, policymakers may be able to use systems models to quantify the impact of specific harm reduction policies, like safe injection sites, on the number overdoses, or other measures of morbidity, in a synthetic population. However, care must be taken in the translation of policy interventions into model inputs, considering, for example, how those interventions are defined, assumptions that are required, and limitations on our understanding of the effectiveness of the interventions.

An important objective of this session is to build shared understanding among modelers, opioids experts and policymakers of how systems modeling analyzes policy interventions. Discussion will focus on the readiness of the models for analyzing existing policy interventions and the process for the effective

integration of policy interventions into systems models going forward. Discussion in this session will also support the development of approaches for assessing and improving the readiness of a policy intervention for integration into the models. Finally, participants will discuss approaches to accounting for geographic variation in intervention implementation and the extent to which state and local level data can be used to estimate intervention effectiveness in national models.

Discussion Questions:

1. How can stakeholders reach consensus on researchable questions related to the potential impact of activities conducted in response to the opioids crisis? Which groups should be involved in this type of consensus building?
2. What type of data is essential to the models' ability to assess and compare intervention effectiveness and where do gaps in knowledge about leading policy interventions exist?

Session 4—Priority Policy Questions and Next Steps for Model Enhancement

To improve the value of systems models as tools to support decision-making, policymakers, in collaboration with their modeling partners and opioid use disorder experts, must determine the priority research questions that the models can be designed to help answer. To maximize the utility of systems models, stakeholders must also engage in cross-disciplinary collaborations to enhance data collection for model input, address data limitations, define policy questions, and focus resources and efforts.

Panelists and participants will identify considerations for the continued development of adaptive systems models that enable decision-makers to address priority policy questions. Discussion will also focus on how stakeholders in the modeling community can best engage with one another to leverage available data, address priority data needs, and build a better understanding of intervention effectiveness to support informed decision-making.

Discussion Questions:

1. How can policymakers, modeling, data, and public health experts collaborate to ensure targeted, relevant, and efficient data collection and modeling efforts related to systems factors associated with the opioids crisis?
2. How should stakeholders collaborate to prioritize researchable questions that each of the models can feasibly address and how should these priority questions be communicated to the research and modeling communities?
3. Where should resources and efforts to improve data collection be focused to support model enhancement and policy decision-making?
4. How can model outputs be changed or improved to support policy decision-making?

Case Study Sessions

Systems modelers encounter similar challenges in the assessment of common evidence-based interventions designed to reduce morbidity and mortality associated with opioid use disorder, such as the increased availability of medication for opioid use disorder in the outpatient setting and the co-prescribing of naloxone to address potential risk of overdose. The process of translating these particular policy interventions into systems models is also complicated by a number of factors, including limitations in data collection and aggregate understanding of treatment trajectories. The case study sessions will include detailed discussion of approaches to enhancing data collection for these specific interventions to better support modeling, research, and policy needs.

Case Study 1—Utilization of Medication for Opioid Use Disorder (MOUD)

The prescription of medication (including methadone and buprenorphine) for the treatment of opioid use disorder has proven effective in decreasing the negative consequences of opioid use, including the incidence of fatal overdoses.⁵ However there have been low-levels of uptake related to MOUD delivery across primary and outpatient care settings, which may impact the ability of systems models of the crisis to generalize information about MOUD interventions and, ultimately, estimate their effectiveness on morbidity and mortality outcomes in modeled populations.

Discussion in this session will cover how systems models incorporate imperfect or incomplete data to provide information about potential intervention effectiveness. Discussants will also outline approaches for improving data on MOUD utilization and how models may support increased uptake of effective policies.

Discussion Questions:

1. What researchable questions related to MOUD delivery are policymakers seeking to address with the help of the models?
2. What priority information gaps need to be addressed to enable effective model integration of MOUD delivery policies?
3. Do model methodologies need to be adjusted to more effectively estimate the impact of leading MOUD delivery policies?

Case Study 2— Naloxone Distribution

Naloxone distribution policies can take a range of approaches, including naloxone co-prescribing for patients receiving long-term opioid therapy, pharmacy-based naloxone dispensing, and community-based naloxone distribution. The evidence base related to the implementation of each of these approaches varies in terms of quality and availability, which can impact the trustworthiness of model-generated estimates of their effectiveness.

Discussion in this session will cover what is known and unknown about currently implemented naloxone interventions and how this information can be integrated into the models. For example, how do modelers interpret emerging data that suggest naloxone co-prescribing may avert fatal overdoses and other negative health outcomes?⁴ Modeling teams will provide commentary about the naloxone interventions currently under consideration as part of their modeling efforts as well as what additional information is needed to improve estimates of the effectiveness of naloxone distribution policies on outcomes of interest at a national level.

Discussion Questions:

1. What researchable questions related to naloxone distribution are policymakers seeking to address with the help of the models?
2. What priority information gaps need to be addressed to enable effective model integration of naloxone distribution policies?
3. Do model methodologies need to be adjusted to more effectively estimate the impact of leading naloxone distribution policies?

References

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