

# **The Infant and Maternal Mortality Project: Reproductive Health as a Complex System**

## **A primer on the research methodology**

We are delighted that you are taking part in our project on reproductive health in Ohio. We thank you for attending and sharing your valuable insights in the first of three workshops in this project. This short note is a primer on the set of research methods we are using in this project.

### **The Problem Statement**

*How do social determinants of health, biases, attitudes, cultural norms, laws, and policies in urban Ohio impact access to and use of reproductive and other health services (e.g. contraception, abortion, prenatal care, birth care), pregnancy, and maternal and child health?*

### **What is the overall approach to solving this problem?**

The above problem statement is a complex problem because it involves interactions and feedbacks between multiple determinants of health operating at multiple levels of organization. Using a complex systems approach, we can embrace the complexity of such problems, take a broad look, and use a learning process that slowly builds upon itself. Our overall approach to solving this problem involves a set of methods called Community Based System Dynamics (CBSD). If you are familiar with Community Based Participatory Research (CBPR), then you may think of CBSD as CBPR with a strong emphasis on computational modeling and policy simulation. The CBSD approach consists of three phases: 1) group model building workshops, 2) system dynamics (SD) modeling and 3) implementation and dissemination. The first workshop that you recently attended falls within Phase 1 of the CBSD approach.

### **What is Group Model Building?**

Group model building (GMB) relies on you as the experts in the research. It is you all who have the insights to come to consensus about key stakeholders, important factors, and policy options for the complex problem. You also have the power and the interest to implement the results. Your expertise, observations and perspectives are captured through a series of group model building workshops that will lead to the co-creation of a model of the reproductive health system in Ohio. Group model building is iterative, social, and oriented toward action, not just information gathering. Your contributions through shared decision-making and co-ownership of the final model will enable you envision and design a new future for reproductive health in Ohio. Overall, our goal is to involve you to create a model that you will advocate for and implement in your community. Thus your role as opinion leaders and interpreters within your communities is critical.

### **What is a System Dynamics (SD) Model?**

A System Dynamics Model is a type of computer simulation model that describes the complex interactions between many factors that are associated with explaining patterns in the outcome(s) of interest based on the problem. The SD Model is conceptually developed via Group Model Building and then iterated upon by GMB participants for the purposes of validation, usability and practical implementation in real-world settings. The development of such a complex model through a participatory modeling approach allows participants (you) to reflect on your roles within these systems and your responsibilities to them. In our project, the SD model will allow us carefully consider multiple perspectives in finding solutions to the set of complex problems in reproductive health in Ohio.

**Please click this [link](#) to view the SD Model shown at the first GMB Workshop.**

Thank you for working with us on the Infant and Maternal Mortality Project. Please see next page for further readings on systems thinking and modeling in public health. All readings are open-access and peer-reviewed.

**Further reading**

- Systems Thinking and Modeling for Public Health Practice ([link](#))
- Advancing the Use of Evidence-Based Decision-Making in Local Health Departments With Systems Science Methodologies ([link](#))
- System Dynamics Modeling for Public Health: Background and Opportunities ([link](#))

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