

Our current methods for ending the overdose crisis are limited by tools that respond **after** overdose events occur.

What if we could prevent overdose events *before* they occur?

How will we do this?

The PROVIDENT Study is a research study looking to prevent drug-related deaths in neighborhoods across Rhode Island, one of the states hardest hit by the nation's overdose crisis.

We will test a new set of tools for public health and policy leaders to help them predict, or forecast, the future overdose trends and patterns in their state - and identify the best ways to intervene and save lives.

Our new tools:

Predictive analytics are forecasting tools that are powered by large datasets. They use **algorithms** and **statistical models** to identify trends and patterns in large datasets.

With predictive analytics, we can use more data than ever before to understand the overdose crisis and create a forecast of what to expect.

We will include **public health surveillance data** from state agencies like the Rhode Island Department of Health. These data include things like fatal and non-fatal overdose events and naloxone availability.

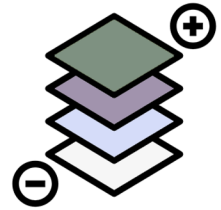
We will also use **neighborhood data** on underlying overdose risks, such as poverty rates, unemployment trends, and resources in each community. These data will come from publicly available datasets, such as the American Community Survey.

Our Partners:

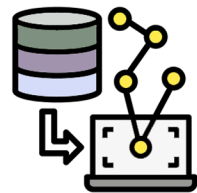
This five-year study is a collaboration between the **Rhode Island Department of Health** and researchers at the **Brown University School of Public Health**, the **New York University School of Medicine**, and the **University of California, Berkeley**. PROVIDENT is funded by the National Institute on Drug Abuse (NIDA) (R01DA046620)

Our Team:

Our team includes experts in epidemiology, biostatistics, machine learning, overdose surveillance, and spatial analysis.



Many datasets will be combined, including surveillance & census data



The data will be analyzed by researchers and epidemiologists using sophisticated predictive models



The predictions will be made into tools, like targeted maps, that will be used for targeted interventions

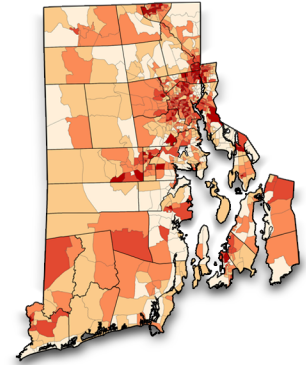
PROVIDENT involves **three phases**, or parts:

Phase 1: We will develop the PROVIDENT Model (Year 1)

Phase 1 will result in the **development and validation** of PROVIDENT, a predictive analytics model to **identify neighborhoods in Rhode Island where future overdose deaths are most likely to occur.**

With PROVIDENT, we will use a type of predictive analytics known as **spatial machine learning** to identify the neighborhoods in Rhode Island at highest risk of future overdose outbreaks. We will create detailed maps for public health leaders and policymakers every six months.

Phase I was launched in December 2019



The PROVIDENT Model will offer detailed predictions using census block groups. This amount of detail will allow for targeted interventions at the neighborhood-level.

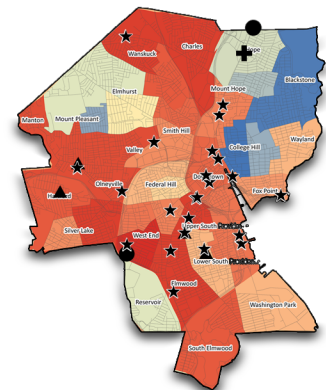
Phase 2: We will launch a randomized trial to test the PROVIDENT model (Years 2-4)

Phase 2 will evaluate whether **targeting interventions** to neighborhoods based on The PROVIDENT model will **reduce the burden of overdoses** at the state level. In order to do this, we are launching a randomized control trial. If the trial is successful, our goal is to reduce overdose rates by 40% in five years.

The study will involve no changes to the overall amount of resources dedicated to preventing overdose deaths in Rhode Island. If the trial is successful, our goal is to reduce overdose rates by 40% in five years.

In municipalities randomized to the control condition, interventions will continue to be funded and deployed at the city/town-level. In cities/towns randomized to receive predictions from the PROVIDENT model, researchers at Brown University and the Rhode Island Department of Health will work with community leaders to target overdose prevention and treatment interventions to those neighborhoods identified by the model as being at highest risk for future overdose outbreaks.

Phase II will launch in October 2021



Some cities in Rhode Island will be randomized to receive the PROVIDENT model predictions. In these communities, research staff will work with stakeholders to deliver interventions to neighborhoods at highest risk of future overdoses.

Phase 3: We will analyze and share the results of the PROVIDENT Model (Year 5)

Phase 3 will determine whether providing predictions from the PROVIDENT model was effective in reducing overdose in the state. We will analyze post-intervention data and then share the results.

Our results will improve public health decision-making and inform resource allocation to communities that should be prioritized for evidence-based prevention, treatment, recovery, and overdose rescue services. **If found to be effective, the PROVIDENT model will be disseminated to other states, which could adapt the tool to guide resource allocation and maximize public health impact.**

Phase II will launch in October 2023