Exploring the Geographic, Economic & Social Impacts of Childhood Lead Poisoning in Rhode Island

The Providence Plan, the Rhode Island Department of Health, and Brown University request $315,500 in Lead Technical Studies funding to further study the effect that the state's Lead Hazard Mitigation Law has had on the incidence of lead poisoning among children.

In July 2005, Rhode Island enacted sweeping changes to the state's lead hazard regulations as part of a comprehensive strategy to reduce lead poisoning incidence rates. Major changes within Rhode Island's law required landlords of non-owner occupied multi-family housing to attend a three-hour Lead Hazard Awareness Class, assess and fix lead hazards on the property, obtain an independently issued Certificate of Conformance (COC), and perform ongoing maintenance of lead safe work practices learned in the course.

In 2011, HUD awarded a Lead Technical Studies grant to The Providence Plan (ProvPlan) to examine the degree to which the housing policy components of the Lead Hazard Mitigation Law have been effective in reducing the incidence of first-time elevated BLLs in children. Findings from this project revealed that the law has had a measurable effect on reducing the lead burden for children who live in properties with compliance certificates. However, our research also identified the lack of enforcement as a barrier in reducing lead poisoning rates even further. In addition, our findings revealed that a majority of properties were exempt from the law and still housed lead-exposed children. These findings came into play during the 2014 legislative session in Rhode Island, in which new maps played a substantial role in reinstating funds for the lead poisoning prevention program that were slated to be cut due to state budget constraints.

Building on these successes, ProvPlan, the RI Department of Health, and Brown University have now developed a second Lead Technical Studies project scope that extends our current model to use secondary data to assess the effectiveness of lead hazard control activities and regulations. Our team believes that new efforts are needed to quantify the impacts of childhood lead poisoning and that such approaches could be an effective strategy to engage state policymakers in a dialogue about the value of appropriating additional resources for policy enforcement.

We hypothesize that the development of more detailed findings that identify micro-geographies where enforcement resources are most needed will engage legislators who will want to do right by their constituents. Furthermore, by conducting analysis that provides data about some of the economic consequences associated with childhood lead poisoning, residents and community groups will be more informed and empowered to understand the link between healthy housing and better public health outcomes.

This proposal will address two primary research questions.

1. Among children (under 72 months) tested for lead between 2010 and 2014, what types of geospatial associations and other covariates exist relative to blood-lead level (BLL) variation among children and the presence of lead compliance certificates?

2. Among children (under 72 months) tested for lead between 1997 and 2014, what direct and indirect costs are associated with BLL variation with regard to Medicaid and Early Intervention expenditures, school readiness, academic achievement, student discipline, and juvenile justice involvement?

These research questions emphasize studying the relationships between children's residential history and lead exposure as well as examining lead exposure rates within the context of longitudinal education, human services, and juvenile justice data. Our research protocol lends itself to a variety of multivariate analytic methods using both logistic and linear regression.

This proposed project focuses on a key priority that HUD has outlined for the Lead Technical Studies Program NOFA: namely, "the creative use of existing databases to assess the effectiveness of lead hazard control activities and regulations."

The datasets used to answer these questions will include: 1) blood-lead level data (1997-2014) via the Department of Health; 2) Certificate of Conformance (COC) data (2010-2014) via the RI Housing Resources Commission; 3) parcel-level property data from Rhode Island's major cities (Central Falls, East Providence, Newport, Pawtucket, and Providence,); 4) Medicaid and Early Intervention claims expenditure data via the RI Executive Office of Health and Human Services (2007-2014), and multiple forms of education data (child outreach screening, student achievement, absenteeism, graduation rates, student discipline, and juvenile justice involvement) via the Rhode Island Department of Elementary and Secondary Education (2007-2014).

A vast majority of these datasets already exist within ProvPlan's data warehouse via active data-sharing agreements among various state and local agencies. No new data collection is needed and no human subjects will be involved. All of the datasets needed to answer our research questions have been used for other types of analysis (by ProvPlan or the respective agency), thus minimizing the level of effort needed to scrub and prepare the data for our project. The number of data points to be used for these analyses will yield more than adequate statistical power.

ProvPlan has assembled a strong project team with the demonstrated capacity to examine our research questions, disseminate results, and implement findings. Our team includes Ms. Alyssa Sylvaria, MPH, ProvPlan's Health Information and Policy Specialist, Dr. Anna Aizer, health and labor economist from the Brown University, Dr. Robert Vanderslice, Team Lead for the RI Department of Health's Healthy Homes and Environment, and Dr. Peter Simon, former Medical Director of the RI Department of Health and national leader in childhood lead poisoning policy. Each of these individuals has extensive experience in presenting their research findings either through practitioner-oriented conferences and/or peer-reviewed academic journals.

At a local level, findings will be shared with policymakers and key stakeholder groups including health officials, state and local housing offices, and lead hazard advocacy organizations. It is highly anticipated that research results will catalyze additional dialogue about lead hazard policy and what changes are needed to help Rhode Island achieve its goal of eliminating childhood lead poisoning. At a broader level, findings will be disseminated through two national networks – the Urban Institute's National Neighborhood Indicators Partnership (NNIP) and the University of Pennsylvania's Actionable Intelligence for Social Policy (AISP) network.

ProvPlan is a 501(c)3 nonprofit with a mission to improve the economic and social well-being of Rhode Island. The organization was launched in 1992 as a joint effort of the City of Providence and the State of Rhode Island with a goal to promote better collaboration between government, the private sector, and the academic community. As a recipient of 25 federal grants since 2004, ProvPlan has a demonstrated track record of grants management, federal funds stewardship, and the capacity to achieve the project objectives within the proposed period of performance.