RETROSPECTIVE LEAD POISONING PREVENTION EVALUATION (2017 – 2022)

Report on Evaluation Findings

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INTRODUCTION

CHILDHOOD LEAD POISONING

Lead poisoning. Lead poisoning is a preventable condition affecting millions of families in the United States (US) (McFarland, Hauer, & Reuben, 2021). Lead dust in older housing is the most common source of childhood exposure to lead, primarily in children under the age of 6 years old (Maine Center for Disease Control and Prevention, 2022). By adulthood, nearly half of all Americans have been exposed to hazardous levels of lead (McFarland, Hauer, & Reuben, 2022).

The US Centers for Disease Control and Prevention (US CDC) uses the 97.5th percentile of blood lead distribution in children ages 1-5 years old to estimate a reference blood lead level. Currently the reference level is 3.5 ug/dL (US Centers for Disease Control and Prevention, 2021). However, it is important to note that because lead has no biological role in the body there is no safe level of lead in children (Hauptman, Bruccoleri, & Woolf, 2018; Vorvolakos, Arseniou, & Samakouri, 2016).

> Blood lead testing uses a sample of children's blood to test the amount of lead present, measured in micrograms per deciliter (ug/dL). Initial testing is usually done using a finger-prick or capillary test. If the capillary test shows a blood lead level of 3.5 ug/dL or higher, a venous blood draw will be conducted to confirm blood lead levels.
>
> (US Centers for Disease Control and Prevention, 2022b)

Health risks. Lead is particularly dangerous for children, who are most at risk because of their frequent hand-to-mouth activities, crawling/play behaviors, and rapidly growing bodies (Maine Childhood Lead Poisoning Prevention Unit, 2019). Lead exposure in young children can lead to lower cognitive functioning, slowed growth, developmental and behavioral issues, and other lifelong health concerns (Hauptman, Bruccoleri, & Woolf, 2018) (Maine Childhood Lead Poisoning Prevention Unit, 2019).

Lead poisoning in Maine. Prior to 1978, lead was a common ingredient in many household products in Maine, particularly paint (Maine Center for Disease Control and Prevention, 2022). Maine ranked 8th in the US for the oldest housing stock in 2019, with more than half of homes built prior to the 1980s and prior to the banning of lead-based paint for residential uses (US Census Bureau, 2021). In addition, 34% of occupied rental units in Maine were built prior to the 1950s (ibid)- most homes in Maine built before 1950 have lead paint (US Department of Housing and Urban Development, 2012). As of 2018, 87% of Maine children with lead poisoning lived in housing built before 1950 and 79% lived in housing with identifiable lead paint hazards (Maine Childhood Lead Poisoning Prevention Unit, 2019).

In 1991, Maine set a goal to eradicate lead poisoning by the year 2010 (Maine Childhood Lead Poisoning Prevention Unit, 2019). Though this goal has not yet been met, much progress has been made (ibid). Maine CDC lead poisoning data shows that an estimated 1.9% of Maine children under three years old who were tested for blood lead levels were identified with lead poisoning (blood lead level of 5 ug/dL or higher) in 2021, compared to 4.3% of the same population in 2010 (Maine Tracking Network, 2022).

> In 2021, the US CDC blood lead reference level was changed from 5 ug/dL to 3.5 ug/dL.
>
> (US Centers for Disease Control and Prevention, 2022a)

Vulnerable populations and high-risk areas. Risks factors for lead poisoning are not evenly distributed nationally nor in Maine, with some areas and populations at a greater risk for lead exposure and poisoning. Currently, there are four high-risk areas in Maine: Lewiston/Auburn, Portland/Westbrook, Biddeford/Saco, and Bangor (Maine Tracking Network, 2022). In addition to consistently higher rates of

lead poisoning among children aged 3 years or younger, these areas also have high percentages of poverty and older housing, both of which are known risk factors (ibid). Of these high-risk areas, in 2020 Lewiston/Auburn had the highest rate of positive tests for lead poisoning (3.3%) among children (ibid).

MAINE CHILDHOOD LEAD POISONING PREVENTION PROGRAM

In 2005, the Maine Legislature established the Lead Poisoning Prevention Fund (LPPF) with revenue from the $0.25 fee collected per gallon of paint sold by paint manufacturers or wholesalers in Maine (The Lead Poisoning Control Act, 22 M.R.S. §§ 1314-1329, 1973). The Maine Childhood Lead Poisoning Prevention Unit (referred to as 'the Program') is the steward of this revenue and aims to prevent exposures to lead in Maine, mainly through primary and secondary prevention strategies. The Program, which sits within the Maine Center for Disease Control and Prevention's (Maine CDC) Environmental and Occupational Health Program undertakes a number of strategies to prevent lead exposure and poisoning, particularly among children. This includes implementing media campaigns; engaging in targeted education and outreach; facilitating lead dusting testing with homeowners and renters; and monitoring and tracking key surveillance data.

> Primary prevention focuses on identifying and removing lead hazards from the environment prior to a child becoming exposed or lead-poisoned. Secondary prevention focuses on blood lead testing to identify potential lead exposures to prevent lead poisoning.
>
> (US Centers for Disease Control and Prevention, 2022)

To meet the directive of the Lead Poisoning Control Act, the Program contracts with community organizations to conduct local outreach and education. In 2010, 40% of children identified with lead poisoning lived in 5 high-risk areas. Maine CDC has funded community organizations in these areas since 2016. Each community partner focuses on engaging landlords, property owners, community members, and parents, and building local capacity to increase support for, and capacity to, address the causes of lead poisoning. Table 1 identifies each of the high-risk areas and the community partner engaged in each area.

Table 1. High-Risk Areas and Community Partners (2017 – 2022)*

HIGH-RISK AREA	COMMUNITY PARTNER
Augusta / Gardiner	Healthy Communities of the Capital Area
Bangor	City of Bangor, Public Health Department
Biddeford / Saco	Coastal Healthy Communities Coalition
Lewiston / Auburn	Healthy Androscoggin
Portland / Westbrook	City of Portland, Public Health Division

** Most partners were engaged throughout the entire five-year period from 2017 to 2022, other than Healthy Communities of the Capital Area, who was a partner until 2021.*

In addition to collaboration with community partners, the Program works with the Maine Department of Environmental Protection (Maine DEP), who has implemented and overseen the Lead-Safe Housing Registry to help Mainers find lead-safe housing through an easy-to-use searchable database of available rental units. Through MaineHousingSearch.org, individuals can search for housing based on three lead-related statuses: lead safe, lead maintained, or lead paint free. This allows property owners / landlords to market their properties with lead in mind and tenants to find housing without lead hazards.

A primary method for preventing lead poisoning is to identify and address lead hazards or potential lead hazards in the homes of young children. At a high level, there are two ways the Program does this: 1) through a free lead dust testing initiative; and 2) by conducting environmental lead investigations. Through the free lead dust testing initiative, the Program and community partners provide families free test kits that allow them to check if there is lead dust in their homes, ideally before their children are exposed to lead or identified as lead poisoned. When a completed lead dust test kit shows high lead dust levels, the Program may conduct a comprehensive environmental investigation to determine if there are lead hazards in the home.

The Program also conducts environmental investigations when a child under age 6 is identified as lead poisoned, if there are reasonable grounds to suspect there is lead in a home, or at the request of a resident with children or the property owner. Environmental investigations conducted in response to a lead-poisoned child may be mandatory under the Lead Poisoning Control Act, as is the case for rental properties, or may be discretionary, as is the case for single-family owner-occupied homes. In the situation of a lead-poisoned child living in a multi-unit building, the Program has the authority to inspect the home in which the child resides, as well as any additional units within the dwelling in order to prevent lead exposure for current and future occupants of those units.

There are additional instances when the Program would initiate an inspection, such as if a lead poisoned child moves from one home to another; if they live part-time in another home; or to identify potential lead-safe housing for the relocation of a lead-poisoned child. For rental properties where the Program identifies lead hazards, by law, property owners must abate the lead hazards, thereby making the properties lead-safe.

Collectively, it is hoped that these lead poisoning prevention strategies result in increases in the identification and mitigation of lead hazards within the home environment. If these are achieved, it is envisaged that there would be an overall increase in lead-safe housing and a reduction in childhood exposures to lead, resulting in fewer cases of lead-poisoned children in Maine. These primary prevention strategies and intended outcomes are detailed in the programmatic logic model in Figures 1 and 2.

Figure 1. Maine Lead Poisoning Primary Prevention Logic Model Strategies and Outputs (2017 - 2022)

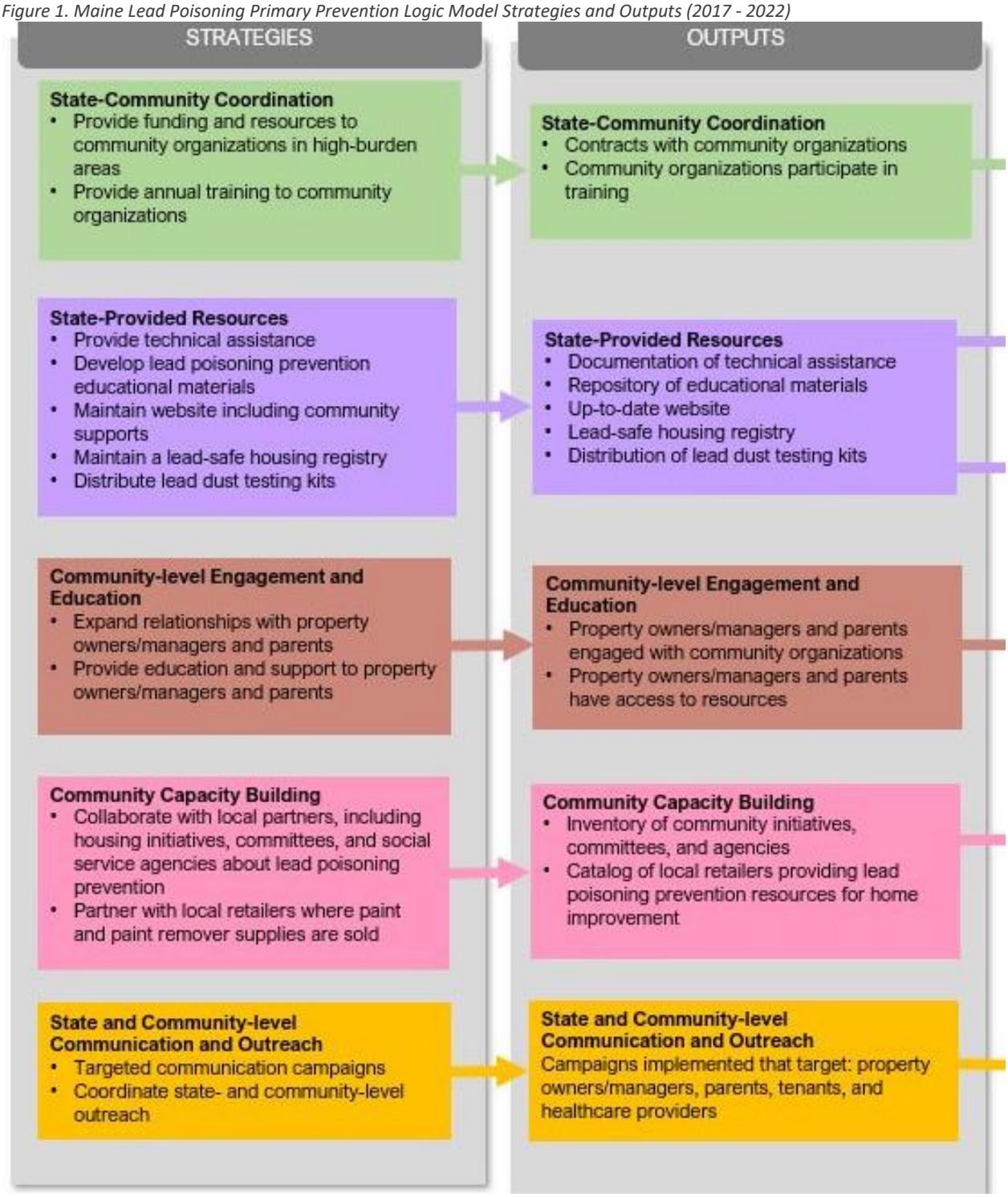
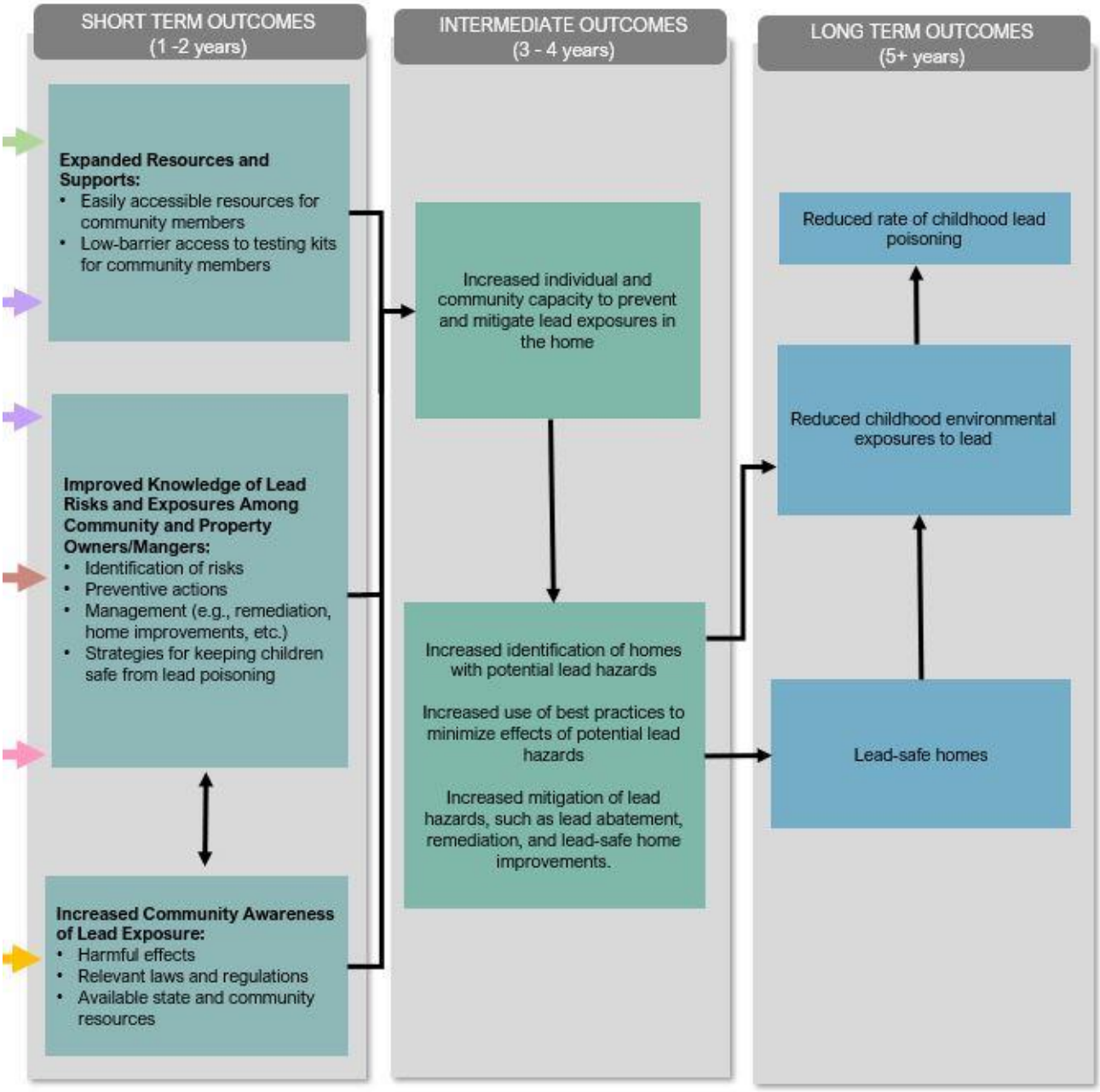


Figure 2. Maine Lead Poisoning Primary Prevention Logic Model Outcomes (2017 - 2022)



EVALUATION

Beginning in 2022, Partnerships For Health (PFH) was contracted by the Program as an independent evaluator to retrospectively assess the state- and community-level lead poisoning prevention strategies between 2017 and 2022. The evaluation aimed to help the Program understand the effectiveness and outcomes of past lead poisoning prevention efforts and guide potential refinements to current and future strategies.

STUDY DESIGN

The evaluation followed a retrospective mixed-methods design with a qualitative priority that focused on answering the following questions:

1. To what extent has the lead poisoning landscape in Maine (state- and community-level) changed in the last 5 years (2017 – 2022)?

2. What were the key state- and community-level activities, strategies, challenges, and innovations that emerged over the last 5 years of lead poisoning prevention efforts?

3. To what extent did the state- and community-level activities achieve their intended outcomes?

The evaluation study was submitted to the University of Southern Maine's Office of Research Integrity and Outreach (ORIO) Institutional Review Board (IRB) for Human Subject Research Determination and was determined to not be human subject research (Protocol HRPP #090622-92).

DATA COLLECTION

Data for the evaluation was collected through multiple channels.

Document/Data Review. The Evaluation Team worked with the Program to access state- and community-level documents to identify programmatic indicators and assess outcomes. This included state-level surveillance data and reporting, as well as community-level documents. In total, over 65 community partner documents and 10 statewide documents were reviewed. In addition, surveillance data was accessed from 5 statewide databases.

As part of the review process, the Evaluation Team reviewed community partners' Capacity Assessments from 2017 to 2022. These Capacity Self-Assessments were completed by each partner on an annual basis, and they rated their organizational capacity to prevent lead poisoning among a number of categories. They were able to rate themselves as having very limited capacity, partial capacity, or full capacity. Using the same method, they also assessed the capacity of the larger community to prevent lead poisoning. Figures 3 and 4 highlight the categories of the internal and community assessments, as well as the general calculation of how capacity scores were determined.

Figure 3. Internal Organizational Capacity Self-Assessment

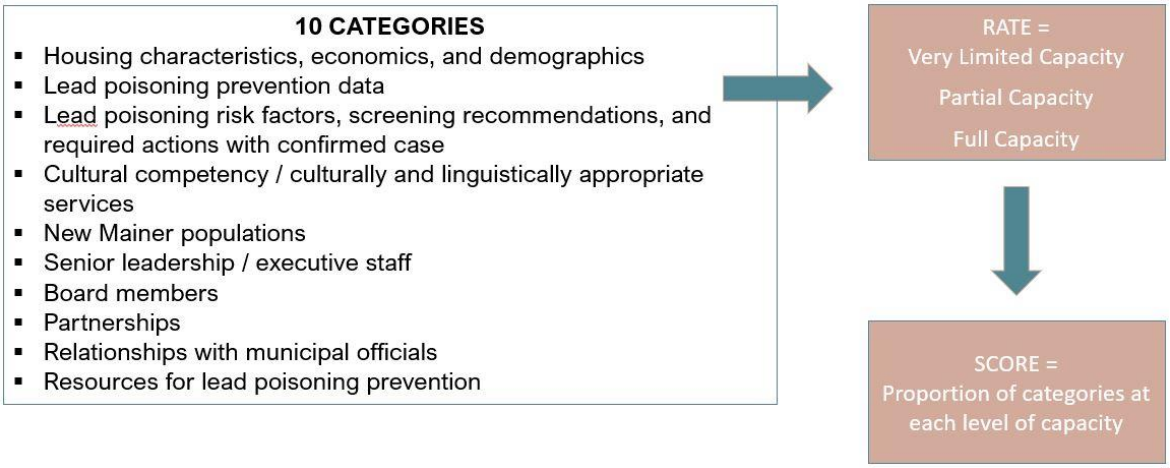
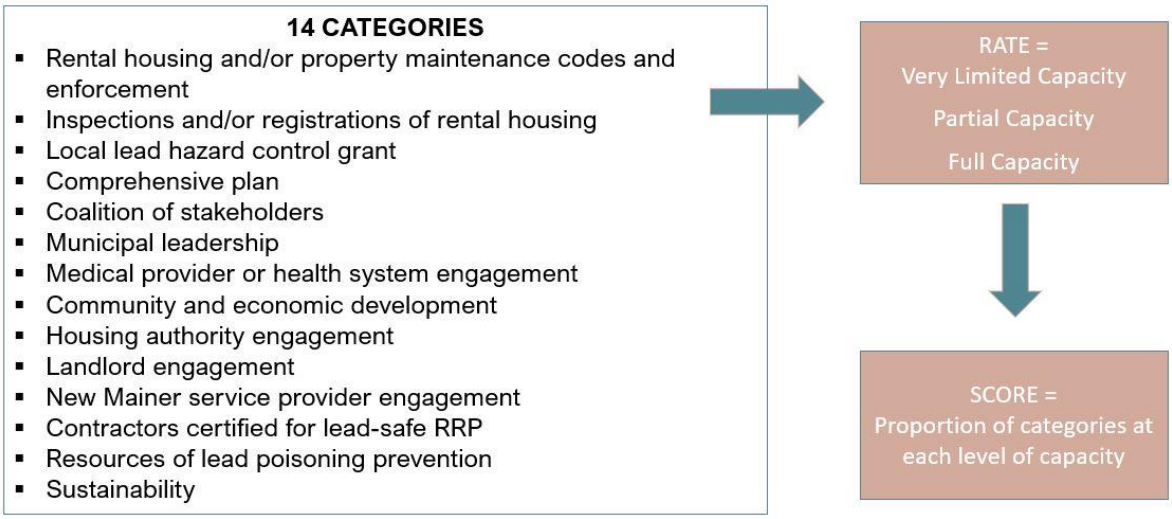


Figure 4. Community Capacity Assessment



Community Partner Interviews. In November 2022, PFH conducted interviews with staff members of 4 community partner organizations that were contracted by the Program to implement lead poisoning prevention strategies in communities identified as high-risk for lead poisoning. The interviews aimed to assess the effectiveness of strategies, successes, challenges, and lessons learned from the past 5 years. In addition, interviewees shared their recommendations for the future. In total, 5 interviews were conducted with 10 individuals who served in various roles within their organizations, including health promotion managers, directors, and program/project coordinators. To capture institutional knowledge, staff at community partner organizations were encouraged to extend the interview invitation to up to four current and/or former colleagues.

Program Interview. In December 2022, the Maine CDC Lead Poisoning Prevention Unit participated in an interview with PFH to reflect on the past 5 years of lead poisoning prevention efforts in Maine. The interview focused on better understanding how the lead poisoning prevention landscape in Maine has changed; the successes and challenges of state- and community-level prevention efforts; lessons learned from the past 5 years; and recommendations for lead poisoning prevention moving forward. One interview was conducted with 2 staff members.

Lead Poisoning Prevention Fund Advisory Board Focus Group. In January 2023, members from the Advisory Board participated in a focus group to share their perspectives and vision for lead poisoning prevention efforts from 2023 and beyond. All five external Advisory Board members participated in the focus group.

Preliminary Findings Presentations. Between February and April 2023, PFH presented the preliminary evaluation findings to the Program, LPPF Advisory Board, and community partners. Brief discussions were facilitated on reflections and contextualizations. In addition, during the Lead Poisoning Prevention Fund Advisory Board meeting, the Program facilitated a discussion on recommendations for community-level strategies moving forward. The results from these discussions have been incorporated into the final report.

DATA ANALYSIS

Transcripts and notes from the interviews and focus group discussions were analyzed using a deductive thematic analysis approach. In addition, an inductive approach was used to explore any unexpected themes that emerged from the discussions. Quantitative outcomes data from the document/data review was analyzed to assess changes over time. The analysis was conducted for each community partner to identify individualized approaches, as well as in aggregate across all community partners to capture the collective outcomes of the work.

All data from the evaluation was collated and triangulated to highlight the changes in Maine's lead poisoning prevention landscape between 2017 and 2022, as well as the state- and community-level strategies, challenges, lessons learned, and recommendations over the time period. When applicable, key strategies and achievements of each community partner have been highlighted to show successes and innovative approaches within each high-risk area.

RESULTS: CONTEXT AND STRATEGIES

Changing Landscape

State-Level Approaches

Community-Level Approaches

Health Disparities Approaches

CHANGING LEAD LANDSCAPE

Public policies. Numerous state- and national-level policy changes have significantly changed the lead poisoning prevention landscape in Maine, which influenced how prevention efforts were approached.

In 2015, Maine's Legislature amended the LPCA's definition of lead poisoning to align with the U.S. CDC's Blood Lead Reference Value which at the time was 5 ug/dL. With this shift, the Department was required to lower the threshold at which it must inspect dwelling units for the presence of lead hazards from a blood lead level of 15 ug/dL to 5 ug/dL. This change in the regulatory definition of a lead-poisoned child resulted in a seven-fold increase in the number of dwelling units inspected for lead hazards, and a six-fold increase in dwelling units under orders to remove identified lead hazards (Maine Childhood Lead Poisoning Prevention Unit, 2019).

> *"I think our capacity to do primary prevention has been a little overshadowed by these big policy changes to secondary prevention." - Interviewee*

In 2019, Maine expanded mandated blood lead testing to include all 1- and 2-year-old children, regardless of insurance type. This mandate, focused on secondary prevention, increased the number of children tested statewide.

Housing market. There is a strong connection between housing and lead, as most lead exposures occur within homes. Given this, the Program and community partners shared that changes in the housing market and overall landscape in Maine play a large role in lead poisoning prevention efforts.

> *"…ongoing lack of affordable housing is a big factor that plays into what we do." – Interviewee*

> *"It's probably safer to be in an unsafe home [with lead hazards] than it is to be unhoused. So how do we deal with that?" – Focus Group Participant*

Between 2017 and 2022, community partners described higher rates of individuals receiving general assistance within their service area, which created a large market for general assistance housing units and resulted in an environment characterized by higher rents, both for general assistance housing and non-subsidized rental properties.

> *"We have a lot of really old housing stock. And we have a lot of really rundown rental units here. And [city] tends to distribute general assistance in a way that is consistent with how the state wants it distributed… if you meet the requirements, then you will receive general assistance. And what that has done is create kind of a secondary housing market of general assistance units." – Interviewee*

General Assistance is a program run by individual towns to support people without the resources to pay for necessities like rent, electricity, heat, food, medicine, etc. (Maine Equal Justice, n.d.).

Subsidized apartments are rental apartments administered and financially subsidized by state and/or local housing agencies or federal programs, such as HUD and the U.S. Department of Agriculture Rural Development (Maine State Housing Authority, 2018).

Through federal funds, the Section 8 housing Choice Voucher Program provides rental assistance to eligible people by subsidizing a portion of their monthly rent and utilities (Maine State Housing Authority, 2021).

> *"When General Assistance rents increase, [landlords] will increase their rent to capture that additional money and we see those units are not inspected." – Interviewee*

During the tight housing market, there was less pressure on landlords to inspect their properties, as tenants were in need of housing and would take housing opportunities regardless of its inspection history. Community partners shared that general assistance rental units were not inspected in the same way as units generating other types of subsidies. Some community partners shared that although their fire departments were inspecting properties for potential hazards, including lead, they did not have dedicated time to devote to this role. As a result, only bigger multi-unit properties were often inspected, but lead was not high on their list of inspection targets.

> *"Units that accept other kinds of subsidies [non-General Assistance], they go through a housing quality check - they're inspected. So, what I'm saying is you can have a totally crap unit and still rent it and no one's checking on you. And no one is looking at the quality of the unit." – Interviewee*

In addition, the Program noted a national and statewide shift in the focus on health equity, in particular around housing.

> *"It seems that there's been more of an interest in the state and nationally to think about housing and equity, especially through COVID. So I do think those conversations have maybe brought lead poisoning up a little bit more on people's minds." - Interviewee*

Population movements. Within their larger population of at-risk individuals, community partners mentioned recent shifts in demographics and transitions within their communities and populations served. In several areas, partners discussed an increase in the number of New Mainers[1] who often arrive with lead exposures in their countries of origin. These families, many with young children, frequently move into lower-income areas with older rental properties, which puts them at additional risk for lead exposure. Moreover, children in these families may have experienced exposures to lead in their country of origin from hazards such as industrial emissions, leaded gasoline, paint, and the burning of materials containing lead (US Centers for Disease Control and Prevention, 2022c).

> *"[High-risk area] is home to a lot of our New Mainer families. So we are unique in the sense that we have had probably, I would say, over 1500, maybe 1700 families in the past three years, relocate to [area] and call Maine home. So there's obviously a lot of concerns coming from other countries where there may be different lead laws." – Interviewee*

> *"I think the data is three out of four children who are lead exposed are coming from rented properties, and then the more at-risk populations, including our refugees and immigrants are going also into those more affordable places that are more rundown, and at higher risk for exposure." – Interviewee*

> *"We know lead poisoning cuts across kids of lots of levels of economic status, races, ethnicities, and languages. And those who have the least resources…or least choices around housing tend to be lower income New Mainers." – Focus Group Participant*

[1] New Mainers are refugees, asylum seekers, and immigrants who have moved to Maine.

In addition, community partners described that one of the high-risk areas has experienced an influx of younger families moving into the area to avoid the higher rental prices in Portland. These young families are more likely to be adults of child-bearing age which may affect the number of at-risk individuals in these areas.

> *"The amount of young people has really risen, and they're seeing a lot of folks in their 20s and 30s populating that city, which is something that's new for them. So it's becoming a much younger city. And I think that's notable, especially because it may mean folks at childbearing age, and maybe we're seeing more kiddos, and that could have implications on rates of childhood lead poisoning potentially." – Interviewee*

State statutes. Maine's Lead Poisoning Control Act (LPCA) determines a number of statewide activities that are required by statute to support lead poisoning prevention among children throughout the state. With this, the Program must require blood lead testing for all 1- and 2-year-old children. The LPCA also gives the Program authority to inspect the home of any child with a confirmed case of lead poisoning. This includes the direct housing unit the lead poisoned child resides in, as well as all other units within the building, if a multi-unit building. When lead-related hazards are identified in a rental unit during the inspection process, the LPCA requires the Program to order the owner to abate the lead hazards and make the dwelling lead-safe. In the case of an owner-occupied, single-family residence, the department may provide technical assistance and guidance in lieu of enforcement activity at the department's discretion.

In addition, the Program is statutorily required to support statewide and community-level prevention activities, including a targeted mailing, an ongoing media campaign, educational programs for rental property owners, and the implementation of a Lead Safe Housing Registry, by the Department of Environmental Protection, which allows renters to search for available lead safe, lead maintained or lead paint free housing. In 2023 this responsibility was re-directed to the Maine Department of Health and Human Services.

STATE-LEVEL APPROACHES

Community Partner Coordination Strategies

The Program provided opportunities to build and support coordination for the community-level work, both between the Program and community partners, as well as between community partners.

Implementation. The Program regularly convened the full group of community partners to share lessons learned and collaboratively problem solve when any issues arose. The Program also facilitated webinars for the community partners to engage with other's working on lead poisoning prevention from their practices and experiences.

> The Maine Public Health Tracking Network provides a web-based data portal that includes data tables, graphs, charts, maps, and other visuals on various environmental topics including asthma, birth outcomes, cancer, temperature-related illnesses, lead poisoning, well water, and radon, among others.
>
> (Maine Tracking Network, n.d.)

The Program acted as community partners' primary point of contact for data. The Program worked with the Maine Public Health Tracking Network to create a dashboard of lead poisoning data for the high-risk areas, which includes data on lead testing, confirmed cases of childhood lead poisoning, and various risk factors often associated with lead poisoning. The dashboard includes tables, graphs, and interactive maps that community partners could use to engage their communities. If additional data was needed, the Program fulfilled these data requests.

> *"…we really try hard to make our data useful, in particular for these partners. So we have created a very specific audience-focused dashboard…for our partners, so they have the data about their high-risk areas in the way that they want it." – Interviewee*

Successes. Coordination and collaboration between the Program and community partners was identified as a primary success of the overall lead poisoning prevention work. Not only did the Program and community partners highlight the usefulness of the collaboration, but stressed the importance of the mutual appreciation that was shared between the two groups.

> *"We have really tried very hard over the years to be very...involved and engaged with our partner organizations so that they felt like they were our partners, not our contracted agencies..." – Interviewee*

> *"I do want to say that the staff at the state that we work with have been wonderful, really wonderful, really doing their best to work collaboratively. They're really one of the best partners we've ever worked with. And we appreciate that." – Interviewee*

The Program highlighted that part of this collaboration included coming together to plan, brainstorm, and problem solve as a group. Community partners and the Program expressed the importance of an equal partnership and shared learning.

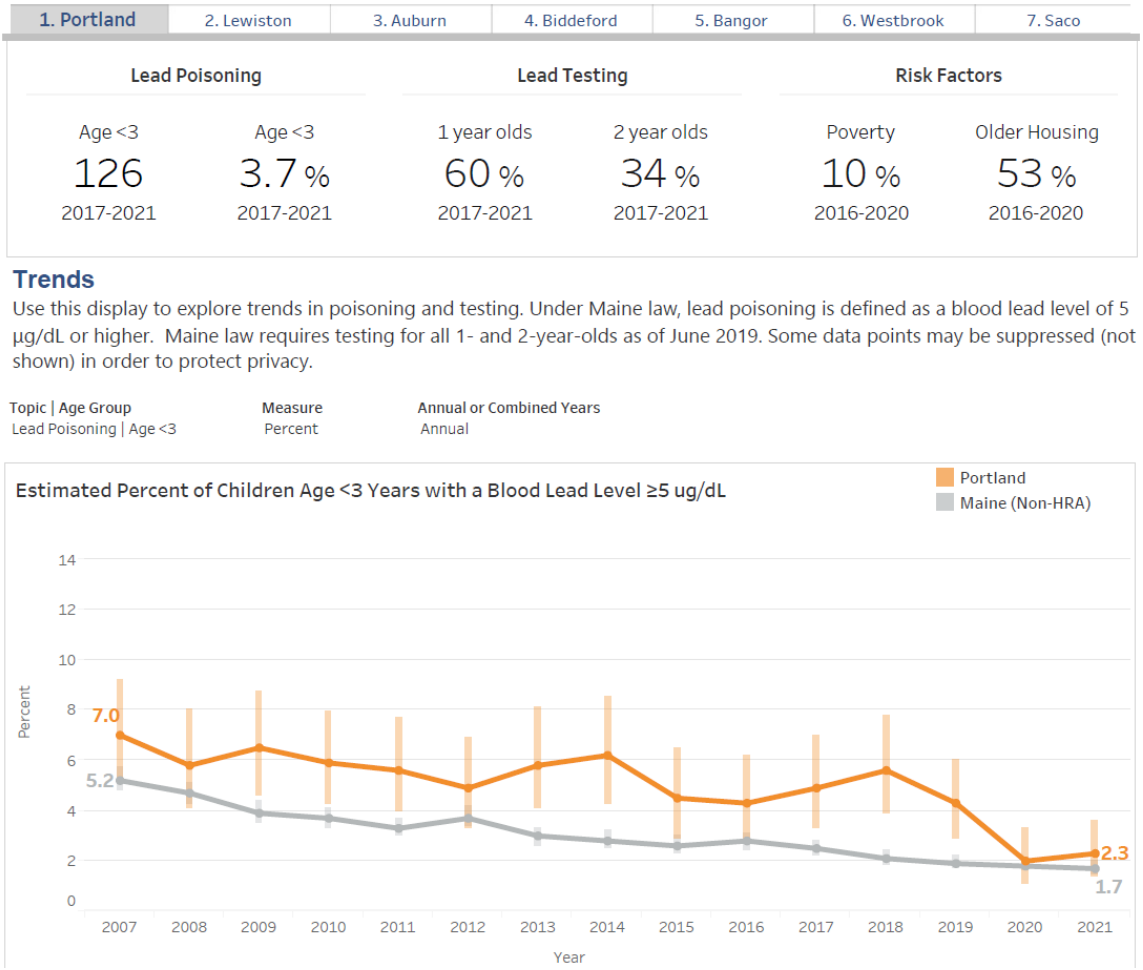
> *"Providing training, convening [community partners] to share resources and ideas and ask questions and troubleshoot and brainstorm and kind of collective, as equals and partners…and coming up with plans for what we could all do together." – Interviewee*

> *"We're just so grateful to have [Program staff] and the connections that they help create for us between [community partners] and [to] talk to other people about what they're doing. Keeping that communication and trainings available is really important." – Interviewee*

One of the greatest successes of the Program and community partner collaboration was the use and sharing of data. Partners cited the effective use of data to target prevention and intervention efforts within their service areas as an overall successful strategy. They also spoke positively about the Program's data dashboard (as shown in Figure 5) and how the data helped them engage with community members and answer key questions about lead poisoning in their area. According to some partners, even more data would help target initiatives. One example mentioned included a desire for results of abatement interventions detailing the different types of hazards found which could inform future prevention and education strategies.

> *"The dashboard has been wonderful. We use it all the time. People look to us as the experts in their community. And so being able to pull up that information really quickly is really important…" - Interviewee*

Figure 5. Maine Public Health Tracking Network Lead Poisoning Data Dashboard



Challenges. Both the Program and community partners reported some resource challenges during the 2017 – 2022 period. Staff turnover and the ability to maintain institutional knowledge was cited as a particular challenge. Community partners shared that a primary reason for organizational turnover was the limited funding which often only allowed partners to hire part-time positions with entry level salaries. Staff often left these roles when they found other full-time or higher paid positions.

> *"One of the limitations… is that… with… [funding], you often can only pay a part time person to do the work. And so people who are in the position of cobbling together multiple grants for their position, often move up and come out of the position. So there's a lot of turnover in the people that do that kind of work, which makes it difficult to establish a rapport and build those relationships." – Interviewee*

> *"We had identified an internal resource that we could bring in to augment our staffing capacity. But then because we had staffing shortages elsewhere, in our secondary prevention, we had to divert that new capacity back to secondary prevention or case management – that has been an ongoing challenge. We haven't quite figured out the full solution on a staffing level." – Interviewee*

Community Partner Capacity Building Strategies

During the 5-year period, the Program incorporated capacity building into community partner contracts to provide financial support for building their internal, organizational capacity to promote lead poisoning prevention within their service areas.

Implementation. The Program was able to support capacity building among community partner organizations in a number of ways. It offered various trainings and educational webinars focused on lead poisoning prevention and also provided technical assistance to partners. For example, the Program worked with community-based organizations to train staff on the lead dust testing process. These staff could help individuals and families to complete the test kit within their home and submit the data for analysis. In addition, the Program acted as technical, subject matter experts to support partners in more technical requests from the community. This sometimes included the Program stepping in to provide presentations to municipalities interested in learning more of the technical aspects involved in lead testing and prevention.

With this support from the Program, community partners took additional steps to build their internal organizational capacity. This included attending additional trainings, webinars, events, and conferences to stay up to date with the latest lead prevention efforts and learning from local partners within their service areas to better understand community needs around lead prevention and how best to engage different populations. In addition, many community partners spoke about building their organizational capacity to prevent lead poisoning by seeking additional funding so they could expand their services within the community and hire additional staff.

Successes. Each year, community partner staff members participated in capacity building activities including trainings, webinars, sharing summits, and/or site visits focused on lead poisoning prevention. Between 2017 and 2022, across all community partners, there was an average increase of 47 percentage

points in their full capacity score[2]. This indicates that, at the end of the period in 2022, the average number of categories that were rated at full capacity increased by 47% when compared to 2017.

Collectively, partners reported highest internal organizational capacity in understanding and using data about childhood lead poisoning; community partnerships; and support from senior leadership and executive staff. Community partners reported having the least capacity in their understanding of and ability to reach the New Mainer population, as well as providing culturally and linguistically appropriate lead poisoning prevention services. Community partners' capacity assessments indicated they are working to establish deeper relationships with agencies to support lead poisoning prevention work with the New Mainer community, building on the strong capacity of the community to engage with New Mainers' expertise within their service areas (see the *Community Capacity Building Strategies* section below).

Challenges. The COVID-19 pandemic was cited as the greatest challenge to capacity building among community partners. The pandemic interrupted the lead poisoning prevention work, both for the Program and the community partners, including their collaboration on capacity building.

> *"COVID, for sure, just really interrupted our work almost completely… And we've been trying to rebuild since then." – Interviewee*

Communication & Media Strategies

The Program took the lead on statewide communication and media initiatives, including:

- Annual targeted mailing to families with young children to promote lead dust testing within the home.
- Central repository of online and print resources on the Maine CDC website for various audiences, including landlords, parents, clinical providers, and tenants.
- Mass media and social media campaigns aimed at increasing awareness of the dangers of lead hazards within the home and the importance of lead dust testing within the home, which included links to videos and other resources.
- Development, translation, and printing of small media materials and educational documents for community partners to distribute within their communities.
- Developed easy-to-use and easy-to-share media content for community partners.

Implementation. Through statewide social media efforts between 2017 and 2022, over 370,000 viewers were reached with lead poisoning prevention content which also resulted in 956,905 impressions, or instances content was viewed. Through social media campaigns, viewers could click on various ads, videos, and/or links to reach additional content and resources. In total, there were 6,375 link clicks.

Through the targeted mailing, between 2017 and 2022, a total of 94,500 lead dust test kit brochures were distributed to families across the state. As a result, nearly 750 test kits were requested from families. In addition to the mailing, the Program shared information of lead dust testing on their website, which was viewed 83,962 times during the 5-year time period and resulted in over 1,700

[2] One partner reported a decrease in their score. However, due to staff turnover at partner organizations, the annual assessments were often completed by different people and the resulting percentage changes may be the result of different perspectives.

requests for lead dust test kits. An informational video on the lead dust testing process was developed and translated into Somali. Overall this video was viewed over 21,000 times between 2017 and 2022.

Successes. Overall, there was a lot of work that went into determining the messaging frameworks and testing the messaging, particularly through social media, which were able to make state-level materials and resources more accessible to various populations.

> *"I think…expanding our portfolio of statewide communications to include social media has been a real success. And we have data!" – Interviewee*

Paint Retailer Engagement Strategies

To support community partner engagement with paint retailers to share educational materials on lead exposures and poisoning within the home, the Program conducted statewide outreach to larger, big box stores (e.g., Home Depot, Lowe's). In 2019, through this outreach, the Program mailed copies of posters and brochures on lead-paint related laws and regulations to 170 big box store locations and 160 independent paint retailers throughout the state.

COMMUNITY-LEVEL APPROACHES

The Program prioritized the following community-level target audiences: parents with young children, and landlords[3] and property owners given their intersection with housing. Using the Community Guide (Community Preventive Services Task Force, 2023), the Program identified evidence-based prevention strategies such as engagement and education among community members and landlords, as well as media campaigns. Community partners were allowed the flexibility to determine the specific activities that would work best within their service areas.

Healthy Androscoggin

Lewiston / Auburn

LEWISTON RENTAL REGISTRY

Healthy Androscoggin (HA) played an instrumental role in getting the Lewiston Rental Registration Program off the ground. HA started with extensive research and engagement with resources such as the National Center for Healthy Housing to better understand the return on investment and benefits of a registry. A Rental Registration Committee was developed and comprised of HA staff, landlords, city officials, code enforcement officers, and other partners. With the guidance of HA, the committee drafted a report to the Lewiston City Council in March of 2019 making the formal recommendation that the city establish a no-charge rental registration program aimed primarily at promoting the health and safety of tenants in rental housing. As a result, the Lewiston City Council enacted a registry for 3-unit and larger rental buildings.

Landlord Engagement & Education Strategies

Engaging landlords was a primary strategy of the community partners in high-risk areas. They worked closely with individual landlords, as well as landlord associations and housing authorities within their service areas, to provide information on lead-related laws and housing regulations, as well as lead prevention and mitigation efforts. Partners focused their efforts on properties built prior to 1950 that had a greater risk of containing lead paint.

[3] For the purposes of this evaluation, the term "landlord" refers to landlords, property owners who rent out their properties, and property managers who oversee rental units.

Implementation. Community partners disseminated lead dust test kits to landlords and tenants and promoted testing within homes. They also reported working closely with local code enforcement officers (CEOs) who engage landlords around housing repairs and renovations. In some cases, CEOs distributed educational materials and resources to landlords, as well as supported community partners in developing and disseminating messaging to landlords around preventing lead hazards and exposures within their rental housing.

To better engage landlords within their service areas, some community partners conducted assessments of landlords' knowledge and perceptions of lead poisoning before and after educational sessions. One assessment showed that landlords were beginning to prioritize lead prevention within their rental units by including language within lease agreements about tenants' responsibilities to notify them of any chipping paint and incorporating regular property maintenance checks to assess areas that commonly have lead paint. Through these strategies, community partners collectively engaged with 1,740 landlords between 2017 and 2022. This equates to an average engagement of around 65 landlords each year, by each community partner.

Successes. Community partners shared 3 primary successes they experienced when engaging with landlords in their community. First, a strong history of direct collaborations and partnership with local landlord associations. This allowed community partners to build relationships and share information with landlords through presentations and/or information posted in the associations' newsletters.

> *"We have a close relationship with [association]. They have a thriving membership. And they have been a wonderful partner with us." – Interviewee*

Second, many community partners shared that their municipality had an existing lead program funded through HUD that focused on lead abatement efforts. Community partners shared that consistent collaboration with these local programs was a successful catalyst of landlord engagement. Through this collaboration, community partners became known as a source of support and resources for landlords and property owners who are going through the abatement process. They were able to provide information to help these individuals navigate their lead abatement issues and also help prevent hazards in the future.

City of Bangor - Public Health Department
Bangor Public Health & Community Services
Bangor

BANGOR HOUSING WORKGROUP

The City of Bangor Public Health Department way key in the development and implementation of a Housing Workgroup aimed looking at the broad housing issues in Bangor. The group engaged an array of partners from sectors such as homeless housing, community and economic development, public health, General Assistance, finance, legal, and more. These partners collaborated to examine housing in the Bangor area and create a plan to address the community's housing-related needs. To do this, a series of educational sessions and planning meetings were implemented among the workgroup members. In December of 2018, the group published an interim report what provided recommendations to improve the status of housing in Bangor. The report addressed issues related to older, unmaintained homes that could have lead hazards.

> *"I would say that, working closely with our lead safe housing program, which is the HUD program, that was a major success for us. When we were at the beginning of my start of this role, we did have a pretty good relationship. During COVID, of course, a lot of that changed. But that has been something that's been a pretty long-term partnership…" – Interviewee*

Finally, community partners reported that providing incentives for landlords to prioritize lead and take certain prevention steps was a successful strategy. Incentives included free lead dust kits; information and scholarships for Lead Renovation, Repair and Painting (RRP) courses through the US Environmental Protection Agency (US EPA); and information about funding opportunities for home improvements.

> *"We were able to offer these [partial] RRP scholarships to allow property owners or managers to get their certification so that they could make renovations in the houses that they run in a lead safe manner, because the law says you're supposed to do that. But… there's a financial deterrent for a landlord to bother doing that. So we help them out by at least providing a great discount for the class." – Interviewee*

> *"What we need is serious incentives for developers…There's so much money floating around these days." – Focus Group Participant*

Challenges. Community partners indicated that landlords are not a homogenous group and were often difficult to reach, explaining that the least motivated landlords, those who would be most important to work with, were often the most difficult to engage. They were not likely to attend landlord association meetings or other landlord forums. To complicate matters, community partners spoke of a pervasive attitude among some landlords that State programs and staff should be feared or avoided as they have regulatory power and could require costly remediation and/or impose fines. This resulted in an "us vs. them" dynamic that made it difficult for community partners to move beyond.

> *"A lot of the times the people that attend the [association] aren't really the landlords that you would hope would be there. The ones that are constantly up against some of the restrictions and the guidelines for lead poisoning and the hazards…. Sometimes it doesn't get expressed to the landlords that we really hope would be hearing this." – Interviewee*

> *"I think one major challenge with landlords is a lot of the times they think of us as kind of like the bad guys. They're not very eager to be working with us. Because usually, if they were notified of a lead poisoning exposure in their home, the state is working with them to get this resolved as soon as possible. And if they fail to do so there is a daily fine, actually. So we're not really their favorite people that they seek." – Interviewee*

One way community partners overcome these challenges around trust and acceptance of ideas, was to work with landlord 'champions', or property owners who were invested in supporting lead poisoning prevention who could help communicate messages, strategies, and overall advice to their peers around lead prevention and intervention.

> *"We had a few landlords who were willing to speak to the program that they had experienced and do some PSAs and news articles about that and having that connection directly and that relationship directly with those landlords who could speak to this experience was really, really, really helpful. That was a pretty good success." – Interviewee*

Parents / Community Member Engagement & Education Strategies

Overall, community partners undertook a number of efforts to reach community members with lead poisoning prevention education and resources, particularly parents of young children, and families living in older housing. This included sharing educational materials and resource documents; offering presentations on the dangers of lead exposures and the importance of identifying lead hazards within the home; encouraging families to test for lead dust within their homes; and promoting blood lead testing for children. In many instances, community partners distributed lead dust test kits at community events and often provided presentations to interested community members on the testing process.

To best engage with community members, all partners reported that they coordinated with a variety of organizations at the local and state level to disseminate educational materials, including town/city officials, social service agencies, realtors, banks, clinical providers, child and maternal nurses, police and fire departments, and community-based coalitions. Pine Tree Legal Assistance was mentioned by multiple community partners as a key collaborator that has access to low-income tenants needing legal advice regarding their housing. Community partners also described efforts to reach community members with lead poisoning prevention messaging by going to places parents and caregivers of young children frequent, such as community events, museums, public libraries, preschools, childcare centers, schools, and churches. Several community partners also mentioned increasing their community outreach and education during Lead Poisoning Prevention Week to further build awareness on the issue.

In some instances, community partners capitalized on existing programs and services offered by collaborating organizations to incorporate lead poisoning prevention. For example, one community partner shared that they worked closely with the Community Action Program (CAP) agency in their area to include lead prevention components in their existing programs like the New Dad Boot Camp, First Time Homebuyers class, and Parent Education classes. Another community partner shared that they collaborated with schools and childcare agencies to distribute lead prevention resources to parents at student registration events.

Healthy Communities of the Capital Area

Augusta / Gardiner

REACHING MORE MOMS COLLABORATION

To reach low-income mothers within the Augusta / Gardiner area, Healthy Communities of the Capital Area (HCCA) collaborated with their local Reaching More Moms program. The program was aimed at providing presentations and resources to clinical providers to support them in helping moms quit smoking. HCCA incorporated slides into the program's existing presentations on lead poisoning prevention. In addition, handouts on lead screenings were made available to clinical providers. Over 70 clinical providers attended these presentations in the Augusta / Gardiner area.

Implementation. As a result of these efforts, collectively, community partners reported making nearly 6,115 personal connections with parents and community members between 2017 and 2022. On average, each partner engaged around 200 community members per year with lead poisoning prevention education and resources. A total of 138 community events were held across the high-risk areas, reaching nearly 11,000 community members with lead poisoning prevention education.

Successes. Community partners highlighted the success of their partnerships and collaborations with other community-based organizations, particularly those assisting parents of young children. Head Start programs and childcare agencies were identified as key collaborators that supported parent engagement in lead poisoning prevention. In addition, community partners noted that their collaboration with agencies and organizations within the community helped to further engage parents and community members who weren't able to prioritize lead poisoning prevention.

> *"I'd say our partnerships with our preschools and getting information to parents through the preschools and childcare has been very effective. We feel like we're really reaching those neighborhoods where the families live that are at the highest risk." – Interviewee*

> *"I think it's that lead just doesn't rise to the level of attention. And so the way I think we overcome that, the way we've reached out in the community, has been to go to those organizations that care for some other reason, so we have a close relationship." – Interviewee*

Community partners also highlighted that their general approach to engaging community members was a success, sharing two specific strategies that seemed to be very effective in reaching community members. First, partners would often approach lead poisoning prevention with community members by focusing on smaller, practical tips for prevention, particularly around lead paint within the home. They eased parents and community members into the topic by focusing on achieving things step-by-step, such as cleaning and other strategies within the home, allowing them to live safely with lead paint and prevent lead poisoning. Second, community partners spoke of efforts to identify and empower parents to share their lead prevention stories with others, including parents, municipal leaders, and city councils, to increase awareness of lead poisoning prevention.

> *"So being able to empower tenants on how to reduce lead exposure, how to clean, what to look for, where children should play. Simple things like don't let your child eat on the floor or on the coffee table. "– Interviewee*

> *"And so I think if we can do a better job of figuring out who those families are, and empowering parents to speak out to city councils and legislators, then I think that could go a long way… it definitely was a win." – Interviewee*

Challenges. Community partners noted the COVID-19 pandemic as a primary challenge to engaging and educating community members. Many of the typical venues for partners to speak to parents, such as health fairs and childcare settings, were not available during the pandemic. One community partner suggested that parents and other community members were tired at the end of the day and less willing to attend an online Zoom meeting or informational presentation. To overcome these challenges community partners focused their efforts on reaching people through social media.

> *"For young families, zoom wasn't something that was working for them at all. There's a big reliance on social media at that point, in trying to raise awareness…" – Interviewee*

In addition, community partners reported that because of resource limitations, their work focused on population-based interventions and information sharing, rather than individualized supports such as home visits. To mitigate this, they leveraged their relationships with other programs and organizations that provide one-on-one support, such as visiting nursing programs, SNAP-Ed, and WIC. These partners shared the lead poisoning prevention education and resources to community members based on their specific needs within the home.

> *"Probably one of the biggest challenges is that [funding] isn't enough to have a robust in-person, home visiting kind of component. And so we tended to do more population-based public health strategies around communication and education, which are great, but it's harder to pull out the individual stories when you're doing that, and you're kind of one step removed from the community." – Interviewee*

Finally, encouraging people to prioritize lead poisoning prevention was a challenge faced by all community partners. Community partners acknowledged that lead was not typically in the forefront of community members' minds. They noted that lead poisoning as a "niche" area in the sense that parents and community members aren't always concerned about it unless there is a current issue within their home and/or community. Community partners noted that community members often had other priorities they were focused on, particularly during the COVID-19 pandemic.

> *"There's just so many other health issues for people to be worried about. And there's so many other pocketbook issues for people to be worried about, like they're trying to put food on their table, they're trying to get their kids to school, they're trying to make sure they don't have mental health challenges. There's just so many other things that it's just difficult to raise the profile of [lead]… " – Interviewee*

Paint Retailer Engagement Strategies

Each of the community partners engaged with paint retailers within their service areas to provide posters, brochures, and other education materials on the dangers of lead exposures and poisoning within the home. Educational materials included posters and brochures on preventing exposure and addressing lead issues with renovation. The materials were often left near the register and customers could take resources at their convenience. Most community partners followed up with retailers on a somewhat regular basis to replenish resources. In addition, some partners also promoted RRP classes to paint retailers to share the information with some of their contractor clients.

Implementation. Between 2017 and 2022, across all community partners, a total of 160 paint retailers were engaged. On average, each partner engaged around 6 retailers per year. Some community partners reported having greater success and more positive and lasting engagement with staff members in smaller hardware stores, as compared to large retail chains such as Home Depot and Lowe's. Given the Program's statewide focus and ability to explain the legal authority to executives at big-box stores, community partners were encouraged to focus on independent stores. Although community partners reported that most retailers were welcoming the information, and some even engaged partners in

positive discussions on lead poisoning prevention, there were differences of opinion about the usefulness of this strategy.

> *"Usually we get feedback from the local paint stores that they still have the same resources from last year. They're still doing what they need to. Not much has changed. But we do like to go out there and make sure that they know that we're available." – Interviewee*

Community Capacity Building Strategies

As part of the 2017 to 2022 funding period community partners focused on bolstering overall community capacity within the high-risk areas around lead poisoning prevention. This included ensuring other community agencies (e.g. municipalities, community coalitions, housing) had a general knowledge of lead and the dangers of lead poisoning; had systems and procedures in place for them to support lead poisoning prevention; and were able to communicate with their clients/patients about lead poisoning.

To do this, community partners provided education and training to community-based agencies, social service providers, childcare centers, and healthcare providers. In addition, they participated in community committees, forums, and other events. The community partners worked to build a better understanding among municipal leaders about the dangers of lead poisoning and the importance of prevention. In some instances, partners also provided technical assistance to local policymakers and municipalities to incorporate lead prevention into their policy language, regulations, and websites. Finally, community partners leveraged their lead poisoning prevention knowledge and expertise to support community agencies and municipalities in seeking, applying for, and often receiving funding to implement additional lead poisoning prevention initiatives within the community.

Implementation. As part of the annual community capacity assessment, community partners reported which category/areas their community had full capacity. Between 2017 and 2022, there was an average increase of about 27 percentage points in communities' full capacity scores[4]. This suggests that in 2022, communities of focus had full capacity in about four more categories than 2017. Across all years, communities reported the highest capacity in New Mainer service provider engagement; resources of lead poisoning prevention; and coalitions of partners. Communities reported the least capacity in rental housing and/or property maintenance codes and enforcement; landlord engagement; and housing authority engagement.

[4] One community showed a decrease in their score. However, due to changes in community partner staff who complete the assessment about the community, this decrease may be the result of different perspectives.

Successes. Nearly all community partners shared the success of securing additional funding to continue building their organization capacity to respond to lead poisoning prevention needs in their community. They spoke of being able to "braid" these income streams to increase their capacity to collaborate on projects and initiatives. A main source of additional funding described was through federal Housing and Urban Development (HUD) Lead Hazard Control grants, which are typically awarded to cities or communities to help qualifying property owners abate or mitigate existing lead hazards. Community partners often partnered or subcontracted with their city's HUD-funded lead hazard control programs to provide services such as education and support for tenants and landlords.

Coastal Healthy Communities Coalition

Biddeford / Saco

HUD LEAD HAZARD REDUCTION GRANT

In a multi-sectoral collaboration, Coastal Healthy Communities Coalition (CHCC) supported the city of Biddeford in submitting for and receiving a $3.2 million HUD Lead Hazard Reduction grant. Over the three and a half year award beginning in 2020, Biddeford planned to support landlords in addressing lead hazards in over 120 eligible housing units, with the overall goal of improving tenants' health with the *Safe Homes for Healthy Families* initiative. CHCC supported the grant application by providing guidance and technical assistance to the city's grant writer and establishing a community advisory committee to advise on the proposal. CHCC's scope of work within the grant includes providing education and outreach to families, property owners, and other community partners.

> *"…in [high-risk area]… they have federal funding…to support lead abatement and they have our funding for lead poisoning prevention. I think that has been a real success…the same partners are working with their municipalities and with us to implement…kind of from the prevention side through abatement. And I think that's a really strong connection." – Interviewee*

Community partners also noted that the flexibility of the lead poisoning prevention funding allowed them to support community organizations and agencies with technical assistance such as grant writing and other expertise. Community partners shared their appreciation for the lead poisoning prevention funding, noting that with other funding sources and grants, there is a fee-for-service structure that wouldn't have allowed them to build capacity within their communities.

> *"Just building that trust within those organizations is really important as well, because ... instead of us always being the ones that apply for grants, because we have the capacity in the grant writing. It's nice to be able to have organizations and support their capacity to apply for grants and administer them appropriately…So really being able to build the capacity of those organizations to do that on their own. And then we provide, whether it's contracted services or just support on their advisory board. Really, trying to put it back out into the community rather than us always being the ones that manage those things, has been a big change for us." – Interviewee*

Community partners highlighted the success of collaboration with other community agencies to support them in achieving their mission and targeting a wider range of individuals at-risk of lead poisoning prevention.

> *"In terms of lead poisoning prevention, we participate in [city-based groups] …There is a lot of resource sharing, a lot of folks that hold a variety of different roles around community organizing. So in terms of capacity building there, we're really making sure that folks know the resources that are available to them. They often serve a lot of really vulnerable clients. It's all very family and child focused." – Interviewee*

Challenges. As with other strategies, the COVID-19 pandemic was identified by community partners as the primary challenge to building community capacity. During the pandemic, not only did community partners often need to shift focus and rethink their engagement strategies to comply with COVID-19 restrictions, but community agencies, municipalities, and collaborators were focused on other priorities, pushing lead prevention capacity building to the back burner.

> *"I mean, the one that obviously comes to mind is that it's been pretty hard to build capacity between 2020 and currently. So, it's just been a lot of rebuilding." – Interviewee*

Communication & Media Strategies

All community partners utilized social media (e.g., Facebook, Instagram, Pinterest, etc.) to promote lead poisoning prevention; raise awareness within the community; and promote lead dust testing. Partners spoke about aspects of social media that make outreach effective. For example, social media posts should be engaging and interactive so that people are drawn to "click" on the post for further information.

City of Portland - Public Health Division

Portland / Westbrook

GORMAN FOUNDATION MEDIA GRANT

In March 2018, the City of Portland Public Health Division applied for and was awarded over $20,000 from the John T. Gorman Foundation to fund a mixed media outreach campaign focused on lead poisoning prevention. The funding supported the development and implementation of lead-focused TV and radio public service announcements, as well as ads that appeared on Facebook, in bus shelters, in local movie theaters, and in Parent and Family magazine. For the bus shelter ads, the City of Portland used the Maine Tracking Network data dashboard to identify particularly at-risk communities in Portland and Westbrook.

In addition to social media, all community partners used additional communication methods to raise awareness on lead poisoning. These included static bus ads, newspaper and magazine ads, tip sheets, newsletters, door hangers, rack cards, online videos, infographics, and information on program websites.

> *"The team has implemented a couple of strategies in terms of bus ads. And I know that we right now pay for an ad in the parent and family magazine that comes out. It has an issue every two months. So we have paid advertisement with that. And we have our [grantee] Instagram page." – Interviewee*

Implementation. Over 72,500 small media materials were distributed throughout the high-risk areas collectively by all community partners. As a result of community partners' media efforts, Mainers in high-risk areas were reached around 9,630,700 times with lead poisoning prevention content and messaging. This included earned and paid media.

Successes. Community partners felt that using mass media during COVID-19 was particularly useful. They also shared that having social media content produced by the Program that could be adapted for their community-level outreach efforts was a helpful tool. Community partners spoke positively about most of their communication strategies, particularly social media, and noted that a diversity of strategies seemed to be an effective way to reach community members with lead poisoning prevention messaging and content.

> *"We really enjoy working with community members. I think they're the most receptive, there's no kind of negative feeling about it. They want the information, they want to be healthy, they want to know. So it's really more about making sure we have different avenues of communication." – Interviewee*

Challenges. Though media and social media outreach was deemed an effective way to reach community members, community partners often felt discouraged because the media outreach they implemented was not always the most effective method; but effective and far-reaching media campaigns often involves working with media professionals, which is resource intensive and beyond their budget.

> *"...you really need to be in there with a firm that can do that geofencing that's needed to make sure you're hitting your target population. And that's $3,000 an effort, and we sometimes get discounted rates. But it's a lot more money than putting a $400 ad in the paper, of which we got no response." – Interviewee*

Approaches to Promote Health Equity

Community partners primarily served groups with greater risk for lead exposure and poisoning. Young children under six years old are still developing and are more susceptible to lead poisoning from exposures. Of the lead-poisoned children in Maine in 2019, 73% were enrolled in MaineCare (Maine's equivalent of Medicare) (Cluett, Fleisch, Decker, Frohmberg, & Smith, 2019). In addition, housing plays an important role in exposures to lead. Houses built before 1978 are more likely to contain lead-based paint. In 2017, two thirds (67%) of occupied rental homes in Maine were built before 1970, putting tenants of the majority of these homes at high-risk for lead exposures (US Census Bureau, 2017). 69% of Maine's lead-poisoned children lived in rental housing in 2019, and 38% lived in housing that was recently renovated, further increasing the chances of lead exposures (Cluett, Fleisch, Decker, Frohmberg, & Smith, 2019). Community partners noted that individuals who work in certain industries in Maine may have a higher risk of lead exposure or transmitting lead dust to others. One example is the lobster industry which has boats that may contain lead paint. Those working in the lobster industry may track lead dust on their clothing and boots to their homes, potentially exposing other family members.

> *"The fishing industry, specifically lobsters, is an important industry to our area. So commercial boats can be a source of lead exposure on their work boots, because of the type of paints that that's used on boats, so there's a lot of reasons to provide this additional education in our community." – Interviewee*

Strategies. Community partners described a number of ways they promoted health equity though their lead poisoning prevention work within their service areas. First, they described partnering or contracting with community-based organizations to reach target communities in their area. These organizations have deeply rooted ties to the community and can act as cultural brokers. Community partners spoke of cultural orientation sessions for New Mainers implemented through organizations like Catholic Charities that bring together several organizations who provide guidance and resources to New Mainers on topics like lead poisoning prevention, legal assistance, and employment. Community partners also collaborated with organizations like WIC, visiting nurse programs, and legal assistance groups that target low-income populations to host events and distribute materials in locations easily accessible for certain populations, such as those in subsidized housing and shelters.

> *"I would say that our connection with our WIC program and our maternal health nurse visiting nurse program, because both of those programs are sort of income specific." – Interviewee*

> *"So often the people who move into the worst housing are immigrants and refugees. We would try to make sure that [we] had Immigrants or refugees or people speaking those languages and knowing those cultures on our staff so we could serve them well. We also would partner with Catholic Charities, who had required new arrival orientation, to make sure that lead poisoning was one of five different health topics that was presented to people when they arrived."– Interviewee*

Community partners distributed materials and other resources in appropriate languages and literacy levels. A pictorial 'flip book' was developed by a community partner, adapted and refined by the Program, and then made widely available to all community partners to use. Another example was a video with animations that clearly outlines lead prevention steps that could be understood by people who speak different languages and have different literacy levels.

> *"We are probably a 95% Caucasian community, but definitely income diverse. Definitely background diverse, and so we're always considering how our information can be consumed easily, so using easier language, pictures. We have some videos that we've made, where it was obvious from the cartoon what all the steps were so that if somebody may have had a language barrier and it didn't translate quickly on their phone, that there were those aspects." – Interviewee*

Successes. Empowering individuals within the community to become 'ambassadors' was a successful way community partners promoted health equity. A few partners described their Neighbor-to-Neighbor programs where trained community members shared lead poisoning prevention messaging and information with fellow community members. In addition to training, ambassadors were often incentivized for their time and encouraged to put their experience on their resume and offered resume writing support if desired.

> *"We did do a couple of successful rounds of our Neighbor-to-Neighbor program, which was when we had people in the New Mainer community, we would teach a group of New Mainers about how to prevent lead in their homes. And then we would give them materials and incentives to go out and teach 10 of their own neighbors about that. …every time we are able to do one of those trainings, we know that the ripple effect of that is really important." – Interviewee*

RESULTS: OUTCOMES

Knowledge

Testing

Housing Inspections & Abatements

Lead-Safe Housing Registry

Recommendations

PARENTAL KNOWLEDGE OF LEAD POISONING

According to data from the Pregnancy Risk Assessment Monitoring System (PRAMS), 55% of new mothers[5] were aware that dust from lead paint was the leading cause of lead poisoning among children. However, this means that about 45% of new moms were unaware of the leading cause of lead poisoning. Table 2 highlights that certain demographic factors were found to be associated with mothers' awareness of lead dust as the lead cause of lead poisoning. First-time mothers, those who are not married, and those who receive Women, Infant, Children (WIC) benefits are among the top individuals who may need additional lead poisoning prevention education.

Table 2. Percentage of New Mothers Unaware of the Leading Cause of Lead Poisoning, by Demographic (2016 - 2020)

DEMOGRAPHIC	% UNAWARE OF LEADING CAUSE OF LEAD POISONING
First-time mothers	50.9%
Not married	50.3%
Enrolled in WIC	50.2%
High school education	49.7%
Lower income ($28,000 – $60,000)	47.3%
Younger (25 – 34 years old)	44.6%
NOTE: There is no historical PRAMS data to use as a comparison to identify if knowledge has increased / decreased over the time. The data represents a snapshot in time.	

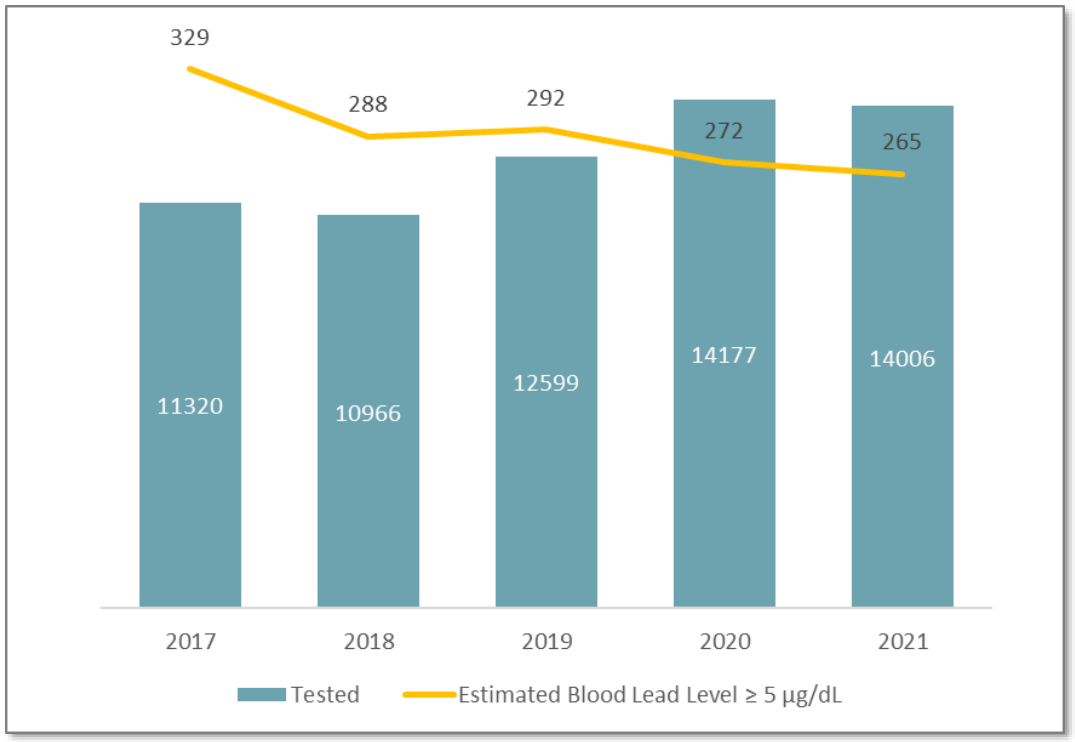
In addition, PRAMS also identified that 59.5% of first-time mothers enrolled in WIC were unaware of the leading cause of lead poisoning, making this a priority population for lead poisoning prevention education.

[5] In this instance, new mothers refer to individuals who have babies and also identify as mothers. Other terms include birthing parents and maternal parents.

BLOOD LEAD TESTING & LEAD POISONING CASES

Statewide. Maine's data on children with elevated blood lead levels from the Maine Tracking Network shows increases in blood lead testing and decreases in children with elevated blood lead levels. From 2017 to 2021, across Maine, a total of 63,068 children under the age of 3 were tested for lead poisoning, resulting in an estimated 1,446 children[6] with an elevated blood lead level (greater than or equal to 5 µg/dL), as shown in Figure 6. This represents 2.3% of children tested statewide.

Figure 6. Number of Children Under 3 Tested and Estimated Blood Lead Level ≥ 5 µg/dL (2017 – 2021)



In the previous 5-year period from 2012 to 2016 (not shown), the percent of children tested with an estimated blood lead level at or above 5 µg/dL was 3.5. The number of screenings went up, and proportionally, the cases of lead poisoned children went down during the 2017 to 2021 period, which may be a result of the expansion of testing requirements beginning in 2019.

High-risk areas. Between 2017 and 2021, there was a total of 13,998 children under the age of 3 living in Maine's high-risk areas who received a blood lead test. An estimated 484 of these children were identified as having an elevated blood lead level. This represents an estimated 3.5% of children tested in the high-risk areas, which is higher than the most recent 5-year statewide percentage.

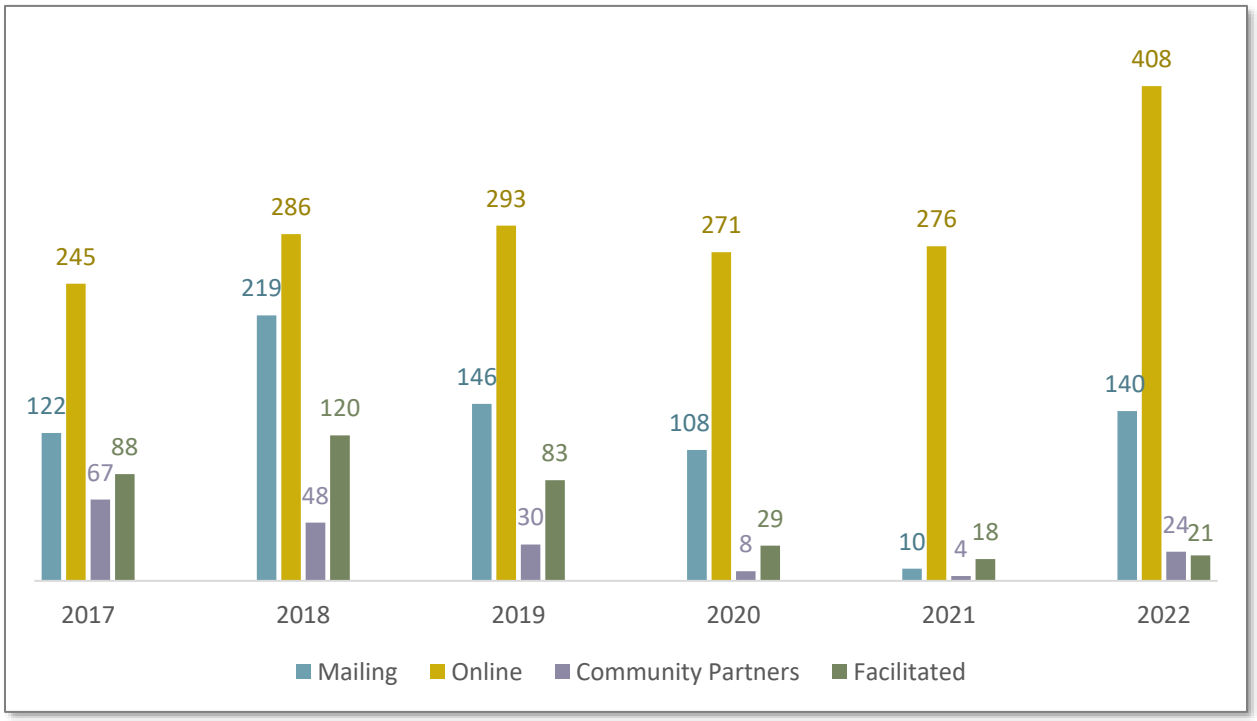
Similar to the statewide data, within the high-risk areas there was an increase in blood lead testing and decrease in the proportion of lead poisoned children in 2017-2021, compared with 2012-2016. This is likely a result of the shift to universal testing of all one- and two-year-olds.

[6]The estimated percentage is calculated from the number of confirmed cases, plus 38% of unconfirmed cases.

LEAD DUST TESTING

Statewide. Across Maine (including the high-risk areas), between 2017 and 2022, a total of 3,010 requests for lead dust test kit were processed across all outreach methods. This includes kits obtained through the Program's targeted mailing, community partners, facilitated testing, and through online access. Figure 7 shows total requests by method over the years, identifying the dip in requests during the COVID-19 pandemic in 2020 and 2021, particularly for in-person methods.

Figure 7. Annual Total of Test Requests, by Method (2017 - 2022)



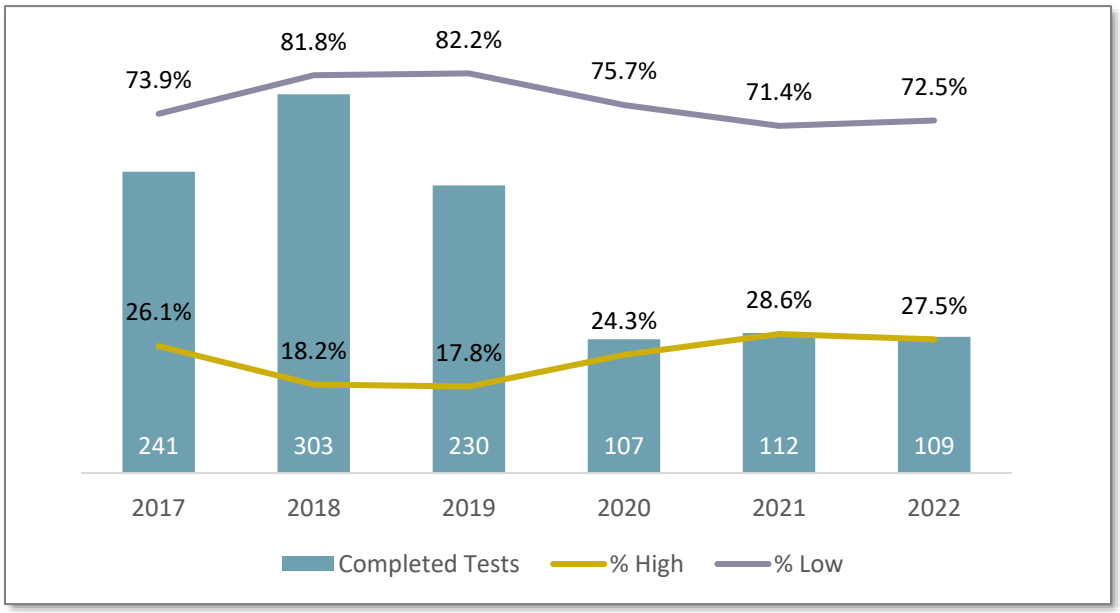
As shown in Table 3, online requests for lead dust test kits were the most popular method, with over half of kits being requested online.

Table 3. Number and Percentage of Lead Dust Test Kit Requests (2017 - 2022)

METHOD	# OF REQUESTS	% OF ALL REQUESTS
Mailing	745	24.8%
Online	1,725	57.3%
Community Partners	181	6.0%
Facilitated	359	11.9%

Between 2017 and 2022, a total of 1,102 lead dust tests were completed, with the majority being completed independently by homeowners or renters (66.2%), and the remaining tests completed through the Program's facilitated lead dust testing program (33.8%). Of the facilitated tests, 29.8% were completed homeowners and 70.2% by renters. As Figure 8 shows, over three quarters of completed tests resulted in low levels of lead dust within the home (77.6%). This leaves around 23% of homes tested with high lead dust levels, indicating that lead dust testing is an effective way to identify lead hazards within residential housing.

Figure 8. Completed Lead Dust Test Kits and Test Outcomes, Statewide (2017 - 2022)

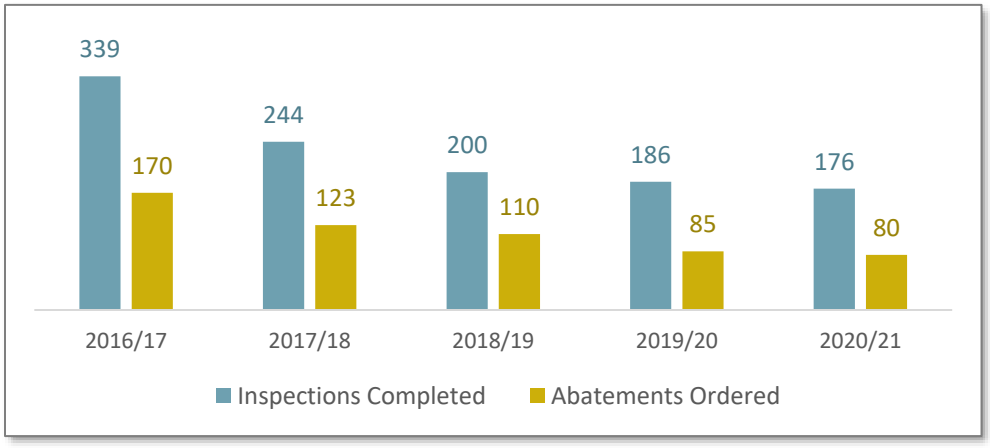


High-risk areas. Specifically, within the high-risk areas of the state, between 2017 and 2022, a total of 334 lead dust tests were completed independently by homeowners (56.0%) or renters (44.0%). Similar to the statewide data, the majority of tests (77.2%) resulted in lead dust levels that were normal or low. However, within the high-risk areas, over 22% of homes tested were successful in identifying lead dust.

HOUSING INSPECTIONS & ABATEMENTS

Between September 2016 and September 2021, there was a total of 1,159 home inspections ordered as a result of children identified with blood lead levels at or above 5 µg/dL. This resulted in 1,145 inspections conducted within those children's direct dwelling (i.e., it does not include additional units inspected within multi-unit buildings). In total, the Program ordered 568 lead abatements based on the results of the home inspections. Figure 9 identifies the number of inspections and abatements per year. On average, across the years, about 50% of inspections resulted in orders to abate for lead issues.

Figure 9. Inspections & Abatements as a Result of Blood Lead Levels > 5 µg/dL (Sept 2016 - Sept 2021)



In addition to the inspections conducted as a direct result of blood lead testing, between 2017 and 2021, 368 inspections statewide were initiated for other reasons. This includes instances of high lead dust levels from lead dust testing; if a child confirmed with lead poisoning moved homes or lived part-time in another home; or to identify lead-safe housing for a lead poisoned child. Of these inspections, 19.6% were a direct result of lead dust testing.

LEAD-SAFE HOUSING

A December 2022 review of the Lead-Safe Housing Registry (MaineHousingSearch.org) identified 2,157 rental listings, totaling 20,244 individual rental units. Of these listings, 51.8% were reported with a lead status of lead maintained, lead safe, or lead-based paint free. Similarly, of the 281 rental listings available on the Registry within high-risk areas, 58.7% were listed with a lead status.

RECOMMENDATIONS

From discussions with the Program, community partners, and members of the LPPF Advisory Board, a number of primary recommendations were identified to improve and streamline lead poisoning prevention efforts moving forward. These recommendations were identified in 3 categories: strategic recommendations that would drive the overall direction of prevention efforts; recommendations for the Program; and recommendations for the community partners.

Strategic Recommendations.

Identify and address lead hazards before children are lead poisoned rather than lead poisoned children identifying problem housing. Currently in Maine, housing is most often inspected for lead hazards as a result of there being a confirmed lead poisoned child. One recommendation is to focus more on primary prevention and identify lead-related issues within housing proactively to prevent poisonings.

Add additional focus area on high-risk populations. While the current lead poisoning prevention model focused on the geographic areas of the state at higher risk of lead poisoning among children, it was recommended to include additional strategies or sub-strategies specifically focused on lead poisoning prevention among high-risk groups, such as New Mainers, low-income individuals, and new / expectant mothers.

Continue to use and share data to make data-informed decisions. The Program and community partners stressed the success of using data, both statewide and within the high-risk areas, to drive decisions and increase community engagement. It was recommended that this strategy continue into the coming years of lead poisoning prevention. This includes continued use of the data dashboard and surveillance data.

Promote lead-related policy and regulation changes. While education can be a primary driver of policy change, it was recommended that the overall direction of lead poisoning prevention efforts moving forward shift from a focus on education to a promotion of statewide and community-level policy changes. This may include working closely with state legislators and local municipalities to promote lead-specific rules and regulation. One suggested action step in this direction was to include lead as a required component in the home-buying inspection process. Current practice dictates that sellers need to disclose any lead-related issues within their home, but this information is often unreliable. Ensuring lead is a legal requirement during home inspections means more homes will be tested, potentially before children are exposed to hazards.

Program Recommendations

Raise awareness of lead poisoning and prevention among state partners and agencies. It was recommended that the Program could take an active role in working with state-level partners to promote lead poisoning prevention. Community partners believed that a greater focus on lead prevention may open more doors for prevention on the community level bringing credibility to the work that would support partners in their local efforts.

Increase coordination, collaboration, and communication between the Program and community partners, and also among community partners. Collaboration between the Program and community partners was one of the biggest successes identified for the 2017 to 2022 time period. Partners would like to keep this momentum going in the future and recommended the Program incorporate additional opportunities to come together and work collaboratively. Community partners specifically identified wanting more opportunities to learn from one another and hear about the work going on in other communities. These learning communities may promote bi-directional learning and sharing of lessons learned.

Collaborate with equity partners to continue promoting health equity in lead poisoning prevention. The Program, partners, and board members all identified the importance of having an equity focus in lead poisoning prevention and recommended expanding this in future years. Some specific strategies suggested including race / ethnicity data in the data dashboard; incorporating a disparities component of the community partners' capacity assessments; assessing the risk for Mainers of becoming unhoused; and working with partners about further defining the term 'New Mainer' and identifying specific housing-related issues for this group.

Maintain flexibility for community partners with lead poisoning prevention funding. Community partners highlighted that the flexible, non-prescriptive nature of their funding was a success, allowing them to provide varying support for their communities. It was recommended that this flexibility be maintained in the future. One specific suggestion was for the Program to offer a 'menu' of potential services that community partners could provide within their services areas. This would allow the partners to identify services that may best meet the needs of their community, while still delivering their contracted services to the Program.

Community Partner Recommendations

Expand community-level collaborations. As noted by community partners, their engagement and collaborations with other organizations and agencies within their service areas was one of the primary drivers of success in reaching community members and landlord with lead poisoning prevention support. Partners recommended that prevention work moving forward should continue to capitalize on the relationships already established and should also focus on building new relationships in the future.

Increase opportunities to incentivize landlords and property managers to address lead hazards within rental housing. Consistent with the recommendation to address lead hazards within housing more proactively, it was also recommended that community partner efforts should continue to focus on engaging landlords and property managers in housing-specific prevention efforts. To do this successfully, it was suggested that they increase opportunities to engage landlords by incentivizing them to prevent or address lead. This includes free lead-related services like lead dust testing and inspections, as well as through educational opportunities, such as RRP classes to increase and improve lead poisoning prevention engagement. In addition, further engagement with landlords may be needed in the future to address changes in the housing landscape in Maine.

Reallocate resources away from paint retailer engagement strategies. The evaluation identified that community-level engagement of paint retailers was not an effective strategy. It was recommended that the paint retailer engagement component of community partners' contracts either be completely removed or reallocated toward other efforts. It was suggested that these resources could be better spent trying to engage landlords and other housing-related professionals, such as contractors, realtors, mortgage lenders and home inspectors to provide landlords, home buyers, and sellers with information on lead-safe maintenance of their homes.

Increase community partners' capacity for effective social media campaigns. While community partners found the support they received from the Program on social media very helpful, it was recommended that additional support could be provided to help partners ensure their local-level social media campaigns were effective. Some suggestions included additional funding to support social media; more content that could be shared within the high-risk areas; and positive messaging around lead abatement to help highlight that abatement is not always a bad thing.

DISCUSSION & LIMITATIONS

To what extent has the lead poisoning landscape in Maine (state- and community-level) changed in the last 5 years?

What were the key state- and community-level activities, strategies, challenges, and innovations that emerged over the last 5 years of lead poisoning prevention efforts?

To what extent did the state- and community-level activities achieve their intended outcomes?

DISCUSSION

TO WHAT EXTENT HAS THE LEAD POISONING LANDSCAPE IN MAINE (STATE- AND COMMUNITY-LEVEL) CHANGED IN THE LAST FIVE YEARS (2017 – 2022)?

Overall, the lead poisoning landscape in Maine between 2017 and 2022 was shaped by three primary factors: changes in lead-related policies, such as testing regulations and inspection thresholds; changes in the rental housing market, in part due to the COVID-19 pandemic; and changes in the populations of focus within the high-risk areas.

WHAT WERE THE KEY STATE- AND COMMUNITY-LEVEL ACTIVITIES, STRATEGIES, CHALLENGES, AND INNOVATIONS THAT EMERGED OVER THE LAST 5 YEARS OF LEAD POISONING PREVENTION EFFORTS?

Successful Strategies

Across the Program and community partners, there were five primary strategies and / or innovations that were highlighted as successes in lead poisoning prevention over the 2017 to 2022 time period.

Collaborations and partnerships. Both the Program and community partners stressed the importance and success of working with one another, but also of community partners engaging with other organizations, coalitions, and committees within their service areas. Such collaborations helped them increase awareness around lead poisoning prevention and also support community capacity building efforts.

Community champions. Community partners found great success in using champions within the community and also among landlords to help advocate for lead poisoning prevention. These champions used their personal lead-related experiences to engage others within their network and directed them to the lead community partners.

Flexible lead poisoning prevention funding. The flexible and non-prescriptive nature of the lead poisoning prevention funding provided to the community partners allowed them the opportunity to tailor services and support to meet the needs of the community. In addition, the funding allowed community partners to seek additional funding to supplement their existing work, which nearly all partners utilized.

Media and communication. The Program and community partners found media and social media outreach to be an effective way to reach people with lead poisoning prevention messaging, particularly during the COVID-19 pandemic.

Capacity building. As an addition to the 2017 – 2022 community partner contracts, there was consensus that the capacity building strategies were an effective mechanism for improving lead poisoning capabilities, both among community partners and within their service areas.

Challenges

A few primary challenges were also noted.

COVID-19 pandemic. The pandemic struck in the middle of the 2017 to 2022 evaluation period. To comply with safety procedures and regulations, the Program and community partners needed to shift the way they engaged around lead poisoning prevention. In addition, community partners noted the prioritization challenge the COVID-19 pandemic created. Landlords and community members were focused on other priorities in their lives, making it difficult for the partners to engage them in lead poisoning prevention.

Resources. Across the board, the Program and community partners mentioned the challenge of resources, particularly staff resources during the 2017 to 2022 period. Maintaining existing staff was a challenge and often resulted in staff turnover and the loss of institutional knowledge, particularly among partners.

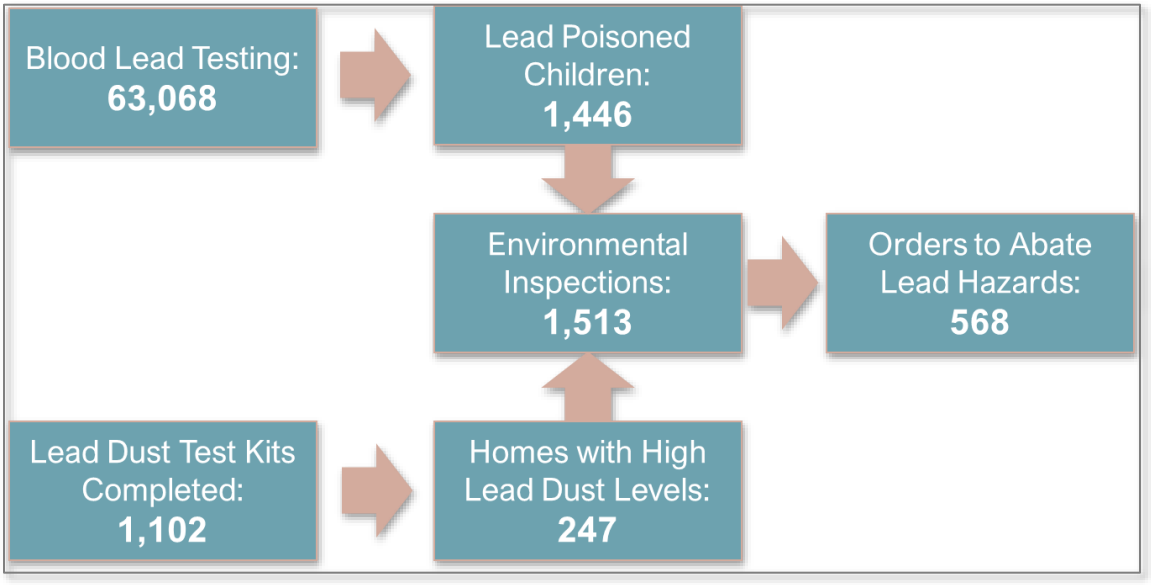
TO WHAT EXTENT DID THE STATE- AND COMMUNITY-LEVEL ACTIVITIES ACHIEVE THEIR INTENDED OUTCOMES?

The primary outcomes for the 2017 to 2022 time period focused on:

- Increasing the identification of homes with (or without) potential lead hazards
- Increasing inspections and abatement efforts to increase lead-safe housing
- Reducing childhood environmental exposures to lead
- Reducing cases of childhood lead poisoning

Figure 10 summarizes the statewide outcomes of the lead poisoning prevention efforts between 2017 and 2022.

Figure 10. Summary of Lead Poisoning Prevention Outcomes (2017 - 2022)



In addition, over 1,100 rental units across the state were listed as lead-safe, lead maintained, or lead paint free.

LIMITATIONS

Participant recall. Evaluation participants may have had difficulty attempting to recall details of what they have done in the past 5 years during interviews and focus groups. The Evaluation Team attempted to mitigate this by designing interview and focus group questions that focus on the overarching activities undertaken to assess major themes.

Community partner staff turnover. Staff turnover within community partner organizations may have resulted in lost institutional knowledge. The Evaluation Team tried to mitigate this by allowing up to 4 staff members, both former and current, to participate in each community partner interview. In addition, community partners completed an annual assessment of internal organizational capacity and community capacity. With staff turnover, different individuals may have completed the assessment each year resulting in varying perspectives.

Social desirability bias. All qualitative data collection asked evaluation participants to self-report about their experiences and perspectives working on lead poisoning prevention efforts over the past 5 years. Though the evaluation sought to learn about their true thoughts, respondents may have provided responses that are socially correct and/or what they believed is desired. This is known as social desirability bias. To mitigate this, the Evaluation Team took the necessary steps to ensure confidentiality for all evaluation participants and provided a space where they feel safe and comfortable to share their honest experiences.

Tracking paint retailer outcomes. The evaluation relied heavily on the data collected and recalled by community partners. It was not feasible for community partners to track data that linked paint retailer engagement with outcomes in community knowledge of lead poisoning. Therefore, this connection was not able to be made in the evaluation.

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