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June 16, 2020

Honorable Tom Barrett, Mayor
The Members of the Common Council
City of Milwaukee

Dear Mayor and Honorable Council Members:

The Comptroller's Office has completed the independent audit of the Childhood Lead Poisoning Prevention Program Audit that was conducted by a third party firm, Public Health Foundation, which is an expert in public health.

This audit included a thorough testing and analysis of the Childhood Lead Poisoning Prevention Program including years from 2012 through 2019. It also examined the findings from the internal reports from the Health Department, and external reports from Housing and Urban Development (HUD) and Wisconsin Department of Health Services.

The report highlights the findings, observations, and recommendations for the Health Department. Following are many appendices for your information in the report. Finally, there are responses included from the Health Department that details actions they have taken and are in the midst of taking to improve the program moving forward.

This project was lengthy and heavily involved by both the Health Department and of the firm Public Health Foundation. The Comptroller's Office and Internal Audit division are committed to conducting follow up with the Health Department in order to ensure that findings are being remediated and the program continues to improve.

Sincerely,

Aycha Sawa, CPA, CIA
Comptroller

Attachments

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MILWAUKEE

Audit of the Milwaukee Health Department Childhood Lead Poisoning Prevention Program

Report from the Public Health Foundation

March 2020

Public Health Foundation

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Public Health Foundation

Executive Summary

Background
Milwaukee faces a high burden of lead and childhood lead poisoning. Lead poisoning has serious consequences, but is largely preventable through eliminating exposure to lead based paint and household dust, which remain the primary sources of lead exposure.

Scope and Methodology
This audit includes a comprehensive review of the Milwaukee Health Department (MHD) Childhood Lead Poisoning Prevention Program (CLPPP) from 2012 to 2019, and provides an assessment and summary of the status and progress of the CLPPP since the previously issued reports from the MHD, Housing and Urban Development (HUD), and Wisconsin Department of Health Services (WI DHS).

Findings and Conclusions
The Public Health Foundation (PHF) identified items that contributed to the deterioration of the program prior to 2018, such as program changes that did not adhere to state statute and administrative code, limited quality assurance and oversight, and a lack of program infrastructure such as policies, procedures, training, and case reviews. There have been significant improvements in the MHD CLPPP in 2018 and 2019. However, not all previously identified items have been fully addressed, and opportunities for continued improvement remain. PHF has identified four findings and five observations, and provided 17 recommendations. These program deficiencies, concerns, and improvement opportunities are important for the city and MHD to consider as work continues to improve the CLPPP.

Findings: Program deficiencies based on a statute, policy, code, or funder requirement.	*Finding 1: Documentation is not sufficient to assure program compliance.* *Finding 2: Corrective Actions from the 2018 WI DHS Report remain incomplete.* *Finding 3: Not all cases adhered to MHD Policy 300-637 on case management assignment.* *Finding 4: Not all cases adhered to MHD Policy 300-660 on environmental investigation.*
Observations: Noted issues or concerns that are not based on a regulatory or program requirement.	*Observation 1: Documentation and surveillance systems are inefficient and ineffective.* *Observation 2: Children being treated for elevated blood lead levels do not always have access to lead-safe housing.* *Observation 3: There is a lack of clarity for budget oversight and accountability.* *Observation 4: Medicaid is not being fully billed for Medicaid-eligible services.* *Observation 5: There is some uncertainty in the completeness of risk assessments.*
Recommendations: Improvement opportunities or suggestions from the PHF team.	*Recommendation 1: Case management should be centrally monitored, and each case overseen by one public health nurse and the nursing coordinator or supervisor.* *Recommendation 2: Convene regular case reviews to coordinate and improve care.* *Recommendation 3: Letters and educational materials sent to families should be in plain language and translated into the common languages spoken in Milwaukee.*

	Recommendation 4: Conduct regular self-audits. *Recommendation 5: Have a periodic performance audit conducted by an independent, neutral, third party.* *Recommendation 6: Review MHD policies to assure they are administratively feasible.* *Recommendation 7: Explore unique staffing models.* *Recommendation 8: Develop and implement a retention strategy for lead poisoning prevention staff.* *Recommendation 9: Provide ongoing staff training.* *Recommendation 10: Conduct regular communications with the child's main health care provider on the public health services being provided to the child and family.* *Recommendation 11: Mobilize public health and health care resources in Milwaukee and surrounding areas to increase lead screening rates.* *Recommendation 12: Move all childhood lead poisoning case management and follow-up activities under the oversight of the MHD.* *Recommendation 13: Institute a "Lead Court."* *Recommendation 14: Participate in or create a public lead hazards registry.* *Recommendation 15: Assess and address lead poisoning "hot spots."* *Recommendation 16: Create and implement a citywide strategic plan to mobilize and coordinate city resources and prioritize childhood lead poisoning throughout Milwaukee.* *Recommendation 17: Conduct lead exposure prevention activities.*

Due to the high quantity of lead poisoning cases, it is essential that Milwaukee have an efficient and high functioning CLPPP, with coordinated and high quality care for children and families. The health department, working with its partners, has the responsibility and the ability to end lead poisoning.

About the Public Health Foundation

The Public Health Foundation (PHF), a private, non-profit, 501(c)(3) organization based in Washington, D.C., works to improve public health and population health practice to support healthier communities. Since 1970, PHF has developed effective resources, tools, information, and training for health agencies, organizations, and individuals to help improve performance and community health outcomes. Over the past decade, PHF has provided quality and process improvement, performance management, and workforce development technical assistance and training to more than 500 state, city, county, tribal, and territorial health departments.

For this audit, PHF assembled a team of national experts in managing and improving health department programs, and who have led, managed, overseen, and improved lead poisoning prevention programs. Team members included: Ron Bialek, PHF President; Vanessa Lamers, Assistant Director, Performance Management and Quality Improvement; Matthew Stefanak, Team Lead; Margaret Anne Vosel, Field Review and Audit Lead; Leslie Beitsch, Statute, Regulatory, and Programmatic Review Lead; Amanda McCarty, Performance Measurement and Management Lead; Kathleen Amos, Assistant Director, Academic/Practice Linkages. Brief biographies for each team member are included in Appendix A.

Introduction

Milwaukee has a very high burden of lead poisoning in comparison to many other U.S. cities[1] and states.[2] The city of Milwaukee consistently averages over 2,500 positive childhood blood lead tests each year,[3] with over 100 of these meeting the state statute definition of an "elevated blood lead level."[4] Several cases each year are children with substantially higher blood lead levels, and these children have additional urgent needs, including chelation or hospitalization, and need more intensive case management. Lead based paint[5] and household dust remain the primary sources of lead exposure for children in Wisconsin.[6]

Lead poisoning is associated with reduced brain development, poor academic achievement, and a range of behavioral issues such as learning disabilities and increased delinquency.[7] Lower academic scores, [8] juvenile delinquency, [9] and gun violence[10] due to lead poisoning have been documented in Wisconsin.

To protect the public's health, the Milwaukee Health Department (MHD) operates a full service Childhood Lead Poisoning Prevention Program (CLPPP) responsible for tracking lead poisoning within the city, providing interventions to children who are lead poisoned (including case management and risk assessment services), conducting and monitoring lead abatement, and providing guidance, coordination, and policy recommendations.

[1] Recent data indicate that about 5% of children in Wisconsin have blood lead levels over the Centers for Disease Control and Prevention's (CDC's) Blood Lead Reference Value of 5 ug/dL, which is higher than the national average. In Milwaukee, this percentage is consistently 9-10%.

[2] CDC National Blood Lead Surveillance Data. National Surveillance Data table, 2012-2017. https://www.cdc.gov/nceh/lead/data/national.htm. Accessed March 10, 2020. Alabama, Arizona, Connecticut, Colorado, Delaware, District of Columbia, Georgia, Indiana, Kentucky, Louisiana, Minnesota, Mississippi, New Hampshire, New Mexico, North Carolina, Oklahoma, Rhode Island, Tennessee, Vermont, Washington, and West Virginia reported less than 1,500 cases of children with 5 ug/dL or more confirmed blood lead level in 2019.

[3] City of Milwaukee Childhood Lead Poisoning Data and Reports. https://city.milwaukee.gov/health/Lead-Poisoning-Prevention-Data#.XnArecPsYdV. Accessed March 15, 2020.

[4] Wisconsin Statute 254 defines elevated blood lead level as 20+ ug/dL as confirmed by one venous blood test or 15-19.9 ug/dL, as confirmed by two venous blood tests that are performed at least 90 days apart.

[5] Wisconsin Statute 254 defines "lead-bearing paint" as "any paint or other surface coating material containing more than 0.06% lead by weight, calculated as lead metal, in the total nonvolatile content of liquid paint, more than 0.5% lead by weight in the dried film of applied paint, or more than 1 milligram of lead per square cm in the dried film of applied paint."

[6] Christensen K, Coons M.J., Walsh R.O., Meiman J.G., Neary E. Childhood Lead Poisoning in Wisconsin. *WMJ.* 2019 Apr;118(1):16-20.

[7] Centers for Disease Control and Prevention. Health Effects of Lead Exposure. https://www.cdc.gov/nceh/lead/prevention/health-effects.htm. Accessed March 15, 2020.

[8] Amato, M.S., Magzamen, S., Imm, P., Havlena, J.A., Anderson, H.A., Kanarek, M.S., Moore, C.F., 2013. Early lead exposure (< 3 years old) prospectively predicts fourth grade school suspension in Milwaukee, Wisconsin. *Environ. Res.* 126, 60–65.

[9] Amato, M.S., Moore, C.F., Magzamen, S., Imm, P., Havlena, J.A., Anderson, H.A., Kanarek, M.S., 2012. Lead exposure and educational proficiency: moderate lead exposure and educational proficiency on end-of-grade examinations. *Ann. Epidemiol.* 22 (10), 738–743.

[10] Emer L.R., Kalkbrenner A.E., O'Brien M, Yan A, Cisler R.A., Weinhardt L. Association of childhood blood lead levels with firearm violence perpetration and victimization in Milwaukee. *Environ Res*. 2020 Jan;180:108822.

Background

In early 2018, the MHD CLPPP completed an internal self-assessment[11] (Appendix B) that revealed program deficiencies in oversight and management, a drop in successful outcomes such as abated units, and failure to properly follow-up with children with elevated blood lead levels. The self-assessment pointed to a lack of training, policies, procedures, and staff capacity, low morale, overall poor documentation, and deteriorated relationships with community partners and abatement contractors.

These findings prompted two further reviews from the major funders of the CLPPP, U.S. Housing and Urban Development (HUD) and the Wisconsin Department of Health Services (WI DHS), covering their respective scopes.

HUD Review

HUD's Office of Healthy Homes and Lead Hazard Control conducted an onsite monitoring visit in February 2018 to review program eligibility and requirements, technical compliance, and city oversight and management of the HUD grant. HUD reported that the MHD performance was rated "red," MHD was not properly documenting matching funds, and the MHD program was not administering the grant within the terms and conditions of the NOFA (Notice of Financial Award) requirements or per HUD guidance. The HUD grant was then placed on a Stop Work Order and High Risk Designation in March 2018. The full report,[12] released in May 2018 (Appendix C), provided findings and concerns in the following areas:

- Finding 1: Project management and oversight
- Finding 2: Poor production performance
- Finding 3: Monitoring of contractor performance
- Finding 4: Documentation collection and planning
- Concern 1: Testing water for lead
- Concern 2: Overall approach for the intake process
- Concern 3: 2014 grant closeout

WI DHS Review

The WI DHS Bureau of Environmental Occupation Health, Lead and Asbestos Section began a review of the MHD CLPPP in February 2018. WI DHS reviewed MHD's compliance with Wisconsin Statute 254 and Wisconsin Administrative Rules 163 and 181, and assessed compliance with funding requirements, including the WI DHS program quality criteria. A WI DHS review of a sample of 108 of the 491 records for the period January 1, 2012 to December 31, 2017 revealed significant deficiencies in documentation and follow-up. The following issues were noted in the 108 sample case files reviewed:

- Only 46% of the nursing case files could be provided for review, and those files had insufficient case management initiation, home visiting, and case closure.

[11] City of Milwaukee Health Department Childhood Lead Poisoning Prevention Program Assessment of Operations and Recommendations for Corrective Actions, January 2018

[12] United States Department of Housing and Urban Development Office of Healthy Homes and Lead Hazard Control Review of City of Milwaukee-Health Department Lead Hazard Control Program, May 2018

- Only 45% of primary address environmental investigation files were able to be provided to the reviewers.
- Zero of the records had a completed risk assessment report filed.
- Zero of the records had a completed clearance report filed.

In the WI DHS report[13] (Appendix D), issued in May 2018, a total of 16 findings and corrective actions in three program areas were noted:

- Program Administration – Seven Findings and Corrective Actions
- Nursing Case Management – Five Findings and Corrective Actions
- Environmental Investigation – Four Findings and Corrective Actions

Scope and Methodology of Public Health Foundation (PHF) Audit

The overall purpose of this audit was to conduct a comprehensive review of the MHD CLPPP for the period January 2012 through December 2019. Where additional documentation was obtained and verified beyond December 2019, PHF included this information as part of this audit. This audit includes a full review of the status and progress of the MHD CLPPP related to findings, concerns, and corrective actions noted in the MHD, HUD, and WI DHS reports. In addition, PHF reviewed the current status of the MHD CLPPP operations. Recommendations were developed for continued program improvement based on the literature, program practices in other jurisdictions, and state and national guidelines.

Audit Methodology

PHF conducted its audit of the MHD CLPPP by identifying and reviewing governing statutes, regulations, ordinances, and municipal codes; standards and guidelines from the Centers for Disease Control and Prevention (CDC), HUD, WI DHS, and the Public Health Accreditation Board; evidence–based interventions in the literature; and standards from other jurisdictions. PHF reviewed case files, as well as MHD CLPPP policies, procedures, and practices. PHF met with MHD staff and leadership frequently in person and by phone from May 2019 to March 2020. PHF discussed, reviewed, mapped, and analyzed workflows of staff in the CLPPP to understand the processes and protocols followed by staff. PHF used key informant interviews with program staff to gather information related to processes, gaps, recent programmatic changes, and opportunities for improvement. PHF held in-person meetings and conference calls with HUD, WI DHS, Wisconsin Department of Justice (WI DOJ), CDC, and the Milwaukee City Attorney's Office. In addition, PHF reviewed past and current cases, policies, procedures, and other documents provided by the MHD such as agendas, meeting minutes and notes, and reports. The PHF team also reviewed peer-reviewed literature, case studies, and examples from other jurisdictions, and conducted interviews with lead programs from around the country. A list of items reviewed is provided in Appendix E.

In December of 2019, PHF conducted an onsite case review of MHD CLPPP cases from January 1, 2012 to December 6, 2019. These cases were of children who met the Wisconsin State

[13] State of Wisconsin Department of Health Services, Division of Public Health, Bureau of Environmental and Occupational Health, Lead and Asbestos Section, Reported on the Review of the City of Milwaukee Health Department Childhood Lead Poisoning Prevention Program, May 2018

Statute Chapter 254 definition of an elevated blood lead level.[14] Lists of cases meeting the state statute definition were provided from WI DHS and randomized by PHF. Random samples of 5% of the historic cases (2012-2017) and 10% of the new cases (2018 and 2019) were selected and these cases were reviewed in depth. PHF slightly oversampled elevated blood lead level cases with more than 45 ug/dL to assure adherence to procedures for higher blood lead level children, including those who had been hospitalized or were undergoing chelation. PHF evaluated 38 components of each nursing case file and 40 components of each environmental case file. A Case Review Methodology Supplemental has been provided in Appendix F.

PHF was provided datasets with aggregate information such as nursing case management, blood lead levels, environmental risk assessment, and abatement timelines, from the MHD and WI DHS to complement this onsite in-depth case review.

PHF Audit Findings and Conclusions

In this audit, PHF provides an analysis and summary of the MHD CLPPP from 2012-2017, in accordance with the timeframe of the previous MHD, HUD, and WI DHS reviews, as well as an analysis of the current state of the program from early 2018 through December 2019. Where additional documentation was obtained and verified for the period beyond December 2019, PHF included this information as part of this audit.

Overall, the state of the MHD CLPPP has improved from 2017. The new leadership team has demonstrated that steps have been taken to lay a solid foundation of program infrastructure and continue progress toward a fully compliant program. However, as of February 2020, not all previously identified issues were fully addressed. PHF has identified four findings and five observations, and provided 17 recommendations. These program deficiencies, concerns, and improvement opportunities are important for the city and MHD to consider as work continues to improve the CLPPP. A “finding” is defined as a program deficiency based on a statute, policy, code, or funder requirement; an “observation” is defined as a noted issue or concern that is not based on a regulatory or program requirement; and a “recommendation” is defined as an improvement opportunity or suggestion from the PHF team.

Summary Analysis of the Historic MHD CLPPP, 2012-2017

From January 1, 2012 to December 31, 2017, 491 children tested at or above the state statute definition of an elevated blood lead level, and should have had case management services initiated. The case files from this time period were moved from the MHD and put under the care of the Milwaukee City Attorney’s Office until the completion of a WI DOJ investigation. Although health department staff spent time organizing these files for WI DOJ and PHF, the files remain poorly catalogued and incomplete. Onsite reviewers reported many boxes were labeled “inactive” and that cases were “inactivated,” and filed away, even though they should have been actively pursued. Files also contained notes of staff being told to close cases, despite

[14] One venous blood test of greater than or equal to 20 ug/dL or two venous blood tests of more than or equal to 15 ug/dL taken at least 90 days apart.

these cases not meeting requirements for case closure.[15] Overall, the files from 2012-2017 show minimal documented effort of following up on cases.

Twenty-five cases were chosen as a random sample for an in-depth review. Of the 25 cases, records for only 21 cases were located. None of the case files were fully complete, and only six of the 21 cases had both case management and environmental risk assessment information located. Of the 21 cases, 13 partial nursing files were located, and 18 partial risk assessment files were located.

Of the 13 partial nursing files:

- All indicated that at least one case management home visit was completed
- Documentation was not sufficient to determine how many visits, on average, were completed
- Five of the 13 case files indicated the child's required development screening was completed
- Nine of the cases indicated case closure, but none of the cases appeared to meet the case closure criteria

Of the 18 partial risk assessment files:

- Three of the 18 cases had a risk assessment report
- Nine of the 18 cases indicated abatement was complete
- None of the 18 files had a clearance report or a closure report

Conclusions Regarding the Historic CLPPP, 2012-2017

In reviewing historical cases and MHD CLPPP operations, PHF identified the following items that contributed to the deterioration of the program prior to 2018:

- Changes to health department protocols in 2015 and 2016 did not adhere to state statute and administrative code
- Guidance in the Wisconsin Childhood Lead Poisoning Prevention and Control Handbook for Local Health Departments not followed
- Limited quality assurance, monitoring, or oversight
- No ongoing internal or external programmatic auditing
- Minimal training materials or orientation manuals for new staff
- Lack of written policies
- Procedures followed were inconsistent and relied on word of mouth
- No team meetings or regular review of elevated blood lead level cases
- Minimal continuing education and maintenance of staff certifications
- Lack of overall health department policies and procedures for employee performance management, discipline, and accountability
- Wide variability in how different personnel performed the same job duties

[15] The WI DHS has adopted the following minimum case closure criteria for an EBLL (elevated blood lead level) case: The child's BLL has remained <15 ug/dL for at least six months; lead hazards have been controlled or eliminated within the child's environment; there are no new lead exposures.

- No supervision or inconsistent supervision of CLPPP staff
- Poor recordkeeping and documentation practices; no documentation training or policy
- Inconsistent housing abatement decisions with no demonstrated prioritization of children with lead poisoning
- No culture of quality or focus on continuous improvement

Taken individually, these items were not the cause, but taken as an aggregate, these deficiencies meant the MHD failed to adhere to state statute and administrative code, compliance with funder requirements, and insufficiently served and responded to children with lead poisoning.

Current State of the Program

The MHD CLPPP demonstrated significant improvements in 2018 and 2019. The updated intervention schedule was aligned with state statute, and CLPPP staff have begun to use written orientation documents, policies, and procedures to assure continuity and decrease variability in the program.

Overview of the Updated MHD Childhood Lead Poisoning Case Management Process

The recommendation for the city of Milwaukee contained in the Wisconsin Blood Lead Screening Recommendations[16] is that all children in the city be tested for lead at least three times before they turn three. These tests are usually performed in health care clinics or during routine well baby visits with pediatric medical providers. All lead test results (positive and negative) for children who reside in Milwaukee[17] are required to be sent to the MHD CLPPP, where the results are entered into HHLPSS.[18]

The MHD Lead Poisoning Intervention Schedule[19] (Appendix G), approved by WI DHS and effective November 1, 2018,[20] stipulates that the CLPPP provide services when a child tests at or above five ug/dL, with additional interventions at higher blood lead levels. Administrative services, such as mailing letters and educational materials are to begin at lower blood lead levels. Children who meet the state statute definition of "elevated blood lead level" in Wisconsin are eligible for nursing case management and risk assessment activities, and then

[16] WI DHS. Testing Children for Lead, https://www.dhs.wisconsin.gov/lead/test-your-child.htm, Accessed March 20, 2020.

[17] Under Wisconsin Statute 254.13, all laboratories – including clinics performing in-office lead testing – must report lead poisoning test results associated with all blood lead level tests.

[18] HHLPSS, or Healthy Homes and Lead Poisoning Surveillance System, is a web-based data management platform developed and supported by CDC for use by state and local CLPPPs to provide a centralized surveillance repository for blood lead data, environmental sampling results, and follow-up information for case management. Use of HHLPSS for surveillance is a requirement of the funder contract with Wisconsin DHS.

[19] Childhood Lead Poisoning Prevention: Intervention Schedule, https://city.milwaukee.gov/ImageLibrary/Groups/healthAuthors/HEH/PDFs/InterventionScheduleforweb.pdf. Accessed March 3, 2020.

[20] In Wisconsin, local health departments act as agents of the WI DHS, and carry out the responsibilities required under Wisconsin Statute 254 and Administrative Rule DHS 163.

should be followed until case closure criteria are met[21]. At higher levels, upwards of 40 ug/dL, children may require hospitalization and additional medical interventions such as chelation, and often need care coordination from the health department.

If the blood lead result is from a capillary test (i.e. a quick foot stick or screening test), the CLPPP sometimes takes additional steps to recommend a venous (confirmatory) test. As of March 2020, the health department only conducts nursing case management and risk assessment services after venous (confirmatory) testing.

MHD Childhood Lead Poisoning Comprehensive Case Management Process
Process mapping of the case management process indicates that complete case management services for children who have an elevated blood lead level requires over 100 steps. This includes the initial blood test received; nursing visits and case follow-up; environmental referral and risk assessment; laboratory processes; hazard reduction, abatement, and lead hazard clearance; and case closure. More complex cases, such as those that require communication with child protective services, or care coordination from hospitalization or chelation, require even more steps, and continuous action by the health department.

In Figure 1, PHF has provided a simplified figure to illustrate the full case management process.

[21] The WI DHS has adopted the following minimum case closure criteria for an EBLL (elevated blood lead level) case: The child's BLL has remained <15 ug/dL for at least six months; lead hazards have been controlled or eliminated within the child's environment; there are no new lead exposures.

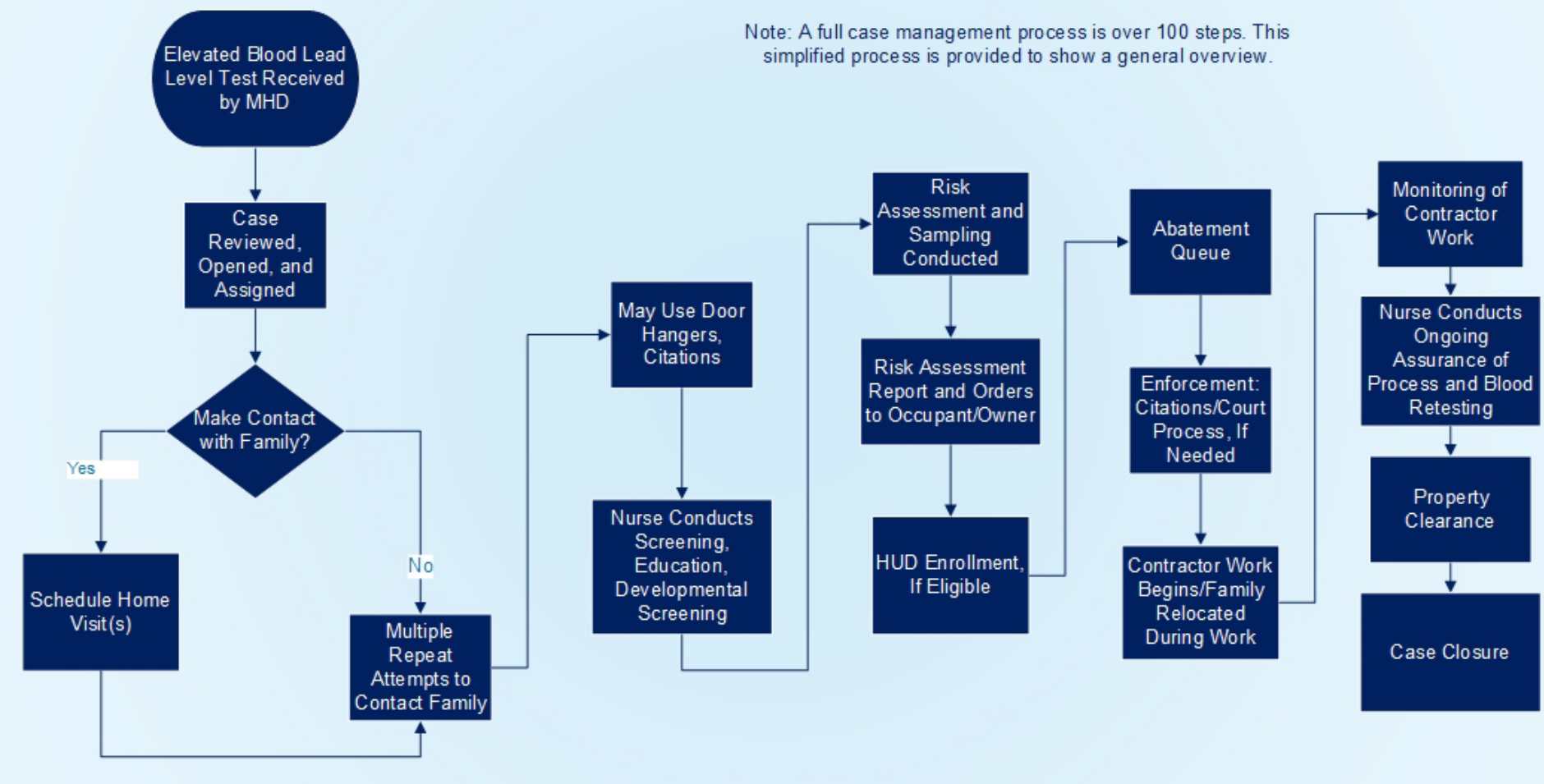

Figure 1 Simplified Flow Chart of Childhood Lead Poisoning Case Management

Case Review of Recent Cases
A review of 2018 and 2019 case files shows that case follow-up, documentation, and timely response have all improved. From January 1, 2018 to December 6, 2019, 143 cases were initiated. PHF selected a random sample of 17 cases for an in-depth review (10% sample + 2 additional cases with elevated blood lead levels over 40 ug/dL). All 17 of the case management files were located, and 18/19 of the accompanying environmental risk assessment files were located. Information for the 19th file was eventually located. (There may be multiple environmental investigation files for a child due to changes in residence.) Although these files did have some missing information, PHF was able to ascertain a mostly complete picture by supplementing with information from HHLPSS and onsite staff.

Difficulties in locating complete case files likely comes from the CLPPP storing records associated with individual case files in multiple locations, filing the nursing and property records separately, and not consistently using a case numbering system between the case management and environmental staff. Reviewers also noted occasional discrepancies between case management and environmental investigation files for the same case (e.g., child's date of birth), documentation differences between staff, and inconsistent use of the chronological record.

The sample included children from 17-78 months of age (1.5-6 years) with an average of 43 months of age (~3.5 years) from 11 different zip codes. Eight of 17 cases had an over 40 ug/dL blood lead level. Analysis of recorded dates shows the median time it takes for a child to move through the health department case management process:

- Five days from elevated blood lead level confirmation test to nursing assignment/case open date (two missing documentation; average 17 days; range 0-142 days)
- Three days from elevated blood lead level confirmation test to risk assessor referral/case open date (two missing documentation; average 10 days; range 1-44 days)
- One day from case open to contact date for nurses (two missing documentation; average three days; range 0-12 days)
- Zero days from case open to contact date for risk assessors (five missing documentation; average 1 day; range 0-3 days)
- Three days from case open date to risk assessment (three missing documentation; average 13 days; range 0-88 days)
- 27 days from risk assessment until report sent to owner (five missing documentation; average 81 days; range 15-406 days)
- 220 days from work order completion to work beginning on home (10 missing; two where work not yet occurred; average 202 days; range 41-306 days)
- Four cases environmental investigations were closed, ranging from 110-320 days from initial elevated blood lead level. Each case had the required case closure documentation.
- One case was fully closed at 375 days from the initial elevated blood lead level. This case file had a case closure report, and met all case closure criteria.

PHF analysis of data provided by the health department regarding abated properties shows an increase in the number of abated properties associated with an elevated blood lead level case, from 27 properties in calendar year 2018 to 89 properties in calendar year 2019. In addition, data provided by the health department regarding abated properties seems to indicate a decrease in time to abatement. However, as of March 2020, it was too early to determine if the decrease in time to abatement was continuing to improve.

The results of the case review demonstrate improvement in the management and follow-up of newer cases. Although some variability existed, the quantity and quality of documentation in late 2019 had improved from 2018, when major program changes were being developed and implemented. For the period January 1, 2018 through December 6, 2019, the MHD CLPPP appeared to be following up on cases that met the state statute requirements; PHF was unable to verify that follow-up on each case had occurred.

Rebuilding a program as extensive and complex as the MHD CLPPP, takes time. While significant progress was made during 2018 and 2019, there are several areas that still need to be addressed.

Findings, Observations, and Recommendations
Based on PHF's complete review and audit of the MHD CLPPP, specific findings, observations, and recommendations are noted below. PHF has identified four findings and five observations, and provided 17 recommendations. These program deficiencies, concerns, and improvement opportunities are important for the city and MHD to consider as work continues to improve the CLPPP.

Definitions

- *Finding:* A program deficiency based on a statute, policy, code, or funder requirement.
- *Observation:* A noted issue or concern that is not based on a regulatory or program requirement.
- *Recommendation:* An improvement opportunity or suggestion from the PHF team.

Findings
A "finding" is a program deficiency based on a statute, policy, code, or funder requirement.

Finding 1: Documentation is not sufficient to assure program compliance.
A case file is a legal document of care provided. Case files should be legible, in chronological order, and errors or changes should be updated with initials and dates. Case files should show that mandated requirements are met and that procedures for grant funding, state and federal requirements, and program policies and procedures are being followed. The case file documentation and recordkeeping should allow for different case managers to review a file and quickly understand what is next.

During PHF's onsite visits, progress in work activities, trainings, and consistency in following policies and procedures was noted. However, the recordkeeping did not adequately or

consistently reflect all activities that had occurred or were occurring with an elevated blood lead level case. Case files PHF reviewed often excluded documentation on:

- previous chelation
- contact with the hospital, and discharge and discharge dates
- orders completed when provided to the homeowner and/or occupant
- HUD enrollment or progress
- citations, when they were written/not written, and the results
- work and monitoring beginning on the home

Other documentation in the files were inconsistent, as noted in the case review of recent cases summary. As of December 2019, documentation was insufficient to assure compliance with Wisconsin Statute 254 and Wisconsin Administrative Rules 163 and 181, and funder (WI DHS and HUD) requirements for each case. This documentation is also necessary for management and oversight of cases, including required follow-up of all past and present cases, as well as requesting reimbursement for services provided.

Finding 2: Corrective Actions from the 2018 WI DHS Report [22](Appendix D) remain incomplete. Significant, notable progress has been made in addressing the findings and program requirements contained in the WI DHS Report. However, as of February 2020, there are several items from the WI DHS Report that have not been addressed, including:

- adequate recordkeeping and documentation
- required written policies and procedures being adopted and implemented
- case management of all historic cases[23]
- assurance of case follow-up for new cases

The MHD CLPPP, in most of its duties, acts as an agent of WI DHS. Compliance with WI DHS requirements is essential.

Finding 3: Not all cases adhered to MHD Policy 300-637 on case management assignment. MHD Policy 300-637: Processing Reported Elevated Blood Lead Levels and Referrals for Case Management Services, effective January 1, 2019, describes the assignment of new cases (i.e., opening or reopening a case). The policy specifies that, "Cases meeting new case criteria should be reviewed and assigned to a PHN [public health nurse] within 24 hours of receipt." In PHF's review of the nine cases dated after January 1, 2019 (the effective date of this policy), in six of the cases, the time to assign/open a case after a confirmatory elevated blood test took longer than 24 hours (overall median of three days; average of 18 days; range of 0-142 days).[24]

[22] State of Wisconsin Department of Health Services, Division of Public Health, Bureau of Environmental and Occupational Health, Lead and Asbestos Section, Reported on the Review of the City of Milwaukee Health Department Childhood Lead Poisoning Prevention Program, May 2018

[23] As of February 10, 2020, the health department reported that 458 of the 491 historic cases had been closed, and the 33 remaining were in various states of review and follow-up.

Finding 4: Not all cases adhered to MHD Policy 300-660 on environmental investigation.
MHD Policy 300-660: Case Assignment for Environmental Investigation, effective March 1, 2019, outlines the policy for case assignment for environmental investigation. In this policy, MHD adopted the CDC recommendations for risk assessment follow-up timeframes, as strongly encouraged by WI DHS. These follow-up timeframes vary based on blood lead level. These timeframes are: within two weeks for blood lead levels 15-19 ug/dL, within one week for blood lead levels 20-44ug/dL, within 48 hours for blood lead levels 45-70 ug/dL, and within 24 hours for blood lead levels 70ug/dL or above. Policy 300-660 also stipulates that environmental investigation assignment will occur "within 48 hours of notification for 15-19.9 ug/dL and within 24 hours for 20-39.9 ug/dL whenever possible," and for children with blood lead level results 40ug/dL or higher should "be assigned with urgency and as soon as possible," but within a maximum of four hours.

Of the nine cases PHF reviewed that were dated after the effective date of MHD Policy 300-660 (March 1, 2019), none adhered to the policy:

- One case was missing a case opening date
- One case in the 15-19.9 ug/dL range should have been opened within 48 hours, and was opened in five days
- Four cases in the 20-39 ug/dL range should have been opened within 24 hours and were opened in 2-5 days
- Three cases had blood lead levels over 40 ug/dL and should have been opened within four hours, but were opened after 2-5 days

For risk assessments:

- Two cases over 45 ug/dL had risk assessments conducted in 1 and 6 days; these should have been conducted within 48 hours
- Five cases in the 20-44 ug/dL range had risk assessments conducted between 2-54 days; these should have all been conducted within 7 days
- One case in the 15-19 ug/dL range had a risk assessment conducted in 12 days; this was within the 14 days dictated by the policy

This represents an overall average of 13 days from blood lead level test receipt to risk assessment for cases reviewed by PHF. All of these cases had confirmatory blood lead tests that came in after the adoption of the MHD Policy 300-660 (median of 6.5 days; range 2-54 days).

Observations

Observation 1: Documentation and surveillance systems are inefficient and ineffective.
Upon receipt of blood lead tests, the results are entered into HHLPSS, a web-based data management platform developed and supported by the CDC to provide a centralized surveillance repository for blood lead data, environmental sampling results, and follow-up information for case management. Use of HHLPSS for surveillance is a requirement of the contract with WI DHS. Along with HHLPSS, as of December 2019, the MHD CLPPP was also using Quickbase, Microsoft Access, Microsoft Excel, and separate paper record systems to document

and track cases. The repetition of data entry into multiple electronic systems uses valuable resources and allows ample opportunity for errors to be made.
In order to review all information for a single childhood lead poisoning case, PHF had to look in multiple places, both paper and electronic. A case numbering systems is not consistently used between nursing case management files and environmental investigations cases; nursing files are filed by last name and environmental investigations are filed by property address. There was no standardization of what information was located in which location, and there was missing as well as duplicative information.

Observation 2: Children being treated for elevated blood lead levels do not always have access to lead-safe housing.
The process from the time a child is identified with an elevated blood lead level to abatement and clearance of lead hazards includes numerous steps, and can be lengthy for families. This process can take over 12 months, particularly for older cases, with a significant waiting period after families have applied for HUD assistance. This waiting period has been referred to as an "abatement queue," and throughout this time period children largely remain in the same property. CLPPP staff occasionally implement some temporary lead dust control strategies to decrease exposure during this time period. For very high blood lead level cases (such as chelation cases), the health department has put additional effort into speeding up the process or assisting the family to move. However, the health department has limited options for immediate relocation of families upon discovery of lead poisoning. This results in many families with children identified as having elevated blood lead levels still living in housing with lead.

As of February 2020, the health department reported a decrease in the queue timeline. An analysis of the late 2019/early 2020 cases average time to abatement should provide evidence of this.

Observation 3: There is a lack of clarity for budget oversight and accountability.
The MHD currently has multiple funding sources, including funding from WI DHS for carrying out the responsibilities as an agent of WI DHS, HUD funding for lead hazard control and abatement, Community Development Block Grant funding, and supplemental city funds. CLPPP staff also mentioned that the program received a small grant from the National Association of County and City Health Officials. When reviewing financial records, it was difficult to obtain complete budgets for the various components of the CLPPP and the program in its entirety. It also was difficult to determine actual program revenue and expenditures. Future funding could be jeopardized by what appeared to be inadequate documentation and oversight of the program's finances.

Observation 4: Medicaid is not being fully billed for Medicaid-eligible services.
While Medicaid-eligible services are currently being billed, it is unclear from what was provided to PHF that Medicaid-eligible services are being fully billed and reimbursed by the WI Medicaid program. The result is that all eligible revenue may not be recovered from the Medicaid program. These WI Medicaid funds could supplement the city's expenditures for the CLPPP. In addition to reimbursement for nursing case management, environmental risk assessment, and

lead hazard clearance testing, as of February 2020 the health department had not implemented reimbursement for a larger pool of funding from WI DHS that allows reimbursement of lead abatement services[25] for low-income families and pregnant women.

Observation 5: There is some uncertainty in the completeness of risk assessments.
Bags of paint chips were found in files, which had not been sent to the laboratory for testing. A risk assessment includes onsite assessment and review, photos, and use of an XRF instrument onsite, but also the laboratory analysis of the paint chips, dust wipes, and soil. These are the components of a complete risk assessment,[26] as required by WI DHS and for Medicaid reimbursement. Risk assessment reports, orders, and scopes of work should not be completed without the results of laboratory analysis of paint chips, dust wipes, and soil.

Recommendations
A "recommendation" is an improvement opportunity or suggestion from the PHF team.

Recommendation 1: Case management should be centrally monitored, and each case overseen by one public health nurse and the nursing coordinator or supervisor.
Case management includes all services provided to the child and their family by the health department, beginning with the child's initial elevated blood lead level, and continuing through all subsequent tests, visits, screenings, risk assessments, orders, abatement, clearance, and case closure. Each case should have one nurse, designated as the lead for the case, who monitors and oversees all care and services provided to the child by the CLPPP. All documentation of care components should be together in a central case file, and easily accessible and readable by outside parties, including auditors. Recordkeeping should reflect all actions, communications, tests, home visits, and follow-up and repetitive or duplicative items should be avoided. Clear and concise documentation provides not only communication among the CLPPP team, but is used for proof of services provided for reimbursement. Files should include a tracking sheet to identify key components of care, along with dates, for a quick and easy review for anyone looking at the chart. In the event that the nursing case management files and risk assessor property files remain separate, the overall tracking sheet should include basic demographic information, including the child's address(es). Finally, if original files need to move to different staff or different departments, there should be a formal process to check-in and checkout files, so that all records are locatable and retrievable at all times.

Recommendation 2: Convene regular case reviews to coordinate and improve care.
Treatment of a child with an elevated blood lead level includes not only medical management but identification and elimination of the cause of the lead poisoning. Multiple professionals will be interacting with the child and family. Efforts must be made to effectively coordinate this care and communicate the ongoing status of the child, the family, and hazard abatement with the

[25] WI DHS Press Release. *DHS Lead Abatement Program Receives Federal Approval.* September 2019. https://www.dhs.wisconsin.gov/news/releases/091219.htm. Accessed March 15, 2020.
[26] Described in further detail in the Wisconsin Childhood Lead Poisoning Prevention Handbook for Local Health Departments. https://www.dhs.wisconsin.gov/publications/p00660.pdf.

full team providing services. One strategy for achieving this is by conducting a routine multidisciplinary, case review. As outlined in the Wisconsin Lead Poisoning Prevention and Control Handbook, regular case reviews should take place that include the risk assessors, WIC (Special Supplemental Nutrition Program for Women, Infants, and Children) nutritionists, early childhood program staff, social services staff, and others who are providing services to the child and/or family. Case reviews can help the team clarify any issues or resolve challenges more directly and efficiently. These reviews can also help facilitate the work of all team members while keeping the focus on the child and improving the overall outcome. Efficiencies can be gained by reviewing multiple cases at each session, and identifying common areas for improvement.

Recommendation 3: Letters and educational materials sent to families should be in plain language and translated into the common languages spoken in Milwaukee.
Educational materials are the first communication that most families receive from the health department after learning their child has lead poisoning. They are an opportunity to provide education to families about what lead poisoning is and is not, the level and severity of the poisoning, and prompt families to take action. This is a valuable intervention and relationship building opportunity for the health department. At present, materials may be difficult to understand, and are only available in English. These materials should be updated to use plain language, [27] imagery, and common language translation. Often public health departments aim to provide materials at a 5th or 6th grade reading level. MHD can use or adapt materials from other health departments or national organizations. The Wisconsin Childhood Lead Poisoning Prevention and Control Handbook for Local Public Health Departments discusses educational interventions for parents and caregivers in more detail and provides an example of a fact sheet from the National Center for Healthy Housing.[28]

Recommendation 4: Conduct regular self-audits.
An internal self-audit will allow staff to assess and evaluate their record keeping and documentation systems, and make improvements. This is a common practice in case management that should end with a short report or briefing of the leadership team and/or the Board of Health. Staff could use or adapt an audit tool from WI DHS or PHF (See Appendix F for further information on PHF's case review methodology) and could conduct the first audit with support from WI DHS or another outside organization or agency. This could begin as an audit every six months, and transition to an annual self-audit once records reach a compliance rate of over 90%.

[27] MHD may want to refer to resources from the Plain Language Action and Information Network (PLAIN), a group of federal employees from different agencies and specialties who support the use of clear communication in government writing. https://www.plainlanguage.gov/guidelines/
[28] National Center for Healthy Housing. Childhood Lead Poisoning: What You Should Know about Your Child's Blood Lead Test Results. https://nchh.org/resource-library/fact-sheet_childhood-lead-poisoning_what-you-should-know_english.pdf

Recommendation 5: Have a periodic performance audit conducted by an independent, neutral, third party.
WI DHS and HUD have limited ability to audit, and must stay within their respective scopes and funding streams. Due to the history and poor performance during the 2012-2017 time period, further external support and oversight is likely needed over the short-term. For the MHD CLPPP to continue to improve and be accountable to city leadership and the public, an independent third-party is suggested. A performance audit could include compliance with the WI state and administrative code, compliance with internal CLPPP policies, and assuring documentation is sufficient. This could begin as an annual assessment, and then move to every three years once records reach a compliance rate of over 90%.

Recommendation 6: Review MHD policies to assure they are administratively feasible.
In PHF's findings, as noted above, MHD CLPPP was unable to adhere to several of the timelines stipulated in their policies. These policies should be evaluated to assure that they are administratively feasible. For example, a 24-hour response time, particularly over a weekend or holiday, may not always be possible.

Recommendation 7: Explore unique staffing models.
As the CLPPP seeks to hire workers to fill vacant positions, the health department may benefit from the exploration of alternative staffing models that may better meet Milwaukee's unique needs for lead poisoning prevention, diagnosis, and treatment[29]. Some CLPPP programs use social workers to assist with management of cases, as social workers are often skilled home visitors with experience in high caseloads, documentation, and case management best practices. In addition, many high functioning CLPPPs include housing or construction project managers as part of their team, who are experienced in planning and managing large-scale construction projects, completing scopes of work, inspecting and tracking projects, or programs may use contractors for some or all of these activities. These other staff would work in concert with public health nursing and environmental staff in the program.

Recommendation 8: Develop and implement a retention strategy for lead poisoning prevention staff.
Ultimately, a competent and skilled workforce is the most important resource for reducing lead poisoning in the city. Frequent changes in leadership and staff turnover can lead to instability in a program. Ongoing audits and investigations can create an atmosphere of insecurity among staff, which can lead to low morale. In an effort to identify program inefficiencies, staff and leadership can experience "audit fatigue," and become overwhelmed by ongoing external evaluations. New staff may be concerned that they are being labeled or identified with a troubled program, or held responsible for something they did not cause.

Staffing for the CLPPP, if fully staffed, is sufficient to provide quality services. However, the almost 100% turnover of nurses during the time period of PHF's audit, and the backlog of the

[29] At this time, the WI DHS contract requires nurses conduct home visits for children with elevated blood lead levels, and WI Medicaid will only reimburse for case management visits completed by nurses.

historic cases, have contributed to services not always being provided in a timely manner. The turnover of staff, particularly nurses, also interrupts continuity of care for children and families, as it takes over six months to get a new staff member fully trained to perform all required duties.

Staff retention is critical for making continued improvement to the CLPPP. It is important to develop and implement an effective, tailored retention strategy. This strategy could be developed, implemented, and monitored as part of an updated MHD Workforce Development plan.

Recommendation 9: Provide ongoing staff training.
Comprehensive onboarding and ongoing training are necessary to ensure that policies, protocols, and processes are consistently being implemented by staff. It is important for there to be well-designed and delivered initial training on policies, protocols, and processes for new CLPPP staff. It is equally important to periodically review and repeat training for the same staff as an element of the organization's quality assurance program. Some areas for identified initial and ongoing training include:

- Quality improvement (QI) – QI promotes a culture of quality within a program, and empowers staff to identify issues/problems and work with management to make improvements. [30] QI tools and techniques are often used within health departments as a vehicle to improve current procedures and achieve efficient program management.
- Performance management – Performance management is useful for developing and implementing performance measures, targets, reporting, and processes for improvement. [31] Along with self-audits (Recommendation 4), this intentional setting of standards, programmatic goals, and targets provides an avenue to regularly monitor meaningful performance measures and track progress. With proper training, development, and implementation, performance measures and reporting would serve as a useful tool for sharing progress with city leadership.
- Team building – Team development and management are critical skills for a well-functioning program and health department. Team building training and exercises can help bridge the gap between the nursing case management and environmental investigations, which are still functioning separately, and assist improve morale and decrease turnover. Many other CLPPPs have found their successes and efficiencies in responding to each case of lead poisoning as a team.
- Communications – Effectively communicating internally and externally with program staff, partners, city leadership, and the public is crucial for program success.[32] Learning to identify target audiences and their needs, defining communications objectives and key messages, and strategizing the when, where, and how to communicate are important skills for public

[30] The Public Health Foundation. Quality Improvement in Public Health. http://www.phf.org/focusareas/qualityimprovement/Pages/Quality_Improvement.aspx
[31] The Public Health Foundation. Performance Management. http://www.phf.org/focusareas/performancemanagement/Pages/Performance_Management.aspx
[32] The Public Health Foundation. Planning Before You Communicate Tool. http://www.phf.org/resourcestools/Pages/Planning_Before_You_Communicate_Tool.aspx.

health professionals. CLPPP staff may benefit from communications training as they work to strengthen relationships with other departments, current and new partners, and the public.

Recommendation 10: Conduct regular communications with the child's main health care provider on the public health services being provided to the child and family.
At present, regular communications are not occurring with the health care providers of children with elevated blood lead levels being served by the health department. The MHD should develop and implement a policy requiring that health care providers be notified when families are not following through or cannot be located. A health care provider needs to be aware when care or services cannot be delivered or when follow-up blood draws are not occurring. Contact with the child's main health care provider should be a requirement of case closure, including administratively closed cases.

Recommendation 11: Mobilize public health and health care resources in Milwaukee and surrounding areas to increase lead screening rates.
The Wisconsin Blood Lead Screening Recommendations recommend that all children in Milwaukee be tested three times before the age of three, and Medicaid requires all children enrolled in Medicaid receive a blood lead test at 12 months and 24 months of age, or at least once before they turn six. Despite these recommendations and requirements, testing overall for children in Milwaukee is low, and a significant percentage of children enrolled in Medicaid are not tested.[33] There is a high likelihood that many children in Milwaukee who are lead poisoned are not being tested, and are therefore falling through the cracks.

Health care providers are in an influential position to support increased testing rates. They can help to educate parents and other caregivers about preventive measures and screen children on a periodic basis to monitor blood lead levels.[34] Milwaukee also has a wealth of potential partners, including Wisconsin Medicaid offices, Wisconsin Office of Primary Care, local community health centers and clinics, and other health care associations and coalitions. Annual data from WI DHS indicate that Medicaid-enrolled children in Wisconsin are three times more likely to be lead poisoned than non-Medicaid enrolled children, so this is a crucial population to target. The MHD should reach out to and actively work with these and other partners to improve education about lead poisoning and lead screening rates, and assist in removing barriers to lead testing for providers.

Recommendation 12: Move all childhood lead poisoning case management and follow-up activities under the oversight of the MHD.
As of February 2020, an assessor from the Department of Neighborhood Services (DNS) completes the scope of work for all MHD CLPPP lead abatement projects. This requires DNS to

[33] Wisconsin Department of Health Services. Testing Children for Lead. https://www.dhs.wisconsin.gov/lead/test-your-child.htm. Access March 15, 2020.
[34] Gettens, Gail and Beverly Drouin. Successfully Changing a State's Climate to Increase Blood Lead Level Testing Journal of Public Health Management and Practice. 25:S31-S36, January/February 2019. https://journals.lww.com/jphmp/Fulltext/2019/01001/Successfully_Changing_a_State_s_Climate_to.6.aspx

be present for all risk assessments, and requires coordination between the MHD CLPPP risk assessors and the DNS to plan visits. In some cases, this may be a barrier for the nurse case manager and risk assessor to respond as a team, especially if the availability of the DNS staff is prioritized over the availability of the nurse case manager. Two teams of MHD staff visiting a child separately may also be confusing to homeowners and families. Combining these activities within a single agency can achieve greater efficiencies and overall effectiveness. In the event these responsibilities remain across two separate departments, there should be precise role delineation, and coordination of activities, processes, accountability, and oversight.

Recommendation 13: Institute a "Lead Court."
Given the magnitude of Milwaukee's lead burden, there does not appear to be a path forward without strong enforcement of lead hazard legislation. Knowing enforcement through the court system can be administratively burdensome, time consuming, and cumbersome,[35] some cities have developed streamlined court processes, often referred to as "lead courts," to improve enforcement and save staff time and resources, while promoting prompt resolution of cases. It can also be beneficial to have one or two assigned judges who are, or become, knowledgeable about lead poisoning, and to have assigned dates, times, and frequency of lead court. Lead courts are often a beneficial way to free up significant CLPPP staff time from pursuing cases in court. An article discussing Philadelphia, Pennsylvania's lead court, and how it was more effective than pre-court enforcement strategies, is included as Appendix H. Chicago, Illinois and Providence, Rhode Island have also instituted lead courts. Information on Mahoning County, Ohio's enforcement of lead hazards is provided as Appendix I.

Recommendation 14: Participate in or create a public lead hazards registry.
A public lead hazards registry is a listing of properties with known, long-term, unremediated lead hazards. Registries of this type often are compiled and maintained at the state level. MHD could work with WI DHS to create such a registry for Wisconsin. An effective and long-running example of a public lead hazards registry is the Ohio Lead Hazardous Properties[36] registry, which is a searchable list of properties in Ohio whose owners have "refused to comply with an order from the Ohio Department of Health or its delegated local board of health to correct known lead hazards." A lead hazards registry can also include a lead-free property component,[37] for properties that never had lead, or a certified lead-safe property registry, for those that have been abated. A registry like this often acts as a helpful guide for individuals looking for housing, and could assist city leadership in prioritizing resources and enforcement activities.

[35] Failure to appear in court, the granting of recurrent continuances, inconsequential fines and remedies, and the complexities of lead poisoning orders often result in limited compliance with remediation orders and timelines stretching into multiple years.
[36] Ohio Public Health Information Warehouse, Ohio Lead Hazardous Properties, http://publicapps.odh.ohio.gov/EDW/DataBrowser/Browse/LeadHazardousProperties. Accessed March 24, 2020.
[37] Cleveland City Council Ordinance No. 747-2019. https://clevelandcitycouncil.org/ClevelandCityCouncil/media/CCCMedia/Documents/lead-prevention-ORD-FINAL.pdf

Recommendation 15: Assess and address lead poisoning "hot spots."
As noted in the City of Milwaukee Health Department Childhood Lead Poisoning Dashboard,[38] several Milwaukee districts have significantly higher numbers of children with lead poisoning.[39] In 2018, four districts represented 60% of the positive lead poisoning tests. These were District 6 (315), Districts 7 (279 children), District 12 (247), and District 15 (478). As of February 2020, no investigation had been completed to determine why these districts had higher burdens of lead poisoning. It may be beneficial to analyze if these districts have the highest lead poisoning over time (looking at multiple years), under differing analysis (for example, elevated blood lead levels vs. over 5 ug/dL), or to gather epidemiological data regarding the causes of lead poisoning (for example, could there be a single building or set of buildings contributing to these high numbers). Other jurisdictions have successfully collaborated with academic institutions to complete this kind of assessment or research.[40]

Further assessment and analysis of factors contributing to higher burdens of childhood lead poisoning in certain districts will provide the city with information to properly strategize, prioritize, and allocate resources for "hot spot" areas. These districts may also be the best places to start pilot projects designed to prevent lead poisoning and limit the impact of future cases of childhood lead poisoning.

Recommendation 16: Create and implement a citywide strategic plan to mobilize and coordinate city resources and prioritize childhood lead poisoning throughout Milwaukee.
The MHD, like health departments in many other communities, cannot address childhood lead poisoning alone. To make significant and measurable progress in reducing and eliminating lead poisoning in the city, as well as adequately protecting children who are lead poisoned, there is a need for a coordinated, strategic, citywide response.

A citywide strategic plan is an important step in aligning partners and activities to eliminate lead poisoning across the city. It is critical for MHD leadership and CLPPP staff, the public health laboratory, community health care, housing partners, university partners, city development, neighborhood services, demolition[41], investment and loan programs, and private sector partners such as real estate, landlords, and community foundations, to work together to remove barriers to progress and align resources to protect the children in Milwaukee. Other cities have successfully addressed childhood lead poisoning through the development and implementation of citywide strategic plans, committees, and taskforces aimed at coordinating limited resources, and efficiently and effectively addressing and preventing lead poisoning.

[38] City of Milwaukee Health Department – Childhood Lead Poisoning Dashboard. https://city.milwaukee.gov/health/Lead-Poisoning-Prevention-Data/Childhood-Lead-Poisoning-Dashboard.htm#.XnAwJcPsYdV. Accessed March 15, 2020.
[39] The lead dashboards contain all lead poisoning, or children with levels equal to or great than 5 ug/dL.
[40] The Public Health Foundation. Academic Health Departments. http://www.phf.org/programs/AHDLC/Pages/Academic_Health_Departments.aspx
[41] The CLPPP may consider referring vacant properties with unremediated lead hazards that have poisoned children and that have fallen into a state of disrepair to DNS as priority candidates for demolition.

Recommendation 17: Conduct lead and healthy housing prevention activities.
In the late 1980s and early 1990s, Milwaukee was a national model for addressing lead poisoning, including conducting innovative primary prevention activities (i.e., activities designed to prevent lead exposure and lead poisoning before it happens) that inspired other cities to take similar action. The city currently is performing minimal primary prevention activities, potentially missing the opportunity to decrease future cases of lead poisoning.

Prevention activities could begin in the areas with the highest lead burden (see *Recommendation 15* on lead hot spots), such as with a pilot program to evaluate prevention solutions that work for Milwaukee. Actions in *Recommendation 16* for a citywide strategic plan will likely provide ample opportunities to find ways to address lead poisoning prevention with current city resources. It should be noted that removing lead paint hazards from older housing provides a $1.39 return for every $1 invested,[42] in addition to protecting children and families.

Conclusion
Lead poisoning contributes to higher rates of poverty, crime, and poor health; lower levels of education and housing stability; and a variety of other social factors impacting the health of individuals. With African American and Latino communities dealing with higher lead burdens,[43] historic inequities and disparities by race and ethnicity may be perpetuated.[44] The consequences of lead poisoning in Milwaukee are serious, and the health department, working with its partners in government, community-based organizations, and the private sector, has the responsibility, and the ability, to end lead poisoning. The MHD has made progress since 2018 to improve its CLPPP. At the same time, additional progress is necessary to improve case management and lead abatement practices, and aggressively address prevention of lead poisoning throughout the city. Lastly, PHF believes it is necessary for city leadership to continue its visible support for, and oversight of, program activities and outcomes.

[42] National Center for Healthy Housing. U.S. Environmental Protection Agency: 2019 Healthy Housing Fact Sheet—Critical Programs and Services. Columbia, MD: National Center for Healthy Housing; 2019. https://nchh.org/resource-library/fact-sheet_healthy-housing-agency_epa.pdf. Accessed March 1, 2020.
[43] Sampson, R.J., and A. S. Winter. The Racial Ecology of Lead Poisoning. Toxic Inequality in Chicago Neighborhoods, 1995-2013. *Du Bois Review*. 2016. https://scholar.harvard.edu/files/alixwinter/files/sampson_winter_2016.pdf. Accessed March 1, 2020.
[44] CDC Morbidity and Mortality Weekly Report. Blood Lead Levels in Children Aged 1-5 Years – United States, 1999-2010. https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6213a3.htm. Accessed February 28, 2020.

Appendix A: The Public Health Foundation Team

The Public Health Foundation (PHF), a private, non-profit, 501(c)(3) organization based in Washington, DC, works to improve public health and population health practice to support healthier communities. Since 1970, PHF has developed effective resources, tools, information, and training for health agencies, organizations, and individuals to help improve performance and community health outcomes. Over the past decade, PHF has provided quality and process improvement, performance management, and workforce development technical assistance and training to more than 500 state, city, county, tribal, and territorial health departments.

The team assembled for this project has years of experience and expertise in assessing and improving program and organizational performance. Team members have run state and local health departments; developed, implemented, and improved health department programs; and developed quality and process improvement and performance management system methods and tools. Team members are the following:

Ron Bialek, MPP – President, PHF – Mr. Bialek has more than 35 years of experience in public health practice and academia, leading efforts to improve the quality, performance and outcomes of public health agencies and systems. He has extensive experience in providing capacity building assistance to build public health infrastructure and improve performance of the workforce and public health agencies at the national, state and local levels. Mr. Bialek has led the national efforts that resulted in establishment of the consensus set of Core Competencies for Public Health Professionals and the Council on Linkages Between Academia and Public Health Practice. He has led the Public Health Foundation's efforts to develop the nation's premier public health learning management network, TRAIN, and the population health driver diagram framework to help communities align actions of public health, healthcare, and other organizations when addressing specific community health challenges.
Mr. Bialek has developed policies and programs with and for local and state health departments to build workforce competencies, performance management systems, and quality improvement initiatives. He is a national leader in capacity building assistance, including developing public health practice guidelines, community health and public health system performance assessment techniques, and building partnerships between health departments, hospitals and health systems, and academic institutions. He has extensive experience in designing and delivering training to public health professionals in state, municipal, county, tribal, and territorial health departments working to improve quality, performance, and outcomes of individuals, programs, and organizations in the areas of performance management, public health practice, and community health assessment.

Vanessa Lamers, MESc, MPH – Assistant Director, Performance Management and Quality Improvement, PHF – Ms. Lamers has more than 10 years of expertise in understanding needs and functions of public health professionals, and providing targeted assistance that addresses timely, identified challenges. She has experience in supporting state, municipal, county, tribal, and territorial health department staff to build their capacity and access resources, tools, and training to improve their program and organizational performance and quality. Ms. Lamers has

concentrated expertise in environmental health and preparedness sectors, including vector control and drinking water assessments, lead and healthy homes, environmental epidemiology, environmental health assessment, and training of public health professionals and the public. She has several years of experience in environmental and occupational safety, and training university staff and faculty in basic emergency preparedness. Ms. Lamers designs programs for public health professionals and health departments to maximize efficiency and effectiveness with the use of quality improvement tools and methods.

Matthew Stefanak, MPH - Team Lead – During his 25-year tenure as Mahoning County (OH) Health Commissioner, Mr. Stefanak led community efforts to dramatically reduce the prevalence of childhood lead poisoning in Youngstown, Ohio and surrounding communities in the rust belt. As a result of Mr. Stefanak's leadership over a 17-year period, childhood lead poisoning cases declined by 95% between 1995 and 2012. He created and secured funding from the Centers for Disease Control and Prevention (CDC) and U.S. Department of Housing and Urban Development (HUD) for Childhood Lead Poisoning Prevention and other lead hazard remediation programs. He supported the development of a specialized department in the Mahoning County government to run the first lead remediation program funded by a HUD grant. Mr. Stefanak's work in county government and with community stakeholders to build significant private financial support resulted in an action plan to eliminate childhood lead poisoning from Mahoning County. The number of housing units with unremediated lead hazards also declined by more than 40% thanks to the targeted strategies, case finding, and effective legal interventions to address hazards in rental properties instituted by Mr. Stefanak. Mr. Stefanak, his health department, and its community partners were recognized by Youngstown's interfaith religious community and the U.S. Environmental Protection Agency for the successful approach to addressing childhood lead poisoning in Mahoning County. Mr. Stefanak has studied the research on lead poisoning for more than 30 years and has written numerous papers on the topic for peer-reviewed journals and published grey literature on his novel approaches to addressing the remediation of childhood lead exposure in the community.

Margaret Anne Vosel, BSN, RN – Audit and Field Review Lead - Ms. Vosel oversaw the Alabama Childhood Lead Program as Director of Women's and Children's Health Division for the Alabama Department of Public Health (ADPH). With ADPH for more than 15 years, she performed countless program reviews and federal compliance audits to ensure high-performing health department operations. For lead poisoning programs, Ms. Vosel was responsible for reviewing all processes for identifying and responding to elevated lead levels, streamlining processes, and identifying targeted opportunities for follow-up. She performed executive management of Alabama's lead program, including program budget, personnel, data, and performance reviews. She monitored lead testing results, how ADPH utilized case managers for follow-up with families, remediation of homes with lead exposure, and ADPH's partnership with Medicaid. Ms. Vosel has worked extensively as a nurse supervisor and trainer in Maternal and Child Health programs within the Alabama Department of Rehabilitation Services and ADPH. She also was the Director for Alabama's Title X Family Planning Program with 82 clinical sites statewide. Ms. Vosel has vast experience with federal grant management including budgets, contracts, data collection, developing quality improvement measures and monitoring private

and public billing practices. She participated in numerous federal grant audits, responding to and developing corrective action plans where needed. Ms. Vosel has experience developing clinical program policies and procedures to reflect grant requirements, state statutes and clinical best practice.

Leslie Beitsch, MD, JD – Statute, Regulatory, Programmatic Review Lead - As Deputy Secretary for Health at the Florida Department of Health and Commissioner of Health and State Health Officer for the Oklahoma State Department of Health, Dr. Beitsch oversaw lead poisoning prevention programs and ensured high-quality operations using proven performance management and quality improvement methodologies. As an attorney for more than 30 years, Dr. Beitsch is also familiar with addressing statutes, regulations, standards, policies, and practices to improve health. Through PHF, Dr Beitsch has provided extensive technical assistance and training to public health professionals in state, municipal, county, tribal, and territorial health departments. More recently, Dr. Beitsch joined the faculty at the Florida State University College of Medicine in November 2003 as Professor of Health Policy and Director of the Center for Medicine and Public Health.

As the Commissioner of the Oklahoma State Department of Health, Dr. Beitsch provided oversight for 2,500 employees and a budget of $260 million. As the Deputy Secretary and Assistant State Health Officer for the Florida Department of Health, Dr. Beitsch provides guidance and direction for public health programs, county health departments, and the state laboratory and pharmacy. Prior to these appointments, Dr. Beitsch served as the Assistant State Health Officer and Division Director for Family Health Services and the Medical Director of the Broward County Health Department in Ft. Lauderdale.

Amanda McCarty, MS, MBA – Performance Measurement and Management Lead - Ms. McCarty helps agencies improve their performance management systems and delivers performance management training, coaching, and consultations. Ms. McCarty has 16 years of experience in public health performance management, including evaluation, project management, quality improvement, and change leadership in government, corporate, not-for-profit, clinical, and academic settings. She is a subject matter expert in process improvement, program evaluation, and change leadership within public health and healthcare delivery organizations. Through PHF, Ms. McCarty provides training to health departments and their staffs who are working to improve performance, quality, and outcomes of program work. She was formerly the Director of the Center for Performance Management for the West Virginia Bureau of Public Health, and is currently Assistant Professor in Health Service Administration at West Virginia University Institute of Technology, researching and teaching courses in public health, health service, and sociology. Ms. McCarty is known for her ability to connect with department staff, develop a good understanding of department goals and objectives, and design performance management systems to improve operations, overcome challenges, and drive key performance indicators.

Kathleen Amos, MLIS – Literature/Model Practices Search Lead - As a trained medical librarian with 10 years of workforce development experience, Ms. Amos is a public health literature

review expert for PHF. She identifies best practices from state, municipal, county, tribal, and territorial health departments to ensure that programs are as effective and efficient as possible. She has experience leading collaborative performance improvement, workforce development, and capacity building initiatives with national scope and multiple stakeholders through the Council on Linkages Between Academia and Public Health Practice. Ms. Amos serves a key role as the primary contact for collecting and analyzing workforce needs and providing training and technical assistance to improve quality, performance, and outcomes of individuals, programs, and organizations.

Appendix B

City of Milwaukee Health Department

Childhood Lead Poisoning Prevention Program

Assessment of Operations and Recommendations for Corrective Actions

January 29, 2018

Executive Summary

OVERVIEW

Lead was once used to make a variety of products commonly found in our environments, including our homes. However, lead is also a potent neurotoxin which has significant effects on childhood health and development. Even at very low levels of childhood exposure, many of these effects may persist into adulthood. It is the role of public health departments to mobilize resources at the local, county, state, and national level to increase community resources to prevention childhood lead poisoning.[i]

The responsibility for childhood lead poisoning prevention is a shared responsibility across many sectors. Community agencies, health care providers, policymakers, funders, and others each have their roles.

The City of Milwaukee Health Department's primary responsibilities are to make policy recommendations, issue medical guidance to area clinicians specific to local circumstances, track the epidemiology of lead poisoning within city boundaries, provide primary prevention services commensurate with available funding, and provide mandated public health follow-up services to children under the age of 6 with elevated blood lead levels.

The purpose of this report is solely to assess the programmatic operations of the City of Milwaukee Health Department Childhood Lead Poisoning Prevention Program. A broader assessment of lead poisoning prevention efforts citywide is beyond the scope of this report. However, the Department suggests that the findings and recommendations in this report be used to drive a broader community discussion related to childhood lead poisoning prevention, and the capacity of its local government and community agencies to respond to local needs.

PROGRAM SUMMARY

Childhood lead poisoning prevention has been a key public health priority for the City of Milwaukee Health Department (MHD) for more than two decades. The MHD's lead-related activities are predominantly housed in its Division of Disease Control and Environmental Health and are divided into Primary Prevention (mitigating lead hazards before a child becomes exposed) and Secondary Prevention (mitigating lead hazards and minimizing adverse effects of health after a child has been lead poisoned) efforts.

There are many potential sources of childhood lead exposure. The most important are deteriorating lead-based paint (and its associated dust), lead in drinking water (in homes with lead service lines or plumbing), and lead in soil. The MHD prevention efforts include all three of these sources, and the Department's recommendations regarding prevention, including recommendations for blood lead testing and the prevention of lead exposure through paint, water, soil and other sources, remain consistent with – or more protective than – national recommendations.

FINDINGS

Despite significant progress, as shown in declines in the overall prevalence of childhood lead poisoning in the city of Milwaukee, this report finds that the City of Milwaukee Health Department Childhood Lead Poisoning Prevention Program is deficient in several areas of its Primary Prevention and Secondary Prevention Program activities.

The number of housing units that MHD provides paint (and soil) mitigation to has decreased substantially over the past six years (compared to the prior six-year period), as has funding available to the program. ***This report finds that the MHD has significant opportunities to streamline and strengthen effective primary prevention efforts.***

Secondary prevention requires different levels of intervention, increasing in intensity as the blood lead level (BLL) increases. ***This report finds that the MHD, through its secondary prevention efforts, has not provided the necessary level of assurance of appropriate follow-up to elevated BLLs during 2015-2017.***

RECOMMENDATIONS

The Department has identified multiple areas for improvement in departmental/divisional structure and operations, in primary prevention activities, in secondary prevention activities, and in policy development. These recommendations are detailed in Section 5 of this report.

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Section 1

The Public Health Significance of Lead

OVERVIEW OF LEAD POISONING

Lead exposure, even at low levels, has been shown to harm the developing brains and bodies of infants and young children. This includes increased behavior problems, impaired school performance, increased juvenile delinquency, and increased health problems such as speech and language delays, hearing problems, kidney damage, seizures, and in rare cases, death. Adults can also be exposed to lead; pregnant and breastfeeding women are a particular concern because of the risk of exposure to a developing baby.

The scientific understanding of lead toxicity has evolved over time. In 1960, developmental problems were recognized at blood lead levels above 60 micrograms per deciliter (µg/dL). As more scientific data became available, the cutoff level for "lead poisoning" was progressively lowered; for the past several decades, the cutoff was a blood lead level of10 µg/dL. Most recently, in 2012, the U.S. Centers for Disease Control and Prevention (CDC) lowered the reference level (level at which public health actions are recommended) from a blood lead level of 10 µg/dL to 5 µg/dL. Although the reference level was lowered to 5 µg/dL, the committee added that, "Because no measureable level of blood lead is known to be without deleterious effects, and because once engendered, the effects appear to be irreversible in the absence of any other interventions, public health, environmental and housing policies should encourage prevention of all exposures to lead."[ii]

Reference levels are determined by evaluating the 97.5th percentile of blood lead distribution in children. As a result, the reference level will likely continue to be revised downward as the population blood lead levels falls.

SOURCES OF LEAD POISONING

There are many possible sources of lead exposure. Of these, deteriorating lead paint is generally considered to be the most important source of lead exposure in children, followed by two other important sources: drinking water and soil. Additional sources of lead exposure can include items such as food, cosmetics, pottery, medicines and more, as well as traditional or folk remedies.

Deteriorating lead-based paint and its associated lead-contaminated dust are the most common sources of lead poisoning. Paint containing lead was not banned in the United States until 1978. Homes built before 1978 may contain some lead-based paint, which can eventually chip, peel or flake. **Young children are most vulnerable to this environmental hazard because they are more likely to ingest contaminated dust or objects due to their hand-to-mouth behaviors.**

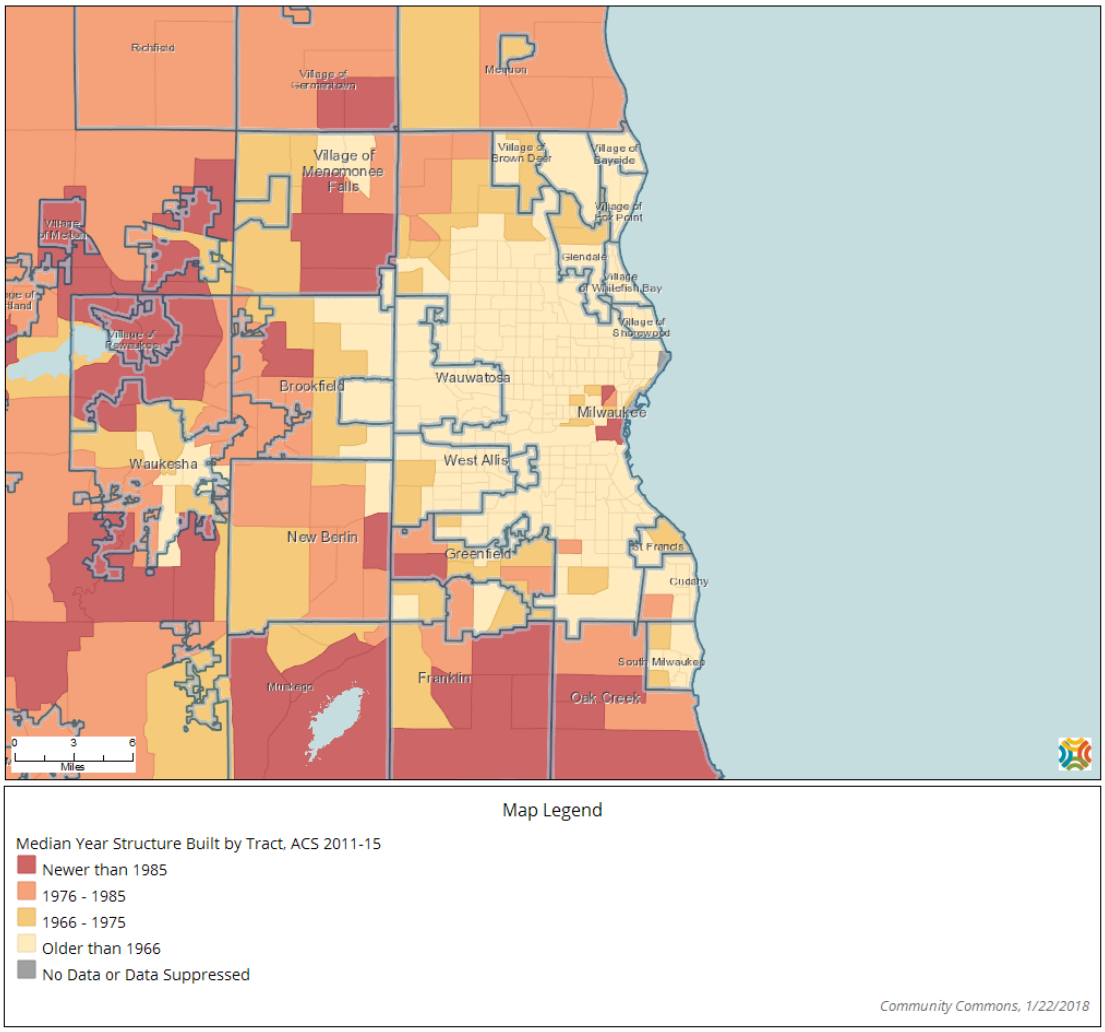
Table 1.1 shows the percentage of Milwaukee County housing units by date constructed. Figure 1.2 provides a visual distribution of that construction throughout Milwaukee County. Importantly, not only is nearly 62% of the housing stock in Milwaukee County built before 1960, more than 80% was built before 1978. This represents more than 100,000 residential structures.

Table 1.1 Percentage Housing Units by Age (Time Period Constructed)

Location	Before 1960	1960-1979	1980-1999	2000-2010	After 2010
Milwaukee County	61.9%	21.8%	10.9%	4.9%	0.6%
Washington County	23.6%	26.2%	32.2%	17.2%	0.9%
Waukesha County	24.3%	29.6%	31.6%	13.4%	1.2%
Wisconsin	37.3%	24.6%	23.9%	13.1%	1.1%
United States	29.2%	26.6%	27.7%	14.9%	1.6%

Source: Community Commons, US Census American Community Survey 2011-2015

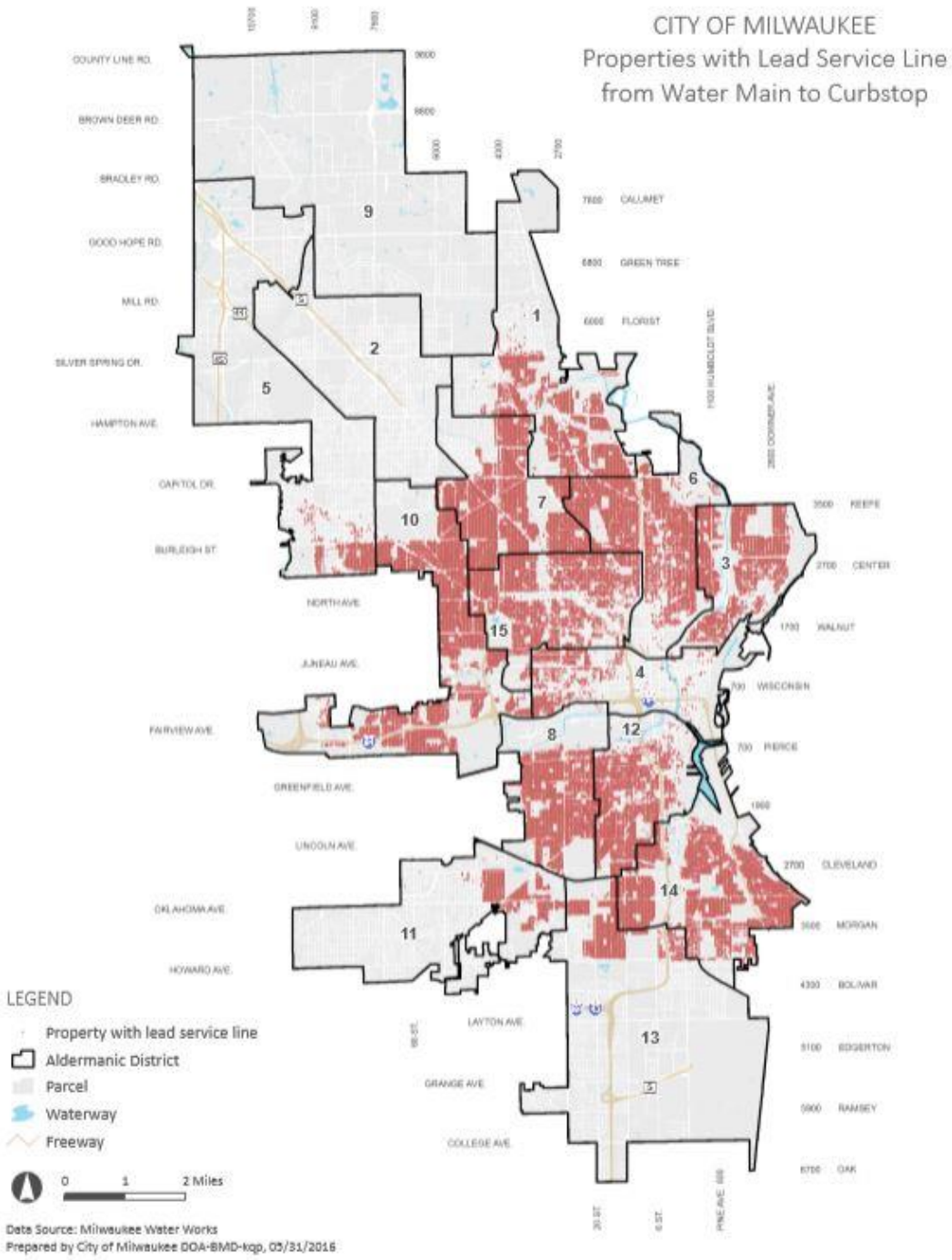
Figure 1.2: Median Year Structure Built by Census Tract, Milwaukee MSA



Another common source of lead exposure is drinking water. Lead may enter drinking water as the result of contact with pipes or plumbing fixtures containing lead. In the U.S., an estimated 6 to 10 million homes receive their water through lead service lines.[iii] In the city of Milwaukee, more than 74,000 properties have active lead service lines, of those 93% are residential properties. Compared to the total 169,816 water services in the city, 46% are lead.[iv] *Figure 1.3 provides a map of known lead service lines in Milwaukee.* The U.S. Environmental Protection Agency (US EPA) requires the use of corrosion control to reduce the risk of lead in drinking water, and

Milwaukee's drinking water remains in compliance with federal testing standards.[v] To further reduce the risk of lead in drinking water, point-of-use filtration systems certified to remove lead are very effective, however the only effective long-term solution is the full removal of lead pipes and plumbing.

Figure 1.3: Map of Housing Units with Lead Service Lines by Zip Code



Children may also be exposed to lead through contaminated soil when they play outside. Lead in dirt can be encountered outside of a home, or tracked into a home where it clings to fingers, toys, and other objects children normally put in their mouths. Lead may contaminate soil as a result of industrial processes or from nearby buildings, structures, or roads. Soil contamination can also persist from past widespread use of leaded gasoline, even though leaded gasoline has been outlawed for several decades.

Additional sources of lead include some candies, toys, makeup, jewelry, clay pots, and home remedies that have been found to contain levels of lead that may have a serious health risks to children.

EPIDEMIOLOGY OF LEAD POISONING IN MILWAUKEE

Nationally, the prevalence of lead poisoning has declined significantly since the bans on lead-based paint, lead in plumbing, and lead in gasoline were enacted. However, environmental lead from these sources remains.

The following maps show the distribution of elevated blood lead levels (EBLL) for children under the age of 6 across the city of Milwaukee by ZIP code (Figure 1.5) and Aldermanic District (Figure 1.6). In 2016, EBLL were most dense in the following ZIP codes: 53205, 53206, 53208, 53210, 53212, and 53215. EBLL were most dense in the following aldermanic districts: 6, 7, 8, 12, and 15.

Figure 1.5: Map of Lead Poisoning Density by ZIP Code, 2016

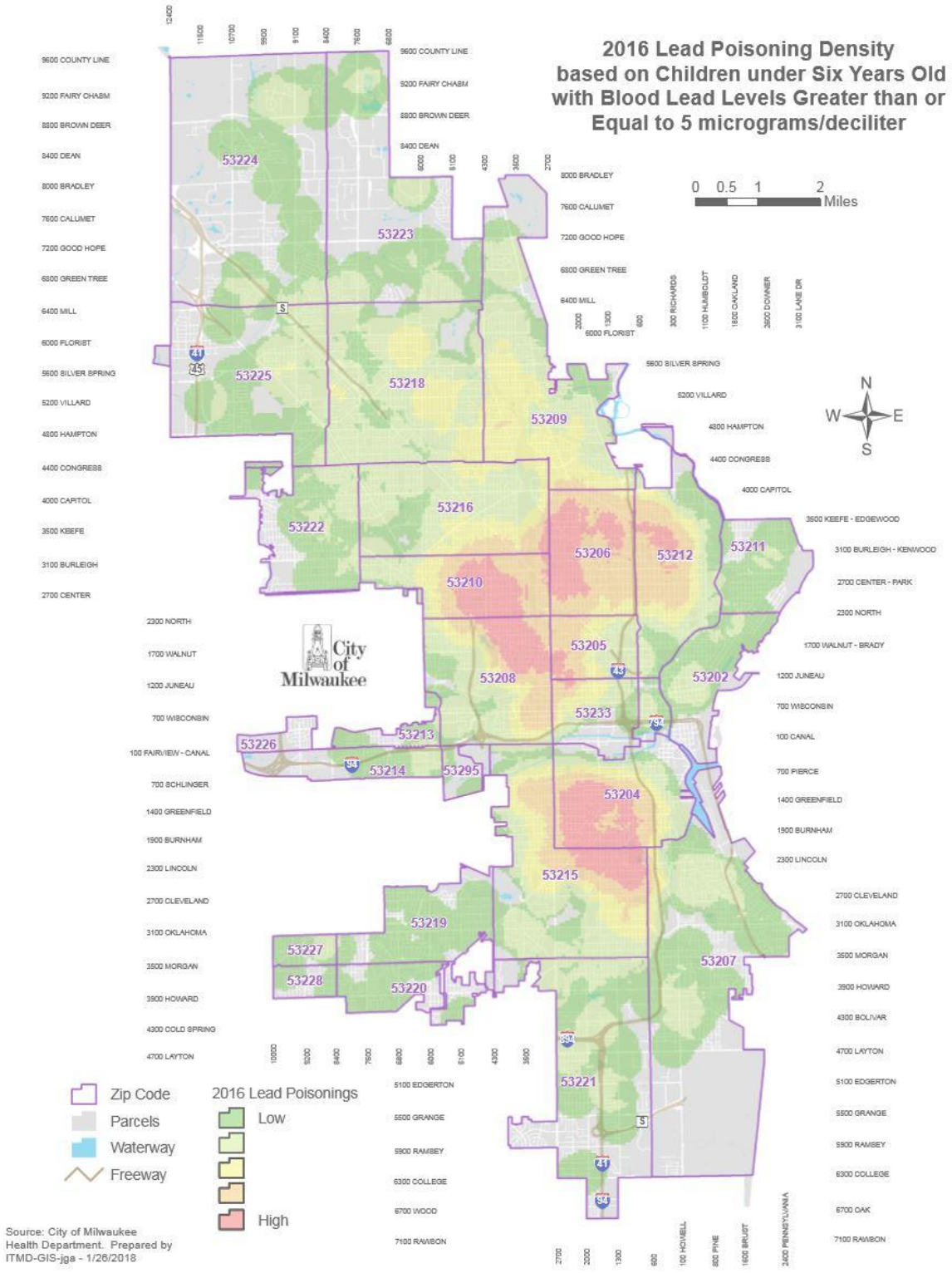
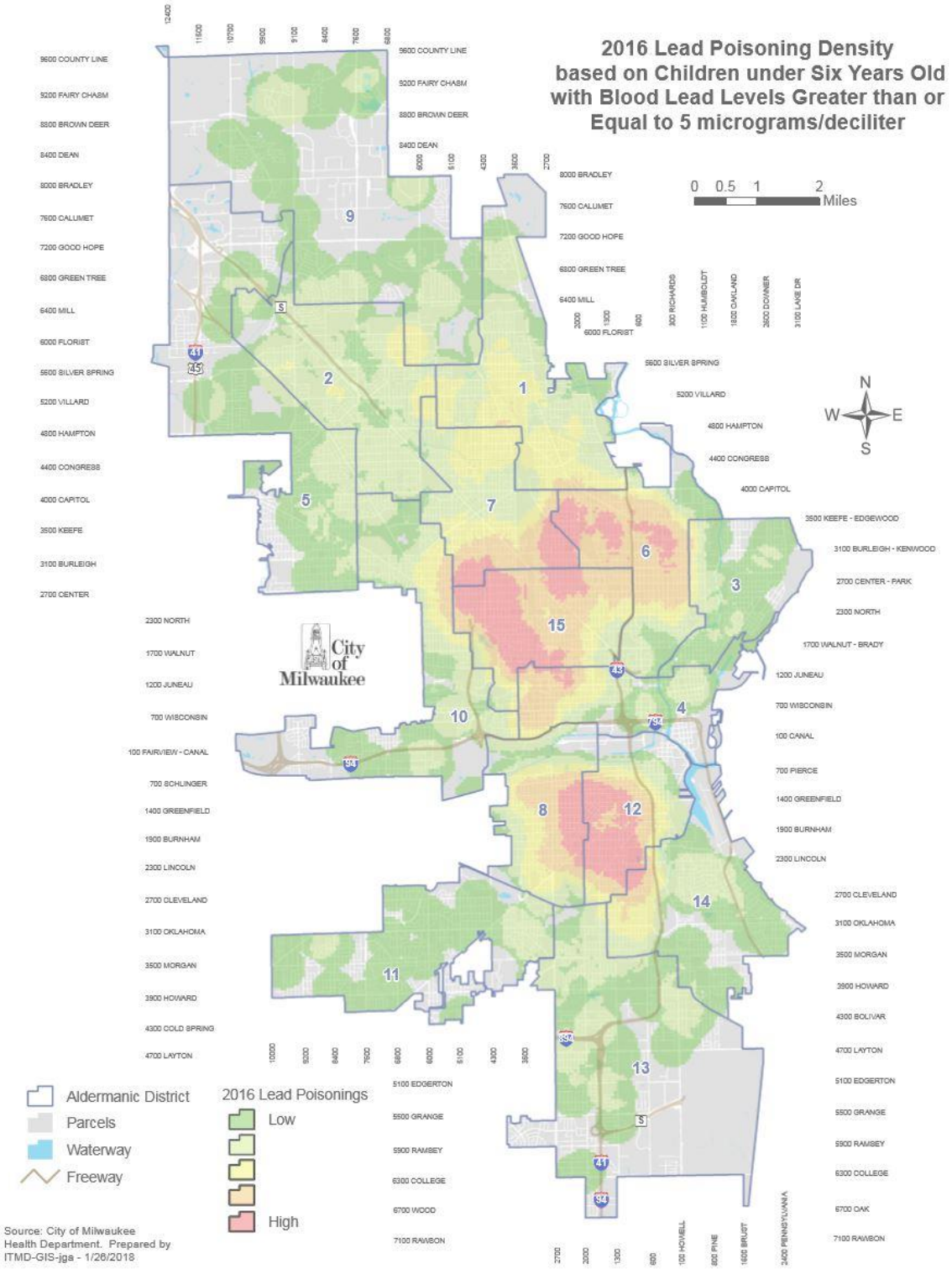


Figure 1.6: Map of Lead Poisoning Density by Aldermanic District, 2016



The city of Milwaukee has seen a significant decline in reported EBLL in recent years. In 1997, 31.9% of children tested had BLL greater than or equal to 10 µg/dL, whereas in 2016, 3.3% of children tested at this level. Although great progress has been made over the 20-year period, much work remains to eliminate BLL at or above 10 µg/dL, and far too many children remain exposed at a lower level of 5 µg/dL. Over a 14-year period, the prevalence of poisoning at this level decreased from 37.9% in 2003 to 11.6% in 2016. Figure 1.7 below demonstrates the BLL trends in the city of Milwaukee for those children tested between 1997 and 2016.

Figure 1.7: Prevalence Rate for Children 6 Years of Age & Younger, City of Milwaukee

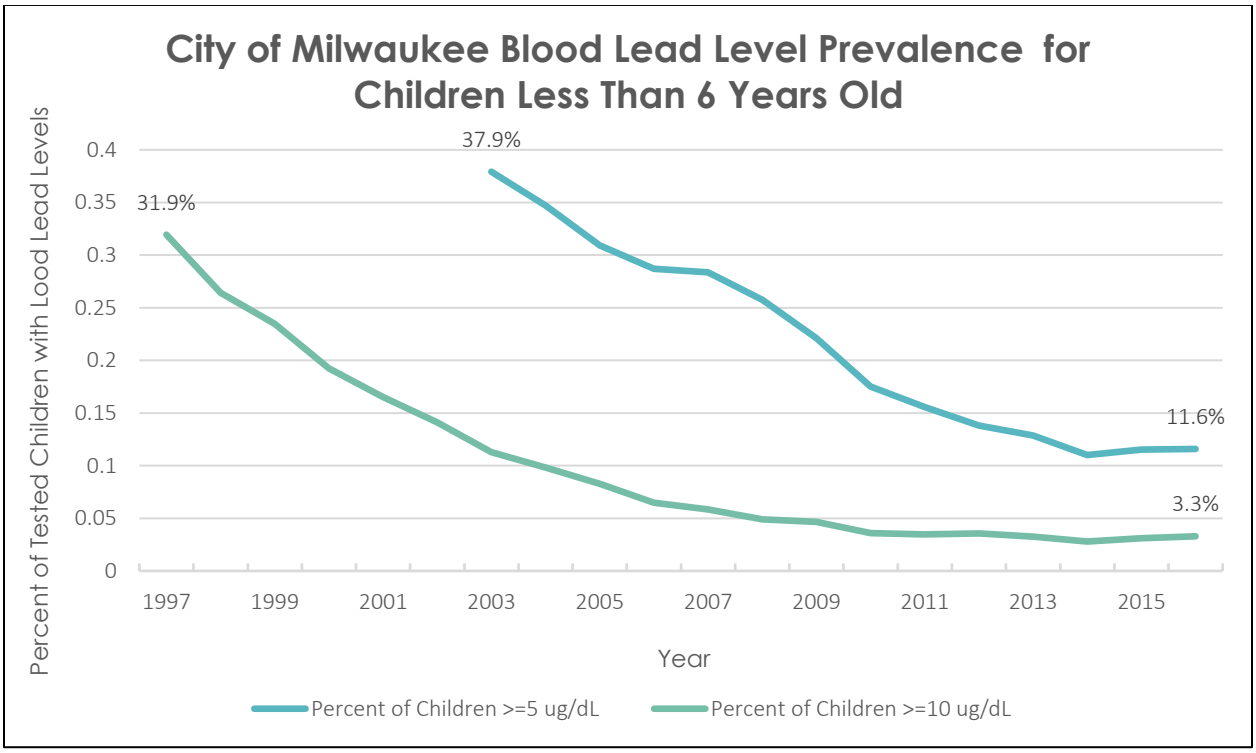
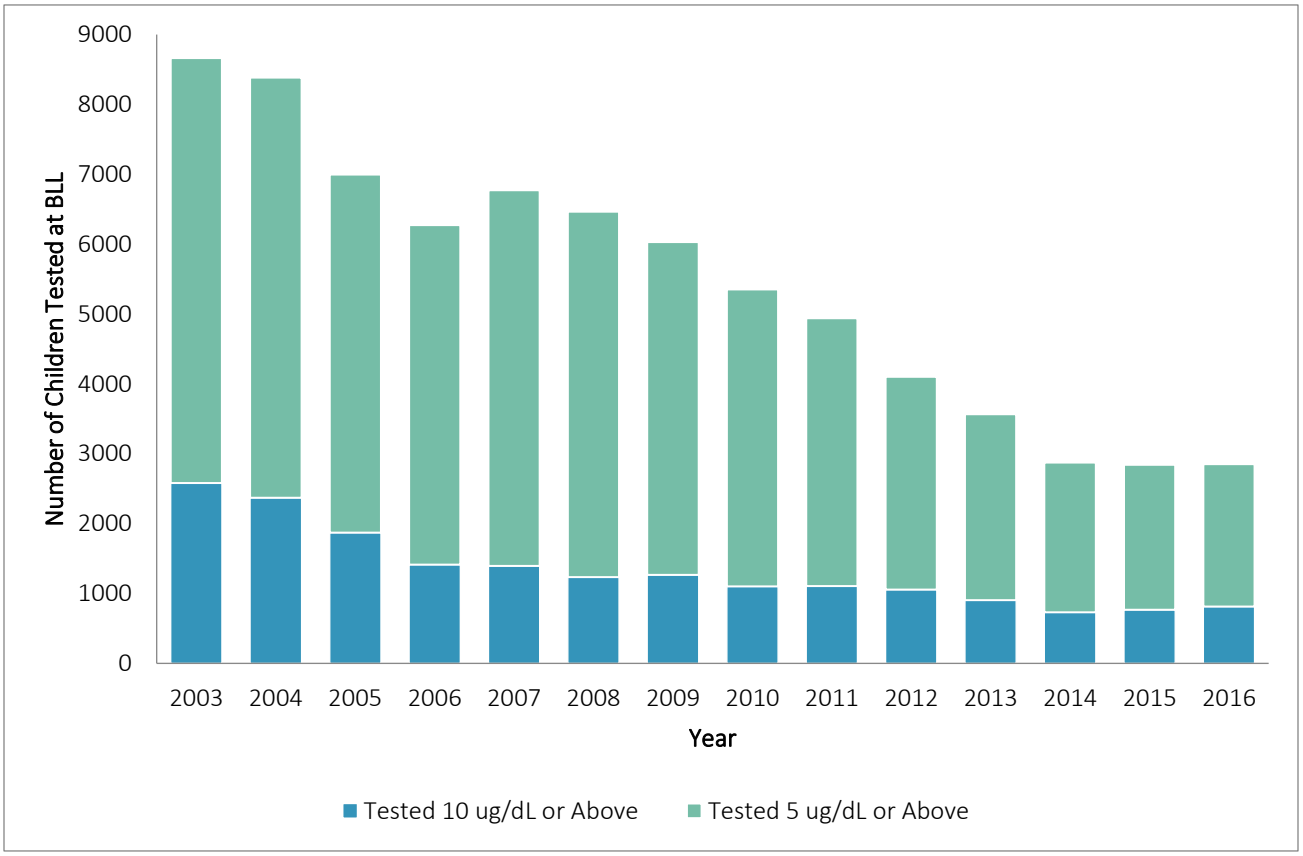


Figure 1.8 shows the number of children under the age of 6 who had EBLL at 10 µg/dL and 5 µg/dL between 2003 and 2016.

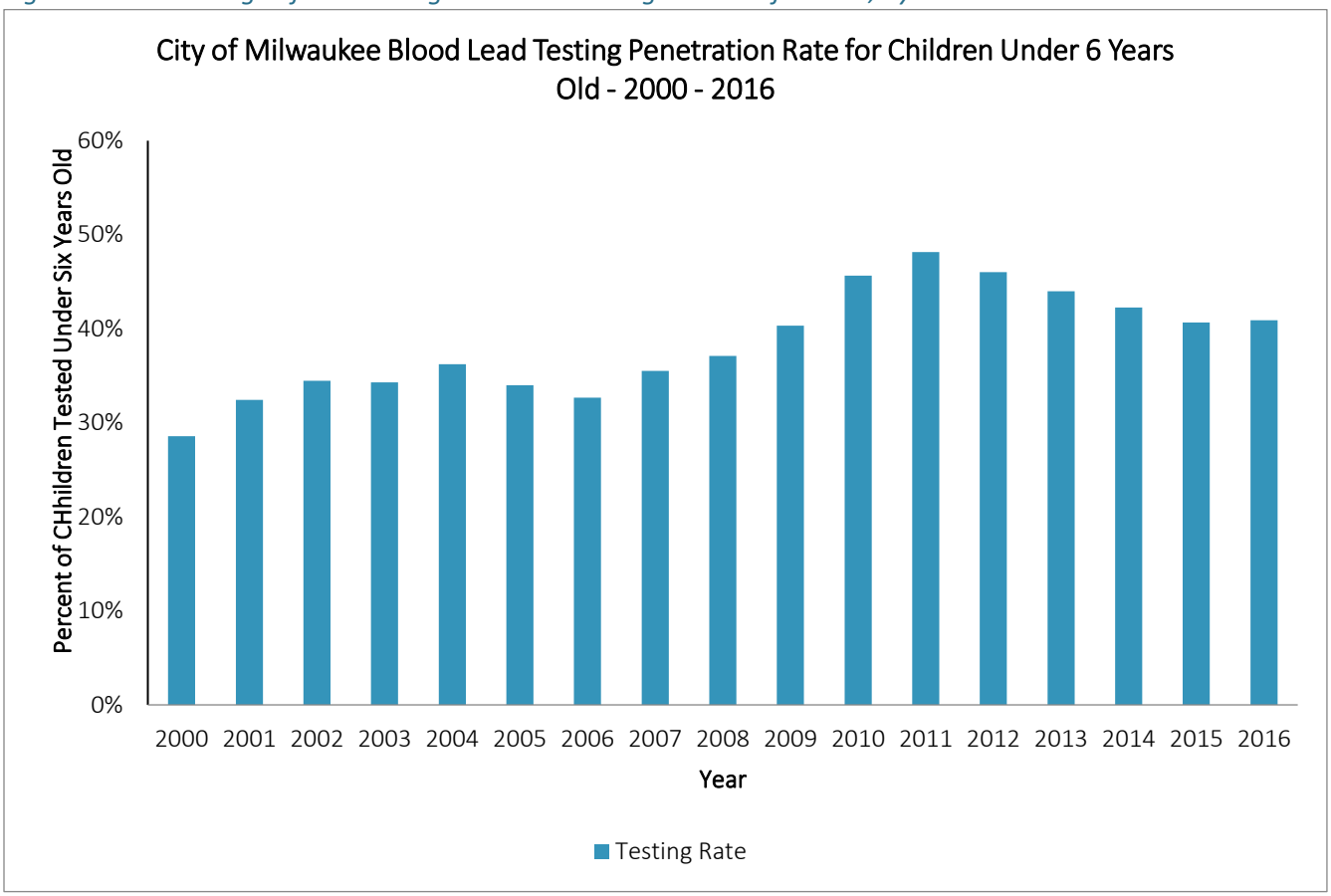
Figure 1.8: Number of Children 6 Years of Age & Younger with an Elevated Blood Lead Level



The MHD recommends that all children receive at minimum three blood lead tests before the age of 3. Typically, these tests are done by health care providers between the ages of 12 to 35 months. Approximately 64% of Milwaukee children under the age of 3 receive the recommended blood lead testing. Additionally, the MHD recommends that children under the age of 6 be tested if they have no record of a previous test, have a history of lead exposure, or if they are at greater risk for lead exposure. Current federal rules require that all children enrolled in Medicaid receive a blood lead test.

Figure 1.9 shows the number and the percent of children under the age of 6 who received a test during the reporting year. Over the past several years, between 40-50% of children under the age of 6 received a blood lead test.

Figure 1.9: Percentage of Children Age 6 Years & Younger Tested for Lead, By Year



Section 2

Department & Division Operations

This section provides a general overview of the City of Milwaukee Health Department (MHD) structure as well as within the Division of Disease Control and Environmental Health (DCEH). It is meant to provide context regarding departmental operations related to childhood lead poisoning prevention.

DEPARTMENT ORGANIZATIONAL STRUCTURE

The MHD carries out its mission through the provision of direct services, evidence-based programs, partnership development, and policy development through seven divisions and offices under the direction of the Commissioner of Health. The divisions and offices of the MHD are:

- Division of Consumer Environmental Health (CEH)
- Division of Disease Control & Environmental Health (DCEH)
- Division of Family & Community Health (FCH)
- Office of Public Health Planning & Policy
- Office of Violence Prevention
- Public Health Laboratory (Lab)
- Administration

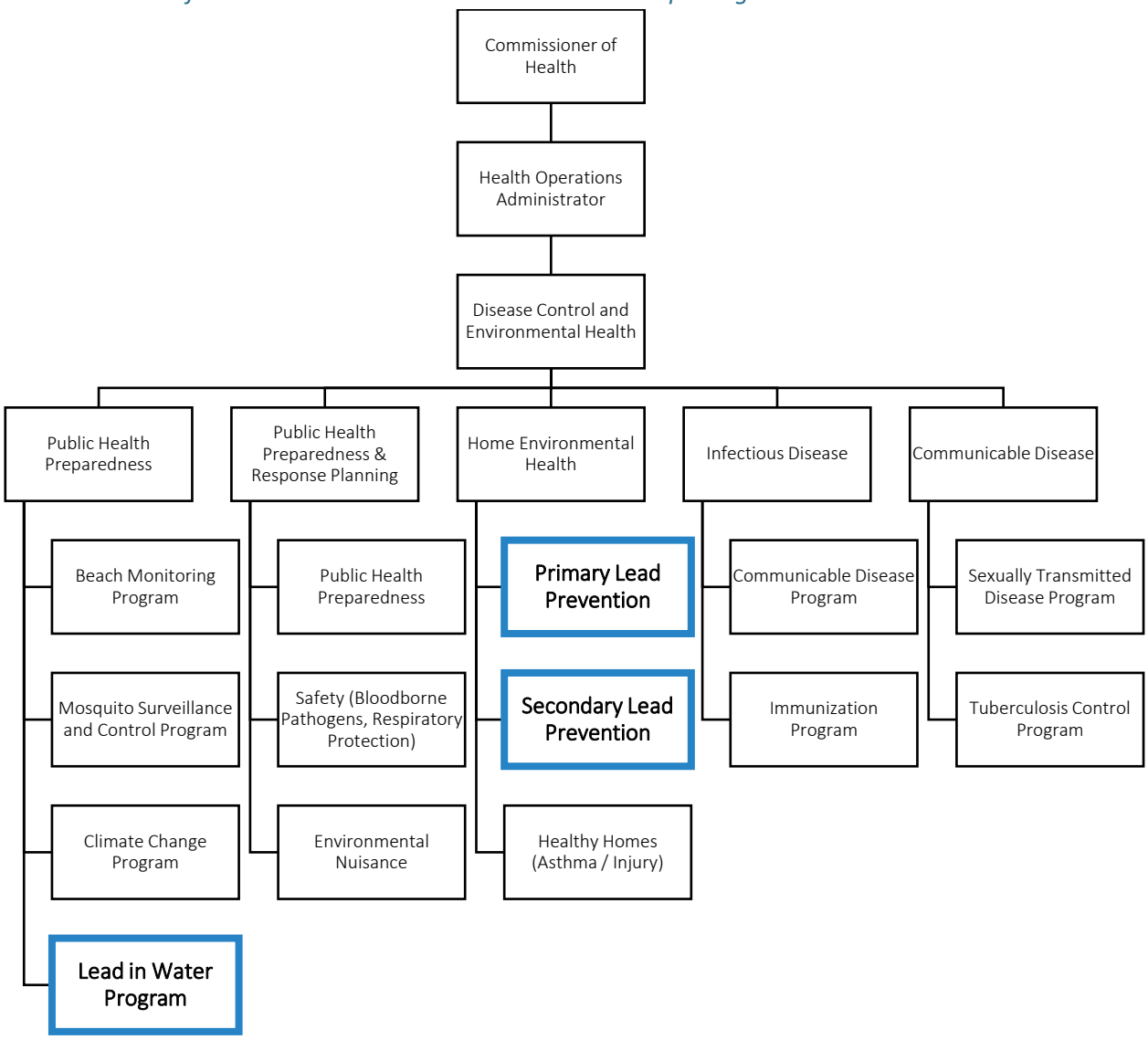
Additionally, medical consultation, guidance, and support is provided to the MHD through a partnership with the University of Wisconsin-Madison School of Medicine and Public Health.

Division Directors provide oversight to the programs and services within each functional division, and are responsible for assuring program activities, outcomes, and effectiveness. Division Directors are also responsible for assuring program policies are up to date and assuring program management and staff receive effective oversight. In turn, the Commissioner of Health is responsible for assuring Division Directors are carrying out their responsibilities, and for providing sufficient resources and support for the department to carry out its function.

DIVISION OF DISEASE CONTROL & ENVIRONMENTAL HEALTH ORGANIZATIONAL STRUCTURE

The Division of Disease Control and Environmental Health (DCEH) was formed by merging three previous divisions and currently operates a wide variety of programs and services (see Figure 2.1). Childhood lead poisoning prevention efforts are housed within this division in two distinct groups: Home Environmental Health and Public Health Preparedness. These efforts are also divided by focus area: Primary Prevention (controlling lead hazards before a child is identified with an elevated blood lead level); and Secondary Prevention (follow-up to reports of elevated blood lead levels from health care providers).

Figure 2.1: Division of Disease Control & Environmental Health Reporting Structure



PROGRAM STAFFING

The MHD Childhood Lead Poisoning Prevention program has approximately 20 staff divided across primary and secondary prevention activities. These staff are entirely grant funded and reported to a single manager. There are two other management-level positions within program, however these positions did not have any direct reports.

Additionally, lead-in-water activities were conducted by a 1.0 FTE tax-levy funded Environmental Disease Control Specialist who reported to a grant-funded manager. (Figure 2.2)

Figure 2.2: DCEH Structure Related to Lead, prior to June 2017

(Grant-funded positions are shaded in blue, tax-levy funded positions are shaded in gray)

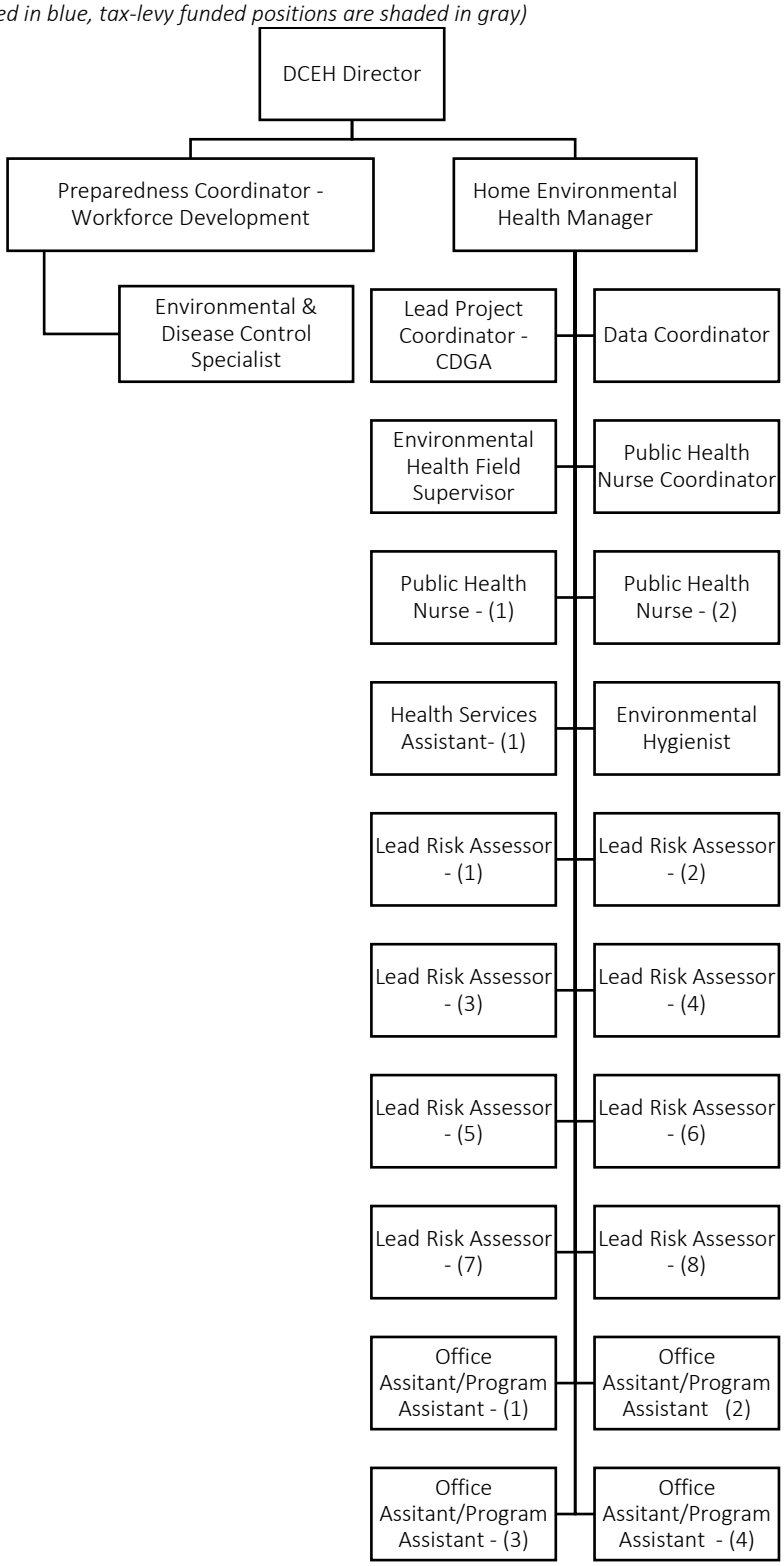


*Table 2.3: Lead Staffing, 2006 to 2018**

Title	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Community Lead Program Mgr	1	1	0	0	0	0	0	0	0	0	0	0	0
Emergency Prep. Coor. - Workforce Dev.	0	0	0	0	0	0	0	1	1	1	1	1	1
Environmental & Disease Control Spec.	5	4	4	3	3	2.5	2.5	2	2	2	2	3	3
Environ. Health Field Supv.	1	1	1	1	1	1	1	1	1	1	1	1	1
Environmental Health Services Mgr.	0	0	0	0	0	0	0	0	0	0	0	0	1
Environmental Hygienist	1	1	1	1	1	1	2	1	1	1	1	1	1
Health Education Assistant	0	0	1	0	0	0	0	0	0	0	0	0	0
Health Project Coordinator	1	1	0	0	0	0	0	0	0	0	0	0	0
Health Services Assistant II	3.5	2.5	2	4	3	3	3	1	1	1	1	1	2
Home Environ. Health Mgr.	1	1	1	1	1	1	1	1	1	1	1	1	1
Lead Education Assistant	1	1	0	0	1	1	1	1	1	0	0	0	0
Lead Hazard Prevention Mgr.	1	1	2	1	0	0	0	0	0	0	0	0	0
Lead Program Information Specialist	1	1	1	1	1	1	1	1	1	1	1	1	1
Lead Project Coordinator (CDBG)	1	1	1	1	1	1	1	1	1	1	1	1	1
Lead Project Coordinator (LDG)	1	1	1	1	1	1	1	0	0	0	0	0	0
Lead Risk Assessor II	14	12	10	11	12	12	12	9	9	8	8	7	8
OA IV	0	0	0	0	1	1	1	0	0	0	0	0	0
OA III	3	3	3	3	3	3	2	2	2	2	1	1	1
OA II	1	1	1	1	1	1	0	0	1	1	2	2	2
PA I	1	1	0	0	0	0	0	0	0	0	0	0	0
PA II	3	3	2	2	2	2	2	2	2	2	2	2	2
PHN/PHN Coord.	5	5	4	4	4	4	3	3	3	3	3	3	3
PHN Supervisor	1	1	1	1	1	1		0	0	0	0	0	0
Public Health Educator II	1	1	1	1	1	1	0	0	0	0	0	0	0
Public Health Emer. Res. & Planning Co.	1	1	1	1	1	1	1	1	1	1	1	1	1
Total	**48.5**	**44.5**	**38**	**38**	**39**	**38.5**	**34.5**	**27**	**28**	**26**	**26**	**26**	**28**

Source: City of Milwaukee Budget Documents

*Includes all environmental health staff in the department other than Consumer Environmental Health as well as preparedness staff other than those assigned to communicable disease.

Table 2.3: Funding Allocated to City of Milwaukee Health Department Childhood Lead Poisoning Prevention Program Annually by Source, 2005-2018

	City	City	Water Filters			Federal				Total
	O&M (1)	Capital	City	Donation	State (3)	HUD	Non-HUD (4)	CDBG	Other (5)	
2005					344,517	2,947,212	323,798	794,852		4,410,379
2006					830,976	2,383,080	323,798	750,063	50,000	4,337,917
2007					652,145	2,940,476	329,497	750,063	16,667	4,688,848
2008					302,337	1,514,286	653,270	1,155,484	33,333	3,658,710
2009					302,337	3,632,522	637,834	1,526,484		6,099,177
2010					283,596	2,549,189	592,039	1,526,484		4,951,308
2011					266,499	2,332,522	1,349,407	1,385,693		5,334,121
2012					261,492	52,564	1,285,714	1,357,993		2,957,763
2013					259,869	105,128	1,295,714	1,357,993		3,018,704
2014					259,869	213,461	857,143	1,358,000		2,688,473
2015					259,869	1,352,564		1,358,000		2,970,433
2016	23,333	340,000	Footnote (2)		251,134	1,300,000		1,358,000		3,272,467
2017	47,583	340,000	150,000	1,400	251,000	2,325,667		1,358,000		4,473,650
2018	47,583	340,000	75,000		251,000	1,134,000		1,210,977		3,058,560
Total	118,499	1,020,000	225,000	1,400	4,776,640	24,782,671	7,648,214	17,248,086	100,000	55,920,510

Footnotes:

(1) S&W for 1 FTE Environmental & Disease Control Specialist

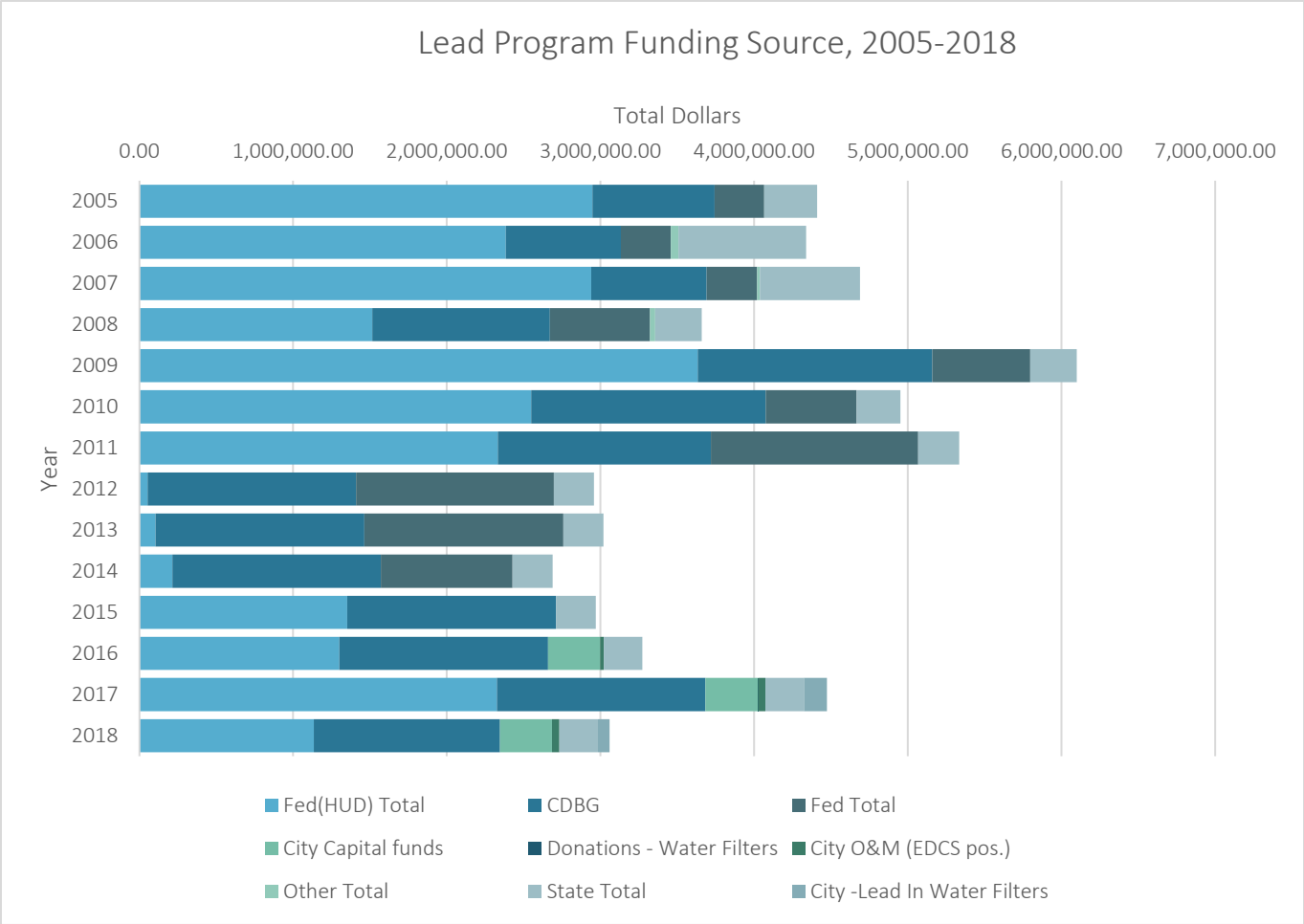
(2) Purchase of 75,000 of water filters donated by community partners: United Way of Greater Milwaukee & Waukesha County, Aurora Health Care, Ascension Wisconsin, Children's Hospital of Wisconsin, and Froedtert and the Medical College of Wisconsin, with additional financial support from Aquasana, an A.O. Smith Company.

(3) Reflects Childhood Lead Detection grants & Child Lead Poisoning Prevention grants

(4) Reflects Childhood Lead Poisoning Prevention grants & Lead Hazard Reduction Demolition grant

(5) Reflects Bader Lead Abatement grant & DuPont Lead Safe Kids grant

Figure 2.4: Lead Program Funding by Source, 2005-2018



Section 3

Primary Prevention

The City of Milwaukee Health Department (MHD) addresses childhood lead poisoning through two types of activities: Primary and secondary prevention efforts. Primary prevention involves actions to mitigate lead hazards *before* a child becomes exposed in order to reduce the risk to children who reside in the dwelling now and in the future, while secondary prevention efforts focus on mitigating lead hazards and minimizing adverse effects on health *after* a child has been reported as lead poisoned.

OVERVIEW

This section provides an overview of the primary prevention activities of the MHD.

Lead primary prevention activities within the Department include:

- Lead Hazard Abatement (Paint and Soil)
- Lead Hazard Abatement (Lead-in-Water Program)
- Lead Education and Awareness

LEAD HAZARD ABATEMENT (PAINT AND SOIL)

Since 1997 the MHD's lead hazard abatement efforts have made thousands of housing units in Milwaukee lead safe through enforcement efforts, innovative partnerships, and federal funding (see Table 3.1).

The program pays to abate lead hazards in the home to make the home lead safe. The lead hazard abatement program stretches the funds awarded to the program by requiring property owners to cover the cost of some of the abatement certain lead hazards (peeling chipping paint on walls and ceilings, planting grass or covering areas of bare soil) while grant funds pay for window replacement.

The following is the comprehensive list of MHD's eligibility requirements for the primary prevention program as of June 2017. The requirements were applied regardless of funding source even though many of the requirements were not required by the funder.

- Home must be located in the 53204, 53205, 53206, 53208, 53209, 53210, 53212, 53215 and 53216 zip codes
- Properties must be assessed at or under $150,000
- Rental properties must have low-income tenants
- Owner-occupants must be low-income and have a pregnant woman or children under 4 years of age
- Vacant units must be made available to low-income families
- Property taxes must not be delinquent
- Properties must have no open building code violations
- Owner must be willing to pay $30 per window plus $57 permit fee
- Owner must be available for inspection with lead inspector
- Owner must be willing to abate other lead paint and soil hazards founds (water hazards are not included in the assessment or requirements for abatement)

Exceptions to the requirements were made on a case by case basis for properties with lead poisoned children. HUD specifically prohibits the use of grant funds for "Chelation or other medical treatment costs, including case management, related to children with elevated blood lead levels (EBLs).

As part of the program a property owner receives:

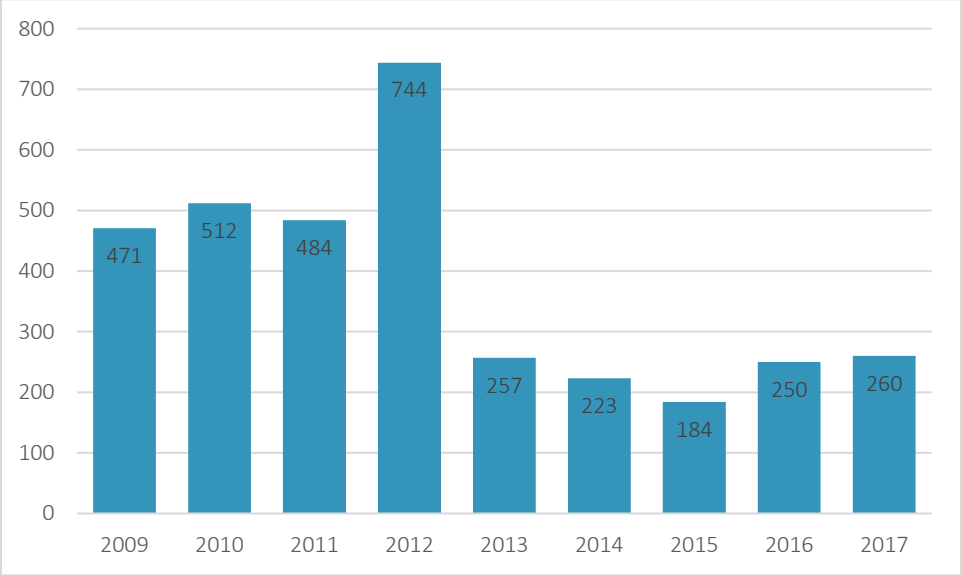
- A full lead risk assessment of the property, including X-ray fluorescence (XRF) testing and dust wipe sampling in compliance with HUD Chapter 5. A copy of the report is provided to the property owner.
- A grant of $400 per window less the $30 owner's share, plus a onetime $57 permit fee. (Note: The typical grant for a single-family home averages $5,000 and for a duplex averages $9,600).
- For families with diagnosed asthma, additional assessment services can be provided, with grants of up to $5,000 for home improvements offered per unit to improve air quality and safety

Table 3.1: Units Abated per Year by Funding Source and Total Program Funding, 2009 to 2017

Year	CDGA	City Capital Funding	HUD	Units Abated with Grant Funds	Total Privately Funded Projects	Total Units Abated	Total HEH Program Funding Available	Total HEH Funding Expended
2009	204	-	267	**471**	270	**741**	$ 6,099,177	$3,215,489
2010	154	-	358	**512**	243	**755**	$ 4,951,307	$3,628,554
2011	159	-	325	**484**	141	**625**	$ 5,334,121	$3,396,141
2012	106	-	638	**744**	163	**907**	$ 2,957,763	$4,828,725
2013	78	-	179	**257**	221	**478**	$ 3,018,704	$2,433,866
2014	93	-	130	**223**	212	**435**	$ 2,688,473	$2,013,153
2015	87	-	97	**184**	222	**406**	$ 2,970,433	$2,018,257
2016	89	25	136	**250**	200	**450**	$ 3,272,467	$2,406,660
2017	69	1	190	**260**	TBD	**TBD**		
Total	**1,039**	**26**	**2320**	**3,385**	**1,672**	**4,797**	**$31,292,446**	

Source: Home Environmental Health Program Data
Abatement year is determined by year the project is started, 2017 data is still pending.

Figure 3.2: Units Abated Funded Under Departmental Lead Hazard Prevention Grants by Year, 2009 to 2017



FUNDING

The program is funded by two lead hazard reduction grants from HUD (2014 and 2016), two CDGA grants (abatement and prevention) and city capital funds. Refer to Table 2.3 for a breakdown of funding by source. *Note: HUD grant funds do not support soil abatement.*

Lead Hazard Reduction Grants (HUD)

The MHD lead hazard abatement activities are currently supported through two Lead Hazard Reduction Grants from the U.S. Department of Housing and Urban Development (HUD), a 2014 award and a 2016 award. The same reporting and administrative processes apply to each. Within each grant is an allocation of funds called Healthy Homes Supplemental, which focuses on safety and asthma control. The Healthy Homes funding is essentially a grant within a grant, with separate eligibility requirements. It is important to note to qualify for Healthy Homes funds you must first qualify for Primary Prevention Funds.

The 2014 Lead Hazard Reduction Grant awarded by HUD is for $3,900,000 inclusive of the $400,000 Healthy Homes Supplemental. The grant period is 12/1/14 to 11/30/17. There is a three month close out period where projects under contract by 11/30/17 can be completed and grant funds can be spent down through 11/28/18.

The 2016 Lead Hazard Reduction Grant awarded by HUD is for $4,000,000 inclusive of the $400,000 Healthy Homes Supplemental. The grant period is 11/1/16 to 10/31/19. There is a three month close out period where projects under contract by 10/30/19 can be completed and grant funds can be spent down through 1/31/19.

In both the 2014 and 2016 Lead Hazard Reduction Grants the entire $400,000 Healthy Homes Supplemental was done as a sole source no-bid contract with the Housing Authority of the City of Milwaukee (HACM).

HUD assesses grant progress every quarter based upon three factors: 1) the number of assessments performed, 2) the number of units abated, and 3) the total grant expenditures. All three factors are assessed in comparison to the program's submitted project plan. While Healthy Homes Supplemental spending can impact the overall grant score, progress towards Healthy Homes assessments and abatements are not counted in the overall program score.

For the 2016 grant award, the program received multiple failing performance scores from HUD (see table below). The letters were emailed directly to the Commissioner, Program Manager, and Program Coordinator but not broadly shared outside the MHD until the third failing report was received in November.

Table 3.3: Obtainment of Failing HUD performance score (RED) Score

Date Received	Funding Quarter	Performance Period	Score
6/8/17	Y1 Q2	January to March 2017	46
9/22/17	Y1 Q3	April to June 2017	58
11/17/17	Y1 Q4	July to September2017	65
TBD	Y2 Q1	October to December 2017	*Pending*

Community Development Block Grant (CDBG)

CDBG has three components. First, CDBG funding accounts for the City's required matching funds to HUD grant awards and is administered identically to the HUD program. Second, CDBG funds support the nursing and environmental follow-up to reported elevated blood lead levels (secondary prevention), which HUD funding cannot support per HUD stipulations.

LEAD HAZARD ABATEMENT (WATER)

Through its primary prevention activities, the MHD provides public health guidance to the City's Lead Service Line Replacement Program and operates a Drinking Water Filter Distribution Program.

Child Care Lead Service Line Replacement: As part of its efforts toward full lead service line replacement citywide, the City of Milwaukee is funding full lead service line (LSL) replacements at all licensed child care facilities in the city of Milwaukee. The MHD supports Milwaukee Water Works in this infrastructure project by assisting in outreach and education of licensed child care providers in Milwaukee. Both prior to and immediately after LSL replacement, the MHD offers drinking water filters certified to remove lead to each facility.

Table 3.4: Child Care Lead Service Line Replacement Project Metrics

Total child care facilities licensed in city of Milwaukee	360
Full replacement completed	146
Full replacement in progress/scheduled	110
No response to initial outreach	104

Water Filter Distribution Program: The distribution of point-of-use (POU) filtration devices is part of a comprehensive strategy to reduce exposure to lead through drinking water by vulnerable populations in the city of Milwaukee. In 2016, the MHD received funding from United Way of Greater Milwaukee & Waukesha County, Aurora Health Care, Ascension Wisconsin, Children's Hospital of Wisconsin, and Froedtert and the Medical College of Wisconsin to coordinate a pilot program for distribution of POU filtration devices certified to remove lead. The devices were distributed in coordination with external organizations and internal MHD programs. Eligibility for a free drinking water filter certified to remove lead through the Pilot Program required only that an individual reside at a home with a lead service line. Messaging through community organizations and media emphasized the recommended populations for filter use. The Drinking Water Filter Pilot Program distributed a total of 1,779 filters to Milwaukee residents. However, only 43% of the filters went to housing units where vulnerable populations resided.

Based upon analysis of the pilot program, the MHD modified its distribution program in 2017 to prioritize availability and access to the populations most at-risk for exposure to lead hazards. The 2017 program screens participants to identify if they live in a housing unit with a lead service line and are within the targeted vulnerable populations (children under 6 years of age, especially bottlefed infants, children with reported blood lead levels greater than 5 ug/dL, pregnant women, breastfeeding women, and women who may become pregnant). Additionally, the MHD has partnered with community-based organizations to provide targeted clientele with a voucher for a free drinking water filter certified to remove lead as well as lead safety educational materials. Filter voucher forms refer recipients to the Social Development Commission (SDC) to redeem their voucher.

Using a 2017 City Budget allocation of $150,000, the MHD sought to distribute approximately 3,000 POU filtration devices in 2017. The program will continue in 2018 with a $75,000 City Budget allocation while seeking additional private funding.

Table 3.5: 2016 Drinking Water Filter Pilot Program Distribution Data

2016 Pilot Filter Distribution		
Distribution Partner	# of Filters Received from MHD	# of Filters Distributed to Community
Social Development Commission	820	820
Sixteenth Street Community Health Centers	791	791
Department of City Development	15	0
MHD, Family and Community Health Services	129	0
Totals:	1,755	1,611

Table 3.6: 2017 and 2018 Drinking Water Filter Program Distribution Data

Filters Distributed 2017 through January 29, 2018		
Distribution Partner	# of Filters Received from MHD	# of Filters Distributed to Community
Sixteenth Street Community Health Centers	450	402
Social Development Commission	252	44
WIC - MLK Heritage	140	129
WIC - Wee Care	283	219
WIC - West Allis	66	47
WIC - 16th Street	75	75
Department of City Development	60	10
MHD, Lead Program	150	47
MHD, Disease Control & Environmental Health	278	203
MHD, Family and Community Health Services	75	30
MHD, Men's Health	24	13
MHD, WIC	650	550
Totals:	2,503	1,769

LEAD EDUCATION & AWARENESS

Historically, the MHD has conducted various awareness and education efforts to inform the public about lead hazards, lead poisoning prevention, and available programmatic resources. These efforts have included but are not limited to marketing and advertising, community events and presentations, and direct outreach to families and high-risk neighborhoods.

The program once had a position dedicated to lead education and community outreach. Graphic design and media outreach and awareness support services are conducted by MHD Communications staff in accordance with MHD Policy. MHD Communications staff have declined from 3.0 FTE to 1.0 FTE in recent years, limiting capacity. There is no dedicated MHD budget allocation for marketing or public awareness. In addition, funding for printing of education and promotional materials must adhere to grant funding requirements.

Most recently, the MHD partnered with Milwaukee Water Works to launch the Lead-Safe Milwaukee public awareness campaign.

Section 4

Secondary Prevention

The City of Milwaukee Health Department (MHD) addresses childhood lead poisoning through two types of activities: Primary and secondary prevention efforts. This section provides an overview of the secondary prevention activities of the MHD.

Secondary prevention is considered a response (or intervention) initiated after an elevated blood lead level is identified. A blood test is used to assess exposure to lead. There are two types of blood lead tests, a capillary (finger stick) test which is considered a preliminary test, and a venous (from the arm) test which is considered a confirmatory test. The type of intervention initiated depends upon the level of lead found in a child's blood and the type of test received (see Table 4.1). From a public health perspective, an intervention may include both a clinical component which entails management of the child and an environmental component management of the property.

OVERVIEW

Under Wisconsin State Statute 254.166, the MHD is obligated upon receipt of a report of a child under the age of 6 with single elevated blood lead level (EBLL) of 20 ug/dL or above, or two venous blood lead level of 15 ug/dL or above taken 90 days apart, to perform a thorough environmental investigation of the child's dwelling or premises in order to attempt to identify the source of the lead. It is important to note that this is different than the CDC case definition of an elevated blood lead level. Per the CDC, as of 2012 an elevated blood lead level is "*a single blood lead test (capillary or venous) at or above the reference range value of 5 µg/dL.*"

A vast majority lead tests in Milwaukee are done by primary care providers. Primary care providers are expected to notify parents of the test results and provide appropriate follow-up recommendations. In addition, in Milwaukee all blood lead tests for children are required to be reported to the MHD, however the MHD should not be the sole source of notification to parents, as the primary responsibility for notification rests with the provider who orders the test.

The MHD does provide blood lead testing on a limited basis, for example, in the home as part of the MHD Primary Prevention Program and at events such as the MHD's annual Back-to-School Health Fairs. On average, the number of blood lead tests provided by the MHD totals less than 300 per year, or less than 1% of tests reported annually citywide. The MHD also operates a WIC program, which provides lead testing to clients according to WIC guidelines.

Table 4.1 MHD Intervention Levels for Children by Blood Lead Level, 2015 to 2017

Level	Status	Intervention
<5 µg/dL	All	No Intervention, level is not considered to be elevated
5 to 9 µg/dL	Confirmed	Letter with test result mailed to family providing educational materials, prevention information, and contact information for MHD to provide further information.
	Preliminary	
10 to 19 µg/dL	Confirmed	A Public Health Services Assistant conducts a home visit to provide educational information, a walk-through home assessment, and wet washing and/or HEPA vacuuming to remove immediate lead hazards. These services are delivered in the client's home until the service goals are met.
	Preliminary	Letter with test result mailed to family providing educational materials, prevention information, recommendation for confirmatory testing, and contact information for MHD.
20 to 39 µg/dL	Confirmed	A Public Health Nurse (PHN) conducts a home visit to provide educational information, conduct a growth and development assessment of the child, and provide ongoing monitoring of the child. The PHN will coordinate closely with a Lead Risk Assessor who will inspect the child's home for lead hazards. These services are delivered in the client's home until the service goals are met.
	Preliminary	A PHN should call to get the child retested. If the PHN is unable to contact the child a letter is sent.
≥40 µg/dL	Confirmed	At this level, an immediate MHD lead poisoning response will be initiated. A Public Health Nurse (PHN) conducts a home visit to provide educational information, conduct a growth and development assessment of the child, and provides ongoing monitoring of the child. The PHN will coordinate closely with a Lead Risk Assessor who will inspect the child's home for lead hazards. These services are delivered in the client's home until the service goals are met.
	Preliminary	A PHN should call to get the child retested within 48 hours with a confirmatory test. If the nurse is unable to contact over the phone, a home visit should be attempted.

TESTING DATA

Approximately 33,000 blood lead level (BLL) tests are reported to the MHD each year. Many children receive multiple tests in a given year, and some children older than 6 are also tested. Of those 33,000 tests, there are about 25,000 unique children under the age of 6 who receive at least one capillary or venous test each year. Capillary tests are considered preliminary while venous tests are considered confirmed. The following review focuses on these unique children.

Importantly, data used in this audit is based on a child's highest reported BLL, whether capillary or venous, in the given year. For example, a child could have received two tests within a year each within a different intervention category. This analysis captures the child's highest test.

<5 µg/dL

On average, between 2015 and 2017, approximately 23,000 (92%) of the 25,000 children who were tested annually had a highest blood lead level less than 5 µg/dL. Although private providers or clinics who order such tests are expected to notify parents of the results, MHD does not provide additional case management services for BLLs lower than 5 µg/dL.

5-9 µg/dL CASE MANAGEMENT

On average, between 2015 and 2017, approximately 2,000 of the 25,000 children who were tested annually had elevated blood lead levels (EBLL) between 5-9 µg/dL. In 2017, STELLAR records show that the MHD sent follow-up letters providing information and recommendations for recommended future testing to 72.2% (or 1,500 of 2078) of children who had capillary or venous blood lead test results between 5-9 µg/dL. Data on the follow-up letters for this group is not well documented for 2015 and 2016. Based on the available data, 6,022 children should have received letters from the MHD over this three-year period, but electronic records document only 1,500 letters being sent.

Table 4.2: 5-9 µg/dL Case Management Services

	2015		2016		2017		Total 2015-17*
Total Tested, under 6	25,360		24,525		25,564		
	N	%	N	%	N	%	
5-9 µg/dL Case Rate	1,902	7.5%	2,042	8.3%	2,078	8.1%	6,022
Letter and Educational Materials Provided	--	--	--	--	1,500	72.2%	1,500

*Aggregate data should not be interpreted as unique cases. Only the highest reported test for a child is reported in each year, but children may be counted more than once when totaled across the three-year period).

How to interpret this table (Examples based on 2017 data):

- In 2017, 8.1% (or 2,078 of 25,564) of children tested had a highest reported blood lead level between 5 and 9 micrograms per deciliter.
- In 2017, there is documentation that 72.2% (1,500 of 2,078) of children at this level received a letter and education materials from the health department.

10-19 µg/dL CASE MANAGEMENT

Between 2015 and 2017 there were 1,897 children who had a highest reported BLL between 10-19 µg/dL (some preliminary and some confirmatory). Referrals for early intervention are based on confirmatory tests. Over 70% did not report a confirmatory test as their highest test result in that year and therefore may not have received a referral for an early intervention. On the other hand, many of these children may have had a confirmatory test that was lower than their preliminary test; these would not be reflected in this preliminary analysis. Of the 522 known confirmed cases of EBLL between 10-19 µg/dL, 44.8% (or 234 of 522) received a referral for early intervention. However, as the number of known confirmed cases increases with investigation, the percent who received referrals for early intervention services will decline further.

Table 4.3: 10-19 µg/dL Case Management Services

	2015		2016		2017		Total 2015-17*
Total Tested, under 6	25,360		24,525		25,564		
	N	%	N	%	N	%	
10-19 µg/dL Case Rate	598	2.4%	647	2.6%	652	2.6%	1,897
No Confirmatory Test Received	443	74.1%	459	70.9%	473	72.5%	1,375
Received Referral for Early Intervention	--	--	--	--	--	--	
Confirmatory Test Received	155	25.9%	188	29.1%	179	27.5%	522
Received Referral for Early Intervention	63	40.6%	58	30.9%	113	63.1%	234

*Aggregate data should not be interpreted as unique cases. Only the highest reported test for a child is reported in each year, but children may be counted more than once when totaled across the three-year period).

How to interpret this table (Examples based on 2017):

- In 2017, 2.6% (or 652 of 25,564) of children tested had a highest reported blood lead level between 10 and 19 micrograms per deciliter.
- Of the 652 children, only 27.5% (or 179 of 652) reported a confirmatory test as their highest test.
- 63.1% (or 113 of 179) of the confirmed cases received a referral for an early intervention. The early intervention includes education, HEPA vacuuming, wet washing, and/or capillary blood lead testing.

20-39 µg/dL CASE MANAGEMENT

Less than 1% of children under the age of 6 who received a BLL test had highest reported blood lead levels between 20 and 39 µg/dL. The majority (69.2% or 320 of 465) of cases did not report a confirmatory test as their highest test result in that year and therefore may not have received public nurse case management. On the other hand, many of these children may have had a confirmatory test that was lower than their preliminary test; these would not be reflected in this preliminary analysis. Of the 145 known confirmed cases, 97.9% (or 142 of 145) received a referral for case management. However, as the number of known confirmed cases increases with investigation, the percent who received referrals for early intervention services will decline further.

During the initial audit, MHD nurses reviewed each case management file for 20-39 µg/dL cases, 14 additional cases were flagged as potentially needing additional follow-up and subsequently received a referral for additional PHN case management outreach.

Table 4.4: 20-39 µg/dL Case Management Services

	2015		2016		2017		Total 2015-17*
Total Tested, under 6	25,360		24,525		25,564		
	N	%	N	%	N	%	
20-39 µg/dL Case Rate	143	0.6%	148	0.6%	174	0.7%	465
Highest Reported Test was Capillary	98	68.5%	97	65.5%	125	71.8%	320
Not Eligible for PHN case management referral							
Highest Reported Test was Venous	45	31.5%	51	34.5%	49	28.2%	145
Received Referral for PHN Case Management	45	100.0%	50	98.0%	47	95.9%	142
Received Referral for Additional PHN Case Management based on audit	2		7		5		14

*Aggregate data should not be interpreted as unique cases. Only the highest reported test for a child is reported in each year, but children may be counted more than once when totaled across the three-year period).

How to interpret this table (Examples based on 2017):

- In 2017, 0.7% (or 174 of 25,564) of children tested had a highest reported blood lead level between 20 and 39 micrograms per deciliter.
- Of the 174 children, only 28.2% (or 49 of 174) reported a confirmatory test as their highest test.
- 95.9% (or 47 of 49) of the confirmed cases received a received case management from the department.
    - During an initial electronic chart audit, 5 cases (5 of 49) were identified as needing additional follow-up.

GREATER THAN 40 µg/dL CASE MANAGEMENT

The greater than 40 µg/dL intervention category includes the most severe cases of EBLL, and as a result a more robust audit is being completed. This audit required nurses to search each case file that had a highest reported EBLL greater than 40 µg/dL to determine if proper case management referrals were made. During this review, 54 cases had a preliminary or confirmed EBLL of 40 µg/dL or higher. However, some cases that were originally considered preliminary were found to be confirmed at this level while others were confirmed at lower intervention levels. A few remained preliminary.

Specifically, between 2015 and 2017, the more robust audit resulted in 11.1% (or 6 of 54) still being considered preliminary at greater than 40 µg/dL. The remaining 48 cases were considered confirmed and 100% (or 48 of 48) received a referral for case management services. However, during the review, an additional 12 cases were flagged by nurses as potentially needing additional follow-up and subsequently received a referral for additional PHN case management outreach.

Table 4.5: Greater than 40 µg/dL Case Management Services

	2015	2016	2017	Total

							2015-17*
Total Tested, under 6	25,360		24,525		25,564		
	N	%	N	%	N	%	
Greater than 40 µg/dL Case Rate	15	0.1%	14	0.1%	25	0.1%	54
Only Reported Test was Capillary	0	0.0%	1	7.1%	5	20.0%	6
Record of PHN Outreach Attempts							
Highest Reported Test was Venous	15	100.0%	13	92.9%	20	80.0%	48
Record of PHN Outreach Attempts	15	100.0%	13	100.0%	20	100.0%	48
Received Referral for Additional PHN Case Management based on audit	0		2		10		12

*Aggregate data should not be interpreted as unique cases. Only the highest reported test for a child is reported in each year, but children may be counted more than once when totaled across the three-year period).

How to interpret this table (Examples based on 2017):

- In 2017, 0.1% (or 25 of 25,564) of children tested had a blood lead level (i.e. capillary or venous) greater than 40 micrograms per deciliter.
- Of the 25 children, 80.0% (or 20 of 25) had a confirmatory test.
- 100.0% (or 48 of 48) of the confirmed cases received a received case management from the department.
    - During the electronic chart audit, 10 cases (10 of 20) were identified as needing additional follow-up.

CHELATION

Children with BLLs of 45 µg/dL or above qualify for chelation therapy. Chelation, which can be done in a hospital or at home, is a medical technique to remove lead from the body. During 2015-2017, approximately 32 Milwaukee children received chelation. It is imperative that children receiving therapy return to a lead-safe home environment, and MHD is responsible for assuring that. In at least two cases during 2015-2017, that was not assured. Additional, intensive investigations are underway to carefully assess the records for other children who received chelation to determine that appropriate protocols were followed with regard to case management and a lead-safe home environment.

ENVIRONMENTAL INVESTIGATIONS

Environmental investigations are initiated at a confirmed BLL of 20 µg/dL. The scope of these investigations depends on the degree of BLL elevation. An environmental investigation seeks to identify the primary source(s) of lead in the child's immediate or secondary environments.

With regard to water, both CDC and HUD are consistent on their recommendations which are as follows "Drinking water in older housing should be tested as a source of lead exposure when the local drinking water system is not

in compliance with LCR or when another source of lead exposure cannot be identified for children with high BLLs."

Table 4.6: Statutorily Required Environmental Investigations

	2015	2016	2017	Total
Total Number of Addresses where Environmental Investigations Required by State Statute	105	98	117	320
Addresses with a Physical Record of an Environmental Investigation referral	68	75	58	201
Addresses with no Physical Record of an Environmental Investigation referral	37	23	59	119
Addresses with an Electronic Record of an Environmental Investigation referral	32	18	39	89
Addresses with an EBL of ≥40	7	1	5	13
Addresses with an EBL of 20-39	23	16	34	73
Addresses with an EBL of 15-19	2	1	0	3
Addresses with no Electronic Record of an Environmental Investigation referral	5	5	20	30
Addresses with an EBL of ≥40	0	0	6	6
Addresses with an EBL of 20-39	2	1	8	11
Addresses with an EBL of 15-19	3	4	6	13

- An audit of environmental investigations is still taking place.
- Based on preliminary data, 320 housing units between 2015-2017 should have received an investigation based on the State of Wisconsin statutory requirements.
    - This includes all reported addresses based on venous cases 20 and above and two venous cases 15-19 more than 90 days apart.

Based on an initial audit of paper records, 62.8% (or 201 of 320) units had paperwork indicating that an environmental investigation was referred and attempts were made.

Section 5

Findings & Recommendations

Based on a preliminary assessment of program activities, this report outlines a series of findings and recommendations in the MHD's Childhood Lead Poisoning Prevention Program. These findings are recommendations are divided into four sections: A) Department/Division Structure and Operations; B) Primary Prevention Activities; C) Secondary Prevention Activities; D) Policy Recommendations.

A. DEPARTMENT / DIVISION STRUCTURE AND OPERATIONS

The following findings and recommendations are based on section 2 of this report.

Finding A.1: Program capacity was limited due to both insufficient staffing and existing staff responsibilities not reflecting functional duties.

Between 2006 and 2018 the number of FTEs assigned to program-related activities was reduced by 19.5 FTEs (reduction of 6 FTE Lead Risk Assessors, 2 FTE Public Health Nurses, 1.5 FTE Health Services Assistant, etc.). In part, this was due to reductions of grant funding; however, generalists within the environmental program have historically been vulnerable to departmental budget proposals developed to meet reductions in funding allocations. Even if the program was fully staffed, there is still insufficient capacity to follow up on the number of cases at each of the proposed elevated blood lead level interventions.

Furthermore, staff capacity was not maximized due to out-of-date job descriptions and functional duties. For example, a review of the public health nurse coordinator job description revealed lack of requirement to do field work, even though home visiting is a critical requirement of lead case management.

Grant funding is overly relied on and basic foundational infrastructure within the department has not been maintained. This makes it difficult to meet community needs of a program with statutorily required services.

> Recommendation A.1.1: Review and revise job descriptions to ensure they reflect the qualifications needed to fulfil the job and describe accurate job duties.
> *Implementation status: In progress.*
>
> Recommendation A.1.2: Recruit for and fill vacant management, environmental, and nursing positions.
> *Implementation status: In progress.*
>
> Recommendation A.1.3: Explore implementation of a community health worker program to assist with follow-up of EBLs at low levels.
> *Implementation status: In progress.*

Finding A.2: Program staff are inadequately trained for job duties. In addition, the program has insufficient policies and procedures in place to support ongoing program operations.

Well-defined orientation and training curriculums do not exist for any positions within the program. Instead, training was provided largely by coworkers on an ad hoc basis, resulting in insufficient and inconsistent training for staff members. Program policies and procedures were also incomplete (lacking sufficient detail to perform the task), outdated (some were more than a decade old), or non-existent. In addition, changes to policies and procedures were often made verbally during staff meetings and not documented in writing. Staff training on procedures was also inconsistent and often not documented. Staff were not cross-trained and lacked an understanding of how their role supported larger program goals and objectives.

Recommendation A.2.1: Develop and implement an orientation and training curriculum for all program staff (Lead Risk Assessors, Nurses, Health Services Assistants).
Implementation status:

Recommendation A.2.2: Draft and/or revise program policies and procedures, and maintain compliance with the MHD's policy 100-600-PP, Developing and Maintaining Written Policies and Procedures requiring review every 24 months.
Implementation status: In progress.

Recommendation A.2.3: Create a system to ensure that staff have received revised policies and procedures and have adequate training to follow the procedures.
Implementation status:

Recommendation A.2.4: Develop and implement periodic joint field assessments with the supervisor to ensure quality service provision.
Implementation status:

Recommendation A.2.5: Train all primary prevention lead risk assessors and environmental and disease control specialists on secondary prevention case investigation.
Implementation status: In progress.

Finding A.3: Program infrastructure decreased program accountability.

STELLAR, the system used by the program for data collection, does not meet the program's needs. Not only are time parameters unavailable, but multiple data extractions are required and additional data analysis software is needed to get even basic information on key performance measures. Additionally, environmental investigation documentation within the system is virtually nonexistent, which means that some files for the program are on paper while others are electronic. Furthermore, the system cannot be used to issue permits nor can it be used to issue orders.

Recommendation A.3.1: Work to implement new data system for tracking EBLs (Healthy Housing in Lead Poisoning Surveillance System, HHLPS), EBL case management and EBL environmental investigations.
Implementation status: In progress, spring 2018

Recommendation A.3.2: Develop and implement a performance management dashboard to regularly monitor key performance measures and program statutory requirements.
Implementation status: In progress.

Recommendation A.3.3: Explore the Implementation of Healthspace for lead permitting and order writing.
Implementation status: In progress.

Recommendation A.3.4: Request technical support from the State of Wisconsin or the CDC to further assist in auditing the program data.
Implementation status: In progress.

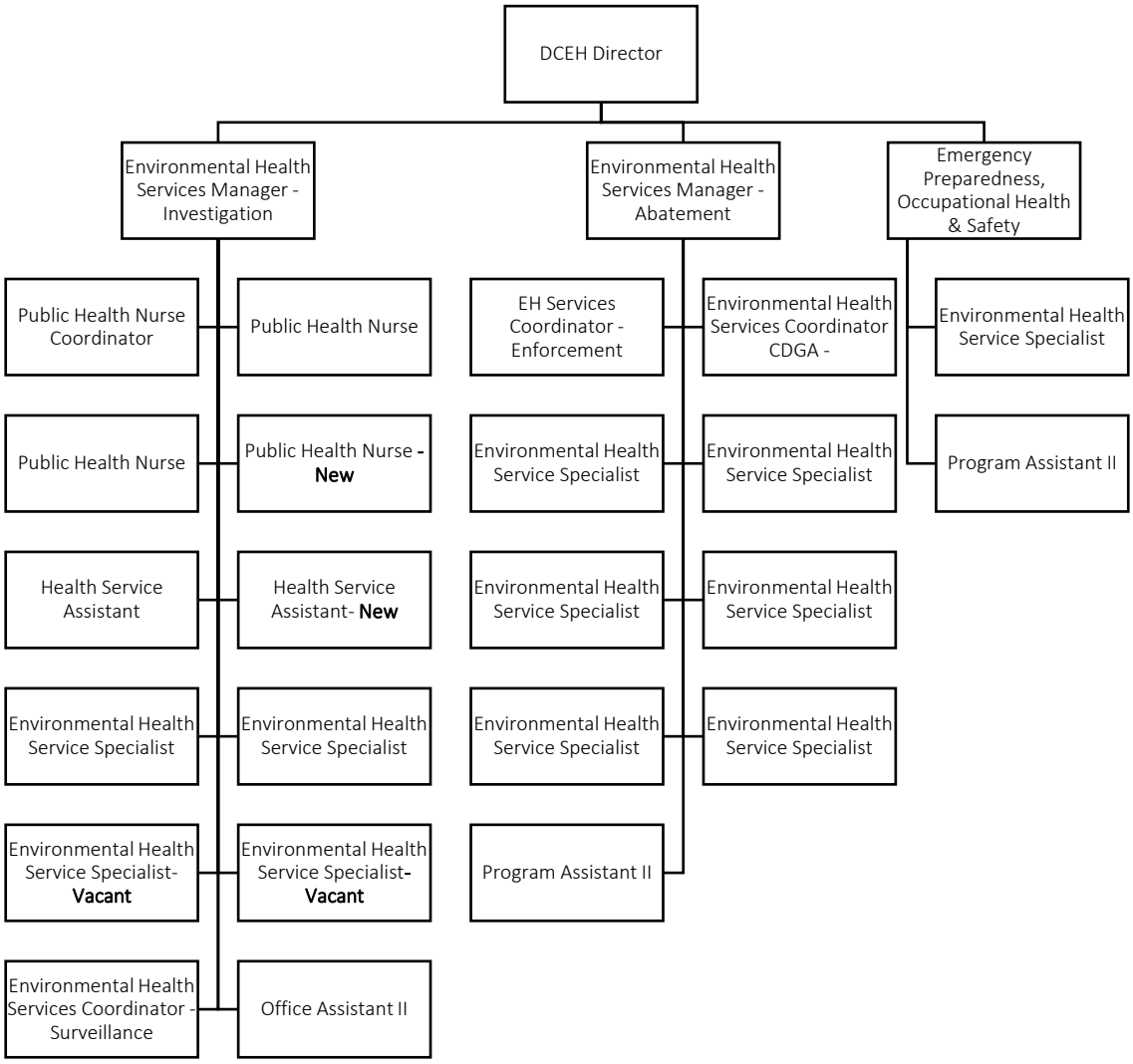
Recommendation A.3.5: Create a routine auditing schedule. Partner with other state or local units to audit files and procedures to identify deficiencies.
Implementation status:

Recommendation A.3.6: Program staff, program managers, and division managers must be held accountable for assuring that program activities are carried out, and that program objectives and requirements are being met.
Implementation status:

Finding A.4: Department Primary and Secondary Prevention activities were not fully coordinated and integrated.

Staff within the program were based out of separate locations, and operated in almost complete isolation of one another. This resulted in a lack of integration between primary and secondary prevention activities, as well as a lack of oversight and accountability for the program.

Recommendation A.4.1: Create a single cohesive Environmental Health Program (refer to current program organization chart on Figure 2.2)
Implementation status: In progress.


DCEH Director
Environmental Health Services Manager - Investigation
Environmental Health Services Manager - Abatement
Emergency Preparedness, Occupational Health & Safety
Public Health Nurse Coordinator
Public Health Nurse
Public Health Nurse
Public Health Nurse - New
Health Service Assistant
Health Service Assistant- New
Environmental Health Service Specialist
Environmental Health Service Specialist
Environmental Health Service Specialist- Vacant
Environmental Health Service Specialist- Vacant
Environmental Health Services Coordinator - Surveillance
Office Assistant II
EH Services Coordinator - Enforcement
Environmental Health Service Specialist
Environmental Health Service Specialist
Environmental Health Service Specialist
Program Assistant II
Environmental Health Services Coordinator CDGA -
Environmental Health Service Specialist
Environmental Health Service Specialist
Environmental Health Service Specialist
Environmental Health Service Specialist
Environmental Health Service Specialist
Program Assistant II

Recommendation A.4.2: Move all program staff to the Zeidler Municipal Building to foster collaboration, integration, and trust, and to further integrate and align activities within MHD structure.
Implementation status: In progress.

Finding A.5: Low program morale has led to high turnover among program staff (particularly Lead Risk Assessors), further decreasing program capacity.

Significant turnover was seen among lead risk assessors dating back to at least 2013. Recruitment and retention of qualified staff in these positions has been challenging and vacancies have significantly impacted program performance.

Recommendation A.5.1: Develop and implement a career ladder for environmental staff to increase employee retention.
Implementation status:

Recommendation A.5.2: Fully implement the MHD's 2018-2020 Workforce Development Plan, which includes activities to increase employee morale and employee recognition.
Implementation status: In progress.

B.PRIMARY PREVENTION ACTIVITIES

The following findings and recommendations are based on section 3 of this report.

Note: Many of the issues identified in primary prevention are addressed through Department/Division Structure and Operations Recommendations.

Finding B.1: Program promotional and education materials require updating and enhancements.

Program staff did not regularly review and/or request updates to the content of existing health education and promotion materials (e.g. flyers, pamphlets, website, etc.), and did not utilize new education materials developed and in-use by lead-in-water staff.

Lead program staff did not consistently bring materials to content experts and communications staff for review per MHD policy, nor were materials updated in an appropriate or timely fashion. At the same time, the number of MHD communications staff declined from 3 FTE to 1 FTE through budgetary processes, limiting capacity to support programs across the MHD.

Recommendation B.1.1: Program staff should track the use of promotion and education materials, implementing a regular review process to update content as necessary using the assistance of MHD Communications staff.
Implementation status: In progress.

Recommendation B.1.2: Increase the staff capacity of MHD Communications and allocate funds for public health education and awareness messaging.
Implementation status:

Recommendation B.1.3: Work to educate the public about lead hazards, prevention, and available resources.
Implementation status: In progress.

Finding B.2: Relationships with community partners deteriorated, reducing the MHD's reach in the community.

Due to capacity issues, the program had not invested time in cultivating new strategic relationships with community partners that serve high-risk populations.

Recommendation B.2.1: Develop relationships with Head Start, K-3, and K-4 programs to identify new strategies for prevention education and awareness activities, including connecting families to existing program resources (i.e. lead paint/window abatement and drinking water filter distribution).
Implementation status:

Recommendation B.2.2: Reestablish relationships with primary care providers, federally qualified health centers, and local clinics to identify new strategies for prevention education and awareness activities, including connecting families to existing program resources (i.e. lead paint/window abatement and drinking water filter distribution).
Implementation status:

Finding B.3: The program has developed adversarial relationships with contractors who carry out abatement work.

The program has developed an adversarial relationship with contractors. In part, this was due to the lengthy rules that the MHD placed on the contracts as a condition of doing business with the program. Contractors have also reported difficulties receiving reimbursement for services (e.g. late payments or fees), contacting staff, and having a system for grievances.

Recommendation B.3.1: Conduct a meeting with contractors to identify challenges in working with the MHD and explore solutions that meet mutual interests.
Implementation status: In progress.

Recommendation B.3.2: Suspend the use of the "Requirements of Doing Business with the Lead Program," which outlines unnecessary constraints on doing business with the MHD.
Implementation status: Completed November 28, 2017.

Recommendation B.3.3: Reimburse contractors for payment adjustments/fees for failed dust wipes.
Implementation status: In progress.

Recommendation B.3.4: Assess whether there is sufficient lead abatement contractor capacity in the city, and if insufficient, open the RFP process to increase the pool of contractors.
Implementation status:

Recommendation B.3.5: Collaborate with contractors and DHS to support contractors in complying with lead abatement requirements.
Implementation status:

Finding B.4: The program did not consistently meet HUD grant performance benchmarks and assure an adequate spend down of funds.

The MHD's primary prevention activities are mostly funded through two HUD grant awards (2014-2016 and 2016-2019). While the 2014 Award received good performance reports, the program failed to address underperforming subcontractors and also failed to reallocate unspent funds. As a result, due to poor performance on the 2016 grant, a no-cost extension was denied. A significant amount of money will be returned to HUD from the 2014 grant award. The 2016 grant award received multiple failing performance scores.

Recommendation B.4.1: Establish and implement a corrective action plan with HUD
Implementation Status: In progress.

Recommendation B.4.2: Partner with established HUD grantee to serve as a mentor on program requirements/processes.
Implementation Status: In progress.

Recommendation B.4.3: Explore adding additional partners for Healthy Homes Supplemental to assure timely completion of HUD grant objectives.
Implementation Status:

Finding B.5: The program established unnecessary and burdensome eligibility criteria on property owners.

Eligibility requirements above and beyond those required by HUD were placed on applicants seeking enrollment into Primary Prevention. This was initiated when requests exceeded program capacity, but ultimately resulted in property owners being disqualified from receiving financial support to abate lead issues unnecessarily. Properties linked to cases with lead poisoned children (secondary prevention) were often excluded from participation in the primary prevention program, despite it being encouraged by HUD.

Recommendation B.5.1: Update program eligibility requirements to align with less restrictive HUD requirements.
Implementation status: In progress.

Recommendation B.5.2: Develop criteria for paying property owner's share when cost is a barrier to participation in primary prevention.
Implementation status:

Recommendation B.5.3: Create an expedited pathway for elevated blood lead level properties to receive abatement funds. Assure properties are prioritized for abatement funding within program funding limitations.
Implementation status:

Finding B.6: The program failed to create a pipeline of homes to enroll in primary prevention, leading to gaps in workload.

At one time the program had a network of partners that it leveraged to create a pipeline of applications to its primary prevention activities. Over the past several years, the MHD stepped back from nearly all of those partnerships. In addition, the Program did not permit Section 8 landlords to obtain assistance from the program.

Recommendation B.6.1: Expand neighborhood canvassing in high-prevalence areas to develop an adequate pipeline of primary prevention applications.
Implementation status: In progress

Recommendation B.6.2: Obtain a list of Section 8 landlords to increase a pipeline of new applicants.
Implementation status: In progress.

Recommendation B.6.3: Partner with Federally Qualified Health Centers and primary health care providers to enroll individuals into primary prevention activities.
Implementation status:

Recommendation B.6.4: Coordinate and collaborate with City governmental partners (Department of Neighborhood Services and Department of City Development) to expand primary prevention activity reach.
Implementation status: In progress.

Finding B.7: The program should explore additional funding sources and opportunities to improve the distribution of drinking water filters certified to remove lead.

The MHD's activities related to distribution of water filters certified to remove lead are relatively new. Over the past two years, different distribution methods have been tested to optimize distribution to target populations. Assessments of current distribution practices (within and outside of the MHD) are still required to ensure efficient processes are in place.

Recommendation B.7.1: Obtain additional and sustainable funding source(s) for water filters certified to remove lead. Ensure that limited resources are distributed to those who are most vulnerable to potential lead exposure through drinking water.
Implementation status:

Recommendation B.7.2: Identify additional partners to distribute filters to targeted populations.
Implementation status:

Recommendation B.7.3: Explore opportunities to evaluate the MHD's filter distribution program to find efficiencies.
Implementation status: In progress.

C. SECONDARY PREVENTION ACTIVITIES

The following findings and recommendations are based on section 4 of this report.

Note: Many of the issues identified in secondary prevention are addressed through Department/Division Structure and Operations Recommendations.

Finding C.1: The program had insufficient documentation practices, making it difficult to determine what level of service was provided to children with confirmed elevated blood lead levels.

The program utilizes both electronic (STELLAR) and paper filing systems to track case management and environmental investigations. A preliminary audit discovered that the program had inadequate documentation practices, making it difficult to determine what level of services the department provided.

> Recommendation C.1.1: Implement new data system for tracking EBLs (Healthy Housing in Lead Poisoning Surveillance System, HHLPS), EBL case management and EBL environmental investigations.
> *Implementation status: In progress, spring 2018.*

> Recommendation C.1.2: Create a system to regularly review referrals and ensure proper documentation at every intervention level.
> *Implementation status:*

Finding C.2: More focus should be placed on increasing community capacity for confirmatory tests so proper interventions can be provided without delay.

The MHD only provides services for confirmed elevated blood lead tests as preliminary tests can result in false elevated results. When children are tested for lead with a capillary (preliminary) test and have an elevated blood lead level, children do not consistently receive the subsequent, necessary venous (confirmatory) testing. While venous testing is the gold standard, two capillary tests collected less than 12 weeks apart is also considered confirmatory. It is unclear to what degree these cases were identified and referred for follow-up.

> Recommendation C.2.1: Work with providers to establish a system of follow up for children who receive an elevated capillary test to ensure venous testing is received within the appropriate timeframe.
> *Implementation status:*

> Recommendation C.2.2: Improve outreach and education to local clinicians and community partners to raise awareness about latest research on lead and on lead testing recommendations.
> *Implementation status: In progress.*

> Recommendation C.2.3: Update tool kits for area clinicians specific to local lead poisoning prevention recommendations to develop materials specifically in support of perinatal lead testing.
> *Implementation status: In progress.*

> Recommendation C.2.4: Work with community partners to educate parents/guardians about the importance of follow-up confirmatory testing.
> *Implementation status:*

Recommendation C.2.5: Develop a system to identify children who received two elevated capillary tests within 12 weeks to ensure that they receive the proper intervention.
Implementation status:

Finding C.3: The program was not consistently delivering interventions to children with elevated blood lead levels.

The MHD provides various case management services to children depending on their confirmed blood lead level. The preliminary audit found that some services, particularly at lower intervention levels, were not being offered to children. The process for determining what case management services should be offered is overly complex and likely to result in error, and there is insufficient staff to provide adequate services.

Environmental investigations were not consistently completed as required by state statute and MHD programmatic goals and policies. Inconsistencies were found at every step of the process, and documentation was substandard.

Recommendation C.3.1: Revise and streamline the process flow for MHD staff who provide interventions to children with elevated blood lead levels.
Implementation status: In progress.

Recommendation C.3.2: Ensure that adequate staffing capacity exists for appropriate elevated blood lead level case management and environmental investigations.
Implementation status:

Recommendation C.3.3: Refine the case management follow-up algorithm and ensure proper referrals are made in a timely manner.
Implementation status:

Recommendation C.3.4: Revise approval process for returning chelated children to lead-safe homes.
Implementation status:

Recommendation C.3.5: Implement electronic documentation for environmental investigations.
Implementation status:

D. POLICY RECOMMENDATIONS

Based on this report, the MHD makes the following policy recommendations:

Finding D.1: City of Milwaukee policies around lead poisoning prevention could be strengthened and better coordinated with other city departments to ensure public health goals are met.

Recommendation D.1.1: Seek a sustainable funding source to support necessary staffing levels to provide desired service levels beyond statuary requirements.
Implementation status:

Recommendation D.1.2: Explore lead-safe certification for rental properties.
Implementation status:

Recommendation D.1.3: Review lead abatement enforcement strategies with the City Attorney's office to ensure timely resolution of abatement orders.
Implementation status:

Recommendation D.1.4: Enhance partnership with DNS Landlord Training Program to educate landlords on lead hazards and available resources.
Implementation status: In progress.

Recommendation D.1.5: Amend the Milwaukee Code of Ordinances to allow property owners to participate in the lead service line replacement program if their water tests high for lead as part of an EBL investigation.
Implementation status: In progress.

Recommendation D.1.6: Amend the Milwaukee Code of Ordinances to allow the Health Department to require child care facilities to participate in the lead lateral replacement program.
Implementation status:

Recommendation D.1.7: Advocate for state legislation requiring lead-free or lead-safe certification at the point of property sale or at minimum full disclosure of all lead hazards, including lead service lines.
Implementation status:

Recommendation D.1.8: Develop a system of billing for environmental and nursing services.
Implementation status: In progress.

Recommendation D.1.9: Ensure all billing revenue generated from EBL case management and environmental intervention returns to program to fund future outreach.
Implementation status:

Recommendation D.1.10: Seek state cooperation to submit a Medicaid waiver to use Medicaid funds to pay for remediation in homes of children with elevated blood lead levels.
Implementation status:

Recommendation D.1.11: Explore ways to maximize the City's ability to bill Medicaid for services provided by MHD for children with blood lead levels greater than 5 µg/dL, including inspections and case management services.
Implementation status:

Finding D.2: Local policies related to lead in water are not aligned with federal funding streams and federal guidance documents. This creates a disconnect between public health recommendations, local expectations, and resources available for implementation.

A directive was given to the program to offer water testing routinely in homes of children who have been lead poisoned. This directive is in conflict with CDC and HUD recommendations to only test the water if other sources of lead cannot be found. Furthermore, Title X, which funds HUD lead abatement activities, does not fund lead in water activities. In addition, it is MHD policy to recommend the use of NSF/ANSI certified filters in homes with lead services lines and vulnerable individuals, regardless if water tests positive or negative.

> **Recommendation D.2.1:** If local policy for property water testing remains, a sustainable funding source must be found.
> *Implementation status:*

Definitions

Abatement-A measure or set of measures designed to permanently eliminate lead-based paint hazards and/or lead-based paint. (Source: HUD and EPA)

BLL – Blood lead level

Case management-The follow-up care of a child with an elevated blood lead level. Case management includes a) client identification and outreach; b) individual assessment and diagnosis; c) service planning and resource identification; d) linkage of clients to needed services; e) service implementation and coordination; f) monitoring of service delivery; g) advocacy; and h) evaluation. (CDC)

Clearance examination-Visual examination and collection of lead dust samples by an inspector or risk assessor and analysis by an accredited laboratory upon completion of an abatement project, interim control intervention, or maintenance job that disturbs lead-based paint (or paint suspected of being lead-based) above the minimus levels. HUD and EPA have established maximum allowable lead dust levels on surfaces (e.g., floors, window sills, and window troughs). (HUD)

DCEH – City of Milwaukee Health Department, Division of Disease Control and Environmental Health

DNS-Department of Neighborhood Services

Elevated BLL: A single blood lead test (capillary or venous) at or above the reference range value of 5 µg/dL established in 2012.

- Confirmed elevated BLL ≥ 10 µg/dL: A child with one venous blood specimen ≥ 10 µg/dL, or two capillary blood specimens ≥ 10 µg/dL drawn within 12 weeks of each other.
- Unconfirmed elevated BLL ≥ 10 µg/dL: A single capillary blood lead test ≥ 10 µg/dL, or two capillary tests ≥ 10 µg/dL drawn more than 12 weeks apart.

Incidence - Defined as the number of children less than 6 years old who have exceeded a limit of lead in the blood (identified at 10 µg/dL) for the very first time in their blood lead history.

Lead hazard-Accessible paint, dust, soil, water, or other source or pathway that contains lead or lead compounds that can contribute to or cause elevated BLLs. (CDC)

Lead-based paint-Paint or other surface coating that contains lead equal to or exceeding 1.0 milligram per square centimeter or 0.5% by weight or 5,000 parts per million by weight. (HUD and EPA)

Lead risk assessment-An onsite investigation of a residential dwelling to discover any lead based paint hazards and description of options to eliminate them, which includes lead dust and soil sampling. (HUD and EPA)

Lead-safe-Housing with no lead paint hazards as determined by a lead risk assessment or by dust sampling at the conclusion of lead hazard control activities. If lead-based paint remains in the housing unit, its condition and any hazard control systems must be monitored to prevent new lead hazards.

Percent of children with elevated BLLs: The number of children less than 72 months of age with an elevated blood lead level ≥5 µg/dL divided by the number of children less than 72 months of age tested for blood lead, multiplied by 100. Also referenced as "Case Rate."

Percent of children tested: The number of children less than 72 months of age tested for blood lead divided by the total number of children less than 72 months of age based on 2000 (years) or 2010 (years) U.S. Census data, multiplied by 100

Primary prevention (PP)-Interventions undertaken to reduce or eliminate exposures or risk factors before the onset of detectable disease. This includes measures to a) prevent the dispersal of lead in the environment through regulations or other measures that prevent harmful uses of lead and b) remove lead from the environment before children are exposed. (CDC)

Prevalence - Defined as the number of children less than 6 years old who have exceeded a limit of lead in the blood (identified at both 5 µg/dL and 10 µg/dL) divided by the total number of children tested for lead in their blood and expressed as a percentage. The time period and age category must be identical for both.

Secondary prevention-Response to a problem after it has been detected. This involves identifying children with elevated BLLs and eliminating or reducing their lead exposure. (CDC)

Screening test: A blood lead test for a child age <72 months who previously did not have a confirmed elevated BLL. (NOTE: A child may be screened in multiple years or even multiple times within a given year, but would be counted only once for each year.)

Test: Any blood lead draw (capillary, venous or unknown sample type) on a child that produces a quantifiable result and is analyzed by a Clinical Laboratory Improvement Amendments (CLIA)-certified facility or an approved portable device. A blood lead test may be collected for screening, confirmation, or follow-up.

Testing penetration - Defined as the percentage of children in the city of Milwaukee who were reported to be tested at least once in any calendar year. These percentages are based upon the number of blood lead tests reported and the total number of children estimated by the reported birth rate.

Appendix: Methods

Organizational Structure Review

To assess the effectiveness of Department and DCEH organization structure the following factors were considered:

- Does the current structure facilitates effective workflow?
- Does the current structure enhances partnership and synergy?
- Does the current structure enables individual or programmatic performance?
- Does the current structure facilitates communication, shared goals and understanding?

Staffing Review

To evaluate staffing the following factors were considered:

- Is there adequate staffing to complete the required duties?
- Do job descriptions reflect the duties assigned, do they reflect the required knowledge skills and abilities as well as licensures required to be successful at the position, is the pay range adequate to be able to recruit and retain qualified applicants?
- Is the supervisor to staff ratio adequate to assure span of control?
- Is there a system of employee performance management in place?
    - Job specific structured orientation and training curriculum?
    - Clear performance expectations and benchmarks for staff that are tracked and shared?
    - Is there adequate training provided prior to independent practice?
    - Is there a system of auditing to assure that skills are maintained?
    - Do supervisors routinely have scheduled meetings with staff?
- How has staffing changed versus program expectations over the past 5 to 10 years?
- How has employee morale been? What has employee turnover rate been and if it has been high what has been driving that?

Program Policy and Procedure Review

To evaluate policies and procedures the following factors were considered:

- What percentage of the original polices identified by the Office of Planning and Policy that needed to be created were finished?
- Were the policies and procedures, adequate, could a person perform the task by reading the policy?
- How complete was the list of policies to be created by planning and policy?
- What is the percentage of the total number of policies regardless of the form it is on had a documented revision date within the last two years in compliance with the PHAB standards?
- Do the policies that exist conform to MHD standards?

Secondary Prevention Review

The City of Milwaukee Health Department's (MHD) preliminary internal audit of its Childhood Lead Poisoning Prevention Program (CLPPP) was completed using both electronic data extracted from the Systematic Tracking of Elevated Lead Levels and Remediation (STELLAR) database and paper records from the CLPPP. The CLPPP uses STELLAR to enter blood lead levels (BLL) and to document case management services. The CLPPP primarily uses a paper filing system for environmental investigations.

Data was exported from STELLAR using the CLARION Report Writer. This software allows the user to design queries and produce reports to extract data from the STELLAR database with specific fields and under specific conditions. **It is important to note that the data presented in this report is reflective of the time the data was exported from STELLAR.** Data in STELLAR changes daily as new case reports are entered.

Case Management Preliminary Audit

It is important to note that the data used in this audit is based on a child's highest reported BLL, whether capillary or venous, in the given year. This was done to ensure that the MHD could evaluate program response based on the highest reported level for each child. As a result, some of those children may have actually had a confirmed test at a lower level.

To understand if proper case management services were offered the following reports were run in STELLAR to generate four databases:

Database 1: All records of children who received a test between 2015 and 2017, their BLL, type of test received, and basic demographic information,
Database 2: All records for children with a referral for initial Public Health Nurse (PHN) home visitation service (event code HVNIN),
Database 3: All records with a referral for initial Health Service Assistant (HSA) home visitation services (event code HVOAB), and
Database 4: All records with a record of an initial outreach letter being sent (event code LTRRE).

Databases 2-4 were based on initial referral events for interventions. This means that referrals were made to initiate the intervention, but does not indicate successful completion of the intervention. The databases also do not identify children who are receiving ongoing case management as those events are recorded under different event codes.

After the four databases were generated, database 1 was then narrowed to include only the highest reported test result in a given year for children under the age of six. Database 1 was then merged with database 2, 3, and 4 respectively based on a unique child ID. The resulting data sets allowed the MHD to determine what services a child received based on their highest reported blood lead level. Databases were sorted based on a child's test results and findings from the analysis are described below.

Client Chart Reviews: Elevated Blood Lead Levels >20 µg/dL

The STELLAR database was queried to identify cases that did not have record of a completed Public Health Nurse (PHN) home visit or appropriate follow-up attempts from 2015 through 2017. These case records were reviewed to determine if a home visit and appropriate follow up occurred. The electronic records of these cases were thoroughly reviewed by looking at events and memos in STELLAR to determine if a completed home visit and/or telephone and home visit attempts were made. The majority of the cases did receive a home visit and appropriate follow-up previously and were being monitored to ensure that lead levels were declining. Cases that were identified as needing additional follow-up have been re-assigned to a PHN.

Environmental Investigation Preliminary Audit

To identify the addresses of required environmental investigations, data from STELLAR was sorted to identify all venous tests in a given year. The data was then further sorted by reported blood lead levels to indicate those children, and the associated addresses of those children at the time of testing, at the levels requiring an

environmental investigation. A final query was used to determine if venous results in the 15 – 19 range were 90 days apart or more. This produced a list of all children and the addresses reported with that elevated BLL that should have received an environmental investigation under state statue.

To determine whether an address that received an environmental investigation met the established closure criteria, an inventory of paper records was completed. The initial inventory of paper records found, collected, and organized existing paper records, recorded information from that file in a spreadsheet, and identified the end result of the investigation at the address. This initial audit was used to determine the addresses where paper records exist for an environmental investigation having being referred. This list was merged with the list of addresses where environmental investigations occurred to identify those without paper records.

The list of addresses without paper records in the initial inventory then underwent an electronic audit in STELLAR to determine if an electronic records of a referral or environmental investigation existed. This process identified those addresses that did not have either a paper record or electronic record of an environmental investigation having occurred.

An ongoing, more robust audit of paper records is taking place to catalogue the contents and determine those addresses where the paper record is incomplete or deficient. This audit is ongoing and will produce a list of addresses where additional follow-up is required.

Environmental Chart Review Methods

A total of 320 EBL files requiring environmental investigations by state statute were found for the time period 2015-17. Files were reviewed to determine if outcomes (clearance examination) had been achieved with the property investigations. For each environmental investigation, the following should be included in the case file: 1.) Upon arrival to a property, the EBL inspector interviews the family to find possible sources of poisoning. 2.) The inspector then searches for hazards that could contribute to the poisoning of a child. Hazards can include deteriorated walls, windows, children's toys, ceramics and other items from overseas or other surfaces. If none of these are found to contain lead, then the inspector considers lead in water. 3.) The inspector takes note of the cleanliness of the home as lack of cleaning can contribute to child poisoning. 4.) On the exterior, the inspector will look for debris, leaded paint chips around the drip line of the home and bare soil as all of these areas--where a child plays--can be sources of lead poisoning. 5.) If no hazards are found, other sources of lead are investigated. For instance, other residences the child spends significant time in may require investigation as well. Due to the transient nature of many EBL families, getting all the information to complete a comprehensive investigation may be a difficult task. 6.) However, if hazards are found, interim controls are completed. This can include wet washing and/or taping deteriorated walls, window wells, jambs or other surfaces. Orders are written for lead hazards, if necessary. Property owners are responsible for all hazard repairs. If repairs to a dwelling are de minimus (disturbs less than 6 SF of interior surfaces or 20 SF of exterior surfaces) the owner may repair deteriorated surfaces without any certification, but must work in a lead safe manner. When work is complete and visually cleared, repairs wills be photographed by the inspector. If repairs are above de minimus amounts, it is recommended that the child be physically removed from the property immediately until the house is again safe. For larger repairs, the owner must obtain a Renovation, Repair and Paint (RRP) certification or hire a lead certified contractor to remedy the hazards found in the investigation. Additionally, if a project is large enough, a clearance that includes dust wipes will be performed by the city inspector.

Again, this chart review focused on finding evidence of the above activities, with close attention paid to whether or not a visual clearance or clearance wipes were necessary at the property.

[i] Wisconsin Childhood Lead Poisoning Prevention and Control Handbook. https://www.dhs.wisconsin.gov/publications/p00660.pdf

[ii] CDC. Interpreting and Managing Blood Lead Levels <10 µg/dL in Children and Reducing Childhood Exposures to Lead: Recommendations of CDC's Advisory Committee on Childhood Lead Poisoning Prevention . *MMWR*. November 2, 2007; 56(RR08):1-14;16. Erratum: Vol. 56, No. RR-8 *MMWR*. November 30, 2007; 56(47):1241-1242

[iii] https://www.edf.org/health/recognizing-efforts-replace-lead-service-lines

[iv] Milwaukee Water Works Lead Service Line Semi-Annual Update. Presented to City of Milwaukee Public Works Committee January 24, 2018.

[v] Milwaukee Water Works Lead Service Line Semi-Annual Update. Presented to City of Milwaukee Public Works Committee January 24, 2018.

Appendix C

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
WASHINGTON, DC 20410-3000

OFFICE OF HEALTHY HOMES AND
LEAD HAZARD CONTROL

May 21, 2018

Dr. Patricia McManus, RN, PHD, GCNPM
Commissioner of Health
City of Milwaukee-Health Department
841 N Broadway, 3rd Floor
Milwaukee, WI 53202

Subject: Monitoring Report for the City of Milwaukee-Health Department WILHD0290-16

Dear Dr. McManus:

The purpose of this letter is to report the results of HUD's on-site monitoring review of the City of Milwaukee-Health Department FY2016 (LHRD). The review was conducted on February 7th – 8th, 2018.

The results of our review were summarized at an exit conference that was held on February 8, 2018 with Angie Hagy, Director. Specific comments and conclusions related to each program area reviewed during our visit are contained in the enclosed monitoring report.

The primary objective of HUD's visit was to monitor compliance with grant requirements, including a limited review of the case files and financial records associated with the grant. The information contained in this report will provide insight into the City of Milwaukee-Health Department -Health Department 's compliance with the grant terms and conditions, and all requirements and conditions contained within the grant agreement.

This report contains items that require follow-up action by the grant agency. Please provide the Office of Healthy Homes and Lead Hazard Control with a response to this report within 30 days of receipt.

I look forward to our continued partnership in making housing safer for children in Milwaukee. If you or your staff has any questions regarding this report, please call me at 202-402-6585.

Sincerely,

Shannon Steinbauer, RN BSN MPH
Lead and Healthy Homes Grant Programs Division
Director

UNITED STATES DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
OFFICE OF HEALTHY HOMES AND LEAD HAZARD CONTROL

REVIEW OF

City of Milwaukee-Health Department
LEAD HAZARD CONTROL PROGRAM

CONDUCTED BY:
Shannon Steinbauer and Damian Slaughter
on
February 7th and 8th 2018

MEETINGS AND STAFF ATTENDANCE

Initial Meeting – February 7, 2018

City of Milwaukee-Health Department

Those in Attendance:
Angie Hagy (Director)
Richard Gaeta (Program Manager)
Ron Green, Lead Program Coordinator
Dale Darrow, HUD-Field Office Director
Robert Graveen, Accountant
Andre Mitchell, Lead Coordinator and Liason
Jeremy Belot, CDGA, Monitor
Bryan Fraier, Housing Authority, Project Manager

Exit Meeting – February 8, 2018
Those in Attendance:
Angie Hagy (Director)
Richard Gaeta (Program Manager)
Ron Green, Lead Program Coordinator
Dale Darrow, HUD-Field Office Director
Robert Graveen, Accountant
Andre Mitchell, Lead Coordinator Liason
Jeremy Belot, CDGA, Monitor,
Steron L. Mahar, CDGA, Director

INTRODUCTION

Under Title X of the Housing and Community Development Act of 1992 (Title X), Congress authorized the U.S. Department of Housing and Urban Development (HUD) to provide grants to States or units of local government that have approved comprehensive housing affordability strategies under Section 105 of the Cranston-Gonzalez National Affordable Housing Act (42 U.S.C. 12705). The purpose of these grants is to evaluate and reduce lead-based paint hazards in privately-owned housing. Grants for this purpose are awarded annually following a competitive application process among eligible applicants. The Office of Healthy Homes and Lead Hazard Control (OLHCHH) is responsible for managing this program on behalf of the department.

Under this program, City of Milwaukee-Health Department (the "Grantee") applied for and received the following Lead-Based Paint Hazard Control and Lead-Based Paint Hazard Reduction Demonstration grant(s):

- FY2016 (WILHD0290-16) for the amount of $ 3,399,998. The grant began on November 1, 2016 and was scheduled to end on October 31, 2019 and had completed 42% of the performance period available. The City of Milwaukee approved work plan indicates the grant has an overall goal of completing lead-based paint hazard reduction in 600 units. At the time of this review, the Grantee indicated that they have assessed, remediated, and cleared 76 units which represents [13%] of the approved work plan and performance objectives set by the grant. The grantee is currently rated "RED" based on self-reported benchmark performance standards. On the date of the monitoring visit, the Grantee had received $ 551,204.00 in funding from OLHCHH. This amount represents [14%] of the total funds available to the Grantee from OLHCHH under this grant. The Grantee is also required, by statute, to match the grant amount with at least 10% of funds from a non-federal source. The Grantee has committed $ 750,000 in matching resources. On the date of the monitoring visit, the Grantee had not been documenting matching funds and could not provide an estimate of match funding provided. As of [February 8, 2018], subsequent requests to the Grantee for cumulative match funding committed for this grant have not yet been reported to OLHCHH. *]

MONITORING OVERVIEW, SCOPE, AND METHODOLOGY

This monitoring review was undertaken by OLHCHH Programs Division Director, Shannon Steinbauer and Government Technical Representative (GTR) Damian Slaughter on February 7th – 8th, 2018. A Pre-Monitoring Evaluation Form was provided to the Grantee on February 5th in advance of the on-site monitoring review. The form was completed and sent back to OLHCHH by the Grantee on February 6, 2018.

During the monitoring review, OLHCHH staff met with Grantee staff members from the City of Milwaukee-Health Department [* and partner organizations. *]

OLHCHH monitoring activities focused on a review of grant requirements, including program eligibility and compliance, technical compliance, and grants oversight and management. OLHCHH staff also conducted a limited review of case files and financial records associated with the grant. The information contained in this report provides insight into Grantee compliance with the grant terms and conditions, and all requirements and conditions contained within the grant agreement.

The purpose of the visit was to review the grant operations in the following areas:

1. Management and Organization
2. Completeness of Database and Files
3. Outreach and Education
4. Property Eligibility
5. Production Process of Lead Hazard Control Activities
6. Financial Management

OLHCHH staff met with Grantee staff and reviewed files for properties completed and funds requested. The issues identified in this report and the conclusions drawn are based on details and information that was made available to OLHCHH staff during the course of the review.

OLHCHH staff conducted a selected file review of the Grantee's City of Milwaukee-Health Department program. This review was programmatic and focused primarily on eligibility, adherence to technical requirements, and record keeping. A financial review of the Grantee's City of Milwaukee-Health Department program was also completed and consisted of a review of selected Line of Credit Control System (LOCCS) vouchers. A complete listing of properties visited, and files reviewed is found in Attachment A. The results of this report were primarily based on the data and information that was provided by the Grantee during the course of this review.

FINDINGS, CONCERNS, RECOMMENDATIONS, AND COMMENTS

Problems identified during the review are discussed below and are labeled as a finding, concern, recommendation, or comment. A "finding" is a deficiency in program performance based on a statutory, regulatory, or program requirement for which sanctions or other corrective actions are authorized. A "concern" is a deficiency in program performance not based on a statutory, regulatory, or other program requirement. A "recommendation" is intended to provide a program improvement opportunity and prevent future findings or concerns. A "comment" is intended to point out an area that could be improved and should be corrected but can also be used to highlight Grantee strengths and positive observations. The criteria included in this report is based on the Notice of Funding Availability (NOFA) for HUD's Fiscal Year (FY) 2016 at FR-6000-N-13 Lead Hazard Reduction Demonstration Grant Program; Uniform Administrative Requirements for Federal Awards 2 CFR 200, 40 CFR Part 745; the 2012 HUD Guidelines for the Evaluation and Control of Lead Based Paint in Housing; Terms and Conditions for FY 2016 Grant Programs, and all OLHCHH Policy Guidance Documents. The report discusses four findings, two concerns, three recommendations, and two comments. The Grantee should provide a written response to this monitoring report within 30 days of the date on the OLHCHH transmittal letter. The Grantee response should identify actions which have been taken or will be taken to address the concerns and recommendations contained in this report.

Based on significant health and safety issue through program noncompliance this grant was placed on a Stop Work Order and High-Risk Designation on March 8, 2018. These findings and required actions are in addition to any special conditions placed on the grant award. In many cases the required actions reflect known actions already in motion by the grant team or correlate to actions already required to be completed by the grant program that also serve to reconcile the findings listed.

A "finding" is a deficiency in program performance based on a statutory, regulatory, or program requirement for which sanctions or other corrective actions are authorized. The following finding was identified as a result of this monitoring visit:

Finding One: Project Management and Oversight

Condition: The City of Milwaukee Lead Hazard Control Grant (MLHCG) has been under the direction of a seasoned program manager that has lead the grant program under more than one grant cycle. Under that direction there has been monitoring visit findings and reconciliation which provided learning opportunities to correct deficiencies and ask for clarifications on expectations that OLHCHH has for program implementation. The program manager has also attended required program manager school trainings that offered the same opportunities to learn and understand roles and responsibilities regarding program compliance and implementation. During this monitoring it was identified that documentation and direction was significantly lacking program compliance both in the supporting documentation of file review and observed in on site unit monitoring in which work was taking place and in which the program manager escorted and prearranged the visit in advance.

Reference: 2 CFR 200.303 (Internal Controls), FY2016 Terms and Conditions Article 22, FY LHRD NOFA Section V.1.c

Effect: The existing program leadership is not administering the grant within the terms and conditions of the grant which includes compliance with all NOFA program requirements and OLHCHH Program Policy Guidance. In addition, there are no levels of administrative checks and balance in place to ensure that full compliance occurred and was documented during required elements of the unit production process.

Impact: There is a possibility that the safety of homeowners and occupants may be have been compromised during completion of work by both owners and contractors, ineffective methods of lead hazard control was promoted and accepted, ineligible cost was incurred, reimbursed, and reported for units that did not meet all of the eligibility requirements for this grant program.

Within 30 Days:

1. The Program Manager and Program Director will meet with the GTR bi weekly for a period of no less than 2 quarters to ensure the work plan and implementation of the grant are in compliance and to provide individual opportunity to clarify roles and expectations of MLHCG staff during the grant administration.
2. All key staff will have the required training and certification to effectively administer the program based on their job description and role.
    a. Copies of training and certifications will be sent to the GTR for record retention.
        i. Lead Inspector Risk Assessors and Lead Abatement Supervisor Certification will be required from the program manager, and all field staff conducting unit monitoring and lead inspection risk assessments, scope writing, or occupant protection plan review.
        ii. In addition, any persons that are identified as an oversite or approver of these activities listed above in 1(a).i; must have the certifications completed and submitted to the GTR for record retention.
3. All staff will be required to attend all Grantee Webinars offered by OLHCHH Programs Division for the duration of the grant performance period. Webinars are recorded and made available and attendance records are kept. A list of required staff will be determined and used to show supporting documentation of this requirement.
4. Any new staff added to the MLHCG program in key roles of the unit production process identified by the GTR; or any that serve in areas affected in 2(a)i., ii above will be required to attend the New Grantee Orientation Sessions and or Program Manager School whichever is closer in date to the turnover in team assignments. Due to the continued significant turnover encountered in this program to date; at some point this travel requirement may have to be met outside of awarded grant funds due to the administrative cost burden it will potentially have on the grant budget.

Finding Two: Poor Production Performance

Condition: The MLHCG has been consistently behind in benchmarks in this grant award. At the time of

monitoring the following progress had been documented in the Healthy Homes Grant Management System.

Period of Performance (POP) This grant has currently completed **42%** of the total POP	Quarterly Score (indicative of whether the program met their own self-selected benchmarks)	Assessments= Total Goal is 630 (total completed/by goal= total percent completed toward goal)	Units+ Total Goal is 600 (total completed/by goal= total percent completed toward goal)	LOCCS Draws= Goal is $3,400,000 (total completed/by goal= total percent completed toward goal)	% of POP completed at end of the quarter (total completed/by goal= total percent completed toward goal)
Q5 (Oct-Dec 17)	**77**	**148/23%**	**76/13%**	**$501,927/15%**	**42%**
Q4 (1year mark)	**65**	**111/18%**	**39/7%**	**$193,580/6%**	**33%**
Q3 (Apr-June 17)	**58**	**70/11%**	**15/3%**	**$69,140/2%**	**25%**

Reference: 2 CFR 200.303 (Internal Controls), FY2016 Terms and conditions Article 39(a), FY2016 LHRD NOFA V.5.2

Effect: The program has failed to meet self-selected benchmarks over consecutive quarters. In addition, the grant shows significant delays in overall expected performance based on the timeline elapsed within the available period of performance in comparison to progress made toward benchmarks. The lack of progress is contributed to the lack of program management, planning and oversite, specific political activity surrounding lead poisoning in the city, as well as approach barriers that are no longer effective and result in unnecessary time and safety issues to be placed on owners.

Impact: The program is a significant risk to OLHCHH based on performance alone. Without process review and resources management the grant will likely fail and will prevent the City from reapplying for OLHCHH funds in the future.

Within 30 days:

1. The program manager will submit for review and approval to the GTR a benchmark revision request that reflects the approach the grant is taking to bring the program on track with benchmarks.
    a. Benchmarks will reflect the analysis of:
        i. Average cost based on scope including more to contractors than before
        ii. Timeline of process to ensure all elements of the unit production process is accounted for
        iii. Peek performance of contractors to complete and clear units post assignment
        iv. Current pipeline of applications or interest into the program
2. The MLHCP will provide an organizational chart that supports full staffing needs of the unit production process detailed in the updated and approved work plan.

Within 45 Days:

1. Full staffing with qualified, trained, and certified (where applicable) persons to fulfill the program needs for all steps of the unit production process will be in place as documented in the approved work plan will be in place with training completed; "ready for work"
2. Full support of this staffing by MLHCP through documented letters of commitment to retain the trained expertise in these roles until the grant is fully meeting benchmarks consistently and a change in resource direction is justified and approved by the GTR.

Finding Three: Monitoring of Contractor Performance (occupant, owners and worker safety)

Condition: The MLHCP has a history of issues identified during monitoring visits previously completed of past awards regarding insufficient supporting documentation completed and present in the unit file regarding unit monitoring of the scope of work identified in the LIRA was completed in activity compliance, on time, and within limitations of the contract for the unit. Though efforts have been made by the program to improve the documentation; the practice of the contractors and owners completing the work are not incompliance per the issues visible during unit walk throughs completed as part of the monitoring visit.

Reference: Title X Section 1011.e.5, Lead Safe Removal Rule for the State of Wisconsin, DHS 163; 24 CFR Part 35, 2 CFR 200.318(a)(b)(c) (General Procurement Standards) and 2 CFR 200.328 (Monitoring and reporting program performance), 40 CFR 745.227.e.5(i-ii); RRP Inspection Manual Chapter 2 page 12-14; 2012 HUD Guidelines Chapter 2 F (1-2), Chapter 11Page 5(3), 2016 LHRD NOFA III.C.4(v), FY16 Terms and Conditions Article 20

Effect: Both owners, occupants, and contractors have been potentially exposed to lead dust hazards due to scope of work assigned, lack of onsite monitoring of work being completed for containment compliance.

- The scope of work completed by owners is of particular concern that includes issues with policy and protocol for how owners scope of work was documented, training verified to be eligible to complete work on investment units, protocol for when the work could start and when it was monitored or cleared and what the specific components, specifications and scale of the owner's work were not clearly documented in the unit file.
- For contractor scopes of work; the unit monitoring form created as a result of past monitoring findings was not being completed consistently and present in files, in some units it wasn't being utilized at all.
- The contractor and program manager did not respond or justify compliance issues related to containment and partial clearances witnessed during the onsite visit.

Impact:

- Owner Scope of Work: During the walk through of the unit in progress in February the owner of the unit was present and described scraping and painting the exterior components including siding and trim. The owner stated that the work had been done months ago. There were no clearance or monitoring notes in the file or reported during the discussion. The Lead Safe Removal Rule for the State of Wisconsin, DHS 163 details the standards for investment property owners and includes requirements for RRP at a minimum standard certification when disturbing lead paint

over 20sq/ft on the exterior or 6 sq./ft on the interior. No record of the owner's credentials was in the unit file or reported during the discussion. The scope of the work reported to be completed "the entire exterior" was not clearly detailed in any scope of work as under or over the threshold of the law. The owner scope of work was not clearly supported by the LIRA to be eligible components or even that it was included in the overall planned scope of work in clearance reports. It is reasonable to believe the owner scope of work reported would have exceed the threshold for lead paint removal certification requirements under Federal and State of Wisconsin Lead Activity regulations.

- Contractor Lead Safe Work Practices: The entire construction crew (5 or more people) was walking through the home with materials in addition to actively working on window completion activities with tools on components not yet installed with no containment secured in the house. Personal belongings were not secured with 6 mil poly double taped to floor, bedroom doors open and beds with blankets/clothes open to dust and debris. The program manager and the contractor made no justification or excuses for why work was continuing without containment.

Prior to the STOP WORK ORDER BEING LIFTED:

1. A mandatory meeting with all of the contractors selected to work under this grant award will be held to discuss the findings of this report and the expectations there are to ensure the issue is not repeated on any unit in the future.
2. Documentation will be obtained that each contractor understands the State of Minnesota Lead Activities Regulations as well as HUD/OLHCHH requirements for this grant program.

Within 30 days:

3. Policy and Procedures for unit monitoring will be updated to reflect compliant practices that include timeline, accountable persons, and relevant items that will be a minimum required to be monitored for every unit reported under this grant award. This will be included in grant documents submitted for review and approval by the HUD assigned GTR.

Finding Four: Documentation Collection and Planning

Condition: The documentation reviewed does not show a compliant unit production and monitoring process from intake to clearance as expected per regulations and program policy. The MLHCP has insufficient supporting documentation that the unit production approach was completed as indicated in the work plan or policies and procedures.

Reference: 2 CFR 200.328 (Monitoring and reporting program performance), 40 CFR 745.227.e.5(i-ii), FY 2016 LHRD NOFA III.C.4(n), OLHCHH Program Policy 2013-01, 2014-01, 2016-01(revised 2018-01) 2012 HUD Guidelines Chapter 7,8 and 15.

Effect: Significant ineligible cost has been identified as a result of insufficient supporting documentation of compliant unit production requirements; as evidenced by:

- Lead Hazards identified in the Lead Inspection Risk Assessment (LIRA) were not clearly included in scopes of work assigned and cleared which could allow lead hazards to have remained in the property.
- Scopes of work documents are not descriptive enough to support the materials, methods, or intended interventions by room and component and cannot be correlated to the LIRA reports.
- Occupancy Protection Plans were not noted or used for relocation planning
- Notice to Proceed did not include owner scopes of work.
- There was no protocol written or followed for when or how the owner scope of work was to be authorized, monitored, documented or cleared
- Clearance Reports do not denote or reference the scope of work or LIRA, identify where samples were taken in all cases, describe the visual clearance result or date, or clearly show a pass or fail overall in determination.
- Specifically, the following documents were shown to miss significant elements that are required per regulation, policy or general eligibility verification elements that would make the unit ineligible for grant program reimbursement or reporting toward required benchmarks. The result of these issues would be ineligible cost due back to HUD if completed or pending units cannot be reconciled by file and unit review of documentation to ensure all elements were verified and the unit was completed per the required regulatory and policy requirements.
    - Intake and income verification documents
    - Tier 2 documentation
    - LIRA
    - Scope of work
    - Procurement for unit work documentation
    - Notice To proceed to owners
    - Monitoring of owner scopes of work
    - Occupant Protection Plan
    - Relocation Needs Assessment or justification
    - Homeowner/occupant agreement
    - Monitoring of unit work site
    - Clearance Reports
    - Abatement reports
    - Healthy Homes Supplemental Funds Report

Within 30 Days:

1. The MLHCP will provide the complete file and analysis of missing documentation that resulted from the review required in action #5 of the High Risk Special Conditions.
2. MLHCP will provide a timeline and work out strategy including who from the trained and certified staff; will be tasked to complete the corrections needed in the unit file and onsite at each unit address as applicable to make the unit fully eligible. This detailed plan including estimated costs will be provided the GTR for approval. This activity progress will be a required report out in the bi weekly status meetings with the GTR once approved.

Within 90 Days:

1. The GTR will perform a desk audit of up to five unit files selected by HHGMS reports to ensure the required elements have been corrected and the file reflects a fully eligible unit with supporting documentation.
    a. IF the desk audit does not reflect a complete and compliant file for each unit selected the desk audit will be repeated in 30 days.
    b. If the desk audit fails the second time additional action could be taken and recommended by the GTR including Stop Work, Stop Payment, or termination of grant for noncompliance.

A "concern" is a deficiency in program performance that is not based on a statutory, regulatory, or other program requirement. The following concerns were identified as a result of this monitoring visit:

Concern One: Testing Water for Lead

Issue: The leadership team indicated that there was some political pressure and expectation to routinely test for lead in water for units completed under this award.

Effect: The guidance provided to the leadership team was that even though testing of water is eligible under the lead funding there are no interventions eligible to remediate in any way a water source that is found or suspected per Title X limitations of this funding. Healthy Homes dollars can be utilized in there is a specified priority identified in the work plan to address the issue with triggers and scale of interventions that will be applied to each unit equally; OLHCHH Policy 2016-02 and the revised OLHCHH Policy 2018-01 for guidance on this issue further.

Minimum Requirement: Establish and provide documentation of a solid collaboration with the City of Milwaukee Water program to ensure the education that is made available to the public with results is consistent and reflects resources that are readily available. Amend the work plan and HH budget to direct funds to remediation options that are reasonable and not beyond the scope of the program. Provide notice to health care providers and encourage blood lead testing in association with education even when remediation is not provided or justified through an amended work plan priority approach.

Concern Two: Overall approach for the Intake Process

Issue: The leadership team for MLHCP indicated that they would like to prioritize Elevated Blood Lead (EBL) Cases as recipients of the grant award as a priority population to outreach to.

Effect: The NOFA in which the MLHCP has applied indicates that EBL children should be prioritized in the communities they serve so this request fits to the expectations of the intended mission of the program. It is understood that the State and or City of Milwaukee has lead laws that require property owners to address lead hazards when an EBL child is present at certain thresholds. The cost is the burden of the owner and the child's unit is made lead safe.

Minimum Requirement: It is the expectation that the MLHCP program team will identify the best way to collaborate with the legal protocol set in place to best utilize resources available for lead remediation. The work plan goals and target population as well outreach and intake process will have to be amended to include a clear collaboration in addition to targeted neighborhoods in the jurisdiction to ensure the pipeline is full of eligible application to prioritize and complete.

Concern Three: 2014 Grant Closeout

Issue: It is known that the 2014 unit files associated with the award in closeout has similar if not significantly more errors and omissions in documentation.

Effect: It is known that if the documentation cannot be amended through review and reassessment by staff that there could be considerable ineligible cost associated with this grant that would be due back to the U.S. Treasury.

Minimum Requirement: The administrative timeline for the closeout for the 2014 grant include a full review of all completed unit files for the same issues listed in Finding 4 in full. A workout plan and assessment of ineligible cost that is not reconcilable through amended documentation will be a requirement of the closeout by the GTR.

A "recommendation" is intended to provide a program improvement opportunity and prevent future findings or concerns. The following recommendations are being made as a result of this monitoring visit:

No recommendation is noted

LIST OF UNIT FILES

3109 N Sherman BL
3144 N 56th Street
2045 S 31st Street
2412 W. McKinley Ave

LIST OF UNITS VISITED

2941 N 44th Street – In progress
3023 W. Lincoln Avenue - Complete

Appendix D

State of Wisconsin

Department of Health Services

Division of Public Health

Bureau of Environmental and Occupational Health

Lead and Asbestos Section

Report on the Review of the

City of Milwaukee Health Department

Childhood Lead Poisoning Prevention Program

May 2018

P-02161 (05/2018)

This report is prepared by:

Lead and Asbestos Section
Bureau of Environmental and Occupational Health
Division of Public Health
Department of Health Services
1 W Wilson Street
Madison WI 53703

May 31, 2018

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Acronyms

BLL – Blood lead level

DHS – Wisconsin Department of Health Services

EBLL – Elevated blood lead level as defined in Wis. Stat. ch. 254 (one venous blood test of ≥ 20 mcg/dL, or two venous blood tests of ≥ 15 mcg/dL taken at least 90 days apart)

HHLPSS – Healthy Homes and Lead Poisoning Surveillance System, the CDC database that will replace STELLAR (see below) for all health departments

HSA – Health Services Assistant, a MHD paraprofessional outreach worker who conducts home visits and provides limited education and cleaning in children's homes.

LHD – Local Health Department

mcg/dL – Micrograms per deciliter, units used to measure the amount of lead in blood

MHD – City of Milwaukee Health Department

MHD CLPP Program – City of Milwaukee Health Department Childhood Lead Poisoning Prevention Program

PHN – Public Health Nurse

STELLAR – Systematic Tracking of Elevated Lead Levels and Remediation, the electronic database that houses blood lead test results, nursing case management, and environmental investigation activities

WCLPP Program– Wisconsin Childhood Lead Poisoning Prevention Program

WCLPP Program Handbook – The Wisconsin Childhood Lead Poisoning Prevention and Control Handbook for Local Public Health Department, P-00660 (2014 edition)

Background

On January 29, 2018, the City of Milwaukee Health Department (MHD) published a self-assessment of its Childhood Lead Poisoning Prevention (CLPP) Program. This assessment reviewed various aspects of its operations, including its primary and secondary prevention programs, and operational policies and procedures. MHD discovered inadequacies in program capacity, operations, staff training and policies. The Wisconsin Department of Health Services (DHS) and MHD determined these self-identified deficiencies were systemic enough to warrant additional review of the MHD Lead Program by DHS. The following section provides an overview of DHS and MHD responsibilities for lead investigations and describes the objectives, scope, and approach of the review.

Department of Health Services

DHS administers and enforces the provisions of Wis. Stat. ch. 254, Environmental Health, statewide for childhood lead poisoning prevention and intervention. Wis. Stat. § 254.152 allows DHS to designate local health departments (LHDs) as its agents in administering and enforcing ss. 254.11 to 254.178. DHS annually provides funding to LHDs to carry out the responsibilities as an agent.

The Wisconsin Childhood Lead Poisoning Prevention (WCLPP) Program provides guidance to LHDs to carry out the statutorily required responsibilities to support the elimination of childhood lead poisoning and the early detection and treatment of children with lead poisoning. Services provided by LHDs must be in compliance with Wis. Stat. ch. 254 and Wis. Admin. Code chs. DHS 163 and 181.

The WCLPP Program provides the standards of practice for LHD agents to follow for nursing and environmental case management of lead poisoned children, including criteria for opening and closing cases and environmental interventions. These standards are clearly delineated in the Wisconsin Childhood Lead Poisoning Prevention and Control Handbook for Local Public Health Department, P-00660 (2014 edition) (WCLPP Program Handbook).

Milwaukee Health Department

The MHD CLPP Program administers a full-service lead poisoning prevention program that serves residents in the City of Milwaukee. As a full-service program, MHD maintains and updates its own STELLAR database that houses blood lead test results, nursing case management, and environmental investigation activities. MHD CLPP Program divides services into primary prevention and secondary prevention programs. The primary prevention program offers window replacements to eligible properties in zip codes with the highest reported numbers of lead poisoned children in an effort to make houses safer *before* children are lead poisoned. Services may also be offered to owners of homes with a child already identified with lead poisoning in an effort to protect that child and future children from being exposed to lead in the dwelling. MHD secondary program activities include tracking and surveillance of blood

lead test results, nursing case management, and environmental interventions for children identified with lead poisoning. MHD services begin at blood lead levels (BLLs) of 5 mcg/dL or more. Services are based on a child's BLL and may include mailing letters to parents and guardians, home visits by a health services assistant (HSA), nursing case management, environmental investigation to identify lead hazards, and orders to remediate or abate identified lead hazards.

Objectives of DHS Review

The objectives of this review are to:

- Provide an objective review of the MHD CLPP Program policies, procedures, and practices.
- Determine compliance with the DHS program quality criteria.
- Determine if program documentation supports nursing case management compliance.
- Determine if program documentation supports environmental investigation compliance.
- Outline corrective actions and program improvements needed.

Scope and Approach

The DHS review of the MHD CLPP Program began after meeting with MHD leaders and CLPP Program staff on February 22, 2018.

DHS staff reviewed the MHD self-assessment report and identified several areas of concern that were used to help focus the state's review. Intervention information provided in the MHD report indicated that the policy for intervention was not following statutory requirements and that some children may not have received required intervention services. Therefore, DHS focused on two main areas of concern in the review:

1. Milwaukee CLPPP secondary prevention program responses to children with elevated blood lead levels, including nursing case management and environmental investigations.
2. Program operational policies and procedures for the MHD CLPP Program.

DHS reviewers chose the period from January 1, 2012, through December 31, 2017, for review. This timeframe was determined based on the MHD "Intervention Levels for Children by Blood Lead Level, 2015-2017" chart found in Table 4.1 of the MHD self-assessment report and on the MHD website. Because this intervention protocol was not consistent with statutory requirements, DHS wanted to review cases of children with elevated blood lead levels (EBLL) from both before and after this protocol was adopted to determine if and how the protocol may have affected these children.

DHS began its program review by requesting records for Milwaukee children who met the statutory definition of EBLL, which is one venous blood test of ≥ 20 mcg/dL, or two venous blood tests of ≥ 15 mcg/dL taken at least 90 days apart, from January 1, 2012, through December 31, 2017. There were 491 children identified as meeting the statutory definition of EBLL during this time period.

Of the 491 Milwaukee children, 37 met the EBLL definition of two venous blood lead test results ≥15 mcg/dL at least 90 days apart during this timeframe. All 37 of these targeted EBLL cases were reviewed.

A second Milwaukee STELLAR query identified 454 children who first met the definition of an EBLL based on a single venous blood lead test result of ≥ 20 mcg/dL. An initial group of 25 records of these children first identified with an EBLL between May and December of 2017 was selected for review. 50 additional records were selected using random number generation from the entire list of 454 child records. These records were selected to be representative of the broader time range back to 2012. Of these, four were determined to be duplicates of records already selected and were removed, leaving 46 records in this last group. A total of 108 EBLL records were thus selected for in-depth review.

Findings and Program Requirements

This section provides findings of the DHS review team and required actions for correction. It provides the description of the conditions and practices found based on a review of the MHD CLPP Program STELLAR database and program files along with a review of other documents. These documents included the MHD self-assessment report published on January 29, 2018, titled "MHD Childhood Lead Poisoning Prevention Program: Assessment of Operations and Recommendations for Corrective Actions," the 2017 Program Quality Criteria, Wis. Stat. ch. 254, the WCLPP Program Handbook, and other relevant documents.

Program Administration (PA) Findings

Finding PA1: Existing program policies and procedures could not be provided to DHS reviewers by the MHD.

Finding PA2: Annual program objectives with outcome measurements could not be provided to the reviewers by the MHD.

Finding PA3: The MHD protocol provided for EBLL intervention (from the MHD website and Table 4.1 in the MHD self-assessment) does not comply with Wis. Stat. ch. 254 requirements, 2017 Program Quality Criteria , or the WCLPP Program Handbook policies for interventions for children with two venous BLLs ≥ 15 mcg/dL at least 90 days apart. This MHD protocol for nursing case management and environmental investigations for EBLL cases with repeat BLLs ≥15 mcg/dL appears to have changed in mid-2016.

Finding PA4: Nursing case opening and closing criteria were not provided and a review of child records found inconsistent and noncompliant practices used by PHNs.

Finding PA5: Environmental investigation opening and closing criteria could not be provided.

Finding PA6: Files for nursing cases and environmental investigations were not available upon request.

Finding PA7: Data entry into the STELLAR database was often inconsistent, unclear, and in conflict with information in the paper file for both environmental investigations and nursing follow up.

Program Administration Corrective Actions

1. Develop and implement written policies, procedures, and protocols or standards of practice to guide the daily work of all aspects of the program. [PA1]

2. Develop and maintain annual program objectives with outcomes measurements documented. [PA2]

3. Remove or revise the MHD Intervention Levels for Children by Blood Lead Level, 2015-2017 protocol posted on the MHD website. This protocol does not comply with Wis. Stat. ch. 254 requirements, 2017 Program Quality Criteria and the WCLPP Program Handbook. [PA3]

4. Develop or adopt criteria for opening and closing nursing case management files for children and environmental investigation files for addresses that meet or exceed EBLL requirements. [PA4 and PA5]

5. Develop and maintain a central filing system for nursing case management files, environmental investigation files, and other key records of the program. [PA6, NC1, EI1]

6. Develop and implement written protocols for entering nursing and environmental investigation information into the childhood lead database that ensures consistency between information in the paper file and in the database. [PA7]

7. Develop and implement written protocols for record-keeping that include required documents for environmental investigation files (including the risk assessment report, written orders with work specifications, and clearance report as required). [EI5]

Nursing Case Management (NC) Findings

Of the 108 records selected for review by DHS that were created by MHD between January 1, , and December 31, 2017, the following was discovered:

Finding NC1: Nursing case files were missing.

- Only 46% of the nursing files requested (50 of 108) could be provided for review.

- 6% of the nursing cases (7 of 108) had neither a paper file **nor** a nursing case record opened in STELLAR.
- The paper case files that were reviewed provided comprehensive documentation of the nurses' findings and interventions.

Finding NC2: Public health nurse (PHN) case management was not initiated for all EBLL cases.

- 94% of cases (101 of 108) had nursing case records opened in STELLAR.
- Before June 1, 2016, PHN case management was often initiated before the child had reached the statutory definition of an EBLL, e.g. after the first venous ≥15 mcg/dL .
- Before June 1, 2016, PHN case management was initiated for all 25 children with repeat BLLs of 15-19.9 mcg/dL.
- After June 1, 2016, PHN case management was not initiated for the 12 cases identified with repeat BLLs of 15-19.9 mcg/dL. One child's case was not opened until the child's BLL exceeded 20 mcg/dL, three received HSA home visits, and one refused an HSA visit. The remaining seven had no case opened.

Finding NC3: PHN home visits were not conducted for all EBLL cases.

- 81% of cases (87 of 108) received a PHN home visit.
- 16% of cases (14 of 87) received the PHN home visit before the child's BLL had reached the statutory definition of an EBLL, e.g. after the first venous ≥15 mcg/dL, but no home visit was conducted after the child reached the EBLL definition.
- 5% of cases (5 of 108) had a home visit by an HSA, and not a PHN.
- 15% of EBLL cases (16 of 108) had no home visit recorded (PHN or HSA), although several unsuccessful home visits and telephone attempts were documented in the STELLAR records.

Finding NC4: Nursing case closure is inconsistent and not in compliance with state program minimum EBLL case closure criteria.

- 70% of case records (70 of 101 opened cases) had documentation in the case events that PHN case management was completed and closed.
  - 91% of cases closed to PHN case management (64 of 70) did not meet the state minimum BLL criteria for case closure, i.e. 2 venous BLLs <15 mcg/dL at least 6 months apart. In most cases the PHN closed the case when the BLL started to decline from previous levels.
  - In 16% of closed cases (11 of 70), the child's BLL increased to ≥ 15 mcg/dL after case closure and the PHN did not reopen the case.
  - 43% of cases were closed to PHN case management (30 of 70) even though BLLs were ≥15 mcg/dL at closure (ranged from 15 mcg/dL to 36.3 mcg/dL).
- 38% of STELLAR case records (38 of 101) were closed.

- 79% of closed STELLAR case records (30 of 38) had the reason of "closure criteria met" but the criteria were not provided.
- 83% of these records (25 of 30) did not meet the state minimum case closure BLL criteria.

Nursing Case Management Corrective Actions

1. Review the 491 EBLL cases identified in MHD between January 1, 2012, and December 31, 2017, to identify and ensure nursing case management is provided for all children who should have had these interventions but who (1) did not receive them, (2) did not receive all required interventions, or (3) had their cases closed before meeting minimum closure criteria. These include the 37 EBLL cases based on two venous BLLs ≥15 mcg/dL and the 454 EBLL cases based on one venous BLL ≥20 mcg/dL. [NC1, NC2 and NC3]

2. At a minimum, initiate nursing case management for all children with two venous BLLs ≥15 mcg/dL that were drawn at least 90 days apart or one venous BLL ≥20 mcg/dL per the WCLPP Program Handbook and the 2017 Program Quality Criteria . [NC2]

3. Conduct nursing home visits for all children identified with an EBLL as specified in the WCLPP Program Handbook. [NC3]

4. Develop and implement nursing case closure criteria that meet or exceed state program minimum case closure criteria as specified in the WCLPP Program Handbook.[NC4]

5. Develop and implement protocols to reopen closed nursing cases when the child has another EBLL. [NC4]

Environmental Investigation (EI) Findings

Of the 108 records selected for review by DHS that were created by MHD between January 1, 2012, and December 31, 2017, the following was discovered:

Finding EI1: Environmental investigation files were missing.

- 45% of primary address files (72 of 161) were able to be provided to the reviewers.
- 22% of the primary addresses (35 of 161) had neither STELLAR notes nor a paper file.

Finding EI2: Environmental investigations were not conducted for all EBLL cases.

- 24% of children's initial primary addresses (26 of 108) had no record of an environmental investigation being conducted.
- 51% of new primary and supplemental addresses (30 of 59) had no record of an environmental investigation being conducted.

Finding EI3: Files had no documentation that a full lead risk assessment was conducted.

- None (0%) of the 108 reviewed records had a completed risk assessment report filed.

Finding EI4: Environmental investigators did not provide a lead clearance report.

- None (0%) of the 108 reviewed records had a completed clearance report filed.
- 19% of environmental investigations that included ordered lead abatement (11 of 58) were closed before clearance wipe results were received.
- 26% of environmental investigations that included ordered lead abatement (15 of 58) were closed indicating remediation completed with no evidence in the file that clearance had been conducted (i.e., no paper file or no dust wipe results).

Finding EI5: Paper records had incomplete supporting documentation of the investigation.

- 12.5% of the reviewed paper records (9 of 72) noted samples were taken but there were no lab results in the file.
- 51% of reviewed paper records (37 of 72) had lab results with no sample location or reason provided for sample collection.
- 25% of reviewed paper records (18 of 72) had no lab results and no documentation of samples being taken.
- None (0%) of the reviewed paper records (0 of 72) included a completed risk assessment or clearance report.
- None (0%) of the reviewed paper records (0 of 72) included XRF results, although one file indicated an inspector had used an XRF analyzer.
- Reviewers found that many files did not have enough documentation to determine if hazards were found by the environmental investigator. Conclusions could not be drawn about the status of a property.

Finding EI6: Orders were not always written when hazards were found or did not include remediation of all identified hazards.

- 18% of address files reviewed (13 of 72) had hazards but no orders were issued.

Environmental Investigation Corrective Actions

1. Review the 491 EBLL cases identified in MHD between January 1, 2012, and December 31, 2017, to identify and ensure environmental investigations are provided for any of the EBLL cases that did not receive required services. These include the 37 EBLL cases based on two BLLs ≥15 mcg/dL and the 454 EBLL cases based on one BLL ≥20 mcg/dL. [EI2, EI3, EI4]

2. Develop and implement program criteria that require conducting a complete lead risk assessment and provision of a full lead risk assessment report for each address associated

with an EBLL case, as referenced in the 2017 Program Quality Criteria and described in the WCLPP Program Handbook. [EI2, EI3]

3. Develop and implement program criteria that require conducting a complete lead clearance and provision of a full lead clearance report for each completed lead hazard remediation, as required under Wis. Admin. Code ch. DHS 163, for each lead clearance conducted. [EI4]

4. Develop and implement program criteria that require written orders for each property where a lead hazard is identified as required under Wis. Stat. ch. 254. [EI6]

Other Observations and Concerns

DHS believes the issues described below are also indicative of program deficiencies and should be further reviewed and addressed by the MHD.

1. Environmental investigators allowed an owner to do work to correct identified hazards with or without writing orders. No documentation of training and certification of the owner was provided in the record.

2. Many orders only included window work and sometimes porches. In several instances, no other work was ordered even when photos showed deteriorated paint in other areas of the property or dust wipe samples indicated the presence of lead hazards. It is impossible to determine if properties received the appropriate lead hazard remediation to make the properties lead-safe.

3. An environmental investigator did not complete an environmental investigation when referring a property into the primary prevention program. The program then provided no information back to the investigator about the status or outcome of that property in the primary prevention program. Investigations were closed with no follow up of whether the property was ever remediated and cleared.

4. An environmental investigation was not conducted for a child referred to Child Protective Services.

5. An environmental investigation was administratively closed when a new owner didn't comply with existing orders.

6. There were instances when PHNs provided referrals to the environmental investigators to initiate the environmental investigation; however, there was no documentation that an environmental investigation was ever conducted.

7. HSA interventions appeared to be ineffective in some cases and may have even delayed decline in a child's BLL. DHS reviewers believe a more in-depth review of the effectiveness of the HSA program by MHD is needed.

Summary

This review focused on the performance of the MHD CLPP Secondary Prevention Program and cannot draw conclusions about other aspects of the MHD Lead Program or its overall capacity to meet statutory requirements and standards of practice. DHS substantiated many of the findings of the MHD's self-assessment, including insufficient policies and procedures to assure appropriate program administration, lack of integration between the primary and secondary prevention programs, insufficient documentation and record-keeping, and failure to provide required interventions for all children identified with EBLLs.

DHS also found program deficiencies not discussed in MHD's self-assessment report, including case management policies that are not in compliance with the requirements of Wis. Stat. ch. 254, the 2017 Program Quality Criteria, and the WCLPP Program Handbook.

Documentation of environmental investigations and nursing case management was poor or missing. This resulted in poor or no documented support for decisions made regarding many EBLL cases. This was evident in three areas: (1) PHN case openings and closures did not follow minimum state criteria, (2) environmental investigations did not have supported decisions for issuing or not issuing orders for a property, and (3) investigations were closed without clear documentation of the reason. Consequently, DHS found a number of children who did not receive required case management and follow-up and properties that did not receive the environmental investigations and remediation needed to ensure a lead-safe environment.

No single environmental investigation file reviewed by DHS was complete and able to fully support the actions and decisions of the MHD investigators. Lead risk assessment reports and clearance reports were not present in the records. STELLAR entries for environmental investigations were incomplete and provided little or no detail. When there were entries, they were inconsistent indicating a lack of protocols or a failure to follow them.

PHN case management files, where provided, were generally complete and informative about the progress of cases. However, PHN case management was sometimes closed for further PHN intervention and not reopened when a child's BLL climbed back into EBLL range, or PHN cases were closed before the child met minimum state case closure criteria.

Most notable was the finding that MHD CLPP Program policies and procedures appear to have changed significantly in mid-2016. The new policies did not adhere to state statute that requires environmental investigations for children who have two venous BLLs of ≥15 mcg/dL taken at least 90 days apart. The DHS review found that these children, beginning around June 1, 2016, were no longer being provided the environmental investigations and PHN case management required for a child with an identified EBLL.

These observations indicate the overall lack of consistent program policies, procedures, and standards of practice needed to ensure program compliance and interventions for all children

who require it. The inability to provide program files is also an indication of a program lacking standard systems of operation necessary to meet program administration requirements.

MHD Plan of Correction

The MHD shall provide a comprehensive plan of correction addressing each of the findings to DHS for review and approval by June 30, 2018. DHS recommends that the MHD plan of correction also takes into consideration the observations and concerns identified by the DHS reviewers and address them in the plan. Once received, DHS will review and provide feedback and any assistance needed to correct or improve the plan for final approval.

Wis. Stat. ch. 254 and the WCLPP Program Handbook may be of assistance to the MHD in developing and preparing its plan of correction. At a minimum, MHD policies, protocols, and criteria must meet Wisconsin statutory requirements. The resources provided below may assist MHD in developing its plan of correction.

Resources

1. **Medicaid reimbursement**: DHS recommends that MHD pursue the appropriate billing of Medicaid-eligible activities as a means of supporting program resources.

2. **Training for MHD CLPP Program staff**: The DHS WCLPP Program can assist with specialized training for MHD program staff, especially in environmental investigation expectations, lead risk assessment, and lead clearance protocols.

3. **Consultation**: DHS can provide assistance with plan development and consultation on program implementation.

4. **MHD/DHS joint inspections and investigations**: DHS has found great value in conducting joint inspections, risk assessments, and clearances with LHD partners and would like to see this continue with MHD.

DHS will monitor and review MHD's implementation of its approved plan of correction and provide ongoing feedback and support, as needed. DHS will also provide ongoing monitoring of MHD CLPP Program interventions and case management. This includes working with the program to ensure all EBLL cases and addresses have been appropriately opened, managed, investigated, and remediated; and that cases and investigations meet the closing criteria before being closed.

Appendix E: Items Reviewed

This document provides a non-exhaustive list of the documentation reviewed in the course of the Public Health Foundation's audit of the Milwaukee Health Department (MHD) Childhood Lead Poisoning Prevention Program (CLPPP).

City of Milwaukee CLPPP Reports, Letters, and Documents

- City of Milwaukee Board of Health Legislation – February 2019
- City of Milwaukee Community Development Grants Administration Request for Proposals – November 2018
- City of Milwaukee Home Visiting Resolution – July 2018
- City of Milwaukee Ordinances
- Grant Agreement between the State of Wisconsin Department of Health Services (DHS) and Milwaukee City HD for 2019 – January 2019
- HUD Assistance Award/Amendment – Removal of Suspension of Work Designation – December 2018
- HUD Healthy Homes Monitoring Visit Notification – May 2018
- HUD High Risk Designation Recommendation and Stop Work Order for City of Milwaukee Health Department – March 2018
- HUD Monitoring Report for the City of Milwaukee Health Department – May 2018
- HUD Removal of Stop Work Order – December 2018
- HUD Request to Lift Stop Work Order and Update Benchmark Request – February 2019
- MHD Draft Corrective Action Plan – July 2018
- MHD Home Environmental Health (HEH) Department Policies and Procedures Tracking List – October 2019
- MHD HEH Organization Chart(s) – August and October 2019
- MHD's HUD Lead Hazard Reduction Grant Final Report, 2014
- MHD HUD Performance and Status Reports, Various
- MHD HUD Program Administrative Work Plan 2018
- MHD's HUD Work Plan Benchmarks - 2019
- MHD Prioritization Schedule of Environmental Properties – September 2018
- MHD Request to Lift Housing and Urban Development (HUD) Stop Work Order Letter – December 2018
- MHD's Workflow Program Guide - 2019
- MHD Status Reports to WI DHS
- MHD Voice Survey Results Presentation - 2018
- MHD Workforce Development Plan, 2018-2020
- Milwaukee Water Quality Task Force Final Report and Presentation – April 2019
- Wisconsin Blood Lead Screening Recommendations
- Wisconsin Childhood Lead Poisoning Prevention and Control Handbook – 2014
- Wisconsin DHS Certification regarding Debarment and Suspension

- Wisconsin DHS Childhood Lead Boundary Statement 2019 – July 2018
- Wisconsin DHS Childhood Lead Program Quality Criteria – December 2018
- Wisconsin DHS Business Associate Agreement – January 2019
- Wisconsin DHS Report on the Review of the Milwaukee Lead Program – May 2018
- Wisconsin statutes and administrative rules

Adopted Milwaukee Health Department Policies and Procedures

- 300.581.PP Point-of-Use Water Filtration Device Distribution Policy - October 2017
- 300.600.PP Intervention Schedule – November 2018
- 300.601.PP Entering Blood Lead Test Results into HHLPSS – November 2018
- 300.602.PP Lead Testing Recommendations - February 2019
- 300.603.PP Generating Letters in Healthy Homes and Lead Poisoning Surveillance System (HHLPSS) - April 2019
- 300.630.TGD Technical Guidance Processing & Uploading Letters in HHLPSS - April 2019
- 300.637.PP Processing Reported Elevated Blood Lead Levels and Referrals for Case Management Services - January 2019
- 300.638.PP Nursing Care Coordination and Case Management for Lead Levels Requiring Immediate Action Including Chelation Interventions - February 2019
- 300.639.PP Nursing Case Management Case Closure - December 2018
- 300.660.PP Case Assignment for Environmental Investigation - March 2019
- 300.661.PP Initial Contact with Target Family - November 2018
- 300.662.PP Tier II Environmental Review - November 2018
- 300.663.PP Special Inspection Warrants - May 2019
- 300.673.PP Lead Water Sampling - March 2019
- 300.675.PP Writing a Lead Inspection Risk Assessment Report - February 2019
- 300.676.PP Orders to Correct Lead Hazards - March 2019
- 300.677.PP Issuing Lead Abatement Permits - May 2019
- 300.678.PP Citations - March 2019
- 300.679.PP Monitoring - February 2019
- 300.690.PP Healthy Homes Inspection, Abatement and Review - May 2019
- 300.691.PP HEPA Vacuum Loan - May 2019
- 300.696.PP Contractor Communication & Training - March 2019

Draft Milwaukee Health Department Policies and Procedures

- Central Filing System Policy – Draft – October 2019
- City Charter School Sampling – Draft – August 2019
- Creating Referrals for New or Supplemental Addresses Related to EBL Cases – Draft – July 2019
- Developing and Maintaining Written Policies and Procedures - Draft – February 2017
- Home Environmental Health Documentation, Data and Record Management – Draft – October 2019

- Home Environmental Health Case Management and Care Coordination Orientation, Training and Professional Development – Draft – October 2019
- Initial Contact with Family – Draft – October 2019
- Intake/Enrollment Procedure – Draft
- Home Environmental Health Case Management and Care Coordination Orientation, Training and Professional Development – Draft – October 2019
- Lead Hazard Reduction Prioritization Recommendations - Draft – February 2020
- Lead Hazard Remediation Clearance Testing & Report – Draft – October 2019
- Mandated Reporting: Human Trafficking, Exploitation, Child Abuse and Neglect – Draft – January 2019
- Nursing Case Management of Childhood Lead Poisoning – Draft – May 2019
- Nursing Chart Audit – Draft – October 2019
- Pre-Construction Meeting Walk-Through - Draft
- Placarding - Enforcement Policy – Draft – July 2019
- Policies and Procedures Training Plan – Draft – October 2019
- Temporary Relocation – Draft – June 2019

Sample Case File and Training Documents

- Acknowledgement of Privacy Policy
- Child Assessment
- Child Development Screening Test and Results
- CLPPP Nursing Interventions
- HEH New Employee Onboarding Guide
- Lead Risk Assessor Core Competencies
- Lead Risk Assessor On-boarding, Orientation and Training Swim Diagram
- Lead Risk Assessors Reading and Review List
- Lead Abatement Contractor Request for Proposals Checklist
- Nursing New Employee On-Boarding Guide
- Email Communications – Owners/Contractors
- Inspection Information Checklist
- Investigation Checklist – Front Cover
- Lead Flow Sheet
- Lead Risk Assessor Core Competency Evaluation form
- Lead Risk Assessor Equipment Check-out page
- Lead Risk Assessor Orientation and Training Draft Policy
- Lead Risk Assessor Policy Handbook Table of Contents
- Lead Risk Assessor Reading and Review List
- Lead Risk Assessor Training Log
- Lead Risk Assessor Training Part 1 Presentation
- Lead Risk Assessor Training Plan
- Milwaukee Health Department Employee Curriculum, modified for lead employees
- Milwaukee Health Department new employee on-boarding and training

- Nursing Standards of Practice for Lead Poisoned Clients
- Occupant Information Checklist
- Ownership Information Checklist
- Protect your family from lead brochure from EPA
- Investigation Check Sheet
- Lead Abatement Notification form
- Lead Abatement Notification form
- Lead Clearance Examination Report sample
- Contractor Daily Monitoring Check Sheet
- Lead Safe Guide to Renovate Right Environmental Protection Agency brochure
- Lead-Based Paint Risk Assessment Report sample
- Occupant Protection Plan Checklist for Lead Abatement Activities sample form
- Orders to Correct Lead Paint Hazards
- Owner Tenant Responsibility While Work in Progress Form
- Property Floor Plan Sketch sheet
- Property Floor Plan Window Treatment Scope sheet
- Property Investigation Closure Report Property Investigation Report
- Property Ownership and Real Estate Bill
- Public Health Laboratory Dust Report Sample
- Public Health Laboratory Report Sample

Forms

- Chronological Record of Services Rendered (H-3059)
- Client Satisfaction Survey (H-93)
- Client Service Record (H-1006)
- Healthy Homes Environmental Assessment Checklist (H-84)
- Homeowner form – Disclosure of information on lead-based paint and/or lead-based paint hazards (H-3012)
- Homeowner Form – Pre-renovation confirmation of pamphlet receipt (H-83)
- Homeowner form – Your responsibility while the work is in progress (H-3011)
- HUD Application Checklist (H-3014)
- HUD Enrollment Forms (H-141)
- Lead Dust Sample Collection and Results sheet (H-3044)
- Resident Questionnaire for Investigation of Children with Elevated Blood Levels (H-3013)
- Temporary Relocation Request form (H-90)
- Water Filter Questionnaire (H-448)

Federal, State, and Local Government and Funder Documents

- American Academy of Pediatrics Bright Futures
- Centers for Disease Control and Prevention Resources, Guidance, and Recommendations
- Environmental Protection Agency Resources and Guidance
- Healthiest Wisconsin 2020 benchmarks

- Healthy People 2020 benchmarks
- HUD Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing, Second Edition, 2012
- Public Health Accreditation Board local health department standards and measures, version 1.5
- Wisconsin DHS - Certified Companies Offering Lead Abatement Services
- Wisconsin DHS HHLPSS Job Aid 1.1 Getting Started: Getting Started with HHLPSS for Local Health Department Managers
- Wisconsin DHS HHLPSS Reports
- Wisconsin DHS Lead pages
- Wisconsin DHS Program Quality Criteria

Additional Resources and Examples from Other Jurisdictions

- Alliance for Healthy Homes: Effective Practices for Enforcing Codes to Ensure Decent Housing Condition, August 2006
- Altarum Cost-Benefit Analysis: Cost-Benefit Analyses of Policies to Prevent & Remediate Childhood Lead Exposure
- Cleveland City Council Ordinance No. 747-2019. https://clevelandcitycouncil.org/ClevelandCityCouncil/media/CCCMedia/Documents/lead-prevention-ORD-FINAL.pdf
- County Health Rankings & Roadmaps – Lead paint abatement programs
- Korfmacher, K. S., Local housing policy approaches to preventing childhood lead poisoning. Public Health Law Research: Making the Case for Laws that Improve Health. September 2014.
- Journal of Public Health Management and Practice, Lead Poisoning Prevention Supplement, January/February 2018.
- Human Impact Partners - Achieving Equity in Lead Poisoning Prevention Policy Making
- Human Impact Partners - 5 Ways to Achieve Equity in Lead Poisoning Prevention Policy Making
- Mahoning County District Board of Health Lead Hazard Court Process and Outcomes (Appendix I)
- Michigan's Healthy Homes & Lead Poisoning Surveillance System User Manual – Childhood Lead Poisoning Prevention Program
- National Association of County and City Health Officials Resources
- National Center for Healthy Housing - Fact Sheet: Health Department Strategies for Implementing Health in all Policies to Reduce and Prevent Lead Exposure
- National Center for Healthy Housing: Code Comparison Tool
- National Environmental Health Association Resources
- Ohio Public Health Information Warehouse, Ohio Lead Hazardous Properties, http://publicapps.odh.ohio.gov/EDW/DataBrowser/Browse/LeadHazardousProperties
- Pew Charitable Trusts - 10 Policies to Prevent and Respond to Childhood Lead Exposure
- Trust for America's Health Resources and Policy Briefs

- Washington State Department of Health – Guide for Public Health Case Management of Children with Elevated Blood Lead Levels, January 2020

Appendix F: Case Review Methodology Supplemental

In December 2019, the Public Health Foundation (PHF) conducted an onsite case review of Milwaukee Health Department (MHD) Childhood Lead Poisoning Prevention Program (CLPPP) records from January 1, 2012 to December 6, 2019. These cases were for children who met the Wisconsin State Statute Chapter 254 definition of an elevated blood lead level.

Overview of Review

PHF assessed and reviewed case files using document best practices for nursing and clinical case management. [1] [2]

Lists of cases meeting the state statute definition were provided from Wisconsin (WI) Department of Health Services (DHS), and randomized by PHF. A random sample of 5% of the historic cases (2012-2017) and 10% of the new cases (2018 and 2019) was selected and the cases were reviewed in depth. PHF slightly oversampled cases with a blood lead level of over 45 ug/dL to assure adherence to procedures for higher blood lead level children, including those who had been hospitalized or were undergoing chelation.

The files for the historic cases (2012-2017) were under the care of the Milwaukee City Attorney's Office for the duration of the WI Department of Justice investigation; PHF reviewed these records in a secure room. The 2018 and 2019 cases were pulled by program staff and made available to PHF in a conference room near MHD CLPPP staff. Program staff were available to provide support and answer questions. In general, one PHF team member reviewed the case management records for each child and another PHF team member reviewed the associated environmental health records. Both PHF team members then worked together to discuss the completeness of each comprehensive record, including case management records for each child and associated environmental investigation files.

PHF developed a case review process by referencing the WI DHS audit tool and MHD CLPPP programmatic requirements. PHF reviewers evaluated 38 components for each nursing case management file (listed below) and 40 components for each environmental investigation file (listed below). PHF also:

- Collected qualitative notes for each case
- Looked for patterns and clarity in documentation, record completeness and staff properly signing off or documenting notes

[1] ANA's Principles for Nursing Documentation. Guidance for Registered Nurses. 2010. http://www.nursingworld.org/~4af4f2/globalassets/docs/ana/ethics/principles-of-nursing-documentation.pdf

[2] Woten, M., Karakashian, A. 2017. Evidence Based Care Sheet. Audits, Nursing: An Overview. https://www.ebscohost.com/assets-sample-content/NRC_Plus__Nursing_Audits_an_Overview___EBCS.pdf

- Observed adherence to proper documentation, including dates being included in notes, as well as copies of letters and/or statements of work
- Reviewed progress notes and case management plans
- Ensured communication with healthcare providers and collaborating CLPPP program staff was evident
- Reviewed records for information related to next steps, including upcoming scheduled family visits, upcoming provider visits or scheduled lab work

PHF developed an Excel-based audit tool to collect consistent information on the specific components. This included the collection of dates in order to calculate response times, and to assess compliance with WI DHS requirements. The collection of dates also was used to facilitate an analysis to identify gaps, bottlenecks, or barriers between process steps and assure that timeframes for follow-up adhered to MHD CLPPP policies (for example, the timeframes discussed in Findings 3 and 4).

The components of case management included in the audit tool are listed below. Any components collected only for the elevated blood lead level $\geq$ 40 ug/dl cases are indicated as such.

Components of the Case Management audit:

1. Case number
2. Child's date of birth
3. Child's zip code
4. Indication of whether the sample test was capillary or venous
5. Date of sample test
6. Date of follow up confirmatory test
7. Date confirmed test result was received by CLPPP
8. Elevated blood lead level
9. Date the case was opened (internally)
10. Was the family contacted?
11. Date the family was contacted
12. Did contacting the family require more than one contact attempt?
13. If the family required more than one contact attempt, or if three contacts were necessary, were these all documented?
14. If the family was not contacted, was the case returned to the supervisor for review?
15. If the family was not contacted or they refused to work with CLPPP staff, was a warrant obtained?
16. Was the child's primary care provider contacted? *(for EBLL $\geq$ 40)*
17. If no contact with the family, are further attempts made weekly with the family? *(for blood lead level $\geq$ 40)*
18. If no contact with the family, are further attempts made weekly with the PCP? *(for blood lead level $\geq$ 40)*
19. Was in-patient chelation done? *(for EBLL $\geq$ 40)*
20. Date chelation started? *(for EBLL $\geq$ 40)*

21. Contact with hospital daily? *(for EBLL ≥ 40)*
22. Discharge date? *(for EBLL ≥ 40)*
23. Was any coordination with the lead risk assessor assigned to this case noted in the case management record?
24. Did a case manager complete a home visit?
25. Date of case management home visit
26. Was a developmental screening completed?
27. Date of developmental screening
28. Was a referral needed to Early Intervention Program or Birth to Three?
29. Was the referral made?
30. Date outpatient chelation completed *(for blood lead level ≥ 40)*
31. Were follow up visits made?
32. Was a follow up contact made to schedule repeat blood test?
33. Was the follow up blood test tracked?
34. Case closed date
35. Did the case meet case closure criteria?
36. Is a closure report included in the record?
37. General comments important to note regarding the case
38. Additional comments important to note regarding information related to the case in HHLPSS

Components of the Environmental Health portion of the audit:

1. Case number
2. Child's date of birth
3. Child's zip code
4. Elevated blood lead level
5. Date confirmed test result was received by CLPPP
6. Date the case was opened (internally)
7. Is the case still open?
8. Initial date of the first family contact attempt
9. Was the family contacted?
10. Date the family was contacted
11. Did contacting the family require more than one contact attempt?
12. Was the environmental risk assessment scheduled?
13. Was risk assessment rescheduled due to owner not being home or requesting a reschedule?
14. Environmental risk assessment date
15. Was this a chelation case? *(for blood lead level ≥ 40)*
16. Were suspected hazards found?
17. Did immediate hazard reduction efforts take place? *(for blood lead level ≥ 40)*
18. Is the environmental risk assessment report in the record?
19. Was a scope of work received from the Department of Neighborhood Services (DNS)?
20. Date the statement of work was received from DNS
21. Date the environmental risk assessment report was sent to home owner and tenant
22. Were work orders completed?

23. Date work orders were completed
24. Date work orders were sent to home owner and tenant
25. Did the owner respond to the work orders within the allotted period?
26. Was a citation written due to no response from the property owner?
27. Was more than one citation issued?
28. Date HUD enrollment was completed, if applicable
29. Was a referral made for relocation assistance?
30. Was the family relocated?
31. Date family was relocated
32. Date abatement work begins on home
33. Are monitoring visits noted in the record?
34. Was a clearance conducted?
35. Are clearance wipes noted in the record?
36. Is a clearance report included in the record?
37. Was the environmental investigation closed?
38. Is a closure report in the record?
39. Date the case was closed
40. General comments important to note regarding the case

Childhood Lead Poisoning Prevention: Intervention Schedule

Effective Date: November 1, 2018

The City of Milwaukee Health Department (MHD) provides interventions to children under 6 years old who have blood lead levels (BLL) greater than or equal to 5 µg/dL. The following table outlines the MHD's intervention schedule:

LEVEL	TEST TYPE	INTERVENTION
<5 µg/dL	All	No intervention.
5 to 9.9 µg/dL	Venous	Letter with test result and educational materials mailed to family.
	Capillary	Letter with test result and educational materials mailed to family. Letter includes recommendations for venous (confirmatory) testing.
10 to 14.9 µg/dL; or 15 to 19.9 µg/dL (unless two venous results that are drawn at least 90 days apart)	Venous	Letter with test result and educational materials mailed to family. Letter includes recommendations for repeat testing if 15-19 µg/dL.
	Capillary	Letter with test result and educational materials mailed to family. Letter includes recommendations for venous (confirmatory) testing.
Two results 15 to 19.9 µg/dL that are drawn at least 90 days apart*	Venous	Letter with test result and educational materials mailed to family. A Public Health Nurse provides case management services to the child. Services include education, home visit(s), growth and development assessments, and ongoing monitoring of the child until meets case closure criteria. A Lead Risk Assessor inspects the child's home for lead hazards.
20 to 39.9 µg/dL*	Venous	Letter with test result and educational materials mailed to family. A Public Health Nurse provides case management services to the child. Services include education, home visit(s), growth and development assessments, and ongoing monitoring of the child until meets case closure criteria. A Lead Risk Assessor inspects the child's home for lead hazards.
	Capillary	Public Health Nurse Coordinator or designee calls the family and encourages them to have a venous blood lead test complete. Letter with test result and need for venous (confirmatory) testing is mailed to family.
≥40 µg/dL	Venous	A Public Health Nurse provides case management services to the child. Services include education, home visit(s), growth and development assessments, and ongoing monitoring of the child until meets case closure criteria. A Lead Risk Assessor inspects the child's home for lead hazards.
	Capillary	Public Health Nurse Coordinator calls the family and encourages them to have a venous (confirmatory) blood lead test complete. A home visit is attempted if the family cannot be reached by phone.
*Wi Stat. 254.11 requires that an environmental risk assessment be provided to all children with an elevated blood lead level (EBLL). State Statute defines an EBLL as one venous BLL ≥20 µg/dL OR two venous BLLs ≥15 µg/dL that are drawn at least 90 days apart. The MHD's Consolidated Contract with the State of Wisconsin requires that the department provide nursing case management services at the State definition of EBLL.		

The MHD also provides the above services (except for sending a Lead Risk Assessor to inspect the home for lead hazards) to individuals between the ages of 6 and 15.99 years old. However, when caseloads are high, priority will be given to children under 6 years old.

Public Health and Law Collaboration: The Philadelphia Lead Court Study

Carla Campbell, MD, MS, Ed Gracely, PhD, Sarah Pan, MPH, Curtis Cummings, MD, MPH, Peter Palermo, MS, and George Gould, Esq

Objectives. We determined whether Philadelphia Lead Court is effective in enforcing lead hazard remediation in the homes of children with elevated blood lead levels.

Methods. We created a deidentified data set for properties with an initial failed home inspection (IFHI) for lead hazards from January 1, 1998, through December 31, 2008, and compared compliance rates within the first year and time to compliance for lead hazard remediation between 1998 and 2002 (precourt period) and between 2003 and 2008 (court period). We evaluated predictors of time to compliance.

Results. Within 1 year of the IFHI, 6.6% of the precourt and 76.8% of the court cases achieved compliance ($P < .001$) for the 3764 homes with data. Four years after the IFHI, 18% had attained compliance in the precourt period compared with 83.1% for the court period ($P < .001$). A proportional hazard analysis found that compliance was 8 times more likely in the court than the precourt period ($P < .001$).

Conclusions. Lead court was more effective than precourt enforcement strategies. Most properties were remediated within 1 year of the IFHI, and time to compliance was significantly reduced. This model court could be replicated in other cities with similar enforcement problems. (*Am J Public Health.* 2013;103:1271–1277. doi:10.2105/AJPH.2012.301076)

Lead toxicity and elevated blood lead levels (EBLLs; defined by the Centers for Disease Control and Prevention since 1991 as a blood lead level [BLL] ≥ 10 μg/dL) are among the major environmental problems affecting US children.[1] As a result of increasing evidence for the harm caused by even low-level lead exposure, the Advisory Committee on Childhood Lead Poisoning Prevention[2] recently recommended to the Centers for Disease Control and Prevention that they abandon the so-called "level of concern" previously used and instead use a reference value representing the BLLs in the 97.5th percentile for children participating in the National Health and Nutrition Examination Survey (which the data presently show to be 5 μg/dL) to identify children needing more clinical and public health follow-up. EBLLs can cause impairment of development, behavior, attention and cognition, anemia, and, rarely, death; new data have shown that intelligence and cognitive function can be affected at BLLs less than 5 micrograms per deciliter.[1–5] Children are more affected than adults because many organ systems are developing during infancy and childhood, including the nervous system, and they absorb more lead, relative to adults.

Children are exposed to lead primarily through contact with deteriorating lead-based paint and lead-contaminated house dust and soil, mostly by ingestion of dust or paint chips through routine hand-to-mouth activity practiced by most infants and toddlers.[6,7] US homes were painted with lead-based paint until 1978, when its residential use was banned by the Consumer Product Safety Commission. A recent study by the US Department of Housing and Urban Development (HUD) found that 38 million houses in the United States had lead-based paint, and 24 million had significant lead paint hazards.[8] According to the 2009 American Housing Survey data, 91.6% of the housing units in Philadelphia, Pennsylvania, were built before 1978.[9] Because 27% of Philadelphia families live in poverty, some owners may defer routine maintenance and repair, leading to property deterioration and the generation of lead hazards, mostly from peeling paint. The prevalence of EBLLs based on the results of children's screening tests reported to the Philadelphia Department of Public Health (PDPH) has always been higher than the corresponding national data. However, it has declined markedly over recent years, from 52% of screening tests in 1993[10] having a BLL of 10 micrograms per deciliter or greater to 2.3% (n = 810 tests), 2.2% (n = 797), and 2.3% (n = 824) of venous lead tests for 2009, 2010, and 2011, respectively. Percentages and numbers of venous lead tests of 5 micrograms per deciliter or greater were higher and were 15.5% (n = 5418), 14.2% (n = 5010), and 10.3% (n = 3666) for 2009, 2010, and 2011, respectively (Claire Newbern, PhD, MPH, personal communication, June 21, 2012). The trend in BLLs of 5 micrograms per deciliter or greater (the recommended reference value) is a downward one but represents a significant number of Philadelphia children for whom additional clinical and public health management would be recommended by the recent Advisory Committee on Childhood Lead Poisoning Prevention recommendations.[2] This problem requires a public health solution because lead exposure of children involves multiple stakeholders, including the child and parents, the property owner, and the local authorities who make and enforce laws, ordinances, and codes.

Workers from the PDPH inspect the homes of children with EBLLs for lead hazards. In April 2002, an inventory was prepared and resulted in the assessment that 1400 "backlog" properties housing children with EBLLs had identified lead hazards for which remediation work had been ordered by the health department but had not been conducted by the property owner, in violation of the health code and presumably because of the PDPH's lack of authority to force the owners to comply with departmental orders. The City of Philadelphia did not have any type of separate

administrative hearing conducted by either the PDPH or any other city office for those who were out of compliance with health department regulations. In short, owners faced no negative consequences if they were noncompliant with the departmental orders. The only course of action that the PDPH's Childhood Lead Poisoning Prevention Program could take was to send out its own crews into the homes to do the remediation work and send the owner an invoice, which was usually not paid. The Childhood Lead Poisoning Prevention Program has had limited staff to do this—generally 2 abatement teams—and it could only remediate 2 to 4 homes per month. In addition, before 2002, they were limited to doing paint stabilization and lead dust cleaning, so they could not do carpentry work, roof or plumbing repair, or any other basic systems work that might help decrease future peeling of old lead-based paint. Presumably, other cities may have a more formal process for issuing violations, holding administrative hearings, issuing judgments, and levying penalties or fines in situations in which remediation of lead hazards has been ordered for a particular property. Before 2002, attempts were made to bring enforcement of orders to remediate properties through the Philadelphia court system, but it usually resulted in the judge ordering the PDPH to do the remediation work, without prioritization by resident children's BLLs or other factors and without supplemental funding. Because of this typical response, the aforementioned strategy was not commonly used in the decade or 2 before the creation of Lead Court.

The Philadelphia Lead Abatement Strike Team (LAST) program was developed by the PDPH in 2002 in response to community concern about the failure to remediate identified lead hazards.[10] A number of advocacy and community-based groups expressed deep concern about this failure, and Public Citizens for Children and Youth was a leader in advocating for improvement of the lead remediation process. A LAST policy group was regularly convened by the office of the city's managing director and included staff from the PDPH, key housing agencies, and the city's Law Department for improvement of health code enforcement for lead hazards[11] and development of an infrastructure for remediation and temporary occupant relocation. Enforcement was strengthened considerably with the November 2002 creation of the Lead Court through a partnership among the PDPH, the Office of the City Solicitor, and the Court of Common Pleas. The creation of the LAST program, enabling much easier collaboration and coordination among the various city agencies, was instrumental in creating a climate in which Lead Court could be created. The Lead Court was created specifically for cases involving owner noncompliance in response to remediation orders issued by the PDPH.[10,12,13] As part of its function, PDPH staff members gave a formal presentation to the judges and Law Department staff on causes of lead exposure, information on the toxic effects of lead, and how remediation of the home is instrumental to stopping and preventing further lead exposure. On reinspection in the first month of a property with an initial failed home inspection (IFHI), cases in which remediation work has not been started are referred to the Law Department to be logged into the Lead Court system.

In this article, we report on a quantitative study of the Philadelphia Lead Court that evaluated whether the court was effective as an innovative law enforcement strategy in (1) reducing time to lead hazard remediation compliance compared with the precourt period and (2) increasing the rate of compliance within 1 year of the IFHI. A Lead Court successful on both of these measures would result in fewer properties with lead hazards (and thus fewer children exposed to them) than would otherwise be the case. In a qualitative analysis, we interviewed Lead Court staff members; results will be reported elsewhere.

METHODS

The quantitative study was a retrospective cohort study by secondary analysis of existing data for addresses with an IFHI from January 1, 1998, through December 31, 2008. We created a deidentified data set for these properties from the database of the PDPH's Childhood Lead Poisoning Prevention Program, which has been subjected to rigorous quality control measures. Lead inspection was done by a certified lead inspector who visually inspected for defects in the condition of painted areas in all rooms, using x-ray fluorescence to determine lead paint concentration when needed. Comparisons were made between the precourt (1998–2002) and court (2003–2008) periods, excluding a 7.5-month transitional period (from November 6, 2002, through June 30, 2003). Therefore, the precourt time period was 4 years, 10.5 months; the court time period was 4 years, 6 months. Before 2001, the homes of children with 1 BLL of 20 micrograms per deciliter or greater were inspected. After 2001, a BLL of 20 micrograms per deciliter or greater, or 2 levels of 15 micrograms per deciliter or greater within a 6-month period triggered an inspection; from 2005 onward, a BLL of 20 micrograms per deciliter or greater, or 2 levels of 10 micrograms per deciliter or greater triggered this inspection.

Data entered included dates on which the property had been inspected, property owner status (owner occupied, landlord owned, or public housing through the Philadelphia Housing Authority or the Section 8 voucher system), zip code and census tract, the date the property achieved compliance (when the lead violations were remediated) through dust wipe samples showing a level below the Environmental Protection Agency standards for dust at the time of reinspection, whether the agent who did the work used a lead hazard control grant from HUD (certified abatement contractors were required for HUD grant properties, and non-HUD grant work was done by certified PDPH staff or property owners), and serial BLL data for an index child whose BLLs triggered the property inspection. Data from the Law Department included the date of referral, complaint filing date, first hearing date, date the case was discontinued and ended (cleared from the court process), and disposition (mostly compliance with occasional referral to the PDPH for remediation or notation of vacancy). An Excel database (Microsoft Corp., Redmond, WA) was reviewed for irregularities, discrepancies, missing values, and out-of-range values; converted into a SPSS version 18 database (PASW, Chicago, IL); and analyzed statistically.

Study question 1 hypothesized that the Lead Court period would have (1) a higher rate of compliance attainment within 1 year of IFHI and (2) a shorter time to compliance. The rate of compliance achieved at 1 year was compared between periods by means of a χ^2 test,

using all homes failing inspection and having at least 1 year of data from the IFHI date through the censoring point as the denominator. We determined the time to compliance in months for each period by means of Kaplan–Meier curves using all data, and we compared them with a log-rank test. Data for the precourt households were censored at November 15, 2002 (start of the transitional period), and those in the court period (with IFHI by December 31, 2008) were censored at May 15, 2010, giving most precourt and all court cases more than 1 year of follow-up.

Study question 2 stated that compliance has reduced BLLs in resident children by 6 months or 1 year after compliance, regardless of when compliance was obtained. The main analysis was a repeated measures analysis of variance between the log-transformed BLL closest to 6 months before compliance and the BLL closest to 6 months and 12 months after compliance. We further stratified this analysis with the court period and age of index child with EBLL (< 2 years vs ≥ 2 years at the IFHI) serving as grouping variables.

For study question 3, we used a proportional hazards model to look at factors predicting time from IFHI to attainment of compliance, or time to compliance. Potential predictors included Lead Court status (precourt or court), occupancy status (owner or tenant), age of index child with EBLL (< 2 years vs ≥ 2 years) at the IFHI, and first BLL of the index child.

Using descriptive statistics, we also examined whether a HUD grant was used and how many inspections were needed to attain compliance (which served as a proxy for number of court hearings required). Sample size allowed for comparison of compliance rates (precourt vs court) with a difference as small as 5% with more than 80% power.

RESULTS

We created a database with a total of 4530 entries. We excluded 117 cases with missing data and 206 cases whose IFHI date was in the transition period, which left 4207 cases: 1987 precourt cases (January 1, 1998–November 15, 2002), including those with less than 1 year of follow-up data from the IFHI date, and 2220 court cases (July 1, 2003–December 31, 2008).

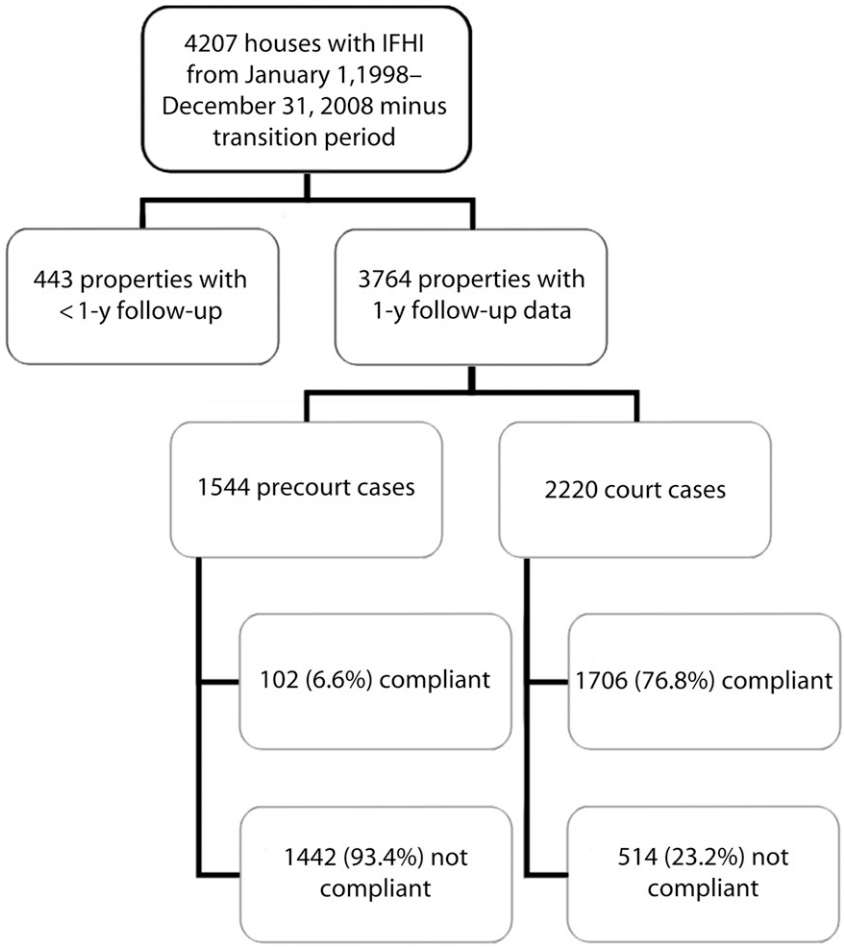
Within the first year of the IFHI date, a significantly ($P < .001$) higher rate of compliance was attained in the court period cases (1706 cases; 76.8%) than in the precourt period cases (102; 6.6%), leading to a total of 1808 compliant properties (Figure 1). The total number of cases was 3764 and was limited to homes with at least 1 year of data from the IFHI date through the censoring point as the denominator (1544 precourt and 2220 court cases).

Compliance was attained rapidly in the court period (Figure 2); the increase in percentage of homes compliant was much slower for precourt cases ($P < .001$). Even 4 years after IFHI, only 18% of precourt properties had attained compliance, compared with 83.1% of court properties.

Blood Lead Level Patterns in Relation to Compliance

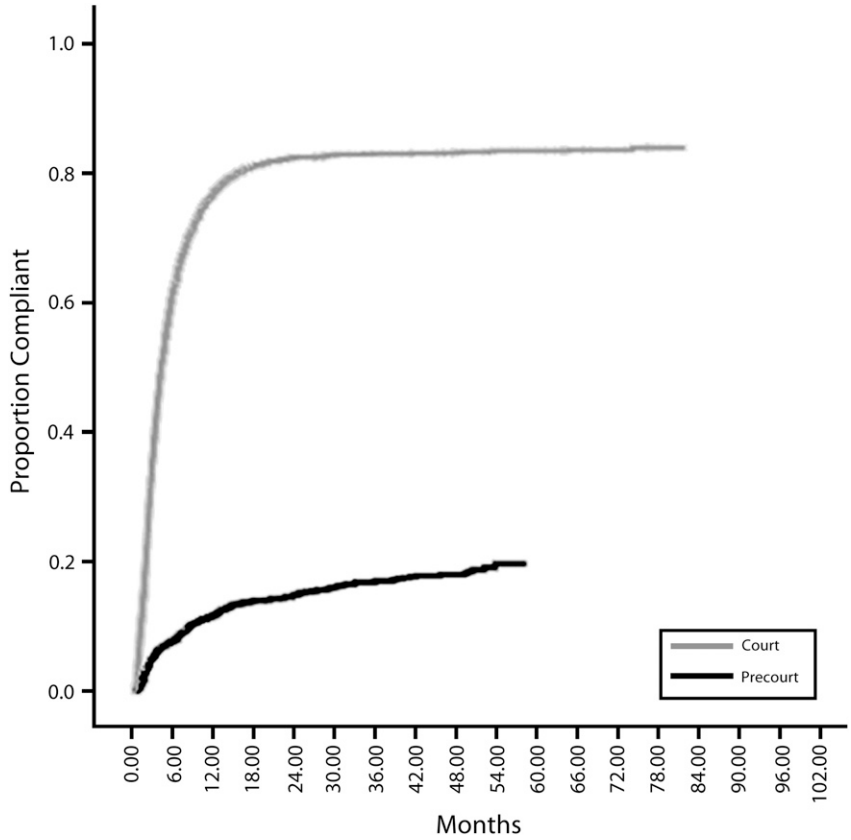
Study question 2 addressed the relationship of BLLs to compliance, regardless of the interval needed to achieve this and whether the case went through Lead Court or not. We analyzed BLLs for the properties that had an index child with a BLL 6 months before and 6 months after compliance; some had levels 12 and 18 months out.

In general, geometric mean BLLs were higher in the precourt period than in the court period (group main effect $P = .018$) and in children aged 2 years and older than in children younger than 2 years at the IFHI (age group main effect $P = .007$; Figure 3; see also Tables A and B, available as a supplement to the online version of this article at



Note. IFHI = initial failed home inspection. $P < .001$ for comparison of compliance rates.

FIGURE 1—Flow diagram of rate of compliance within 1 year of IFHI: Philadelphia, PA, January 1, 1998–December 31, 2008.



Note. $P < .001$ by log-rank test.

FIGURE 2—Time to compliance with lead remediation by precourt group (1998–2002) and court group (2003–2008): Philadelphia, PA, January 1, 1998–December 31, 2008.

http://www.ajph.org). BLLs decreased over time (time main effect $P < .001$) from 6 months before compliance versus 6 and 12 months after compliance. We found a trend toward a court group × time interaction ($P = .09$) and a significant age group × time interaction ($P = .018$), the latter indicating more change over time in younger children.

Factors Predictive of Attainment of Compliance

Study question 3 addressed factors that predict time from the IFHI date to compliance, or time to compliance. Occupancy status differed between the periods ($P < .001$). Specifically, the precourt properties included more owners (865; 48.4%) and fewer tenants (818; 45.8%) than the court properties (owners = 899 [43.2%]; tenants = 1151 [55.4%]). Both groups had a small percentage in Section 8 housing (4.9% and 1.3%, respectively) and public housing (0.9% and 0.1%, respectively). Occupancy status data was available for 1786 precourt and 2079 court cases (out of a total of 4207 cases). The mean age of the index child at the IFHI date was 36.3 months (SD = 18.3) for the precourt group and 34.1 months (SD = 19.2) for the court group ($P < .001$). Of the precourt children, 486 (28.6%) were aged 2 years or younger at the IFHI date, compared with 590 (31.8%) of the court children ($P = .037$). Age data was available for 1702 precourt and 1857 court cases (out of a total of 4207 cases). The mean for the first BLL was 18.1 (SD = 11.4) for the precourt children and 14.2 (SD = 10.0) for the court children; geometric means were 14.0 and 10.9, respectively ($P < .001$).

A Cox proportional hazards model, looking for predictors of time from IFHI to compliance while controlling potential confounding variables, found a hazard ratio of 8 (95% confidence interval = 6.992, 9.200) comparing court to precourt, indicating that compliance across time was an average 8 times more likely in the former ($P < .001$). Additionally, none of the confounders such as occupancy status, age of child at IFHI, and first BLL were significant predictors of compliance in the court group (Table 1).

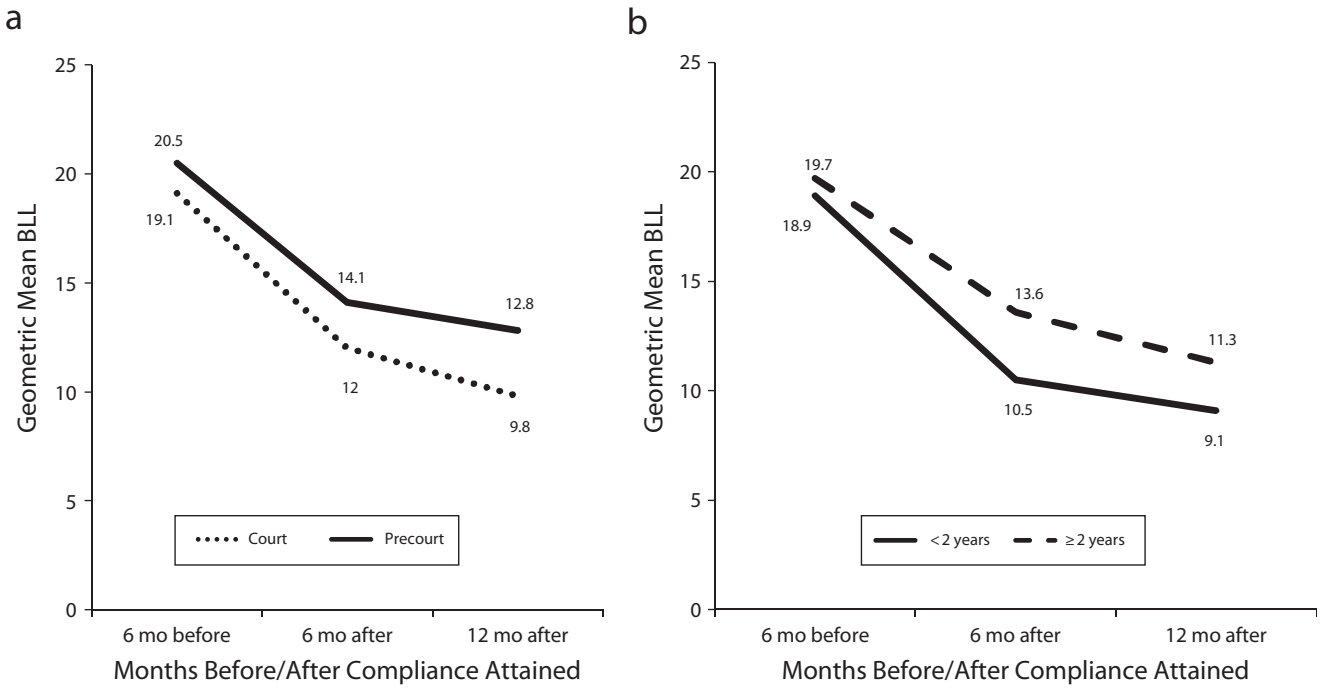
Other Analyses

Table C (available as a supplement to the online version of this article at http://www.ajph.org) compares the time to compliance for work done with and without HUD grants, with the HUD grant work taking significantly longer. Precourt compliance took an average of 12.5 months with an HUD grant versus 9.4 months without a grant. Corresponding figures in the court period were 5.6 and 4.8 months, respectively. Both comparisons were significant ($P < .001$). HUD grants were much more utilized in the court period; a total of 767 grants constituting 41.5% of the properties were obtained in the court period, as contrasted with 71 grants representing 24.1% of the properties in the precourt period.

The number of reinspections (which followed the IFHI) and court hearings needed to attain compliance were tracked for court properties. If the first reinspection did not result in compliance, the case was referred to Lead Court. Seven (0.4%) required 1 reinspection, presumably because the property came into compliance before the date of the first court hearing; 1548 (87.3%) had 2 reinspections (1 court hearing); 120 (6.8%) had 3 reinspections (2 court hearings); and 98 (5.5%) had 4 or more reinspections (≥ 3 court hearings) for the 1773 properties tabulated. A total of 4167 cases were filed for a first court hearing between September 2, 2002, and December 31, 2010, with 1668 cases filed by December 31, 2003. Therefore, the court initially handled a large volume of cases that has slowed down over time, with 177 cases filed in 2010.

DISCUSSION

The development of a specialized court as an innovative law enforcement strategy has been very effective in Philadelphia, markedly



Note. BLL = blood lead level.

FIGURE 3—Geometric mean blood levels by (a) time and court period and (b) time and age group: Philadelphia, PA, January 1, 1998–December 31, 2008.

increasing the number of properties with lead hazards that became compliant after remediation work. We have demonstrated that the precourt enforcement strategy was not effective, based on the rate of properties becoming compliant within the first year and over a 4-year follow-up period. The act of appearing before a judge in a court of law seems to have served as an incentive for many owners. Cities that already have a formal process in place for enforcement of orders to remediate lead hazards from properties might not need to consider a specialized court process, but it was very good solution for Philadelphia under the conditions present in the city when Lead Court was created in 2002. We also think that educating judges hearing cases in Lead Court regarding how children get exposed to lead and what measures need to be taken to prevent further lead exposure was helpful in having them understand the consequences of giving the owner more time to remediate a given property.

To our knowledge, no other study has analyzed this type of enforcement strategy, and only 2 other similar courts exist nationally. A lead court in Chicago, Illinois, is run within the Housing Court division,[14] and the Mahoning County (Ohio) Common Pleas Court hears cases against owners of rental units that were not remediated of lead hazards.[15] By comparison, the Philadelphia Lead Court has operated out of both the municipal and the common pleas courts, but not through housing court. A literature search found several references discussing various aspects of enforcement of housing policies.[14,16–18] A common theme is that stricter laws and housing codes may lead to healthier homes with fewer subsequent cases of children with EBLLs and lower societal costs.

One practical question raised is how well the court might have worked without the provision

TABLE 1—Multivariate Predictors of Time to Compliance Using a Cox Proportional Hazards Model: Philadelphia, PA, January 1, 1998–December 31, 2008

Predictor	HR (95% CI)	*P*
Occupancy		.38
Tenant (Ref)	1.000	
Section 8	1.277 (0.905, 1.803)	.163
Owner	1.016 (0.919, 1.123)	.751
Age at IFHI	1.000 (0.996, 1.004)	.825
First BLL	0.999 (0.995, 1.003)	.594
Court group	8.020 (6.992, 9.200)	< .001

Note. BLL = blood lead level; CI = confidence interval; HR = hazard ratio; IFHI = initial failed home inspection.

of HUD grants and without the LAST program serving as a catalyst to create Lead Court. Time to compliance was increased when a HUD grant was used to fund the remediation work, particularly in the precourt period. However, for the court period, the mean number of months to compliance was much lower for properties both receiving and not receiving grants, a much higher number of properties achieved compliance (767 vs 71), and a higher percentage secured HUD grant funding (41.5% vs 24.1%). The shorter time to compliance for property owners not using HUD grant funding may be attributable to an ability to immediately pay to get the work done. The HUD grant application requires the deed to the property and verification of low-income status as well as PDPH inspection. It took time in 2002–2003 for an infrastructure (including hiring of lead abatement contractors and temporary resident relocation) to be developed, which then streamlined the process thereafter; this work was facilitated by the LAST program. The HUD grant properties may also have had more work done relative to non-HUD properties. Therefore, if the court process had been created without the LAST program and HUD grant funding for at least some of the owners, compliance times and rates might have been different. Also, central to the formation of the LAST program was active input from Philadelphia's children's advocacy group and other community-based groups. The LAST group has not met recently, and Lead Court continues to run well, but the LAST group definitely facilitated the creation of Lead Court.

An important question raised by the study is this: "Does an indicator of positive environmental change, such as achieving compliance, necessarily correspond to a genuine health improvement?" We assumed that if a property was remediated, it did not contain housing-based lead hazards that could further expose resident children to lead (although lead-contaminated toys, food, and other items might have added to the sum total of lead exposure). Therefore, by counting compliant properties, we were able to document an improvement in home environments in the city. However, the lead safety of a property is time specific, and proper maintenance is needed to retain it over time.

No specific health indicators are available for decreased lead exposure. We used BLLs as a proxy for lead exposure to determine whether compliance in a property had a direct and positive impact on a child's lead status; in general, BLLs measure acute or subacute exposure and decline as children outgrow the hand-to-mouth activity that leads to ingestion of lead. The national and Philadelphia trends have been toward declining BLLs in recent years. Most lead is stored in the bones and eliminated from the body over many years. However, some studies have found a prolonged half-life of lead in the blood in chronically exposed children as compared with more acutely exposed individuals.[19] We followed trends in BLLs before and at intervals after compliance. These results indicated that BLLs declined after compliance and further declined over time, regardless of whether compliance was achieved through Lead Court or in the precourt period. Because Lead Court produced many more compliant properties than in the precourt era, Lead Court had an indirect influence on lowering BLLs for those children who lived in properties achieving compliance.

Strengths and Limitations

Strengths of this study include the analysis of a large number of properties over a long time period and the clear and strong association between time period and time to compliance, with the latter being much shorter for court period cases. Results may be generalized to other populations of children living in similar older housing where local governments are working on attaining compliance for properties with identified lead hazards through lead hazard remediation work. Limitations of this study include varying total sample sizes depending on the analysis because of missing or incomplete data (as indicated in the results) and having no other similar studies with which to compare our results.

Conclusions

We found this specialized court process to be very effective in resolving exposure of children to property-based lead hazards by mandating compliance with orders to remediate them. It could be used as a model by other cities that have difficulty in enforcing remediation of housing violations. Cities that have an effective enforcement system built into their city infrastructure, through either the health or housing department or other city agency, would presumably not need to resort to the creation of a specialized court to achieve compliance with orders to remediate lead hazards. Elements that would increase the likelihood of successful replication would be to include collaboration among public health, law, and judicial officials and staff through a multidepartmental citywide task force similar to the LAST program; input from advocates and community-based organizations; and identification of a source of remediation funding for low-income property owners. Use of this model in other cities might ultimately lead to fewer children being exposed to housing-based lead hazards. ■

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Contributors

C. Campbell initiated the study, wrote the first draft of the article, and coordinated revisions. E. Gracely and S. Pan analyzed the study results. All authors helped conceptualize the study, helped with oversight of the study and interpretation of results, and critically reviewed the article and its revision.

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Human Participant Protection

This study was approved by the institutional review boards of the Philadelphia Department of Public Health and Drexel University.

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Appendix I

Mahoning County District Board of Health Lead Hazard Court Process and Outcomes

I. Background

The local health department in Mahoning County, Ohio has begun using alternative legal strategies to encourage landlords to remediate lead hazards in properties that have poisoned young children.

These strategies, which rely on municipal anti-blight and lead hazard disclosure laws (Ohio Revised Code Section 3767.41), have yielded promising results for the special prosecutor appointed by the City of Youngstown to handle these cases. Since this effort began with the support of a private foundation (The Raymond John Wean Foundation) and City of Youngstown, a special prosecutor has filed 40 civil complaints in Mahoning County Common Pleas Court against the owners of occupied rental units with unremediated lead hazards. The special prosecutor has also requested and obtained injunctions against the sale, transfer, or rental of properties in these civil cases.

This local enforcement initiative has also attracted the attention of U.S. EPA and HUD law enforcement officials in Chicago and Washington. Using information about non-compliant rental property owners provided by the District Board of Health and special prosecutor, attorneys from these federal enforcement agencies have negotiated consent agreements with several local rental property owners to make more than 100 of their rental units lead-safe.

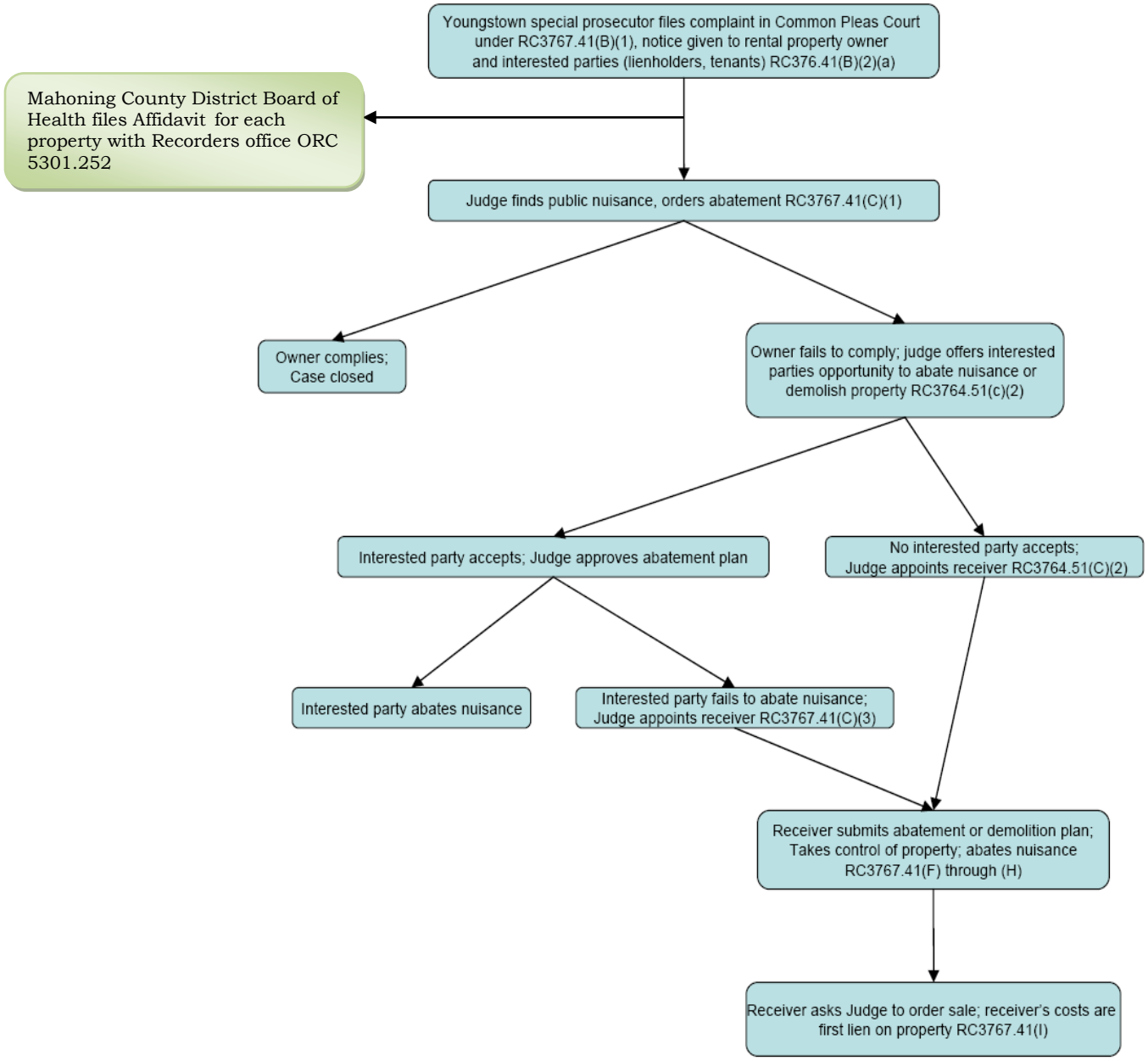
Although federal law requires disclosure of lead hazards to homebuyers and renters, this requirement has routinely been ignored by local property owners who fail to disclose lead hazards in their properties identified by the District Board of Health in the course of a child lead poisoning investigation. To prevent such acts of nondisclosure that can threaten unsuspecting families with young children who move into these homes, the District Board of Health has begun using a provision in Ohio law (Ohio Revised Code 5301.252) allowing the attachment of affidavits to property titles to force the disclosure of unremediated lead hazards to homebuyers conducting deed searches. The health department believes that this strategy will be a credible deterrent to the sale of toxic houses to unsuspecting buyers – many of them with young children susceptible to these lead hazards.

II. Strategy

Non-compliant housing units are those whose owners have refused to remediate lead hazards detected in them by a sanitarian from the District Board of Health who conducts an investigation in response to a report of a lead poisoned child living in the unit. These cases are referred to the special prosecutor who has a contract with the Youngstown City Health District to provide legal services. Cases where the property owner continues to rent units with lead hazards despite orders from the District Board of Health to vacate and remediate them receive priority for legal action.

To our knowledge, this initiative is the first application of anti-blight statutes in Ohio to compel remediation of residential properties with lead hazards. The process is depicted on the next page.

CIVIL ACTIONS TO MAKE RENTAL PROPERTIES LEAD-SAFE



II. Outcomes

The special prosecutor provided this evidence that these strategies for reducing the number of non-compliant housing units can be successful:

- Since 2005, the special prosecutor has prepared civil actions under Ohio Revised Code Section 3767.41 for violations on 40 rental properties, accompanied by service instructions and Judgment Entry and Motion for Injunction against transfer.

- Sixteen properties are in full compliance, either by demolition or by remedy. One property which was brought into compliance subsequently developed issues which rendered the property again in violation, and action against that property remains pending.

- In several cases, the HUD-funded Mahoning County Healthy Homes and Lead Hazard Control Program has stepped forward to act as an interested party or receiver for properties whose owners have not responded to the courts' instructions.

- Several rental property owners were ordered to pay all court costs as well as prosecution costs by the Magistrate.

- To date, the Court has granted all injunctions against transfer until the subject property is brought into compliance.

- Five additional properties have been recommended by the prosecutor to the courts for demolition based on uninhabitable conditions.

- Ten Affidavit on Facts Relating to Title to Real Estate (ORC 5301.252) has been filed.

- In summary, the number of unremediated rental homes has dropped from 237 in 2005 to 137 in April 2011.

Reported by:

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Public Health
Prevent. Promote. Protect.
Mahoning County
District Board of Health

NEWS RELEASE

FOR IMMEDIATE RELEASE	**CONTACT**: **Joseph Diorio, Director** **Community Health Division** **(330) 270-2855 ext. 142**
	DATE: September 12, 2011

DISTRICT BOARD OF HEALTH UPDATES LEAD SAFE HOUSING REGISTRIES

The District Board of Health has updated its web-based registry of homes in Mahoning County that have been made "lead-safe" by an Ohio Department of Health licensed lead abatement contractor. This registry, updated quarterly, can be found on the Board of Health website at www.mahoninghealth.org. Currently there are 356 properties on the "lead-safe" list, a significant increase from the 217 properties listed in 2010.

Other homes with unremediated lead hazards that have caused lead poisoning in young children are also listed on the website. In 2005, there were 237 unremediated rental properties with lead hazards in Mahoning County in this registry; that number has decreased to 137. Families with young children seeking a lead-safe home are urged to consult these registries and ask property owners for all information they have about the presence of lead hazards in their properties. Both registries are updated quarterly.

Among the 2,781 Mahoning County children tested in 2010, 51 of them, or 1.8%, had blood lead elevations. "This represents a 95% reduction in the number of lead poisoned children since 1995," said Matthew Stefanak, health commissioner of the General Health District in Mahoning County. "Our goal of eliminating child lead poisoning from Mahoning is within reach if we sustain our efforts to test all children at risk and make sure their homes are lead-safe," he said.

A blood test is the only way to determine if a child has lead poisoning. Although lead can poison adults as well as children, children are at greater risk of being lead poisoned due to increased hand-to-mouth activity. Lead can enter the human body by either ingestion or inhalation and affects the brain and the central nervous system. It is recommended that all children who live in high risk neighborhoods be tested for lead poisoning around the age of 1 year.

The District Board of Health receives referrals from the Ohio Department of Health for any children whose blood lead level is 10 micrograms per deciliter or greater and resides in Mahoning County. An investigation is then conducted at the address of the lead-poisoned child. Noncompliant property owners are referred to the Youngstown Special Prosecutor for enforcement action.

For more information, please contact the Community Health Division of the District Board of Health at (330) 270-2855 extension 142.

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Marivel Montejano, R.S.
Home Environmental Health Director
City of Milwaukee Health Department
841 North Broadway, RM 304
Milwaukee, WI 53202

May 15th, 2020

Re: Response to the Public Health Foundation Audit Findings, Observations and Recommendations

Dear Ms. Sawa,

Listed below are the responses to the Audit Findings, Observations and Recommendations for the City of Milwaukee Childhood Lead Poisoning Prevention Program from the Home Environment Health Department. I would also like to take this opportunity to thank you and your staff for the time and value-added professional feedback you have provided to the program.

Finding 1: Documentation is not sufficient to assure program compliance.

HEH Response: The Home Environmental Health (HEH) Division recognizes that this was an area that needed improvement. To ensure compliance with all the documentation requirements, the HEH Department finalized the Documentation policy on January 10, 2020. All staff were required to read this policy and submit a sign-off form during January. Also, there was training completed during the all-staff meeting on March 27, 2020. This training addressed documentation at every level in the division including: Management, Coordinator, Field Staff, and Administrative Support Staff. Also, to ensure this policy is followed, the HEH Department finalized the Quality Assurance and Proficiency Test Guidance Document on January 30, 2020, and provided training to all the staff on February 29, 2020. This policy implemented a review process of selecting a random number of files or cases and assess compliance with program requirements. Also, this includes field assessments to ensure proper documentation is collected. The HEH Public Health Nurse (PHN) Supervisor has taken steps to assure that the "Nursing Standards of Practice Lead Poisoning Prevention Program Policy 600-053" documentation criteria is clear and follows the WI State Statutes Department of Safety and Professional Services and Wisconsin Board of Nursing. The HEH division is implementing the necessary steps to ensure documentation meets program compliance and State Statue.

Finding 2: Corrective Actions from the 2018 WI DHS Report remain incomplete.

HEH Response: The HEH management team submits a monthly report to DHS detailing the progress of the 2018 WI DHS Report Action Work Plan. Below is the status of the work plan:

1. **Adequate recordkeeping and documentation:** The Central Filing System and Data Management policy was approved by the Department of Health Services (DHS) and completed on 02/01/2020. HEH acquired software, Quickbase, to accurately record and verify documentation for each case. This is complete for nursing and environmental with a draft "Quickbase Technical Guidance for Home Environmental Health App" shared April 2020. The PHN Coordinator provides one on one training of the PHN Case Managers with the PHN Supervisor identifying missing or inaccurate data through the analytical reports and notifying the PHN Case Manager on what needs correction or completion to adhere to Case Management and Documentation Policy timelines and criteria.

2. **Required written policies and procedures being adopted and implemented**: All the policies and procedures required by Department of Health Services (DHS) were finalized and submitted on January 31, 2020. HEH created a training policy plan that is being implemented to ensure all policies and procedures are adopted and followed.

3. **Case management of all historic cases**: Follow-up and close all the Historical Nursing and Environmental Cases. HEH understands that providing the proper care to these children is extremely important, and our goal as a department it to ensure these cases meet the closure criteria per the State Statute. HEH is informed by DHS what case management or environmental measures are needed to officially close these historical cases with a related timeline. DHS has observed significant progress and has lifted the monthly reporting requirements in April 2020 for the historical cases. The historic cases are now included in the monthly "Active" report obtained from the Quickbase reporting system. Due to COVID-19 and the inability of Lead Risk Assessors and Department of Neighborhood Services field staff to go into homes to do risk assessments and scopes of work, the historical cases are on HOLD. We anticipate resuming the work once we have implemented "Nursing Case Management and Lead Risk Assessor Home Visit protocol". (June 2020)
   a. Nursing Cases to Close: 29
   b. Environmental Cases to Close: 30

4. **Assurance of case follow-up for new cases:**

The following processes will ensure all the new cases are assigned have the required follow-up services:

a. HEH implemented the "Case Assignment for Environmental Investigations" and "Processing Reported EBLL Referrals for Case Management Services" policies to monitor alerts for new cases generated by Healthy Homes Lead Poisoning Surveillance System (HHLPSS). HEH Staff received the proper training and reviewed of the policy to ensure full understanding of the process and expectations.

b. DHS sends a weekly report notifying HEH of new nursing and environmental investigation cases generated each week. The PHN and Environmental Supervisor review this report on a weekly basis to ensure all cases were assigned and added into the HEH Database, QuickBase.
c. Monthly submission of Active Nursing and Environmental Investigation Cases to the DHS which demonstrates to DHS the HEH division has provided the proper oversight ensure all the cases are receiving the required follow-up services. These reports are generated from a recent implemented database QuickBase and the report is generated from HEH Supervisor to review and submit to DHS.

Overall, the HEH department has made significant progress since the beginning of 2019. We recognize that the Public Health Foundation made an attempt to obtain progress made in writing from the Wisconsin Department of Health Services (DHS), but wasn't successful; however, we are waiting for final feedback confirming that HEH nearly complete the corrective action plan.

Finding 3: Not all cases adhered to MHD Policy 300-637 on case management assignment.

HEH Response: The referral timeframe and response time established in the 300-637 Policy was created with the assumption that the department is at full staff capacity. During the 2019 year, the HEH department encountered staffing retention challenges, and policies and procedures were in the process of development. HEH hired three new Public Health Nurses at the beginning of the year, and by early fall, HEH had to start new recruitment of four new nurses due to staffing turnover. The HEH Department was able to stabilize the nursing case management area by the end of 2019. We have a Public Health Nurse Supervisor, a Public Health Nurse Coordinator, and close to having full staffing of the Public Health Nursing Case Managers. The HEH division is now in compliance with the MHD Policy 300-637 "Processing Reported Elevated Blood Lead Levels and Referrals for Case Management Services" due to staffing of those key positions. Future revision of this policy will clarify the timeframes for EBL review and assigning a new case to reflect "Cases meeting new case criteria will be reviewed and assigned to a PHN within 24 hours of receipt during MHD business hours. Other notifications will be reviewed within 48 hours of the PHN Coordinator receiving the notification during MHD business hours." The nursing team started weekly training of policies and procedures, and the Public Health Nurse Supervisor continuously delivers Nursing Case Management training to ensure a consistent process and documentation compliance. In addition this includes the review of policies at monthly meetings. The "Nursing Care Coordination and Case Management for Lead Levels Requiring Immediate Action Including Chelation Interventions' has an in depth review with recommendations for revisions based on PHN Case Manager, PHN Coordinator and PHN Supervisor teamwork. The "Case Closure" policy is currently under review and will include a formal checklist with clear requirements and Case review sign off by the PHN Supervisor. (In preparation for onboarding new PHN Case Managers, the "Home Environmental Health Nursing Case Management and Care Coordination Orientation, Training and Professional Development" policy is under review and will be implemented to assure appropriate skillsets are in place for PHN Case Management prior to assignment of active cases.

Finding 4: Not all cases adhered to MHD Policy 300-660 on environmental investigation.

HEH Response: The referral timeframe and response time established in the 300-600 Policy was created with the assumption that the department is at full staff capacity. There has been an ongoing challenge retaining lead risk assessors. Additionally there is a need for additional management support which will be requested in the 2021 budget. During the 2019 year, the department gained a better understanding of the volume of properties that needed an environmental investigation for all the Elevated Blood Lead Level referrals. HEH has determined to maintain an adequate response time for all new referrals, and due to the volume of properties generated, HEH is planning to increase staffing to have fourteen Lead Risk Assessors. Also, the Environmental Investigation team will review the policy and ensure it meets minimum response expectations by State Statue to ensure compliance of this policy is met moving forward by July 2020.

To ensure this timeframe improves overtime and monitor compliance, HEH implemented the Quality Assurance and Proficiency Test Guidance.

Observation 1: Documentation and surveillance systems are inefficient and ineffective.

HEH Response: The HEH division was in the process of implementing the Central Filing System and Data Management Policy during the Site Visit. At that time there were three sources of documentation which included the Physical File, Electronic Shared Folder and the new Database, QuickBase that was in the process of development and transferring the documentation. To ensure this process was completed, efficient and ensure each case met the required documentation requirements, all staff received proper training on the Central Filing System Policy, Data Management and Documentation during the first quarter of 2020. These policies have been implemented and are discussed and reviewed by HEH Management during one-on-one meetings with staff every 2 weeks. The PHN Supervisor conducts ongoing quality checks of documentation along with monthly one on one meetings with the PHN case managers to review caseload and problem solve difficult follow-up situations. Case Conferencing will be implemented in June 2020 with the PHN Case Managers and the Lead Risk Assessors to optimize communication.

Observation 2: Children being treated for elevated blood lead levels do not always have access to lead- safe housing.

HEH Response: MHD has seen a decrease in abatement wait times starting late summer of 2019. Staff perform interim control measures on all properties to increase safety of the child until the abatement process starts. Properties that are deemed inhabitable for the child and family will be brought to the attention of HEH.

Observation 3: There is a lack of clarity for budget oversight and accountability.
HEH Response: The City of Milwaukee Health Department was able to staff the Business Operations Division. We now have the Business Operations Manager and Grant Accountant onboard supporting the HEH Department. In addition, the Business Operations Department and Home Environment Health Division initiated monthly check-in meetings to discuss budgets vs. expense reports and other important financial items to ensure proper oversight and accountability.

Observation 4: Medicaid is not being fully billed for Medicaid-eligible services.

HEH Response: The HEH will evaluate this process and incorporate fields in QuickBase to ensure the department identifies all families eligible for Medicaid early in the process and add fields to track each eligible case for reimbursement. The HEH Division projects for this process to be completed early fall as the Data and Evaluation Team is supporting COVID-19. Also, HEH will create a policy and procedure for Medicaid Reimbursement and properly train staff to ensure this process is completed and monitored.

Observation 5: There is some uncertainty in the completeness of risk assessments.

HEH Response: The Lead Risk Assessment team completed the following training to ensure the staff have a standard process to complete Environmental Investigations, Enforcement and Clearances during the week of March 9-13, 2020.

Quality review of Lead Inspections reports, Orders, Citations and Clearance Reports are completed by the HEH Coordinators to ensure proper completeness of reports. In addition, the Department of Health Services requires that this documentation is submitted for each property in HHLPSS and they review and process these reports.

Recommendation 1: Case management should be centrally monitored, and each case overseen by one public health nurse and the nursing coordinator or supervisor.

HEH Response: All active cases are now assigned to one PHN Case Manager by the PHN Coordinator with support from the PHN Supervisor. All physical cases files are located in a locked Central filing system by PHN Case Manager name in alphabetical order. Any file pulled is required to be replaced at the end of each work day. The PHN Supervisor maintains daily assessment of charts being worked on are returned to the Central filing system by the end of the workday. The PHN Coordinator and the PHN Supervisor perform electronic audits of the Quickbase and notifies the PHN case manager with follow up review within 2 days. A draft "Home Environmental Health Nursing Case Management Chart Audit is in development.

Recommendation 2: Convene regular case reviews to coordinate and improve care.

HEH Response: The PHN Supervisor conducts ongoing quality checks of documentation along with monthly one on one meetings with the PHN case managers to review caseload and problem solve difficult follow-up situations. Case Conferencing will be implemented in June 2020 with the PHN Case Managers and the Lead Risk Assessors to optimize communication.

Recommendation 3: Letters and educational materials sent to families should be in plain language and translated into the common languages spoken in Milwaukee.

HEH Response: Letters sent to families have all been revised and are more user friendly and in English and Spanish. They have been named appropriately so that the proper letter is generated and documented within the database. Letters with blood lead levels for existing cases can be personalized

by the PHN Case Managers. Letters for elevated blood lead levels that are not case-making are sent out with an improved education flyer with instructions to connect with our community partners for outreach and education along with a pre-screening for the Lead Risk Reduction Program. Educational Materials have all been revised for literacy, visual engagement and are shared with our community partners.

Recommendation 4: Conduct regular self-audits.

HEH Response: Regarding the Housing and Urban Development (HUD) Grant, the HEH Division ensures all units that receive funding meet required enrollment and income eligibility standards set by HUD policy guidance. In terms of the lead abatement work performed on qualifying units, staff will check the scope of work of each unit and the Environmental Manger randomly samples units for accuracy to assure that all HUD funds are used to abate lead hazards only. The abated units are spot checked to verify that repairs have stood up to the harsh Wisconsin winters. We will conduct these spot checks throughout the year. HEH managers also conduct unannounced visits (Quality Assurance Guidance Document) while staff field are conducting inspections and clearances to evaluate performance and assure consistency throughout the department. A draft "Home Environmental Health Nursing Case Management Chart Audit Policy is being piloted by the PHN Coordinator and PHN Supervisor during quality checks of Physical Charts, Quickbase and the Healthy Home Lead Poisoning Surveillance System database case documentation.

Recommendation 5: Have a periodic performance audit conducted by an independent, neutral, third party.

HEH Response: The City of Milwaukee has now employed an Inspector General for the City who will perform periodic audits of the Home Environmental Health Division. Additionally as funds become available, outside audits will be requested.

Recommendation 6: Review MHD policies to assure they are administratively feasible.

HEH Response: All policies have recently been re-written based on our processes and requirements. On an annual basis, our program will review all relevant policies to make sure that they are still applicable and reflect current practice as processes are improved.

Recommendation 7: Explore unique staffing models.

HEH Response: Working with the Health Department HR and DER to conduct a Job Analysis (in-depth study) for the Lead Risk Assessor position to update the job description to recruit candidates with the necessary skills to perform the job successfully.

Recommendation 8: Develop and implement a retention strategy for lead poisoning prevention staff.
HEH Response: Currently HEH is working with the Health Department HR and DER on the reclassification of the pay scale for the Lead Risk Assessors. Once management staff vacancies have been filled the department will resume individual performance evaluations.

Recommendation 9: Provide ongoing staff training. The program has recently concluded a re-training of all staff.

HEH Response: These trainings are continuous and cover all aspects of the investigation, monitoring and clearance processes. Best practices are shared regarding Lead Inspection/Risk Assessment and Clearance Report writing and all other necessary documentation. All PHN Case Managers and the Public Health Nurse Supervisor have attended the CDC National Lead Poisoning Training Center and have access to American Nurses Association webinars, American Public Health Association journals, Family and Community Health journals, Journal of Public health Management and Practice and the Public Health Nurse Residency Program series sponsored by the Southeastern Region of Wisconsin Public Health Nursing of the Wisconsin Department of Health Services.

Recommendation 10: Conduct regular communications with the child's main healthcare provider on the public health services being provided to the child and family.

HEH Response: Conducting and documenting communications with healthcare providers is included in the "Nursing Standards of Practice-Documentation", "Nursing Care Coordination and Case Management for Lead Levels Requiring Immediate Action Including Chelation Interventions" and the "Case Closure" policies.

Recommendation 11: Mobilize public health and health care resources in Milwaukee and surrounding areas to increase lead screening rates.

HEH Response: Testing is available at the City of Milwaukee Health Centers and community partners including Sixteenth Street Health Center and SDC.

Recommendation 12: Move all childhood lead poisoning case management and follow-up activities under the oversight of the MHD.

HEH Response: All case management and follow-up activities are under the oversight of the MHD.

Recommendation 13: Institute a "Lead Court." MHD will continue to utilize the City of Milwaukee Municipal court for lead hazard hearings.

HEH Response: MHD has increased lead enforcement significantly and look to hold home owners and landlords more responsible for the upkeep of their properties. Our Municipal court is fully aware of the issues with lead.

Recommendation 14: Participate in or create a public lead hazards registry.

HEH Response: This request has been made to the State of Wisconsin Department of Health Services.

Recommendation 15: Assess and address lead poisoning "hot spots."

HEH Response: The City of Milwaukee Health Department developed heat maps and prioritize outreach and resources in areas with the greatest need.

Recommendation 16: Create and implement a citywide strategic plan to mobilize and coordinate city resources and prioritize childhood lead poisoning throughout Milwaukee.

HEH Response: In collaboration with the BOH (Board of Health) the Lead Safe Advisory Committee has been created, made up of community agencies, hospital systems and other educational agencies and community residents. The LAC (Lead Safe Advisory Committee) will be tasked with the creation of factsheets and educational materials to be distributed to the community.

Recommendation 17: Conduct lead exposure prevention activities.

HEH Response: MHD currently has a partnership with Sixteenth Street Community Health Centers and Social Development Commission (SDC) to increase lead outreach efforts throughout the City of Milwaukee. The Community Lead Outreach Program will support MHD by identifying new strategies for lead prevention education and awareness activities, including developing relationships with Head Start, K-3, and K-4 programs, childcares, health centers, advocacy groups, neighborhood, and parent organizations. By connecting families with children under the age of six and pregnant women to existing program resources, i.e., lead hazard reduction, drinking water filter distribution, provide education, home visiting and education on the lead-safe kits, if available from MHD.

Sincerely,

Marivel Montejano
Home Environmental Health Division Director
City of Milwaukee Health Department

C. Evers

Claire Evers
Deputy Commissioner of Environmental Health
City of Milwaukee Health Department