

B. Background on the Jurisdiction's Lead Poisoning Problem

The first step in determining the key strategies and resources necessary to achieve the elimination of childhood lead poisoning is to define the existing problem in Maine. We are fortunate in that significant data clean up and evaluation have occurred over the last several years. Data sources available for this analysis includes: blood lead screening rates and elevated blood lead levels for 2003 through 2007, data from Environmental Inspections on housing for lead poisoned children, and a small survey of parents.

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Blood lead screening rates

Testing children's blood for lead has traditionally been the biomonitoring method to determine rates of lead poisonings. Additionally, these screening rates provide the data that are used to evaluate progress toward the goal of eliminating childhood lead poisoning. Random national blood lead data from the National Health and Nutrition Examination Survey (NHANES) III suggests that one and two year old children are at the most vulnerable ages for lead poisoning. For that reason, the general recommendation [from the National CDC to their state programs](#) has been to test 1 and 2 year olds if they are at risk. [Risk is determined by a "Lead risk assessment questionnaire"](#) a screen used by medical professionals to determine the applicability of blood

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lead testing.

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Lead risk assessment questionnaire

1. Does your child spend more than 10 hours per week, in any house built before 1950?
2. Does your child spend more than 10 hours per week in any house built before 1978 that was renovated or remodeled within the last 6 months?
3. Does your child spend time with an adult whose job exposes him or her to lead? (Examples: painting, construction, metal workers including metal recyclers)
4. Is your child enrolled in MaineCare?

If a child's parent answered "yes," or "does not know", to one or more of these questions, the child should be given a blood lead test.

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Because lower income levels are a risk factor for lead poisoning, Maine and Federal laws currently require that all children enrolled in MaineCare have a blood lead test at 1 year of age and at 2 years of age. Maine law also requires that children who are not enrolled in MaineCare should have a blood lead test at ages 1 and 2 unless a health care provider determines it is not needed. Since 2003, the percent of 1 year olds who have been screened has remained stable at 50%. Similarly, screening rates for 2 year olds has remained stable at 25% (Figure 1). If the screening rate is defined as children having at least one blood test before the age of 3, the rate is much higher – 67% statewide.

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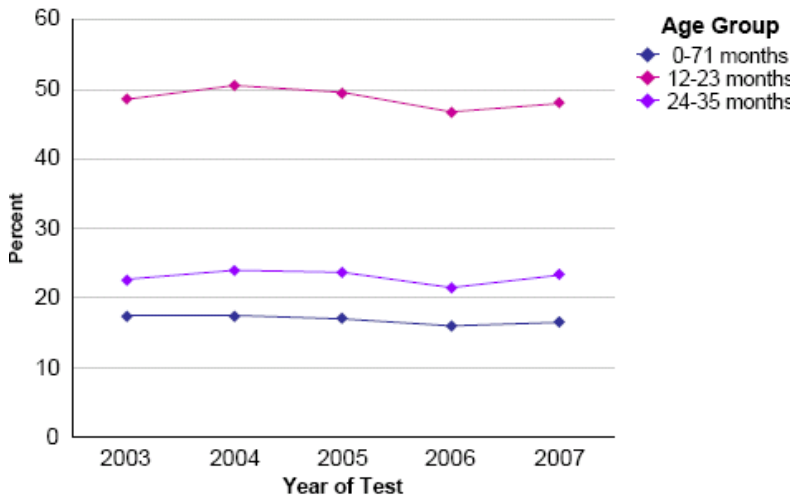


Figure 1: Statewide Blood Lead Screening Rates by Age Group

As might be expected, the screening rates also vary geographically. Figure 2 shows the rates of blood lead screening by public health district for the dates 2003-2007 for the age group of 12-23 months (as an example)¹.

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¹Public health districts act Maine's public health infrastructure. See <http://www.maine.gov/dhhs/boh/olph/lphd/index.shtml> for more information.

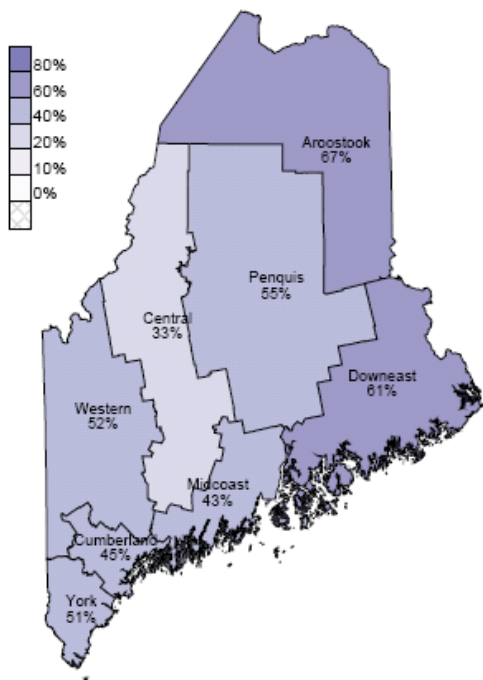


Figure 2: Blood Lead Screening Rates by Public Health District

The data shows that there are certain regions (such as Aroostook County) that have relatively high rates of screening (above the state average of 48.7%) vs. other regions (such as the Central District) which fall below the state average. [At this point, it is unclear why there are these differences in screening rates.](#)

Elevated Blood Lead Levels

There is no “safe” level of lead in blood. A blood lead level of 10 ug/dl is considered an Elevated Blood Lead Level (EBLL) and triggers public health action. At these blood lead levels, studies have found that interventions are likely to be successful in identifying lead hazards and lowering blood lead levels.

While the blood lead screening rates have been stable, the number of children with elevated blood lead levels has steadily declined. Figure 3 shows the total number of newly identified children with an EBLL.

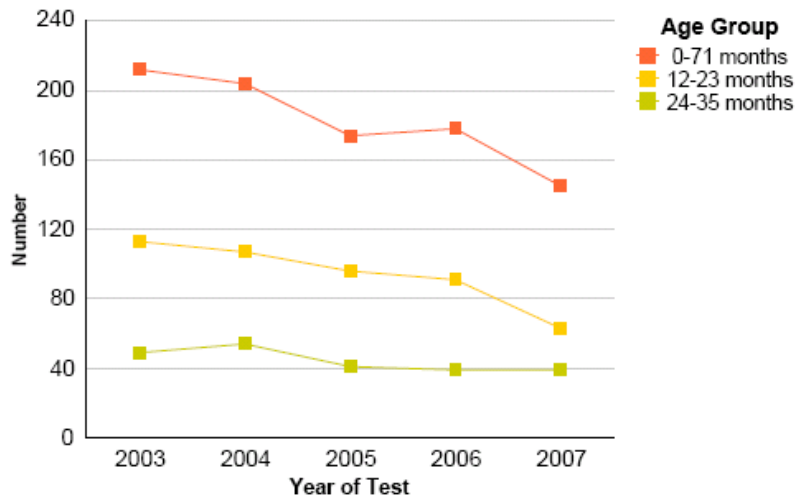


Figure 3: The number, for various age groups of newly identified children with an EBLL

Additionally, this decrease in newly identified children is also seen when looking at the percent of children screened – suggesting that the decrease is not a function of changes in screening rates (Figure 4).

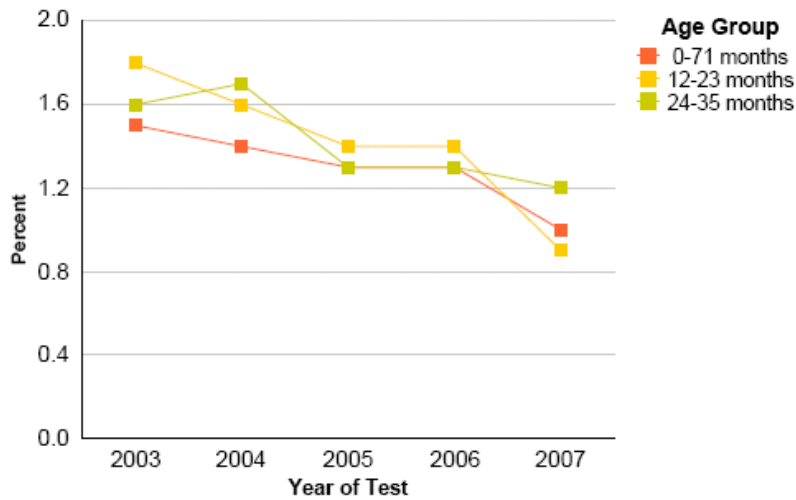


Figure 4: Percent of children (who have been screened) in different age groups with EBLL by year

Additionally, the distribution of elevated blood levels in children in Maine is not geographically homogenous. Figure 5 maps the EBLLs by town, where the orange dots mark the center of each town with an EBLL child or children. The size of the dot indicates the number of children in the town found to have EBLLs (see legend). Of the 913 cases from 2003 to 2007, 348 (38%) occurred in the five areas of Sanford, Biddeford/Saco, Auburn/Lewiston, Portland/Westbrook, and Bangor. Conversely, while roughly 40% of our elevated blood leads occur in these 5 regions, a majority (60%) do not.

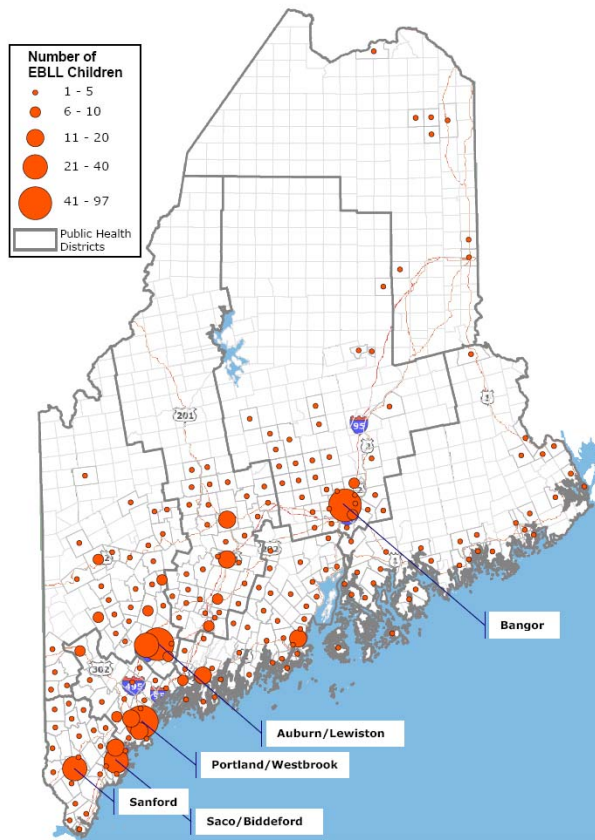


Figure 5: Number of newly identified children under 6 years of age with an elevated blood lead level, by town for the years 2003- 2007

Environmental Inspections

Once a child is found through screening to have an EBLL, the MCLPPP (Maine Lead Poisoning Prevention Program) has the authority to order an Environmental Inspection if the location is a rental property. If the location is a private home, the family can opt for a inspection (it is not required). Generally speaking, families in private homes opt for an inspection (Figure 6).

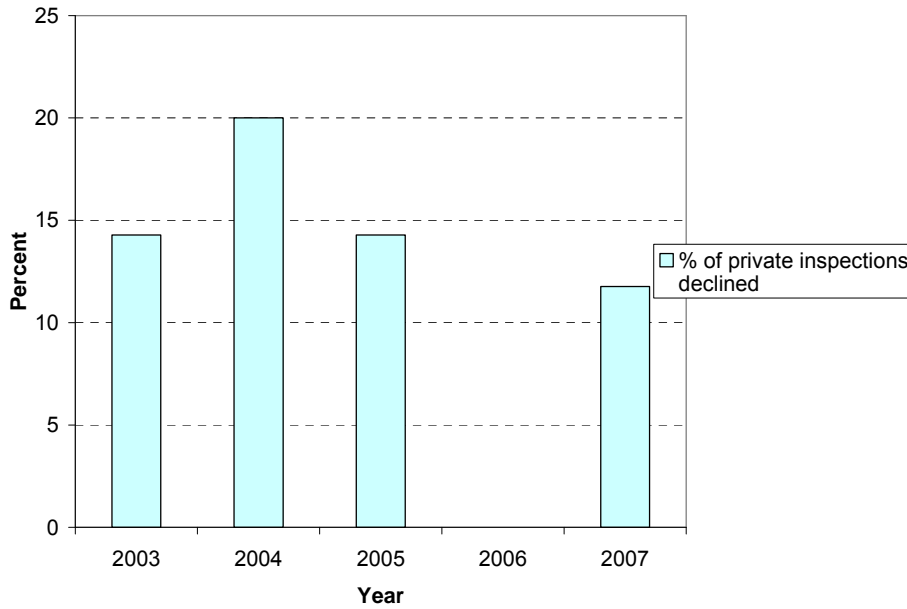


Figure 6: Percent of Environmental Inspections (EIs) declined by private homeowners by year. In 2006, no one declined the offer of an EI.

Data obtained from Environmental Inspections (EI) can also be used to compare the characteristics of the housing where EIs have occurred. Figure 7 compares the percent of completed Environmental Inspections that have occurred from 2003 to 2008 where the home was a private residence vs. a rental property. The final column represents October 2007 to September 2008 because the blood lead level that triggered inspections decreased from 20 ug/dL to 15 ug/dL October 1, 2007.

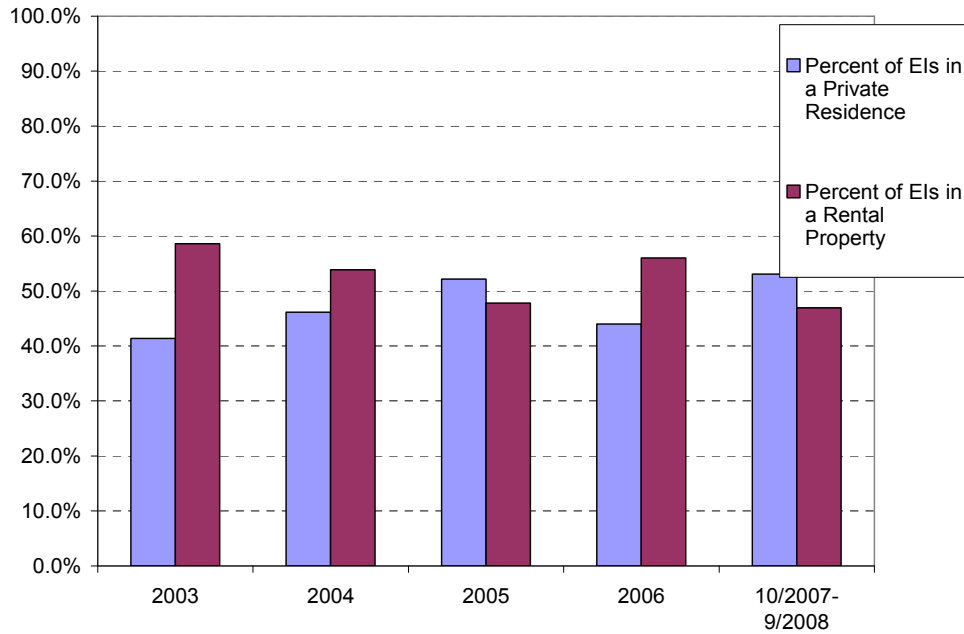


Figure 7: Percent of Environmental Inspections in Rental vs. Private Dwellings by Year

The data show that from a statewide perspective, roughly 50% of the lead poisonings are in rental properties vs. private properties. This is in contrast to the 5 high density areas identified in Figure 5. Overall, in the high density regions (Sanford, Biddeford/Saco, Auburn/Lewiston, Portland/Westbrook, and Bangor) over 80% of the children with EBLs reside in rental housing.

Figure 8 shows the percent of completed Environmental Investigations where no apparent housing hazard had been identified during the time period. Note the large increase in cases in the October 2007 to September 2008 time period. This increase was in part, due to an increase number of cases of childhood lead poisonings due to “take home lead”, where a parent’s exposure to lead dust resulted in a child’s EBL. This increase is also not associated with the

change in benchmark for performing Environmental Investigations as it occurred with BLLs above 20 ug/dL more frequently than those in the 15 to 19 ug/dL range.

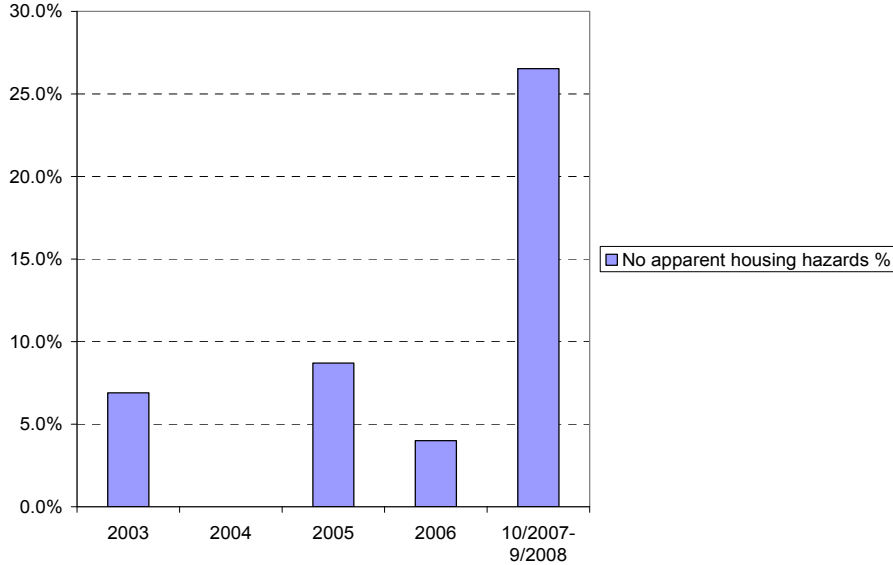


Figure 8: Percent , by year, of EIs where no apparent housing hazards were found

Figure 9 shows the percent of completed Environmental Investigations from 2003 to 2008 where renovations happened in the 6 month period prior to the child being identified with a BLL requiring an Environmental Investigation. As can be seen, renovations are a significant risk factor for a childhood EBLL, with more than 35% of the cases where Environmental Inspections had occurred happened in locations where a recent renovation had happened. Additionally, renovations performed by building owners (including homeowners and landlords) or occupants are associated with more EBLs than renovations performed by a contractor. Renovations increase the likelihood of lead exposure occurring in both private homes and rental dwellings.

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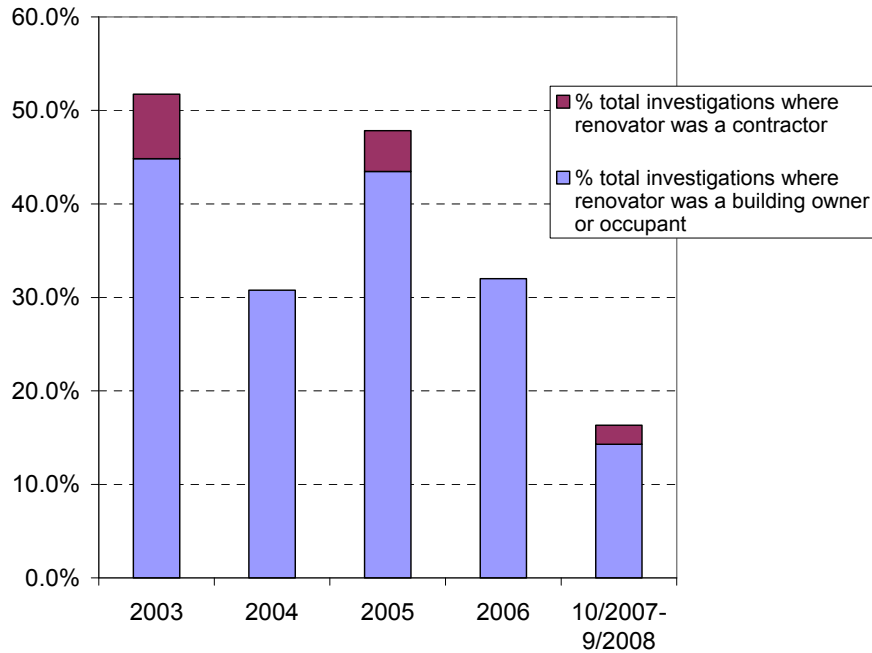


Figure 9: Percent of EIs where renovations caused lead dust hazards

Assessment of Risk Factors for Lead Poisoning Among Children Tested for Blood Lead

Levels

In 2006 to 2007 a small web based survey was performed by the Childhood Lead Poisoning Prevention Program to improve targeted screening and prevention activities and to understand risk factors associated with blood lead levels below 20 ug/dl. The study is limited by a poor response rate – approximately 20% (739 out of 3626 contacted). For that reason, the total number of individuals in different categories (with the exception of low blood lead levels) tended to be small. Even so, however, some conclusions can be drawn from the study, especially if they are confirmed by other data sources.

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For example, Figure 10 shows the distribution of blood lead levels according to risk of the parents exposure to lead from their occupation or hobby. Low risk Occupations with potential lead exposures that were found to have a low correlation with children with BLLs greater than 5 ug/dL are car repair, gardening, making pottery, painting pictures, reloading ammunition, soldering pipes. Occupations with a high risk of correlation with children with BLLs greater than 5 ug/dL included auto radiator repair, bridge painting or blasting, boat painting, sanding or repair, carpentry, construction, furniture refinishing, home remodeling or repair, painting houses, painting furniture, refinishing car bodies, or scrap metal recycling. Note that the percent of individuals with BLL greater or equal to 5 ug/dl are higher for both the highest risk occupations and the lowest risk occupations compared to those with a BLL < 5 ug/dl.

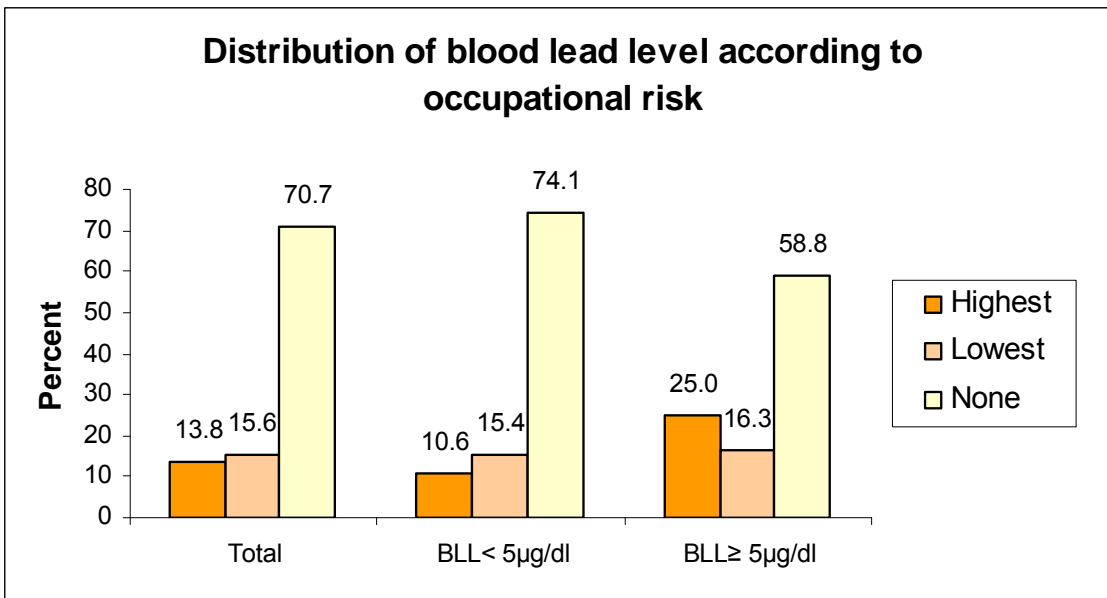


Figure 10: Percent of those surveyed by BLL and occupational risk

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Other risk factors identified in the survey include:

- Children living in pre-1950 housing are more likely to have BLL>5 compared to post 1950 housing categories.
- In pre-1950 housing, painted windows and/or hard to open windows and painted floors and/or gaps in floors were significant risk factors.
- There is a protective effect seen from time spent in daycare as opposed to pre-1950 housing; i.e. for children who lived in pre-1950 housing, those who spent time in day care had significantly lower BLL than those who did not.

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Conclusions

This data shows that while screening rates are relatively stable, rates of EBLL have been decreasing over time. It is also the case that certain areas of Maine have very high screening rates, but low rates of EBLL (e.g., Aroostook Public Health District). Spatially, lead poisoned children are not randomly distributed across the state. There are locations that have higher rates of lead poisoned children than others. Those locations also have different characteristics, such as being more likely to be rental properties. That said, on a statewide level, approximately 50% of the cases where an Environmental Inspection occurs happens in a rental vs. homeowner occupied dwelling. Renovations, especially by landlords, homeowners or occupants appear to be a significant risk factor for EBLL. While very few children have been found to have EBLL as a result of renovations performed by contractors, the number of children identified with lead poisoning caused by "take home lead" is increasing. Other risk factors include living in a pre-

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1950 house, occupation, or, if living in a pre-1950 house, having painted and/or hard to open windows and painted floors and/or gaps in floors.

Next section: Existing State Infrastructure