During the 1970s state and federal government through public policy has been attempting to limit the use of lead in products. Gasoline, paint, soda and food drink cans, and solder in pipes were the primary products that included lead. Aluminum is an environmental toxic poison that is harmful to the nervous system. Children from 0 – 4 and adults if exposed to “Lead,” can cause serious lifelong adverse health, developmental and cognitive outcomes. The major source of lead exposure for children is lead-based paint and lead-contaminated dust. Historically, the standard threshold for lead poisoning intervention was 10 or more micrograms per deciliter of lead. However, even lower levels (5 micrograms/dcliter) of exposure cause serious damage if left untreated. Below are Children’s and Adult Reactions to Lead for 10 – 100 micrograms/dcliter:

**Children’s Reactions to Lead**
- Micrograms per deciliter
- Blood Lead level: Possible Health Effects
- 15 ug/dL: Sight loss in IQ, hearing and growth problems
- 20 ug/dL: Moderate loss in IQ; hyperactivity; poor attention span; difficulty learning; language and speech problems; slower reflexes
- 40 ug/dL: Poor bone and muscle development; clumsiness; lack of coordination; early anemia; fewer red blood cells to carry oxygen and zinc
- 50 ug/dL: Stomach aches and cramps; anemia; destruction of red blood cells; bruin damage
- 100 ug/dL & above: Swelling of the brain; seizures; coma; death

**Adult Reactions to Lead**
- Micrograms per deciliter
- Blood Lead level: Possible Health Effects
- 15 ug/dL: Increase in blood pressure; harmful effects on heart, liver and kidneys
- 25 ug/dL: Reproductive problems
- 40 ug/dL: Kidney damage; damage to blood formation
- 50 ug/dL: Anemic; nerve damage; constipation; stomach pains; mental and behavioral retardation; memory and concentration problems; clumsiness; drowsiness and sleep problems
- 80 ug/dL & above: Blue line on gums; uncontrollable shaking of hands; wind and foot drop; hallucinations; brain damage; coma, death

Within the United States, residential homes built prior to 1950 had 50% lead in the paint. From 1950 – 1977 paint manufacturers voluntarily began to reduce the amount of lead paint in their product. Since 1978 MA prohibited the use of lead paint in homes. The law specifically states the following: “...removal or covering of lead paint hazards in homes built before 1978 where any children under six live. Lead paint hazards include loose lead paint and lead paint on windows and other surfaces accessible to children. Owners are responsible with complying with the law. This includes owners of rental property as well as owners living in their own single family home...”

Since 1995, the City of Boston Public Health Commission has been aggressively working to identify, test, and treat children with the prevalence between >= 10 micrograms/liter of lead poisoning in children 0 – 4 years old.

**PROJECT DESCRIPTION**

To create a City of Boston, Lead Poisoning Database to view, understand, interpret, frame research and spatial questions, reveal relationships, patterns, and trends that will allow someone to identify strategies, plans and reports, create maps, charts, and advocate for public policy and funding to prevent and eliminate current and future lead poisoning residential properties of Boston. To begin to create the database, I asked the following research and spatial questions that will be answered via charts and maps:

**Research and Spatial Questions**
- Which neighborhoods within the City of Boston have the highest rate of Elevated Blood Lead Levels?
- What has been the City of Boston Public Health Commission’s progress on reducing lead poisoning in children within the last 10 years or more?
- Which residential parcels within the City of Boston, with potentially children 0 – 18, are at risk from lead poisoning? Federal, state and city governments were only tracking 0-4 years of age. However, on January 4, 2012, 5 micrograms per deciliter is the new threshold level for children, by the Center for Disease Control. Thus, the new threshold will require re-testing and notifying children and teenagers who were not notified if their blood lead level was less than or equal to 10 microgram deciliter in prior years.
- What residential parcels require inspection and compliance with lead poisoning laws?

**RESULTS**

The Childhood Lead Poisoning Database can be used to identify, analyze and recommend local and state public policy to address lead poisoning, not only for children, but adults and senior as well. The power of the database is its ability to identify properties that have not been inspected that may have lead paint and lead dust and have people living in the property. Given the ability to identify hazard properties, people can advocate for increased funding to de-lead the properties for safe habitation. Low to moderate income families who live in “hazard” properties might need funding to de-lead their homes. The “City of Boston Lead Database to the left shows that inspections of parcels and remodel- ing of units pre-1978 have been happening throughout all the neighborhoods in Boston. The individual maps below demonstrate what can be done to identify the following: 1) which parcels have not been inspected with or without children, 2) which parcels have been inspected, but need follow-up, and 3) which parcels have been remediated.

Lead poisoning is a serious childhood health problem that impacts people. The state of MA has primarily concentrated on housing built pre-1950. The state of MA has done an exemplary job in reducing lead poisoning in the homes. There is still much to be done. There are initial and follow-up inspections to be done to inspect and clean up the property. The Commonwealth of MA developed a strategic plan to end lead-based poisoning by 2010. On January 4, 2012, the U.S. Center for Disease Control (CDC) announced that the new threshold change from 10 to 5 micrograms/deciliter. The threshold change will require re-inspections and a statewide coordinate effort that will require contacting individuals with threshold levels of less than 10 micrograms per deciliter to get tested and treated. Lead is a preventable disease, effective policy, programs and funding needs to be obtained through strategic and deliberate advocacy to solve the problem. My recommenda- tion would be to use this database to not only address the lead exposure for children, but for anyone who lives in the hazardous residential properties.