

Williams County Lead Report









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Purpose

The Williams County Health Department recognizes the harmful effects of lead, especially to children, and is working towards the ultimate goal of eliminating childhood lead poisoning by reducing the number of children who are lead poisoned. The purpose of this report is to create awareness of the issue and to promote options to prevent lead poisoning in Williams County.

What is lead?

Lead is a metal that is naturally found in small amounts in the earth's crust. Though lead does have several beneficial uses, it can be harmful to humans and animals alike and be detrimental to health.

Where is it found?

Lead can be found in various places, especially in homes built before 1978, as these often contain leadbased paint. The main cause of lead exposure is the dust or chips from deteriorating lead-based paint, as residents can breathe in the dust and children could consume the chips (Hamilton County Public Health, 2007). Even when these older homes are in good condition, lead-based paint can also be disrupted and cause problems during remodeling. Remodeling may cause chips in the paint or can create lead-based

paint dust to enter the environment, all of which could cause health problems.

Lead can also be found in water. When found in water, lead often entered the source because the water system is older and contains lead pipes or lead solders. These pipes and connectors may have rusted and the flakes have come loose and entered the water. Water can also sit in these pipes for an extended period of time which allows the lead to seep into the water (Hamilton County Public Health, 2007; Center for Disease Control and Prevention (CDC), 2016a).

Though lead-based paint and water are the most commonly heard of sources of lead, other sources do exist. Contaminated soil, lead-glazed pottery or ceramics, and some inexpensive metal jewelry are just a few examples of everyday items that can contain lead (National Institute of Health (NIH), 2016). Figure 1 depicts several other possibilities of lead sources within the home.



Figure 1: Potential Lead Sources in the Home (CDC, 2016a).

How is lead harmful?

No amount of lead in the body is safe. Lead poisoning occurs when there is a buildup of lead in the body, which typically takes place over several months or even years (Mayo Clinic, 2014). This buildup of lead can impact any person regularly interacting with the contaminated source. The level of lead in the blood impacts the severity of health concerns, often the more lead in the body the more likely severe health problems will arise (NIH, 2016).

In children, certain blood lead levels are correlated with "increases in behavioral effects, delayed puberty, and decreases in hearing, cognitive performance, and postnatal growth" as well as "lower IQ scores, [and] decreased academic achievement" (NIH, 2016). Though these are not all of the potential health effects children may face, Table 1 provides a breakdown of health effects by blood lead level.

In adults, certain blood lead levels are associated with "increases in blood pressure [and] hypertension" while chronic lead exposure can cause nerve disorders, cataracts, muscle and joint pain, heart conditions, and memory and concentration issues (NIH, 2016). Though these are not all of the potential health effects adults may face, Table 1 provides a breakdown of health effects by blood lead level.

Blood Lead Level	Health Effects
Blood lead levels below 5µg/dL	Children: Decreased academic achievement, decreased IQ, and decreases in specific cognitive measures, increased incidence of attention-related behaviors and problem behaviors
(NIH, 2016)	Adults: Decreased kidney function, maternal blood level associated with reduced fetal growth
Blood lead levels below 10µg/dL	Children: Delayed puberty, reduced postnatal growth, decreased IQ, and decreased hearing
(NIH, 2016)	Adults: Increased blood pressure, increased risk of hypertension, and increased risk of essential tremor
Blood lead levels above 10µg/dL	Children: decreased vitamin D metabolism, increased nerve conduction velocity, colic, nephropathy, encephalopathy, if it reaches 150µg/dL death can occur. (WHO, 2010)
	Adults: impaired concentration, hearing loss, seizures, miscarriage, and hypertension. These types of effects typically begin occurring at higher levels, at 25µg/dL and up. (New York State Department of Health, 2009).

Table 1: Health Effects of Lead by Blood Lead Level

Who is at higher risk for lead poisoning?

The population most at risk for lead poisoning is children under the age of six (NIH, 2016). This is likely because children in this age group frequently put their hands and other items in their mouths and these objects can have lead from dust or soil on them. Children are also at risk of exposure from toys with lead-based paint. Not only are children at higher risk of lead poisoning, their bodies "absorb more lead

than adults do and their brains and nervous systems are more sensitive to the damaging effects of lead" (Williams County Health Department (WCHD), 2016).

Adults who are at higher risk are those that have certain occupations, as most exposed adults are exposed at work. Jobs that have a higher risk for lead exposure include: mining, ironwork or welding, construction, renovation, smelters, firing ranges, car radiator repair, metal shop work, and manufacturing of pottery/stained glass and car batteries (NIH, 2016).

Lead exposure and poisoning also disproportionately affects those with a lower socioeconomic status. This sub-population is more likely to live in older and poorly maintained rental properties, as well as hold the occupations listed above that are at a higher risk for lead exposure (CDC, 2015). In 2015, 7% of children under 6 years of age in Williams County lived below the poverty line, while 38% of all housing units were built prior to 1950 (CDC, 2016b). The long term health effects and financial costs of lead poisoning could also assist the perpetuation of these living conditions.

Signs and symptoms of lead poisoning:

In the beginning, lead poisoning is difficult to identify, as symptoms often do not occur until the level of lead in the body has become dangerously high (Mayo Clinic, 2014). Once these symptoms do occur, however, they appear differently in children than they do in adults. See Table 2 for a list of symptoms.

Children	Adults
Learning trouble	High blood pressure
) Irritability) Joint pain
) Developmental delay	Abdominal pain
J Loss of appetite) Muscle pain
Sluggishness and fatigue) Constipation
) Weight loss	Decline in mental functions
) Vomiting) Headache
) Constipation	Pain, numbness or tingling in extremities
Hearing loss) Memory loss
) Abdominal pain) Mood disorders

Table 2: Signs and Symptoms of Lead Poisoning in Adults and Children. (Mayo Clinic, 2014)

Steps to Take:

Knowing who needs to be tested for potential lead poisoning is one of the first steps that can be taken. In Ohio, children are tested for blood lead levels at ages 1 and 2 years if they fit the following criteria:

-) The child is on Medicaid
- Child lives in a high-risk zip code area
 - High-risk zip codes in Williams County include: 43517, 43543, and 43506
- J If the parent answers "yes" or "unknown" to one or more of the following questions:
 - o Child lives or regularly visits a building constructed before 1950

- Child lives or regularly visits a building constructed before 1978 that has chipping paint
- Child lives or regularly visits a building constructed before 1978 with recent or ongoing remodeling
- o Child has sibling or friend with lead poisoning
- o Child has frequent contact with adults who have lead-related job or hobby
- Child lives close to an active/former lead smelter, battery recycling plant, or other industry known to generate airborne lead dust

If any level of lead in the blood is confirmed, this is an indication that the individual has been exposed to lead (WCHD, 2016). When a child in Williams County has a lab confirmed elevated blood level of 10 or higher, a Lead Investigator from the Ohio Department of Health will come and test various locations inside and around the home. Health providers and lead case managers provide the affected family with instructions to reduce the effects of the lead already in the body and to prevent further exposure.

Lead Cases in Williams County:

The Williams County Health Department provides several services for the community concerning lead exposure and poisoning. These services include lead education, case management and home visits when a lead case occurs. WCHD also serves as a liaison between the family and the Ohio Department of Health (ODH) Family Homes and Lead Poisoning Prevention Program representative. See Graph 1 below for a look at the number of lead cases in children between the ages of zero (0) to six (6) years old in the past five (5) years in Williams County.



Graph 1: Number of Lead Cases in Williams County in Children between 0 and 6 years of age, 2011-2015

As can be seen the overall number of lead cases has decreased over the past five (5) years. In the past year, however, the number of cases has increased, looking especially at cases where the blood lead level was between 10-14 μ g/dL, where the number of cases tripled. In the past two years, the number of cases with blood lead levels between 15-19 μ g/dL has also increased. While knowing the number of cases in the county is vital, knowing where they occur is equally as important. Often lead cases occur in less affluent areas, as these homes are more likely to have been built prior to 1978.

The year a house was built can greatly influence the chances of an individual being exposed to lead, as houses built prior 1978 often were painted with lead-based paint. Even if the paint is undisturbed or painted over, the risk of exposure is still higher in these older homes than in others that were built after the 1978 ban on the use of lead-based paint. Homes built before 1980 make up over 1 in 4 of the housing units in Williams County. See Graph 2 for a look at the number of houses built before 1980 and that could have a higher risk for lead exposure.



Graph 2: Number of Houses in Williams County built either Pre-1980 or Post-1980

Though over 1 in 4 homes in Williams County were built prior to 1980, these homes are not equally dispersed throughout the county. There are higher concentrations of these older homes in certain census tracts within the county. Census tracts are "small, relatively permanent geographic entities within counties...Generally, census tracts have between 2,500 and 8,000 residents and boundaries that follow visible features" (United States Census Bureau, N.D.). This breakdown of Williams County was used to make comparisons across the different areas easier and more accurate, see Figure 2 for a census tract map. In Williams County there are 9 census tracts, ranging from 9501 to 9509. See Graph 3 for a look at which census tracts in Williams County have a higher concentration of homes built before 1979.



As can be seen in Graph 3 below, the differences between several of the census tract areas are substantial. Especially between tracts that are located next to one another, such as 9506 (East Bryan) and 9507 (West Bryan). These tracts are the east and west halves of one city and yet there is a 12% difference in the number of older homes located within the census tract. The greatest difference seen is occurring between census tracts 9503 (Montpelier area) at 84% and the 9505 (Stryker area) and 9508 (South Central area) tied at 64%, resulting in a 20% difference in the number of homes older than 1979. A map of these results can be seen in Appendix A.



Graph 3: Percentages of Houses Built Prior to 1979, by Census Tract, 2011-2015

The locations of these older homes can be associated with the number of homes with confirmed cases in each census tract as well. The results displayed in Graph 4 below reveal the number of individual houses in each census tract that have at least one lead case, it does not account for multiple cases that occurred in the same house.





A link can be seen between where the lead cases have occurred and where the older homes are built. Census tract 9506 (East Bryan) has the second highest percentage of homes built prior to 1979 and has the highest number of homes with confirmed lead cases. The connection can also be seen in census tracts with only a few lead cases. Census tracts 9505 (Stryker area) and 9508 (South Central area) are tied for having the lowest number of homes with lead cases, at two apiece. These areas are also tied for having the lowest percentage of homes built prior to 1979, at 64% of homes being built prior to the ban on lead paint use. See a map of the results in Appendix A.

As discussed previously, individuals with a lower socioeconomic status are more likely to live in the older homes, and thus are inherently at greater risk of lead exposure. The locations of the older homes and the number of confirmed lead cases both can be aligned with the median income and poverty rates in the area. It has been found that the census tracts with the highest percentage of older homes and more homes with lead cases also had the lowest median incomes and highest poverty rates in the county. Census tract 9503 (Montpelier area) has the highest percentage of homes built prior to 1979 at 84%, the third highest number of homes with lead cases at 9, the second highest poverty rate at 17%, and the second lowest median income of \$39,298. Census tract 9506 (East Bryan) has the second highest percentage of homes with lead cases at 18, the

highest poverty rate at 30% and the lowest median income of \$25,474 (American Fact Finder, 2016a: American Fact Finder, 2016b). This correlation works in the other direction as well, with census tract 9505 (Stryker area) and 9508 (South Central area) having the lowest percentage of older homes, tied at 64%, tied for the lowest number of homes with lead cases at 2, tied for the third lowest poverty rate at 12%, and are in the top three for highest median incomes in the county (American Fact Finder, 2016a: American Fact Finder, 2016b). The age of the house and whether a case has occurred there are not the only aspects to consider when looking at potential lead exposure.

How these older homes are owned is important in the sense that homes older than 1978 that are rented have the potential to affect the health of more individuals as the turnover of residents may be greater in rented homes than owned homes. Rented homes may also include more furniture being moved within the house which could increase the risk of exposure as paint may be chipped or exposed during the moving process. Graph 5 below depicts the number of homes built prior to 1980 that are either renter-occupied or owner-occupied.



Graph 5: Tenure of Pre-1980 Housing

Of the homes that are older than 1980, a majority (75%) of houses are owner-occupied while the remaining homes (25%) are renter-occupied. Though most of the older homes are owner-occupied this does not mean that there is not resident turnover in the area. No matter the location of the home or an individual's income level, certain preventative steps can be taken to reduce exposure to lead before renting or purchasing a home.

Preventative measures:

Proactive measures need to be taken if the number of lead cases and the related negative health effects are to be reduced. Many steps can be taken around the house, or even before moving into a new home.

Proactive measures can include:

Know your rights before moving. As a homebuyer or renter, you have the important right of knowing "whether lead is present—before signing contracts or leases" (Environmental Protection Agency (EPA), 2016). See Table 3 for your rights as a homebuyer or renter.

Homebuyer	Renter
Before you are mandated by contract to buy a house older than 1978, Federal law states the seller of the home must provide you with:	Federal law mandates that before signing a lease for housing older than 1978, landlords must provide renters with:
 An EPA approved lead informational pamphlet Any information on the presence of lead-based paint in the home An section in the contract that includes a "Lead Warning Statement' and confirms that the seller has complied with all notification requirements" A 10-day period to complete a paint inspection/risk assessment for lead-paint 	 An EPA approved lead informational pamphlet Any information on the presence of lead-based paint in the home For multi-unit housing, information must include common areas as well An section in the contract that includes a "Lead Warning Statement' and confirms that the seller has complied with all notification requirements"

Table 3: Homebuyer and Renter Lead Rights (EPA, 2016)

If there is a concern about the presence of lead in the housing unit, request a lead inspection to be conducted by a certified inspector before buying or signing the lease (EPA, 2016).

If you already live in an older home or rental unit, there are preventative steps that can be taken to reduce lead exposure. These steps include:

- Keeping your child away from renovation or maintenance work that disturbs paint, and make sure no paint chips or dust remain in the work area before your child enters. If you hire someone to conduct renovation, repairs, or painting in a home built before 1978, make sure that they are lead safety certified by the Environmental Protection Agency (EPA).
- Look for and safely fix peeling paint: report it to your landlord if you're a tenant so that repairs will get made (and call code enforcement or a legal aid society if there's no response). To learn more about repairing paint safely, visit <u>http://www.hud.gov/offices/lead/training/LBPguide.pdf</u>
- 3. Obtain professional help with screening your home for hazards and making repairs. A lead risk assessment will tell you if you have hard-to-find hazards such as lead dust, lead in bare soil, or lead in your water to prioritize any repairs you can have done. A lead-based paint inspection

will tell you where the lead-based paint is in your home so you know the places (such as windows, doors, trim, porches, and other locations) to maintain and avoid disturbing. An abatement contractor knows how to eliminate hazards identified by either type of evaluation.

- 4. Wash your child's hands, toys, bottles, pacifiers, and any other items your child often puts in his or her mouth.
- 5. Regularly clean floors, windowsills, and dusty places with wet mops or wet cloths to pick up any dust. Use two buckets one for soap and one for rinsing.
- 6. Use only cold tap water for making baby formula, drinking and cooking. Let the water run for a few minutes first.
- Avoid using certain products from other countries, such as health remedies, eye cosmetics (e.g. kohl, kajal, and surma), candies, spices, snack foods, clay pots and dishes, painted toys, and children's jewelry. These items may contain high levels of lead.
- 8. Remove shoes before entering your home.
- 9. Any household member who does construction work or other work that may involve lead should remove work clothes before entering; wash them separately.

Conclusion

Lead exposure and poisoning can cause serious long-term health effects and disproportionately affects children and individuals with a lower socioeconomic status. The Williams County Health Department has identified the reduction of lead exposure and poisoning in the community as a goal. This analysis has revealed that within the county the number of lead cases has increased in the past year and the cases are primarily occurring in areas with a high number of homes built prior to 1979, with higher poverty rates and lower median incomes. Using this data, the Williams County Health Department will be better able to target preventive resources and services to work to achieve its goal of reducing lead exposure and poisoning.

Additional Lead Resources

- Call 1-877-LEADSAFE (532-3723) for more information about childhood lead poisoning and precautions for home renovation work.
- Visit the Ohio Department of Health website <u>https://www.odh.ohio.gov/odhprograms/eh/phs_environmental/leadlp/lead.aspx</u>
- Visit the Environmental Protection Agency website <u>http://www2.epa.gov/lead</u>
- / Visit the National Center for Healthy Housing website <u>www.nchh.org</u>
- / Visit the Centers for Disease Control and Prevention website http://www.cdc.gov/nceh/lead/
- If you rent, you may wish to call Legal Aid (1-888-534-1432) or First Call for Help (211). These agencies can resolve housing conditions that may be contributing to lead in the home.

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Appendix A:

- 1. Percentage of Houses Built Prior to 1979 by Census Tract Map
- 2. Number of Houses with Lead Cases by Census Tract, 2011-2016 Map



Data selected from: American Fact Finder, U.S. Census Bureau. Physical Housing Characteristics for Occupied Housing Units.2011-2015 American Community Survey 5-Year Estimates

