

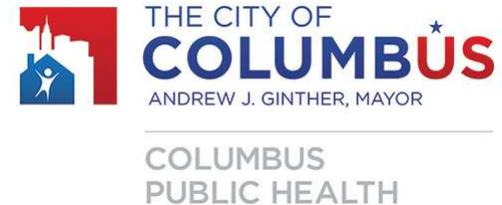
# Columbus Public Health

# Healthy Homes Program

## Presenters:

**Phillip Bouton, LRA, HHS and Chris Bragg, RS. LRA**  
**Ph. 614-724-6000**

Environmental Health Division  
Columbus Public Health  
City of Columbus  
December 3, 2019



# Columbus Public Health

- Serve City of Columbus and Worthington
- Five-member Board of Health
- 500 staff approximately
- 40+ public health programs
- Main campus and satellites



# Healthy Homes Program Overview

---

- Primary function of the program is to investigate elevated blood lead levels (EBLs) referred from the Ohio Department of Health.
- Work with Columbus Dept. of Development Lead Safe Columbus (HUD Grant) to control lead hazards in housing throughout the city.
- Perform Healthy Home Rating System inspections for Lead Safe Columbus.

# What is Lead (Pb)?



- Naturally occurring element
- Used since ancient times as soft metal and pigment for paints; was used in gasoline (anti-knocking agent), ammunition, ceramics, plumbing and solders, jewelry, keys, batteries and cosmetics.
- Typically ingested or inhaled
- Toxic to humans (especially the young) affecting almost every organ and system in the body.
- Hypertension and eye disease in older adults



# Lead pigments

---



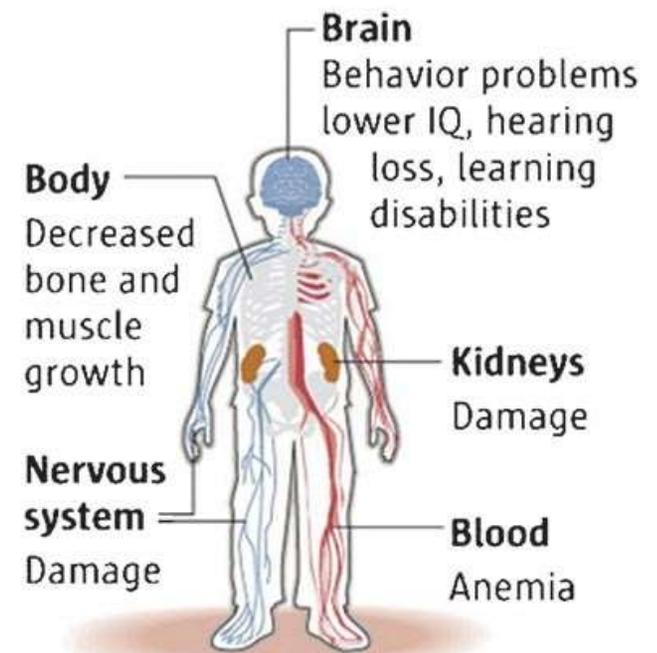
- Yellow Lead—lead chromate, naples or antimony yellow ranges from muted to earthy, reddish yellow pigment to bright yellow.
- Red Lead—Minium, lead tetraoxide is bright red or orange.
- White Lead—Lead carbonate, opaque white pigment

# Health Effects of Lead Poisoning in Children

- Behavior and learning problems
- Lower IQ and hyperactivity
- Slowed growth
- Hearing problems
- Reproductive problems
- Anemia
- In rare cases, seizures, coma and even death



## CHILDREN



# Symptoms of Lead Poisoning in Children

---

- Abdominal pain
- Constipated, nausea or vomiting
- Headaches
- Irritability
- Fatigue
- Loss of appetite
- Memory loss
- Some have no signs at all

# Testing

---

- Children with relatively low levels of lead generally show *no symptoms*
- Lead levels can only be identified through a venous or capillary blood test



# Testing Recommendations

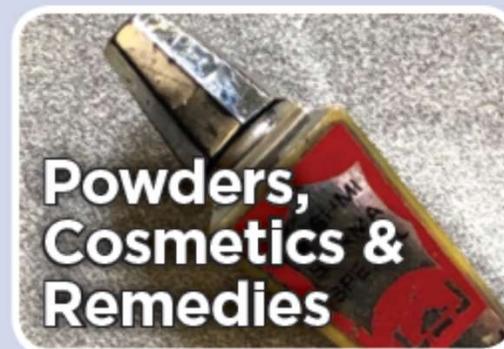
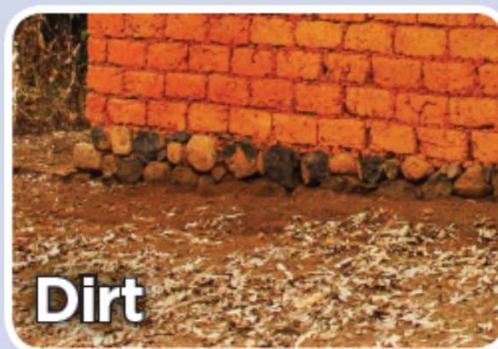
The Ohio Department of Health recommends that children be screened for lead at ages 1 and 2 if they meet one of the following criteria:

- Receives Medicaid
- Lives in or visit a house built before 1978

*However, this is for housing/building related lead paint exposure*



# Examples of Lead Contamination



# How do Children Get Exposed?

---

- Lead dust from deteriorated paint in older homes is the ***most common*** source of exposure today
- Children exposed by putting hands, toys or other objects in their mouths

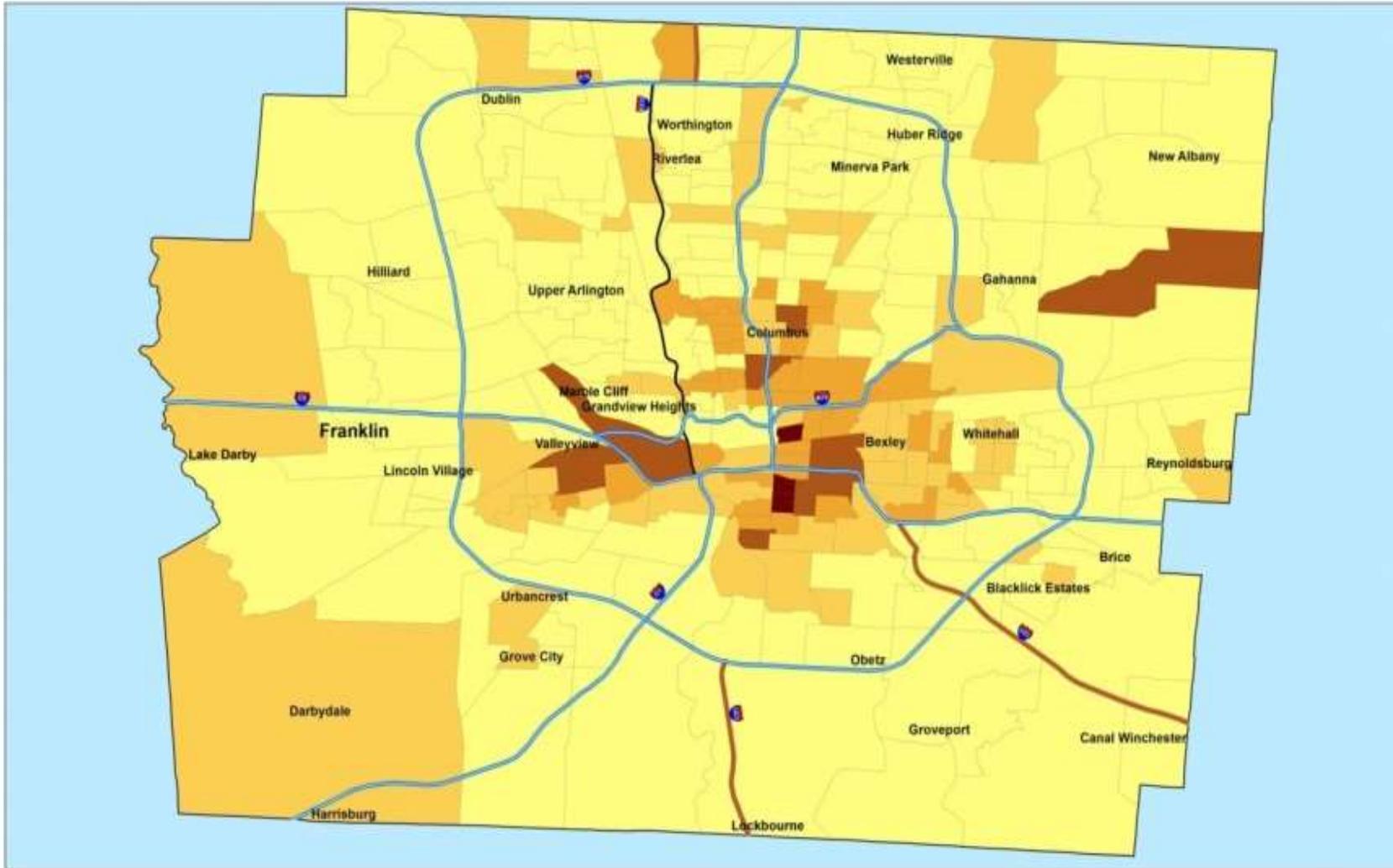


# Identifying Lead Paint

- Often found on exterior paint, windows, door frames, in kitchens and bathrooms
- Only high risk if chipping or peeling or on a “friction or impact” surface



Observed Proportion of Blood Lead Levels  $\geq 5 \mu\text{g}/\text{dL}$  of Children less than six for 2007-2011 in Franklin County



**Legend**

Observed Probability of BLLs  $\geq 5$

Obs\_prob\_ge\_05

Lightest Yellow	< 6.8%
Light Orange	6.8% - 11.4%
Orange	11.5% - 18.2%
Dark Orange	18.2% - 27.3%
Dark Red	> 27.3%

The map depicts the observed proportion of children, less than six years of age, whose blood-lead concentration was equal to or exceeds  $5 \mu\text{g}/\text{dL}$  during the 2007-2011 time frame. Only the highest confirmed test, or highest test, was retained for each unique patient during this time frame. The address associated with this test was used to determine the census tract. These estimates were obtained by The Ohio State University Statistical Consulting Service in conjunction with the Ohio Department of Health Healthy Homes and Lead Poisoning Prevention Program. As part of the same project, predicted probabilities of blood lead levels greater than or equal to  $5 \mu\text{g}/\text{dL}$  were also obtained (not shown here).



Ohio Healthy Homes Health

# Other Sources...

---

- Handmade or imported ceramics used for cooking and eating
- Bean pots commonly used in Mexican households



# Pot Metal...

## Nepali Pans



## Pakistani Pot



Typically a dull finish, may include **lead** and zinc, copper, tin, magnesium, aluminum, iron, and cadmium. Easy to cast and requires no sophisticated foundry equipment or molds.

# Turmeric



- High levels of lead found in turmeric (and curry) from international foods stores.
- These are frequently repackaged or generic in bags or other containers.
- Ground turmeric brought back by family or friends cannot be used.
- Make your own or find safer brands from large grocery stores.

## Recalls



# Kohl, Kajal, Al-Kalh, Surma, Saott or generic black powder make-up

---

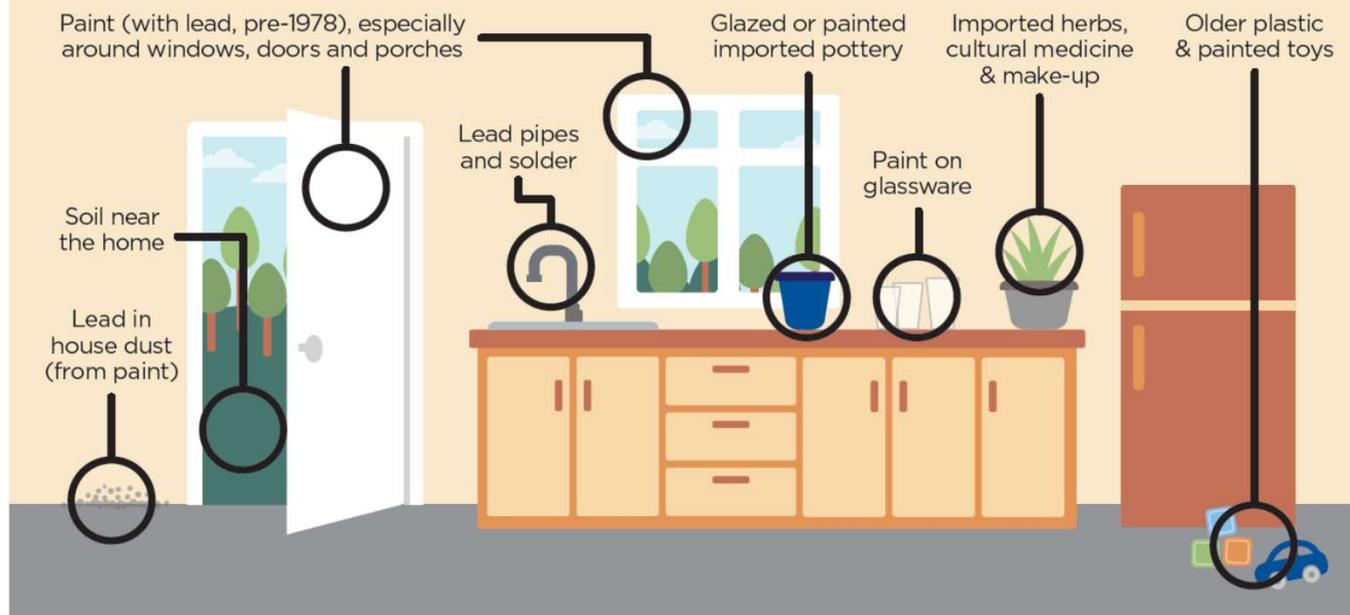
- There is no "safe guarantee" unless it's been tested for each metal, as well as other chemicals.
- No safe "powder" type, like a black eyeshadow is available.
- Below 10 ppm for adults is OK as tested by U.S. EPA  
PESU: Mabeline's Kajal and the other is Loreal's Infallible.
- **“Risk reduction”, but not necessarily “lead free”, use USA, Canada or European brands.**

# Questions?

## Prevent Lead Dangers In Your Home

### Protect Your Children from Lead.

Lead in paint, toys and other items around your home can harm your kids and make them sick.



# KumKuma and Lead Poisoning

**Kumkuma** is a powder used for social and religious markings in India. It is made from turmeric or any other local materials. The turmeric is dried and powdered with a bit of slaked lime, which turns the rich yellow powder into a red color. Sometimes, red lead (lead tetroxide, also known as minium) is added. Red lead is toxic. The CDC has identified this as a major source of lead poisoning in children.

In India, it is known by many names including *kuṅkumam* (Sanskrit कुङ्कुमम्), *kumkuma* (Telugu కుంకుమ), *kunku* (Marathi कुंकू), *kumkum* (Bengali কুমকুম, Hindi कुमकुम), *kunkuma* (Kannada ಕುಂಕುಮ), *kungkumam* (Tamil குங்குமம்), and *kuṅkumam* (Malayalam കുങ്കുമാ). Sources <https://en.wikipedia.org/wiki/Kumkuma>, <https://cdc.gov> on 4/18/2019



# Holi Powder Toxicity Concerns

red lead oxide and yellow lead chromate (lead poisoning)

## Synthetic colors

Natural colors were used in the past to celebrate Holi safely by applying turmeric, sandalwood paste, extracts of flowers and leaves. As the spring-blossoming trees that once supplied the colors used to celebrate Holi have become more rare, chemically produced industrial dyes have been used to take their place in almost all of urban India. Due to the commercial availability of attractive pigments, slowly the natural colors are replaced by synthetic colors. As a result, it has caused mild to severe symptoms of skin irritation and inflammation. Lack of control over the quality and content of these colors is a problem, as they are frequently sold by vendors who do not know their origin Source:

[https://en.wikipedia.org/wiki/Holi#Health\\_Impact](https://en.wikipedia.org/wiki/Holi#Health_Impact) on 4/18/2019



By Kamalakanta777 - Own work, CC BY-SA 3.0, <https://commons.wikimedia.org/w/index.php?curid=18624345>

## Health Impact

Sometimes, red lead (lead tetroxide, also known as minium) is added. Red lead is toxic.

A 2007 study found that malachite green, a synthetic bluish-green dye used in some colors during Holi festival, was responsible for severe eye irritation in Delhi, if eyes were not washed upon exposure. Though the study found that the pigment did not penetrate through the cornea, malachite green is of concern and needs further study.<sup>[105]</sup>

Another 2009 study reports that some colors produced and sold in India contain metal-based industrial dyes, causing an increase in skin problems to some people in the days following Holi. These colors are produced in India, particularly by small informal businesses, without any quality checks and are sold freely in the market. The colors are sold without labeling, and the consumer lacks information about the source of the colors, their contents, and possible toxic effects. In recent years, several nongovernmental organizations have started campaigning for safe practices related to the use of colors. Some are producing and marketing ranges of safer colors derived from natural sources such as vegetables and flowers.<sup>1</sup>

These reports have galvanized a number of groups into promoting more natural celebrations of Holi. Development Alternatives, Delhi and Kalpavriksh,<sup>1</sup> – Kalpavriksh Environment Action Group, Pune, The CLEAN India campaign<sup>[108]</sup> and Society for Child Development, through its Avacayam Cooperative Campaign<sup>[109]</sup> have launched campaigns to help children learn to make their own colors for Holi from safer, natural ingredients. Meanwhile, some commercial companies such as the National Botanical Research Institute have begun to market "herbal" dyes, though these are substantially more expensive than the dangerous alternatives. However, it may be noted that many parts of rural India have always resorted to natural colors (and other parts of festivities more than colors) due to availability.

In urban areas, some people wear nose mask and sun glasses to avoid inhaling pigments and to prevent chemical exposure to eyes. Source: [https://en.wikipedia.org/wiki/Holi#Health\\_Impact](https://en.wikipedia.org/wiki/Holi#Health_Impact) on 4/18/2019

# Sindoor Toxicity Concerns

red lead (lead poisoning) and vermilion (mercury poisoning)

Sindoor or Sindooram is a traditional vermilion red or orange-red coloured cosmetic powder from Indian Subcontinent, usually worn by married women along the part of their hair. Traditional sindoor is derived from the seeds of a plant named: Bixa Orellana or made with turmeric and alum or lime, or from other herbal ingredients. Unlike red lead and vermilion, these are not poisonous. Modern material being sold as sindoor mainly uses vermilion, an orange-red pigment, the purified and powdered form of cinnabar, which is the chief form in which mercury sulfide naturally occurs. As with other compounds of mercury, sindoor is toxic and must be handled carefully. Sometimes, red lead (lead tetroxide, also known as minium) is added to sindoor. Red lead is toxic. Source: <https://en.wikipedia.org/wiki/Sindoor> on 4/18/2019



# LEAD

## IN SPICES AND OTHER CULTURAL ITEMS

*Some spices, herbal remedies, ceremonial powders, and cosmetics may contain lead, especially those imported from India, Asia, Mexico, and the Middle East.*

Lead poisoning can cause decreased IQ, attention-related deficits, hearing impairment, kidney disease, and delayed growth and development in children.

whole chilies



ash powder (Vibhuti)



kum kum



kajal



### SPICES:

- Anise Seeds
- Asafoetida
- Chili powder/ whole chilies
- Cinnamon
- Cloves
- Coriander
- Cumin
- Curry powder
- Dagar Phool (stone flower)
- Garam Masala
- Ginger
- Hungarian Paprika
- Kabsa Mix
- Seven Spices Mix
- Turmeric

### HERBAL TEAS AND REMEDIES:

- Ash powder
- Azarcon
- Balguti Kesaria
- Bali Gali
- Ghasard
- Greta
- Kandu
- Mojhat ceremonial drink
- Pay-loo-ah

### CEREMONIAL POWDERS:

- Ash powder (Vibhuti)
- Kum kum
- Incense
- Pooja powder
- Rangoli

### COSMETICS:

- Kohl
- Kajal
- Sindoor
- Surma

## Prevent LEAD Poisoning



Additional Resources are available online at:



<https://nchealthyhomes.com/>



<https://ehs.ncpublichealth.com/hhcehb/cehu/lead/resources.htm>

- ▶ Get your child tested for lead at the local health department or doctor's office.
- ▶ Buy spices locally, rather than overseas. Domestic products have stricter safety standards and are more likely to have been screened for heavy metals.
- ▶ Do not use products sent from other countries by family or friends.
- ▶ Keep ceremonial powders and cosmetics that may contain lead out of children's reach.
- ▶ Check products for state or federal agency safety labels.
- ▶ Check for product recalls at [www.FDA.gov](http://www.FDA.gov) and [www.CPSC.gov](http://www.CPSC.gov).



# SAFETY NOTICE

## Imported Spices, Medicines & Home Remedies May Contain Lead

Lead may be found in imported spices, medicines and home remedies from some countries outside of the United States. Ingesting too much lead can cause lead poisoning. Lead poisoning can be dangerous, especially to babies and children under 6. It can cause a lower IQ and hyperactivity, hearing problems and slowed growth. And a pregnant woman can pass lead from her body to her unborn baby's.

Keep your family healthy – don't expose them to any of the following items if you suspect they are unsafe.

### Spices that may contain lead if imported:

- Cumin
- Turmeric
- Chillies
- Chloee Masala
- Allspice
- Kabsa
- Ginger
- Curry Powder
- Garam Masala

### Medicines, home remedies, cosmetics and ceremonial powders that may contain lead:

- **Azarcon and Greta** - Fine powders (often yellow, orange or red) used in Latino cultures for an upset stomach and other illness that may contain up to 90% lead.
- **Kajal, Kohl and Surma** - Black powders used in Asian and Middle Eastern cultures mainly for cosmetic uses, but also used on the navel of a newborn baby, and as a medicine to treat skin infections.
- **Sindoor and Kumkuma** - Orange-red powder typically used by the Asian Indian community as a cosmetic applied to the forehead and hairline for religious purposes.
- **Pay-loo-ah** - Red powder used in Southeast Asian countries to treat rash or high fever.
- **Ghasard, Kandou, Bali Gali** - Brown or red powders used in Asia and India for digestion and stomach aches.
- **Balguti Kesaria Ayurvedic** - Orange powder or liquid used in India and Pakistan for infants and children to treat a variety of conditions including rickets, cough/cold, worms and teething.
- **Pooja powder, Vibuti** - Ash used in religious worship ceremonies.

### Other sources of lead:

Lead can also be found in and around homes built before 1978. Children under 6 should be tested for lead poisoning to know if they are being exposed.

## Prevent Lead Poisoning

### Keep your family safe from lead in imported spices, medicines and home remedies by following these tips:

- Do not expose children and pregnant women to products suspected to be unsafe.
- Purchase spices from trusted sources or make them using whole, basic ingredients from trusted sources.
- Purchase potentially unsafe products from large grocery stores rather than smaller international stores.
- Avoid colored powders that have unnaturally deep or vibrant colors.
- Ask to see the manufacturer's label of bulk products.
- Only purchase medicines produced in the United States.
- Check labels of medicines for a safety label from a state or federal agency.

**Get your children tested.** The only way to know if a child has been exposed to lead is through a blood test at the doctor's office.



**For more information** on how to prevent lead poisoning or get your child tested, call (614) 724-6000 or visit [www.columbus.gov/lead](http://www.columbus.gov/lead).

*Adapted with permission from a document created by Forsyth County (NC) Department of Public Health.*



COLUMBUS  
PUBLIC HEALTH



# Protect Your Child From Lead Poisoning

## Get Your Child Tested for Lead

- Children under the age of 6 are at risk for lead poisoning.
- Children with lead poisoning may not look or act sick.
- The only way to know if a child has lead poisoning is through a blood test.
- Medical providers can test a child's blood to measure lead levels.

## Keep Surfaces Clean

- Dust in the home is a major source of lead for children. It can come from lead-based paint in homes built before 1978, but also from paint dust blown through windows and dirt that is tracked into homes.
- Leave shoes at the door to avoid tracking in dirt.
- Wet-mop floors and wet-wipe surfaces once per week or more, especially window ledges.



## Keep Outside Play Areas Lead-Free

- Avoid letting children play in bare dirt that could have lead in it. Lay down a thick layer of sod or mulch, or make a sand box for your children to play in.
- Keep children's play areas and vegetable gardens away from the sides of your home or garage, where water drips down and dirt is more likely to have lead and flaking paint.



## Wash Up

- Have children wash hands before eating, after playing outside and before bed.



## Eat Well

- Good nutrition can protect children from the effects of lead. Children who don't get enough calcium, iron and vitamin C absorb more lead.



## Effects of Lead Poisoning

There is no safe level of lead in a child's body. Studies continue to show harm at low levels.

### Possible health affects of lead poisoning above 5 µg/dL include:

- Decreased IQ
- Hyperactivity and behavior problems
- Hearing problems
- Slowed growth



### If levels are over 10 µg/dL:

- A home inspection is conducted by local health officials to help identify lead sources.

### If levels are over 45 µg/dL:

- Child may be hospitalized for a medical treatment that removes lead from the body.

### If levels are over 70 µg/dL, serious health risks include:

- Seizures
- Coma
- Possible death

*Lead levels are measured in micrograms per deciliter of blood (µg/dL).*

**For more information** on how to prevent lead poisoning or get your child tested, call (614) 724-6000 or visit [www.columbus.gov/lead](http://www.columbus.gov/lead).



# Lead in Kohl, Hindu Powders, Turmeric, Pottery

---

Lead paint is the main cause of lead poisoning in children. However, high amounts of lead have been found in certain cultural items, including:

- Kohl, kajal, surma, sormeh (black eye powder)
- Hindu colored powders (sindoor, kumkum, tikka)
- Turmeric
- Mexican pottery

Consuming even small amounts of lead can be harmful and cause lead poisoning.

Lead may be added to these items when they're made for color, weight (to make it cost more) or water resistance.

You can't tell if something contains lead simply by looking at it.

## What You Can Do

Our cultural traditions are important. They build strong family bonds across generations and give us a sense of belonging.

If you use these items, you should get them tested for lead by a lab. Call us at 503-988-4000 for more information.

You can also use a lead-free alternative.

You can check your family for lead poisoning with a simple blood test. Talk to your doctor, or go to a [free lead screening](http://multco.us/health/lead-poisoning-prevention/test-your-child-lead)»  
(<http://multco.us/health/lead-poisoning-prevention/test-your-child-lead>)

---

## Kohl, Kajal, Surma, Sormeh, Athmad or Ithmid

Kohl, a black powder used in the Middle East, South Asia and the Horn of Africa, may contain high levels of lead. In Multnomah County, we have found lead in kohl purchased locally and abroad.

Kohl is used as a traditional eyeliner and is highly valued for spiritual, medicinal and cosmetic qualities. It's commonly made by grinding a mineral called galena (lead ore or lead sulfide) into a powder and mixing it with other ingredients.

You can be exposed to lead when kohl gets on your hands and then in your mouth. This is especially common for children.



### If you use kohl:

- Wash hands after handling it
- Keep containers away from children
- Test it for lead (call us at 503-988-4000)
- Use kohl that has been labeled lead-free (made in the U.S., Canada or Europe)
- Test your family for lead. Talk to your doctor or go to a [free lead screening](http://multco.us/health/lead-poisoning-prevention/test-your-child-lead)» (<http://multco.us/health/lead-poisoning-prevention/test-your-child-lead>)

## Hindu Colored Powders

### Sindoor, Kumkum, Tikka and Roli

Red, orange and yellow powders used by Hindu communities from South Asia (India, Bangladesh, Nepal) may contain high levels of lead. This includes those purchased locally as well as abroad.

Sindoor and kumkum are applied to the hairline, forehead or face. They're also used in ceremonies and on holy days. You can be exposed to lead if powder gets in your eyes or mouth.

### If you use these powders:

- Wash your hands after you handle them
- Keep containers away from children
- Test it for lead (call us at 503-988-4000)
- Test your family for lead. Talk to your doctor or go to a [free lead screening](http://multco.us/health/lead-poisoning-prevention/test-your-child-lead)» (<http://multco.us/health/lead-poisoning-prevention/test-your-child-lead>)



## Turmeric

Turmeric spice is the main ingredient in curry powder and is used daily in South Asian cuisine. It's also valued for its health benefits and is used for traditional medicine.

Both the root and powder can contain high levels of lead, which can cause lead poisoning when eaten.

Lead-contaminated turmeric is most often bought in India or Bangladesh. A bright yellow powder that is high in lead is sometimes added to give it color.

Health officials are mainly concerned about turmeric that is carried into the country, rather than turmeric sold in major U.S. supermarkets.

### If you use turmeric:

- Buy it at a major U.S. supermarket
- Test it for lead (call us at 503-988-4000)
- Test your family for lead. Talk to your doctor or go to a [free lead screening](https://multco.us/health/lead-poisoning-prevention/test-your-child-lead)» (<https://multco.us/health/lead-poisoning-prevention/test-your-child-lead>)



This photo shows two handfuls of turmeric roots. Lead chromate was added to the turmeric roots on the left to enhance the yellow color. Photo: icddr,b Lead Study Team

## Mexican Pottery (Barro)

## Molcajete, chilmolera, cazuela, Olla de barro

Barro is a traditional hand-made pottery found in some parts of Mexico, Central America and South America. It's used for cooking and serving food and beverages.

Barro may have lead in the glaze, which can contaminate food. You can be exposed to lead if you eat or drink from these dishes.

There is a long tradition of using these dishes, which are passed down through generations. Most of the time, they are brought into the country from abroad.

### If you have these dishes:

- Use a lead test swab (inexpensive, from your local hardware store) to test them for lead
- Don't use dishes that contain lead for cooking and serving
- Test your family for lead. Talk to your doctor or go to a [free lead screening](http://multco.us/health/lead-poisoning-prevention/test-your-child-lead)» (<http://multco.us/health/lead-poisoning-prevention/test-your-child-lead>)



---

## Exam Room Posters

- [Lead in Kohl \(11 x 17\)](http://multco.us/file/84818/download) (http://multco.us/file/84818/download) (850.09 KB)
- [Lead in Colored Powders \(11 x 17\)](http://multco.us/file/84819/download) (http://multco.us/file/84819/download) (4.21 MB)
- [Lead in Turmeric \(11 x 17\)](http://multco.us/file/84820/download) (http://multco.us/file/84820/download) (2.77 MB)
- [Lead in Mexican Pottery \(11 x 17\)](http://multco.us/file/84821/download) (http://multco.us/file/84821/download) (2.9 MB)

## More Information

Questions? Call the Leadline at 503-988-4000.

- [South Asians and Lead Poisoning - New York City Health](https://www1.nyc.gov/site/doh/health/health-topics/lead-poisoning-hazardous-consumer-products.page) (https://www1.nyc.gov/site/doh/health/health-topics/lead-poisoning-hazardous-consumer-products.page)
- [Kohl, Kajal, Al-Kahal, Surma, Tiro, Tozali, or Kwalli](https://www.fda.gov/cosmetics/cosmetic-products/kohl-kajal-al-kahal-surma-tiro-tozali-or-kwalli) (https://www.fda.gov/cosmetics/cosmetic-products/kohl-kajal-al-kahal-surma-tiro-tozali-or-kwalli-any-name-beware-lead-poisoning)



All ▾



J Jennifer.Johnson@jfs.ohio.gov X



New message

Reply ▾

Delete

Archive

Junk ▾

Move to ▾

Categorize ▾



See page 3:00 PM

Favorites

Inbox 7

Sent Items 8

Drafts 1

Add favorite

Folders

Groups

Jennifer.Johnson@jfs.ohio.gov ☆

Jennifer.Johnson@jfs.ohio.gov

Send email View profile



All results



Jennifer.Johnson@jfs.ohio.gov [External Email] County Lea... 12/9/2019 Hi, As a follow up from our Lead S... Inbox



Jennifer.Johnson@jfs.ohio.gov [External Email] December ... 12/5/2019 Good afternoon, Thank you to eve... Inbox

Agenda 12.3.19... +6



Jennifer.Johnson@jfs.ohio.gov [External Email] Ohio Refug... 11/22/2019 Good afternoon, Attached is the a... Inbox

Agenda 12.3.19...



Jennifer.Johnson@jfs.ohio.gov [External Email] ORAC SEPT... 9/6/2019 Good afternoon everyone, ... Deleted Items



Jennifer.Johnson@jfs.ohio.gov [External Email] Ohio Refug... 6/14/2019 Hi everyone, Attached is the agen... Inbox

[External Email] County Lead Programs



Jennifer.Johnson@jfs.ohio.gov Mon 12/9/2019 2:43 PM



Hi, As a follow up from our Lead Safety Presentation last week, here are contacts for lead programs in counties outside of Columbus. I hope you find this helpful.

Montgomery :

Jason Turner Lead Risk Field Coordinator/Assessor Public Health - Dayton & Montgomery County 117 S. Main Street Dayton , OH 45422 Phone : 937-225-5553

Hamilton County:

Hamilton County General Health District 513-946-7800 Cristie Iwasko

Cincinnati City:

Rashmi V. Aparajit, MS, RS, LRA, HHS Lead Program Director Childhood Lead Poisoning Prevention Program (CLPPP) 3301 Beekman Street Cincinnati, OH 45225 Rashmi.Aparajit@cincinnati-oh.gov

Cleveland City:



Links to additional information regarding lead:

[https://www.accessdata.fda.gov/cms\\_ia/importalert\\_134.html](https://www.accessdata.fda.gov/cms_ia/importalert_134.html)

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6289082/>

[https://nchealthyhomes.com/files/2019/10/Factsheet-Lead-in-Spices\\_Final\\_10-24-19.pdf](https://nchealthyhomes.com/files/2019/10/Factsheet-Lead-in-Spices_Final_10-24-19.pdf)

<https://multco.us/health/lead-poisoning-prevention/lead-kohl-hindu-powders-turmeric-pottery>

<https://www1.nyc.gov/site/doh/health/health-topics/lead-poisoning-hazardous-consumer-products.page>

<https://www.fda.gov/cosmetics/cosmetic-products/kohl-kajal-al-kahal-surma-tiro-tozali-or-kwalli-any-name-beware-lead-poisoning>

<https://en.wikipedia.org/wiki/Galena>

Source of information:

**Phillip Bouton** | Healthy Homes Program | Program Manager 1

Tel: 614.645.6226; Fax: 614.645.7155; [pbouton@columbus.gov](mailto:pbouton@columbus.gov)

**Columbus Public Health – Protecting Health, Improving Lives**

240 Parsons Avenue, Columbus, Ohio 43215