

Children's Health and the Environment 6th Annual Conference September 19th, 2008

The Pennsylvania Department of Health (PADOH)
Bureau of Epidemiology
Division of Environmental Health Epidemiology

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Background

Since 1989 the Bureau of Epidemiology has had a federal grant from the Agency for Toxic Substances and Disease Registry (ATSDR) for the Health Assessment Program.

The Program has a long history of collaboration and cooperation with ATSDR, USEPA, PADEP, Regional/County Health Departments, and others.

A Public Health Assessment is prepared on each site proposed to the USEPA National Priority List or Superfund. Currently PA is third in the nation, with 93 current and 2 proposed sites.

Goals

- Prevent or reduce potential exposures, and illnesses resulting from exposure, to contaminants from NPL hazardous waste sites and other sites of interest in the Commonwealth
- Determine the potential human public health effects associated with any such exposures
- Produce health assessment and consultation documents on such sites
- Provide health education regarding health effects and exposure reduction to residents, health care professionals, elected officials in impacted communities (community fact sheets, public meetings, grand rounds)

▶ Evaluation Process

1. Obtain environmental sampling data (air, soil, water)
2. Screen in or out compounds/contaminant levels of concern
3. Evaluate exposure pathways (complete or incomplete)
4. Evaluate exposure doses
5. Determine potential for public health effects
6. Classify potential public health threat

Child Health Considerations

- Are children exposed to potentially harmful substances?
- Are any exposure pathways unique to children?
- Do children differ from adults in their weight-adjusted intake of the toxicant?
- Do pharmacokinetic or pharmacodynamic parameters differ between adults and children?
- What are the effects of multiple and cumulative exposures?
- Are latent or delayed effects of early exposure possible?
- At what stage of development is the child exposed?
- Could any developmental processes be altered by the toxicant?
- Are there adequate animal models for childhood exposure after birth?
- What do these models indicate about adverse effects on children who are exposed?
- Are there transgenerational effects?
- Are there ethical and cultural consequences unique to children?

High Risk Sites

- **Schools**

- Built on former suspected waste sites
 - exposure to contaminated soils on playground
 - potential exposure to VOCs via indoor air
- Athletic fields built on or utilized contaminated soil as fill
 - battery casings
 - ash
 - Creosote
- Storing “legacy” chemicals

- **Vacant lots or piles of contaminated waste**

- Riding dirt bikes or ATVs
- Sledding
- Ice skating
- Playing ball or sports
- Example contaminants:
 - steel slag (manganese)
 - asbestos containing material
 - Pesticides (arsenic)
 - Battery casings (lead)

High Risk Sites (continued)

- **Renovated former industrial buildings**
 - College student housing
- **Abandoned buildings**
 - Children or teenagers trespass
 - radioactive aircraft components
- **Former orchards developed into residential neighborhoods**
 - Potential exposure to pesticide residues
 - Lead arsenate
- **Parks and Playgrounds**
 - Former waste disposal site
 - Asbestos containing waste
 - Lead contaminated fill
 - Air deposition from lead smelter
- **Campground**
 - Lead contaminated fill
- **Waterways**
 - Fishing downstream from source of contamination
 - PCBs
 - Kepone

Site #1:

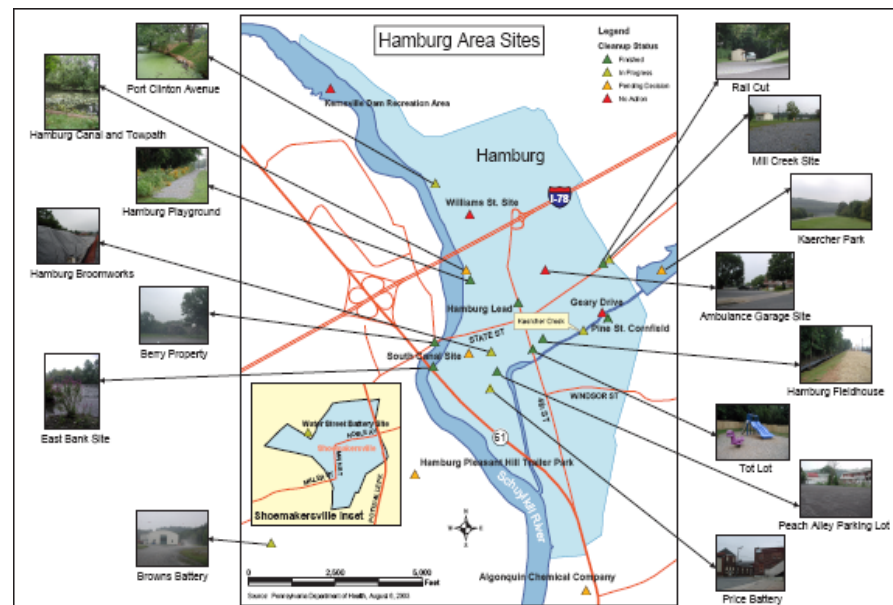
PADOH partnered with ATSDR and EPA to evaluate a community impacted by emissions and waste disposal from a former battery plant.

- ▼ Between 1918 to 1971 a lead smelter and oxide plant operated in the borough.
- ▼ Air deposition of lead contaminated the soil of homes and businesses downwind from the former smelter
- ▼ Battery recycling practices led to disposal of empty cases (whole or in pieces) as fill.



Site #1 (continued):

Widespread contamination of soil in the community. Resulted in the remediation of soil at local parks, playgrounds, vacant lots, yards, road surfaces, and waterways.



Site #1 (continued):

PADOH and ATSDR reviewed childhood blood lead levels in the zip code area and 2000 Census Data. Focused on increasing awareness in the community and blood lead screening among health care providers.

Number of Children Screened by BLL Category (Ages 0-6 Years old)
City: Hamburg Or Zip Code: 19526

BLL Categories	Year:					Total
	1998	1999	2000	2001	2002	
00.0 - 09.9	0	4	27	36	38	105
10.0 - 14.9	1	2	3	1	4	11
15.0 - 19.9	2	1	0	0	3	6
20.0 - 44.9	2	2	3	1	4	12
45.0+	0	0	0	0	0	0
Total Screened	5	9	33	38	49	134

BLL as a % of Children Screened

BLL Categories	1998	1999	2000	2001	2002	Total
00.0 - 09.9	0.0%	44.4%	81.8%	94.7%	77.6%	78.4%
10.0 - 14.9	20.0%	22.2%	9.1%	2.6%	8.2%	8.2%
15.0 - 19.9	40.0%	11.1%	0.0%	0.0%	6.1%	4.5%
20.0 - 44.9	40.0%	22.2%	9.1%	2.6%	8.2%	9.0%
45.0+	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total %	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

SOURCE: PA DOH, Bureau of Family Health PALL tracking system

Site #1 (continued):

PADOH and ATSDR conducted the following health education activities to increase lead poisoning awareness, prevention, and screening:

- ❖ Free blood lead screenings
- ❖ Updated local pediatricians
- ❖ Visits with local physician offices
- ❖ Formed a community task force



Site #2:

PADOH and ATSDR evaluated the air quality of a residential community located near a concrete crushing plant.

- ▼ Community concerned about off site particulate emissions, particularly silica from the plant.
- ▼ Industry implemented measures to reduce fugitive emissions at the plant.
- ▼ PADOH and ATSDR provided input to EPA on an air sampling plan.
- ▼ PADOH and ATSDR reviewed the air quality results and provided advice to residents with specific concerns about asthma and other conditions.



Site #2 (continued):

While the sampling results did not exceed recommended exposure guidelines, PADOH and ATSDR made the following recommendations:

- ▼ Residents sensitive to the dust or with a pre-existing respiratory condition consider using:
 - ▼ central or whole house air conditioning in summer
 - ▼ a heating system, which includes a high-efficiency particulate (HEPA) filter during the winter months
 - ▼ air purifiers fitted with HEPA air filters
- ▼ Reduce indoor air contaminants
 - ▼ tobacco smoking
 - ▼ household products that contain harmful substances.
- ▼ The township conduct regular street cleaning operations to remove and control dust.

Site #3:

PADOH and ATSDR evaluated the potential for exposure to airborne asbestos to residents of a community surrounding a waste disposal site which contains asbestos.

- ▼ The site exists as a result of waste disposal operations by former asbestos manufacturing plants.
- ▼ Portions of the site were covered with soil in the mid-60's and most of the property is vegetated.



Site #3 (continued):

PADOH and ATSDR's Recommendations:

- ▼ Based on the air sampling results collected when site soils are not being aggressively disturbed, ATSDR and PADOH conclude that exposures to the airborne asbestos levels are not expected to cause any harmful health effects.
- ▼ Based on the EPA air sampling results collected when soils on the site are intentionally and vigorously disturbed (e.g. raking the soils), ATSDR and PADOH conclude that activities that significantly disrupt the surface of the site could result in asbestos releases and therefore pose a *potential* public health risk.
- ▼ Due of the potential for exposure to the surrounding community, PADOH and ATSDR recommend immediate and sufficient containment of asbestos containing materials on the site to prevent possible off-site migration of asbestos.

Site #3 (continued):

Child health considerations:

- ▼ Children could be more vulnerable to asbestos exposures because they are more likely to disturb asbestos fiber-laden soil or indoor dust while playing, and they are closer to the ground and thus more likely to inhale contaminated soil or dust.
- ▼ Children may have a higher risk of developing disease after asbestos exposure because they have a longer life expectancy and thus more time to develop asbestos-related respiratory diseases, which have long latency periods between exposure and onset of disease.
- ▼ Due to differences in anatomy, activity, and ventilation patterns, children are likely to inhale and retain larger quantities of pollutants per unit body weight than adults. (Adams, 1993)
- ▼ Studies also suggest that the immaturity of the neonatal human lung may result in slower and less complete particle clearance (CA EPA 2004).

Site #4:

In August 2008, ATSDR determined that mercury vapors in an elementary school did not pose a health risk to students.

- ▼ Mercury was discovered in a plumbing pipe of an urinal in a second floor boys bathroom
- ▼ Air monitoring results taken on the floor and at the breathing zone ranged from 0.2 – 4.0 micrograms per cubic meter.
- ▼ The school's contractor:
 - ▼ Removed the urinal
 - ▼ Conducted a clean up using a mercury-specific vacuum
 - ▼ Applied a mercury-vapor-reducing powder (Merc-X)
 - ▼ Recovered approximately 2 mm of mercury

Site #5:

ATSDR determined that the use of treated municipal incinerator waste, known as Aggrite, as construction fill at an elementary school is not a current public health concern.

- ▼ ATSDR determined that children and adults do not have direct contact with Aggrite because it is covered with clean fill and a macadam parking lot.
- ▼ ATSDR recommended that the school continue to visually monitor the areas where Aggrite was used and take steps to protect the clean cover material from eroding.

Contact Information

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Questions?