



Something is Wrong with My Child: Determining Exposures that May Affect Health in Children

Jennifer Lowry, MD

Director, Mid-America Pediatric Environmental Health Specialty Unit, Region 7
Children's Mercy, Kansas City MO



+ What are PEHSUs?

PEHSUs were created to ensure that children and communities have access to, usually at no cost, special medical knowledge and resources for children faced with a health risk due to a natural or human-made environmental hazard.



- Educate physicians during grand rounds.
- Organize conferences and seminars to provide trainings.
- Prepare the next generation of health professionals.



+ Why are PEHSUs Important?



- The Institute of Medicine reports that most health professionals receive only 6 hours of training in pediatric environmental health.
- While Poison Control Centers respond to acute toxic exposures, PEHSUs have expertise in longer term, lower dose exposures.



+ PEHSU Specialists

Because children's environmental health covers a wide variety of issues, the PEHSU network has experts in

- Pediatrics
- Allergy/Immunology
- Neurodevelopment
- Toxicology and medical toxicology
- Occupational and environmental medicine
- Obstetrics and Gynecology
- Nursing
- Other specialties



+ Fact Sheets

The PEHSU Network develops fact sheets for patients, parents, and community members as well as health professionals. These fact sheets provide valuable information on children's environmental exposures that is otherwise not widely available.

- Phthalates and BPA for Patients
- Melamine Exposure
- PBDEs (Polybrominated Diphenyl Ethers)
- Natural Gas Extraction and Hydraulic Fracturing
- Health Risks of Wildfires for Children and Aftermath Guidance
- Return of Children to Areas Impacted by Flooding and/or Hurricanes
- Arsenic in Food
- Phthalates and BPA
- Chelation Therapy
- Medical Management of Childhood Lead Exposure and Poisoning



+ Consultation and Referrals

People contact the PEHSU Network over 1,200 times annually; this resulted in over 12,500 consultations between 2007 and 2011.



The 5 top exposure concerns based on inquiries from 2007 to 2011 were:

- Lead exposure
- Fungus/mold
- Mercury
- Pesticides
- Phthalates/Bisphenol A



+ Case to Region 7 PEHSU

- 4 year old presents to Environmental Health Clinic with 6 months of hair loss.
- Started when moved into new home.
- Younger sibling and mom also losing hair
- Dermatology appointment showed Telogen Effluvium.
- Laboratory results normal (thyroid, iron studies, arsenic and mercury included)

+ Case continued

- Dad is radiology technician and tested “negative” for increased radiation.
- Mom diagnosed with thyroiditis and younger sister with celiac disease after hair loss.
- Within city limits and water was “negative”
- No unusual smells in the home
- No pests (thus, no pesticides including boric acid)
- No mold in home
- Neighbor states that she has hair loss too

+ Telogen Effluvium

- Characteristic of sudden loss of large amounts of hair.
- Noted 6 weeks to 3 months after precipitating cause (e.g. autoimmune)
- Exposure may have precipitated event or ongoing exposures given family (and neighbor?) with similar symptoms.

Differential Diagnosis

Immunotoxicity

- PCBs/PBBs
- Metals
 - Arsenic, lead, mercury, cadmium, chromium, nickel, beryllium, indium, silver, gold, cobalt, molybdenum, platinum and zirconium
- Pesticides
 - Organochlorines, OPs, pyrethroids
- Hydrocarbons (benzene)

Autoimmunity

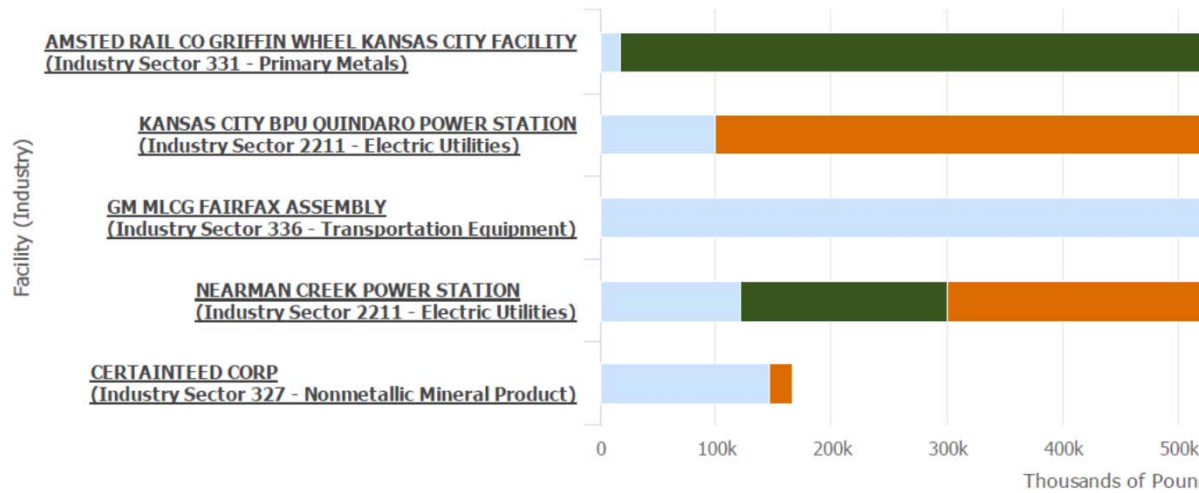
- Drugs
- Chemical (mercuric chloride, gold salts, dieldrin, methylcholanthrene)

TABLE 15-14. Chemicals and drugs associated with alopecia

Accutane	Melphalan
Androgens	Mepesulfate
Arsenic	Mephenasin
Auranofin	Methotrexate
Barium	Methyldopa
Bismuth	Methylsergide
Borax	Metoprolol
Carbimazole	Mitomycin
Chloroprene	Mitoxantrone
Chloroquine	Monobenzene
Cimetidine	Nicotinyl alcohol
Clofibrate	Nitrofurantoin
Clonazepam	Oral contraceptives
Colchicine	Para-aminosalicylic acid
Cyclophosphamide	Propranolol
Dacarbazine	Quinacrine
Danazol	Radiotherapy
Doxorubicin	Salicylates
Ethambutol	Thallium
Ethionamide	Thiouracil
Etoposide	Trichlormethiazide
Etretinate	Trimethadione
Gold	Triparanol
Heparin	Valproic acid
Ifosfamide	Vinblastine
Indomethacin	Vincristine
Interferon- α	Vindesine
Isotretinoin	Vitamin A
Levodopa	5-Fluorouracil
Lithium	6-Mercaptopurine

Hair Loss (MEDITEXT Medical Management). In: Hall AH, Rumack BH, eds. TOMES System. (V93 edition.) Englewood, CO: Micromedex. Reprinted with permission from Micromedex, Inc.

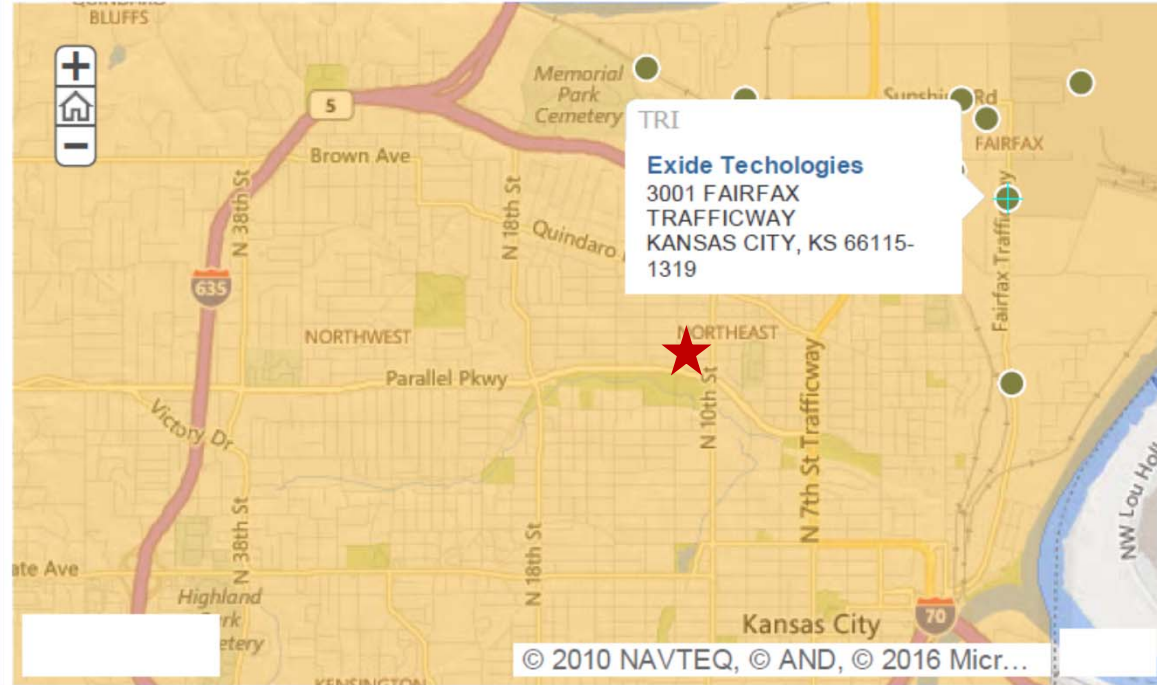
Top Five Facilities by Total Disposal or Other Releases Kansas City, KS, 2014



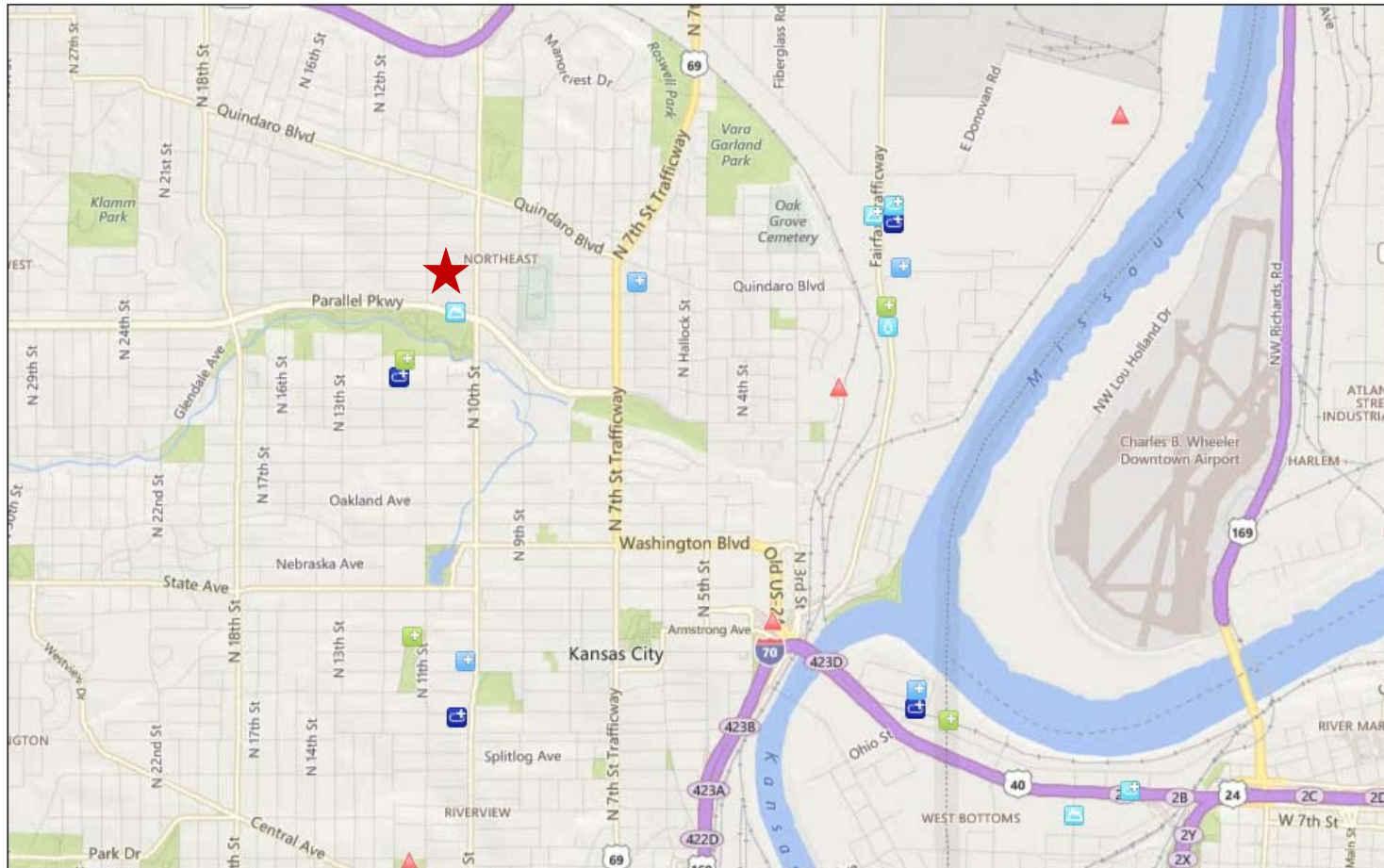
Quick Facts for 2014

	Kansas City, KS	United States
Number of TRI Facilities:	30	22,054
Total Production-Related Waste Managed:	14.8 million lbs	28.1 billion lbs
Total On-site and Off-site Disposal or Other Releases:		
Total On-site:	1.9 million lbs	3.5 billion lbs
• <u>Air</u> :	1.0 million lbs	752.8 million lbs
• <u>Water</u> :	307 lbs	217.4 million lbs
• <u>Land</u> :	863.2 thousand lbs	2.5 billion lbs
Total Off-Site:	1.0 million lbs	464.8 million lbs

Map of TRI Facilities in Kansas City, KS

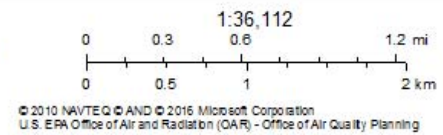


My environment



October 17, 2016

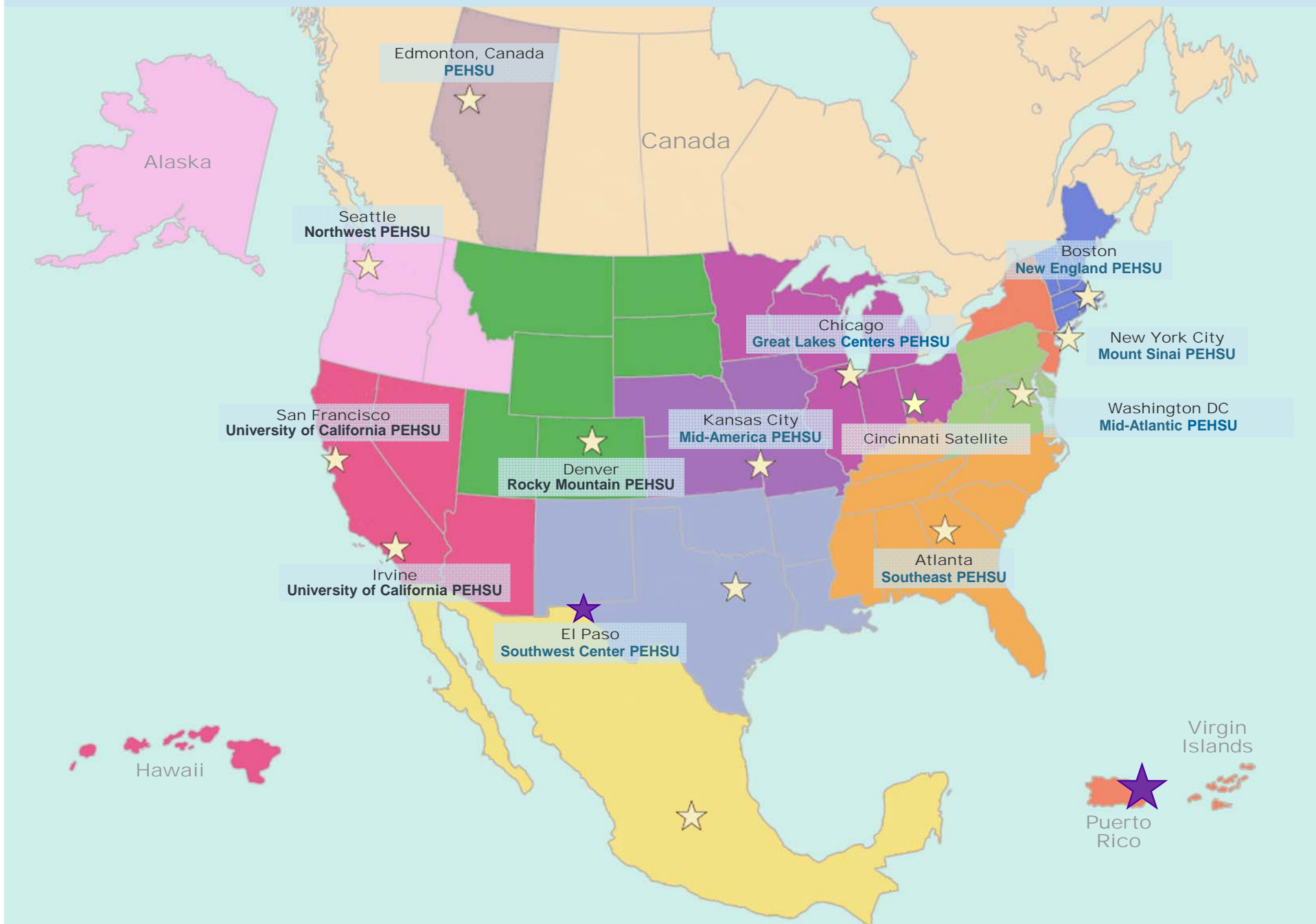
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|--|--|--|--|--|---|
| | Toxic Releases to Land (TRI) (clustered) | | Toxic Releases to Water (TRI) (single) | | Air Emissions (AIRS/AFS) (clustered) |
| | Toxic Releases to Land (TRI) (single) | | Water Dischargers (PCS/ICIS) (clustered) | | Toxic Releases to Air (TRI) (clustered) |
| | Hazardous Waste (RCRAInfo) (clustered) | | Toxic Releases to Air (TRI) (single) | | Maintenance |
| | Emergency Incidents (single) | | Nonattainment | | |



Summary

- Children are referred to PEHSUs to help determine if environmental exposures have resulted in disease
- Data is available to help, but is often out of date and limited in details
- Better collaboration is needed between PEHSUs, EPA and other public health agencies to link environmental releases to potential exposures and health effects.

Pediatric Environmental Health Specialty Units (PEHSU) In North America





PEHSU Pediatric Environmental Health Specialty Units
A network of experts in children's environmental health



Martha Berger

Office of Children's Health Protection
United States Environmental Protection Agency

Berger.martha@epa.gov

202-564-2191

Dr. Alan D. Woolf

REGION 1- New England PEHSU

Dr. Maida Galvez

REGION 2- Mount Sinai PEHSU

Dr. Laura Anderko

REGION 3- Mid-Atlantic Center for
Children's Health & the Environment

Dr. Robert Geller

REGION 4- Southeast PEHSU

Dr. Susan Buchanan

REGION 5- Great Lakes Centers PEHSU

Dr. Steven Borrone

REGION 6- Southwest Center for
Pediatric Environmental Health

Dr. Jennifer Lowry

REGION 7- Mid-America PEHSU

Dr. Mark Anderson

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Dr. Catherine Karr

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Questions?

