Pediatric Environmental Health

What is it? Why does it matter?

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Acknowledgments

The findings and conclusions in this presentation have not been formally disseminated by the Agency for Toxic Substances and Disease Registry and should not be construed to represent an agency determination or policy.

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Objectives

- Introduce the Southwest Center for Pediatric Environmental Health (PEHSU Region 6)
- Define pediatric environmental health
- Provide examples of issues from A to Z of importance to the environmental health of children.
- Identify common hazards in and around the home
- Challenge participants to take action

Southwest Center for Pediatric Environmental Health

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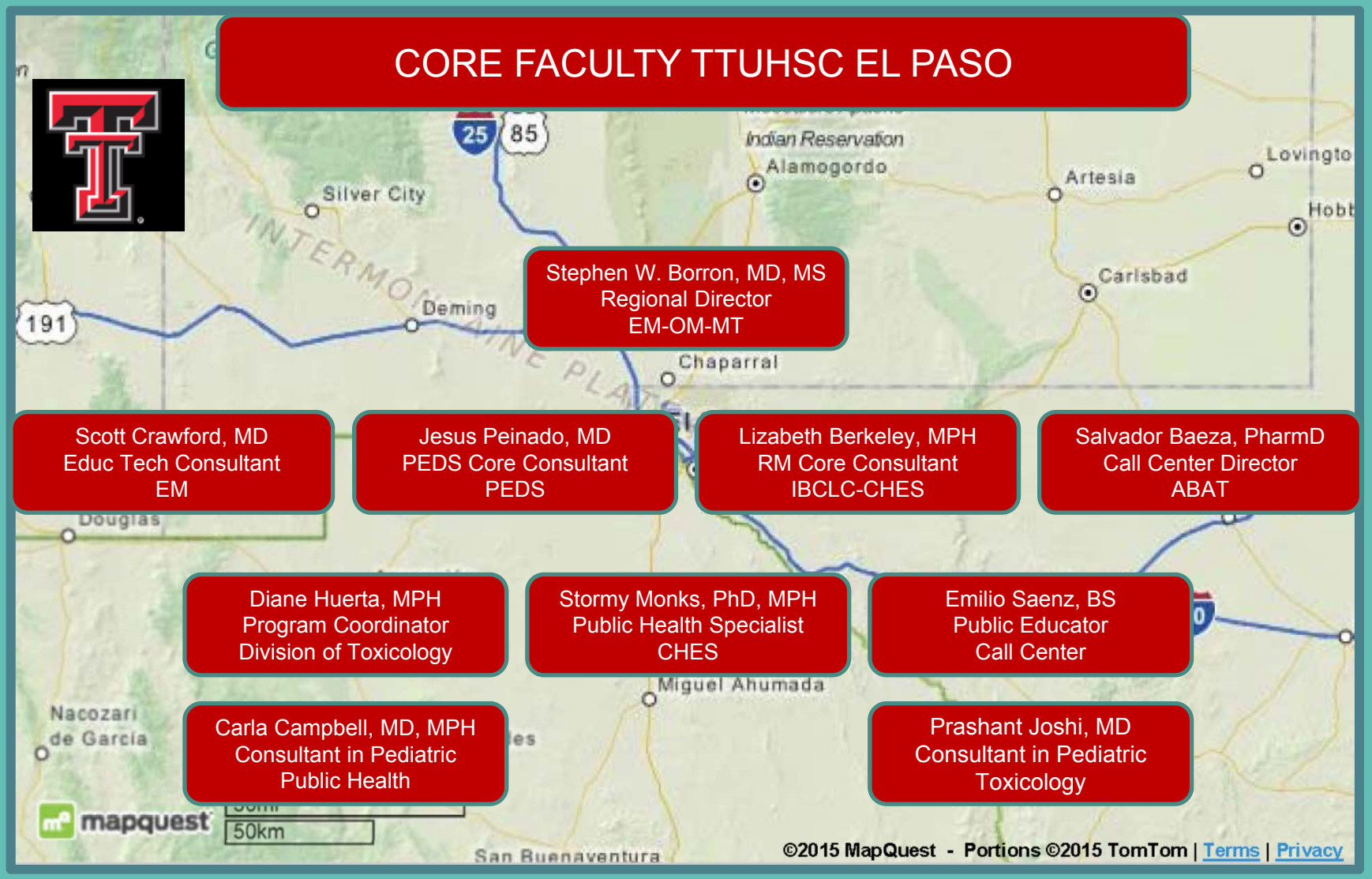
PEHSU

SWCPEH – Who we are

We are a group of health education professionals and medical specialists prepared to respond to requests for information and give advice on the prevention, diagnosis, management, and treatment of environmentally-related health effects in children.

We are composed of public health specialists, pharmacists, nurses, occupational and environmental health physicians, pediatricians, reproductive health specialists, emergency physicians, and toxicologists.

Who staffs the SWCPEH?



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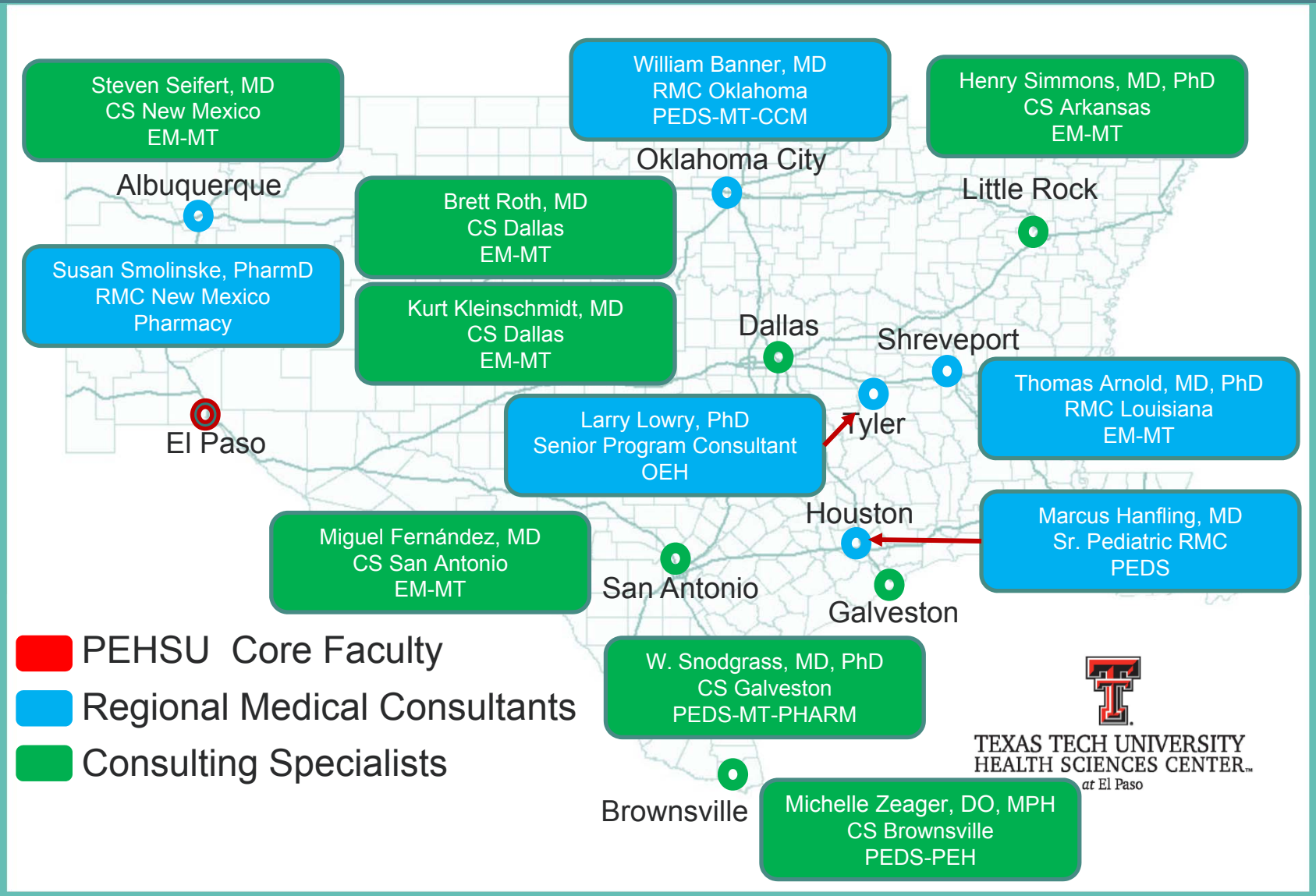


SWCPEH – What we do

Community Education and Outreach

- Raising awareness about environmental conditions that may harm children and families
- Guidance on preventing or reducing harmful environmental exposures in everyday situations
- Providing practical advice on helping children cope and recover during and after floods, wildfires, chemical spills and other crises

Training Health Professionals

- Conducting seminars and conferences
- Publishing peer-reviewed articles that raise environmental health literacy
- Translating health care research into medical practice
- Providing on-line educational programs and case studies on environmental health issues

Consultation and Referral

- Evaluating suspected toxic exposures
- Identifying and interpreting appropriate diagnostic tests
- Medical management
- Referral to specialty care

What is pediatric environmental health?

Disease prevention model

- Prevention of illness due to preconception, prenatal, perinatal, childhood and adolescent exposures to environmental hazards.
  - Environmental illness may result from contamination of air, water, soil, or food.
  - This model recognizes that early environmental exposures may influence health and development across the entire human lifespan

Health promotion model

- Healthy environments protect children's health and nurture growth and development.
  - A healthy environment requires utmost attention to the protection of food, water, soil, and the air.
  - PEH focuses on those areas where children spend most of their time – in the home and at school
  - This model recognizes that the early attention to protection of the environment may positively influence health and development across the entire human lifespan.

A broader definition of environment

- While we are dependent on the earth to provide us with fresh water, clean breathing air, fertile soil and food, the earth is subject to external forces. All of these forces, including those exerted by human beings, play a role in the well-being of the earth.

- Thus, the definition of environment must include its inhabitants, their attitudes, their willingness to be good citizens, and to care for the next generation and generations to come.

Pediatric environmental health from A to Z

Pediatric environmental health from A to Z

A Air quality

Without air, there is no life. Children breathe much faster than adults. Closer to the ground, any pollutant heavier than air will be closer to their lungs than to ours. When at play, they breathe even faster, drawing in the air and whatever contaminants it may hold.

Diesel exhaust from vehicular traffic exacerbates upper respiratory infections, pneumonia, and asthma.

Environmental tobacco smoke has been shown to increase the incidence of upper respiratory infections and ear infections. It increases the risk of development of asthma.

Darrow 2014 Am J Epidemiol 180, 968-977
US DHHS 2006 The health consequences of voluntary exposure to tobacco smoke. A Report of the Surgeon General.

Pediatric environmental health from A to Z

B

Built environment

Children need safe, stable, clean housing and schools, devoid of excessive noise, extremes of heat or cold, of toxicants like asbestos, mold, and lead. The built environment includes parks, roads, and vehicles.

Housing mobility (frequent moves) is associated with learning disabilities, including lower verbal cognitive abilities.

Overcrowding increases stress levels, reduces academic achievement, and may lead to social withdrawal and conflict.

Landrigan 2014 Textbook of Children's Environmental Health, pp. 43-47
Fowler 2015 Child Abuse Neglect 48, 104-118

Pediatric environmental health from A to Z

Chemical exposures

The EPA inventory of toxic substances contains around 84,000 chemical substances that may possibly be in commerce. This ignores food additives, drugs and cosmetics, pesticides, tobacco and mixtures[1]. The toxicity of many of these compounds has not been explored fully and may never be. Children are at greater risk, relative to adults, of exposure to toxic chemicals due to anatomical and physiological differences.

- Infants and toddlers have large body surface areas relative to their weight, and thinner skin, increasing the risk of skin absorption of chemicals.
- Small children have increased hand to mouth activity, less taste discrimination, and natural curiosity, leading to increased risk of toxic ingestions.
- Children are at greater risk of inhalational toxicity due to increased respiratory rate, proximity to the ground (greater concentration of heavier than air toxicants) and limited ability to escape hazards.
- Children have longer lives ahead of them, and thus greater opportunity to express chronic toxicity, such as cancer or reproductive damage.

1. Institute of Medicine. Roundtable on environmental health sciences, research, and medicine. 2014 National Academies Press

Toxic Substances Control Act Reform – 2016

Gina McCarthy

Under the leadership of EPA administrator, Gina McCarthy, U.S. Congress and President Obama have enacted the 1st major update to TSCA since 1976.

According to Administrator McCarthy, the law gives EPA the authority's needed to protect American families from the health effects of dangerous chemicals... 40 years after TSCA was enacted, there are still tens of thousands of chemicals on the market that have never been evaluated safe for safety, because TSCA didn't require it.

- The new law requires EPA to evaluate existing chemicals, with clear and enforceable deadlines.
- EPA will evaluate chemicals purely on the basis of the health risks they pose.
- The new law provides a consistent source of funding for EPA to carry out its new responsibilities.

https://blog.epa.gov/blog/2016/06/tsca-reform-a-bipartisan-milestone-to-protect-our-health-from-dangerous-chemicals/

Pediatric environmental health from A to Z

D Diet and nutrition

Children require nutritious food, at home and at school. Impoverished children often live in "food deserts," where there is access only to convenience stores. Unhealthy foods such as lunch meats laden with salt, chips and snack food, and sodas may replace fresh fruits and vegetables, grains, and fresh meats.

Children who go to school hungry have greater anxiety, depression, chronic illness, and behavior problems than children with no hunger.

While replacing sugar sweetened beverages with water or milk is inversely associated with body fat development, there appears to be a downside to following dietary variety and diversity guidelines: increased body mass index.

Emulsifiers, high fructose corn syrup, bisphenol A (BPA)and other additives to prepared foods have been identified as potentially leading to obesity.

Weinreb 2002 Pediatrics 110, e41
Zheng 2015 Nutrition 31, 38-44
Fernandez 2016 Pediatrics 137, e20152307
D'Aniello 2015 J Pediatr Gastroenterol Nutr 60, 113-119

Pediatric environmental health from A to Z

E

Ethanol (alcohol), drugs of abuse

In 2007, the Surgeon General issued a call to action to reduce underage drinking, which was associated with nearly 5000 injury deaths annually, poor academic performance, risky sexual behavior and physical and sexual assaults. Significant reductions have been achieved, in part due to new laws restricting access. Nonetheless underage drinking remains a problem.

Prescription drug misuse is at epidemic proportions. In a recent study of middle school students, low resistance self-efficacy, family substance use, low parental respect and offers of other substances by peers were associated with illicit prescription drug use throughout middle school. 6.6% of youth initiated nonmedical prescription drug use in middle school.

Drug use often starts in the home or school, and thus is an environmental issue.

US DHHS 2007 The Surgeon General's call to action to prevent and reduce underage drinking.
Hingson 2016 J Stud Alcohol Drugs 75, 158-169
Tucker 2015 drug alcohol dependence 156, 254-260

Pediatric environmental health from A to Z

F

Fossil fuels and climate change

Children suffer now and will increasingly suffer the effects of the continued use of fossil fuels. Fossil fuels, in particular high-sulfur coal, are responsible for most of the mercury vapor in our environment. Oil and natural gas burning contribute to particulate pollution, generation of carbon dioxide, and global climate change.

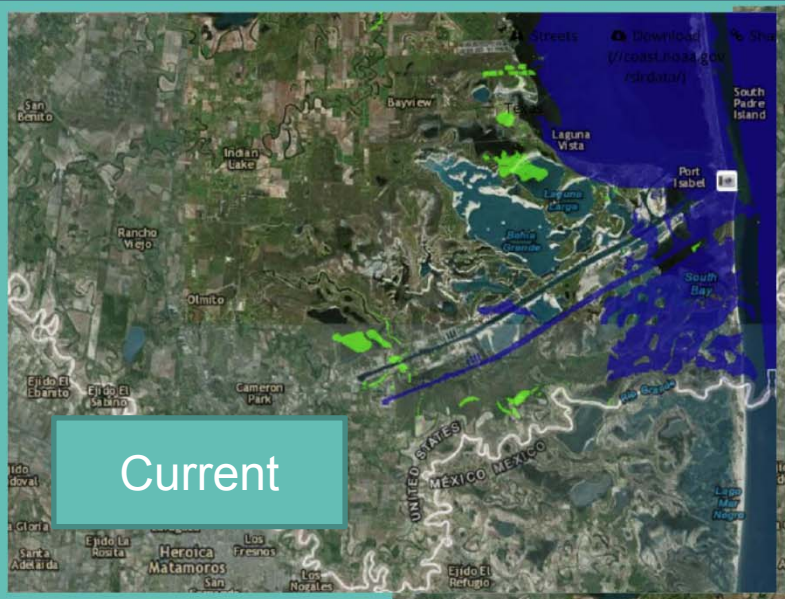
Outdoor air pollution has already been signaled as a cause of pediatric respiratory illness and asthma

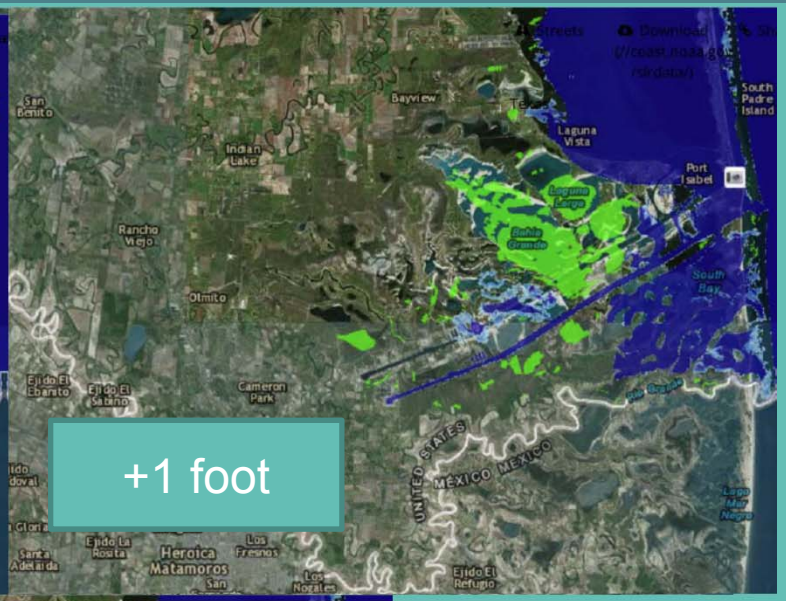
As water levels rise, children in coastal areas may be forced to move inland. This could pose an extraordinary burden on disadvantaged families and potentially bring about family instability. Dozens of children have died this year due to flooding.

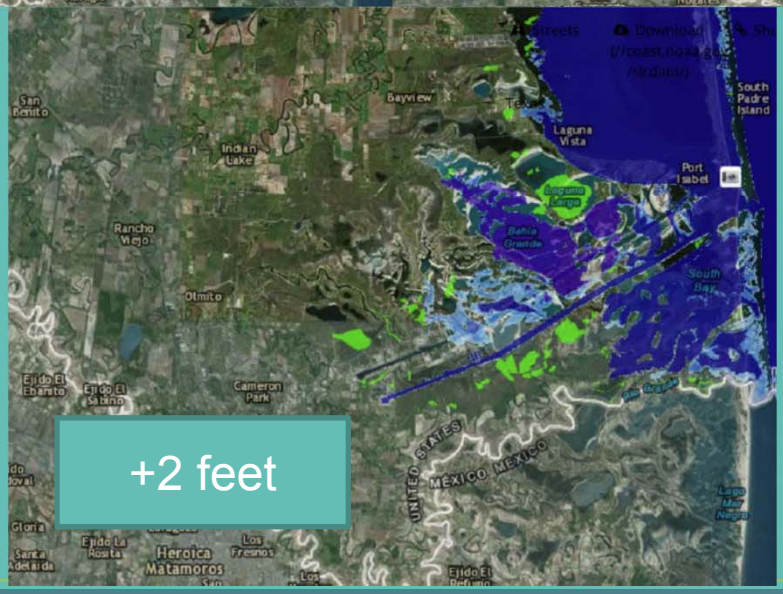
Another adverse effect of climate change is extreme heat. Excessive heat may lead to heat exhaustion or heatstroke. Children are particularly vulnerable to heat-related illness. Increased exposure to ultraviolet rays may lead to skin cancers.

Goldman 2001 Pediatrics 108, 197-207
Perera 2008 Environ Health Perspect 116, 987-990
Smith 2016 J Epidemiol Community Health 70, 459-465

Effects of sea level rise on Brownsville area







Levels represent inundation at high tide
Low-lying areas in green are hydrologically unconnected areas that may flood.

https://coast.noaa.gov/slr/

Pediatric environmental health from A to Z

Geopolitical instability/disasters

It goes without saying that children's lives have been torn apart by war in the Middle East and elsewhere. In addition to the children killed, many, many more have been orphaned or maimed for life.

A study of adolescents with ongoing exposure to terrorism reported that PTSD, functional impairment, and suicidal ideation were associated with exposure to trauma due to terrorism. Older age was associated with increased risk for suicidal ideation.

Comer and colleagues reported that 6 months after 9/11 in New York City, 1 in 5 youths reported a family member lost his/her job and 1 in 3 had their travel restricted. These disruptions were associated with increased PTSD, anxiety disorders, and major depressive disorders.

Chemtob 2011 J Trauma Stress 24, 756-759
Comer 2010 J Clin Child Adolesc Psychol 39, 460-469

Pediatric environmental health from A to Z

H Healthy homes

There is no place like home. One cannot overestimate the impact of the home environment on the well-being of the child, whether the home is nurturing, loving and protective one, or a dangerous, disruptive atmosphere. Even in the nurturing home, there is always room for improvement in safety and health.

Keeping a home dry, clean, pest-free (using integrated pest management), with safe drinking water, safe food storage and handling, good indoor air quality, undertaking poisoning and injury prevention steps and being prepared for emergencies and disasters goes a long way toward making children's life safer.

https://www.cdc.gov/healthyhomes/
http://www.greenandhealthyhomes.org/get-involved/get-ghhi-trained

No comment necessary

Pediatric environmental health from A to Z

I

Injury prevention

According to the CDC, injury is the number 1 killer of children and teens in the United States. In 2009, 9,000 youth died from unintentional injuries in the US. Leading causes of child injury include motor vehicle crashes, suffocation, drowning, poisoning, fires, and falls. Childhood injuries are predictable and preventable.

A National Action Plan has been established by CDC. The goals are:

- Raise awareness about the problem of child injury
- Highlight prevention solutions
- Mobilize action on a national coordinated effort to reduce child injury

Hemenway and Solnick estimate that there were 110 annual unintentional firearm deaths in children 0 to 14 years from 2005 to 2012. Victims were 81% male. The shooter was typically a brother or friend. The authors point out the importance of keeping guns away from children, their siblings, and their friends.

https://www.cdc.gov/safechild/nap/
Hemenway 2015 Inj Epidemiol 2, 26

Rural environmental health risks also exist

This is not a toy.

From 1982 through 2013:

- 3,023 ATV-related fatalities occurred in children younger than 16 years of age. This represents 23 percent of the total number of reported ATV-related fatalities (13,043).
- Of the 3,023 victims, 1,303 (43 percent) were younger than 12 years of age.
- In 2009, the most recent year where reporting is considered complete, 96 (13 percent) of the reported 721 ATV-related fatalities were children younger than 16 years of age.

Consumer Product Safety Commission. 2013 Annual Report of ATV-related Deaths and Injuries, February 2015
The Last Ride-ATV safety: https://www.youtube.com/watch?v=kC_LB9X1WEg. Also available in the PEHSU National Classroom

Pediatric environmental health from A to Z

J

Justice, environmental

Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

It will be achieved when everyone enjoys:

- The same degree of protection from environmental and health hazards, and
- Equal access to the decision-making process to have a healthy environment in which to live, learn, and work.

The lead debacle at Flint, Michigan is a textbook example of environmental injustice. This conference will provide additional examples of environmental injustice visited upon the disadvantaged, people of color, and others with little voice.

https://www.epa.gov/environmentaljustice

Pediatric environmental health from A to Z

K

Knowledge and the right to know

"Right to know", in the context of United States workplace and community environmental law, is the legal principle that the individual has the right to know the chemicals to which they may be exposed in their daily living. It is embodied in federal law in the United States as well as in local laws in several states.

One could reasonably argue that the adults and children of West, Texas had the right to know that between 40 and 60 tons of fertilizer grade ammonium nitrate, the same chemical used by Timothy McVeigh to blow up the Oklahoma City Federal Building, was being stored within close proximity of 4 schools, nursing homes, and residences.

14 were killed and 200 others injured in the explosion that occurred at the West Fertilizer Company on April 17, 2013 at 8:13 pm. Had students been in school at the time the death toll would have almost certainly been much higher.

A prominent state official opined that government can withhold the locations of dangerous chemicals listed in state records to protect the public from terrorism or other threats. He suggested that people can identify such facilities with a "drive around" their neighborhoods, finding out about chemicals by asking the companies via letter or email.

http://www.csb.gov/west-fertilizer-explosion-and-fire-/

Pediatric environmental health from A to Z

L

Lead

Lead has posed a threat to the developing brain of young children for thousands of years. Exposures to even small quantities of lead can result in diminished intelligence quotient (IQ). Exposure to larger doses may lead to behavioral disorders, gastrointestinal symptoms,and peripheral nervous changes, such as neuropathy

Vast improvements in the proportion of children with high blood lead levels have occurred in the US, largely due to the banning of lead in paint and in gasoline.

Nonetheless, the events of Flint, Michigan remind us that lead is still with us and still poses a substantial hazard to growing children. It is likely that there are other "Flints" yet to be discovered.

https://www.epa.gov/flint

Pediatric environmental health from A to Z

M Metals, other heavy

Arsenic, a known human carcinogen, is found in a significant number of water wells, in certain foods, and in pesticides. In areas of extremely high arsenic in drinking water, such as Bangladesh, children often suffer from painful neuropathies, skin diseases, including cancer, and malnutrition due to gastrointestinal disturbances.

Mercury, like lead, has been removed from many consumer products, such as fever thermometers, blood pressure cuffs, thermostats, etc. It is still found, however, in certain fish, such as tuna, and in industrial emissions, particularly from coal-fired plants. Mercury has numerous, potentially irreversible effects on the body, including hypertension, intense sweating, rashes, irritability, altered mental status, and even death. Children should be cautioned never to play with elemental mercury.

Selenium (as selenious acid) is found in gun bluing solutions. Gun owners should pay particular attention to keep it out of the reach of children. A mouthful could be deadly to a toddler.

Majumdar 2012 Indian J Public Health 56, 223-226
https://www.atsdr.cdc.gov/dontmesswithmercury/
Quadrani 2000 Vet Hum Toxicol 42, 96-98.

Pediatric environmental health from A to Z

N Noise

Balk defines noise as loud, unpleasant, unexpected, or undesired sound. Noise is often thought of as a simple nuisance, but may have serious detrimental effects on children and adults alike.

Health effects of noise include noise-induced hearing loss from acute or chronic exposure to excessive noise, or tinnitus from extreme noise such as a gunshot occurring near the ear.

Noise may induce other physiological and psychological effects, as well. Repeated exposure to noise during development may affect the child's acquisition of speech, language, language related skills such as reading and listening. It induces stress and contributes to sleep deprivation.

Balk in Landrigan & Etzel. Textbook of Children's Environmental Health 2014, Oxford University Press.

Pediatric environmental health from A to Z

Obesity

Obesity is one of the most complex and pernicious problems facing children today. The CDC estimates that 17% of children and adolescents 2 through 19 years old are obese. Obesity is defined as a body mass index (BMI) at or above the 95th percentile of the sex-specific CDC BMI- for-age growth charts.

Many factors contribute to obesity, including, of course diet, the education level of the adult head of household, race and ethnicity, cultural perceptions of weight, and income group. Genetics, epigenetics and metagenomics appear to be involved as well.

Numerous food additives and chemicals have been identified as potential obesogens, among these, high fructose corn syrup, bisphenol A and other plasticizers, persistent organic products, and so-called endocrine-disrupting chemicals, including some pesticides.

Obesity contributes to heart disease, kidney disease, gallbladder disease, diabetes mellitus, hypertension and poor self-esteem.

Pigeyre 2016 Clin Sci 130, 943-986

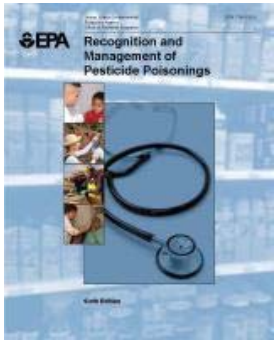
Pediatric environmental health from A to Z

P

Pesticides

Many extremely hazardous pesticides have been removed from commerce in the United States, thanks to the diligent efforts of the US EPA. Among these are the most toxic of the organophosphorus pesticides and the carbamates. However, many of these dangerous pesticides are still available in Mexico and elsewhere and cross the border with some frequency.

Remaining pesticides, including the pyrethrins, pyrethroids and neonicotinoids have far less acute toxicity to humans than their organophosphate, organochlorine and carbamate predecessors, but may nonetheless cause toxicity, and in the case of pyrethroids – allergy.



Chronic effects of pesticides are more poorly understood, but may include neurological injury, immunomodulation, and endocrine disrupting effects.

A rodenticide of particular concern to clinical toxicologists is bromethalin, which is replacing coumadin derivatives. Its acute toxicity is to disrupt oxidative phosphorylation in the brain, for which there is no antidote. Parents should be cautioned to use the bait stations in which these products come and in general to avoid use of pesticides whenever practical.

Recognition and Management of Pesticide Poisonings: 6th Edition
https://www.epa.gov/pesticide-worker-safety/pesticide-poisoning-handbook-complete-document

Pediatric environmental health from A to Z

Quakes, induced

We rarely think of earthquakes as anything other than natural phenomena, which cannot be avoided in certain areas. Earthquakes are responsible for the deaths of thousands of children each year throughout the world and for leaving many others orphans.

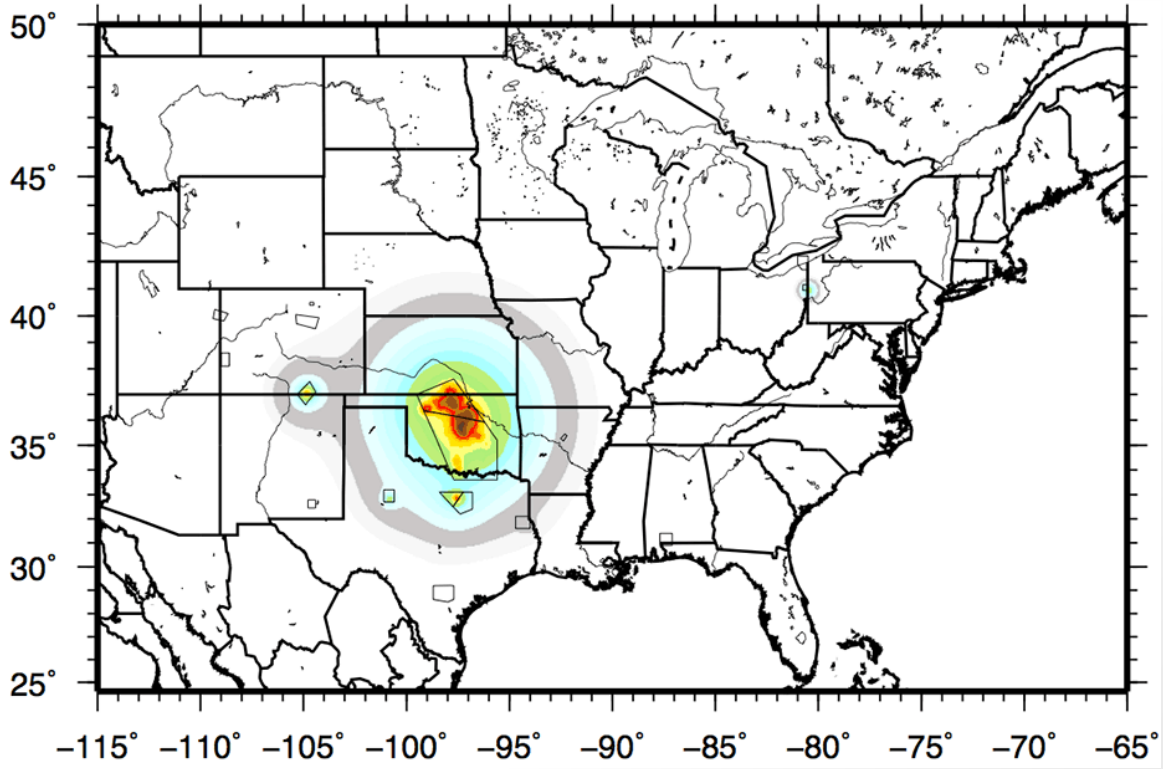
Wastewater disposal associated with hydraulic fracturing or "fracking" is now considered a cause of induced earthquakes. While the quakes so far have been mostly of low seismic impact, the increasing frequency of induced earthquakes is deeply concerning.

The United States Geological Survey points out that not all wastewater injection wells induce earthquakes and that not all wastewater comes from fracking. They cannot rule out the possibility of greater tectonic shifts and severe earthquakes in the future associated with petroleum exploration.

http://earthquake.usgs.gov/research/induced/myths.php

Pediatric environmental health from A to Z

Quakes, induced



Example computation of ground shaking probability from induced seismicity.
http://earthquake.usgs.gov/research/induced/hazards.php

Pediatric environmental health from A to Z

R

Radiation, ionizing

Children are exposed to numerous sources of ionizing radiation. Cosmic rays from the sun, radon seeping up from the ground and low level radioactivity in certain foods expose all of us to certain background level of radiation. Medical examinations such as CT scans add to these exposures

Nuclear power plant releases, such as those seen after Fukushima and Chernobyl have resulted in marked increases in the incidence of thyroid cancers, as well as stress from displacement, and insertion into new schools and communities, where residents often fear refugees of nuclear incidents.

The Cold War led to great fear of nuclear attack, among children and adults alike. Growing geopolitical instability throughout the world once again raises the risk of the "unthinkable."

Pediatric environmental health from A to Z

S

Sanitation

Children in some border communities, especially colonias, may have inadequate access to purified water for drinking or cooking. Gastrointestinal illnesses resulting from this disparity are common.

Furthermore, some lack septic systems, relying on poorly functioning cesspools. Increased flies and mosquitoes may harbor and transmit diseases.

Absence of organized trash collection may lead to haphazard dumping, which contributes to proliferation of vectors and diseases in the communities.

Pediatric environmental health from A to Z

T

Teen employment dangers

Farmers often depend on their children and neighbors' children to assist with cultivation and harvest of crops. Farm machinery, including combines, balers, rakes and tractors pose significant risks to teenagers, particularly if not carefully supervised.

Nearly 2 million kids work and live on farms in the US and as many as 22,000 are injured seriously each year. 100 children and teens die each year due to farm-related injuries.

In addition to heavy machinery injuries, teens may be exposed to hazardous chemicals, such as hydrogen sulfide or nitrogen dioxide in manure pits or feed silos, respectively. Efforts at education and improve safety are underway.

http://kidshealth.org/en/teens/farm-safety.html

Pediatric environmental health from A to Z

U Unintentional poisoning

Unintentional poisoning killed 838 US children in 2010, more than 90% of them teenagers. Prescription drug abuse and misuse has reached epidemic proportions – the prescription drug death rate more than doubled among children 12 to 17 years old from 1999 to 2008.

US poison centers receive nearly 2 million calls each year. The vast majority of calls are for children under age 5 and more than half of them involve exposures to medications.

Poison centers save lives and money by avoiding unnecessary hospitalizations and by assisting physicians and nurses with the care of poisoned patients. They form a critical link in the public health system.

CDC 2013 A National Action Plan for child injury prevention – Reducing poisoning injuries
Texas Poison Center Network –http://poisoncontrol.org/home/
American Association of Poison Control Centers – http://aapcc.org

Pediatric environmental health from A to Z

V Violence

Violence is unfortunately a daily fact of life for many children. Children are vulnerable, and thus subject to all forms of abuse: emotional, physical, and sexual.

The New York City Alliance Against Sexual Assault cites studies indicating that 46% of children who are raped are victims of family members; that the majority of American rape victims (61%) are raped before the age of 18 and that an astounding 29% of all forcible rapes occurred when the victim was less than 11 years old. These events take a terrible toll: of male survivors of child sexual abuse, >80% have history of substance abuse, 50% have suicidal thoughts, 23% attempt suicide and 31% had violently victimized others.

Firearm violence committed by children against children or adults is clearly a public health issue. In 1997, the U.S. Congress essentially banned research on gun violence by the Centers for Disease Control. Kellermann argues convincingly that injury prevention research has reduced the number of those dying in motor vehicle crashes, fires and drowning and that we might expect similar reductions if allowed to study gun violence with appropriate funding. .

http://www.svfreenyc.org/survivors_factsheet_37.html
Kellermann 2013 JAMA 309, 549-550

Pediatric environmental health from A to Z

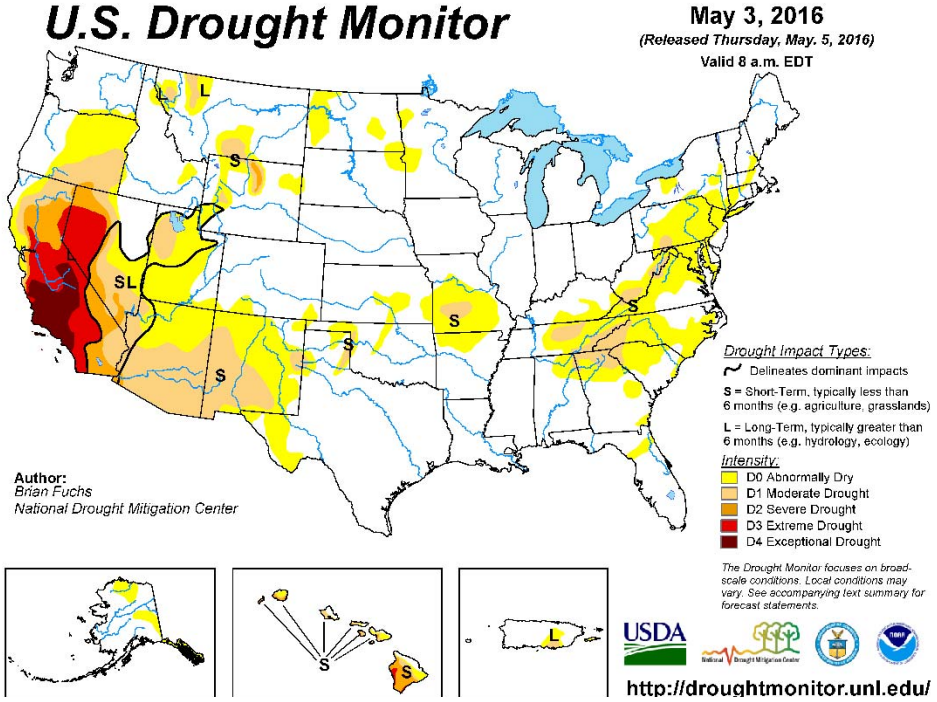
W Water

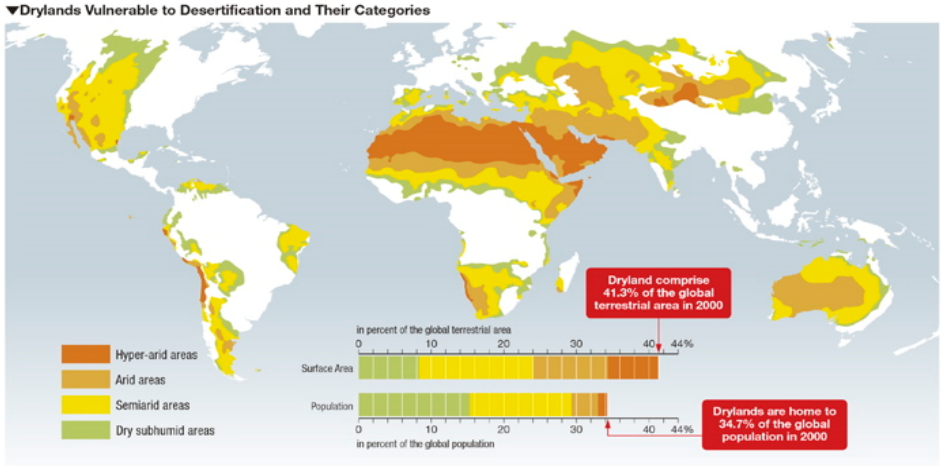
Many of us have taken for granted that clean drinking water flows from the tap and assumed that it would always be so in a developed country. However, clean drinking water is not a given in some colonias and methods of filtration sometimes beyond economic reach. The debacle at Flint, Michigan has shown us that we must always be vigilant about our water supply, taking nothing for granted.

Climate change is bringing with it extensive periods of drought in some parts of the country. The long-term outlook for drinking water supplies is not bright.

For our children's sake, we will have to alter our water use and our concepts about what is acceptable use of fresh water. Expect to hear more about desalination and reuse of water.

Good to the last drop?





Worst Drought in 1,000 Years Predicted for American West

Global warming to cause historic "megadrought" by century's end.

By **Brian Clark Howard**, National Geographic

PUBLISHED FEBRUARY 12, 2015

A paddle wheeler and a small motorboat sail on Lake Mead, North America's largest man-made reservoir. The water is at its lowest level since the Hoover Dam was built in the 1930s. The white "bathtub ring" of mineral deposits on the rocks

http://droughtmonitor.unl.edu
www.env.go.jp
www.nationalgeographic.com

Pediatric environmental health from A to Z

X

Xenophobia

Merriam-Webster defines xenophobia as fear and hatred of strangers or foreigners or of anything that is strange or foreign. As the US becomes more and more heterogeneous in makeup, xenophobia has become even more evident. This too is a pediatric environmental health issue, because hatred of the "other" may lead to violence, social isolation, or even suicide.

Xenophobia is often thought of as being passed from parent to child, although there is no longitudinal evidence supporting this claim. A recent study among 507 adolescents and their parents revealed mutual influences between the two. Adolescents who perceive their parents as supportive of xenophobia showed higher parent-adolescent correspondence in prejudice than youth with low parental support. Parents prejudice influences adolescence attitudes to the extent that youths perceive their parents as supportive.

Miklikowska 2016 Br J Psychol 107, 95-116.

Pediatric environmental health from A to Z

Y

Youth risk behavior

Risk-taking behavior is a natural phenomenon among adolescents. Certain behaviors predict escalation and call for intervention. Warning signs may be expressed or evident to schoolmates and teachers.

Bullying and sexual harassment are significant predictors of teen dating violence (TDV) perpetration.

Suicide is a common cause of death among adolescents. In a recent study, 67% of successful suicides in the age range of 15 to 19 were not receiving mental health treatment at the time of death. Among these, 22% had disclosed their intent to commit suicide to another person. 1/3 were identified as being depressed and ¼ as undergoing a crisis within 2 weeks of their suicides. Clearly, greater attention is needed for children in crisis outside of the mental health treatment system.

Cutbush 2016 Prev Sci Epub ahead of print
McLone 2016 J Trauma Acute Care Surg Epub ahead of print

Pediatric environmental health from A to Z

Z

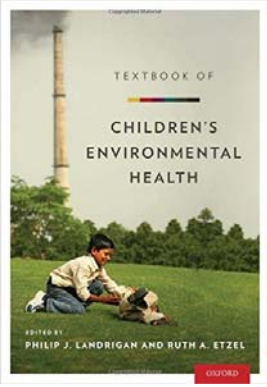
Zika

Zika is the latest in a series of viruses posing risks to children. In this case, the greatest risk is to the unborn. We will hear a great deal more about Zika in later presentations.

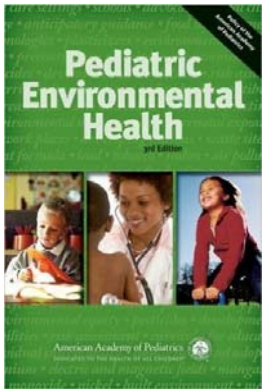
Mosquitos serve as vectors for many diseases – malaria, chikungunya, dengue, West Nile virus, and others.

Standing water serves as a breeding ground for mosquitoes and is very difficult to control in many neighborhoods, especially colonias, where discarded tires, potholes in roads collect rainwater.

Pediatric environmental health resources



Textbook of Children's Environmental Health, 1st Ed.
Philip J. Landrigan & Ruth A. Etzel
Oxford University Press, December 13, 2013



Pediatric Environmental Health, 3rd Ed.
American Academy of Pediatrics,
Ruth A. Etzel, & Sophie J. Balk
American Academy of Pediatrics, October 1, 2011

Pediatric environmental health resources

Pediatric Environmental Health Specialty Units

http://www.pehsu.net

Links to online free CME, fact sheets, contact info for regional PEHSU units

Southwest Center for Pediatric Environmental Health (Region 6 PEHSU)

http://www.swcpeh.org

Links to fact sheets, contact info for Region 6: Arkansas, Louisiana, New Mexico, Oklahoma and Texas.

Consultation: 1.888.901.5665 or swcpeh@ttuhsc.edu

Pediatric environmental health resources

US EPA Office of Children's Health Protection
https://www.epa.gov/children

ATSDR Principles of Pediatric Environmental Health
http://www.atsdr.cdc.gov/csem.asp?csem=27&po=0

NIEHS/EPA Children's Environmental Health and Disease Prevention Research Centers
https://www.niehs.nih.gov/research/supported/centers/prevention

World Health Organization Children's Environmental Health
http://www.who.int/ceh/en

Children's Environmental Health Institute
http://www.cehi.org

Children's Environmental Health Network
http://cehn.org

Texas Environmental Lead Program
https://www.dshs.texas.gov/elp/

Conclusions

- Pediatric environmental health is impacted by many factors –
  - Home and school environments
  - Chemical and physical exposures
  - Injustice and violence
  - Climate change
  - Healthy diets and access to fresh water and sanitation
- These factors may have life-long implications

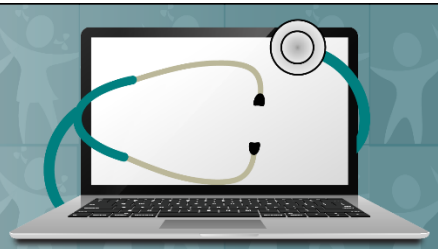
A challenge

- Do something tangible, however small, to improve the environment, and thus the future of a child
  - Convince your neighbors to join you in identifying and cleaning up hazards to children where you live
  - Volunteer at your school or church to help with a youth group or to clean up and repaint a classroom
  - Complete the healthy homes curriculum and spread the word to your neighbors
  - Buy your groceries at a local farmers market. If there's not one, start a community garden raising organic produce.
  - Minimize waste, use fewer toxic chemicals, decrease your use of fossil fuels by 10%
  - Vote for candidates who care about public health, including mental health and education

Thank you!

PEHSU NATIONAL CLASSROOM

Pediatric Environmental Health Specialty Units



www.pehsu.net/nationalclassroom.html

Webinars

- Series of scientific webinars that provide a forum for discourse on scientific issues.
- Live and On-Demand
- Case Conferences
  Journal Clubs
  Grand Rounds
- CE Available

Online Courses

- Evidence-based online courses on a variety of children's environmental health topics.
- Interactive and Self-Paced
- CE Available

Resource Catalog

- Fact sheets, journal publications, reports, and other resources for parents, community members, patients and healthcare professionals
- Topics included:
  Air Quality, Pesticides, Natural Disasters, BPA, Mold, Lead, Mercury