

Children's Environmental Health on the Border: Protecting Children Where They Live, Learn, and Play

September 24-25, 2015

Texas Tech University Health Sciences Center – El Paso
El Paso, Texas

PEHSU Panel Discussion

Top 10 Environmental Health Concerns

Acknowledgments

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Our panel



Stephen Borron, MD, MS, FACMT

- Director, PEHSU Region 6 (El Paso)

Marcus Hanfling, MD, FAAP

- Senior Pediatric Regional Medical Consultant, PEHSU Region 6 (Houston)

Jennifer Lowry, MD, FAAP, FACMT

- Director, PEHSU Region 7 (Kansas City)

Larry Lowry, PhD

- Senior Program Consultant, PEHSU Region 6 (Tyler)

Mark Miller, MD, MPH

- Director, PEHSU Region 9 (San Francisco)

Objectives

- Describe the roles and activities of the Pediatric Environmental Health Specialty Units
- List 10 environmental exposures of significant concern to children
- Present a few illustrative examples
- Respond to your questions



Audience participation question 1

- Poisoning by which of the following metals is associated with a pink, painful rash of the palms and soles, increased sweating, hypertension, and salivation?
- 1. Lead
- 2. Mercury
- 3. Arsenic

Audience participation question 1 - Answer

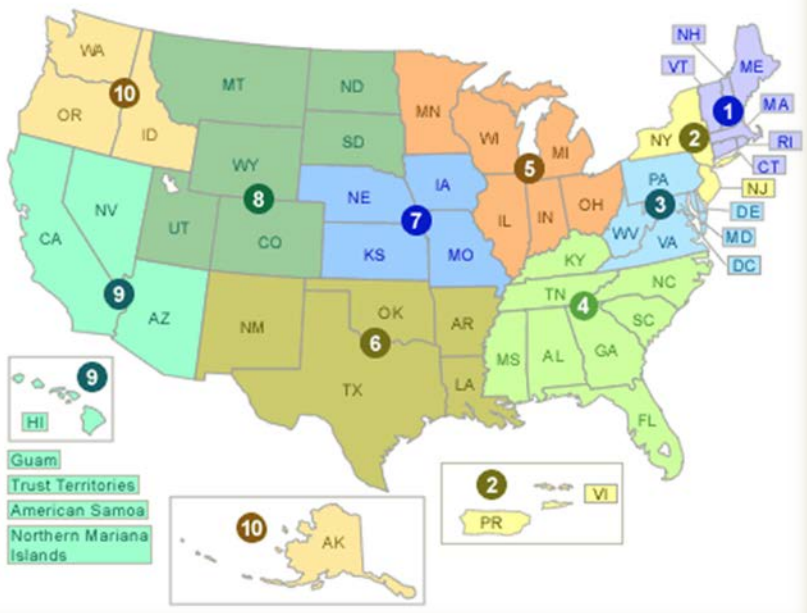
- Poisoning by which of the following metals is associated with a pink, painful rash of the palms and soles, increased sweating, hypertension, and salivation?
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Audience participation question 2

- All of the following are primary areas of focus of the Pediatric Environmental Health Specialty Units, EXCEPT
 - 1. Community education and outreach
 - 2. Training health professionals
 - 3. Complex environmental chemical analysis
 - 4. Consultation and referral

Audience participation question 2 - Answer

- All of the following are primary areas of focus of the Pediatric Environmental Health Specialty Units, EXCEPT
 - 1. Community education and outreach
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 - 3. Complex environmental chemical analysis
 - 4. Consultation and referral



www.pehsu.net

What is a PEHSU?





What is a PEHSU?

- Who we are
 - A source of medical information and advice on environmental conditions that influence children's health
 - Academically-based, professional network which renders advice on prevention, diagnosis, and management of environmentally-related health effects
 - Composed of experts in pediatrics, medical toxicology, occupational and environmental medicine, neurodevelopment, emergency medicine, industrial hygiene and other specialty areas

What does a PEHSU do?

- What we do
 - Work with healthcare professionals, parents, schools and community groups to provide information on protecting children from environmental hazards
 - Work with federal, state, and local agencies to address environmental health issues in homes
 - Primary areas of focus:
 - Community education and outreach
 - Training health professionals
 - Consultation and referral

The PEHSU Network

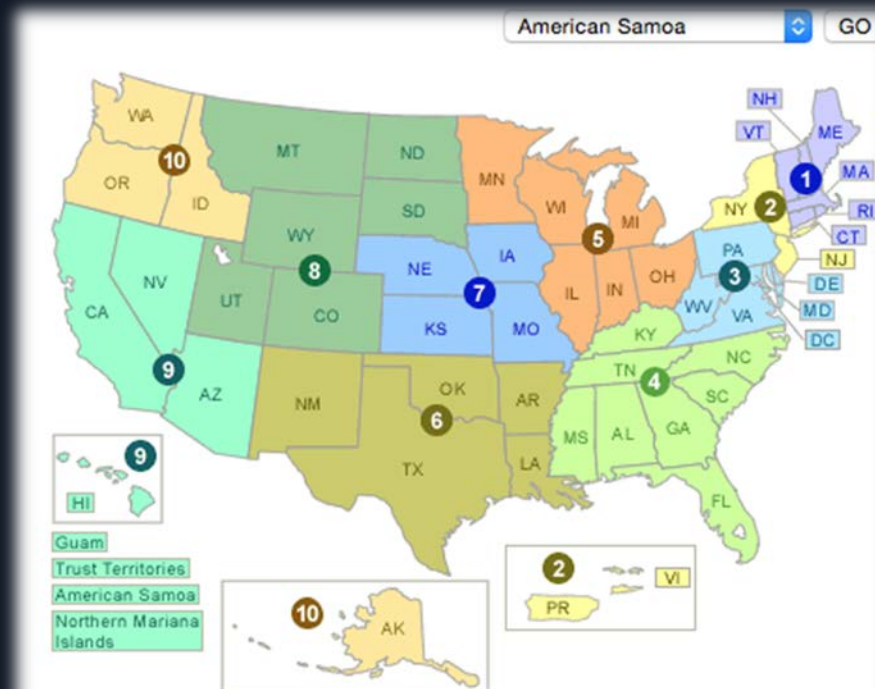
10 regional offices providing services to the U.S.

Co-managed by the American Academy of pediatrics and the
American College of Medical Toxicology

Funded by the Agency for Toxic Substances and Disease Registry

With support of the U.S. Environmental Protection Agency

<http://www.pehsu.net/serviceareas.html>



You are here: swcpeh.org



Southwest Center for Pediatric Environmental Health



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WELCOME

We are the Southwest Center for Pediatric Environmental



FACTSHEETS FOR PROVIDERS

This page is your portal to valuable information on



TOPICS FOR PARENTS

This page contains information and resources for parents on



Who staffs the SWCPEH?

A map of the El Paso region in New Mexico, showing major roads like I-10 and I-191, and cities such as Silver City, Alamogordo, and El Paso. A red box at the top center contains the text "CORE FACULTY TTUHSC EL PASO". Below this, a black and red "TT" logo is centered. Seven red callout boxes with white text are arranged in a grid-like pattern, each containing the name and title of a staff member. A scale bar for 50 miles and 50 kilometers is located in the bottom left corner. The bottom right corner contains copyright information for MapQuest and TomTom.

CORE FACULTY TTUHSC EL PASO

TT

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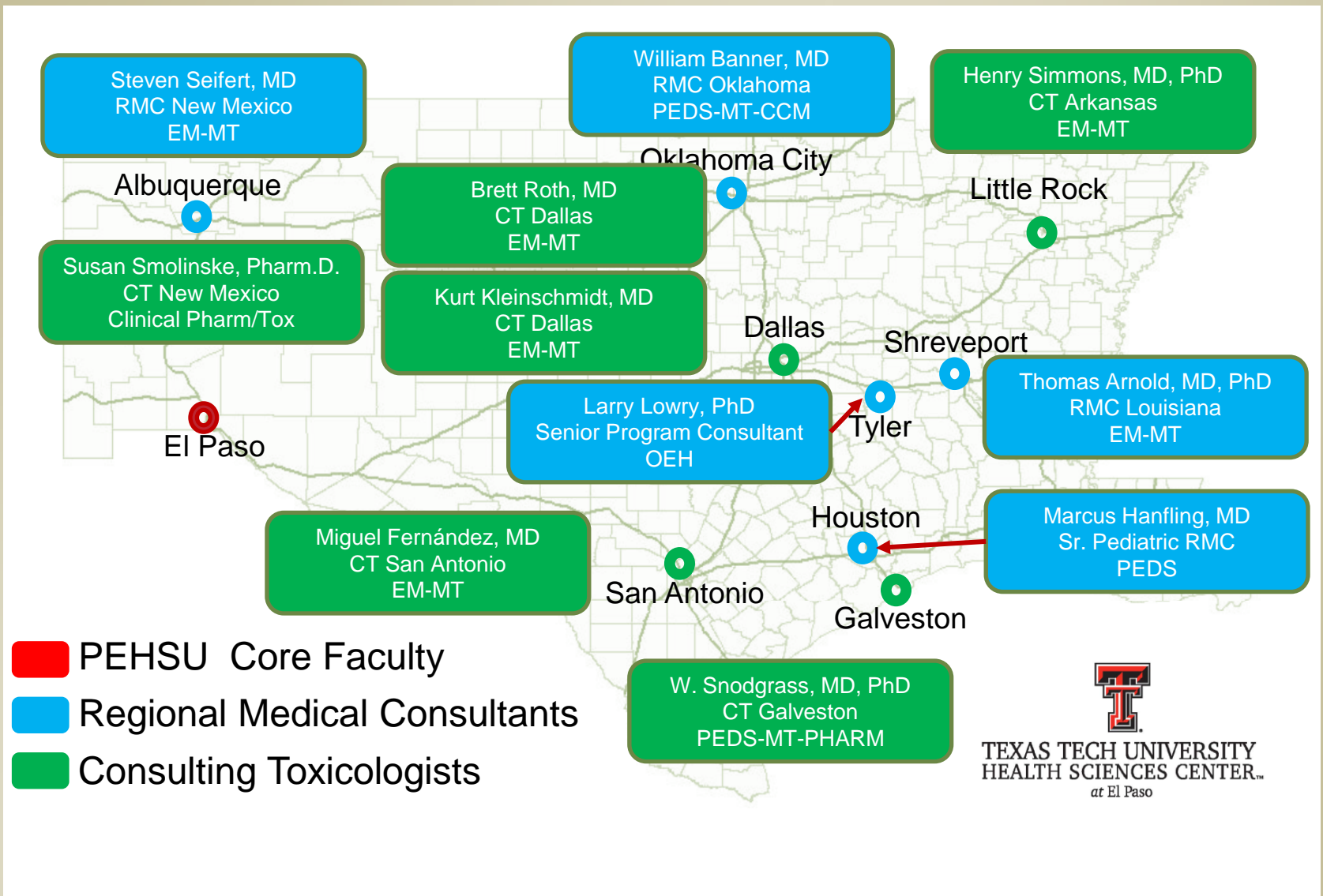
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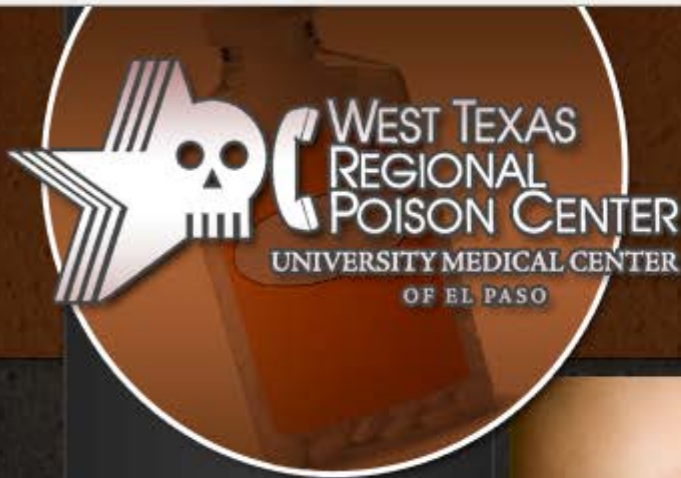
mapquest 50mi 50km

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Who staffs the SWCPEH?



Our partner: WTRPC



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1-800-222-1222

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The Call is
Free
Peace of Mind is
Priceless



West Texas Regional Poison Center

POISON- Anything that can make you sick/hurt you if you eat, drink, touch, or smell it.

- Poisons are not just pesticides, arsenic or other heavy metals or products with the skull and cross-bones on the container.
- Poisons are more often regular everyday products that are used in the wrong way or in the wrong amounts.

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Top 10 Environmental Health Concerns

Our Top 10

- Heavy metals – lead, mercury, and arsenic
- Air pollution and its effects on asthma
- Threats to clean, safe, inexpensive drinking water
- Endocrine disruptors
- Environmental carcinogens
- Pesticides
- Global climate change
- Mold
- Carbon monoxide
- Social determinants of health / healthy homes



Heavy metals – LEAD

Top 10 Environmental Health Concerns



Heavy metals – MERCURY

Top 10 Environmental Health Concerns

An Unusual Case of Leg Pain

- Previously healthy 5 year old Hispanic male with intermittent leg pain, waking from sleep, improves with massage
- Seen in ER and clinic over last 2 weeks
- Unremarkable FHx, SHx, ROS
- Normal vitals and PE
- Diagnosis “Growing Pains”

One Week Later

- Normal CBC, ESR, lytes, Ca, Mg, Phos, Thyroid, Hip x-ray
- However, leg pain worse:
 - Continuous
 - Pins and needles
 - Able to walk, but prefers to sit with knees drawn to chest
 - Intermittent profuse sweating

Admitted to Local Hospital

- Labs:
 - Normal thyroid labs, PPD negative
- Vitals/PE
 - SBP over 150, diaphoresis
- Imaging/Consults
 - Normal X-rays
 - **Labs ordered**
 - Urine VMA, HVA, plasma and urine catecholamines
 - Serum renin, aldosterone
 - Urine heavy metal screen, Serum lead
 - ANA, rheumatoid factor, vitamin B6
 - Transferred to Children's Hospital

Children's Hospital Admission

- Vitals/Exam
 - Persistent HTN 110-150/80-90
 - Bilateral leg pain and diaphoresis
- Consultation:
 - Neuro-
 - Spot urine mercury mildly elevated 26.7 mcg/L (NI < 24mcg/l)
 - 24 hour urine mercury, serum mercury sent
 - Began gabapentin
 - Renal -
 - Spot urine: catecholamines mildly elevated
 - 24 hour urine/serum catecholamines mildly elevated
 - Began amlodipine
 - Cards: EKG, Echo- normal

Two Weeks Later

- Rash on feet
- Neurologic symptoms improved – off gabapentin
- BP within normal range on med
- Neuro consult suggests mercury levels for entire family

Acrodynia (Pink disease)

- Latin root *acr-* “extremity” + *odynia-* “pain”
 - Painful hands and feet
- Pink hands and feet/pruritis
- Tachycardia & Hypertension
- Profuse sweating
- Profuse salivation
 - Photophobia
 - Hypotonia
 - Muscle wasting and loss of deep tendon reflexes
 - Lethargy, apathy, irritability
- Described from elemental and inorganic exposures



Acrodynia

- NOT dose related
 - Idiosyncratic/hypersensitivity rxn
 - Seen in young children
 - Described in the literature at urine Hg levels as low as 10 µg/l
- Catecholamines elevated
 - Investigated for secreting tumor
 - Hg bind and inactivates S-adenosylmethionine
 - Catecholamine-O-methyltransferase inactivated
 - Results in build up of catecholamines

STEEDMAN'S SOOTHING POWDERS

are prepared by

JOHN STEEDMAN & Co.,
272, Walworth Road, London, England,
and sold in Packets at 1s. 1½d. and
2s. 9d. each, by all Chemists and
Medicine Vendors in the Kingdom.

IMPORTANT NOTICE.

Steedman's Soothing Powders contain
no poison or opiate of any description.

CAUTION.

Owing to the success of STEEDMAN'S SOOTHING
POWDERS in the treatment of the minor
complaints of children, there have been many
imitations of this valuable medicine. It is
therefore necessary, when purchasing, to
observe that the name Steedman is always spelt
with EE, and pronounced as it is spelt.

*N.B.—It is particularly to be observed
that no other Medicine be given while
using these powders.*

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Figure 1 Advertisement from *Hints to Mothers on the Treatment of their Children*, published by Steedmans in 1914. Reproduced by courtesy of the Wellcome Institute Library, London

Lumex screening indicated
Hg >20,000 ng/m³ at front door





MEMBER
H&M-B&T SCOT
STYLE NO. 8830
COLOR YELLOW
SIZE 1
50 PAPER
MADE IN CHINA

ESP

SECRET WITNESS? BEWARE FOR INFO CALL 382-2222



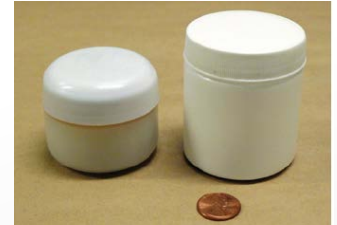
Azoque – Onset of Sxs coincides with 1 year anniversary of double murder

- Caribbean/Haitian Voodoo
- Santeria
- Mexican/Central American Beliefs
- Wards off demons
- Brings good luck
- Helps with romance



WARNING: Mercury in Home Made Face Creams

- Family in N. California identified by participating in study
 - Using cream from Mexico for 3 years
 - Mother and child with very high exposure
 - Cream 6% Hg by wt.
- Survey by Chicago Tribune finds 6/50 skin whitening creams contained Hg
 - From sources around the world
- NYC NHANES – common cause for Hg elevation



Examples of home made face cream jars from Mexico.



Heavy metals – ARSENIC

Top 10 Environmental Health Concerns

Arsenic

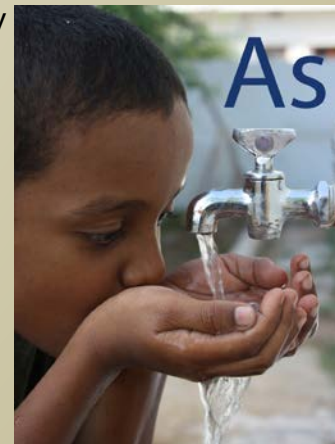
- Acute and chronic poisoning
- 200 million people at risk
- Cancer of the skin, lung, kidney, liver, bladder & bladder
- Sources:
 - Well water
 - Pesticides
 - Wood preservatives
 - Mining and metal processing



Agency for Toxic Substances and Disease Registry
atsdr.cdc.gov



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Air pollution and asthma

Top 10 Environmental Health Concerns



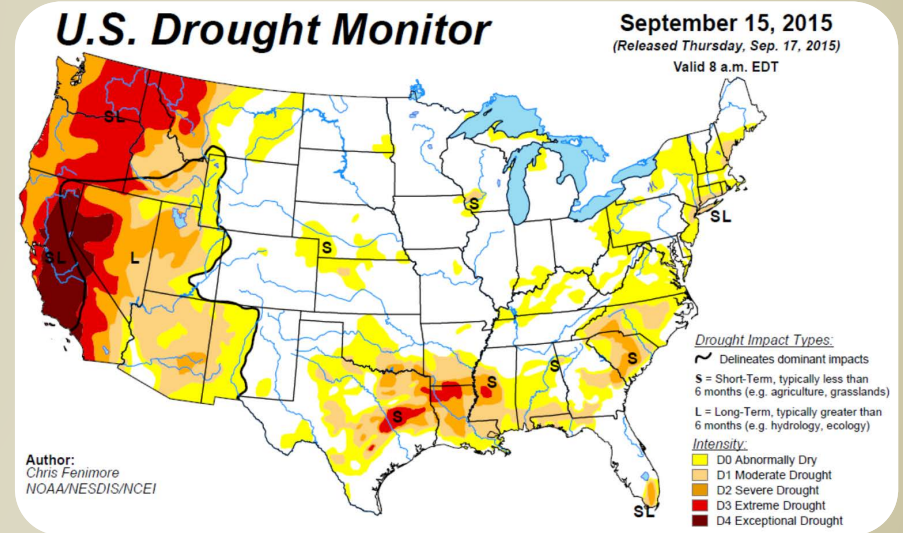
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Drinking water

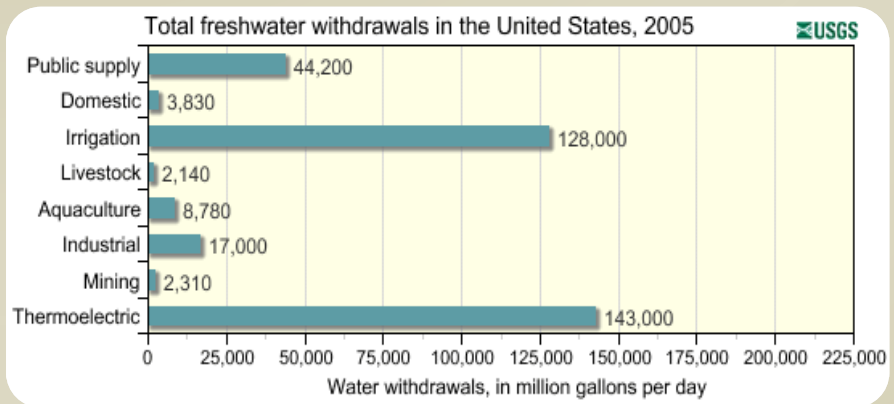
Top 10 Environmental Health Concerns

Drinking water

- Drought due to climate change
- Overuse
- Contamination of aquifers
- Privatization of public water sources



US Drought Monitor
<http://droughtmonitor.unl.edu/>

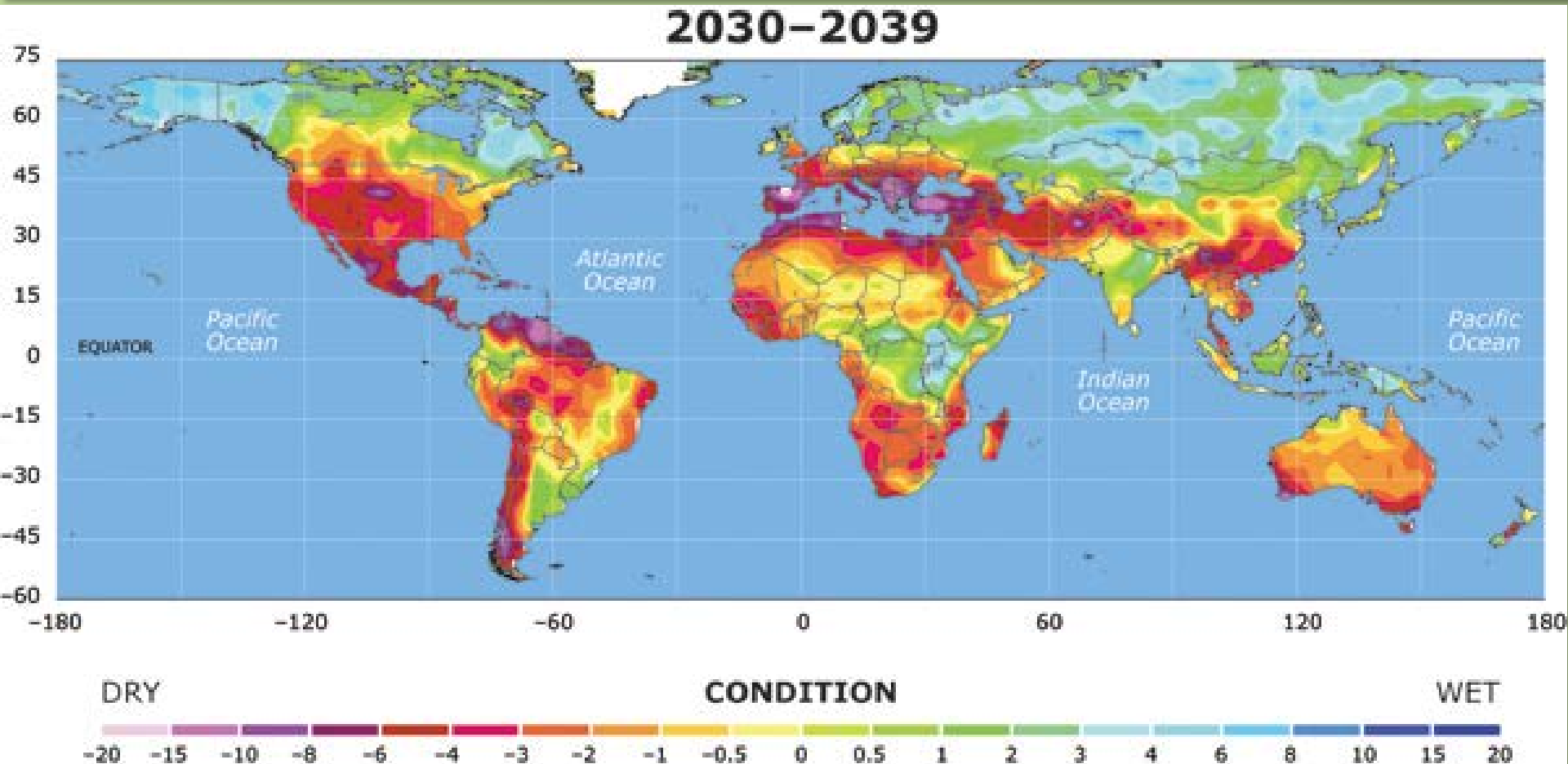


National Water Use Program
<http://water.usgs.gov/edu/wateruse-total.html>



Credit: U.S. Bureau of Reclamation

Drinking water–Drought in 2030-2039



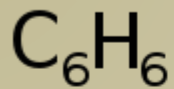
<http://droughtmonitor.unl.edu/AboutUSDM.aspx>



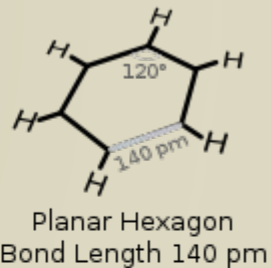
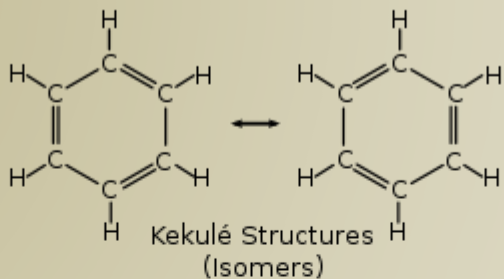
Muffet - CC

Endocrine disruptors

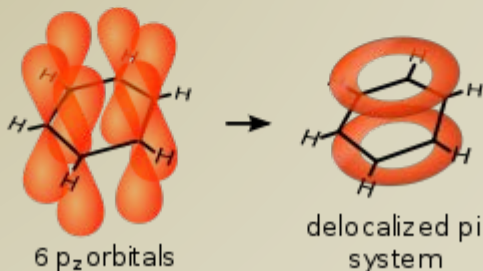
Top 10 Environmental Health Concerns



Benzene
Molecular formula



Sigma Bonds
 sp^2 Hybridized orbitals

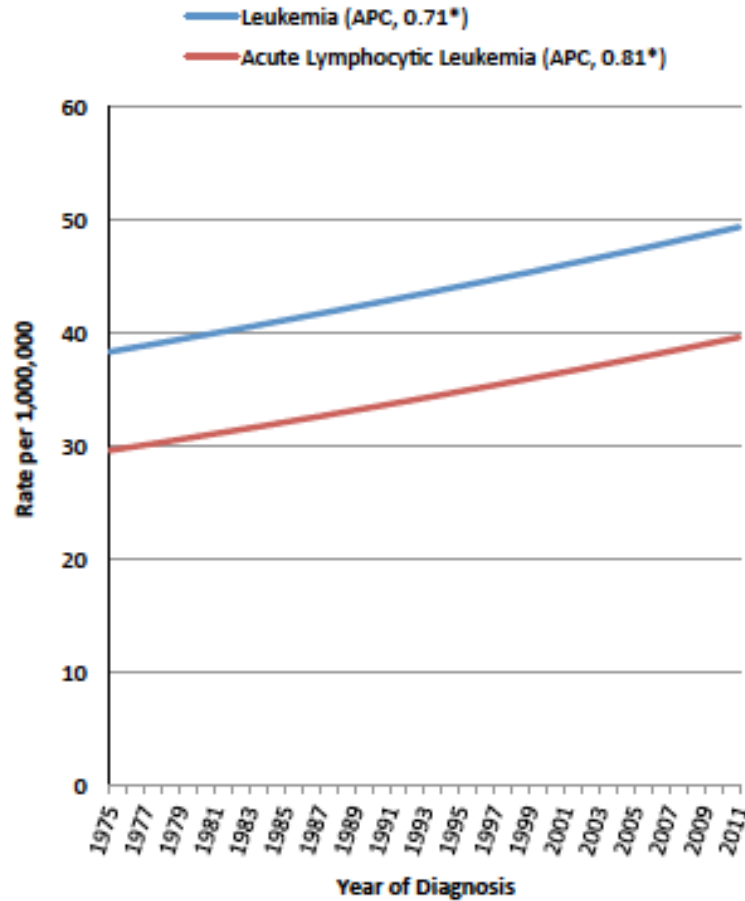


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Environmental carcinogens

Top 10 Environmental Health Concerns

Trends in the Age-Adjusted Incidence Rate of Childhood Leukemia and Acute Lymphocytic Leukemia, Ages 0-14, SEER 9, 1975-2011



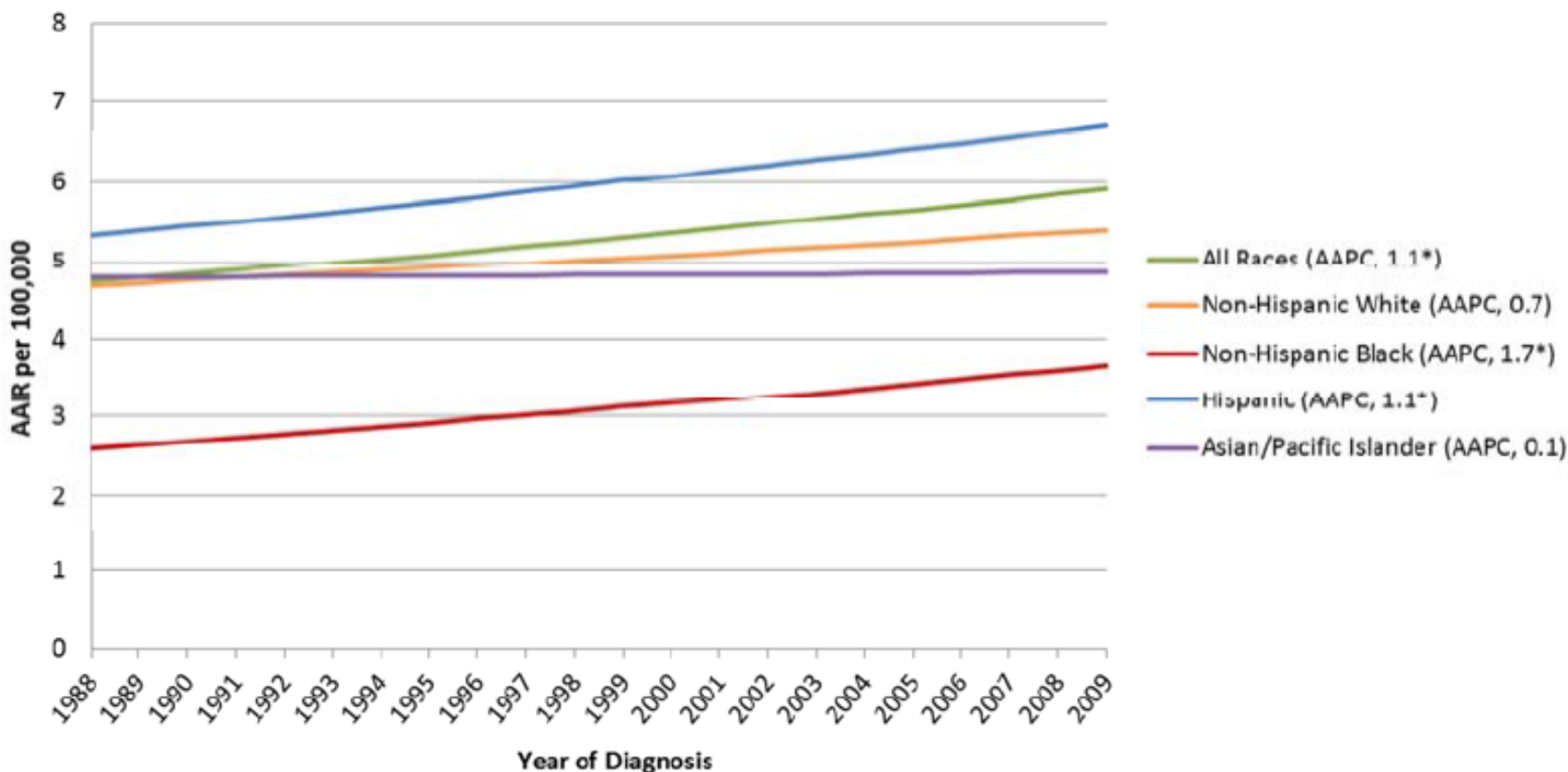
*The Annual Percent Change (APC) is significantly different from zero at $\alpha=0.5$

Source: Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov) SEER*Stat Database: Incidence - SEER 9 Regs Research Data, Nov 2013 Sub (1973-2011) <Katrina/Rita Population Adjustment>

Graphic used with permission.

Story of Health
Used with permission

Trend in the Age-Adjusted Incidence Rate of Leukemia among Children Aged 0-14 years by Race/Ethnicity, CA, 1988-2009



*The Average Annual Percent Change (AAPC) is significantly different from zero at $\alpha=0.05$.

Source: California Cancer Registry, California Department of Public Health, Chronic Disease Surveillance and Research Branch. SEER*Stat Database: Incidence - California, February 2013 (1988-2010), 04/15/2013.

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U.S. Navy photo by Petty Officer 2nd Class
Timothy Smith



Pesticides

Top 10 Environmental Health Concerns



Global climate change

Top 10 Environmental Health Concerns



Mold

Top 10 Environmental Health Concerns



Carbon monoxide

Top 10 Environmental Health Concerns

Leading Our Nation to Healthier Homes:

The Healthy Homes Strategic Plan



Social determinants of health / Healthy homes

Top 10 Environmental Health Concerns



Audience Q&A

Audience participation question 1

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- All of the following are primary areas of focus of the Pediatric Environmental Health Specialty Units, EXCEPT
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Thank you!



¡Muchísimas gracias!