



POLLUTION IN PEOPLE

A Study of Toxic Chemicals in Oregonians

Renee Hackenmiller-Paradis, PhD, MPH
Environmental Health Program
Director



Oregon Environmental Council

Oldest statewide environmental non-profit,
founded in 1968.

OEC seeks proactive solutions that benefit all
Oregonians.

Strategic Focus:

Protect kids from toxics,
stop global warming,
keep Oregon's rivers clean, promote
healthy food & farms, and ensure
sustainable economies





POLLUTION IN PEOPLE

A Study of Toxic Chemicals in Oregonians

Tested 10 Oregonians for the presence of 6 classes of toxic chemicals in their bodies.



What is the Problem?

- The incidence of chronic disease is rising:
 - asthma, learning and developmental disabilities, birth defects, diabetes, ALS, Parkinson's disease, and some cancers.
- Scientific evidence indicates that toxic chemicals are contributing to this epidemic.
- These chemicals are in our air, water, food, schools, workplaces, everyday products and, ultimately, in our bodies.



How Are We Exposed?

- Ingestion: what we eat and drink
 - Food
 - Soil
- Inhalation: what we breathe
- Skin absorption
- Eye contact



Sources of exposure

- Consumer Products
 - 5000 chemicals in cosmetics
 - 3200 chemicals added to food
 - 500 pesticides



Federal Toxic Substances Control Act

Federal laws fail to control most chemicals

Number of Chemicals

62,000 Existing Chemicals as of 1979

200 Evaluated by EPA since 1976

5 Banned since 1976

0 Banned since 1990

20,000+ New Chemicals Added Since 1979.

U.S. Government Accountability Office, 2005



Oregon Pollution in People Project

- Biomonitoring:
 - Directly measuring for chemicals in people's bodies.
 - GOAL: Detect how much of the chemicals present in the environment and consumer products actually cross over into our bodies.
- Tested 10 Oregonians for 6 classes of toxic chemicals:
 - o Phthalates
 - o Mercury
 - o Perfluorinated compounds (PFCs)
 - o Organophosphate Pesticides
 - o Bisphenol-A
 - o PCBs



Oregon Pollution in People Participants

- Alan Bates, MD
 - Ashland/Medford Physician, Democratic State Senator
- Vicki Berger
 - Salem Republic State Representative
- Doug Stamm
 - Portland, Executive Director Meyer Memorial Trust
- Don Sampson
 - Pendleton, ED of Confederated Tribes Umatilla Indian Reservation
- Cathy Bloome
 - Portland mother of two young children



Oregon Pollution in People Participants

- Danya Rumore
 - 2006-2007 Oregon State Cross Country & Track Team
- Linda Hornbuckle
 - Portland area Gospel singer
- Jeff VonAllman
 - Portland area firefighter
- Doug Phillips
 - Central Oregon Business Leader
- Donalda Dodson
 - Salem, Public Health professional,
Environmental Quality Commission



Key Findings

- At least 9 and as many as 16 chemicals detected
- 29 chemicals tested:
 - 6 perfluorinated chemicals (PFCs);
 - 6 phthalates;
 - Mercury;
 - 4 OP metabolites;
 - bisphenol A; and
 - PCBs
- All contaminated with PCBs, mercury, PFCs, and phthalates.



Phthalates: exposure sources

- Used to soften plastic and can be found in many products:
 - food containers
 - plastic wrap
 - toys
 - perfumes
 - beauty products
 - lubricants
 - building materials (pipes, vinyl flooring & wallpaper).

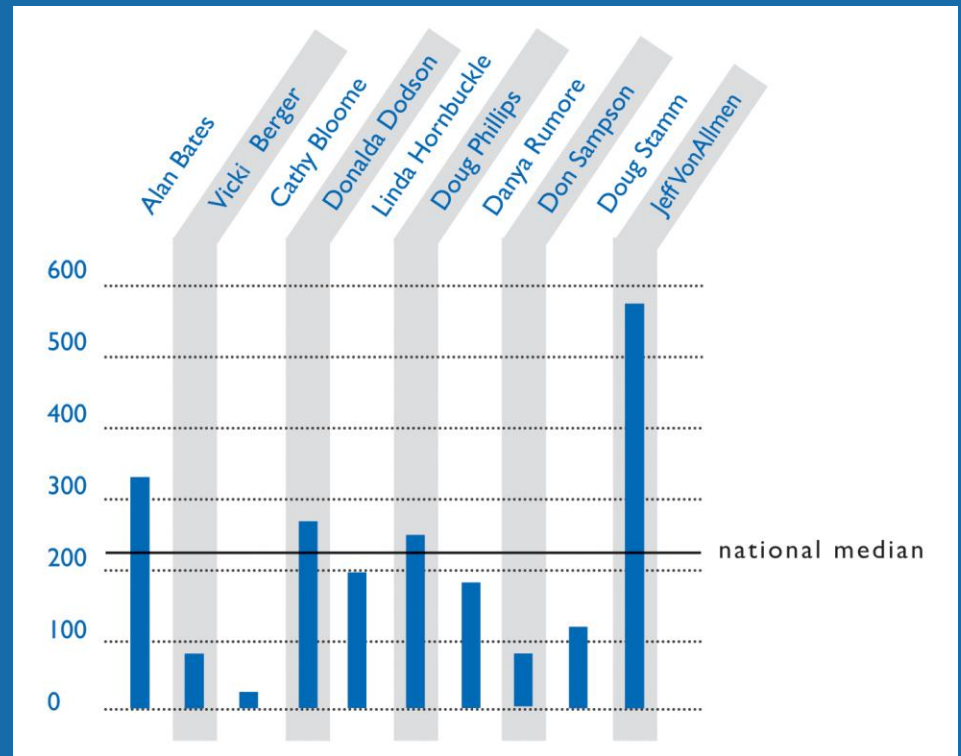


Phthalates: Health Impacts

- In humans, exposure to phthalates has been linked with:
 - Reduced sperm counts
 - Sperm DNA damage
 - Feminization of males

Phthalates in Oregonians

- 4 people had total phthalate levels that exceeded the national median.
- 2 participants had total phthalate levels in the top 25% nationally for phthalate exposure.
- Cathy Bloome, the participant with the lowest total phthalate level has made the conscious choice to eliminate many phthalate-containing products from her home.



Phthalates: Reducing Exposure

- *Avoid plastics with recycling code #3.* Plastics marked with the #3 symbol contain PVC.
- *Use PVC-free food storage.* Buy plastic wrap and bags made from polyethylene, such as GLAD®. If you do use plastic containers, do not heat or microwave food in them.
- *Choose phthalate-free toys.* Look for polypropylene or polyethylene toys or avoid plastic toys altogether.
- *Purchase phthalate-free beauty products.* Avoid nail polish, perfumes, and other scented products. For more information visit the National Campaign for Safe Cosmetics (www.safecosmetics.org)



Mercury:

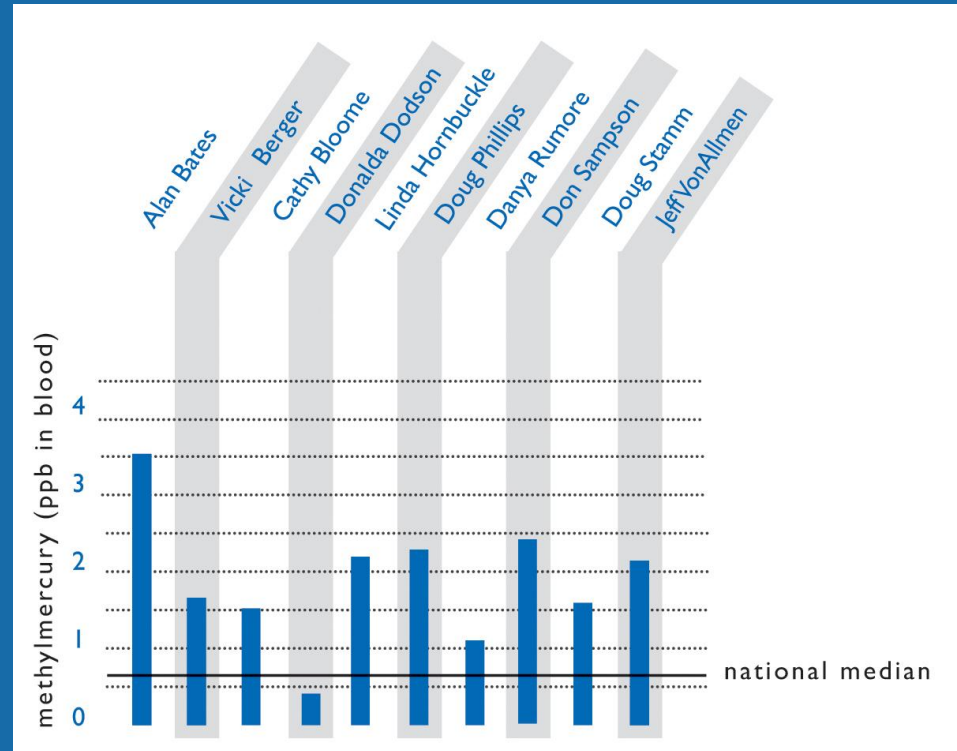
Exposure Sources and Health Impacts

- *Most common exposure:* Consumption of mercury contaminated fish.
- Mercury is a PBT and a potent neurotoxin
 - slows fetal and child development
 - causes irreversible deficits in brain function.
- In Oregon, Mercury fish advisories for 11 water bodies, including entire main stem of the Willamette.



Mercury in Oregonians

- Methylmercury was detected in the blood of all ten Oregonians we tested.
- A wide range of mercury was detected in the participants, from 0.37 to 3.5 ppb, with a median of 1.83 ppb.
- Mercury levels for all but one Oregonian tested were higher than the national median of 0.70 ppb.



Mercury: Reducing Exposure

- Avoid fish high in mercury. Fish species that are known to be high in mercury are long-lived, large predators.
 - king mackerel, swordfish, orange roughy, and marlin.
 - In a recent study, 100% of tested canned tuna contained methylmercury.
- Avoid purchasing and using consumer products that contain mercury: thermostats, barometers, manometers and thermometers.
- Dispose of mercury-containing products responsibly.
 - recycle batteries and mercury-containing wall-mounted thermostats.
 - Exchange mercury-containing thermometers.
 - Recycle compact fluorescent lightbulbs (CFLs) appropriately.



PFCs: exposure sources

- PFCs are a family of fluorine-containing chemicals with unique properties to make materials stain and stick resistant.
 - Scotchgard (PFOS)
 - Teflon (PFOA)
- PFCs are also used in wide array of consumer products and food packaging.
 - Pizza boxes
 - Microwave Popcorn bags (PFOS)
 - Gore-tex clothing

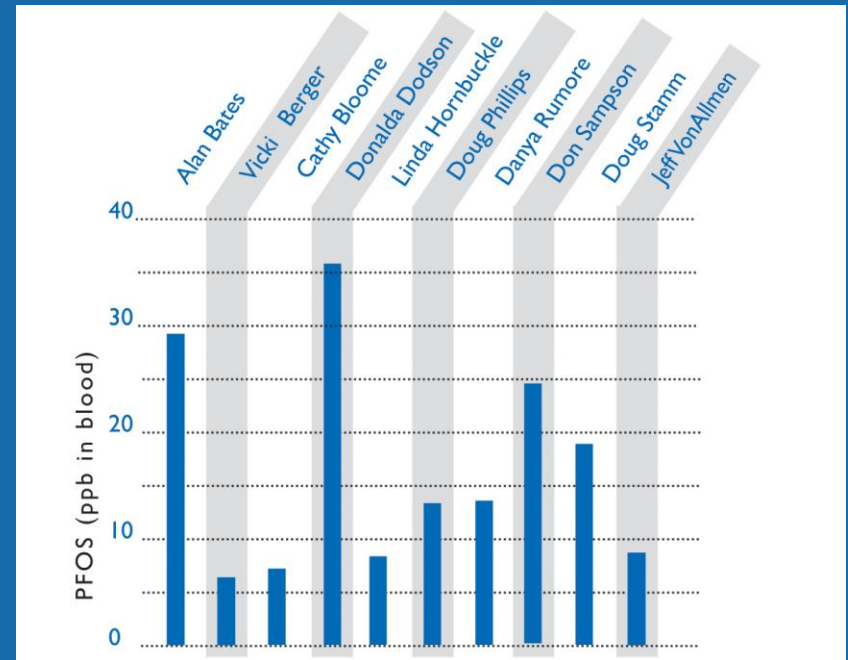


PFCs: Health Impacts

- PFC exposure has been linked with:
 - liver, pancreatic, testicular, & mammary gland tumors
 - liver and kidney damage
 - reproductive problems
 - low birth weight and reduced head circumference.

PFCs in Oregonians

- All 10 participants had PFCs in their blood.
- 6 different PFCs were found of the 13 PFCs that we tested.
- PFOS and PFOA were detected in every participant.
- PFOS was the highest PFC for every participant, but all were within or below national median levels.



PFCs: Reducing Exposure

- Reduce greasy packaged foods and fast foods in your diet.
- Avoid stain-resistant carpets and furniture.
- Read the labels of your personal care products. Avoid personal care products made with Teflon or polytetrafluoroethylene (PTFE), a Teflon-like PFC. PFCs can be found in shaving cream, dental floss, and a variety of cosmetics, including nail polish, facial moisturizers, and eye makeup.
- Avoid Teflon® and other non-stick cookware.



Organophosphate Pesticides: exposure sources

- Fruit and Vegetable consumption
- Contacting pesticide-contaminated surfaces and dust
- Breathing air near pesticide applications (both indoors and outdoors).



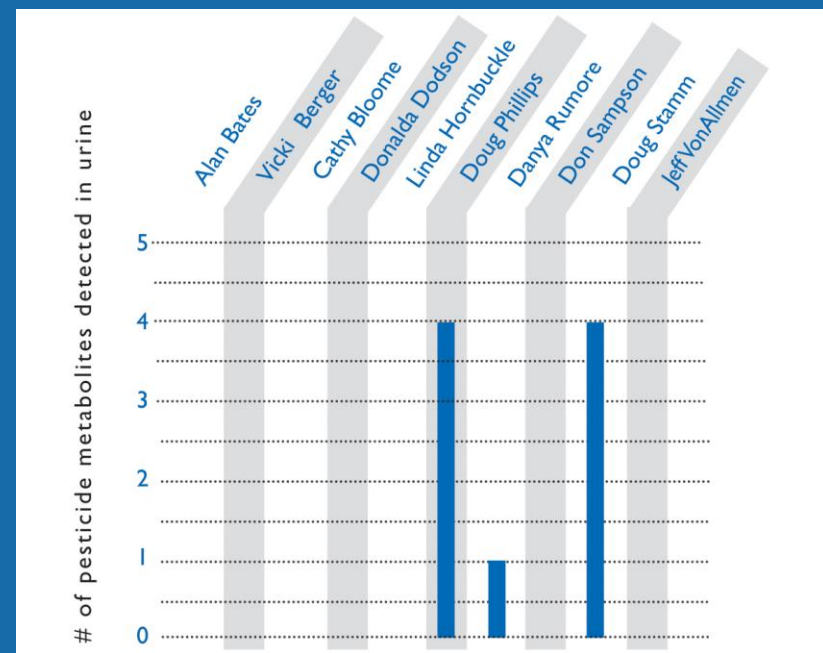
Organophosphate Pesticides: Health Impacts

- Acute exposure impacts the nervous system
 - Weakness
 - Cramps
 - breathing trouble
 - nausea, and vomiting
- May impair children's brain development.
- Studies on farmworkers find that people with greater exposure have poorer motor function and shorter attention spans.



Organophosphate Pesticides in Oregonians

- Dimethylphosphate (DMP) and dimethylthiophosphate (DMTP) were detected in two participants, which is indicative of exposure to several organophosphate pesticides including azinphos methyl and malathion.
- 2 participants had detectable levels of diethylphosphate (DEP), suggesting they had been exposed to the organophosphates diazinon or chlorpyrifos.



Organophosphate Pesticides : Reducing Exposure

- Buy organic.
- Grow your own fruits and vegetables.
- Use alternatives to pesticides in your home, garden, and workplace.
- Advocate for pesticide reduction in your school and park.



Bisphenol A: exposure sources

Main ingredient in hard polycarbonate plastics

Drinking water bottles

Food containers

Baby bottles

Food can liners

Top 50 production volume chemical in U.S.

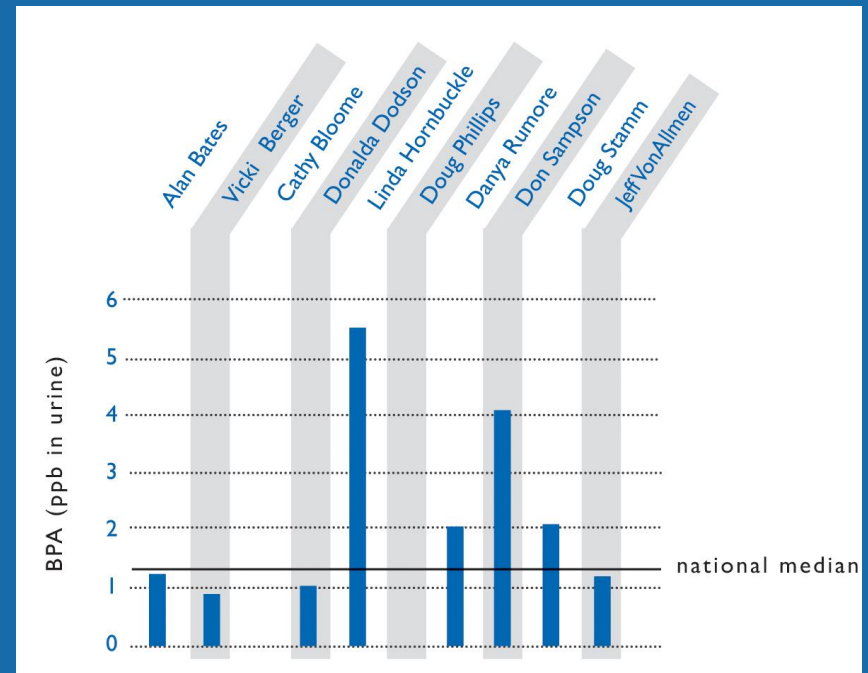


Bisphenol A: Health Impacts

- Biggest Concern: Ultra Low-Dose Hormone Disruptor
 - Endocrine Disruptor
- Animal studies show adverse effects at levels to which many people in the U.S. are currently exposed.
- Low-level exposure has been linked to:
 - Spontaneous miscarriages
 - Birth defects
 - Reproductive damage
 - Hormone disruption
 - Obesity

Bisphenol A in Oregonians

- The median BPA level found in Oregon participants was similar to the national average median.
- 2 participants had bisphenol A levels that were higher than 90% of people that have been tested in national biomonitoring studies.



Bisphenol A: Reducing Exposure

Looking for Bisphenol-A

People are primarily exposed to this chemical from the following:

HARD PLASTIC CONTAINERS

Polycarbonate plastics are often hard and transparent. They are common components in **water and infant bottles** and food containers.



They *may* have the recycling symbol "7 Other" however, this broad category includes many other plastics. The letters "PC" may be present.



Bisphenol-A-free bottles are increasingly available.

CAN LININGS

Epoxy resins are used in food and beverage cans to create a **protective lining**.



The packaging industry says there are no suitable alternative coatings.

THE NEW YORK TIMES

- *Avoid reusable polycarbonate plastic water and baby bottles. Avoid plastic labeled #7. Choose polyethylene, metal, or glass bottles instead. If you prefer plastic baby bottles, choose milky or opaque colored baby bottles.*
- *Minimize the use of canned foods and canned drinks. Until industry reformulates the lacquer lining of metal cans, choose fresh or frozen foods or glass containers or bottles.*
- *Ask your dentist for BPA-free sealants and composite fillings.*

The Price OF POLLUTION

Cost Estimates of Environmentally-Related Disease in Oregon

Oregon spends at least **\$1.57 billion** per year on preventable disease caused by pollution.

The Price of Pollution study estimated how much money is spent in Oregon annually to pay for environmentally attributable diseases and disabilities, which are largely preventable.

Environmental Asthma Costs in Oregon

- Childhood Asthma

- 71,085 children with asthma in Oregon

- Annual cost = \$1,116 per case

- \$79,330,860 total annual asthma cost in Oregon for children

- Environmentally Attributable Fraction of 30% for asthma:

- \$23,799,258 annual costs of childhood asthma attributable to environmental contaminants.

Averaging the estimates, the environmentally attributable costs of childhood asthma in OR are:

\$27.65 million per year



The Price OF POLLUTION

Cost Estimates of Environmentally-Related Disease in Oregon

Asthma: \$30.0 million

Cardiovascular disease: \$342.5 million

Cancer: \$131.0 million

Lead exposure: \$878.0 million

Birth defects: \$2.8 million

Neurobehavioral disorders: \$187.1 million

TOTAL: \$1.57 billion annually

Hospitalization, physician visits, lost earning potential, and lost work days are some of the direct and indirect costs reflected in the calculations.

1.18% of Oregon Gross State Product

Economic Costs of Environmental Diseases and Disabilities

Typically decision makers consider only the upfront costs of implementing environmental health protection measures designed to reduce pollution, ignoring the financial impacts of inaction.

Health and related costs are born by society, unlike the costs of environmental protection measures

These costs are largely *preventable*, by eliminating and reducing exposures to environmental exposures

Eliminating and reducing exposures to toxic chemicals makes good economic sense, as well as good sense from a public health perspective.



Recommendations

Personal Action

- Details in Pollution in People report
- Parent Pledge

Local Community Action

- Anti-Idling Campaign
- Integrated Pest Management on grounds
- Green Cleaning Supplies
- Environmental Preferable Purchasing and Contracting
- Sustainable food practices
- Sustainable Curriculum Themes



SOLUTION

We need common-sense chemical policies that ensure that only the safest chemicals are used in products, manufacturing, and agriculture.

- Require that complete information on chemical ingredients be provided for all products
- Categorize all chemicals into levels of concern; manage these chemicals based on hazards; and substitute chemicals of highest concern with safer alternatives.
- Establish policies, practices, and incentives that result in safer alternatives.



STATE BASED ACTION

Consumer Products

- 2009 Children's Safe Products Act
 - Categorize chemicals in children's products into levels of concern;
 - Require disclosure of these chemicals in products from manufacturers;
 - Require the substitution of these high priority chemicals when safer alternatives exist.
- 2009 Oregon Healthy Schools Initiative
 - Implement Integrated Pest Management in OR schools
 - Use Green Cleaning Supplies in Schools
 - Incentives for Green Buildings in the school community



Upstream Approaches to Toxic Reduction



Pollution
Prevention

Comprehensive
Chemical
Reform

Sustainable
Agriculture

Low Impact
Development



POLLUTION IN PEOPLE

A Study of Toxic Chemicals in Oregonians

Thank You!

www.oconline.org

Renee Hackenmiller-Paradis,

Environmental Health Program Director,
reneep@oconline.org or 503.222.1963 x110

