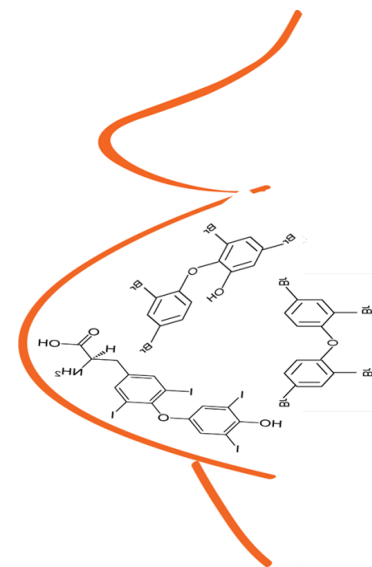


WHAT COUNTS? ESTIMATING THE HEALTH BENEFITS OF REGULATING ENVIRONMENTAL CHEMICALS

Patrice Sutton, MPH, Research Scientist
University of California San Francisco
Program on Reproductive Health and the Environment

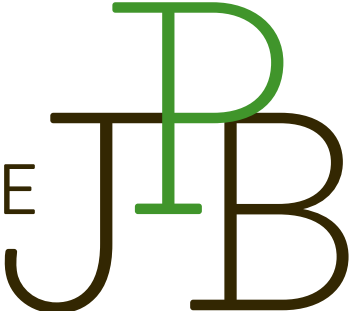
Wisconsin Environmental Health Network
Making the Connection Conference, Madison WI
March 1, 2019

Patrice.Sutton@ucsf.edu



Nothing to declare

- Funding for the work on the chemical policy and the UCSF Rapid Response Network provided by the
 - **Clarence E. Heller Charitable Foundation**
 - **Broadreach Foundation**
 - **Passport Foundation**
- Funding for the research on formaldehyde and asthma provided by:

THE  FOUNDATION

UCSF Program on Reproductive Health and the Environment

Mission

To create a healthier environment for human reproduction and development



<https://prhe.ucsf.edu>

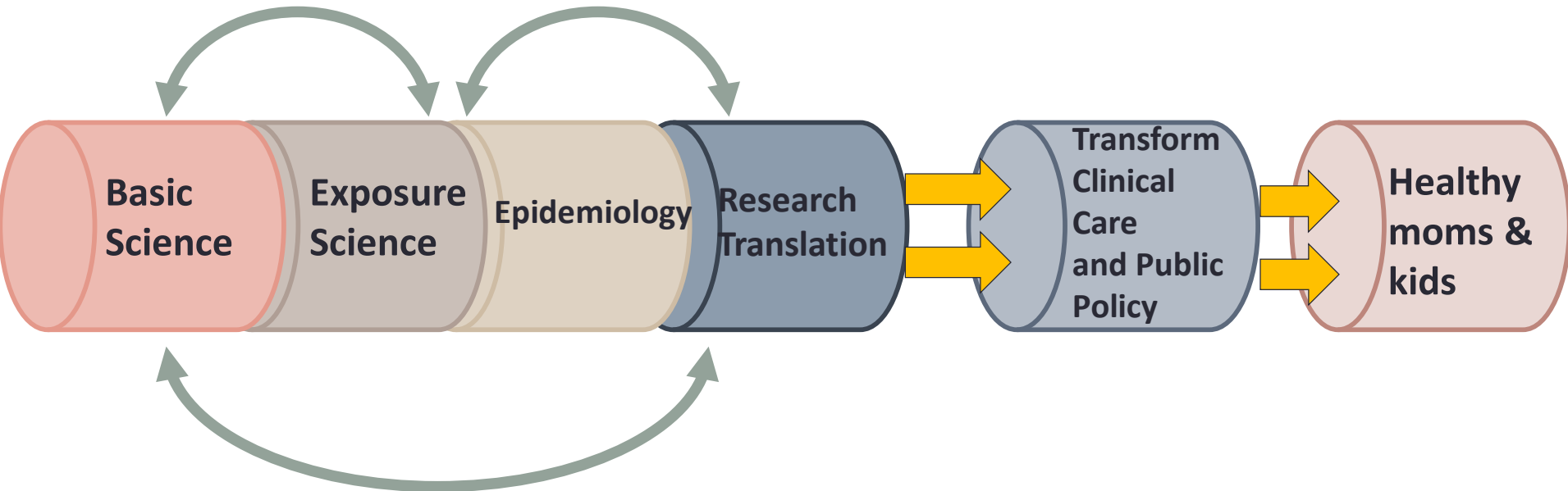
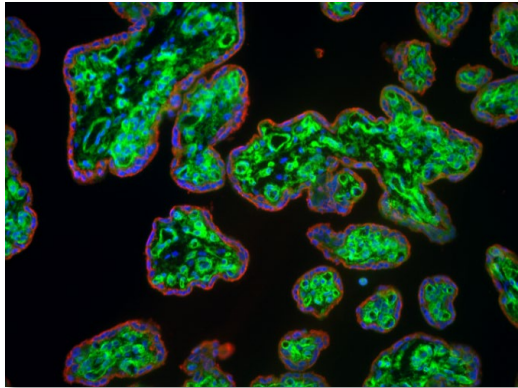


Program on Reproductive Health and the Environment

RESEARCH

CLINICAL
ENGAGEMENT

POLICY

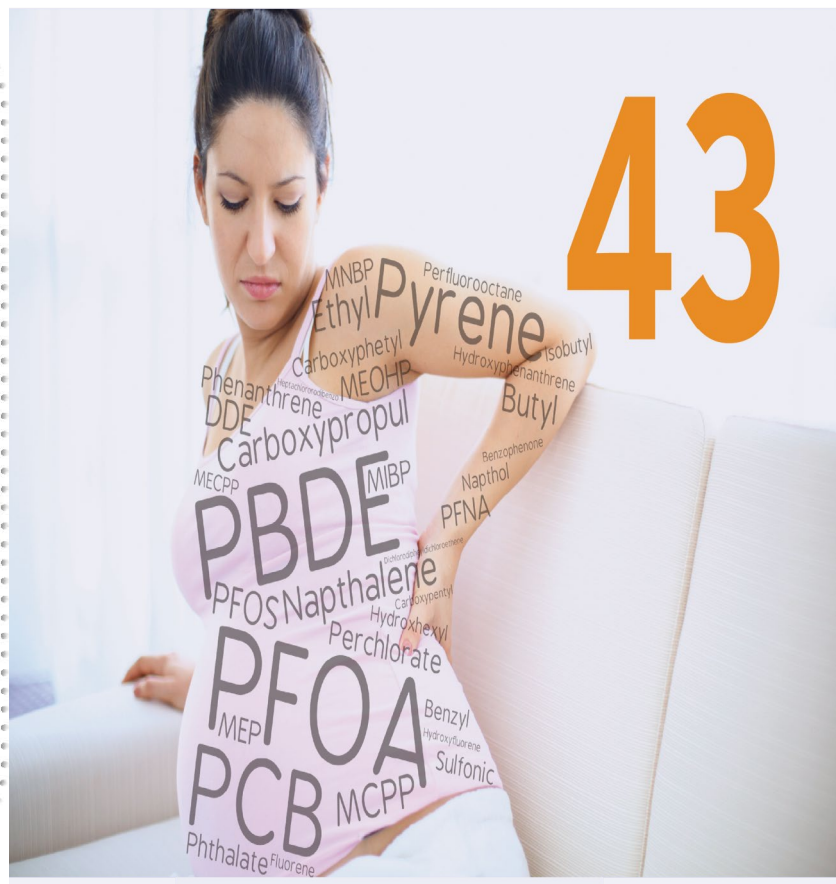


MEET MOLLY GRAY.

Eats organic. Avoids BPA. Buys natural cleaners.
Loaded with toxic chemicals.



<https://saferchemicals.org>







President Gerald Ford signed the legislation.

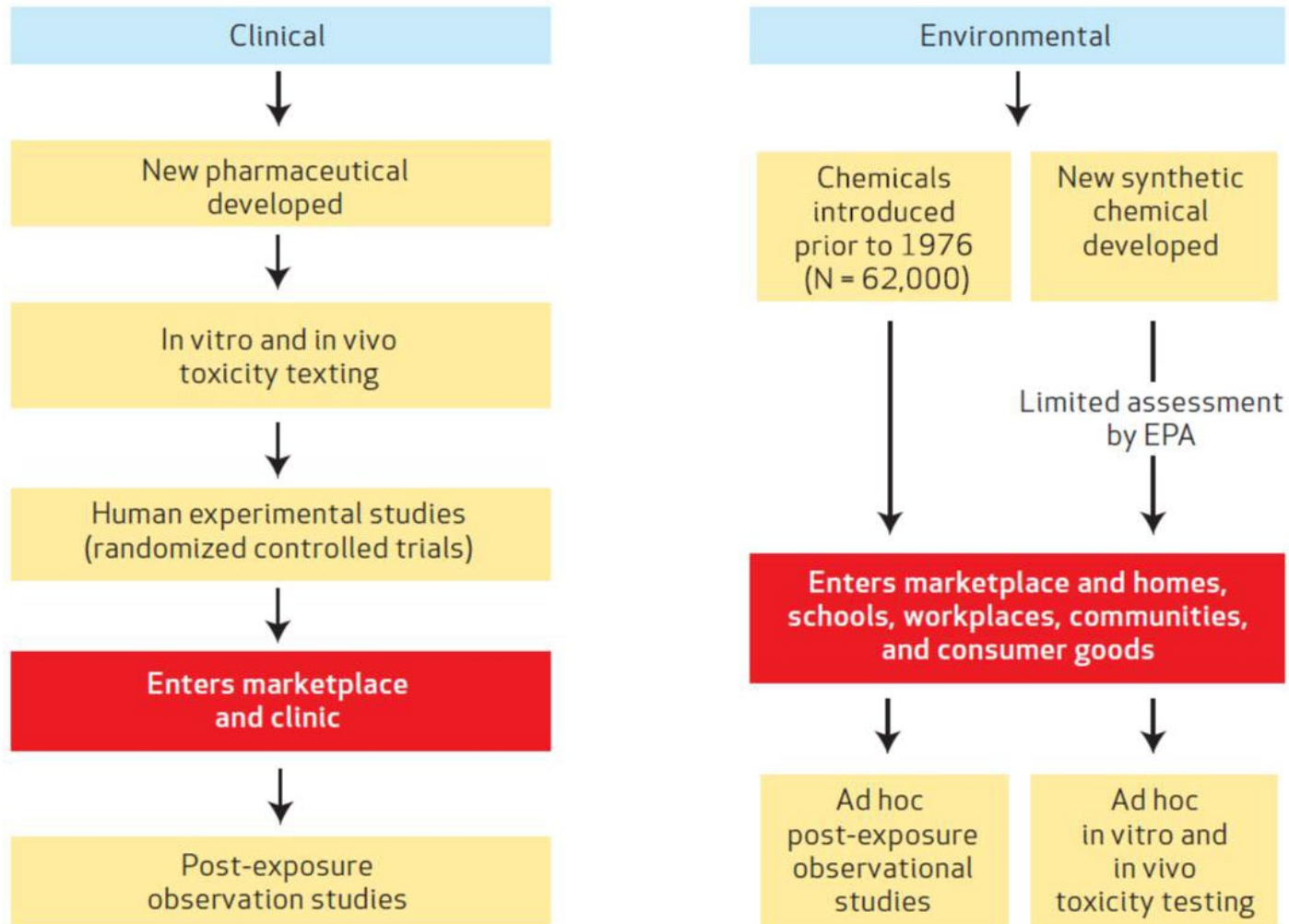
Congress passes Toxic Substances Control Act, Sept. 28, 1976

1976 Toxics Substances Control Act (TSCA)

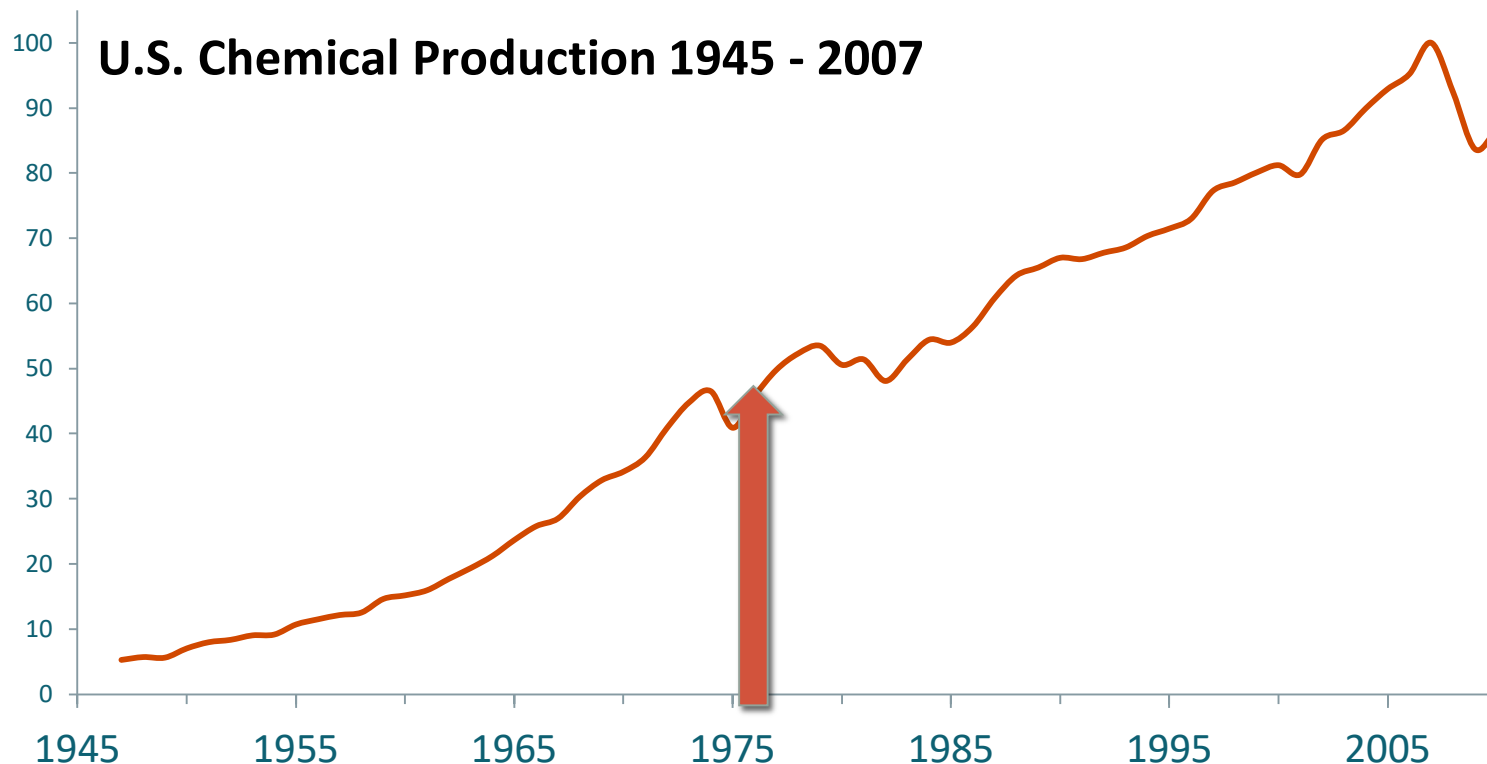


"Don't touch him. He's grandfathered in."

Comparison of Regulation of Pharmaceuticals and Environmental Chemicals under 1976 TSCA



1976 Toxics Substances Control Act (TSCA)



Federal reserve data on chemical production is only offered as relative production, which is unit-less. A specific reference year is chosen and values are calculated relative to that years production. In this particular data set 2007 is the reference year and is assigned a value of 100.

Data from: U.S. Federal Reserve Board, Division of Research and Statistics

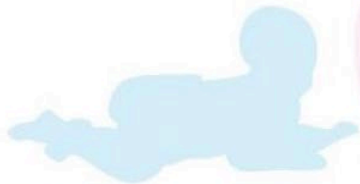
~30,000 lbs of industrial chemicals
produced for **each person**
in the U.S. **each year**



Exposure to Environmental Chemicals Everyone, Everywhere, Everyday



Toxic chemicals are **contaminating people**



“to a disturbing extent
babies
are born
‘pre-
polluted’”

National Cancer Institute,
President's Cancer Panel, April 2010

**Phthalates +
PBDE flame
retardants in
100%
of pregnant women**

Woodruff, et al 2011
Environmental chemicals
in pregnant women in the U.S.
Environmental Health Perspectives

43+
toxic chemicals
found in
pregnant women
+ newborns'
umbilical cords

Morello-Frosch, et al 2016
Environmental Chemicals in an
Urban Population of Pregnant
Women and Their Newborns...
Environmental Science & Technology



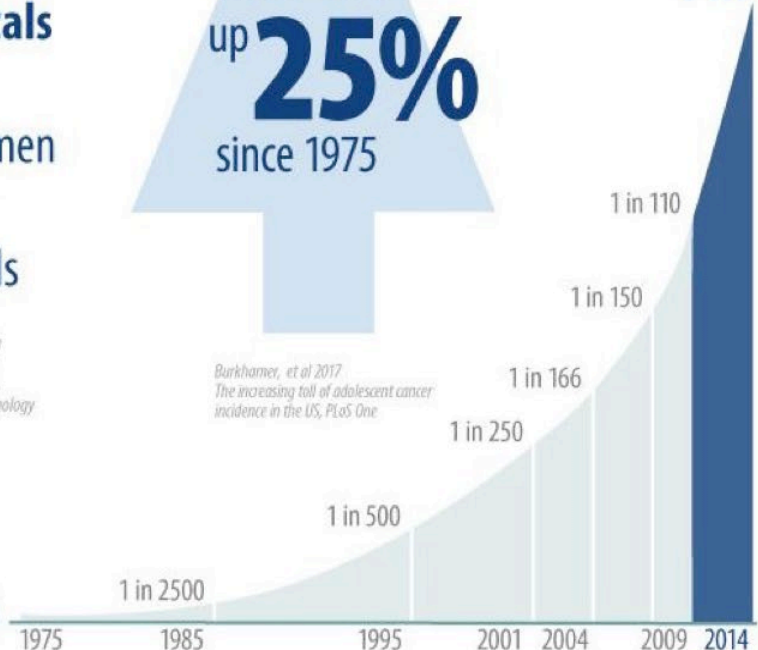
Teen cancer
up
25%
since 1975

**Autism has
skyrocketed
1975-2014**

CDC 2014

1 in 68

1 in 5000



Burkhalter, et al 2017
The increasing toll of adolescent cancer
incidence in the US, PLoS One



Program on Reproductive Health and the Environment

Environment Special:
The oceans—why 70%
of our planet is in danger

The Facebook Movie:
The secret history of
social networking

TIME

**How the
first nine
months
shape
the rest
of your life**

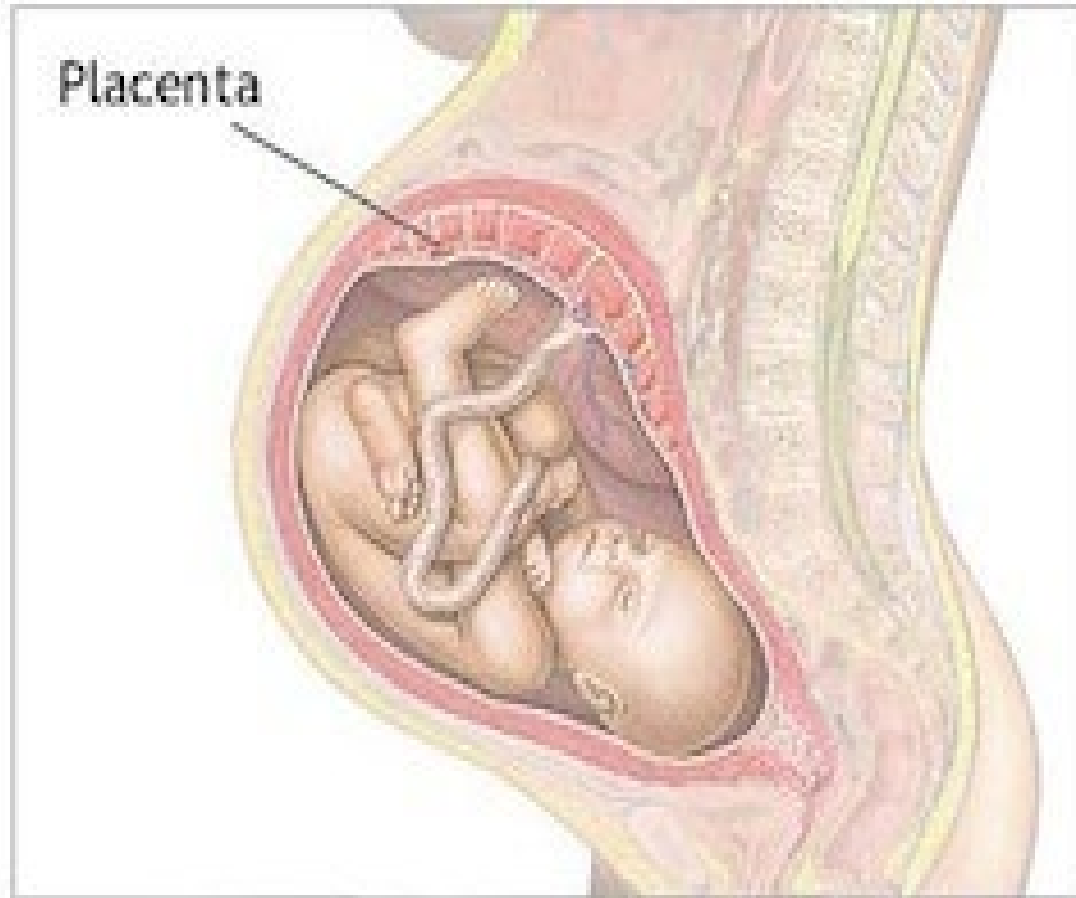
The new science
of fetal origins
BY ANNE MURPHY PALL



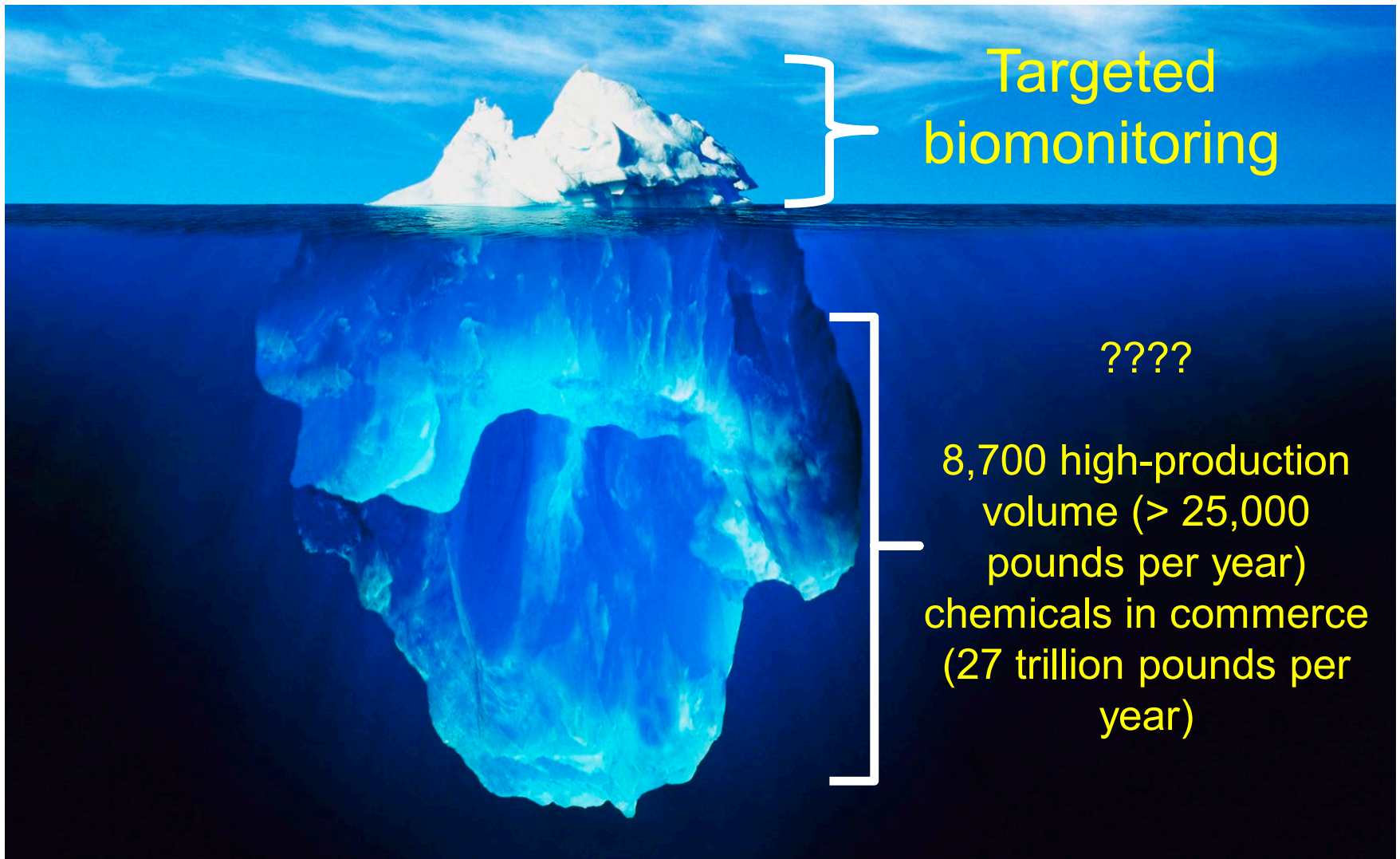
NOVEMBER 4, 2010

WWW.TIME.COM

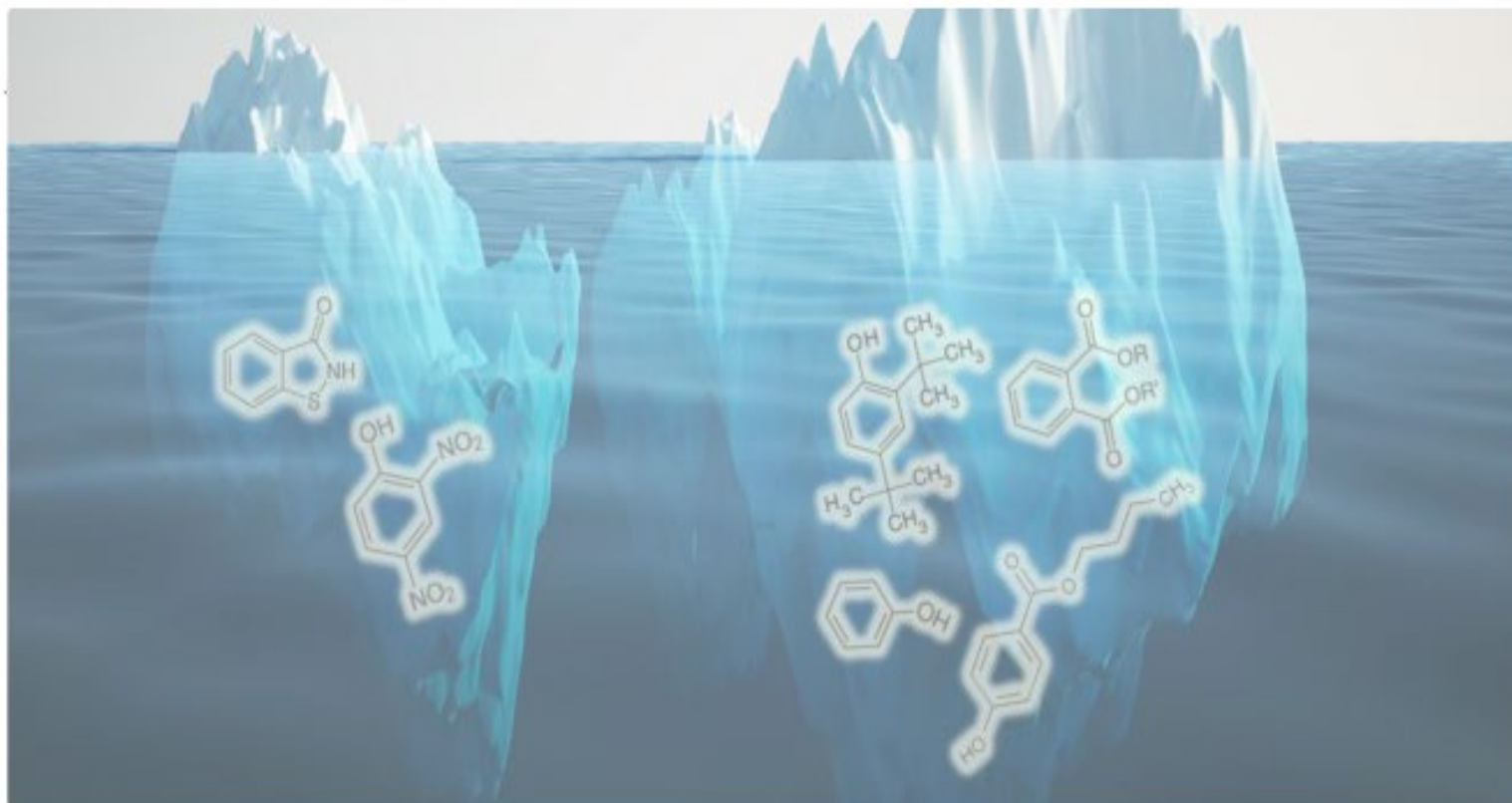
Most chemicals cross the placenta



Chemicals in our bodies... largely unidentified



New method uncovers hidden chemicals in pregnant women



JULY 22, 2018 ~ AOLIN WANG

<https://prheucsf.blog/2018/07/22/new-method-uncovers-hidden-chemicals-in-pregnant-women/>

1976 Toxics Substances Control Act (TSCA) = “Legally Poisoned”

EPA has banned
5 chemicals since
1976

Europe has
banned > 1000
since 2000



<http://www.hup.harvard.edu/catalog.php?isbn=9780674072213>

2016

CHEMICALS

Obama signs TSCA reform into law

Colby Bermel, E&E News reporter

Greenwire: Wednesday, June 22, 2016



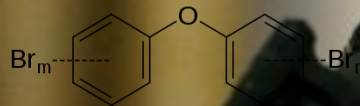
President Obama signs TSCA reform into law. Photo courtesy of the White House via YouTube.

2016 TSCA

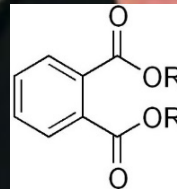
~ 40,000 industrial, commercial consumer product chemicals



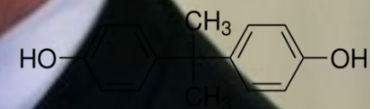
PFAS



Flame Retardants

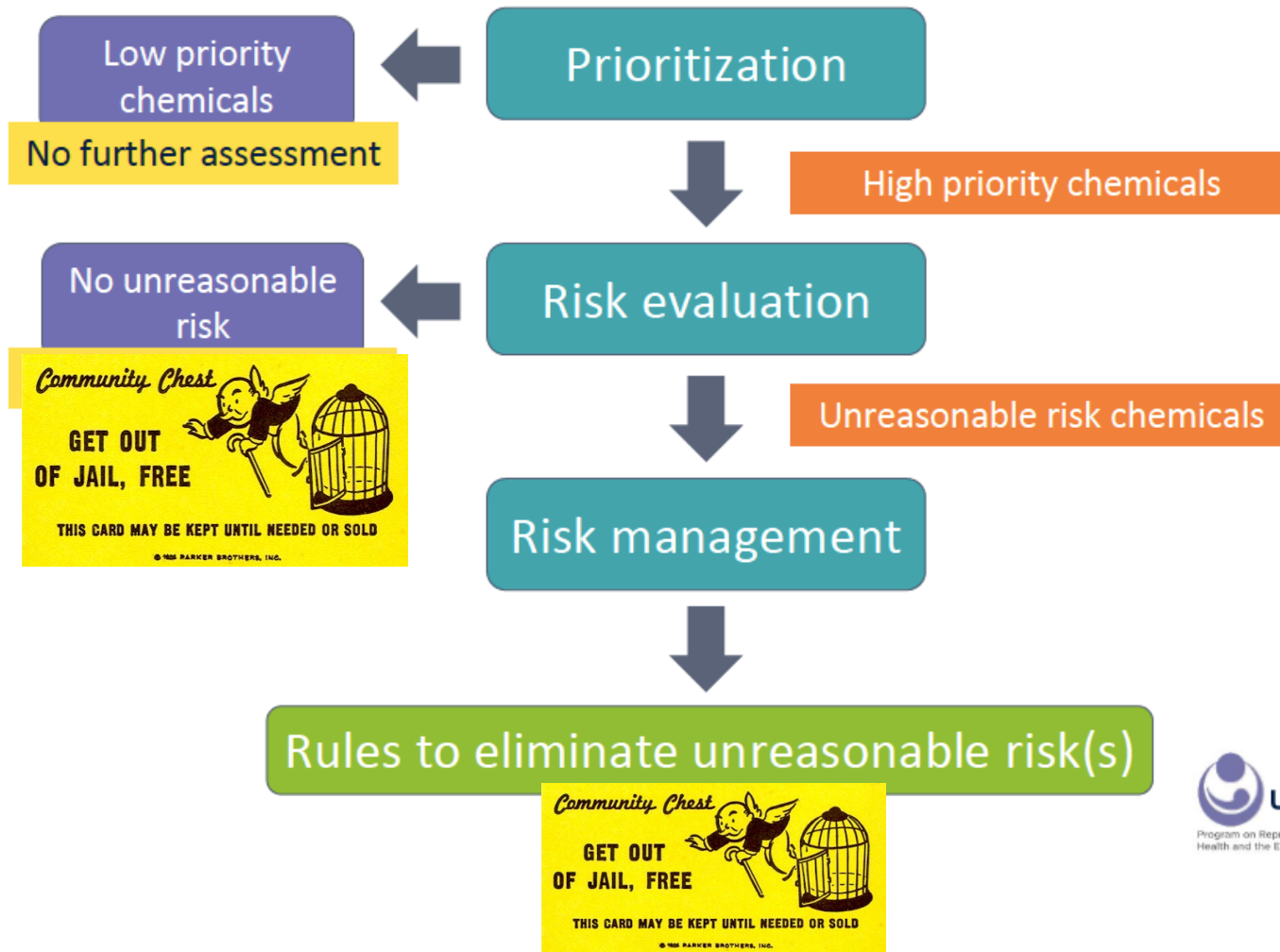


Phthalates

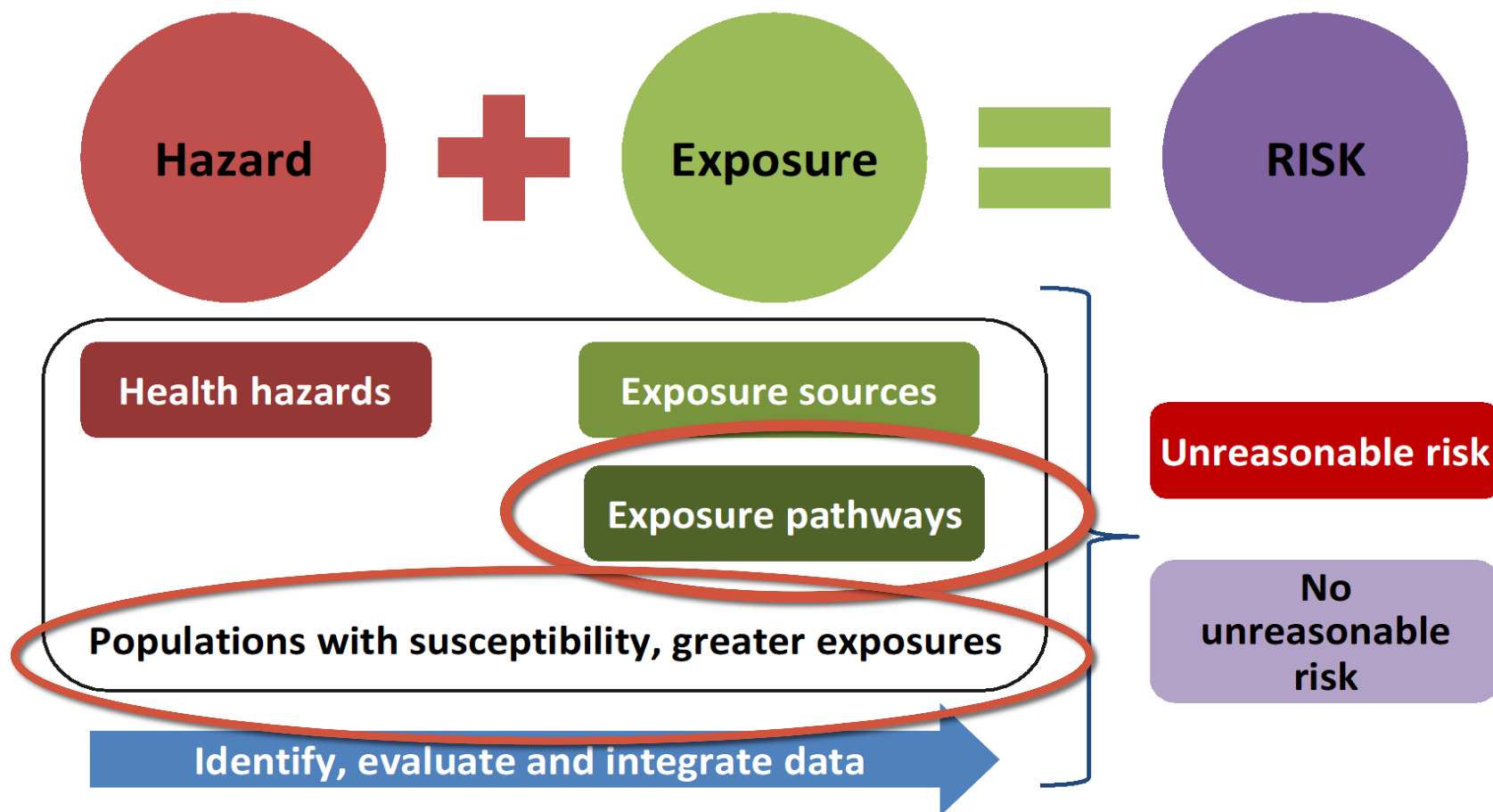


Phenols

Amended TSCA process for existing chemicals



How does EPA account for chemical risk?



Two real world TSCA accounting rules

1. We are exposed to the same chemical through many pathways



- **Food, water, air, work, consumer products, legacy uses and disposal**

1. We are exposed to the same chemical through many pathways

The Chemical Industry Scores a Big Win at the E.P.A.

But as it moves forward reviewing the first batch of 10 chemicals, the E.P.A. has in most cases decided to exclude from its calculations any potential exposure caused by the substances' presence in the air, the ground or water, according to more than 1,500 pages of documents released last week by the agency.



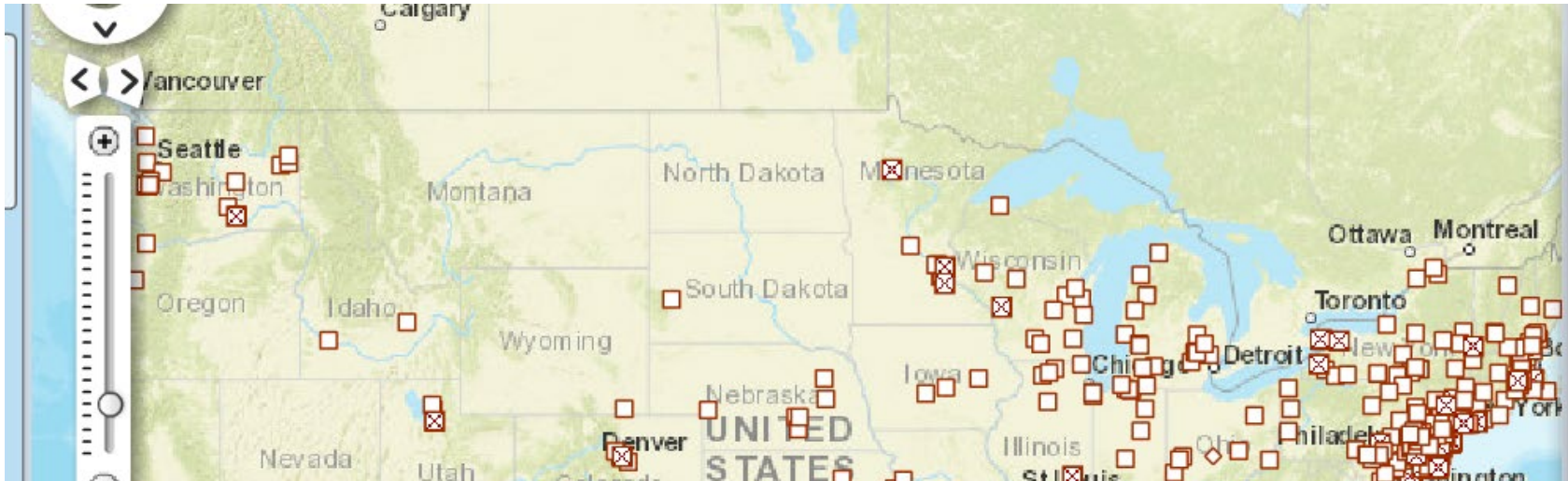
The E.P.A., after heavy lobbying by the chemical industry, narrowed how it will conduct safety checks on toxic substances — like perchloroethylene, used in dry cleaning. Justin Sullivan/Getty Images

By Eric Lipton

June 7, 2018



Air, water, “legacy” toxic contamination ignored = underestimate risks



Instead, the agency will focus on possible harm caused by direct contact with a chemical in the workplace or elsewhere. The approach means that the improper disposal of chemicals — leading to the contamination of drinking water, for instance — will often not be a factor in deciding whether to restrict or ban them.



Superfund sites contaminated with TCE



EPA ignoring major risks in chemical assessments

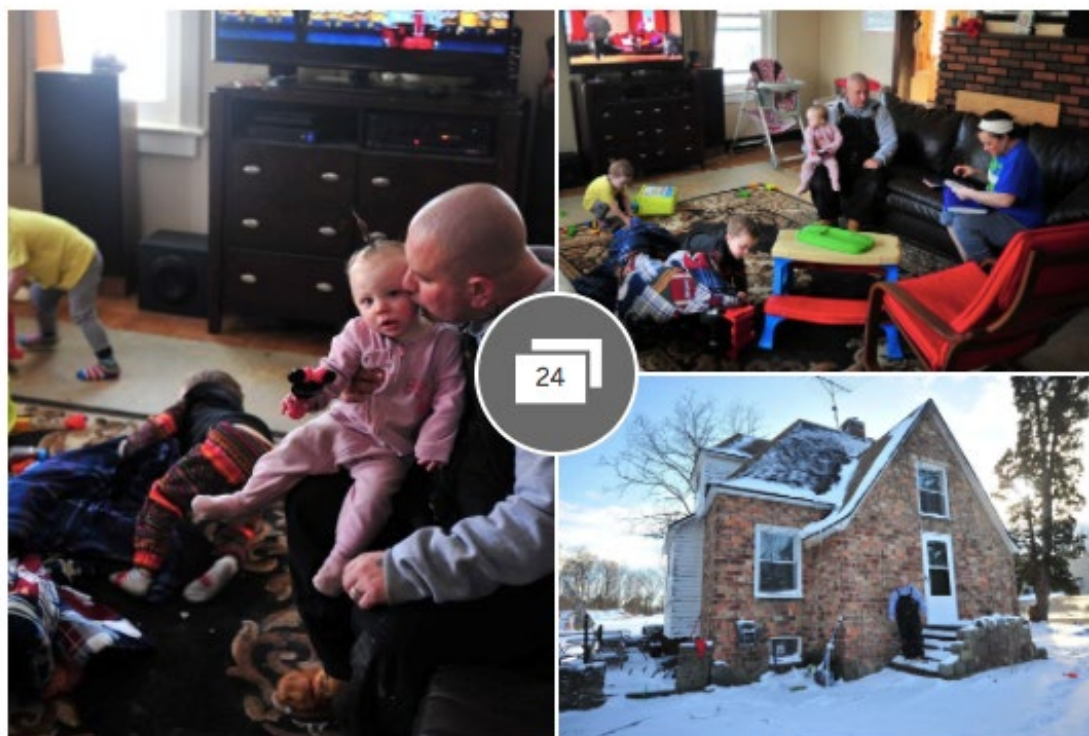
by Veena Singla

1,4-dioxane is a cancer-causing chemical contaminating drinking water in Michigan, a situation local officials are calling “[a slow-motion environmental disaster](#),” and significant problem with the water supply. Yet, despite such clear and acknowledged dangers, EPA [will ignore](#) 1,4-dioxane in people’s drinking water entirely in its health risk evaluation under the Toxic Substances Control Act (TSCA). In fact, EPA is ignoring *all* 1,4-dioxane exposures to the general public and only assessing occupational exposures (workers). This will obviously underestimate the risk to the public.



Family with 3 children living in home with dioxane-poisoned water

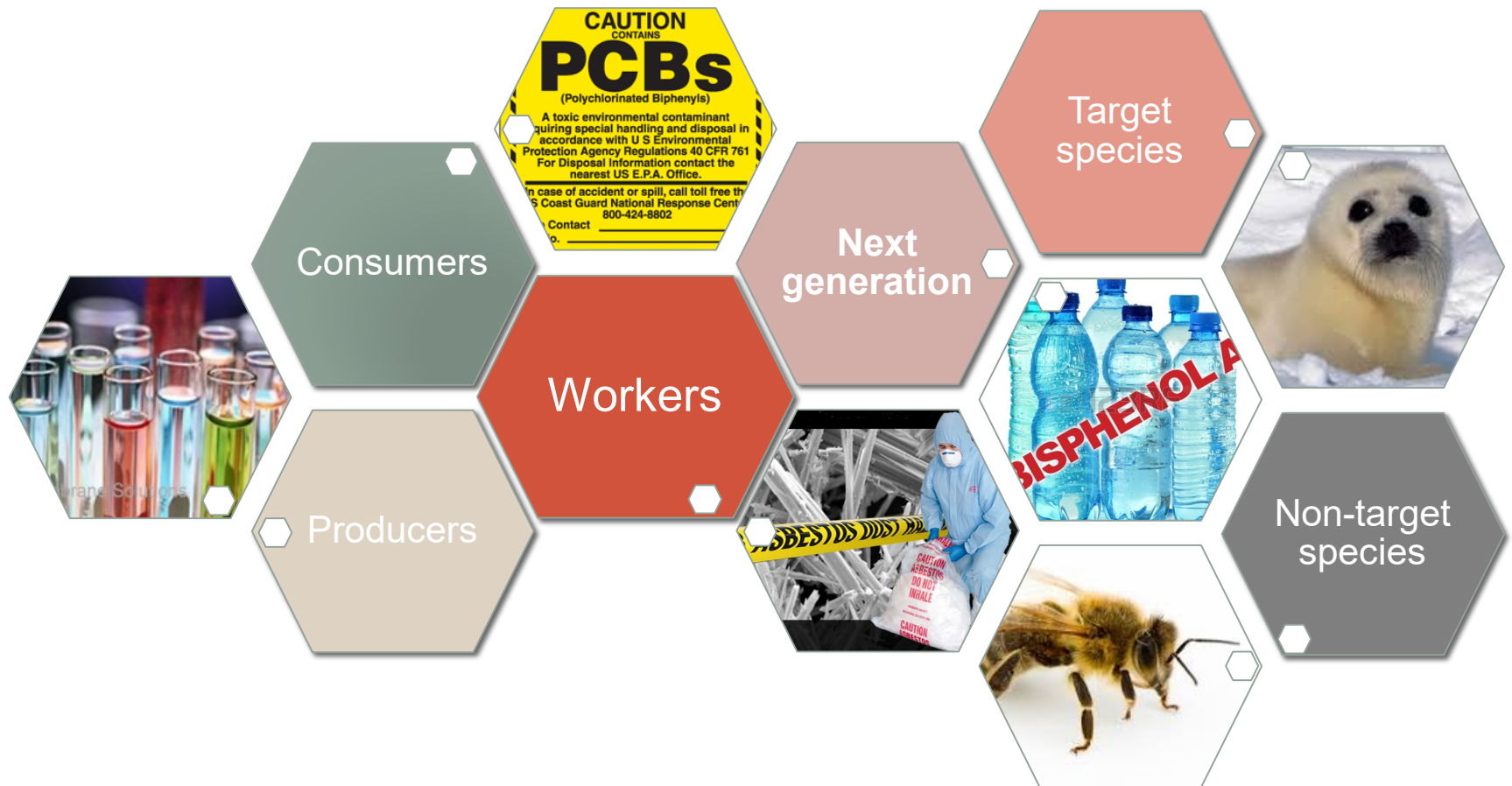
Updated Aug 31, 2017; Posted Mar 3, 2016



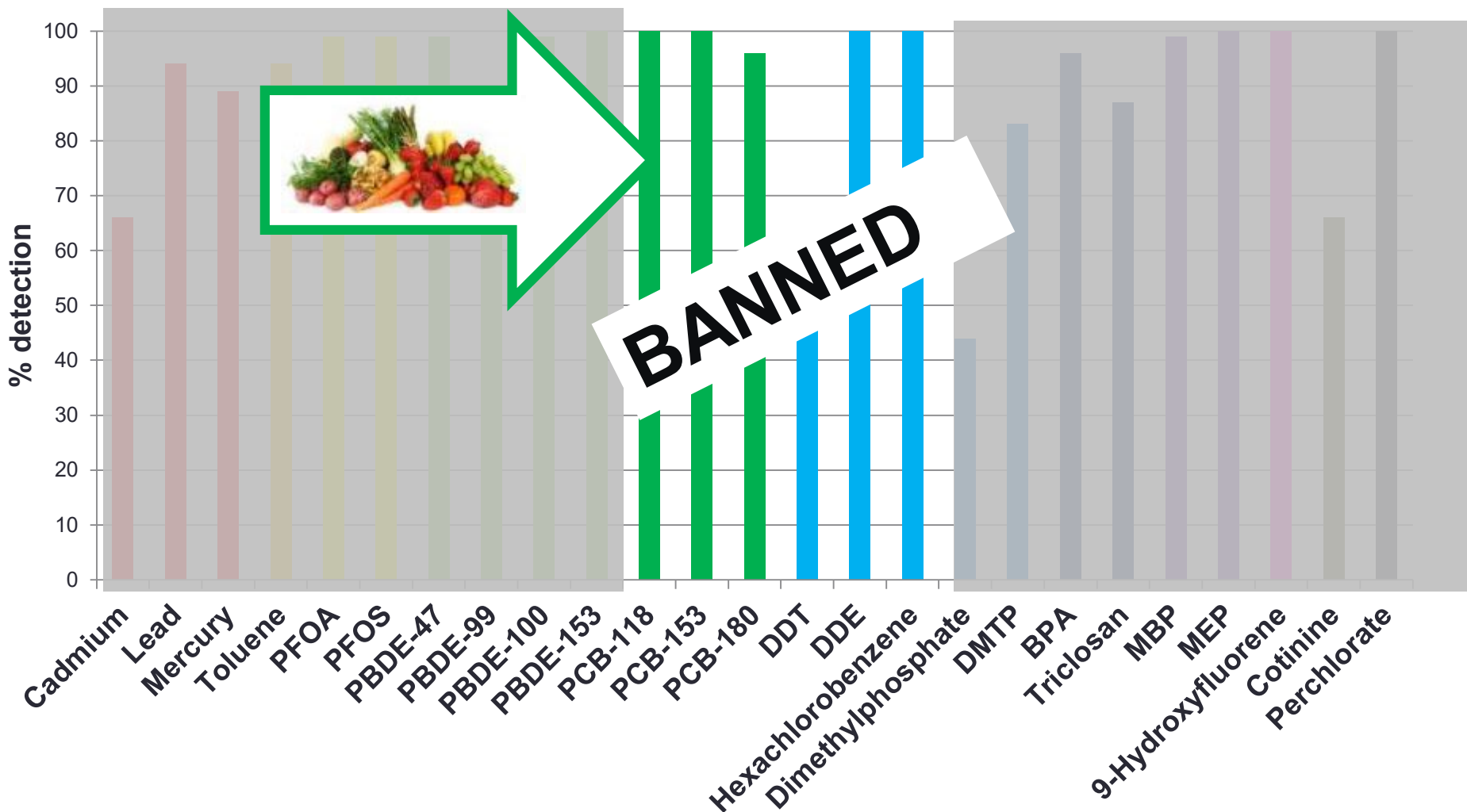
Gallery: Dioxane contaminates well water at 5005 Jackson Road in Scio Township

https://www.mlive.com/news/ann-arbor/index.ssf/2016/03/family_with_3_children_living.html

Exposure to toxic chemicals expands over time and place



Chemicals in pregnant women in the U.S.



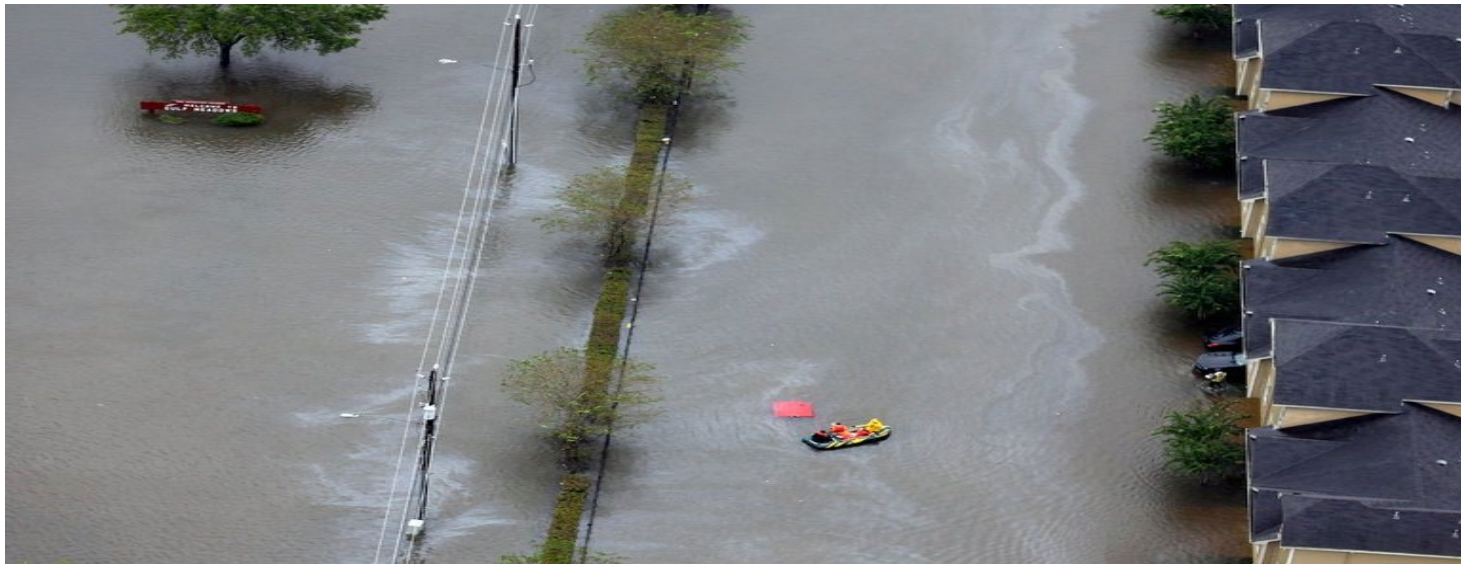


U.S.

A Sea of Health and Environmental Hazards in Houston's Floodwaters

By HIROKO TABUCHI and SHEILA KAPLAN AUG. 31, 2017

Officials in Houston are just beginning to grapple with the health and environmental risks that lurk in the waters dumped by Hurricane Harvey, a stew of toxic chemicals, sewage, debris and waste that still floods much of the city.



Florence's Floodwaters Breach Defenses at Duke Energy Plant, Sending Toxic Coal Ash Into River

By **Glenn Thrush** and **Kendra Pierre-Louis**

Sept. 21, 2018



- <https://www.nytimes.com/2018/09/21/climate/florences-floodwaters-breach-defenses-at-power-plant-prompting-shutdown.html>
- Picture credit: https://www.huffingtonpost.com/entry/hurricane-florence-coal-ash-north-carolina_us_5b9a85a6e4b0b64a336cafd9

Chemical pollution could wipe out half of all killer whale populations



By **James Griffits**, CNN

Health » Chemical pollution could wipe out half of all killer whale populations

Live TV

U.S. Edition +



(CNN) — Chemical pollutants banned more than 40 years ago are still having a devastating effect on marine life and could lead to the disappearance of half the world's killer whale populations before the end of the century.

That's according to a new study, published in the [journal Science](#), which found that killer whales, or orcas, are most at risk from polychlorinated biphenyls (PCBs), which were once widely used as coolants and in the production of carbonless copy paper before they were found to be highly toxic and carcinogenic.

Production of PCBs were banned in the US in 1979 and under an international treaty in 2001, but they are still in use in many parts of the world and not due to be completely phased out until 2025.

This has led to PCBs seeping into the oceans, where they present a particular risk to marine mammals at the top of the food chain like orcas. Because the chemicals do not readily break down, the concentration of them builds up in the bodies of predators as they eat more and more fish contaminated with PCBs.

For mammals, PCB contamination is inter-generational, with mothers passing the chemicals to their offspring through milk.

Orcas are the last link in a long food chain and are therefore among the most affected by this problem over the course of their 50 to 80 year lifespan.

Researchers found levels of PCB as high as 1,300 milligrams per kilo in the blubber of some orca, studies show that just 50 milligrams per kilo can cause infertility and immune system problems.

The Chemical Industry Scores a Big Win at the E.P.A.

Cumulatively, the approach being taken for the 10 chemicals means the E.P.A.'s risk analysis will not take into account an estimated 68 million pounds a year of emissions, according to an analysis by the Environmental Defense Fund, based on agency data.

<https://www.nytimes.com/2018/06/07/us/politics/epa-toxic-chemicals.html>

2. Some of us are more vulnerable than others to exposure

Extrinsic and intrinsic factors increase vulnerability: **risk is not simply a function of exposure**



Stress Worsens Effects of Toxic Chemicals in Pregnant Women

By Brett Israel/UC Berkeley on July 20, 2017



When a pregnant woman suffers from stress, she's more likely to have a low-birth-weight baby than a non-stressed pregnant woman if both are exposed to the same toxic chemicals, stress and environmental chemicals on fetal development.

Data suggests that the harmful effects of smoking and air pollution are worse for pregnant women who also suffer from stress.



EPA not addressing known susceptibility

Pregnant Women + Chemicals Don't Mix

Physical changes in pregnancy make women **more susceptible to toxic chemicals**

- 40%** increase in **Volume of air inhaled/exhaled per minute**
- 20%** increase in **Oxygen consumption**
- 50%** increase in **Cardiac output**

The infographic features a dark blue background with a white silhouette of a pregnant woman's head and neck. Dashed white lines show the respiratory pathway. Three yellow arrows point upwards from the text blocks to the corresponding physiological areas. A yellow heart and lungs are visible in the lower right corner.

Ignoring susceptibility ignores environmental justice

Monique Harden, JD



- Assistant Director of Law and Policy, Deep South Center for Environmental Justice
- Extensive experience providing legal support to Gulf Coast communities harmed by pollution and vulnerable to climate change

Is the New Toxic Substances Control Act (TSCA) Working as Congress Intended?



APRIL 18, 2018 ~ PRHE

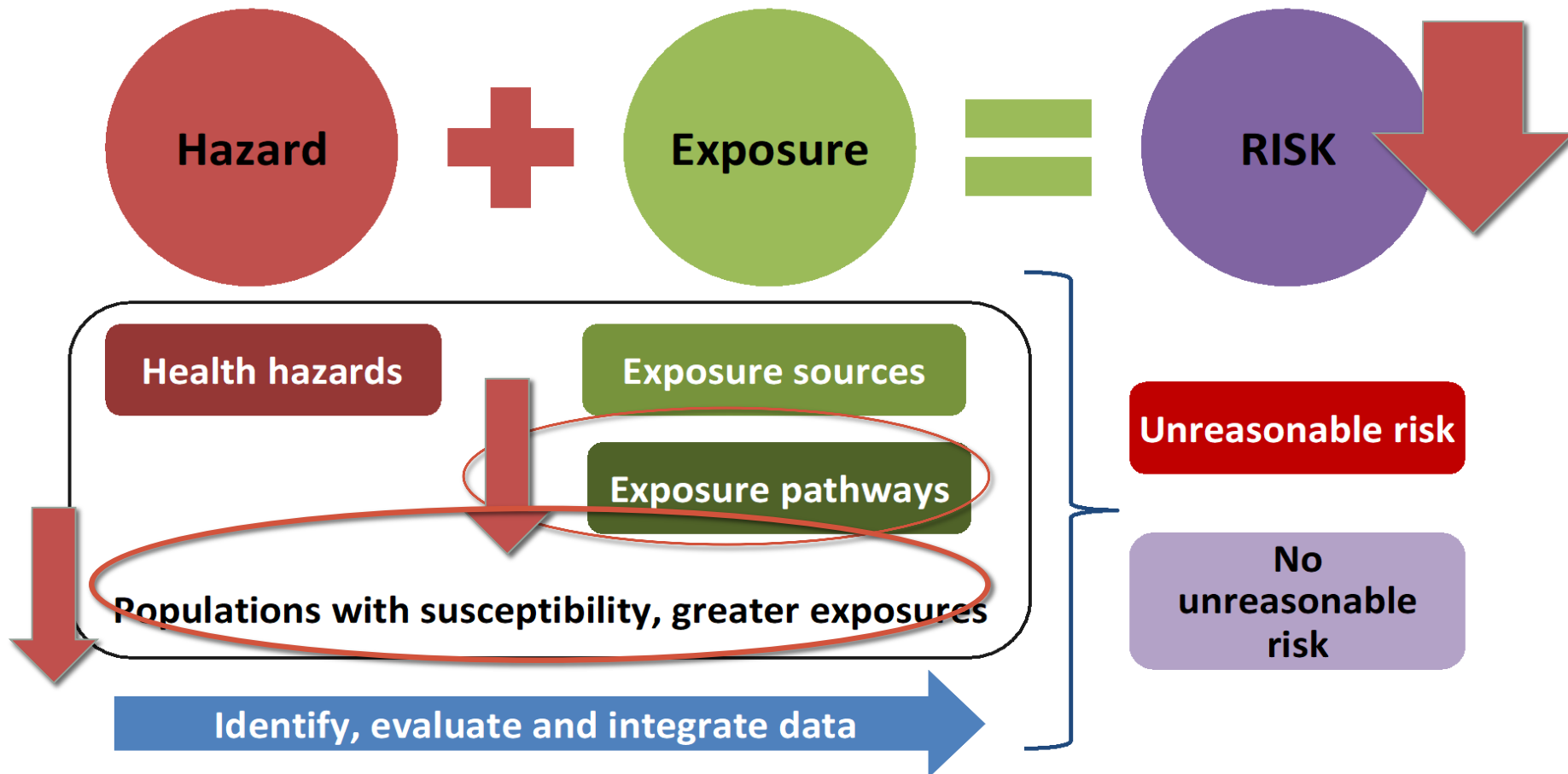


The problem: EPA is failing its legal obligation as a federal agency by denying the protections of TSCA to communities of color and poor communities, who are exposed and susceptible to the millions of pounds of chemicals manufactured, processed, and disposed in close geographic proximity to their homes, schools, and places of worship each year.

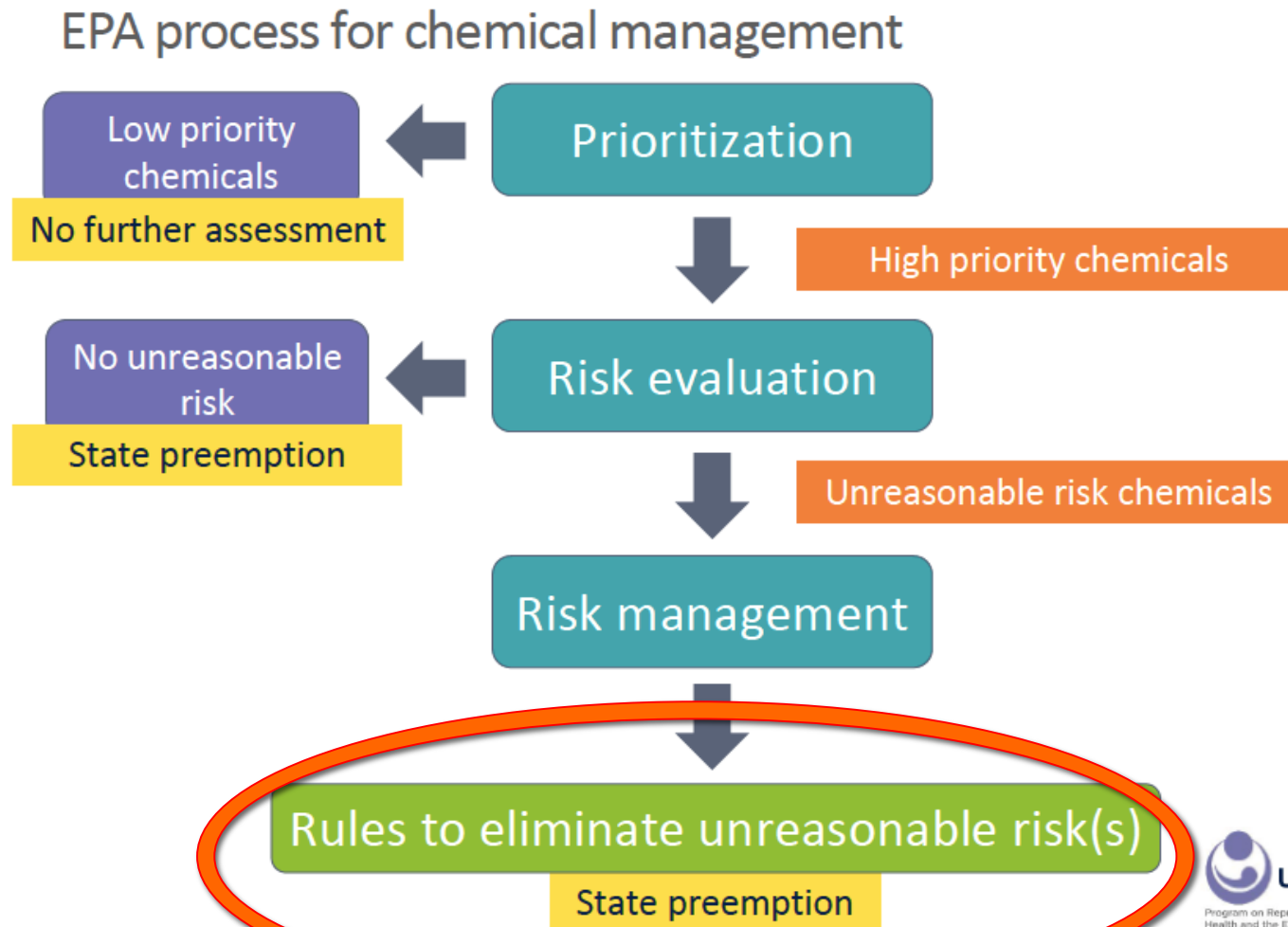


<https://prheucsf.blog/2018/04/18/is-the-new-toxic-substances-control-act-tsca-working-as-congress-intended/>

How does EPA account for chemical risk?



EPA TSCA process





**Signed Executive Order 12291
Feb. 17, 1981**

**"regulatory action shall
not be undertaken unless
the potential benefits to
society
from the regulation
outweigh the potential
costs to society."**

SATURDAY, NOVEMBER 7, 1981

Reagan Order on Cost-Benefit Analysis Stirs Economic and Political Debate

By PHILIP SHABECOFF

Special to The New York Times

WASHINGTON, Nov. 6—When President Reagan signed Executive Order 12291 on Feb. 17, he transformed with a stroke of his pen what had been a useful economic tool into an imperative of Federal decision making.

The order is designed to reduce the burden that Federal regulation places on the economy. Among other things, it provides that, to the extent the law permits, "regulatory action shall not be undertaken unless the potential benefits to society from the regulation outweigh the potential costs to society."

Cost-benefit analysis has been used for some years by economists, including Government analysts, as an aid to efficient decision making. But by making the quantification of the pluses and minuses of Administration action a central element of policy making, the President has touched off an intense economic, political and philosophical debate.

Administration and business officials and others who applaud the President's decision say that the uniform application of cost-benefit analysis, which simply looks at the returns that come from any action in relationship to the cost, will stem the tide of unnecessary and excessive regulations that they say have been a severe and growing burden to the nation's economy.

Savings Foreseen

They insist that without it the nation has been forced to spend many billions of dollars on actions that do not return anywhere near commensurate benefits to society.

But opponents of the measure, including those concerned with the Administration's efforts to reduce environmental, health and safety programs, view the cost-benefit requirement as little more than a justification for deregulating business and industry.

They also complain that the rule requires assigning dollar values to things that are essentially not quantifiable: human life and health, the beauty of a forest, the clarity of the air at the rim of the Grand Canyon.

The intensity of opposition to the use of cost-benefit analysis in the regulatory

process is a reflection of the broad social application of cost-benefit analysis: concede that it can unmask exceptionally rigid rules.

Several economists cited the rule as a barrier incorporating into consumer products elements that have been found to cause cancer in test animals. They noted that the nitrite used to cure bacon and ham fell into this category. But if nitrite was banned, they pointed out, it could lead to increased sickness or death from botulism.

Much of the debate over cost-benefit analysis is swirling around the Clean Air Act, the landmark antipollution law, which Congress is considering amending. The original law, adopted in 1970, prohibits considering costs in designing national standards for air quality to protect human health.

The law requires that the standards be set at a level that provides an adequate margin of safety, so that all sectors of the population will be protected from polluted air.

Health Standards Exempt

The Reagan Administration, in "principles" it enunciated for changing the act, has said it will not seek to subject the health standards to cost-benefit analysis. One major reason probably is that the act is a very sensitive political issue. Public opinion polls have consistently shown that the great majority of Americans do not want any weakening of its health standards. But industry officials and many Administration officials insist that the law be re-examined with an eye to what they say is the enormous waste of scarce dollars.

While the clean air law may prohibit regulatory decisions based solely on cost-benefit analysis, "it is important to do such analysis because it gives us an important perspective on what we are doing," said Roy N. Gamse, deputy associate administrator for policy and resource management in the Environmental Protection Agency.

If one program for protecting the public from polluted air costs \$100,000 for each life it saves and another program costs \$10 million per life, Mr. Gamse said, "it tells me we should take a real hard look at the second program to see if there is a better way to do it."



Representative Henry A. Waxman of California feels that cost-benefit analysis "will be a political tool rather than a regulatory tool."

nitro oxide emissions from vehicles to 15 grams per mile, "thus prolonging 30,000 lives an average of one year, at a cost of \$23,000 for each life."

"To meet the 1981 standard of 3.4 grams per mile," Mr. Weidenbaum continued, "the company estimates that it will cost \$100 million in addition and prolong 20 lives by one year at an estimated cost of \$25 million for each life."

"Human lives are precious, which is why it is so sad to note another use of that money. It has been estimated that the installation of special cardiac-care units in ambulances could prevent 24,000 premature deaths each year at an average cost of \$200 for each year of life. Thus, spending the \$100 million for the special ambulances conceivably could save 500,000 lives a year."

In an interview, Mr. Weidenbaum said that cost-benefit analysis could help achieve better environmental protection. "The notion is," he said, "that if you examine the consequences of your actions you get better decision mak-

ing. It will favor business and industry in this country rather than the public."

"It will be a political tool rather than a regulatory tool," he said.

So far, the cost-benefit requirement ordered by Mr. Reagan has had relatively little impact on policy. One reason, according to an official of the Office of Management and Budget, which reviews all the regulatory impact statements prepared by the Federal agencies, is that there have been relatively few regulations since the Reagan Administration took office.

Only 30 Major New Regulations

"The pipeline of regulation just seems to have dried up," said the official, who, because of his office's policy, asked not to be identified by name. He noted that since the Administration took office, only 30 major new regulations had been promulgated.

In past years, the Government annually issued 100 to 200 such major regulations, which are those costing more than \$100 million to put into effect. In addition to subjecting all new regulations to cost-benefit analysis, the Reagan Administration is also using the test on 100 existing regulations.

The budget official noted that cost-benefit analyses of regulation had been conducted on an informal basis in both the Ford and Carter Administrations. The reason President Reagan made the requirement explicit, he said, was "the perception that regulatory proliferation had not been stemmed."

"If you wanted a rational basis for stemming regulation and lessening the regulatory burden," the official said, "it would be best to look at each regulation with a cost-benefit test and eliminate those that did not meet the test."

Supreme Court Rulings

Two recent Supreme Court decisions involving costs and benefits of Occupational Safety and Health Administration regulations for protecting workers from benzene and cotton dust seemed, in balance, to have ended up saying that the individual regulatory law determined whether such a test could be used for decision making.

In the benzene case the High Court

will favor business and industry in this country rather than the public."

"To me, benefit-cost analysis is analytical common sense," said Paul R. Portney, senior fellow at Resources for the Future, an environmental research group. "The idea is that we don't have the resources to do everything. So we have to choose carefully."

Mr. Portney said critics who said that cost-benefit analysis would always lead to the curtailment of regulation were mistaken. In many cases such analysis might show the need for stricter regulation, he asserted.

Assessment of Issue

As an example, he said that cost-benefit analysis of the clean air standards would likely show that the rules for auto emissions were unnecessarily stringent to protect human health but those for stationary sources of pollution, such as factories and power plants, were not strict enough.

But he warned that cost-benefit analysis could not simply be a "mechanistic" exercise of adding up the numbers and making a decision. "Qualitative" factors must also be considered, he said.

Lester Lave, an economist at the Brookings Institution, said that cost-benefit analysis "is a delightful tool for economists because it is complete, flexible and allows you to look at everything."

But when the question of society's values enters the equation, the considerations often become political, he noted.

The problem with the President's order, he asserted, is that it says "you shall choose the alternative with the most social benefits."

Advice Against Specifics

"Well, anyone who has ever dealt with cost-benefit analysis knows there is never a unique alternative," he said, adding that it is better to talk of "trade-offs" between social benefits and costs without attempting to be too specific.

Mr. Lave and other economists noted that for many years the Army Corps of Engineers had used cost-benefit analysis to justify building big dams and other major projects.

something that doesn't fit into numbers, like the value of clean air to our grandchildren," he said. "Cost benefit analysis discounts the future."

"It allows costs to flow to small groups and benefits to large groups and vice versa. It is concerned with efficiency but not with equity. It is deceptively precise and ignores ethical and moral choices."

If the Federal agencies comply with the executive order, he said, "the result will be to obstruct regulations that protect health, the environment and the workplace."

System Called Altered

But Jerry J. Jasinski, senior vice president and chief economist of the National Association of Manufacturers, said that "historically, we have biased the system toward more regulation by not making any effort to estimate the benefits or overestimating them."

One of the major results of this failure, he said, is a serious decline in the nation's productivity.

Members of the manufacturers' association, Mr. Jasinski said, would benefit "by decreased regulation where benefits of sufficient magnitude are not demonstrated."

"This would free up economic resources for investment in plant and equipment and improve productivity and international competitiveness," he said. "What we are really talking about here is competition for scarce resources."

To Steven Kelman, who teaches public policy at Harvard University's Kennedy School of Government, the problem with cost-benefit analysis is that it is blind to such issues as human rights.

Parallels in Movie

"It's like the doctors in the movie 'Conan,'" he said, "who killed healthy people to use their organs to save other people and defended themselves by saying, 'We saved two people for every one we killed.'"

Here, he added, was a case of arguing that anything should be permitted if the benefits outweigh the costs. "The very process of placing a monetary value on such things as human life and pristine

New York Times November 17, 1981

Richard Ayres, senior economist for the Natural Resources Defense Council and director of the National Clean Air Coalition, said that cost-benefit analysis "is basically fraudulent."

"They are trying to put into numbers something that doesn't fit into numbers, like the value of clean air to our grandchildren," he said. "Cost benefit analysis discounts the future.

"It allows costs to flow to small groups and benefits to large groups and vice versa. It is concerned with efficiency but not with equity. It is deceptively precise and ignores ethical and moral choices."

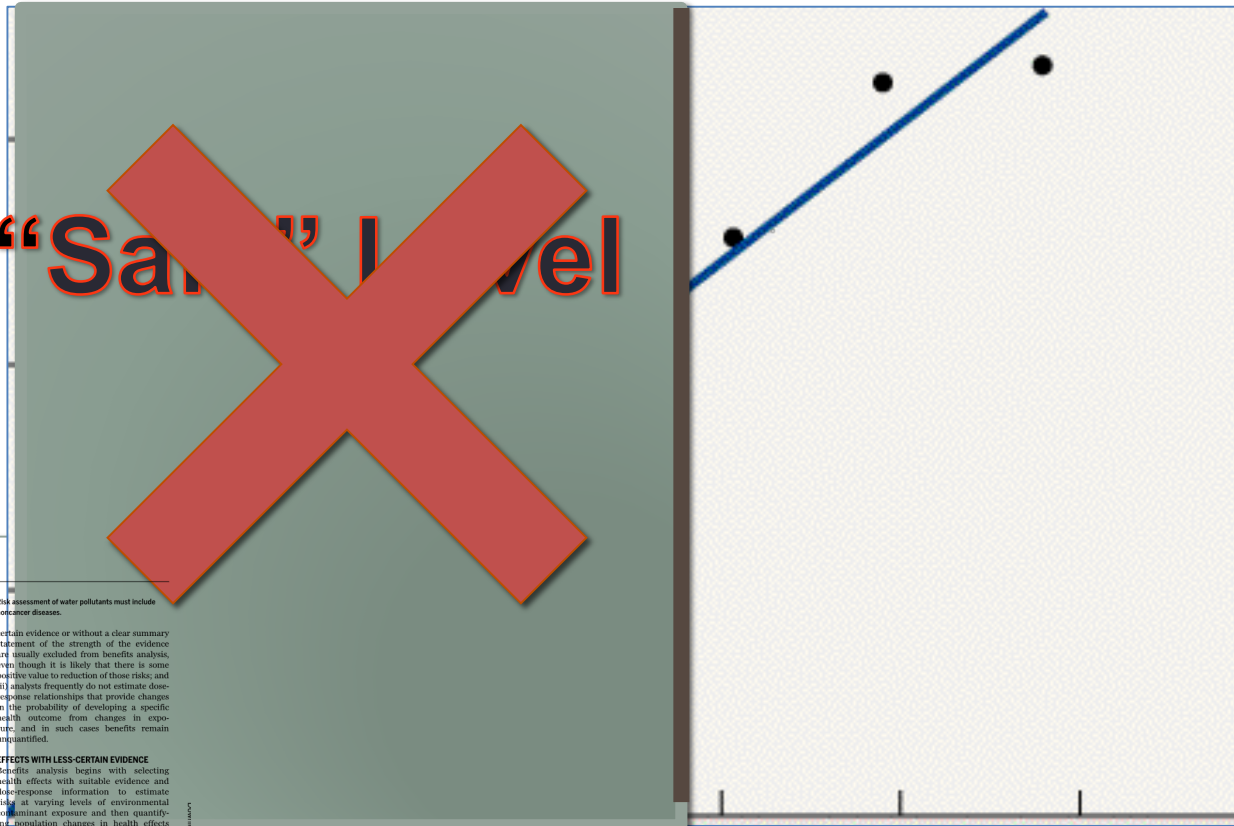
- <https://www.nytimes.com/1981/11/07/us/reagan-order-on-cost-benefit-analysis-stirs-economic-and-political-debate.html>

Two real world **benefits**
accounting rules

1. Safest to assume there is some risk at every level of exposure absent evidence to the contrary

Risk

~~“Safe” Level~~



Exposure

Risk assessment of water pollutants must include noncancer diseases.

certain evidence or without a clear summary statement of the strength of the evidence are usually excluded from benefits analysis, even though it is likely that there is some positive value to reduction of those risks; and (ii) analysts frequently do not estimate dose-response relationships that provide changes in the probability of developing a specific health outcome from changes in exposure, and in such cases benefits remain unquantified.

EFFECTS WITH LESS-CERTAIN EVIDENCE

Benefits analysis begins with selecting health effects with suitable evidence and dose-response information to estimate risk at varying levels of environmental contaminant exposure and then quantifying population changes in health effects due to exposure reduction. BCAs thus rely on risk assessments that evaluate and synthesize the health effects literature (usually laboratory animal toxicology studies and/or human observational epidemiology studies) for a particular contaminant.

EPA risk assessments for cancer and “critical” air pollutants (ground-level ozone, lead, particulate matter, carbon monoxide, nitrogen oxides, and sulfur dioxide) use standard terms to summarize the strength of evidence regarding a health effect. A high degree of confidence in the association between exposure and a health outcome, usually based on high-quality epidemiological and/or animal



POLICY FORUM

Estimating the health benefits of environmental regulations

Changes needed for complete benefits assessment

By Al McCartland, Richard Revesz, Daniel A. Acedral, Chris Dockins, Patrice Sutton, Tracey J. Woodruff

Assessing health benefits of policies addressing environmental contaminants is important for decision-making and for informing the public about how policy affects their welfare (1). Benefits analysis, one side of benefit-cost analysis (BCA), can be relatively straightforward when sufficient data are available on

We focus on issues unique to benefits analysis for policies addressing health risks, where the goal is to estimate society's total willingness to pay (WTP) to reduce these risks and thereby improve health. WTP for health improvements encompasses the value of avoided treatment costs, of lost productivity, and of avoided pain, suffering, and discomfort (2). WTP may be estimated from market transactions or through survey techniques. Alternatively, BCAs may use more limited “cost of illness” estimates that reflect only di-

2. Benefits need to account
for all relevant health
outcome

2005 New Orleans



> $\frac{3}{4}$ million people displaced
300,000 homes uninhabitable



FEMA provided more than 140,000 temporary housing units to people across the Gulf Coast

FEMA trailers in Louisiana after Hurricane Katrina

PHOTO COURTESY OF MARVIN NAUMAN /

FEMA

2006

Risky chemical found in hurricane trailers

Will Dunham

4 MIN READ



WASHINGTON (Reuters) - Many of the government-supplied trailers housing thousands of people displaced by Hurricane Katrina contain potentially dangerous levels of the chemical formaldehyde, U.S. federal health officials said on Thursday.



File photo shows trailer homes at a trailer site which houses hundreds of victims of Hurricane Katrina, in Baker, Louisiana October 6, 2005. Many of the government-supplied trailers contain potentially dangerous levels of the chemical formaldehyde, U.S. federal health officials said on Thursday. REUTERS/Lee Celano

<https://www.reuters.com/article/us-katrina-usa-trailers/risky-chemical-found-in-hurricane-trailers-idUSN1446777120080215>

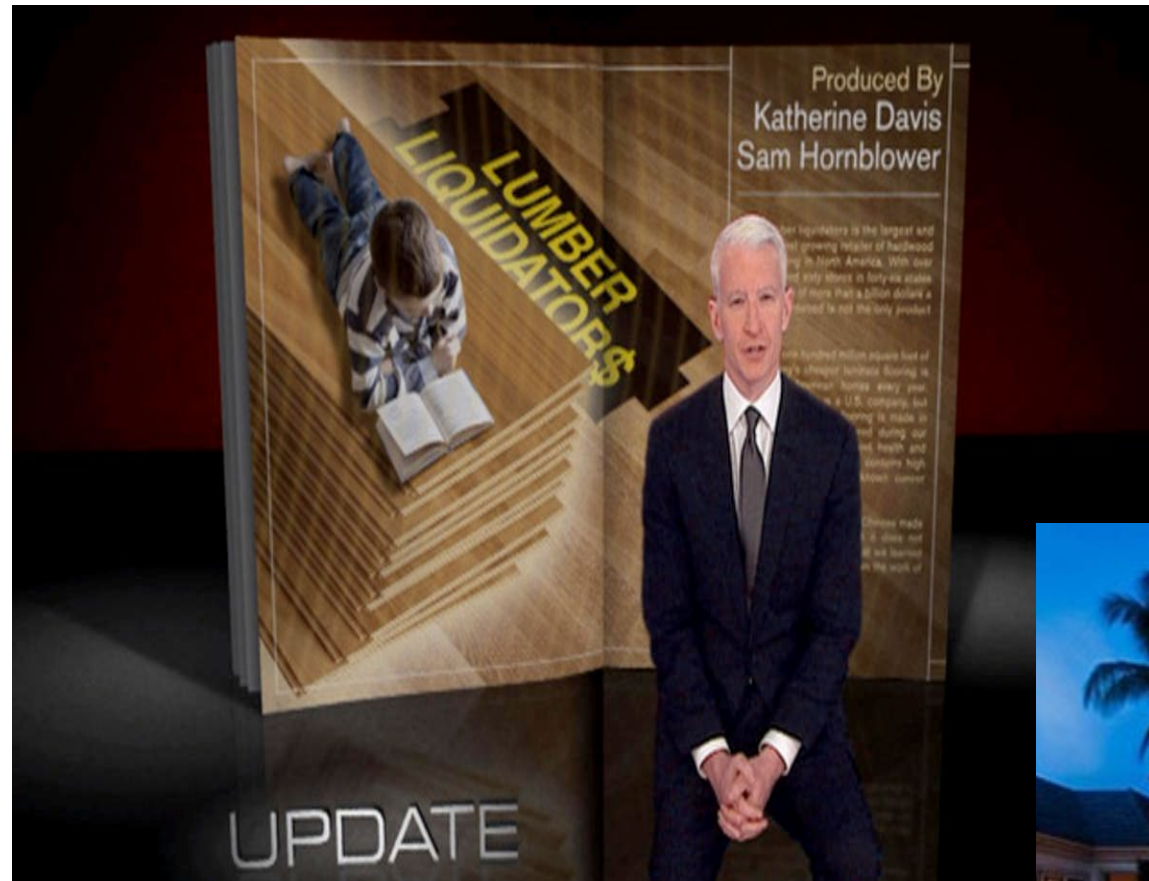
Formaldehyde

Adhesive in plywood, particle board, flooring, carpet, upholstery



Residents living in FEMA trailers report respiratory effects, headaches and eye irritation

2015



- Exposure to formaldehyde ubiquitous
- Disproportionate risk among low-income populations



<https://www.cbsnews.com/news/36-million-settlement-approved-in-lumber-liquidators-lawsuit-60-minutes/>

A few decades of regulatory history

1990

US EPA IRIS
releases
formaldehyde
assessment

1998

US EPA IRIS
initiates
formaldehyde
reassessment

2010

US EPA IRIS
releases draft
assessment
for review

2011

NAS
publishes
independent
review of
EPA IRIS
assessment

2016



Asthma excluded from 2016 formaldehyde rulemaking



What difference does it make to exclude asthma from formaldehyde rulemaking?

- Conducted systematic review of relationship between exposure to formaldehyde and asthma
- Monetized the asthma-related benefits of reducing exposure to formaldehyde



Is exposure to formaldehyde associated with diagnosis, signs, symptoms, exacerbation, or other measures of asthma in humans?

There is **“Sufficient”** evidence that exposure to formaldehyde is associated with child diagnosis, child symptoms, adult diagnosis, and adult symptoms of asthma

Definition of “sufficient”: (ESTABLISHED IN PROTOCOL)

A positive relationship is observed between exposure and outcome where chance, bias, and confounding can be ruled out with reasonable confidence. The available evidence includes results from one or more well-designed, well-conducted studies, and the conclusion is unlikely to be strongly affected by the results of future studies.

What are the asthma benefits of preventing formaldehyde exposure?

- Estimate based on the meta-analysis and “willingness to pay”
- **\$585,000 - \$1.4 million/100,000 children** in benefits annually
- **150-650 cases asthma/100,000 children** avoided annually

Formaldehyde and asthma systematic review conclusion

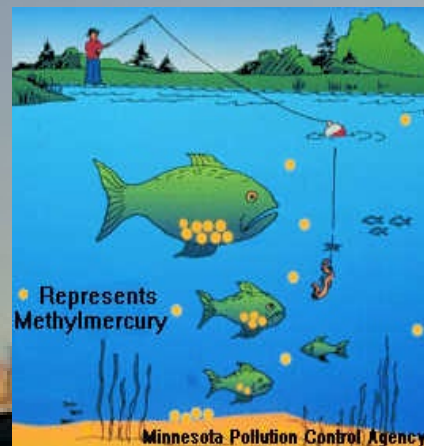
- Excluding asthma health benefits from regulatory analysis underestimated the true benefits of regulation
- Preventing relatively “low” risks brings “high” health benefits when exposures are ubiquitous
- Regulations need to account for all relevant health outcomes

Cost-Benefit Analysis at EPA today



Mercury and Air Toxics Regulation:

- Annual monetized benefits (in 2007\$) of \$33 to \$81 billion
- Benefits > costs 9:1
- Majority of benefits attributable to co-benefits from reductions in PM2.5-related mortality
- Mercury emissions from US coal plants down 85% (2006 – 2016)
- Mercury levels in water and fish decreased



Mercury and Air Toxics

\$1.8 billion in health benefits in Wisconsin in 2016



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Mercury and Air Toxics Standards

Mercury and Air Toxics
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Cleaner Power Plants

Healthier Americans

Safer Environment

MATS Benefits Where You Live

Related Information

Mercury and Air Toxics Standards in Wisconsin

EPA's new Mercury and Air Toxics Standards (MATS) - the first ever national limits on mercury and other toxic emissions from power plants – will improve people's health by requiring power plants that contribute to air pollution in Wisconsin to use widely available, proven pollution control technologies to protect families from pollutants like mercury, arsenic, chromium, nickel and acid gases.

These new standards will prevent up to 220 premature deaths in Wisconsin while creating up to \$1.8 billion in health benefits in 2016.

Additional Information

- [Map of utilities covered by this rule](#)
- [EPA's Cross-State Air Pollution Rule \(CSAPR\)](#)

Mercury and air toxics proposed re-count



- EPA's proposes a significant policy shift - "co-benefits" (PM2.5) not counted as a benefit
- EPA now asserts the costs outweigh the benefits
- EPA's costs and benefits in this current proposal are "out of date, inaccurate and artificial"

EPA Takes a Toxic Turn by Backing Away from Mercury Regulation

FEBRUARY 3, 2019 10:49:49 AM | **Janet McCabe**

Edited by: **Stephanie Sundier**



JURIST Guest Columnist Janet McCabe, Professor of Practice at the Indiana University McKinney School of Law, discusses the EPA's proposed revision of MATS and its consequences...

<https://www.jurist.org/commentary/2019/02/janet-mccabe-epa-mats-revision/>

In summary

EPA's accounting doesn't add up

HAZARDOUS VAPORS SEEPING INTO YOUR HOME?

The movement of underground contaminants into buildings is attracting increased scrutiny from health experts, advocates and...

'Recycling plastics contaminate children with toxic chemicals'

By Chinedum Uwaezbulam

As OSHA Emphasizes Safety, Long-Term Health Risks Foster EPA plans for calculating chemical risks just don't add up

By IAN URBINA

Asbestos scare delays state school

Asbestos in the air at Crossroads Elementary School is not contaminated, as testing is being installed.

Cancer-Causing Pollutants Found In Westbury District Drinking Water, Study Shows

The Westbury Water District serves approximately 20,500 people.

By Mike McAlister (Patch Staff) - Updated July 27, 2017 1:32 pm ET

[WEDMD HEALTH NEWS]

Unequal Risk: Asbestos disease opened by America's 'third wave'

Life was going smoothly... called mesothelioma

When I'm an environmental reporter, the air quality was eye-opening

Mother Questions Chemical After Child's Death

By Brenda Goodman, MA

<https://prheucsf.blog/2017/09/19/epa-plans-for-calculating-chemical-risks-just-dont-add-up/>

EPA's TSCA rules need to account for:

- We are exposed to the same chemical through many pathways - exposure to environmental chemicals moves over time and space
- Some of us are more vulnerable than others to exposure – environmental justice

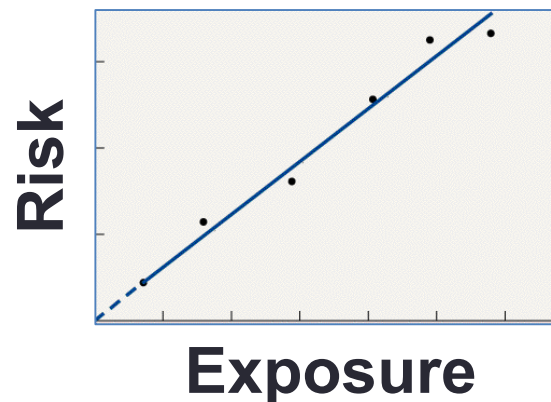
EPA's TSCA rules are high stakes for our health now and for future generations



First 10 TSCA chemicals over 1 billion pounds of production volume

EPA's calculation of benefits needs to account for:

1. Risk at every level of exposure for all toxic chemicals
2. All health outcomes associated with the exposure
3. Co-benefits of the regulation



Lawsuits will be decisive in these policy outcomes

Eve Gartner, JD



- Staff Attorney, Earthjustice
- Healthy Communities Program
- EPA implementation of risk evaluations for existing chemicals



Judge to EPA: Stop Stalling on Regulating Chemical That Sickened Katrina Refugees

The EPA keeps delaying enforcement of its formaldehyde rule, so we're taking the agency to court.

By **Patti Goldman** | December 12, 2017



FEMA housed Hurricane Katrina victim Martha Hentor, 82, in this trailer in Gulfport, Mississippi. Some of the trailers FEMA provided to hurricane refugees emitted toxic levels of formaldehyde, a cancer-causing chemical.

PHOTO COURTESY OF JOHN FLECK / FEMA

EPA delayed implementation of the 2016 formaldehyde in composite wood rule

EPA sued by Earthjustice on behalf of the Sierra Club and a Louisiana based Community Voices

Tag: Formaldehyde Limits in Composite Wood Products

Mar 13, 2018

Federal Court Rejects EPA Rule Delaying Formaldehyde Limits in Composite Wood Products



<http://www.sgrlaw.com/tag/formaldehyde-limits-in-composite-wood-products/>

Formaldehyde Emission Standards for Composite Wood Products

National Program Chemicals Division
Office of Pollution Prevention and Toxics
Updated April 2018



So what can health professionals do?



Defend science and future generations



Critical need to
build science
into the record



Defend science and future generations

Science-based hazard and risk assessment is key to greener supply chains



Defend science and future generations

Environmental justice requires science-based public policy



Legislative Briefing: Is the New Toxic Substances Control Act Working as Congress Intended?

Legislative Briefing
April 12, 2018
The Capitol, Washington, DC

MORE VIDEOS

UCSF The American College of Obstetricians and Gynecologists

0:00 / 55:40

CC YouTube

Health professional societies speaking out

Nathaniel DeNicola, MD, MSHP, FACOG



- Physician and Fellow, American College of Obstetricians and Gynecologists (ACOG)
- GWU School of Medicine & Health Sciences
- Why TSCA matters for women & children's health

Is the New Toxic Substances Control Act (TSCA) Working as Congress Intended?



APRIL 18, 2018 ~ PRHE

ACOG & TSCA Reform

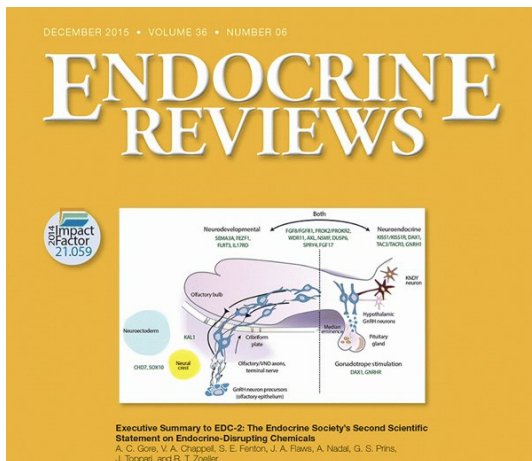
ACOG's Principles for Chemical Safety Reform:

- Pregnant women should be considered a **vulnerable population**
- Unless and until proven otherwise, potential exposure to chemicals during pregnancy is an **unreasonable risk**
- The **burden of safety must shift** from the public to the chemical industry
- Chemical assessments must consider **exposures** from multiple sources



Health professional societies calls for action

Endocrine Society
(2008, 2015)



International Federation of
Gynecology and Obstetrics
(2015)

Project TENDR (2016)

Perspectives | Brief Communication

Project TENDR: Targeting Environmental Neuro-Developmental Risks. The TENDR Consensus Statement

<http://dx.doi.org/10.1289/EHP358>

SUMMARY: Children in America today are at an unacceptably high risk of developing neurodevelopmental disorders that affect the brain and nervous system including autism, attention deficit hyperactivity disorder,

i
r
c
c

Ob-gyns from 125 countries say...



Tell policymakers to listen.

#HealthNotToxics

Organizations that Endorse or Support the TENDR Consensus Statement

American College of Obstetricians and Gynecologists (ACOG)

ACOG supports the value of this clinical document as an educational tool (March 2016)

Child Neurology Society

Endocrine Society

International Neurotoxicology Association

International Society for Children's Health and the Environment

International Society for Environmental Epidemiology

National Council of Asian Pacific Islander Physicians

National Hispanic Medical Association

National Medical Association



Rapid Response Network

Advancing Health and Science in Chemical Policy

Brought to you by



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Program on Reproductive Health and the Environment

Join over 180 scientists and clinicians who are sharing their science and standing up for scientific integrity

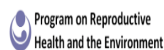


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Chemical Policy Resources



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Chemical Policy



Public Comments on Chemical Policy

Draft Risk Evaluation for C.I. Pigment Violet 29 January 2019

A Working Approach for Identifying Potential Candidate Chemicals for Prioritization November 2018

Agency for Toxic Substances and Disease Registry's (ATSDR) Proposed Data Collection: Prenatal Assessment of Environmental Risk November 2018

Legislative Briefings

Is the New Toxic Substances Control Act (TSCA) Working as Congress Intended?
April 12, 2018

What the Science Says: How EPA Matters to Children's Health
April 5, 2017



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DECEMBER 17, 2018 - VEENA SINGLA

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<https://prhe.ucsf.edu/chemical-policy>

<https://prheucsf.blog/2018/12/17/epas-unwritten-policy-on-chemical-data-dont-ask-dont-tell/>

Patient-Centered Resources



60 MiNueTs: The shocking truth about environmental health threats

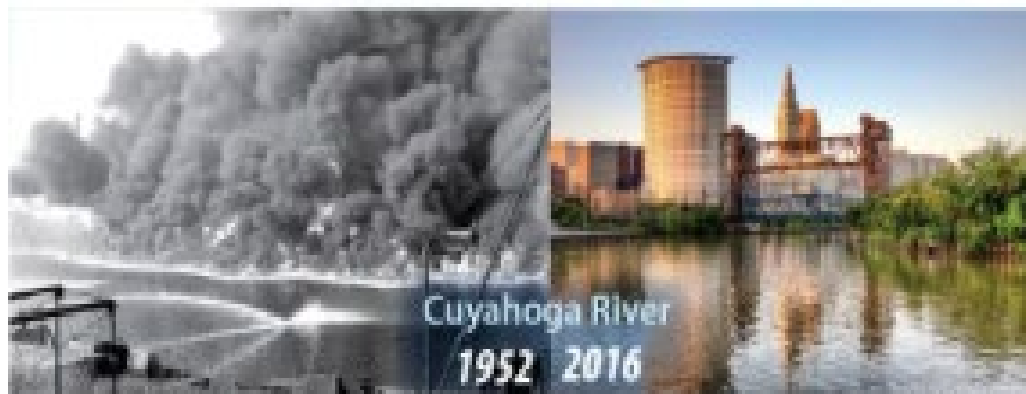
<https://prhe.ucsf.edu/toxic-matters>

<https://prhe.ucsf.edu/multimedia-library>

Defending Science and Children's Health in the USA Today

*I never saw the mornin' 'til I stayed up all night
I never saw the sunshine 'til you turned out the light
I never saw my hometown until I stayed away too long
I never heard the melody until I needed the song*

[Tom Waits - San Diego Serenade](#)





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Thank you!

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