

SACIM

Environmental
Contributions to
Infant & Maternal
Health

January 26, 2021



UCSF

Program on Reproductive Health
and the Environment

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- Professor and Director, University of California, San Francisco Program on Reproductive Health and the Environment (UCSF PRHE)
- Former EPA scientist
- Leading expert on toxic chemicals, chemical policy, women & children's health
- Overview of new TSCA and scientific concerns with EPA plans



Program on Reproductive Health and the Environment

Information for Families

Resources to help your family reduce their environmental exposures



Clinical Practice

Resources for health care professionals to promote environmental health



Research

Targeted research to inform clinical decision making and public policy



Policy

Resources to advance science-based policy solutions.



Mission:

To create a healthier environment for human reproduction and development by advancing scientific inquiry, clinical care, and health policies that prevent exposures to harmful chemicals in our environment.

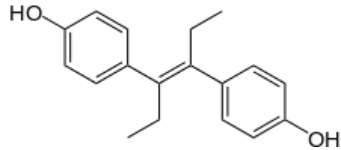


University of California
San Francisco

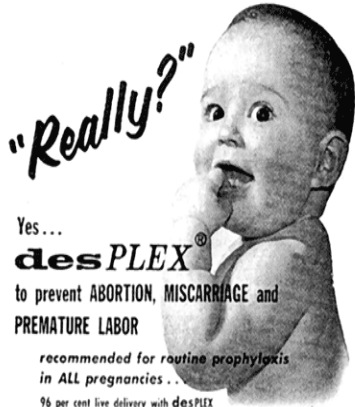


Pharmaceuticals

Diethylstilbestrol



Medscape www.medscape.com



Yes...
desPlex[®]
 to prevent ABORTION, MISCARRIAGE and
 PREMATURE LABOR

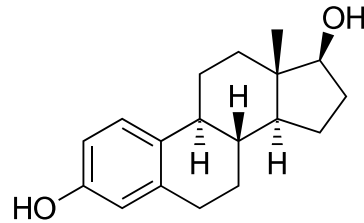
recommended for routine prophylaxis
 in ALL pregnancies...

96 per cent live delivery with desPlex
 in one series of 1200 patients*—
 —bigger and stronger babies, too**

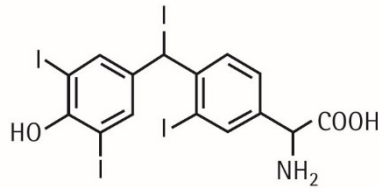
No gastric or other side effects with desPlex
 — in either high or low dosage†,‡,§

Source: J Midwifery Womens Health © 2003 Elsevier Science, Inc.

Hormones

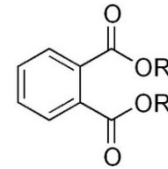
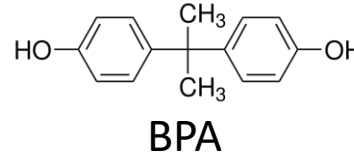


Estradiol

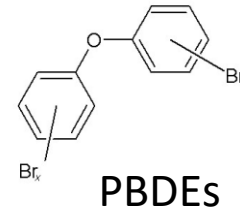
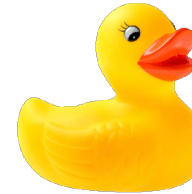


Thyroid hormone

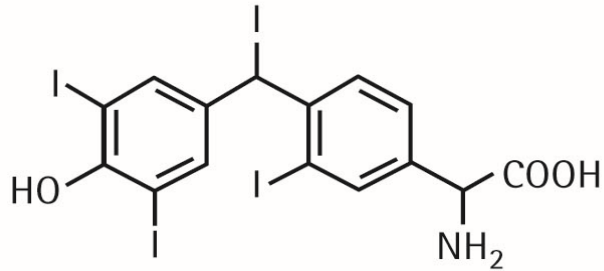
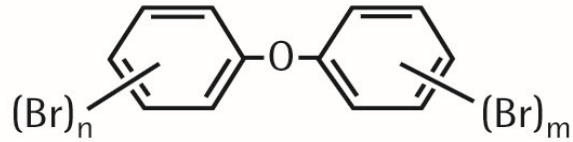
Industrial Chemicals



Phthalates



Polybrominated Diphenyl Ethers (PBDEs) Flame chemicals



Thyroid hormone



WHERE FLAME RETARDANTS ARE FOUND

In home insulation

In upholstered furniture containing polyurethane foam — manufacturers add it to meet flammability standards enacted by California but followed nationwide

In the plastic casing of some electronics

In dust — children are exposed to higher doses of flame retardants than adults because they spend more time on the floor and put things in their mouths

In carpet padding made with recycled foam

In some baby products containing polyurethane foam, including highchairs and diaper-changing pads

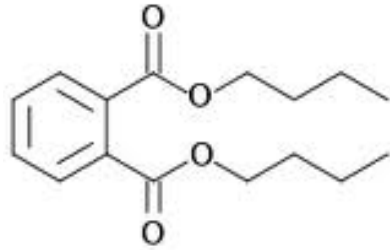


PBDE exposures not uniform across the US

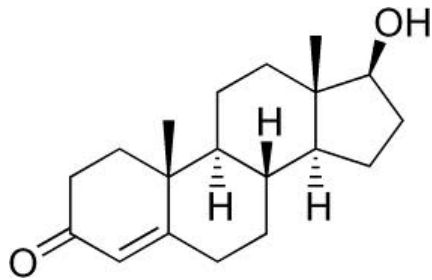
Subpopulations with potentially higher exposures:

- Socially vulnerable/ Low SES
- Children
- Californians





Dibutyl Phthalate



Testosterone



PHTHALATES



Shampoo, lotion,
nail polish and other
personal care products



Cosmetics



Medical equipment
including tubing,
blood bags, and
plastics in the NICU

Automobiles (phthalates are
responsible for
the 'new car' smell);



Enteric coatings
of pharmaceuticals



Toys



Baby products including
lotion, shampoo,
powders and teething



Building materials
including vinyl
flooring, wall paper,
paint, glue and adhesives



Scented products such as
candles, detergent
and air fresheners



Art supplies including
paint, clay, wax and ink



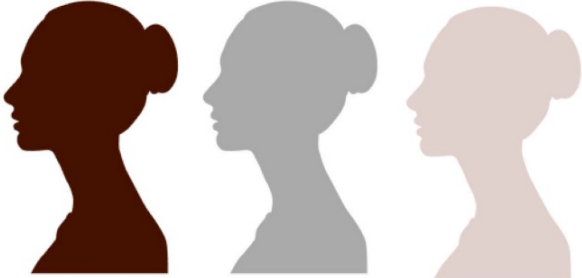


Contains:

Phthalates



Racial Disparities in Phthalates Exposure



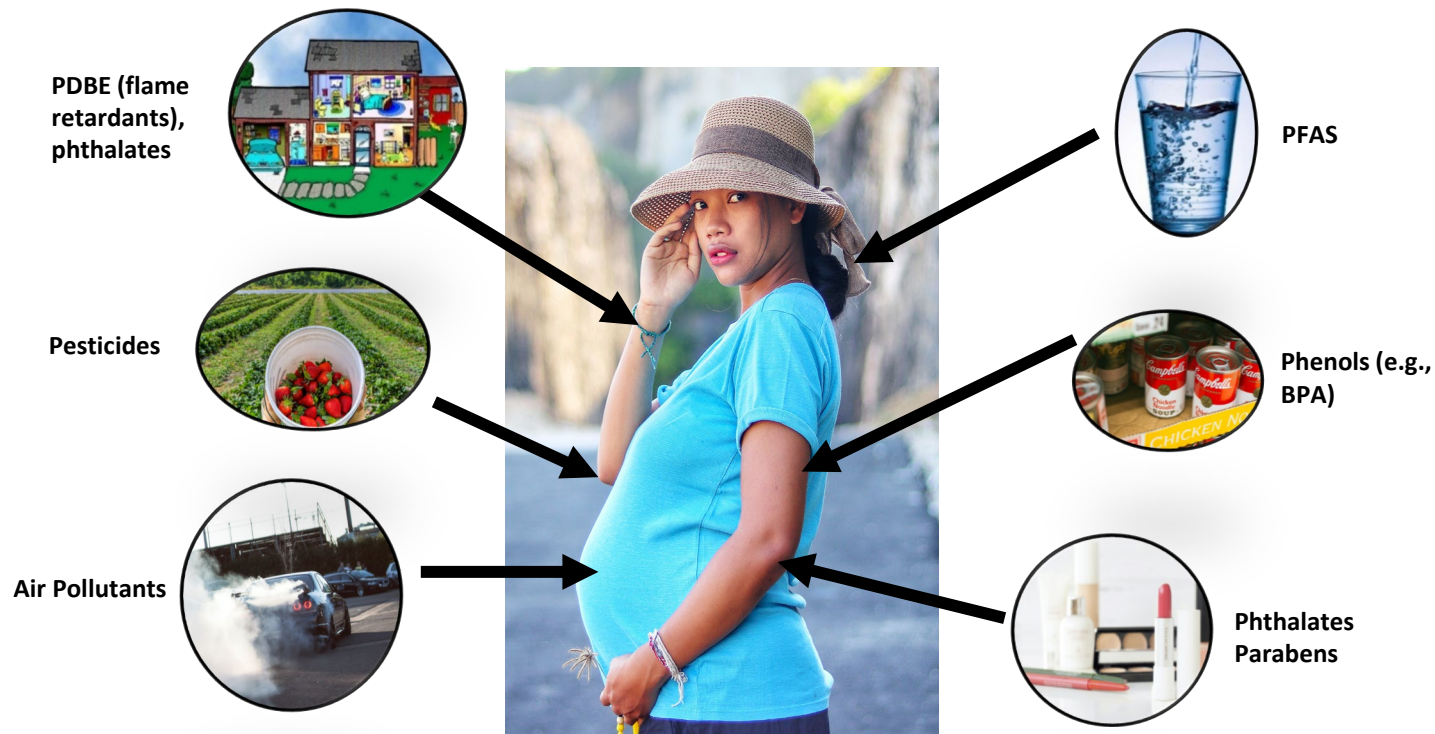
Beauty product-related phthalate exposure was **more than 30% higher in Black women**



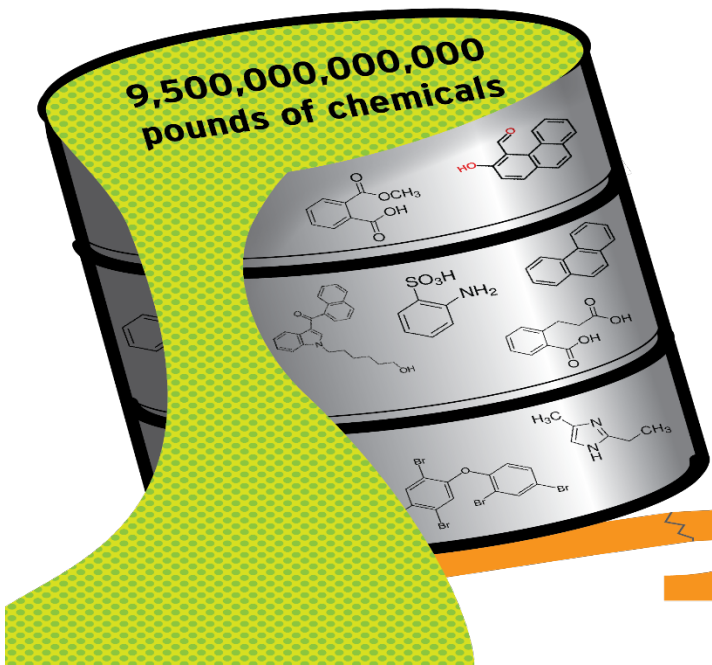
Zota et al. *Fertility and Sterility* 2018




Exposures to Environmental Chemicals occur every day and everywhere



U.S. Chemical Production Volume Compared to Population



• 30,000 pounds of chemicals
per person 

U.S. POPULATION:
313,000,000



US EPA CDR Fact Sheet: Chemical Snapshot, June 2014. The total reported (domestically manufactured and imported) for 2012.



Exposures start in utero to Toxic Chemicals

Industrial Chemicals in Virtually Every U.S. Pregnant Woman

43+

industrial chemicals found
in pregnant women

Perchlorate	PCB-170
1-Hydroxypyrene	PCB-153
3-Hydroxyphenanthrene	PCB-146
2-Hydroxyphenanthrene	PCB-118
1-Hydroxyphenanthrene	PCB-110
1-Naphthol	PCB-105
2-Naphthol	PCB-101
2-Hydroxyfluorene	PCB-99
3-Hydroxyfluorene	PCB-74
9-Hydroxyfluorene	PCB-66
Mono-(3-carboxypropyl) phthalate (MCPP)	PCB-52
Mono-(2-ethyl-5-carboxypentyl) phthalate (MECPP)	PCB-49
Mono-(2-ethyl-5-oxohexyl) phthalate (MEOHP)	PCB-44
Mono-(2-ethyl-5-hydroxyhexyl) phthalate (MEHHP)	PCB-28
Mono-ethyl phthalate (MEP)	PBDE-153
Mono-n-butyl phthalate (MnBP)	PBDE-100
Mono-isobutyl phthalate (MiBP)	PBDE-47
Mono-benzyl phthalate (MBzP)	Perfluorononanoic acid (PFNA)
Benzophenone-3	Perfluorooctane sulfonic acid (PFOS)
Hexachlorobenzene	Perfluorooctanoic acid (PFOA)
p,p' - Dichlorodiphenyldichloroethene (DDE)	PCB-138 and -158
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	



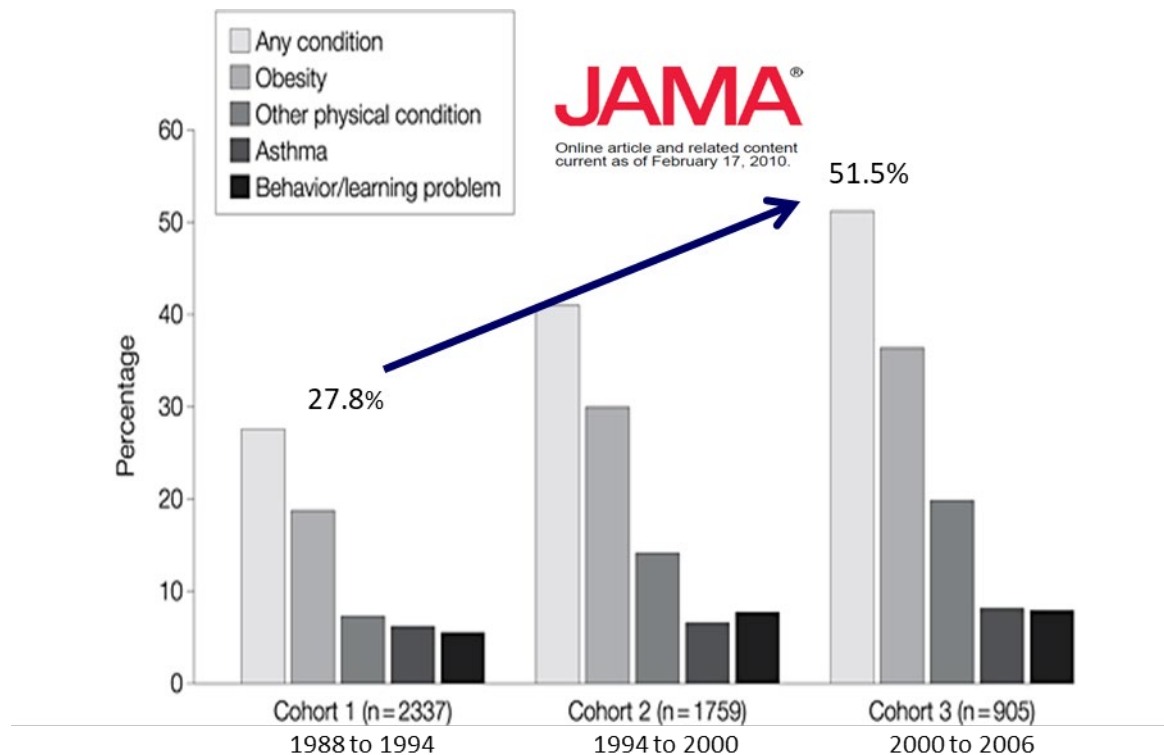


... “ to a disturbing extent,
babies are born pre-polluted.”

-National Cancer Institute



Increasing childhood chronic health conditions

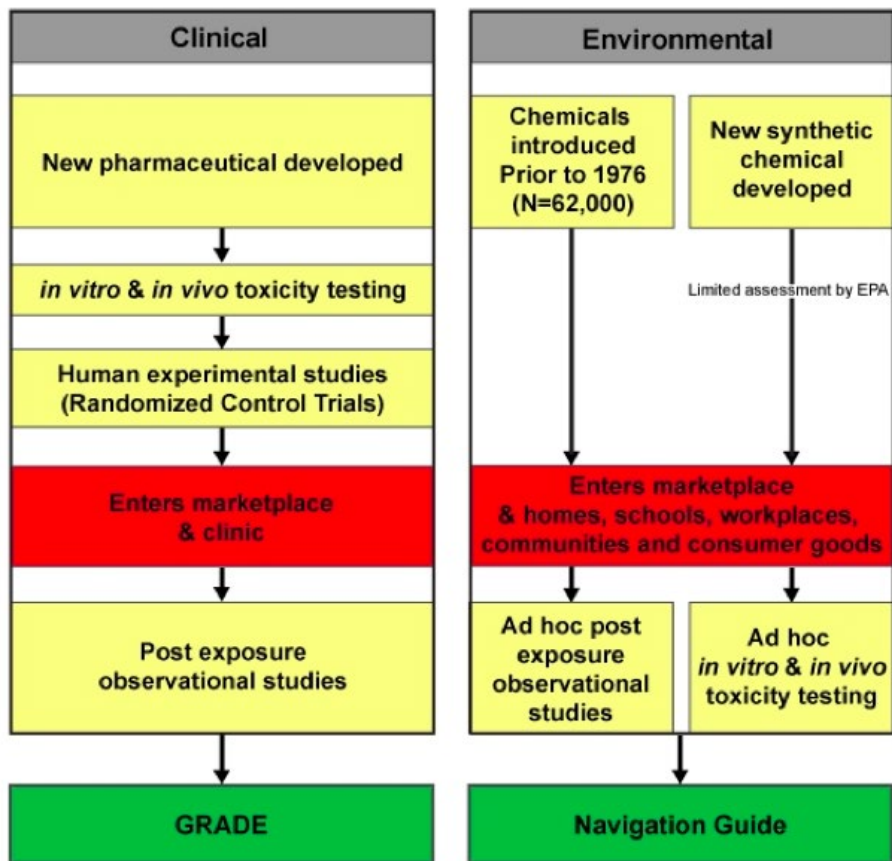


Manufactured pharmaceuticals are required to have data to show **safety** before use

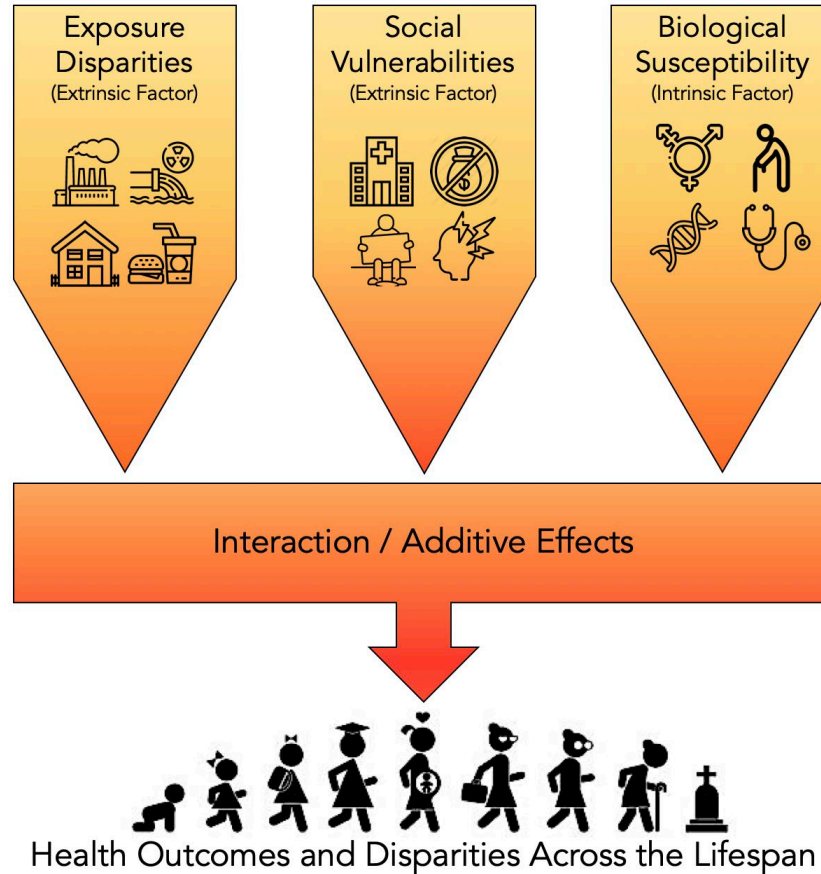
Manufactured chemicals do **NOT**



Figure 1. Streams of Evidence for Chemical Toxicity Assessment in Clinical and Environmental Health Sciences



Triple Jeopardy of Social Inequality



Sensitive Developmental Periods for EDCs & Women's Reproductive Disorders

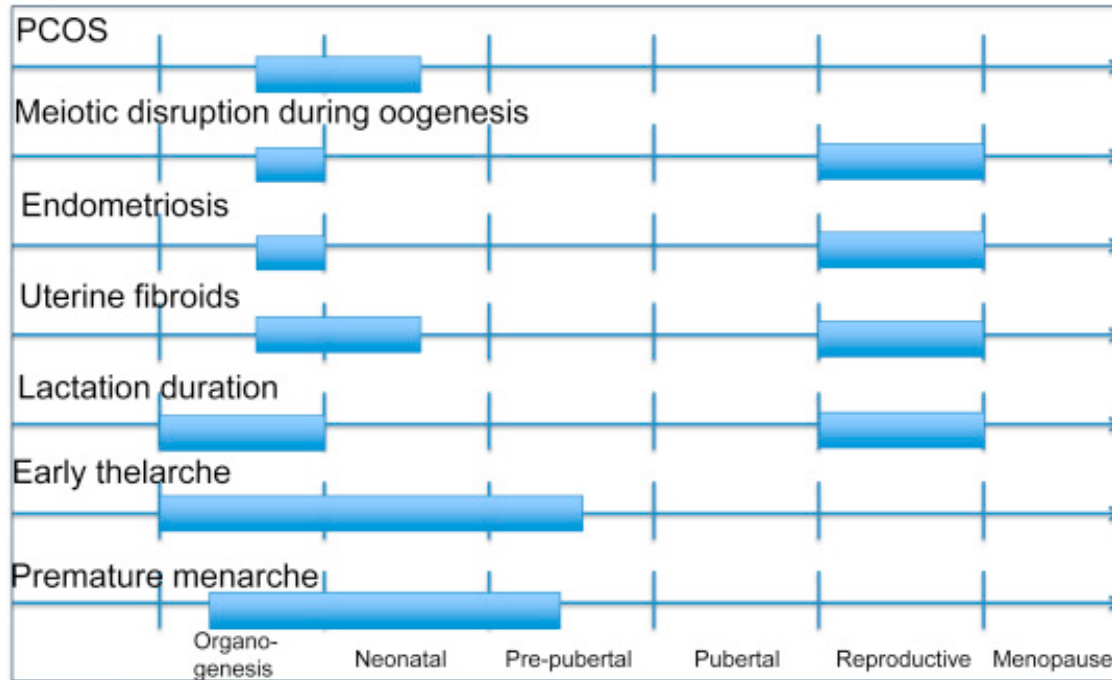


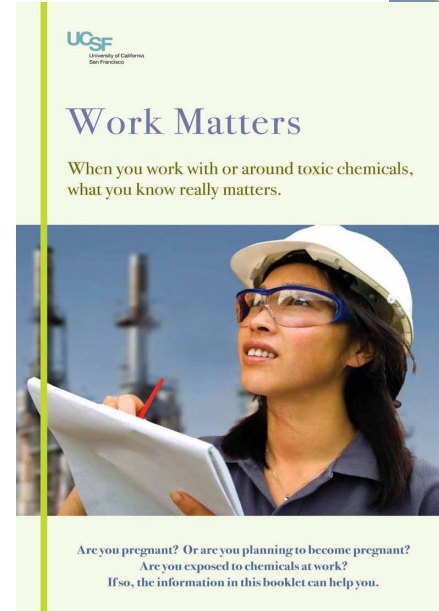
Figure 1. Sensitive developmental periods when exposures to endocrine-disrupting chemicals greatly increase the risk of female reproductive disorders. Data are derived from studies conducted in mice, rats, lamb, sheep, and humans. Adapted from Crain et al. [3]...



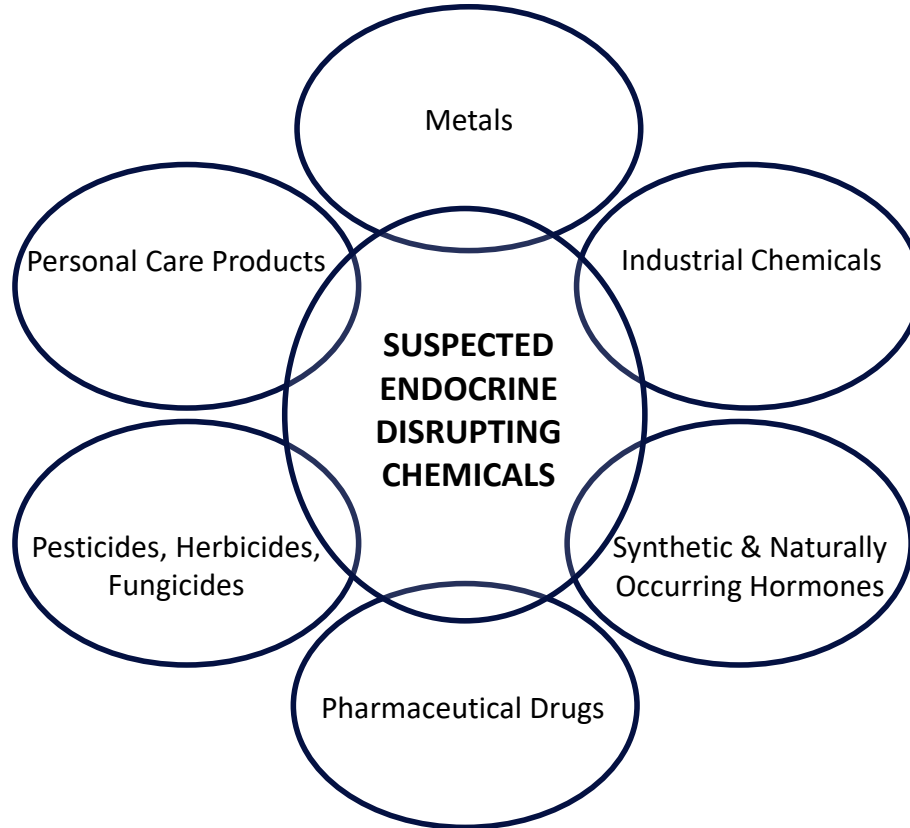
ACOG/ASRM Committee Opinion

All exposures are not created equal

- Underserved & minority populations are disproportionately impacted
- Higher risk for occupational exposure



Endocrine Disruptors



Conclusions

- Environmental chemical exposures is ubiquitous and is adversely affecting health inequitably
- Environmental chemicals can contribute to neurodevelopmental disorders
- Science alone cannot move systematic change but engagement by scientists and health care providers is critical
- Research and translation that leads to less biased science is needed
- Community partnership & support are key
- New tools and cohorts provide opportunity to understand & prevent environmental contributors to neurodevelopmental disorders

