

# Chemicals and Reproductive Health

What's the Connection?

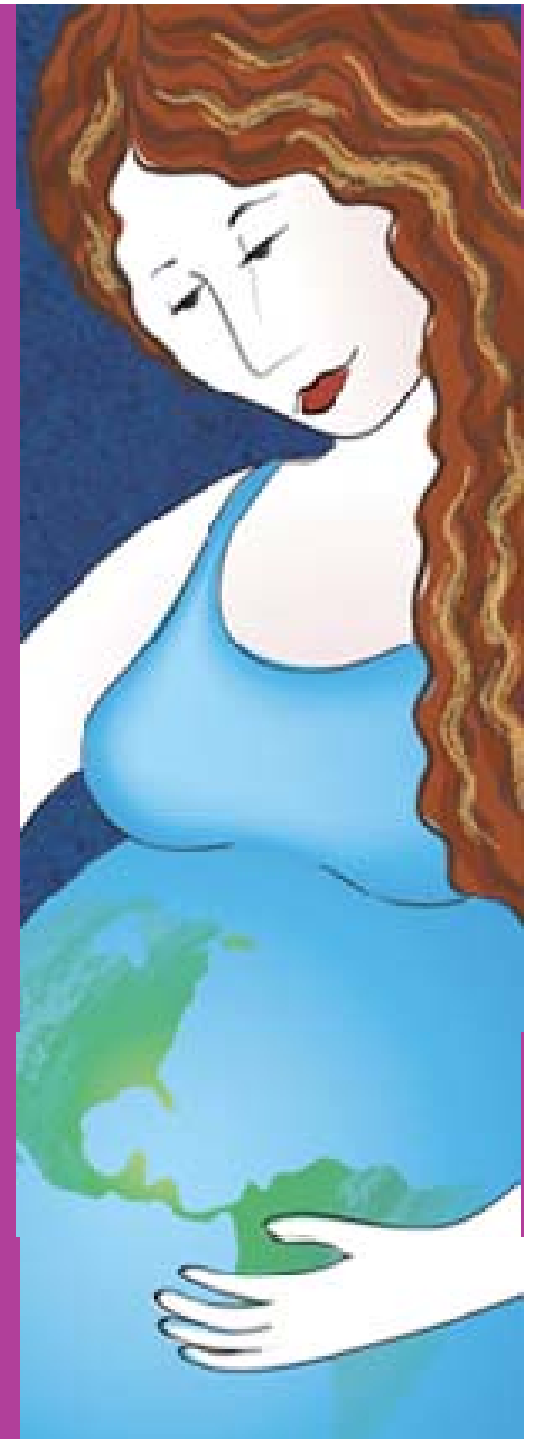
Charlotte Brody, RN

BlueGreen Alliance

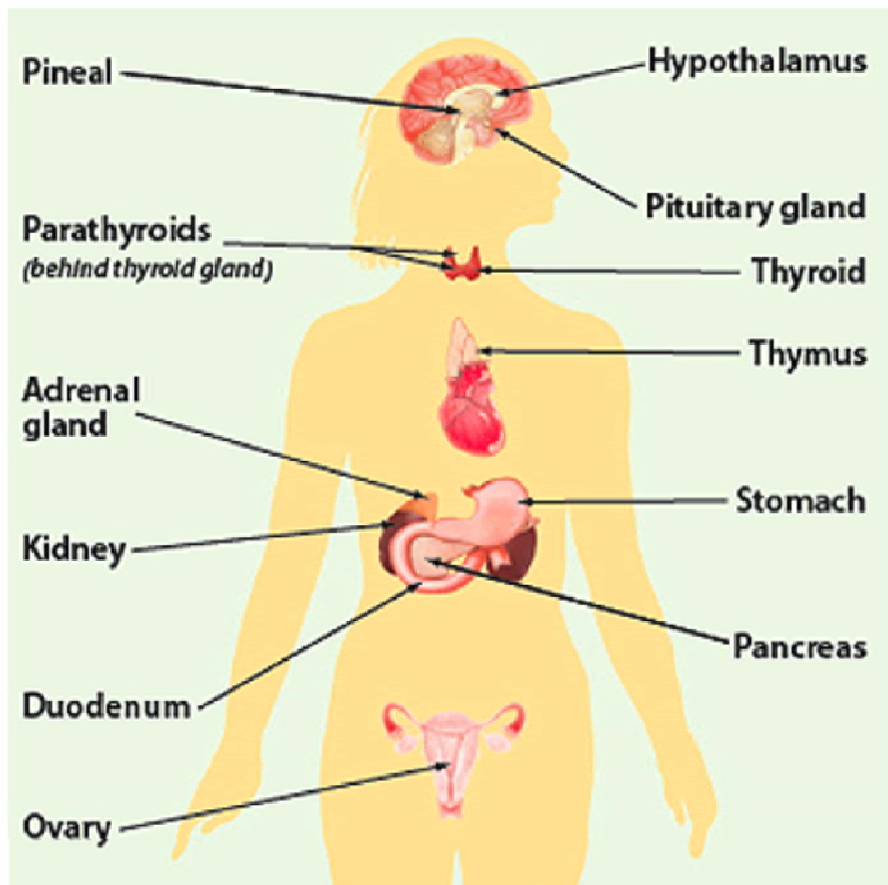


# Endocrine-Disrupting Chemicals

An Endocrine Society Scientific Statement



# Two Ways to Make Hormones



# Two Ways to Make Hormones

## *In a human body*

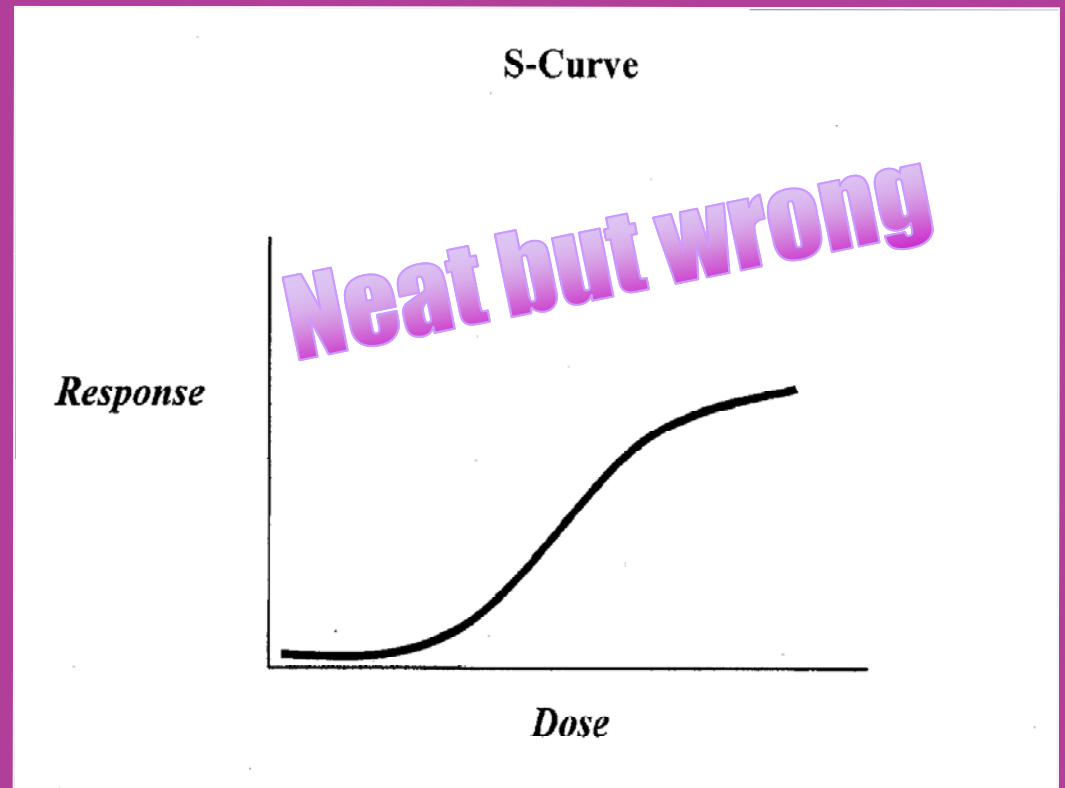
- Estrogens
- Testosterone
- Adrenaline
- Insulin
- Thyroid
- Progesterone
- LH
- FSH

## *In a factory*

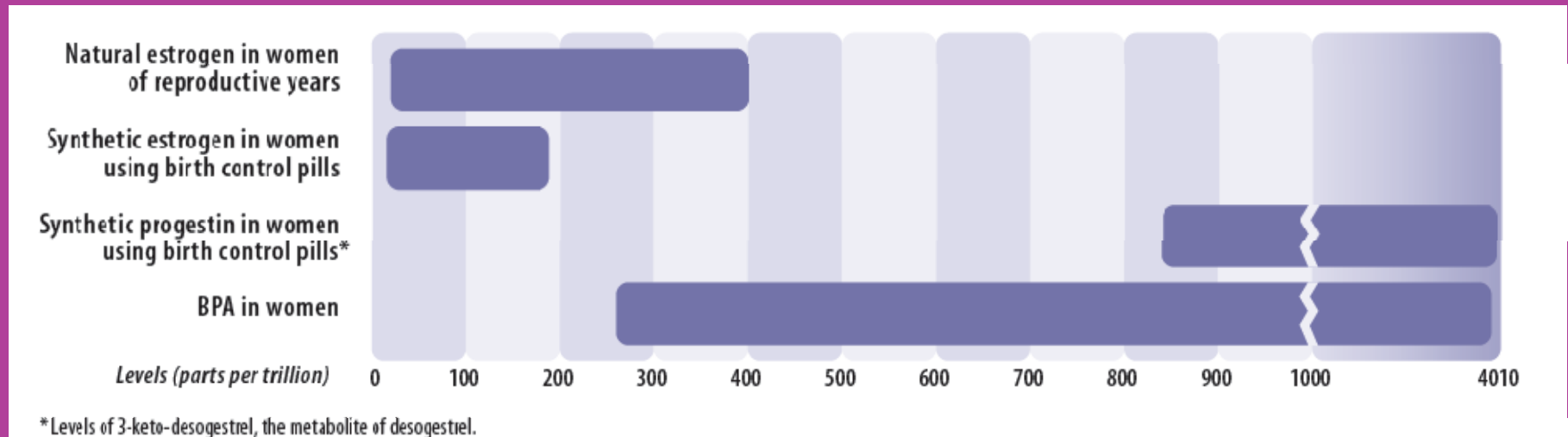
- Atrazine
- Bisphenol A
- DDT
- DES
- Dioxins
- PBB
- PCB
- Phthalates

# Outdated Scientific Frameworks Miss:

- Low dose effects
- Mixtures
- Synergies
- Timing
- Sensitivities and other differences between people
- Long delays between exposures and visible effects, including multigenerational effects



# Hormones: Tiny doses control communication and coordination of body tissues



300 ppt in a 143 lb. woman is equivalent to .00000000000002 of one plain M &M candy

# Long Delays

Women exposed to relatively high levels of DDT prior to mid-adolescence are 5 times more likely to develop breast cancer



Cohn, BA, MS Wolff, PM Cirillo and RI Sholtz. 2007. DDT and breast cancer in young women: New data on the significance of age at exposure. *Environmental Health Perspectives* doi:10.1289/ehp.10260

# Multigenerational Effects: Diethylstilbestrol (DES)

Exposure to DES  
in the womb

Deformed uterus

Impaired fertility  
Increased risk of miscarriage  
Premature labor & birth

Fibroids

Cancer of the Vagina and  
Cervix

Third Generation Effects





# Synergies and Mixtures can add up to harm



+



+



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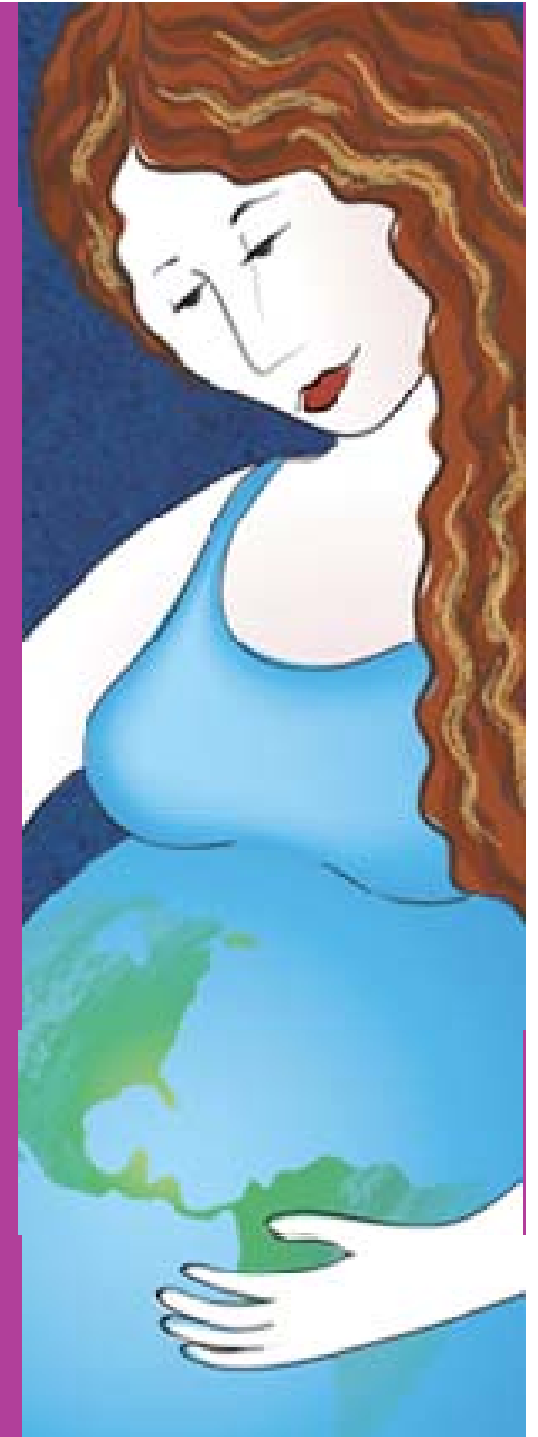
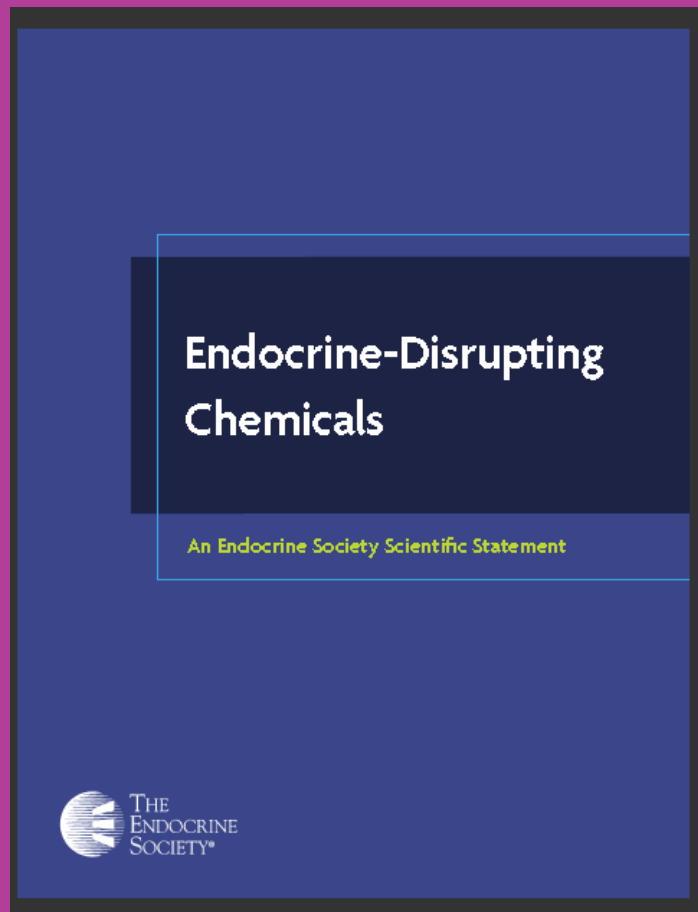
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harm

# Clinical and Translational Impacts

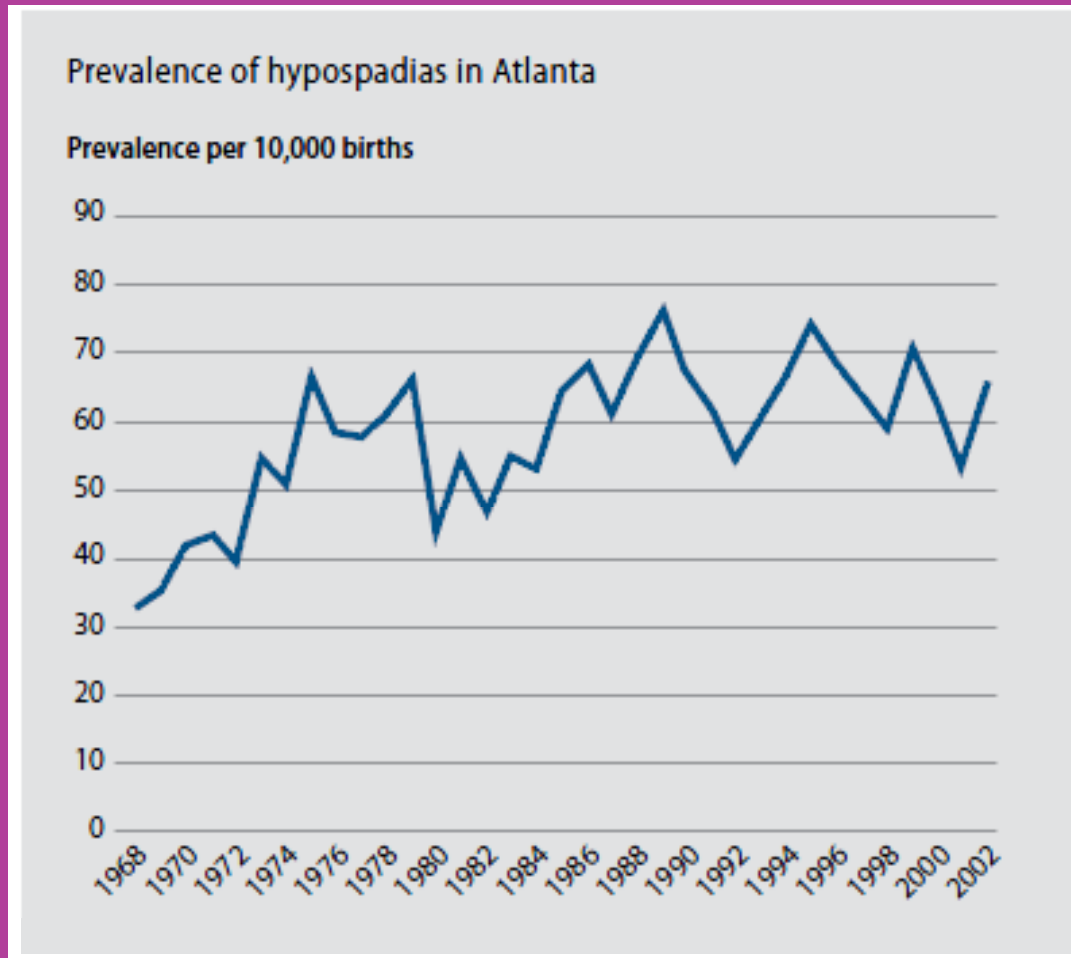


# Wildlife Tragedies



Florida Panther

# And a similar problem in baby boys



- Low birth weight
- Hypospadias
- Cryptorchidism
- Low Testosterone
- Low Sperm Counts
- More Female than Males
- Testicular Cancer


Source: Centers for Disease Control and Prevention, National Center on Birth Defects and Developmental Disabilities, "Temporal and Spatial Variations in Birth Defects in Atlanta" (March, 2004); Laurence S. Baskin, et al., "Hypospadias and Endocrine Disruption: Is There a Connection?" *Environmental Health Perspectives* 109 (11) (November 2001): A542–A543.

# Human Tragedies: DBCP



Harmful to workers who made it and the workers who used it

## Jury Awards Millions to Farmers Sterilized by Pesticides

By Brandon Keim 

November 06, 2007 | 11:02:12 AM

Categories: Agriculture, Health

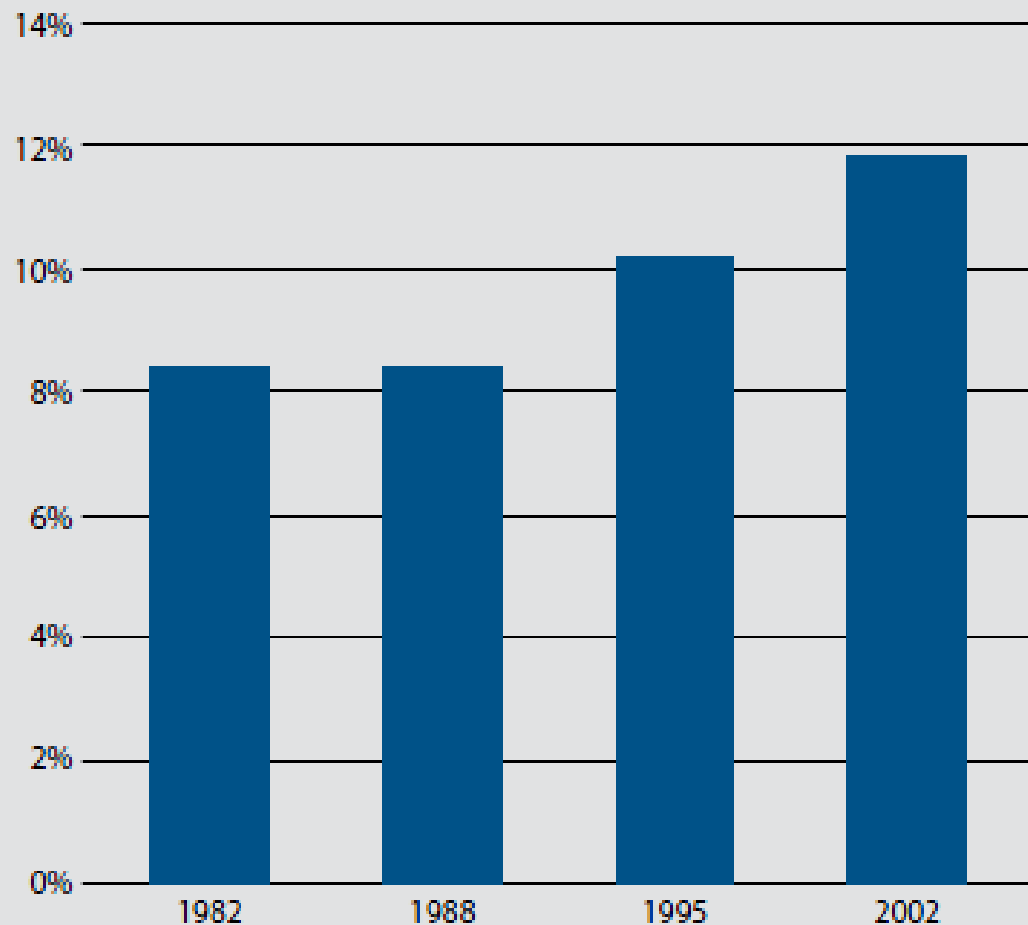
A California jury yesterday awarded \$3.3 million to six Nicaraguan farm workers sterilized by pesticides made by Dow Chemical and used at Dole's banana plantations.

The plaintiffs alleged that Dow and Amvac, another chemical company, hid information about the dangers of dibromochloropropane, or DBCP: high exposures left lab animals organ-damaged, sterile and prone to birth defects. The Occupational Health and Safety Administration sets DBCP's occupational exposure limit at *one part per billion per workday*; during the 1970's and 1980's, the plaintiffs reportedly inhaled DBCP vapors and wore clothing soaked by water dripping from DBCP-treated trees.



Women  
are  
having a  
harder  
time  
getting  
pregnant

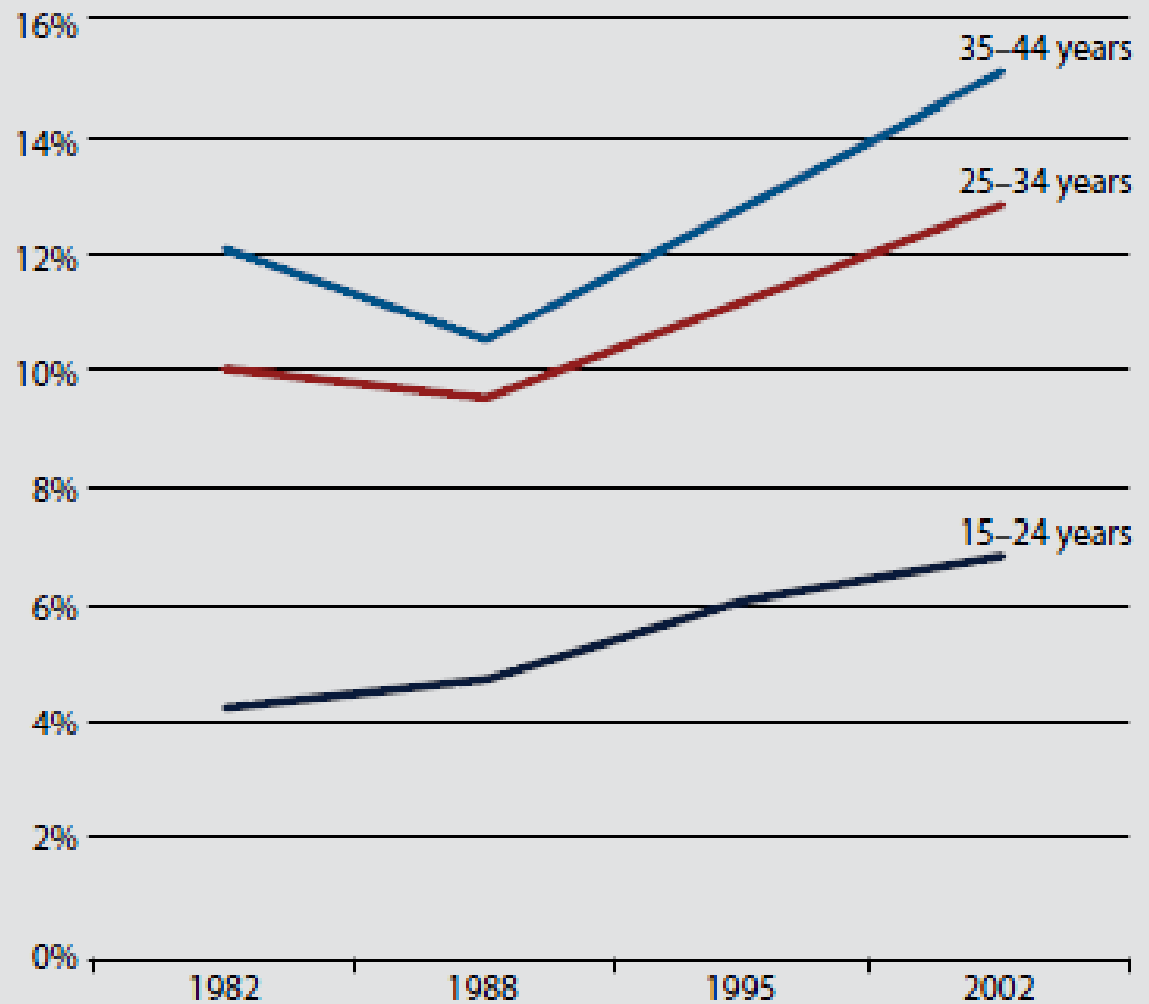
Percentage of all women with impaired fecundity for selected years, 1982–2002



Anjani Chandra and Elizabeth Hervey Stephen, "Impaired Fecundity in the United States: 1982–1995," *Family Planning Perspectives* 30 (1) (1998): 34–42; Chandra, et al., "Fertility, Family Planning, and Reproductive Health of U.S. Women: Data from the 2002 National Survey of Family Growth," National Center for Health Statistics, *Vital Health Stat* 23 (25) (2005).

And this  
problem  
is true  
for all  
age  
groups

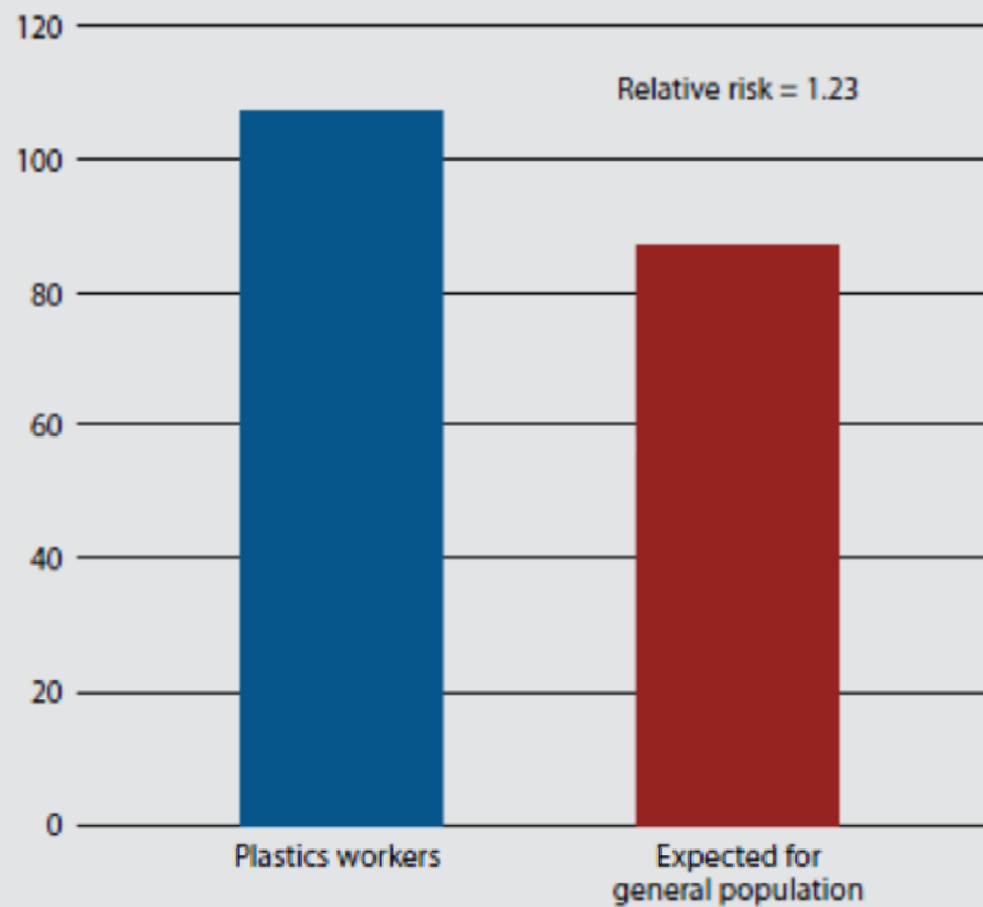
Trends in the percentage of women (15–44 years) with impaired fecundity by age group, 1982–2002





### More infertility treatment among women in plastics industry

Cases of infertility treatment out of 27,445 person years\*



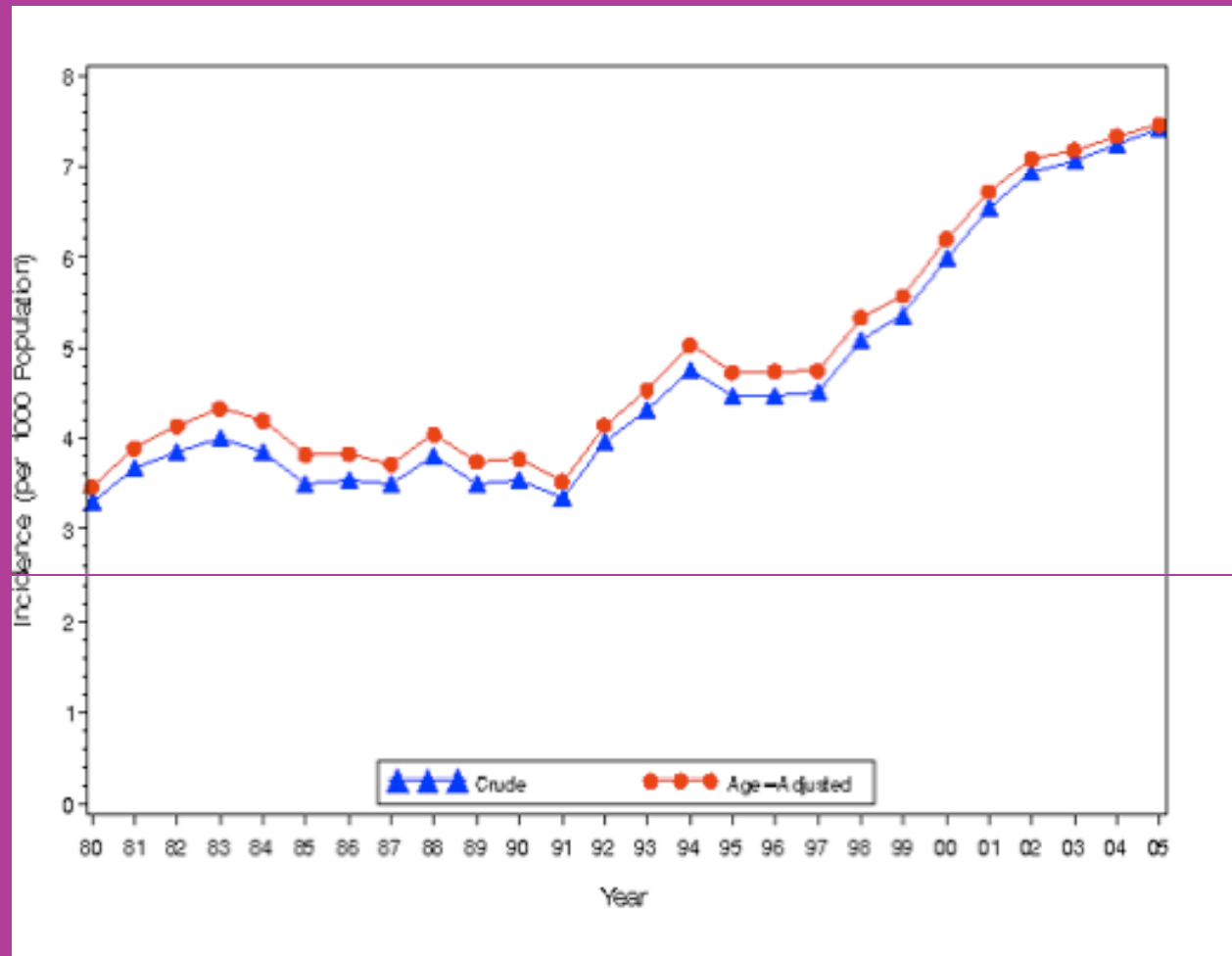
\* "Person years" is the sum of the number of years that each person in the study was under observation

Source: Karin S. Hougaard, et al., "Increased Incidence of Infertility Treatment Among Women Working in the Plastics Industry," *Reproductive Toxicology* 27 (Jan. 21, 2009): 186–189.



It has been hypothesized that the significant increase of the incidence of breast cancer in the industrialized world observed during the last 50 years may be due to exposure to hormonally active chemicals, particularly xenoestrogens. A similar increase in the incidence of testicular cancer and malformations of the male genital tract and decreased quantity and quality of human sperm have been observed during the same half century, again suggesting a link to the introduction of these chemicals into the environment.

# It's Not Just Cancer



The CDC estimates that from 1980 to 2005 the incidence of diagnosed diabetes increased 124%

# Young women may be losing their health and their right to choose to become mothers

- 30% more babies are being born premature
- 25 to 50% of women have fibroids
- 10 to 15% suffer from endometriosis
- Girls are developing breasts and starting their periods earlier
- Breast cancer went up 40% between 1973 and 1998



# Young men may grow up to be half the man their fathers were



- Sperm counts are down 50% over 50 years

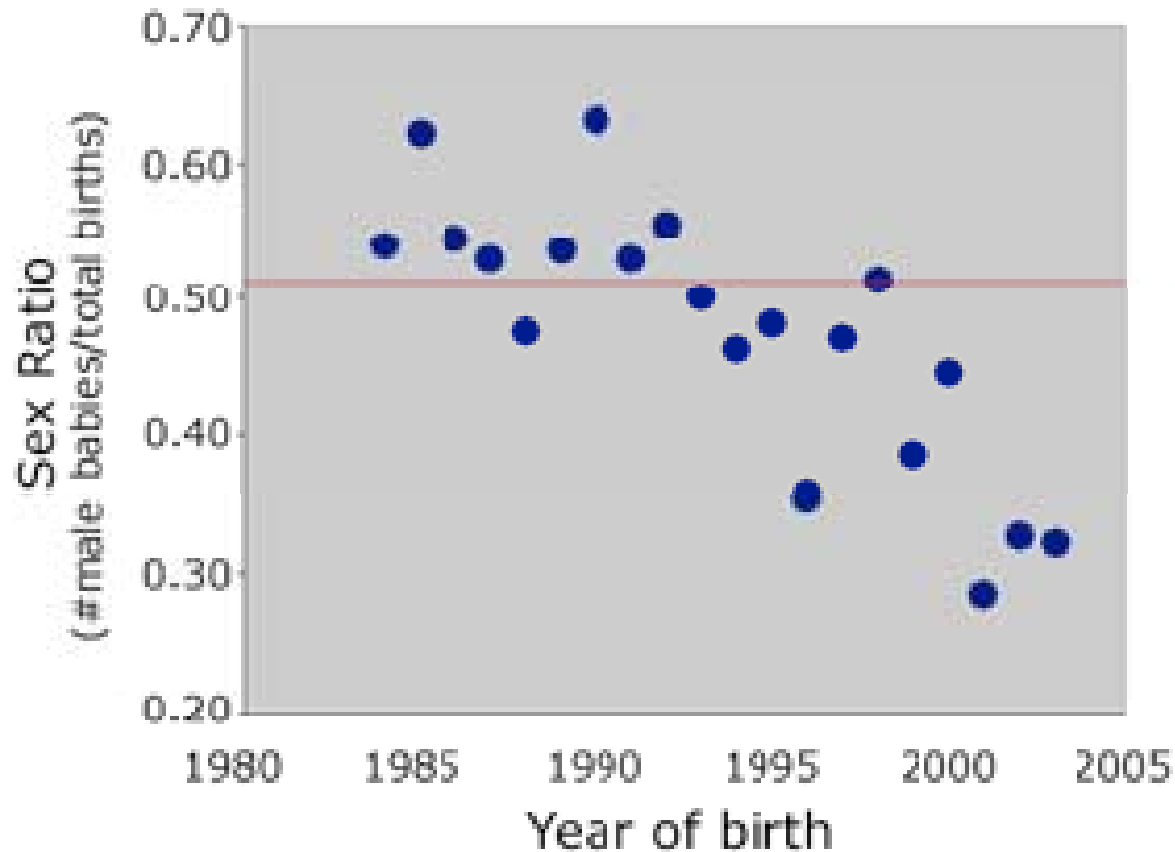
Compared with 30 years ago:

- 46% more men get testicular cancer
- 76% more men get prostate cancer

# The Disease Burden is worse for Blacks, Latinos and Native Americans

- African American men are twice as likely to have prostate cancer as Caucasian men.
- African American women are twice as likely to die from cervical cancer than white women.
- American Indians, Alaska natives, African Americans and Hispanics are at least twice as likely to have diabetes than whites.

# Fewer boys being born



adapted from Mackenzie et al. 2005

Sarnia  
Ontario  
Aamjiwnaang  
decline from  
50% to 35%  
in male births

CA Mackenzie et al,  
Declining Sex Ratio in a  
First Nation Community,  
Environmental Health  
Perspectives, 2005

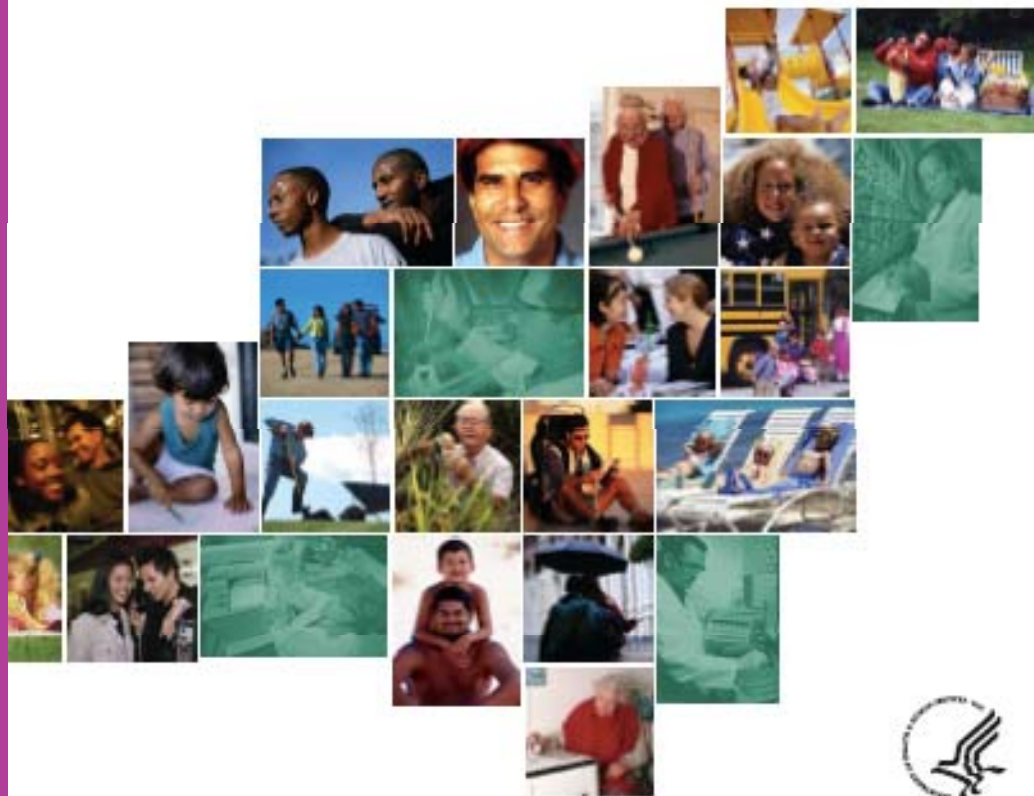
# Boys More Passive and Girls More Aggressive



Jo M. Braun, et al., "Prenatal Bisphenol A Exposure and Early Childhood Behavior," *Environmental Health Perspectives*, October 6, 2009

Third National Report on Human Exposure to  
Environmental Chemicals

2005



Executive Summary



Bisphenol A  
in 92.6%  
of  
2,517 NHANES  
participants  
6 years old  
and older  
in 2003-2004

[www.cdc.gov/exposurereport/](http://www.cdc.gov/exposurereport/)



In the absence of direct information regarding cause and effect, the precautionary principle is critical to enhancing reproductive and endocrine health .

As endocrinologists, we suggest that The Endocrine Society actively engages in lobbying for regulation seeking to decrease human exposure to the many endocrine-disrupting agents.



What can we do while we're  
waiting for elected officials  
to act?





GREEN CHOICES | Planned Parenthood

## Environmental Health Assessment Form

Every day, we eat, drink, breathe, and touch chemicals that exist around us. This assessment will help you identify some of your exposure to common chemicals. Planned Parenthood GREEN CHOICES and our staff will then give you the information you need to make choices for better health and a greener environment — for yourself, your family, and your community.

Name \_\_\_\_\_

**To be completed by staff:**

Staff name \_\_\_\_\_

Chart number \_\_\_\_\_



GREEN CHOICES | Planned Parenthood

## Productos De Limpieza

Todos los días comemos, bebemos, respiramos y tocamos sustancias químicas a nuestro alrededor. Estas sustancias químicas pueden afectar nuestra salud.

Obtenga la información necesaria para proteger su salud y el medio ambiente –

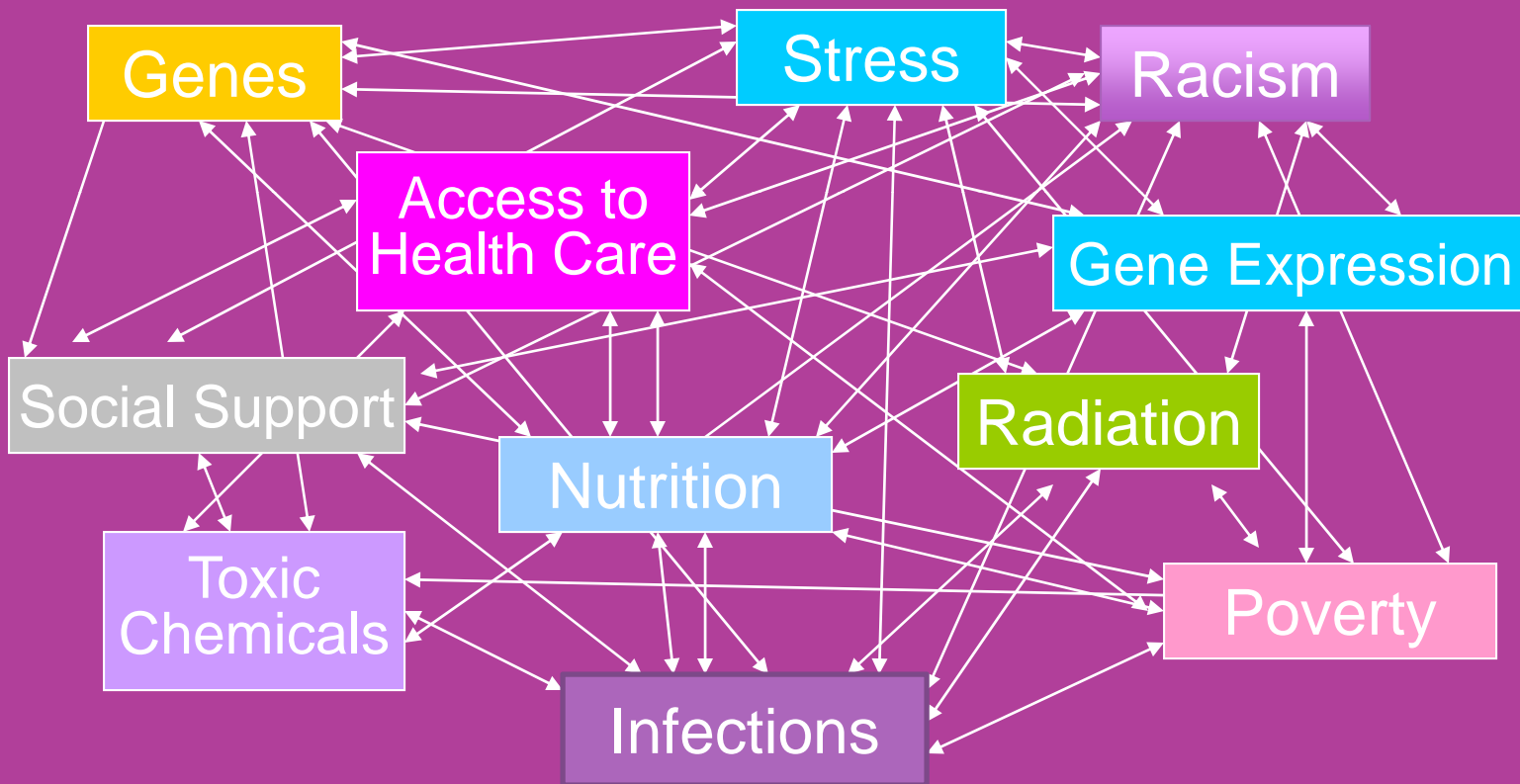


GREEN CHOICES | Planned Parenthood

## Plastic

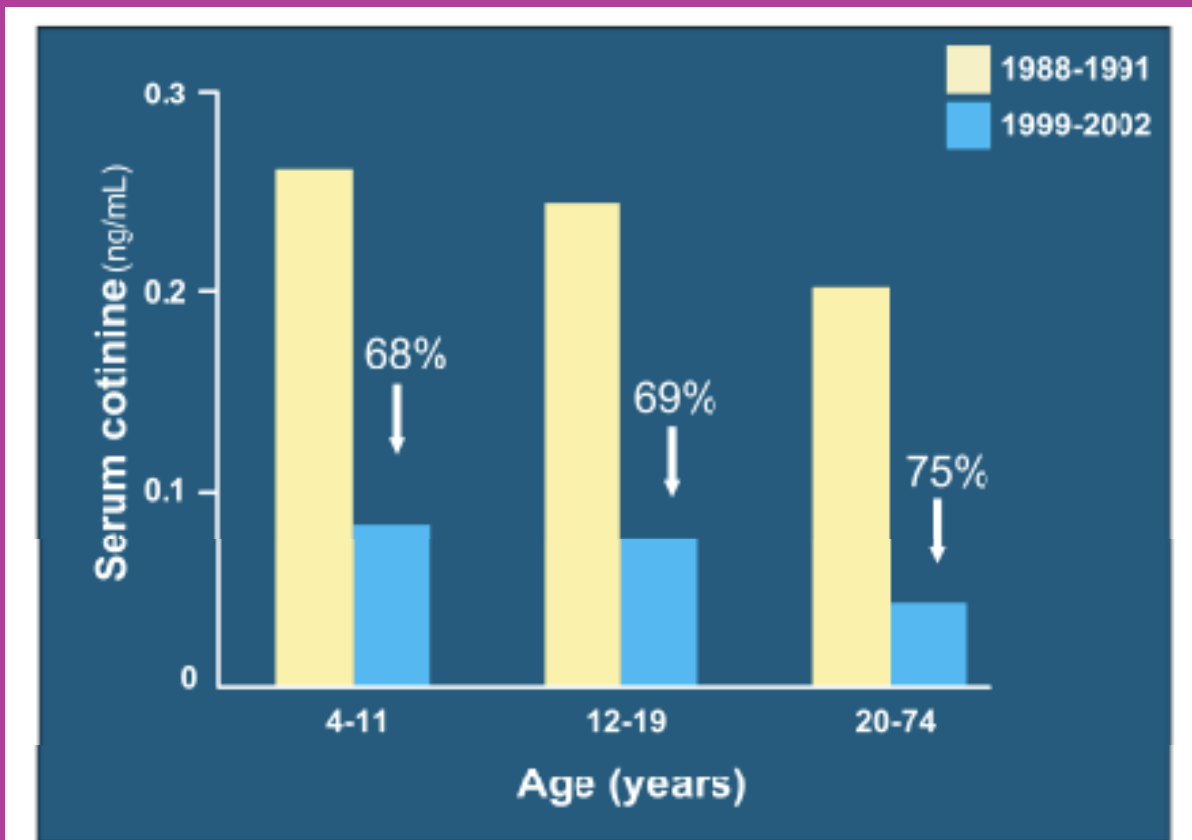
Everyday, we eat, drink, breathe, and touch chemicals that exist around us. The chemicals can affect our health. Planned Parenthood GREEN CHOICES will give you the information you need to make choices for better health and a greener environment — for yourself, your family, and your community.

# Lessen stressors to create resiliency and decrease disease



Adapted from T. Schettler's modification of Hubbs-Tait et al. "Psychological science in the public interest"

# Lower exposures we can lower



**Figure 2.** Serum cotinine levels tracking exposure to secondhand smoke in the non-smoking U.S. population

Thanks.

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