

Silent Spring Institute

Researching the Environment and Women's Health

“Certainly for the generations yet unborn, prevention is the imperative need.”

--Rachel Carson
1962



Selected Breast Cancer Risk Factors

- Ionizing radiation
- Family history
- Reproductive history: early menarche, late menopause, nulliparity, late first pregnancy
- Body size
- Pharmaceutical hormones: HRT, OCs, DES
- Alcohol use, lack of physical exercise
- Socioeconomic status



Chemicals that make breast cancer cells grow are found in . . .

- Pesticides
- Insect repellent
- Food packaging
- Laundry detergent
- Hair spray
- Glues, adhesives
- Plastic toys
- Synthetic leather
- Disinfectants
- Transformers (PCBs)
- Spermicide
- Oral contraceptives
- Hormone replacement
- DES
- Soybeans



Chemicals that cause mammary tumors in animals are found in . . .

- gasoline
- auto exhaust
- pesticides
- flame retardants
- solvents
- explosives
- air pollution (particulates)
- furniture finishes
- paint remover
- textile dyes
- moldy grain



Community Studies

A few organochlorine pesticides, PCBs

- Inconsistent and mostly negative findings

Dieldrin (Hoyer, 1998, 2000)

- ↑ About 3-fold in 70s: Mortality $RR\ 2.78\ (1.38-5.59)$
- ↑ About 6-fold average of 70s, 90s $RR = 5.76\ (1.86-17.92)$

DDT during years of use (Cohn et al., 2002)

- ↑ About 10-fold for highest group; significant trend
 $OR = 10.4\ (2.5-43.2)$

PAH DNA adducts (Gammon et al. 2002)

- ↑ About 50% for highest group $OR = 1.49\ (1.00-2.21)$



Disasters, Accidents Linked to Breast Cancer

- Ionizing radiation Hiroshima, Nagasaki
 - ↑ 30% to 6-fold
highest for exposures at younger age
- Dioxin Seveso, Italy, '76 accident (Warner et al., 2002)
 - ↑ 2-fold women exposed at < 40 yrs (95% CI 1.0-4.6)
- PERC in drinking water (Aschengrau et al., 2002)
 - ↑ 30% to about 2-fold



Occupation

- Men - gasoline and vehicle exhaust (Hansen, 2000)
 - ↑ 2 ½-fold with 10 –year lag time (95% CI 1.3-4.5)
 - ↑ More than 5-fold under 40 at diagnosis (95%CI 2.4-1.9)
- Women aged 20-55 - organic solvents (Hansen,1999)
 - ↑ 2-fold with > 10 years work (95% CI 1.4-2.8)
- White collar jobs, truckers, engine mechanics, molding & casting machine operators, garage & service-station, clinical laboratory technologists, painters, sculptors



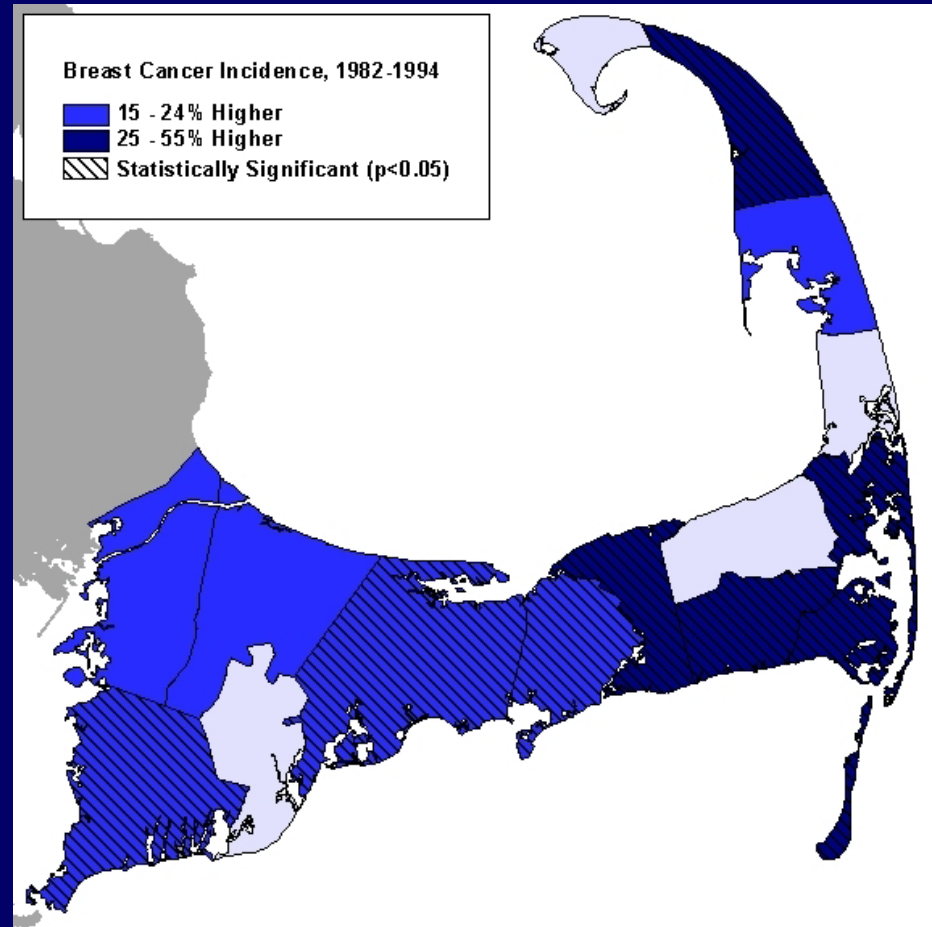
With strong leads from the lab... why is it hard to find the link?

Exposure Measurement Challenges

- We can't ask
- Mixtures, degradation products
- Widespread exposure
- Timing -- Latency
- Timing -- Vulnerability periods
- Money



Cape Cod Breast Cancer and Environment Study



Household Exposure Study

89 chemicals in air, dust, water

■ Pesticides

o-phenylphenol
permethrin
piperonyl butoxide
carbaryl
methoxychlor
heptachlor
4,4'-DDT
propoxur
pentachlorophenol
chlorpyrifos
chlordane
diazinon





The Spatial Proximity Tool calculates distance and direction as well as using local climatic data to calculate exposure from nearby cranberry bog spraying

Points represent the residences of women in our study. Points shown here are just examples.



More Challenges

- Susceptibility - gene-environment interactions
- Diagnosis -- more than one disease
- Small effects



■ What will success look like?

- Breast feeding reduces moms' risk
 - 47 studies
 - 96,973 women

Collaborative Group on Hormonal Factors in Breast Cancer (*Lancet* 2002)

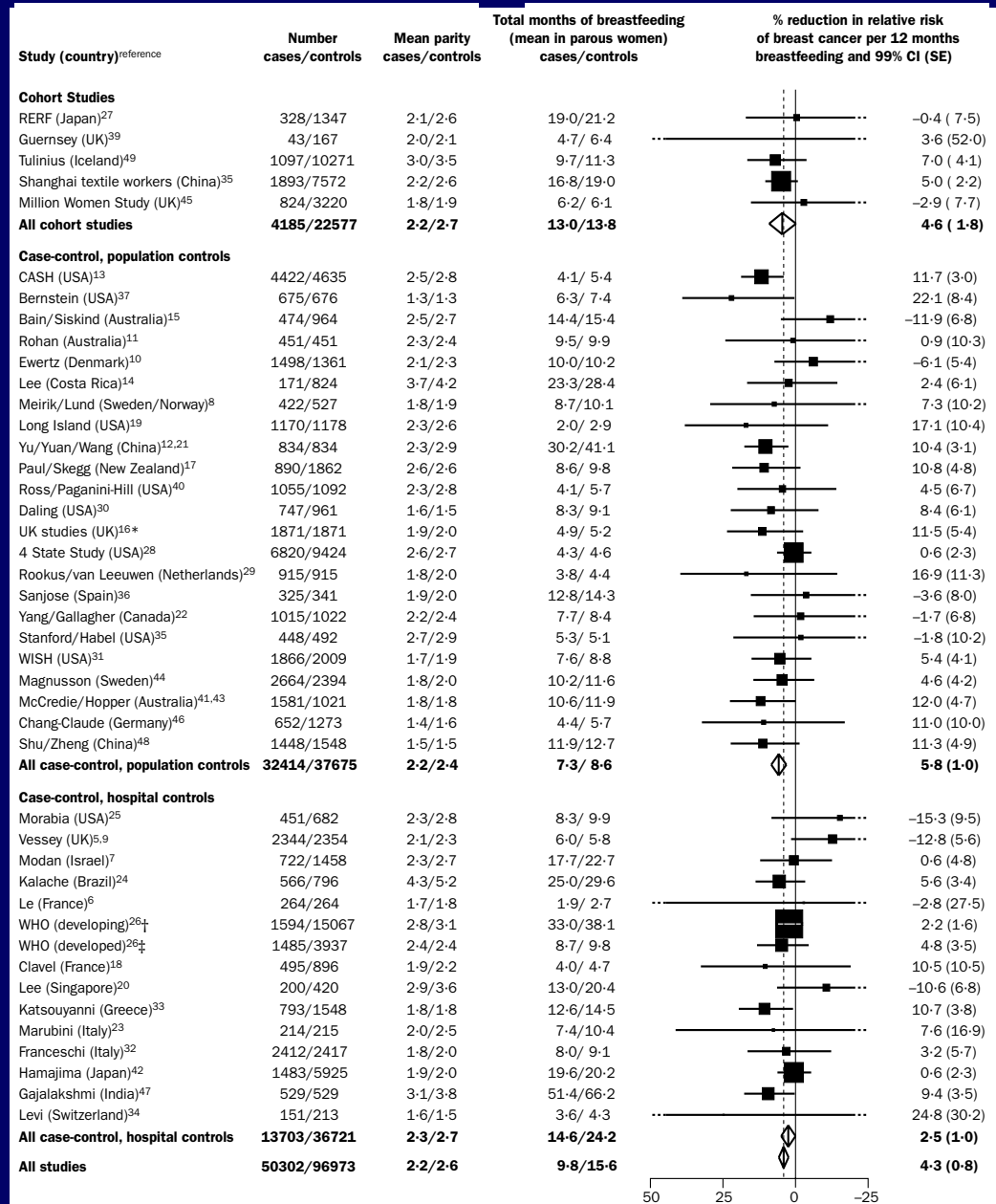


Figure 1: Details and results from studies that contributed data on breastfeeding and breast cancer

*Results of two unpublished studies are also cited here. †Ten developing countries. ‡Three developed countries.

www.SilentSpring.org



Alliance of Science, Activism, Public Policy

- Silent Spring Institute
- Boston University School of Public Health
- Harvard School of Public Health
- Tufts University School of Medicine
- US Centers for Disease Control - NCEH
- MA Breast Cancer Coalition



■ Stay Involved

- Join with your community
- Be a “multiplier” - share your knowledge
- Support prevention research and action

She's the test subject for thousands of toxic chemicals. **Why?**

Industry falsely discredits current animal testing.

In previous ads in this series, we physicians and scientists have presented a body of scientific evidence linking toxic chemicals to a wide range of health problems in humans, from learning disabilities and brain injury in children to certain cancers in both children and adults.

We have emphasized that these health problems are preventable. We have stressed that thorough pre-market testing of chemicals is a critical component of disease prevention.

There is a well-established and respected FDA approval process that a company must follow before it can market a chemical as a medicine. That process includes testing at various doses on animals. Only if the medicine is shown to be safe for animals is it approved for tests on humans.

America's pharmaceutical industry acknowledges, indeed embraces, these animal testing regimes for medicines. At the same time, however, certain segments of the chemical industry are making false claims about similar pre-market testing for chemicals other than medications.

They claim that testing has little value "because at a high enough dose all chemicals cause cancer." That's not true. The National Cancer Institute and the National Toxicology Program find that only 5-10% of commercial chemicals cause cancer at any dose. The industry also claims that animal testing bears little connection to human risk. That's not true either – the Human Genome Project has shown that laboratory animals and humans have very great genetic similarity and share very similar endocrine, immune and nervous systems.

The industry claims that testing has little value unless it involves tens of thousands of animals at low dose levels. Not true – the National Toxicology Program has developed sophisticated

technologies for testing chemicals at a range of doses in small numbers of animals and then predicting human risk.

Inaccurate and false as all these claims are, they have found a certain audience in government and the press. These claims have paralyzed the regulatory process. They are preventing whole classes of chemicals from being properly tested. And that puts everybody's health at risk, especially the health of our children.

What We Know

- Every known human carcinogen causes cancer in animals.
- Every chemical known to cause brain damage in humans causes damage to the brain and nervous system in animals.
- Every chemical known to interfere with reproductive function in humans interferes with reproduction in animals.
- Almost every known cause of birth defects in humans also causes birth defects in animals.
- And, with few exceptions, when toxic chemicals harm animals, they almost always cause similar harm in humans.

What We Can Do

Parents should limit their children's exposure to synthetic chemicals. They should minimize use of pesticides outside and inside the house. They should choose safe cleaning products. Wherever possible, they should purchase organically produced food. Fish from contaminated waters should be avoided. There are more suggestions at www.childenvironment.org.

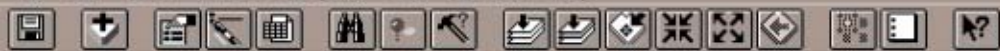
We must do more. The evidence is incontrovertible. We must move quickly to phase out those toxic chemicals that are known to pose a danger to human health. And we must institute a system of regulation that tests new synthetic chemicals and proves them safe before they are allowed to be sold, before our children are exposed. Isn't that the system you thought we already had?



**Center for
Children's Health
and the
Environment**

**MOUNT SINAI
SCHOOL OF
MEDICINE**





8. Activities within Zones of Recharge

- Lu2_1951_zoo.shp
- Lu2_1971_zoo.shp
- Zone IIs
- Lu2_1984_zoc.shp
- Lu51_Agr_ZOC
- Public Water Supplies
- Sagamore GW Lense
- Monomoy GW Lense
- Nauset GW Lense
- Chequesset GW Lense
- Pamet GW Lense
- Lu71_Agr_ZOC
- Pilgrim GW Lense
- Roads
- Groundwater Contours
- Cranberry Bogs
- Golf Courses

