

WP7 – An example of Ecologic Study

Triazine Herbicide Exposure and Breast Cancer Incidence: An Ecologic Study of Kentucky Counties

Michele A. Kettles, Steven R. Browning, Timothy Scott Prince, and Sanford W. Horstman

Department of Preventive Medicine and Environmental Health, University of Kentucky College of Medicine, Lexington, KY 40504-9842 USA

Volume 105, Number 11, November 1997 • Environmental Health Perspectives

- Ecologic study (120 counties in Kentucky, mix of urban and rural area)
- 70% use of surface water, 30% wells or other sources
- Focus on organochlorines, such as the triazine herbicides, and their possible role in the initiation or promotion of human breast cancer
- Exposure to triazines estimated by use of water contamination data, corn crop production, pesticide use data

WP7 – An example of Ecologic Study

Methods (exposure 1 - groundwater):

- Data gathered from a survey report (1990-1991)
- 4859 wells tested (2,3% of total wells)
- Multiple samples from each well in different periods
- Triazines measured by immunoassay (only 10% gas chromatography)
- Average measure of exposure for each county

Methods (exposure 2 – surface water):

- Reports of Kentucky Environmental Protection Cabinet
- Tests for triazines every 4 months (1993-1996)
- Tests at the faucets (sample of selected homes)
- Triazines measured by gas chromatography

WP7 – An example of Ecologic Study

Methods (exposure 3 - pesticides):

- Two surrogate measures of pesticide exposure:
 - 1 – acres of corns planted in each county
 - 2 - survey of the amount of pesticide used by applicators in each county (1979)

Methods (exposure 4 – exposure status):

- Based on the water contaminant, corn planted, and pesticide use variables, counties were categorized by exposure status.

Methods (health data):

- Data on county breast cancer rates from the state registry (1991-1994)

WP7 – An example of Ecologic Study

Data analysis:

- Adjusting variables: age, race, age at first live birth, income and level of education
- Results revealed a statistically significant increase in breast cancer risk with medium and high levels of triazine exposure
OR = 1.14; $p < 0.0001$ (medium level)
OR = 1.2; $p < 0.0001$ (high level)