Health Concerns and Data Around the Illinois Nuclear Power Plants

Joseph R. Sauer, MD
The Cancer-Cluster Myth
When is an Epidemic Not an Epidemic?
BEIR

- NRC stated that BEIR VI showed low levels did not have health effects
- Actual report showed numerous studies showing increased cancer risk
- BEIR VII emphasized risk of low level radiation
- No safe level
Cancer in Populations Living Near Nuclear Facilities

- NRC stated that the NCI study proved that there was no increase in cancer risk for people living near plants.
- Wanted results in short period of time.
- Mortality Data.
- County-wide Data leads to dilution.
- Can not determine incidence from Mortality Data.
Illinois Dept of Public Health

- County-wide data
- Compared Nuclear vs. Non-nuclear counties
Improved design

Zip Code Data

Only included pediatric malignancies

Included all nuclear power plants including closed Zion Plant
Will County Health Department

- Stated number of cancer cases increased near plants at same rate as increase in population
- Used change in population from 1990 to 2000 and change in cancer numbers from 1995 to 2000
- Indicates incidence was doubling over the 5 years
IDPH Public Data Set

- All data from public data set V16
- Zip Code Level
- Cancer type broken down to 10 categories
- Age grouping in 4 categories 0-14, 15-44, 45-64, 65+
- Grouped in 5 year intervals to protect privacy
Braidwood & Dresden Nuclear Power Plants

- Largest and oldest of Illinois nuclear power plants
- Poor safety history
- NRC Watch List through most of 1990’s
- Numerous leaks of radioactive wastes and reactor by-products
- Two leaks in excess of 3 million gallons into ground water
Dosimetry

- Practical under controlled circumstances
- Accuracy dependent on quality of measurements
- Numerous concerns for validity of testing
- Self-testing, self-reporting
- Unplanned releases via unmonitored pathways
Methodology

- Radius of 15 miles of either Braidwood or Dresden
- Chosen to maximize population without including Joliet which had different socioeconomic makeup
- All zip codes in which any portion lies within radius
Intervals

- Provides a full 20 years of data
- Similar relation to respective Census years of 1990 and 2000
- One interval prior to and one after the first reported leak of 1996
Illinois

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<td>IL leuk increased 15.8%</td>
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<td>Total</td>
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<td>51561</td>
<td>1.09</td>
<td>9.0</td>
<td>IL total increased 9%</td>
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### Braidwood and Dresden

<table>
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<tr>
<th>Age Adjusted</th>
<th>Cases 1987-96</th>
<th>Cases 1997-06</th>
<th>Relative Risk</th>
<th>Percent Change</th>
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<td>21.3</td>
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Dres/Braid breast increased 15.3%

Dres/Braid neuro cancer increased 30.2%

Dres/Braid leukemia increased 30.8%

Dres/Braid total increased 17.8%
Summary

- In Illinois, overall cancer rate increased 9%
- In Braidwood & Dresden area, overall cancer rate increased 17.8%
Illinois increased 15.8%

Braidwood & Dresden increased 30.8%
Brain Cancer

- Illinois decreased 0.7%
- Braidwood & Dresden increased 30.2%
<table>
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<th>Tumor Type</th>
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<th>1997-06</th>
<th>Percent Change</th>
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<tr>
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<tr>
<td>Total</td>
<td>1.02</td>
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Relative Risk for Breast cancer increased 15.2%
Relative Risk for neurologic malignancy increased 31%
Relative Risk for leukemia increased 13%
Relative Risk of developing malignancy is 10% higher than state of IL for past 10 years
Relative Risk after Spills 1997-2006

- Braidwood & Dresden: Illinois Ratio
  - All Cancers Combined: 1.10
  - Leukemia: 1.18
  - Brain: 1.23

- 10% more likely to develop cancer living near plants
- 23% more likely to develop brain cancer near plants
Pediatric Cancer - Total

- Rate for ten years before (1986-95) versus ten years after (1996-05) change in exposure

- **Zion** showed pediatric cancer rate **decreased 9.7%** after closure of plant

- **Braidwood & Dresden** showed pediatric cancer rate **increased 55%** after leaks began

- Using 1987-96 vs. 1997-06 showed 13% decrease at Zion and 38% increase at Braidwood & Dresden
Recommendation One

- Focus on the most vulnerable populations
- Pediatrics (unborn babies)
- Those who live closest to plants and location of discharges
- Consider including workers who are involved with nuclear side of plant
Recommendation Two

- Focus on plants with a poor safety history
- Concentrate on plants with leaks, spills or other unanticipated releases
- Look at older plants where low levels of radiation have accumulated in plants, fish, livestock and soil
Recommendation Three

- Know your Population
- Know your plant History
Recommendation Four

• Remember the Precautionary Principle

• “When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically. In this context the proponent of an activity, rather than the public, should bear the burden of proof.”

Recommendation Four

“Some will argue that if no effect is found there isn’t a problem...but the fact that you can’t measure a risk in an epidemiological study doesn’t mean that the risk isn’t there.”

–David Brenner,
Director of the Center for Radiological Research, Columbia University
Recommendation Five

- Policies and regulations may need to be changed

- If this study demonstrates an increased cancer risk near the nuclear facilities but does not reach statistical significance, safety of people and especially children must trump profit
Recommendation Five

- U.S. nuclear regulator lets industry write rules. In the fall of 2001, inspectors with the Nuclear Regulatory Commission were so concerned about possible corrosion at Ohio’s Davis Besse Nuclear Power Station that they prepared an emergency order to shut it down for inspection. But senior officials at the agency held off – in part because they did not want to hurt the plant’s bottom line. ProPublica
Radioactive leaks increasing at U.S. nuclear plants.
–Asbury Park Press, New Jersey.

Leaks put spotlight on aging nuclear plants – US news

1/4 of U.S. nuclear plants leak radiation ... Mar 26, 2010 ... In Illinois, the Braidwood Nuclear Plant leaked millions of gallons of ... –Adirondack Daily Enterprise

Illinois Sues Exelon for Radioactive Tritium Releases Since 1996

Braidwood Nuclear Power Station, Aug. 16, 2010

Duct Tape Repair

Online NewsHour: Exelon Corportaion Mishandles Nuclear Power ... Apr 17, 2006 ... JAMES GLASGOW, WILL COUNTY STATE'S LAWYER: It reminded me of a Homer Simpson episode that I ... Will County state's attorney Glasgow was outraged
## Sample IDPH Data Points

<table>
<thead>
<tr>
<th>Zip Code</th>
<th>Sex</th>
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**Zip Code**

**Sex**

**Cancer**

**Age**

**Stage**

**Year**
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Sarah Sauer