

Health Concerns and Data Around the Illinois Nuclear Power Plants

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Illinois Dept of Public Health

- 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

- 1987-1996 and 1997-2006
- 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

| | Cases | Cases | (1997-06) : (1987-96) | | | | | |
|--------------|---------|---------|-----------------------|----------------|-------------------------------|--|--|--|
| Age Adjusted | 1987-96 | 1997-06 | Relative Risk | Percent Change | | | | |
| Oral | 1113 | 1100 | 0.99 | -1.2 | | | | |
| Colorectal | 6089 | 5969 | 0.98 | -2.0 | | | | |
| Lung | 7162 | 7484 | 1.04 | 4.5 | | | | |
| Breast | 7174 | 7178 | 1.00 | 0.1 | No change in IL breast cancer | | | |
| Cervix | 650 | 529 | 0.81 | -18.5 | | | | |
| Prostate | 6077 | 7062 | 1.16 | 16.2 | | | | |
| Urinary | 3189 | 3789 | 1.19 | 18.8 | | | | |
| Nervous | 657 | 652 | 0.99 | -0.7 | IL neuro decreased 0.7% | | | |
| Leukemia | 3130 | 3624 | 1.16 | 15.8 | IL leuk increased 15.8% | | | |
| Other | 11172 | 12603 | 1.13 | 12.8 | | | | |
| Total | 47293 | 51561 | 1.09 | 9.0 | IL total increased 9% | | | |

Braidwood and Dresden

| | | Cases | | Cases | (1997-06):(1987-96) | | | | | | |
|--------------|--|---------|--|---------|---------------------|----------------|---|--|--|--|--|
| Age Adjusted | | 1987-96 | | 1997-06 | Relative Risk | Percent Change | | | | | |
| Oral | | 1153 | | 1302 | 1.13 | 13.0 | | | | | |
| Colorectal | | 6302 | | 6817 | 1.08 | 8.2 | | | | | |
| Lung | | 8322 | | 8861 | 1.06 | 6.5 | | | | | |
| Breast | | 6487 | | 7479 | 1.15 | 15.3 | Dres/Braid breast increased 15.3% | | | | |
| Cervix | | 594 | | 581 | 0.98 | -2.2 | | | | | |
| Prostate | | 6035 | | 7123 | 1.18 | 18.0 | | | | | |
| Urinary | | 3362 | | 4531 | 1.35 | 34.8 | | | | | |
| Nervous | | 615 | | 801 | 1.30 | 30.2 | Dres/Braid neuro cancer increased 30.2% | | | | |
| Leukemia | | 3281 | | 4293 | 1.31 | 30.8 | Dres/Braid leukemia increased 30.8% | | | | |
| Other | | 11335 | | 13747 | 1.21 | 21.3 | | | | | |
| Total | | 48198 | | 56792 | 1.18 | 17.8 | Dres/Braid total increased 17.8% | | | | |

Summary

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

Leukemia

Illinois increased 15.8%

Braidwood & Dresden increased 30.8%

Brain Cancer

- Illinois decreased 0.7%
- Braidwood & Dresden increased 30.2%

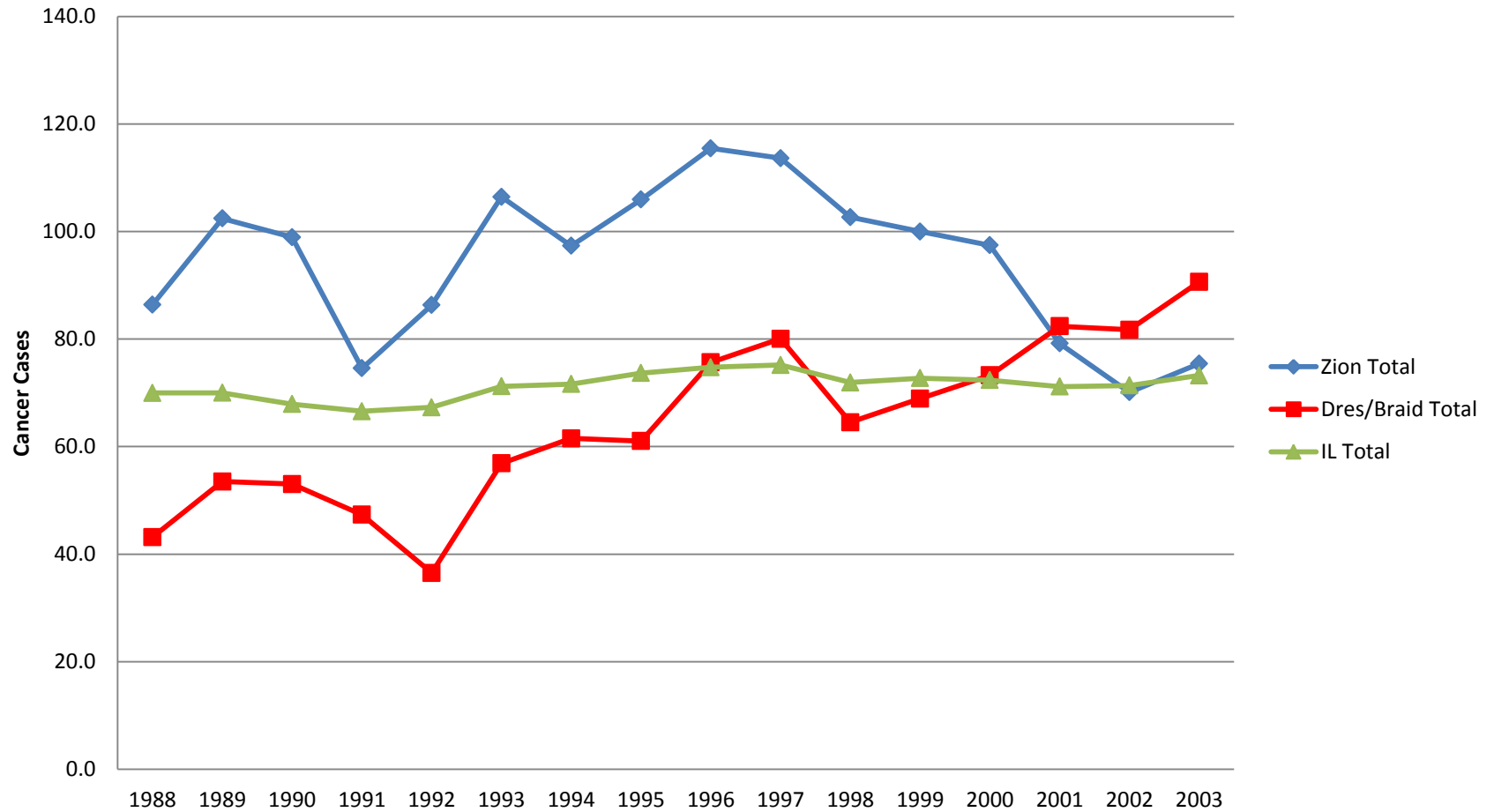
Relative Risk Dresden & Braidwood vs IL

| | 1987-96 | 1997-06 | Percent Change | | | | | | | | |
|------------|---------|---------|----------------|---|--|--|--|--|--|--|--|
| Oral | 1.04 | 1.18 | 14.3 | | | | | | | | |
| Colorectal | 1.03 | 1.14 | 10.3 | | | | | | | | |
| Lung | 1.16 | 1.18 | 1.9 | | | | | | | | |
| Breast | 0.90 | 1.04 | 15.2 | Relative Risk for Breast cancer increased 15.2% | | | | | | | |
| Cervix | 0.91 | 1.10 | 20.1 | | | | | | | | |
| Prostate | 0.99 | 1.01 | 1.6 | | | | | | | | |
| Urinary | 1.05 | 1.20 | 13.4 | | | | | | | | |
| Nervous | 0.94 | 1.23 | 31.0 | Relative Risk for neurologic malignancy increased 31% | | | | | | | |
| Leukemia | 1.05 | 1.18 | 13.0 | Relative Risk for leukemia increased 13% | | | | | | | |
| Other | 1.01 | 1.09 | 7.5 | | | | | | | | |
| Total | 1.02 | 1.10 | 8.1 | 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 Cases Per Hundred Thousand



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

Reference Man

- Male
- 20-30 years old
- Weight 70 kg (154 lbs)
- Height 170 cm (5 ft 7 in)
- Caucasian

Price-Anderson Nuclear Industries Indemnity Act

- Implemented in 1957 for a fledgling industry
- Encouraged private sector involvement by removing the deterrent ... presented by the threat of potential liability claims following a large nuclear accident.
- Role expanded to include any incident involving radioactive materials by industry or contractors
- Does not mean they are not responsible

National Academy of Science Study

- Independent study commissioned by Chairman Jaczko of the NRC
- Purpose: to recommend scientifically sound approaches to study cancer risks associated with living near a nuclear power plant
- Phase I completed
- One of the two approaches is a case controlled evaluation of children with cancer born near a nuclear facility

Sarah Sauer



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19972001

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