THE GEOGRAPHY OF CANCER: WHEN PLACE MATTERS

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MN Environmental Public Health Tracking

John Soler
Minnesota Cancer Surveillance System
The Geography of Cancer: When Place Matters

• Part 1:
  • Overview of MN Environmental Public Health Tracking
  • Demonstration of MN Public Health Data Access

• Part 2:
  • How important is geography’s role in the incidence of cancer?
  • When is geography a risk factor for developing a certain kind of cancer?
  • Why is investigating geographically-based cancer clusters, especially in small communities, so challenging?
What is Environmental Public Health Tracking (EPHT)?

HAZARDS

Air
Water

EXPOSURE

Lead
PFCs
Mercury

HEALTH

Asthma
COPD
Birth defects
Cancer
National Tracking Network

• Congress first appropriated funding to the CDC to establish the Network in 2002

• The Network was charged to…
  • Provide data that are nationally consistent
  • Make information available through a web-based network (data portals)
Tracking Network (2013)

Network includes 23 states, NYC, and 5 academic partners.
THE GEOGRAPHY OF CANCER: DOES PLACE MATTER?

1) Cancer Worldwide (quick examples)
2) Cancer U.S. (quick examples)
3) Cancer Minn. (interesting data/situations)
4) Polluting Event looking for a Disease
5) Cancer Clusters looking for a Cause
Points to be made

• Much has been learned about cancer risks from large area geographical differences
• Little to nothing has been learned about cancer risks from small area cluster studies
• Smoking matters – big time!!
• Geography matters – but in ways that may surprise you
Estimated age-standardised incidence rate per 100,000
Lung: male, all ages
Estimated age-standardised incidence rate per 100,000
Breast, all ages

GLOBOCAN 2008 (IARC) - 16.1.2013
Estimated age-standardised incidence rate per 100,000
Liver: both sexes, all ages

GLOBOCAN 2008 (IARC) - 4.2.2013
Estimated age-standardised incidence rate per 100,000
Stomach: both sexes, all ages

GLOBCAN 2008 (IARC) - 1.2.2013
Male Lung & Bronchus by State (05-09)

Invasive Cancer Incidence Rates by State/Province in North America
Male Lung and Bronchus, 2005-2009

Age-Adjusted Rate/100,000

C.L.L by State (05-09)

Invasive Cancer Incidence Rates by State/Province in North America
Chronic Lymphocytic Leukemia, 2005-2009

Age-Adjusted Rate/100,000

Source: Data as of July 2010 reported by NAACCR as meeting high quality standards for 2003-2007 and include data from state and provincial cancer registries participating in SEER, NPCR, or both, in the US and the Canadian Cancer Registry in Canada. To account for population anomalies caused by Hurricane Katrina in 2005, statistics for AL, LA, and TX are based on cases diagnosed through June 2005.

Age-Adjusted Invasive Cancer Incidence Rates in North America
Chronic Lymphocytic Leukemia, 2005-2009
By State/Province
Age-Adjusted to the 2000 U.S. Standard Population
North America Combined Rate: 4.26

Rate per 100,000
- 2.42 - 3.77
- 3.83 - 4.34
- 4.41 - 5.15
- 5.60 - 7.67
- No Data Available
Liver Cancer by State (05-09)

Invasive Cancer Incidence Rates by State/Province in North America
Liver, 2005-2009

Age-Adjusted Rate/100,000

Source: Data as of July 2010 reported by NAACCR as meeting high quality standards for 2003-2007 and include data from state and provincial cancer registries participating in SEER, NPCR, or both, in the US and the Canadian Cancer Registry in Canada. To account for population anomalies caused by Hurricane Katrina in 2005, statistics for AL, LA, and TX are based on cases diagnosed through June 2005.

Age-Adjusted Invasive Cancer Incidence Rates in North America
Liver, 2005-2009
By State/Province
Age-Adjusted to the 2000 U.S. Standard Population
North America Combined Rate: 5.92

Rate per 100,000

- 2.15 - 4.02
- 4.00 - 5.10
- 5.11 - 5.97
- 5.98 - 9.73

Map created Jan 17, 2013

Source: Data submitted for the 2012 NAACCR Call For Data, December 2011.
Registries included in the maps and tables meet the NAACCR criteria for high quality data for 2005-2009. The data are provided from state and provincial cancer registries participating in SEER, NPCR, or both, in the US and the Canadian Cancer Registry in Canada. To account for population anomalies caused by Hurricane Katrina in 2005, statistics exclude data for AL, LA, MS, and TX from July 2005 through December 2005.
Deaths Due to Heart Disease and Cancer, Minnesota, 1980-2010

Source: MCSS. Rates are age-adjusted to the 2000 U.S. population.
Risk of cancer by age

<table>
<thead>
<tr>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 in 333 by 20 years</td>
<td>1 in 333 by 20 years</td>
</tr>
<tr>
<td>1 in 125 by 30 years</td>
<td>1 in 111 by 30 years</td>
</tr>
<tr>
<td>1 in 66 by 40 years</td>
<td>1 in 45 by 40 years</td>
</tr>
<tr>
<td>1 in 33 by 50 years</td>
<td>1 in 19 by 50 years</td>
</tr>
<tr>
<td>1 in 11 by 60 years</td>
<td>1 in 9 by 60 years</td>
</tr>
<tr>
<td>1 in 4 by 70 years</td>
<td>1 in 4 1/2 by 70 years</td>
</tr>
<tr>
<td>52% lifetime</td>
<td>45% lifetime</td>
</tr>
</tbody>
</table>
Lung & Bronchus Cancer Incidence by Race/Ethnicity, Minnesota, 2000-2009
Cancer in Minnesota
Lung and Bronchus
2005 - 2009 | Female
Age-adjusted Incidence Rates (per 100,000)

Age-adjusted Incidence Rates (per 100,000)

- 6.2 - 42.4
- 42.5 - 60.1
- 60.2 - 77.9
- 78.0 - 95.6
- 95.7 - 113.3
- Unstable rate*
- Data not shown**

Minnesota = 49.8

* Rates based on numerators less than 10 may be unstable and should be interpreted with caution.
** To protect an individual's privacy, cancer counts are suppressed if the underlying population is less than or equal to 1,000 population. The number may also be suppressed due to complementary suppression or in a situation where the total number of all types of cancers for a region is less than 20 and within those twenty cancers, a few cancer types account for many of the total number of cancers.
Mesothelioma Mortality Rates by County, Age >15, 2000-2004

2. Koochiching 77.5/10^7 (6)
4. Carlton 55.3/10^7 (8)
50. St. Louis 31.3/10^7 (32)
### Cancer Rates NE – Males 1988-2007

<table>
<thead>
<tr>
<th>Cancer Site</th>
<th>Ratio of Observed vs. Expected Cancers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral Cavity (610)</td>
<td>NE Rate Lower</td>
</tr>
<tr>
<td>Esophagus (305)</td>
<td>NE Rate Higher</td>
</tr>
<tr>
<td>Stomach (389)</td>
<td>NE Rate Lower</td>
</tr>
<tr>
<td>Colon (1,571)</td>
<td>NE Rate Higher</td>
</tr>
<tr>
<td>Rectum (712)</td>
<td>NE Rate Lower</td>
</tr>
<tr>
<td>Liver (148)</td>
<td>NE Rate Lower</td>
</tr>
<tr>
<td>Pancreas (366)</td>
<td>NE Rate Higher</td>
</tr>
<tr>
<td>Larynx (261)</td>
<td>NE Rate Lower</td>
</tr>
<tr>
<td>Lung and Bronchus (2,776)</td>
<td>NE Rate Higher</td>
</tr>
<tr>
<td>Mesothelioma (150)</td>
<td>NE Rate Lower</td>
</tr>
<tr>
<td>Soft Tissues (111)</td>
<td>NE Rate Lower</td>
</tr>
<tr>
<td>Melanomas - Skin (557)</td>
<td>NE Rate Lower</td>
</tr>
<tr>
<td>Prostate (5,907)</td>
<td>NE Rate Lower</td>
</tr>
<tr>
<td>Testis (188)</td>
<td>NE Rate Lower</td>
</tr>
<tr>
<td>Urinary Bladder (1,340)</td>
<td>NE Rate Lower</td>
</tr>
<tr>
<td>Kidney And Renal Pelvis (543)</td>
<td>NE Rate Lower</td>
</tr>
<tr>
<td>Brain (247)</td>
<td>NE Rate Lower</td>
</tr>
<tr>
<td>Thyroid Gland (133)</td>
<td>NE Rate Lower</td>
</tr>
<tr>
<td>Hodgkin's Lymphoma (101)</td>
<td>NE Rate Lower</td>
</tr>
<tr>
<td>Non-Hodgkin's Lymphoma (877)</td>
<td>NE Rate Lower</td>
</tr>
<tr>
<td>Multiple Myeloma (221)</td>
<td>NE Rate Lower</td>
</tr>
<tr>
<td>Leukemias (572)</td>
<td>NE Rate Lower</td>
</tr>
<tr>
<td>All Cancers (19,223)</td>
<td>NE Rate Lower</td>
</tr>
</tbody>
</table>
Cancer Rates NE – Females 1988-2007

Ratio of Observed vs. Expected Cancers

0.5 1.0 2.0

NE Rate Lower  NE Rate Higher

Oral Cavity (311)
Esophagus (99)
Stomach (220)
Colon (1,578)
Rectum (471)
Liver (75)
Pancreas (386)
Larynx (65)
Lung and Bronchus (2,049)
Mesothelioma (13)
Soft Tissues (93)
Melanomas - Skin (489)
Breast (5,282)
Cervix Uteri (285)
Corpus Uteri (1,176)
Ovary (661)
Urinary Bladder (460)
Kidney and Renal Pelvis (310)
Brain (168)
Thyroid Gland (254)
Hodgkin's Lymphoma (79)
Non-Hodgkin's Lymphoma (750)
Multiple Myeloma (163)
Leukemias (437)
All Cancers (17,110)
Cancer mystery ignored

Rare and incurable, mesothelioma is striking men in northeastern Minnesota at a rate far higher than average. But a state inquiry into the reason for the high rate of asbestos-related cancer has never been launched — despite years of warnings and concern.

Taconite may not be culprit

Taconite, a rock used to make iron, may not be causing mesothelioma cancers as once feared. Multiple studies have linked the rock to the cancers, but a new study concludes the rock is not the cause.

State kept quiet on cancer in 35 miners

A new study finds that miners exposed to a dust containing asbestos may have contracted the deadly disease mesothelioma.

Multiple births multiply risks for parents and children

Multiple births increase the risk of several health problems for the mother and child. This is especially true for those who are born prematurely. A new study suggests that multiple births can also increase the risk of obesity in children.
CMC On-site Remediation

Hot spot excavation
Remove source for groundwater
### “Arsenic Triangle” zip code 55404 2002-2006

<table>
<thead>
<tr>
<th>Cancer Type</th>
<th>Males Observed</th>
<th>Males Expected</th>
<th>Females Observed</th>
<th>Females Expected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral Cavity</td>
<td>19</td>
<td>13</td>
<td>15</td>
<td>8</td>
</tr>
<tr>
<td>Esophagus+Stomach</td>
<td>13</td>
<td>13</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>Colon-Rectum</td>
<td>48</td>
<td>41</td>
<td>38</td>
<td>48</td>
</tr>
<tr>
<td><strong>Lung</strong></td>
<td><strong>89</strong></td>
<td><strong>48</strong></td>
<td><strong>58</strong></td>
<td><strong>45</strong></td>
</tr>
<tr>
<td>Melanoma of Skin</td>
<td>10</td>
<td>22</td>
<td>3</td>
<td>18</td>
</tr>
<tr>
<td>Breast</td>
<td>2</td>
<td>1</td>
<td>101</td>
<td>121</td>
</tr>
<tr>
<td>Cervix</td>
<td></td>
<td></td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Uterine</td>
<td></td>
<td></td>
<td>22</td>
<td>22</td>
</tr>
<tr>
<td>Ovary</td>
<td></td>
<td></td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>Prostate</td>
<td>84</td>
<td>122</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bladder</td>
<td>18</td>
<td>27</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>Kidney</td>
<td>9</td>
<td>16</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Non-Hodgkin Lymphoma</td>
<td>12</td>
<td>23</td>
<td>12</td>
<td>19</td>
</tr>
<tr>
<td>Leukemias</td>
<td>14</td>
<td>17</td>
<td>21</td>
<td>13</td>
</tr>
<tr>
<td><strong>All Cancer Types Combined</strong></td>
<td><strong>428</strong></td>
<td><strong>428</strong></td>
<td><strong>389</strong></td>
<td><strong>411</strong></td>
</tr>
</tbody>
</table>
PFBA in Southeast Metro - Jan. 2008

- Not detected
- 0.2 - 0.5 ppb
- 0.6 - 0.9 ppb
- 1.0 - 1.5 ppb
- 1.6 - 1.9 ppb
- > 2.0 ppb

PFOA and PFOS also detected, in addition to PFBA (see single aquifer maps for PFBA concentrations in these areas)

Note: PFCs detected at Pig's Eye, Pine Bend and SKB are in the shallow groundwater; PFCs at Pine Bend and SKB are contained on-site.

NOTE: This map compiles sample results from four aquifers. Wells in any given area may have lower levels of PFCs than shown.

Map updated - 3/3/08
PFC Site Remediation: Former Washington County Landfill
Cass Lake MN - St Regis Paper Company Superfund Site
2002 and 2003 Sample Locations

[Map showing sample locations with labels: S 1st St, S 3rd St, Cedar, Norway, Chippewa Nat’l Forest, BNSF.]

Dioxin Values (PPT)
~ 0-4" Soil
- 0 - 50
- 50 - 200
- 200 - 400
- 400 - 600
- 600 - 800
- 800 - 1000
- 1000 - 8000
Oil Slick On Pond

Coordination/Cooperation
Observed/Expected Cancers

in 56633 - all sites combined (1993-2002)
Observed/Expected in 56633 by Race – All Cancers Combined, 1992-2001
Trail of asbestos leads to Minnesota

Vermiculite, a harmless mineral used in home insulation, is now a feared culprit to families of lung disease victims. For years, a mine in Montana shipped vermiculite contaminated with deadly asbestos fibers to two Minneapolis plants, where at least 24 workers have since died of lung disease.

In 1977, the Minneapolis plant was a happy place for Noelle W. Anderson. A 23-year-old single mother, she bedazzled her heart with her job, her husband, two sons and the family pets. When a fire alarm sounded, she raced out the door, floundering over the dust, her two boys in tow.

The plant had been in operation for 40 years. The vermiculite was sold as recylced, but it was barely recylced. It was deadly.

Noelle's family believes she smoked the embedded asbestos fibers inside her lungs and died of lung cancer. She was a hard worker, she was a mom, she was 55 years old. She was a dedicated worker, she never complained. She never wanted to quit. She never complained. She never wanted to quit.
“As a child, we often played in the vermiculite for hours at a time. We jumped off the sideboards into it, we buried ourselves in it and we played dolls in it. When we returned home it was often in our hair, in our pockets and in our shoes. We played in it just like you would play in a large sand box.”

Former Resident of Northeast Minneapolis
<table>
<thead>
<tr>
<th>Cancer Type</th>
<th>Males Observed</th>
<th>Males Expected</th>
<th>Females Observed</th>
<th>Females Expected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lung &amp; Bronchus Cancer</td>
<td>398 ↑</td>
<td>325</td>
<td>309</td>
<td>300</td>
</tr>
<tr>
<td>Colon-Rectal Cancer</td>
<td>238</td>
<td>255</td>
<td>226 ↓</td>
<td>290</td>
</tr>
<tr>
<td>Breast Cancer</td>
<td>6</td>
<td>6</td>
<td>652 ↓</td>
<td>774</td>
</tr>
<tr>
<td>Prostate Cancer</td>
<td>712 ↓</td>
<td>800</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Mesothelioma</td>
<td>10</td>
<td>11</td>
<td>8 ↑</td>
<td>3</td>
</tr>
<tr>
<td>All Cancer Types Combined</td>
<td>2424</td>
<td>2464</td>
<td>2271</td>
<td>2349</td>
</tr>
</tbody>
</table>

Expected based on cancer rates for 7 county metro area
Fridley Cancer Cluster Facebook Group Reaches 2,500 Members

Group founder Jason McCarty said he's been surprised by the community response.
By Zac Farber | Email the author | April 3, 2012

On Monday, the Fridley Cancer Cluster Facebook group, a discussion board started by former Fridley resident Jason McCarty in order to explore the possibility that Fridley's elevated cancer rates could be due to environmental causes, hit the 2,500 member milestone.

McCarty, who started the group in January after a close friend died of brain cancer at age 49, said he has been surprised by the community response.

"All the support and email that we've been receiving has been phenomenal," he said. "I walked into Cope's Barber Shop in Fridley and someone got out of the chair, shook my hand and said 'Thank you' and I wasn't expecting that—that was unexpected."

IN THIS ARTICLE
- Fridley Facebook Group Founder: I'm at Risk for Cancer
  By Zac Farber
- Cancer Rates in Fridley 10 Percent Above State Average
  By Zac Farber
- Cope's Barber Shop
  1301 Mississippi St NE, Minneapolis, MN
- UPDATED: Erin Brockovich to Investigate Fridley's Elevated Cancer Rates
  By Zac Farber
- MN Health Dept. to Release 1990s Fridley Cancer Data Soon
  By Zac Farber
## Cancer Incidence, 2000-2009 for 7 census tracts of Fridley, MN

<table>
<thead>
<tr>
<th></th>
<th>Observed</th>
<th>Expected</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>All Cancer Types Combined</strong></td>
<td>1529</td>
<td>1421</td>
<td>7.60%</td>
</tr>
<tr>
<td>(selected sites)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oral Cavity (mouth &amp; throat)</td>
<td>33</td>
<td>33</td>
<td>0.00%</td>
</tr>
<tr>
<td>Esophagus &amp; Stomach</td>
<td>34</td>
<td>31</td>
<td>9.70%</td>
</tr>
<tr>
<td>Colo-Rectal</td>
<td>135</td>
<td>136</td>
<td>-0.70%</td>
</tr>
<tr>
<td>Pancreas</td>
<td>32</td>
<td>28</td>
<td>14.30%</td>
</tr>
<tr>
<td><strong>Lung &amp; Bronchus</strong></td>
<td>223</td>
<td>172</td>
<td>29.70%</td>
</tr>
<tr>
<td>Melanoma of Skin</td>
<td>55</td>
<td>60</td>
<td>-8.30%</td>
</tr>
<tr>
<td>Breast</td>
<td>212</td>
<td>203</td>
<td>4.40%</td>
</tr>
<tr>
<td>Uterine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ovarian</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prostate</td>
<td>259</td>
<td>260</td>
<td>-0.40%</td>
</tr>
<tr>
<td>Bladder</td>
<td>77</td>
<td>89</td>
<td>16.70%</td>
</tr>
<tr>
<td>Kidney</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brain</td>
<td>77</td>
<td>89</td>
<td>16.70%</td>
</tr>
<tr>
<td>Thyroid</td>
<td>30</td>
<td>27</td>
<td>11.10%</td>
</tr>
<tr>
<td>NH Lymphoma Leukemias</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comparison Group - State of Minnesota**

- State of Minnesota: Lung + 49%

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**Erin Brockovich announces interest**

**Superfund Sites – past history of TCE in water**

**Facebook Page (Fridley Cancer Cluster)**
“Don’t trust anyone!”
Media Attention
A few other zip codes – lung cancer elevations

- Coon Rapids zip codes UP +39%
- W. Blaine zip code UP +37%
- Princeton zip code UP +30%
- **New Brighton-Arden Hills** zips Down -3%
- Robbinsdale NMpls zip code UP +37%
- Brooklyn Center zip code UP +25%
- South St. Paul zip code UP +58%
- Frogtown-Como zip code UP +48%
- Midway zip code UP +20%
Metro Area: % current smokers

Anoka County has highest female lung cancer rates in MN

Source: 2010 Metro Adult Health Survey
Community Concerns about Cancer in Fridley & Anoka County, Minnesota

In the spring of 2012, residents of Fridley contacted the Minnesota Department of Health for information because they observed what they perceived to be an unusual number of cancers among their neighbors. In response to their request, MDH epidemiologists looked at the numbers and types of cancer reported to the Minnesota Cancer Surveillance System (MCSS) in Fridley residents. Since 1988, the MCSS has collected information on all newly diagnosed cases of almost all types of cancer.

Is there an unusual occurrence of cancer in Fridley?
Cancer is not just one disease, but many diseases. We looked at all cancers that occurred from 2000-2009. A common way to tell whether or not there was an unusual number of cancers that were seen or “observed” is to compare that number to the number that would be projected or “expected” to occur based on the size and age of the population compared to Minnesota as a whole. If the observed number is greater than the expected number, then the rate is higher than the state rate. If the observed number is less than the expected number, then the rate is lower than the state rate. The chart below shows the observed and expected number of common cancers for residents of Fridley from 2000 to 2009.

Incidences of common cancer types in Fridley, Minnesota (2000-2009)

- Number of observed: how many cancers were diagnosed in residents of Fridley from 2000-2009.
- Number of expected: how many cancers expected in Fridley residents if the cancer rates for Fridley were exactly the same as the rates for Minnesota, age-adjusted.
Many Public Misunderstandings
Limits of Science

• Studies of cancer in small areas have a history of challenges
  • Virtually none have answered the questions asked because
    • Long lag time (latency period) for cancer after exposure - People move
    • Many, many confounders
    • Faulty/biased memories
    • Exposure measures lacking
We know a lot about causes!
On a population level

Causes of Cancer Deaths
(Harvard Report on Cancer Prevention)
Prescription For Failure
Poorly designed, superficial studies mean the state can't answer key questions about cancer clusters on Long Island

By Don Fagin
Staff Writer

August 11, 2002

Roseann Rubin did not go quietly.

She was deep into an ongoing battle with cancer when she sat down at her wooden desk, used the familiar "Grandmother of the Year" certificate on her six grandchildren, and let the anger flow from her fingertips. It was a muggy August morning in her home and the letter she tapped out on her ancient electric typewriter was addressed to a weekly newspaper in her adopted hometown of Rock Center.

"As a victim of lung cancer, I was appalled to find myself within a four-block radius of a fallen victim to cancer within the past few years."

New data confirms Acreage cancer cluster; health officials puzzled on cause of children's ailments

FALLON

The heartbreak shows on his face, in the unguarded moments when his smile suddenly disappears. It shows in his actions, in his words. It comes out sounding like anger.

\[\text{Focus on FALLON: Cancer confounds experts} \]

Frustrated families of leukemia sufferers look everywhere for answers

By RICHARD LAKE
WJH-THE-NEWS

Photos by Christine R. Welcel.
• Geography Matters

Yes, on a broad scale

Radon
Sun Exposure
Infectious Agents
Cultural Determinants
Racial/Ethnic Factors
Access to Health Care
Poverty/SES
Thank you!

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Epidemiologist  
MN Cancer Surveillance System (MCSS)  
651-201-5481  
john.soler@state.mn.us
Extra slides...
## Cottage Grove 55016

<table>
<thead>
<tr>
<th>Population increase 2000-2010</th>
<th>13%</th>
</tr>
</thead>
<tbody>
<tr>
<td>60+ age population increase 2000-2010</td>
<td>92%</td>
</tr>
</tbody>
</table>

### Age Breakdown for Cancer

**Expected Incidence - 55016**

**2000-2009**

<table>
<thead>
<tr>
<th>Age Group 20-59</th>
<th>423 expected</th>
<th>(based on overall state of Minnesota rate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age Group 60+</td>
<td>625 expected</td>
<td>(based on overall state of Minnesota rate)</td>
</tr>
</tbody>
</table>
Epi studies and Green Tea

- Colon cancer
  - three protective
  - one increased risk
  - one null
- Rectal cancer
  - one protective
  - two increased risk
  - one null

- Stomach cancer
  - 6 protective
  - 3 increased risk
  - 1 null

- Lung cancer
  - protective (Okinawan tea)
  - increased risk (others)