Greater Bay Area Cancer Registry

Surveillance Research Program: Innovation, Impact and Productivity

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Cancer Prevention Institute of California

CARCR Meeting
December 8, 2015
Greater Bay Area of Northern California
GBACR

- Two regional registries in the CCR
  - Region 8: San Francisco-Oakland
  - Region 1: San Jose-Monterey
- Two SEER programs:
  - San Francisco-Oakland, since 1973
  - San Jose-Monterey, since 1990
- Also supported by
  - CDC-NPCR
  - Stanford Cancer Institute
GBACR Surveillance Research Program

- Surveillance Research program in place since the mid 1990s
  - Carries out funder work scopes
  - Staffed by epidemiologists and analysts
- Two work scope-driven goals
  - Data dissemination to all stakeholders
    - GBACR data
  - Data use for research to understand cancer burden
    - Population-based cancer and related data
      - CCR, SEER, census, CHIS, etc.
GBACR Data Dissemination

• Respond to cancer clusters/concerns
  • First response, coordination with state and others, epidemiologic and statistical support

• Provide consultation and expertise to public, scientists, cancer control organizations, etc.

• Use local and regional cancer data to address local needs and issues
  • ~150 requests in 2015 for these services

• Promote and support use of local/regional data, including for research
  • Patient contact studies (25 in 2010-2015)
  • Peer-reviewed scientific papers (723 in 2010-2015)
GBACR Data Dissemination: Fact Sheets

CANCER FACTS: A FACT SHEET FROM THE GREATER BAY AREA CANCER REGISTRY

April 2015

Trends in Thyroid Cancer Incidence in the Greater Bay Area, 1988-2012

Background

In the United States, thyroid cancer is the 9th most common cancer diagnosed, with an estimated 22,980 new cases in 2014.1,2 Incidence has increased significantly in recent years, both in the Greater Bay Area and nationwide. For the period 2008 through 2012, rates are highest among non-Hispanic white and non-Hispanic/Pacific Islander females in the Greater Bay Area, and are lowest in non-Hispanic black males (Figures 1 and 2). Since 1988, incidence rates for both genders have increased in the Greater Bay Area, most significantly among non-Hispanic whites and Hispanics, and among females of the four main racial/ethnic groups (Figure 3). Mortality rates, however, are low (0.06 per 100,000 deaths for all races, both genders) and have remained stable over the past few decades. Relative survival (an estimate that excludes the chance of death from diseases other than the cancer) has increased over time, for cases diagnosed nationwide in the period 2004 through 2010, five-year relative survival was 97.8%.3

Among the four main types of thyroid cancer (papillary, follicular, medullary, and anaplastic), the most common is papillary (80 – 85%).4 This type is generally slow-growing and not as aggressive as the other forms. Known risk factors for papillary thyroid cancer are: older age, being female (3 times higher risk than males), a history of radiation to the head and neck, prior thyroid disease, and rare genetic disorders. The rapidly increasing incidence has prompted questions regarding additional risk factors. One apparent contributor is more sensitive detection methods. Technological advances in imaging and scanning equipment—and more people taking advantage of them—have enabled earlier detection of smaller tumors and resulted in higher rates of diagnosis. However, broader use of diagnostic imaging may only partially account for the rise in rates.5 Research is ongoing to identify additional potential risk factors such as obesity, environmental radiation, immune and endocrine disruptors.1,6

Key Points

- Thyroid cancer incidence has increased dramatically in recent years, however, mortality has remained low and stable.
- In the most recent five years for which data are available by region (2008-2012), the incidence rates in the Greater Bay Area are lower than those seen statewide and nationwide (Figures 1 and 2).
- In the Greater Bay Area, thyroid cancer incidence is three-fold higher among females than males.
- Current thyroid cancer incidence rates are highest in NH whites and NH Asian/Pacific Islanders and lowest in NH blacks and Hispanics. However, since the late 1990s, incidence has increased dramatically in all groups (Figure 3).
  - Among males, the rates from 2000 through 2012 increased by 79% in NH whites, 7% in NH blacks, 57% in Hispanics, and 118% in NH Asian/Pacific Islanders.
  - Among females, the rates from 2000 through 2012 increased by 58% in NH whites, 165% in NH blacks, 110% in Hispanics, and 72% in NH Asian/Pacific Islanders.
- The rise in thyroid cancer rates can be explained at least in some part, by wider use of sensitive scanning technologies, which results in the detection of smaller and perhaps asymptomatic and/or non-invasive tumors. However, in the Greater Bay Area, the incidence of larger tumor sizes has increased over time as well, particularly among females (Figures 4 and 5). The search for explanations is ongoing, with researchers postulating environmental factors and the obesity epidemic as possible keys to this phenomenon.6

Figure 1: Age-adjusted incidence rates and 95% confidence intervals of thyroid cancer in males by race/ethnicity, 2008-2012

Figure 2: Age-adjusted incidence rates and 95% confidence intervals of thyroid cancer in females by race/ethnicity, 2008-2012

Figure 3: Age-adjusted incidence rates of thyroid cancer in the Greater Bay Area, by race/ethnicity and gender over time, 1988-2012

Figure 4: Thyroid cancer incidence rates by tumor size, males, Greater Bay Area, 2004-2012

Figure 5: Thyroid cancer incidence rates by tumor size, females, Greater Bay Area, 2004-2012

Footnotes


GBACR Data Use for Research

- Systematic, creative and impactful use of population-based cancer registry/other data
  - Research we support collaboratively
  - Research we initiate
- Cross-cutting perspectives
  - Relevance to clinical practice
  - Registry data quality and enhancement
  - Disparities: race/ethnicity, immigration, SES
  - Impact of social and built environment
  - Quality of cancer care
- Productive
  - 142 peer-reviewed papers by staff 2010-2015
GBACR Data Use for Research: Examples

- Rare disease: Hodgkin lymphoma
  - Incidence differences by nativity
  - Artefactual time trends by histologic subtype

- Scarlett Gomez
  - Social & built environment cancer incidence and outcomes
  - Cancer surveillance in Asian Americans
  - Clinical surveillance: early-stage breast cancer

- Tina Clarke
  - Precision surveillance: molecularly defined cancers, e-path
  - Complex cancer cluster: Marin County breast cancer
Hodgkin lymphoma: Incidence characteristics

- Rare disease overall, but common cancer of adolescents/young adults (AYA)
- Epidemiologically and pathologically heterogeneous
  - Age, sex, race/ethnicity, histologic subtype
- Big datasets required for insightful research
- Series of studies of Hodgkin lymphoma incidence and survival patterns
Hodgkin lymphoma: Incidence differences by nativity

- Understand lower rates in Hispanics
  - Homogeneity of California Hispanics
  - Augmentation of missing birthplace in CCR data
- CCR data for 1988-2004: 2,595 Hispanics, 8,637 whites
- Rates higher in US- than foreign-born Hispanics
  - Overall: 22% for males, 55% for females
  - AYA: ~2 times for males, >3 times for females
  - AYA gradient: whites>US-born Hispanics>foreign-born Hispanics

Hodgkin lymphoma: Artefactual time trends

- Histologic subtypes important predictors of Hodgkin lymphoma epidemiology and survival
- Reports of trends by histologic subtype
  - Opposing directions of two major subtypes
  - Growing incidence of not otherwise specified
- SEER data for 1988-2004 for Hodgkin lymphoma cases
- Time trend analysis by age, sex, race/ethnicity, SEER regional registry
Hodgkin lymphoma: Artefactual time trends

Annual incidence rates by histologic subtype

- Nodular sclerosis
- Lymphocyte depletion
- Lymphocyte rich
- Not otherwise specified
- Mixed cellularity
- Nodular lymphocyte predominance

Hodgkin lymphoma: Artefactual time trends

**Mixed cellularity**

- For mixed cellularity, rates in almost every age group
- For not otherwise specified, rates in almost every age group
- Similar patterns by sex, race/ethnicity, SEER regional registry
- Supports misclassification of MC as NOS over time
- Changes in biopsy methods make histologic diagnosis harder
- However, better adherence to NCCN biopsy best practices needed

Accounting for context: social and built environment and cancer incidence and outcomes
“Unnatural Causes. Place Matters.”
(PBS documentary, 2008)

Why is your street address...such a good predictor of your health?

“When we think about health, we usually think about health care and access to health care and the quality of care. But what research clearly shows is that health is embedded in the larger conditions in which we live and work....

Sometimes, we naively think of improving health by simply changing behaviors. But the choices of individuals are often limited by the environments in which they live.” (David Williams)
Neighborhood Research at GBACR

- California Neighborhoods Data System (CNDS)
  - Compile existing geospatial and other secondary data for characterizing contextual factors
  - Statewide
  - Small geography - block group level desirable
  - A dynamic resource - constantly being updated (e.g., with 2010 Census and American Community Survey (ACS) data, ESRI Tapestry Segmentation data)

- Incorporate data into surveillance analyses of cancer registry data

→ Useful for generating hypotheses, identifying potentially vulnerable sub-populations
Cancer surveillance in Asian Americans
Meet the New Immigrants: Asians Overtake Hispanics
Percent of immigrants, by year of arrival, 2000-2010


18,205,898
TOTAL U.S. ASIAN AMERICANS
THEY MAKE UP 5.8% OF THE TOTAL U.S. POPULATION.

### Leading Causes of Death
by Race and Ethnic Group, California 2005–2010

<table>
<thead>
<tr>
<th>Race/Ethnic Group</th>
<th>No. 1 Cause % of Total for Group</th>
<th>No. 2 Cause % of Total for Group</th>
<th>No. 3 Cause % of Total for Group</th>
<th>No. 4 Cause % of Total for Group</th>
<th>Cause of Death with Greatest % Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asian American</td>
<td>Cancer (28%)</td>
<td>Heart disease (24%)</td>
<td>Stroke (9%)</td>
<td>Diabetes (4%)</td>
<td>Alzheimer’s disease (118%)</td>
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<td>Cambodian</td>
<td>Heart disease (21%)</td>
<td>Cancer (20%)</td>
<td>Stroke (10%)</td>
<td>Diabetes (5%)</td>
<td>Liver disease (43%)</td>
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<tr>
<td>Chinese</td>
<td>Cancer (31%)</td>
<td>Heart disease (23%)</td>
<td>Stroke (9%)</td>
<td>Influenza/pneumonia (5%)</td>
<td>Alzheimer’s disease (153%)</td>
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<tr>
<td>Filipino</td>
<td>Heart disease (27%)</td>
<td>Cancer (26%)</td>
<td>Stroke (9%)</td>
<td>Diabetes (5%)</td>
<td>Alzheimer’s disease (88%)</td>
</tr>
<tr>
<td>Hmong</td>
<td>Heart disease (19%)</td>
<td>Cancer (16%)</td>
<td>Stroke (10%)</td>
<td>Accidents and diabetes (6%)</td>
<td>Influenza/pneumonia and hypertension (200%)</td>
</tr>
<tr>
<td>Indian</td>
<td>Heart disease (30%)</td>
<td>Cancer (19%)</td>
<td>Stroke (6%)</td>
<td>Accidents (6%)</td>
<td>Lung Disease (23%)</td>
</tr>
<tr>
<td>Japanese</td>
<td>Heart disease (27%)</td>
<td>Cancer (27%)</td>
<td>Stroke (8%)</td>
<td>Influenza/pneumonia (4%)</td>
<td>Alzheimer’s disease (79%)</td>
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<tr>
<td>Korean</td>
<td>Cancer (32%)</td>
<td>Heart disease (21%)</td>
<td>Stroke (8%)</td>
<td>Accidents (5%)</td>
<td>Alzheimer’s disease (200%)</td>
</tr>
<tr>
<td>Lao</td>
<td>Cancer (24%)</td>
<td>Heart disease (18%)</td>
<td>Stroke (10%)</td>
<td>Accidents (5%)</td>
<td>Stroke (74%)</td>
</tr>
<tr>
<td>Thai</td>
<td>Cancer (33%)</td>
<td>Heart disease (21%)</td>
<td>Stroke (7%)</td>
<td>Diabetes (6%)</td>
<td>Stroke (140%)</td>
</tr>
<tr>
<td>Vietnamese</td>
<td>Cancer (31%)</td>
<td>Heart disease (19%)</td>
<td>Stroke (9%)</td>
<td>Accidents (4%)</td>
<td>Alzheimer’s disease (195%)</td>
</tr>
<tr>
<td>NHPI</td>
<td>Heart disease (29%)</td>
<td>Cancer (22%)</td>
<td>Stroke (7%)</td>
<td>Diabetes (6%)</td>
<td>Alzheimer’s disease (240%)</td>
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<tr>
<td>Chamorro</td>
<td>Heart disease (24%)</td>
<td>Cancer (22%)</td>
<td>Stroke (7%)</td>
<td>Diabetes (6%)</td>
<td>Cancer (44%)</td>
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<tr>
<td>Native Hawaiian</td>
<td>Heart disease (29%)</td>
<td>Cancer (23%)</td>
<td>Stroke (6%)</td>
<td>Diabetes (5%)</td>
<td>Cancer (46%)</td>
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<tr>
<td>Samoan</td>
<td>Heart disease (29%)</td>
<td>Cancer (22%)</td>
<td>Diabetes (6%)</td>
<td>Stroke (6%)</td>
<td>Lung disease (29%)</td>
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<tr>
<td>Total Population</td>
<td>Heart disease (26%)</td>
<td>Cancer (23%)</td>
<td>Stroke (6%)</td>
<td>Lung disease (6%)</td>
<td>Alzheimer’s disease (41%)</td>
</tr>
</tbody>
</table>

Cancer incidence trends by AAPI group, males, SEER 13, 1990-2008

Asian Indian & Pakistani

Chinese

Filipino

Japanese

Gomez et al., JNCI 2013
Cancer incidence trends by AAPI group, males, SEER 13, 1990-2008
Cancer incidence trends by AAPI group, females, SEER 13, 1990-2008
### Increasing cancer trends (among 5 most common cancers)

<table>
<thead>
<tr>
<th>Ethnic group</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Hispanic White</td>
<td>Liver</td>
<td>Uterus, Pancreas</td>
</tr>
<tr>
<td>Native Hawaiian</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Samoan</td>
<td></td>
<td>Breast, Uterus, Colorectal*</td>
</tr>
<tr>
<td>Asian Indian &amp; Pakistani</td>
<td>Lung</td>
<td>Breast, Uterus</td>
</tr>
<tr>
<td>Chinese</td>
<td></td>
<td>Breast, Uterus</td>
</tr>
<tr>
<td>Filipino</td>
<td>Liver</td>
<td>Breast, Uterus, Lung, Thyroid</td>
</tr>
<tr>
<td>Japanese</td>
<td>Bladder,</td>
<td>Uterus</td>
</tr>
<tr>
<td>Kampuchean (Cambodian)</td>
<td>Liver*, Prostate*, Colorectal*</td>
<td>Breast*, Colorectal*, Liver*</td>
</tr>
<tr>
<td>Korean</td>
<td>Prostate, Colorectal</td>
<td>Breast, Colorectal, Lung</td>
</tr>
<tr>
<td>Laotian</td>
<td>Colorectal*</td>
<td>Breast, Colorectal, Liver*</td>
</tr>
<tr>
<td>Vietnamese</td>
<td>Liver</td>
<td>Breast, Liver*</td>
</tr>
</tbody>
</table>

*Large increases (>2% per year), but trend not statistically significant
Cancer registry data used to demonstrate heterogeneity in cancer incidence & outcomes among ethnic groups

Heterogeneity (risk factors, disease risk) within population provides potential opportunities for identifying novel risk factors

Research into what determines favorable prognosis despite poor prognosis tumor biology

Size + heterogeneity = Opportunities for accelerating cancer discoveries
Clinical surveillance:
1) Treatment for early-stage breast cancer
2) Informing precision medicine
CPIC’s Clinical Surveillance Initiative

- Help clinicians use cancer registry data to address clinically relevant questions
  - Population disparities in occurrence or survival
    - Increasingly, for precision medicine
  - Disparities in treatment standards
  - Time trends

- Formal affiliation with Stanford Cancer Institute
- Other collaborators: UCSF, MD Anderson, Mayo
- Build teams through professional networks
- Process for initiating and vetting potential projects, authorship, roles and responsibilities
Treatment for early-stage breast cancer
Clinical Trials vs. “Real-World” Care

- A disconnect between results of clinical trials (3%) and “real-world” care (97%)
- How do we study “real-world” outcomes of survival, quality of life, cost?

Time trends in the percentage of non-Hispanic White women diagnosed with breast cancer undergoing mastectomy, by stage, California, 1990-2007

25% of patients with DCIS or stage I disease had mastectomy

Time trends in the percentage of non-Hispanic White women diagnosed with breast cancer undergoing mastectomy, by socioeconomic status, California, 1990-2007

Use of and Mortality After Bilateral Mastectomy Compared With Other Surgical Treatments for Breast Cancer in California, 1998-2011

Allison W. Kurian, MD, MSc; Daphne Y. Lichtensztajn, MD, MPH; Theresa H. M. Keegan, PhD; David O. Nelson, PhD; Christina A. Clarke, PhD; Scarlett L. Gomez, PhD

Contralateral Prophylactic Mastectomy Is It a Reasonable Option?

Lisa A. Newman, MD, MPH
Figure 1. Joinpoint Analysis Showing Time Trends in Use of Bilateral Mastectomy, Breast-Conservering Surgery with Radiation, and Unilateral Mastectomy, According to Patient Age in Years at Breast Cancer Diagnosis.
Figure 2. Propensity-Weighted Kaplan-Meier Plots of Estimated Mortality Among All Patients if Surgical Procedure Had Been Randomly Assigned and of Estimated Mortality if a Different Surgical Procedure Had Been Performed Among Patients Who Had Undergone a Specific Surgical Procedure

(A) All patients randomly assigned with propensity weighting

(B) Patients undergoing breast-conserving surgery assuming a different surgical procedure

(C) Patients undergoing unilateral mastectomy assuming a different surgical procedure

(D) Patients undergoing bilateral mastectomy assuming a different surgical procedure

Log-rank P < .001

Years After Diagnosis

Mortality Rates Over Time, %
Selected Headlines

HEALTHY LIVING
DOUBLE MASTECTOMY MAY NOT INCREASE CHANCE OF SURVIVAL

Mastectomies Are on the Rise, Despite the Evidence Against Them. Why?
By Peggy Orenstein

New Study Questions Benefits of Double Mastectomy
Thu, Sep 4, 2014 -- 9:00 AM
Key Questions for Future Research

• Why is BLM use rising despite lack of survival benefit?
  • Patients’ desire for a sense of control; management of anxiety
  • Unrealistically optimistic view of complication rates with BLM
  • Must improve communication, decision support

• Will these results alter BLM utilization?
  • Will physicians advise against BLM?
  • Will patients choose BLM less often?
  • Will practice guidelines and/or insurance coverage change?

• Why worse survival for women having ULM?
  • Disparities in effective access to care (i.e. daily travel to radiation)?
  • A marker for co-morbidities (i.e. diabetes) that limit therapy?
Cancer registry data and precision medicine: Molecular markers and e-path
Precision medicine and cancer registration

• Tailoring treatment to individual tumor and patient characteristics
• Success stories from oncology treatment
  • HER2-overexpressing breast cancer (trastumuzab)
  • EGFR overexpressing lung cancer and glioma (EGFR inhibitors)
• Epidemiologic studies of molecularly-defined cancers uncover knowledge about etiology which may lead to new prevention
• SEER registries have collecting some molecular pathology test results as “site specific factors” since 2010
Breast cancer in the Greater San Francisco Bay Area*, 1995-2009

Age-adjusted incidence rates of invasive breast cancers in the Greater SF Bay Area, by year of diagnosis, 1995-2009

2002: Results from Women's Health Initiative were reported
2006: Herceptin approved by the FDA to treat HER2 positive breast cancer

Average annual age-adjusted incidence rates of invasive breast cancers in Greater SF Bay Area, by race/ethnicity†, 2006-2009

Legend:
- All
- ER and/or PR positive, HER2 positive
- ER, PR, and HER2 negative (triple negative)
- ER and/or PR positive, HER2 negative
- ER and PR negative, HER2 positive
Impact of breast cancer subtypes on 3-year survival among adolescent and young adult women

Theresa H M Keegan, David J Press, Li Tao, Mindy C DeRouen, Allison W Kurian, Christina A Clarke and Scarlett L Gomez

Figure 1 Overall survival for adolescents and young adults (15 to 39 years of age) and women aged 40 to 64 years with breast cancer by subtype, California, 2005 through 2009.
• Does the well-described disparity in breast cancer mortality for African-American women extend to all molecular subtypes and stages?
• SAME OUTCOME: Stage I or IV cancer, regardless of subtype and HER2+ regardless of stage
• WORSE OUTCOME: Stage II or III HR+/HER2-, stage III TNBC
• Interpretation: learn more about disparities in HER2- chemotherapy
Will new molecular markers be available from electronic pathology?

- Electronic pathology reports used in California to find new cancer cases
- May be able to inform whether molecular testing was done and results
- Availability of information should map to clinical utilization
- Efforts underway to assess quality of epath information for two standards-relevant molecular markers
  - HPV for oropharyngeal cancer
  - KRAS for metastatic colorectal cancer
Biomarker data from electronic pathology

Preliminary results

• Reports can be retrieved, but may not represent complete pathologic workup
  • If molecular test done in outside lab, more likely for results to be stored outside epath

• HPV: 86% of reports mentioned HPV or p16 testing

• KRAS: 15% of reports mentioned

• Reports are rich but largely unstructured, detail varies markedly by facility

• Ambiguous terminology used to describe results may impede natural language processing
  • Example: “consistent with...” vs. “indirectly supports...”
Longstanding cancer cluster concern: Marin County
Marin County as breast cancer hotspot

- 1994: first report of elevated rates of invasive breast cancer in non-Hispanic white women in the Bay Area
- County health department and advocacy groups become involved

Evaluating local differences in breast cancer incidence rates: A census-based methodology (United States)

Angela Witt Prehn and Dee W. West

Cancer Causes and Control, 1998, 9, pp. 511-517

Increase in Breast Cancer Incidence in Middle-aged Women during the 1990s

ANGELA WITT PREHN, PhD, CHRISTINA CLARKE, PhD, BARBARA TOPOL, MS, SALLY GLASER, PhD, AND DEE WEST, PhD

• 3.6% increase/year (95% CI, 1.8-5.5)
• 6x more rapid than in comparison areas
• Women aged 45-64, hormone-sensitive tumors only
• Mortality: no increase
Rates were same as similar sub-county regions

Evaluating local differences in breast cancer incidence rates: A census-based methodology (United States)

Angela Witt Prehn and Dee W. West
*Cancer Causes and Control*, 1998, 9, pp. 511-517

Table 2. Age-adjusted incidence rates of breast cancer by block-group risk factor for Marin County, block-groups with risk factors like Marin County (high-risk), and block-groups with risk factors not like Marin County (low-risk)

<table>
<thead>
<tr>
<th>Risk factor (cutpoint for high risk)</th>
<th>Marin County (reference)</th>
<th>High-Risk block-groups</th>
<th>Low-Risk block-groups</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Rate</td>
<td>N</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>---</td>
<td>------</td>
<td>---</td>
</tr>
<tr>
<td>Parity (≤1.33 children/woman)</td>
<td>169</td>
<td>119.3</td>
<td>1216</td>
</tr>
<tr>
<td>Urban/rural residence (urban)</td>
<td>6729</td>
<td>112.6</td>
<td>811&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Household income (≥$50 000)</td>
<td>1683</td>
<td>120.7</td>
<td>5891</td>
</tr>
<tr>
<td>Poverty level (≤5%)</td>
<td>2935</td>
<td>115.7</td>
<td>4639</td>
</tr>
<tr>
<td>College education (≥45%)</td>
<td>1104</td>
<td>126.2</td>
<td>6470</td>
</tr>
<tr>
<td>Working class occupation (≥50%)</td>
<td>1664</td>
<td>119.2</td>
<td>5879</td>
</tr>
</tbody>
</table>

<sup>a</sup> Statistically significantly different than high-risk block-groups at $p < 0.05$.
<sup>b</sup> Total number of block-groups differs by risk factor due to missing values.

The table shows that for each risk factor, block-groups with characteristics similar to those in Marin County had a statistically significantly higher breast cancer incidence rate than block-groups that were not like Marin County with regards to these characteristics.
• First publication describing rate change and relating it to HT use

• Incidence tracks to in HT changes after WHI trial data release in 2002

Clarke et al., J Clin Oncol, 2006
Detailed report released online 2015

Recent trends in breast cancer incidence and mortality in Marin County, California, 1988-2012

An Update from the Greater Bay Area Cancer Registry
September 21, 2015

Christina A. Clarke, Ph.D., Meg McKinley, M.P.H., Sally L. Glaser, Ph.D.
Cancer Prevention Institute of California and Stanford Cancer Institute
Correspondence: tina@cpic.org

Executive summary:

As part of our regular surveillance of cancer in the nine-county Greater Bay Area region of California, the Greater Bay Area Cancer Registry has carefully assessed recent trends in breast cancer incidence in the non-Hispanic white female population of Marin County, a population for whom elevated rates had been reported in the past. Our review of the most complete incidence data (1988-2012) and mortality data (1988-2013) available, finds:

The hotspot cools off

- **Incidence**
  - 2012 rate—130 cases per 100,000 women—lowest reported since 1988
  - 31% decline from the peak rate in 2001

- **Mortality**
  - 2013 rate—16 deaths per 100,000 women—lowest reported since 1988
  - 65% decline from rate in 1988

- **Comparison to other regions**
  - Similar trends to those in Bay Area, California
  - No evidence of a geographic excess in Marin since mid-2000’s
Annual incidence rates of breast cancer in non-Hispanic white women 1988-2012

- California (Marin excluded)
- Greater Bay Area (Marin excluded)
- Marin County
Annual mortality rates of breast cancer in non-Hispanic white women 1988-2012
Why? Mammography?

- 2009 recommendations for population-wide screening revised; biennial screening 50-74 only
- Screening adherence data: stable trends thru 2013
- *In situ* breast cancer incidence
  - Should be 1st indication of reduction in mammography
  - Did not decline, rather increased significantly
- Incidence in women aged outside recommended ages
  - No age variation in patterns
- Comparison to other regions
  - Similar trends to Bay Area, California
- Expert opinion: no obvious influence of mammographic screening change
Annual incidence rates of breast cancer in non-Hispanic white women by stage 1988-2012
Why? Other reasons?

- Prevalence of menopausal hormone therapy (HT) use measured as high in Marin County women as part of Marin Women’s Study
  - More women used estrogen/progestin combined HT than elsewhere
  - Sharp reduction in HT use reported in Marin and elsewhere in 2003
  - Hormone sensitive breast cancers among women aged 50-69 fell notably in 2003-3004
- Marin Women’s Study: HT quitters did not reinitiate use, and newly menopausal women never initiated use
- Expert opinion: excess rates of late 1990’s consistent with HT use
Getting message to the public

Marin County no longer a hot spot for breast cancer, study finds
By Victoria Colliver  Updated 12:31 pm Wednesday, October 7, 2015

Marin County’s Breast Cancer Rate Has Plummeted. Why?

Marin County Breast Cancer Rate
SINCE 2001

TINA CLARKE
CANCER PREVENTION INSTITUTE OF CALIFORNIA

Source: Cancer Prevention Institute of California

31%
GBACR scientific publications related to Marin breast cancer


CANCER PREVENTION INSTITUTE OF CALIFORNIA

Preventing Cancer. Promoting Life.