Gaps in screening mammography:
Pierce County, WA

July, 2011

Office of Community Assessment
Tacoma-Pierce County Health Department
Pierce County, Washington
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A needs assessment for the
Carol Milgard Breast Center

Prepared by
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Tacoma-Pierce County Health Department

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Executive Summary

The purpose of this needs assessment is to help answer the question: With limited resources for breast cancer screening, how can the Carol Milgard Breast Center (CMBC) best target underserved and at-risk populations in Pierce County with outreach and free mammography services?

We looked at three broad indicators of need:
- Breast cancer burden (incidence, mortality, etc.),
- Mammography utilization,
- Economic need (poverty, health insurance, etc.)

For each dimension of need we tried to identify populations of particularly high need.

Populations based on Pierce County Council District
- Breast cancer death rates and premature death from breast cancer were highest in Tacoma (CD4: Central Tacoma to Ruston), despite relatively high rates of mammography screening, perhaps because of the federal breast and cervical screening program available for low-income women or current outreach activities of CMBC. It is unclear from the data we have why mortality was high here in spite of high mammography utilization. Possible explanations are that women in this area had more aggressive tumors or that they received delayed or inadequate care after their diagnoses. By multiple measures, economic need was high in this area and in CD5: SE Tacoma to Spanaway. We recommend that these geographic areas be targeted if service decisions are to be based on breast cancer burden or economic need.
- Mammography use among 40-64 year old women was lowest in eastern Pierce County (CD1: Bonney Lake to Mt Rainier, and CD3: Ashford/Mt Rainier). Geographical isolation may be an important barrier to screening mammography for working-age women in this area. Although this is outside of the CMBC catchment area, there is clearly unmet need here.

Populations based on race
- Black women were more likely to be diagnosed at a regional or distant stage, to die of breast cancer and to die at a younger age than other women. We recommend that they be targeted for outreach and intervention.
- Hispanic women were at low risk of breast cancer mortality and so we do not recommend that they be specifically targeted.

Populations based on age
- Breast cancer incidence, hospitalization and death increased dramatically with age in Pierce County as elsewhere in the nation.
• Access to care tended to improve with age, particularly after age 65 when almost all women become eligible for Medicare. Still, 8.5% of women 65 or older in CD5: SE Tacoma to Spanaway could not afford health care sometime in the previous year.
• If screening services are financially limited, we recommend:
  o Considering U.S. Preventive Services Task Force guidelines, namely, routine biennial screening of women age 50-74 unless clinical considerations dictate otherwise.
  o Using tools for individual risk assessment to help women understand their risk of breast cancer and to help them decide whether they should seek mammography.
Introduction

The purpose of this needs assessment is to help answer the question: With limited resources for breast cancer screening, how can the Carol Milgard Breast Center best target underserved and at-risk populations in Pierce County with outreach and free mammography services? Because Carol Milgard Breast Center resources are limited, it is important to focus efforts strategically. The goal is to apply a screening strategy that will expand the pool of women who undergo screening while optimizing the likelihood of identifying early cancer in that pool. The long term goal is to improve breast cancer outcomes for women in Pierce County.

We have taken a population-based approach in this report. That is, we tried to identify populations of high need. An alternative approach, individual risk assessment, is described in Attachment A.

Methods

Concept definitions

Subpopulations
We defined subgroups based on race, age and geography because these subgroups were common to many of our data sources. Race is self-identified and generally indicates a social and cultural rather than a biological designation. Women of Hispanic ethnicity, regardless of race, were categorized as Hispanic. Non-Hispanic women were categorized by their race.

We used County Council Districts to classify women geographically. These areas are described in greater detail in a later section of the report and in Attachment B. Our data are too sparse to examine at a finer grain than County Council Districts. These areas are large enough to be quite heterogeneous demographically, but are still useful for roughly describing the geographic distributions of women with different characteristics.

We used zip codes to place women within County Council Districts. Because zip code boundaries did not coincide with County Council District boundaries, we included a zip code in a district whenever a significant portion of the zip code area overlapped the County Council District. Because of this, some zip codes were included in more than one County Council District.

At risk/underserved populations
Ideally we would like to identify subpopulations of women who:
- Have high breast cancer burden, i.e. have higher incidence or mortality, AND
- Do not receive mammograms regularly AND
- Are uninsured or have low income or other health care access barriers.
Generally, however, the data sources for disease burden are different than those providing information about mammography history or barriers to health care services. Therefore, we can only look for populations in which these characteristics may coincide, recognizing that what is true for the population may not be true for individuals. In other words, we can identify a population where, say, burden is high and screening mammography low, but we can’t say that the individuals with high burden had infrequent screening mammography.

**Breast cancer**
Our data sources defined breast cancer as ICD-10 codes C50.0-C50.9 excluding histology codes 9140 (Kaposki’s sarcoma) and 9590-9989 (leukemias and lymphomas). These codes include *in situ* cancers. In this report we only include breast cancer in women, although breast cancer occurs in men as well.

**Data sources**
Much of the data in this report come from a few key sources. These sources and their limitations are briefly described below.

**Washington State Cancer Registry**
The Washington State Cancer Registry was established in 1990 to monitor cancer incidence, stage at diagnosis, tumor size, nodal involvement and other demographic and clinical information in a standardized fashion. Cancer case information is reported to the Washington State Cancer Registry from a variety of reporting sources. These reporting sources include hospitals and other health care facilities, pathology laboratories, ambulatory surgery centers, freestanding radiation and oncology centers, medical clinics and health care providers who diagnose and/or treat cancers or conditions that meet the criteria for reporting. It includes information on Washington residents who may have been diagnosed or treated elsewhere, and is estimated to be 95% complete.

**Behavioral Risk Factor Surveillance System (BRFSS)**
The Behavioral Risk Factor Surveillance System is an ongoing national telephone survey conducted by the Centers for Disease Control and Prevention. The survey includes adults age 18 years and older and provides state- and county-level data for each calendar year. Topics are wide ranging and include disease prevalence, health care access and use, health behaviors and demographics.

There are several biases inherent to BRFSS. First, cell phone-only households are excluded. These households tend to be younger and poorer than households with landlines. Second, BRFSS excludes people in institutions such as hospitals and nursing homes and so may underreport responses from people who are ill or in poor health. Third, data are self-reported and so are subject to social desirability bias and recall error. Finally, BRFSS is conducted in English and Spanish, and so underreports responses from speakers of other languages.
Death Certificate Data
For death certificates, funeral directors collect information about the deceased person, including race and ethnicity, from an informant who is usually a family member or close personal friend of the deceased person. A certifying physician, medical examiner, or coroner generally provides cause-of-death information. Cause-of-death data come from underlying causes of death and not immediate causes. For example, if a person dies of a complication or metastasis of breast cancer, breast cancer would be the underlying cause of death. Data are compiled by the Washington State Department of Health, Center for Health Statistics.

Washington State Comprehensive Hospitalization and Recording System
This is an administrative database that includes the discharge or death diagnosis of all patients hospitalized in non-federal hospitals in the state. Madigan Army Medical Center, a federal facility, does not report to this data source. A hospitalization for breast cancer means that breast cancer is based on the Principal Diagnosis Code defined as the ICD-9-CM code describing the principal diagnosis (i.e., the condition established after study to be chiefly responsible for occasioning the admission of the patient for care).

In these data, the unit of analysis is the hospitalization event, not the patient (i.e., a patient may have multiple admissions with the principle diagnosis of breast cancer). Geography for hospitalization data refers to the patient’s residence, not the location of the hospital. Hospitalization data are recorded for billing purposes, and so may not always fully and accurately capture the clinical diagnosis.

American Community Survey (ACS)
The American Community Survey is a mailed survey conducted every year by the U.S. government to estimate a wide variety of social and economic data for the U.S. population. The ACS replaces the long form of the census for collecting detailed population data and has the advantage of being released annually rather than at 10-year intervals.

Other data considerations
- In order to describe breast cancer for subgroups of interest, data were usually averaged over multiple years to provide accurate estimates.
- For some measures, data have been age-adjusted. Age-adjustment is a statistical method for standardizing different populations with different age distributions. Because breast cancer burden is strongly age-dependent, two populations can differ significantly in breast cancer burden if they are very different in age. If age-adjusted values are different for two populations, it means the difference must be attributable to something other than age. Age-adjusted measures are indicated in the figure legends.
- For many of the measures we used, data for Washington State was also available and so we reported this as well.
- Error bars in the figures show 95% confidence intervals. These indicate the margin of error for the value estimated.
County and local data can tell us what has occurred, but usually not why. For that we have used studies in the medical literature that were designed to answer just such questions.

Description of the service area

Pierce County is the second most populous county in Washington State. As of 2009, the Pierce County population was 813,600. This number included 133,300 females 40-64 years of age.

Geography

Pierce County is divided into seven County Council Districts of approximately equal population (Figure 1). These are the geographic units we have used throughout this report. The geographic areas included in each district are shown in greater detail in Attachment B.

Figure 1 Pierce County Council Districts
Female population

The size of the female population varied among the seven Pierce County Council Districts (Figures 2-3). Districts Bonney Lake to Mt Rainier, Ashford/Mt Rainier, and UP/Key Peninsula tended to have larger numbers of women age 40-64.

**Figure 2** Pierce County females, all ages, 2009

<table>
<thead>
<tr>
<th>District</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Tacoma to Ruston</td>
<td>49,242</td>
</tr>
<tr>
<td>Lakewood/JBLM</td>
<td>51,348</td>
</tr>
<tr>
<td>NE Tacoma to Meridian E.</td>
<td>54,346</td>
</tr>
<tr>
<td>UP/Key Peninsula</td>
<td>60,077</td>
</tr>
<tr>
<td>Bonney Lake to Mt Rainier</td>
<td>61,675</td>
</tr>
<tr>
<td>SE Tacoma to Spanaway</td>
<td>62,620</td>
</tr>
<tr>
<td>Ashford/Mt Rainier</td>
<td>69,074</td>
</tr>
</tbody>
</table>


**Figure 3** Pierce County Females, 40-64, 2009

<table>
<thead>
<tr>
<th>District</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lakewood/JBLM</td>
<td>14,337</td>
</tr>
<tr>
<td>Central Tacoma to Ruston</td>
<td>14,718</td>
</tr>
<tr>
<td>NE Tacoma to Meridian E.</td>
<td>17,924</td>
</tr>
<tr>
<td>SE Tacoma to Spanaway</td>
<td>18,671</td>
</tr>
<tr>
<td>Bonney Lake to Mt Rainier</td>
<td>21,802</td>
</tr>
<tr>
<td>Ashford/Mt Rainier</td>
<td>22,629</td>
</tr>
<tr>
<td>UP/Key Peninsula</td>
<td>23,132</td>
</tr>
</tbody>
</table>


Pierce and King Counties had proportionately more black women in the targeted age group than neighboring counties (Table 1). A higher proportion of Pierce County women in this age group lived in poverty than women in neighboring counties.

<table>
<thead>
<tr>
<th>County</th>
<th>White-NH</th>
<th>Black-NH</th>
<th>American Indian/Alaskan Native-NH</th>
<th>Asian/Pacific Islander-NH</th>
<th>Hispanic as Race</th>
<th>% in poverty</th>
</tr>
</thead>
<tbody>
<tr>
<td>King</td>
<td>77.5%</td>
<td>5.1%</td>
<td>0.8%</td>
<td>12.8%</td>
<td>3.8%</td>
<td>7.4</td>
</tr>
<tr>
<td>Snohomish</td>
<td>86.4%</td>
<td>1.3%</td>
<td>1.3%</td>
<td>7.9%</td>
<td>3.2%</td>
<td>7.1</td>
</tr>
<tr>
<td>Pierce</td>
<td>80.2%</td>
<td>5.9%</td>
<td>1.4%</td>
<td>8.8%</td>
<td>3.7%</td>
<td>9.8</td>
</tr>
<tr>
<td>Kitsap</td>
<td>85.4%</td>
<td>1.9%</td>
<td>1.5%</td>
<td>8.2%</td>
<td>3.0%</td>
<td>7.6</td>
</tr>
<tr>
<td>Thurston</td>
<td>86.4%</td>
<td>1.9%</td>
<td>1.4%</td>
<td>7.2%</td>
<td>3.2%</td>
<td>7.9</td>
</tr>
</tbody>
</table>


Women age 40-64 of different races tended to live in different parts of Pierce County (Table 2). Black-NH women were more frequent in Tacoma, Spanaway, Lakewood and JBLM (Districts 4, 5 and 6). Asian/Pacific Islander-NH women tended to live in S. Tacoma and Spanaway (District 5) and
Hispanic women tended to live in the area around Ashford and Mt. Rainier (Districts 3) and S. Tacoma and Spanaway (District 5). This information is represented graphically in Attachment C.

### Table 2 Pierce County female population by race, 2009

<table>
<thead>
<tr>
<th>CD1</th>
<th>White-NH</th>
<th>Black-NH</th>
<th>Amer.Ind./Alask.Nat.-NH</th>
<th>Asian/Pac.Isl.-NH</th>
<th>Hispanic as Race</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>All ages</td>
<td>55,949</td>
<td>596</td>
<td>672</td>
<td>1,899</td>
<td>2,549</td>
<td>61,665</td>
</tr>
<tr>
<td>Bonney Lake to Mt Rainier Ages 40-64</td>
<td>20,233</td>
<td>140</td>
<td>230</td>
<td>674</td>
<td>507</td>
<td>21,784</td>
</tr>
<tr>
<td>CD2</td>
<td>All ages</td>
<td>41,749</td>
<td>2,712</td>
<td>1,185</td>
<td>4,854</td>
<td>54,344</td>
</tr>
<tr>
<td>NE Tacoma to Meridian E. Ages 40-64</td>
<td>14,648</td>
<td>673</td>
<td>383</td>
<td>1,627</td>
<td>575</td>
<td>17,906</td>
</tr>
<tr>
<td>CD3</td>
<td>All ages</td>
<td>56,621</td>
<td>2,884</td>
<td>932</td>
<td>4,880</td>
<td>69,071</td>
</tr>
<tr>
<td>Ashford/Mt Rainier Ages 40-64</td>
<td>18,940</td>
<td>746</td>
<td>301</td>
<td>1,917</td>
<td>725</td>
<td>22,629</td>
</tr>
<tr>
<td>CD4</td>
<td>All ages</td>
<td>35,359</td>
<td>6,405</td>
<td>736</td>
<td>3,860</td>
<td>49,246</td>
</tr>
<tr>
<td>Central Tacoma to Ruston Ages 40-64</td>
<td>11,152</td>
<td>1,753</td>
<td>234</td>
<td>1,159</td>
<td>487</td>
<td>14,785</td>
</tr>
<tr>
<td>CD5</td>
<td>All ages</td>
<td>39,820</td>
<td>7,963</td>
<td>1,014</td>
<td>8,525</td>
<td>62,630</td>
</tr>
<tr>
<td>SE Tacoma to Spanaway Ages 40-64</td>
<td>12,496</td>
<td>1,882</td>
<td>312</td>
<td>3,231</td>
<td>754</td>
<td>18,675</td>
</tr>
<tr>
<td>CD6</td>
<td>All ages</td>
<td>31,686</td>
<td>6,888</td>
<td>692</td>
<td>6,750</td>
<td>51,345</td>
</tr>
<tr>
<td>Lakewood/JBLM Ages 40-64</td>
<td>9,874</td>
<td>1,247</td>
<td>167</td>
<td>2,417</td>
<td>643</td>
<td>14,348</td>
</tr>
<tr>
<td>CD7</td>
<td>All ages</td>
<td>50,233</td>
<td>3,134</td>
<td>610</td>
<td>3,606</td>
<td>60,074</td>
</tr>
<tr>
<td>UP/Key Peninsula Ages 40-64</td>
<td>20,198</td>
<td>821</td>
<td>205</td>
<td>1,339</td>
<td>566</td>
<td>23,129</td>
</tr>
</tbody>
</table>


### Figure 4 Pierce County female population, by race

![Pierce County females race composition chart](source)

Overview

The remainder of this report is organized in three major sections corresponding to the three broad ways of defining high risk/underserved, namely breast cancer burden, mammography utilization and barriers to accessing health services. Breast cancer burden is further subdivided into several subsections. Within each section or subsection we examine the high risk/underserved indicator in the county as a whole and for subgroups defined by geography, race and age, when data on subgroups was available.

Burden of breast cancer

The effect of breast cancer on the health of the population can be summarized by using a number of different measures. Such measures can be used for estimating resources needed for breast cancer screening. We consider the following measures of breast cancer burden in this report:

- Breast cancer incidence;
- Breast cancer stage at diagnosis;
- Hospitalizations for breast cancer;
- Breast cancer mortality;
- Years of potential life lost due to breast cancer.

Breast cancer incidence

Incidence rate is the number of new breast cancer cases diagnosed in one year divided by the total population, multiplied by 100,000.

\[
Incidence = \frac{\text{new cases}}{\text{female population/year}} \times 100,000
\]

Incident cases do not include reoccurrence of a previously reported breast cancer case, or metastatic sites.

In order to create a reliable picture of incidence, data from 1999 to 2008 were averaged. The breast cancer incidence rate for Pierce County averaged for the period 1999-2008 was 298 new cases per 100,000 women age 40-64 per year; this was similar to the Washington State rate (307.0 per 100,000).
Figure 5 Annual age-adjusted breast cancer incidence rates, females 40-64 y.o., Pierce County, 1999-2008

Race

Through the 1990s White-Non-Hispanic (NH) women in the U.S. were at higher risk of invasive breast cancer than other races. Beginning about 2003, breast cancer incidence dropped markedly among White-NH women, a change probably attributable to discontinuation of hormone replacement therapy in this group\(^2\).

Incidence in Pierce County varied significantly among subgroups defined by race. The highest age-adjusted incidence rate was among American Indian/Alaskan Native-NH women, although the small number of cases for this group means the estimated rate is imprecise. White-NH and Black-NH women also had relatively high incidence. Hispanic women had particularly low incidence. Pierce County rates were similar to those for Washington State.

Although incidence in White-NH women was not significantly different than that for American Indian/Alaskan Native-NH or Black-NH women it is important to remember that the overwhelming majority of breast cancer cases are White-NH women because they comprise the biggest share of the population in our county (Figure 6). Just 470 cases of breast cancer in Pierce County for races other than White-NH were reported in the past ten years.
**Figure 6 Total breast cancer cases, females 40-64 y.o., Pierce County, 1999-2008**

<table>
<thead>
<tr>
<th>Cases of breast cancer</th>
<th>Hispanic as Race</th>
<th>49</th>
<th>Asian/Pacific Islander-NH</th>
<th>200</th>
<th>Black-NH</th>
<th>172</th>
<th>American Indian/Alaskan...</th>
<th>49</th>
<th>White-NH</th>
<th>3006</th>
</tr>
</thead>
<tbody>
<tr>
<td>New cases in the period 1999-2008</td>
<td>0</td>
<td>2,000</td>
<td>4,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


**Age**

Breast cancer incidence is strongly age dependent (Figures 7-8). In Pierce County incidence reached a peak in the 75-79 age group. Although incidence is more common in older women, studies have shown that survival rates are higher among women diagnosed at ages 70 and older compared to women diagnosed before 50.\(^3\)

**Figure 7 Breast cancer incidence rate by age, Pierce County females, 1999-2008**

Figure 8 Breast cancer incidence rate by age, Washington State females, 1999-2008

Stage at diagnosis

Stage at diagnosis is categorized into four classes by the Washington State Cancer Registry: in situ, localized, regional and distant. Advanced stage diagnosis (regional or distant) can be an indication of inadequate breast cancer screening. Among Pierce County cases diagnosed in 2004-2008 in which the cancer could be staged, 72% were diagnosed at the in situ or localized stages.

Race

There was some variation in late-stage diagnosis by race, although the small number of these cases among American Indian/Alaskan Native-NH and Hispanic women makes the estimates for these groups very rough (Figure 9). Breast cancer cases among Black-NH women, however, were more likely than those among White-NH women to be diagnosed at a regional or distant stage.
Figure 9  Percent of breast cancer cases with regional or distant involvement at diagnosis, all ages, Pierce County, 2004-2008


Hospital burden of breast cancer

There were 842 hospitalizations for which breast cancer was the principal diagnosis in Pierce County 40-64 y.o. females in the period 2000-2009 which corresponds to the age-adjusted rate of 68.6 hospitalizations per 100,000 females, per year. This rate for Washington State was 76.0 hospitalizations per 100,000 females.

Geography

Hospitalization rates were similar for women residing in different Council Districts (Figure 10 Hospitalization rates, per 100,000 40-64 y.o. females: Pierce County, 2000-2009). The exception was CD6: Lakewood/JBLM which had a particularly low rate of hospitalizations. This may be because women in this area received care at Madigan Army Medical Center which is excluded from this data source.
Figure 10 Hospitalization rates, per 100,000 40-64 y.o. females: Pierce County, 2000-2009

Source: Hospitalization Discharge Data: Comprehensive Hospital Abstract Reporting System (CHARS), Washington State Department of Health, Center for Health Statistics.

Age
Like incidence, hospitalizations were strongly age-dependent (Figure 1). While incidence peaked at ages 75-79, hospitalizations peaked at ages 80-84.

Figure 11 Hospitalization rates by age, per 100,000 females: Pierce County females, 2000-2009

Source: Hospitalization Discharge Data: Comprehensive Hospital Abstract Reporting System (CHARS), Washington State Department of Health, Center for Health Statistics.

Breast cancer mortality

Breast cancer mortality rate is the number of women who died from breast cancer divided by the population then multiplied by 100,000.

\[
\text{Mortality rate} = \frac{\text{deaths/female population/year}}{} \times 100,000
\]

In Pierce County 913 women died from breast cancer in the period 2000–2009, or about 91 deaths per year. 361 of these were among women 40-64 years of age. The mortality rate for Pierce County was 26.8 per 100,000, per year; the rate for Washington State was 29.6 per 100,000.
Geography
The breast cancer death rate for 40-64 year old women was highest in CD4: Central Tacoma to Ruston (Figure 12). The number of deaths was also high in this District, as it was in CD3: Ashford/Mt Rainier and CD7: UP/Key Peninsula (Figure 13). The lowest number of breast cancer deaths was in CD6: Lakewood/JBLM, (33 deaths). Although the relatively low hospitalization rates in this area might be attributable to women receiving care at a Madigan Army Medical Center, this cannot explain the low death rate since all deaths of county residents are reported, regardless of where those deaths occur.

Death rates and hospitalization rates sometimes presented a similar geographic picture of disease burden. Among 40-64 y.o. women CD6: Lakewood/JBLM had both low rates of hospitalization and low rates of death, while CD4: Central Tacoma to Ruston, had high rates of both hospitalization and death. In CD1: Bonney Lake to Mt Rainier, however, hospitalizations and deaths were discordant. For reasons we can’t explain, this area had a high rate of hospitalizations and a low rate of deaths.

Figure 12 Breast cancer death rates in 40-64 y.o. females, age-adjusted, Pierce County, 2000–2009

![Breast Cancer Death Rates](source)


Figure 13 Breast cancer deaths in 40-64 y.o. females, by CD’s, Pierce County, totals for 2000–2009

![Breast Cancer Deaths](source)

Age
Breast cancer mortality increased with age (Figure 14). It is important to remember that a woman who died of breast cancer at age 80 could have first been diagnosed decades earlier.

Figure 14 Breast cancer death rates, by age, Pierce County females, 2000–2009

Race
Black-NH women had the highest rates of death from breast cancer (Figure 15). The fact that Black-NH women have lower incidence but higher mortality from breast cancer compared with White-NH women means that factors in addition to incidence make this population particularly vulnerable to poor outcomes. These factors might include:

- Diagnosis at a later stage
- More aggressive tumors
- Inadequate care following diagnosis which might include inability to afford care, refusing or delaying care or other barriers to receiving optimal care.

Figure 15 Breast cancer death rates, age-adjusted, by race, in 40-64 y.o. females, Pierce County, 2000–2009
Years of potential life lost due to breast cancer

Years of potential life lost (YPLL) is an estimate of the average years a woman would have lived if she had not died of breast cancer. It is, therefore, a measure of premature mortality. It is a measure that captures both the risk of death and the age of death in a population. In this section YPLL relative to age 65 per 100,000 population was calculated.

Geography
Breast cancer resulted in 139 years of potential life lost in Pierce County per 100,000 women. This indicator of premature death largely followed the same geographical pattern as did the rate of death: YPLL was highest in CD4: Central Tacoma to Ruston, and lowest in CD6: Lakewood/JBLM (Figure 16).

Figure 16 Years of potential life lost, per 100,000, averaged for 2000-2009


Race
YPLL followed the same racial pattern as seen for rate of death: high in Black-NH women and low in Hispanic women (Figure 17). The differences, however, were more striking for YPLL. The death rate for Black-NH women was about 160% that of Hispanic women. YPLL for Black-NH women, however, was about 380% that of Hispanic women. This means that Black-NH women are not only dying in greater numbers than Hispanic women, they are also dying at younger ages.
Breast cancer screening involves clinical breast examination or mammography. Studies have shown that regular screening of women with no symptoms has decreased the number of women who die from breast cancer by approximately 45 percent\textsuperscript{4}.

About 26% of women aged 40-64 in Pierce County and about 25% women in Washington State did not receive a mammogram in the past two years. Compared to Pierce County women who had a recent mammogram, those who had not were more likely to be:
- under age 50,
- nonwhite,
- uninsured,
- without a usual source of health care and
- unable to afford needed health care in the past year.

These characteristics have also been associated with mammography under-utilization in other studies\textsuperscript{5}. Among Pierce County women aged 40-64 who did not receive a mammogram in the past two years, about 26% were nonwhite and 14% had no usual source of health care. Additionally, about 70% reported that they did not have health insurance and 65% had forgone medical care in the past year due to cost. Family income and education were not associated with mammography utilization in our county.

**Geography**

There was a strong effect of geography on mammography utilization. Women 40-64 years of age in CD1: Bonney Lake to Mt Rainier and CD3: Ashford/Mt Rainier were less likely to have received a recent screening mammogram (Figure 18 and Attachment D). Women in these districts who were better educated or had higher income nevertheless had low mammography utilization rates. These women, however, received a recent clinical breast exam at rates similar to women in other Districts (Figure 19).
These regional gaps in mammography utilization were not observed among older women (Figure 18). Taken together, these data indicate that geographic isolation may be an important barrier to accessing mammography among working-age women.

In contrast, screening mammography was highest in CD4: Central Tacoma to Ruston. The previous section, however, showed that this district had disproportionately high breast cancer burden. This could come about if women in this district had particularly aggressive tumors or did not receive optimal or timely care after diagnosis. It is also important to remember that two very different data sources provide these data: death information comes from death certificates, a relatively unbiased data source. Mammography utilization information is self-reported during a telephone interview, and is subject to several biases.

**Figure 18  Percent of women who did not receive a mammogram within preceding two years, Pierce County, 2006-2008**

*Source: Behavioral Risk Factor Surveillance System (BRFSS)*
Economic and access barriers in Pierce County

Figure 19 Percent of women who did not have clinical breast exam within preceding two years, Pierce County, 2006-2008

![Bar chart showing percent of women who did not have breast exam within the preceding 2 years by age group and area.]

Source: Behavioral Risk Factor Surveillance System (BRFSS)

Figure 20 Women who did not have personal doctor, by age group, Pierce County, 2008-2009

![Bar chart showing percent of women who don't have personal doctor by age group and area.]

Source: Behavioral Risk Factor Surveillance System (BRFSS)

Economic resources are very important for accessing health care. Our measures for this include women who do not have a personal doctor, reported inability to afford needed health care in the past
year, insurance coverage, and poverty. Because Medicare coverage begins at age 65 years we do not report insurance or poverty for that age group.

**Figure 21 Women who couldn’t afford health care in last year, Pierce County, 2008-2009**

![Bar chart showing women who couldn’t afford health care in last year, Pierce County, 2008-2009](chart.png)

*Source: Behavioral Risk Factor Surveillance System (BRFSS)*

**Geography**

In Pierce County, CD4: Central Tacoma to Ruston, and CD 5: SE Tacoma to Spanaway, had the highest percentages of economic need among women 40-64 years of age, by all these measures (Figures 20-23).

Having a physician referral is very strongly associated with mammography utilization and women without a primary care provider are less likely to receive mammography referral. Women with no usual source of care tended to reside in County Council Districts with high levels of poverty: CD4: Central Tacoma to Ruston, CD5: SE Tacoma to Spanaway, and CD 6: Lakewood/JBLM.

**Figure 22 Uninsured women 40-64 y.o., Pierce County, 2008-2009**

![Bar chart showing uninsured women 40-64 y.o., Pierce County, 2008-2009](chart.png)

*Source: Behavioral Risk Factor Surveillance System (BRFSS)*
Conclusions and recommendations

Geography

Our analysis shows that there is significant geographical variation in breast cancer burden, mammography utilization, and socioeconomic barriers to care across Pierce County, but that these indicators of high risk/underserved were not always in alignment. Breast cancer death rates and years of potential life lost to breast cancer were highest in Tacoma (CD4: Central Tacoma to Ruston). By multiple measures, economic need was also high in this area and in CD5: SE Tacoma to Spanaway. If service decisions are to be based on breast cancer burden or economic need, these central Tacoma areas would be the places to focus.

Mammography use, however, was high in these areas, perhaps because of the federal breast and cervical screening program available for low-income women or current outreach activities of CMBC. It is unclear from the data we have why mortality was high here in spite of high mammography utilization. Possible explanations are that women in these areas had more aggressive tumors or that they received delayed or inadequate care after their diagnoses.

CD6: Lakewood/JBLM had low breast cancer mortality and high rates of mammography. This may reflect the high prevalence of military families with good health care coverage who live in this area.

Mammography use among 40-64 year old women was lowest in eastern Pierce County (CD1: Bonney Lake to Mt Rainier, and CD3: Ashford/Mt Rainier) in precisely the areas with lowest rates of poverty. Mammography use was low in these areas even among women with more economic resources. This suggests that geographical isolation itself or a factor that correlates with geographical isolation may be an important barrier to screening mammography for working-age women in this area.
Race

The most striking and consistent finding regarding race was that Hispanic women were at markedly low risk of breast cancer burden compared with other women. White-NH, Black-NH and American Indian/Alaskan Native-NH women were about equally likely to develop breast cancer. Black women, however, were more likely to be diagnosed at a later stage, to die of breast cancer and to die at a younger age. National studies have shown that black women were more likely than other women to have large, advanced-stage, high-grade and lymph-node positive tumors. Inadequate screening history accounted for much of the discrepancy, although even well-screened black women tended to have higher grade tumors.6

Age

Breast cancer incidence, hospitalization and death were very strongly related to age; each of these measures of burden increased monotonically with age and peaked sometime after age 75. The utility of mammography in saving lives is also age-dependent7. The number needed to offer screening to prevent one breast cancer death is 1904 for women 39-49 and 377 for women 50-69. There have been few studies that report results for women age 70 and older.

Although breast cancer burden increases with age, access to care tends to improve with age, particularly after age 65 when almost all women become eligible for Medicare. Still, 8.5% of women 65 or older in CD5: SE Tacoma to Spanaway could not afford health care sometime in the previous year.

Recommendations

- Black women were at higher risk of late-stage diagnosis, death and years of potential life lost than other race groups and so would be an appropriate target population. Hispanic women were at low risk of late stage diagnosis and breast cancer mortality and so should not be specifically targeted.
- Working-age women 40-64 in eastern Pierce County (Bonney Lake to Mt Rainier and Ashford/Mt Rainier) were not receiving regular mammograms. Although this area is not in the catchment area for CMBC, there is unmet need here. If this geographic area is targeted, we recommend conducting focus groups or key informant interviews to better understand the barriers of these rural women before mounting outreach to them.
- CD4: Central Tacoma to Ruston had high rates of poverty, of not having health insurance and of not having a usual source of health care and high breast cancer mortality. These factors dictate targeting this area. Paradoxically, however, this area also had high mammography utilization. Because County Council Districts are large and can be quite heterogeneous, we recommend further analyses to better understand which women in this district might be high risk/underserved.
- To the extent that resources need to be deployed strategically, we recommend:
  - Following the screening guidelines of the U.S. Preventive Services Task Force, namely, routine biennial screening of women age 50-74 unless clinical considerations dictate otherwise.7
○ Using tools for individual risk assessment to help women understand their risk of breast cancer and to help them decide whether they should seek mammography. This option is described in Attachment A.
References

1 Washington State Department of Health – Office of Hospital and Patient Data Systems Procedure


4 Memorial Sloan-Kettering Cancer Center Breast Cancer Screening Guidelines http://www.mskcc.org/mskcc/html/65280.cfm


Attachment A
Individual Risk Assessment for Breast Cancer

An alternative approach to identifying populations with high need would be to teach women a self-evaluation procedure. As the result of self evaluation, a woman becomes aware of the breast cancer risk she has. If the risk is high, a woman is likely to be motivated for making next step – pursuing breast cancer screening. The goal of the individual-based approach is to increase public awareness about breast cancer risk factors.

The individual-based approach suggests usage of the breast cancer risk assessment tools that are used for determining the risk group a patient is in. An essential part of the breast cancer risk assessment tools is a questionnaire designed for collecting information specific to the risk factors of interest. Examples of the breast cancer risk factor questionnaire are:

1. National Cancer Institute Questionnaire
   and
2. Group Health Cooperative Risk Factor Questionnaire

More details on the individual-based approach can be found at:
Attachment B

Geography of County Council Districts

**Council District 1** covers eastern and southern Pierce County, including the areas of Buckley, Wilkeson, Carbonado, Bonney Lake, Sumner, Edgewood, Milton, South Prairie, Orting, and Graham.


**Council District 3** covers the communities of Ashford, Eatonville, Elbe, Elk Plain, Frederickson, Graham-west, Harts Lake, Lacamas, Roy-east, Spanaway-east, and South Hill.

**Council District 4** covers north and central Tacoma, including the downtown corridor and Hilltop areas, and Ruston.

**Council District 5** covers most of south Tacoma, a portion of east Tacoma, Midland, Parkland, and part of Spanaway.


**Council District 7** covers the Gig Harbor and Key peninsulas, Fox Island, Fircrest, University Place, and a portion of W. Tacoma.
Attachment C
Race composition of Pierce County Council Districts

Figure 1 Female population, by race: CD1 (Bonney Lake to Mt Rainier)

Figure 2 Female population, by race: CD2 (NE Tacoma to Meridian E.)

Figure 4 Female population, by race: CD4 (Central Tacoma to Ruston)

Figure 2 Female population, by race: CD5 (SE Tacoma to Spanaway)
Figure 6 Female population, by race: CD6 (Lakewood/JBLM)

![CD6 Female Population Diagram](image)

Figure 3 Female population, by race: CD7 (UP/Key Peninsula)

![CD7 Female Population Diagram](image)
Women who did not receive mammogram within the preceding 2 years, Aged 40-64

Attachment D  Map of mammography utilization and poverty

% Females 35-64 below FPL
- 5% or less
- 5.1% - 10%
- 10.1% - 20%
- More than 20%

Milgard Catchment Area
- Council Dist 1
- Council Dist 2
- Council Dist 3
- Council Dist 4
- Council Dist 5
- Council Dist 6
- Council Dist 7

Sources:
- Geography: Pierce County GIS, ESRI
- Poverty Data: ACS 5-year Estimates 2005-2009
- Mammogram Screening Rates: BRFSS 2006-2008, Females 40-64
- Map: Tacoma-Pierce County Health Dept. 2011.07.08: rp

The map features are approximate and are intended only to provide an indication of said feature. Additional areas that have not been mapped may be present. This is not a survey. Orthophotos and other data may not align. The County assumes no liability for variations ascertained by actual survey.

ALL DATA IS EXPRESSLY PROVIDED 'AS IS' AND 'WITH ALL FAULTS'. The County makes no warranty of fitness for a particular purpose.

Map: Tacoma-Pierce County Health Department

0 1.25 2.5 5 Miles