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Disparities in Screening for Breast Cancer in the Redwood Coast Region

CCRP
California Center for Rural Policy

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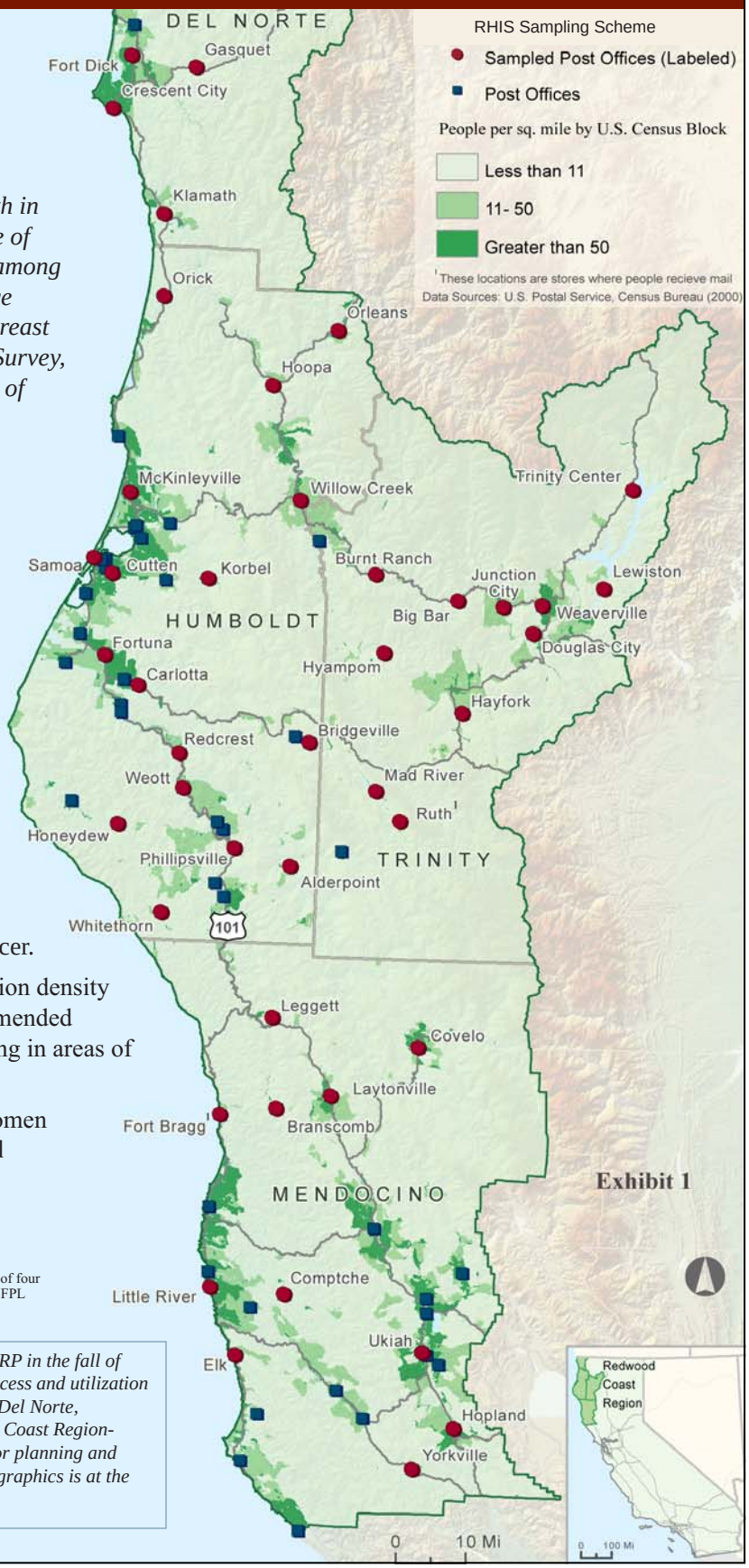
Breast cancer is the most common type of cancer among women in the United States, other than skin cancer. It is the second-leading cause of cancer death in women after lung cancer.[1] Humboldt County has one of the highest death rates due to female breast cancer among all California counties.[2] There is convincing evidence that screening mammography reduces deaths from breast cancer.[3] Results from the Rural Health Information Survey, 2006 indicate that there are disparities in utilization of mammograms in the Redwood Coast Region:

- More than ¼ of the women respondents in the Redwood Coast Region had not received the recommended screening for breast cancer.
- Low-income* women respondents were significantly less likely than non low-income women to receive the recommended screening for breast cancer in three of the four counties in the Redwood Coast Region. Del Norte County does not show this disparity.
- Women respondents without insurance or with Medi-Cal insurance were significantly less likely than those with private insurance to receive the recommended screening for breast cancer.
- Women respondents who had a routine check-up in the past 2 years were 2.3 times more likely to receive the recommended screening for breast cancer.
- Women respondents living in areas of low population density were significantly less likely to receive the recommended screening for breast cancer compared to those living in areas of higher population density.
- In some sampled communities over 40% of the women respondents reported not having the recommended screening for breast cancer.



* Low-income is defined as less than 200% of the federal poverty level (FPL). For a family of four (two adults, two children) the 2006 Federal Poverty Level (100% FPL) was $20,444, 200% FPL was $40,888 and 300% FPL was $61,332.

The Rural Health Information Survey (RHIS) was conducted by CCRP in the fall of 2006. The purpose of the survey was to assess health disparities, access and utilization of healthcare, and other determinants of health among residents in Del Norte, Humboldt, Trinity and Mendocino counties (known as the Redwood Coast Region- Exhibit 1). The goal of the survey is to provide useful information for planning and policy development. A description of the methods and sample demographics is at the end of this report (Exhibits 13 & 14).

Why Study Mammograms?

Breast cancer is the most common type of cancer among women in the United States, other than skin cancer. It is the second-leading cause of cancer death in women after lung cancer.[1] The incidence (new cases) of breast cancer increased from the 1970's to late 1990's, which coincided with the widespread adoption of screening mammography.[4] Recent data show a decrease in breast cancer incidence from 1998 to 2007, with a significant decrease from 2002 to 2003. A plausible explanation for this is the sharp decline in the use of post-menopausal hormone replacement therapy following the 2002 publication of the Women's Health Initiative suggesting an increased risk for invasive breast cancer among women using combined estrogen progestin hormone replacement therapy.[5,6,7] Breast cancer death rates have been decreasing since 1990, which has been attributed to a combination of early detection through screening and improved treatments.[4,8]

The incidence of breast cancer varies considerably by ethnicity. In the U.S. between 2003-2007, white women had the highest incidence rate of breast cancer (age adjusted rate of 126.5 cases per 100,000 women per year), followed by black (118.3 per 100,000), Asian/Pacific Islander (90 per 100,000), Hispanic (86 per 100,000), and American Indian/Alaska Native women (76.4 per 100,000).[7] Before the age of 35, black women have a higher incidence of breast cancer than white women and have the highest mortality rate due to breast cancer at every age.[9] Alarmingly; Humboldt County has one of the highest death rates due to female breast cancer among all California counties.[2] While the reasons for this are unknown, it is possible that late detection plays a role.

Mammograms are intended to detect cancer in the pre-clinical stage (before it starts to cause symptoms) when it can be treated most effectively. There is convincing evidence that screening mammography reduces deaths from breast cancer with a greater reduction for women aged 50 to 74 years than for women aged 40 to 49 years.[3]

Research has shown that there are disparities in mammogram use by insurance status, race, body weight, disabilities and geographic location. A recent US-based analysis found that women were less likely to receive mammograms if they were uninsured or Medicaid-insured compared to women with private insurance. Furthermore, uninsured and Medicaid-insured patients had substantially increased risks of presenting with advanced-stage cancers at diagnosis compared to patients with private insurance.[10]

A national level study found that women residing in rural areas of the U.S. were significantly less likely than their urban counterparts to receive mammograms; however these differences were largely explained by differences in education, household income and insurance status.[11] By race, studies have shown that Hispanic, Chinese and Vietnamese women are less likely to receive mammograms than white or black women.[12] Women with disabilities are less likely to receive mammograms compared to women without disabilities[13] and women who are obese are less likely to receive mammograms than their normal weight counterparts.[14]

What does it mean to be statistically significant?

Whenever comparisons are made between groups there is always the possibility of finding a difference simply by chance. In research we like to find "true" differences and not differences that have occurred by chance. By convention, most researchers use a *P*-value of <.05 to determine if a difference is significant. This means there is less than a 5% probability that the difference observed has occurred by chance alone.

Why Study Mammograms? *continued*

The U.S. Preventive Services Task Force (USPSTF) recently updated its recommendations for breast cancer screening with some significant changes from its 2002 recommendations. The task force no longer recommends routine screening mammography for women 40 to 49 years of age who are not at increased risk for breast cancer. Exhibit 2 contains a list of known risk factors for breast cancer, which would need to be taken into consideration in determining if a woman is at increased risk for breast cancer. Additionally, the task force recommends screening mammography every two years rather than every year for women 50 to 74 years of age. These updated recommendations are based on evidence showing that women aged 40 to 49 are more likely to have false-positive mammograms resulting in unnecessary imaging and biopsies and are less likely to have a significant improvement in mortality. For women in the 50 to 74 age range, the recommended change from annual to biennial routine screening is based on evidence showing biennial screening saves nearly as many lives, but produces only half the number of false positive results.[3]

Exhibit 2: Known Risk Factors for Female Breast Cancer

- Age– the chance of getting breast cancer goes up with age.
- Family history of breast cancer– breast cancer in first-line relatives (mother, sister, daughter) increases risk by a factor of two to three.
- Genetic mutations– BRCA1, BRCA2 and p53 are rare, but significantly increase risk.
- Early menarche (start of menses before age 12)
- Late Menopause (>55 years)
- Late age at first childbirth (>30 years)
- Exogenous hormones:
  Oral contraceptives– slight increase risk with recent use, but risk drops after discontinuing use.
  Recent and long-term use of hormone replacement therapy with estrogen-progestin combination.
- Alcohol Consumption
- Tobacco Smoke– Active & Passive Exposures
- Overweight & Obesity
- Physical Inactivity
- High dose radiation to the chest
- Environmental Factors:
  Many chemical compounds have known or probable links with increased risk for breast cancer, including: Estrogens and Progestins in personal care products; Dioxins; polychlorinated biphenyls (PCBs); Polycyclic Aromatic Hydrocarbons (PAHs); Some Metals; Benzene; Organic Solvents; Vinyl Chloride; 1,3-Butadiene; Ethylene Oxide; Aromatic Amines.

Sources: World Health Organization[15], American Cancer Society[9], International Journal of Occupational and Environmental Health[16]

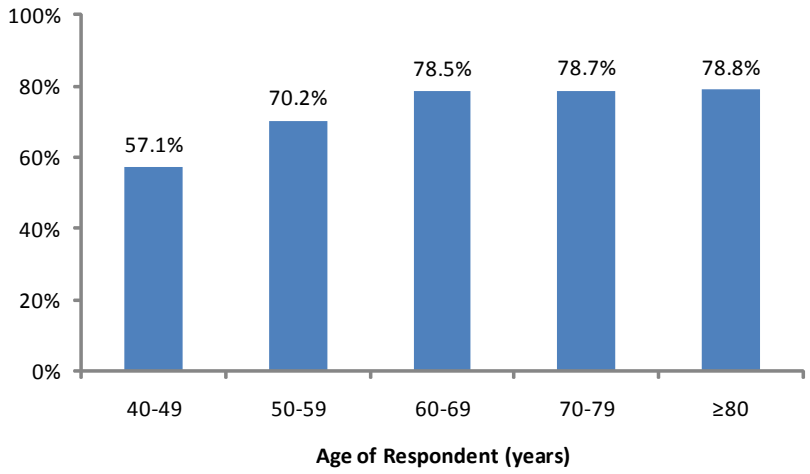
Mammography Screening: The Impact of Age

Women 60 years and older were the most likely to report mammography screening in the past two years.

Age was significantly associated with mammography screening. Over 78% of the women age 60 or older reported mammography screening in the past two years, whereas 70.2% of women age 50 to 59 and 57.1% of women age 40 to 49 reported mammography screening in the past two years (all statistically significant differences) (Exhibit 3).

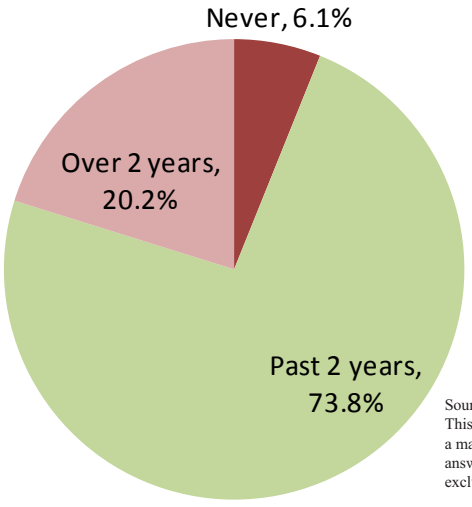
Of the women age 50 to 74 (the USPSTF's recommended age range for routine mammography screening every two years), 73.8% reported having a mammogram in the past 2 years, whereas 20.2% reported their last mammogram was over 2 years ago and 6.0% reported never having a mammogram (Exhibit 4).

Exhibit 3: Mammography Screening in Past Two Years by Age Group (*n* = 1426)



Source: Rural Health Information Survey, 2006, California Center for Rural Policy
This analysis was for the question, "To the best of your knowledge, when did you last have a mammogram?" Analysis was restricted to women respondents aged 40 years or older who answered the question. Respondents who answered "don't know" or "not applicable" were excluded from the analysis.

Exhibit 4: Mammography Screening in Redwood Coast Region: Women Ages 50-74 (*n* = 1006)



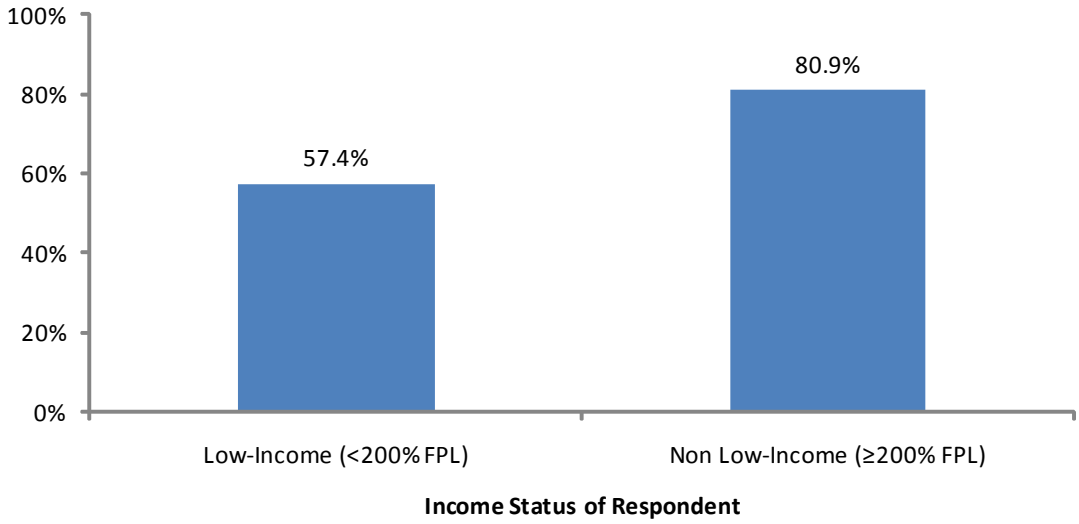
Source: Rural Health Information Survey, 2006, California Center for Rural Policy
This analysis was for the question, "To the best of your knowledge, when did you last have a mammogram?" Analysis was restricted to women respondents aged 50 to 74 years who answered the question. Respondents who answered "don't know" or "not applicable" were excluded from the analysis.

Mammography Screening: The Impact of Income

Low-income women were significantly less likely to have received mammography screening during the preceding 2 years than non low-income women.

Of the low-income women in the age range of 50-74 years, 57.4% reported having a mammogram in the past 2 years, which is significantly lower than the non low-income women in the same age range (80.9%) (Exhibit 5).

Exhibit 5: Mammography Screening in Past Two Years by Income Level of Respondents: Women Ages 50-74 (*n* = 872)



Source: Rural Health Information Survey, 2006, California Center for Rural Policy
This analysis was for the question, "To the best of your knowledge, when did you last have a mammogram?" Analysis was restricted to women respondents aged 50 to 74 years who answered the question and provided information necessary for determining Income level. Respondents who answered "don't know" or "not applicable" were excluded from the analysis.

"Couldn't afford an eye exam, skin exam, pap smear, mammogram."
—Trinity County Respondent,
≤99% FPL

"Refused annual mammogram because local hospital no longer accepts my insurance."
—Humboldt County Respondent, ≥300% FPL

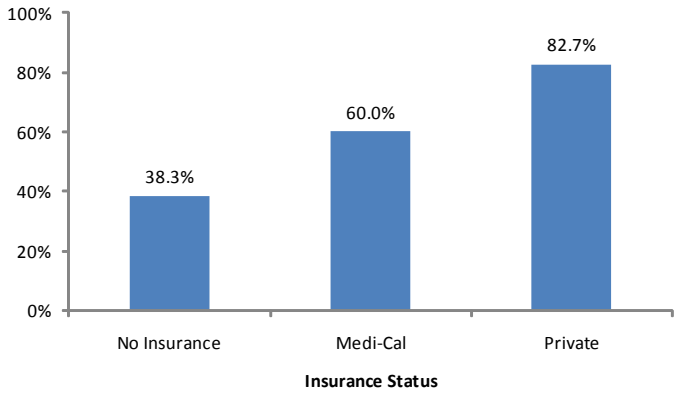
Mammography Screening: The Impact of Insurance Coverage and Access to Care

Women without insurance or with Medi-Cal insurance were significantly less likely than those with private insurance to receive the recommended screening for breast cancer.

Of the women ages 50-64, only 38.3% of those that were uninsured reported having a mammogram in the past 2 years, while 60% of the women with Medi-Cal insurance and 82.7% of the women with private insurance reported having a mammogram in the past 2 years. All differences are statistically significant (Exhibit 6).

Of the women in the age range of 65 to 74, those with private insurance and Medicare were equally likely to have had a mammogram in the past 2 years (85.2% and 78.8% respectively) (data not shown).

Exhibit 6: Mammography Screening in Past Two Years by Insurance Status:Women Ages 50-64 (*n* = 659)

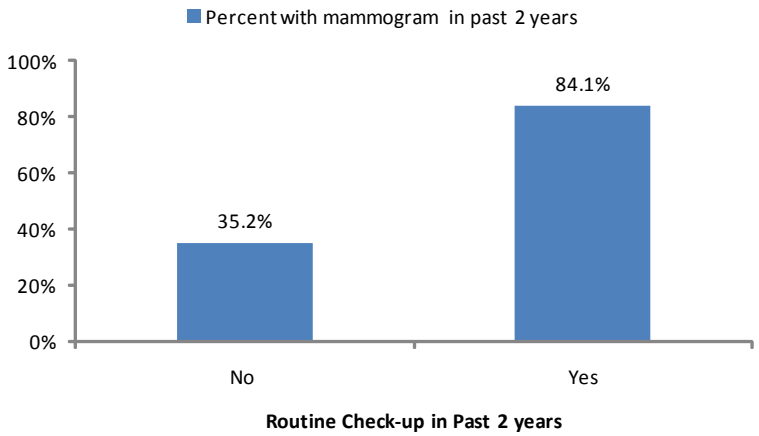


Source: Rural Health Information Survey, 2006, California Center for Rural Policy
This analysis was for the questions, "To the best of your knowledge, when did you last have a mammogram?" and "What type(s) of health insurance do you have?" Analysis was restricted to women respondents aged 50 to 64 years who answered both questions and reported their insurance status as either "None", " Medi-Cal", or "Private". Respondents who answered "don't know" or "not applicable" were excluded from the analysis.

Women who had a routine check-up with a healthcare provider in the past 2 years were significantly more likely to have had a mammogram compared to women who did not have a routine check-up.

Of the women ages 50 to 74, who had a routine check-up with a healthcare provider in the past 2 years, 84.1% also had a mammogram in the past 2 years. Conversely, of those who did not have a routine check-up, only 35.2% had a mammogram (Exhibit 7).

Exhibit 7: Mammography Screening and Routine Check-up in Past Two Years: Women Ages 50-74 (*n* = 905)



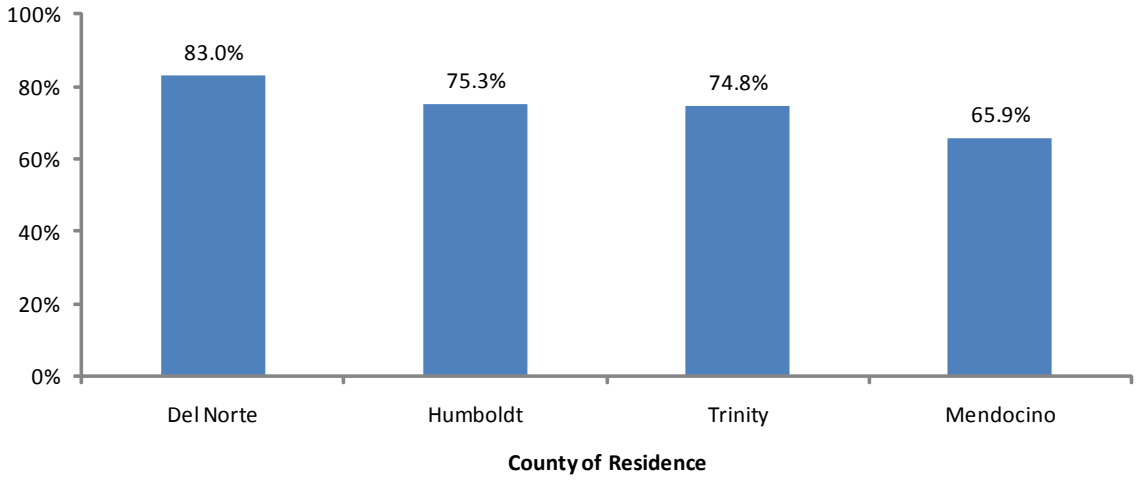
Source: Rural Health Information Survey, 2006, California Center for Rural Policy
This analysis was for the questions, "To the best of your knowledge, when did you last have a mammogram?" and "How long has it been since you last visited a doctor or healthcare provider for a routine check-up?" Analysis was restricted to women respondents aged 50 to 74 years who answered both questions. Respondents who answered "don't know" or "not applicable" were excluded from the analysis.

Mammography Screening: The Impact of Place

Del Norte County had the highest percent of women reporting mammography screening in the past 2 years (83.0%), while Mendocino County had the lowest (65.9%) (Exhibit 8).

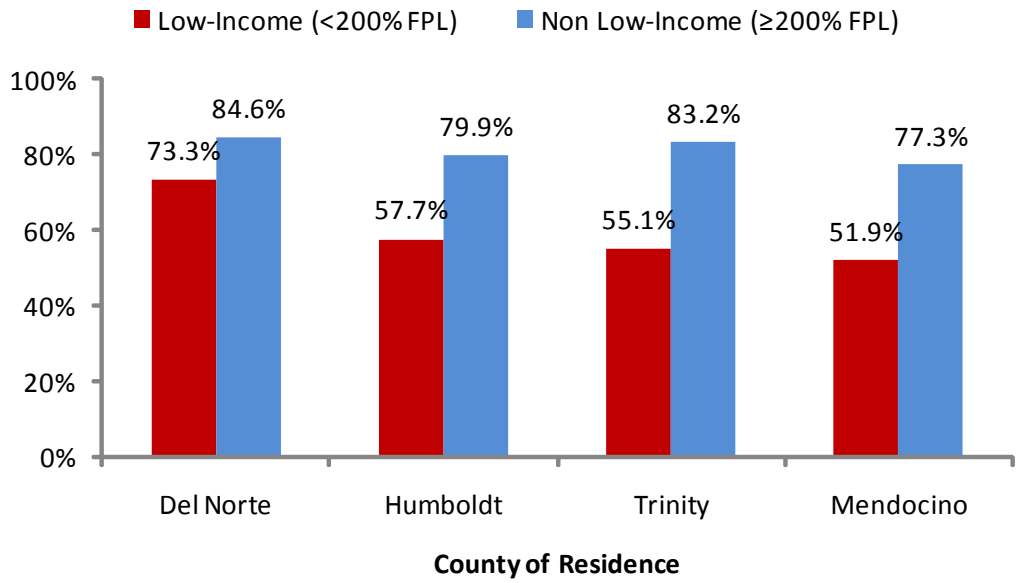
Del Norte County was the only county that did not show a statistically significant difference between low-income and non low-income women reporting mammography screening in the past 2 years. In Humboldt, Trinity and Mendocino counties, low-income women were significantly less likely than and non low-income women to report mammography screening in the past 2 years (Exhibit 9).

Exhibit 8: Mammography Screening in Past Two Years by County of Residence: Women Ages 50-74 (*n* = 1004)



Source: Rural Health Information Survey, 2006, California Center for Rural Policy
This analysis was for the question, "To the best of your knowledge, when did you last have a mammogram?" Analysis was restricted to women respondents aged 50 to 74 years who answered the question and provided their county of residence. Respondents who answered "don't know" or "not applicable" were excluded from the analysis.

Exhibit 9: Mammography Screening in Past Two Years by County of Residence and Income Level: Women Ages 50-74 (*n* = 870)



Source: Rural Health Information Survey, 2006, California Center for Rural Policy
This analysis was for the question, "To the best of your knowledge, when did you last have a mammogram?" Analysis was restricted to women respondents aged 50 to 74 years who answered the question and provided their county of residence and information necessary for determining Income level. Respondents who answered "don't know" or "not applicable" were excluded from the analysis.

Mammography Screening: The Impact of Place *continued*

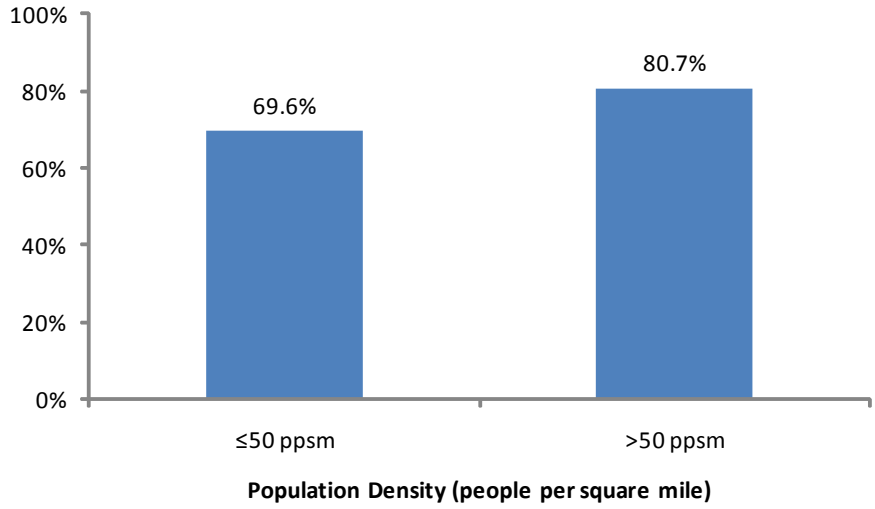
Women living in areas of low population density were significantly less likely to report mammography screening in the past 2 years compared to women living in areas of higher population density.

Of the women respondents living in areas of low population density (≤50 people per square mile), 69.6% reported having a mammogram in the past 2 years. This is significantly lower than the 80.7% of women living in areas of higher population density (>50 people per square mile) (Exhibit 10). On further analysis, it appears that this difference can be explained in part by income levels and in part by other factors. There is a higher percentage of low-income women living in areas of low population density, which explains some of the difference seen between population density.

However, non low-income women living in areas of low population density are less likely to receive mammograms than their counterparts living in areas of higher population density. Thus, there appear to be factors other than income status that are associated with living in an area of low population density and lower utilization of mammograms.

Analysis on a sub-county level revealed variability by sampled community with respect to women respondents in the age range of 50 to 74 years who reported no mammogram in the past 2 years. In towns such as Laytonville and Covelo the percent of women without the recommended screening was 40% or greater (Exhibit 11).

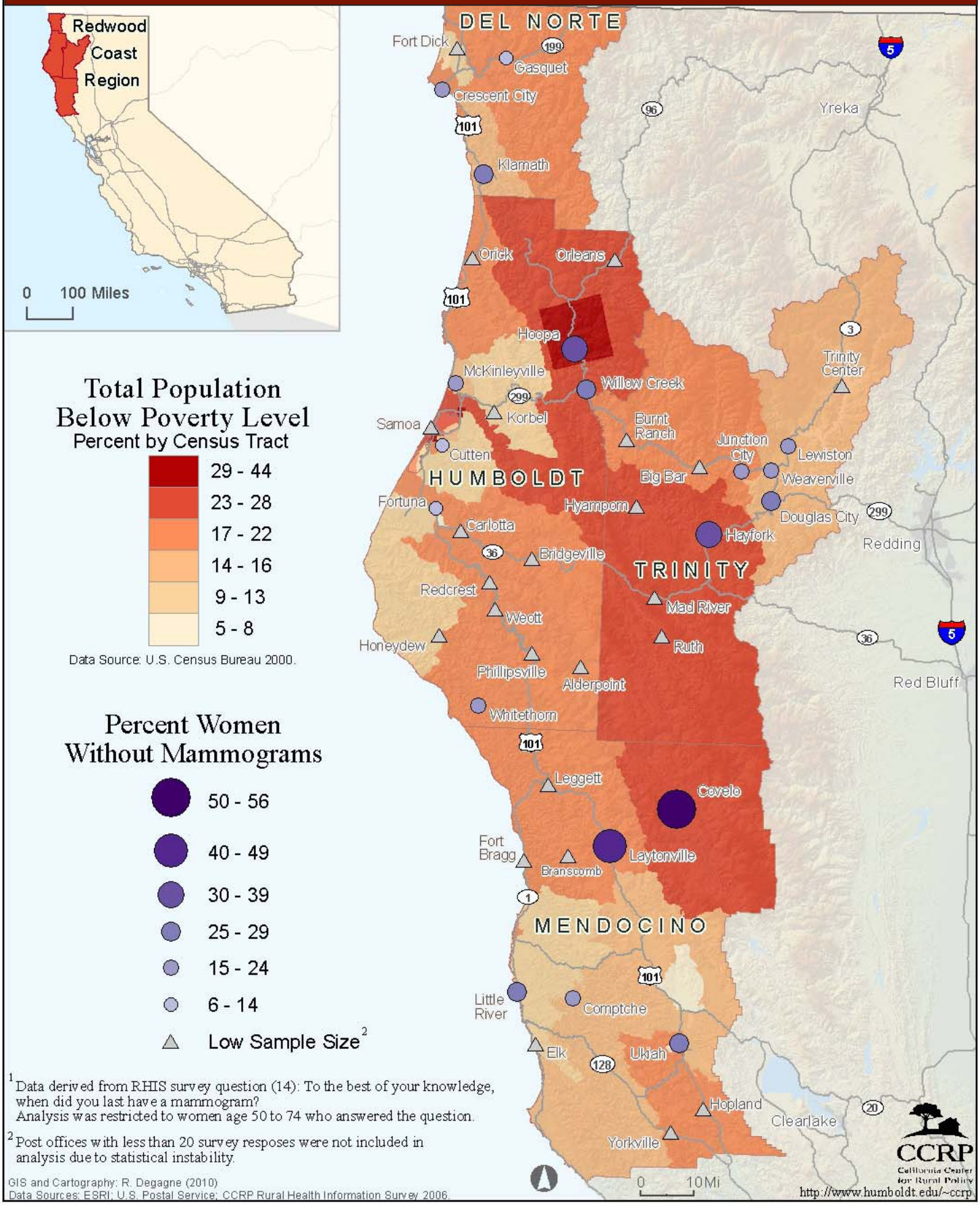
Exhibit 10: Mammography Screening in Past Two Years by Population Density: Women Ages 50-74 (*n* = 1004)



Source: Rural Health Information Survey, 2006, California Center for Rural Policy
This analysis was for the questions, "To the best of your knowledge, when did you last have a mammogram?" and "How far do you live from the post office where you get your mail?" Analysis was restricted to women respondents aged 50 to 74 years who answered both questions. Population density was calculated based on GIS analysis using 2000 Census block population density estimates and distance in which 95% of the respondents live from the Post Office within its given ZIP Code.

Exhibit 11

CCRP Rural Health Information Survey:
Percent of Women Respondents (age 50 to 74) Without Mammogram in Past 2 Years[1], 2006



[1] Data derived from RHIS survey question (14): To the best of your knowledge, when did you last have a mammogram?
Analysis was restricted to women age 50 to 74 who answered the question.

[2] Post offices with less than 20 survey resposes were not included in analysis due to statistical instability.

GIS and Cartography: R. Degagne (2010)
Data Sources: ESRI; U.S. Postal Service; CCRP Rural Health Information Survey 2006.

Implications for Programs, Policy & Research

The results of this study clearly show that there are disparities in screening for breast cancer with mammograms in the Redwood Coast Region. Women who are low-income, uninsured or with Medi-Cal insurance or living in areas of low population density are less likely to receive the recommended screening for breast cancer compared to their counterparts without these factors.

Having a routine check-up in the past 2 years is associated with receiving the recommended screening for breast cancer. Additional analysis of RHIS showed that women who are receiving mammograms are significantly more likely than women not receiving mammograms to receive other preventive health screenings including screening for cervical cancer, colorectal cancer, diabetes, cholesterol and blood pressure as well as professional teeth cleaning.

This study did not find a significant difference between race/ethnicity with respect to mammogram utilization, but the sample sizes for the different ethnic groups may not have been large enough to detect small differences.

The California Breast Cancer Research Program has reported that minority and low income women are less likely than other women to be diagnosed at an early stage, and therefore less likely to survive breast cancer. Lack of screening and access to health insurance is the likely cause of the late stage diagnosis among this section of the population.[17]

Mammogram utilization appears to be lower in the Redwood Coast Region than in California as a whole. In 2007, The California Health Interview Survey found that 84.5% (95% confidence interval, 83.4- 85.5) of women respondents in the age range of 50 to 74 had received a mammogram in the past 2 years.[18] This is significantly higher than what was found in the Rural Health Information Survey where only 73.8% of women in the same age range reported receiving a mammogram in the past 2 years.

Most studies primarily analyze health survey data at the national or state levels. The large sample size from RHIS allowed analysis on the county and sub-county level, which helps to identify geographic disparities in mammography use.

This study has some limitations. It provides information about the respondents of the survey and does not necessarily describe the population in general. However, this is the largest and most comprehensive study ever conducted in this rural region of California. This study also relies on self-report of when individuals last had a mammogram. Studies have suggested that patients tend to over report their use of screening and underreport the time lapse since their last screening.[19] This means it is possible that the percent of women who actually had a mammogram in the past two years may be lower than what is reported.

Some women use thermography as an alternate method of screening for breast cancer. In this analysis 52 women reported having thermography in the past 2 years. Many of these women had both a mammogram and thermography (87.5%). Of the women who did not have a mammogram in the past 2 years, only 6 reported having thermography in the past 2 years, which is not enough to make any significant difference in the percent of women without screening.

The new USPSTF guidelines have become a point of contention and not all medical organizations are in agreement with the new guidelines. Many organizations have provided breast cancer screening recommendations over the years. The USPSTF, the World Health Organization, and the American Academy of Family Physicians agree that routine mammography screening should start at age 50. These organizations emphasize that the decision to screen for breast cancer at an earlier age should be based on discussions between the woman and her

Implications for Programs, Policy & Research *continued*

health care provider. These discussions should include the potential benefits and harms of breast cancer screening tests, evidence regarding each screening test, the risk of breast cancer, and individual patient preference.[3,20,21]

Organizations that continue to recommend routine mammography screening start at age 40 include the American Cancer Society, the American Medical Association, the American College of Radiology, the National Cancer Institute and the American College of Obstetricians and Gynecologists.[22]

The debate about the appropriate age to start mammogram screening and the interval at which the screening should occur is complex, but basically comes down to weighing risks and benefits. The risks of mammogram screening include exposure to radiation, false positive results (the screening suggests cancer is present, when the women is healthy), false negative results (the screening does not detect cancer that is present), overdiagnosis and over treatment (finding a slow-growing, nonaggressive cancer that may not cause symptoms or death). False positive results are more common in women aged 40 to 49 years and are estimated to occur in 50% of women screened annually for 10 years, 25% of whom will have unnecessary biopsies. The benefit of mammography is reduced mortality from breast cancer. This reduction is greatest for women aged 50 to 74 than for women aged 40 to 49. Changing from annual to biennial screening in women aged 50 to 74 is likely to reduce the harms of mammography screening by nearly half while not changing the mortality significantly.[3,4] Compared to older women, younger women are significantly less likely to develop and die from breast cancer within 10 years. Thus, a much higher number of younger women need to be screened with mammography in order to prevent one death from breast cancer (Exhibit 12). The USPSTF has determined that the increased risks associated with mammography screening in the age range of 40 to 49 years outweigh the small net benefit, and therefore recommend routine biennial screening start at age 50.[3]

Exhibit 12: Risk of Breast Cancer and Number Needed to Screen

Age of Woman	Chance of Developing Breast Cancer in the next 10 Years	Chance of Dying from Breast Cancer in the next 10 Years	Number Needed to Invite for Mammogram Screening to Prevent 1 Breast Cancer Death
39 to 49 years	Age 40: 1 in 69	Age 40-44: 1 in 333 Age 45-49: 1 in 250	1904
50 to 59 years	Age 50: 1 in 42	Age 50-54: 1 in 167 Age 55-59: 1 in 143	1339
60 to 69 years	Age 60: 1 in 29	Age 60-64: 1 in 125 Age 65-69: 1 in 100	377

Sources: National Cancer Institute[4] and U.S. Preventive Task Force[3]

Policy Directions

Policy Checklist

- ✓ Ensure that the decision to obtain a mammogram is between a woman and her health care provider- not insurers
- ✓ Continue funding mammography screenings for low income, uninsured, and underserved women
- ✓ Support programs that promote free or low-cost access to mammograms
- ✓ Increase mammography utilization for women living in remote areas of the region
- ✓ Increase Medi-Cal reimbursement rate for digital mammograms
- ✓ Raise awareness about primary prevention of breast cancer
- ✓ Raise awareness about breast cancer screening
- ✓ Support research to improve breast cancer screening tools
- ✓ Continue monitoring breast cancer screening in the redwood coast region

1) Ensure that the Decision to Obtain a Mammogram is between a Woman and her Health Care Provider- Not Insurers

The decision about getting a mammogram should be between a woman and her healthcare provider. The USPSTF recommendations should not be used to deny coverage of mammograms regardless of insurer.

When the USPSTF released their new recommendations for mammograms some advocates were concerned that these recommendations were linked to health care reform as a way to control costs. The USPSTF is an independent panel of experts in primary care and prevention that systematically reviews the evidence of effectiveness of clinical preventive services and develops recommendations. Recommendations issued by the USPSTF are intended for use in the primary care setting and provide the evidence-base needed for healthcare providers to make informed decisions with their patients about the use of various screening modalities. Women should be provided with evidence-based information regarding the risks and benefits of mammograms and other breast cancer screening modalities in order to allow them to make a truly informed decision. As with all decisions in medicine, the process of weighing risks and benefits is complex and should not be clouded by limitations of insurance coverage.

To estimate risk for developing breast cancer, assessment tools are available at the Harvard Center for Cancer Prevention http://www.diseaseriskindex.harvard.edu.

The recent Patient Protection and Affordable Care Act (PPACA) passed March 21, 2010, includes language that would require insurers to provide minimum coverage and not impose cost sharing requirement for certain evi-

Policy Directions *continued*

dence based preventive services. To protect women from being denied mammogram coverage based solely on age, the new health reform law would cover routine mammograms for women starting at age 40. Additionally, insurers can provide coverage for services other than those recommended by USPSTF or those that are supported by guidelines issued by the Health Resources and Services Administration.[23,24]

There are several California bills that would prevent women from getting denied from mammogram coverage based on their age. Many are focused around the Every Woman Counts program (EWC), which is discussed below. AB 113 (Portanico) would require that preferred provider network health insurance companies cover mammograms when they are recommended by a woman's personal physician, regardless of her age.[25] Laws are already in place for health maintenance organizations to cover mammograms regardless of age.

A law should be enacted to ensure that Medi-Cal also covers mammograms based on a physician's recommendation.

2) Continue Funding Mammography Screenings for Low Income, Uninsured, and Underserved Women

The Breast and Cervical Cancer Mortality Prevention Act of 1990 provides improved access to screening for low income, uninsured, underserved women. The Act required that the Center for Disease Control create the National Breast and Cervical Cancer Early Detection Program (NBCCEDP). The NBCCEDP helps to provide access to clinical breast exams, mammograms, pap tests, pelvic examinations, diagnostic screening for abnormal tests, and referrals to treatment for uninsured and underinsured women that are at or below 200% of the federal poverty level. California's NBCCEDP program is called Every Woman Counts (EWC), and it has suffered greatly from the state's financial situation.

In January, 2010, the Department of Public Health announced that they would be freezing enrollment of the mammogram services provided in EWC to cut costs. Additionally EWC will now only cover mammograms for women who are above 50 years old.[26] California must re-implement mammogram screening services through EWC, and should reverse the adoption of the new USPSTF guidelines. As stated above, the USPSTF guidelines are intended for women and health care providers. The Department of Public Health should not stand between a patient and a doctor.

SB 836 (Oropeza) was introduced after the changes to the EWC program. The purpose of the bill is to return the age of eligibility back to 40. It also helps sustain funding for EWC by appropriating an unspecified amount of the general fund to the program. Currently, the program is funded by sources other than the general fund. SB 836 has been held in committee and is under submission. It is unlikely to pass this year.[27]

AB 1640 would restore the former EWC eligibility guidelines. The bill also requires the Department of Public Health to report to the legislature 90 days before changing any eligibility guidelines in the future. Unfortunately, the bill does not set out regular funding for EWC. Instead, it provides that funding will be contingent upon the annual Budget Act.[28] AB 1640 has passed through the Assembly and is now in the Senate.

The Department of Finance, Office of State Audits and Evaluations conducted an audit of EWC at the request of the Assembly. The audit report was released in the end of May and provided necessary insight to improve administration of EWC. The audit found that EWC's governance is weak, revenues are decreasing, and expenditures are increasing.

Policy Directions *continued*

The Department of Public Health must coordinate with the Department of Health and Human Services, which creates most of the governance inefficiencies. The revenues from Tobacco taxes are decreasing, so state funding for the program is not as robust as it once was. Expenditures are increasing because of avoidable duplicated billings related to case management fees. Not all states pay these fees, and the audit recommended this option. Instead the Department of Public Health is looking into a tiered fee system or offering mammograms every other year.[29]

In the past, most bills concerning the expansion of mammograms to low income women have failed to make it through the appropriations committee. Given California's current budgetary constraints, bills that assist programs such as Every Woman Counts are in need of more support than ever.

3) Support Programs that Promote Free or Low-Cost Access to Mammograms

The Humboldt Community Breast Health Project provides many different services to help women obtain mammograms. Once a year, the Project hosts a free mammogram giveaway. Providers in the community donate mammograms and women who enter the giveaway are picked at random. Women who do not win a mammogram are provided with information on prevention and early detection. Another service the Project offers is patient navigation to help women who are having trouble paying for a mammogram. First the navigator determines if the woman is eligible for Medi-Cal, and if not, they are referred to EWC. Since EWC's program freeze, women are more frequently being referred to the local American Cancer Society's program for free screenings.

The American Cancer Society in Eureka has established the See's Community Fund to provide mammograms to women who cannot afford them. The Fund is a standalone non-profit and survives solely by selling candy at the American Cancer Society. The only requirements that the program has are that the woman has a physician and a clinical breast exam before receiving the mammogram. Other counties could establish similar funds to help women pay for mammograms.

Several hospitals in the area offer a price discount on a mammogram if a woman does not have health insurance and is able to pay cash at the time of the visit. This discount varies at each hospital, but is around 50%. Generally, this discount does not include the radiology reading fee. Some hospitals also donate free mammograms to their local American Cancer Society chapter.

4) Increase Mammography Utilization for Women Living in Remote Areas of the Region

The research shows that low-income women are at a disadvantage when it comes to screening for breast cancer. The reasons for this are likely multi-factorial involving transportation problems, insurance issues, lack of a regular source of health care, and other life stresses.

Whether or not women of different socioeconomic status receive the same level of recommendations for mammograms from their health care providers is another area that needs to be studied.[11]

The Rural Health Information Survey found that transportation problems were common for people living in remote areas, especially for low-income populations.[30] For the more remote areas, it is important to either provide transportation for people or provide mobile mammogram screening services. There are several successful examples in other rural areas.

One rural county in Oregon has provided an excellent service to promote mammogram screenings to its rural residents. A mammogram bus picks up about 10 women from Fossil, Oregon and transports them to a radiology

Policy Directions *continued*

clinic in Bend, nearly three hours away. The program has partnered with the clinic and negotiated a special rate for mammograms to bus attendees. If a follow up exam is needed, it will be done that same day and any additional appointments will be made if necessary. The bus is the senior transportation bus that has been borrowed from the county for the day. The trip also combines the screening with lunch out and shopping. For the women who participate, this program provides more than a medical service; it provides them with a fun day filled with camaraderie and support. The trip occurs once a month. For women who do not have insurance or cannot afford a mammogram, the program finds donations to cover the costs and also uses vouchers provided through the Susan G. Komen Foundation. There are no eligibility requirements for the program, so any woman can register. The program is supported by the Komen Foundation, donations, and volunteers.[31]

A similar program could easily be implemented in the Redwood Coast Region. The GIS maps contained in this report could be used to target communities with low mammogram utilization.

In rural Louisiana a mobile cancer screening unit provides mammograms to women in remote locations. After the mobile units transmit digital images to radiologists, the patients are notified if they require a follow up exam. This effort is made possible through a partnership between a rural hospital trade organization, the Rural Hospital Coalition, Feist-Weiller Cancer Center in Shreveport, and the Louisiana Health Information Exchange. The unit is also equipped to provide pap smears, prostate exams, head and neck screenings, and colorectal screenings, but is primarily aimed at providing mammograms.[32]

5) Increase Medi-Cal Reimbursement Rate for Digital Mammograms

The reimbursement rate for digital mammography must reflect the actual cost of the screening. Most health care facilities are switching to digital mammograms, which allow digital images to be enhanced, stored and easily transferred. Legislation passed in 2009 allows the Department of Health Services to cover digital mammography when film mammography is not available.[33] The reimbursement rate does not pay providers for the cost of digital mammography; reimbursement is set at the much lower film mammography rate.[33,34] In effect, the low reimbursement rate will create a barrier for Medi-Cal patients because fewer providers may be willing to perform digital mammograms without better compensation, and it may be difficult for patients to travel to facilities still offering film mammography.

6) Raise Awareness about Primary Prevention of Breast Cancer

While it is incredibly important to detect breast cancer at an early stage when it is still treatable (secondary prevention), women should also be made aware of things they can do to decrease their chance of getting breast cancer in the first place (primary prevention). An active lifestyle, healthy diet, reduction of overweight and obesity can all contribute to decreasing risk of breast cancer.[15] In high income countries, it is estimated that 27% of all breast cancer deaths are attributable to alcohol use, overweight and obesity, and physical inactivity with the most important contributor being overweight and obesity.[35] Additionally, studies have shown a 30% reduction in breast cancer risk associated with a few hours per week of vigorous activity compared to no exercise at all.[15]

A healthy diet is also important for reducing risk of breast cancer. Consumption of fruits and vegetables may reduce the risk of developing breast cancer, while dietary intake of fat appears to increase the risk.[15] Reducing alcohol consumption may also decrease risk of breast cancer. Research suggests that consumption of approximately 2 alcoholic beverages a day is associated with a 21% increased risk of breast cancer.[36]

It is important to engage teens and encourage healthy behaviors, such as those discussed above. Education

Policy Directions *continued*

through high schools could be used to raise awareness among young women about health habits that could reduce breast cancer later in life. High school health education classes should discuss prevention of all types of cancer.

Women should also be encouraged to breast feed their children as breastfeeding has consistently been shown to reduce the risk of breast cancer with the added benefit of improving other health outcomes for the mother and child.[37]

7) Raise Awareness about Breast Cancer Screening

The Humboldt County Breast Health Project attends a number of health fairs throughout the community to promote breast cancer awareness. They also have a number of volunteers focused on outreach to the Native American and Latina populations in Humboldt County. Similar outreach through an appropriate nonprofit could be done in other counties.

A new program in North Carolina funded by the Avon Breast Care Fund employs an educator and outreach coordinator to conduct outreach in communities. The coordinator hosts lunches or other events at churches, health fairs, or workplaces to educate women about breast cancer awareness, prevention, and mammography. The coordinator also has a wide range of contacts, including doctors who will provide services at lower fees. At times, the coordinator also travels with a mobile unit so mammograms can be performed on the spot. A similar program could be adopted in the Redwood Coast Region.[38,39]

8) Support Research to Improve Breast Cancer Screening Tools

While mammography is the current gold standard for breast cancer screening, there are clearly limitations to this tool. Research should focus on identifying the most effective breast cancer screening tools or combination of tools.

Thermography is a noninvasive procedure that uses high resolution temperature measurements of breast tissue to assess physiological function. Thermography was first introduced in 1956 as a breast cancer screening tool and has been approved by the FDA as a breast cancer risk assessment tool since 1982. Initially widely accepted by the medical profession, thermography fell out of favor in 1977, when a study that has since been criticized for its lack of quality control, reported that it was not as good as ultrasound or mammography for detecting breast cancer. No randomized clinical trials have been conducted using thermography, but various studies have suggested that it may provide effective noninvasive early detection of breast cancer without the use of radiation. Additional research is required to confirm this.[40]

More research is also needed comparing film mammography to digital mammography. Film mammography has been the standard for detecting breast cancer, but more recently, digital mammography has been replacing film mammography. Digital is more expensive than film and the evidence for benefits of digital mammography as a substitute for film mammography is lacking and should be studied further.[3]

9) Continue Monitoring Breast Cancer Screening in the Redwood Coast Region

State and Federal funding should support ongoing efforts for assessment. This study was the largest study to date on access to health care in rural northern California. However, assessments should be ongoing in order to determine effective and ineffective strategies. While establishing a baseline is important, periodic assessments are critical for measuring progress.

Methods & Demographics

Exhibit 13: Methods

The Rural Health Information Survey was conducted by the California Center for Rural Policy in the fall of 2006. The purpose of the survey was to assess health disparities, access and utilization of healthcare, and other determinants of health among residents in rural Northern California with the goal of providing useful information for planning and policy development.

A four-page self-administered survey was developed by project administrators at CCRP. The survey instrument was based on existing surveys (Behavioral Risk Factor Surveillance Survey, California Health Interview Survey, Canadian Community Health Survey and Mendocino Community Health Survey). New questions were developed as needed to inquire about areas of rural health not previously explored, such as access to transportation, phones, computers and Internet as well as skills for responding to emergency medical situations.

A total of 23,606 surveys were mailed to a random sample of adults residing in the four counties of Humboldt, Del Norte, Trinity and Mendocino. The sampling strategy employed the use of a Geographic Information System (GIS) to map the population density for Zip Code Tabulation Areas (ZCTA)[41] with an overlay of the locations of post offices. All of the post offices in low population density areas (<11 people per square mile) were selected (total post offices = 24; total post office boxes = 8,165). Post offices located in higher population density areas (≥11 people per square mile) were randomly selected (total post offices = 19; total post office boxes = 15,441) (Exhibit 1).

The total number of returned surveys was 3,003 for an overall response rate of 12.7%. A total of 2,950 surveys provided usable responses for analysis. Responses were analyzed with SPSS version 14.0. Chi Square was used to test for differences between groups with a *P*-value less than .05 considered statistically significant. When multiple comparisons were made adjustments were made to account for alpha inflation.

Sample Demographics are presented in Exhibit 14.

A total of 41.4% of the sample lives in a low-income household (<200% FPL).

Exhibit 14: Sample Demographics

Characteristics	Frequency	Percent
Federal Poverty Level[42]		
≤99%	416	16.2
100%-199%	645	25.2
200%-299%	491	19.2
≥300%	1009	39.4
Total	2561	100
Ethnicity		
White	2459	84.2
African American	7	0.2
Latino/Latina	34	1.2
Asian	13	0.4
Native American	148	5.1
Multiracial	173	5.9
Other	87	3.0
Total	2921	100
Gender		
Female	1882	64.1
Male	1053	35.9
Other	2	0.1
Total	2937	100
Age (mean = 55.3)		
18-29	173	6.0
30-39	240	8.3
40-49	455	15.7
50-59	930	32.2
60-69	656	22.7
70-79	310	10.7
≥ 80	126	4.4
Total	2890	100
County of Residence		
Del Norte	421	14.3
Humboldt	880	29.8
Trinity	940	31.9
Mendocino	705	23.9
More than 1 of above	4	0.1
Total	2950	100

Source: Rural Health Information Survey, 2006, California Center for Rural Policy.

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