



Oklahoma State
Department of Health

STATE FISCAL YEAR
2018



Oklahoma
Breast and Cervical Cancer
Annual Report



Table of Contents

Executive Summary	1
Purpose	2
Breast and Cervical Cancer Act Revolving Fund.....	2
Populations at Highest Risk for Breast and Cervical Cancer	3
Data Sources for Breast and Cervical Cancer Burden in Oklahoma.....	3
Breast Cancer Burden in Oklahoma.....	4
Cervical Cancer Burden in Oklahoma	6
Oklahoma Breast and Cervical Cancer Early Detection Programs	7
Oklahoma Diagnostic and Treatment Program.....	9
Oklahoma Cares	10
Statewide Breast and Cervical Cancer Activities	10
Epidemiological Trend Studies	10
Take Charge! Statewide Provider Recruitment/Outreach	10
Upcoming Priority Strategies	13
Emerging Technology and Strategies to Reduce the Costs of Breast and Cervical Cancer	14
Breast and Cervical Cancer Resources for Oklahomans.....	15
Advancement of Wellness Advisory Council	15
Advancement of Wellness Advisory Council Recommendations	16
References	17

Contact the Center for Chronic Disease Prevention and Health Promotion, Oklahoma State Department of Health at (405) 271-3619 or CancerPCP@health.ok.gov for an electronic copy of this report. This report was developed by Stephanie U'Ren, MA LPC CPS, Raffaella Espinoza, MPH, Stephanie Pharr, BS, CHES, and Tia Yancey, MPH, CHES.

Executive Summary

The overall purpose of this report is to provide breast and cervical cancer information in accordance with the requirements of the Oklahoma Breast and Cervical Cancer Act (63 O.S. § 1-554). This report provides breast and cervical cancer data specific to Oklahoma and can be used for planning purposes.

Breast cancer is the most frequently diagnosed cancer among Oklahoma women and is the second leading cause of cancer death among women. Men can get breast cancer, but it is very uncommon.¹ Research has shown there are steps that can help to reduce the risk of breast cancer which include: maintain a healthy weight, exercise at least four hours a week, get a good night's sleep, avoid or limit alcohol consumption, limit exposure to medical imaging if not medically necessary, and breastfeed.²

In 2015 3,348 new cases of breast cancer and 164 new cases of cervical cancer were diagnosed among Oklahoma females. The rates of breast cancer differ by race, ethnicity, and age. American Indian/Alaska Native women have the highest incidence of breast cancer while Hispanic women had consistently lower incidence than any other population. This is in contrast to deaths from breast cancer.

In Oklahoma, the incidence and mortality rates of cervical cancer continue to be higher than the U.S. Oklahoma women report receiving a Papanicolaou smear (Pap test) less frequently compared to the U.S. Oklahoma also has a lower percentage of persons receiving Human Papilloma Virus (HPV) vaccination in comparison to the U.S.

As Oklahomans, there are steps we can take to help reduce the occurrence and impact of breast and cervical cancer:

- Increase high quality breast and cervical cancer screening in Oklahoma in collaboration with partners by encouraging utilization of U.S. Preventative Task Force Guidelines;
- Encourage evidence-based breast and cervical cancer public education and targeted outreach to women at highest risk;
- Utilize policy approaches and health systems changes to improve implementation of breast and cervical guidelines and practices for healthcare professionals;
- Encourage patient navigation services to assist with access to screening and diagnostic services;
- Support and maintain the funding in the Breast and Cervical Cancer Act Revolving Fund (63 O.S. §1-557);
- Increase education and promotion efforts around the HPV and the importance of vaccinations;
- Examine the Take Charge! program eligibility gap and move the needle to reduce cancer mortality rates for Oklahomans in comparison to the U.S. and
- Increase state funding to enhance staffing infrastructure for the Take Charge! and Oklahoma Cares programs to increase breast and cervical cancer screening opportunities.

Purpose

The Oklahoma Breast and Cervical Cancer Act (OBCCA) was established in 1994 to implement plans to significantly decrease breast and cervical cancer morbidity and mortality in the state of Oklahoma (63 O.S. §1-554). In 2013, the OBCCA was amended and shifted the responsibility of annual reporting from the Breast and Cervical Cancer Prevention and Treatment (BCCPT) Advisory Committee to the Oklahoma State Department of Health (OSDH). The following items in this report are mandated in the OBCCA:

- Funding information for breast and cervical cancer screening activities;
- Identification of populations at highest risk for breast and cervical cancer;
- Identification of priority strategies and emerging technologies, to include newly introduced therapies and preventive vaccines that are effective in preventing and controlling the risk of breast and cervical cancer;
- Recommendations for additional funding, if necessary, to provide screenings and treatment for breast and cervical cancer for uninsured and underinsured women; and
- Strategies or actions to reduce the costs of breast and cervical cancer in the state of Oklahoma.

Breast and Cervical Cancer Act Revolving Fund

The Oklahoma Breast and Cervical Cancer Act established the Breast and Cervical Cancer Act Revolving Fund. The monies in the revolving fund consist of gifts, donations, and contributions from individual income tax returns. In addition, \$20 of each *Fight Breast Cancer License Plate* sold is deposited into the Breast and Cervical Cancer Act Revolving Fund. Samples of the *Fight Breast Cancer License Plates* are shown below. All monies in the revolving fund are appropriated to the OSDH to support the implementation of the Oklahoma Breast and Cervical Cancer Act. Past expenditures of funds have paid for breast and cervical cancer screening and diagnostic services for women enrolled in the Take Charge! program.

Samples of Fight Breast Cancer License Plates



Populations at Highest Risk for Breast and Cervical Cancer

Breast Cancer Risk Factors

According to the Centers for Disease Control and Prevention (CDC), several factors increase the risk for developing breast cancer. The risk factors include: female gender, increasing age (over 50 years of age), change in breast cancer genes (BRCA1 and BRCA2), early menstrual period, family or personal history of breast cancer, being overweight or obese, sedentary lifestyle and drinking alcohol.³ Additional information and a complete listing of breast cancer risk factors can be found on the CDC website at https://www.cdc.gov/cancer/breast/basic_info/risk_factors.htm.

Cervical Cancer Risk Factors

According to the CDC, several factors increase the risk for developing cervical cancer. These risk factors include behaviors related to exposure to the Human Papilloma Virus (HPV), lack of HPV immunization, immunosuppression, and smoking.⁴ Additional information and a complete listing of cervical cancer risk factors can be found on the CDC website at https://www.cdc.gov/cancer/cervical/basic_info/risk_factors.htm.

Risk Reduction for Breast and Cervical Cancer

To reduce the risk of breast and cervical cancer, it is recommended that persons exercise four hours a week, maintain a healthy weight, limit alcoholic drinks, stop smoking, and practice safe sex along with limiting the number of sexual partners.^{2,5} Additional information about reducing breast cancer risk and cervical cancer risk can be found on the CDC website at https://www.cdc.gov/cancer/breast/basic_info/prevention.htm and https://www.cdc.gov/cancer/cervical/basic_info/prevention.htm.

Data Sources for Breast and Cervical Cancer Burden in Oklahoma

The following figures represent data collected from three sources:

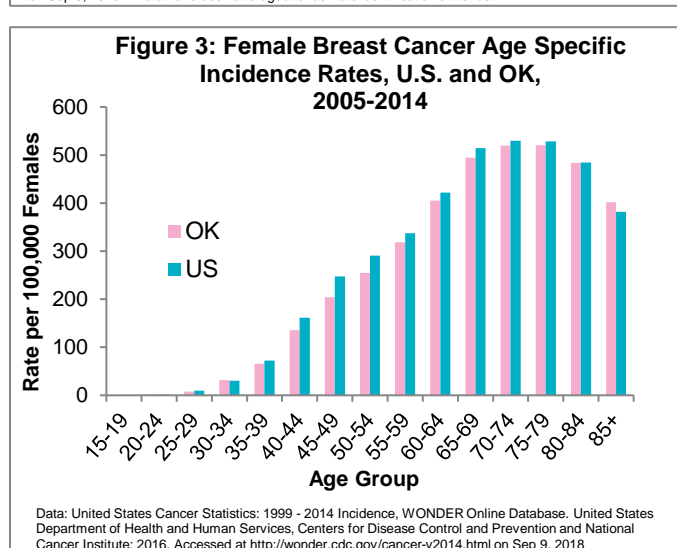
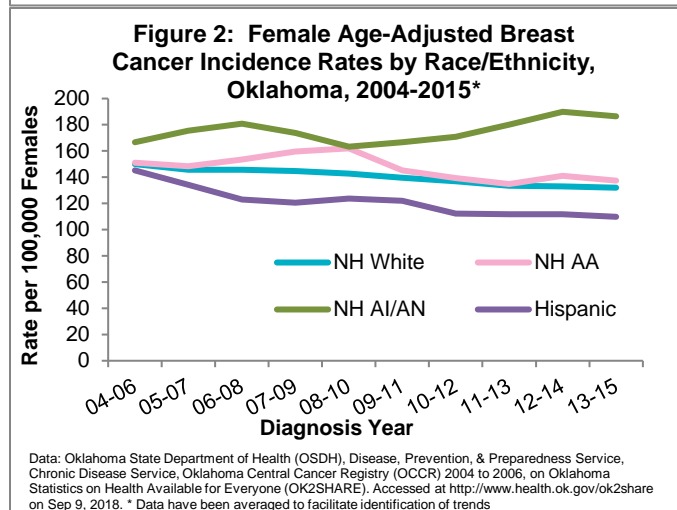
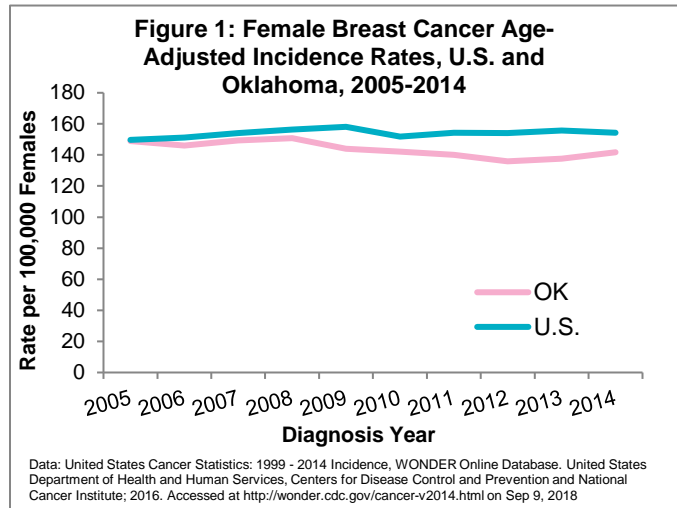
1. The Oklahoma Central Cancer Registry (OCCR) is a statewide central database of information on all cancers diagnosed or treated in Oklahoma since January 1, 1997. The latest Oklahoma specific cancer incidence data is available through 2015.⁶
2. CDC WONDER (Wide-ranging Online Data for Epidemiologic Research, WONDER.cdc.gov) provides the latest national cancer incidence (2014) and mortality data (2016).⁷
3. Behavioral Risk Factor Surveillance System (BRFSS) data provide the prevalence of the major behavioral risks among adults associated with premature morbidity and mortality. The latest finalized BRFSS data are through 2016.⁸

Breast Cancer Burden in Oklahoma

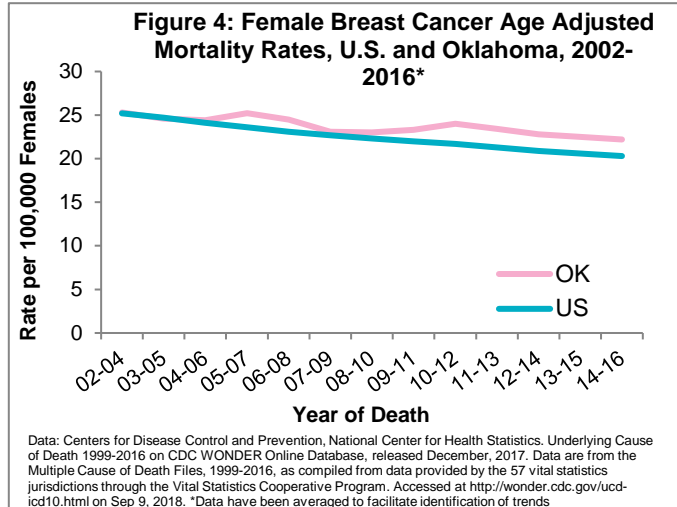
According to OCCR data, there were 3,348 new cases of female breast cancer (including in situ) diagnosed in Oklahoma in 2015. The age-adjusted female breast cancer incidence rates for the U.S. gradually increased by 3% between 2005 (149.7/100,000 females) and 2014 (154.2/100,000 females). In Oklahoma, the age-adjusted female breast cancer incidence rates decreased by 5% between 2005 (149.0/100,000 females) and 2014 (141.7/100,000 females). From 2011 to 2013 the difference in age-adjusted female breast cancer incidence rates between U.S. and Oklahoma was significant; however in 2014 Oklahoma the incidence rate increased slightly and is no longer significantly less than U.S. (Figure 1).

In Oklahoma, the incidence of breast cancer differed by race and ethnicity. Females of all races and ethnicities with the exception of American Indians/Alaska Natives (AI/AN) had an overall decline in incidence rates over the past decade. Hispanic females had consistently lower incidence than any other non-Hispanic (NH) population. Incidence among AI/AN females had a steady increase since the 2008-2010 period. During the years 2013-2015, incidence rates among AI/AN females was 41% and 36% higher than White and African American (AA) females, respectively. When compared with Hispanic females, the rates among AI/AN females were 70% higher (Figure 2).

Breast cancer incidence increases substantially with increasing age, peaking at 75-79 years (Figure 3). These trends were similar in both Oklahoma and the U.S. Interestingly, Oklahoma had slightly lower incidence rates than the U.S. among women under 85 years of age (except among 30-34 year olds) and higher rates than the U.S. among women 85 years and older.



Both U.S. and Oklahoma female breast cancer mortality rates have declined over time (Figure 4). The rate of the decline for the U.S. has been faster than that in Oklahoma. Oklahoma has seen a 12.3% overall decline, while there has been a decline of 19.4% in mortality from breast cancer among U.S. females. Despite the declines, Oklahoma continues to have a mortality rate greater than the U.S. Oklahoma continues to need improvements in detecting breast cancer at the earliest stage through high quality screening to facilitate effective and efficient treatment. Cases identified at earlier stages have lower mortality.⁹



Screening rates for breast cancer were higher in the U.S. than in Oklahoma. Screening was defined as women 50-74 years of age having received a mammogram in the past two years. In 2016, Oklahoma’s proportion of women who had a mammogram screening in past 2 years was 74.4% and the proportion of women in the U.S. was 77.6%.⁸ This lower screening may help explain the higher mortality rates in Oklahoma compared to the U.S. Currently the U.S. Preventive Services Task Force (USPSTF) recommends biennial screening mammography for women 50-74 years of age.¹⁰

Figure 5: Percentage of Women Aged 50-74 who had Not Received a Mammogram in the Past Two Years in Oklahoma, by Region, 2016

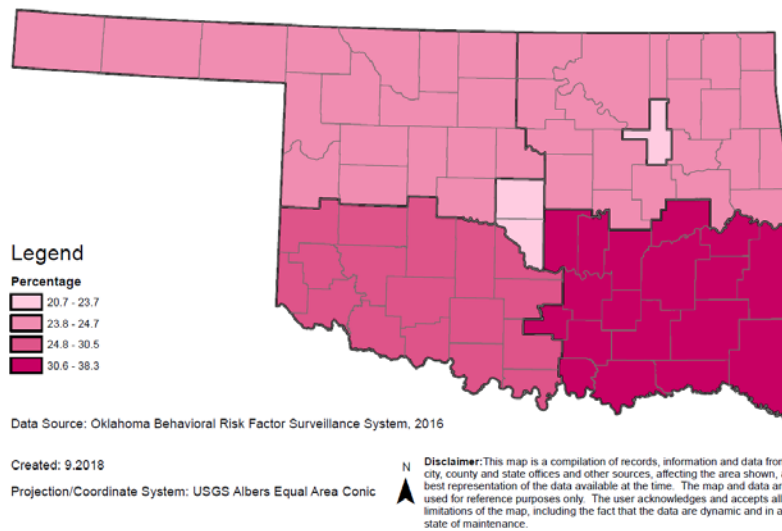
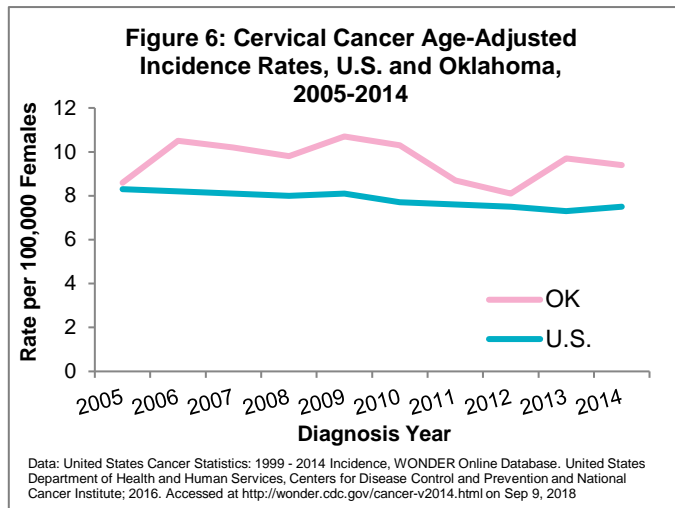


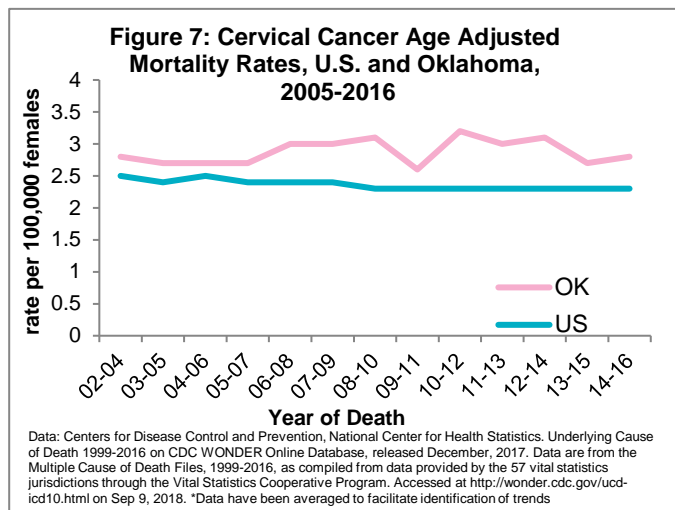
Figure 5 displays the percentage of women 50 to 74 years of age in 2016 who had not received a mammogram in the past two years by region based on BRFSS data collected by the Center for Health Statistics at the OSDH. The BRFSS weighted regional data for mammograms were used since county level data were not available; 2016 was the most recent year data available. Overall in 2016, 25.6% of Oklahoma females 50-74 years of age reported not having a mammogram in the past two years. Counties located in the southeast region of the state had the greatest proportion of women not receiving breast cancer screening (38.3%).

Cervical Cancer Burden in Oklahoma

According to OCCR data, there were 164 new cases of cervical cancer diagnosed in Oklahoma in 2015. The cervical cancer incidence rates have been steadily decreasing in the U.S. In Oklahoma, however, the rates have not followed the same pattern. There is more instability in the Oklahoma rates due to a relatively small number of cases; after seeing a reduction in the rate from 2009 to 2012, an increase was observed in 2013; there is a slight decrease observed for 2014 (Figure 6). It is of concern that in the past 2 years the rates in Oklahoma have been significantly higher than rates in the U.S. Many forms of cervical cancer can be prevented through appropriate screenings by detecting and treating abnormal cells.



Mortality from cervical cancer has remained very stable in the U.S. over the past decade with little improvement. The Oklahoma’s cervical cancer mortality rates fluctuated due to small numbers, but continue to remain higher than the U.S., similar to the incidence rates (Figure 7). With appropriate screening, cervical cancer should not result in death¹¹, suggesting screening needs to be increasingly promoted.



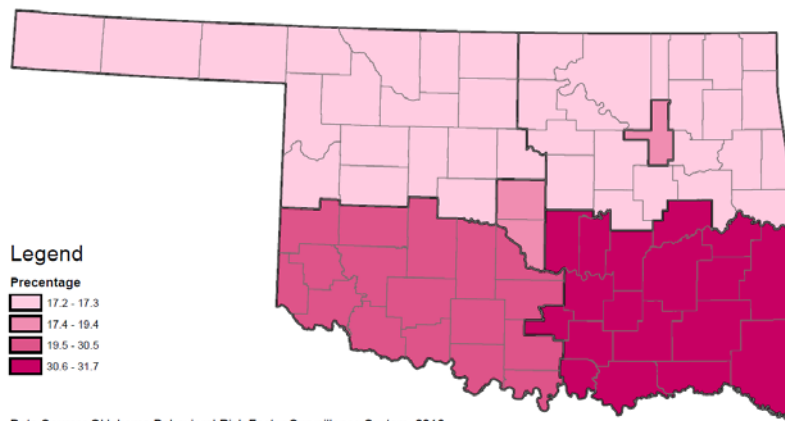
Human papillomavirus (HPV) is a risk factor for development of several types of cancer, including cervical.⁴ The HPV vaccination can provide protection from contracting this disease in both males and females. In 2016, 43.6% of Oklahoma females 13-17 years old had received three doses of the HPV vaccine which is a 35% increase from 2015. However it is 5.9% lower than the U.S. level. The vaccination level of males was lower than females: 35.0% of Oklahoma males 13-17 years old had received three doses of the HPV vaccine in 2016. Oklahoma’s coverage level for males was 0.7% lower than the U.S. level.¹² Additional information can be found on the OSDH’s Immunization Service website at <http://imm.health.ok.gov>.

Based on data from the BRFSS, screening rates for cervical cancer in both Oklahoma and the U.S. appear to be declining.⁸ Furthermore, the percentage of Oklahoma women receiving Pap tests has consistently remained lower than women throughout the U.S. In August 2018, the USPSTF updated the screening guidance and currently recommends cervical cancer screening every 3 years with cervical cytology alone in women aged 21-29 years. For women 30-65 years

old, the USPSTF recommends screening every 3 years with cervical cytology alone, every 5 years with high-risk human papillomavirus (hrHPV) testing alone, or every 5 years with hrHPV testing in combination with cytology (cotesting).¹³

In 2016, 21.2% of Oklahoma women ages 21-65 years reported they had not received a Pap test within the last three years versus 20.2% in the U.S.⁸ BRFSS weighted regional data for a Pap test were used in Figure 8 below since county level data were not available. Counties located in the southeast region of the state had a higher proportion of women who had not received a Pap test within the past three years when compared to the rest of state.⁸

Figure 8: Percentage of Women Aged 21-65 who Received a Pap Test More Than Three Years Ago in Oklahoma, by Region, 2016



Data Source: Oklahoma Behavioral Risk Factor Surveillance System, 2016

Created: 9.2018

Projection/Coordinate System: USGS Albers Equal Area Conic

Disclaimer: This map is a compilation of records, information and data from various city, county and state offices and other sources, affecting the area shown, and is the best representation of the data available at the time. The map and data are to be used for reference purposes only. The user acknowledges and accepts all inherent limitations of the map, including the fact that the data are dynamic and in a constant state of maintenance.

Oklahoma Breast and Cervical Cancer Early Detection Programs

Oklahoma has three Breast and Cervical Cancer Early Detection Programs (BCCEDP): Cherokee Nation Breast and Cervical Cancer Early Detection Program, Kaw Nation Women’s Health Program, and the OSDH Take Charge! Program. These three screening programs receive funding through a cooperative agreement with the CDC.

The screening programs serve low-income, uninsured, and underinsured women. The screening programs provide access to breast and cervical cancer screening services including a clinical breast exam, mammogram, pelvic examination, Pap test and HPV co-testing as appropriate. The purpose is to facilitate earlier screening, ensure prompt diagnosis, and improve access to treatment for breast and cervical cancer. The three screening programs work in partnership with each other to ensure Oklahoma women are enrolled in the screening program that best fits their needs.

Women with abnormal findings on breast and/or cervical cancer screening examinations receive a referral and access to diagnostic services. The three screening programs encourage women in need of diagnostic or treatment services to apply for Oklahoma Cares, a SoonerCare Medicaid program. The Cherokee Nation BCCEDP will often provide diagnostic services for women who are screened regardless of their eligibility for Oklahoma Cares. The Take Charge! Program provides diagnostic services for women that are screened through Take Charge! who are ineligible for Oklahoma Cares.

The Oklahoma BCCEDP programs strive to serve women who are at highest risk for breast cancer, which includes women with increasing age and women in minority populations. In state fiscal year (SFY) 2017, a greater proportion of African American women received screening through Take Charge! than was represented among the population of the state. It should be noted that American Indian women are also served through the Cherokee Nation and Kaw Nation BCCEDPs, in addition to Take Charge! The data in Table 1 only reflects Take Charge! clients. All women served through Cherokee Nation and Kaw Nation

Table 1: Racial/Ethnic Distribution of Take Charge! Clients and the Oklahoma Population, SFY 2017

Race/Ethnicity	Program Percentage	Population Percentage
African American	12.5%	7.8%
American Indian*	0.3%	9.2%
Asian/Pacific Islander	0.07%	2.3%
Hispanic**	40.2%	10.6%
Other/Unknown	0.05%	N/A
White**	81.7%	74.3%
More than one Race	0.7%	6.1%

Data Sources: Cancer Screening and Tracking System (CaST) and U.S Census.gov (2012-2016 estimates)

*American Indian reflects Take Charge! clients only.

**White and Hispanic are not mutually exclusive.

The priority populations, contracting facilities, types of services provided, and funding level of each BCCEDP program are described in Table 2.

Table 2: Description of BCCEDP Programs				
BCCEDP Program	Priority Population	Contracts	Services Provided	Funding SFY 2017
Cherokee Nation Began: 1996	<p>Breast cancer screening: American Indian (AI) women enrolled in a federally recognized tribe, 40-64 years of age, with an income at or below 250% of the federal poverty level (FPL), and uninsured or underinsured.</p> <p>Cervical cancer screening: AI women enrolled in a federally recognized tribe, 21-64 years of age who have not had a Pap test in five or more years, with the same income and insurance guidelines as breast cancer screening.</p>	Provided services through Cherokee Nation Health Facilities, Cherokee Nation W.W. Hastings Hospital, Cherokee Nation healthcare providers, and a mobile mammography facility.	<p>Screened 24,296 eligible women since inception.</p> <p>In FY 2017 provided 1,621 breast cancer screenings and 1,596 cervical cancer screenings.</p>	<p>Federal: \$845,000</p> <p>Tribal: \$281,667</p> <p>Total: \$1,126,667</p> <p>Federal BCCEDP funds require a \$3:\$1 match in the amount of \$281,667.</p>

Oklahoma State Department of Health

Oklahoma Breast and Cervical Cancer Annual Report State Fiscal Year 2018

BCCEDP Program	Priority Population	Contracts	Services Provided	Funding SFY 2017
Kaw Nation Began: 2001	<p>Breast cancer screening: All women 50-64 years of age, with an income at or below 250% of the FPL, and uninsured or underinsured.</p> <p>Cervical cancer screening: All women 21-64 years of age who have not had a Pap test in five or more years, with the same income and insurance guidelines as breast cancer screening.</p>	Provided services through Kanza Clinic and clinics located within the Ponca Tribe, Pawnee Tribe, Osage Tribe, and Iowa Tribe through memorandums of understanding (MOU).	<p>Since inception screened 4,378 eligible women.</p> <p>In FY 2017 provided 316 breast cancer screenings and 171 cervical cancer screenings.</p>	<p>Federal: \$397,367</p> <p>Tribal: \$135,640</p> <p>Total: \$533,007</p> <p>Federal BCCEDP funds require a \$3:\$1 match in the amount of \$135,640.</p>
Take Charge! Began: 1995	<p>Breast cancer screening: Oklahoma women 50-65 years of age, with an income at or below 185% of the FPL, and uninsured or underinsured.</p> <p>Cervical cancer screening: Oklahoma women 35-65 years of age who have not had a Pap test in five or more years, with the same income and insurance guidelines as breast cancer screening. Oklahoma women not included in the priority population may qualify for services based on appointment availability and funding resources.</p>	Provided services through contracted healthcare providers, federally qualified health centers, health care organizations, laboratories, surgical consultants, mammography facilities, and colposcopy providers.*	<p>Since inception screened 70,737 eligible women.</p> <p>In FY 2017 provided 3,505 breast cancer screenings and 1,261 cervical cancer screenings. Provided 832 diagnostic procedures or referrals. ^</p>	<p>Federal: \$1,148,827</p> <p>State: \$236,667</p> <p>Revolving: \$50,000</p> <p>Total: \$1,385,544</p> <p>Federal BCCEDP funds require a \$3:\$1 match in the amount of \$236,667.</p>

*The list of current contracts with healthcare providers is located on <http://takecharge.health.ok.gov>.

^The breast and cervical cancer screenings and diagnostic referrals are the number of procedures performed.

Oklahoma Diagnostic and Treatment Program

The Breast and Cervical Cancer Prevention and Treatment Act of 2000 (Public Law 106-354) provides medical assistance through SoonerCare Medicaid for women screened through any of

the BCCEDPs in the state that need assistance with breast and cervical cancer treatment. Oklahoma implemented the SoonerCare program, Oklahoma Cares, in January 1, 2005.

Oklahoma Cares

Oklahoma Cares provides diagnostic and treatment services for eligible women with abnormalities indicating a breast or cervical pre-cancerous condition or cancer. To be eligible to enroll in Oklahoma Cares for treatment services, women must be screened by a healthcare provider in accordance with Take Charge!, Cherokee Nation BCCEDP or the Kaw Nation Women's Health Program. Women must be 19-64 years of age, not insured, low income, and meet medical eligibility guidelines. Women enrolled in the Oklahoma Cares program receive full scope SoonerCare coverage inclusive of diagnostic and treatment services. Additional information about the Oklahoma Cares program can be found on the Oklahoma Health Care Authority (OHCA) website at <http://www.okhca.org>.

Statewide Breast and Cervical Cancer Activities

In FY 2018 over 17,000 Oklahomans participated in public education awareness events or outreach campaigns through multiple community organizations across the state. Major contributors to these efforts include Susan G. Komen Race for the Cure®, American Cancer Society (ACS) Making Strides against Breast Cancer Walk®, Oklahoma Health Care Authority, Take Charge! contracted healthcare providers, and Oklahoma Project Woman.

Epidemiological Trend Studies

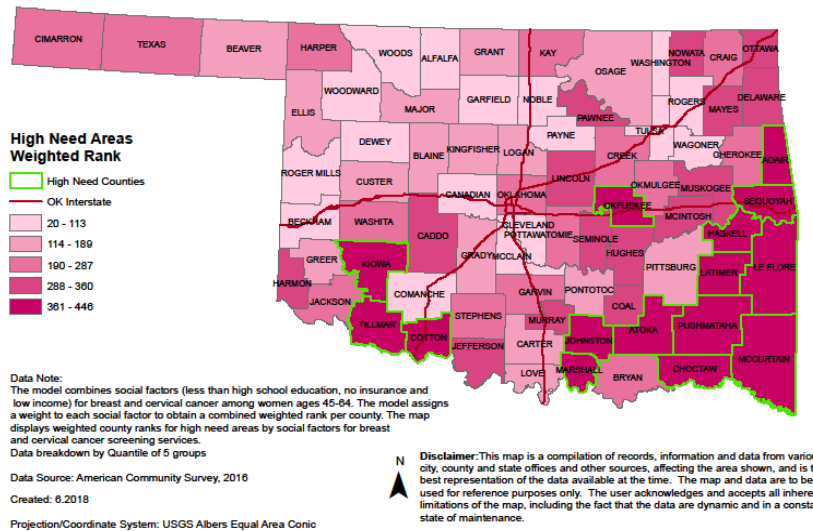
The following epidemiological trend studies requested data from the OCCR during FY 2018.

1. Breast cancer in U.S. women ages 20-39
 - Investigator: Carlos DeSantis, American Cancer Society
 - Date Requested: May 22, 2018

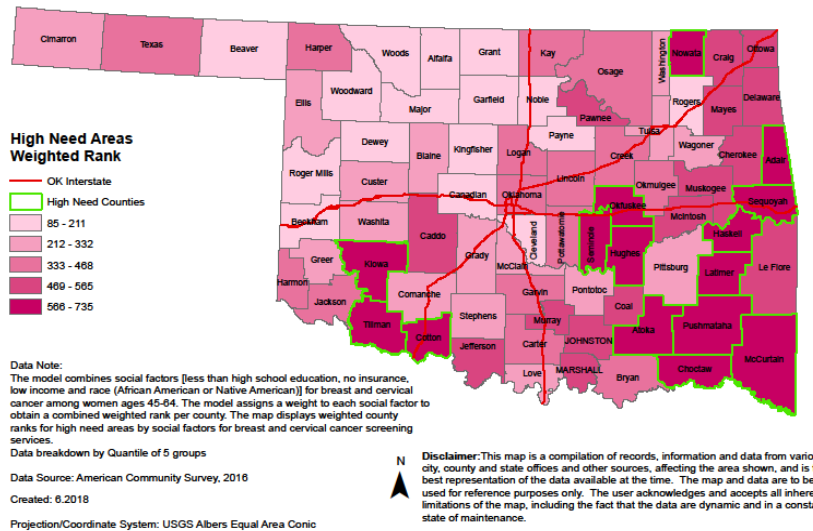
Take Charge! Statewide Provider Recruitment/Outreach

Take Charge! uses multiple methods to ensure screening services are provided to women in the geographic areas of highest need and in the most cost effective manner possible. In order to determine which counties had the highest need, U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates were reviewed and analyzed. Using the data, two weighted models (Model 2 and 2R) were developed combining social factors for breast and cervical cancer among women ages 45-64. Model 2 combined social factors such as low education level, no insurance and low income among all women in Oklahoma ages 45-64 (Figure 9). Model 2R combined social factors such as low education level, no insurance and low income among African American and Native American women ages 45-64 (Figure 10). The models assigned a weight to each social factor to obtain a combined weighted rank for each Oklahoma County. The maps represent high need service areas by social factors for FY 2018. The resulting total ranks are split into five quintiles. The counties with the highest ranks are considered highest need.

**Figure 9: High Need Areas by Social Factors Modeling
 Women, Age (45-64), Education, Insurance Status, Income
 Oklahoma, FY2018**



**Figure 10: High Need Areas by Social Factors Modeling
 Women, Age (45-64), Education, Insurance Status, Race (African American and Native American), and Income, Oklahoma, FY2018**



Recruitment efforts of healthcare providers are enhanced in highest need counties based on demographic and social factors in conjunction with breast cancer late stage incidence (Figure 9) and breast and cervical cancer mortality burden by county. In addition, healthcare providers are selected by reviewing Oklahoma Cares screener lists, conducting internet searches, receiving referrals from county health department staff, and referrals from contracted healthcare providers.

Table 3: Female Breast Cancer Age-Adjusted Death Rate* by County, Oklahoma, 2007-2016

County	Rate	County	Rate	County	Rate
Adair	20.3	Grant	42.1	Nowata	24.7
Alfalfa	24.7	Greer	18.9	Okfuskee	36.7
Atoka	21.7	Harmon	27.8	Oklahoma	24.9
Beaver	34.9	Harper	24.0	Okmulgee	25.5
Beckham	22.1	Haskell	25.5	Osage	20.4
Blaine	23.3	Hughes	29.1	Ottawa	22.0
Bryan	22.0	Jackson	24.4	Pawnee	26.5
Caddo	24.8	Jefferson	14.0	Payne	23.9
Canadian	20.4	Johnston	24.3	Pittsburg	18.7
Carter	21.8	Kay	23.2	Pontotoc	21.5
Cherokee	20.6	Kingfisher	15.2	Pottawatomie	25.8
Choctaw	18.2	Kiowa	32.6	Pushmataha	19.7
Cimarron	*	Latimer	19.3	Roger Mills	*
Cleveland	20.8	Leflore	26.7	Rogers	22.0
Coal	12.0	Lincoln	21.9	Seminole	21.0
Comanche	21.5	Logan	21.1	Sequoyah	29.4
Cotton	26.0	Love	34.5	Stephens	20.5
Craig	14.7	McClain	18.9	Texas	14.9
Creek	25.2	McCurtain	29.7	Tillman	22.7
Custer	20.7	McIntosh	18.4	Tulsa	23.6
Delaware	17.9	Major	23.1	Wagoner	22.3
Dewey	19.8	Marshall	28.6	Washington	27.5
Ellis	14.7	Mayes	22.7	Washita	14.2
Garfield	23.0	Murray	19.4	Woods	17.9
Garvin	23.5	Muskogee	22.3	Woodward	19.5
Grady	22.0	Noble	22.6	STATE	23.0

*Rate per 100,000 females

*Calculations have been suppressed due to small cell size (less than 5 deaths/populations less than 20)

Source: Oklahoma State Department of Health, Center for Health Statistics, 2007-2016

Table 4: Cervical Cancer Age-Adjusted Death Rate* by County, Oklahoma, 2007-2016

County	Rate	County	Rate	County	Rate
Adair	5.2	Grant	*	Nowata	*
Alfalfa	*	Greer	*	Okfuskee	*
Atoka	*	Harmon	*	Oklahoma	2.7
Beaver	*	Harper	*	Okmulgee	3.4
Beckham	6.0	Haskell	*	Osage	2.3
Blaine	*	Hughes	5.5	Ottawa	5.0
Bryan	2.9	Jackson	5.8	Pawnee	*
Caddo	4.7	Jefferson	*	Payne	2.1
Canadian	2.7	Johnston	*	Pittsburg	6.6
Carter	3.5	Kay	2.9	Pontotoc	2.5
Cherokee	2.0	Kingfisher	*	Pottawatomie	4.4
Choctaw	*	Kiowa	*	Pushmataha	*
Cimarron	*	Latimer	10.7	Roger Mills	*
Cleveland	2.2	Leflore	3.4	Rogers	1.9
Coal	*	Lincoln	*	Seminole	4.5
Comanche	2.5	Logan	2.8	Sequoyah	5.3
Cotton	*	Love	*	Stephens	2.8
Craig	*	McClain	2.4	Texas	*
Creek	3.1	McCurtain	5.5	Tillman	*
Custer	*	McIntosh	*	Tulsa	2.3
Delaware	*	Major	*	Wagoner	2.2
Dewey	*	Marshall	*	Washington	4.4
Ellis	*	Mayer	3.0	Washita	*
Garfield	1.6	Murray	*	Woods	*
Garvin	*	Muskogee	4.4	Woodward	*
Grady	2.9	Noble	*	STATE	2.9

*Rate per 100,000 females

*Calculations have been suppressed due to small cell size (less than 5 deaths/populations less than 20)

Source: Oklahoma State Department of Health, Center for Health Statistics, 2007-2016

Upcoming Priority Strategies

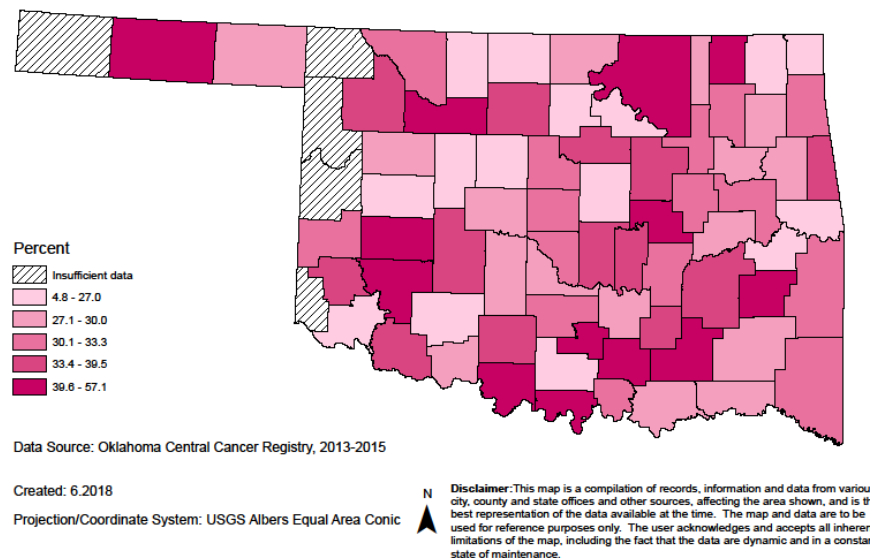
- Increase high quality breast and cervical cancer screening in Oklahoma in collaboration with partners;
- Encourage evidence-based breast and cervical cancer public education and targeted outreach to women at highest risk;
- Utilize policy approaches and health systems changes to improve implementation of breast and cervical guidelines and practices for healthcare professionals;
- Encourage patient navigation services to assist with access to screening and diagnostic services; and
- Decrease structural barriers (transportation, availability, and accessibility) that limit access to breast and cervical cancer screening, and diagnostic and treatment services in collaboration with partners.

Emerging Technology and Strategies to Reduce the Costs of Breast and Cervical Cancer

Genome research is an emerging technology studying the detailed maps of structural variations in a cancer cell's genome. Scientists at the Cold Spring Harbor Laboratory have determined the benefit of long-read sequencing technology in deoxyribonucleic acid (DNA) rather than short-read technology. Long-read technology analyzes lengthier segments of DNA that encompass large chunks of chromosomes. Using the long-read sequencing to capture the complexity of structural variations will allow further research and clinical practice which could eventually reduce death from breast cancer.¹⁴

Multiple studies have been conducted to evaluate the long-term effects of Vitamin D when given to patients with Cervical Intraepithelial Neoplasia cervical cancer. The patients who received Vitamin D over a six month period have experienced multiple, beneficial effects. Further evaluation should be completed to determine the value of Vitamin D given to cervical cancer patients.^{15,16}

Figure 11: Percent of Female Breast Cancer Cases Diagnosed at Late Stage by County, Oklahoma, 2013-2015



As seen in Figure 11, women in multiple counties of the state would benefit from early screening, diagnostic and treatment services. Barriers to accessing services in Oklahoma include financial, transportation, distance to services, culturally appropriate clinic availability, and clinic hours. In addition, many counties are considered medically underserved areas/populations with too few primary care providers, high poverty, and/or high elderly populations. Table 5 shows the proportion of diagnosed late stage breast cancers by region. The percent of Oklahoma women diagnosed with late stage breast cancer is slightly higher in the Southeast of Oklahoma as compared to rest of the state.

Percentage	Region	Counties
31.9%	Central	Cleveland and Oklahoma
30.9%	Northeast	Adair, Cherokee, Craig, Creek, Delaware, Kay, Lincoln, Mayes, Muskogee, Noble, Nowata, Okfuskee, Okmulgee, Osage, Ottawa, Pawnee, Payne, Rogers, Sequoyah, Wagoner, and Washington
30.2%	Northwest	Alfalfa, Beaver, Blaine, Canadian, Cimarron, Custer, Dewey, Ellis, Garfield, Grant, Harper, Kingfisher, Logan, Major, Roger Mills, Texas, Woods, and Woodward
33.3%	Southeast	Atoka, Bryan, Choctaw, Coal, Haskell, Hughes, Johnston, Latimer, LeFlore, McCurtain, McIntosh, Marshall, Murray, Pittsburg, Pontotoc, Pottawatomie, Pushmataha, and Seminole
30.4%	Southwest	Beckham, Caddo, Carter, Comanche, Cotton, Garvin, Grady, Greer, Harmon, Jackson, Jefferson, Kiowa, Love, McClain, Stephens, Tillman, and Washita
30.4%	Tulsa	Tulsa

Note: Cimarron, Harper, Ellis, Roger Mills, and Harmon Counties have insufficient data

Breast and Cervical Cancer Resources for Oklahomans

The Oklahoma Cancer Resource Guide, *Threads of Support*, is available for Oklahomans to use to find resources to assist with breast and cervical cancer screening, diagnostic testing and treatment. The guidebook contains resource information about all cancers, not just breast and cervical cancer. *Threads of Support* can be accessed online at <http://cccp.health.ok.gov>. The link is located on the left side of the page. Limited hard copies of the guide are available by calling (405) 271-3619.

Advancement of Wellness Advisory Council

The Advancement of Wellness Advisory Council (63 O.S. §1-103a.1) is comprised of seven members serving three-year terms who are appointed by the Governor, Speaker of the House of Representatives, President Pro Tempore of the Senate, and the Oklahoma State Board of Health. All members of the Council are knowledgeable of issues that arise in the area of advancing the health of all Oklahomans with one member being an expert in breast and cervical cancer issues. The Oklahoma Breast and Cervical Cancer Annual Report is authorized by statute (63 O.S. §1-556) and must give consideration to the recommendations of the Council.

Advancement of Wellness Advisory Council Recommendations

The Advancement of Wellness Advisory Council (Council) has reviewed the Oklahoma Breast and Cervical Cancer Annual Report and has indicated the following recommendations.

- The Council recommends that the state of Oklahoma continue to support the efforts of the breast and cervical cancer screening program and maintain the funds in the Breast and Cervical Cancer Act Revolving Fund (63 O.S. §1-557).
- The Council recommends the Oklahoma State Department of Health increase education and promotion efforts around the Human Papillomavirus (HPV) and the importance of vaccinations.
- The Council recommends the Oklahoma State Department of Health examine the program eligibility gap and move the needle to reduce cancer mortality rates for Oklahomans in comparison to the U.S.
- The Council recommends the state of Oklahoma fully fund and staff the Take Charge! and Oklahoma Cares programs.

References

1. Centers for Disease Control and Prevention. Breast Cancer. Basic Information About Breast Cancer. Accessed on June 19, 2018 at https://www.cdc.gov/cancer/breast/basic_info/index.htm.
2. Centers for Disease Control and Prevention. What Can I Do to Reduce My Risk of Breast Cancer? Accessed on June 29, 2018 at https://www.cdc.gov/cancer/breast/basic_info/prevention.htm.
3. Centers for Disease Control and Prevention. What Are the Risk Factors for Breast Cancer? Accessed on June 29, 2018 at https://www.cdc.gov/cancer/breast/basic_info/risk_factors.htm.
4. Centers for Disease Control and Prevention. What Are the Risk Factors for Cervical Cancer? Accessed on June 29, 2018 at https://www.cdc.gov/cancer/cervical/basic_info/risk_factors.htm.
5. Centers for Disease Control and Prevention. What Can I Do to Reduce My Risk of Cervical Cancer? Accessed on June 29, 2018 at https://www.cdc.gov/cancer/cervical/basic_info/prevention.htm.
6. OK2Share. Accessed on June 21, 2018 at <http://www.health.state.ok.us/stats/>.
7. CDC WONDER. Accessed on June 21, 2018 at <https://wonder.cdc.gov/>.
8. Centers for Disease Control and Prevention. BRFSS. Prevalence and Trends Data. Accessed on July 11, 2018 at https://www.cdc.gov/brfss/data_tools.htm.
9. Koroukian SM, Bakaki PM, Han X, Schluchter M, Owusu C, Cooper GS, et al. Lasting Effects of the Breast and Cervical Cancer Early Detection Program on Breast Cancer Detection and Outcomes, Ohio, 2000–2009. [Erratum appears in Prev Chronic Dis 2015;12. http://www.cdc.gov/pcd/issues/2015/14_0491e.htm.] Prev Chronic Dis 2015;12:140491. DOI: <http://dx.doi.org/10.5888/pcd12.140491>
10. U.S. Preventive Services Task Force. Screening for Breast Cancer. Released January 2016. Accessed on June 29, 2018 at <https://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/breast-cancer-screening1>.
11. National Institutes of Health. Cervical Cancer. NIH Consensus Statement. 1996;14(1):1–38.
12. Oklahoma State Department of Health. Fact Sheet: How is Oklahoma Doing Immunizing Teens? Results from the National Immunization Survey for Teens 2012-2016.
13. U.S. Preventive Services Task Force. Cervical Cancer: Screening. Released August 2018. Accessed on September 13, 2018 at <https://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/cervical-cancer-screening2?ds=1&s=cervical>.

14. Nattestad, M, et al. Massive genome havoc in breast cancer is revealed. Accessed on July 26, 2018 at <https://www.cshl.edu/massive-genome-havoc-in-breast-cancer-is-revealed>.
15. Vahedpoor, Z, et al. Effects of Long-Term Vitamin D Supplementation on Regression and Metabolic Status of Cervical Intraepithelial Neoplasia: a Randomized, Double-Blind, Placebo-Controlled Trial. Access on July 13, 2018 at <https://www.ncbi.nlm.nih.gov/pubmed/28050798>.
16. Vahedpoor, Z, et al. Long-Term Vitamin D Supplementation and the Effects on Recurrence and Metabolic Status of Cervical Intraepithelial Neoplasia Grade 2 or 3: A Randomized, Double-Blind, Placebo-Controlled Trial. Accessed on July 13, 2018 at <https://www.ncbi.nlm.nih.gov/pubmed/29466786>.

