

Oklahoma
Breast and Cervical Cancer



ANNUAL REPORT
STATE FISCAL YEAR

2017

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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. §1 554-558). 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 leading cause of cancer death among women. Men can get breast cancer, but it is very uncommon.¹ 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 2014, 3,212 new cases of breast cancer and 178 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 and African American women have the lowest incidence. This is in contrast to deaths from breast cancer. African American women have the highest mortality rate from breast cancer, whereas White and Hispanic females have the lowest mortality rates. The incidence of female breast cancer is lower in Oklahoma than in the U.S. as a whole.

In Oklahoma, the incidence and mortality rates of cervical cancer continue to be higher than U.S. rates. Oklahoma women report receiving a Pap test less frequently compared to U.S. women. Oklahoma also has a lower percentage of persons receiving human papillomavirus (HPV) vaccination in comparison to the U.S. HPV is a group of viruses that can lead to warts or cancer.³

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

- 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.

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. §1 554-558). 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 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 put 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.⁴ 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 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.^{5,6} Additional information about reducing breast cancer risk and cervical cancer risk can be found on the CDC websites at

https://www.cdc.gov/cancer/breast/basic_info/prevention.htm and

https://www.cdc.gov/cancer/cervical/basic_info/prevention.htm.

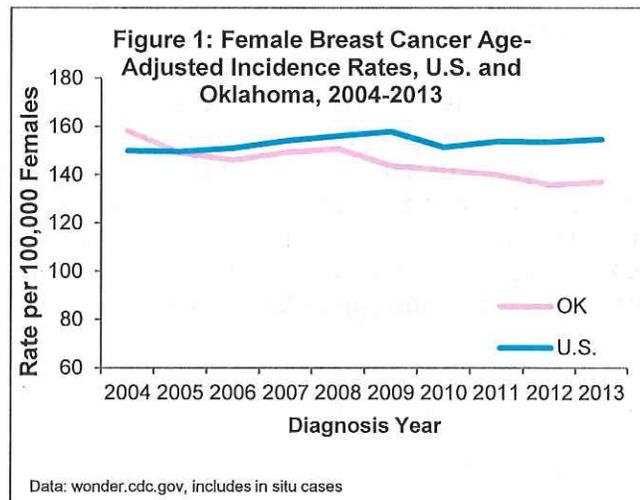
Data Sources for Breast and Cervical Cancer Burden in Oklahoma

The following figures represent data collected from three sources:

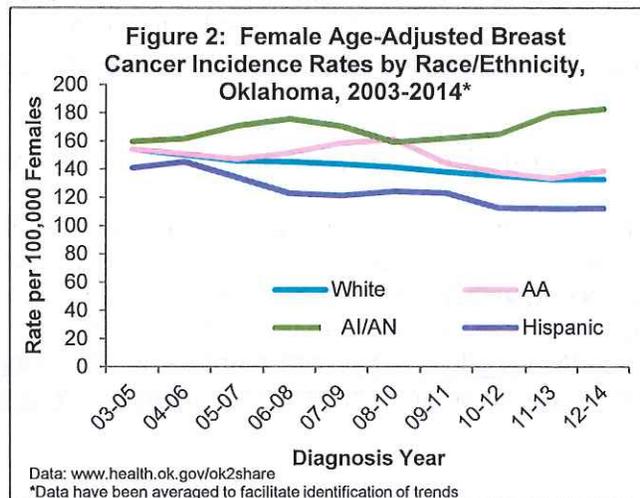
1. The Oklahoma Central Cancer Registry (OCCR) is a statewide centralized database of information on all cancers diagnosed or treated in Oklahoma since January 1, 1997. The latest Oklahoma specific cancer incidence data is available through 2014. The data is publicly available at <http://www.health.state.ok.us/stats/>.
2. CDC WONDER (Wide-ranging Online Data for Epidemiologic Research, WONDER.cdc.gov) provided the latest national cancer incidence (2013) and mortality data (2015).
3. Behavioral Risk Factor Surveillance System (BRFSS) data provided the prevalence of the major behavioral risks among adults associated with premature morbidity and mortality. The latest finalized BRFSS data is through 2014 for breast and cervical cancer and can be found at https://www.cdc.gov/brfss/data_tools.htm.

Breast Cancer Burden in Oklahoma

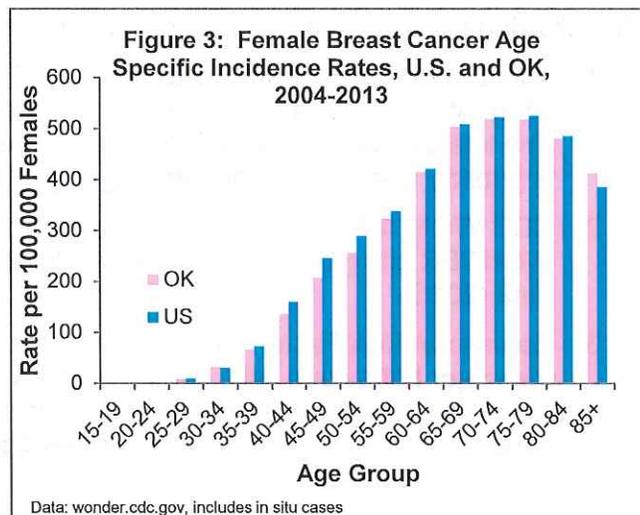
According to OCCR data, there were 3,212 new cases of female breast cancer (including in situ) diagnosed in Oklahoma in 2014. The age-adjusted female breast cancer incidence rates for the U.S. gradually increased by 3.2% between 2004 (149.9/100,000 females) and 2013 (154.7/100,000 females). In Oklahoma, the age-adjusted female breast cancer incidence rates decreased by 13.4% between 2004 (158.2/100,000 females) and 2013 (137.0/100,000 females). The last two years had a slight increase in incidence in Oklahoma (Figure 1).



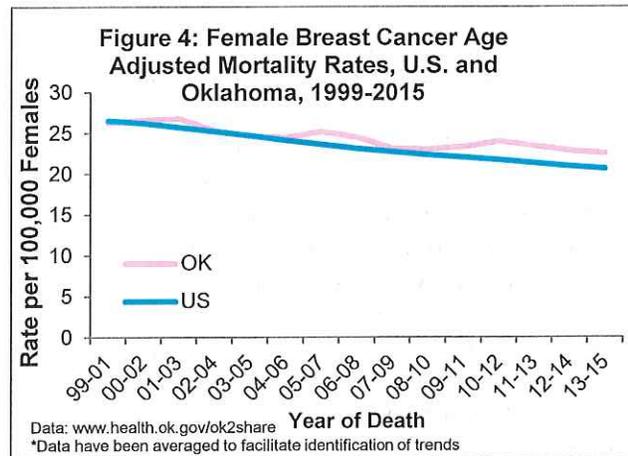
In Oklahoma, the incidence of breast cancer differed by race and ethnicity. Females of all races and ethnicities with the exception of American Indians/Alaska Natives (AI/AN) had an overall decline in incidence rates over the past decade. Hispanic females had consistently lower incidence than any other population. Incidence among AI/AN females had a steady increase over the past few years. During the years 2012-2014, incidence among AI/AN females were 37% and 32% higher than White and African American (AA) females, respectively. When compared with Hispanic females, the rates among AI/AN females were 63% higher (Figure 2).



Breast cancer incidence increased 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. This data supports the trends seen in Figure 1 where Oklahoma females displayed a lower overall incidence of breast cancer than females in the U.S., particularly in recent years.



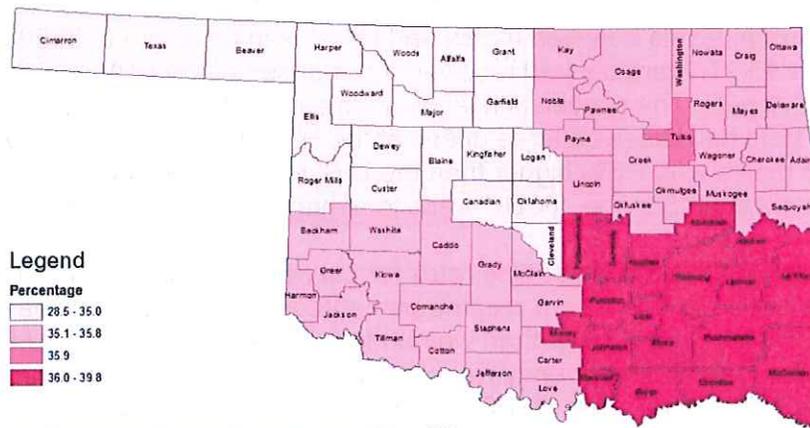
Both U.S. and Oklahoma female breast cancer mortality rates have declined over time (Figure 4). The rate of the decline for the U.S. has been faster than that in Oklahoma. Oklahoma has seen a 14% overall decline, while there has been a decline of 24% in mortality from breast cancer among U.S. females. While the rates continued to decline, there is still a need for 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.



Screening rates for breast cancer were higher in the U.S. than in Oklahoma. Screening was defined as women 50 years and older having received a mammogram in the past two years. Oklahoma’s proportion of women screened was approximately 7% lower than the U.S. on average. This would at least partially 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 displays the percentage of women aged 40 years and older in 2014 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. BRFSS weighted regional data for mammograms was used since county level data was not available; 2014 was the most recent year data was collected and available. Overall, in 2014, 34.4% of Oklahoma females 40 and older 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 (39.8%).

Figure 5: Percentage of Women 40 Years and Older who had Not Received a Mammogram in the Past Two Years in Oklahoma, by Region, 2014



Data Source: Oklahoma Behavioral Risk Factor Surveillance System, 2014

Created: 7.2017

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.

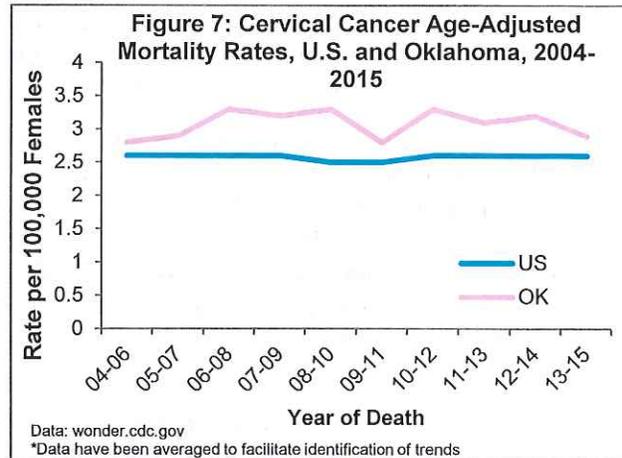
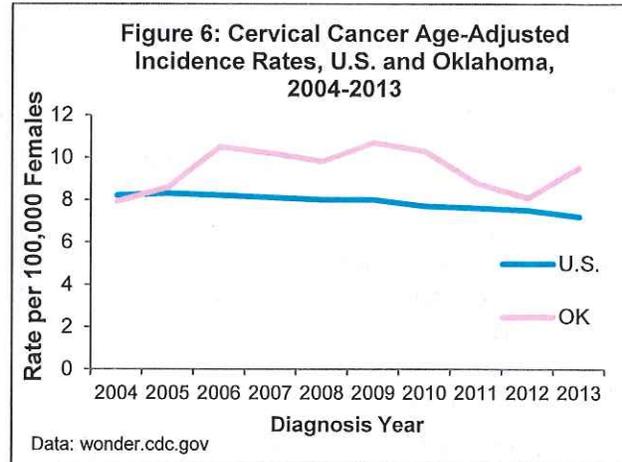
Cervical Cancer Burden in Oklahoma

According to OCCR data, there were 178 new cases of cervical cancer diagnosed in Oklahoma in 2014. 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; however, there has been an increasing trend in incidence in the most recent years (Figure 6). The increasing incidence rate of cervical cancer is of great concern because cervical cancer can be prevented through appropriate cervical cancer screenings by detecting abnormal cells. It is of additional concern that the rates in Oklahoma have consistently stayed much higher than rates in the U.S.

Mortality from cervical cancer remained very stable in the U.S. over the past decade. In contrast, Oklahoma's cervical cancer mortality rates fluctuated but continued to remain higher than the U.S., similar to the incidence rates (Figure 7). With appropriate screening, cervical cancer should not result in death, suggesting screening needs to be increasingly promoted.

Human papilloma virus (HPV) is a risk factor for development of several types of cancer, including cervical.⁴ There is a vaccination for HPV now available, and there are clear differences in coverage levels between males and females in Oklahoma. In 2015, 32.2% of Oklahoma females 13-17 years old had received three doses of the HPV vaccine. This is 9.7% lower than the U.S. level. The vaccination level of males was higher: 35.7% of Oklahoma males 13-17 years old had received three doses of the HPV vaccine in 2015. Oklahoma's coverage level for males was 7.6% higher than the U.S. level.¹⁰ Additional information can be found on the Immunization Service, OSDH 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.⁹ Furthermore, the percentage of Oklahoma women receiving Pap tests has consistently remained lower than women throughout the U.S. The U.S. Preventive Services Task Force (USPSTF) currently recommends cervical cancer screening for women 21-65 years old every three years. The USPSTF further recommends that women 30-65 years old who have a normal Pap test and HPV test may lengthen the testing interval to every five years.¹¹



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In 2014, 27.6% of Oklahoma women aged 18 years and older reported that they had not received a Pap test within the last three years versus 24.8% in the U.S.⁹ BRFSS weighted regional data for a Pap test was used in Figure 8 below since county level data was not available. Eastern Oklahoma counties 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.⁹

Figure 8: Percentage of Women 18 Years and Older who Received a Pap Test More Than Three Years Ago in Oklahoma, by Region, 2014



Data Source: Oklahoma Behavioral Risk Factor Surveillance System, 2014

Created 7.2017

Projection/Coordinate System: USGS Albers Equal Area Conic

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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 (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) 2016, a greater proportion of African American and Hispanic women received screening through Take Charge! than was represented among the general population of the state (Table 1). It is important to note that American Indian women are also served through the Cherokee Nation and Kaw Nation BCCEDP along with Take Charge! The data in Table 1 reflects only Take Charge! clients. All women served through Cherokee Nation BCCEDP and Kaw Nation are American Indian.

Table 1: Racial/Ethnic Distribution of Take Charge! Clients and the Oklahoma Population, SFY 2016

Race/Ethnicity	Program Percentage	Population Percentage
African American	9.8%	7.2%
American Indian*	1.5%	7.3%
Asian/Pacific Islander	0.8%	2.0%
Hispanic**	51.1%	9.6%
Other/Unknown	0.3%	N/A
White**	87.6%	73.1%
More than one Race	0.6%	7.8%

Data Sources: Cancer Screening and Tracking System (CaST) and Census.gov (2011-2015 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 FY 2016
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 23,270 eligible women since inception.</p> <p>In FY 2016 provided 2,349 breast cancer screenings and 1,006 cervical cancer screenings.</p> <p>Provided 286 diagnostic referrals.</p>	<p>Federal: \$ 824,400</p> <p>Tribal: \$ 274,525</p> <p>Total: \$1,098,925</p> <p>Federal BCCEDP funds require a \$3:\$1 match in the amount of \$274,525.</p>

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BCCEDP Program	Priority Population	Contracts	Services Provided	Funding FY 2016
Kaw Nation Began: 2001	<p>Breast cancer screening: AI 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: AI 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 4,318 eligible women.</p> <p>In FY 2016 provided 401 breast cancer screenings and 277 cervical cancer screenings.</p>	<p>Federal: \$385,264 Tribal: \$128,421 Total: \$513,685</p> <p>Federal BCCEDP funds require a \$3:\$1 match in the amount of \$128,421.</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 68,602 eligible women.</p> <p>In FY 2016 provided 3,490 breast cancer screenings and 2,423 cervical cancer screenings. Provided 1,409 diagnostic procedures or referrals.^</p>	<p>Federal: \$1,148,827 State: \$ 660,088 Revolving: \$ 0 Total: \$1,808,915</p> <p>Federal BCCEDP funds require a \$3:\$1 match in the amount of \$660,088.</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) provided medical assistance through SoonerCare Medicaid for women screened through any of the BCCEDPs in the state that needed 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

Over 14,100 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 Making Strides against Breast Cancer Walk,[®] Take Charge! contracted healthcare providers, and Oklahoma Project Woman.

Epidemiological Trend Studies

The following epidemiological trend studies requested data from the OCCR during FY 2017.

1. Improving Geocoding of Cancer Registry and Development of a Spatiotemporal Database of Environmental Exposures
 - Investigator: Naci Dilekli
 - Date Requested: July 6, 2016
2. Association between Cancer and Venous Thromboembolism in Oklahoma County
 - Investigator: Micah McCumber
 - Date Requested: July 22, 2016
3. Osteosarcoma Surveillance Study/Forteo Patient Registry Linkage Study
 - Investigator: David Harris
 - Data Requested: July 27, 2016
4. A Follow-Up Study for Causes of Cancer in Black Women
 - Investigator: Lynn Rosenberg
 - Date Requested: January 26, 2017

5. Cohort Cancer Registry Follow-up Study
 - Investigator: Meir J. Stampfer
 - Date Requested: February 21, 2017

6. Assessing the Incidence of Osteosarcoma Among Teriparatide Users Using Medicare Part D and State Cancer Registry Data
 - Investigator: Alicia Gilsenan
 - Date requested: March 3, 2017

7. Spatial Analysis of Sociodemographic Risk Factors for Incidence of Triple-Negative Breast Cancer
 - Investigator: Zaria Tatalovich and Jennifer Moss
 - Date Requested: March 27, 2017

8. Incidence of Hepatocellular Carcinoma and Intrahepatic by Racial/Ethnic Group in the U.S.
 - Investigator: Katherine McGlynn
 - Date Requested: March 27, 2017

9. Rates of Cancers among Children and Young Adults in the U.S.
 - Investigator: Meredith Shiels
 - Date Requested: March 27, 2017

10. Measuring Observed Incidence of Prostate Cancer by Grade and Extent of Disease for Race/Ethnic Groups in the U.S. and Canada
 - Investigator: Raymond Blaise
 - Date Requested: March 27, 2017

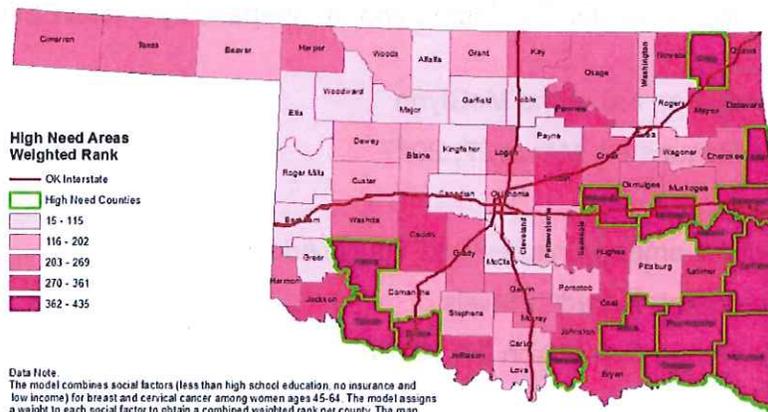
11. State-Level Lung Cancer Burden
 - Investigator: American Lung Association and Dennis Deapen
 - Date Requested: March 27, 2017

12. Forecast of Trends in Esophageal and Gastric Cancer in the U.S. through 2030
 - Investigator: Jessica Petrick
 - Date Requested: March 27, 2017

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, Census 2015 (American Community Survey) data 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 (map on page 16). 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 services areas by social factors for FY 2017. The resulting total ranks are split into five quintiles. The counties with the highest ranks are considered highest need.

Figure 9: Model 2 High Need Areas by Social Factors Modeling Women, Age (45-64), Education, Insurance Status, Income Oklahoma, FY2017



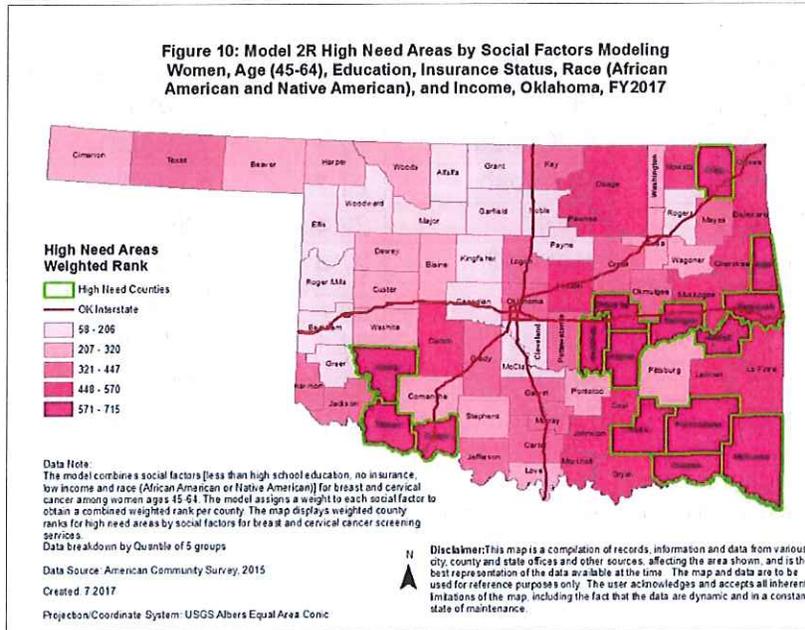
Data Note:
 The model combines social factors (less than high school education, no insurance and low income) for breast and cervical cancer among women ages 45-64. The model assigns a weight to each social factor to obtain a combined weighted rank per county. The map displays weighted county ranks for high need areas by social factors for breast and cervical cancer screening services.
 Data breakdown by Quintile of 5 groups

Data Source: American Community Survey, 2015

Created: 7.2017

Projection/Coordinate System: USGS Albers Equal Area Conic

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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. Identification of healthcare providers located within high need counties is performed 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, 2006-2015

County	Rate	County	Rate	County	Rate
Adair	21.5	Grant	37.0	Nowata	23.7
Alfalfa	24.2	Greer	16.1	Okfuskee	33.6
Atoka	23.0	Harmon	34.5	Oklahoma	24.9
Beaver	37.5	Harper	29.2	Okmulgee	25.9
Beckham	19.9	Haskell	26.6	Osage	18.6
Blaine	23.1	Hughes	29.2	Ottawa	22.7
Bryan	21.1	Jackson	26.2	Pawnee	23.5
Caddo	24.1	Jefferson	19.0	Payne	23.9
Canadian	19.8	Johnston	24.4	Pittsburg	19.2
Carter	22.4	Kay	24.6	Pontotoc	22.0
Cherokee	21.8	Kingfisher	15.2	Pottawatomie	27.6
Choctaw	19.3	Kiowa	32.2	Pushmataha	15.0
Cimarron	*	Latimer	19.2	Roger Mills	19.5
Cleveland	19.5	Leflore	27.2	Rogers	22.5
Coal	12.0	Lincoln	24.9	Seminole	23.6
Comanche	21.5	Logan	22.0	Sequoyah	27.3
Cotton	23.6	Love	35.7	Stephens	20.9

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County	Rate	County	Rate	County	Rate
Craig	17.8	McClain	18.9	Texas	15.0
Creek	24.7	McCurtain	32.1	Tillman	16.3
Custer	20.7	McIntosh	21.7	Tulsa	25.2
Delaware	18.0	Major	22.4	Wagoner	22.5
Dewey	19.7	Marshall	27.4	Washington	26.9
Ellis	11.2	Mayes	23.7	Washita	15.8
Garfield	23.2	Murray	21.1	Woods	16.0
Garvin	20.9	Muskogee	21.4	Woodward	21.3
Grady	22.0	Noble	25.0	STATE	23.4

*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, 2006-2015

Table 4: Cervical Cancer Age-Adjusted Death Rate⁺ by County, Oklahoma, 2006-2015

County	Rate	County	Rate	County	Rate
Adair	*	Grant	*	Nowata	*
Alfalfa	*	Greer	0.0	Okfuskee	*
Atoka	*	Harmon	*	Oklahoma	2.8
Beaver	*	Harper	*	Okmulgee	3.4
Beckham	5.2	Haskell	0.0	Osage	2.5
Blaine	*	Hughes	4.6	Ottawa	5.0
Bryan	2.9	Jackson	5.7	Pawnee	*
Caddo	5.0	Jefferson	*	Payne	2.8
Canadian	2.4	Johnston	*	Pittsburg	6.3
Carter	3.5	Kay	2.4	Pontotoc	*
Cherokee	2.0	Kingfisher	5.8	Pottawatomie	4.6
Choctaw	*	Kiowa	*	Pushmataha	*
Cimarron	0.0	Latimer	10.6	Roger Mills	*
Cleveland	2.1	Leflore	3.6	Rogers	1.8
Coal	0.0	Lincoln	*	Seminole	4.5
Comanche	2.7	Logan	3.2	Sequoyah	5.1
Cotton	*	Love	*	Stephens	2.5
Craig	*	McClain	2.5	Texas	*
Creek	3.5	McCurtain	4.4	Tillman	*
Custer	*	McIntosh	*	Tulsa	2.6
Delaware	*	Major	*	Wagoner	1.8
Dewey	*	Marshall	*	Washington	3.7
Ellis	*	Mayes	3.0	Washita	*

County	Rate	County	Rate	County	Rate
Garfield	1.6	Murray	*	Woods	0.0
Garvin	*	Muskogee	4.3	Woodward	*
Grady	3.6	Noble	*	STATE	1.5

*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, 2006-2015

Upcoming Priority Strategies

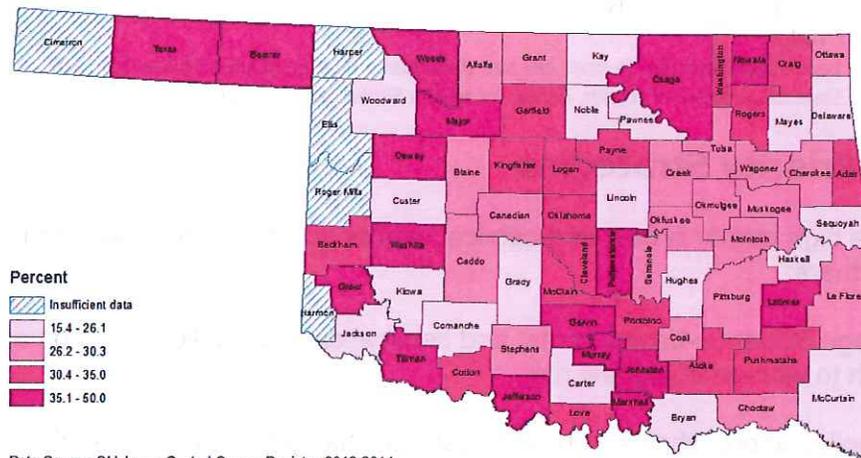
- Increase high quality breast and cervical cancer screening in Oklahoma in collaboration with partners;
- Encourage evidence-based breast and cervical cancer public education and targeted outreach to women at highest risk;
- Utilize policy approaches and health systems changes to improve implementation 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

An emerging technology to prevent breast cancer is the development of a smartphone app, Physical Activity and Your Nutrition for Cancer (PYNC). The authors in a recent study indicated that with the advances in social media, increasing use of smartphones, and existing wearable devices, smartphone app technology could assist with prevention of breast cancer. The study recommended development of a smartphone app focusing on prevention using a behavior modification framework, interconnectivity with existing products, and varying levels of health literacy.¹² The study further indicated that 30-35% of breast cancer could be prevented by focusing on modifiable risk factors such as obesity, physical inactivity, alcohol consumption, and hormone replacement therapy (HRT).

A strategy to reduce the medical costs of breast cancer is to prevent late stage diagnosis by promoting breast screening for early detection. Early detection of cancer at the in situ stage (cancer cells have not spread to nearby tissue) or local stages (cancer is limited to the place it started, with no sign that it has spread) provides better chances of five-year survival.¹³ Figure 11 displays the proportion of late stage cases of breast cancer by Oklahoma counties.

Figure 11: Percent of Female Breast Cancer Cases Diagnosed at Late Stage by County, Oklahoma, 2012-2014



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.

Table 5 shows the proportion of diagnosed late stage breast cancers by region. The rate of Oklahoma women diagnosed with late stage breast cancer is slightly higher in the Central region of Oklahoma as compared to rest of the state. As seen in Figure 11, women in multiple counties of the state need access to additional 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: Percent of Breast Cancer Cases Diagnosed at Late Stage in Oklahoma by Region, 2012-2014

Percentage	Region
32.3%	Central Cleveland and Oklahoma
28.7%	Northeast Adair, Cherokee, Craig, Creek, Delaware, Kay, Lincoln, Mayes, Muskogee, Noble, Nowata, Okfuskee, Okmulgee, Osage, Ottawa, Pawnee, Payne, Rogers, Sequoyah, Wagoner, and Washington
30.5%	Northwest Alfalfa, Beaver, Blaine, Canadian, Cimarron, Custer, Dewey, Ellis, Garfield, Grant, Harper, Kingfisher, Logan, Major, Roger Mills, Texas, Woods, and Woodward

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Percentage	Region
30.0%	Southeast Atoka, Bryan, Choctaw, Coal, Haskell, Hughes, Johnston, Latimer, LeFlore, McCurtain, McIntosh, Marshall, Murray, Pittsburg, Pontotoc, Pottawatomie, Pushmataha, and Seminole
27.8%	Southwest Beckham, Caddo, Carter, Comanche, Cotton, Garvin, Grady, Greer, Harmon, Jackson, Jefferson, Kiowa, Love, McClain, Stephens, Tillman, and Washita
30.3%	Tulsa Tulsa

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

A recent emerging strategy to increase participation in cervical cancer screening is to provide an alternative to using a speculum during cervical cancer screening. The authors in a recent study indicated the speculum has been identified as a potential barrier for women to receive cervical cancer screening. The barriers included anxiety, fear, discomfort, pain, embarrassment, and/or vulnerability during the procedure. The study explored the feasibility of a tampon-sized inserter and a miniature pen sized colposcopy (POCKET Colposcope) for comfort and potential for a self-colposcopy. The authors utilized 3D computer-aided design software to develop and test prototypes. The prototypes were tested and compared to the speculum by volunteers. The prototype designs included a mini camera that assisted with illumination and the ability to capture images. The study indicated that images were comparable to the speculum visual area for normal position uteri and better than the speculum for anteverted and sideverted uteri. The study subjects indicated a preference for the inserter instead of the speculum. The authors in the study indicated the inserter is an option for cervical cancer screening.¹⁴

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 Recommendations

The Advancement of Wellness Advisory Council has reviewed the Oklahoma Breast and Cervical Cancer Annual Report State Fiscal Year 2017 and has indicated two recommendations. The council recommended that the state of Oklahoma continue to support the efforts of the breast and cervical cancer services and to maintain the funds in the Breast and Cervical Cancer Act Revolving Fund.

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