

Cervical Cancer in Arizona 2000-2010





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Rationale & Acknowledgements

✿ Rationale:

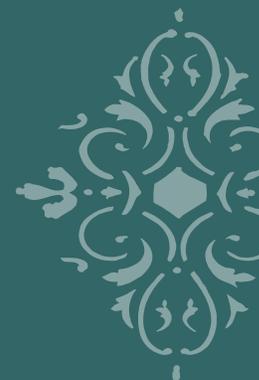
This report is the result of a coordinated effort by the Arizona Department of Health Services (ADHS) Cancer Prevention and Control Programs (Arizona Cancer Registry, HealthCheck Programs, and Arizona Cancer Control Program). One of the primary functions of the Arizona Cancer Prevention and Control Programs is to serve as a leading information resource for cancer information in Arizona. The goal is to develop a consistent message on the state of cancer in Arizona by providing current, reliable, and meaningful information on a regular basis. In 2012, [Breast Cancer in Arizona 2000-2009](#) was produced, the first in a series of planned documents to inform stakeholders, providers, and community members about cancer in Arizona. *Cervical Cancer in Arizona 2000-2010* is the second document in this series and has the same intent. This team is now working toward developing a colorectal cancer-focused report.

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✿ Acknowledgements:

Producing a document meeting everyone's needs is challenging. It was a pleasure having a broad team of experts provide input and guidance for this document. The following all played a role in this final document:

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Executive Summary & Well Woman HealthCheck Program Overview

✦ Executive Summary:

Cervical cancer is slow-growing and develops in the tissues of the uterine cervix. It typically has few symptoms and is most often caused by the human papillomavirus (HPV). Effective screening and treatments continue to decrease the incidence of cases and deaths from cervical cancer.

Arizona's age adjusted incidence rates of cervical cancer are lower than the United States as a whole; however, the U.S. has witnessed a greater decrease in cervical cancer rates in the last ten years than Arizona. Data has shown that Arizona can expect to see 211 invasive cervical cancer cases annually for an average annual rate of 7.3 cases per 100,000 females. The average annual invasive cervical cancer rate in the U.S. is higher than Arizona at 8.4 cases per 100,000 females. Of the cervical cancer cases in Arizona, the age group with the highest age specific rate is that of 40-64 year olds. Stage at diagnosis is an important indicator for survivorship. Late stage diagnosis lowers the length of survival after diagnosis. Long-term outcomes impacted by stage at diagnosis vary across ethnic groups. The highest proportion of late stage diagnosis are Blacks followed by Asian & Pacific Islanders. When age-adjusted rates are reviewed by race/ethnicity, White Hispanics have the highest rates followed by American Indians. The information provided in this report is key to targeting cervical cancer screening and diagnostic efforts across the state.

✦ Well Woman HealthCheck Program (WWHP) Overview

The [Well Woman HealthCheck Program](#) (WWHP) is Arizona's grantee for the [National Breast and Cervical Cancer Early Detection Program](#) (NBCCEDP). The NBCCEDP is funded by the Centers for Disease Control and Prevention (CDC). In Arizona, this program funding is augmented with an important budget line item from the state legislature. CDC's funds are allocated to screen women 50 years of age and older for breast cancer. The state funds allow the WWHP to screen women from 40-49 years old for breast cancer. Both funding sources support cervical cancer screening for women 21 years of age and older.



The WWHP is a breast and cervical cancer screening program that does much more than screening. Outside of providing screening and diagnostic services, WWHP contractors are guided to provide complete follow-up on all abnormal results within 60 days. Data is gathered on each patient and maintained in a data base. When a report is returned with an abnormal result immediate follow-up is of the utmost importance. Case managers work with each patient to complete the diagnostic tests within the 60 day time frame. Each diagnostic test is tracked and entered into the database. If the patient is in need of treatment services, immediate attention to treatment is priority. Treatment services are mandated within 60 days of the diagnosis. All of these parameters are tracked, recorded, and reported to CDC. CDC evaluates these measures every six months and provides each program with a report card. On the following page, you will find a sample of the program performance indicator report card with Arizona's results listed and compared with CDC's standards.

WWHP Core Indicator Reports

Arizona's Well Woman HealthCheck Program (WWHP) contractors have consistently met or exceeded CDC's standards for NBCCEDP grantees (See Tables 1 and 2 for the most current report). High quality outcomes are driven by timely services. Studies have been done to determine the complete follow-up rate on abnormal cervical cancer screening results for patients screened outside of the NBCCEDP. Those rates are far lower than Arizona's WWHP rate of more than 90%. Sharing the WWHP model broadly would improve follow-up across the state, thereby improving outcomes. Early diagnosis is key to survivorship. Combining regular screenings with patient navigation throughout the diagnostic process would help improve outcomes across the state in any setting that provides breast and cervical cancer screenings.

Table 1: Cervical Cancer Screening and Diagnostics

Type	Program Performance Indicator	CDC Standard	Arizona's Status?
Screening	Initial Program Pap Tests; Rarely or Never Screened	≥ 20%	Yes
Screening	Mammograms Provided to Women > 50 years of age	≥ 75%	Yes
Cervical Cancer Diagnostics	Abnormal Screening Results with Complete Follow-Up	≥ 90%	Yes
CD	Abnormal Screening Results: time from Screening to Diagnosis >90 days	≤ 25%	Yes
CD	Treatment Started for Diagnosis of HSIL, CIN2, CIN3, CIS, Invasive	≥ 90%	Yes
CD	Invasive Carcinoma; Time from Diagnosis to Treatment > 60 days	≤ 20%	Yes
CD	HSIL, CIN2, CIN3, CIS; Time from Diagnosis to Treatment > 90 days	≤ 20%	Yes

CD: Cervical Cancer Diagnostics

Yes = Met Standard; No = Standard Not Met

Table 2: Breast Cancer Screening and Diagnostics

Type	Program Performance Indicator	CDC Standard	Arizona's Status?
Breast Cancer Diagnostics (BC Dx)	Abnormal Screening Results with Complete Follow-Up	≥ 90%	Yes
BC Dx	Abnormal Screening Results; Time from Screening to Diagnosis > 60 Days	≤ 25%	Yes
BC Dx	Treatment Started for Breast Cancer	≥ 90%	Yes
BC Dx	Breast Cancer; Time from Diagnosis to Treatment > 60 Days	≤ 20%	Yes

Introduction

In 1900, the leading cause of cancer death among women was cervical cancer.¹ Cancer at that time was considered a women's disease as most cancer mortality came from cervix, uterus, breast, and ovarian cancer.² In 2008, cervical cancer was the second most common type of cancer in women in the world.³ In the U.S. however, cervical cancer ranks 14th among all women as the routine use of PAP smears finds the disease in its earliest stages and if treated immediately is considered curable.⁴ In 2009, 12,357 women were diagnosed with cervical cancer and 3,909 women died from cervical cancer.⁵



Most cervical cancer is caused by the human papilloma virus (HPV). HPV is a common virus that is spread through sexual contact. HPV is so common that 4 out of 5 people will get it at some point in their lives.⁶ For most women, HPV resolves on its own; however, if it does not, over time it may cause cervical cancer.⁷

There are two categories of HPV infections. Low-risk HPVs, which do not cause cancer and high-risk or oncogenic HPVs, which can cause cancer. Over a dozen high-risk HPV types have been identified. Two high-risk types, 16 and 18, cause approximately 70 percent of all cases of cervical cancer.⁸ Most high-risk HPV infections occur without any symptoms and disappear within two years.⁹ Some HPV infections, however, can persist for years and increase a woman's risk of cervical cancer. Persistent infections with high-risk HPV types can lead to more serious cytologic abnormalities or lesions that, if untreated, may progress to cancer. However only about 50 percent or less of high-grade cervical lesions progress to invasive cervical cancer.¹⁰ Researchers believe that for women with normal immune systems it can take between 15 and 20 years from the time of initial infection until a tumor forms or only 5 to 10 years for women with weakened or compromised immune systems.¹¹

Risk factors for cervical cancer include HPV infection, smoking, poor economic status, chlamydia infection, immunosuppression, obesity, long term use of oral contraceptives, women of mothers who used the miscarriage prevention drug diethylstilbestrol (DES) during pregnancy in the early 1960s, and a weakened immune system.¹²

The HPV Vaccine

The Food and Drug Administration (FDA) has approved two HPV vaccines: Gardasil® for the prevention of HPV related cervical, anal, vulvar, and vaginal cancer, as well as precancerous lesions in these areas and genital warts; and Cervarix® for the prevention of HPV related cervical cancer and precancerous cervical lesions. Both vaccines are highly effective in preventing infections with HPV types 16 and 18.¹³ The HPV vaccine is recommended for girls ages 11 or 12 years through age 26 and boys ages 11 and 12 years through age 21.¹⁴

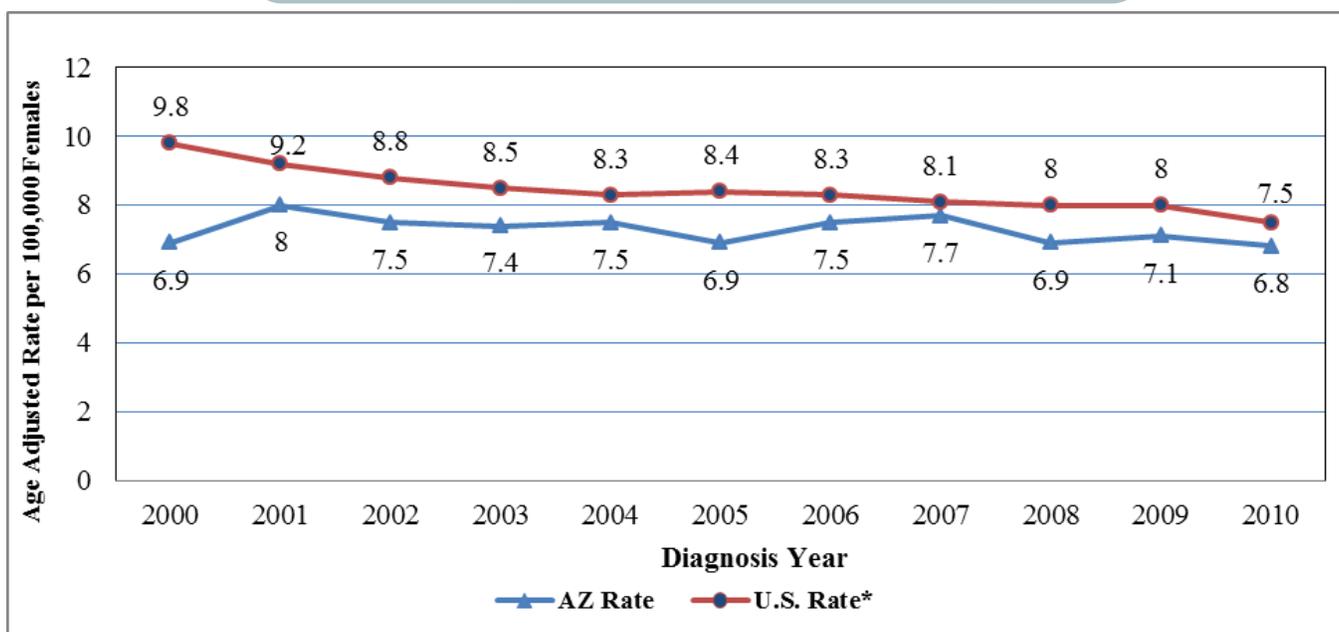


Age Adjusted Incidence Rates

In Arizona, an average of 211 invasive cervical cancer cases were reported annually between 2000 and 2010. The age adjusted rate of cervical cancer among females in Arizona varied from 6.8 cases per 100,000 females to 8.0 cases per 100,000 females during this time frame. The average annual rate for the combined years is 7.3 cases per 100,000 females. This rate is significantly lower than the U.S.* cancer rate of 8.4 cases per 100,000 females (Figure A).



Figure A: Comparison of Arizona and U.S.* Age Adjusted Incidence Rates of Cervical Cancer 2000-2010



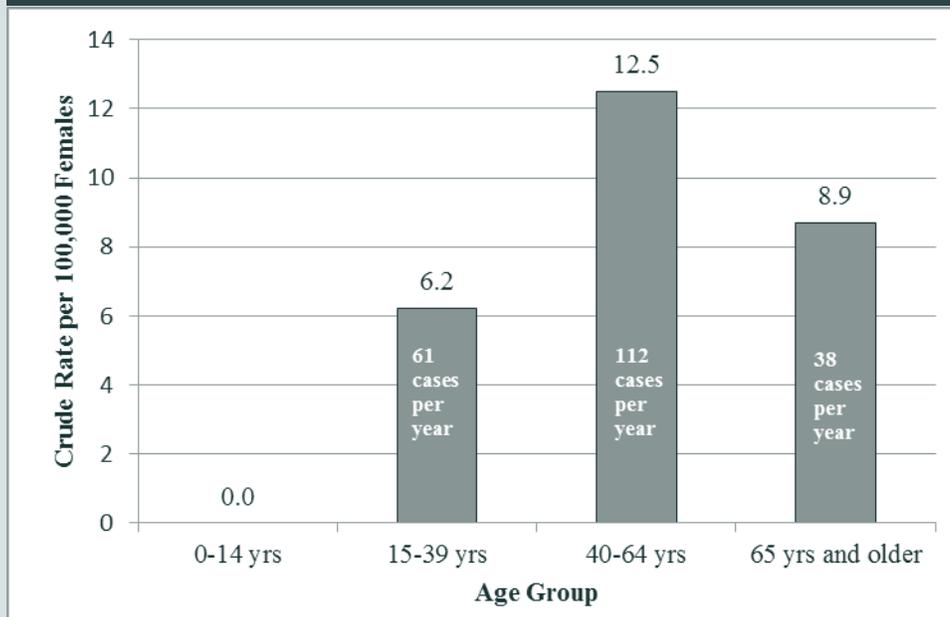
*National Program of Cancer Registries: 1999 - 2010 Incidence, WONDER On-line Database. United States Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; 2013. Accessed at <http://wonder.cdc.gov/cancernpcr.html> on May 7, 2013 11:24:46 AM.

Incidence by Age Group

The risk of developing cervical cancer is highest among females 40 to 64 years old. This group has an age specific rate of 12.5 cases per 100,000 females. The median age of cervical cancer diagnosis in Arizona is 47 years. In Arizona from 2000 to 2010, the average annual case count increased to 61 cases among the 15-39 year old age group and 112 cases among the 40-64 year old age group; and decreased to 38 cases among the 65 and older age group (Figure B).



Figure B: Age Specific Rate of Arizona Resident Cervical Cancer Incidence and Average Annual Case Count by Age Group for Diagnosis Years 2000-2010



Incidence by Race/Ethnicity

Most invasive cervical cancer cases in Arizona are among White Non-Hispanic women (64.4%). White Hispanic cases comprise 23.4% of cases, while other racial groups make up 9.9% of cases (Black 2.8%, American Indian 4.8%, Asian & Pacific Islander 2.3%) (Figure C). The highest age adjusted rate of cervical cancer among race and ethnic groups was found among White Hispanic cases (8.8 cases per 100,000 females). It was followed by American Indian cases (8.4 cases per 100,000 females) and White Non-Hispanic cases (7.0 cases per 100,000 females). The lowest rates were found among Asian & Pacific Islanders (5.3 cases per 100,000 females) and Blacks (6.7 cases per 100,000 females) (Figure D).

Figure C: Race/Ethnicity percent of cases for Arizona Resident Cervical Cancer Years 2000-2010

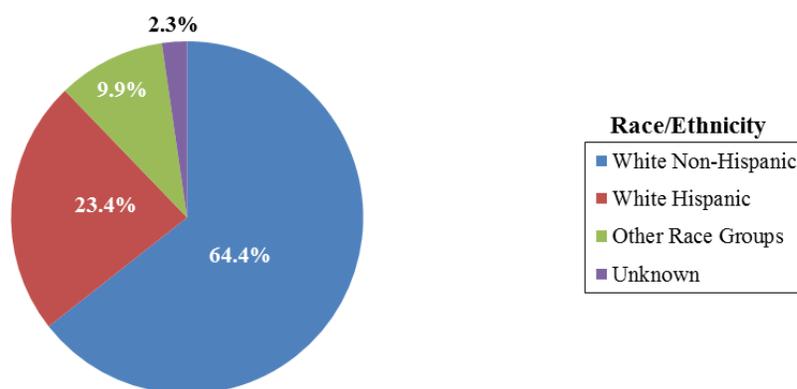
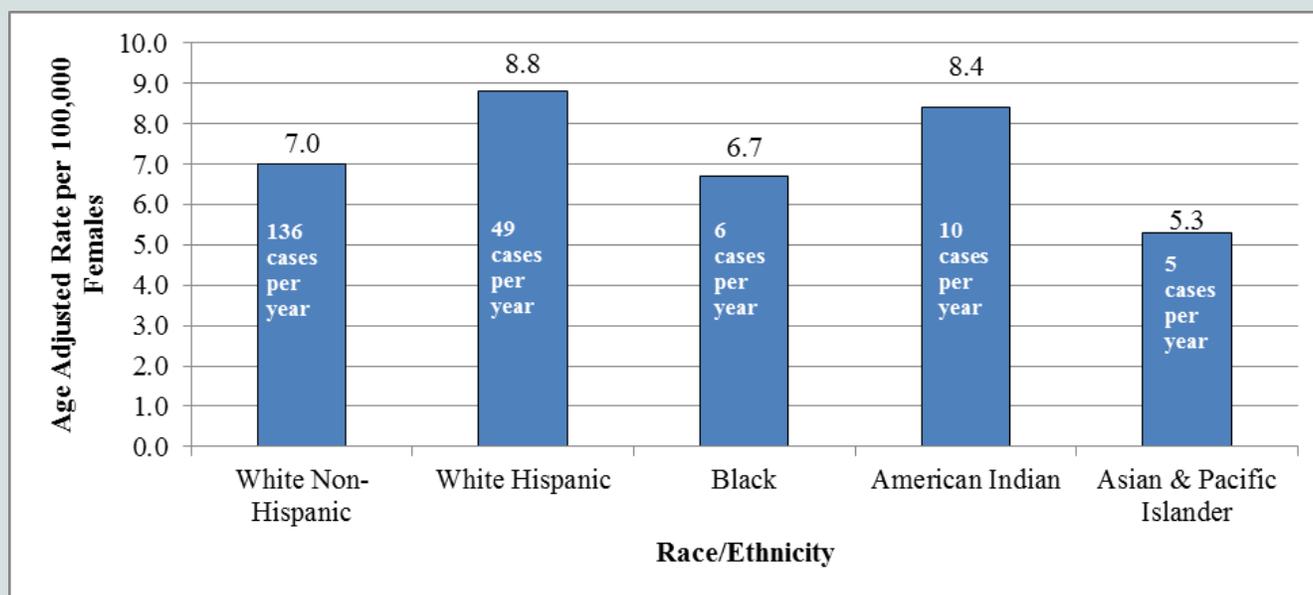


Figure D: Age Adjusted Rates by Race/Ethnicity for Arizona Resident Cervical Cancer Years 2000-2010

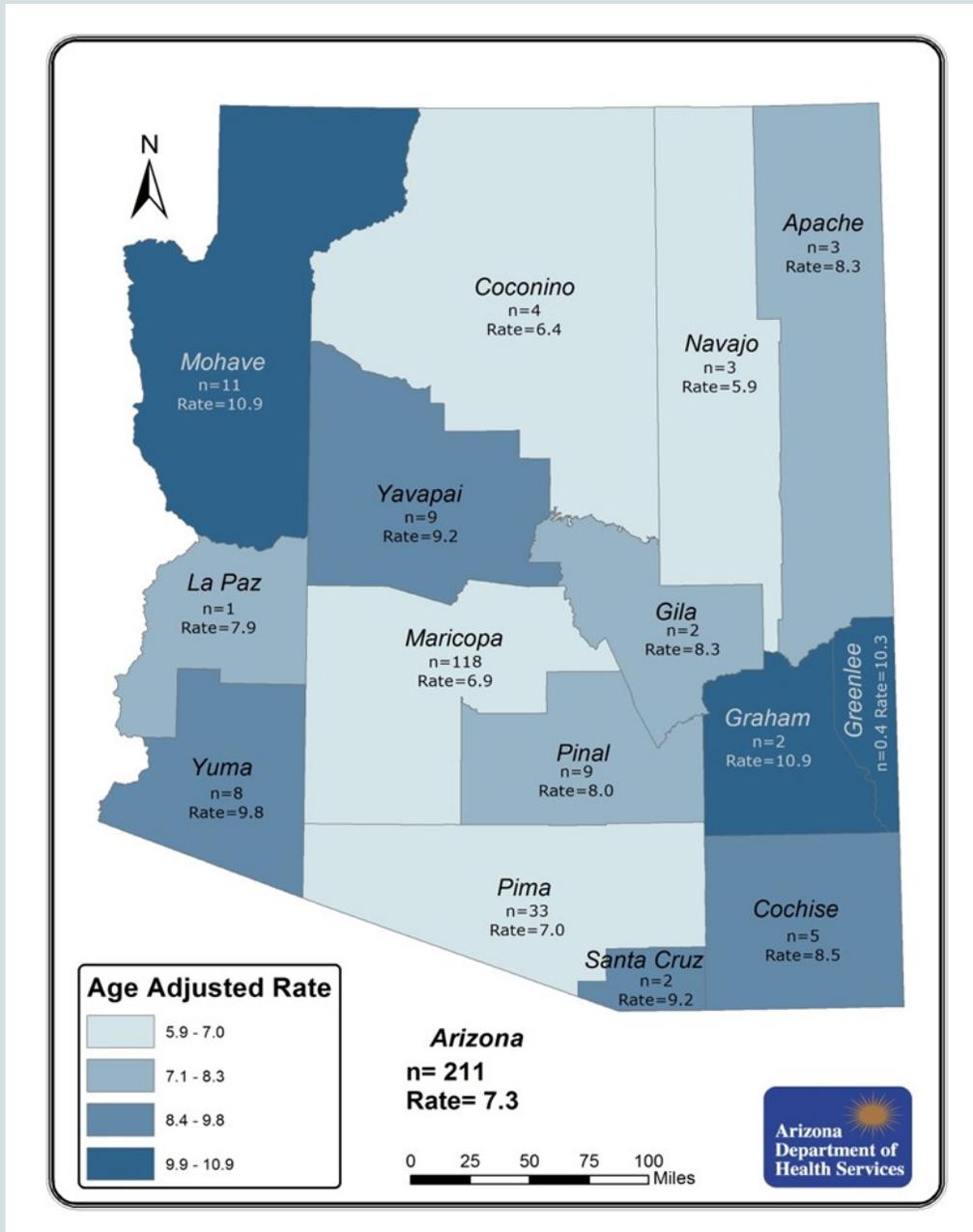


*An average of five cases a year had an unknown race classification

County of Residence

In the years 2000-2010, Mohave County had the highest significant incidence rate of cervical cancer (10.9 per 100,000 females), while Maricopa and Pima Counties had the lowest rates (6.9 and 7.0 cases per 100,000 females) (Figure E).

Figure E: Incidence Cervical Cancer in Arizona
Average Annual Counts and Age Adjusted Rates by County
Years 2000-2010



† An average of 0.6 cases annually had an unknown county residence at diagnosis.

* Greenlee County rate is not significant as its case count was too small to calculate an accurate age adjusted rate.

Incidence of Invasive Cervical Cancer Race/Ethnicity

White Hispanic and White Non-Hispanic females were most likely to be staged local (43.3% and 43.4%). Black females had the lowest percentage of cases diagnosed in a local stage (34.3%). Cases diagnosed in a local stage have a greater chance of curative treatment than cases in a later stage. Earlier diagnosis of cervical cancer using PAP tests can lead to curative treatment (Figures F through J).

Proportion of Cervical Cancer Summary Stage of each Race/Ethnicity Group for Years 2000-2010

Figure F: **White Hispanic**

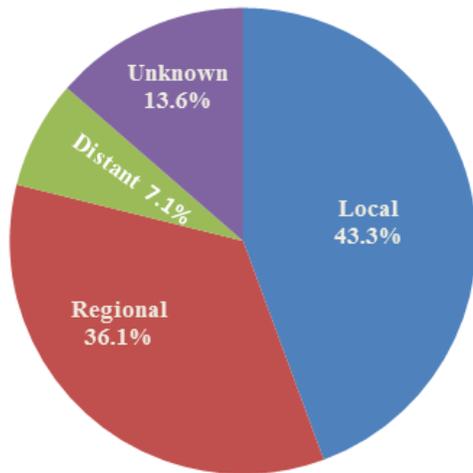


Figure G: **White Non-Hispanic**

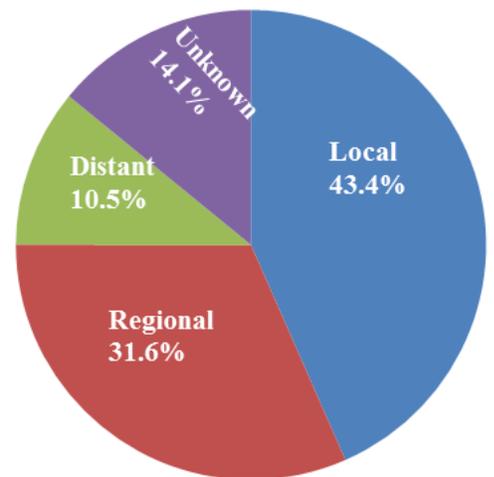


Figure I: **Asian & Pacific Islander**

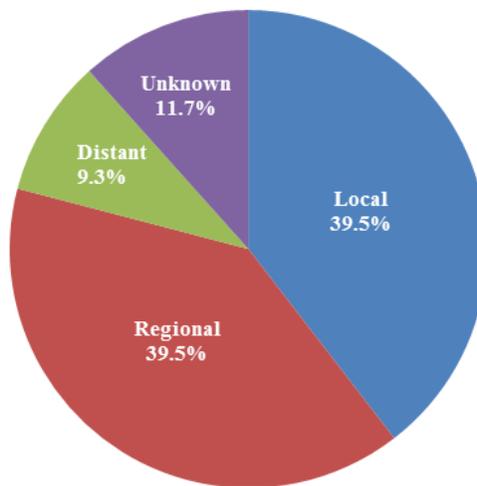


Figure H: **Black**

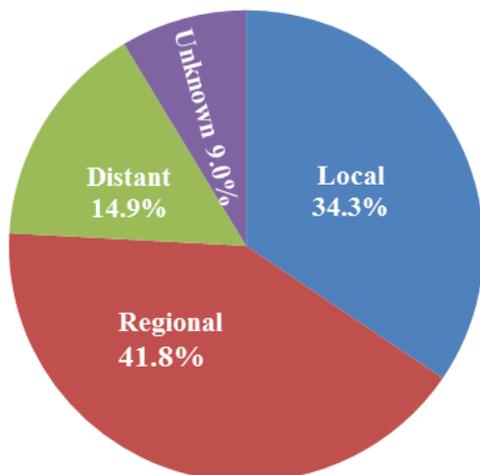
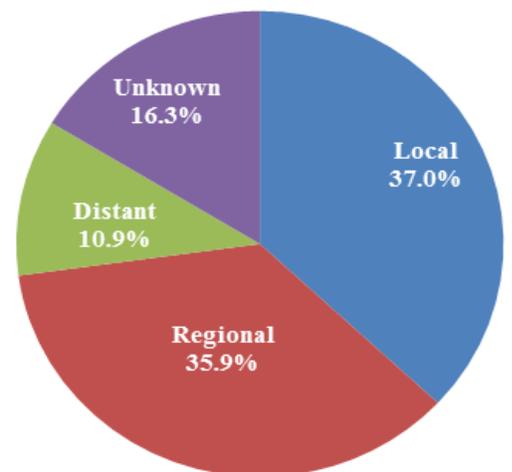


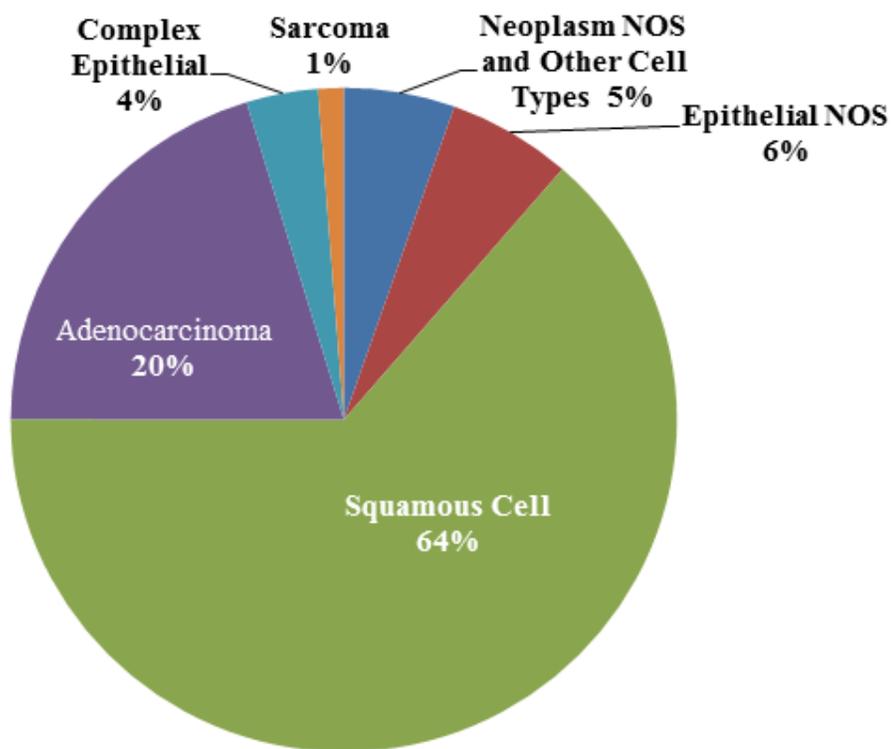
Figure J: **American Indian**



Type of Cancer (Histology)

Squamous and adenocarcinoma are the most common forms of cervical cancer (84%). Non squamous cell types may be less amenable to screening (Figure K).

Figure K: Histology Percent of Arizona Resident Invasive Cervical Cancer Cases 2000-2010

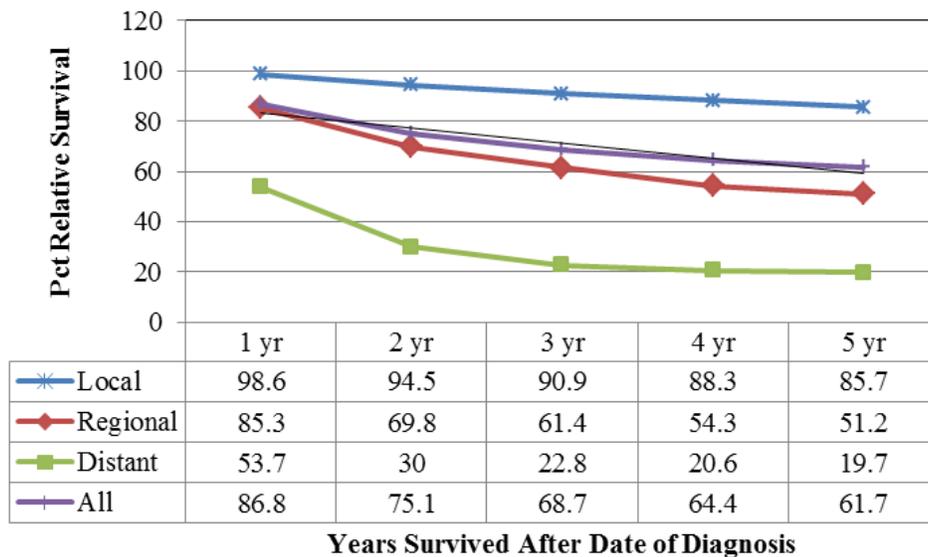


Invasive Cervical Cancer Survival

The stage of disease at diagnosis impacts the length of survival of the patient. Local stage of diagnosis had an 85.7% five year relative survival rate. Females diagnosed in a distant stage had 19.7% five year relative survival rate. The “All Stage” category represents the combined stage of local, regional and distant stages of all females with cervical cancer (Figure L).



Figure L: Five Year Relative Survival of Invasive Cervical Cancer By SEER Summary Stage for Diagnosis Years 1995-2007



Methods and Technical Notes

This cervical cancer report includes cases diagnosed from years 2000 through 2010. Survival analysis data uses cases diagnosed from 1995 through 2007. The data for this report were retrieved from the Arizona Cancer Registry database on February 5, 2013. This report focuses on invasive cervical cancer cases as in situ cases are not required to be reported to the Arizona Cancer Registry. This approach was used to create data comparable to the Surveillance, Epidemiology, and End Results (SEER) program reports. This report used the SEER definitions of the cases by cancer type.

Cases were classified by primary site and/or histologic type, behavior, race and ethnicity, age at diagnosis, sex and county of residence at diagnosis.

ANALYSIS CRITERIA

⇒ **Primary Site and Histologic Type**

Primary site and histologic type were classified according to the International Classification of Diseases for Oncology, Third Edition (a.k.a. ICD-O-3).

⇒ **Behavior**

Behavior code: The fifth digit of the morphology code that indicates the growth pattern of a tumor, and whether or not it is invasive. Invasive definition is as follows: A malignant tumor that has invaded the basement membrane of the tissue of origin.

⇒ **Race/Ethnicity**

Race/Ethnicity is identified from the physician's notations and the medical record that generally contains information concerning a person's race and ethnicity. American Indian race is also identified through linkage with Indian Health Service (IHS) data. The linkage identifies cases that may be misclassified as another race. Race/Ethnicity definitions used in this report are; White non-Hispanic, White Hispanic, Black, American Indian, and Asian & Pacific Islander.

Incidence rates were divided into two ethnicity categories: Hispanic and non-Hispanic. For this report, all cases with an unknown ethnicity were considered non-Hispanic.

⇒ **Age at Diagnosis**

Age groups were divided into four age groups for incidence counts. These age groups were 0-14 years, 15-39 years, 40-64 years, and 65 years and older.

⇒ **Residence at Diagnosis**

The residency of cases at the time of diagnosis was grouped by county and by Arizona versus non-Arizona resident. Non-Arizona residents were excluded in the analysis.



Incidence Counts

Incidence counts were the number of cases diagnosed with invasive cervical cancer from years 2000 through 2010. A cancer case can either be a tumor originating in one primary site or may be a systemic cancer of a specific histologic type. More than one cancer case may be reported for an individual. This “one-to-many” relationship results in a higher number of cancer cases than individual persons recorded in the registry.

Certain demographic variables may be unknown for some cases. Therefore comparing total numbers between different figures and tables may not yield equal numbers. Additionally, the totals for all categories within a figure or table may not equal the state total.

Age-Adjusted Incidence

Age-adjustment is a process used to compare incidence rates over time or among geographic areas or populations that have different age distributions. Because most disease rates increase with increasing age, age-adjustment eliminates the confounding effect of age when comparing rates.

Beginning with the 1999 data year, federal agencies and the Arizona Cancer Registry have adopted the year 2000 projected U.S. population as the new standard for age-adjusting incidence. All incidence rates were adjusted using the 2000 U.S. standard population by the direct method, and were presented as number of cancers per 100,000 persons.

Average Counts and Rates

This report contains several figures and tables that average ten years of data to produce an average annual count. When doing so, each averaged number is calculated separately, and rounded to a whole number. Due to rounding the *total* rounded value may not equal the total of two individually calculated numbers in that category.

Population Denominators

The population numbers used for analysis in this report were taken from United States Census Bureau and modified by SEER. The SEER program applied a race/ethnicity bridge to the population numbers previous to the year 2000 to more accurately estimate the number of minorities in years previous to the 2000 census. New intercensal estimates were developed to reflect the actual yearly changes in populations based on the 2010 census. These changes lowered the expected population for Arizona in each year as population projections used in the past had over-estimated the state and county populations. These new populations slightly increase the rate of cancer. The ACR chose to use these population numbers for calculating age-adjusted rates in order to be comparable with other state and national cancer data.



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