

# **Cervical Cancer in Texas**

Prepared by the Texas Cancer Registry  
Texas Department of State Health Services

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# Index of Select Slides

- [Cervical Cancer Overview](#)
  - [Cervical Cancer Risk Factors](#)
  - [Cervical Cancer Screening](#)
  - [Cervical Cancer Screening Prevalence](#)
  - [Cervical Cancer Screening in Texas by Race/Ethnicity and Age](#)
  - [Cervical Cancer Screening in Texas by Education and Income](#)
- [Overview of Cervical Cancer in Texas](#)
- [Cervical Cancer Incidence in Texas](#)
  - [Cervical Cancer Incidence Rates by Race/Ethnicity](#)
  - [Cervical Cancer Incidence Rate Trends](#)
  - [Cervical Cancer Incidence Rates by Age at Diagnosis](#)
  - [Cervical Cancer Incidence Rates by Race/Ethnicity and Stage at Diagnosis](#)
  - [Cervical Cancer Cases by Race/Ethnicity and State at Diagnosis](#)
  - [Cervical Cancer Incidence Rates by Health Service Region](#)
  - [Cervical Cancer Incidence Rates by Urban-Rural Classification](#)
- [Cervical Cancer Mortality in Texas](#)
  - [Cervical Cancer Mortality Rates by Race/Ethnicity](#)
  - [Cervical Cancer Mortality Trends](#)
  - [Cervical Cancer Mortality Rates by Age at Death](#)
  - [Cervical Cancer Mortality Rates by Health Service Region](#)
  - [Cervical Cancer Mortality Rates by Urban-Rural Classification](#)
- [Cervical Cancer Survival](#)
  - [Cervical Cancer Cause-Specific Survival by Race/Ethnicity](#)
  - [Cervical Cancer Cause-Specific Survival by Race/Ethnicity and Stage at Diagnosis](#)

# Background

- Cervical cancer screening is one of three age-based cancer screenings currently recommended for all women by the U.S. Preventive Services Task Force.<sup>1</sup> Breast and colorectal cancer screenings are the other two recommended.
- According to the Centers for Disease Control and Prevention, routine cervical cancer screening is the most effective way to prevent cervical cancer or find it early.
- The human papillomavirus (HPV) vaccination protects against types of HPV that cause almost all cervical cancers.<sup>2</sup>
- This statistical report describes cervical cancer screening rates and the burden of cervical cancer in Texas.

## Implications for Public Health Practice:

- The burden of cervical cancer can be reduced through efforts to screen all women at risk and to increase use of the HPV vaccination.
- Identifying disparities in cervical cancer screening, incidence, mortality, and survival can help identify strategies to reduce the cancer burden.

<sup>1</sup> Cervical Cancer: Screening. United States Preventive Services Task Force. <https://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/cervical-cancer-screening2>

<sup>2</sup> What Can I Do to Reduce My Risk for Cervical Cancer? Centers for Disease Control and Prevention. [https://www.cdc.gov/cancer/cervical/basic\\_info/prevention.htm](https://www.cdc.gov/cancer/cervical/basic_info/prevention.htm)

# Cervical Cancer Overview

- Cervical cancer is cancer that starts in the cervix. The cervix is the part of the female reproductive system that connects the body of the uterus and vagina.
- Cervical cancer usually develops slowly over time. Normal cells gradually develop pre-cancerous changes, also called dysplasia, that can turn into cervical cancer.
- Most pre-cancerous cells will go away without treatment, but some can develop into cancer. Treating cervical pre-cancers can prevent almost all cervical cancers.
- Screening helps find pre-cancerous cells and cervical cancer early, when it is most easily treated.

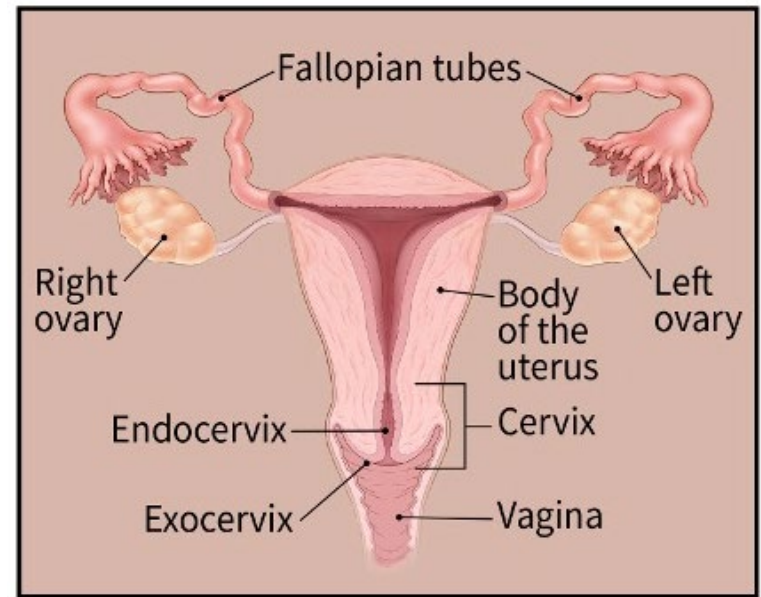
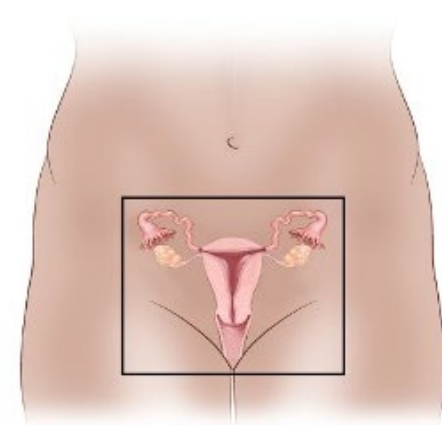


Image: What is Cervical Cancer? American Cancer Society. <https://www.cancer.org/cancer/cervical-cancer/about/what-is-cervical-cancer.html>

# Cervical Cancer Risk Factors

- Human papillomavirus (HPV) causes almost all cervical cancers.
  - Genital HPV is the most common sexually transmitted infection in the United States. Most people get it at some time in their lives.
  - HPV usually causes no symptoms.
  - Most HPV infections go away on their own or are treated before turning into cervical cancer.
- Exposure to the drug diethylstilbestrol (DES) while in the mother's womb increases the risk of cervical dysplasia and clear cell adenocarcinoma of the cervix. DES was given to some pregnant women in the United States from 1940 to 1971 to prevent miscarriage and premature labor.
- Other risk factors for cervical cancer include, but are not limited to:
  - Smoking
  - Having a weakened immune system
  - Being overweight
  - Having three or more full-term pregnancies
  - Using oral contraceptives for a long period of time

What Are the Risk Factors for Cervical Cancer? American Cancer Society. <https://www.cancer.org/cancer/cervical-cancer/prevention-and-early-detection/cervical-cancer-risk-factors.html>

# Cervical Cancer Screening

- Screening is a check for cancer or abnormal cells that may become cancer in people who have no symptoms.
- Two screening tests can help find pre-cancerous cells or cervical cancer at an early stage, when it is most easily treated. Both tests involve collecting cells from the surface of the cervix and vagina.
  - The Pap test is a cytology test that views the cells under a microscope to look for cellular abnormalities.
  - The HPV test is a laboratory test that checks DNA or RNA from the sample for certain types of HPV infections.
- The U.S. Preventative Services Task Force (USPSTF) currently recommends cervical cancer screening for women ages 21 to 65 years.<sup>1</sup>
  - Women ages 21-29 should have a Pap test alone every 3 years.
  - Women ages 30-65 have three options:
    - Pap test alone every 3 years
    - HPV test alone every 5 years
    - Pap and HPV tests together every 5 years

<sup>1</sup> Cervical Cancer: Screening. United States Preventive Services Task Force.  
<https://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/cervical-cancer-screening2>

# Cervical Cancer Screening Prevalence, 2016

In 2016, 76% of Texas women ages 21-65 years self-reported they had received a Pap test in the past three years. This was less than the self-reported screening rate for the US (80%).

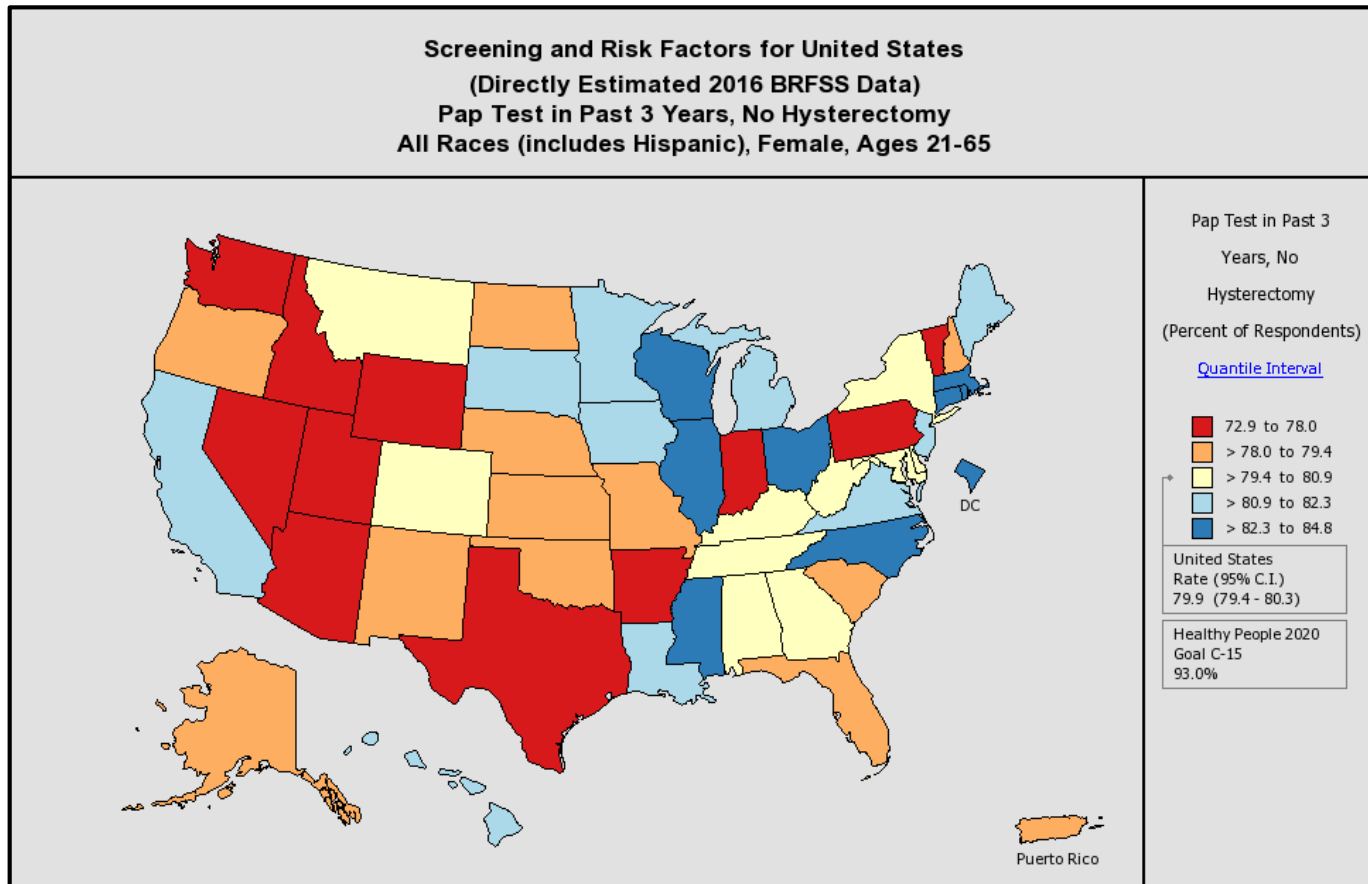
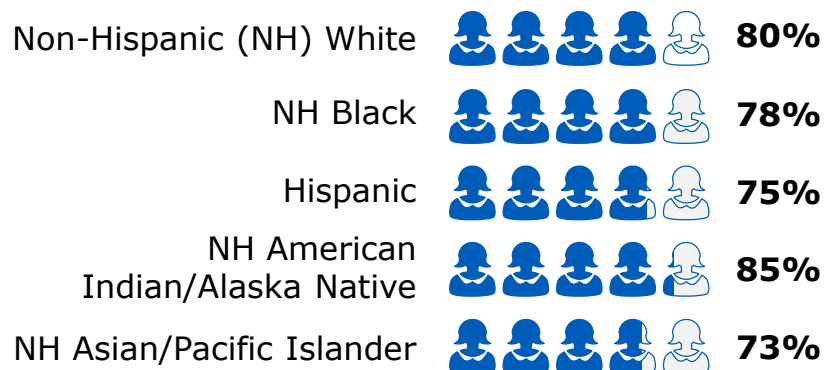


Image source: State Cancer Profiles. National Cancer Institute. <https://statecancerprofiles.cancer.gov/quick-profiles/index.php?statename=texas#t=1>

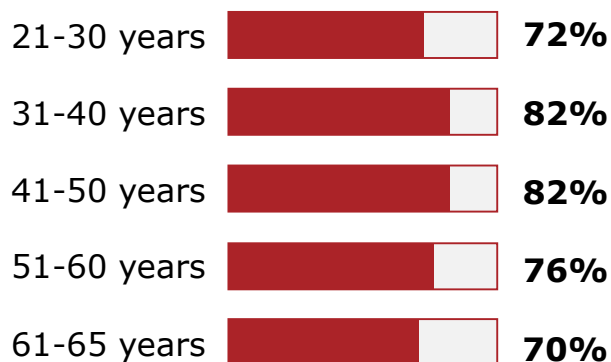
# Cervical Cancer Screening in Texas by Race/Ethnicity and Age, 2012-2016

From 2012-2016, 78% of 9,266 women ages 21-65 self-reported having a Pap test within the past 3 years.<sup>1</sup>

## Screening by Race/Ethnicity



## Screening Rates by Age



<sup>1</sup> Texas Health Data - Community Survey - Texas Behavioral Risk Factor Survey. Texas Center for Health Statistics. <http://healthdata.dshs.texas.gov/CommunitySurveys/BRFSS>

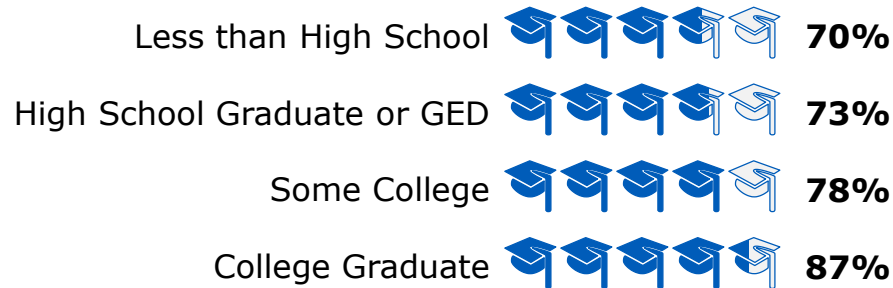
Rates are averaged across surveys conducted in 2012, 2014, and 2016.



# Cervical Cancer Screening in Texas by Education and Income, 2012-2016

From 2012-2016, 78% of 9,266 women ages 21-65 self-reported having a Pap test within the past 3 years.<sup>1</sup>

## Screening Rates by Education



## Screening Rates by Income



<sup>1</sup> Texas Health Data - Community Survey - Texas Behavioral Risk Factor Survey. Texas Center for Health Statistics.  
<http://healthdata.dshs.texas.gov/CommunitySurveys/BRFSS>

Rates are averaged across surveys conducted in 2012, 2014, and 2016.

# Overview of Cervical Cancer in Texas

## **Incidence (New Cases)**

- During 2012-2016, the cervical cancer incidence rate was 9.2 cases per 100,000 women.
- Cervical cancer is the 3<sup>rd</sup> leading cancer diagnosis in women ages 20-39 (9.9 cases per 100,000) and 5<sup>th</sup> in women ages 40-49 (17.7 cases per 100,000).
- In 2019, it is estimated that 1,395 new cases of cervical cancer will be diagnosed in Texas.

## **Mortality (Deaths)**

- During 2012-2016, the cervical cancer mortality rate was 2.9 deaths per 100,000 women.
- Cervical cancer is the 2<sup>nd</sup> leading cause of cancer death in women ages 20-39 (1.6 deaths per 100,000) and 4<sup>th</sup> in women ages 40-49 (4.6 deaths per 100,000).
- In 2019, an estimated 447 women will die of cervical cancer in Texas.

## **Survivorship (Prevalence)**

- There are 14,458 cervical cancer survivors in Texas. This is the number of Texans who were diagnosed with cervical cancer between 1995-2015 and are alive as of January 1, 2016.

# Definitions and Abbreviations

- **Age-adjusted incidence rate:** number of new cancer cases diagnosed per 100,000 people per year. Numbers are age-adjusted to allow for comparison between populations with different age compositions.
- **Age-adjusted mortality rate:** number of cancer deaths per 100,000 people per year. Numbers are age-adjusted to allow for comparison between populations with different age compositions.
- **Annual percent change (APC):** measures the trend in rates over time, such as how quickly (or slowly) a cancer has increased in incidence over a given time period. For example, an APC of -2.0% over 10 years means that there was a 2% decrease in incidence rate per year. It is calculated by fitting a least squares regression line to the natural logarithm of the age-adjusted rates. The slope is tested for a significant difference from 0. If the slope changes over the assessed time period, the trend is considered to have a 'joinpoint.'
- **Race/ethnicity group acronyms:** Non-Hispanic (NH), Asian/Pacific Islander (A/PI), American Indian/Alaska Native (AI/AN).
- **Note on confidence intervals (CIs):** 95% confidence intervals are shown and provide a range of values that have a specified probability of containing the true rate. 95% of the time the true rate will lie within these limits. Rates with large confidence intervals should be interpreted with caution. A 95% confidence interval around a rate that is at least as large as the rate itself is generally considered unstable. When there is no overlap in confidence intervals, rates can be considered to be significantly different. If confidence intervals partially overlap, further testing may be required to determine whether there is a statistically significant difference.

# **Cervical Cancer Incidence in Texas**

# Cervical Cancer Incidence Rates, 2012-2016

From 2012 to 2016, Texas ranked 4<sup>th</sup> out of all US states and DC in cervical cancer incidence. The cervical cancer incidence rate in Texas was 9.2 cases per 100,000 women. The US rate was 7.6.

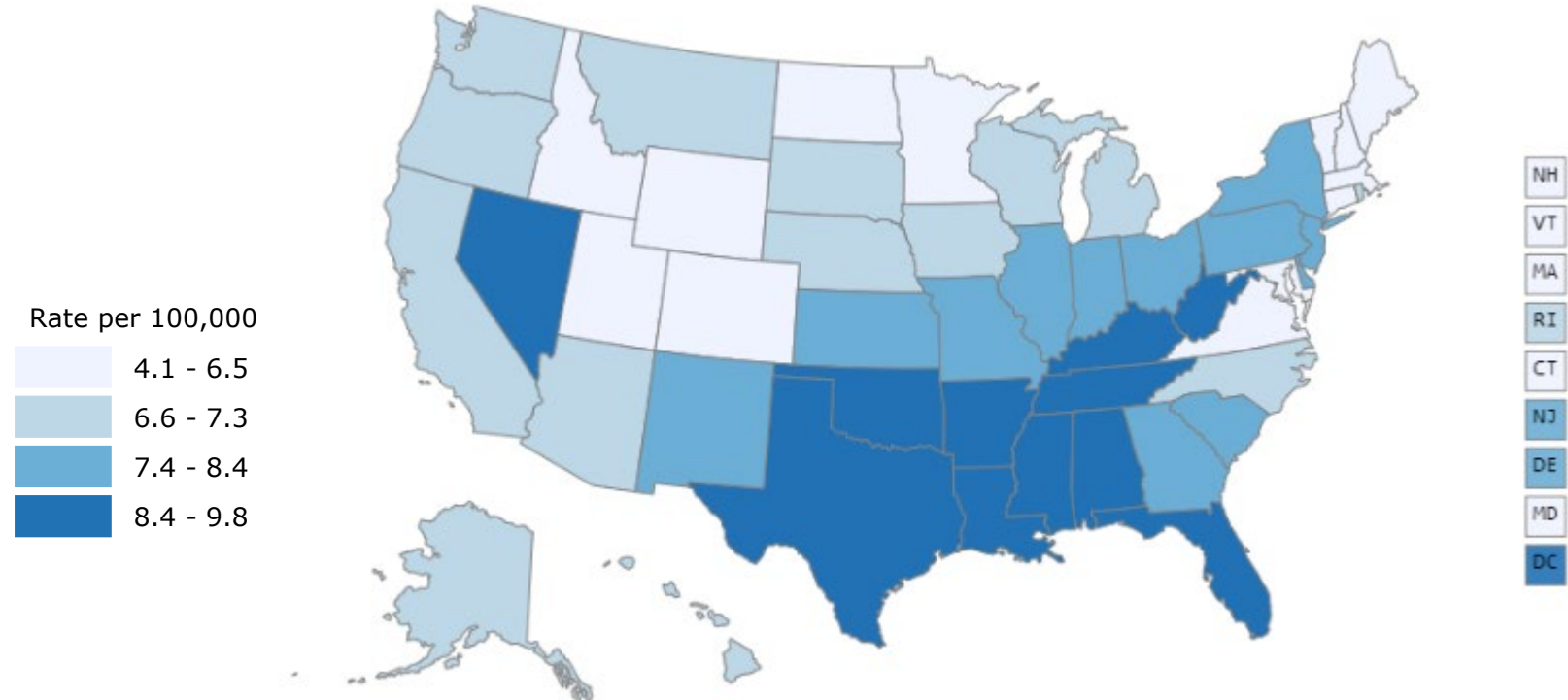
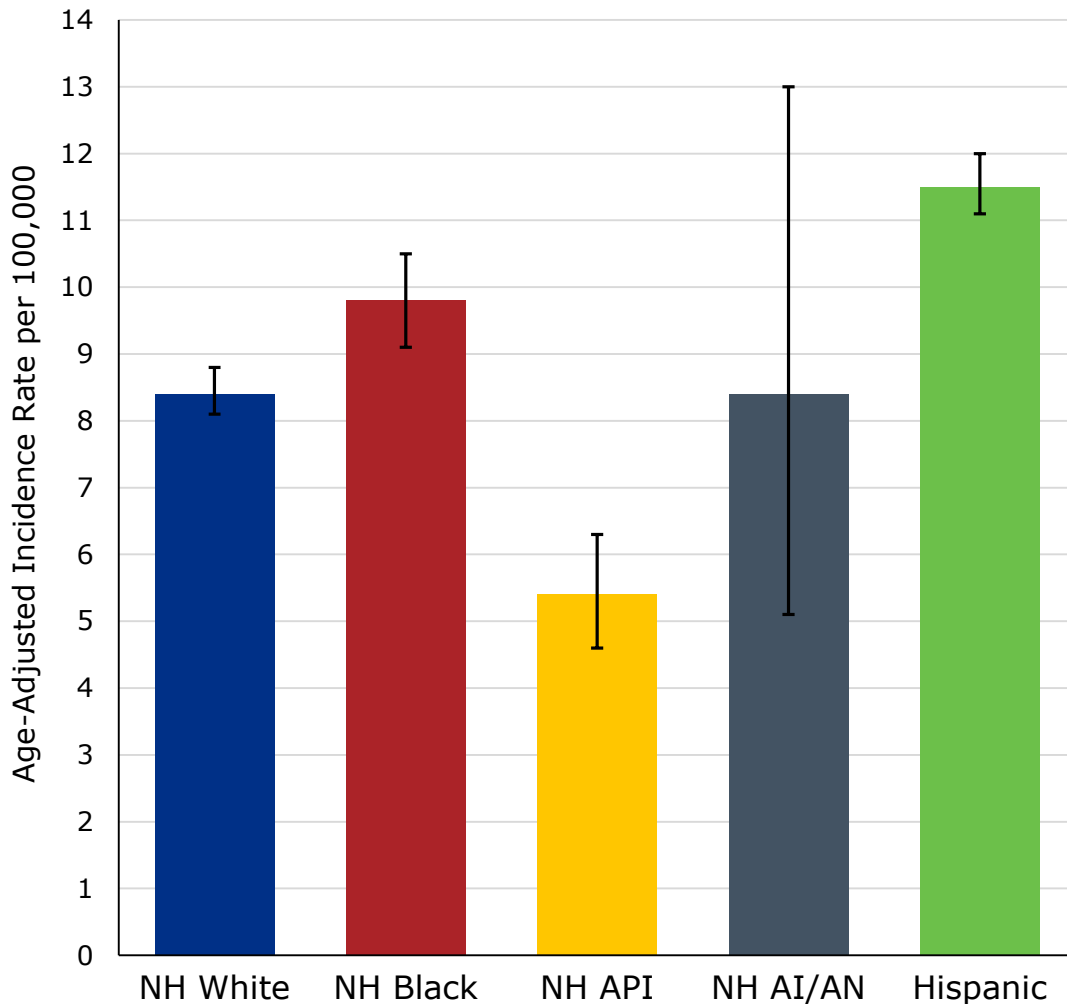


Image Source: United States Cancer Statistics: Data Visualizations. Centers for Disease Control and Prevention. <https://gis.cdc.gov/Cancer/USCS/DataViz.html>

# Cervical Cancer Incidence Rates by Race/Ethnicity, 2012-2016



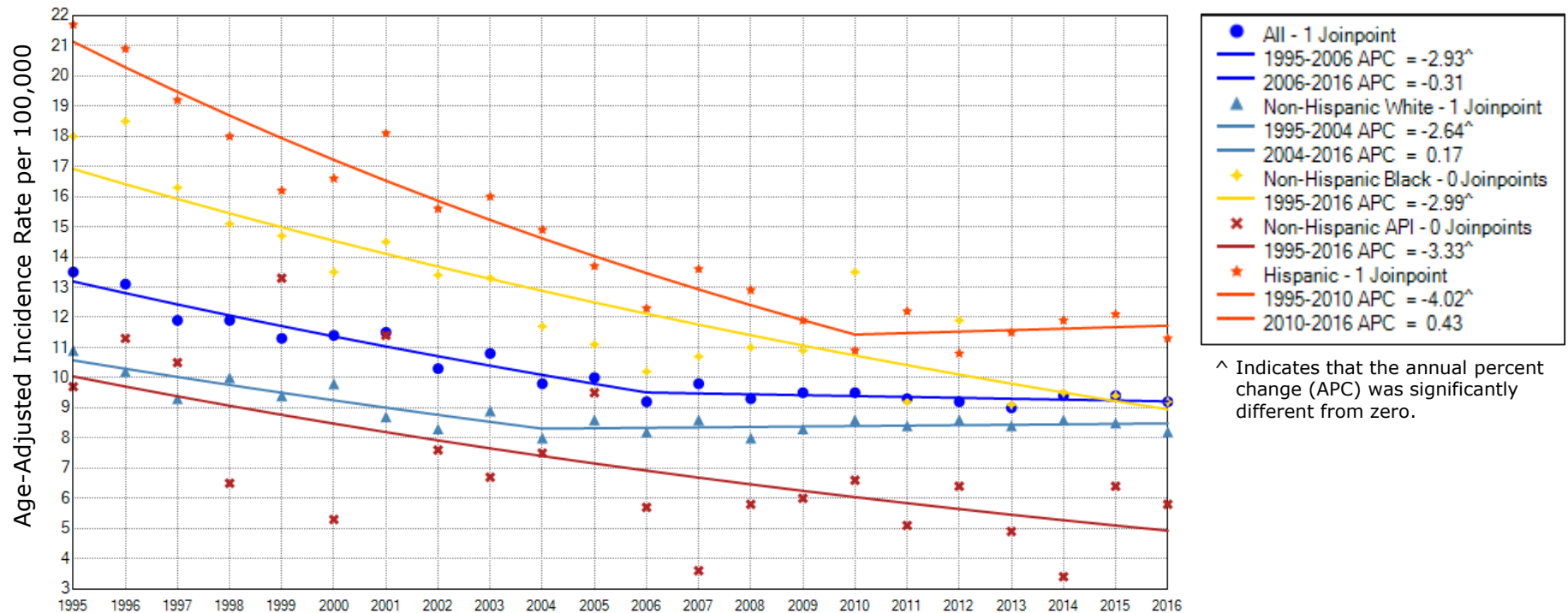
- Hispanic women had the highest rates of cervical cancer (11.5 cases per 100,000 women).
- Non-Hispanic (NH) Asian/Pacific Islanders women had the lowest rates of cervical cancer (5.4).

AI/AN = American Indian/Alaska Native; A/PI = Asian/Pacific Islander

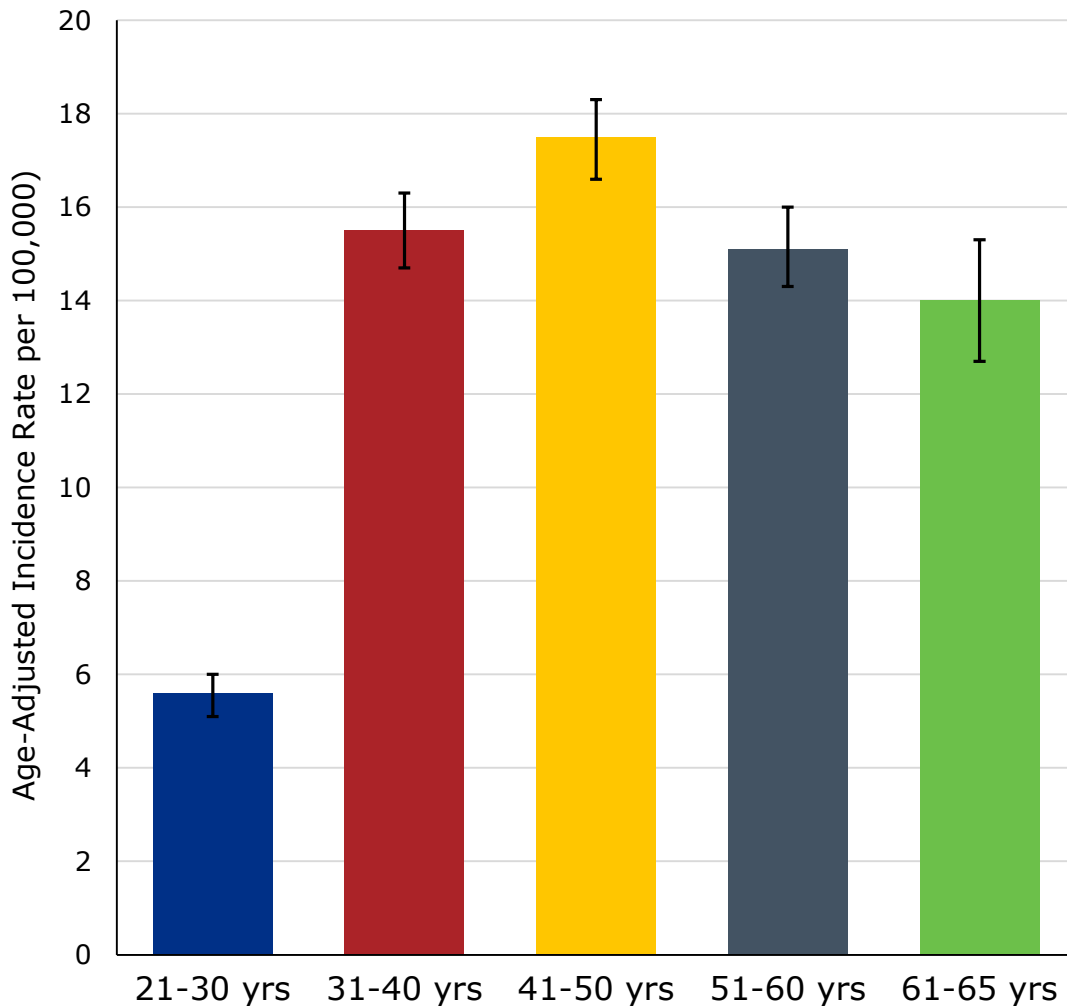
The black bars indicate the 95% confidence interval. 95% of the time the true rate will lie within these limits. A wider bar indicates uncertainty or instability in the rate.

# Cervical Cancer Incidence Rate Trends in Texas, 1995-2016

- Overall, incidence rates decreased significantly by an average of 2.9% per year, from 1995-2006.
- Incidence rates decreased most sharply among Hispanic women, decreasing by an average of 4% per year, from 1995-2010.
- Incidence rates also decreased significantly among non-Hispanic (NH) white women, NH black women, and NH Asian/Pacific Islander women.



# Cervical Cancer Incidence Rates by Age at Diagnosis, 2012-2016

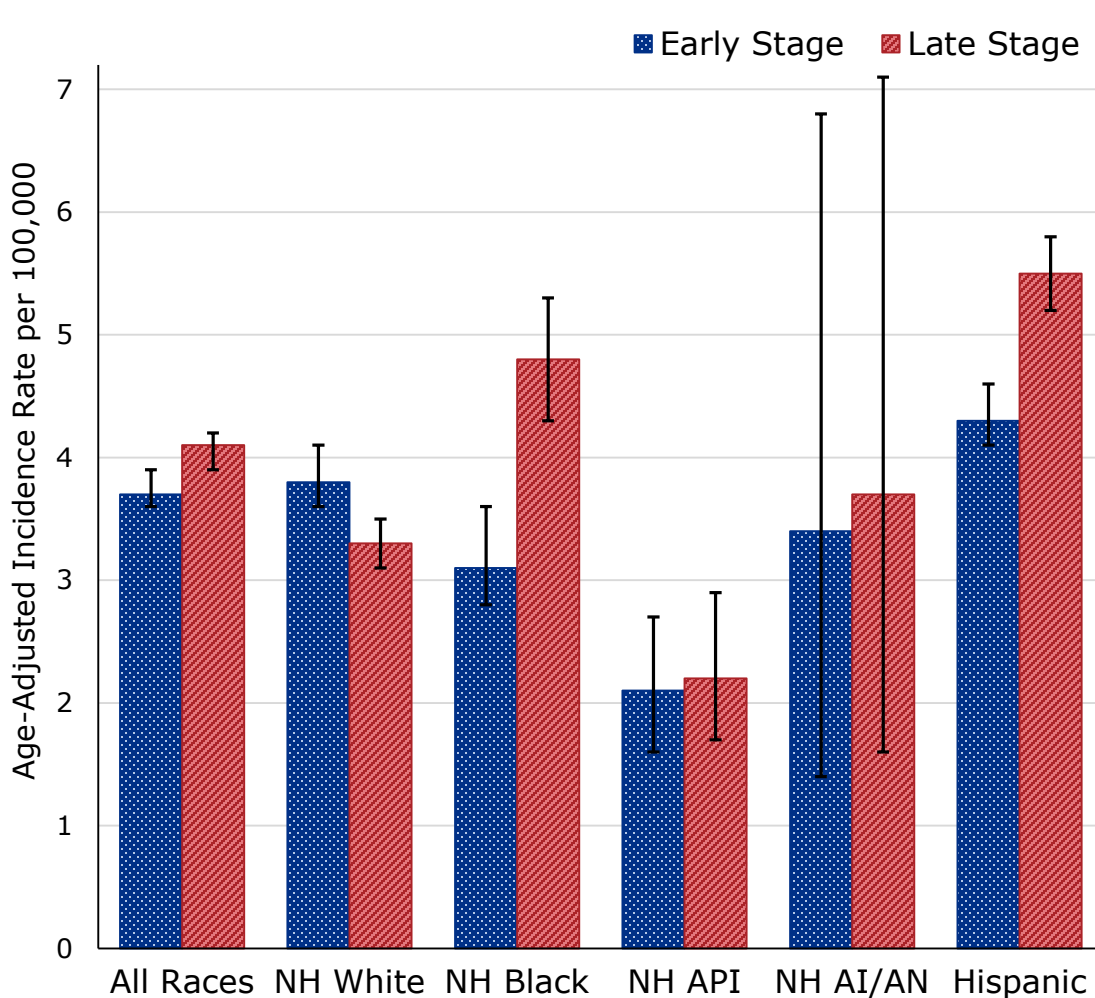


- Incidence rates increased sharply after age 30. The rate almost tripled between the age groups 21-30 years (5.6 cases per 100,000) and 31-40 years (15.6).
- Incidence rates were highest among women ages 41-50 years (17.5).

The black bars indicate the 95% confidence interval. 95% of the time the true rate will lie within these limits. A wider bar indicates uncertainty or instability in the rate.



# Cervical Cancer Incidence Rates by Race/Ethnicity and Stage at Diagnosis, 2012-2016

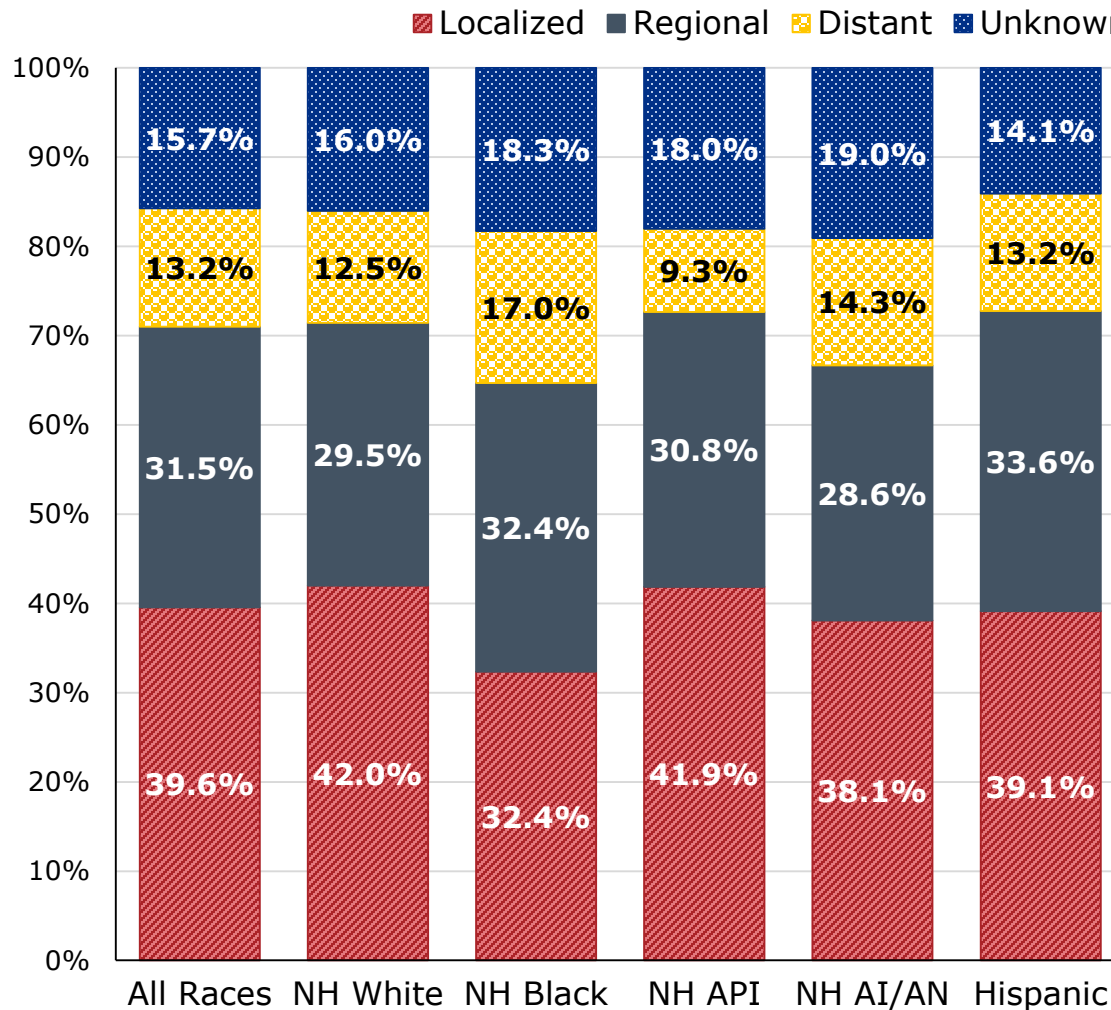


- Non-Hispanic (NH) white women had a higher incidence rate of early-stage cervical cancer than late-stage.
- All other race/ethnicity groups had a higher incidence of late-stage cervical cancer as compared to early-stage diagnoses.
- Hispanic women had the highest incidence rate of late-stage cervical cancer (5.5 cases per 100,000).

AI/AN = American Indian/Alaska Native; A/PI = Asian/Pacific Islander

The black bars indicate the 95% confidence interval. 95% of the time the true rate will lie within these limits. A wider bar indicates uncertainty or instability in the rate.

# Cervical Cancer Cases by Race/Ethnicity and Stage at Diagnosis, 2012-2016



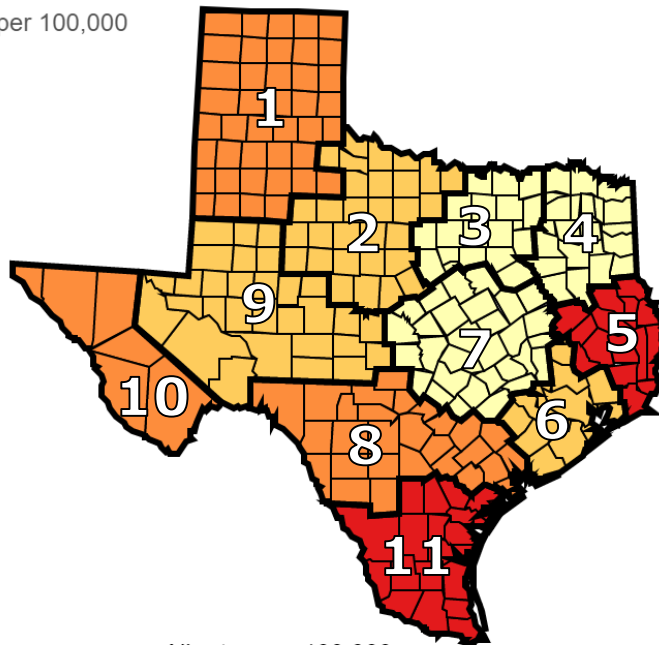
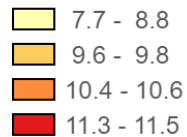
- Non-Hispanic (NH) white women had the highest percentage of cervical cancer cases diagnosed at a localized stage (42%).
- NH black women had the highest proportion of cases diagnosed at the distant stage (17%).

AI/AN = American Indian/Alaska Native; A/PI = Asian/Pacific Islander

# Cervical Cancer Incidence Rates by Health Service Region, 2012-2016

Age-Adjusted Invasive Cancer Incidence Rates in Texas  
Cervix Uteri, 2012 - 2016  
By Health Service Region  
Age-Adjusted to the 2000 U.S. Standard Population

Texas Rate: 9.2 / per 100,000



All rates per 100,000.  
Data accessed June 5, 2019. Cancer Incidence File, Jan 2019.  
© 2019 Texas Cancer Registry.

From 2012-2016, 6168 new cases of cervical cancer were diagnosed in Texas. The incidence rate was 9.2 per 100,000 women.

Health Service Region	Number of Cases	Incidence Rate
HSR 1	206	10.6
HSR 2	120	9.8
HSR 3	1,492	8.0
HSR 4	247	8.8
HSR 5	212	11.3
HSR 6	1,613	9.7
HSR 7	612	7.7
HSR 8	726	10.5
HSR 9	134	9.6
HSR 10	219	10.4
HSR 11	585	11.5

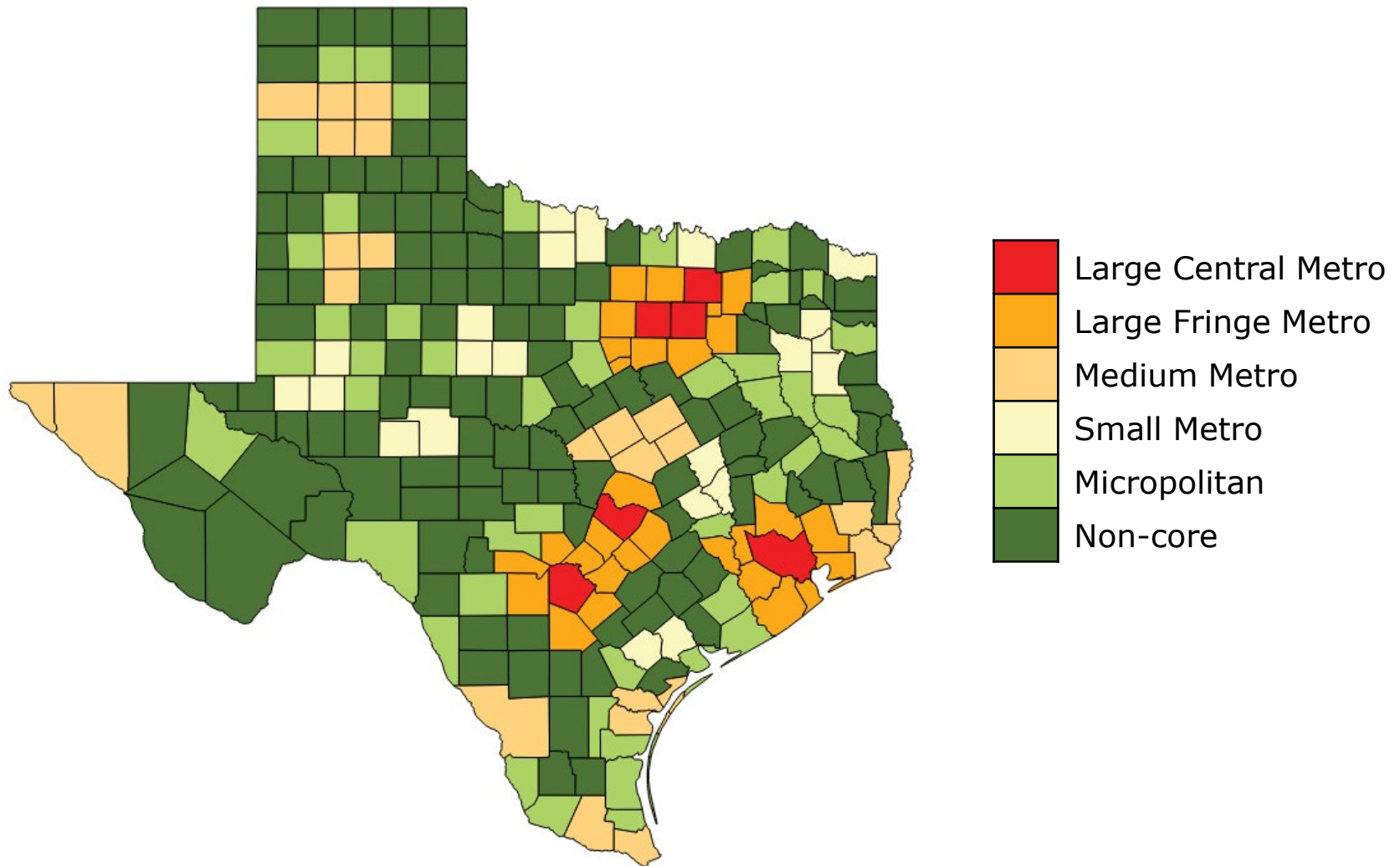
# Urban-Rural Classifications

The Texas Cancer Registry uses the National Center for Health Statistics (NCHS) Urban-Rural Classification Scheme for Counties to classify population areas across the state.

Category	Definition
<b>Metropolitan</b>	
Large central metro	Counties in metropolitan statistical areas (MSA) with populations of 1 million or more that contain entire populations in the largest principal city, have entire populations contained in largest principal city, or contain at least 250,000 inhabitants of any principal city.
Large fringe metro	Counties in MSAs with populations of 1 million or more that do not qualify as large central metro counties.
Medium metro	Counties in MSAs of populations between 250,000 – 999,999.
Small metro	Counties in MSAs of populations less than 250,000.
<b>Nonmetropolitan</b>	
Micropolitan	Counties with an urban cluster population of 10,000-49,999.
Noncore	Nonmetro counties that do not qualify as micropolitan.

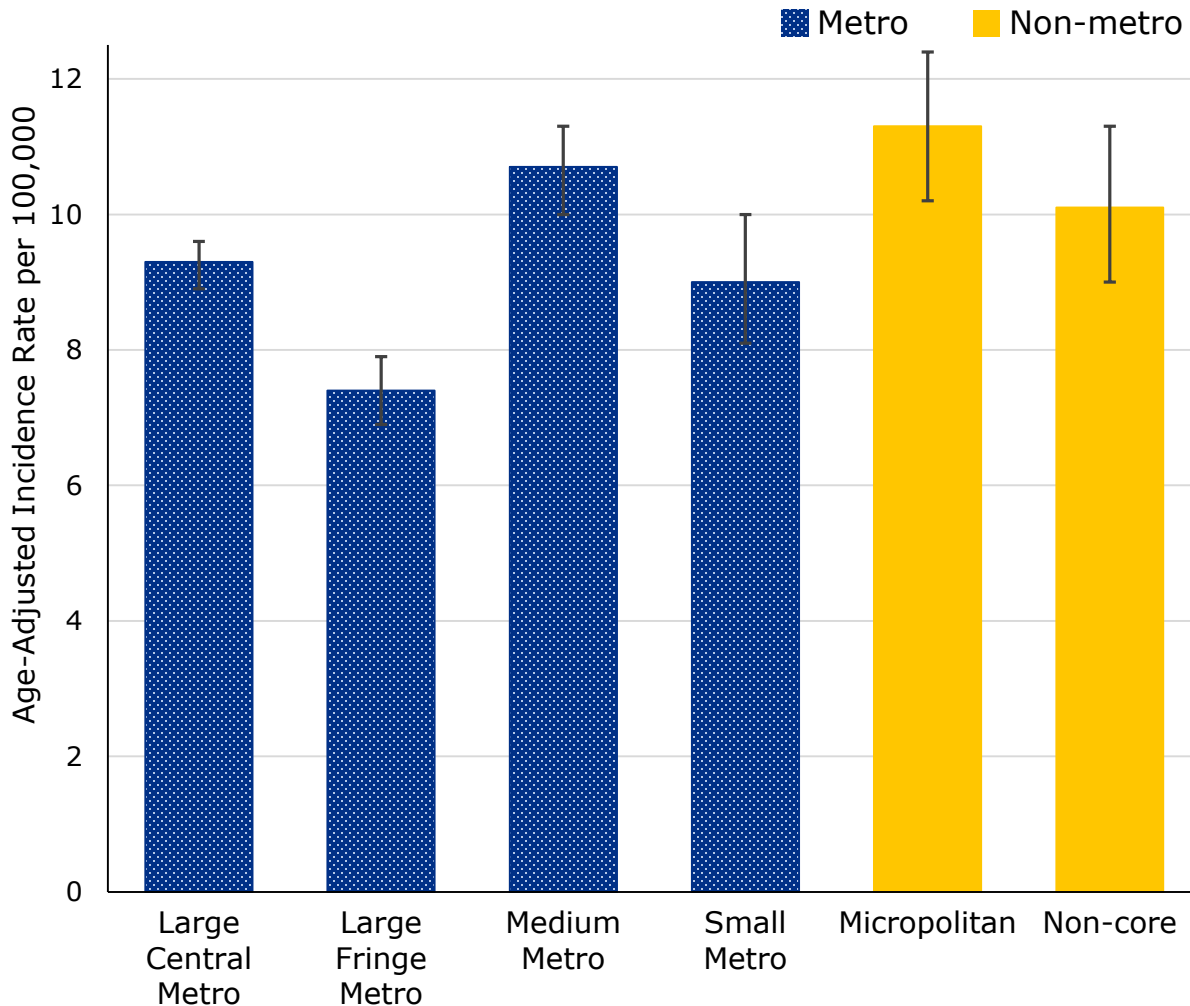
Source: NCHS Urban-Rural Classification Scheme for Counties, NCHS/CDC, Updated June 2017.

# Urban-Rural Classification of Texas Counties



Source: NCHS Urban-Rural Classification Scheme for Counties, NCHS/CDC, Updated June 2017.

# Cervical Cancer Incidence by Urban-Rural Classification, 2012-2016



- Incidence rates were highest in micropolitan (11.3 cases per 100,000), medium metro (10.7), and non-core areas (10.1)
- Large fringe metro (7.4), small metro areas (9.0) and large central metro (9.3) had the lowest incidence rates.
- Overall, incidence rates were significantly higher in non-metro counties (10.7) compared to metro counties (9.4).

The black bars indicate the 95% confidence interval. 95% of the time the true rate will lie within these limits. A wider bar indicates uncertainty or instability in the rate.

# **Cervical Cancer Mortality in Texas**

# Cervical Cancer Mortality Rates, 2012-2016

From 2012 to 2016, Texas ranked 7<sup>th</sup> out of all US states and DC in cervical cancer incidence. The mortality rate of cervical cancer in Texas was 2.9 deaths per 100,000. The US rate was 2.3.

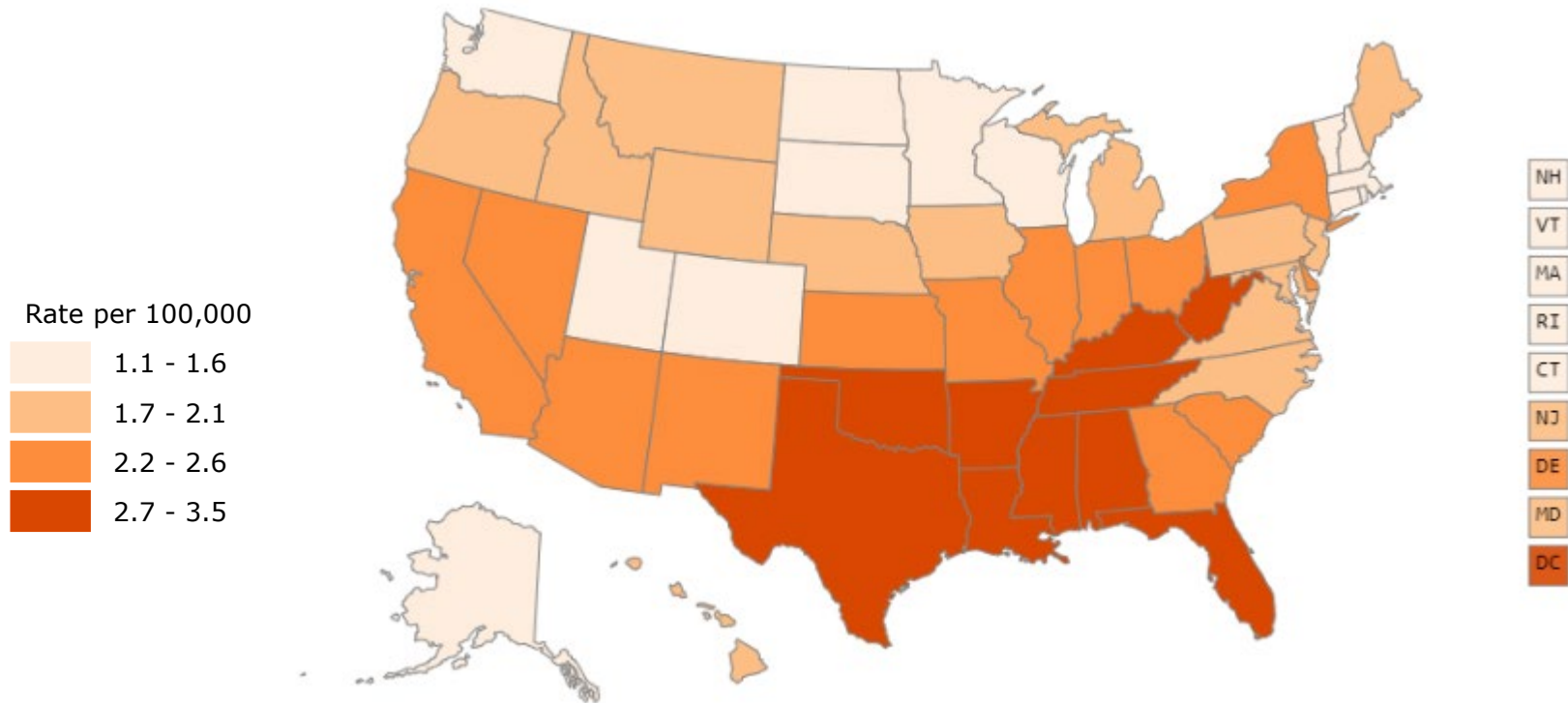
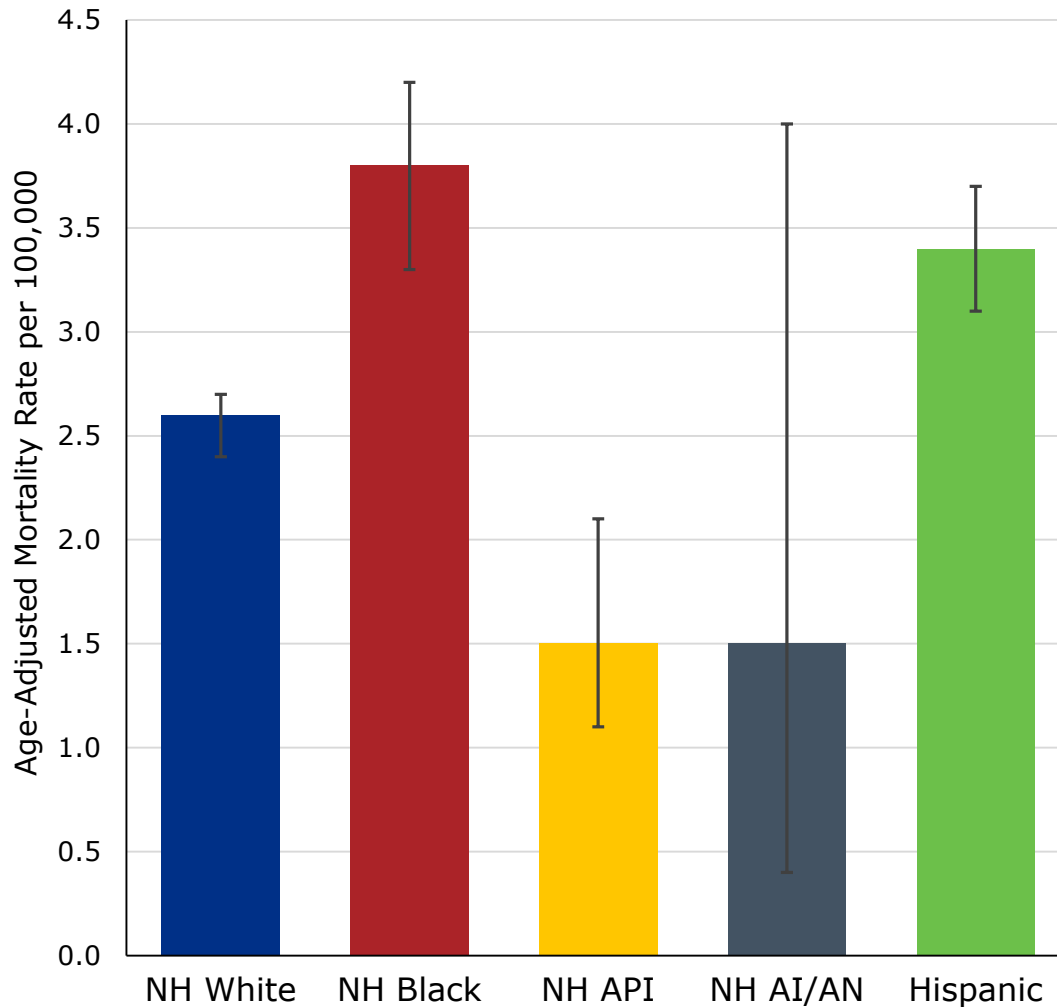


Image Source: United States Cancer Statistics: Data Visualizations. Centers for Disease Control and Prevention. <https://gis.cdc.gov/Cancer/USCS/DataViz.html>



# Cervical Cancer Mortality Rates by Race/Ethnicity, 2012-2016



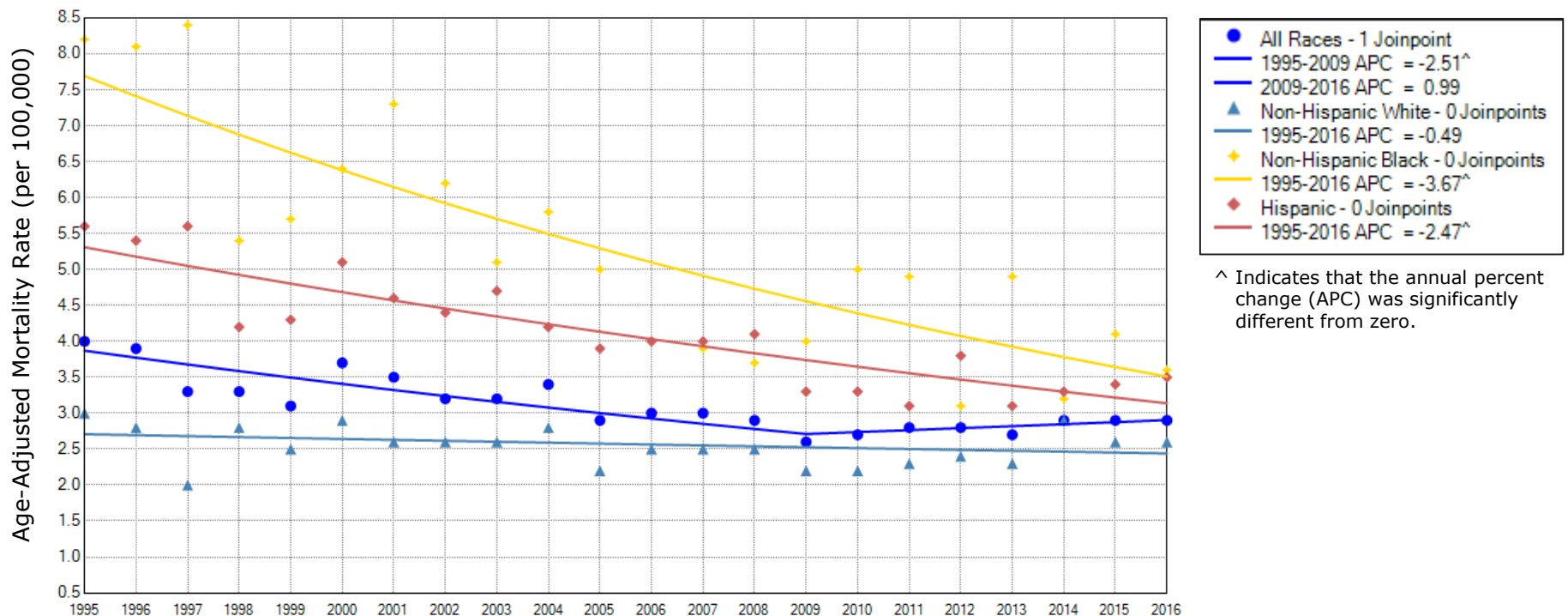
- Non-Hispanic (NH) blacks had the highest mortality rate (3.8 deaths per 100,000).
- NH Asian/Pacific Islanders (1.5) and American Indian/Alaska Natives (1.5) had the lowest mortality rates.

AI/AN = American Indian/Alaska Native; A/PI = Asian/Pacific Islander

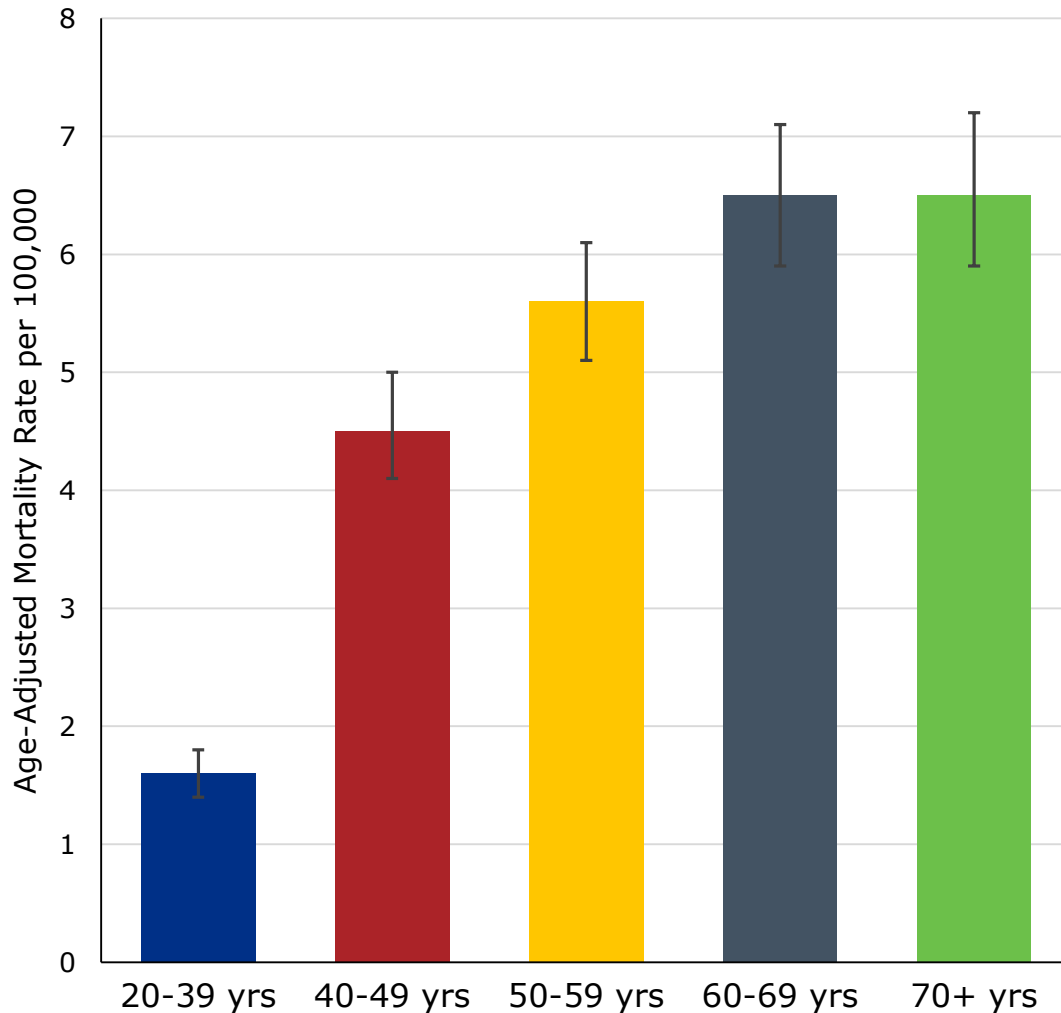
The black bars indicate the 95% confidence interval. 95% of the time the true rate will lie within these limits. A wider bar indicates uncertainty or instability in the rate.

# Cervical Cancer Mortality Rate Trends in Texas, 1995-2016

- Overall, mortality rates decreased significantly by an average of 2.5% per year, from 1995-2009.
- Mortality rates decreased to the largest extent in Non-Hispanic (NH) black women by an average of 3.7% per year. Mortality rates also decreased significantly in Hispanic women by an average of 2.5% per year.
- Rates among NH White women did not change significantly.



# Cervical Cancer Mortality Rates by Age at Death, 2012-2016



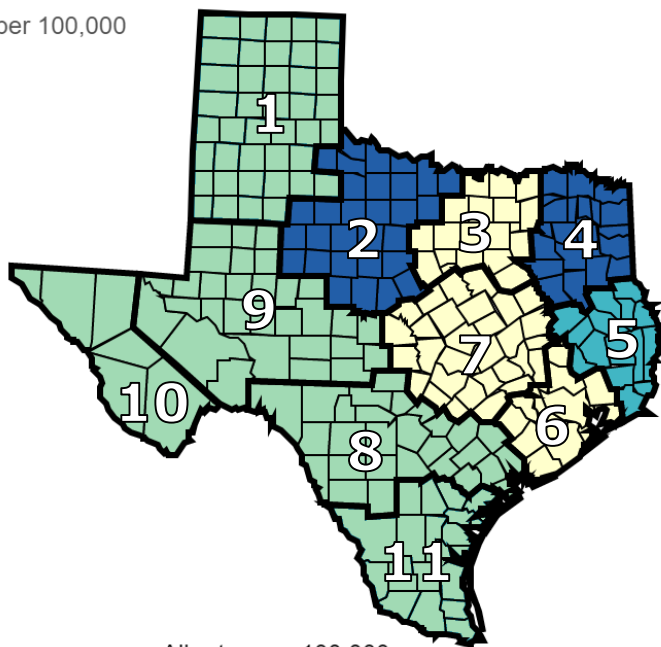
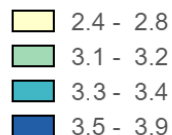
- Mortality rates increased substantially after age 40. The rate nearly tripled between the age groups 20-39 years (1.6 deaths per 100,000) and 40-49 years (4.5).
- Mortality rates continued to increase with age among women in their 50s (5.6), 60s (6.5), and older (6.5).

The black bars indicate the 95% confidence interval. 95% of the time the true rate will lie within these limits. A wider bar indicates uncertainty or instability in the rate.

# Cervical Cancer Mortality Rates by Health Service Region, 2012-2016

Age-Adjusted Cancer Mortality Rates in Texas  
 Cervix Uteri, 2012 - 2016  
 By Health Service Region  
 Age-Adjusted to the 2000 U.S. Standard Population

Texas Rate: 2.9 / per 100,000

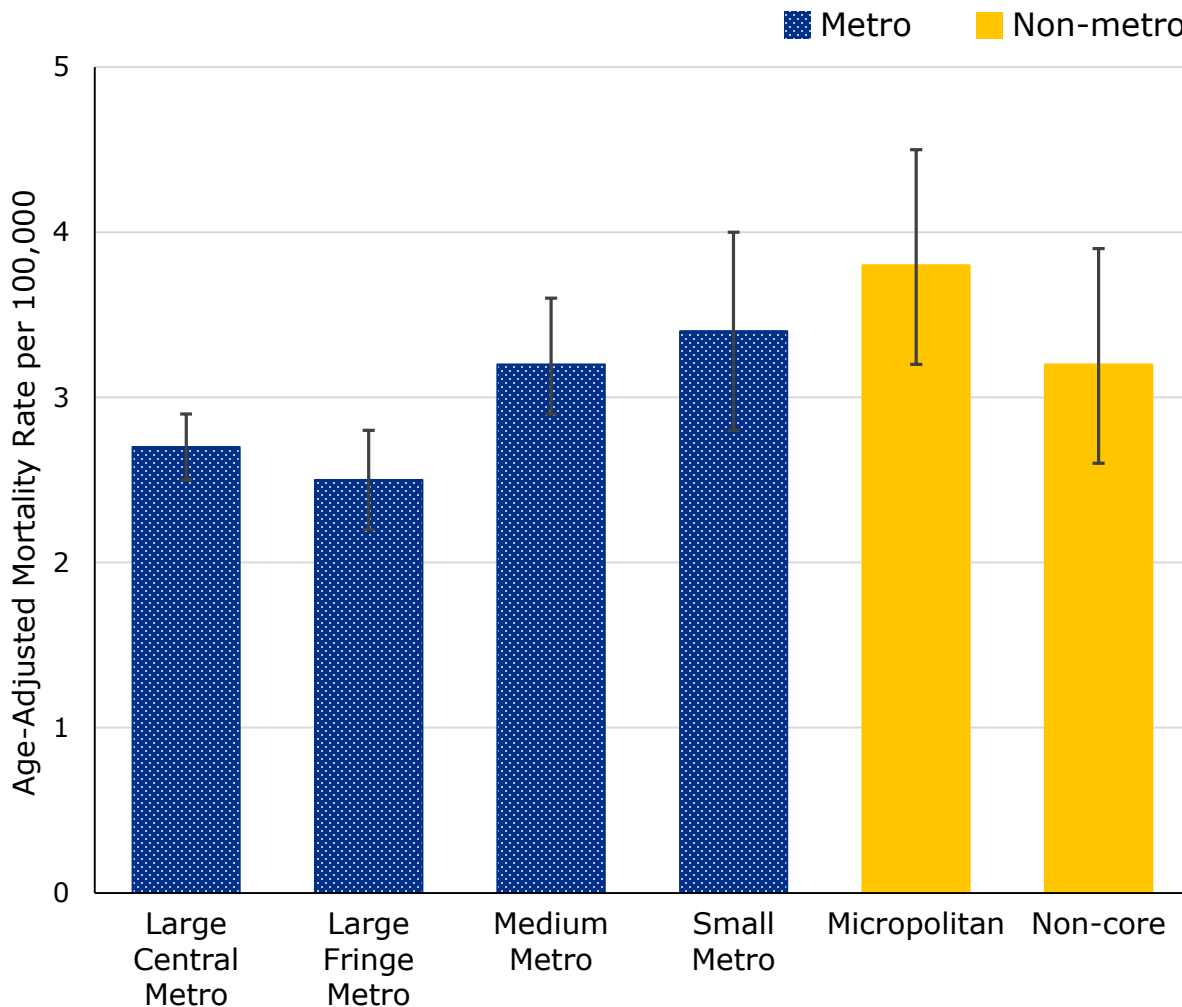


All rates per 100,000.  
 Data accessed July 25, 2019. Cancer Mortality File, Jan 2019.  
 © 2019 Texas Cancer Registry.

From 2012-2016, 1957 women died of cervical cancer in Texas. The mortality rate was 2.9 per 100,000 women.

Health Service Region	Number of Cases	Incidence Rate
HSR 1	68	3.2
HSR 2	54	3.9
HSR 3	501	2.7
HSR 4	108	3.5
HSR 5	69	3.4
HSR 6	452	2.8
HSR 7	193	2.4
HSR 8	223	3.1
HSR 9	47	3.2
HSR 10	70	3.2
HSR 11	168	3.2

# Cervical Cancer Mortality by Urban-Rural Classification, 2012-2016

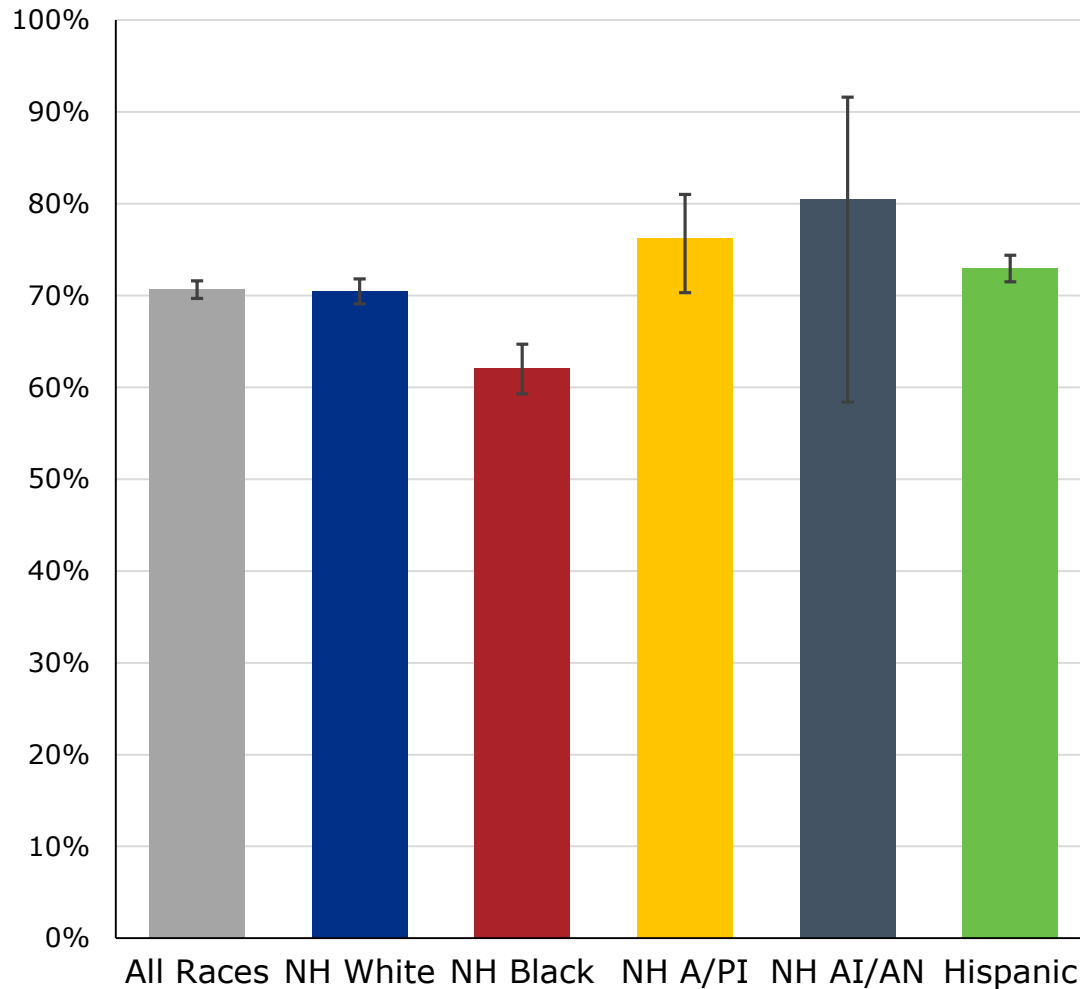


- Mortality rates were highest in micropolitan (3.8 deaths per 100,000), small metro (3.4), and medium metro (3.2), and non-core (3.2) areas
- Mortality rates were lowest in large fringe metro (2.5) and large central metro (2.7) areas.
- Overall, mortality rates were significantly higher in non-metro counties (3.5) compared to metro counties (2.8).

The black bars indicate the 95% confidence interval. 95% of the time the true rate will lie within these limits. A wider bar indicates uncertainty or instability in the rate.

# **Cervical Cancer Survival in Texas**

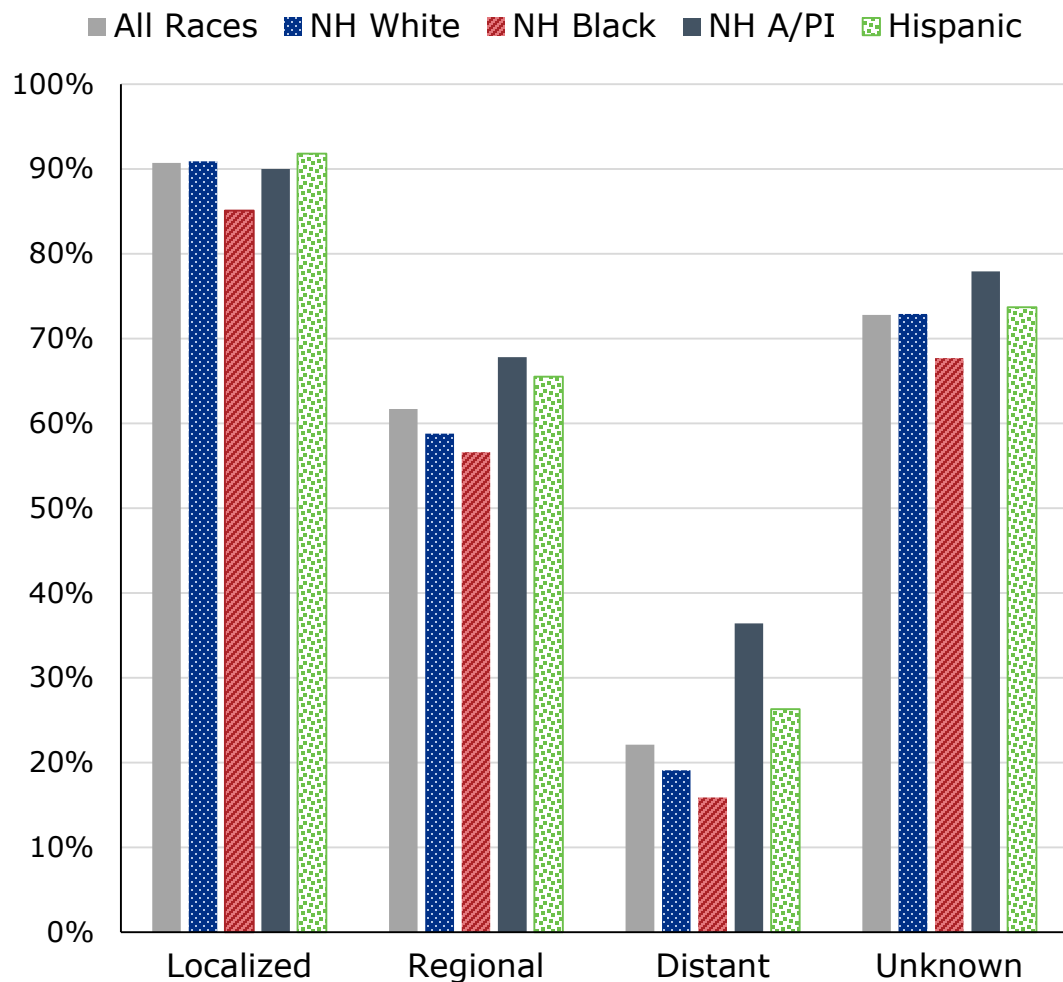
# Cervical Cancer Cause-Specific Survival\* by Race/Ethnicity, 2007-2016



- The overall cause-specific survival for cervical cancer is 70.7%.
- Non-Hispanic (NH) American Indian/Alaska Native (AI/AN) had the highest survival at 80.5%, followed by NH Asian/Pacific Islander (A/PI) at 76.2%.
- Non-Hispanic (NH) black women had the lowest survival (62.1%).

\*Cause-specific survival estimates the percentage of patients diagnosed between 2007 and 2016 that did not die from cervical cancer within 5 years after diagnosis. The black bars indicate the 95% confidence interval. 95% of the time the true survival percentage will lie within these limits. A wider bar indicates uncertainty or instability in the percentage.

# Cervical Cancer Cause-Specific Survival\* by Race/Ethnicity and Stage at Diagnosis, 2007-2016



- As with other cancers, survival was highest for patients diagnosed at the localized stage and lowest for those diagnosed at the distant stage.
- Non-Hispanic (NH) black women had the lowest survival across all stages at diagnosis (85.1% at localized, 56.6% at regional, and 15.9% at distant).
- NH Asian/Pacific Islander (A/PI) women had the highest survival for those diagnosed at the regional (67.8%) and distant (36.4%) stages.

\* Cause-specific survival estimates the percentage of patients diagnosed between 2007 and 2016 that did not die from cervical cancer within 5 years after diagnosis. Survival by stage could not be calculated for American Indian/Alaska Native women due to small numbers.



# Technical Notes

- Incidence Data Source: Texas Cancer Registry ([www.dshs.texas.gov/tcr](http://www.dshs.texas.gov/tcr)) SEER\*Stat Database, 1995-2016 Incidence, Texas statewide, created February 2019, based on NPCR-CSS Submission, cut-off 11/9/2018.
- Mortality Data Source: Texas Cancer Registry ([www.dshs.texas.gov/tcr](http://www.dshs.texas.gov/tcr)) SEER\*Stat Database, 1990-2016 Mortality, Texas statewide, created February 2019.
- Rates are per 100,000 and age-adjusted to the 2000 U.S. Standard Population (19 age groups - Census P25-1130). Confidence Intervals (CI) are 95% for rates (Tiwari mod). Confidence intervals provide a range of values that have a specified probability of containing the rate or trend. Error bars represent 95% confidence intervals around rates and were calculated using the Tiwari et al. modification in SEER\*Stat.
- The annual percentage change (APC) was calculated using Joinpoint by fitting a least squares regression line to the natural logarithm of the age-adjusted rates, with calendar year as the regressor variable. This method allows more than one APC to describe the trend over a time period. An average APC is the weighted average of the APCs from the joinpoint model, and can be used to summarize a trend even when there were changes in trends over the assessed time period.
- Error bars represent 95% confidence intervals around rates and were calculated using the Tiwari et al. modification in SEER\*Stat.
- The CDC's National Center for Health Statistics (NCHS) Urban-Rural Classification Scheme for Counties was used in this report. This scheme is a six-level urban-rural classification scheme for US counties. The most urban category consists of central counties in large metropolitan areas; the most rural category consists of nonmetropolitan "noncore" counties. (Source: NCHS Urban-Rural Classification Scheme for Counties, NCHS/CDC, Updated June 2017. Accessed April 2018. [https://www.cdc.gov/nchs/data\\_access/urban\\_rural.htm](https://www.cdc.gov/nchs/data_access/urban_rural.htm)).

# Acknowledgment

The Texas Cancer Registry (TCR) recognizes the following whose financial support is essential to accomplishing the Registry's mission for our State.

## **Federal Grant Funding**

- We acknowledge the Centers for Disease Control and Prevention (CDC) for its financial support under Cooperative Agreement #1NU58DP006308.

## **State Agency Funding**

- Texas Department of State Health Services
- Texas Health and Human Services Commission
- Cancer Prevention and Research Institute of Texas

The TCR also wants to thank all cancer reporters for their hard work and collaboration. Cancer reporters help us meet national high quality and timeliness standards, and enable us to serve as the primary source of cancer data in Texas.