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Background

• Colorectal cancer screening is the only age-based cancer screening currently recommended for all adults by the U.S. Preventive Services Task Force.\(^1\) Breast and cervical cancer screenings are also recommended for all women.
• According to the Centers for Disease Control and Prevention, routine colorectal cancer screening is the most effective way to reduce the risk of colorectal cancer. Screenings can help prevent colorectal cancer by identifying and removing precancerous polyps before they turn into cancer. Screening can also find colorectal cancer early, when it is easier to treat.\(^2\)
• This statistical report describes colorectal cancer screening prevalence and the burden of colorectal cancer in Texas.

Implications for Public Health Practice

• The burden of colorectal cancer can be reduced through efforts to screen a large percentage of the population at risk and by encouraging healthy lifestyles that reduce modifiable risk factors.
• Identifying health disparities in colorectal cancer incidence, mortality, and survival can help determine and implement strategies to reduce the cancer burden.

\(^2\) What Can I Do to Reduce My Risk for Colorectal Cancer? Centers for Disease Control and Prevention. [https://www.cdc.gov/cancer/colorectal/basic_info/prevention.htm](https://www.cdc.gov/cancer/colorectal/basic_info/prevention.htm)
Colorectal Cancer Overview

- Colorectal cancer (CRC) is cancer that starts in the colon or rectum.
- The colon and rectum make up the large intestine.
- Most CRCs begin as adenomatous polyps (precancerous growths called adenomas) that grow slowly over 10-20 years.
- Although all adenomas have the potential to become cancerous, fewer than 10% become an invasive cancer.
- 90% of all CRCs are adenocarcinomas which arise from the inner lining of the colon or rectum.
- The most common colorectal tumor location is the proximal colon (37% of cases), which includes the cecum, ascending colon and transverse colon. The second most common location is in the rectum (30%).

Colorectal Cancer Symptoms

Symptoms of colorectal cancer include:

- Bleeding from the rectum
- Blood in the stool
- Dark or black stools
- A change in bowel habits or shape of the stool (e.g., more narrow than usual)
- Cramping or discomfort in the lower abdomen
- An urge to have a bowel movement when the bowel is empty
- Constipation or diarrhea that lasts for more than a few days
- Decreased appetite
- Unintentional weight loss
Colorectal Cancer—Modifiable Risk Factors

Modifiable risk factors contribute to around 55% of cases and include:

1. Overweight/obesity, especially in men
2. Physical inactivity
3. Diets high in red or processed meats
4. Diets low in fiber, fruit, and vegetables
5. Smoking
6. Heavy alcohol use

Colorectal Cancer–Unmodifiable Risk Factors

Risk factors for colorectal cancer that you cannot change include:¹

- Age
- Family history of colorectal polyps or colorectal cancer (One of three people who develop colorectal cancer have other family members with colorectal cancer; however, only a small percentage of these have a hereditary syndrome.)
- Personal history of inflammatory bowel disease (This is different from irritable bowel syndrome, which does not increase risk.)
- Racial/ethnic background (African Americans and Ashkenazi Jews are at higher risk.)
- Type 2 diabetes
- Certain inherited conditions, including Lynch syndrome which causes about 4% of all colorectal cancers

Colorectal Cancer Screening

• Screening is a check for cancer or abnormal cells that may become cancer in people who have no symptoms.
• Regular colorectal cancer screening can find polyps that can be removed before turning into cancer.
• Screening also helps find cancer at an early stage, when it is more easily treated.
• If colorectal cancer is found early, the survival rate is very high. 89% of patients diagnosed at an early stage survive at least five years after diagnosis; only 17% diagnosed at a late stage survive five years.
• The U.S. Preventive Services Task Force recommends colorectal cancer screening for all adults ages 50-75 years. Individuals with an increased risk might follow different screening guidelines, including starting screening earlier or using specific screening methods.
• Due to an increase in colorectal cancer in younger age groups, some groups, including the American Cancer Society, now recommend that people at average risk start screening at age 45.

# Colorectal Cancer Screening Methods

The U.S. Preventive Services Task Force\(^1\) and the Centers for Disease Control and Prevention\(^2\) recommend the following colorectal cancer screening methods for all adults between the ages of 50 and 75.

<table>
<thead>
<tr>
<th>Screening Method</th>
<th>Description</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stool tests</td>
<td>Stool sample taken at home. Test looks for blood or altered DNA in the stool. Three different tests available—gFOBT, FIT and FIT-DNA.</td>
<td>• Every year for gFOBT and FIT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Every 3 years for FIT-DNA</td>
</tr>
<tr>
<td>Flexible sigmoidoscopy</td>
<td>Conducted in the doctor’s office. Allows the doctor to view the lower third of the colon.</td>
<td>Every five years</td>
</tr>
<tr>
<td>Colonoscopy</td>
<td>Conducted in the doctor’s office. Allows the doctor to view the entire colon and remove most polyps and some cancers. Can also be used as a follow-up if anything unusual is found using one of the other tests.</td>
<td>Every 10 years</td>
</tr>
<tr>
<td>Virtual colonoscopy</td>
<td>Conducted in the doctor’s office. Uses x-rays to let doctor view images of the colon on a computer screen.</td>
<td>Every five years</td>
</tr>
</tbody>
</table>

---

Colorectal Cancer Screening Prevalence

- In 2014, the National Colorectal Cancer Roundtable launched a goal to increase the US colorectal cancer screening rate to 80%.

- Based on the Behavioral Risk Factor Surveillance System 2016:
  - 67% of eligible adults ages 50-75 self-reported that they were up-to-date\(^1\) with colorectal cancer screening
  - 7% had been screened in the past but were not up-to-date with screening
  - A quarter of eligible adults had never been screened\(^2\)

- In Texas, 60% of eligible adults self-reported that they were up-to-date with colorectal cancer screening, which is lower than the national average.\(^3\)

---

1. People were considered up-to-date on screening based on the 2008 US Preventative Services Task Force Recommendations: home-based blood stool test within the past year; a colonoscopy within the past 10 years; or sigmoidoscopy within the past 5 years combined with a blood stool test within the past 3 years.
Colorectal Cancer Screening Prevalence, 2016

In 2016, 60% of Texas adults ages 50-75 years self-reported they were up-to-date on colorectal cancer screening. This was less than the self-reported screening rate for the US (68%).

Colorectal Cancer Screening in Texas by Race/Ethnicity, Sex and Age, 2012-2016

From 2012-2016, 60% percent of 15,875 Texas adults ages 50-75 years self-reported they were up-to-date on colorectal cancer screening.¹

Screening by Race/Ethnicity

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Hispanic (NH) White</td>
<td>67%</td>
</tr>
<tr>
<td>NH Black</td>
<td>69%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>42%</td>
</tr>
<tr>
<td>NH American Indian/Alaska Native</td>
<td>62%</td>
</tr>
<tr>
<td>NH Asian/Pacific Islander</td>
<td>54%</td>
</tr>
</tbody>
</table>

Screening by Sex

<table>
<thead>
<tr>
<th>Gender</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>58%</td>
</tr>
<tr>
<td>Female</td>
<td>61%</td>
</tr>
</tbody>
</table>

Screening by Age

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 to 64 Years</td>
<td>54%</td>
</tr>
<tr>
<td>65 to 75 Years</td>
<td>75%</td>
</tr>
</tbody>
</table>


People were considered up-to-date on screening based on the 2008 US Preventative Services Task Force Recommendations: home-based blood stool test within the past year; a colonoscopy within the past 10 years; or sigmoidoscopy within the past 5 years combined with a blood stool test within the past 3 years.
From 2012-2016, 60% percent of 15,875 Texas adults ages 50-75 years self-reported they were up-to-date on colorectal cancer screening.1

Screening by Education

<table>
<thead>
<tr>
<th>Education Level</th>
<th>Up-to-date (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than High School</td>
<td>38%</td>
</tr>
<tr>
<td>High School Graduate or GED</td>
<td>58%</td>
</tr>
<tr>
<td>Some College</td>
<td>65%</td>
</tr>
<tr>
<td>College graduate</td>
<td>71%</td>
</tr>
</tbody>
</table>

Screening by Insurance Status

<table>
<thead>
<tr>
<th>Insurance Status</th>
<th>Up-to-date (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insured</td>
<td>66%</td>
</tr>
<tr>
<td>Uninsured</td>
<td>24%</td>
</tr>
</tbody>
</table>

Screening by Income Level

<table>
<thead>
<tr>
<th>Income Level</th>
<th>Up-to-date (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than $25,000</td>
<td>47%</td>
</tr>
<tr>
<td>$25,000-$49,999</td>
<td>60%</td>
</tr>
<tr>
<td>$50,000 or more</td>
<td>69%</td>
</tr>
</tbody>
</table>

1 Texas Health Data - Community Survey - Texas Behavioral Risk Factor Survey. Texas Center for Health Statistics. [http://healthdata.dshs.texas.gov/CommunitySurveys/BRFSS](http://healthdata.dshs.texas.gov/CommunitySurveys/BRFSS)

Rates are averaged across surveys conducted in 2012, 2014, and 2016. People were considered up-to-date on screening based on the 2008 US Preventative Services Task Force Recommendations: home-based blood stool test within the past year; a colonoscopy within the past 10 years; or sigmoidoscopy within the past 5 years combined with a blood stool test within the past 3 years.
Colorectal Cancer Screening by Texas County

- The average US screening rate in 2014 was 66%, while the average Texas rate was 61%.
- Seven of the 20 US counties with the lowest estimated percentages for being current with any type of colorectal cancer screening test were in Texas.
  - Six of the counties—Starr, Maverick, Brooks, Zavala, Webb and Willacy—are in South Texas.
  - One of the counties—Hudspeth—is in West Texas.

County-level CRC testing prevalence was derived from small-area estimate models.¹

¹ Berkowitz et al. (2018). Cancer Epidemiol Biomarkers Prev. 27(3):245-253
Overview of Colorectal Cancer Incidence in Texas

Incidence (New Cases)

• In 2016, colorectal cancer was the 3rd leading cancer diagnosis in both males and females, representing 9.2% of all new malignant cancers diagnosed in Texas.

• During 2012-2016, the colorectal cancer incidence rate was 37.7/100,000.

• In 2019, it is estimated that 11,533 new cases of colorectal cancer will be diagnosed in Texas.
Overview of Colorectal Cancer Mortality and Survival in Texas

Mortality (Deaths)

• In 2016, colorectal cancer was the 2\textsuperscript{nd} leading cause of cancer death in males and the 3\textsuperscript{rd} leading cause in females, representing 9.6\% of all cancer deaths in Texas. Most deaths are from cases that were diagnosed years before.

• During 2012-2016, the colorectal cancer mortality rate was 14.2/100,000.

• In 2019, an estimated 4,242 Texans will die of this disease.

Survival (Prevalence)

• There are 77,008 colorectal cancer survivors in Texas. This is the number of Texans who were diagnosed with colorectal cancer between 1995-2015 and are alive as of January 1, 2016.

Cancer Deaths, 2016

- CRC, 3,831
- All Other Cancers, 36,168
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. It can be stated that 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.
Colorectal Cancer Incidence in Texas
Colorectal Cancer Incidence Rates, 2012-2016

From 2012 to 2016, Texas ranked 28th out of all US states and DC in colorectal cancer incidence. The colorectal cancer incidence rate in Texas was 37.7 cases per 100,000. The US rate was 38.7.

Leading Cancer Diagnoses for Males by Age, 2012-2016

Colorectal cancer is the most common cancer diagnosis for Texas males ages 20-49, the second most common for those ages 50-64, and the third most common for those ages 65 years and older.

Males, 20-49 Years Old

- Colon & Rectum
- Testis
- Kidney & Renal Pelvis

Males, 50-64 Years Old

- Prostate
- Colon & Rectum
- Lung & Bronchus

Males, 65 Years Old and Older

- Prostate
- Lung & Bronchus
- Colon & Rectum

All incidence rates are per 100,000
Colorectal cancer is the third most common cancer for Texas women ages 50-64 and ages 65 years and older. It is not in the top three for those ages 20-49.

**Females, 20-49 Years Old**
- Breast
- Thyroid
- Cervix Uteri

**Females, 50-64 Years Old**
- Breast
- Lung & Bronchus
- Colon & Rectum

**Females, 65 Years Old and Older**
- Breast
- Lung & Bronchus
- Colon & Rectum

All incidence rates are per 100,000
By Sex

The colorectal cancer incidence rate for combined ages was significantly higher in males (44.9 per 100,000) than females (31.6).

By Age

The incidence rate increases with age, from 12.0 for ages 20-49 years to 72.3 for ages 50-64 years, and 170.3 for ages 65 years and older.

By Sex and Age

- Incidence rates were significantly higher in males than females across all age groups. The percentage difference in incidence rate between males and females changed with age.
  - Male incidence rates were 16% higher than female rates for ages 20-49 years
  - 48% higher for ages 50-64 years
  - 47% higher for ages 65 years and over
- Higher rates in males than females is thought to reflect risk factors, sex hormones, and differences in screening behavior.¹


The black bars indicate the 95% confidence intervals. 95% of the time the true rate will lie within these limits. A wider bar indicates uncertainty or instability in the incidence rate.
Leading Cancer Diagnoses in Men by Race/Ethnicity, 2012-2016

Colorectal cancer is the third most common cancer diagnosis for non-Hispanic (NH) white and NH black males, and the second most common for Hispanic males. Additionally, it was also the third most common cancer diagnosis in NH Asian/Pacific Islander and NH American Indian/Alaska Native males.

All incidence rates are per 100,000
Colorectal cancer is the third most common cancer diagnosis for non-Hispanic (NH) white and NH black females, and the second most common for Hispanic females. Additionally, it was also the third most common cancer diagnosis in NH Asian/Pacific Islander and NH American Indian/Alaska Native females.
Colorectal Cancer Incidence Rates by Sex and Race/Ethnicity, 2012-2016

• For both sexes combined, incidence rates were highest in non-Hispanic (NH) blacks (47.4 per 100,000), followed by NH whites (37.9) and Hispanics (36.0).

• In males, rates were highest in NH blacks (56.4), followed by Hispanics (46.0) and NH whites (44.5).

• In females, rates were highest in NH blacks (40.9), followed by NH whites (32.1). The rate in Hispanic females (28.0) was similar to NH American Indian/Alaska Natives (AI/AN) (28.5).

A/PI = Asian/Pacific Islander
The black bars indicate the 95% confidence intervals. 95% of the time the true rate will lie within these limits. A wider bar indicates uncertainty or instability in the incidence rate.
Colorectal Cancer Incidence by Age at Diagnosis and Tumor Location, 2012-2016

Males
- For ages 20-49 years and 50-64 years, colorectal cancer was most commonly diagnosed in the rectum, followed by the proximal colon.
- For ages 65 years and over, colorectal cancer was most commonly diagnosed in the proximal colon, followed by the rectum.

Females
- For ages 20-49 years, colorectal cancer was most commonly diagnosed in the rectum, followed the distal colon.
- For ages 50-64 years and 65 years and older, colorectal cancer was most commonly diagnosed in the proximal colon, followed by the rectum.
Colorectal Cancer Incidence by Race/Ethnicity and Diagnosis Stage, 2012-2016

- Non-Hispanic (NH) whites had the highest proportion of cases that were diagnosed at the localized stage.

- NH blacks had the highest proportion of cases that were diagnosed at the distant stage.

AI/AN = American Indian/Alaska Native; A/PI = Asian/Pacific Islander
Colorectal Cancer Incidence by Age and Stage, 2012-2016

- For ages 20-49 years, a smaller proportion of cases were diagnosed at the localized stage (and a larger proportion at the distant stage) compared to older age groups.

- For ages 50-64 years, a smaller proportion of cases were diagnosed at the localized stage (and a larger proportion at the distant stage) compared to ages 65 years and older.
Urban-Rural Classifications

The Texas Cancer Registry uses the National Center for Health Statistics (NCHS) Urban-Rural Classification Scheme for Counties\(^1\) to classify population areas across the state.

<table>
<thead>
<tr>
<th>Category</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metropolitan</td>
<td></td>
</tr>
<tr>
<td>Large central</td>
<td>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.</td>
</tr>
<tr>
<td>Large fringe</td>
<td>Counties in MSAs with populations of 1 million or more that do not qualify as large central metro counties.</td>
</tr>
<tr>
<td>Medium metro</td>
<td>Counties in MSAs of populations between 250,000 – 999,999.</td>
</tr>
<tr>
<td>Small metro</td>
<td>Counties in MSAs of populations less than 250,000.</td>
</tr>
<tr>
<td>Nonmetropolitan</td>
<td></td>
</tr>
<tr>
<td>Micropolitan</td>
<td>Counties with an urban cluster population of 10,000-49,999.</td>
</tr>
<tr>
<td>Noncore</td>
<td>Nonmetro counties that do not qualify as micropolitan.</td>
</tr>
</tbody>
</table>

\(^1\)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.
Colorectal Cancer Incidence Rates by Urban-Rural Classification\textsuperscript{1}, 2012-2016

- In both males and females, incidence rates were higher in small metro, micropolitan, and non-core areas compared to other areas.
- The overall incidence rates, per 100,000, were significantly higher in non-metro counties (41.8) compared to metro areas (37.0), and this difference occurred in both males (49.6 vs 44.1) and females (34.9 vs 31.1).

\textsuperscript{1} 2013 NCHS Urban-Rural Classification Scheme for Counties. Centers for Disease Control and Prevention. \url{https://www.cdc.gov/nchs/data_access/urban_rural.htm}

The black bars indicate the 95% confidence intervals. 95\% of the time the true rate will lie within these limits. A wider bar indicates uncertainty or instability in the incidence rate.
From 2012-2016, 49,252 new cases of colorectal cancer were diagnosed in Texas. The incidence rate was 37.7 per 100,000 population.

### Health Service Region

<table>
<thead>
<tr>
<th>Health Service Region</th>
<th>Number of Cases</th>
<th>Incidence Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSR 1</td>
<td>1715</td>
<td>38.9</td>
</tr>
<tr>
<td>HSR 2</td>
<td>1439</td>
<td>43.0</td>
</tr>
<tr>
<td>HSR 3</td>
<td>12,417</td>
<td>36.7</td>
</tr>
<tr>
<td>HSR 4</td>
<td>3037</td>
<td>42.8</td>
</tr>
<tr>
<td>HSR 5</td>
<td>2003</td>
<td>43.1</td>
</tr>
<tr>
<td>HSR 6</td>
<td>11,320</td>
<td>37.5</td>
</tr>
<tr>
<td>HSR 7</td>
<td>5279</td>
<td>34.8</td>
</tr>
<tr>
<td>HSR 8</td>
<td>5542</td>
<td>38.3</td>
</tr>
<tr>
<td>HSR 9</td>
<td>1211</td>
<td>39.2</td>
</tr>
<tr>
<td>HSR 10</td>
<td>1466</td>
<td>36.2</td>
</tr>
<tr>
<td>HSR 11</td>
<td>3818</td>
<td>37.3</td>
</tr>
</tbody>
</table>

Colorectal Cancer Incidence Rate Trends by Sex, 2007-2016

- Colorectal cancer incidence rates declined from 45.0 in 2007 to 36.1 in 2016, which is an average yearly decrease of 2.1%.
- This average decline was similar in males (2.2%) and females (2.1%).
- In females, the decline in incidence rate was faster in 2007-2011 than 2011-2016.

^ Indicates that the annual percent change (APC) was significantly different from zero.
Colorectal Cancer Incidence Rate Trends by Age at Diagnosis, 2007-2016

Ages 20-49 years
- Incidence rates in Texas increased from 11.1 in 2007 to 12.3 in 2016, which is an average yearly increase of 1.4%.
- This trend is also observed across the United States and may be related to increased rates of obesity, lack of physical activity, and unhealthy diets.1

Ages 50 years and older
- Incidence rates significantly decreased for ages 50-64 years and 65 years and older but the decrease was faster in ages 65 years and older (-3.7%) than in ages 50-65 years (-0.7%)
- For ages 65 years and older the decrease was faster in 2007-2009 than 2009-2016.
- Declines in older adults may reflect the success of screening programs.

Colorectal Cancer Incidence Rate Trends by Age at Diagnosis and Sex, 2007-2016

Trends in males and females were generally similar within each age group.

**Ages 20-49 Years**
Rates significantly increased in females, but only showed a tendency to increase in males.

**Ages 50-64 Years**
Trends were similar and not significant in either sex.

**Ages 65 Years and Older**
Similar average declines occurred in both sexes. However, in females there was a stronger decline from 2007 to 2011 than from 2011 to 2016.

<table>
<thead>
<tr>
<th>Age</th>
<th>Sex</th>
<th>Average Annual Percent Change 2007-2016</th>
<th>95% Confidence Interval</th>
<th>5-Year Incidence Rate, 2012-2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-49</td>
<td>Male</td>
<td>1.3</td>
<td>-0.1</td>
<td>2.7</td>
</tr>
<tr>
<td>20-49</td>
<td>Female</td>
<td>1.6^</td>
<td>0.3</td>
<td>2.9</td>
</tr>
<tr>
<td>50-64</td>
<td>Male</td>
<td>-0.6</td>
<td>-1.3</td>
<td>0.1</td>
</tr>
<tr>
<td>50-64</td>
<td>Female</td>
<td>-0.7</td>
<td>-1.6</td>
<td>0.1</td>
</tr>
<tr>
<td>65 and older</td>
<td>Male</td>
<td>-3.6^</td>
<td>-4.3</td>
<td>-2.9</td>
</tr>
<tr>
<td>65 and older</td>
<td>Female</td>
<td>-3.6^</td>
<td>-4.4</td>
<td>-2.8</td>
</tr>
</tbody>
</table>

^ Trend was significantly different than 0
Colorectal Cancer Incidence Rate Trends by Race/Ethnicity, 2007-2016

- Colorectal cancer incidence rates decreased significantly by an average of 2.1% per year in non-Hispanic (NH) whites, 3.3% in NH blacks, 2.4% in NH Asian/Pacific Islanders (A/PI), and 1.3% in Hispanics.

- The rate in NH American Indian/Alaska Natives (AI/AN) remained stable (a non-significant 1.2% increase).

- In NH whites, the decline was stronger during 2007-2010 than during 2010-2016. In NH blacks, the decline was stronger during 2007-2012 than during 2012-2016.

- Despite a faster decline in NH blacks, 2016 incidence rates remained highest for this group.
Colorectal Cancer Incidence Rate Trends by Sex and Race/Ethnicity, 2007-2016

• Trends were similar in males and females for most race ethnicity groups.
• The decline in incidence was significant in male Hispanics but not in female Hispanics.

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Sex</th>
<th>Average APC 2007-2016</th>
<th>95% Confidence Interval</th>
<th>5-Year Incidence Rate, 2012-2016</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lower</td>
<td>Upper</td>
</tr>
<tr>
<td>NH White</td>
<td>Male</td>
<td>-2.2^</td>
<td>-2.8</td>
<td>-1.6</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>-2.0^</td>
<td>-2.9</td>
<td>-1.1</td>
</tr>
<tr>
<td>NH Black</td>
<td>Male</td>
<td>-3.5^</td>
<td>-4.7</td>
<td>-2.2</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>-3.2^</td>
<td>-4.5</td>
<td>-1.9</td>
</tr>
<tr>
<td>NH A/PI</td>
<td>Male</td>
<td>-2.9</td>
<td>-5.9</td>
<td>0.3</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>-2.2</td>
<td>-4.8</td>
<td>0.4</td>
</tr>
<tr>
<td>NH AI/AN</td>
<td>Male</td>
<td>-2.9</td>
<td>-9.5</td>
<td>4.3</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>7.0</td>
<td>-1.9</td>
<td>16.8</td>
</tr>
<tr>
<td>Hispanic</td>
<td>Male</td>
<td>-1.3^</td>
<td>-2.4</td>
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</tr>
<tr>
<td></td>
<td>Female</td>
<td>-1.6</td>
<td>-3.2</td>
<td>0.1</td>
</tr>
</tbody>
</table>

^ Trend was significantly different than 0

NH = non-Hispanic; A/PI = Asian/Pacific Islander; AI/AN = American Indian/Alaska Native
Counts for NH AI/AN were low and gave annual rates with large confidence intervals.
## Colorectal Cancer Incidence Rate Trends by Age at Diagnosis and Race/Ethnicity, 2007-2016

<table>
<thead>
<tr>
<th>Age</th>
<th>Race/ethnicity</th>
<th>Average APC 2007-2016</th>
<th>95% Confidence Interval</th>
<th>5-Year Incidence Rate, 2012-2016</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Lower</td>
<td>Upper</td>
<td>Lower</td>
</tr>
<tr>
<td>20-49 Years</td>
<td>NH white</td>
<td>2.4</td>
<td>1.2</td>
<td>3.6</td>
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<tr>
<td></td>
<td>NH black</td>
<td>0.1</td>
<td>-1.6</td>
<td>1.9</td>
</tr>
<tr>
<td></td>
<td>NH A/PI</td>
<td>0.5</td>
<td>-3.0</td>
<td>4.2</td>
</tr>
<tr>
<td></td>
<td>NH AI/AN</td>
<td>4.4</td>
<td>-6.6</td>
<td>16.8</td>
</tr>
<tr>
<td></td>
<td>Hispanic</td>
<td>1.0</td>
<td>-0.1</td>
<td>2.2</td>
</tr>
<tr>
<td>50-64 Years</td>
<td>NH white</td>
<td>-0.5</td>
<td>-1.4</td>
<td>0.4</td>
</tr>
<tr>
<td></td>
<td>NH black</td>
<td>-2.1</td>
<td>-3.1</td>
<td>-1</td>
</tr>
<tr>
<td></td>
<td>NH A/PI</td>
<td>0.7</td>
<td>-2.2</td>
<td>3.8</td>
</tr>
<tr>
<td></td>
<td>NH AI/AN</td>
<td>2.3</td>
<td>-4.8</td>
<td>10.0</td>
</tr>
<tr>
<td></td>
<td>Hispanic</td>
<td>-0.5</td>
<td>-1.3</td>
<td>0.4</td>
</tr>
<tr>
<td>65 Years and Older</td>
<td>NH white</td>
<td>-3.7</td>
<td>-4.1</td>
<td>-3.3</td>
</tr>
<tr>
<td></td>
<td>NH black</td>
<td>-4.6</td>
<td>-6.2</td>
<td>-2.9</td>
</tr>
<tr>
<td></td>
<td>NH A/PI</td>
<td>-4.4</td>
<td>-6.7</td>
<td>-1.9</td>
</tr>
<tr>
<td></td>
<td>NH AI/AN</td>
<td>-1.5</td>
<td>-10.0</td>
<td>7.9</td>
</tr>
<tr>
<td></td>
<td>Hispanic</td>
<td>-2.1</td>
<td>-2.8</td>
<td>-1.5</td>
</tr>
</tbody>
</table>

^ Trend was significantly different than 0

**20-49 Years**
- Incidence rates increased significantly in non-Hispanic (NH) whites only (2.4%).
- 5-year incidence rates during 2012-2016 were highest in NH whites, followed by NH blacks.

**50-64 Years**
- Incidence rates decreased significantly in NH blacks only (-2.1%).
- The 5-year incidence rates during 2012-2016 were highest in NH blacks.

**65 Years and Older**
- Incidence rates decreased significantly all groups except NH American Indian/Alaska Native (AI/AN).
- The 5-year incidence rates during 2012-2016 were highest in NH blacks.
Colorectal Cancer Incidence Rate Trends by Metro/Non-Metro Counties, 2007-2016

- There was a significant decline in colorectal cancer incidence from 2007 to 2016 in both metro and non-metro counties, but the average yearly decline was significantly faster in metro counties (2.3%) compared to non-metro counties (1.2%).

- In metro areas the decline was faster during 2007-2011 than during 2011-2016.

- By 2016, the incidence rate was significantly higher in non-metro areas than in metro areas.

^ Indicates that the annual percent change (APC) was significantly different from zero.
Colorectal Cancer Mortality in Texas
Colorectal Cancer Mortality Rates, 2012-2016

From 2012 to 2016, Texas ranked 25th out of all US states and DC in colorectal cancer mortality. The colorectal cancer mortality rate in Texas was 14.3 cases per 100,000. The US rate was 14.2.

Colorectal Cancer Mortality Rates by Sex and Age, 2012-2016

By Sex
- In Texas from 2012 to 2016, there were 14.2 deaths from colorectal cancer per 100,000 people per year.
- The mortality rate was significantly higher in males (17.7) than females (11.4).

By Sex and Age
- Mortality rates increased with age from 2.9 for patients diagnosed at ages 20-49 years to 22.2 at ages 50-64 years to 76.0 at ages 65 years and older.
- Rates were significantly higher for males than females in all age groups.

The black bars indicate the 95% confidence intervals. 95% of the time the true rate will lie within these limits. A wider bar indicates uncertainty or instability in the mortality rate.
Colorectal Cancer Mortality Rates by Sex and Race/Ethnicity, 2012-2016

- Overall, mortality rates were highest in non-Hispanic (NH) blacks, followed by NH whites and Hispanics.

- In males, rates were highest in NH blacks, followed by Hispanics and NH whites.

- In females, rates were highest in NH blacks, followed by NH whites and Hispanics.

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

The black bars indicate the 95% confidence intervals. 95% of the time the true rate will lie within these limits. A wider bar indicates uncertainty or instability in the mortality rate.
Colorectal Cancer Mortality Rates by Sex and Urban-Rural Classification\(^1\), 2012-2016

- In both males and females mortality rates were lower in large central metro, large fringe metro, and medium metro areas compared to in small metro, micropolitan, and noncore areas.
- The overall mortality rate, per 100,000, was significantly higher in non-metro (15.9) versus metro areas (13.9), for males (19.7 vs 17.4) and females (12.5 vs 11.2).

\(^1\) 2013 NCHS Urban-Rural Classification Scheme for Counties. Centers for Disease Control and Prevention. [https://www.cdc.gov/nchs/data_access/urban_rural.htm](https://www.cdc.gov/nchs/data_access/urban_rural.htm)

The black bars indicate the 95% confidence intervals. 95% of the time the true rate will lie within these limits. A wider bar indicates uncertainty or instability in the mortality rate.
From 2012-2016, 18,140 Texans died of colorectal cancer. The mortality rate was 14.2 per 100,000 population.

<table>
<thead>
<tr>
<th>Health Service Region</th>
<th>Number of Cases</th>
<th>Mortality Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSR 1</td>
<td>697</td>
<td>15.7</td>
</tr>
<tr>
<td>HSR 2</td>
<td>608</td>
<td>17.5</td>
</tr>
<tr>
<td>HSR 3</td>
<td>4461</td>
<td>13.8</td>
</tr>
<tr>
<td>HSR 4</td>
<td>1100</td>
<td>15.3</td>
</tr>
<tr>
<td>HSR 5</td>
<td>771</td>
<td>16.3</td>
</tr>
<tr>
<td>HSR 6</td>
<td>4125</td>
<td>14.4</td>
</tr>
<tr>
<td>HSR 7</td>
<td>1910</td>
<td>12.8</td>
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<tr>
<td>HSR 8</td>
<td>2127</td>
<td>14.7</td>
</tr>
<tr>
<td>HSR 9</td>
<td>474</td>
<td>15.4</td>
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<td>HSR 10</td>
<td>517</td>
<td>13.1</td>
</tr>
<tr>
<td>HSR 11</td>
<td>1347</td>
<td>13.3</td>
</tr>
</tbody>
</table>
Because similar trends were observed for both males and females within each age group, both sexes were analyzed together.

**Ages 20-49 Years**
Colorectal cancer mortality increased by 1.9% per year from 2007-2016.

**Ages 50-64 Years**
Rates remained stable with an average decrease of -0.2% per year.

**Ages 65 Years and Older**
Rates decreased significantly by 3.0% per year.
Colorectal Cancer Mortality Rate Trends by Race/Ethnicity, 2007-2016

**Non-Hispanic (NH) Whites**
Mortality rates decreased by an average of 1.8% per year. Rates tended to decrease between 2007 and 2009. Rates significantly decreased by 1.2% per year from 2009-2016.

**NH Blacks**
Mortality rates decreased by an average of 2.8% per year but this was not significantly different from 0. Rates significantly decreased by 4.7% per year from 2007-2014, then tended to increase from 2014-2016.

**NH Asian/Pacific Islander**
Mortality rates tended to decrease but this trend was not significant.

**Hispanic**
Mortality rates decreased significantly from 2007-2016 by 1.4% per year.
Colorectal Cancer Survival in Texas
• As with other cancers, survival was lowest for patients diagnosed at the distant stage and highest for those diagnosed at the localized stage.

• For tumors diagnosed at all stages, survival was highest for non-Hispanic (NH) Asian/Pacific Islanders (A/PI).

• NH blacks had the lowest survival for each staging group. NH blacks also had the highest proportion of cases diagnosed at the distant stage (see Colorectal Cancer Incidence by Race/Ethnicity and Diagnosis Stage, 2012-2016).

* Cause-specific survival estimated the percentage of patients diagnosed between 2007 and 2016 that did not die from colorectal cancer within 5-year after diagnosis. Individuals who died of other causes are censored.

The black bars indicate the 95% confidence intervals. 95% of the time the true survival percentage will lie within these limits. A wider bar indicates uncertainty or instability in the survival percentage.
As with other cancers, 5-year relative survival was highest for tumors diagnosed at the localized stage, and lowest for tumors diagnosed at the distant stage.

At each stage, survival was highest for younger adults than for older age classes.

However, a larger proportion of tumors are diagnosed at the distant stage in younger adults than in older adults (see Colorectal Cancer Incidence by Age and Stage, 2012-2016).
Technical Notes

• Data Source: Texas Cancer Registry (www.dshs.state.tx.us/tcr) SEER*Stat Database, Incidence - Texas, 1995-2016, statewide, Texas Department of State Health Services, created February 2019, based on NPCR-CSS Submission, cut-off 11/09/18.

• Data Source: Texas Cancer Registry (www.dshs.texas.gov/tcr) SEER*Stat Database, Mortality - Texas, 1990-2016, statewide, Texas Department of State Health Services (created June 2019).


• 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).
References


Additional Resources for Colorectal Cancer Screening

- CDC colorectal cancer screening brochure: https://www.cdc.gov/cancer/colorectal/pdf/no_pocket_brochure.pdf
Acknowledgment

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

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• 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.