Alcohol-Associated Cancers in Texas, 2008–2017

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

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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.

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Background

- This statistical report describes the burden of alcohol-related cancers in Texas and compares cancer rates and trends to national data.
- Alcohol use is associated with an increased risk of at least six different types of cancer: oral cavity and pharynx, larynx, liver, esophagus, female breast, and colorectal.
- Since cancer registries do not routinely collect information on alcohol use this report uses data from all tumors diagnosed at the 6 cancer sites associated with alcohol use, rather cases diagnosed in persons who drink alcohol.

Implications for Public Health Practice

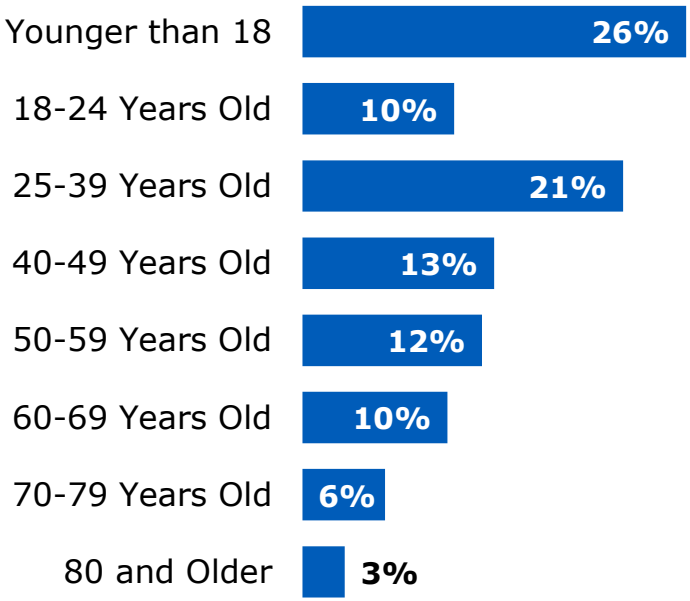
- The burden of alcohol-associated cancers can be reduced through efforts to lower alcohol consumption, in particular underage drinking, heavy drinking, and binge drinking.
- Evidence-based population-level interventions to reduce alcohol intake could help decrease the incidence of these cancers in Texas.

Texas Overview

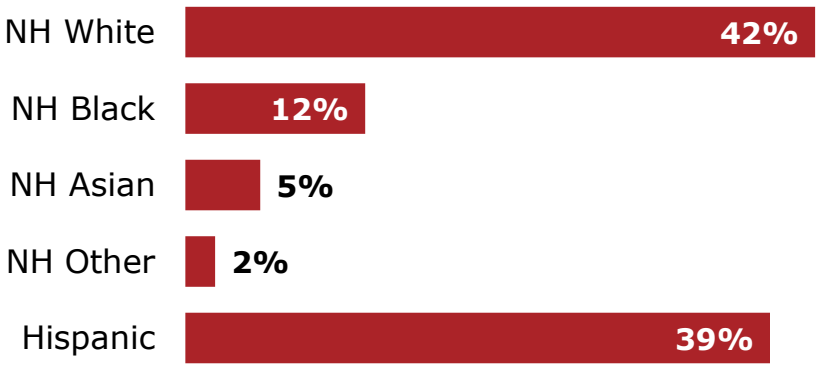
Texas Population Estimates

- The estimated population of Texas for 2019 was 28,995,881.[1]
- The population of Texas is 1/12th of total U.S. population.

Population by Age Group, Texas, 2018[2]



Population by Race/Ethnicity, Texas, 2018[2]



[1] United States Census Bureau QuickFacts, census.gov/quickfacts/fact/table/TX,US/PST045219
[2] Texas Demographic Center, demographics.texas.gov/Data/TPEPP/Estimates/
NH = Non-Hispanic

Key Population Demographics for Texas

- Six Texas counties have a population over 1,000,000 people — Harris, Dallas, Tarrant, Bexar, Travis and Collin. About 47% of Texans live in one of these counties.[1]
- 33 counties have a population between 100,000–1,000,000 people.[1]
- 181 counties each have a population less than the number of Texans expected to die from cancer in 2020, which is 45,858.[1]

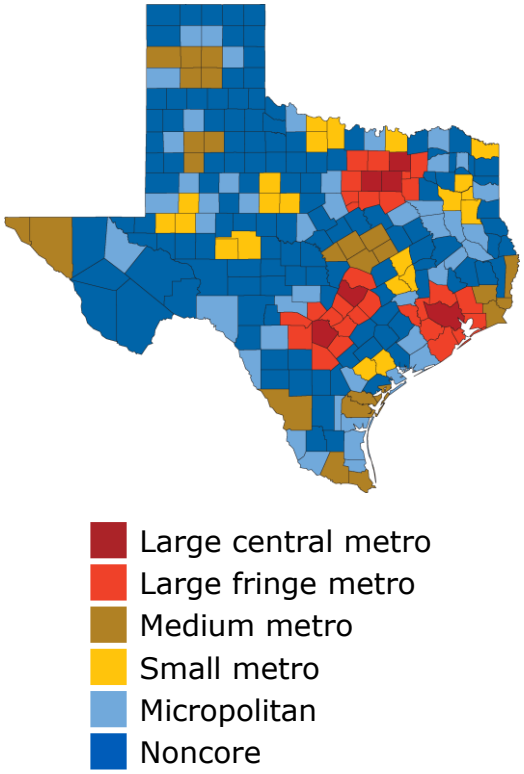
	Texas[2]	United States[2]
Population	29 Million	328.2 Million
Hispanic	39.6%	18.3%
Persons living in poverty	14.9%	11.8%
Persons without health insurance (ages 0-64)	20.0%	10.0%
Persons who speak a language other than English spoken at home (ages 5 years and older)	35.5%	21.5%
Adults ages 25 and older with a high school diploma	83.2%	87.7%

[1] Texas Demographic Center, demographics.texas.gov/Data/TPEPP/Estimates/
[2] United States Census Bureau QuickFacts, census.gov/quickfacts/fact/table/TX,US/PST045219

Texas Urban-Rural Classification

In this report, Texas counties are classified using the 2013 Urban-Rural Classification Scheme for Counties.[1]

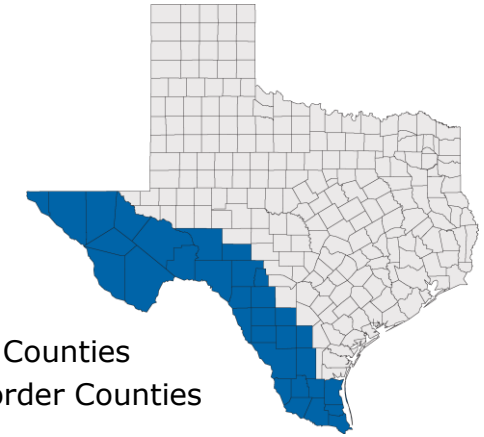
Metropolitan	
Large central metro	Counties in metropolitan statistical areas of 1,000,000 or more population that: contain the entire population of the largest principal city of the MSA, or have their entire population contained in the largest principal city, or contain at least 250,000 inhabitants of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



[1] 2013 Urban-Rural Classification Scheme for Counties, National Center for Health Statistics, Centers for Disease control and Prevention (CDC). cdc.gov/nchs/data_access/urban_rural.htm

Texas Border Region

- In this report, "border counties" are defined as the 32 counties designated by the La Paz Agreement.
- Some of the key differences in demographics between the border and non-border counties are presented in the table below.



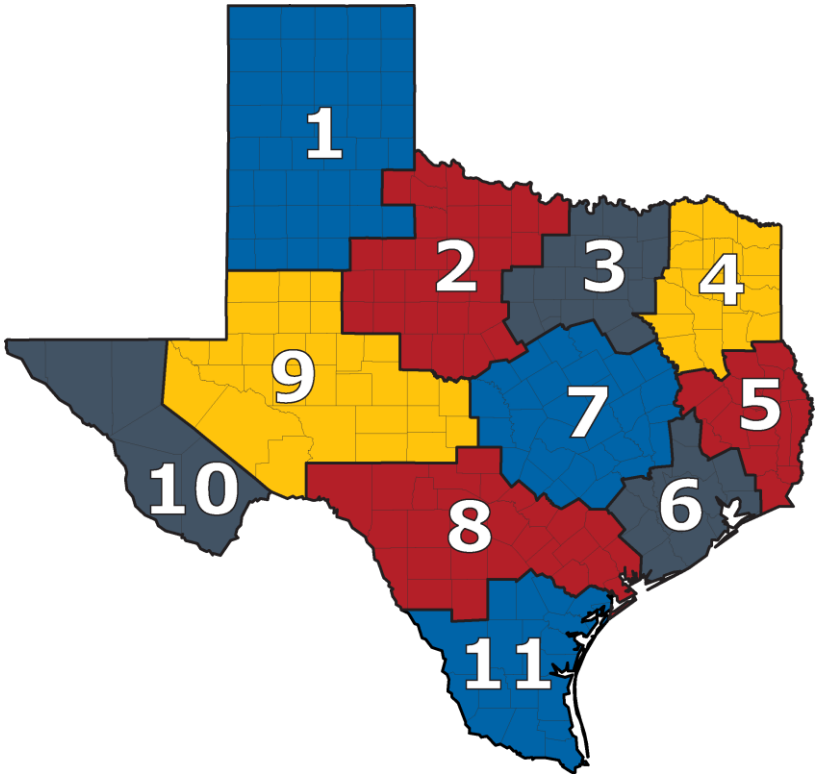
	Border Counties[1]	Non-Border Counties[1]
Population	3.0 Million	25.7 Million
Hispanic	88.4%	35.5%
Below poverty level	29.3%	15.9%
Adults ages 18–64 without health insurance	46.1%	28.3%
Do not speak English very well	31.7%	12.2%
Adults ages 25 and older without a high school diploma	32.8%	16.5%

[1] Office of Border Public Health, Texas Department of State Health Services, dshs.texas.gov/borderhealth/. Based on 2015 Census projections from DSHS Center for Health Statistics.

Texas Public Health Regions

- The Texas Department of State Health Service divides the state into 11 administrative Public Health Regions (also sometimes called health service regions).
- This report presents some information by public health region to show the variation of cancer statistics across the state.
- TCR's Web Query Tool can display cancer incidence and morality rates by health service region, as well as county, at cancer-rates.info/tx/.

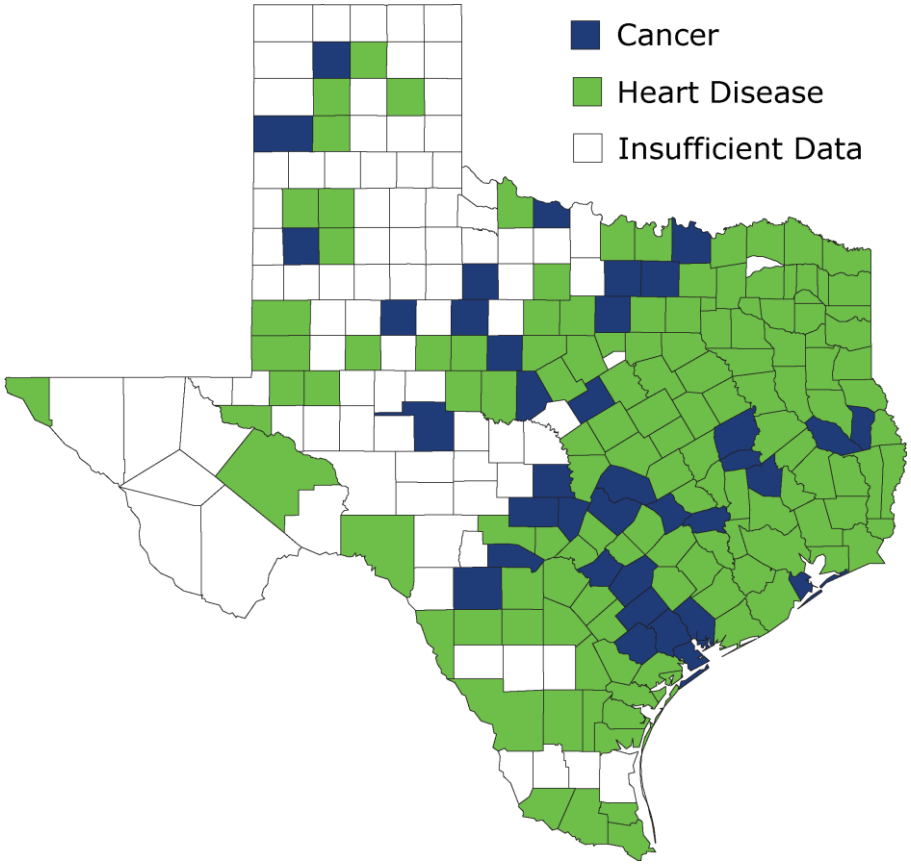
Map of Public Health Regions



Burden of Cancer in Texas

- In 2020, an estimated 127,131 new Texas cancer cases will be diagnosed.
- An estimated 45,858 Texans will die from cancer in 2020.
- As of January 1, 2017, 824,631 Texans who were diagnosed with cancer in the last 22 years were alive.
- Overall, cancer is the 2nd leading cause of death in Texas, but the 1st in some areas of the state.[1]
- Cost of cancer in Texas for 2018 is estimated to be over $40.3 billion.[2]

Leading Cause of Death by Texas County, 2016

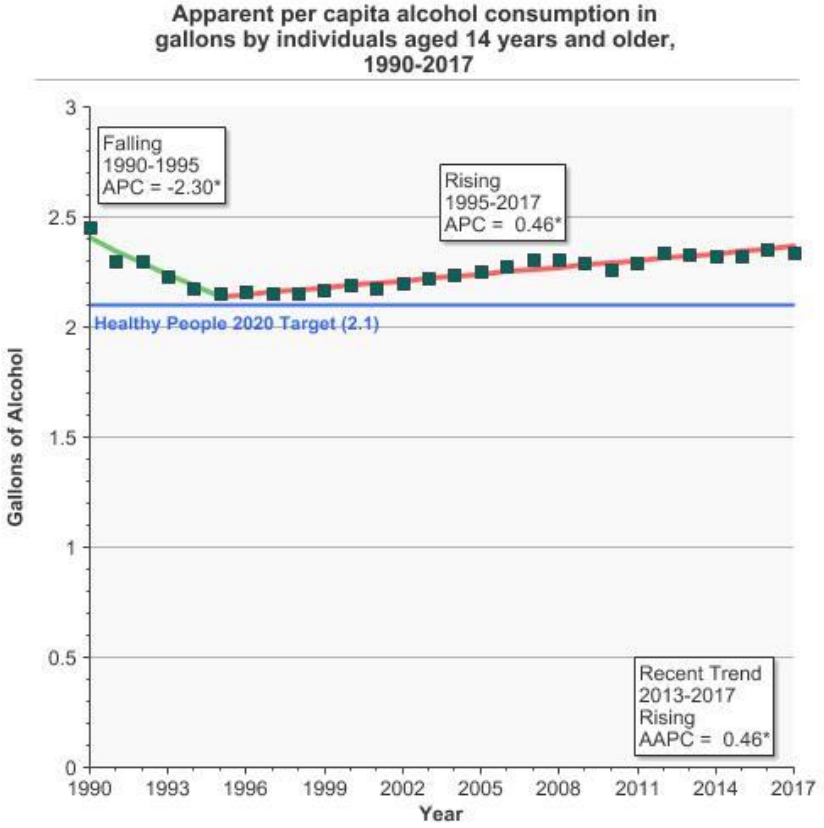


[1] Texas Department of State Health Services, Center for Health Statistics, Vital Statistics Annual Reports, Leading Causes of Death for Selected Years Texas Residents.
[2] An Economic Assessment of the Cost of Cancer in Texas and the Benefits of the Cancer Prevention and Research Institute of Texas and its Programs: 2018 Update

Alcohol Use and Cancer Risk

Alcohol Consumption in the United States

- Healthy People 2020, a U.S. Department of Health and Human Services program to promote healthy behaviors, has set a goal of reducing the average annual alcohol consumption of individuals aged 14 and older to 2.1 gallons or less by 2020.
- 2.1 gallons is about 448 'standard' drinks in a year.
- Alcohol consumption in the US declined from 1990-1995; however, it has been increasing since 1995.

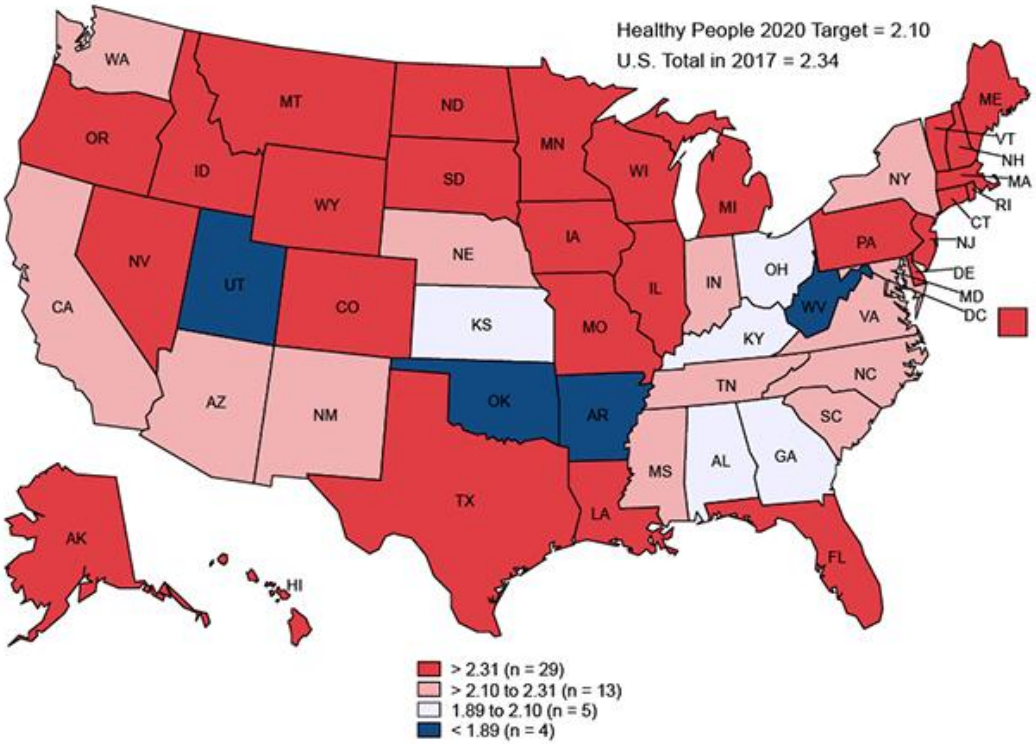


HP 2020 Target SA-16: 2.1 Gallons.
Source: Slater, Megan E.; Alpert, Hillel R. Surveillance Report #113: Apparent Per Capita Alcohol Consumption: National, State, and Regional Trends, 1977-2017. Bethesda, MD: National Institute on Alcohol Abuse and Alcoholism, Division of Epidemiology and Prevention Research (April 2019).
Data are not age-adjusted.
Regression lines are calculated using the Joinpoint Trend Analysis Software, Version 4.7 Feb. 2019, National Cancer Institute.
The AAPC is the Average Annual Percent Change and is based on the APCs calculated by Joinpoint.
* The Annual Percent Change (APC)/Average Annual Percent Change (AAPC) is statistically significant.

Alcohol Consumption in Texas

- In 2017, based on beverage sales, the average annual alcohol consumption in Texas for individuals 14 and older was more than 2.31 gallons.[1]
- In 2018, 51.6% of Texas adults self-reported drinking alcohol in the last month, 6.2% reported heavy drinking, and 17.4% reported binge drinking. [2]

Total Per Capita Consumption of Gallons of Alcohol by State, 2017[1]

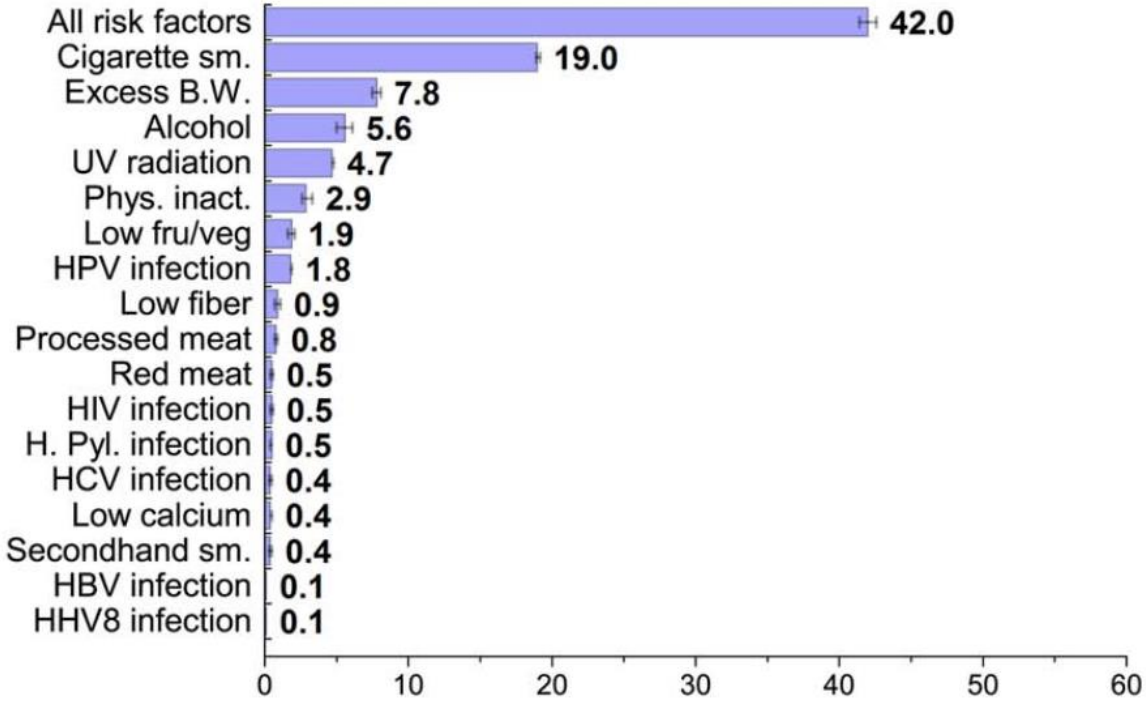


[1] National Institute on Alcohol Abuse and Alcoholism (NIAAA). Surveillance Report #113, 2019.
[2] Behavioral Risk Factor Surveillance System (BRFSS), 2018. Heavy drinking=8 or more drinks per week for females, and 15 or more drinks per week for males; binge drinking=5 or more drinks for males and 4 or more drinks for females in one occasion. Figure: National Cancer Institute, 2019. Retrieved from https://progressreport.cancer.gov/prevention/alcohol.

Alcohol and Cancer Risk

- Alcohol is estimated to be the 3rd largest modifiable contributor to cancer incidence. It is estimated to be directly attributed to 5.6% of all cancer cases and 4% of all cancer deaths in the U.S.[1]
- It increases the risk of six different types of cancer: oral cavity & pharynx, larynx, liver, esophagus, female breast, and colorectal.

Estimated Proportion of Incident Cancer Cases Attributable to Evaluated Risk Factors in Adults Aged 30 Years and Older in the U.S. in 2014[1]



[1] Islami et al. CA Cancer J Clin. 2018;68(1):31-54.

Amount of Alcohol Consumption and Cancer Risk

According to the National Cancer Institute:[1]

- The more alcohol a person drinks—particularly the more alcohol a person drinks regularly over time— his or her risk of developing an alcohol-associated cancer increases.
- Even light drinkers and binge drinkers have a modestly increased risk of some cancers.
- Heavy alcohol use is particularly harmful. It strongly increases the risk of oral cavity and pharynx cancer, esophageal cancer, and liver cancer.

Definitions of Alcohol Use Terms[1]

Term	Males	Females
Moderate alcohol use	Up to 2 drinks a day	Up to 1 drink a day
Heavy alcohol use	15 or more drinks a week, or 5 or more on any day	8 or more drinks a week, or 4 or more on any day
Binge drinking	5 or more drinks in one sitting	4 or more drinks in one sitting
In the US, one drink is defined as 14 grams of alcohol. This equals 12 fluid ounces of regular beer, 8-9 fl oz of malt liquor, 5 fl oz of table wine, or 1.5 fl oz of distilled spirits.		

[1] National Cancer Institute, Alcohol and Cancer Risk, cancer.gov/about-cancer/causes-prevention/risk/alcohol/alcohol-fact-sheet#how-does-alcohol-affect-the-risk-of-cancer

Health Effects of Alcohol

- Alcohol is thought to increase cancer risk through several mechanisms:[1]
  - Directly damaging body tissue in the mouth and throat
  - Converting to acetaldehyde, which can damage cells
  - Interacting with harmful chemicals in tobacco smoke
  - Increasing estrogen levels and therefore risk of breast cancer in women
  - Reducing absorption of nutrients
  - Increasing body weight
- Heavy alcohol use can also cause other health problems such as inflammation and cirrhosis of the liver, increased blood pressure, heart disease and stroke, and is especially harmful for underage drinkers and pregnant women.

[1] American Cancer Society: https://www.cancer.org/cancer/cancer-causes/diet-physical-activity/alcohol-use-and-cancer.html

Alcohol-Associated Cancer Incidence

- Alcohol use is a key modifiable risk factor for six cancer sites, contributing to approximately 5.6% of all new cancer cases (4.8% in males, 6.4% in females).[1]
- Not all cancer cases at alcohol-associated cancer sites are attributed to, or caused by, alcohol consumption. The percent of alcohol-attributable cases varies by cancer site and sex.[1]
  - Oral cavity and pharynx have the highest proportion of cases attributed to alcohol use, but it's higher in males (46.3%) than females (27.4%).
  - The proportion of cases attributed to alcohol use was higher in males for all cancer sites except for esophagus.

Estimated Proportion of Cancer Cases in US Adults 30 Years and Older Attributed to Alcohol Consumption, 2014 [1]

Site	Males	Females	All
Oral cavity & pharynx	46.3%	27.4%	40.9%
Larynx	25.6%	14.0%	23.2%
Liver	24.8%	11.9%	21.6%
Esophagus	19.0%	28.4%	21.0%
Female breast	~	16.4%	16.4%
Colorectal	17.1%	8.1%	12.8%

[1] Islami et al. CA Cancer J Clin. 2018;68(1):31-54.

Alcohol-Associated Cancers 2008–2017

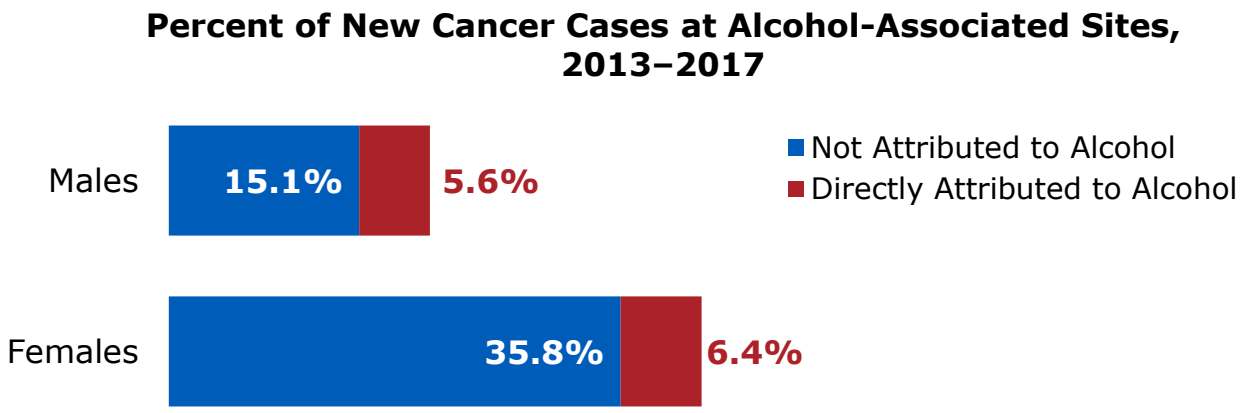
Overall Trends — Texas vs US

Because colorectal cancer incidence rates have declined due to increased screening for precancerous polyps, trends for all sites combined were analyzed without colorectal cancer in this report.[1] However, 5-year incidence rates include colorectal cancer.

[1] Steele et al. 2017. MMWR, 66(39):1052-1058

Percent of New Cancer Cases at Alcohol-Associated Sites

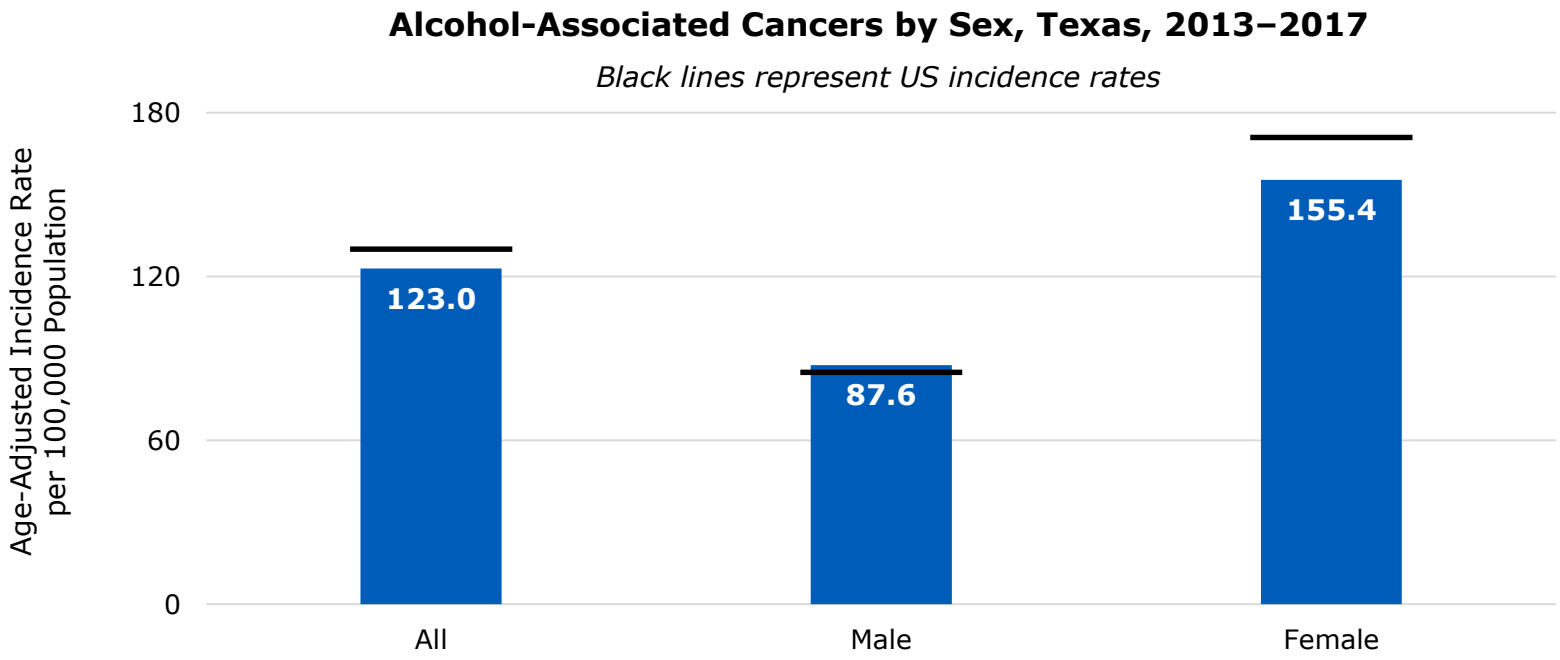
- From 2013–2017, 31% of all new invasive cancers—21% in males and 42% in females—diagnosed in Texas are at cancer sites associated with alcohol consumption. Not all cases can be attributed to alcohol use.
- 6.4% of all new invasive cancers in females and 5.6% in males are estimated to be directly attributed to alcohol.[1]
- For Texas, this means approximately 3,600 cancers diagnosed in females and 3,300 cancers in males in 2017 were directly attributable to alcohol consumption.



[1] Islami et al. 2018. CA Cancer J. Clin. 68(1):31-54

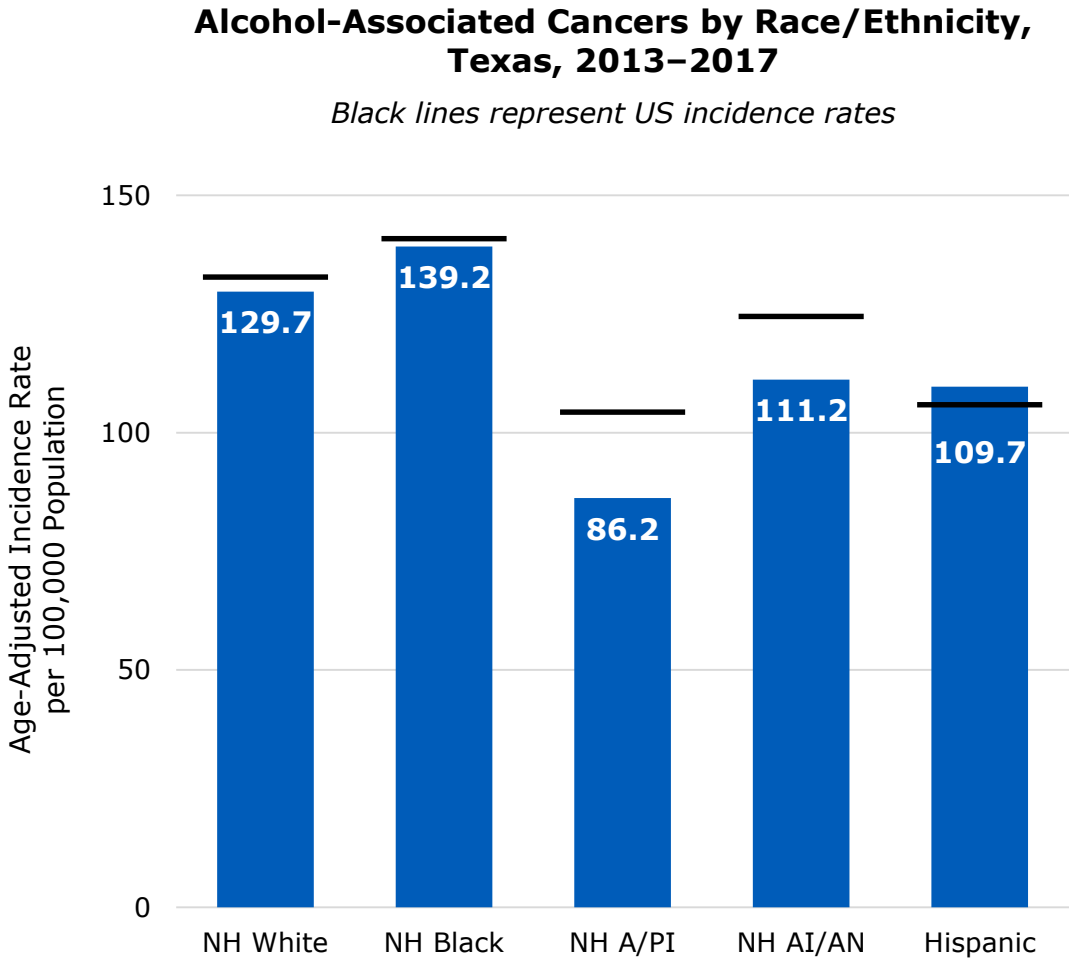
Alcohol-Associated Cancers Incidence Rates by Sex

- The 5-year incidence rate of all alcohol-associated cancers combined was lower in Texas than the US in females, but not in males.
- During 2008–2017, the incidence rate trend* for alcohol-associated cancers (not including colorectal cancer) remained stable overall in Texas and US. It was also stable for males and females in Texas.



* 10-year trends were assessed after excluding colorectal cancer which has declined due to screening programs to detect pre-cancerous polyps.

Alcohol-Associated Cancer Incidence Rates by Race/Ethnicity



Incidence Rates (2013–2017)

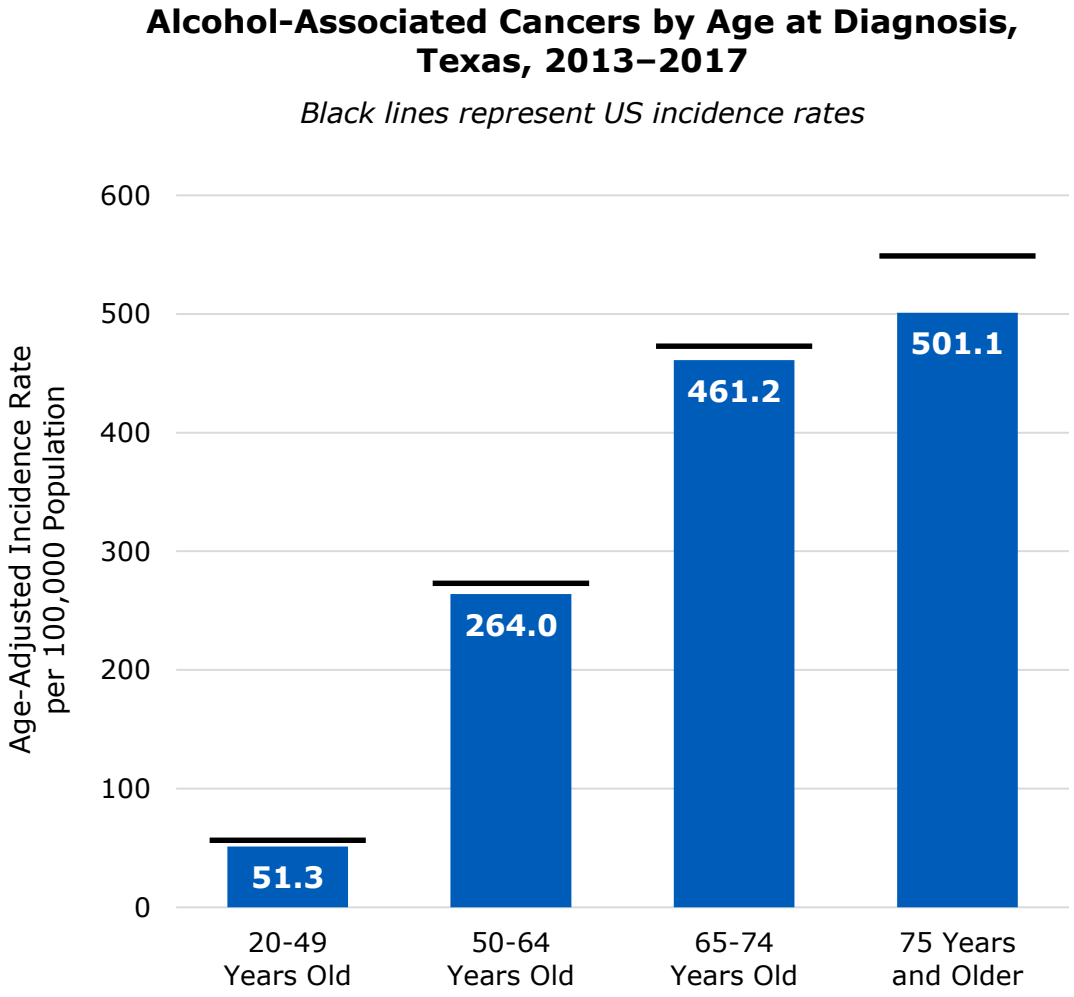
- Incidence rates for alcohol-associated cancers were lower in Texas compared to the US average for all race/ethnicity groups except Hispanics.
- Non-Hispanic blacks had the highest rate.

10-year Trends (2008–2017)*

- In Texas, rates decreased in NH blacks (-0.9% average annual percent change). Rates increased in NH American Indian/Alaska Native (5.6% AAPC). Rates in other groups remained stable.
- In the US, rates also decreased in NH blacks (-0.6% AAPC) and increased in NH AI/AN (1.3% AAPC).

NH = Non-Hispanic; A/PI = Asian/Pacific Islander; AI/AN = American Indian/Alaska Native.
* Trends were assessed after excluding colorectal cancer which has declined due to screening programs to detect pre-cancerous polyps.

Alcohol-Associated Cancer Incidence Rates by Age at Diagnosis



Incidence Rates (2013–2017)

- Incidence rates for alcohol-associated cancers were lower in Texas compared to the US average for all age groups.
- Rates increased with each age group.

10-year Trends (2008–2017)*

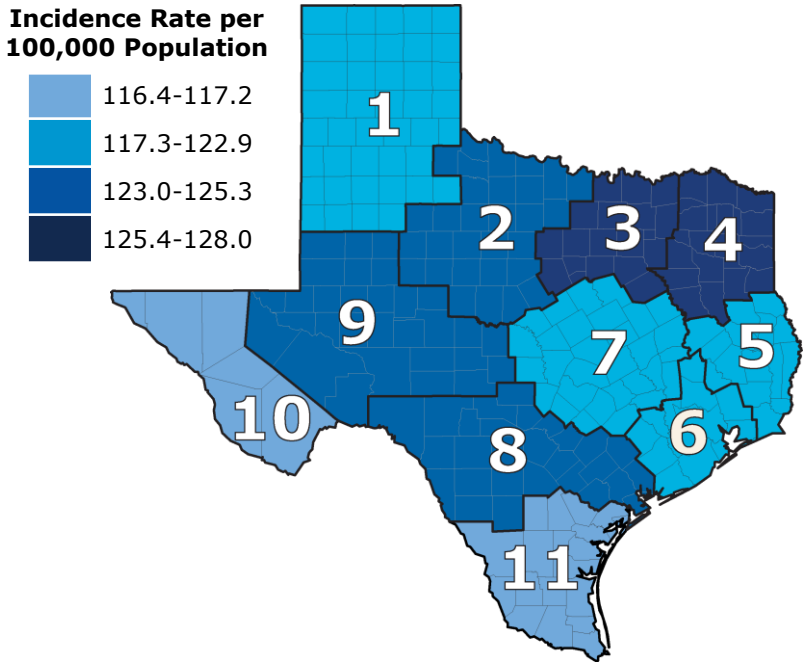
- In Texas, rates increased significantly in ages 65–74 years old (0.8% AAPC). They decreased significantly in ages 75 years and older (-1.0% AAPC).
- In the US, similar trends were seen in ages 65–74 years old (0.6% AAPC) and ages 75 years and older (-0.7% AAPC).

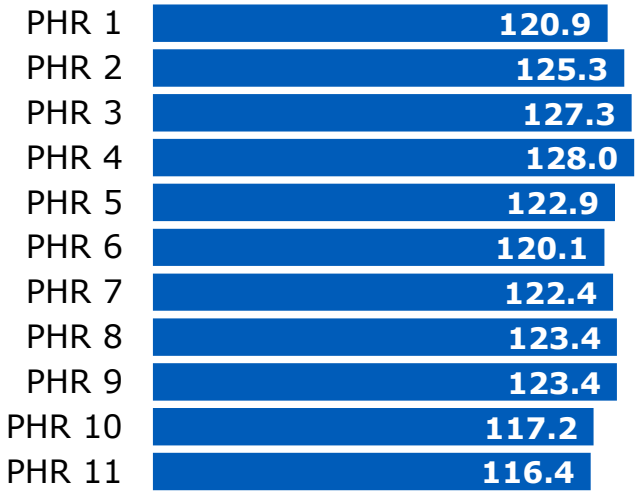
NH = Non-Hispanic; A/PI = Asian/Pacific Islander; AI/AN = American Indian/Alaska Native.
* Trends were assessed after excluding colorectal cancer which has declined due to screening programs to detect pre-cancerous polyps.

Alcohol-Associated Cancer Incidence Rates And Trends By Texas Public Health Region

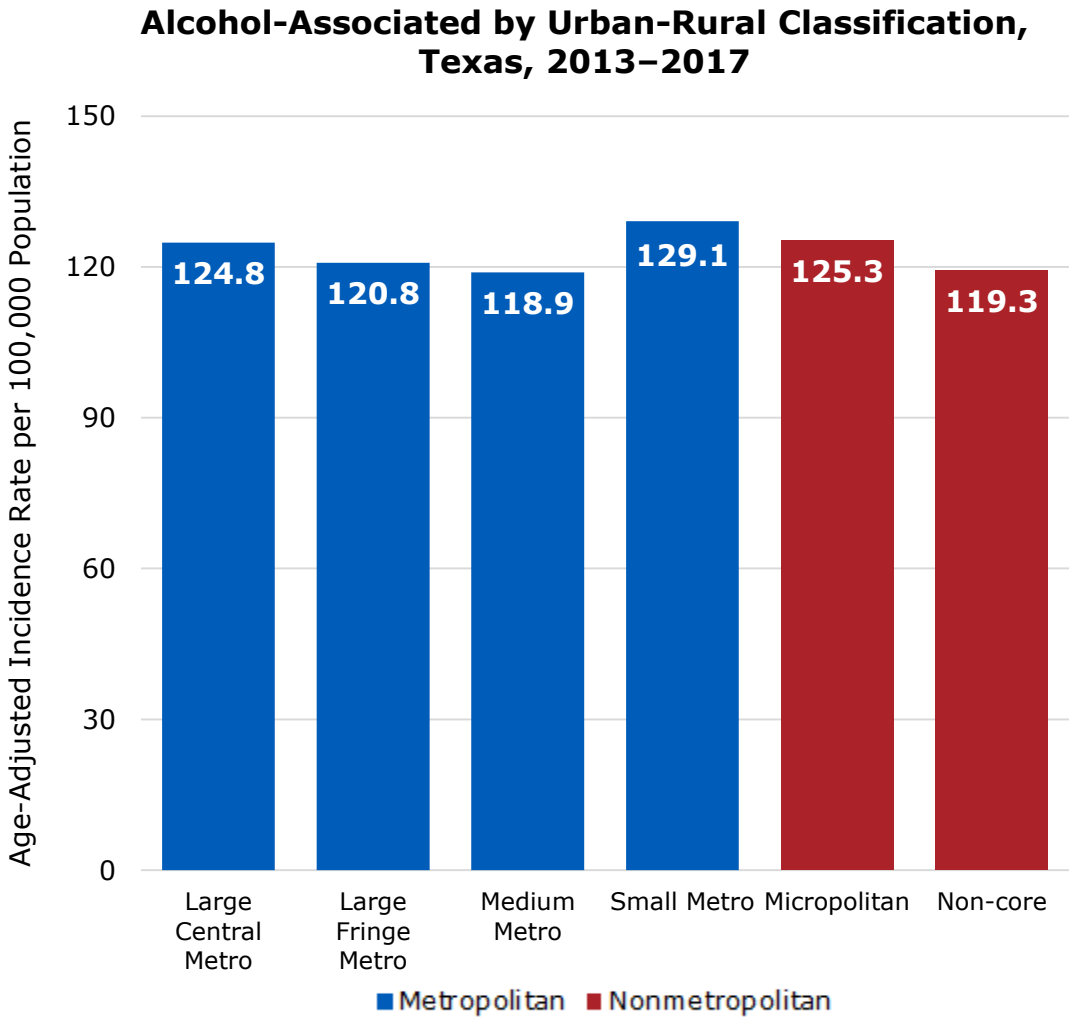
- Incidence rates of alcohol-associated cancers are highest in PHRs 3 and 4.
- When colorectal cancer is excluded, incidence rates for obesity/overweight-associated cancers have been significantly increasing only in PHR 10 (1.3% average annual percent change) from 2008-2017. They have significantly decreased only in PHR 6 (-1.5% AAPC).

Incidence Rates of All Alcohol-Associated Cancers by PHR, 2013–2017





Alcohol-Associated Cancer Incidence Rates by Rural-Urban Classification



Incidence Rates (2013–2017)

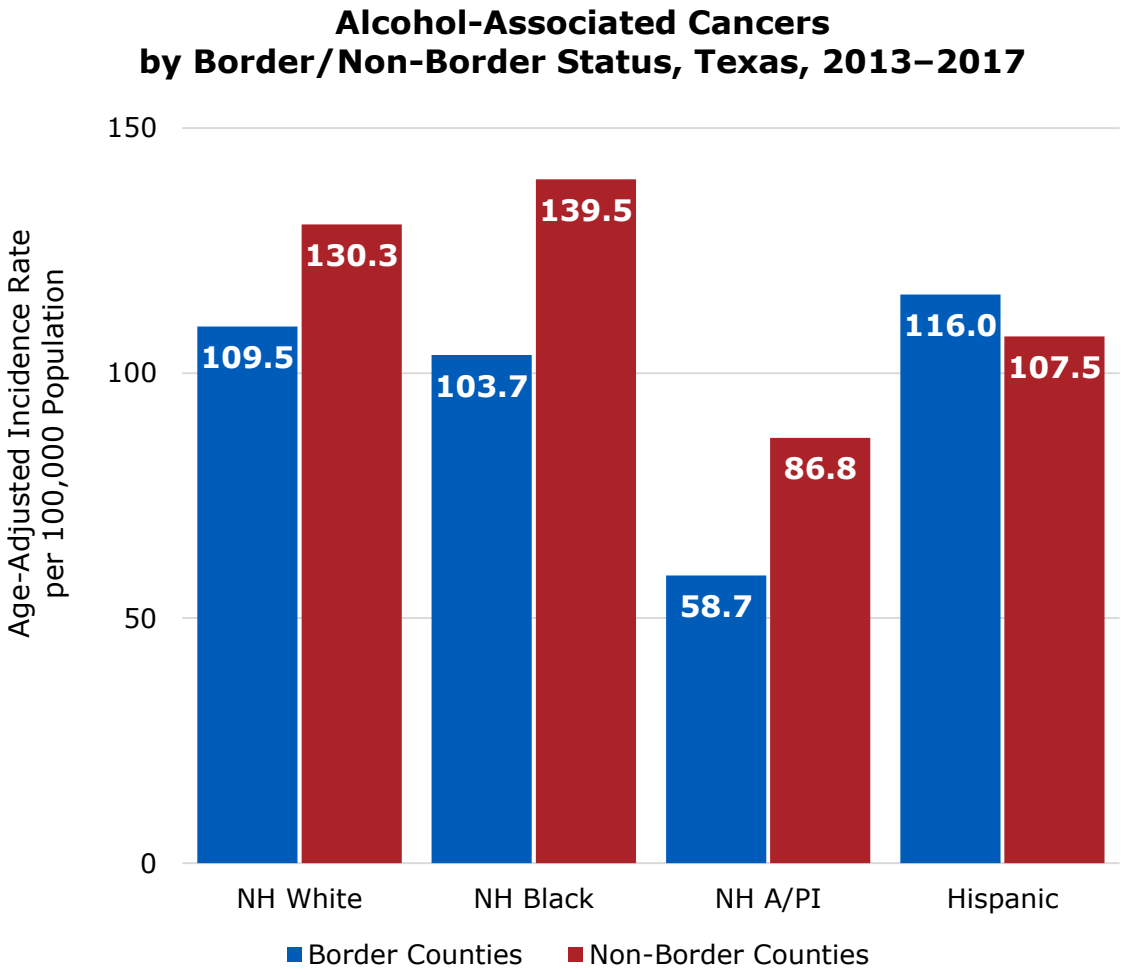
- Incidence rates for alcohol-associated cancers were highest in small metro areas. The difference was statistically significant when compared to other metropolitan areas.

10-year Trends (2008–2017)*

- Rates decreased in large central metro counties (-0.8% average annual percent change) and large fringe metro counties (-0.3% AAPC.)
- Rates increased in micropolitan counties (0.7% AAPC) and non-core counties (0.9% AAPC).
- Rates were stable in small and medium metro counties.

* Trends were assessed after excluding colorectal cancer which has declined due to screening programs to detect pre-cancerous polyps.

Alcohol-Associated Cancer Incidence Rates by Border/Non-Border Status



Incidence Rates (2013–2017)

- For Hispanics, the incidence rate for alcohol-associated cancers was significantly higher in border counties compared to the rest of Texas.
- Rates were significantly higher in non-border counties for non-Hispanic white, NH black and NH Asian/Pacific Islander groups.

10-year Trends (2008–2017)*

- In NH whites, rates remained stable in both border and non-border counties.
- In Hispanics, rates increased only in border counties (0.9% average annual percent change).

NH = Non-Hispanic; A/PI = Asian/Pacific Islander. Rates for non-Hispanic American Indian/Alaska Native are suppressed because fewer than 16 cases were reported for border counties. Border counties as defined by the La Paz agreement (see slide Texas Border Region).
*Trends were assessed after excluding colorectal cancer which has declined due to screening programs to detect pre-cancerous polyps.

Alcohol-Associated Cancers, 2008–2017

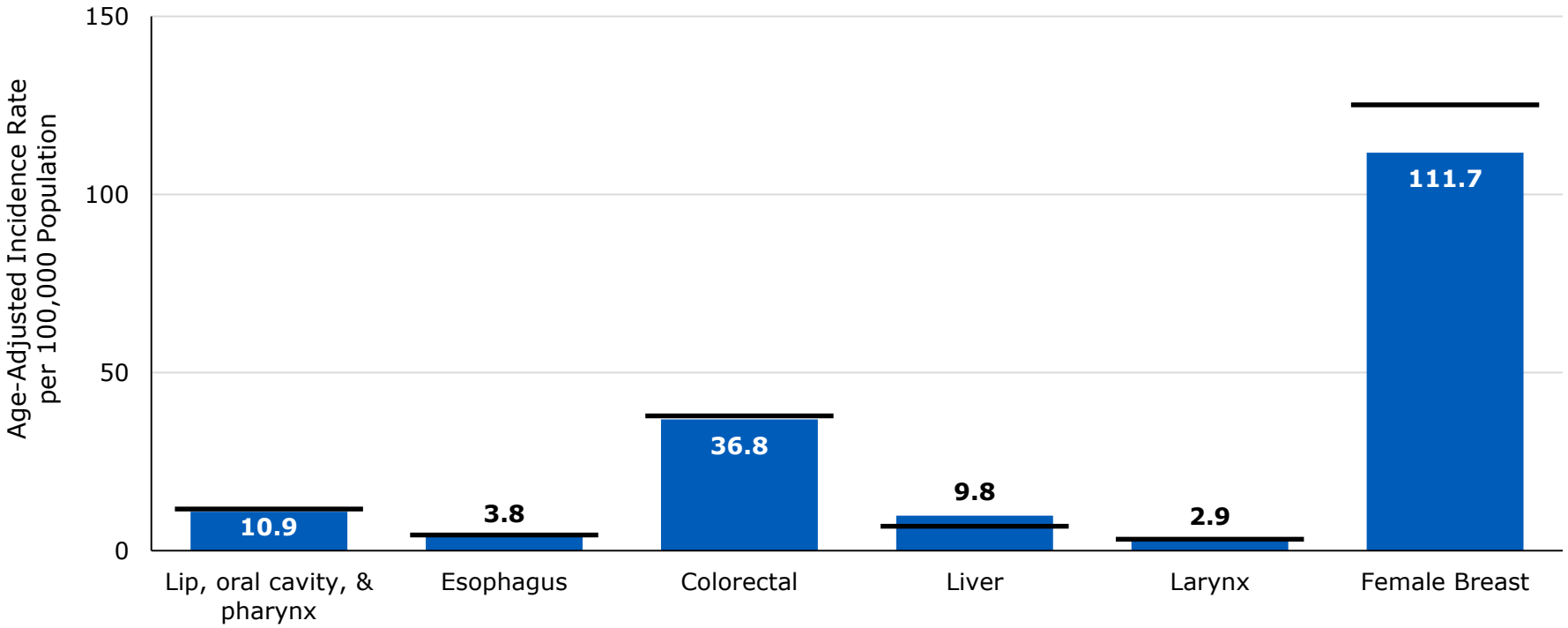
Rates & Trends for Specific Cancer Sites — Texas vs US

Alcohol-Associated Cancer Incidence Rates by Site

- Incidence rates of most alcohol-associated cancer sites were lower or similar in Texas compared to the US.
- However, liver cancer incidence rates were significantly higher in Texas compared to the US average.

Alcohol-Associated Cancers by Site, Texas, 2013–2017

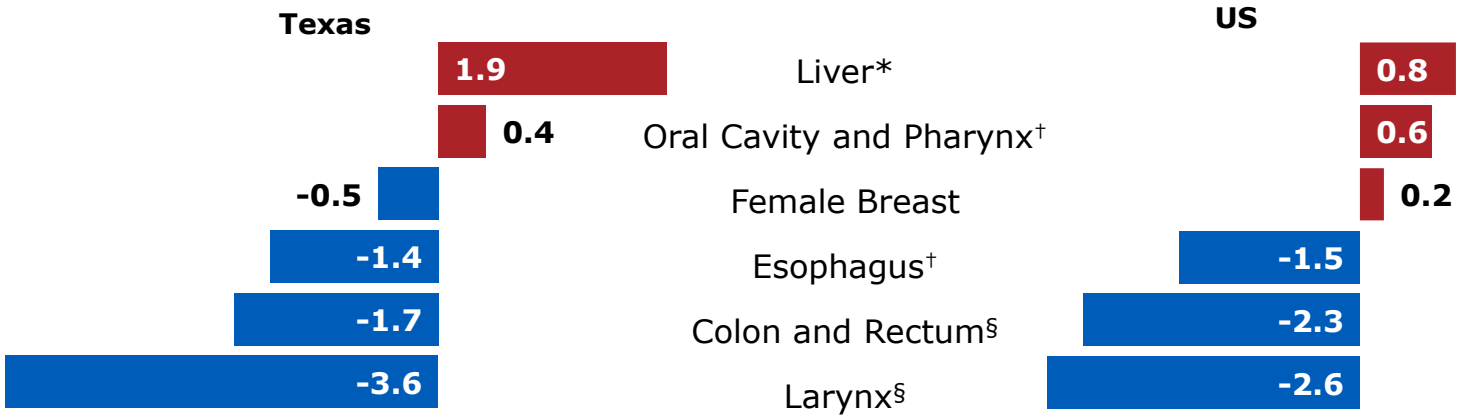
Black lines represent US incidence rates



Incidence Rate Trends for Alcohol-Associated Cancers by Site

- In Texas, liver cancer incidence rates significantly increased from 2008–2017. During the same period, colorectal cancer and larynx cancer rates significantly decreased.
- By comparison, national liver cancer rates remained stable from 2008–2017.

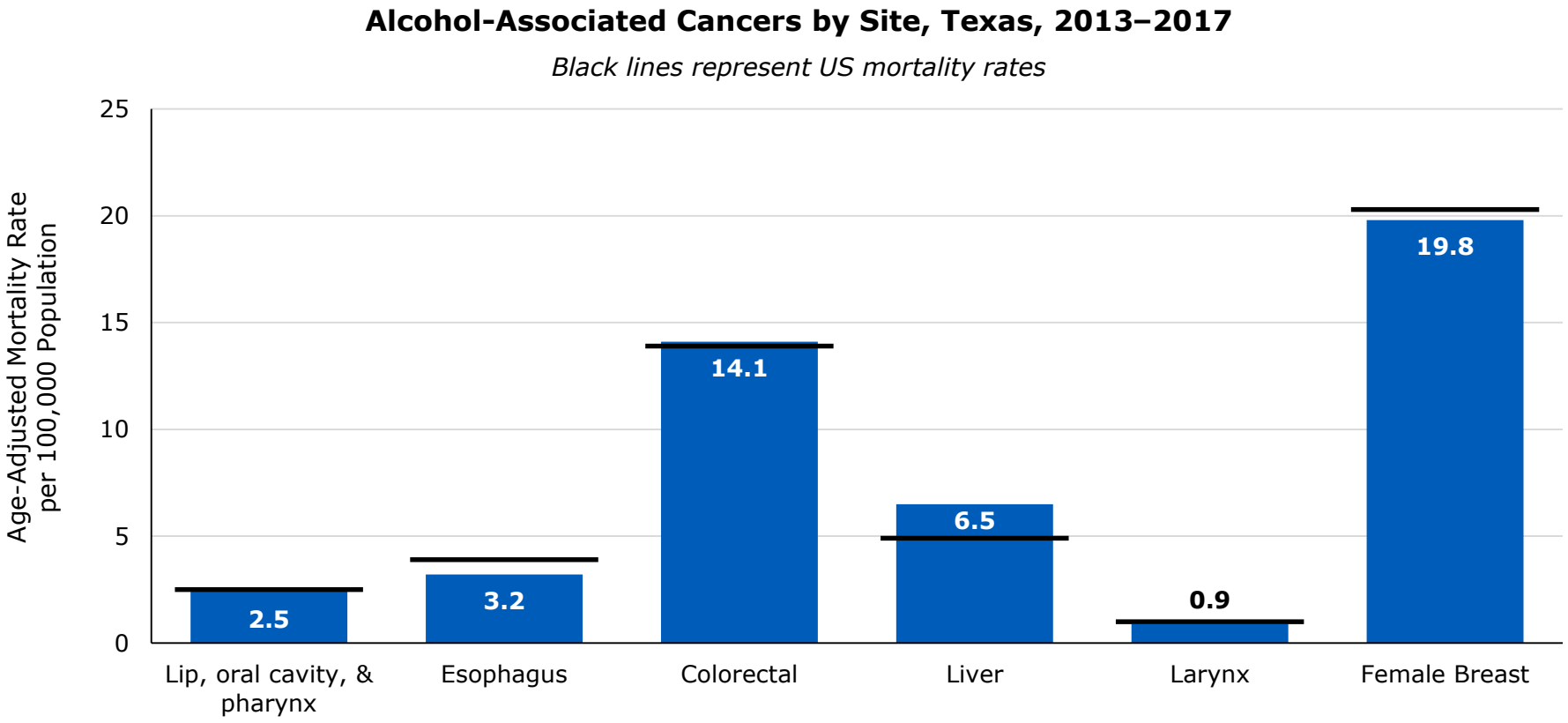
Annual Average Percent Change of Incidence Rates, Texas vs US, 2013-17



* Annual average percent change was significantly different than 0 in Texas.
† Annual average percent change was significantly different than 0 in the US.
§ Annual average percent change was significantly different than 0 in Texas and the US

Alcohol-Associated Cancer Mortality Rates by Site

- Liver cancer mortality rates were higher in Texas than the US from 2013–2017.
- Mortality rates for other alcohol-associated sites were similar to the national average.



Alcohol-Associated Cancers, 2008–2017

Rates & Trends for Select Cancer Sites in Texas

Oral Cavity and Pharynx Cancer

- Oral cavity and pharynx cancer is the 10th most commonly diagnosed cancer in Texas males with 3,464 new cases and 782 deaths expected in 2020.
- As of January 1, 2017, there were 21,995 Texans living with oral cavity and pharynx cancer*.
- Overall 5-year survival in Texas is 65.3%.
- 41% of cases are estimated to be attributable to alcohol – the highest proportion out of any of the 6 cancer sites associated with alcohol use.[1]
- The relative risk of oral cavity and pharynx cancer varies based on how much alcohol is used. [2]

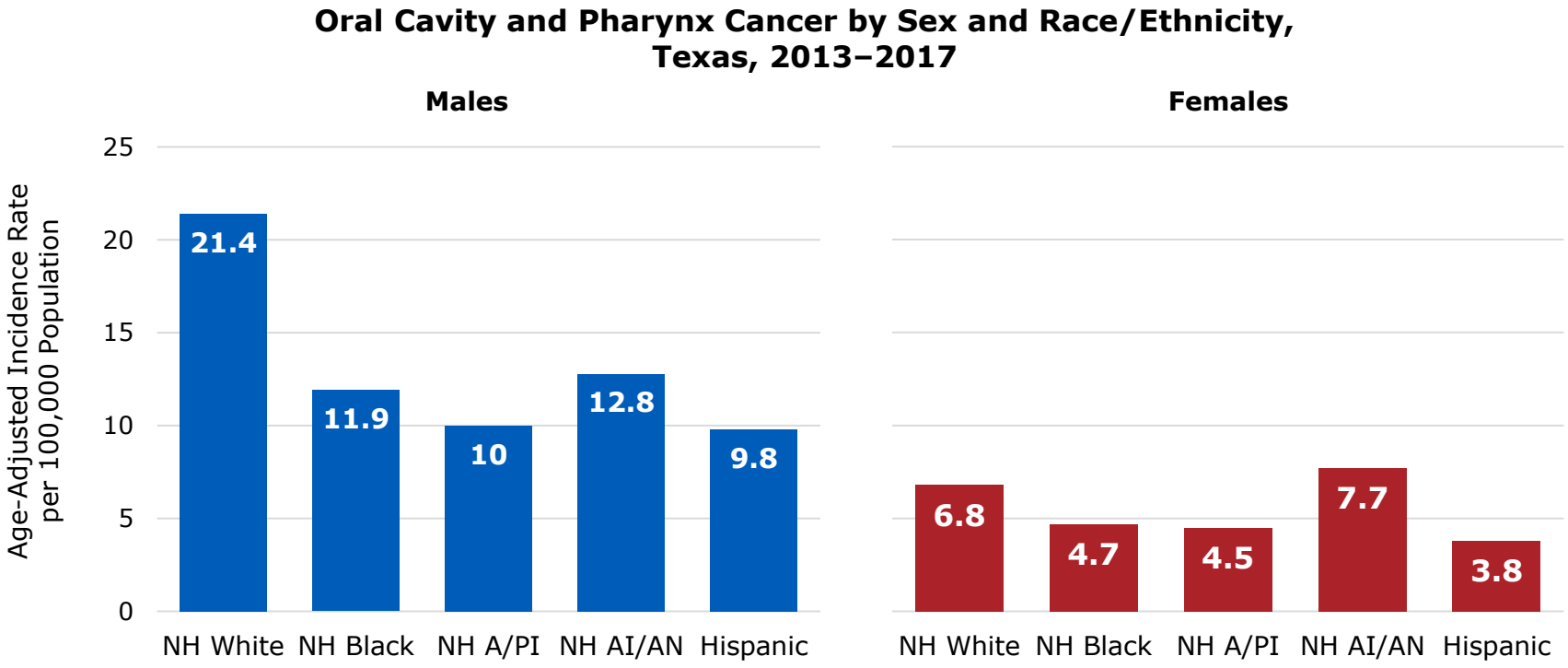
Amount of Alcohol Consumed Per Day†	Relative Risk Increase Compared to Nondrinkers and Occasional Drinkers
12.6-50 grams	100%
More than 50 grams	400%

- The risk is higher if tobacco is also used.[3]

[1] Islami et al. CA Cancer J Clin. 2018;68(1):31-54.
[2] Bagnardi et al. Br J Cancer. 2015;112(3):580-593.
[3] Hashibe et al. Cancer Epidemiol Biomarkers Prev. 2009;18(2):541-550.
* The most recent date for which prevalence data are available, includes all cases diagnosed since 1995.
† In the US, one serving is considered to be 14 grams of alcohol.

Oral Cavity and Pharynx Cancer Incidence Rates by Sex and Race/Ethnicity

- For 2013–2017, oral cavity and pharynx cancer incidence rates were highest in non-Hispanic white males.
- From 2008-2017, incidence rates increased for NH white males (1.3% average annual percent change).

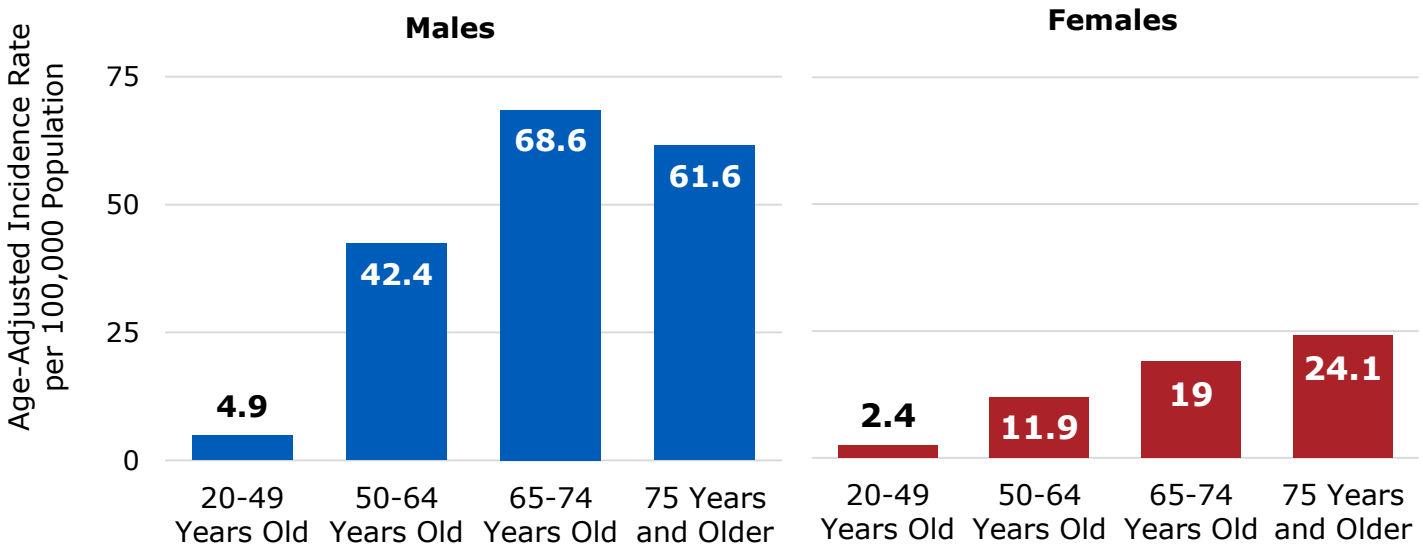


NH = Non-Hispanic; A/PI = Asian/Pacific Islander; AI/AN = American Indian/Alaska Native.

Oral Cavity and Pharynx Cancer Incidence Rates by Sex and Age at Diagnosis

- In males, oral cavity and pharynx cancer incidence rates peaked in ages 65–74 years old from 2013–2017. In women, the rates increased with each age group.
- From 2008–2017, incidence rates significantly increased in males ages 65–74 years old (2.2% average annual percent change) and ages 75 years and older (1.2% AAPC). They significantly decreased in males ages 20–49 years old (-1.7% AAPC). Rates were stable for all other groups.

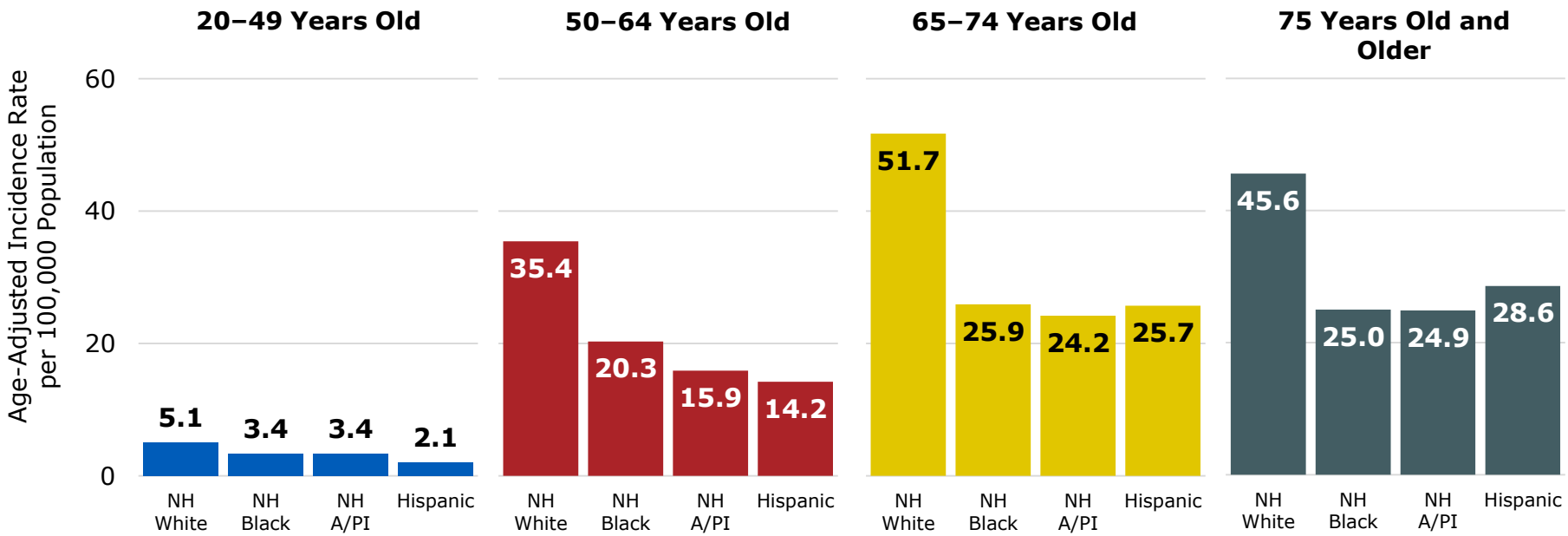
Oral Cavity and Pharynx Cancer by Sex and Age at Diagnosis, Texas, 2013–2017



Oral Cavity and Pharynx Cancer Incidence Rate by Age at Diagnosis and Race/Ethnicity

- From 2013-2017, oral cavity and pharynx incidence rates were highest for non-Hispanic whites across all ages.
- For ages 20-49 years and 50-64 years, incidence rates were lowest for Hispanics. However, by age 75 years and over, Hispanics had the second highest incidence rate.

Oral Cavity and Pharynx Cancer by Age at Diagnosis and Race/Ethnicity, Texas, 2013–2017

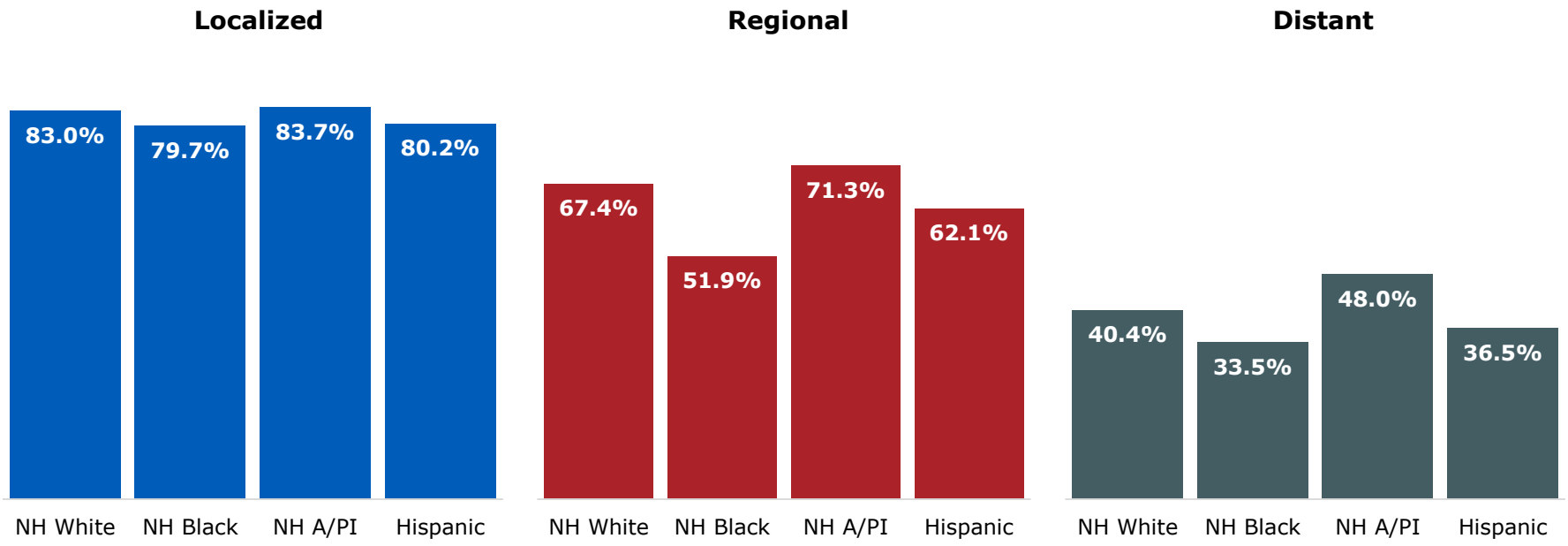


Rates for NH American Indian/Alaska Native are suppressed because fewer than 16 cases were reported for each age group.
NH = Non-Hispanic; A/PI = Asian/Pacific Islander.

Five-Year Relative Survival for Oral Cavity and Pharynx Cancer by Stage and Race/Ethnicity

- Overall survival was 83% for patients diagnosed at the localized stage, 66% for those diagnosed at the regional stage, and 39% for those diagnosed at the distant stage.
- Survival was lowest for non-Hispanic blacks compared to other race/ethnicity groups for tumors diagnosed at the regional or distant stage.

Five-Year Relative Survival for Oral Cavity & Pharynx Cancer by Stage and Race/Ethnicity, Texas, 2008–2017



Cases diagnosed between 2008–2017 are included, with follow-up through 2018. 14% of oral cavity & pharynx cancer cases were reported to TCR with an unknown stage.
NH = Non-Hispanic; A/PI = Asian/Pacific Islander; AI/AN = American Indian/Alaska Native. Rates for NH American Indian/Alaska Native are suppressed because fewer than 16 cases were reported for some stage groups.
Expected survival table: US by SES/geography/race (NHW, NHB, NHAIAN, NHAPI, HISP) 1992-2013, Ages 0-99, State-county.

Esophageal Cancer

- Esophageal cancer is the 10th most common cancer cause of death in Texas males with 1,245 new cases and 986 deaths expected in Texas in 2020.
- As of January 1, 2017, there were 2,970 Texans living with esophageal cancer.*
- Overall 5-year survival is 22.1%.
- 21% of esophageal cancer cases are estimated to be attributed to alcohol.[1]
- The relative risk of esophageal cancer varies based on how much alcohol is consumed.[2]

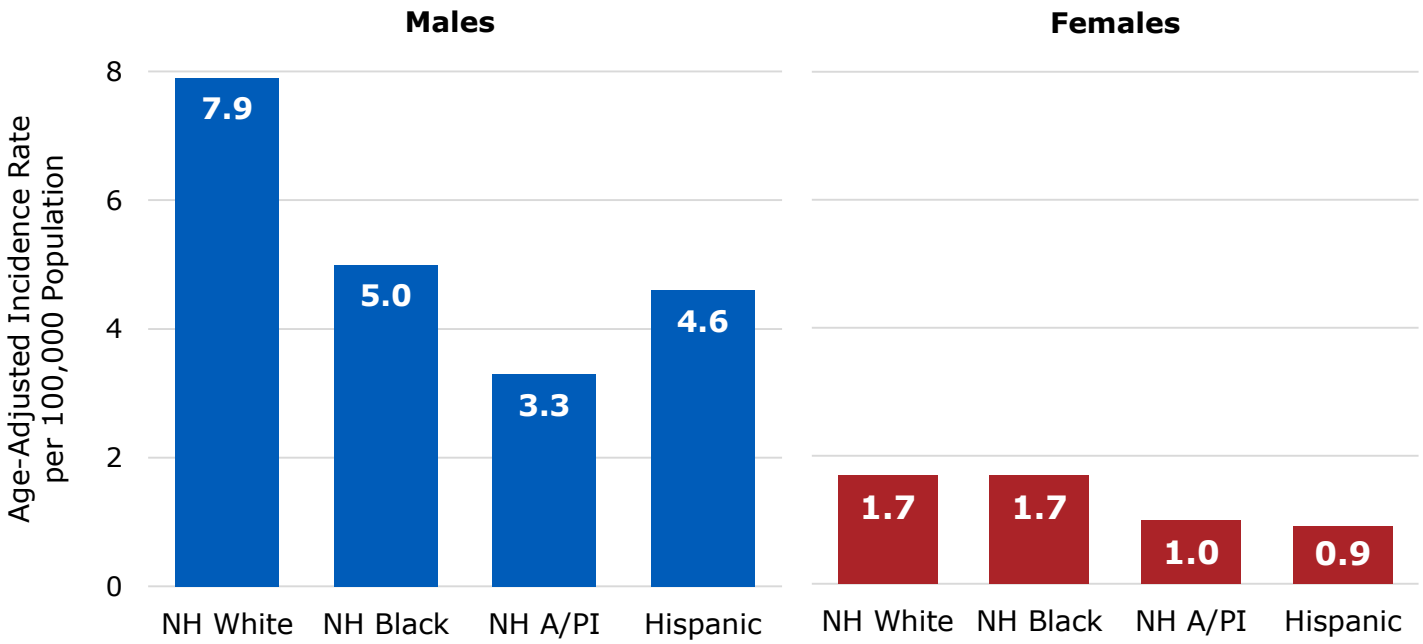
Amount of Alcohol Consumed Per Day†	Relative Risk Increase Compared to Nondrinkers and Occasional Drinkers
12.5 grams or less	30%
12.6-50 grams	120%
More than 50 grams	400%

[1] Islami et al. CA Cancer J Clin. 2018;68(1):31-54.
[2] Bagnardi et al. Br J Cancer. 2015;112(3):580-593.
* The most recent date for which prevalence data are available, includes all cases diagnosed since 1995.
† In the US, one serving is considered to be 14 grams of alcohol.

Esophageal Cancer Incidence Rates by Sex and Race/Ethnicity

- For 2013–2017, the esophageal cancer incidence rate was highest in non-Hispanic white males.
- NH black males were the only group with a significant decrease (-6.7% average annual percent change) in incidence rates from 2008–2017. Rates were stable for all other groups.

Esophageal Cancer by Sex and Race/Ethnicity, Texas, 2013–2017

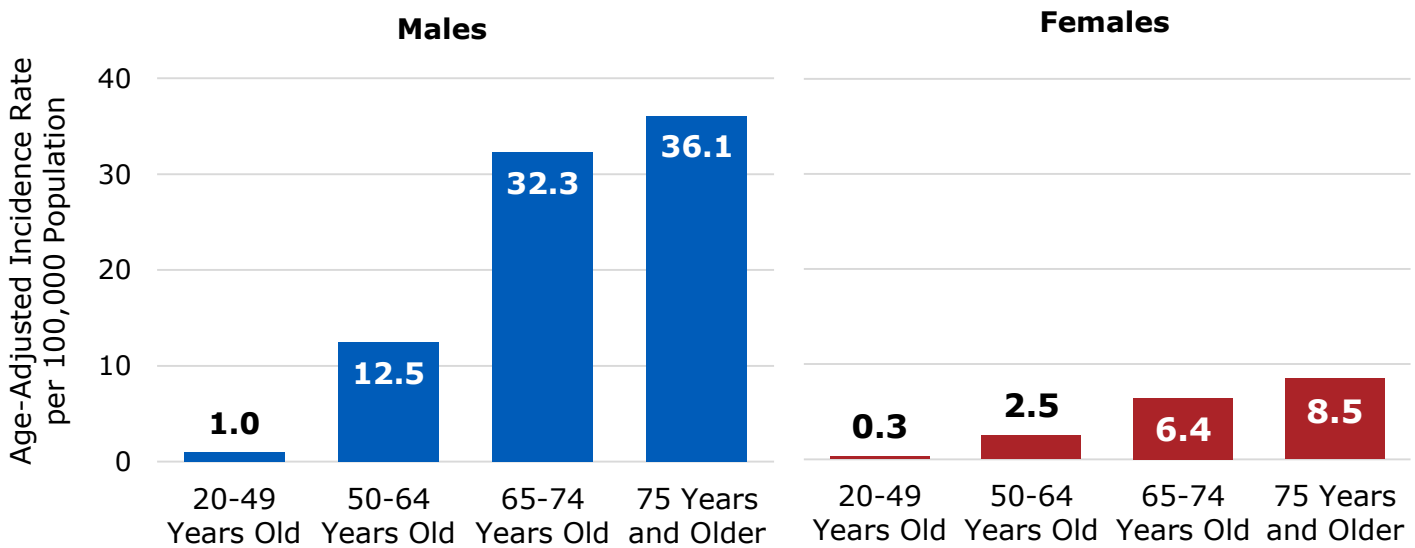


Rates for NH American Indian/Alaska Native are suppressed because fewer than 16 cases were reported for each sex.
NH = Non-Hispanic; A/PI = Asian/Pacific Islander.

Esophageal Cancer Incidence Rates by Sex and Age at Diagnosis

- In both males and females, esophageal cancer rates increased with each age group.
- From 2008–2017, incidence rates significantly decreased in males ages 50–64 years old (-1.8% average annual percent change) and ages 75 years and older (-1.9% AAPC). Rates were stable for all other groups.

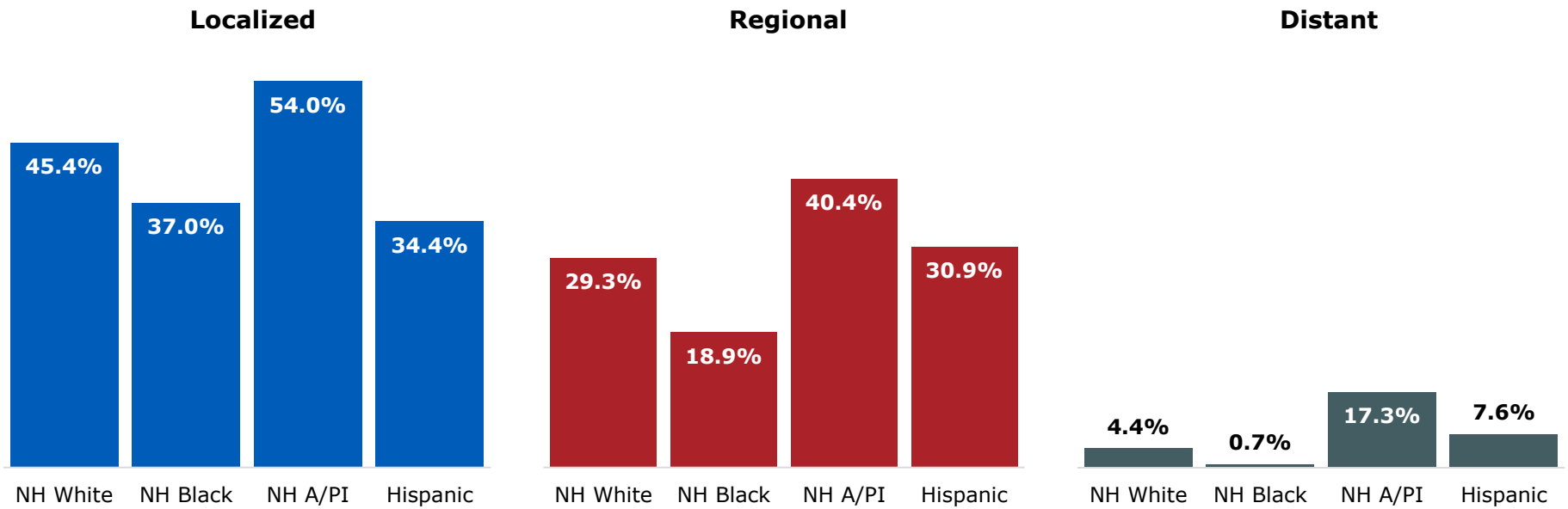
Esophageal Cancer by Sex and Age at Diagnosis, Texas, 2013–2017



Five-Year Relative Survival for Esophageal Cancer by Stage and Race/Ethnicity

- Overall survival was 43% for patients diagnosed at the localized stage, 29% for those diagnosed at the regional stage, and 5% for those diagnosed at the distant stage.
- For those diagnosed at the localized stage, survival was lowest for Hispanics. Survival was lowest for non-Hispanic blacks compared to other race/ethnicity groups for tumors diagnosed at the regional or distant stage.

Five-Year Relative Survival for Esophageal Cancer by Stage and Race/Ethnicity, Texas, 2008–2017



Cases diagnosed between 2008–2017 are included, with follow-up through 2018. 21% of esophageal cancer cases were reported to TCR with an unknown stage.
NH = Non-Hispanic; A/PI = Asian/Pacific Islander; AI/AN = American Indian/Alaska Native. Rates for NH American Indian/Alaska Native are suppressed because fewer than 16 cases were reported by stage.
Expected survival table: US by SES/geography/race (NHW, NHB, NHAIAN, NHAPI, HISP) 1992-2013, Ages 0-99, State-county.

Colorectal Cancer

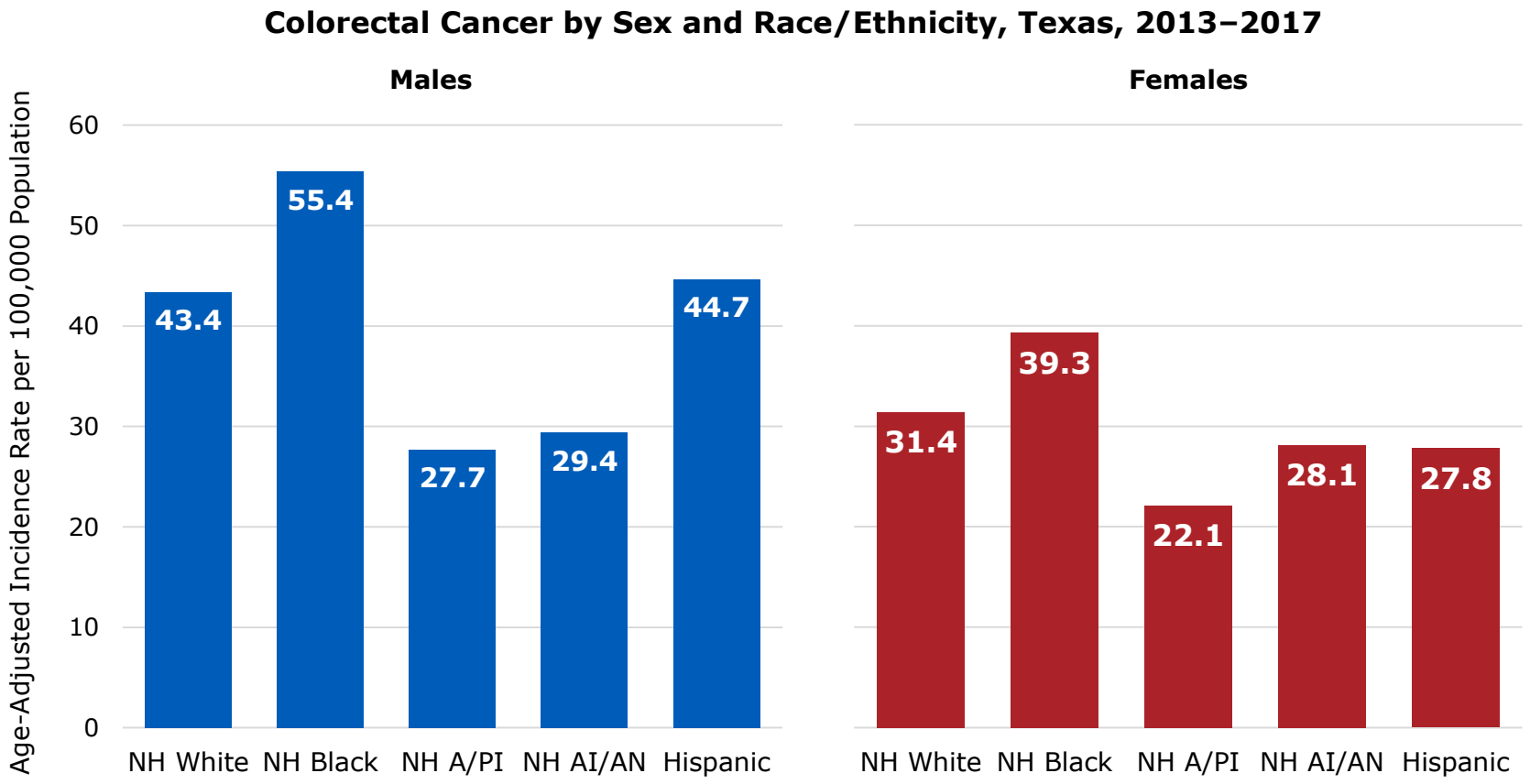
- In Texas, colorectal cancer is the 3rd most common type of cancer diagnosed in males and females. It's the 3rd leading cause of cancer death in both sexes.
- 11,632 new cases and 4,276 deaths are expected in 2020.
- As of January 1, 2017, there were 79,544 Texans living with colorectal cancer.
- Overall 5-year survival is 64.1%.
- 13% of colorectal cancer cases are estimated to be attributed to alcohol.[1]
- The relative risk of colorectal cancer varies based on how much alcohol is consumed.[2]

Amount of Alcohol Consumed Per Day†	Relative Risk Increase Compared to Nondrinkers and Occasional Drinkers
12.6-50 grams	20%
More than 50 grams	30%

[1] Islami et al. CA Cancer J Clin. 2018;68(1):31-54.
[2] Bagnardi et al. Br J Cancer. 2015;112(3):580-593.
* The most recent date for which prevalence data are available, includes all cases diagnosed since 1995.
† In the US, one serving is considered to be 14 grams of alcohol.

Colorectal Cancer Incidence Rates by Sex and Race/Ethnicity

For 2013–2017, colorectal cancer incidence rates were highest in non-Hispanic black males, followed by Hispanic males and NH white males.

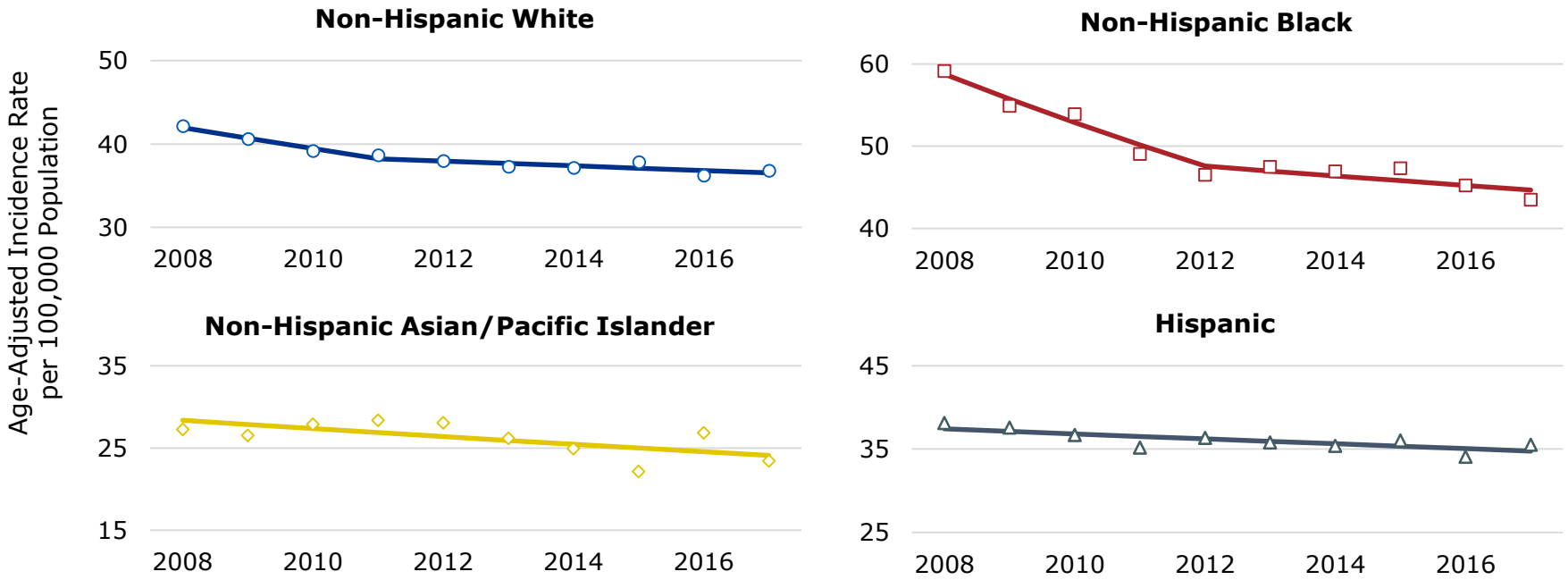


NH = Non-Hispanic; A/PI = Asian/Pacific Islander; AI/AN = American Indian/Alaska Native.

Colorectal Cancer Incidence Rate Trends by Race/Ethnicity

- Overall, incidence rates for colorectal cancer significantly decreased from 2008–2017 (-1.7% average annual percent change), with a similar trend in both sexes. Rates decreased faster from 2008-2011 (-3.2% annual percent change) compared to 2011–2017 (-1.0% APC).
- Incidence rates decreased significantly for non-Hispanic white (-1.5 AAPC), NH black (-3.0 AAPC), NH Asian/Pacific Islander (-1.8 AAPC) and Hispanic (-0.8 AAPC). Rates were stable for NH American Indian/Alaska Native (not shown).

Colorectal Cancer by Race/Ethnicity, Texas, 2008–2017

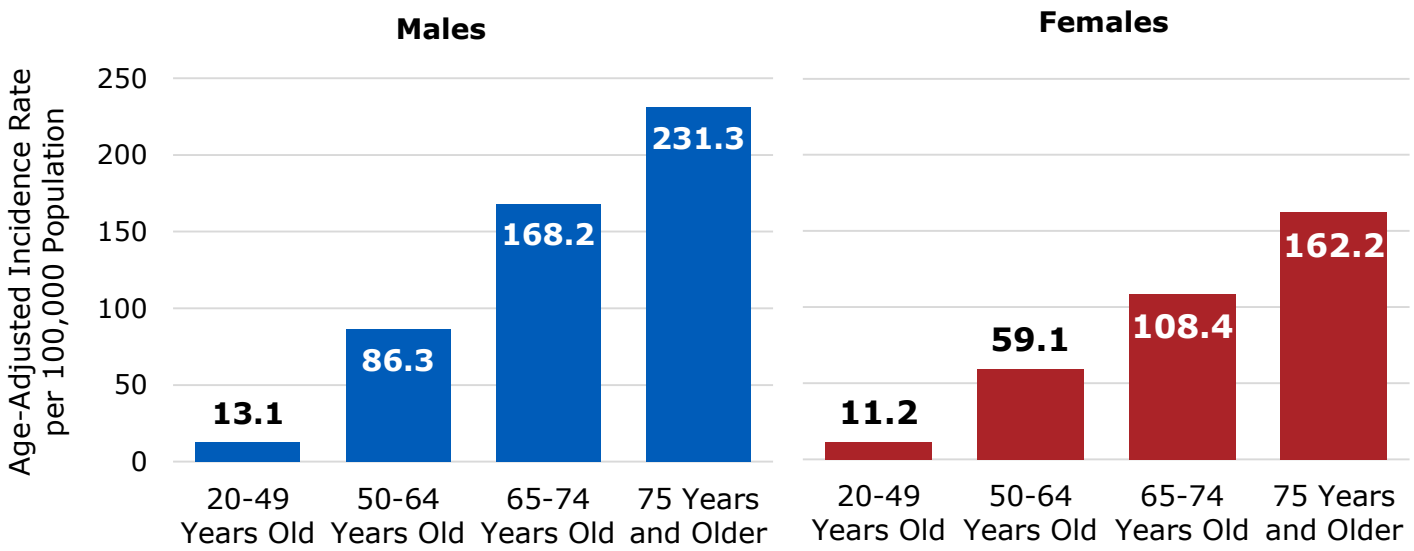


Lines represent the Joinpoint modeled trend, and points represent observed data.

Colorectal Cancer Incidence Rates by Sex and Age at Diagnosis

- In both males and females, colorectal cancer rates increased with each age group.
- From 2008–2017, incidence rates significantly decreased in males ages 50–64 years old (-1.8 average annual percent change) and ages 75 years and older (-1.9 AAPC). Rates were stable for all other groups.

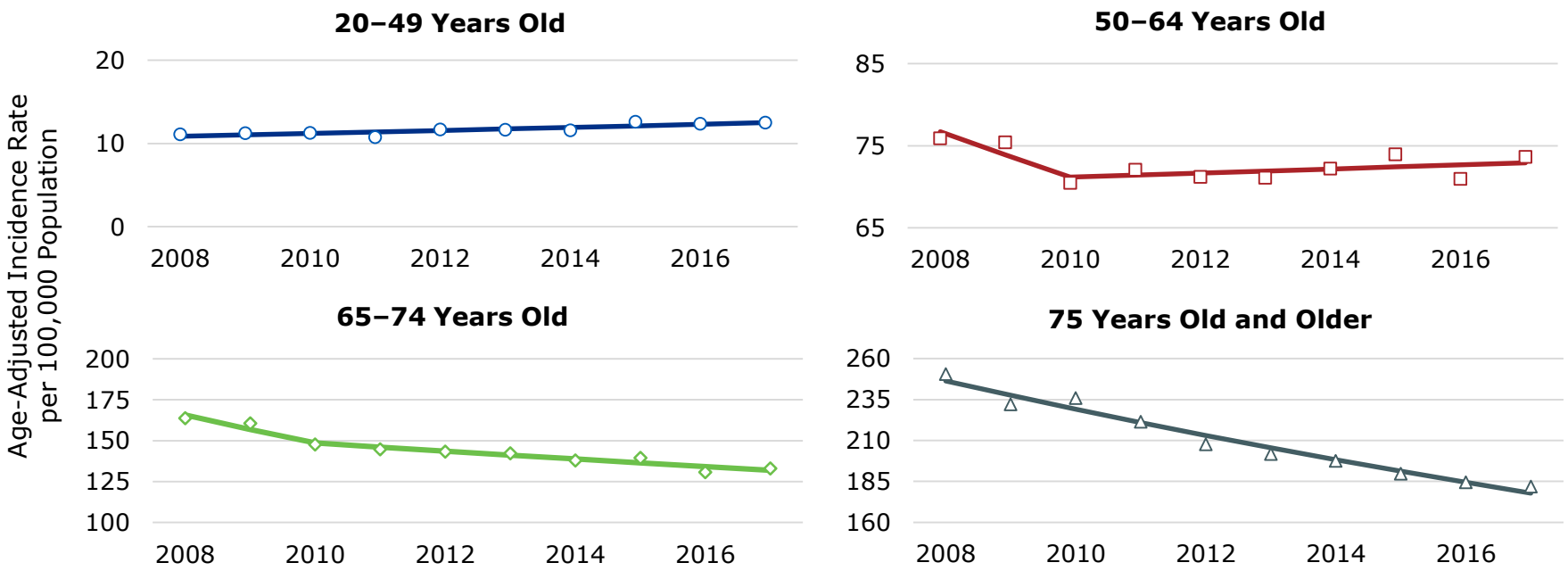
Colorectal Cancer by Sex and Age at Diagnosis, Texas, 2013–2017



Colorectal Cancer Incidence Rate Trends by Age at Diagnosis

- One age group saw a significant increase in incidence rates: ages 20–49 years (1.6% average annual percent change.)
- Overall, rates remained stable for ages 50–64 years over the ten-year period.
- Rates declined for ages 65–74 years (-2.5% AAPC) and for ages 75 years and older (-3.6% AAPC).

Colorectal Cancer by Age at Diagnosis, Texas, 2008–2017

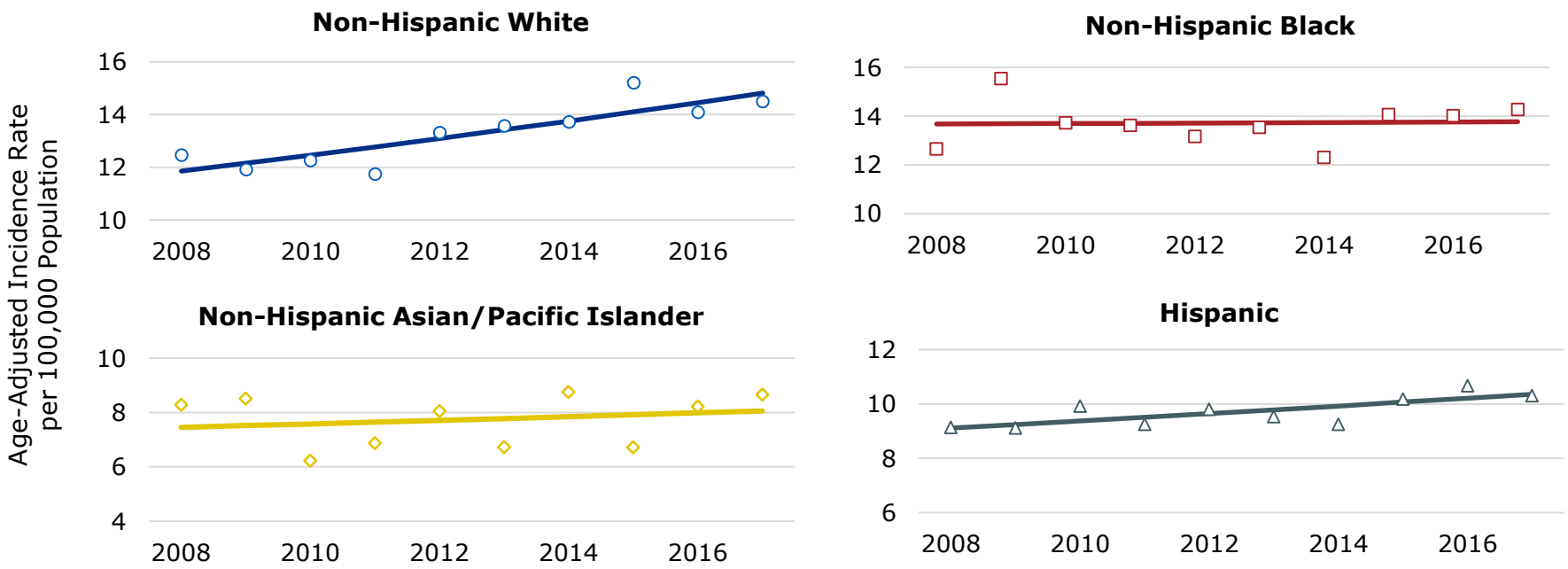


Lines represent the Joinpoint modeled trend, and points represent observed data.

Colorectal Cancer Incidence Rate Trends in Ages 20–49 Years by Race/Ethnicity

- The fastest rate of increase in colorectal cancer incidence rates for ages 20–49 years old was in non-Hispanic whites, who saw a total increase of 16% over 10 years.
- Hispanics also saw a significant increase of 13% over 10 years.

Colorectal Cancer in Adults 20–49 Years Old by Race/Ethnicity, Texas, 2008–2017

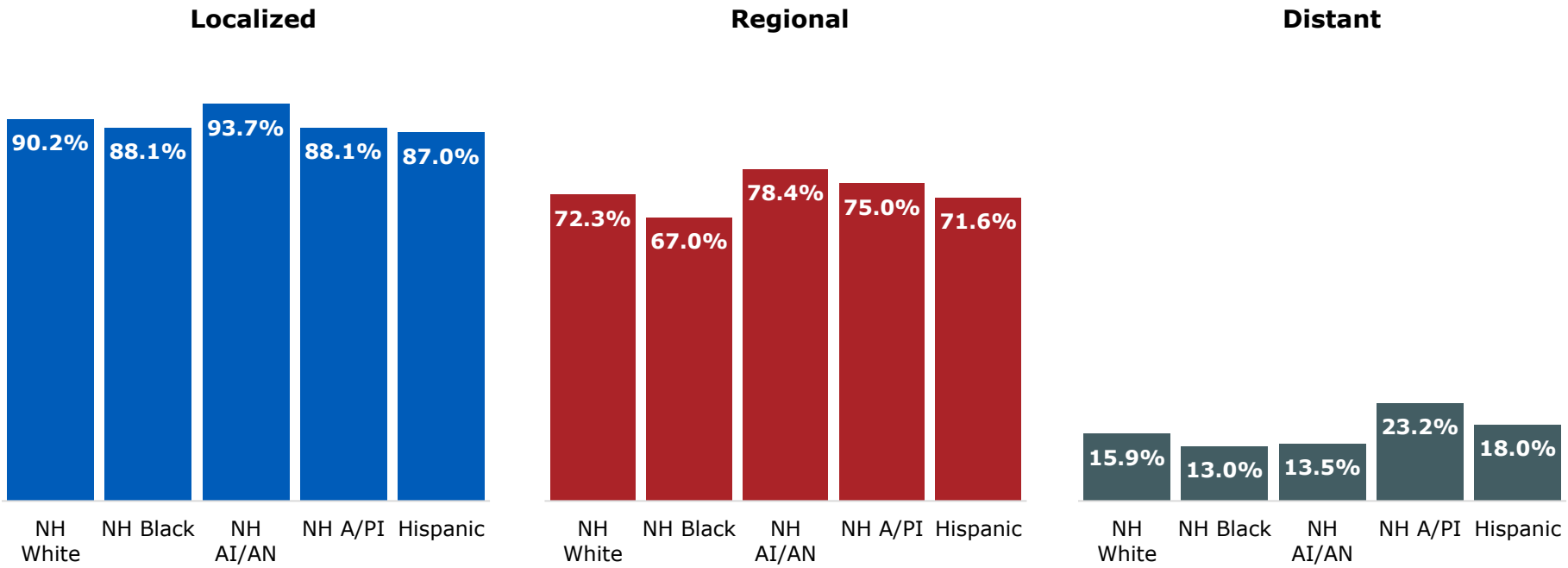


Rates for non-Hispanic American Indian/Alaska Native are suppressed because fewer than 16 cases were reported per year for this age group.
Lines represent the Joinpoint modeled trend, and points represent observed data.

Five-Year Relative Survival for Colorectal Cancer by Stage and Race/Ethnicity

- Overall survival was 89% for patients diagnosed at the localized stage, 72% for those diagnosed at the regional stage, and 16% for those diagnosed at the distant stage.
- Survival was lower for non-Hispanic blacks compared to other race/ethnicity groups for those diagnosed at the regional and distant stage.

Five-Year Relative Survival for Colorectal Cancer by Stage and Race/Ethnicity, Texas, 2008–2017



Cases diagnosed between 2008–2017 are included, with follow-up through 2018. 10% of colorectal cancer cases were reported to TCR with an unknown stage.
NH = Non-Hispanic; A/PI = Asian/Pacific Islander; AI/AN = American Indian/Alaska Native.
Expected survival table: US by SES/geography/race (NHW, NHB, NHAIAN, NHAPI, HISP) 1992-2013, Ages 0-99, State-county.

Liver Cancer

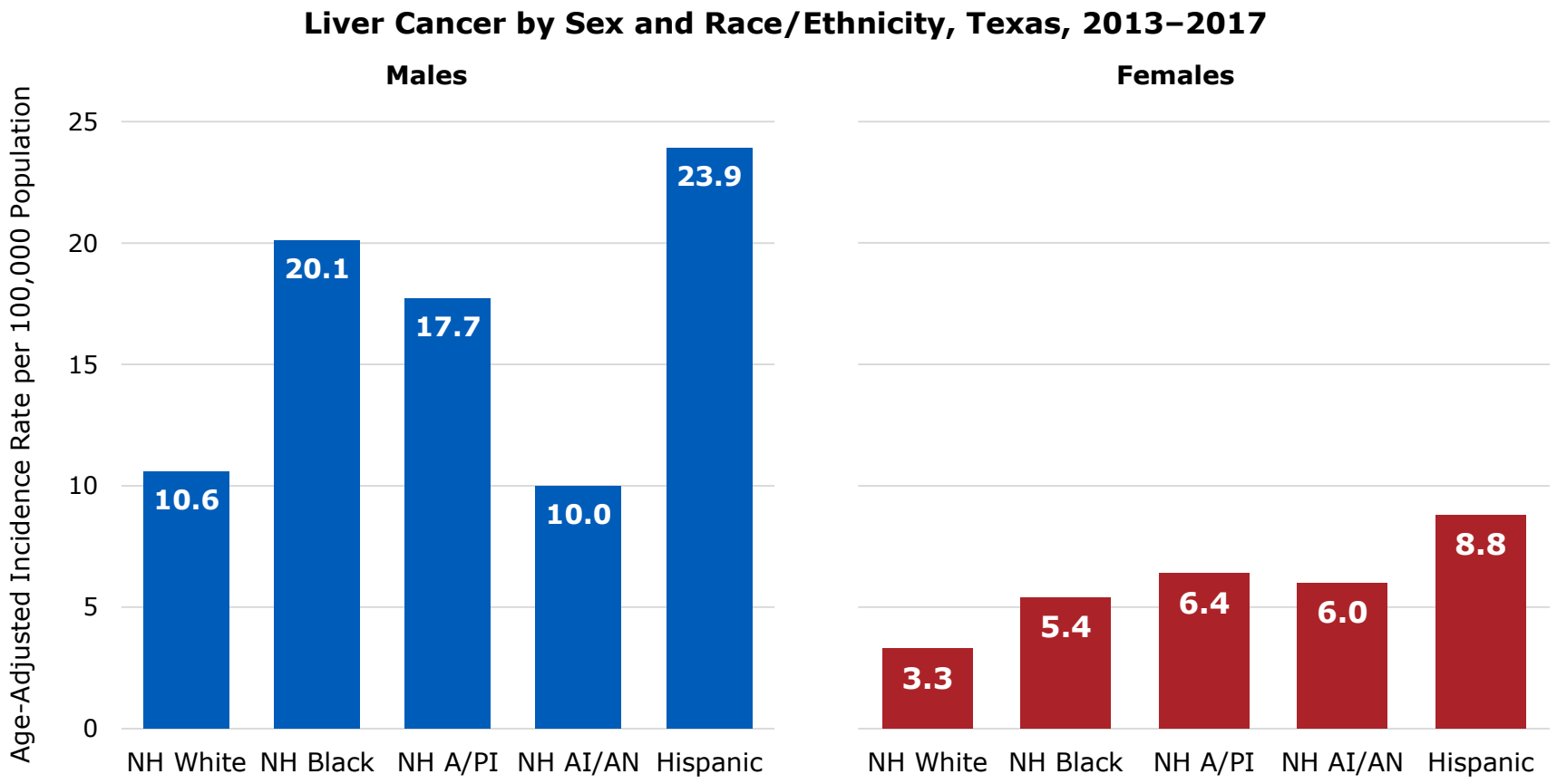
- In Texas males, liver± cancer is the 9th most commonly diagnosed cancer and 4th leading cause of cancer mortality.
- 3,958 new cases and 2,678 deaths are expected in 2020±.
- As of January 1, 2017, there are 7,548 Texans living with liver cancer.*±
- Overall 5-year relative survival is 20.2%.
- Alcohol is a primary cause of liver cancer with 22% of liver cancer cases estimated to be directly attributed to alcohol[1].
- The relative risk of liver cancer varies based on the person's sex and how much alcohol is consumed. [2]

Amount of Alcohol Consumed Per Day	Sex	Relative Risk Increase Compared to Nondrinkers and Occasional Drinkers
More than 50 grams	Male	60%
	Female	300%

[1] Islami et al. CA Cancer J Clin. 2018;68(1):31-54.
[2] Bagnardi et al. Br J Cancer. 2015;112(3):580-593.
± Includes intrahepatic bile duct cancer.
* The most recent date for which prevalence data are available, includes all cases diagnosed since 1995.
† In the US, one serving is considered to be 14 grams of alcohol.

Liver Cancer Incidence Rates by Sex and Race/Ethnicity

For 2013–2017, liver cancer incidence rates were highest in Hispanics in both males and females.

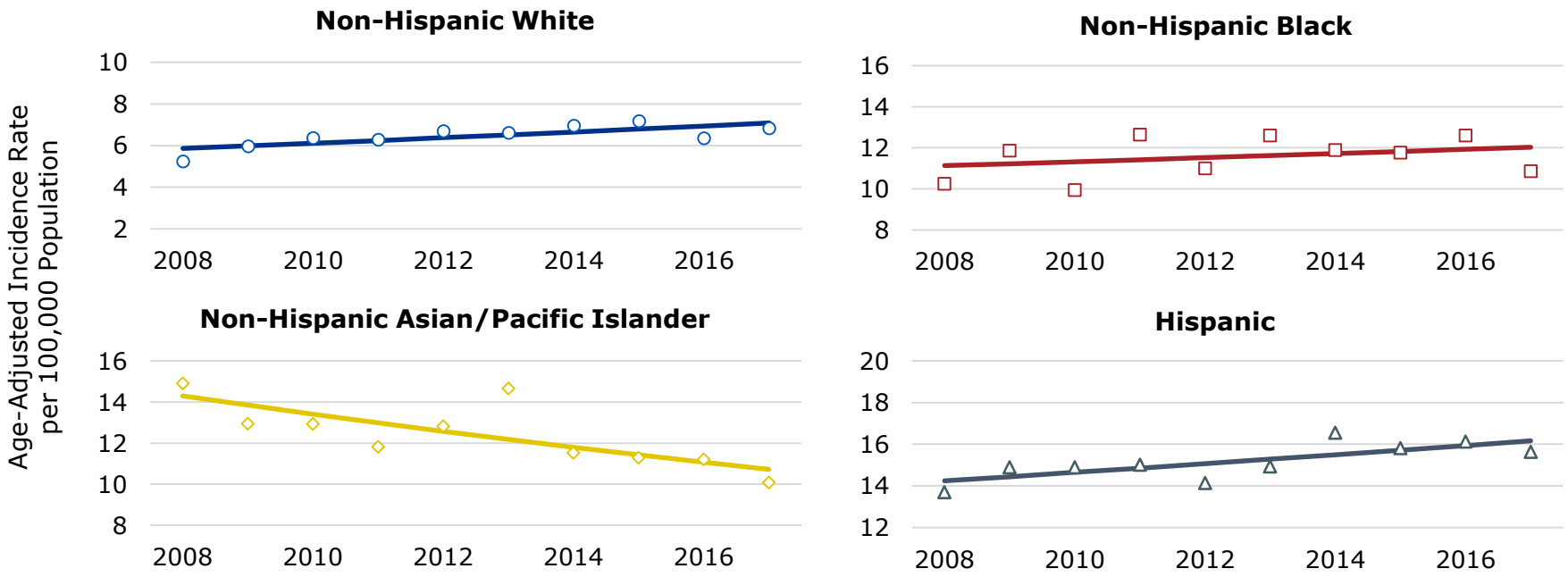


NH = Non-Hispanic; A/PI = Asian/Pacific Islander; AI/AN = American Indian/Alaska Native.

Liver Cancer Incidence Rate Trends by Race/Ethnicity

- Overall, the incidence rate of liver cancer increased by 1.9% per year from 2008–2017.
- The incidence rate significantly increased for two race/ethnicity groups: non-Hispanic white (2.1% average annual percent change) and Hispanic (1.4% AAPC).
- The incidence rate significantly decreased for NH Asian/Pacific Islander (-3.2% AAPC).

Liver Cancer by Race/Ethnicity, Texas, 2008–2017

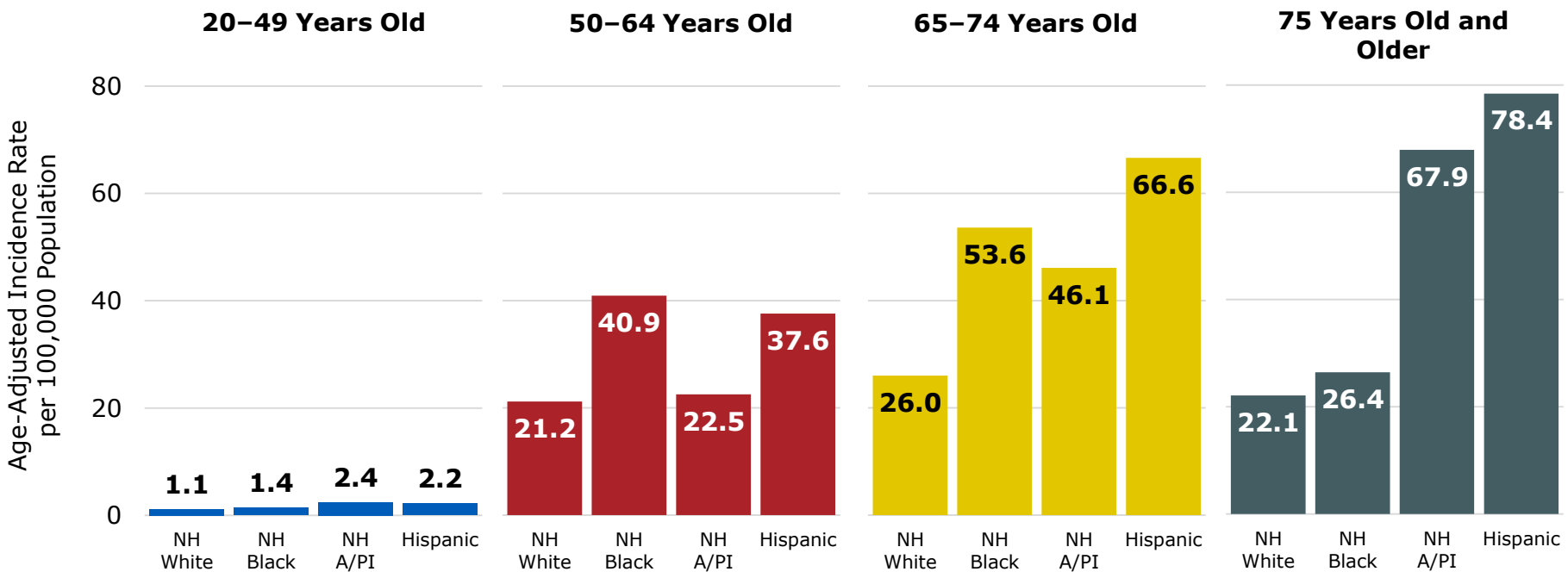


Lines represent the Joinpoint modeled trend, and points represent observed data.
Rates for NH American Indian/Alaska Native are suppressed because fewer than 16 cases were reported per year.

Liver Cancer Incidence Rates by Age at Diagnosis and Race/Ethnicity

During 2013–2017, incidence rates for liver cancer peaked at ages 65–74 years in non-Hispanic blacks and NH whites, but continued to increase with age in Hispanics and NH Asian/Pacific Islanders.

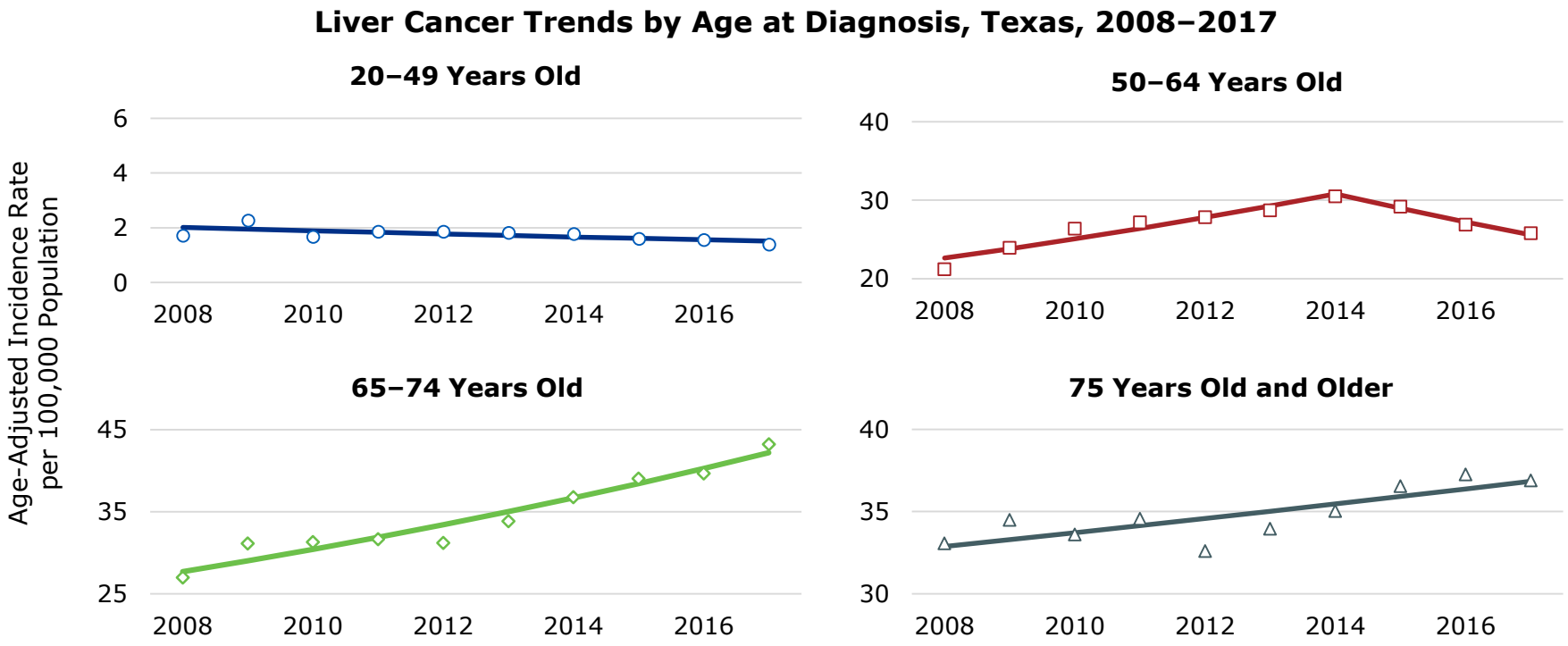
Liver Cancer by Age at Diagnosis and Race/Ethnicity, Texas, 2013–2017



Rates for NH American Indian/Alaska Native are suppressed because fewer than 16 cases were reported for each age group.
NH = Non-Hispanic; A/PI = Asian/Pacific Islander.

Liver Cancer Incidence Rate Trends by Age at Diagnosis

- The liver cancer incidence rate significantly decreased for ages 20–49 years (-3.1% average annual percent change). It increased significantly increased for ages 65–74 years (4.8% AAPC) and 75 years and older (1.3% AAPC).
- For ages 50–64 years, the overall rate was stable, but with an underlying increase from 2008-2014 followed by a decrease.

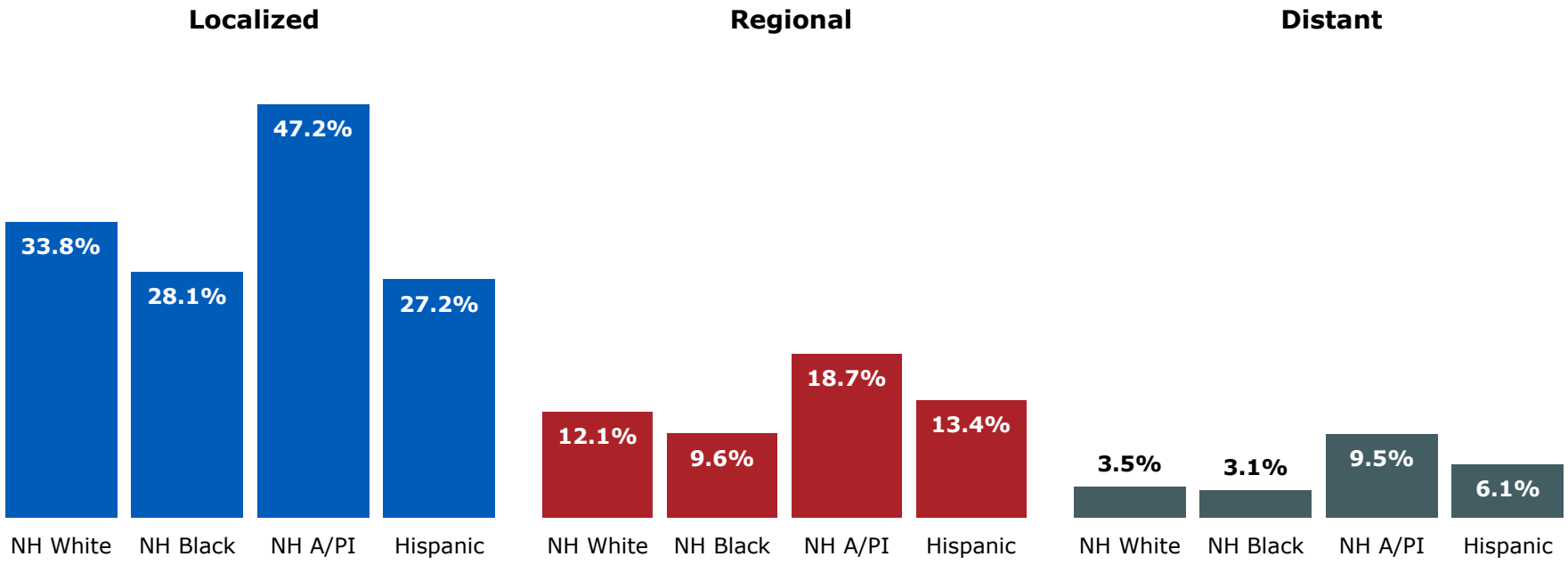


Lines represent the Joinpoint modeled trend, and points represent observed data.

Five-Year Relative Survival for Liver Cancer by Stage and Race/Ethnicity

Overall, survival was 31% for those diagnosed at the localized stage, 12.5% for those diagnosed at the regional stage, and 4.8% for those diagnosed at the distant stage.

Five-Year Relative Survival for Liver Cancer by Stage and Race/Ethnicity, Texas, 2008–2017



Cases diagnosed between 2008–2017 are included, with follow-up through 2018. 18% of liver cancer cases were reported to TCR with an unknown stage. NH = Non-Hispanic; A/PI = Asian/Pacific Islander; AI/AN = American Indian/Alaska Native. Rates for NH American Indian/Alaska Native are suppressed because fewer than 16 cases were reported for each stage.
Expected survival table: US by SES/geography/race (NHW, NHB, NHAIAN, NHAPI, HISP) 1992-2013, Ages 0-99, State-county.

Larynx Cancer

- In Texas, 955 new cases of larynx cancer and 293 deaths are expected in 2020.
- As of January 1, 2017, there are 6,268 Texans living with larynx cancer.*
- Overall 5-year relative survival in Texas is 59.2%.
- 23% of larynx cancer cases are estimated to be attributed to alcohol.[1]
- The relative risk of larynx cancer varies based on how much alcohol is consumed.[2]

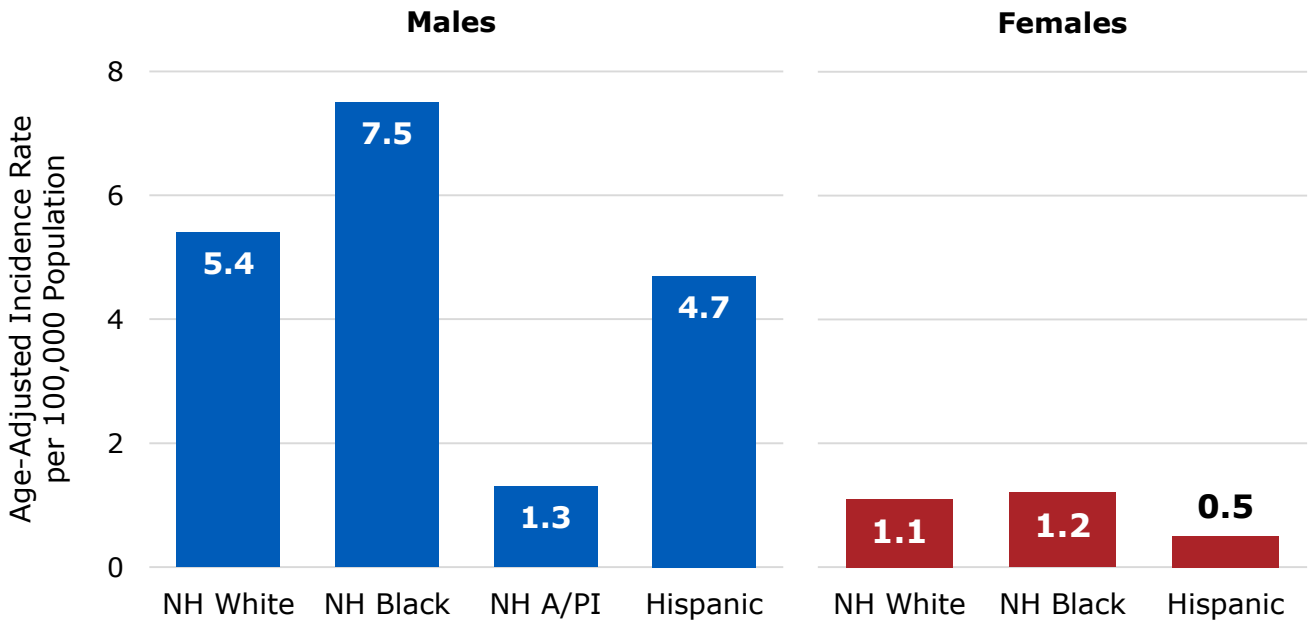
Amount of Alcohol Consumed Per Day†	Relative Risk Increase Compared to Nondrinkers and Occasional Drinkers
12.6-50 grams	50%
More than 50 grams	200%

[1] Islami et al. CA Cancer J Clin. 2018;68(1):31-54.
[2] Bagnardi et al. Br J Cancer. 2015;112(3):580-593.
* The most recent date for which prevalence data are available, includes all cases diagnosed since 1995.
† In the US, one serving is considered to be 14 grams of alcohol.

Larynx Cancer Incidence Rates by Sex and Race/Ethnicity

- The larynx cancer incidence rate was highest in non-Hispanic black males for 2013-2017.
- From 2008-2017, incidence rates significantly decreased in all groups, except NH black females and Hispanic females which had stable rates. The largest decrease was in NH black males (-5.0% average annual percent change.)

Larynx Cancer by Sex and Race/Ethnicity, Texas, 2013–2017

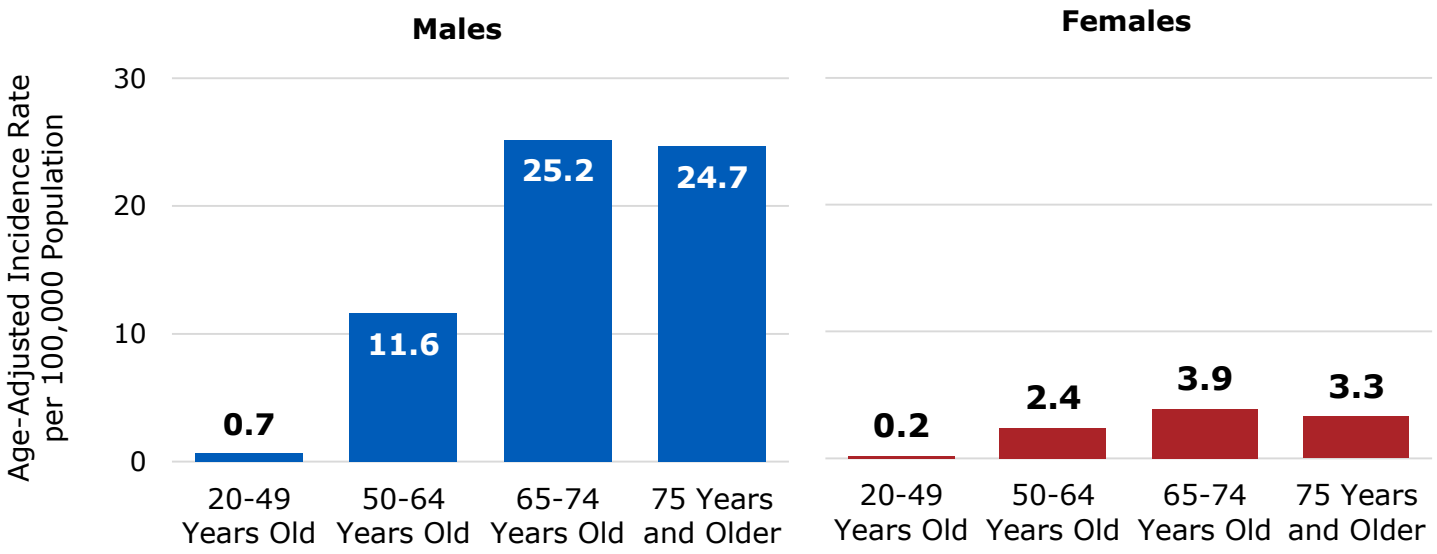


Rates for NH American Indian/Alaska Native and female Asian/Pacific Islander are suppressed because fewer than 16 cases were reported for each sex.
NH = Non-Hispanic; A/PI = Asian/Pacific Islander.

Larynx Cancer Incidence Rates by Sex and Age at Diagnosis

- For 2013–2017, the highest larynx cancer incidence rate was in males ages 65–74 years.
- All male age groups saw significant decreases in incidence rates from 2008–2017. Females ages 50–64 years and 65–74 years also saw significant decreases. Rates were stable for other female age groups.

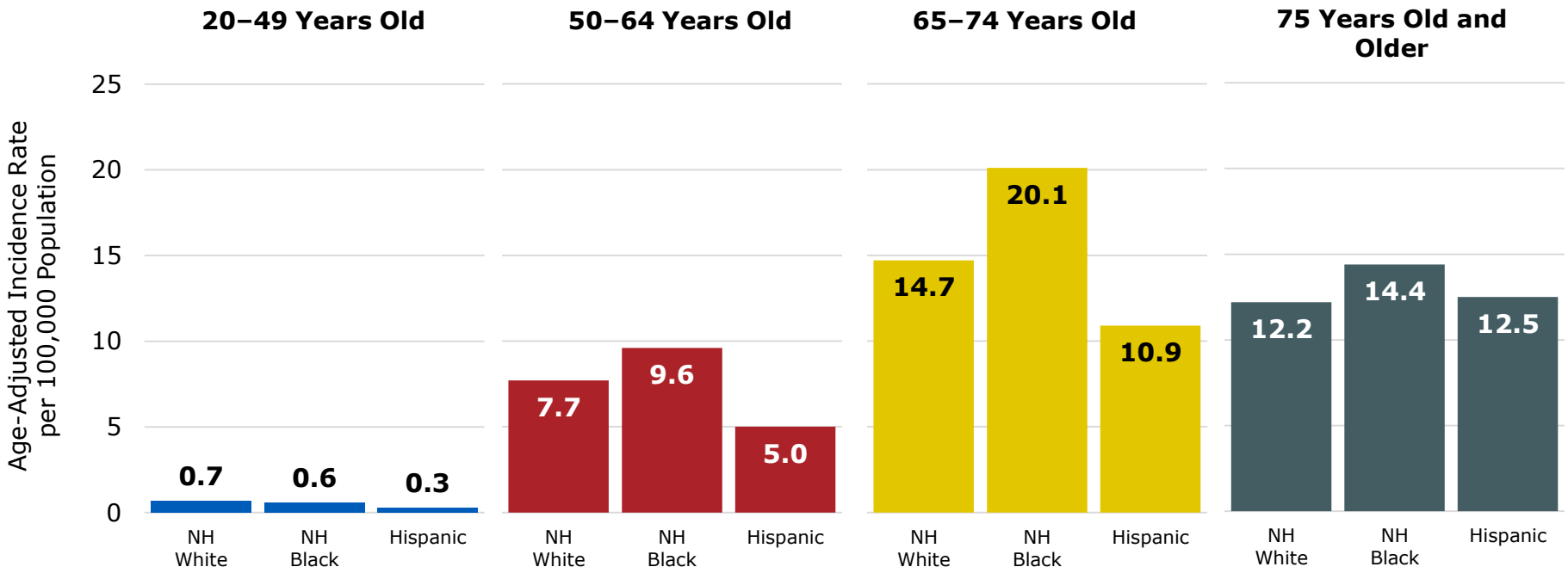
Larynx Cancer by Sex and Age at Diagnosis, Texas, 2013–2017



Larynx Cancer Incidence Rate by Age at Diagnosis and Race/Ethnicity

- During 2013–2017, incidence rates for larynx cancer peaked at ages 65–74 years in non-Hispanic blacks and NH whites, but continued to increase with age in Hispanics.
- The highest incidence rate was in NH blacks ages 65–74 years old.

Larynx Cancer by Age at Diagnosis and Race/Ethnicity, Texas, 2013–2017

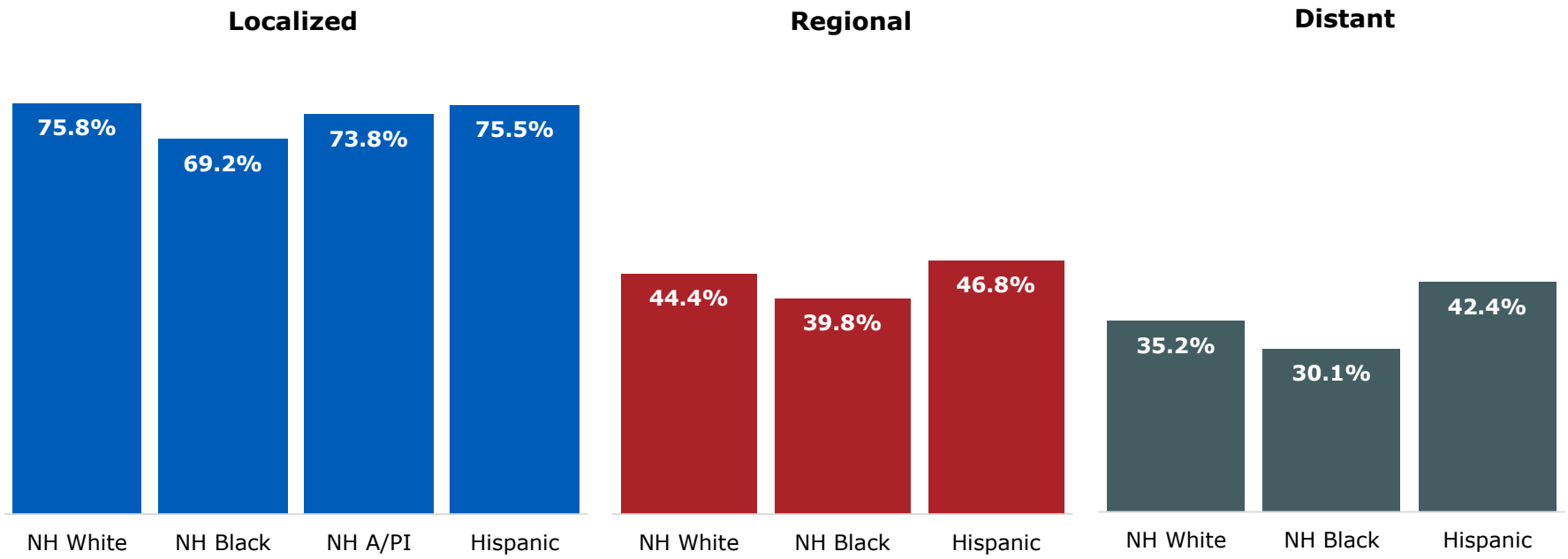


Rates for NH Asian/Pacific Islander and NH American Indian/Alaska Native are suppressed because fewer than 16 cases were reported for some age groups.
NH = Non-Hispanic.

Five-Year Relative Survival for Larynx Cancer by Stage and Race/Ethnicity

- Overall survival was 75% for patients diagnosed at the localized stage, 44% for those diagnosed at the regional stage, and 36% for those diagnosed at the distant stage.
- Survival was lowest for non-Hispanic blacks compared to other race/ethnicity groups for tumors diagnosed at the regional or distant stage.

Five-Year Relative Survival for Larynx Cancer by Stage and Race/Ethnicity, Texas, 2008–2017



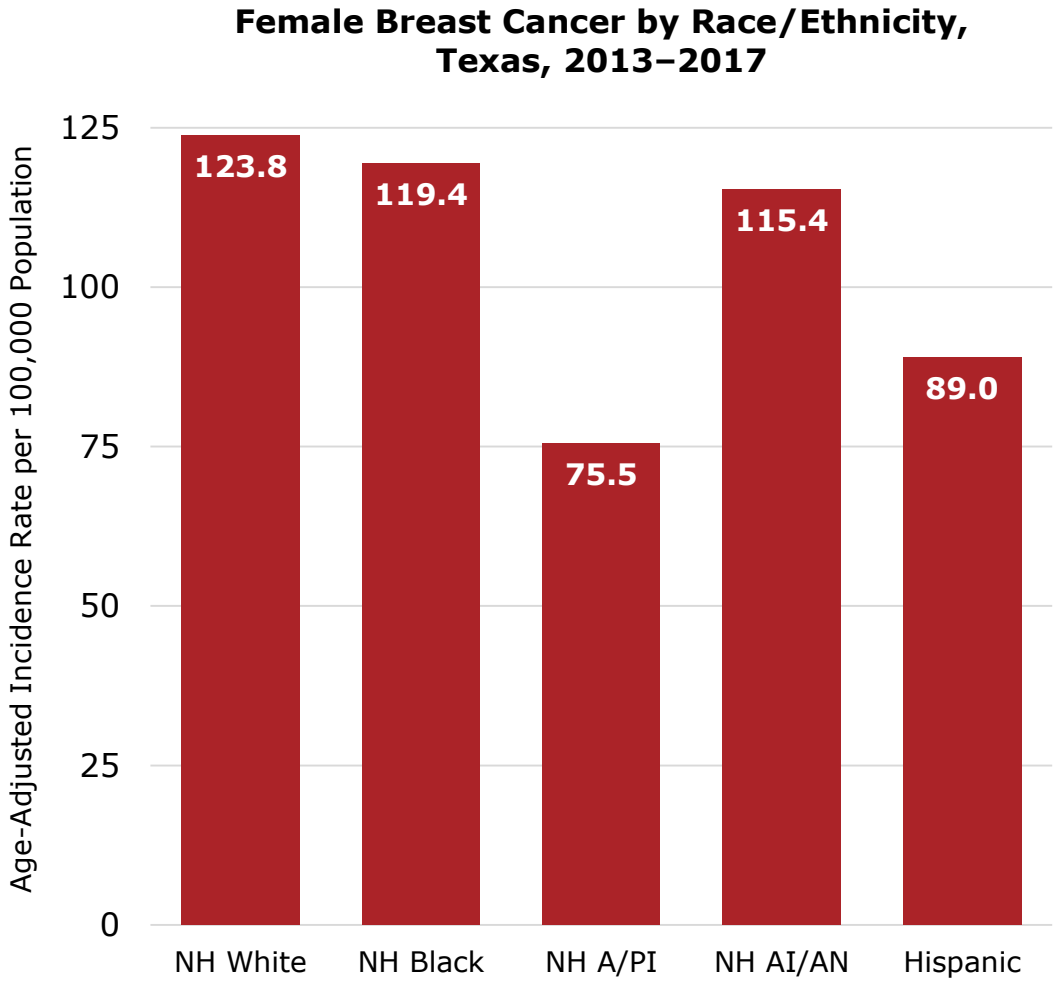
Cases diagnosed between 2008–2017 are included, with follow-up through 2018. 16% of larynx cancer cases were reported to TCR with an unknown stage.
NH = Non-Hispanic; A/PI = Asian/Pacific Islander. Rates are suppressed if fewer than 16 cases were reported for a specific race/ethnicity and staging group.
Expected survival table: US by SES/geography/race (NHW, NHB, NHAIAN, NHAPI, HISP) 1992-2013, Ages 0-99, State-county.

Female Breast Cancer

- In Texas females, breast cancer is the most common type of cancer diagnosed and the 2nd leading cause of cancer death.
- 18,478 new cases and 3,288 deaths are expected in 2020.
- As of January 1, 2017, there are 187,166 female Texans living with breast cancer.*
- Overall 5-year relative survival in Texas is 89.5%.
- 16% of female breast cancer cases are estimated to be attributed to alcohol.[1]
- The relative risk of female breast cancer varies based on how much alcohol is consumed.[2]
  - For females who consume 15 or more drinks per week, the relative risk increases by 50% compared to nondrinkers and former drinkers.†
  - Each increase of 10 grams of alcohol a day increases relative risk by 12% compared to nondrinkers and former drinkers. †

[1] Islami et al. CA Cancer J Clin. 2018;68(1):31-54.
[2] Allen et al. J Natl Can Inst. 2009;101(5):296-305.
* The most recent date for which prevalence data are available, includes all cases diagnosed since 1995.
† In the US, one serving is considered to be 14 grams of alcohol.

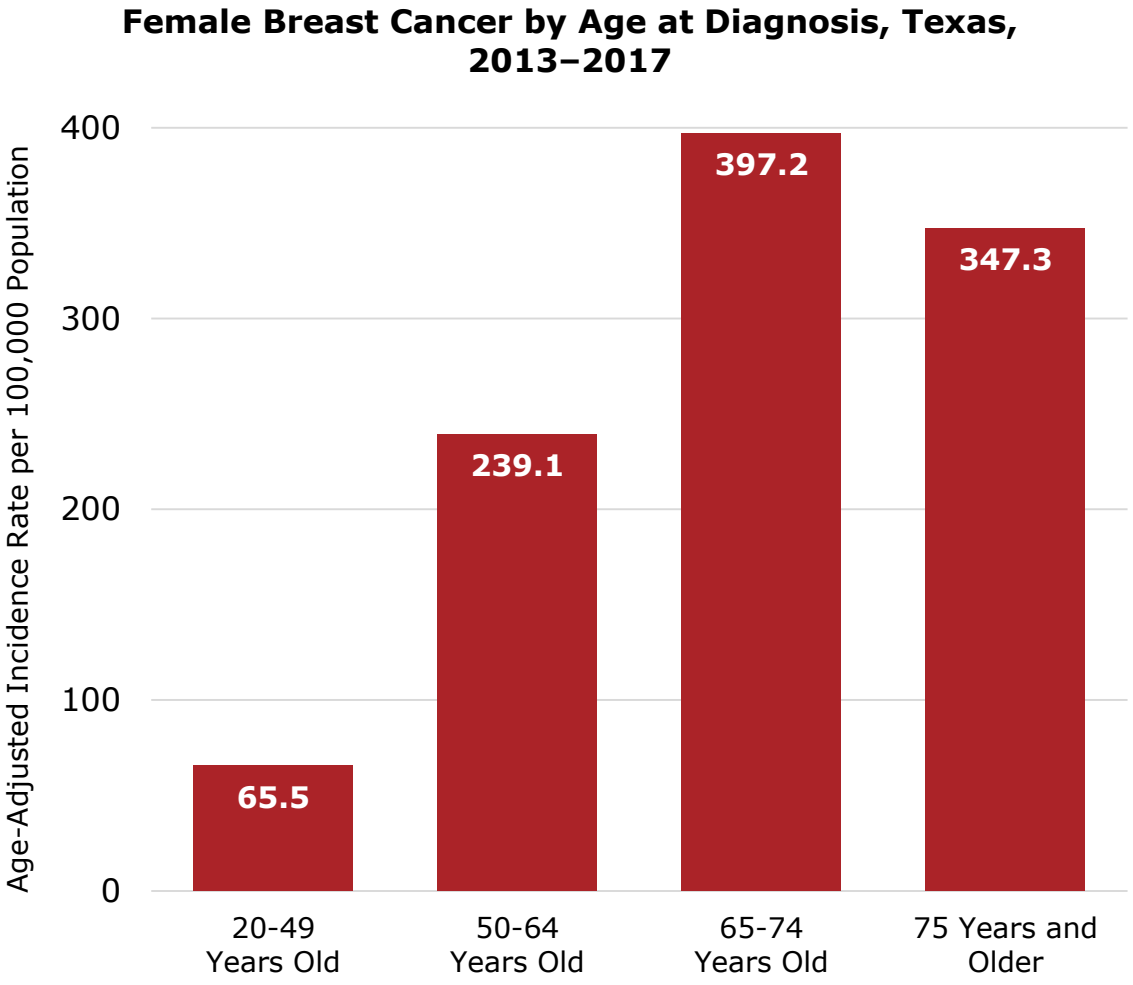
Female Breast Cancer Incidence Rates by Race/Ethnicity



- Non-Hispanic whites have the highest incidence rate of female breast cancer, followed by NH blacks and NH American Indian/Alaska Natives in 2013–2017.
- Incidence rates remained stable during 2008–2017 across all race/ethnicity groups.

NH = Non-Hispanic; A/PI = Asian/Pacific Islander; AI/AN = American Indian/Alaska Native.

Female Breast Cancer Incidence Rates by Age at Diagnosis



- For 2013–2017, female breast cancer incidence rates peaked at ages 65–74 years.
- Incidence rates saw significant declines for two age groups from 2008–2017: 50–64 years (-0.8 average annual percent change) and 75 years and older (-1.0 AAPC). Rates for other age groups were stable.

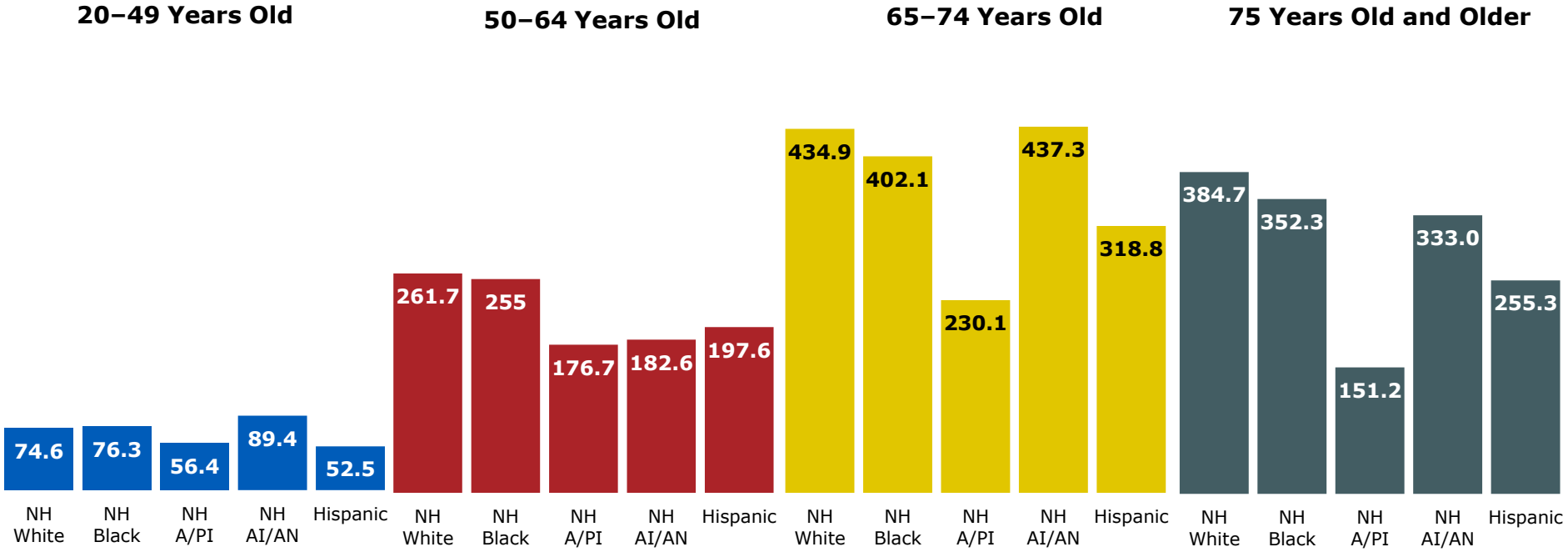
NH = Non-Hispanic; A/PI = Asian/Pacific Islander; AI/AN = American Indian/Alaska Native.

Female Breast Cancer Incidence Rate by Age at Diagnosis and Race/Ethnicity

- During 2013–2017, incidence rates for female breast cancer peaked at ages 65–74 years for all race/ethnicity groups.
- From 2008–2017, significant increases were seen in Hispanics 65–74 years. NH blacks ages 50–64 years saw significant declines. All other groups had stable incidence rates.

Female Breast Cancer by Age at Diagnosis and Race/Ethnicity, Texas, 2013–2017

Age-Adjusted Incidence Rate per 100,000 Population

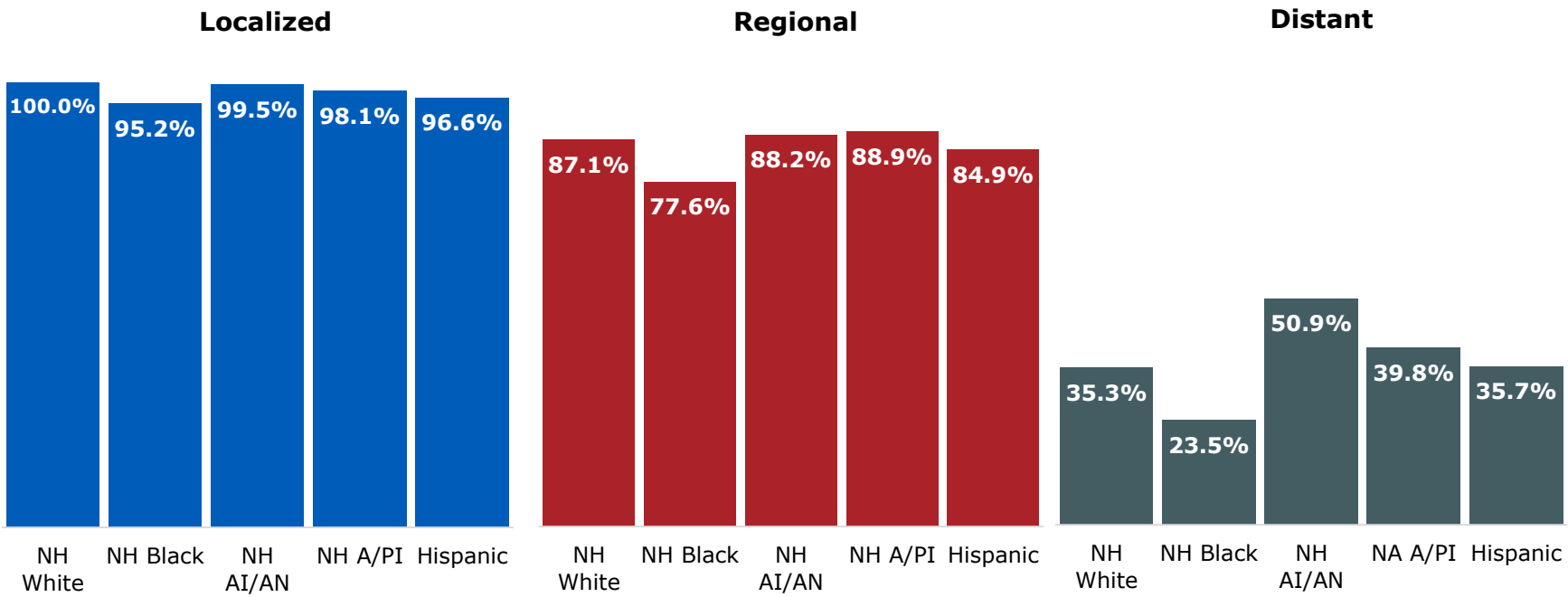


NH = Non-Hispanic; A/PI = Asian/Pacific Islander; AI/AN = American Indian/Alaska Native.

Five-Year Relative Survival for Female Breast Cancer by Stage and Race/Ethnicity

- Overall survival was 99% for patients diagnosed at the localized stage, 85% for those diagnosed at the regional stage, and 33% for those diagnosed at the distant stage.
- Survival was lowest for non-Hispanic blacks compared to other race/ethnicity groups for tumors diagnosed at all stages.

Five-Year Relative Survival for Female Breast Cancer by Stage and Race/Ethnicity, Texas, 2008–2017



Cases diagnosed between 2008–2017 are included, with follow-up through 2018. 7% of female breast cancer cases were reported to TCR with an unknown stage.
NH = Non-Hispanic; A/PI = Asian/Pacific Islander; AI/AN = American Indian/Alaska Native.
Expected survival table: US by SES/geography/race (NHW, NHB, NHAIAN, NHAPI, HISP) 1992-2013, Ages 0-99, State-county.

Report Information

Definitions and Abbreviations

- **Age-adjusted incidence rate:** number of new cancers of a specific site/type occurring in a specified population during a year, usually expressed as the number of cancers per 100,000 population at risk. An age-adjusted rate is a weighted average of the age-specific rates, where the weights are the proportions of persons in the corresponding age groups of a standard population. The potential confounding effect of age is reduced when comparing age-adjusted rates computed using the same standard population.
- **Age-adjusted mortality rate:** number of deaths, with cancer as the underlying cause of death, occurring in a specified population during a year. Cancer mortality is usually expressed as the number of deaths due to cancer per 100,000 population. Numbers are age-adjusted to allow for comparison between populations with different age compositions.
- **Annual percent change (APC):** one way to characterize trends in cancer rates over time. With this approach, the cancer rates are assumed to change at a constant percentage of the rate of the previous year. For example, if the APC is 1%, and the rate is 50 per 100,000 in 1990, the rate is 50 x 1.01 = 50.5 in 1991 and 50.5 x 1.01 = 51.005 in 1992. Rates that change at a constant percentage every year change linearly on a log scale.
- **Average annual percent change (AAPC):** a summary measure of the trend over a pre-specified fixed interval. It allows us to use a single number to describe the average APCs over a period of multiple years. It is valid even if the joinpoint model indicates that there were changes in trends during those years. It is computed as a weighted average of the APCs from the joinpoint model, with the weights equal to the length of the APC interval.
- **Race/ethnicity group abbreviations:** Non-Hispanic (NH), Asian/Pacific Islander (A/PI), American Indian/Alaska Native (AI/AN).

For more information about defining cancer statistics, visit seer.cancer.gov/statistics/types.html.

Technical Notes

- Texas incidence data source: Texas Cancer Registry (www.dshs.texas.gov/tcr) SEER*Stat Database, 1995-2017 Incidence, Texas statewide, created December 2019, based on NPCR-CSS Submission, cut-off 11/07/2019. **Note: Cases diagnosed by death certificate or autopsy only are excluded from all data in this report to allow direct comparison with national rates.**
- Texas mortality data source: Texas Cancer Registry (www.dshs.texas.gov/tcr) SEER*Stat Database, 1990-2017 Mortality, Texas statewide, created December 2019.
- US incidence data source: SEER*Stat Database: NPCR and SEER Incidence - U.S. Cancer Statistics Public Use Database, Nov 2019 submission (2001-2017). United States Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute. Released June 2020, based on the Nov 2019 submission. Accessed at cdc.gov/cancer/npcr/public-use
- US mortality data source: Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov) SEER*Stat Database: Mortality - All COD, Aggregated With State, Total U.S. (1990-2017) <Katrina/Rita Population Adjustment>, National Cancer Institute, DCCPS, Surveillance Research Program, released December 2019. Underlying mortality data provided by NCHS (www.cdc.gov/nchs).
- 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 and ratios (Tiwari mod). Small counts frequently produced unstable rates for Texas NH Native American/Alaska Natives and are therefore not always presented.
- The Joinpoint Regression Program is statistical software for the analysis of trends using joinpoint models. The software enables the user to test whether an apparent change in trend is statistically significant. Joinpoint fits the selected trend data (e.g., cancer rates) into the simplest joinpoint model that the data allow.
  - Annual Percent Change (APC) is calculated by fitting a least squares regression line to the natural logarithm of the age-adjusted rates, with year as the regressor variable. This method allows for more than one APC to describe the trend over a time period. The joinpoint model uses statistical criteria to determine when and how often the APC changes. Cancer rates are fit using joined log-linear segments, so each segment can be characterized using an APC.
  - Average Annual Percent Change (AAPC) is computed as a weighted average of the APCs from the joinpoint model. AAPC is derived by first estimating the underlying joinpoint model that best fits the data. The AAPC over any fixed interval is calculated using a weighted average of the slope coefficients of the underlying joinpoint regression line with the weights equal to the length of each segment over the interval.
  - In this report, if the AAPC was significantly greater than zero, rates were reported to have increased. If the AAPC was significantly lower than zero, rates were reported to have decreased. If the AAPC was not significantly different from zero, rates were reported as stable.
- Joinpoint Regression Program, Version 4.7.0.0 – Feb 2019; Statistical Methodology and Applications Branch, Surveillance Research Program, National Cancer Institute.

Alcohol-Associated Cancer Site Specifications

Cancer	ICD-O-3 site codes	ICD-O-3 histology codes	Additional restrictions
Oral cavity and pharynx	C00.0–14.8	8000–9049, 9056–9139, 9141–9589	
Esophagus	C15.0–15.9	8000–9049, 9056–9139, 9141–9589	
Colon and rectum	C18.0–20.9, C26.0	8000–9049, 9056–9139, 9141–9589	
Liver	C22.0	8000–9049, 9056–9139, 9141–9589	
Larynx	C32.0–32.9	8000–9049, 9056–9139, 9141–9589	
Female breast	C50.0–50.9	8000–9049, 9056–9139, 9141–9589	Restrict to females

https://www.cdc.gov/cancer/uscs/public-use/predefined-seer-stat-variables.htm

References

- Baan R, Straif K, Grosse Y, et al. Carcinogenicity of alcoholic beverages. *Lancet Oncology*. 2007;8(4):292-293.
- Bagnardi V, Rota M, Botteri E, et al. Alcohol consumption and site-specific cancer risk: a comprehensive dose-response meta-analysis. *British Journal of Cancer.* 2015;112:580-593.
- Hashibe M, Brennan P, Chuang SC, et al. Interaction between Tobacco and Alcohol Use and the Risk of Head and Neck Cancer: Pooled Analysis in the International Head and Neck Cancer Epidemiology Consortium. *Cancer Epidemiology, Biomarkers, & Prevention*. 2009;18(2):541-550.
- Islami F, Goding Sauer A, Miller, KD, et al. Proportion and number of cancer cases and deaths attributable to potentially modifiable risk factors in the United States. *CA: A Cancer Journal for Clinicians.* 2018;68(1):31-54.

Useful Links

- Alcohol Consumption, National Institutes of Health: progressreport.cancer.gov/prevention/alcohol#field_most_recent_estimates
- Alcohol Use and Cancer, American Cancer Society: cancer.org/cancer/cancer-causes/diet-physical-activity/alcohol-use-and-cancer.html
- Alcohol and Cancer Risk, National Cancer Institute: cancer.gov/about-cancer/causes-prevention/risk/alcohol/alcohol-fact-sheet