

Burden of Cancer in Kansas

January 2017





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Vision - Healthy Kansans living in a safe and sustainable environments.

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Burden of Cancer in Kansas

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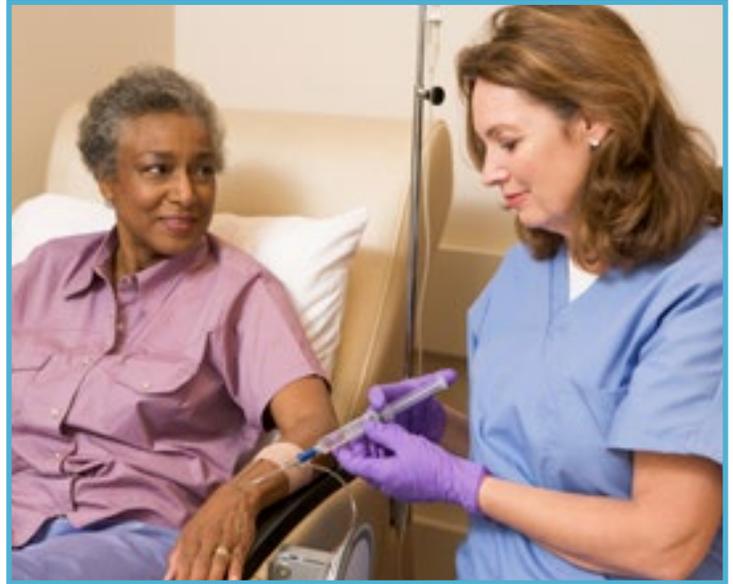
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EXECUTIVE SUMMARY

More than 13,000 Kansans are diagnosed with cancer each year, and approximately 5,300 die from the disease. In fact, cancer is one of the leading causes of death in the state. This report describes the current status of cancer incidence and mortality in Kansas, as well as associated risk and protective factors among Kansans. The purpose of this report is to help guide cancer stakeholders at the state and local levels in their cancer prevention and control activities by identifying gaps and establishing baselines for planning objectives. Ongoing surveillance of statewide data described in this report will continue to support stakeholders' need to monitor their progress and evaluate the impact of their work.



Report Highlights

Incidence

- From 2003-2012, the age-adjusted cancer incidence rates have remained relatively stable in Kansas, while they decreased significantly in the U.S. from 2007-2012.
- In Kansas, overall cancer incidence is significantly higher among: males compared to females; African Americans compared to whites; and non-Hispanics compared to Hispanics. However, this varies by cancer type.
- Cancer incidence increases dramatically with age, with the highest rates among Kansans aged 80-84 years old.
- The most commonly diagnosed invasive cancers in Kansas are prostate, lung, and colorectal among men; and breast, lung and colorectal among women.

Mortality

- From 2003-2014, the age-adjusted cancer mortality rates decreased significantly in Kansas, and they also decreased significantly in the U.S. from 2003-2012.
- In Kansas, cancer mortality rates are significantly higher among males compared to females; African Americans compared to whites; and non-Hispanics compared to Hispanics. However, this varies by cancer type.
- Cancer mortality increases dramatically with age, with the highest rates among Kansans aged 85 years and older.
- The leading causes of cancer death in Kansas are lung, colorectal, and prostate among men; and lung, breast, and colorectal among women.

Lung Cancer

- In Kansas, lung cancer is the leading cause of cancer death, and the second most commonly diagnosed cancer overall.
- In 2012, the age-adjusted lung cancer incidence rate in Kansas was 56.5 cases per 100,000 persons. In 2014, the age-adjusted lung cancer mortality rate in Kansas was 47.2 deaths per 100,000 persons.
- Age-adjusted lung cancer incidence and mortality rates are significantly higher among males compared to females; African Americans compared to whites; and non-Hispanics compared to Hispanics.
- In Kansas, the age-adjusted late stage lung cancer incidence rates dropped significantly among males, whites, non-Hispanics, and those who lived in rural counties from 2003-2007 to 2008-2012.

Colorectal Cancer

- In Kansas, colorectal cancer is the second leading cause of cancer death among men and the third leading cause of cancer death among women. It is the third most commonly diagnosed cancer overall.
- In 2012, the age-adjusted colorectal cancer incidence rate was 40.7 cases per 100,000 persons. In 2014, the age-adjusted colorectal cancer mortality rate was 15.1 deaths per 100,000 persons.
- In Kansas, age-adjusted colorectal cancer incidence and mortality rates are significantly higher among males compared to females; African Americans compared to whites. Rates are significantly higher for colorectal cancer incidence only among non-Hispanics compared to Hispanics.
- In Kansas, the age-adjusted late stage colorectal cancer incidence rates dropped significantly among both males and females, whites, non-Hispanics, and those who lived in both rural and urban counties from 2003-2007 to 2008-2012.

Female Breast Cancer

- Among Kansas women, breast cancer is the most commonly diagnosed invasive cancer, and the second leading cause of cancer death.

In 2012, the age-adjusted female breast cancer incidence rate in Kansas was 124.1 cases per 100,000 females. In 2014, the age-adjusted female breast cancer mortality rate was 18.6 deaths per 100,000 Kansas females.

- In Kansas, female breast cancer incidence rates are not significantly different between African American and white women. However, the mortality rates are significantly higher among African American compared to white women. Female breast cancer incidence and mortality rates are significantly higher among non-Hispanics compared to Hispanics.
- In Kansas, the age-adjusted late stage female breast cancer incidence rates dropped significantly among whites, non-Hispanics, and those who lived in urban counties from 2003-2007 to 2008-2012.

Cervical Cancer

- In Kansas, the age-adjusted cervical cancer incidence rates are not significantly different during the period 2003- 2012 and the age-adjusted cervical cancer mortality rates also remained stable during the period 2003-2014.

- In 2012, the age-adjusted cervical cancer incidence rate was 6.5 cases per 100,000 Kansas females. In 2014, the age-adjusted cervical cancer mortality rate was 1.7 deaths per 100,000 females in Kansas.
- Racial comparison cannot be made for the age-adjusted cervical cancer incidence and mortality rates. However, age-adjusted cervical cancer incidence rates are significantly higher among Hispanic compared to non-Hispanic women in Kansas.
- In Kansas, the age-adjusted late stage cervical cancer incidence rates were not significantly different among whites, non-Hispanics, and population density groups between 2003-2007 and 2008-2012.

Prostate Cancer

- In Kansas, prostate cancer is the most commonly diagnosed invasive cancer and the third leading cause of cancer death among men.
- In 2012, the age-adjusted prostate cancer incidence rate was 114.6 cases per 100,000 males. In 2014, the age-adjusted prostate mortality rate was 20.1 deaths per 100,000 males.
- In Kansas, prostate cancer incidence and mortality rates are significantly higher among African Americans compared to whites; and among non-Hispanics compared to Hispanics.
- In Kansas, the age-adjusted late stage prostate cancer incidence rates were not significantly different among race, ethnicity, and population density groups between 2003-2007 and 2008-2012.

Melanoma

- In Kansas, age-adjusted melanoma incidence rates increased significantly during the period 2003-2012 while age-adjusted melanoma mortality rates remained stable during the period 2003-2012.
- In 2012, the age-adjusted melanoma incidence rate in Kansas was 23.5 cases per 100,000 persons. In 2014, the age-adjusted melanoma mortality rate was 3.0 deaths per 100,000 Kansans.
- During 2003-2013, the age-adjusted melanoma incidence and mortality rates were significantly higher among men compared to women in Kansas.
- In Kansas, the age-adjusted late stage melanoma incidence rates were not significantly different among both males and females, whites, non-Hispanics, and population density groups between 2003-2007 and 2008-2012.

Cancer Screening Practices

- In 2015, 16 percent of Kansas adults had discussed with their health care provider whether or not to be screened for lung cancer. The percentages were higher among males, aged 55-80 years old, those who have health insurance, those who lived in frontier and semi-urban/urban counties, and those who are living with a disability.
- In 2014, 65 percent of Kansas adults aged 50-75 years old had met the U.S. Preventive Services Task Force (USPSTF) recommendation for colorectal cancer screening. The percentages were lower among Hispanics compared to non-Hispanic whites, and adults aged 50-64 years old, those who attained lower levels of education, those whose annual household income was less than \$50,000, those who did not have health insurance, and those who resided in frontier, rural, and densely-settled rural counties.
- In 2014, 68 percent of Kansas adults 50 years and older had ever had a sigmoidoscopy or colonoscopy.
- In 2014, 13 percent of Kansas adults 50 years and older had an FOBT in the past two years.

- In 2014, 71 percent of Kansas women aged 40 years and older had a mammogram within the past two years. The percentages were significantly lower among women who are Hispanics, aged 40-49 years old, those who did not graduate from high school, and those whose annual household income was less than \$15,000, those who lived in frontier and rural counties, and those who did not have health insurance.
- In 2014, 74 percent of Kansas women aged 18 years and older had a Pap test within the past three years. The percentages were lower among women aged 18-24 years old, those with less than high school graduate degrees, those whose annual household income was less than \$15,000, and those who did not have health insurance.
- In 2014, 45 percent of Kansas men aged 40 years and older had a PSA test within the past two years. The percentages were significantly lower among men aged 40-49 years old, who are Hispanics, those who did not graduate from high school, those whose annual household income was less than \$15,000, and those without health insurance.

Cancer Risk and Protective Factors

- In 2015, 18 percent of Kansas adults 18 years and older were current smokers. In 2013, 10 percent of Kansas high school students in grade 9-12 currently smoked cigarettes.
- During 2014-2015, approximately 11 percent of Kansas males 18 years and older used smokeless tobacco products. In 2013, approximately 13 percent of male high school students in grades 9-12 in Kansas currently used smokeless tobacco.
- In 2015, 34 percent of Kansas adults 18 years and older were obese.
- In 2015, 42 percent of Kansas adults 18 years and older consumed fruits and vegetables 1 or more times per day.
- In 2015, 60 percent of Kansas adults 18 years and older met physical activity guidelines.

Genetic Counseling and Clinical Trials

- In 2015, 24 percent of Kansas adults with a family history of breast, ovarian, or colorectal cancer received genetic counseling. The percentages of Kansans who received genetic counseling were lower among adults aged 18-39 compared to those aged 40 years and older.
- In 2015, 4 percent of Kansas adults 18 years and older talked to their health care provider about participating in a clinical trial. The percentages were higher among females, and adults aged 65 years and older, those who were college graduates, those whose annual household income was \$50,000 or more, those who lived in urban counties, and those living with a disability.
- In 2015, 31 percent of Kansas adults 18 years and older enrolled in a cancer clinical trial managed by their health care provider.

Cancer Survivorship

- In 2014 and 2015, about 7 percent of Kansas adults have been diagnosed with cancer (excluding skin cancer).
- In 2014, the adjusted percentages of Kansans who are current smokers, self-reported fair/poor health, limited access in any activities due to physical/mental and emotional problems, physically and emotionally unhealthy for 14 days or more in the past month, and poor health interfered with usual activities for 14 days or more in the past month, uninsured, have a health care provider, and couldn't see doctor due to cost were significantly higher among adults with cancer diagnosis compared to those without cancer diagnosis.
- In 2015, the adjusted percentages of Kansans who had alcohol in the past 30 days, did not participate in any physical activities in the past 30 days, self-reported fair/poor health, limited access in any activities due to physical/mental and emotional problems, physically and emotionally unhealthy for 14 days or more in the past month, and poor health interfered with usual activities for 14 days or more in the past month, have a health care provider, and couldn't see doctor due to cost were significantly higher among adults with cancer diagnosis compared to those without cancer diagnosis.

INTRODUCTION

Cancer is a group of diseases in which abnormal cells divide uncontrollably and invade other tissues. Cancer cells can spread to other parts of the body through the blood and lymphatic systems. There are more than 100 different types of cancer, most of which are named for the organ or type of cell in which they start.¹ If the spread is not controlled, cancer can result in death. In the U.S., cancer is the second most common cause of death, accounting for nearly 1 in 4 deaths.² The burden of cancer incidence and death in Kansas is highlighted in Chapters 1 and 2 of this report.

Although anyone can develop cancer, the risk of being diagnosed with cancer increases with age because most cancers result from damage to genes that occurs over the course of one's lifetime, as opposed to inherited genetic mutations. Genetic damage may result from internal factors, such as hormones and immune conditions, or external factors, such as tobacco, viruses, chemicals, and radiation. Several of the most common cancers are largely preventable through avoidance of tobacco use and exposure, maintenance of a healthy weight, adequate physical activity, and healthful nutrition. Other cancers caused by viruses and ultraviolet radiation are also preventable through vaccination and skin protection, respectively. Cancer screenings can also prevent certain cancers, such as colorectal and cervical cancer, through the detection and removal of precancerous cells before they turn into cancer. In addition, screenings are beneficial because they can result in the diagnosis of cancers at an early stage when they are most amenable to treatment. For example, research has demonstrated that early detection of breast cancer with mammography saves lives and increases treatment options for women.² Chapters 3-8 of this report focus on incidence and mortality of cancers that are largely preventable or amenable to treatment if detected early. Disparities in late stage diagnoses are also identified in these chapters, including lung, colorectal, breast, cervical, prostate cancer, and melanoma. Chapters 9 and 10 of this report describe the current prevalence of cancer screening practices, as well as risk and protective behaviors, among Kansans. Chapter 11 provides information on genetic counseling for patients who have family history of cancer and their treatment access to clinical trials. The last chapter focus on the quality of life for cancer survivorship.

This report serves as a companion piece to the 2017-2021 Kansas Cancer Prevention and Control Plan, a product of the Kansas Cancer Partnership whose goal is to reduce the burden and suffering of cancer and to enhance the lives of all Kansas cancer survivors and their families. The current Burden of Cancer in Kansas report was updated to help guide cancer stakeholders at the state and local levels in their cancer prevention and control activities by identifying gaps and establishing baselines for plan objectives. Ongoing surveillance of statewide data described in this report, including the Kansas Cancer Registry, Kansas Vital Statistics, and the Kansas Behavioral Risk Factor Surveillance System, will continue to support stakeholders' need to monitor progress and evaluate the impact of their work.

¹ What is Cancer? 2012. National Cancer Institute. <http://www.cancer.gov/cancertopics/cancerlibrary/what-is-cancer>

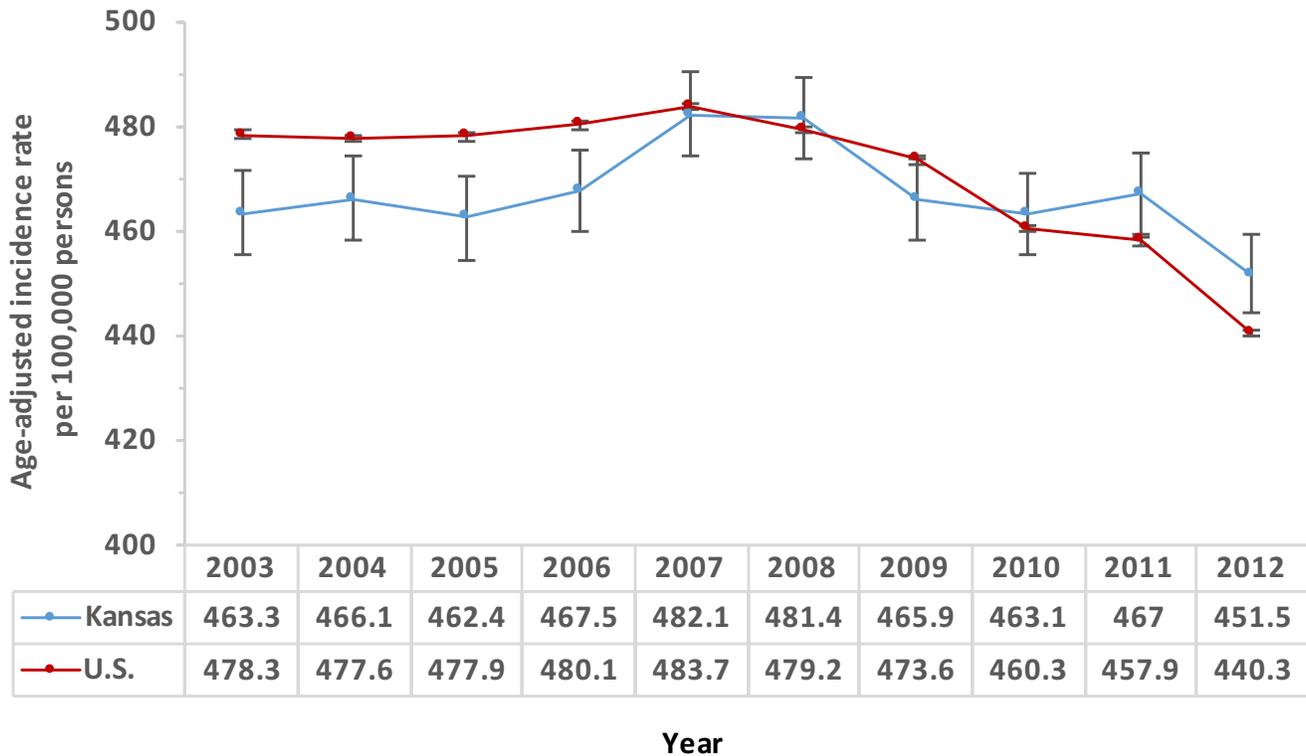
² American Cancer Society. Cancer Facts & Figures 2012. Atlanta: American Cancer Society; 2012.

CHAPTER 1: CANCER INCIDENCE

Cancer Incidence

Each year, on average, more than 13,000 invasive cancers are diagnosed among Kansas residents. In Kansas, age-adjusted cancer incidence rates remained relatively stable during the period 2003-2012 with 463.3 cases per 100,000 persons (95% confidence interval: 455.4 to 471.4) in 2003 and 451.5 cases per 100,000 persons (95% confidence interval: 444.0 to 459.1) in 2012. Meanwhile, age-adjusted cancer incidence rates decreased significantly in the U.S. from 483.7 cases per 100,000 persons (95% confidence interval: 483.0 to 484.5) in 2007 to 440.3 cases per 100,000 persons (95% confidence interval: 439.6 to 441.0) in 2012 (Figure 1-1).

Figure 1-1. Age-adjusted cancer incidence rates, Kansas and the U.S. 2003-2012.

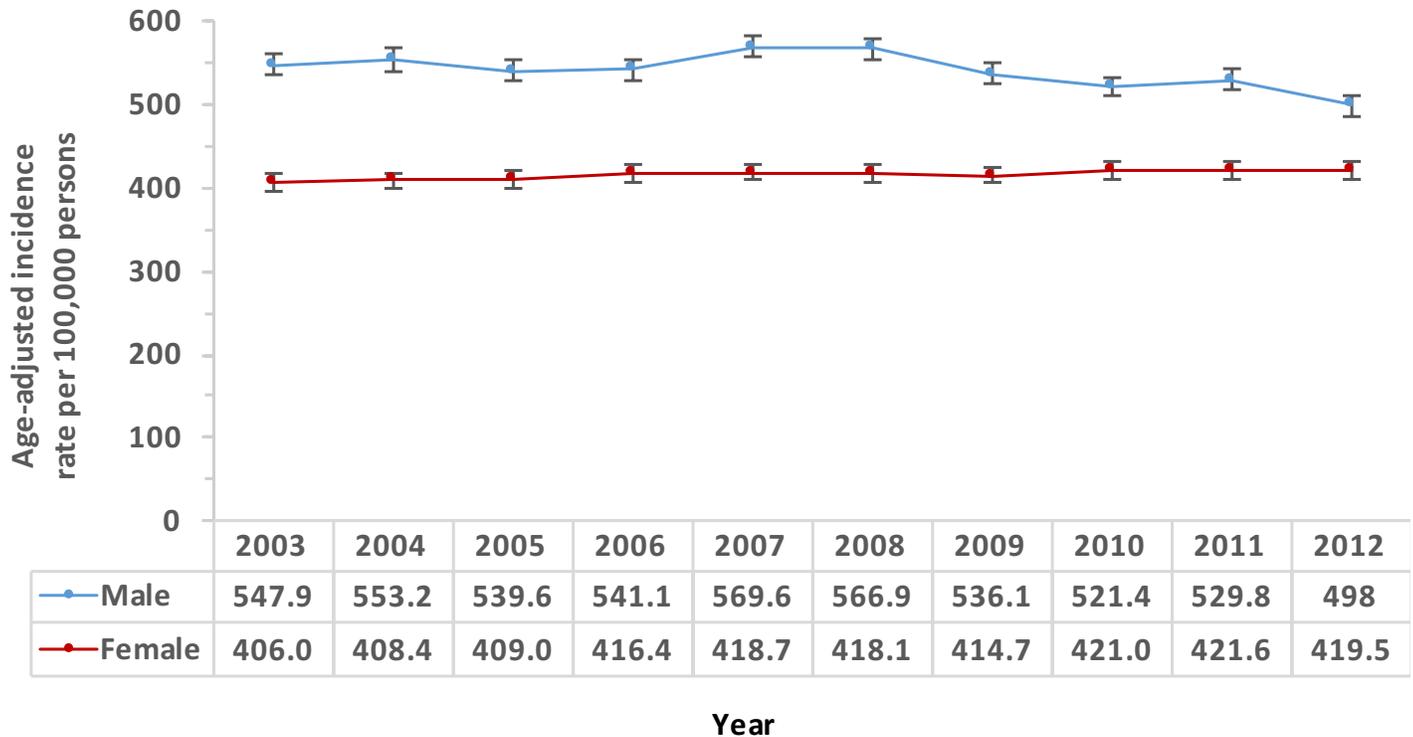


Source: 2003-2012 Kansas Cancer Registry. U.S. Cancer Statistics: 1999-2012 Incidence, WONDER Online Database, US DHHS, CDC; 2016. <http://wonder.cdc.gov> Rates were age-adjusted to the U.S. 2000 standard population using the direct method. See Technical Appendix for details on how rates were calculated. Vertical bars indicate 95% confidence intervals. Cancer incidence was defined according to ICD-O-3 codes with a behavior code indicating invasive malignancy; includes in situ bladder cancer.

Cancer Incidence among Gender Groups

In Kansas, age-adjusted cancer incidence rates were significantly higher for males as compared to females during the period 2003-2012 (Figure 1-2). Age-adjusted cancer incidence rates were approximately 30 percent higher for men than for women throughout this period. The large difference in age-adjusted incidence rates between males and females is similar at the national level.³

Figure 1-2. Age-adjusted cancer incidence rates among gender groups, Kansas 2003-2012.



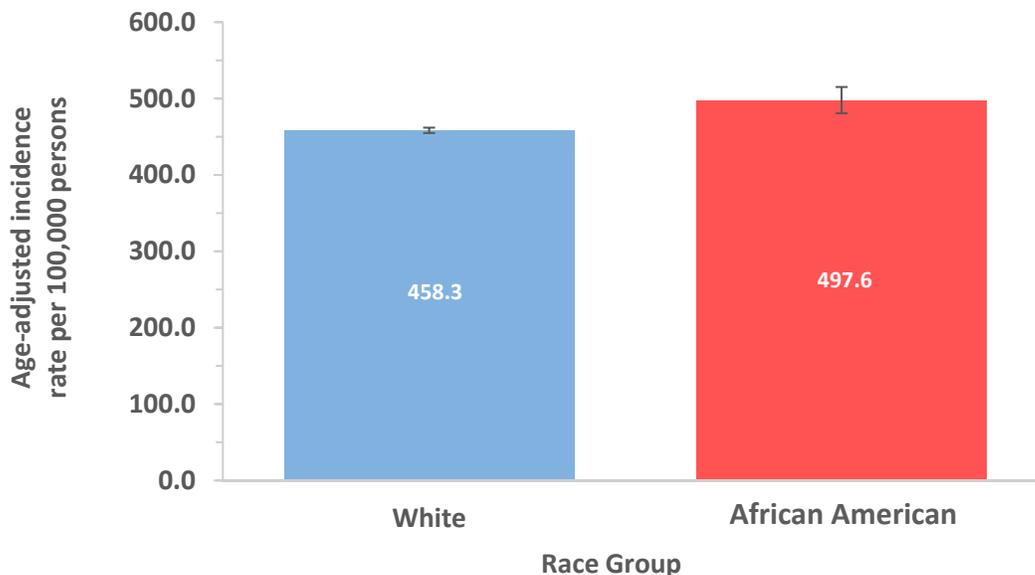
Source: 2003-2012 Kansas Cancer Registry. Rates were age-adjusted to the U.S. 2000 standard population using the direct method. See Technical Appendix for details on how rates were calculated. Vertical bars indicate 95% confidence intervals. Cancer incidence was defined according to ICD-O-3 codes with a behavior code indicating invasive malignancy; includes in situ bladder cancer.

³ Ehemann C, Henley SJ, Ballard-Barbash R, Jacobs EJ, Schymura MJ, Noone AM, Pan L, Anderson RN, Fulton JE, Kohler BA, Jemal A, Ward E, Plescia M, Ries LAG, Edwards BK. Annual Report to the Nation on the Status of Cancer, 1975-2008, Featuring Cancers Associated with Excess Weight and Lack of Sufficient Physical Activity. Cancer. Epub 2012 Mar 28.

Cancer Incidence among Race Groups

Age-adjusted cancer incidence rates were significantly higher for African American Kansans (497.6 cases per 100,000 persons; 95% confidence interval: 480.7 to 515.1) than for white Kansans (458.3 cases per 100,000 persons; 95% confidence interval: 454.8 to 461.9) during the time period 2008-2012 (Figure 1-3). Incidence rates for Kansans of other race categories are not shown because the number of cases were insufficient for computing statistically reliable rates for these race groups.

Figure 1-3. Age-adjusted cancer incidence rates among race groups, Kansas 2008-2012

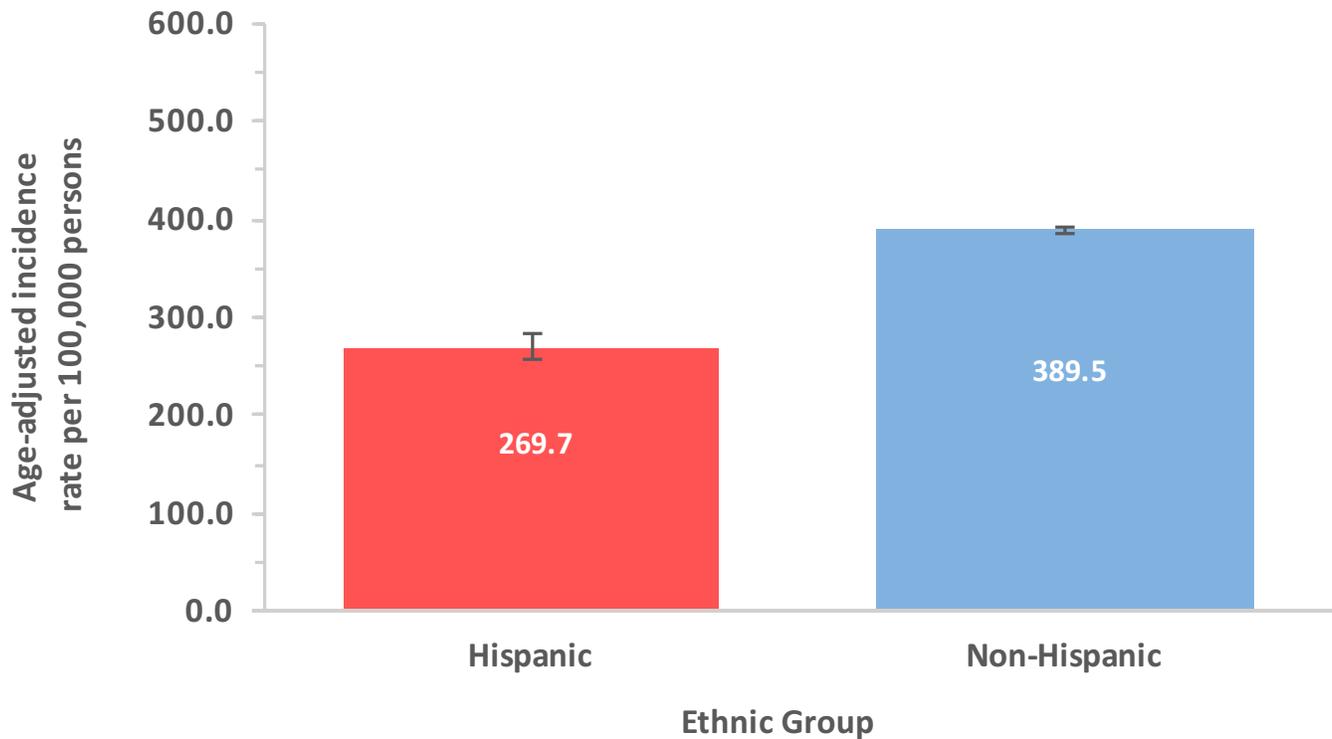


Source: 2008-2012 Kansas Cancer Registry. Rates were age-adjusted to the U.S. 2000 standard population using the direct method. See Technical Appendix for details on how rates were calculated. Vertical bars indicate 95% confidence intervals. Cancer incidence was defined according to ICD-O-3 codes with a behavior code indicating invasive malignancy; includes in situ bladder cancer.

Cancer Incidence among Ethnic Groups

In Kansas, age-adjusted cancer incidence rates were significantly lower for Hispanics (269.7 cases per 100,000 persons; 95% confidence interval: 255.7 to 284.4) as compared to non-Hispanics (389.5 cases per 100,000 persons; 95% confidence interval: 386.2 to 392.7) during the period 2008-2012 (Figure 1-4).

Figure 1-4. Age-adjusted cancer incidence rates among ethnic groups, Kansas 2008-2012.

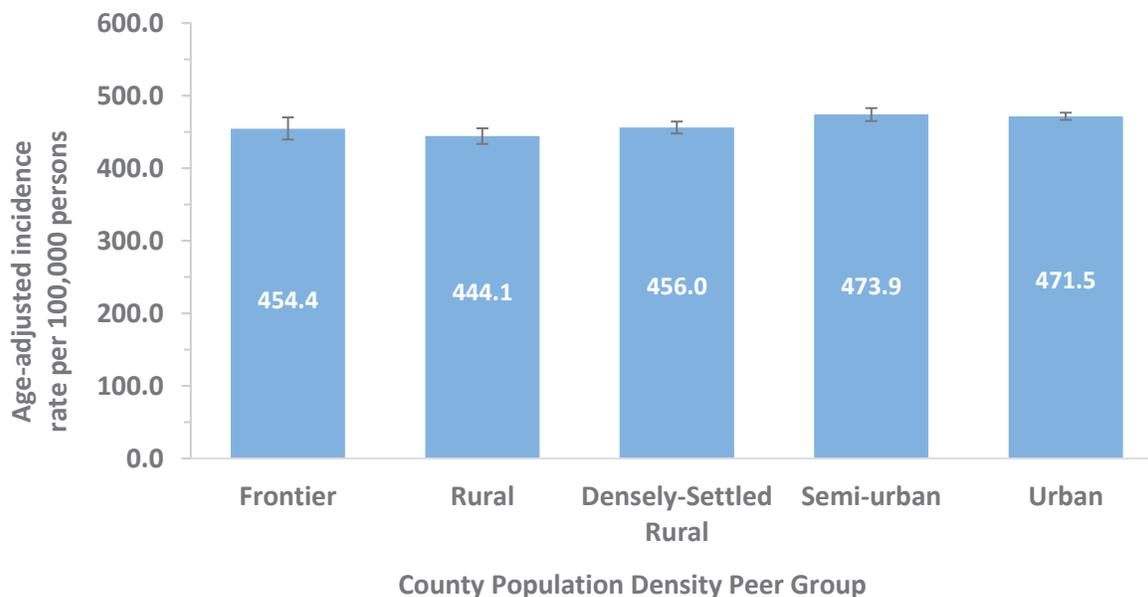


Source: 2008-2012 Kansas Cancer Registry. Rates were age-adjusted to the U.S. 2000 standard population using the direct method. See Technical Appendix for details on how rates were calculated. Vertical bars indicate 95% confidence intervals. Cancer incidence was defined according to ICD-O-3 codes with a behavior code indicating invasive malignancy; includes in situ bladder cancer. Hispanics were defined as persons of Mexican, Puerto Rican, Cuban, South or Central American, Other Spanish, Spanish not otherwise specified, or Dominican Republic ethnicity. Persons with Spanish surname only or unknown ethnicity were excluded.

Cancer Incidence among County Population Density Groups

In Kansas, there were no significant differences in age-adjusted cancer incidence rates among different county population density groups during the time period 2008-2012 (Figure 1-5).

Figure 1-5. Age-adjusted cancer incidence rates among county population density peer groups, Kansas 2008-2012.

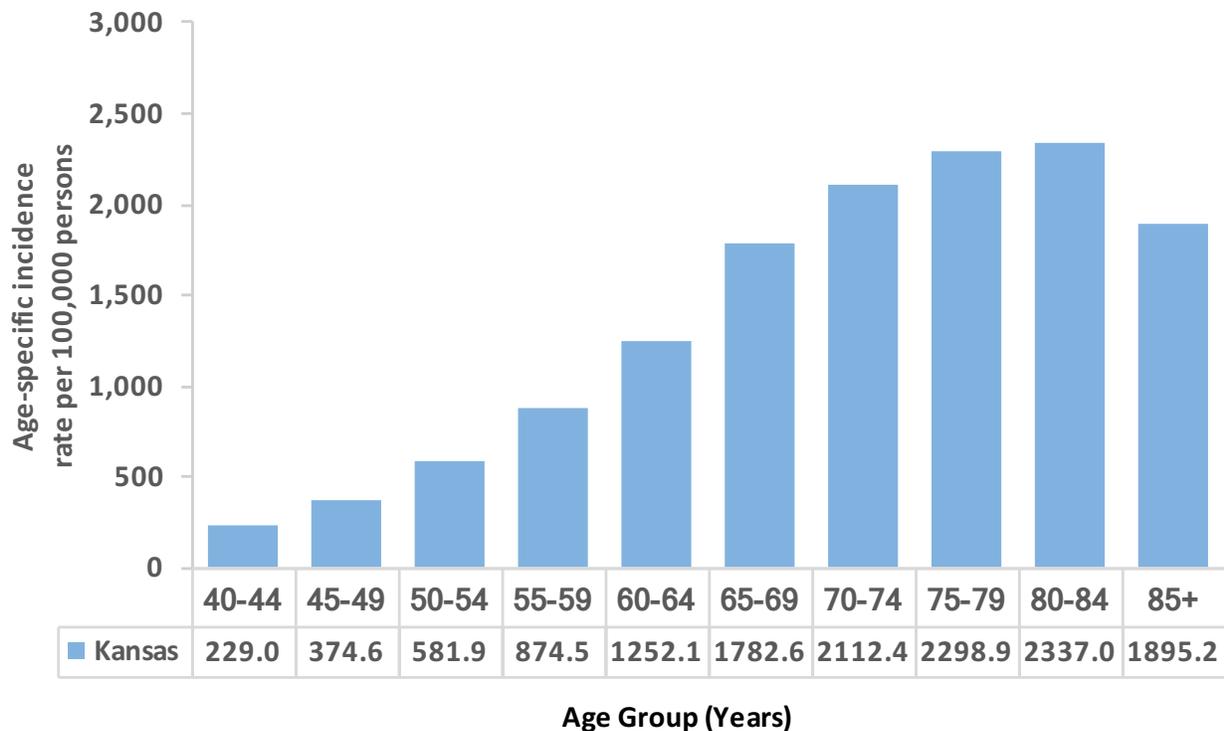


Source: 2008-2012 Kansas Cancer Registry. Rates were age-adjusted to the U.S. 2000 standard population using the direct method. See Technical Appendix for details on how rates were calculated. County population density peer groups are based on the population for each county in the 2000 population and are defined as follows: Frontier (fewer than 6 persons per square mile), Rural (6 to 19.9 persons per square mile), Densely-Settled Rural (20 to 39.9 persons per square mile), Semi-Urban (40 to 149.9 persons per square mile), and Urban (150 or more persons per square mile). Vertical bars indicate 95% confidence intervals. Cancer incidence was defined according to ICD-O-3 codes with a behavior code indicating invasive malignancy; includes in situ bladder cancer.

Cancer Incidence among Age Groups

In Kansas, cancer incidence increased dramatically with age as shown by the data in the period of 2008-2012 (Figure 1-6). Cancer incidence rates peaked among Kansans aged 80-84 years old (2337.0 cases per 100,000 persons; 95% confidence interval: 2281.2 to 2393.8), and then decreased thereafter.

Figure 1-5. Age-adjusted cancer incidence rates among county population density peer groups, Kansas 2008-2012.

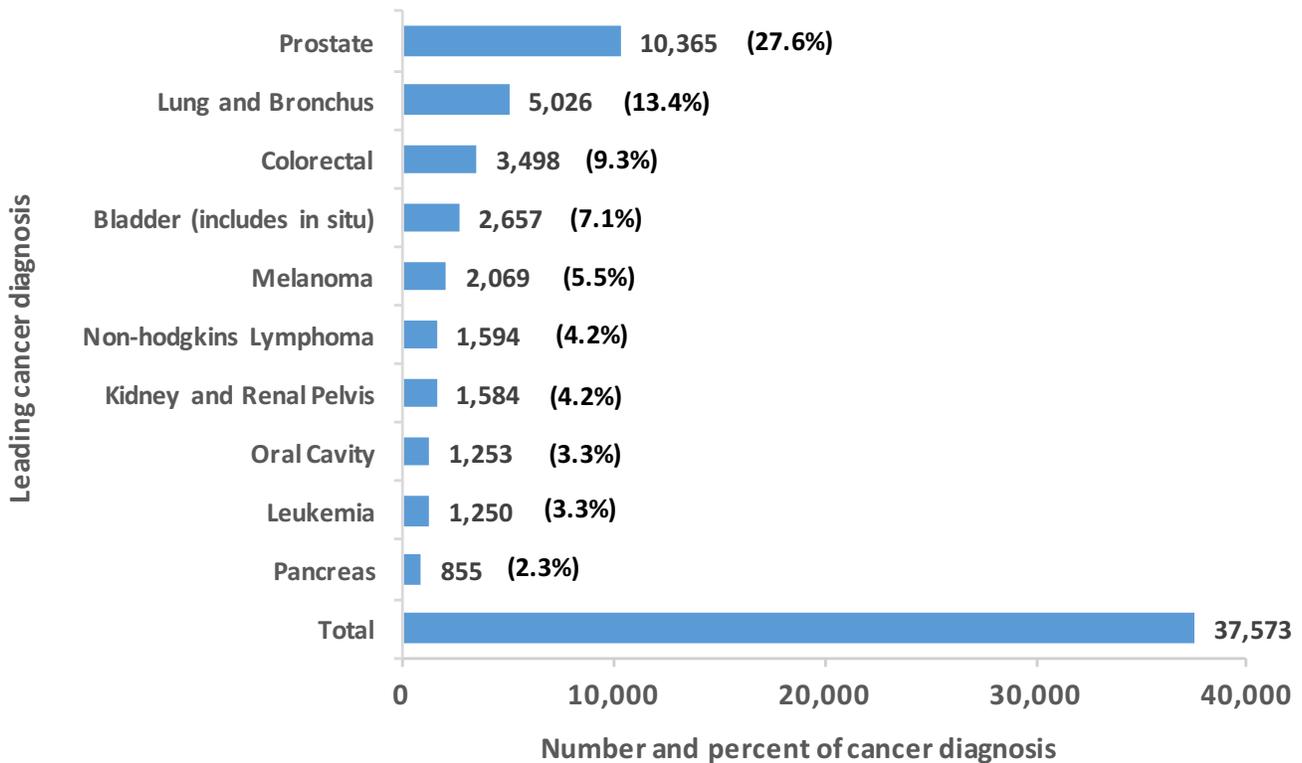


Source: 2008-2012 Kansas Cancer Registry. See Technical Appendix for details on how rates were calculated. Cancer incidence was defined according to ICD-O-3 codes with a behavior code indicating invasive malignancy; includes in situ bladder cancer.

Most Commonly Diagnosed Cancers by Gender

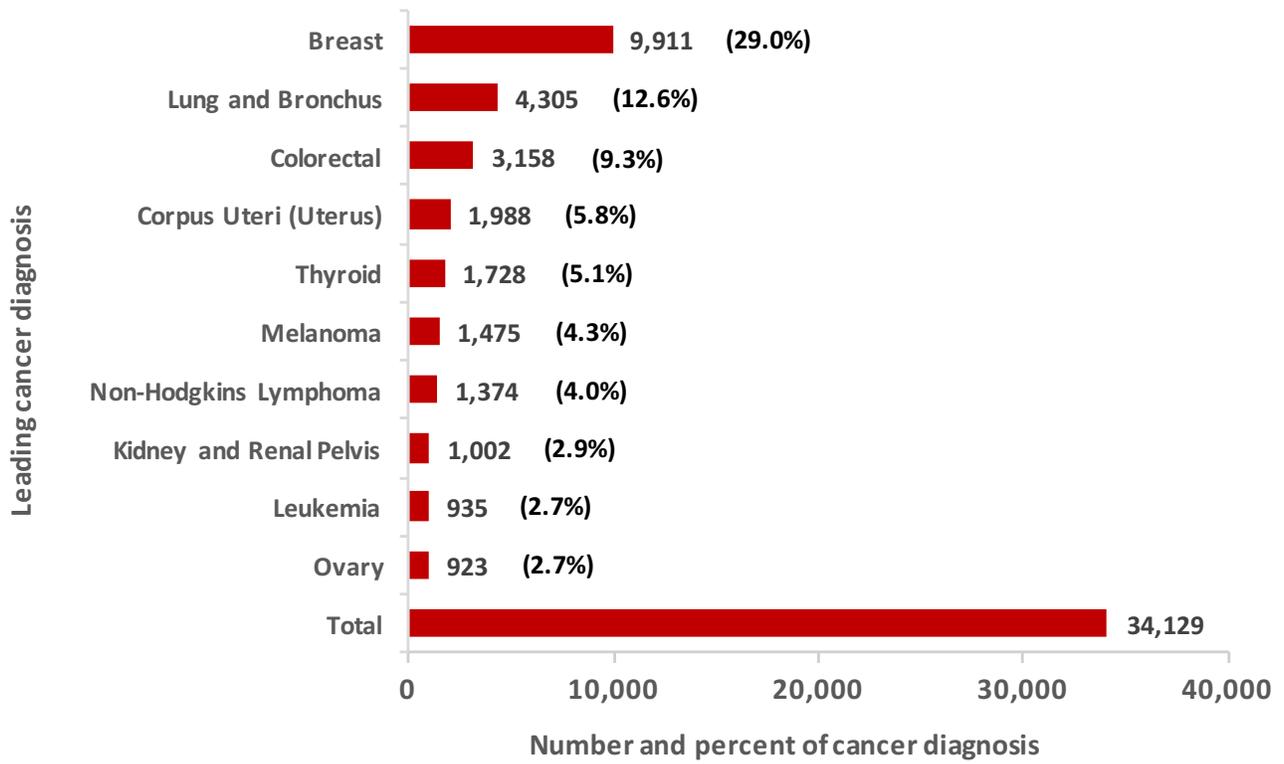
The most commonly diagnosed cancers among Kansas males during the time period 2008-2012 were prostate (27.6%), lung (13.4%), and colorectal (9.3%) cancer (Figure 1-7). Among Kansas females, the most commonly diagnosed cancers during this time period were breast (29.0%), lung (12.6%), and colorectal (9.3%) cancer (Figure 1-8).

Figure 1-7. Top 10 cancer diagnoses among males, Kansas 2008-2012



Source: 2008-2012 Kansas Cancer Registry. See Technical Appendix for details on how leading cancer diagnoses were defined.

Figure 1-8. Top 10 cancer diagnoses among females, Kansas 2008-2012



Source: 2008-2012 Kansas Cancer Registry. See Technical Appendix for details on how leading cancer diagnoses were defined.

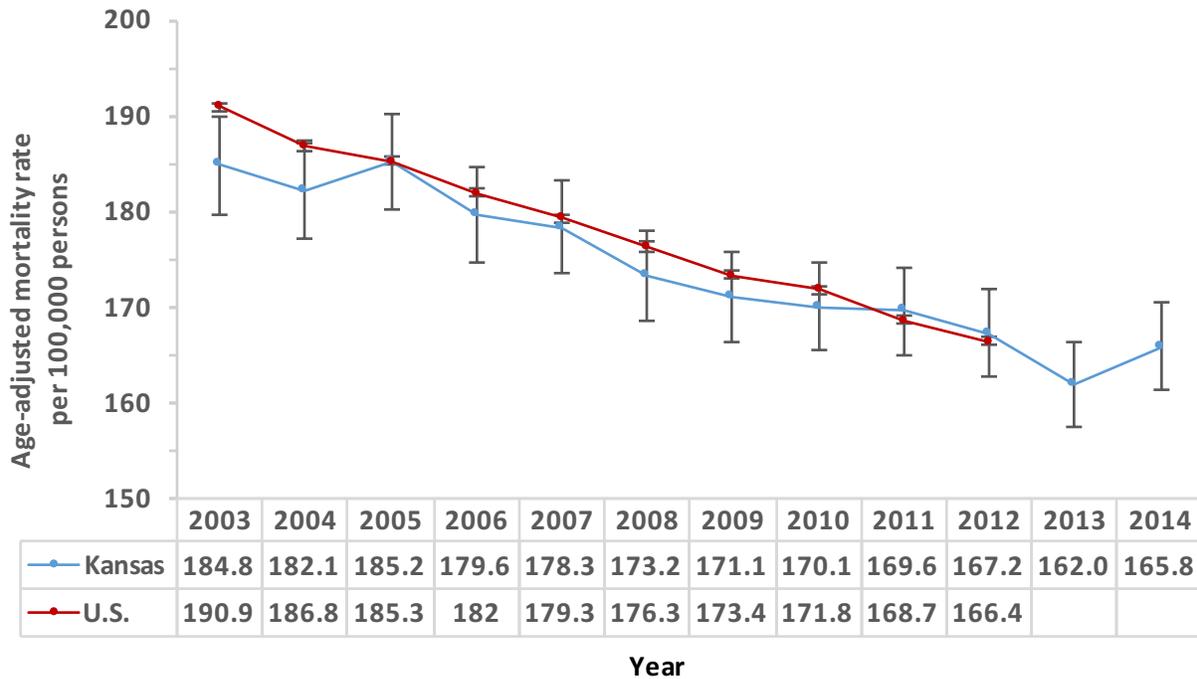
CHAPTER 2: CANCER MORTALITY

Cancer Mortality

More than 5,300 Kansans, on average, die of cancer each year. In Kansas, age-adjusted cancer mortality rates decreased significantly during the period 2003-2014 from 184.8 deaths per 100,000 persons (95% confidence interval: 179.6 to 189.6) in 2003 to 165.8 deaths per 100,000 persons (95% confidence interval: 161.4 to 170.4) in 2014 (Figure 2-1). Age-adjusted cancer mortality rates also decreased significantly in the U.S. during 2003-2012 from 190.9 deaths per 100,000 persons in 2003 (95% confidence interval: 190.4 to 191.4) to 166.4 deaths per 100,000 persons in 2012 (95% confidence interval: 166.0 to 166.8).



Figure 2-1. Age-adjusted cancer mortality rates, Kansas and the U.S. 2003-2014.

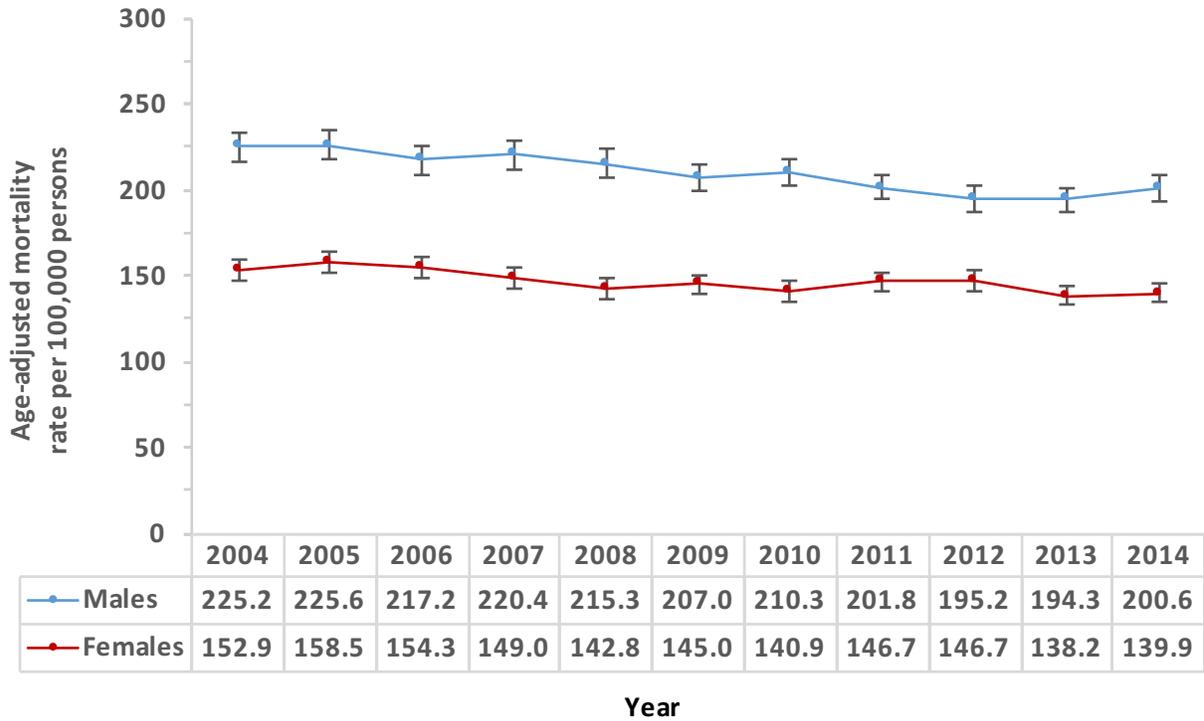


Source: 2003-2014 Kansas Vital Statistics, Bureau of Epidemiology and Public Health Informatics, KDHE. U.S. Cancer Statistics: 1999- 2012 Mortality, WONDER Online Database, US DHHS, CDC; 2015. <http://wonder.cdc.gov>. U.S. cancer mortality data for 2013 and 2014 were not available at the time the document was created. Rates were age-adjusted to the U.S. 2000 standard population using the direct method. See Technical Appendix for details on how rates were calculated. Vertical bars indicate 95% confidence intervals. Cancer mortality was defined as ICD-10 codes C00-C97.

Cancer Mortality among Gender Groups

In Kansas, age-adjusted cancer mortality rates were significantly higher for males as compared to females during the period 2004-2014 (Figure 2-2). Age-adjusted cancer mortality rates were approximately 40 percent to 50 percent higher for men than for women throughout this period.

Figure 2-2. Age-adjusted cancer mortality rates among gender groups, Kansas 2004-2014.

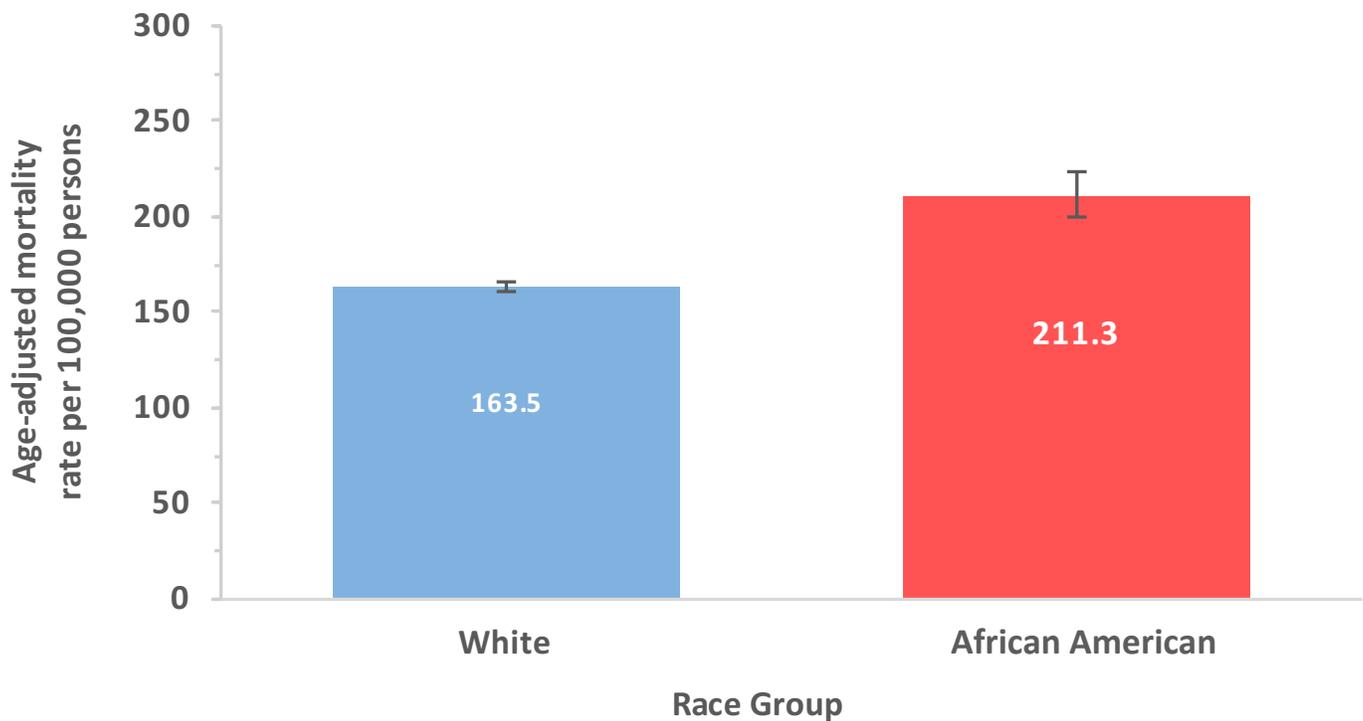


Source: 2004-2014 Kansas Vital Statistics, Bureau of Epidemiology and Public Health Informatics, KDHE. Rates were age-adjusted to the U.S. 2000 standard population using the direct method. See Technical Appendix for details on how rates were calculated. Vertical bars indicate 95% confidence intervals. Cancer mortality was defined as ICD-10 codes C00-C97.

Cancer Mortality among Race Groups

Age-adjusted cancer mortality rates were significantly higher for African American Kansans (211.3 deaths per 100,000 persons; 95% confidence interval: 200.0 to 223.0) than for white Kansans (163.5 deaths per 100,000 persons; 95% confidence interval: 161.4 to 165.6) during the time period 2010-2014 (Figure 2-3).

Figure 2-3. Age-adjusted cancer mortality rates among race groups, Kansas 2010-2014.

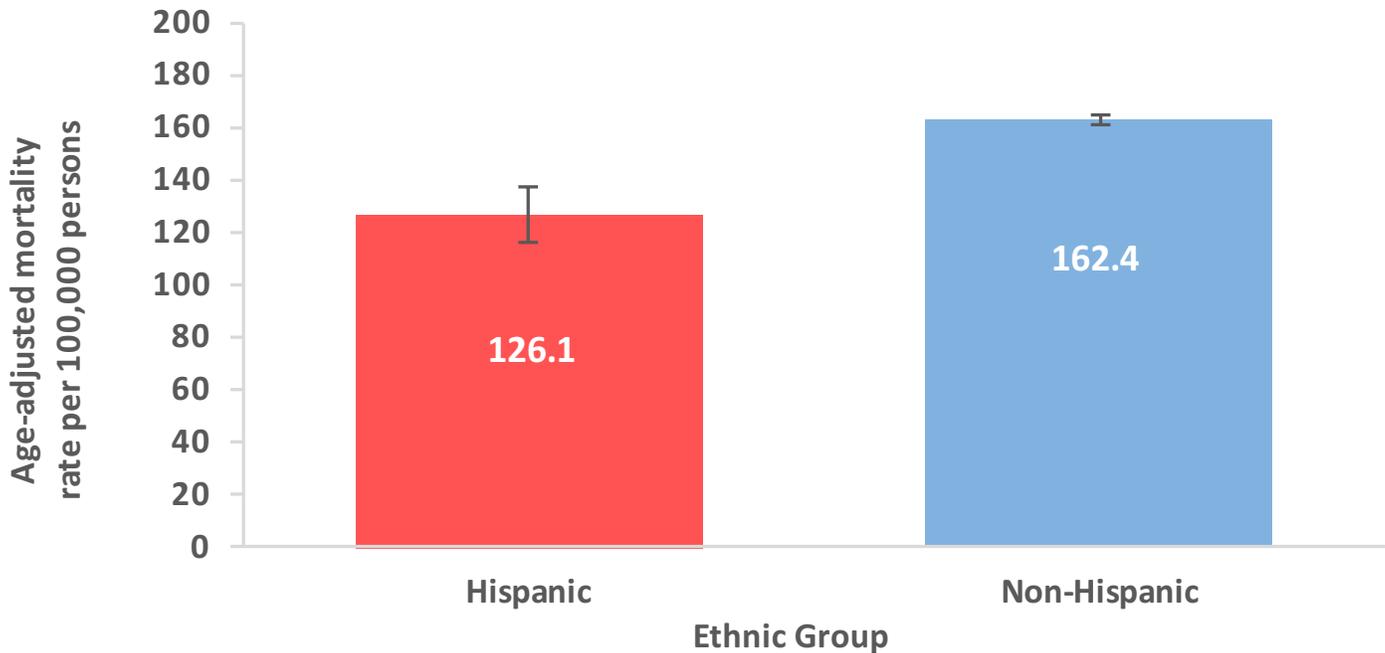


Source: 2010-2014 Kansas Vital Statistics, Bureau of Epidemiology and Public Health Informatics, KDHE. Rates were age-adjusted to the U.S. 2000 standard population using the direct method. See Technical Appendix for details on how rates were calculated. Vertical bars indicate 95% confidence intervals. Cancer mortality was defined as ICD-10 codes C00-C97.

Cancer Mortality among Ethnic Groups

Age-adjusted cancer mortality rates were significantly lower for Hispanic Kansans (126.1 deaths per 100,000 persons; 95% confidence interval: 116.4 to 136.5) than for non-Hispanic Kansans (162.4 deaths per 100,000 persons; 95% confidence interval: 160.4 to 164.4) during the time period 2010-2014 (Figure 2-4).

Figure 2-4. Age-adjusted cancer mortality rates among ethnic groups, Kansas 2010-2014.

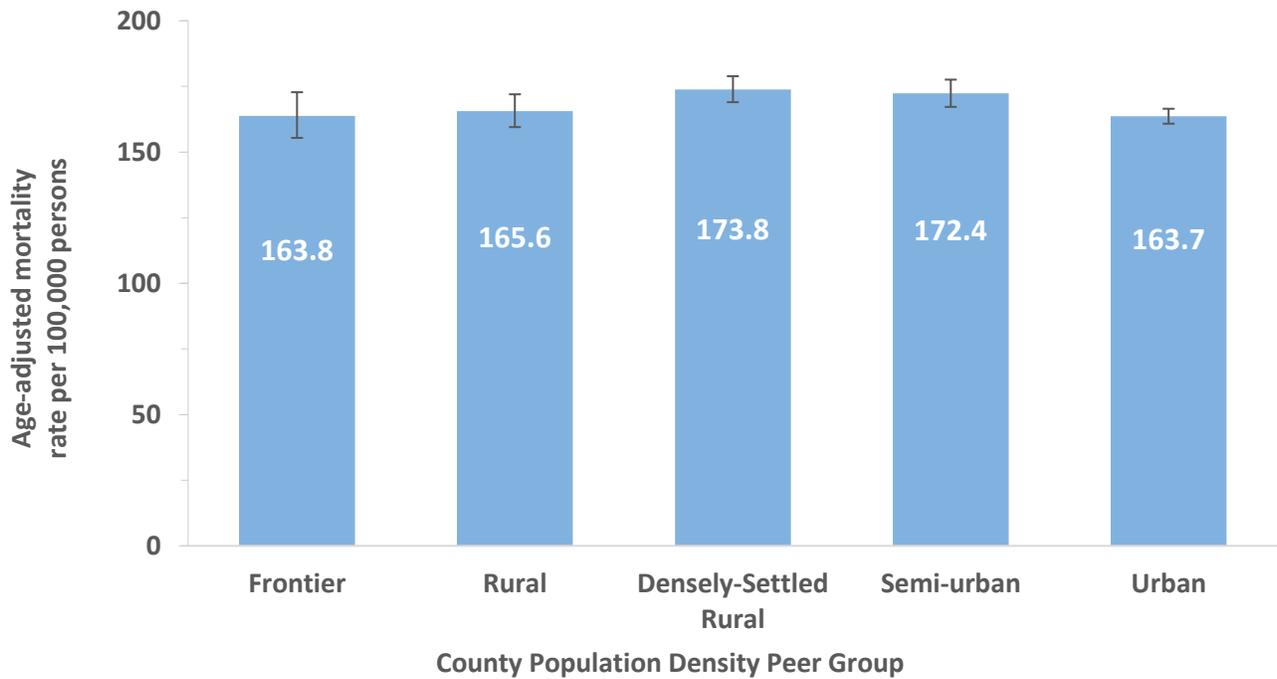


Source: 2010-2014 Kansas Vital Statistics, Bureau of Epidemiology and Public Health Informatics, KDHE. Rates were age-adjusted to the U.S. 2000 standard population using the direct method. See Technical Appendix for details on how rates were calculated. Vertical bars indicate 95% confidence intervals. Cancer mortality was defined as ICD-10 codes C00-C97. Hispanics were defined as persons of Mexican, Puerto Rican, Cuban, South or Central American, Other Spanish, Spanish not otherwise specified, or Dominican Republic ethnicity. Persons with Spanish surname only or unknown ethnicity were excluded.

Cancer Mortality among County Population Density Groups

In Kansas, there were slight differences in age-adjusted cancer mortality rates among county population density groups during the time period 2010-2014 (Figure 2-5). The age-adjusted cancer mortality rate in urban counties (163.7 deaths per 100,000 persons; 95% confidence interval: 160.8 to 166.5) was significantly lower than the rate in densely-settled rural counties (173.8 deaths per 100,000 persons; 95% confidence interval: 169.0 to 178.9).

Figure 2-5. Age-adjusted cancer mortality rates among county population density peer groups, Kansas 2010-2014.

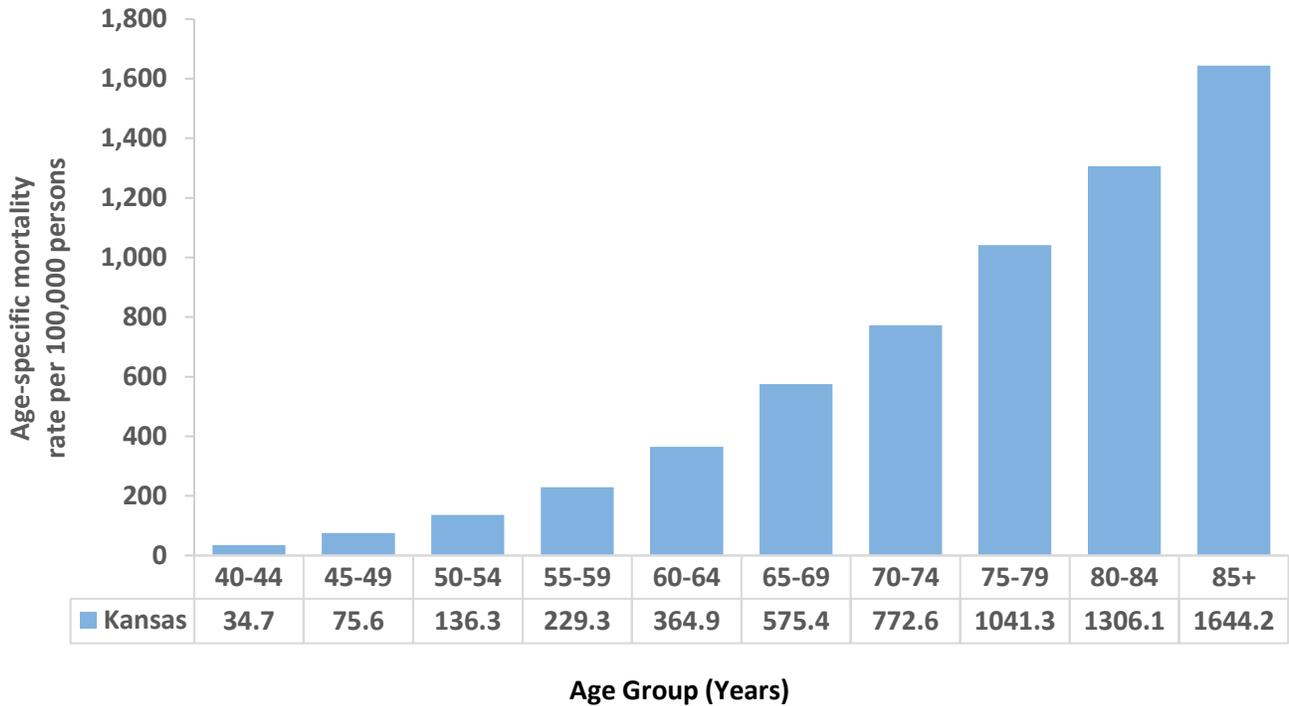


Source: 2010-2014 Kansas Vital Statistics, Bureau of Epidemiology and Public Health Informatics, KDHE. Rates were age-adjusted to the U.S. 2000 standard population using the direct method. See Technical Appendix for details on how rates were calculated. County population density peer groups are based on the population for each county in the 2000 population and are defined as follows: Frontier (fewer than 6 persons per square mile), Rural (6 to 19.9 persons per square mile), Densely-Settled Rural (20 to 39.9 persons per square mile), Semi-Urban (40 to 149.9 persons per square mile), and Urban (150 or more persons per square mile). Vertical bars indicate 95% confidence intervals. Cancer mortality was defined as ICD-10 codes C00-C97.

Cancer Mortality among Age Groups

In Kansas, cancer mortality increased dramatically with age as shown by the data for the period of 2010-2014 (Figure 2-6). Cancer mortality rates were highest among Kansans aged 85 years and older (1644.2 cases per 100,000 persons; 95% confidence interval: 1599.3 to 1690.7).

Figure 2-6. Age-specific cancer mortality rates for Kansas residents 40 years and older, Kansas 2010-2014.

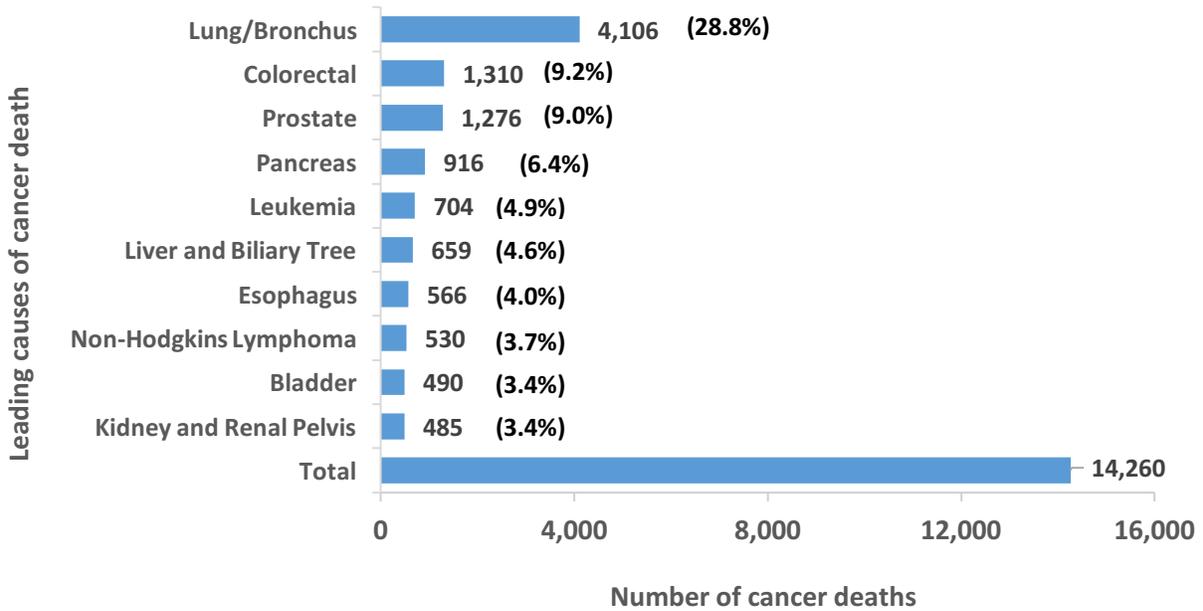


Source: 2010-2014 Kansas Vital Statistics, Bureau of Epidemiology and Public Health Informatics, KDHE. See Technical Appendix for details on how rates were calculated. Cancer mortality was defined as ICD-10 codes C00-C97.

Leading Causes of Cancer-Related Death by Gender

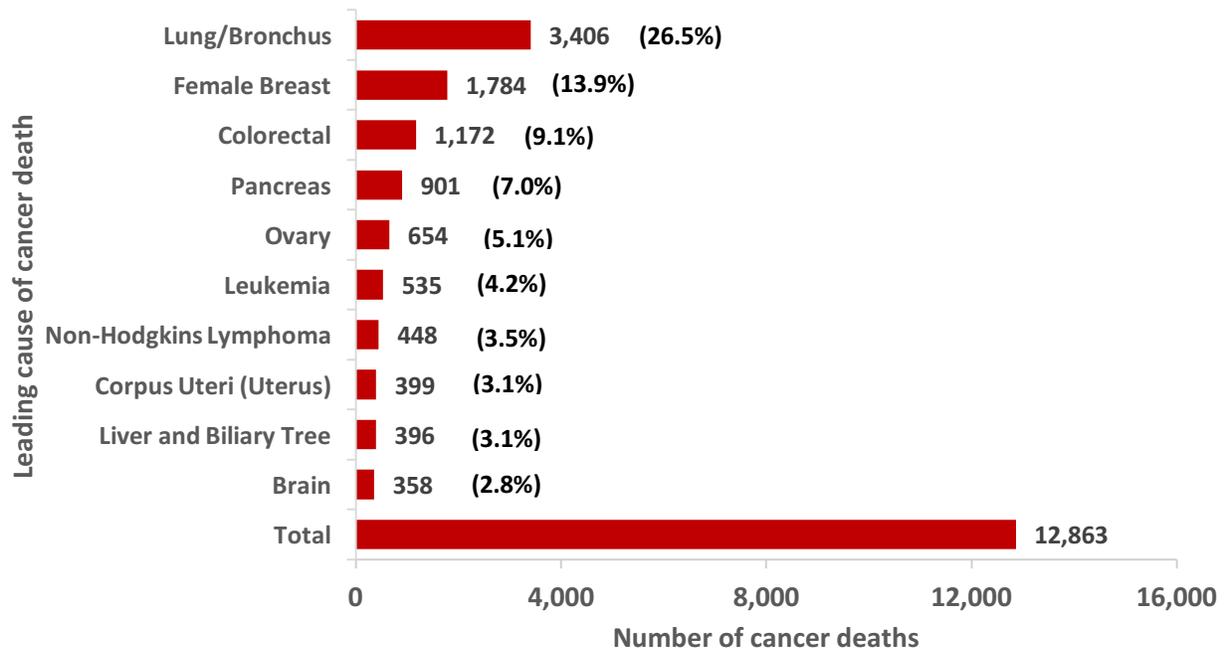
The most common causes of cancer-related death among Kansas males during the time period 2010- 2014 were lung (28.8%), colorectal (9.2%), and prostate (9.0%) cancer (Figure 2-7). Among Kansas females, the leading causes of cancer-related death during this time period were lung (26.5%), breast (13.9%), and colorectal (9.1%) cancer (Figure 2-8).

Figure 2-7. Top 10 causes of cancer death among males, Kansas 2010-2014



Source: 2010-2014 Kansas Vital Statistics, Bureau of Epidemiology and Public Health Informatics, KDHE. See Technical Appendix for details on how leading causes of cancer death were defined.

Figure 2-8. Top 10 causes of cancer death among females, Kansas 2010-2014



Source: 2010-2014 Kansas Vital Statistics, Bureau of Epidemiology and Public Health Informatics, KDHE. See Technical Appendix for details on how leading causes of cancer death were defined.

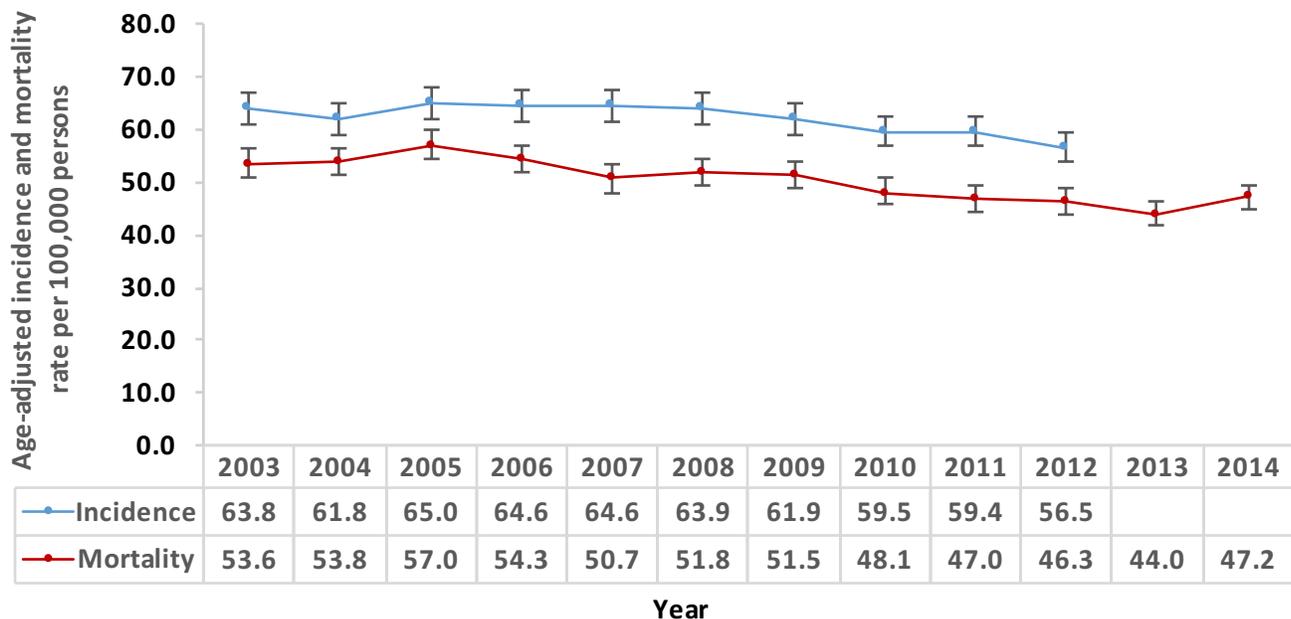
CHAPTER 3: PROFILES OF SELECTED CANCERS – LUNG AND BRONCHUS

Lung cancers are usually grouped into two main types, small cell and non-small cell, which grow differently and are treated differently. Non-small cell lung cancer is more common than small cell lung cancer.⁴ Cigarette smoking is the number one preventable cause of lung cancer. The disease can also be caused by exposure to secondhand smoke, asbestos, or radon.⁵ In Kansas, lung cancer is the leading cause of cancer death, and the second most commonly diagnosed cancer overall.

Lung Cancer Incidence and Mortality

On average, each year more than 1,800 lung cancers are diagnosed among Kansas residents and more than 1,500 Kansans die of the disease. Age-adjusted lung cancer incidence rates have decreased significantly during the period 2003-2012, and the age-adjusted lung cancer mortality rates have also decreased significantly during the period of 2003-2014 (Figure 3-1). In 2012, the age-adjusted lung cancer incidence rate in Kansas was 56.5 cases per 100,000 persons (95% confidence interval: 53.9 to 59.2). In 2014, the age-adjusted lung cancer mortality rate in Kansas was 47.2 deaths per 100,000 persons (95% confidence interval: 44.8 to 49.6).

Figure 3-1. Age-adjusted lung cancer incidence and mortality rates, Kansas 2003-2014.



Source: 2003-2012 Kansas Cancer Registry. 2003-2014 Kansas Vital Statistics, Bureau of Epidemiology and Public Health Informatics, KDHE. Cancer incidence data for 2009 were not available at the time the document was created. Rates were age-adjusted to the U.S. 2000 standard population using the direct method. See Technical Appendix for details on how rates were calculated. Vertical bars indicate 95% confidence intervals. Lung cancer incidence was defined as ICD-O-3 codes C340-C349 (excluding histology codes 9590-9989) with a behavior code indicating invasive malignancy. Lung cancer mortality was defined as ICD-10 code C34.

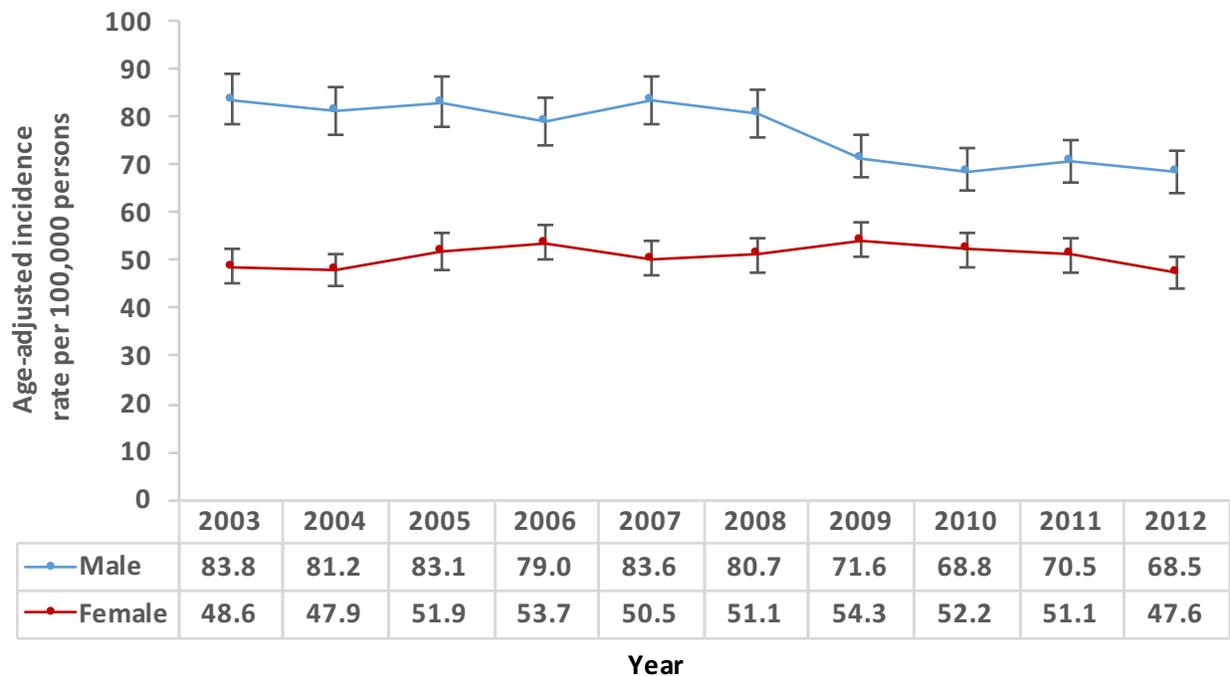
⁴ Johnson DH, Blot WJ, Carbone DP, et al. Cancer of the lung: non-small cell lung cancer and small cell lung cancer. In: Abeloff MD, Armitage JO, Niederhuber JE, Kastan MB, McKenna WG. Clinical Oncology. 4th ed. Philadelphia, Pa: Churchill Livingstone Elsevier; 2008.
⁵ Alberg AJ, Ford FG, Samet JM. Epidemiology of lung cancer: ACCP evidence-based clinical practice guidelines (2nd edition). Chest 2007;132(3 Suppl):295-555.

Lung Cancer Incidence among Gender Groups

Age-adjusted lung cancer incidence rates were significantly higher for males as compared to females during the period 2003-2012. In 2012, there were 68.5 cases of lung cancer per 100,000 males (95% confidence interval: 64.2 to 73.0) and 47.6 cases of lung cancer per 100,000 females (95% confidence interval: 44.3 to 51.0) (Figure 3-2). Age-adjusted lung cancer incidence rates has decreased significantly among males but not in females from 2003 to 2012.



Figure 3-2. Age-adjusted lung cancer incidence rates by gender and year, Kansas 2003-2012.

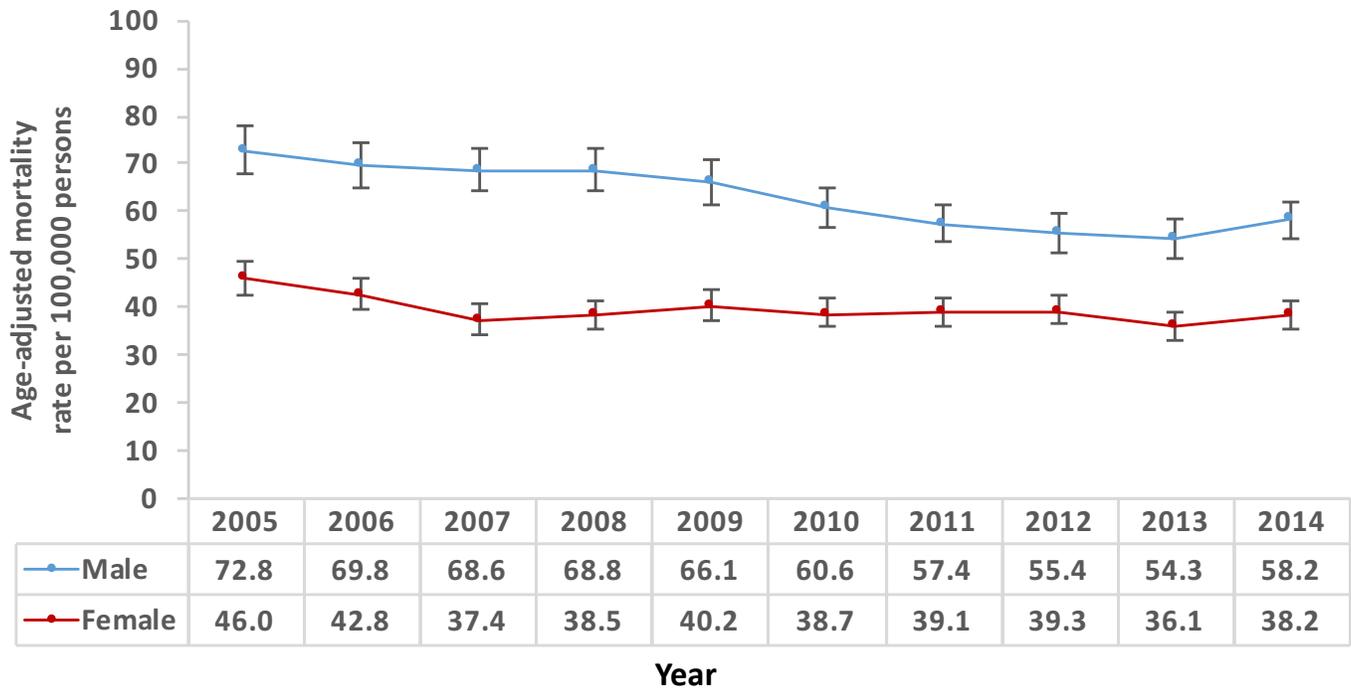


Source: 2003-2012 Kansas Cancer Registry. Rates were age-adjusted to the U.S. 2000 standard population using the direct method. See Technical Appendix for details on how rates were calculated. Vertical bars indicate 95% confidence intervals. Lung cancer incidence was defined as ICD-O-3 codes C340-C349 (excluding histology codes 9590-9989) with a behavior code indicating invasive malignancy.

Lung Cancer Mortality among Gender Groups

Age-adjusted lung cancer mortality rates were significantly higher for males as compared to females during the period 2005-2014. In 2014, there were 58.2 lung cancer deaths per 100,000 males (95% confidence interval: 54.3 to 62.3) and 38.2 lung cancer deaths per 100,000 females (95% confidence interval: 35.4 to 41.3) (Figure 3-3). Age-adjusted lung cancer mortality rates have decreased significantly for both males and females from 2005 to 2014.

Figure 3-3. Age-adjusted lung cancer mortality rates among gender groups, Kansas 2005-2014.

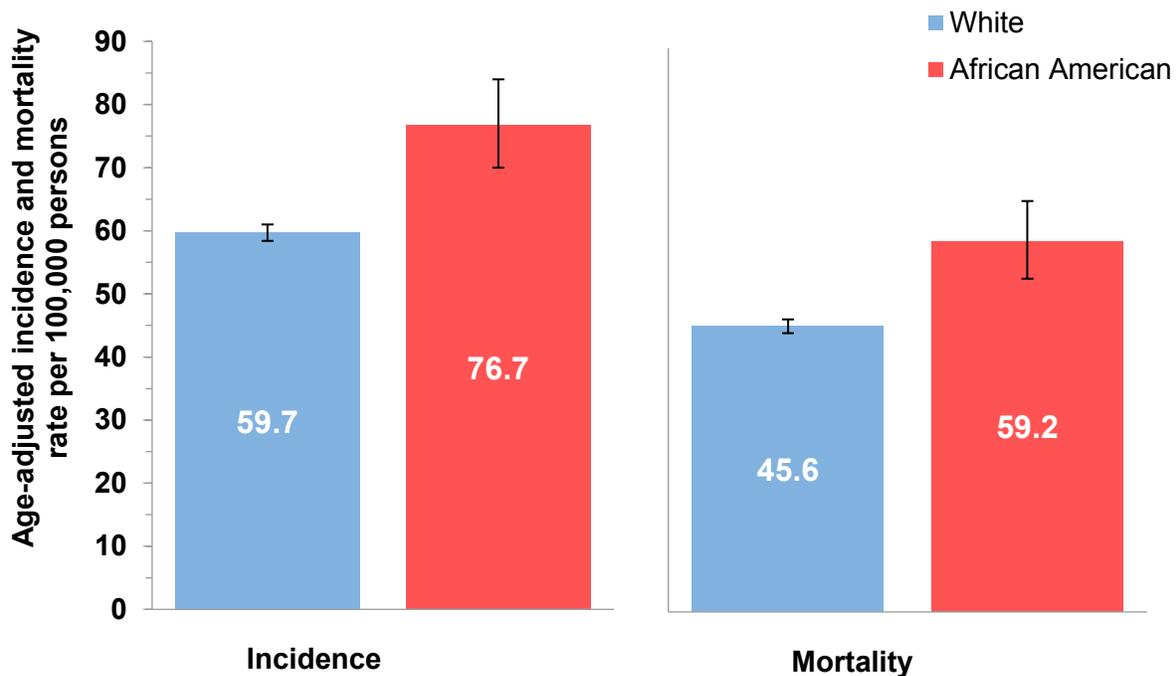


Source: 2005-2014 Kansas Vital Statistics, Bureau of Epidemiology and Public Health Informatics, KDHE. Rates were age-adjusted to the U.S. 2000 standard population using the direct method. See Technical Appendix for details on how rates were calculated. Vertical bars indicate 95% confidence intervals. Lung cancer mortality was defined as ICD-10 code C34.

Lung Cancer Incidence and Mortality among Race Groups

The age-adjusted lung cancer incidence rate was significantly higher for African American Kansans (76.7 cases per 100,000 persons; 95% confidence interval: 70.0 to 84.0) than for white Kansans (59.7 cases per 100,000 persons; 95% confidence interval: 58.4 to 61.0) during the period 2008-2012 (Figure 3-4). Similarly, the age-adjusted lung cancer mortality rate was significantly higher for African American Kansans (59.2 deaths per 100,000 persons; 95% confidence interval: 53.2 to 65.6) than for white Kansans (45.6 deaths per 100,000 persons; 95% confidence interval: 44.5 to 46.7) during the period 2010-2014.

Figure 3-4. Age-adjusted lung cancer incidence (2008-2012) and mortality (2010-2014) rates among race groups, Kansas 2008-2014.

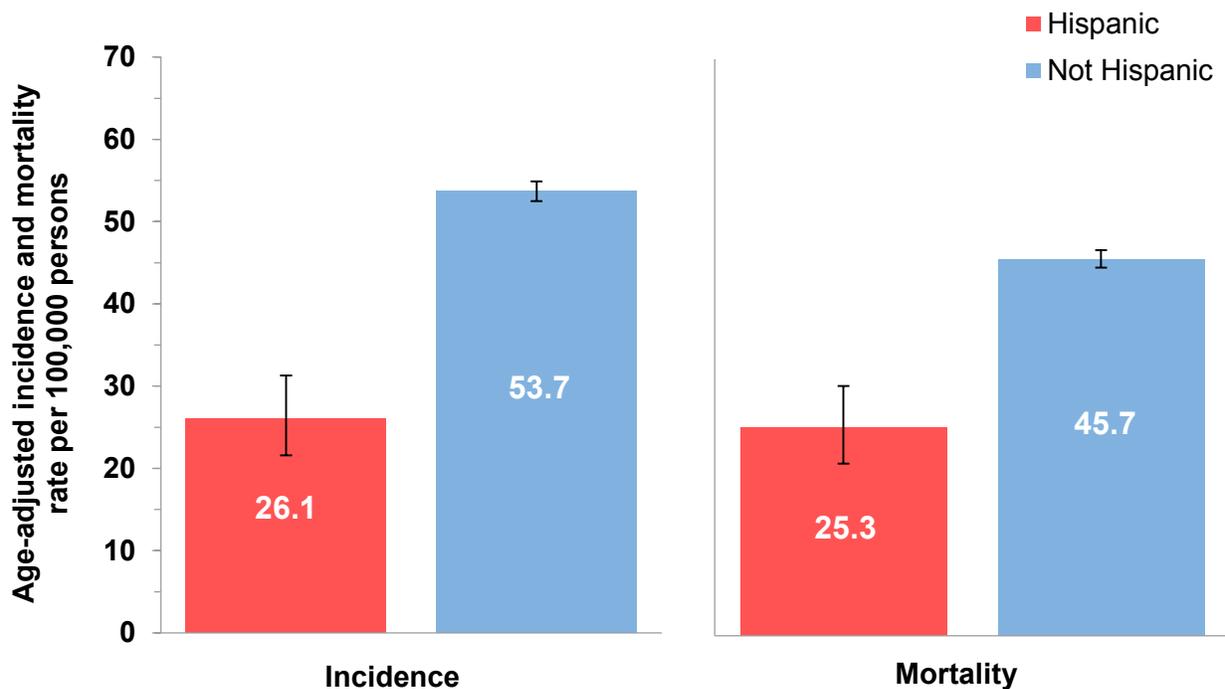


Source: 2008-2012 Kansas Cancer Registry. 2010-2014 Kansas Vital Statistics, Bureau of Epidemiology and Public Health Informatics, KDHE. Rates were age-adjusted to the U.S. 2000 standard population using the direct method. See Technical Appendix for details on how rates were calculated. Vertical bars indicate 95% confidence intervals. Lung cancer incidence was defined as ICD-O-3 codes C340-C349 (excluding histology codes 9590-9989) with a behavior code indicating invasive malignancy. Lung cancer mortality was defined as ICD-10 code C34.

Lung Cancer Incidence and Mortality among Ethnic Groups

The age-adjusted lung cancer incidence rate was significantly lower for Hispanic Kansans (26.1 cases per 100,000 persons; 95% confidence interval: 21.6 to 31.3) than for non-Hispanic Kansans (53.7 cases per 100,000 persons; 95% confidence interval: 52.5 to 54.9) during the period 2008-2012 (Figure 3-5). Also, the age-adjusted lung cancer mortality rate was significantly lower for Hispanic Kansans (25.3 deaths per 100,000 persons; 95% confidence interval: 20.9 to 30.3) than non-Hispanic Kansans (45.7 deaths per 100,000 persons; 95% confidence interval: 44.7 to 46.8) during the period of 2010-2014 (Figure 3-5).

Figure 3-5. Age-adjusted lung cancer incidence (2008-2012) and mortality (2010-2014) among ethnic groups, Kansas 2008-2014.



Source: 2008-2012 Kansas Cancer Registry. 2010-2014 Kansas Vital Statistics, Bureau of Epidemiology and Public Health Informatics, KDHE. Rates were age-adjusted to the U.S. 2000 standard population using the direct method. See Technical Appendix for details on how rates were calculated. Vertical bars indicate 95% confidence intervals. Lung cancer incidence was defined as ICD-O-3 codes C340-C349 (excluding histology codes 9590-9989) with a behavior code indicating invasive malignancy. Lung cancer mortality was defined as ICD-10 code C34. Hispanics were defined as persons of Mexican, Puerto Rican, Cuban, South or Central American, Other Spanish, Spanish not otherwise specified, or Dominican Republic ethnicity. Persons with Spanish surname only or unknown ethnicity were excluded.

Lung Cancer Late Stage Diagnosis

Among gender group in Kansas, the age-adjusted late stage lung cancer incidence rate dropped significantly among males from 2003-2007 (60.6 cases per 100,000 persons; 95% CI: 58.7 to 62.6) to 2008-2012 (53.8 cases per 100,000 persons; 95% CI: 52.1 to 55.6). However, the late stage age-adjusted lung cancer incidence rate did not differ significantly for females between 2003-2007 and 2008-2012 (Table 3-1).

Among race group in Kansas, the age-adjusted late stage lung cancer incidence rate dropped significantly among Whites from 2003-2007 (46.5 cases per 100,000 persons; 95% CI: 45.3 to 47.7) to 2008-2012 (43.5 cases per 100,000 persons; 95% CI: 42.4 to 44.6). However, the late stage age-adjusted lung cancer incidence rate did not differ significantly for African Americans, Asian/Pacific Islanders, and American Indian/Alaska Natives between 2003-2007 and 2008-2012 (Table 3-1).

Among ethnicity group in Kansas, the age-adjusted late stage lung cancer incidence rate dropped significantly among Non-Hispanics from 2003-2007 (46.3 cases per 100,000 persons; 95% CI: 45.2 to 47.5) to 2008-2012 (39.5 cases per 100,000 persons; 95% CI: 38.4 to 40.5). In comparison, the late stage age-adjusted lung cancer incidence rate did not differ significantly for Hispanic population during the same time period (Table 3-1).

Among race group in Kansas, the age-adjusted late stage lung cancer incidence rate dropped significantly among Whites from 2003-2007 (46.5 cases per 100,000 persons; 95% CI: 45.3 to 47.7) to 2008-2012 (43.5 cases per 100,000 persons; 95% CI: 42.4 to 44.6). However, the late stage age-adjusted lung cancer incidence rate did not differ significantly for African Americans, Asian/Pacific Islanders, and American Indian/Alaska Natives between 2003-2007 and 2008-2012 (Table 3-1).

Table 3-1. Age-adjusted late stage lung cancer incidence rates by years and selected characteristics, Kansas, 2003-2012.

Characteristics	2008-2012			2003-2007		
	Age-adjusted Rate	95% Confidence Interval		Age-adjusted Rate	95% Confidence Interval	
Gender						
Male	53.8	52.1	55.6	60.6	58.7	62.6
Female	36.5	35.2	37.8	35.8	34.5	37.2
Race						
White	43.5	42.4	44.6	46.5	45.3	47.7
African American	59.6	53.7	66.0	57.9	51.8	64.7
Asian/Pacific Islander	33.6	25.5	44.0	20.7	13.9	30.9
American Indian/Alaska Native	28.4	18.8	42.2	22.0	12.8	36.3
Ethnicity						
Hispanic	17.7	14.1	22.1	16.5	12.4	21.7
Non-Hispanic	39.5	38.4	40.5	46.3	45.2	47.5
Population Density						
Rural	41.5	39.8	43.3	45.9	44.1	47.8
Urban	45.6	44.3	47.0	47.0	45.6	48.5

* Late stage was defined as the combination of regional and distant stage of diagnosis.

Source: 2010-2014 Kansas Vital Statistics, Bureau of Epidemiology and Public Health Informatics, KDHE. See Technical Appendix for details on how leading causes of cancer death were defined.

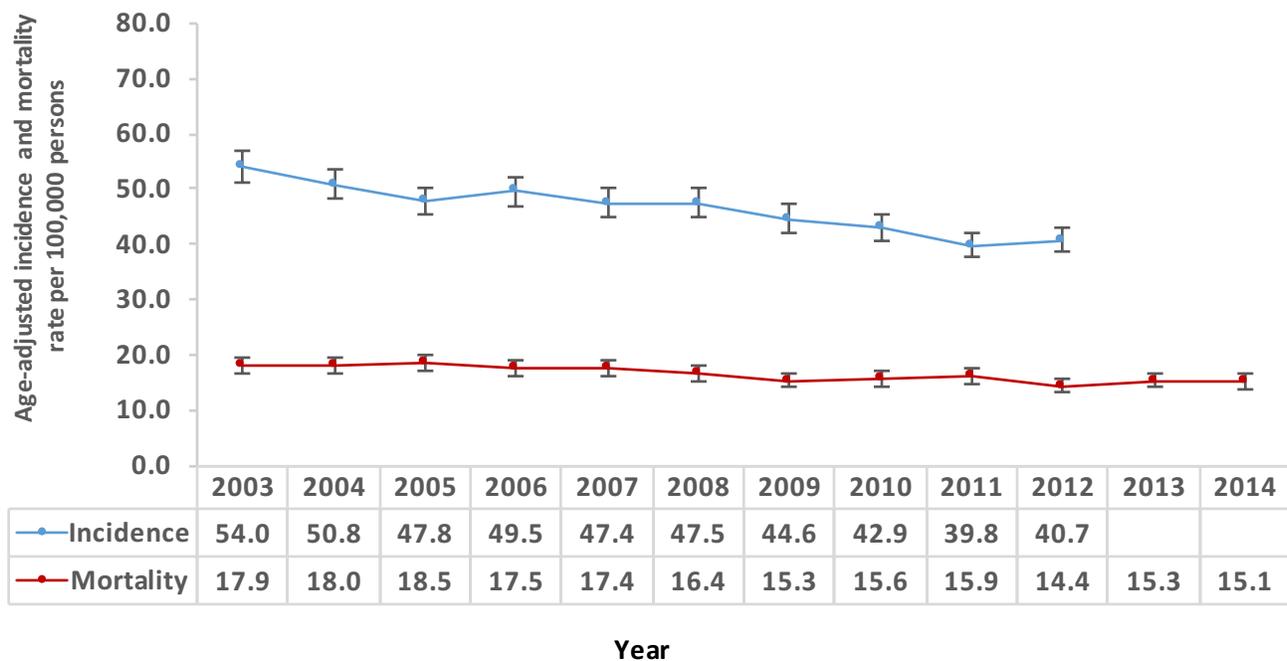
CHAPTER 4: PROFILES OF SELECTED CANCERS – COLORECTAL

Colorectal cancer develops from precancerous polyps in the colon (large intestine) or rectum. The exact cause of most colorectal cancers is not yet known; however, research has shown that increased physical activity and maintaining a healthy weight can decrease the risk for colorectal cancer.⁶ In Kansas, colorectal cancer is the second leading cause of cancer death among males and the third leading cause of cancer death among females, and the third most commonly diagnosed cancer among both males and females.

Colorectal Cancer Incidence and Mortality

Each year, on average, nearly 1,400 colorectal cancers are diagnosed among Kansas residents and more than 500 Kansans die of the disease. Age-adjusted colorectal cancer incidence decreased significantly during the period 2003-2012 from 54.0 cases per 100,000 persons (95% confidence interval: 51.3 to 56.7) in 2003 to 40.7 cases per 100,000 persons (95% confidence interval: 38.5 to 43.1) in 2012 (Figure 4-1). Age-adjusted colorectal cancer mortality remained stable during the same time period from 17.9 deaths per 100,000 persons (95% confidence interval: 16.4 to 19.5) in 2003 to 15.1 deaths per 100,000 persons in 2014 (95% confidence interval: 13.8 to 16.6) as no statistically significant difference was observed.

Figure 4-1. Age-adjusted colorectal cancer incidence and mortality rates, Kansas 2003-2014.



Source: 2003-2012 Kansas Cancer Registry. 2003-2014 Kansas Vital Statistics, Bureau of Epidemiology and Public Health Informatics, KDHE. Cancer incidence data for 2013 and 2014 were not available at the time the document was created. Rates were age-adjusted to the U.S. 2000 standard population using the direct method. See Technical Appendix for details on how rates were calculated. Vertical bars indicate 95% confidence intervals. Colorectal cancer incidence was defined as ICD-O-3 codes C180-C189, C199, C209, or C260 (excluding histology codes 9590-9989) with a behavior code indicating invasive malignancy. Colorectal cancer mortality was defined as ICD-10 codes C18-C20 or C260.

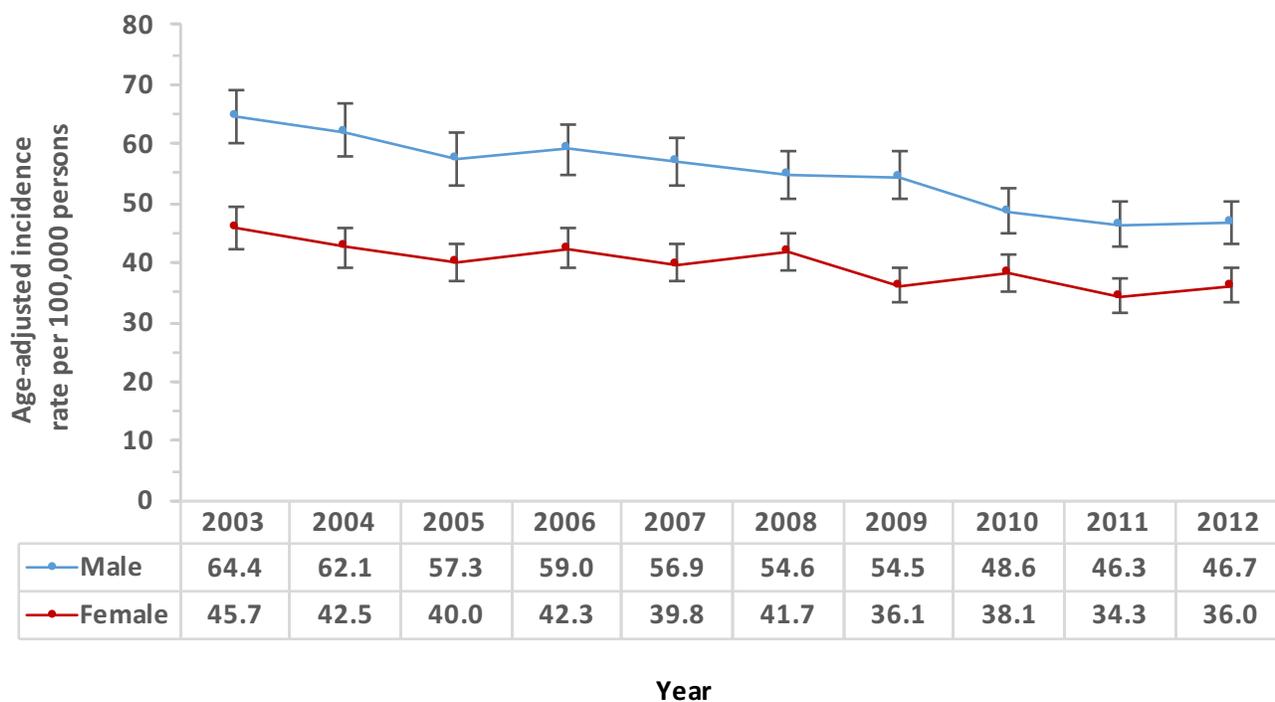
⁶ "Basic Information about Colorectal Cancer." Division of Cancer Prevention and Control, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention. www.cdc.gov/cancer/colorectal/basic_info/index.htm

Colorectal Cancer Incidence among Gender Groups

Age-adjusted colorectal cancer incidence rates were significantly higher for males as compared to females during the period 2003-2012 (Figure 4-2). Age-adjusted colorectal cancer incidence rates decreased significantly for men during this time period from 64.4 cases per 100,000 males (95% confidence interval: 60.0 to 69.1) in 2003 to 46.7 cases per 100,000 males (95% confidence interval: 43.1 to 50.4) in 2012. Age-adjusted colorectal cancer incidence rates also decreased significantly for women during the same time period from 45.7 cases per 100,000 females (95% confidence interval: 42.4 to 49.2) in 2003 to 36.0 cases per 100,000 females in 2012 (95% confidence interval: 33.2 to 39.1).



Figure 4-2. Age-adjusted colorectal cancer incidence rates by gender and year, Kansas 2003-2012.

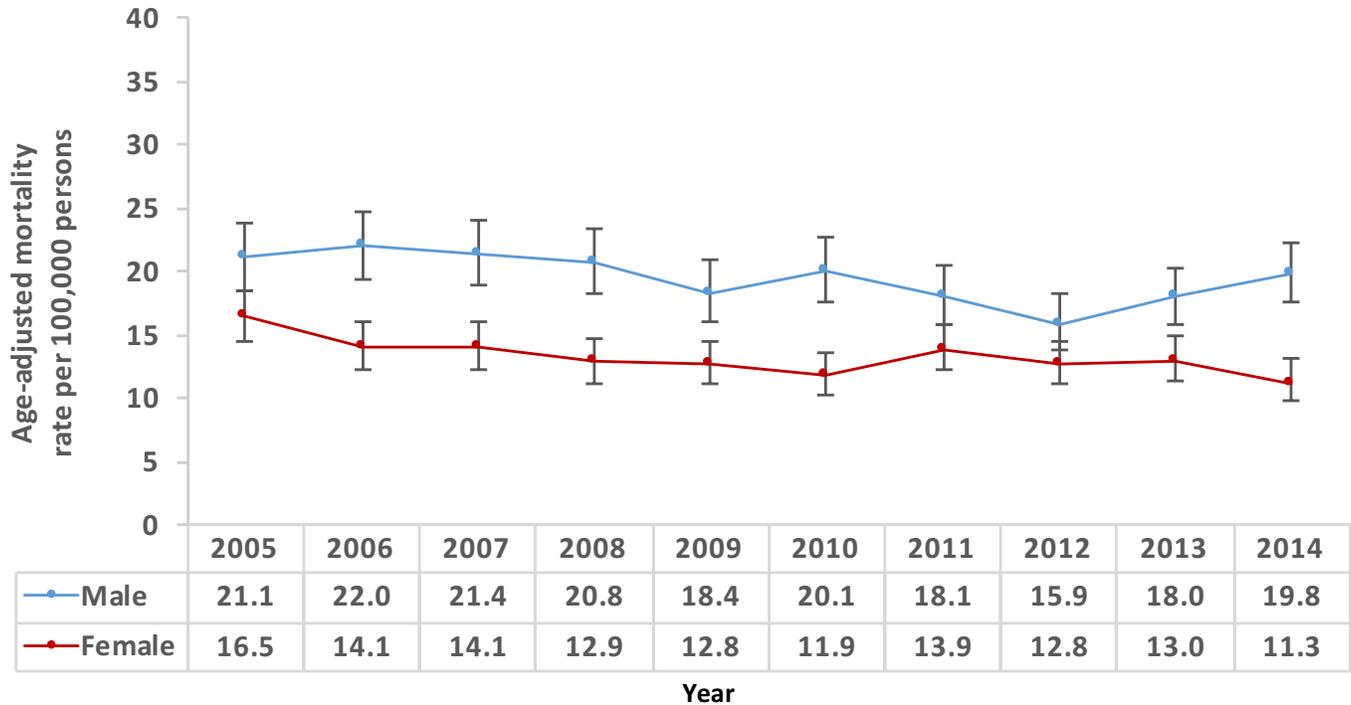


Source: 2003-2012 Kansas Cancer Registry. Rates were age-adjusted to the U.S. 2000 standard population using the direct method. See Technical Appendix for details on how rates were calculated. Vertical bars indicate 95% confidence intervals. Colorectal cancer incidence was defined as ICD-O-3 codes C180-C189, C199, C209, or C260 (excluding histology codes 9590-9989) with a behavior code indicating invasive malignancy.

Colorectal Cancer Mortality among Gender Groups

Age-adjusted colorectal cancer mortality rates were significantly higher for males as compared to females during the period 2005-2014. In 2014, there were 19.8 deaths per 100,000 males (95% confidence interval: 17.6 to 22.3) and 11.3 deaths per 100,000 females (95% confidence interval: 9.8 to 13.1) (Figure 4-3). Age-adjusted colorectal cancer mortality rates did not change significantly for males but has decreased significantly for females from 2005 to 2014.

Figure 4-3. Age-adjusted colorectal cancer mortality rates among gender groups, Kansas 2005-2014.

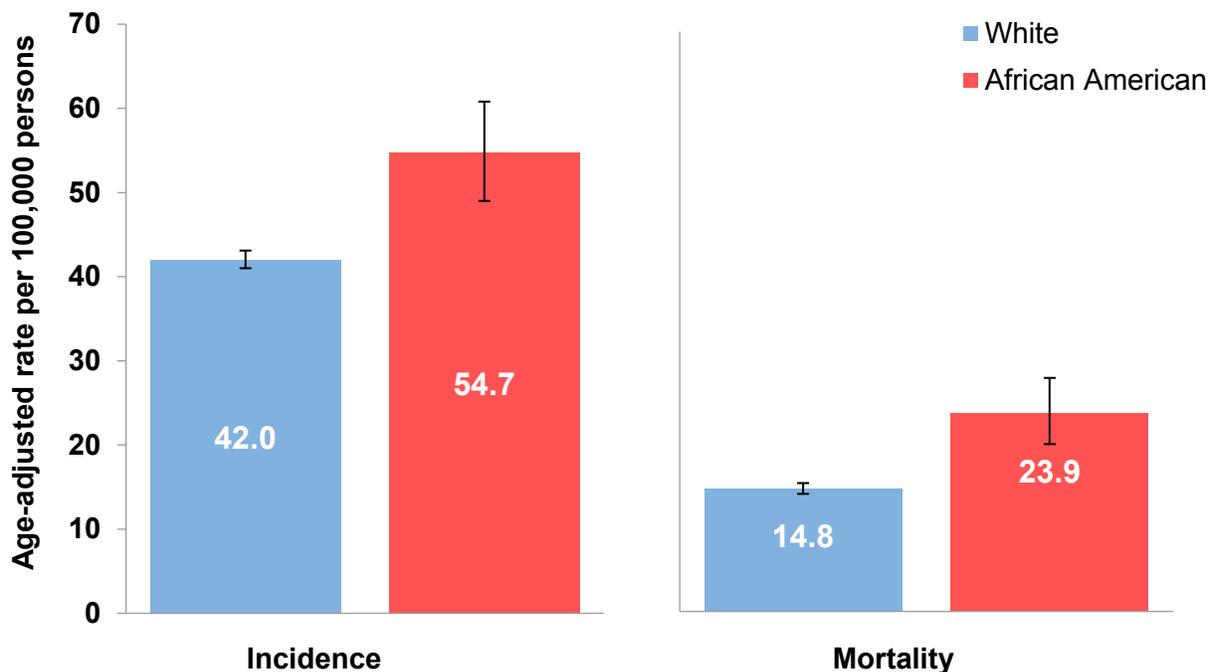


Source: 2005-2014 Kansas Vital Statistics, Bureau of Epidemiology and Public Health Informatics, KDHE. Rates were age-adjusted to the U.S. 2000 standard population using the direct method. See Technical Appendix for details on how rates were calculated. Vertical bars indicate 95% confidence intervals. Colorectal cancer mortality was defined as ICD-10 codes C18-C20 or C260.

Colorectal Cancer Incidence and Mortality among Race Groups

The age-adjusted colorectal cancer incidence rate was significantly higher among African American Kansans (54.7 cases per 100,000 persons; 95% confidence interval: 49.0 to 60.8) as compared to white Kansans (42.0 cases per 100,000 persons; 95% confidence interval: 41.0 to 43.1) during the period 2008-2012 (Figure 4-4). Similarly, the age-adjusted colorectal cancer mortality rate was significantly higher for African American Kansans (23.9 deaths per 100,000 persons; 95% confidence interval: 20.2 to 28.2) as compared to white Kansans (14.8 deaths per 100,000 persons; 95% confidence interval: 14.2 to 15.5) during the period 2010-2014.

Figure 4-4. Age-adjusted colorectal cancer incidence (2008-2012) and mortality (2010-2014) rates among race groups, Kansas 2008-2014.

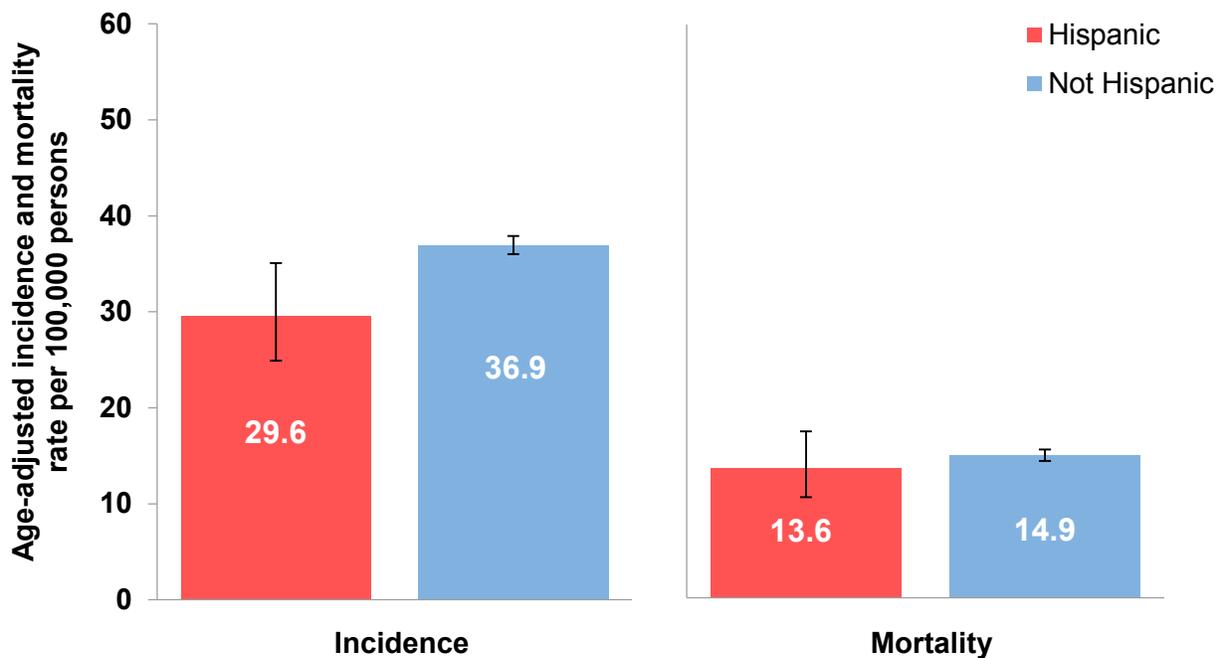


Source: 2008-2012 Kansas Cancer Registry. 2010-2014 Kansas Vital Statistics, Bureau of Epidemiology and Public Health Informatics, KDHE. Rates were age-adjusted to the U.S. 2000 standard population using the direct method. See Technical Appendix for details on how rates were calculated. Vertical bars indicate 95% confidence intervals. Colorectal cancer incidence was defined as ICD-O-3 codes C180-C189, C199, C209, or C260 (excluding histology codes 9590-9989) with a behavior code indicating invasive malignancy. Colorectal cancer mortality was defined as ICD-10 codes C18-C20 or C260, incidence rates for 2010-2014 were not available at the time the document was created.

Colorectal Cancer Incidence and Mortality among Ethnic Groups

The age-adjusted colorectal cancer incidence rate was significantly lower for Hispanic Kansans (29.6 cases per 100,000 persons; 95% confidence interval: 24.9 to 35.1) than for non-Hispanic Kansans (36.9 cases per 100,000 persons; 95% confidence interval: 36.0 to 37.9) during the period 2008-2012 (Figure 4-5). However, the age-adjusted colorectal cancer mortality rate did not differ significantly between Hispanic Kansans and non-Hispanic Kansans during the period 2010-2014.

Figure 4-5. Age-adjusted colorectal cancer incidence (2008-2012) and mortality (2010-2014) among ethnic groups, Kansas 2008-2014.



Source: 2008-2012 Kansas Cancer Registry. 2010-2014 Kansas Vital Statistics, Bureau of Epidemiology and Public Health Informatics, KDHE. Rates were age-adjusted to the U.S. 2000 standard population using the direct method. See Technical Appendix for details on how rates were calculated. Vertical bars indicate 95% confidence intervals. Colorectal cancer incidence was defined as ICD-O-3 codes C180-C189, C199, C209, or C260 (excluding histology codes 9590-9989) with a behavior code indicating invasive malignancy, incidence rates for 2010-2014 were not available at the time the document was created. Colorectal cancer mortality was defined as ICD-10 codes C18-C20 or C260. Hispanics were defined as persons of Mexican, Puerto Rican, Cuban, South or Central American, Other Spanish, Spanish not otherwise specified, or Dominican Republic ethnicity. Persons with Spanish surname only or unknown ethnicity were excluded.

Colorectal Cancer Late Stage Diagnosis

Among gender groups in Kansas, the age-adjusted late stage colorectal cancer incidence rate dropped significantly for both males and females from 2003-2007 (30.4 cases per 100,000 persons; 95% CI: 29.1 to 31.8 and 22.7 cases per 100,000 persons; 95% CI: 21.6 to 23.7, respectively) to 2008-2012 (26.2 cases per 100,000 persons; 95% CI: 25.0 to 26.7 and 19.3 cases per 100,000 persons; 95% CI: 18.4 to 20.3, respectively). (Table 4-1).

Among race groups in Kansas, the age-adjusted late stage colorectal cancer incidence rate dropped significantly among Whites from 2003-2007 (25.9 cases per 100,000 persons; 95% CI: 25.0 to 26.7) to 2008-2012 (22.0 cases per 100,000 persons; 95% CI: 21.3 to 22.8). However, the late stage age-adjusted colorectal cancer incidence rate did not differ significantly for African Americans and Asian/Pacific Islanders between 2003-2007 and 2008-2012 (Table 4-1).

Among ethnicity groups in Kansas, the age-adjusted late stage colorectal cancer incidence rate dropped significantly among Non-Hispanics from 2003-2007 (24.6 cases per 100,000 persons; 95% CI: 23.7 to 25.4) to 2008-2012 (19.7 cases per 100,000 persons; 95% CI: 18.9 to 20.4). In comparison, the late stage age-adjusted colorectal cancer incidence rate did not differ significantly for Hispanic population during the same time period (Table 4-1).

Among population density groups in Kansas, the age-adjusted late stage colorectal cancer incidence rate dropped significantly among Kansans who lived in rural counties from 2003-2007 (29.0 cases per 100,000 persons; 95% CI: 27.6 to 30.6) to 2008-2012 (24.1 cases per 100,000 persons; 95% CI: 22.7 to 25.5). Similarly, the late stage age-adjusted colorectal cancer incidence rate also dropped significantly among Kansans who lived in urban counties during the same time period (24.4 cases per 100,000 persons; 95% CI: 23.4 to 25.5 and 21.5 cases per 100,000 persons; 95% CI: 20.6 to 22.4, respectively) (Table 4-1).

Table 4-1. Age-adjusted late stage colorectal cancer incidence rates by years and selected characteristics, Kansas, 2003-2012.

Characteristics	2008-2012			2003-2007		
	Age-adjusted Rate	95% Confidence Interval		Age-adjusted Rate	95% Confidence Interval	
Gender						
Male	26.2	25.0	27.4	30.4	29.1	31.8
Female	19.3	18.4	20.3	22.7	21.6	23.7
Race						
White	22.0	21.3	22.8	25.9	25.0	26.7
African American	29.6	25.5	34.2	31.9	27.4	37.0
Asian/Pacific Islander	16.4	11.2	23.9	21.9	14.5	32.8
Ethnicity						
Hispanic	15.2	11.9	19.2	17.2	13.2	22.1
Non-Hispanic	19.7	18.9	20.4	24.6	23.7	25.4
Population Density						
Rural	24.1	22.7	25.5	29.0	27.6	30.6
Urban	21.5	20.6	22.4	24.4	23.4	25.5

* a. Late stage was defined as the combination of regional and distant stage of diagnosis.

b. Due to insufficient count, data for American Indian/Alaska Native was not displayed in the table.

Source: 2003-2012 Kansas Cancer Registry. Colorectal cancer incidence was defined as ICD-O-3 codes C180-C189, C199, C209, or C260 (excluding histology codes 9590-9989) with a behavior code indicating invasive malignancy.

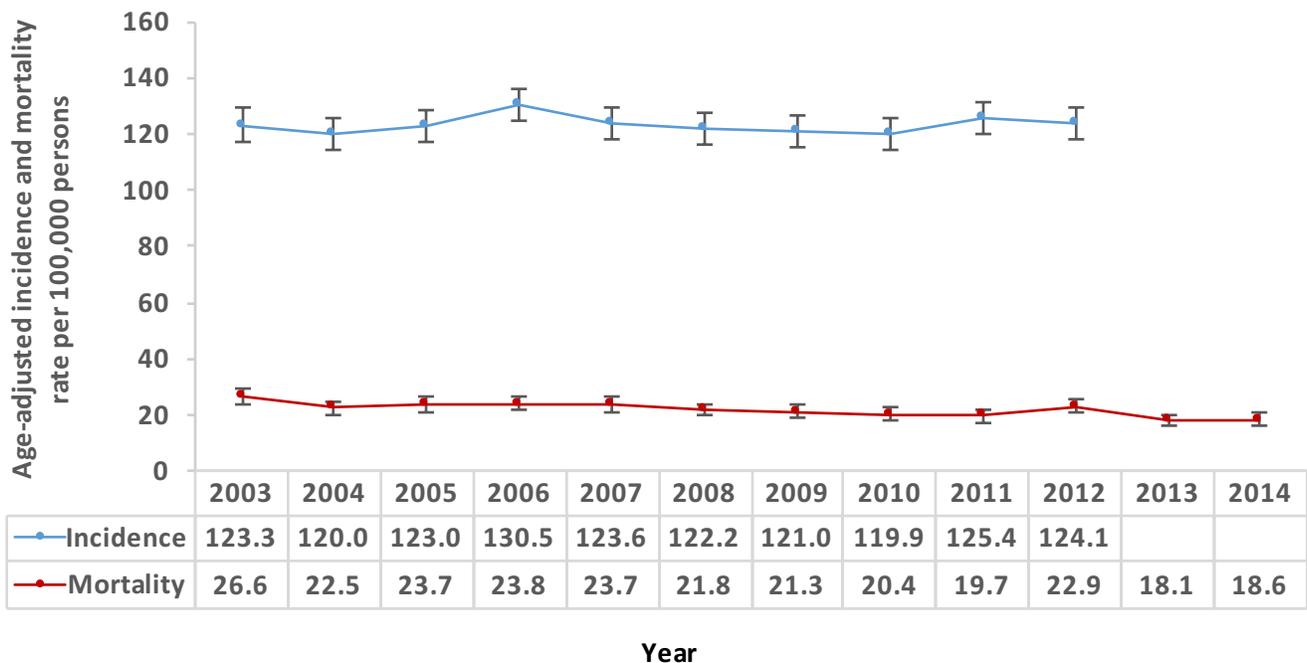
CHAPTER 5: PROFILES OF SELECTED CANCERS – FEMALE BREAST

There are different kinds of breast cancer depending on which cells in the breast turn into cancer, such as the ducts which carry milk to the nipple (ductal carcinoma), or the glands which produce milk (lobular carcinoma). Although men can get breast cancer, it is not very common. For every 100 cases of breast cancer, less than one is in men.⁷ Among Kansas women, breast cancer is the most commonly diagnosed cancer and the second leading cause of cancer death.

Female Breast Cancer Incidence and Mortality

Each year on average, nearly 2,000 breast cancers are diagnosed among Kansas females and approximately 360 Kansas females die of the disease. Age-adjusted female breast cancer incidence rates did not differ significantly during the period 2003-2012. In 2003, the age-adjusted incidence rate was 123.3 cases per 100,000 females (95% confidence interval: 117.6 to 129.1); and the age-adjusted incidence rate was 124.1 cases per 100,000 females (95% confidence interval: 118.6 to 129.8) in 2012 (Figure 5-1). However, age-adjusted female breast cancer mortality rates decreased significantly during this period from 26.6 deaths per 100,000 females (95% confidence interval: 24.1 to 29.4) in 2003 to 18.6 deaths per 100,000 females (95% confidence interval: 16.7 to 20.8) in 2014.

Figure 5-1. Age-adjusted female breast cancer incidence and mortality rates, Kansas 2003-2014.



Source: 2003-2012 Kansas Cancer Registry. 2003-2014 Kansas Vital Statistics, Bureau of Epidemiology and Public Health Informatics, KDHE. Cancer incidence data for 2013 and 2014 were not available at the time the document was created. Rates were age-adjusted to the U.S. 2000 standard population using the direct method. See Technical Appendix for details on how rates were calculated. Vertical bars indicate 95% confidence intervals. Female breast cancer incidence was defined as ICD-O-3 codes C500-C509 (excluding histology codes 9590-9989) with a behavior code indicating invasive malignancy. Female breast cancer mortality was defined as ICD-10 code C50.

⁷ "Basic Information about Breast Cancer." Division of Cancer Prevention and Control, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention.
www.cdc.gov/cancer/breast/basic_info/index.htm

Female Breast Cancer Incidence and Mortality among Race Groups

In Kansas, the age-adjusted female breast cancer incidence rate was not significantly different between white women (121.3 cases per 100,000 females; 95% confidence interval: 118.8 to 123.9) and African American women (128.1 cases per 100,000 females; 95% confidence interval: 116.9 to 140.3) during the period 2008-2012 (Figure 5-2). The age-adjusted female breast cancer mortality rate was significantly higher for African American Kansas women (28.1 deaths per 100,000 females; 95% confidence interval: 23.0 to 34.1) compared with white Kansas women (19.4 deaths per 100,000 females; 95% confidence interval: 18.4 to 20.4) during the period 2010-2014.

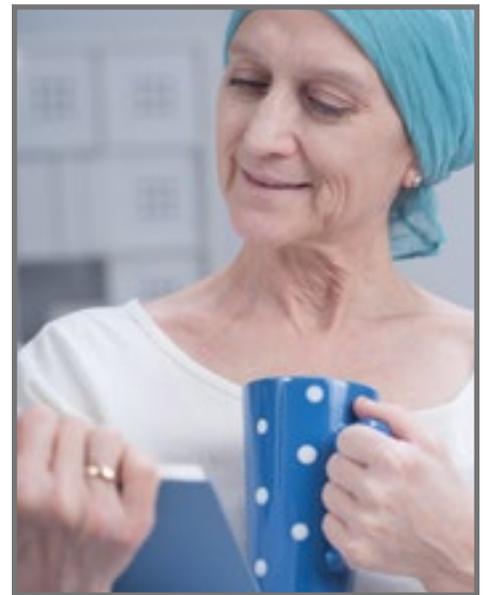
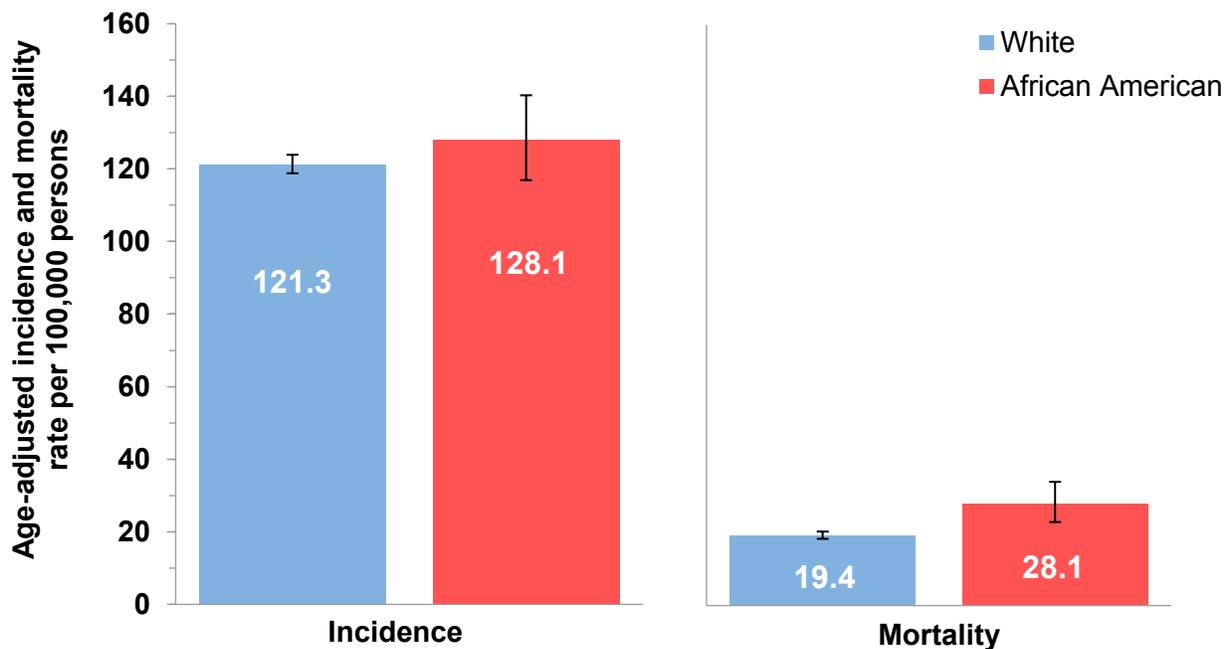


Figure 5-2. Age-adjusted female breast cancer incidence (2008-2012) and mortality (2010-2014) rates among race groups, Kansas 2008-2014.

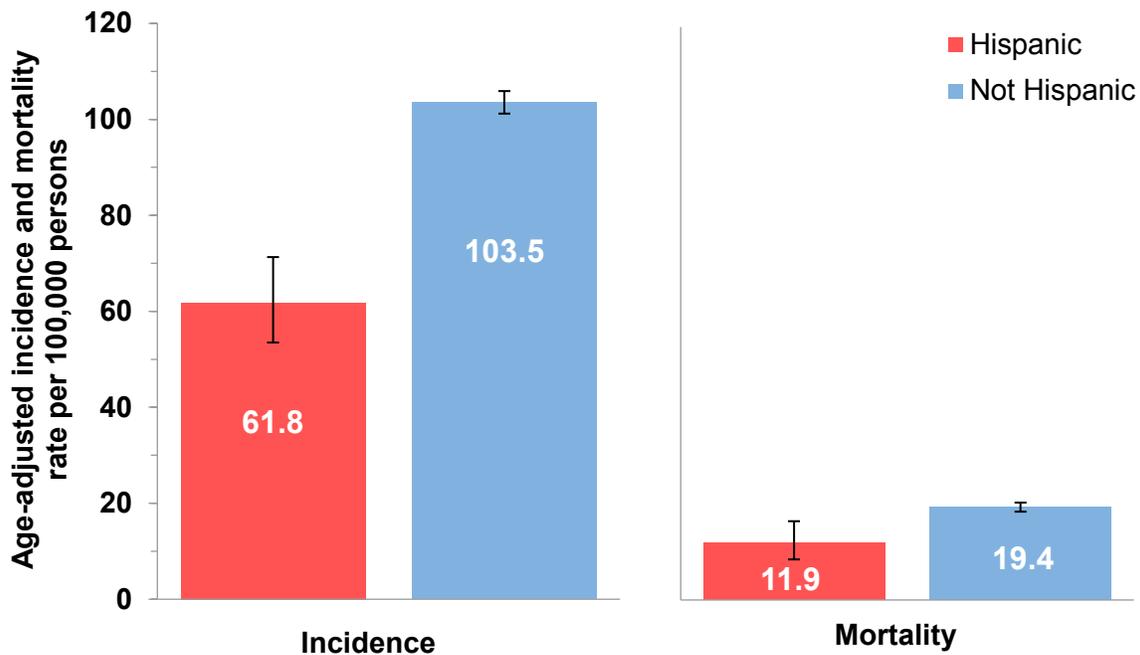


Source: 2008-2012 Kansas Cancer Registry. 2010-2014 Kansas Vital Statistics, Bureau of Epidemiology and Public Health Informatics, KDHE. Rates were age-adjusted to the U.S. 2000 standard population using the direct method. See Technical Appendix for details on how rates were calculated. Vertical bars indicate 95% confidence intervals. Female breast cancer incidence was defined as ICD-O-3 codes C500-C509 (excluding histology codes 9590-9989) with a behavior code indicating invasive malignancy. Female breast cancer mortality was defined as ICD-10 code C50.

Female Breast Cancer Incidence and Mortality among Ethnic Groups

In Kansas, the age-adjusted female breast cancer incidence rate was significantly lower for Hispanic women (61.8 cases per 100,000 females; 95% confidence interval: 53.5 to 71.3) than for non-Hispanic women (103.5 cases per 100,000 females; 95% confidence interval: 101.2 to 105.9) during the period 2008-2012 (Figure 5-3). Similarly, age-adjusted female breast cancer mortality rates were significantly lower for Hispanic Kansas women (11.9 deaths per 100,000 females; 95% confidence interval: 8.5 to 16.5) than for non-Hispanic Kansas women (19.4 deaths per 100,000 females; 95% confidence interval: 18.5 to 20.4) during the period 2010-2014.

Figure 5-3. Age-adjusted female breast cancer incidence (2008-2012) and mortality (2010-2014) among ethnic groups, Kansas 2008-2014.



Source: 2008-2012 Kansas Cancer Registry. 2010-2014 Kansas Vital Statistics, Bureau of Epidemiology and Public Health Informatics, KDHE. Rates were age-adjusted to the U.S. 2000 standard population using the direct method. See Technical Appendix for details on how rates were calculated. Vertical bars indicate 95% confidence intervals. Female breast cancer incidence was defined as ICD-O-3 codes C500-C509 (excluding histology codes 9590-9989) with a behavior code indicating invasive malignancy. Female breast cancer mortality was defined as ICD-10 code C50. Hispanics were defined as persons of Mexican, Puerto Rican, Cuban, South or Central American, Other Spanish, Spanish not otherwise specified, or Dominican Republic ethnicity. Persons with Spanish surname only or unknown ethnicity were excluded.

Female Breast Cancer Late Stage Diagnosis

Among race groups in Kansas, the age-adjusted late stage female breast cancer incidence rate dropped significantly among White women from 2003-2007 (46.3 cases per 100,000 persons; 95% CI: 44.7 to 47.9) to 2008-2012 (41.7 cases per 100,000 persons; 95% CI: 40.2 to 43.2). However, the late stage age-adjusted female breast cancer incidence rate did not differ significantly for African American women between 2003-2007 and 2008-2012 (Table 5-1).

Among ethnicity groups in Kansas, the age-adjusted late stage female breast cancer incidence rate dropped significantly among Non-Hispanic women from 2003-2007 (42.1 cases per 100,000 persons; 95% CI: 40.5 to 43.6) to 2008-2012 (36.5 cases per 100,000 persons; 95% CI: 35.1 to 38.0). In comparison, the late stage age-adjusted female breast cancer incidence rate did not differ significantly for Hispanic women during the same time period (Table 5-1).

Among population density groups in Kansas, the age-adjusted late stage female breast cancer incidence rate dropped significantly among Kansans who lived in urban counties from 2003-2007 (47.9 cases per 100,000 persons; 95% CI: 46.0 to 49.9) to 2008-2012 (43.0 cases per 100,000 persons; 95% CI: 41.3 to 44.9). However, the late stage age-adjusted female breast cancer incidence rate did not differ significantly among Kansans who lived in rural counties during the same time period (Table 5-1).

Table 5-1. Age-adjusted late stage female breast cancer incidence rates by years and selected characteristics, Kansas, 2003-2012.

Characteristics	2008-2012			2003-2007		
	Age-adjusted Rate	95% Confidence Interval		Age-adjusted Rate	95% Confidence Interval	
Race						
White	41.7	40.2	43.2	46.3	44.7	47.9
African American	56.2	49.0	64.4	57.8	50.0	66.5
Ethnicity						
Hispanic	22.6	17.9	28.4	25.1	19.4	32.3
Non-Hispanic	36.5	35.1	38.0	42.1	40.5	43.6
Population Density						
Rural	40.9	38.4	43.6	43.3	40.7	46.1
Urban	43.0	41.3	44.9	47.9	46.0	49.9

* a. Late stage was defined as the combination of regional and distant stage of diagnosis.

b. Due to insufficient count, data for Asian/Pacific Islander and American Indian/Alaska Native were not displayed in the table.

Source: 2003-2012 Kansas Cancer Registry. Female breast cancer incidence was defined as ICD-O-3 codes C500-C509 (excluding histology codes 9590-9989) with a behavior code indicating invasive malignancy.

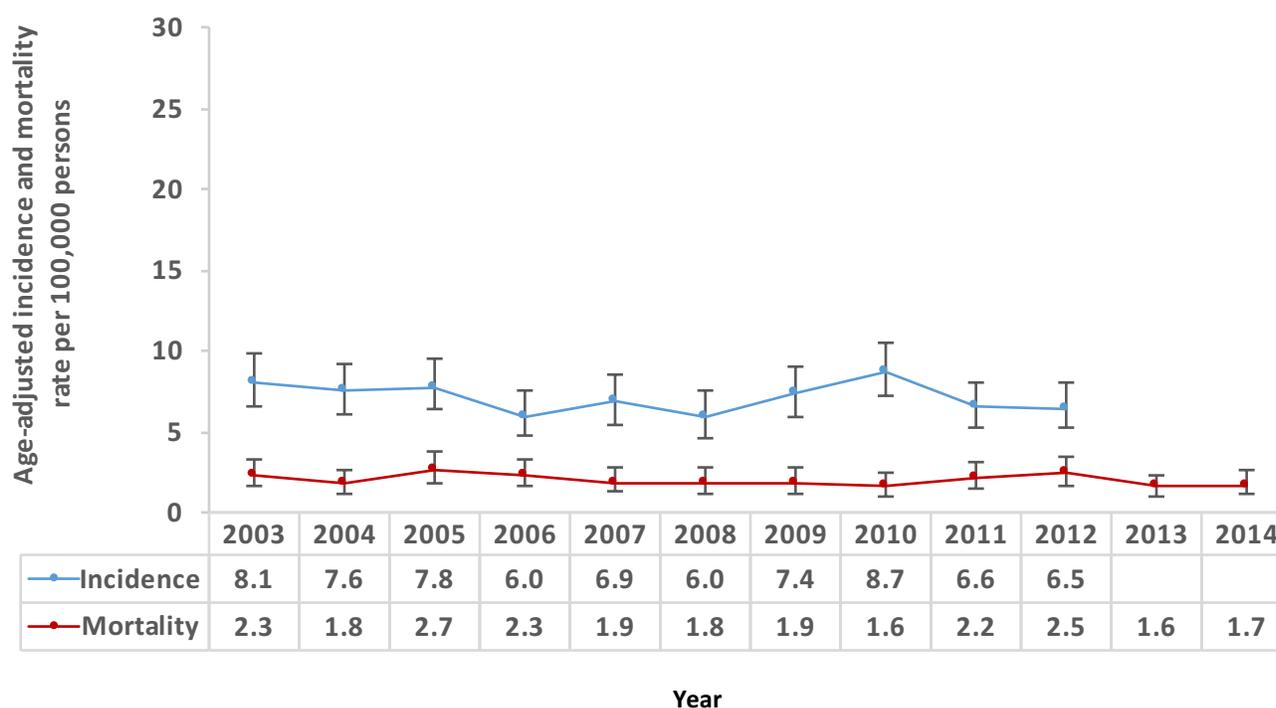
CHAPTER 6: PROFILES OF SELECTED CANCERS – CERVICAL

The cervix is the lower, narrow end of the uterus. The human papillomavirus (HPV) is the main cause of cervical cancer. Cervical cancer is highly preventable because screening tests and a vaccine to prevent HPV infections are available.⁸

Cervical Cancer Incidence and Mortality

On average, each year approximately 100 cervical cancers are diagnosed among Kansas females and approximately 30 Kansas females die of the disease. In Kansas, there was no statistically significant difference in the age-adjusted cervical cancer incidence rates during the period 2003-2012 (Figure 6-1). Age-adjusted cervical cancer mortality rates also remained stable during the period 2003-2014 from 2.3 deaths per 100,000 females (95% confidence interval: 1.6 to 3.3) in 2003 to 1.7 deaths per 100,000 females (95% confidence interval: 1.1 to 2.6) in 2014.

Figure 6-1. Age-adjusted cervical cancer incidence and mortality rates, Kansas 2003-2014.



Source: 2003-2012 Kansas Cancer Registry. 2003-2014 Kansas Vital Statistics, Bureau of Epidemiology and Public Health Informatics, KDHE. Cancer incidence data for 2013 and 2014 were not available at the time the document was created. Rates were age-adjusted to the U.S. 2000 standard population using the direct method. See Technical Appendix for details on how rates were calculated. Vertical bars indicate 95% confidence intervals. Cervical cancer incidence was defined as ICD-O-3 codes C530-C539 (excluding histology codes 9590-9989) with a behavior code indicating invasive malignancy. Cervical cancer mortality was defined as ICD-10 code C53.

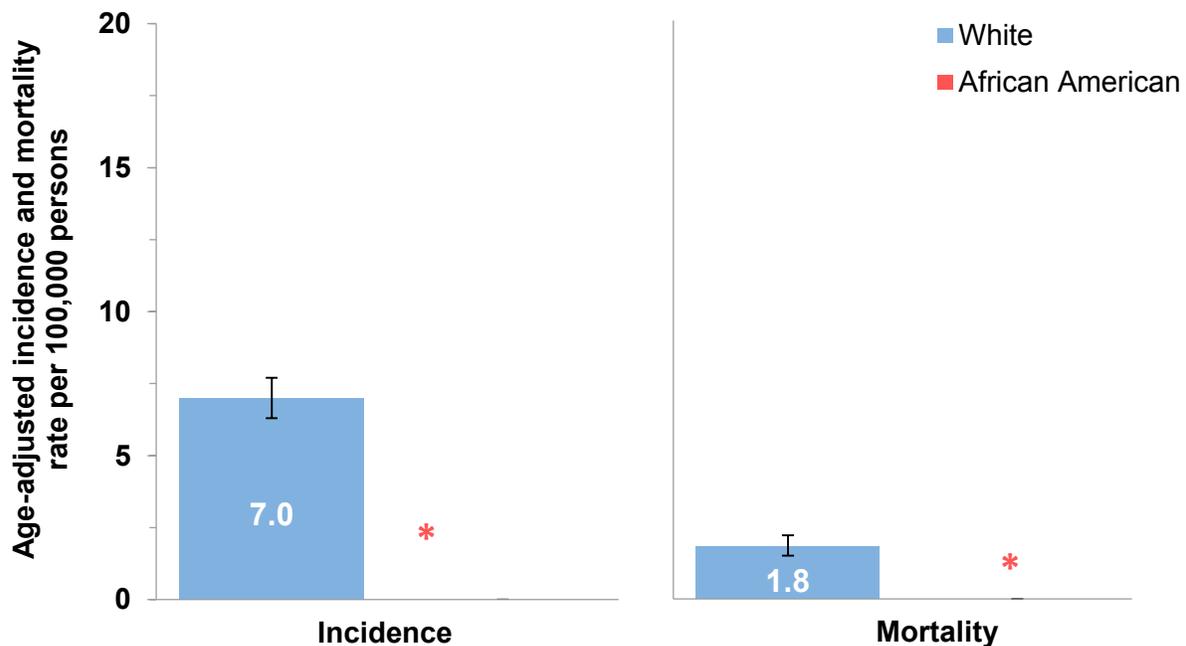
⁸ "Cervical Cancer." Division of Cancer Prevention and Control, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention. www.cdc.gov/cancer/cervical/index.htm

Cervical Cancer Incidence and Mortality among Race Groups

Due to the small number of cervical cancer cases among specified racial populations other than white during the most recent 5-year period, incidence and mortality rates are suppressed. Racial comparisons cannot be made.



Figure 6-2. Age-adjusted cervical cancer incidence (2008-2012) and mortality (2010-2014) rates among race groups, Kansas 2008-2014.

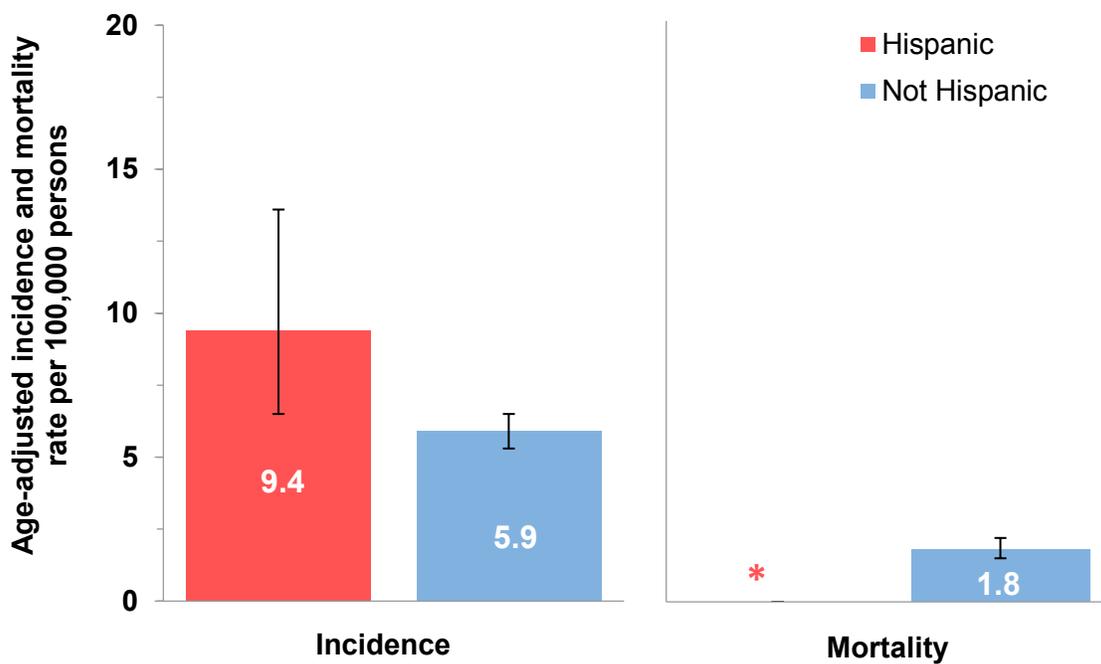


Source: 2008-2012 Kansas Cancer Registry. 2010-2014 Kansas Vital Statistics, Bureau of Epidemiology and Public Health Informatics, KDHE. * denotes that the rate is not reported due to insufficient number of cases. Rates were age-adjusted to the U.S. 2000 standard population using the direct method. See Technical Appendix for details on how rates were calculated. Vertical bars indicate 95% confidence intervals. Cervical cancer incidence was defined as ICD-O-3 codes C530-C539 (excluding histology codes 9590-9989) with a behavior code indicating invasive malignancy. Cervical cancer mortality was defined as ICD-10 code C53.

Cervical Cancer Incidence and Mortality among Ethnic Groups

In Kansas, the age-adjusted cervical cancer incidence rate was significantly higher for Hispanic females (9.4 cases per 100,000 females; 95% confidence interval: 6.5 to 13.6) as compared to non-Hispanic females (5.9 cases per 100,000 females; 95% confidence interval: 5.9 to 6.5) during the period 2008-2012 (Figure 6-3). The age-adjusted cervical cancer mortality rate for non-Hispanic Kansas females was 1.8 deaths per 100,000 females (95% confidence interval: 1.5 to 2.2) during the period 2010-2014. The mortality rate for Hispanic females in Kansas is not shown because the number of deaths was insufficient for computing a statistically reliable rate for this ethnic group.

Figure 6-3. Age-adjusted cervical cancer incidence (2008-2012) and mortality (2010-2014) among ethnic groups, Kansas 2008-2014.



Source: 2008-2012 Kansas Cancer Registry. 2010-2014 Kansas Vital Statistics, Bureau of Epidemiology and Public Health Informatics, KDHE. * denotes that the rate is not reported due to insufficient number of cases. Rates were age-adjusted to the U.S. 2000 standard population using the direct method. See Technical Appendix for details on how rates were calculated. Vertical bars indicate 95% confidence intervals. Cervical cancer incidence was defined as ICD-O-3 codes C530-C539 (excluding histology codes 9590-9989) with a behavior code indicating invasive malignancy. Cervical cancer mortality was defined as ICD-10 code C53. Hispanics were defined as persons of Mexican, Puerto Rican, Cuban, South or Central American, Other Spanish, Spanish not otherwise specified, or Dominican Republic ethnicity. Persons with Spanish surname only or unknown ethnicity were excluded.

Cervical Cancer Late Stage Diagnosis

Among race groups in Kansas, the age-adjusted late stage cervical cancer incidence rate did not differ significantly among White women between 2003-2007 (3.1 cases per 100,000 persons; 95% CI: 2.6 to 3.5) and 2008-2012 (3.4 cases per 100,000 persons; 95% CI: 2.9 to 3.9). We were not able to make comparisons for the late stage age-adjusted cervical cancer incidence rates among African American women between 2003-2007 and 2008-2012 due to insufficient counts (Table 6-1).

Among ethnicity groups in Kansas, the age-adjusted late stage cervical cancer incidence rate did not differ significantly among Non-Hispanic women between 2003-2007 (2.9 cases per 100,000 persons; 95% CI: 2.5 to 3.4) and 2008-2012 (3.0 cases per 100,000 persons; 95% CI: 2.6 to 3.5). We were not able to make comparisons for the late stage age-adjusted cervical cancer incidence rates among Hispanic women during the same time period (Table 6-1).

Among population density groups in Kansas, the age-adjusted late stage cervical cancer incidence rates did not differ significantly among population density groups between 2003-2007 and 2008-2012 (Table 6-1).

Table 6-1. Age-adjusted late stage cervical cancer incidence rates by years and selected characteristics, Kansas, 2003-2012.

Characteristics	2008-2012			2003-2007		
	Age-adjusted Rate	95% Confidence Interval		Age-adjusted Rate	95% Confidence Interval	
Race						
White	3.4	2.9	3.9	3.1	2.6	3.5
African American	-	-	-	5.6	3.4	8.9
Ethnicity						
Hispanic	-	-	-	-	-	-
Non-Hispanic	3.0	2.6	3.5	2.9	2.5	3.4
Population Density						
Rural	4.2	3.4	5.3	3.6	2.8	4.5
Urban	2.9	2.5	3.5	2.9	2.5	3.5

* a. Late stage was defined as the combination of regional and distant stage of diagnosis.

b. Due to insufficient counts, data for Asian/Pacific Islander, American Indian/Alaska Native, and Hispanic population were not displayed in the table.

c. Data for African American women during 2008-2012 were insufficient to display in the table.

Source: 2003-2012 Kansas Cancer Registry. Cervical cancer incidence was defined as ICD-O-3 codes C530-C539 (excluding histology codes 9590-9989) with a behavior code indicating invasive malignancy.

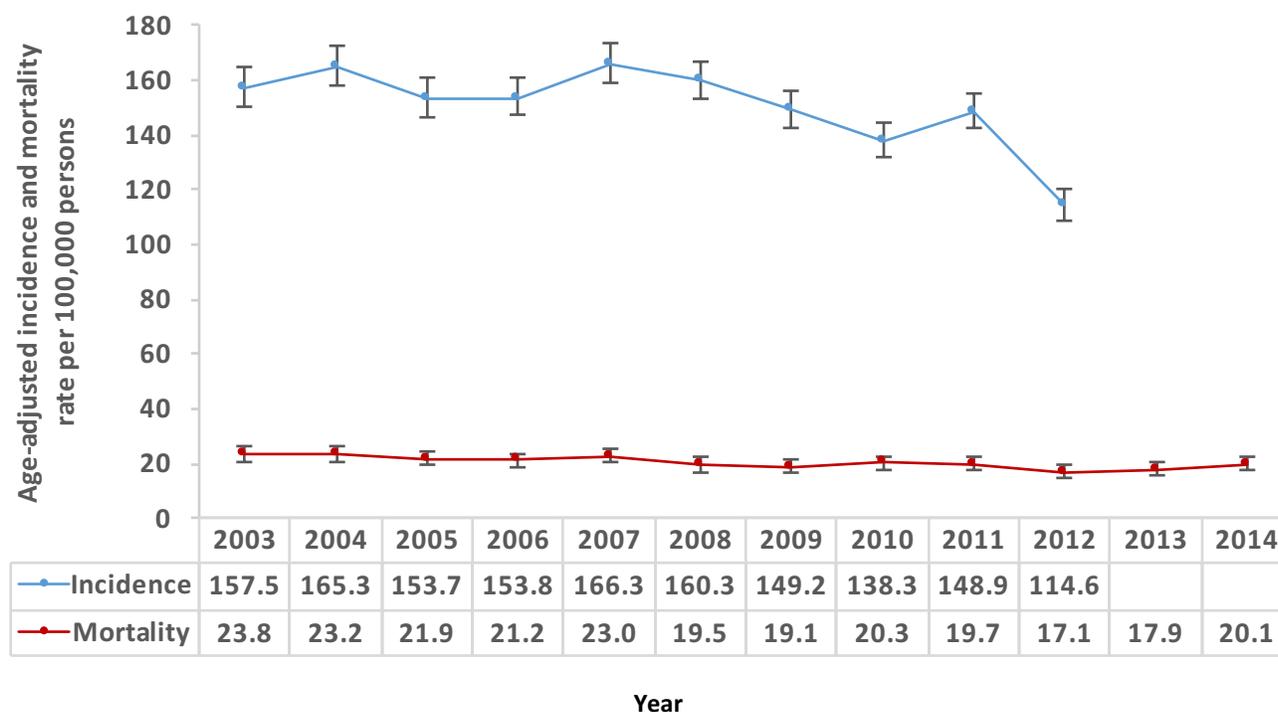
CHAPTER 7: PROFILES OF SELECTED CANCERS – PROSTATE

The prostate, a part of the male reproductive system, produces fluid that makes up a part of semen. Researchers do not yet agree on the factors that can influence a man’s risk of developing prostate cancer, either positively or negatively.⁹ In Kansas, prostate cancer is the most commonly diagnosed cancer, and for the time period 2008-2012, the third leading cause of cancer death, among men.

Prostate Cancer Incidence and Mortality

On average each year, more than 2,000 prostate cancers are diagnosed among Kansas males and approximately 250 men die of the disease. Age-adjusted prostate cancer incidence rates decreased significantly during the period 2003-2012 from 157.5 cases per 100,000 males (95% confidence interval: 150.5 to 164.7) in 2003 to 114.6 cases per 100,000 males (95% confidence interval: 109.2 to 120.2) in 2012 (Figure 7-1). Age-adjusted prostate cancer mortality rates also decreased significantly during the period 2003-2013 from 23.8 deaths per 100,000 males (95% confidence interval: 21.0 to 26.9) in 2003 to 17.9 deaths per 100,000 males (95% confidence interval: 15.7 to 20.3) in 2013.

Figure 7-1. Age-adjusted prostate cancer incidence and mortality rates, Kansas 2003-2014.



Source: 2003-2012 Kansas Cancer Registry. 2003-2014 Kansas Vital Statistics, Bureau of Epidemiology and Public Health Informatics, KDHE. Cancer incidence data for 2013 and 2014 were not available at the time the document was created. Rates were age-adjusted to the U.S. 2000 standard population using the direct method. See Technical Appendix for details on how rates were calculated. Vertical bars indicate 95% confidence intervals. Prostate cancer incidence was defined as ICD-O-3 code C619 (excluding histology codes 9590-9989) with a behavior code indicating invasive malignancy. Prostate cancer mortality was defined as ICD-10 code C61.

⁹“Basic Information about Prostate Cancer.” Division of Cancer Prevention and Control, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention. www.cdc.gov/cancer/prostate/basic_info/index.htm

Prostate Cancer Incidence and Mortality among Race Groups

In Kansas, the age-adjusted prostate cancer incidence rate was significantly higher for African American men (207.8 cases per 100,000 males; 95% confidence interval: 191.1 to 225.9) than for white men (133.6 cases per 100,000 males; 95% confidence interval: 130.8 to 136.4) during the period 2008-2012 (Figure 7-2). Similarly, the age-adjusted prostate cancer mortality rate was significantly higher for African American Kansas men (44.1 deaths per 100,000 males; 95% confidence interval: 35.4 to 54.4) than for white Kansas men (18.0 deaths per 100,000 males; 95% confidence interval: 17.0 to 19.1) during the period 2010-2014.

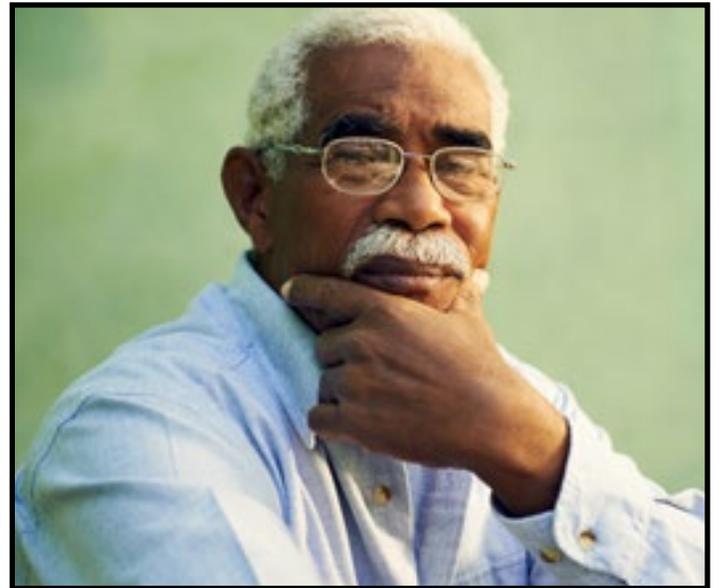
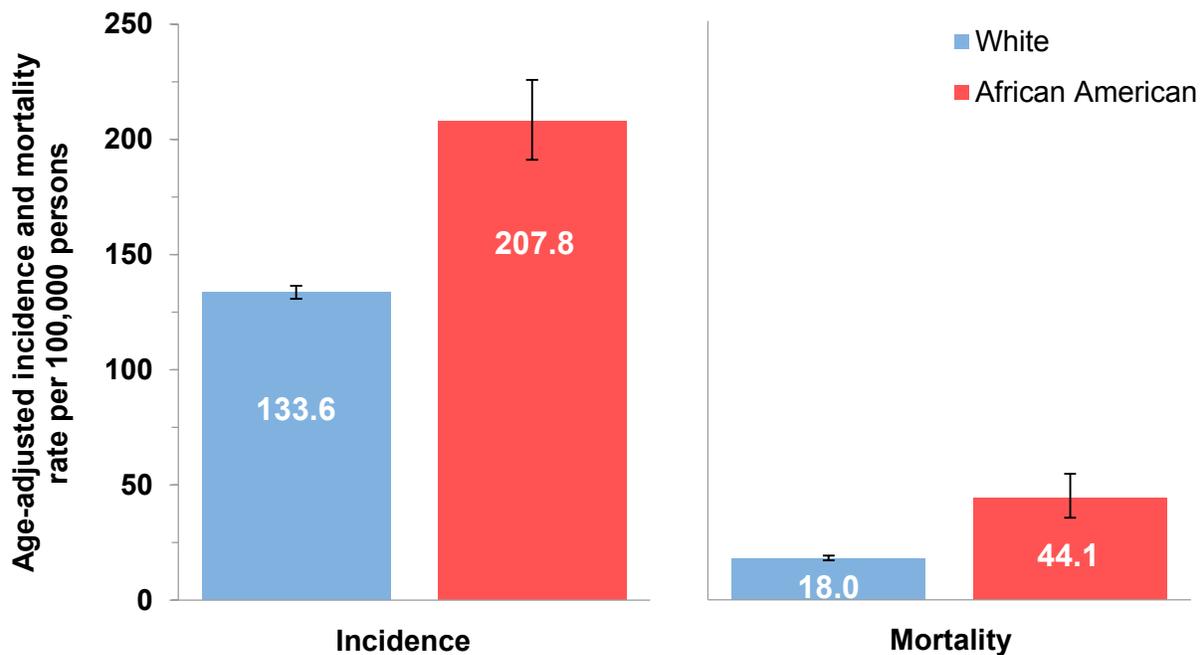


Figure 7-2. Age-adjusted prostate cancer incidence (2008-2012) and mortality (2010-2014) rates among race groups, Kansas 2008-2014.

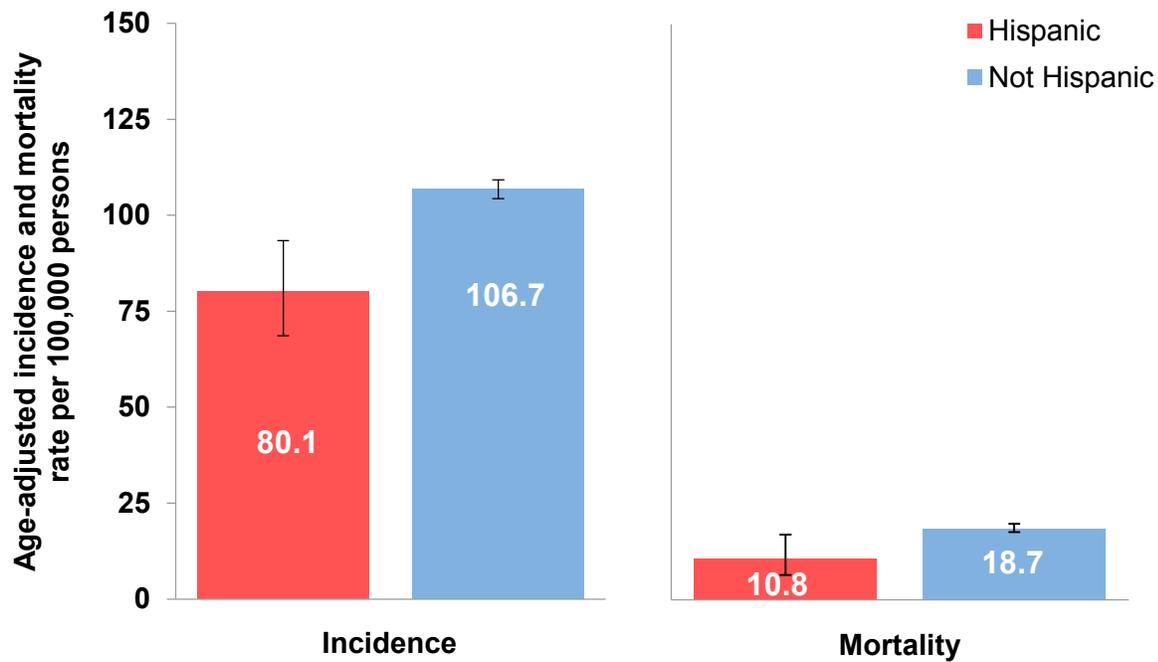


Source: 2008-2012 Kansas Cancer Registry. 2010-2014 Kansas Vital Statistics, Bureau of Epidemiology and Public Health Informatics, KDHE. Rates were age-adjusted to the U.S. 2000 standard population using the direct method. See Technical Appendix for details on how rates were calculated. Vertical bars indicate 95% confidence intervals. Prostate cancer incidence was defined as ICD-O-3 code C619 (excluding histology codes 9590-9989) with a behavior code indicating invasive malignancy. Prostate cancer mortality was defined as ICD-10 code C61.

Prostate Cancer Incidence and Mortality among Ethnic Groups

In Kansas, the age-adjusted prostate cancer incidence rate was significantly lower for Hispanic men (80.1 cases per 100,000 males; 95% confidence interval: 68.6 to 93.4) than for non-Hispanic men (106.7 cases per 100,000 males; 95% confidence interval: 104.3 to 109.2) during the period 2008-2012 (Figure 7-3). Similarly, the age-adjusted prostate cancer mortality rate was significantly lower for Hispanic Kansas men (10.8 deaths per 100,000 males; 95% confidence interval: 6.5 to 17.0) as compared to non-Hispanic Kansas men (18.7 deaths per 100,000 males; 95% confidence interval: 17.7 to 19.8) during the period 2010-2014.

Figure 7-3. Age-adjusted prostate cancer incidence (2008-2012) and mortality (2010-2014) among ethnic groups, Kansas 2008-2014.



Source: 2008-2012 Kansas Cancer Registry. 2010-2014 Kansas Vital Statistics, Bureau of Epidemiology and Public Health Informatics, KDHE. Rates were age-adjusted to the U.S. 2000 standard population using the direct method. See Technical Appendix for details on how rates were calculated. Vertical bars indicate 95% confidence intervals. Prostate cancer incidence was defined as ICD-O-3 code C619 (excluding histology codes 9590-9989) with a behavior code indicating invasive malignancy. Prostate cancer mortality was defined as ICD-10 code C61. Hispanics were defined as persons of Mexican, Puerto Rican, Cuban, South or Central American, Other Spanish, Spanish not otherwise specified, or Dominican Republic ethnicity. Persons with Spanish surname only or unknown ethnicity were excluded.

Prostate Cancer Late Stage Diagnosis

In Kansas, the age-adjusted late stage prostate cancer incidence rates did not differ significantly for white and African American race groups between 2003-2007 and 2008-2012 (Table 7-1).

In Kansas, the age-adjusted late stage prostate cancer incidence rates did not differ significantly for Hispanic and non-Hispanic ethnicity groups between 2003-2007 and 2008-2012 (Table 7-1).

During the same time period, the age-adjusted late stage prostate cancer incidence rates did not differ significantly for rural and urban population density groups between 2003-2007 and 2008-2012 (Table 7-1).

Table 7-1. Age-adjusted late stage prostate cancer incidence rates by years and selected characteristics, Kansas, 2003-2012.

Characteristics	2008-2012			2003-2007		
	Age-adjusted Rate	95% Confidence Interval		Age-adjusted Rate	95% Confidence Interval	
Race						
White	20.5	19.4	21.6	20.9	19.8	22.1
African American	40.5	33.4	49.0	32.1	25.2	40.6
Ethnicity						
Hispanic	15.5	10.9	21.8	13.2	8.4	20.9
Non-Hispanic	18.3	17.3	19.3	18.3	17.2	19.4
Population Density						
Rural	17.4	15.8	19.2	19.7	18.0	21.6
Urban	23.6	22.2	25.0	22.3	20.9	23.8

* a. Late stage was defined as the combination of regional and distant stage of diagnosis.

b. Due to insufficient count, data for Asian/Pacific Islander and American Indian/Alaska Native were not displayed in the table.

Source: 2003-2012 Kansas Cancer Registry. Prostate cancer incidence was defined as ICD-O-3 code C619 (excluding histology codes 9590-9989) with a behavior code indicating invasive malignancy.

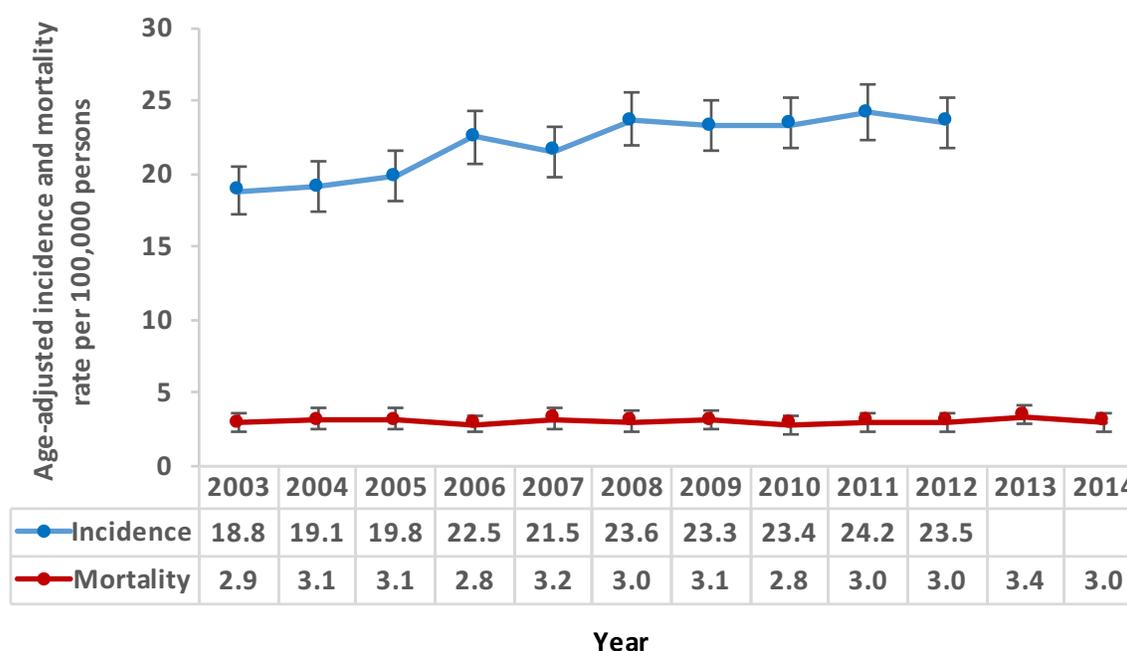
CHAPTER 8: PROFILES OF SELECTED CANCERS – MELANOMA OF THE SKIN

Skin cancer is the most common form of cancer in the United States. The two most common types of skin cancer—basal cell and squamous cell carcinomas—are highly curable. Melanoma, the third most common skin cancer, is almost always curable in its early stages, but it is much more likely than basal or squamous cell cancer to spread to other parts of the body if not caught early.¹⁰ About 65–90 percent of melanomas are caused by exposure to ultraviolet (UV) light.¹¹ Ultraviolet (UV) rays are an invisible kind of radiation that comes from the sun and tanning beds, and can change skin cells.¹²

Melanoma Incidence and Mortality

Each year, on average, approximately 700 melanomas are diagnosed among Kansas residents, and almost 100 Kansans die of the disease. In Kansas, age-adjusted melanoma incidence rates increased significantly during the period 2003-2012 from 18.8 cases per 100,000 persons (95% confidence interval: 17.2 to 20.5) in 2003 to 23.5 cases per 100,000 persons (95% confidence interval: 21.8 to 25.3) in 2012 (Figure 8-1). Age-adjusted melanoma mortality rates remained stable during the period 2003-2014 with 2.9 deaths per 100,000 persons (95% confidence interval: 2.3 to 3.6) in 2003 and 3.0 deaths per 100,000 persons (95% confidence interval: 2.4 to 3.7) in 2014.

Figure 8-1. Age-adjusted melanoma incidence and mortality rates, Kansas 2003-2014.



Source: 2003-2012 Kansas Cancer Registry. 2003-2014 Kansas Vital Statistics, Bureau of Epidemiology and Public Health Informatics, KDHE. Cancer incidence data for 2013 and 2014 were not available at the time the document was created. Rates were age-adjusted to the U.S. 2000 standard population using the direct method. See Technical Appendix for details on how rates were calculated. Vertical bars indicate 95% confidence intervals. Prostate cancer incidence was defined as ICD-O-3 code C619 (excluding histology codes 9590-9989) with a behavior code indicating invasive malignancy. Prostate cancer mortality was defined as ICD-10 code C61.

¹⁰ "Melanoma Skin Cancer." American Cancer Society.

<http://www.cancer.org/Cancer/SkinCancerMelanoma>

¹¹ Armstrong BK, Kricger A. How much melanoma is caused by sun exposure? *Melanoma Research* 1993;3(6):395–401.

¹² "Basic Information about Skin Cancer." Division of Cancer Prevention and Control, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention.

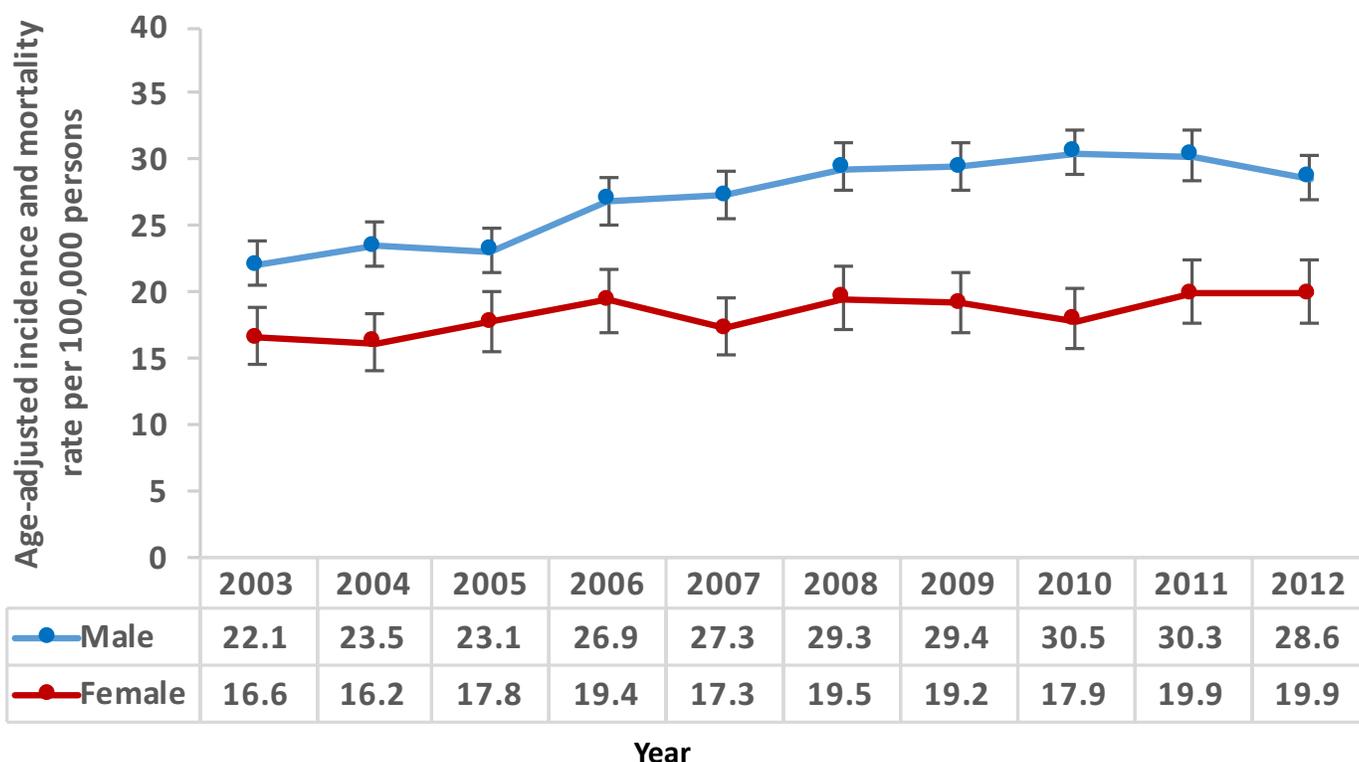
www.cdc.gov/cancer/skin/basic_info/index.htm

Melanoma Incidence among Gender Groups

Age-adjusted melanoma incidence rates were significantly higher for males as compared to females during the period 2003-2012 (Figure 8-2). Age-adjusted melanoma incidence rates increased significantly for males during the time period 2003-2012 from 22.1 cases per 100,000 males (95% confidence interval: 19.6 to 24.9) in 2003 to 28.6 cases per 100,000 males (95% confidence interval: 25.8 to 31.6) in 2012. However, age-adjusted melanoma incidence rates remained stable for females during the time period 2003-2012.



Figure 8-2. Age-adjusted melanoma incidence rates among gender groups, Kansas 2003-2012.

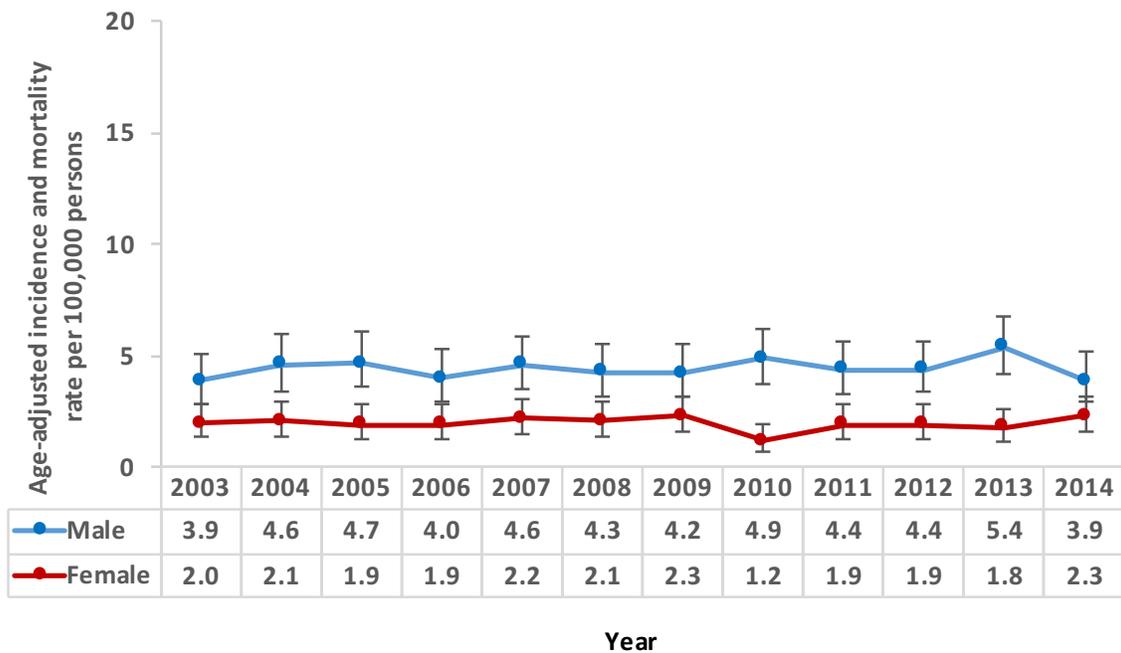


Source: 2003-2012 Kansas Cancer Registry. Rates were age-adjusted to the U.S. 2000 standard population using the direct method. See Technical Appendix for details on how rates were calculated. Vertical bars indicate 95% confidence intervals. Melanoma incidence was defined as ICD-O-3 codes C440-449 and histology codes 8720-8780 with a behavior code indicating invasive malignancy. Melanoma mortality was defined as ICD-10 code C43.

Melanoma Mortality among Gender Groups

Age-adjusted melanoma mortality rates were significantly higher for males as compared to females during the period 2003-2013 (Figure 8-3). Age-adjusted melanoma mortality rates did not differ significantly among gender groups in 2014. Age-adjusted melanoma mortality rates remained stable for males and females from 2003 to 2014 from 3.9 deaths per 100,000 males (95% confidence interval: 2.9 to 5.1) and 2.0 deaths per 100,000 females (95% confidence interval: 1.4 to 2.9) in 2003 to 3.9 deaths per 100,000 males (95% confidence interval: 3.0 to 5.2) and 2.3 deaths per 100,000 females (95% confidence interval: 1.6 to 3.2) in 2014.

Figure 8-3. Age-adjusted melanoma mortality rates among gender groups, Kansas 2003-2014.

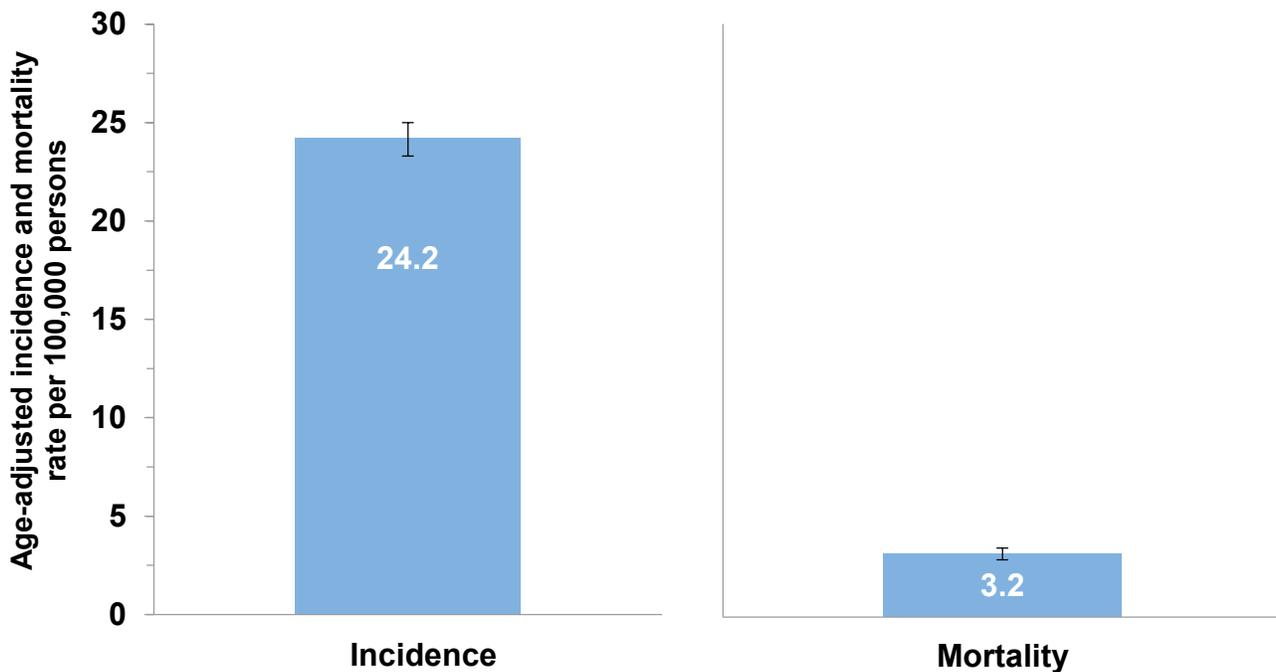


Source: 2003-2014 Kansas Vital Statistics, Bureau of Epidemiology and Public Health Informatics, KDHE. Rates were age-adjusted to the U.S. 2000 standard population using the direct method. See Technical Appendix for details on how rates were calculated. Vertical bars indicate 95% confidence intervals. Melanoma mortality was defined as ICD-10 code C43.

Melanoma Incidence and Mortality among Race Groups

The age-adjusted melanoma incidence rate for white Kansans during the period 2008-2012 was 24.2 cases per 100,000 persons; 95% confidence interval: 23.3 to 25.0) (Figure 8-4). The age-adjusted melanoma mortality rate for white Kansans was 3.2 deaths per 100,000 persons; 95% confidence interval: 2.9 to 3.5) during the period 2010-2014. Data for African American and other racial group of Kansans are not shown because the number of cases was insufficient for computing a statistically reliable rate for this race group.

Figure 8-4. Age-adjusted melanoma incidence (2008-2012) and mortality (2010-2014) rates among whites, Kansas 2008-2014.

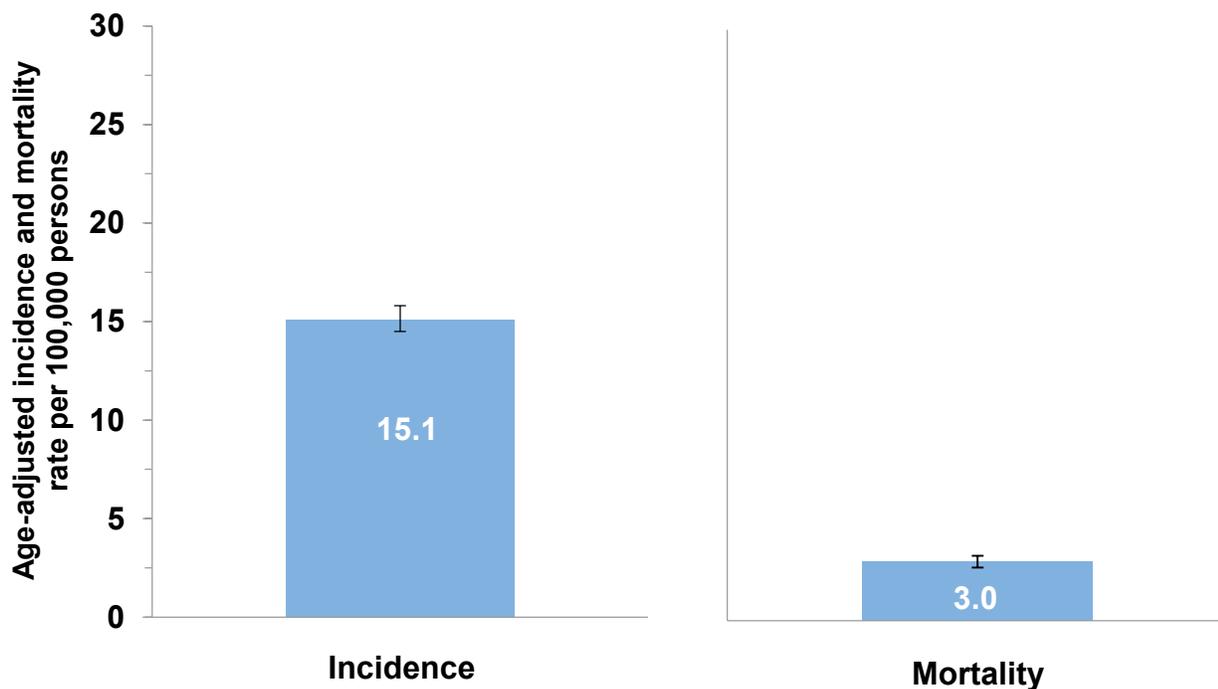


Source: 2008-2012 Kansas Cancer Registry. 2010-2014 Kansas Vital Statistics, Bureau of Epidemiology and Public Health Informatics, KDHE. The rate is not reported for African Americans due to insufficient number of cases. Rates were age-adjusted to the U.S. 2000 standard population using the direct method. See Technical Appendix for details on how rates were calculated. Vertical bars indicate 95% confidence intervals. Melanoma incidence was defined as ICD-O-3 codes C440-449 and histology codes 8720-8780 with a behavior code indicating invasive malignancy. Melanoma mortality was defined as ICD-10 code C43.

Melanoma Incidence and Mortality among Ethnic Groups

The age-adjusted melanoma incidence rate for non-Hispanic Kansans was 15.1 cases per 100,000 persons (95% confidence interval: 14.5 to 15.8) during the period 2008-2012 (Figure 8-5). The age-adjusted melanoma mortality rate for non-Hispanic Kansans was 3.0 deaths per 100,000 persons (95% confidence interval: 2.7 to 3.3) during this time period. Data for Hispanic Kansans are not shown because the number of cases was insufficient for computing a statistically reliable rate for this ethnic group. Nationally, age-adjusted melanoma incidence and mortality rates are about four times higher among non-Hispanics as compared to Hispanics.¹³

Figure 8-5. Age-adjusted melanoma incidence (2008-2012) and mortality (2010-2014) rates among non-Hispanics, Kansas 2008-2014.



Source: 2008-2012 Kansas Cancer Registry. 2010-2014 Kansas Vital Statistics, Bureau of Epidemiology and Public Health Informatics, KDHE. The rate is not reported for Hispanics due to insufficient number of cases. Rates were age-adjusted to the U.S. 2000 standard population using the direct method. See Technical Appendix for details on how rates were calculated. Vertical bars indicate 95% confidence intervals. Melanoma incidence was defined as ICD-O-3 codes C440-449 and histology codes 8720-8780 with a behavior code indicating invasive malignancy. Melanoma mortality was defined as ICD-10 code C43. Hispanics were defined as persons of Mexican, Puerto Rican, Cuban, South or Central American, Other Spanish, Spanish not otherwise specified, or Dominican Republic ethnicity. Persons with Spanish surname only or unknown ethnicity were excluded.

¹³U.S. Cancer Statistics: 1999-2012 Incidence, WONDER Online Database, US DHHS, CDC; 2015.

Melanoma Late Stage Diagnosis

Among gender groups in Kansas, the age-adjusted late stage melanoma incidence rate did not differ significantly among males and females between 2003-2007 and 2008-2012 (Table 8-1).

Among race groups in Kansas, the age-adjusted late stage melanoma incidence rate did not differ significantly among whites between 2003-2007 (2.7 cases per 100,000 persons; 95% CI: 2.4 to 3.0) and 2008-2012 (3.1 cases per 100,000 persons; 95% CI: 2.8 to 3.4). We were not able to make comparisons for the late stage age-adjusted melanoma incidence rate among African American women between 2003-2007 and 2008-2012 due to insufficient counts (Table 8-1).

Among ethnicity groups in Kansas, the age-adjusted late stage melanoma incidence rate did not differ significantly among non-Hispanics between 2003-2007 (2.5 cases per 100,000 persons; 95% CI: 2.3 to 2.8) and 2008-2012 (2.6 cases per 100,000 persons; 95% CI: 2.3 to 2.9). We were not able to make comparisons for the late stage age-adjusted melanoma incidence rate among Hispanics due to insufficient counts during the same time period (Table 8-1).

Among population density groups in Kansas, the age-adjusted late stage melanoma incidence did not differ significantly among population density groups between 2003-2007 and 2008-2012 (Table 8-1).

Table 8-1. Age-adjusted late stage melanoma incidence rates by years and selected characteristics, Kansas, 2003-2012.

Characteristics	2008-2012			2003-2007		
	Age-adjusted Rate	95% Confidence Interval		Age-adjusted Rate	95% Confidence Interval	
Gender						
Male	4.2	3.7	4.7	3.4	3.0	3.9
Female	1.8	1.5	2.1	1.9	1.6	2.3
Race						
White	3.1	2.8	3.4	2.7	2.4	3.0
African American	-	-	-	-	-	-
Ethnicity						
Hispanic	-	-	-	-	-	-
Non-Hispanic	2.6	2.3	2.9	2.5	2.3	2.8
Population Density						
Rural	3.0	2.6	3.6	2.6	2.2	3.2
Urban	2.8	2.5	3.1	2.5	2.2	2.9

* a. Late stage was defined as the combination of regional and distant stage of diagnosis.

b. Due to insufficient count, data for Asian/Pacific Islander, American Indian/Alaska Native, and Hispanic population were unable to display in the table.

c. Data for African Americans during 2008-2012 were also insufficient to display.

Source: 2003-2012 Kansas Cancer Registry. Prostate cancer incidence was defined as ICD-O-3 codes C440-449 and histology codes 8720-8780 with a behavior code indicating invasive malignancy.

CHAPTER 9: CANCER SCREENING PRACTICES

Cancer screening is the process of undergoing tests or examinations to detect disease in the absence of symptoms. If detected at an early stage, cancer can be treated more effectively, and in the case of cervical and colorectal cancer, prevented from occurring altogether. Recommended guidelines for cancer screening are becoming more individualized, depending on each person's family history, genetics, lifestyle behaviors, and other risk or protective factors. It is more important than ever that clinicians keep abreast of the most current recommendations from professional organizations and groups such as the U.S. Preventive Services Task Force (USPSTF) and the American Cancer Society (ACS) so they are able to respond to patients questions about cancer screening.



National Cancer Screening Recommendations

Lung

In light of recent research findings from the National Lung Screening Trial (NLST), ACS has released interim guidance for people and their doctors regarding the use of low-dose CT scans for the early detection of lung cancer.¹⁴ ACS recommends that heavy smokers and former smokers between the ages of 55 and 74 with no history or symptoms of lung cancer discuss with their doctors the currently known benefits, limits, and risks of lung cancer screening in order to make a shared decision as to whether they should be screened for lung cancer. ACS plans to develop full lung cancer screening guidelines in the future.

The USPSTF concludes that the current evidence is insufficient to recommend for or against screening asymptomatic persons for lung cancer.¹⁵

Colorectal

Several screening tests are used to detect polyps and colorectal cancer, including:

- High-sensitivity fecal occult blood test (FOBT) and fecal immunochemical test (FIT), which detect blood in the stool;
- Flexible sigmoidoscopy, an examination by a physician who uses a short, thin, flexible light to check for polyps and cancer inside the rectum and lower third of the colon; and
- Colonoscopy, an examination by a physician who uses a longer, flexible, lighted tube to check for polyps or cancer inside the rectum and entire colon.

Both the USPSTF and ACS recommend screening for colorectal cancer among adults beginning at age 50 years using annual FOBT, sigmoidoscopy every 5 years combined with high-sensitivity FOBT every 3 years, or colonoscopy every 10 years.¹⁶⁻¹⁷ ACS supports double-contrast barium enema every 5 years or CT colonography every 5 years as additional screening options.

¹⁴ American Cancer Society Interim Guidance on Lung Cancer Screening. Lung Cancer Guidance Workgroup, American Cancer Society. <http://www.cancer.org/acs/groups/content/@editorial/documents/document/acspc-030879.pdf>

¹⁵ Lung Cancer Screening, Topic Page. May 2004. U.S. Preventive Services Task Force. <http://www.uspreventiveservicestaskforce.org/uspstf/uspplung.htm>

¹⁶ U.S. Preventive Services Task Force. Screening for Colorectal Cancer: U.S. Preventive Services Task Force Recommendation Statement. AHRQ Publication 08-05124-EF-3, October 2008.

<http://www.uspreventiveservicestaskforce.org/uspstf08/colocancer/colors.htm>

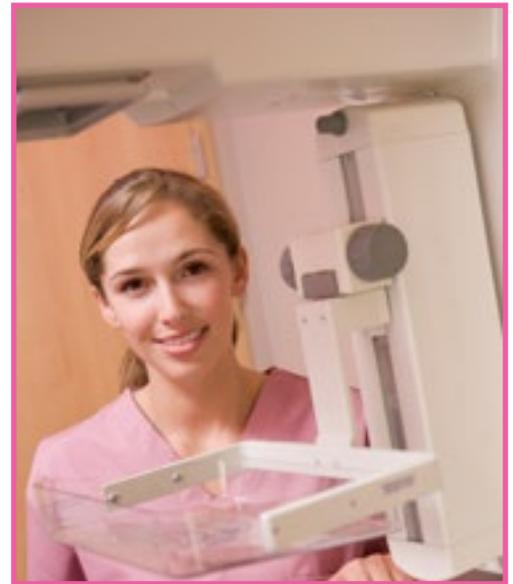
¹⁷ Smith, RA, Cokkinides V, Brawley OW. Cancer screening in the United States, 2008: A review of current American Cancer Society guidelines and cancer screening issues. 2008. CA Cancer J Clin. 2008;58:161-179.

Breasts

There are three main tests used to screen for breast cancer:

- Mammogram, an x-ray of the breast;
- Clinical breast exam, an examination by a physician or nurse who uses their hands to feel a woman's breasts for lumps or other changes; and
- Breast self-exam, an examination by a woman who uses their hands to feel their own breasts for lumps or other changes.

Mammograms are considered the best method for detecting breast cancer. The USPSTF recommends biennial (every two years) screening mammography for women aged 50 to 74 years, while ACS promotes annual mammograms for women starting at age 40 and continuing for as long as a woman is in good health.¹⁸⁻¹⁹



Cervical

There are two screening tests used to help prevent cervical cancer or detect it early:

- Pap test, which examines cell changes on the cervix that might become cervical cancer if they are not appropriately treated; and
- HPV test, which determines the presence of human papillomavirus, a virus that can cause cell changes on the cervix.

Both the USPSTF and ACS recommend that women aged 21-65 years receive a Pap test every three years or, for women aged 30 to 65 years, receive a Pap test and HPV test every five years.²⁰⁻²¹

Prostate

There are two tests commonly used to screen for prostate cancer:

- Digital rectal exam (DRE), an examination by a doctor or nurse who estimates the size of the prostate and feels for any lumps or other abnormalities; and
- Prostate specific antigen test (PSA), a blood test that measures the level of PSA in the blood.

The USPSTF states that there is insufficient evidence to recommend for or against routine screening for prostate cancer using PSA or DRE.²² The ACS recommends that men have the opportunity to make an informed decision with their physician about whether or not to be screened for prostate cancer.²³

¹⁸ U.S. Preventive Services Task Force. Screening for breast cancer: U.S. Preventive Services Task Force Recommendation Statement. *Ann Intern Med* 2009; 151:716-726.

¹⁹ Smith, RA, Cokkinides V, Brawley OW. Cancer screening in the United States, 2008: A review of current American Cancer Society guidelines and cancer screening issues. 2008. *CA Cancer J Clin*. 2008;58:161-179.

²⁰ Screening for Cervical Cancer, Topic Page. March 2012. U.S. Preventive Services Task Force.

<http://www.uspreventiveservicestaskforce.org/uspstf/uspscerv.htm>

²¹ Screening Guidelines for the Prevention and Early Detection of Cervical Cancer. Published online March 14, 2012 in *CA: A Cancer Journal for Clinicians*. First author: Debbie Saslow, PhD, American Cancer Society, Atlanta, GA.

²² Screening for Prostate Cancer, Topic Page. U.S. Preventive Services Task Force.

<http://www.uspreventiveservicestaskforce.org/uspstf/uspSprca.htm>

²³ Prostate Cancer: Early Detection. American Cancer Society.

<http://www.cancer.org/Cancer/ProstateCancer/MoreInformation/ProstateCancerEarlyDetection/prostate-cancer-early-detection-acs-recommendations>

Melanoma

The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of using a whole-body skin exam by a physician or nurse, or patient skin self-exam, for the early detection of melanoma in the adult general population.²⁴ However, the USPSTF does recommend counseling children, adolescents, and young adults aged 10 to 24 years who have fair skin about minimizing their exposure to ultraviolet radiation to reduce risk for skin cancer.²⁵ ACS supports skin exam by a physician during routine cancer-related checkups, in addition to monthly skin self-exams.²⁶

²⁴ 24 U.S. Preventive Services Task Force. Screening for Skin Cancer, Topic Page. February 2009.

<http://www.uspreventiveservicestaskforce.org/uspstf/uspsskca.htm>

²⁵ Moyer VA. Behavioral Counseling to Prevent Skin Cancer: U.S. Preventive Services Task Force Recommendation Statement. *Ann Intern Med.* 2012;157.

²⁶ Skin Cancer Prevention and Early Detection. American Cancer Society.

<http://www.cancer.org/Cancer/CancerCauses/SunandUVExposure/SkinCancerPreventionandEarlyDetection/skin-cancer-prevention-and-early-detection-skin-exams>

Lung Cancer Screening: Discussion with Health Care Providers

In 2015, 16 percent (95% confidence interval: 14.8% to 17.1%) of Kansas adults 18 years and older had ever discussed with their health care providers whether or not to be screened for lung cancer (Table 9-1).

The percentage of Kansans 18 years and older who have ever discussed with their health care providers whether or not to be screened for lung cancer was significantly higher among males (19.0%; 95% confidence interval: 17.3% to 20.7%) as compared to females (12.3%; 95% confidence interval: 10.9% to 13.7%).

The percentage of Kansans who have ever discussed with their health care providers whether or not to be screened for lung cancer was significantly higher among Kansans aged 55 to 80 years (17.0%; 95% confidence interval: 15.8% to 18.3%) as compared to Kansans aged 40 to 54 years (11.6%; 95% confidence interval: 8.7% to 14.5%).

The age-adjusted percentage of Kansans 18 years and older who have ever discussed with their health care providers whether or not to be screened for lung cancer did not differ significantly by race and ethnicity status.

The percentage of Kansans 18 years and older who have ever discussed with their health care providers whether or not to be screened for lung cancer also did not differ significantly by education level and annual household income.

In 2015, the percentage of Kansans 18 years and older who have ever discussed with their health care providers whether or not to be screened for lung cancer was significantly higher among those with health insurance (16.6%; 95% confidence interval: 15.4% to 17.8%) when compared with adults without insurance (8.7%; 95% confidence interval: 5.2% to 12.1%).

In 2015, the percentage of Kansans 18 years and older who have ever discussed with their health care providers whether or not to be screened for lung cancer was significantly higher among Kansans who lived in frontier (20.0%; 95% confidence interval: 14.5% to 25.6%), semi-urban (17.5%; 95% confidence interval: 14.8% to 20.1%) and urban counties (16.4%; 95% confidence interval: 14.7% to 18.0%) as compared to those who resided in rural counties (11.9%; 95% confidence interval: 9.3% to 14.5%).

In Kansas, the percentage of adults 18 years and older who have ever discussed with their health care providers whether or not to be screened for lung cancer was significantly higher among those living with a disability (18.9%; 95% confidence interval: 17.0% to 20.8%) compared to those living without a disability (14.1%; 95% confidence interval: 12.7% to 15.5%)

Table 9-1. Percentage of adults 18 years and older who have discussed with their health care providers whether or not to be screened for lung cancer by selected characteristics, Kansas 2015

Characteristic	Percentage of adults 18 years and older who have discussed with their health care providers whether or not to be screened for lung cancer	95% Confidence Interval		
			to	
Total	15.9%	14.8%	to	17.1%
Gender				
Male	19.0%	17.3%	to	20.7%
Female	12.3%	10.9%	to	13.7%
Age group				
18-39*	-	-	to	-
40-54	11.6%	8.7%	to	14.5%
55-80	17.0%	15.8%	to	18.3%
81 and older	16.1%	12.7%	to	19.5%
Race and Ethnicity (age-adjusted)				
White, Non-Hispanic	14.3%	12.7%	to	15.8%
African American, Non-Hispanic	20.9%	9.1%	to	32.8%
Other/Multi-Race, Non-Hispanic	22.2%	8.3%	to	36.1%
Hispanic	9.4%	3.8%	to	15.0%
Education				
Less than high school	13.3%	9.4%	to	17.2%
High school graduate or G.E.D.	15.3%	13.5%	to	17.1%
Some college	17.5%	15.5%	to	19.6%
College graduate	16.0%	14.1%	to	17.9%
Household Income				
Less than \$15,000	21.1%	16.3%	to	25.9%
\$15,000 to \$24,999	14.6%	11.9%	to	17.3%
\$25,000 to \$34,999	19.0%	15.2%	to	22.8%
\$35,000 to \$49,999	15.2%	12.5%	to	17.9%
\$50,000 or higher	15.6%	13.8%	to	17.5%
Insurance Status				
Insured	16.6%	15.4%	to	17.8%
Uninsured	8.7%	5.2%	to	12.1%
County Population Density				
Frontier	20.0%	14.5%	to	25.6%
Rural	11.9%	9.3%	to	14.5%
Densely-settled rural	14.6%	11.7%	to	17.5%
Semi-urban	17.5%	14.8%	to	20.1%
Urban	16.4%	14.7%	to	18.0%
Disability Status				
Living with a disability	18.9%	17.0%	to	20.8%
Living without a disability	14.1%	12.7%	to	15.5%

*Prevalence estimates are unable to present due to insufficient counts.

Source: 2015 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, Kansas Department of Health and Environment. Prevalence estimates for race and ethnicity were age-adjusted to the U.S. 2000 standard population. See Technical Appendix for details on how prevalence estimates were calculated. County population density peer groups are based on the population for each county in the 2000 population and are defined as follows: Frontier (fewer than 6 persons per square mile), Rural (6 to 19.9 persons per square mile), Densely-Settled Rural (20 to 39.9 persons per square mile), Semi-Urban (40 to 149.9 persons per square mile), and Urban (150 or more persons per square mile).

Colorectal Cancer Screening: Sigmoidoscopy/Colonoscopy

In 2014, 68 percent (95% confidence interval: 66.4% to 68.8%) of Kansas adults 50 years and older had ever had a sigmoidoscopy or colonoscopy (Table 9-2).

The percentage of Kansans 50 years and older who have ever had a sigmoidoscopy or colonoscopy did not differ significantly by gender groups.

The percentage of Kansans who have ever had a sigmoidoscopy or colonoscopy was significantly lower among Kansans aged 50 to 64 years (61.0%; 95% confidence interval: 59.3% to 62.8%) compared to Kansans aged 65 years and older.

The age-adjusted percentage of Kansans 50 years and older who have ever had a sigmoidoscopy or colonoscopy was significantly lower among Hispanics (44.6%; 95% confidence interval: 36.4% to 52.9%) compared to non-Hispanic whites (69.9%; 95% confidence interval: 68.7% to 71.1%) in 2014. No statistically significant differences were observed in screening prevalence among non-Hispanic African Americans 50 years and older (63.9%; 95% confidence interval: 57.4% to 70.3%) as compared to non-Hispanic whites 50 years and older (69.9%; 95% confidence interval: 68.7% to 71.1%).

In 2014, the percentage of Kansans 50 years and older who have ever had a sigmoidoscopy or colonoscopy was significantly higher among college graduates (76.6%; 95% confidence interval: 74.8% to 78.4%) compared to those who attained lower levels of education. The percentage of Kansans 50 years and older who have ever had a sigmoidoscopy or colonoscopy was significantly lower among those whose annual household income was less than \$15,000 (49.1%; 95% confidence interval: 44.3% to 54.0%) compared to those whose annual household income was \$25,000 or higher.

The percentage of Kansans 50 years and older who have ever had a sigmoidoscopy or colonoscopy was significantly higher among those with health insurance (70.2%; 95% confidence interval: 69.0% to 71.4%) when compared with adults without insurance (32.8%; 95% confidence interval: 27.6% to 38.0%), and significantly higher among Kansans who lived in urban counties (71.4%; 95% confidence interval: 69.7% to 73.2%) compared to those who resided in less population-dense counties.

In Kansas, the percentage of adults 50 years and older who have ever had a sigmoidoscopy or colonoscopy was significantly higher among those living with a disability (70.9%; 95% confidence interval: 68.9% to 73.0%) compared to those living without a disability (66.0%; 95% confidence interval: 64.5% to 67.5%).

Table 9-2. Percentage of adults 50 years and older who have ever had a sigmoidoscopy or colonoscopy by selected characteristics, Kansas 2014

Characteristic	Percentage of adults 50 years and older who have ever had a sigmoidoscopy or colonoscopy	95% Confidence Interval		
			to	
Total	67.6%	66.4%	to	68.8%
Gender				
Male	66.4%	64.6%	to	68.3%
Female	68.6%	67.1%	to	70.2%
Age group				
50-64	61.0%	59.3%	to	62.8%
65 and older	76.8%	75.3%	to	78.3%
Race and Ethnicity (age-adjusted)				
White, Non-Hispanic	69.9%	68.7%	to	71.1%
African American, Non-Hispanic	63.9%	57.4%	to	70.3%
Other/Multi-Race, Non-Hispanic	56.6%	49.3%	to	63.9%
Hispanic	44.6%	36.4%	to	52.9%
Education				
Less than high school	51.6%	46.4%	to	56.9%
High school graduate or G.E.D.	62.8%	60.6%	to	64.9%
Some college	69.2%	67.1%	to	71.3%
College graduate	76.6%	74.8%	to	78.4%
Household Income				
Less than \$15,000	49.1%	44.3%	to	54.0%
\$15,000 to \$24,999	59.3%	55.9%	to	62.6%
\$25,000 to \$34,999	65.5%	61.7%	to	69.3%
\$35,000 to \$49,999	68.8%	65.5%	to	72.1%
\$50,000 or higher	74.8%	73.0%	to	76.6%
Insurance Status				
Insured	70.2%	69.0%	to	71.4%
Uninsured	32.8%	27.6%	to	38.0%
County Population Density				
Frontier	59.3%	53.3%	to	65.3%
Rural	62.1%	58.8%	to	65.3%
Densely-settled rural	60.6%	57.4%	to	63.8%
Semi-urban	69.7%	67.0%	to	72.3%
Urban	71.4%	69.7%	to	73.2%
Disability Status				
Living with a disability	70.9%	68.9%	to	73.0%
Living without a disability	66.0%	64.5%	to	67.5%

Source: 2014 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, Kansas Department of Health and Environment. Prevalence estimates for race and ethnicity were age-adjusted to the U.S. 2000 standard population. See Technical Appendix for details on how prevalence estimates were calculated. County population density peer groups are based on the population for each county in the 2000 population and are defined as follows: Frontier (fewer than 6 persons per square mile), Rural (6 to 19.9 persons per square mile), Densely-Settled Rural (20 to 39.9 persons per square mile), Semi-Urban (40 to 149.9 persons per square mile), and Urban (150 or more persons per square mile).

Colorectal Cancer Screening: Fecal Occult Blood Test (FOBT)

In 2014, 13 percent (95% confidence interval: 11.9% to 13.5%) of Kansas adults 50 years and older have had an FOBT in the past two years (Table 9-3).

The percentage of Kansans who have had an FOBT in the past two years did not differ significantly among gender groups.

The percentage of Kansans who have had an FOBT in the past two years was significantly lower among Kansans aged 50 to 64 years (9.1%; 95% confidence interval: 8.1% to 10.1%) compared to Kansans aged 65 years and older (17.6%; 95% confidence interval: 16.3% to 19.0%).

The age-adjusted percentage of Kansans 50 years and older who have had an FOBT in the past two years was significantly lower among Hispanics (5.7%; 95% confidence interval: 1.9% to 9.5%) compared to non-Hispanic whites (13.2%; 95% confidence interval: 12.3% to 14.0%) in 2014. No statistically significant differences were observed in screening prevalence among non-Hispanic African Americans 50 years and older (13.6%; 95% confidence interval: 8.8% to 18.4%) as compared to non-Hispanic whites 50 years and older (13.2%; 95% confidence interval: 12.3% to 14.0%).

In 2014, the percentage of Kansans 50 years and older who have had an FOBT in the past two years did not differ significantly by education level and household income. However, the percentage of Kansans 50 years and older who have had an FOBT in the past two years was significantly higher among those with health insurance (13.2%; 95% confidence interval: 12.3% to 14.0%) when compared with adults without insurance (5.9%; 95% confidence interval: 3.7% to 8.2%).

The percentage of Kansans 50 years and older who have had an FOBT in the past two years was significantly lower among Kansans who lived in urban counties (10.8%; 95% confidence interval: 9.7% to 11.9%) compared to those who resided in frontier and semi-urban counties.

In Kansas, the percentage of adults 50 years and older who have had an FOBT in the past two years was significantly higher among those living with a disability (14.6%; 95% confidence interval: 13.1% to 16.1%) compared to those living without a disability (11.8%; 95% confidence interval: 10.9% to 12.8%).

Table 9-3. Percentage of adults 50 years and older who have had an FOBT in the past two years by selected characteristics, Kansas 2014

Characteristic	Percentage of adults 50 years and older who have had an FOBT in the past two years	95% Confidence Interval		
			to	
Total	12.7%	11.9%	to	13.5%
Gender				
Male	12.9%	11.7%	to	14.2%
Female	12.5%	11.5%	to	13.5%
Age group				
50-64	9.1%	8.1%	to	10.1%
65 and older	17.6%	16.3%	to	19.0%
Race and Ethnicity (age-adjusted)				
White, Non-Hispanic	13.2%	12.3%	to	14.0%
African American, Non-Hispanic	13.6%	8.8%	to	18.4%
Other/Multi-Race, Non-Hispanic	15.0%	9.6%	to	20.4%
Hispanic	5.7%	1.9%	to	9.5%
Education				
Less than high school	12.2%	8.8%	to	15.5%
High school graduate or G.E.D.	12.0%	10.6%	to	13.4%
Some college	13.4%	12.0%	to	14.9%
College graduate	12.8%	11.5%	to	14.1%
Household Income				
Less than \$15,000	15.3%	11.9%	to	18.7%
\$15,000 to \$24,999	14.7%	12.4%	to	17.0%
\$25,000 to \$34,999	16.6%	13.7%	to	19.4%
\$35,000 to \$49,999	12.0%	9.9%	to	14.1%
\$50,000 or higher	10.9%	9.7%	to	12.0%
Insurance Status				
Insured	13.2%	12.3%	to	14.0%
Uninsured	5.9%	3.7%	to	8.2%
County Population Density				
Frontier	16.4%	12.2%	to	20.6%
Rural	12.1%	9.9%	to	14.2%
Densely-settled rural	13.2%	11.2%	to	15.3%
Semi-urban	17.2%	15.0%	to	19.4%
Urban	10.8%	9.7%	to	11.9%
Disability Status				
Living with a disability	14.6%	13.1%	to	16.1%
Living without a disability	11.8%	10.9%	to	12.8%

Source: 2014 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, Kansas Department of Health and Environment. Prevalence estimates for race and ethnicity were age-adjusted to the U.S. 2000 standard population. See Technical Appendix for details on how prevalence estimates were calculated. County population density peer groups are based on the population for each county in the 2000 population and are defined as follows: Frontier (fewer than 6 persons per square mile), Rural (6 to 19.9 persons per square mile), Densely-Settled Rural (20 to 39.9 persons per square mile), Semi-Urban (40 to 149.9 persons per square mile), and Urban (150 or more persons per square mile).

U.S. Preventive Services Task Force Recommendation for Colorectal Cancer Screening

Based on the U.S. Preventive Services Task Force (USPSTF) recommendation for colorectal cancer screening, men and women ages 50-75 years old should have one of the following tests: 1) Annual high-sensitivity fecal occult blood testing (FOBT), 2) Sigmoidoscopy every 5 years combined with high-sensitivity FOBT every 3 years, or 3) Colonoscopy every 10 years.²⁷

In 2014, 65 percent (95% confidence interval: 63.2% to 66.0%) of Kansas adults aged 50-75 years old have met the USPSTF recommendation for colorectal cancer screening (Table 9-4).

The percentage of Kansans aged 50-75 years old who have met the USPSTF recommendation for colorectal screening in 2014 did not differ significantly among gender groups.

The percentage of Kansans aged 50-75 year old who have met the USPSTF recommendation for colorectal screening was significantly lower among Kansans aged 50-64 years (59.5%; 95% confidence interval: 57.7% to 61.2%) compared to Kansans aged 65 years and older (76.2%; 95% confidence interval: 74.3% to 78.1%).

In 2014, the age-adjusted percentage of Kansans aged 50-75 years old who have met the USPSTF recommendation for colorectal screening was significantly lower among Hispanics (39.3%; 95% confidence interval: 31.2% to 47.5%) compared to any other racial subgroups. No statistically significant differences were observed in screening prevalence among non-Hispanic African Americans (59.3%; 95% confidence interval: 51.9% to 66.6%) as compared to non-Hispanic whites (66.5%; 95% confidence interval: 65.1% to 67.9%).

In 2014, the percentage of Kansans aged 50-75 years old who have met the USPSTF recommendation for colorectal screening were significantly lower among those with education level less than high school, followed by those who were high school graduate or G.E.D., and significantly higher among those who graduated from college, followed by those who have reached the education level of some college.

In Kansas, the percentage of Kansans aged 50-75 years old who have met the USPSTF recommendation for colorectal screening were significantly lower among those whose annual household income was less than \$50,000 when compared to those whose annual household income was \$50,000 or more (71.9%; 95% confidence interval: 70.0% to 73.9%). The percentage of Kansans aged 50-75 years old who have met the USPSTF recommendation for colorectal screening was significantly lower among those without health insurance (29.3%; 95% confidence interval: 24.0% to 34.7%) when compared with adults who have insurance (67.7%; 95% confidence interval: 66.3% to 69.1%).

The percentage of Kansans aged 50-75 years old who have met the USPSTF recommendation for colorectal screening was significantly lower among Kansans who lived in frontier, rural, and densely-settled area when compared to those who lived in urban counties (68.2%; 95% confidence interval: 66.2% to 70.2%).

In Kansas, the percentage of adults aged 50-75 years old who have met the USPSTF recommendation for colorectal screening did not differ significantly by disability status.

²⁷ United States Preventive Services Task Force. Colorectal Cancer: Screening. Available at: <http://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/colorectal-cancer-screening>

Table 9-4. Percentage of adults aged 50-75 years old who have met the USPSTF screening recommendation

Characteristic	Percentage of adults 50 years and older who have met the USPSTF screening recommendation	95% Confidence Interval		
			to	
Total	64.6%	63.2%	to	66.0%
Gender				
Male	63.8%	61.6%	to	65.9%
Female	65.5%	63.6%	to	67.3%
Age group				
50-64	59.5%	57.7%	to	61.2%
65 and older	76.2%	74.3%	to	78.1%
Race and Ethnicity (age-adjusted)				
White, Non-Hispanic	66.5%	65.1%	to	67.9%
African American, Non-Hispanic	59.3%	51.9%	to	66.6%
Other/Multi-Race, Non-Hispanic	58.1%	50.2%	to	66.0%
Hispanic	39.3%	31.2%	to	47.5%
Education				
Less than high school	45.0%	38.5%	to	51.4%
High school graduate or G.E.D.	59.2%	56.6%	to	61.8%
Some college	66.1%	63.7%	to	68.6%
College graduate	73.7%	71.6%	to	75.7%
Household Income				
Less than \$15,000	47.3%	41.8%	to	52.9%
\$15,000 to \$24,999	52.5%	48.4%	to	56.6%
\$25,000 to \$34,999	60.3%	55.6%	to	64.9%
\$35,000 to \$49,999	66.0%	62.3%	to	69.7%
\$50,000 or higher	71.9%	70.0%	to	73.9%
Insurance Status				
Insured	67.7%	66.3%	to	69.1%
Uninsured	29.3%	24.0%	to	34.7%
County Population Density				
Frontier	58.2%	51.1%	to	65.3%
Rural	58.7%	55.0%	to	62.4%
Densely-settled rural	57.2%	53.5%	to	61.0%
Semi-urban	66.9%	63.8%	to	70.0%
Urban	68.2%	66.2%	to	70.2%
Disability Status				
Living with a disability	67.1%	64.6%	to	69.6%
Living without a disability	63.6%	61.9%	to	65.3%

Source: 2014 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, Kansas Department of Health and Environment. Prevalence estimates for race and ethnicity were age-adjusted to the U.S. 2000 standard population. See Technical Appendix for details on how prevalence estimates were calculated. County population density peer groups are based on the population for each county in the 2000 population and are defined as follows: Frontier (fewer than 6 persons per square mile), Rural (6 to 19.9 persons per square mile), Densely-Settled Rural (20 to 39.9 persons per square mile), Semi-Urban (40 to 149.9 persons per square mile), and Urban (150 or more persons per square mile).

Breast Cancer Screening among Kansas Women

In 2014, 71 percent (95% confidence interval: 69.7% to 72.5%) of Kansas women aged 40 years and older had a mammogram within the past two years (Table 9-5).

The percentage of women who have had a mammogram within the past two years was significantly lower among Kansas women aged 40 to 49 years (59.1%; 95% confidence interval: 55.5% to 62.7%) compared to women 50 years and older.

The age-adjusted percentage of women aged 40 years and older who have had a mammogram within the past two years was significantly lower among Hispanic (57.4%; 95% confidence interval: 48.5% to 66.2%) compared to the non-Hispanic white subgroups in 2014. No significant differences were seen in screening prevalence among non-Hispanic white and African American women.

In 2014, the percentage of women 40 years and older who have had a mammogram within the past two years was significantly lower among those who did not graduate from high school (53.2%; 95% confidence interval: 46.9% to 59.5%) compared to those who attained higher levels of education. Similarly, the percentage of women 40 years and older who have had a mammogram within the past two years was significantly lower among those whose annual household income was less than \$15,000 (57.3%; 95% confidence interval: 51.8% to 62.8%) compared to those whose annual household income was \$15,000 or higher. However, the percentage of Kansas women 40 years and older who have had a mammogram within the past two years was significantly higher among those with health insurance (73.7%; 95% confidence interval: 72.3% to 75.2%) when compared with adults without insurance (40.5%; 95% confidence interval: 34.6% to 46.4%).

The percentage of women 40 years and older who have had a mammogram within the past two years was significantly lower among women in frontier (61.3%; 95% confidence interval: 53.2% to 69.4%) and rural counties (65.6%; 95% confidence interval: 61.6% to 69.6%) compared to women in semi-urban (73.7%; 95% confidence interval: 70.6% to 76.9%) and urban counties (73.4%; 95% confidence interval: 71.4% to 75.4%).

The percentage of women 40 years and older who have had a mammogram within the past two years did not differ significantly by disability status.

Table 9-5. Percentage of women 40 years and older who have had a mammogram within the past two years by selected characteristics, Kansas 2014

Characteristic	Percentage of women 40 years and older who have had a mammogram within the past two years	95% Confidence Interval		
			to	
Total	71.1%	69.7%	to	72.5%
Age group				
40-49	59.1%	55.5%	to	62.7%
50-64	75.3%	73.2%	to	77.4%
65 and older	74.6%	72.7%	to	76.6%
Race and Ethnicity (age-adjusted)				
White, Non-Hispanic	69.9%	68.2%	to	71.6%
African American, Non-Hispanic	74.1%	67.0%	to	81.3%
Other/Multi-Race, Non-Hispanic	56.2%	47.6%	to	64.9%
Hispanic	57.4%	48.5%	to	66.2%
Education				
Less than high school	53.2%	46.9%	to	59.5%
High school graduate or G.E.D.	69.9%	67.4%	to	72.5%
Some college	71.9%	69.4%	to	74.4%
College graduate	77.2%	75.0%	to	79.3%
Household Income				
Less than \$15,000	57.3%	51.8%	to	62.8%
\$15,000 to \$24,999	61.1%	57.1%	to	65.0%
\$25,000 to \$34,999	68.4%	63.9%	to	72.8%
\$35,000 to \$49,999	72.2%	68.4%	to	76.1%
\$50,000 or higher	78.5%	76.3%	to	80.6%
Insurance Status				
Insured	73.7%	72.3%	to	75.2%
Uninsured	40.5%	34.6%	to	46.4%
County Population Density				
Frontier	61.3%	53.2%	to	69.4%
Rural	65.6%	61.6%	to	69.6%
Densely-settled rural	67.5%	63.7%	to	71.3%
Semi-urban	73.7%	70.6%	to	76.9%
Urban	73.4%	71.4%	to	75.4%
Disability Status				
Living with a disability	69.3%	66.7%	to	71.8%
Living without a disability	72.1%	70.4%	to	73.8%

Source: 2014 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, Kansas Department of Health and Environment. Prevalence estimates for race and ethnicity were age-adjusted to the U.S. 2000 standard population. See Technical Appendix for details on how prevalence estimates were calculated. County population density peer groups are based on the population for each county in the 2000 population and are defined as follows: Frontier (fewer than 6 persons per square mile), Rural (6 to 19.9 persons per square mile), Densely-Settled Rural (20 to 39.9 persons per square mile), Semi-Urban (40 to 149.9 persons per square mile), and Urban (150 or more persons per square mile).

Cervical Cancer Screening

In 2014, 74 percent (95% confidence interval: 72.2% to 75.5%) of Kansas women aged 18 years and older had a Pap test within the past three years (Table 9-6).

The percentage of women who have had a Pap test within the past three years was significantly lower among Kansas women aged 18 to 24 years (47.3%; 95% confidence interval: 41.6% to 53.0%) compared to women aged 25 to 64 years.

The age-adjusted percentage of women 18 years and older who have had a Pap test within the past three years did not differ significantly by racial and ethnic subgroups in 2014.

In 2014, the percentage of women 18 years and older who have had a Pap test within the past three years was significantly lower among those who did not graduate from high school (61.4%; 95% confidence interval: 54.0% to 68.6%) compared to those who attained higher levels of education. Similarly, the percentage of women 18 years and older who have had a Pap test within the past three years was significantly lower among those whose annual household income was less than \$15,000 (61.0%; 95% confidence interval: 54.7% to 67.3%) compared to those whose annual household income was \$35,000 or higher. However, the percentage of Kansas women 18 years and older who have had a Pap test within the past three years was significantly higher among those with health insurance (76.3%; 95% confidence interval: 74.6% to 78.0%) when compared with adults without insurance (63.8%; 95% confidence interval: 58.6% to 68.9%).

The percentage of women 18 years and older who have had a Pap test within the past three years did not differ significantly by county population density or disability status subgroups.

Table 9-6. Percentage of women 18 years and older who have had a Pap test within the past three years by selected characteristics, Kansas 2014

Characteristic	Percentage of women 18 years and older who have had a Pap test within the past three years	95% Confidence Interval		
			to	
Total	73.8%	72.2%	to	75.5%
Age group				
18-24	47.3%	41.6%	to	53.0%
25-34	88.5%	85.5%	to	91.4%
35-44	87.5%	84.8%	to	90.2%
45-64	80.2%	78.0%	to	82.4%
65 and older	53.7%	50.5%	to	56.8%
Race and Ethnicity (age-adjusted)				
White, Non-Hispanic	75.2%	73.7%	to	76.7%
African American, Non-Hispanic	75.9%	69.1%	to	82.7%
Other/Multi-Race, Non-Hispanic	64.4%	57.2%	to	71.6%
Hispanic	70.8%	64.7%	to	76.9%
Education				
Less than high school	61.4%	54.0%	to	68.6%
High school graduate or G.E.D.	67.4%	64.1%	to	70.8%
Some college	69.9%	66.8%	to	72.9%
College graduate	87.9%	86.3%	to	89.5%
Household Income				
Less than \$15,000	61.0%	54.7%	to	67.3%
\$15,000 to \$24,999	68.0%	63.4%	to	72.5%
\$25,000 to \$34,999	69.9%	64.8%	to	75.0%
\$35,000 to \$49,999	76.9%	72.7%	to	81.0%
\$50,000 or higher	86.0%	83.9%	to	88.2%
Insurance Status				
Insured	76.3%	74.6%	to	78.0%
Uninsured	63.8%	58.6%	to	68.9%
County Population Density				
Frontier	68.7%	60.4%	to	77.0%
Rural	66.0%	60.6%	to	71.3%
Densely-settled rural	69.5%	65.2%	to	73.9%
Semi-urban	70.7%	66.5%	to	74.8%
Urban	77.8%	75.6%	to	80.1%
Disability Status				
Living with a disability	69.7%	66.4%	to	73.1%
Living without a disability	75.0%	73.0%	to	76.9%

Source: 2014 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, Kansas Department of Health and Environment. Prevalence estimates for race and ethnicity were age-adjusted to the U.S. 2000 standard population. See Technical Appendix for details on how prevalence estimates were calculated. County population density peer groups are based on the population for each county in the 2000 population and are defined as follows: Frontier (fewer than 6 persons per square mile), Rural (6 to 19.9 persons per square mile), Densely-Settled Rural (20 to 39.9 persons per square mile), Semi-Urban (40 to 149.9 persons per square mile), and Urban (150 or more persons per square mile).

Prostate Cancer Screening

In 2014, about 45 percent (95% confidence interval: 43.0% to 46.6%) of Kansas men aged 40 years and older had a PSA test within the past two years (Table 9-7).

The percentage of men who have had a PSA test within the past two years was significantly lower among Kansas men aged 40 to 49 years (16.4%; 95% confidence interval: 13.4% to 19.3%), followed by the age group of 50-64 (47.8%; 95% confidence interval: 45.1% to 50.5%), and was significantly higher among men aged 65 years and older (66.8%; 95% confidence interval: 64.1% to 69.5%).

The age-adjusted percentage of men aged 40 years and older who have had a PSA test within the past two years was significantly lower among Hispanics (26.0%; 95% confidence interval: 18.1% to 34.0%) when compared with other racial and ethnic subgroups in 2014.

In 2014, the percentage of men aged 40 years and older who have had a PSA test within the past two years was significantly lower among those who did not graduate from high school (24.7%; 95% confidence interval: 18.3% to 31.0%) as compared to those who attained higher levels of education.

The percentage of men aged 40 years and older who have had a PSA test within the past two years was significantly lower among those whose annual household income was less than \$15,000 (%; 95% confidence interval: % to %), followed by those whose annual household income was \$15,000 to \$24,999 (%; 95% confidence interval: % to %), and was relatively higher for those whose annual household income was \$25,000 or higher. Similarly, the percentage of Kansans men aged 40 years and older who have had a PSA test within the past two years was significantly lower among adults without health insurance (17.7%; 95% confidence interval: 13.0% to 22.3%) when compared with those who have insurance (47.8%; 95% confidence interval: 45.9% to 49.7%).

The percentage of men aged 40 years and older who have had a PSA test within the past two years did not differ significantly by county population density or disability status subgroups.

Table 9-7. Percentage of men 40 years and older who have had a PSA test within the past two years by selected characteristics, Kansas 2014

Characteristic	Percentage of men 40 years and older who have had a PSA test within the past two years	95% Confidence Interval		
			to	
Total	44.8%	43.0%	to	46.6%
Age group				
40-49	16.4%	13.4%	to	19.3%
50-64	47.8%	45.1%	to	50.5%
65 and older	66.8%	64.1%	to	69.5%
Race and Ethnicity (age-adjusted)				
White, Non-Hispanic	42.8%	41.1%	to	44.5%
African American, Non-Hispanic	45.5%	35.3%	to	55.6%
Other/Multi-Race, Non-Hispanic	40.7%	32.3%	to	49.2%
Hispanic	26.0%	18.1%	to	34.0%
Education				
Less than high school	24.7%	18.3%	to	31.0%
High school graduate or G.E.D.	43.7%	40.4%	to	46.9%
Some college	47.6%	44.2%	to	50.9%
College graduate	49.6%	46.8%	to	52.4%
Household Income				
Less than \$15,000	19.9%	13.8%	to	25.9%
\$15,000 to \$24,999	32.8%	27.6%	to	37.9%
\$25,000 to \$34,999	44.9%	39.1%	to	50.7%
\$35,000 to \$49,999	48.8%	44.1%	to	53.5%
\$50,000 or higher	49.1%	46.6%	to	51.6%
Insurance Status				
Insured	47.8%	45.9%	to	49.7%
Uninsured	17.7%	13.0%	to	22.3%
County Population Density				
Frontier	54.3%	45.6%	to	63.0%
Rural	49.3%	44.1%	to	54.5%
Densely-settled rural	41.4%	36.8%	to	46.1%
Semi-urban	45.5%	41.5%	to	49.5%
Urban	43.9%	41.3%	to	46.5%
Disability Status				
Living with a disability	46.3%	42.8%	to	49.8%
Living without a disability	44.2%	42.1%	to	46.3%

Source: 2014 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, Kansas Department of Health and Environment. Prevalence estimates for race and ethnicity were age-adjusted to the U.S. 2000 standard population. See Technical Appendix for details on how prevalence estimates were calculated. County population density peer groups are based on the population for each county in the 2000 population and are defined as follows: Frontier (fewer than 6 persons per square mile), Rural (6 to 19.9 persons per square mile), Densely-Settled Rural (20 to 39.9 persons per square mile), Semi-Urban (40 to 149.9 persons per square mile), and Urban (150 or more persons per square mile).

CHAPTER 10: CANCER RISK AND PROTECTIVE FACTORS

Smoking

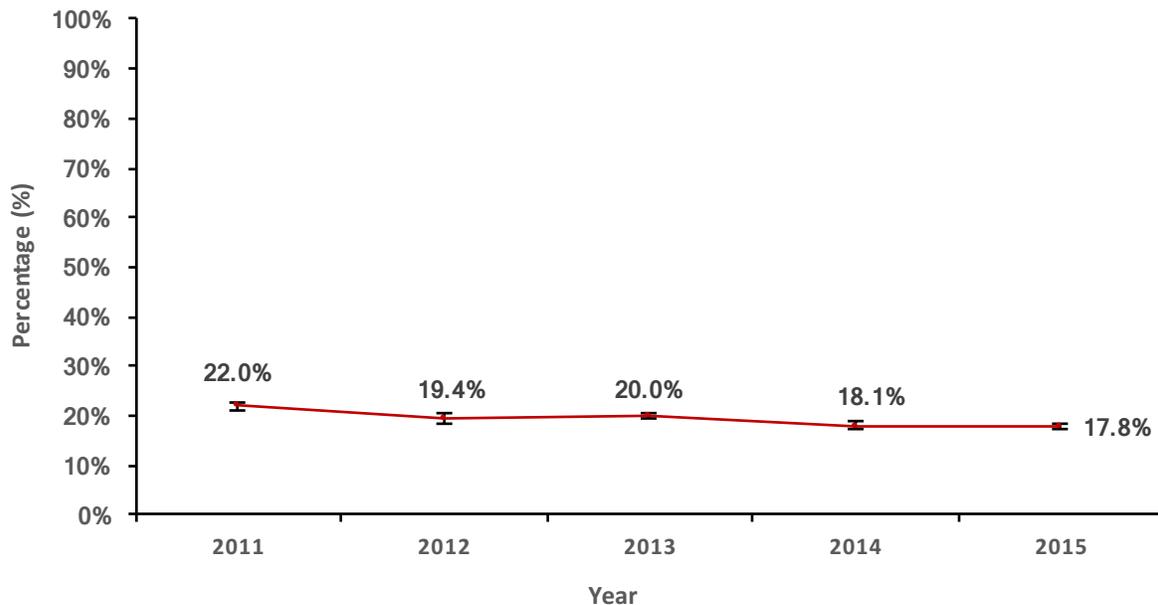
Smoking is the major cause of lung cancer in the United States. About 90 percent of lung cancer deaths in men and almost 80 percent of lung cancer deaths in women in the U.S. are due to smoking. Smoking also causes several other cancers, including cancer of the bladder, cervix, esophagus, kidney, larynx, oral cavity, pancreas, throat and stomach, as well as acute myeloid leukemia.²⁸

Smoking among Kansas Adults

In 2015, 18 percent (95% confidence interval: 17.1% to 18.5%) of Kansas adults 18 years and older were current smokers (Figure 10-1). The percentage of Kansas adults who are current smokers has remained steady since 2011.



Figure 10-1. Percentage of adults 18 years and older who are current smokers, Kansas 2011-2015.



Source: 2011-2015 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, Department of Health and Environment. Vertical bars indicate 95% confidence intervals.

²⁸ U.S. Department of Health and Human Services. The Health Consequences of Smoking: A Report of the Surgeon General. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2004.

In 2015, the percentage of Kansans who were current smokers was significantly higher among male (19.4%; 95% confidence interval: 18.4% to 20.4%) as compared to female (16.2%; 95% confidence interval: 15.4% to 17.1%).

The percentage of Kansans who were current smokers in 2015 was significantly higher among Kansans aged 25 to 34 years (23.6%; 95% confidence interval: 21.5% to 25.6%), followed by adults aged 45 to 64 years (20.0%; 95% confidence interval: 18.9% to 21.0%), and adults aged 18 to 24 years (15.4%; 95% confidence interval: 13.2% to 17.6%). However, the percentage of Kansans who were current smokers was significantly lower among Kansans aged 65 years and older (8.7%; 95% confidence interval: 7.9% to 9.5%) as compared to any other age group.

The age-adjusted percentage of Kansans 18 years and older who were current smokers was significantly higher among non-Hispanic African Americans (23.5%; 95% confidence interval: 20.3% to 26.7%), and non-Hispanic Kansans of other races or multi-racial Kansans (21.2%; 95% confidence interval: 18.5% to 23.9%), compared to non-Hispanic whites (17.0%; 95% confidence interval: 16.4% to 17.7%) and Hispanics (14.1%; 12.3% to 16.0%).

In 2015, the percentage of Kansans 18 years and older who were current smokers was significantly lower among college graduates (7.3%; 95% confidence interval: 6.6% to 8.0%) compared to those who attained lower levels of education. Similarly, the percentage of Kansans 18 years and older who were current smokers was significantly lower among those whose annual household income was \$50,000 or higher (11.7%; 95% confidence interval: 10.8% to 12.6%) compared to those whose household income was lower.

The percentage of Kansans 18 years and older who were current smokers did not differ significantly by county population density subgroups.

In Kansas, the percentage of adults 18 years and older who were current smokers was significantly higher among those living with a disability (24.7%; 95% confidence interval: 23.3% to 26.2%) compared to those living without a disability (15.8%; 95% confidence interval: 15.1% to 16.6%).

Smoking among Kansas Adults with and without History of Cancer Diagnosis

In 2015, approximately 15 percent (15.2%; 95% confidence interval: 13.2% to 17.1%) of Kansas adults 18 years and older ever diagnosed with cancer currently smoked cigarettes, while 18.0% (95% confidence interval: 17.3% to 18.7%) of Kansas adults with no history of cancer diagnosis currently smoke. However, after adjusting for age, sex, race/ethnicity, employment status, and education level, the adjusted prevalence of smoking among those ever diagnosed with cancer did not differ significantly as compared to those with no history of cancer diagnosis (adjusted odds ratio: 1.05; 95% confidence interval: 0.88 to 1.24; $p=0.61$).

Smoking among Kansas Adolescents

In 2013, approximately 10 percent (10.2%; 95% confidence interval: 8.8% to 11.9%) of Kansas high school students in grades 9-12 currently smoked cigarettes. The percentage of Kansas high school students in grades 9-12 who currently smoked cigarettes did not differ significantly by gender groups. The percentage of Kansas students who currently smoked cigarettes did not differ significantly by their grade levels. The percentage of high school students in grade 9-12 (males, females, or both) who currently smoked cigarettes did not differ significantly by race/ethnic groups.

Table 10-1. Percentage of adults 18 years and older who are current smokers, by selected characteristics, Kansas 2015.

Characteristic	Percentage of adults 18 years and older who are current smokers	95% Confidence Interval		
			to	
Total	17.8%	17.1%	to	18.5%
Gender				
Male	19.4%	18.4%	to	20.4%
Female	16.2%	15.4%	to	17.1%
Age Group				
18-24	15.4%	13.2%	to	17.6%
25-34	23.6%	21.5%	to	25.6%
35-44	20.7%	18.9%	to	22.5%
45-64	20.0%	18.9%	to	21.0%
65 and older	8.7%	7.9%	to	9.5%
Race and Ethnicity (age-adjusted)				
White, Non-Hispanic	17.0%	16.4%	to	17.7%
African American, Non-Hispanic	23.5%	20.3%	to	26.7%
Other/Multi-Race, Non-Hispanic	21.2%	18.5%	to	23.9%
Hispanic	14.1%	12.3%	to	16.0%
Education				
Less than high school	28.8%	25.8%	to	31.7%
High school graduate or G.E.D.	23.2%	21.9%	to	24.5%
Some College	18.7%	17.5%	to	19.9%
College Graduate	7.3%	6.6%	to	8.0%
Household Income				
Less than \$15,000	31.3%	28.1%	to	34.6%
\$15,000 to \$24,999	27.8%	25.7%	to	29.9%
\$25,000 to \$34,999	22.3%	19.9%	to	24.6%
\$35,000 to \$49,999	19.1%	17.3%	to	21.0%
\$50,000 or higher	11.7%	10.8%	to	12.6%
County Population Density				
Frontier	16.7%	13.7%	to	19.7%
Rural	18.4%	16.5%	to	20.3%
Densely-settled rural	19.6%	17.8%	to	21.4%
Semi-urban	18.9%	17.2%	to	20.5%
Urban	16.9%	16.0%	to	17.9%
Disability Status				
Living with a disability	24.7%	23.3%	to	26.2%
Living without a disability	15.8%	15.1%	to	16.6%

Source: 2014 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, Kansas Department of Health and Environment. Prevalence estimates for race and ethnicity were age-adjusted to the U.S. 2000 standard population. See Technical Appendix for details on how prevalence estimates were calculated. County population density peer groups are based on the population for each county in the 2000 population and are defined as follows: Frontier (fewer than 6 persons per square mile), Rural (6 to 19.9 persons per square mile), Densely-Settled Rural (20 to 39.9 persons per square mile), Semi-Urban (40 to 149.9 persons per square mile), and Urban (150 or more persons per square mile).

Smokeless Tobacco Use

Smokeless tobacco includes chewing tobacco, which is placed between the cheek and gums, and snuff, which can be placed between the cheek or lip and gums, or taken orally or inhaled through the nostrils. Newer smokeless tobacco products include lozenges, tablets, tabs, strips, and sticks. Smokeless tobacco is known to cause oral, esophageal, and pancreatic cancer.²⁹

Smokeless Tobacco Use among Kansas Adults

During 2014-2015, approximately 11 percent of Kansas males 18 years and older used smokeless tobacco products (10.6%; 95% confidence interval: 10.0% to 11.2%), while less than 1 percent of Kansas females did (0.9%; 95% confidence interval: 0.7% to 1.1%). Due to the relative low smokeless tobacco use among females in Kansas, the following data describes smokeless tobacco use among Kansas males only. Two years of data were combined to maximize sample size and to allow for descriptive analyses by selected characteristics.



The percentage of Kansas males 18 years and older who currently used smokeless tobacco during 2014-2015 was lower among Kansas males aged 65 years and older (4.7%; 95% confidence interval: 4.0% to 5.4%) compared to Kansas males age 18 to 64 years.

The age-adjusted percentage of Kansas males 18 years and older who currently used smokeless tobacco during 2014-2015 was significantly higher among non-Hispanic whites (12.8%; 95% confidence interval: 12.0% to 13.5%) compared to non-Hispanic African Americans (4.1%; 95% confidence interval: 2.3% to 5.9%), non-Hispanic Kansans of other races or multi-racial Kansans (8.8%; 95% confidence interval: 6.5% to 11.2%), and Hispanics (4.0%; 95% confidence interval: 2.8% to 5.3%).

During 2014-2015, the percentage of Kansas males 18 years and older who currently used smokeless tobacco was significantly lower among college graduates (6.6%; 95% confidence interval: 5.8% to 7.3%) compared to those who received less than college graduate level of education.

The percentage of Kansas males 18 years and older who currently used smokeless tobacco did not differ significantly by household income level during 2014-2015.

The percentage of Kansas males 18 years and older who currently used smokeless tobacco was significantly lower among those who lived in urban (7.1%; 95% confidence interval: 6.4% to 7.9%) and semi-urban (11.3%; 95% confidence interval: 9.9% to 12.6%) areas compared to those who lived in rural (17.4%; 95% confidence interval: 15.2% to 19.6%) and densely-settled rural (15.3%; 95% confidence interval: 13.4% to 17.2%) areas during 2014-2015.

In Kansas, the percentage of adult males 18 years and older who currently used smokeless tobacco did not differ significantly by disability status subgroups.

²⁹ World Health Organization. Smokeless Tobacco and Some Tobacco-Specific N-Nitrosamines. International Agency for Research on Cancer Monographs on the Evaluation of Carcinogenic Risks to Humans Vol. 89. Lyon (France): World Health Organization, 2007.

Table 10-2. Percentage of males 18 years and older who currently use smokeless tobacco, by selected characteristics, Kansas 2014-2015.

Characteristic	Percentage of adults 18 years and older who currently use smokeless tobacco	95% Confidence Interval		
			to	
Total	10.6%	10.0%	to	11.2%
Age Group				
18-24	13.3%	11.3%	to	15.4%
25-34	13.3%	11.6%	to	15.0%
35-44	13.5%	11.9%	to	15.2%
45-64	9.9%	9.0%	to	10.7%
65 and older	4.7%	4.0%	to	5.4%
Race and Ethnicity (age-adjusted)				
White, Non-Hispanic	12.8%	12.0%	to	13.5%
African American, Non-Hispanic	4.1%	2.3%	to	5.9%
Other/Multi-Race, Non-Hispanic	8.8%	6.5%	to	11.2%
Hispanic	4.0%	2.8%	to	5.3%
Education				
Less than high school	8.1%	6.2%	to	10.1%
High school graduate or G.E.D.	13.1%	11.9%	to	14.3%
Some College	12.7%	11.5%	to	13.9%
College Graduate	6.6%	5.8%	to	7.3%
Household Income				
Less than \$15,000	8.6%	6.3%	to	11.0%
\$15,000 to \$24,999	10.3%	8.6%	to	11.9%
\$25,000 to \$34,999	11.9%	9.9%	to	14.0%
\$35,000 to \$49,999	11.5%	9.9%	to	13.1%
\$50,000 or higher	10.7%	9.8%	to	11.6%
County Population Density				
Frontier	15.7%	12.2%	to	19.2%
Rural	17.4%	15.2%	to	19.6%
Densely-settled rural	15.3%	13.4%	to	17.2%
Semi-urban	11.3%	9.9%	to	12.6%
Urban	7.1%	6.4%	to	7.9%
Disability Status				
Living with a disability	9.8%	8.6%	to	11.0%
Living without a disability	10.9%	10.2%	to	11.6%

Source: 2014-2015 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, Kansas Department of Health and Environment. Prevalence estimates for race and ethnicity were age-adjusted to the U.S. 2000 standard population. See Technical Appendix for details on how prevalence estimates were calculated. County population density peer groups are based on the population for each county in the 2000 population and are defined as follows: Frontier (fewer than 6 persons per square mile), Rural (6 to 19.9 persons per square mile), Densely-Settled Rural (20 to 39.9 persons per square mile), Semi-Urban (40 to 149.9 persons per square mile), and Urban (150 or more persons per square mile).

Smokeless Tobacco Use among Kansas Adolescents

In 2013, approximately 13 percent (13.2%; 95% confidence interval: 10.9% to 15.9%) of male high school students in grade 9-12 in Kansas currently used smokeless tobacco, while only 2 percent (2.3%; 95% confidence interval: 1.4% to 3.9%) of female high school students in grade 9-12 did.³⁰ The percentage of high school students in grades 9-12 (males, females, or both) who currently used smokeless tobacco did not differ significantly by grade level or race/ethnicity groups.

Secondhand Smoke

Secondhand smoke contains hundreds of chemicals known to cause cancer, and nonsmokers who are exposed to secondhand smoke at home or at work increase their risk of developing lung cancer by 20 to 30 percent.³¹

In 2014, approximately 7 percent of Kansas adults 18 years and older were exposed to secondhand smoke at home at least once during the past week (6.9%; 95% confidence interval: 6.1% to 7.8%). There was no significant difference in reported exposure to secondhand smoke at home by gender groups.

About 13 percent of Kansas adults 18 years and older were exposed to secondhand smoke in vehicles during this time period (13.0%; 95% confidence interval: 11.9% to 14.1%). The percentage of Kansas males 18 years and older who were exposed to secondhand smoke in vehicles (15.1%; 95% confidence interval: 13.3% to 16.9%) was significantly higher as compared to adult females (11.0%; 95% confidence interval: 9.6% to 12.3%).

Radon

Although cigarette smoking is responsible for about 90 percent of lung cancers in the U.S.,³² long-term exposure to radon—a colorless, odorless, radioactive gas—can also cause lung cancer. In fact, radon is the second leading cause of lung cancer, after cigarette smoking. The combination of cigarette smoking and exposure to radon increases the risk of lung cancer even greater than exposure to either risk factor alone. For most, the largest source of radon exposure occurs at home, and there are several options that people can choose to reduce their exposure, including using radon-resistant building techniques in new homes or installing radon-mitigation systems in existing homes.³³ As of 2013, about 8.5 percent of existing homes in Kansas have radon mitigation systems installed, and only three Kansas cities have adopted building codes requiring radon-resistant building techniques.³⁴ The percentage of existing homes that have radon mitigation systems installed is significantly higher among Kansans with annual household income >\$50,000 (10.2%; 95% confidence interval: 9.0% to 11.5%) as compared to those whose household income was less.



³⁰ 2013 Kansas Youth Risk Behavior Survey. Child Nutrition & Wellness, Kansas Department of Education.

³¹ U.S. Department of Health and Human Services. The Health Consequences of Involuntary Exposure to Tobacco Smoke: A Report of the Surgeon General. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2006.

³² U.S. Department of Health and Human Services. The Health Consequences of Smoking: A Report of the Surgeon General (2004).

³³ American Cancer Society (2012). Radon. <http://www.cancer.org/Cancer/CancerCauses/OtherCarcinogens/Pollution/radon>

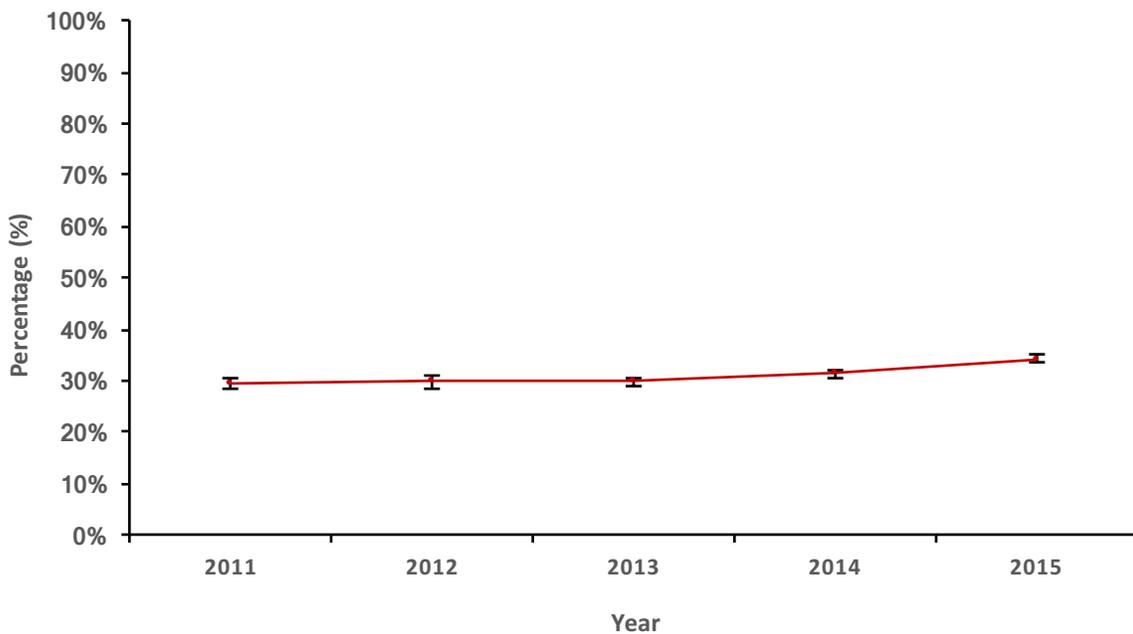
³⁴ Kansas Radiation Control Program, Kansas Department of Health and Environment.

Obesity

Obesity is associated with increased risk of esophageal, postmenopausal breast, endometrial colorectal, kidney, pancreatic, thyroid, and gallbladder cancer. Although the mechanisms that link obesity and cancer remain unknown, several possible explanations include: excessive hormone production; increased levels of insulin and insulin-like growth-factor; and chronic low-level inflammation.³⁵

In 2015, 34 percent (34.3%; 95% confidence interval: 33.5% to 35.1%) of Kansas adults 18 years and older were obese (Figure 10-2). The percentage of Kansas adults who were obese has increased gradually since 2011, but the percentage of Kansas adults who were obese was significantly higher in 2015 as compared to 2011-2014.

Figure 10-2. Percentage of adults 18 years and older who are obese, Kansas 2011-2015.



Source: 2011-2015 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, Kansas Department of Health and Environment. Vertical bars indicate 95% confidence intervals.

³⁵ National Cancer Institute. Obesity and Cancer Risk, 2012. <http://www.cancer.gov/cancertopics/factsheet/Risk/obesity>

In 2015, the percentage of Kansans who were obese did not differ significantly by gender groups (Table 10-3).

The percentage of Kansans who were obese in 2015 was significantly lower among Kansans aged 18 to 24 years (22.1%; 95% confidence interval: 19.6% to 24.6%) compared to Kansans aged 25 years and older.

The age-adjusted percentage of Kansans 18 years and older who were obese was significantly higher among non-Hispanic African Americans (46.6%; 95% confidence interval: 42.1% to 51.0%) and Hispanics (39.7%; 95% confidence interval: 36.4% to 43.0%) compared to non-Hispanic whites (33.6%; 95% confidence interval: 32.7% to 34.6%) and other/multi-racial groups (29.0%; 95% confidence interval: 25.4% to 32.3%).

In 2015, the percentage of Kansans 18 years and older who were obese was significantly lower among college graduates (30.1%; 95% confidence interval: 28.9% to 31.3%) compared to those who attained lower levels of education. During the same time period, the percentage of Kansans 18 years and older who were obese was significantly lower among those whose annual household income was \$50,000 or higher (32.2%; 95% confidence interval: 31.0% to 33.4%) compared to those whose annual household income was less than \$50,000.

The percentage of Kansans 18 years and older who were obese in 2015 did not differ significantly by county population density.

In Kansas, the percentage of adults 18 years and older who were obese in 2015 was significantly higher among those living with a disability (44.7%; 95% confidence interval: 43.0% to 46.3%) compared to those living without a disability (31.2%; 95% confidence interval: 30.3% to 32.1%).



Table 10- 3. Percentage of adults 18 years and older who are obese, by selected characteristics, Kansas 2015.

Characteristic	Percentage of adults 18 years and older who are obese	95% Confidence Interval		
Total	34.3%	33.5%	to	35.1%
Gender				
Male	35.1%	33.9%	to	36.3%
Female	33.4%	32.3%	to	34.5%
Age Group				
18-24	22.1%	19.6%	to	24.6%
25-34	35.8%	33.5%	to	38.1%
35-44	38.0%	35.8%	to	40.2%
45-64	39.2%	37.9%	to	40.5%
65 and older	30.5%	29.2%	to	31.7%
Race and Ethnicity (age-adjusted)				
White, Non-Hispanic	33.6%	32.7%	to	34.6%
African American, Non-Hispanic	45.6%	42.1%	to	51.0%
Other/Multi-Race, Non-Hispanic	29.0%	25.4%	to	32.6%
Hispanic	39.7%	36.4%	to	43.0%
Education				
Less than high school	39.3%	36.0%	to	42.6%
High school graduate or G.E.D.	36.4%	34.9%	to	38.0%
Some College	34.5%	33.0%	to	35.9%
College Graduate	30.1%	28.9%	to	31.3%
Household Income				
Less than \$15,000	38.4%	34.9%	to	41.8%
\$15,000 to \$24,999	37.7%	35.4%	to	40.0%
\$25,000 to \$34,999	38.2%	35.5%	to	40.8%
\$35,000 to \$49,999	37.5%	35.2%	to	39.7%
\$50,000 or higher	32.2%	31.0%	to	33.4%
County Population Density				
Frontier	33.7%	29.9%	to	37.6%
Rural	36.1%	33.8%	to	38.4%
Densely-settled rural	36.7%	34.6%	to	38.8%
Semi-urban	35.8%	34.0%	to	37.7%
Urban	32.8%	31.7%	to	34.0%
Disability Status				
Living with a disability	44.7%	43.0%	to	46.3%
Living without a disability	31.2%	30.3%	to	32.1%

Source: 2015 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, Kansas Department of Health and Environment. Prevalence estimates for race and ethnicity were age-adjusted to the U.S. 2000 standard population. See Technical Appendix for details on how prevalence estimates were calculated. County population density peer groups are based on the population for each county in the 2000 population and are defined as follows: Frontier (fewer than 6 persons per square mile), Rural (6 to 19.9 persons per square mile), Densely-Settled Rural (20 to 39.9 persons per square mile), Semi-Urban (40 to 149.9 persons per square mile), and Urban (150 or more persons per square mile).

Fruit and Vegetable Consumption

The American Cancer Society (ACS) recommends eating at least 2½ cups of fruits and vegetables per day to reduce the risk of cancer. Research studies have reported associations between higher fruit and vegetable consumption and lower risk of breast, colorectal, oral, esophageal, prostate, and stomach cancers.³⁶

In 2015, about 42 percent (95% confidence interval: 40.8% to 42.4%) of Kansas adults 18 years and older consumed both fruits and vegetables one or more times per day (Table 10-4).

The percentage of Kansas males 18 years and older who consumed both fruits and vegetables one or more times per day in 2015 (35.8%; 95% confidence interval: 34.7% to 36.9%) was significantly lower than the percentage of Kansas females (47.2%; 95% confidence interval: 46.1% to 48.3%) who did.

In 2015, the percentage of Kansans who consumed both fruits and vegetables one or more times per day was significantly higher among adults 65 years and older (45.2%; 95% confidence interval: 43.9% to 46.5%) compared to adults 18-34 years old.

The age-adjusted percentage of adults 18 years and older who consumed both fruits and vegetables one or more times per day in 2015 was significantly lower among non-Hispanic African Americans (34.5%; 95% confidence interval: 30.4% to 38.6%) compared to non-Hispanic whites and Hispanics.

The percentage of Kansas adults 18 years and older who consumed both fruits and vegetables one or more times per day in 2015 was significantly higher among college graduates (52.1%; 95% confidence interval: 50.8% to 53.4%) compared to those who attained lower levels of education.

In 2015, the percentage of Kansans 18 years and older who consumed both fruits and vegetables one or more times per day was significantly higher among those whose annual household income was \$50,000 or higher (48.6%; 95% confidence interval: 47.4% to 49.9%) compared to those whose annual household income was less than \$50,000, and significantly lower among those with annual household income less than \$15,000 (32.6%; 95% confidence interval: 29.4% to 35.8%).

The percentage of Kansas adults 18 years and older who consumed both fruits and vegetables one or more times per day in 2015 was significantly higher among residents of urban counties (43.2%; 95% confidence interval: 42.0% to 44.3%) compared to residents of densely-settled rural counties (39.3%; 95% confidence interval: 37.3% to 41.3%).

In Kansas, the percentage of adults 18 years and older who consumed both fruits and vegetables one or more times per day was significantly higher among those living without a disability (44.2%; 95% confidence interval: 43.3% to 45.2%) compared to those living with a disability (39.8%; 95% confidence interval: 38.3% to 41.4%).



³⁶ Kushi, L. H., Doyle, C., McCullough, M., Rock, C. L., Demark-Wahnefried, W., Bandera, E. V., Gapstur, S., Patel, A. V., Andrews, K., Gansler, T. and The American Cancer Society 2010 Nutrition and Physical Activity Guidelines Advisory Committee (2012), American Cancer Society guidelines on nutrition and physical activity for cancer prevention. CA: A Cancer Journal for Clinicians, 62: 30–67.

Table 10- 4. Percentage of adults 18 years and older who consume both fruits and vegetables one or more times per day, by selected characteristics, Kansas 2015.

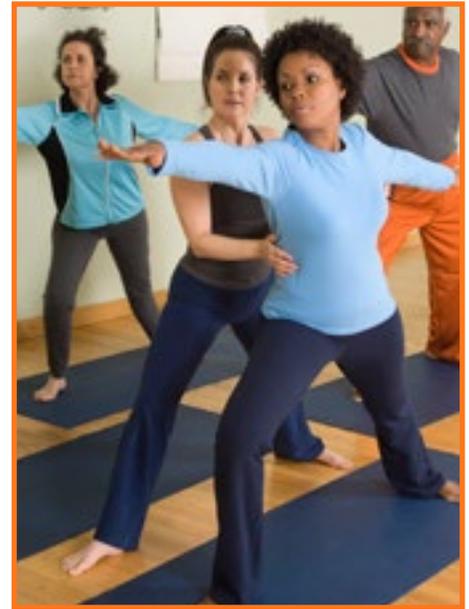
Characteristic	Percentage of adults 18 years and older who consume both fruits and vegetables 1+ times/day	95% Confidence Interval		
			to	
Total	41.6%	40.8%	to	42.4%
Gender				
Male	35.8%	34.7%	to	36.9%
Female	47.2%	46.1%	to	48.3%
Age Group				
18-24	35.5%	32.7%	to	38.3%
25-34	39.5%	37.3%	to	41.6%
35-44	42.3%	40.2%	to	44.4%
45-64	42.7%	41.5%	to	44.0%
65 and older	45.2%	43.9%	to	46.5%
Race and Ethnicity (age-adjusted)				
White, Non-Hispanic	42.1%	41.2%	to	43.0%
African American, Non-Hispanic	34.5%	30.4%	to	38.6%
Other/Multi-Race, Non-Hispanic	41.1%	37.3%	to	44.9%
Hispanic	42.8%	39.7%	to	45.8%
Education				
Less than high school	33.6%	30.7%	to	36.6%
High school graduate or G.E.D.	33.8%	32.4%	to	35.2%
Some College	42.1%	40.7%	to	43.6%
College Graduate	52.1%	50.8%	to	53.4%
Household Income				
Less than \$15,000	32.6%	29.4%	to	35.8%
\$15,000 to \$24,999	40.0%	37.7%	to	42.2%
\$25,000 to \$34,999	40.5%	37.9%	to	43.1%
\$35,000 to \$49,999	40.4%	38.2%	to	42.6%
\$50,000 or higher	48.6%	47.4%	to	49.9%
County Population Density				
Frontier	39.2%	35.5%	to	43.0%
Rural	37.1%	34.9%	to	39.3%
Densely-settled rural	39.3%	37.3%	to	41.3%
Semi-urban	41.3%	39.4%	to	43.1%
Urban	43.2%	42.0%	to	44.3%
Disability Status				
Living with a disability	39.8%	38.3%	to	41.4%
Living without a disability	44.2%	43.3%	to	45.2%

Source: 2015 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, Kansas Department of Health and Environment. Prevalence estimates for race and ethnicity were age-adjusted to the U.S. 2000 standard population. See Technical Appendix for details on how prevalence estimates were calculated. County population density peer groups are based on the population for each county in the 2000 population and are defined as follows: Frontier (fewer than 6 persons per square mile), Rural (6 to 19.9 persons per square mile), Densely-Settled Rural (20 to 39.9 persons per square mile), Semi-Urban (40 to 149.9 persons per square mile), and Urban (150 or more persons per square mile).

Physical Activity

The U.S. Department of Health and Human Services' 2015-2020 Physical Activity Guidelines for Americans and the American Cancer Society's (ACS) Guidelines on Nutrition and Physical Activity for Cancer Prevention recommends that adults participate in at least 150 minutes a week of moderate-intensity aerobic activity, or 75 minutes a week of vigorous-intensity aerobic activity, or an equivalent combination of moderate- and vigorous-intensity aerobic activity, and muscle strengthening activity on two or more days a week.³⁷⁻³⁸ Physical activity has been linked to lower risk of several types of cancer, including cancers of the breast, colon/rectum, uterus, pancreas, and prostate.

In 2015, 19.3 percent (95% confidence interval: 18.6% to 20.0%) of Kansas adults 18 years and older met physical activity guidelines (i.e. 150 minutes a week of moderate-intensity aerobic activity, or 75 minutes a week of vigorous-intensity aerobic activity, or an equivalent combination of moderate- and vigorous-intensity aerobic activity) (Table 10-5).



Kansas males 18 years and older were significantly more likely to meet physical activity guidelines (21.2%; 95% confidence interval: 20.1% to 22.3%) compared to females (17.5%; 95% confidence interval: 16.6% to 18.5%) in 2015.

In 2015, Kansas adults aged 18 to 24 years (27.3%; 95% confidence interval: 24.5% to 30.2%) were significantly more likely to meet physical activity guidelines compared to adults aged 25 to 64, and was significantly lower among adults aged 65 and older (15.8%; 95% confidence interval: 14.8% to 16.8%).

The age-adjusted percentage of adults 18 years and older who met physical activity guidelines in 2015 did not differ significantly by race and ethnicity status.

In 2015, the percentage of Kansas adults 18 years and older who met physical activity guidelines was significantly lower among those with lower levels of education compared to those who attained college level (15.8%; 95% confidence interval: 18.9% to 21.5%) or graduated from college (24.7%; 95% confidence interval: 23.5% to 25.8%). Similarly, the percentage of Kansas adults 18 years and older who met physical activity guidelines was significantly lower among those whose annual household income was less than \$35,000 compared to those whose annual household income was \$35,000 or greater.

The percentage of Kansas adults 18 years and older who met physical activity guidelines in 2015 was significantly lower among residents of frontier, rural or densely-settled rural counties as compared to residents of urban counties (20.7%; 95% confidence interval: 19.7% to 21.7%).

In Kansas, the percentage of adults 18 years and older who met physical activity guidelines in 2015 was significantly lower among those living with a disability (13.0%; 95% confidence interval: 11.9% to 14.1%) compared to those living without a disability (21.2%; 95% confidence interval: 20.3% to 22.0%).

³⁷ U.S. Department of Health and Human Services. Physical Activity Guidelines for Americans (2015-2020).

³⁸ Kushi, L. H., Doyle, C., McCullough, M., Rock, C. L., Demark-Wahnefried, W., Bandera, E. V., Gapstur, S., Patel, A. V., Andrews, K., Gansler, T. and The American Cancer Society 2010 Nutrition and Physical Activity Guidelines Advisory Committee (2012), American Cancer Society guidelines on nutrition and physical activity for cancer prevention. CA: A Cancer Journal for Clinicians, 62: 30-67.

Table 10-5. Percentage of adults 18 years and older who met physical activity guidelines, by selected characteristics, Kansas 2015.

Characteristic	Percentage of adults 18 years and older who met physical activity guidelines	95% Confidence Interval		
		18.6%	to	20.0%
Total	19.3%	18.6%	to	20.0%
Gender				
Male	21.2%	20.1%	to	22.3%
Female	17.5%	16.6%	to	18.5%
Age Group				
18-24	27.3%	24.5%	to	30.2%
25-34	21.0%	19.0%	to	23.0%
35-44	19.6%	17.8%	to	21.4%
45-64	17.2%	16.2%	to	18.2%
65 and older	15.8%	14.8%	to	16.8%
Race and Ethnicity (age-adjusted)				
White, Non-Hispanic	19.7%	18.9%	to	20.5%
African American, Non-Hispanic	19.6%	15.6%	to	23.6%
Other/Multi-Race, Non-Hispanic	21.6%	18.0%	to	25.1%
Hispanic	17.7%	15.1%	to	20.3%
Education				
Less than high school	11.8%	9.4%	to	14.2%
High school graduate or G.E.D.	15.3%	14.0%	to	16.5%
Some College	20.2%	18.9%	to	21.5%
College Graduate	24.7%	23.5%	to	25.8%
Household Income				
Less than \$15,000	13.6%	11.1%	to	16.2%
\$15,000 to \$24,999	15.9%	14.1%	to	17.8%
\$25,000 to \$34,999	16.5%	14.3%	to	18.7%
\$35,000 to \$49,999	20.9%	18.8%	to	23.0%
\$50,000 or higher	22.5%	21.4%	to	23.6%
County Population Density				
Frontier	13.4%	10.5%	to	16.2%
Rural	15.4%	13.5%	to	17.4%
Densely-settled rural	17.5%	15.7%	to	19.2%
Semi-urban	19.7%	18.0%	to	21.3%
Urban	20.7%	19.7%	to	21.7%
Disability Status				
Living with a disability	13.0%	11.9%	to	14.1%
Living without a disability	21.2%	20.3%	to	22.0%

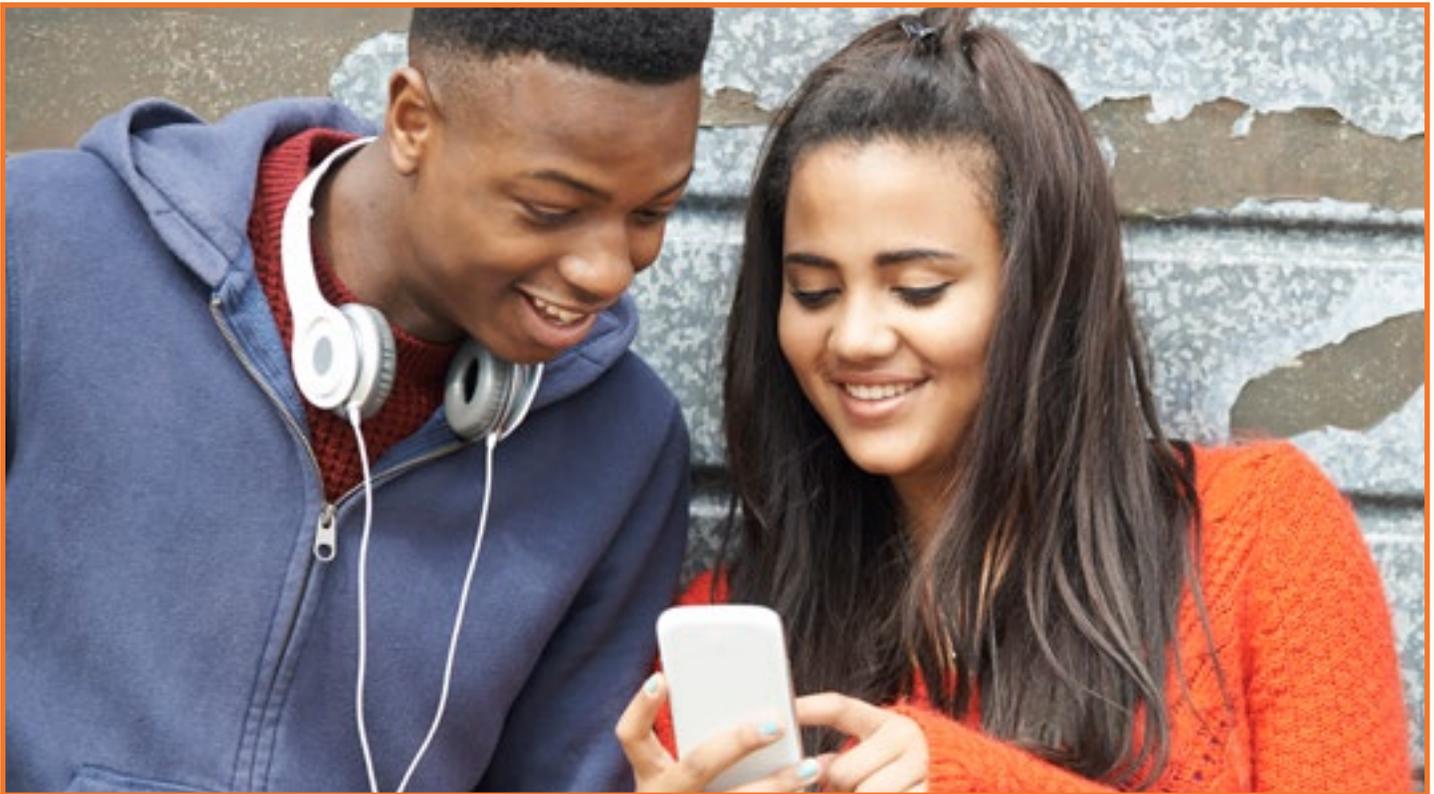
Source: 2015 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, Kansas Department of Health and Environment. Prevalence estimates for race and ethnicity were age-adjusted to the U.S. 2000 standard population. See Technical Appendix for details on how prevalence estimates were calculated. County population density peer groups are based on the population for each county in the 2000 population and are defined as follows: Frontier (fewer than 6 persons per square mile), Rural (6 to 19.9 persons per square mile), Densely-Settled Rural (20 to 39.9 persons per square mile), Semi-Urban (40 to 149.9 persons per square mile), and Urban (150 or more persons per square mile). Note: ACS Guidelines on Physical Activity for Cancer Prevention recommends that adults participate in at least 150 minutes a week of moderate-intensity aerobic activity, or 75 minutes a week of vigorous-intensity aerobic activity, or an equivalent combination of moderate- and vigorous-intensity aerobic activity, and muscle strengthening activity on two or more days a week.

Human Papillomavirus (HPV) Vaccination

Human papillomavirus (HPV) is a common virus that is transmitted during sex. Although HPV often does not cause health problems, nearly all cervical cancers are caused by HPV.³⁹ HPV also increases the risk of vulvar, vaginal, penile, anal, and oropharyngeal (throat) cancer.

HPV vaccine has been found to be safe and effective for both males and females aged 9-26 years. In 2016, the CDC began recommending two doses of HPV vaccine at least six months apart for males and females aged 9-14 years to protect against cancers, and three doses for those who begin in the series at a later age (15-26 years). However, teens and young adults aged 9-26 who received 2 doses of HPV vaccine less than 5 months apart are required to have 3 doses to complete the series.⁴⁰

In 2015 before the new guidelines, 51 percent (95% confidence interval: 42.1% to 59.7%) of Kansas females ages 13-17 years had received one or more doses of the HPV vaccine, while only 32 percent (95% confidence interval: 23.7% to 39.7%) received the recommended three (or more) doses of the vaccine. The percentage of Kansas males ages 13-17 years had received one or more doses of the HPV vaccine is 36 percent (95% confidence interval: 27.9% to 44.1%), while only 19 percent (95% confidence interval: 11.8% to 25.2%) received the recommended three (or more) doses of the vaccine.⁴¹



³⁹ Centers for Disease Control and Prevention (2014). Cervical cancer risk factors.

http://www.cdc.gov/cancer/cervical/basic_info/risk_factors.htm

⁴⁰ Centers for Disease Control and Prevention (2016). CDC recommends only two HPV shots for younger adolescents.

<https://www.cdc.gov/media/releases/2016pl020-hpv-tshots.htm>

⁴¹ Reagan-Steiner S, Yankey D, Jeyarajah J, et al. National, Regional, State, and Selected Local Area Vaccination Coverage Among Adolescents Aged 13–17 Years — United States, 2015. *MMWR Morb Mortal Wkly Rep* 2016;65:850–858. DOI:

<http://dx.doi.org/10.15585/mmwr.mm6533a4>

Ultraviolet Radiation (UV)

About 65-90% of melanomas are caused by exposure to ultraviolet (UV) light, which is an invisible kind of radiation that comes from the sun, tanning beds, and sunlamps.⁴² Unprotected and/or excessive exposure to UV light and a history of severe sunburns increases the risk for melanoma.⁴³

In 2015, Kansas BRFSS has collected a population-based data related to prevalence estimates of sunburn for adults 18 years and older. About 40 percent (95% confidence interval: 38.4% to 40.9%) of Kansas adults had sunburn within the past 12 months (Table 10-6).

The percentage of Kansas adults 18 years and older who had sunburn within the past 12 months were significantly higher among males (43.9%; 95% confidence interval: 42.0% to 45.8%) compared to females (35.6%; 95% confidence interval: 33.8% to 37.3%).

In 2015, the percentage of Kansans who had sunburn within the past 12 months in 2015 was significantly higher among adults aged 18 to 44 years compared to adults aged 45 years and older, and significantly lower among adults aged 65 years and older (13.5%; 95% confidence interval: 12.2% to 14.8%).

The age-adjusted percentage of adults 18 years and older had sunburn within the past 12 months in 2015 was significantly lower among non-Hispanic African Americans (7.4%; 95% confidence interval: 3.5% to 11.4%) compared to any other race and ethnicity subgroups.

In 2015, the percentage of Kansas adults 18 years and older who had sunburn within the past 12 months was significantly lower among those with less than high school education (25.9%; 95% confidence interval: 21.1% to 30.8%) compared to those who attained higher levels of education. Conversely, the percentage of Kansas adults 18 years and older who had sunburn within the past 12 months was significantly higher among those whose annual household income was \$50,000 or more (47.5%; 95% confidence interval: 45.6% to 49.4%) compared to those whose annual household income was less than \$50,000.

The percentage of Kansas adults 18 years and older who had sunburn within the past 12 months in 2015 did not differ significantly by county population density.

In Kansas, the percentage of adults 18 years and older who had sunburn within the past 12 months in 2015 was significantly lower among those living with a disability (29.1%; 95% confidence interval: 26.8% to 31.5%) compared to those living without a disability (42.6%; 95% confidence interval: 41.1% to 44.1%).

⁴² Armstrong BK, Kricger A. How much melanoma is caused by sun exposure? *Melanoma Research* 1993;3(6):395–401.

⁴³ American Cancer Society. *Skin Cancer Facts* (2012).

Table 10-6. Percentage of adults 18 years and older reported having sunburn, by selected characteristics, Kansas 2015.

Characteristic	Percentage of adults 18 years reported having sunburn	95% Confidence Interval		
			to	
Total	39.6%	38.4%	to	40.9%
Gender				
Male	43.9%	42.0%	to	45.8%
Female	35.6%	33.8%	to	37.3%
Age Group				
18-24	59.9%	55.2%	to	64.6%
25-34	56.0%	52.4%	to	59.7%
35-44	50.2%	46.9%	to	53.5%
45-64	35.0%	33.1%	to	36.9%
65 and older	13.5%	12.2%	to	14.8%
Race and Ethnicity (age-adjusted)				
White, Non-Hispanic	48.9%	47.5%	to	50.3%
African American, Non-Hispanic	7.4%	3.5%	to	11.4%
Other/Multi-Race, Non-Hispanic	24.4%	19.2%	to	59.6%
Hispanic	21.1%	17.4%	to	24.9%
Education				
Less than high school	25.9%	21.1%	to	30.8%
High school graduate or G.E.D.	33.4%	31.0%	to	35.7%
Some College	44.7%	42.4%	to	47.1%
College Graduate	44.0%	42.0%	to	46.0%
Household Income				
Less than \$15,000	31.4%	26.3%	to	36.5%
\$15,000 to \$24,999	30.8%	27.4%	to	34.3%
\$25,000 to \$34,999	31.9%	27.8%	to	35.9%
\$35,000 to \$49,999	39.2%	35.8%	to	42.6%
\$50,000 or higher	47.5%	45.6%	to	49.4%
County Population Density				
Frontier	38.6%	32.6%	to	44.7%
Rural	46.8%	43.1%	to	50.6%
Densely-settled rural	40.7%	37.4%	to	44.0%
Semi-urban	41.6%	38.6%	to	44.5%
Urban	37.2%	35.4%	to	39.0%
Disability Status				
Living with a disability	29.1%	26.8%	to	31.5%
Living without a disability	42.6%	41.1%	to	44.1%

Source: 2015 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, Kansas Department of Health and Environment. Prevalence estimates for race and ethnicity were age-adjusted to the U.S. 2000 standard population. See Technical Appendix for details on how prevalence estimates were calculated. County population density peer groups are based on the population for each county in the 2000 population and are defined as follows: Frontier (fewer than 6 persons per square mile), Rural (6 to 19.9 persons per square mile), Densely-Settled Rural (20 to 39.9 persons per square mile), Semi-Urban (40 to 149.9 persons per square mile), and Urban (150 or more persons per square mile).

CHAPTER 11: GENETIC COUNSELING AND CLINICAL TRIALS

Genetic Counseling

The National Cancer Institute describes cancer genetics as having implications for all aspects of cancer management, including prevention, screening, and treatment. The etiology of cancer is multifactorial, with genetic, environmental, medical, and lifestyle factors interacting to produce a given malignancy. Knowledge of cancer genetics is rapidly improving understanding of cancer biology, helping to identify at-risk individuals, establishing treatment tailored to the molecular fingerprint of the disease, and leading to the development of new therapeutic modalities.



Some cancers are caused by an abnormal gene that is passed from generation to generation. Only about 5-10 percent of all cancers result directly from inherited genetic mutations. Having a genetic risk does not mean that a person will develop cancer; not having a genetic risk doesn't mean that a person will not develop cancer. Cancer is such a common disease that most families have at least a few members who have had cancer. Sometimes, this is because family members have risk factors in common, such as tobacco use or obesity, which can cause cancer or influence cancer risk.⁴⁴ Having a genetic counseling can help people make informed decisions about genetic testing and follow-up care.

Genetic Counseling among Kansas Adults

In 2015, about 28 percent of Kansas adults 18 years and older reported having a family history of breast, ovarian, or colorectal cancer (27.9%; 95% confidence interval: 26.7% to 29.0%).⁴⁵

The percentage of Kansans who received genetic counseling in 2015 was significantly higher among adults who have a family history of breast, ovarian, or colorectal cancer (23.7%; 95% confidence interval: 21.8% to 25.6%) as compared to Kansans who do not have a family history of cancer (6.0%; 95% confidence interval: 5.3% to 6.7%).⁴⁵

In 2015, the percentage of Kansans 18 years and older with family history of cancer and received genetic counseling was significantly lower among adults aged 18-39 (14.2%; 95% confidence interval: 10.7% to 17.8%) as compared to adults aged 40 and older (Table 11-1).

The percentage of Kansans 18 years and older with family history of cancer and received genetic counseling did not differ significantly by race/ethnicity, education level, annual household income level, insurance status, county population density or disability status subgroups (Table 11-1).

⁴⁴ American Cancer Society. Family Cancer Syndromes. Available at: <http://www.cancer.org/cancer/cancercauses/geneticsandcancer/heredity-and-cancer>. Accessed September 1, 2016.

⁴⁵ 2015 KS BRFSS. Bureau of Health Promotion, KDHE. http://www.kdheks.gov/brfss/Survey2015/ct2015_cafmlyhx.html. Accessed December 1, 2016.

Table 11-1. Percentage of adults with family history of cancer who received genetic counseling (Family history of breast, ovarian or colorectal cancer for females and breast or colorectal cancer for males), Kansas 2015

Characteristic	Percentage of adults with family history of cancer and received genetic counseling	95% Confidence Interval		
Total	23.7%	21.8%	to	25.6%
Gender				
Male	20.2%	16.9%	to	23.6%
Female	25.3%	23.0%	to	27.6%
Age group				
18-39	14.2%	10.7%	to	17.8%
40-64	27.9%	25.0%	to	30.8%
65 and older	28.2%	25.0%	to	31.4%
Race and Ethnicity (age-adjusted)				
White, Non-Hispanic	22.6%	20.6%	to	24.6%
African American, Non-Hispanic	29.3%	18.4%	to	40.1%
Other/Multi-Race, Non-Hispanic	26.7%	16.2%	to	37.2%
Hispanic	23.9%	14.0%	to	33.7%
Education				
Less than high school	19.0%	10.8%	to	27.1%
High school graduate or G.E.D.	24.8%	21.0%	to	28.6%
Some college	24.3%	20.9%	to	27.8%
College graduate	23.2%	20.2%	to	26.2%
Household Income				
Less than \$15,000	23.2%	15.2%	to	31.1%
\$15,000 to \$24,999	22.9%	17.5%	to	28.3%
\$25,000 to \$34,999	23.6%	17.5%	to	29.7%
\$35,000 to \$49,999	22.1%	17.2%	to	27.0%
\$50,000 or higher	25.2%	22.2%	to	28.2%
Insurance Status				
Insured	24.5%	22.4%	to	26.5%
Uninsured	17.4%	11.5%	to	23.3%
County Population Density				
Frontier	19.5%	10.6%	to	28.4%
Rural	23.2%	18.0%	to	28.3%
Densely-settled rural	25.3%	20.3%	to	30.4%
Semi-urban	22.2%	18.2%	to	26.1%
Urban	24.2%	21.4%	to	27.1%
Disability Status				
Living with a disability	24.7%	21.2%	to	28.3%
Living without a disability	23.4%	21.2%	to	25.7%

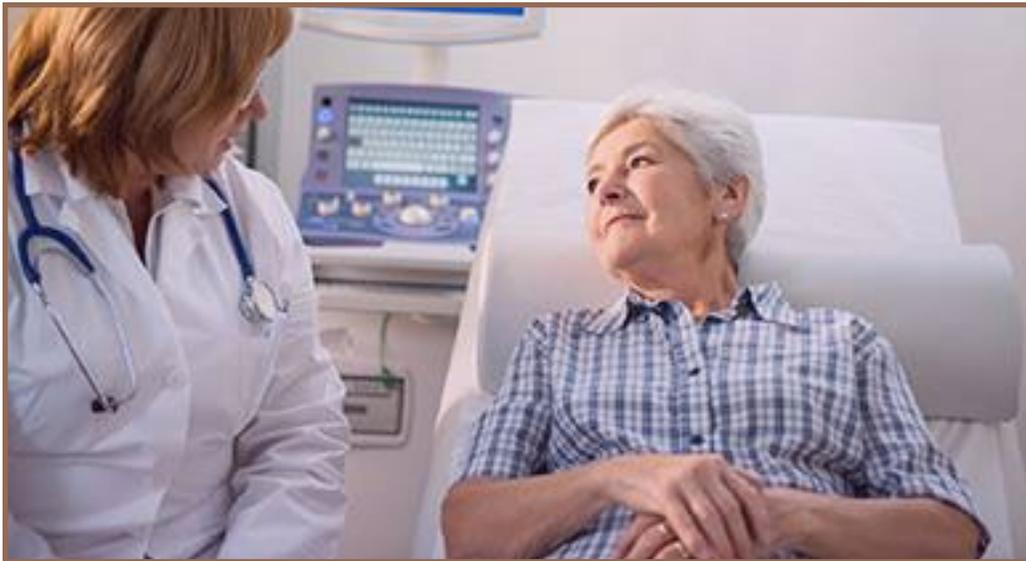
Source: 2015 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, Kansas Department of Health and Environment. Prevalence estimates for race and ethnicity were age-adjusted to the U.S. 2000 standard population. See Technical Appendix for details on how prevalence estimates were calculated. County population density peer groups are based on the population for each county in the 2000 population and are defined as follows: Frontier (fewer than 6 persons per square mile), Rural (6 to 19.9 persons per square mile), Densely-Settled Rural (20 to 39.9 persons per square mile), Semi-Urban (40 to 149.9 persons per square mile), and Urban (150 or more persons per square mile).

Clinical Trials

Some clinical trials study treatments, and others look at new ways to prevent, detect, diagnose, or learn the extent of disease. Many trials are drug trials, and some test other forms of treatment, such as new surgery or radiation therapy techniques, or complementary or alternative medicines.

The biggest barrier to completing clinical trials is that not enough people participate. Fewer than 5% of adults with cancer take part in a clinical trial. The main reason people give for not taking part in a clinical trial is that they did not know the studies were an option for them.⁴⁶ Clinical trials are much more commonly used to treat children with cancer. In fact, 60% of children under age 15 participate in clinical trials. This is one reason that survival rates for childhood cancer have increased so dramatically in the last few decades.

Kansas BRFS has collected a population-based data related to prevalence estimates of adults having discussion with their health care provider about participating in a cancer clinical trial and adults actually enrolled in a cancer clinical trial managed by their health care provider, which is publicly available in 2015 Kansas BRFS.



⁴⁶ Clinical Trials: What You Need to Know — American Cancer Society, 2016. Available at:

In 2015, about 4 percent of Kansas adults 18 years and older reported ever talked to their health care provider about participating in a clinical trial (4.0%; 95% confidence interval: 3.5% to 4.4%) (Table 11-2).

The percentage of Kansans who have ever talked to their health care provider about participating in a clinical trial in 2015 was significantly higher among females (4.7%; 95% confidence interval: 4.0% to 5.4%) as compared to males (3.2%; 95% confidence interval: 2.6% to 3.8%) (Table 11-2).

In 2015, the percentage of Kansans 18 years and older who have ever talked to their health care provider about participating in a clinical trial was significantly higher among adults aged 65 and older (5.8%; 95% confidence interval: 4.9% to 6.8%), followed by adults aged 40-64 (4.2%; 95% confidence interval: 3.5% to 4.9%), as compared to adults aged 18-39 (2.7%; 95% confidence interval: 1.9% to 3.4%) (Table 11-2).

The percentage of Kansans 18 years and older who have ever talked to their health care provider about participating in a clinical trial did not differ significantly by race/ethnicity (Table 11-2).

In 2015, the percentage of Kansans 18 years and older who have ever talked to their health care provider about participating in a clinical trial was significantly higher among those who were college graduates (5.5%; 95% confidence interval: 4.6% to 6.4%) as compared to those who attained lower levels of education (Table 11-2).

The percentage of Kansans who have ever talked to their health care provider about participating in a clinical trial was significantly higher among adults whose annual household income was \$50,000 or more (4.6%; 95% confidence interval: 3.8% to 5.4%) as compared to those whose annual household income was \$25,000 to \$34,999 (2.1%; 95% confidence interval: 1.5% to 3.7%) (Table 11-2).

The percentage of Kansans 18 years and older who have ever talked to their health care provider about participating in a clinical trial was significantly higher among those who lived in urban counties (5.4%; 95% confidence interval: 4.7% to 6.2%) as compared to those living in any other areas (Table 11-2).

In 2015, the percentage of Kansans 18 years and older who have ever talked to their health care provider about participating in a clinical trial was significantly higher among those living with a disability (7.8%; 95% confidence interval: 6.6% to 9.1%) as compared to those living without a disability (2.8%; 95% confidence interval: 2.4% to 3.3%) (Table 11-2).

Table 11-2. Percentage of adults who have ever talked to their health care provider about participating in a clinical trial, Kansas 2015

Characteristic	Percentage of adults who have ever talked to their health care provider about participating in a clinical trial	95% Confidence Interval		
Total	4.0%	3.5%	to	4.4%
Gender				
Male	3.2%	2.6%	to	3.8%
Female	4.7%	4.0%	to	5.4%
Age group				
18-39	2.7%	1.9%	to	3.4%
40-64	4.2%	3.5%	to	4.9%
65 and older	5.8%	4.9%	to	6.8%
Race and Ethnicity (age-adjusted)				
White, Non-Hispanic	4.1%	3.6%	to	4.6%
African American, Non-Hispanic	5.2%	2.7%	to	7.7%
Other/Multi-Race, Non-Hispanic	3.0%	1.2%	to	4.8%
Hispanic	3.7%	0.9%	to	6.4%
Education				
Less than high school	2.7%	1.2%	to	4.1%
High school graduate or G.E.D.	2.7%	2.0%	to	3.5%
Some college	4.1%	3.3%	to	4.9%
College graduate	5.5%	4.6%	To	6.4%
Household Income				
Less than \$15,000	5.1%	3.1%	to	7.1%
\$15,000 to \$24,999	4.1%	2.9%	to	5.3%
\$25,000 to \$34,999	2.6%	1.5%	to	3.7%
\$35,000 to \$49,999	3.4%	2.3%	to	4.4%
\$50,000 or higher	4.6%	3.8%	to	5.4%
Insurance Status				
Insured	4.2%	3.7%	to	4.6%
Uninsured	2.8%	1.5%	to	4.1%
County Population Density				
Frontier	1.2%	0.2%	to	2.3%
Rural	2.8%	1.6%	to	4.0%
Densely-settled rural	2.2%	1.5%	to	2.9%
Semi-urban	2.5%	1.7%	to	3.3%
Urban	5.4%	4.7%	to	6.2%
Disability Status				
Living with a disability	7.8%	6.6%	to	9.1%
Living without a disability	2.8%	2.4%	to	3.3%

Source: 2015 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, Kansas Department of Health and Environment. Prevalence estimates for race and ethnicity were age-adjusted to the U.S. 2000 standard population. See Technical Appendix for details on how prevalence estimates were calculated. County population density peer groups are based on the population for each county in the 2000 population and are defined as follows: Frontier (fewer than 6 persons per square mile), Rural (6 to 19.9 persons per square mile), Densely-Settled Rural (20 to 39.9 persons per square mile), Semi-Urban (40 to 149.9 persons per square mile), and Urban (150 or more persons per square mile).

In 2015, about 9 percent of Kansas adults 18 years and older who have ever been diagnosed with cancer reported ever talked to their health care provider about participating in a cancer clinical trial (8.5%; 95% confidence interval: 7.0% to 10.0%) (Table 11-3).

The percentage of Kansans with cancer diagnosis who have ever talked to their health care provider about participating in a cancer clinical trial in 2015 did not differ significantly by gender, age group, race and ethnicity status, education level, annual household income, and insurance status.

In 2015, the percentage of Kansans 18 years and older who have ever been diagnosed with cancer and have ever talked to their health care provider about participating in a cancer clinical trial was significantly higher among those who lived in urban counties (12.0%; 95% confidence interval: 9.4% to 14.6%) as compared to those living in densely-settled rural and semi-urban areas (Table 11-3).

The percentage of Kansans 18 years and older with cancer diagnosis who have ever talked to their health care provider about participating in a cancer clinical trial was significantly higher among those living with a disability (11.6%; 95% confidence interval: 8.6% to 14.7%) as compared to those living without a disability (6.6%; 95% confidence interval: 5.0% to 8.2%) (Table 11-3).

Table 11-3. Percentage of adults diagnosed with cancer who have ever talked to their health care provider about participating in a clinical trial, Kansas 2015

Characteristic	Percentage of adults who have ever talked to their health care provider about participating in a clinical trial	95% Confidence Interval		
Total	8.5%	7.0%	to	10.0%
Gender				
Male	6.4%	4.4%	to	8.4%
Female	10.2%	8.0%	to	12.5%
Age group				
18-39*	-	-	to	-
40-64	9.7%	6.9%	to	12.6%
65 and older	8.0%	6.3%	to	9.8%
Race and Ethnicity (age-adjusted)				
White, Non-Hispanic	7.7%	4.8%	to	10.6%
African American, Non-Hispanic	19.8%	3.6%	to	35.9%
Other/Multi-Race, Non-Hispanic*	-	-	to	-
Hispanic*	-	-	to	-
Education				
Less than high school*	-	-	to	-
High school graduate or G.E.D.	6.0%	3.4%	to	8.7%
Some college	9.4%	6.4%	to	12.5%
College graduate	10.8%	8.2%	To	13.4%
Household Income				
Less than \$15,000	10.8%	3.2%	to	18.3%
\$15,000 to \$24,999	10.7%	6.3%	to	15.2%
\$25,000 to \$34,999	5.1%	2.0%	to	8.1%
\$35,000 to \$49,999	10.6%	5.9%	to	15.3%
\$50,000 or higher	8.8%	6.3%	to	11.3%
Insurance Status				
Insured	8.6%	7.0%	to	10.2%
Uninsured*	-	-	to	-
County Population Density				
Frontier*	-	-	to	-
Rural	6.8%	3.0%	to	10.6%
Densely-settled rural	3.4%	1.3%	to	5.5%
Semi-urban	6.0%	2.8%	to	9.1%
Urban	12.0%	9.4%	to	14.6%
Disability Status				
Living with a disability	11.6%	8.6%	to	14.7%
Living without a disability	6.6%	5.0%	to	8.2%

* Prevalence estimates are unable to present due to insufficient counts.

Source: 2015 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, Kansas Department of Health and Environment. Prevalence estimates for race and ethnicity were age-adjusted to the U.S. 2000 standard population. See Technical Appendix for details on how prevalence estimates were calculated. County population density peer groups are based on the population for each county in the 2000 population and are defined as follows: Frontier (fewer than 6 persons per square mile), Rural (6 to 19.9 persons per square mile), Densely-Settled Rural (20 to 39.9 persons per square mile), Semi-Urban (40 to 149.9 persons per square mile), and Urban (150 or more persons per square mile).

In 2015, about 31 percent of Kansas adults 18 years and older reported ever enrolled in a clinical trial managed by their health care provider (31.4%; 95% confidence interval: 23.1% to 39.8%) (Table 11-4).

The percentage of Kansans 18 years and older who have ever enrolled in a clinical trial managed by their health care provider did not differ significantly by gender, age group, education level, annual household income, county population density or disability status subgroups (Table 11-4).

Table 11-4. Percentage of adults diagnosed with cancer who have ever enrolled in a cancer clinical trial managed by their health care provider, Kansas 2015

Characteristic	Percentage of adults diagnosed with cancer who have ever enrolled in a cancer clinical trial managed by their health care provider	95% Confidence Interval		
			to	
Total	31.4%	23.1%	to	39.8%
Gender				
Male	22.3%	10.5%	to	34.1%
Female	36.4%	25.6%	to	47.2%
Age group				
18-39*	-	-	to	-
40-64	33.9%	20.1%	to	47.7%
65 and older	32.0%	21.4%	to	42.6%
Race and Ethnicity (age-adjusted)				
White, Non-Hispanic	21.7%	15.6%	to	27.7%
African American, Non-Hispanic*	-	-	to	-
Other/Multi-Race, Non-Hispanic*	-	-	to	-
Hispanic*	-	-	to	-
Education				
Less than high school*	-	-	to	-
High school graduate or G.E.D.	32.8%	12.8%	to	52.7%
Some college	30.2%	16.1%	to	44.3%
College graduate	34.7%	22.2%	To	47.2%
Household Income				
Less than \$15,000*	-	-	to	-
\$15,000 to \$24,999	21.5%	5.8%	to	37.2%
\$25,000 to \$34,999*	-	-	to	-
\$35,000 to \$49,999	33.0%	11.2%	to	54.8%
\$50,000 or higher	34.8%	21.8%	to	47.9%
Insurance Status				
Insured	30.8%	22.3%	to	39.2%
Uninsured*	-	-	to	-
County Population Density				
Frontier*	-	-	to	-
Rural	36.2%	9.4%	to	63.0%
Densely-settled rural*	-	-	to	-
Semi-urban*	-	-	to	-
Urban	31.8%	21.5%	to	42.1%
Disability Status				
Living with a disability	28.5%	17.0%	to	40.0%
Living without a disability	34.6%	22.5%	to	46.7%

* Prevalence estimates are unable to present due to insufficient counts.

Source: 2015 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, Kansas Department of Health and Environment. Prevalence estimates for race and ethnicity were age-adjusted to the U.S. 2000 standard population. See Technical Appendix for details on how prevalence estimates were calculated. County population density peer groups are based on the population for each county in the 2000 population and are defined as follows: Frontier (fewer than 6 persons per square mile), Rural (6 to 19.9 persons per square mile), Densely-Settled Rural (20 to 39.9 persons per square mile), Semi-Urban (40 to 149.9 persons per square mile), and Urban (150 or more persons per square mile).

CHAPTER 12: CANCER SURVIVORSHIP

Cancer survivors are at greater risk for recurrence and developing second cancers due to effects of treatment, lifestyle behaviors, genetics or risk factors that contributed to the first cancer. Cancer survivors can help enhance their quality of life, maintain their health and improve survival.

About 1 in 10 adult cancer survivors in Kansas were diagnosed before age 25. Survivors of childhood cancer have special health care needs and require follow-up care and medical surveillance for the rest of their lives.⁴⁷ This specialized care is necessary to monitor late effects that may develop months or years after treatment has ended.⁴⁸ The risk of late effects depends on the type of cancer, the type and dosage of treatment received, and the child's age.⁴⁹ Late effects of childhood cancer may include: recurrence, second cancers, premature death, disability, impaired development, and learning problems.

While prevention is key to the public health response to cancer among adults, little is known about how to develop evidence-based interventions to prevent cancer among children. Further, there are no nationally-recognized cancer screening guidelines to detect childhood cancers in their early stage.



⁴⁷ American Cancer Society. Cancer in Children. Available at:

<http://www.cancer.org/acs/groups/cid/documents/webcontent/002287-pdf.pdf> Accessed September 1, 2016.

⁴⁸ National Cancer Institute. Cancer in Children and Adolescents. Available at:

<http://www.cancer.gov/types/childhood-cancers/child-adolescent-cancers-fact-sheet#2>. Accessed September 1, 2016

⁴⁹ Centers for Disease Control and Prevention. Basic Information for Cancer Survivors. Available at:

http://www.cdc.gov/cancer/survivorship/basic_info/index.htm. Accessed September 1, 2016.

Health risk behaviors, health status, and health care access among cancer survivors

During 2014 and 2015, about 7 percent of Kansas adults have been diagnosed with cancer (excluding skin cancer) (data not shown).

In 2014, the adjusted percentage of Kansans who are current smokers was significantly higher among adults with cancer diagnosis as compared to those without cancer diagnosis ($p=0.02$). However, the adjusted percentage of Kansans who are current smokers did not differ significantly by cancer diagnostic status in 2015.

In 2014, the adjusted percentage of Kansans who reported ever drank alcohol in the past 30 days did not differ significantly by cancer diagnostic status. In 2015, the adjusted percentage of Kansans who reported ever drank alcohol in the past 30 days was significantly higher among adults without cancer diagnosis as compared to those with cancer diagnosis ($p<0.001$).

The adjusted percentage of Kansans who consume fruits and vegetables one or more times per day did not differ significantly by cancer diagnostic status in 2015.

The adjusted percentage of Kansans who reported never participate in any physical activities in the past 30 days in 2014 did not differ significantly by cancer diagnostic status. In 2015, the adjusted percentage of Kansans who reported never participate in any physical activities in the past 30 days was significantly higher among adults with cancer diagnosis as compared to those without cancer diagnosis ($p<0.001$).

During 2014 and 2015, the adjusted percentages of Kansans who self-reported fair/poor health, limited access in any activities due to physical/mental and emotional problems, physically and emotionally unhealthy for 14 days or more in the past month, and poor health interfered with usual activities for 14 days or more in the past month were both significantly higher among adults with cancer diagnosis as compared to those without cancer diagnosis.

In 2014, the adjusted percentage of Kansans who did not have insurance was significantly higher among adults without cancer diagnosis as compared to those with cancer diagnosis ($p<0.001$). However, the adjusted percentage of Kansans who are uninsured in 2015 did not differ significantly by cancer diagnostic status.

In Kansas, the adjusted percentage of adults who reported not having a health care provider in 2014 and 2015 were both significantly higher among adults without cancer diagnosis as compared to those with cancer diagnosis. Conversely, the adjusted percentages of Kansans who reported couldn't see doctor due to cost were both significantly higher among adults with cancer diagnosis as compared to those without cancer diagnosis.

Table 12-1. Adjusted prevalence of health risk behaviors, health status, and health care access indicators among adults 18 years and older, by history of cancer diagnosis, Kansas, 2014-2015

Adjusted Prevalence*						
Year	2014			2015		
Diagnostic status	Cancer	No cancer		Cancer	No cancer	
Health Risk Behaviors	% ± SE	% ± SE	P-value	% ± SE	% ± SE	P-value
Current smoker	20.6 ± 1.9	16.8 ± 0.8	0.02	16.6 ± 1.3	16.5 ± 0.7	0.89
Drank alcohol in past 30 days	35.7 ± 2.0	38.4 ± 1.2	0.08	34.0 ± 1.5	38.7 ± 1.0	< 0.001
Consume fruits ≥1 times per day^a	-			58.1 ± 1.6	58.3 ± 1.0	0.90
Consume vegetables ≥1 times per day^a	-			74.2 ± 1.5	75.9 ± 0.9	0.22
No physical activity in past 30 days	33.7 ± 2.0	30.5 ± 1.1	0.07	36.2 ± 1.6	31.0 ± 0.9	< 0.001
Overweight/obese (BMI≥25kg/m²)	68.9 ± 1.9	72.3 ± 1.1	0.04	72.9 ± 1.4	72.3 ± 0.9	0.67
Health Status						
Self-reported fair/poor health	37.5 ± 2.3	23.3 ± 1.0	< 0.001	40.1 ± 1.8	22.9 ± 0.8	< 0.001
Limited in any way in any activities because of physical, mental, or emotional problems	32.0 ± 2.0	23.7 ± 1.0	< 0.001	35.4 ± 1.6	24.0 ± 0.8	< 0.001
Physically unhealthy for ≥ 14 days in past 30 days	21.4 ± 1.9	11.8 ± 0.8	< 0.001	21.3 ± 1.5	12.0 ± 0.6	< 0.001
Emotionally unhealthy for ≥ 14 days in past 30 days	13.0 ± 1.6	9.7 ± 0.7	0.01	13.4 ± 1.2	9.0 ± 0.5	< 0.001
Poor health interfered with usual activities for ≥ 14 days in past 30 days	19.7 ± 2.5	13.8 ± 1.2	0.002	22.8 ± 2.1	15.6 ± 0.9	< 0.001
Health Care Access						
Uninsured	7.3 ± 1.4	12.1 ± 0.8	0.005	9.7 ± 1.3	10.2 ± 0.6	0.71
Do not have health care provider	11.7 ± 1.7	16.3 ± 0.8	0.02	12.0 ± 1.4	16.9 ± 0.7	0.002
Could not see doctor because of cost	20.1 ± 2.0	13.4 ± 0.8	< 0.001	15.3 ± 1.4	10.2 ± 0.5	< 0.001

* Predicted population margins; adjusted for age, sex, race/ethnicity, employment status, and education level. SE= standard error. P-values <0.05 indicate statistically significant between-group differences.

a. Data are not available in 2014 BRFSS.

Source: 2014-2015 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, KDHE.

TECHNICAL NOTES

Data Sources

Kansas Cancer Registry

The Kansas Cancer Registry (KCR), which operates on behalf of the Kansas Department of Health and Environment by the University of Kansas Medical Center, is the only population-based source of information on cancer incidence in Kansas. Per Kansas statute and administrative regulation, cancer has been a reportable disease in Kansas since 1982. Hospitals and physicians provide information to the KCR on all cancer diagnoses in the state, including type of cancer (primary site), date of diagnosis, and stage at diagnosis. Patient demographics, including sex, age, race/ethnicity, and county of residence, as well as survival status are also collected. Kansas residents who are diagnosed or treated with cancer in Missouri, Nebraska, Colorado, Oklahoma, Texas, and Washington are included in the KCR database through data exchange.

Types of cancer are defined according to the National Cancer Institute (NCI) Surveillance Epidemiology and End Results (SEER) Site Recode International Classification of Diseases for Oncology, Third Edition (ICD-O-3) (1/27/2003) definitions (http://seer.cancer.gov/siterecode/icdo3_d01272003).

Several considerations should be taken into account when interpreting cancer incidence data in this report:

- All incidence data reflects invasive cancers only, with the exception of bladder cancer, which includes both invasive and in situ cancers.
- The KCR identifies approximately 95% of the expected cases of cancer within 24 months of the close of the year of diagnosis. KCR continues to update the cancer cases from previous years as they are reported to the registry; thus, counts may change slightly over time as the data become more complete.
- Hispanics were defined as persons of Mexican, Puerto Rican, Cuban, South or Central American, Other Spanish, Spanish not otherwise specified, or Dominican Republic ethnicity. Persons with Spanish surname only or unknown ethnicity were excluded. Other data reporting systems (e.g. Kansas Information for Communities) may define Hispanic origin differently, which may yield slightly different results from data presented in this report.

Kansas Vital Statistics

All deaths in Kansas are reported to the Kansas Department of Health and Environment's Office of Vital Statistics. Death certificates are completed and registered through the efforts of physicians, hospital personnel, funeral directors, attorneys, and local courts. Underlying cause of death is defined as the disease or injury that initiated the chain of events leading directly to death and is classified according to the International Classification of Diseases, 10th Revision (ICD-10). For this report, cancer causes of death were defined according to the National Cancer Institute (NCI) Surveillance Epidemiology and End Results (SEER) Cause of Death Recode 1969+ (9/17/2004) definitions (http://seer.cancer.gov/codrecode/1969+_d09172004/index.html).

Several considerations should be taken into account when interpreting cancer mortality data in this report:

- All mortality data in this report include only deaths of Kansas residents registered in the annual research summary files that are provided to the Bureau of Health Promotion by the Office of Vital Statistics. The number of deaths in this database may differ slightly from those available through the National Center for Health Statistics due to differences in the procedures for collecting mortality data.
- Mortality data reported by the Office of Vital Statistics in the Annual Summary or Vital Statistics include only deaths that are registered by June 1 of the year after the year the death occurred. Mortality data presented in this report also include deaths registered at later dates. Thus, the number of deaths reported by the Office of Vital Statistics and this report may differ slightly.

- Kansas residents who die in other states or abroad may be less likely to be included than Kansas residents who die in Kansas.
- In 2005, the Kansas death certificate was revised to allow reporting of multiple races and collect race separately from ethnicity. Race and ethnicity data are reported as five-year averages for the time period 2010-2014 in this report.

Behavioral Risk Factor Surveillance System (BRFSS)

The BRFSS is an ongoing, population-based, random-digit-dial survey of non-institutionalized adults ages 18 years and older living in private residences or college housing with landline or cell phone service in Kansas. The survey is coordinated by the Centers for Disease Control and Prevention (CDC) and is conducted annually by all 50 states, the District of Columbia, and several U.S. territories. Due to weighting methodology changes after 2011, this report includes only data collected by the Kansas Department of Health and Environment from 2011-2014. The complex survey methodology and analytical procedures for BRFSS are designed to produce prevalence estimates that can be generalized to Kansas adults statewide. A more detailed explanation of the weighting methodology used for the Kansas BRFSS is available at: <http://www.kdheks.gov/brfss/technotes.html>.

Several considerations should be taken into account when interpreting BRFSS estimates:

- BRFSS estimates do not apply to individuals without telephone service, those who reside on military bases or within institutions, or those who are unable to complete a telephone survey.
- BRFSS prevalence estimates are self-reported and are subject to bias due to respondents' inability or unwillingness to provide accurate information about their own behaviors or characteristics.

Youth Risk Behavior Survey (YRBS)

The Kansas YRBS is part of a biennial national effort coordinated by the CDC to monitor health risks and behaviors among youth, including tobacco use. In spring 2013, the Kansas State Department of Education and the Kansas Department of Health and Environment conducted the YRBS in a random sample of Kansas high schools, which included nearly 2,000 students in grades 9-12. Weighted YRBS data can be generalized to all 9th-12th grade students in Kansas. Additional Kansas YRBS data can be found on the Kansas Coordinated School Health website at www.kshealthykids.org.

National Immunization Survey (NIS-Teen)

The NIS-Teen, conducted by the Centers for Disease Control and Prevention (CDC), collects data on vaccination coverage of adolescents in the United States. Randomly-selected households in all 50 States, the District of Columbia, and selected areas for oversampling are interviewed by telephone. To assure the accuracy and precision of the vaccination coverage estimates, immunization data for surveyed adolescents are also collected through a mail survey of their health care providers. For more information about NIS-Teen, visit http://www.cdc.gov/nchs/nis/about_nis.htm#nis_teen

Statistical Methods

Incidence and Mortality Rates

Incidence and mortality rates presented in this report are calculated as the number of cancer diagnoses or deaths divided by Kansas' total population or subpopulation of interest. Kansas population estimates were attained from the National Cancer Institute's (NCI) Surveillance Epidemiology and End Results (SEER) website. These population estimates are a modification of the Vintage 2009 annual time series of July 1 county population estimates by age, sex, race and Hispanic origin produced by the U.S. Census Bureau's Population Estimates Program, in collaboration with the National Center for Health Statistics, with support from the NCI. Detailed information on these population estimates are available at: <http://seer.cancer.gov/popdata/methods.html>

Age-adjusted Rates

Age adjustment is a statistical method for standardizing rates so that groups with different underlying age distributions are more comparable. Age-adjusted rates can be used to compare two different groups at the same time or the same group over time, if the underlying age distributions are different or change. Age-adjusted rates are not actual measures of burden and are not comparable to unadjusted (crude) rates. Age-adjusted rates in this report are calculated using the direct method. Briefly, rates are first calculated within each age subgroup to create age-specific rates. Each age-specific rate is then multiplied by the proportion of the U.S. Standard Population in that particular age category.⁵⁰ These products are then summed across age subgroups to produce an age-adjusted rate. For age-adjusted incidence and mortality rates, age-specific rates are based on 19 age groups (<1, 1-4, 5-9, 10-14, 15-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65-69, 70-74, 75-79, 80-84, 85+). For BRFSS age-adjusted prevalence estimates, age-specific rates are based on 5 age groups for most indicators (18-24, 25-34, 35-44, 45-64, 65+), 3 age groups for breast cancer screening-related indicators (40-49, 50-64, 65+), and 2 age groups for colorectal cancer screening-related indicators (50-64, 65+).

95% Confidence Intervals

All rates and prevalence estimates are estimates of a true value (population parameter) and are thus subject to random variation. 95% confidence intervals are used to characterize this variability and can be thought of as a range of values that will contain the true value 95% of the time. Confidence intervals for incidence and mortality rates were computed using a method based on the gamma distribution.⁵¹ For BRFSS prevalence estimates, the complex survey design is taken into account for variance estimation and 95% confidence intervals are computed using a normal approximation.

All statistical analyses presented in this report were conducted using SAS, Version 9.4.

County Population Density Subgroups

County population density subgroups were established by the Kansas Department of Health and Environment's Office of Local and Rural Health (Table T-1). County population density peer groups are based on the population for each county in the 2000 population and are defined as follows: frontier (fewer than 6 persons per square mile), rural (6 to 19.9 persons per square mile), densely-settled rural (20 to 39.9 persons per square mile), semi-urban (40 to 149.9 persons per square mile), and urban (150 or more persons per square mile).

⁵⁰ Klein RJ, Schoenborn CA. Age adjustment using the 2000 Projected U.S. Population. Healthy People Statistical Notes, no. 20. Hyattsville, Maryland: National Center for Health Statistics. January 2001.

⁵¹ Fay MP, Feuer EJ. Confidence intervals for directly standardized rates: a method based on the gamma distribution. (1997). *Statistics in Medicine*, 16, 791-801.

Category	Population Density	Kansas Counties
Frontier	Fewer than 6 persons per square mile	Barber, Chase, Cheyenne, Clark, Comanche, Decatur, Edwards, Elk, Gove, Graham, Greeley, Hamilton, Hodgeman, Jewell, Kearny, Kiowa, Lane, Lincoln, Logan, Meade, Morton, Ness, Osborne, Rawlins, Rush, Sheridan, Smith, Stanton, Trego, Wallace, Wichita
Rural	6 to 19.9 persons per square mile	Anderson, Brown, Chautauqua, Clay, Cloud, Coffey, Ellsworth, Grant, Gray, Greenwood, Harper, Haskell, Jackson, Kingman, Linn, Marion, Marshall, Morris, Nemaha, Norton, Ottawa, Pawnee, Phillips, Pratt, Republic, Rice, Rooks, Russell, Scott, Sherman, Stafford, Stevens, Thomas, Wabaunsee, Washington, Wilson, Woodson
Densely-Settled Rural	20 to 39.9 persons per square mile	Allen, Atchison, Barton, Bourbon, Cherokee, Cowley, Dickinson, Doniphan, Ellis, Finney, Ford, Jefferson, Labette, McPherson, Neosho, Osage, Pottawatomie, Seward, Sumner
Semi-Urban	40 to 149.9 persons per square mile	Butler, Crawford, Franklin, Geary, Harvey, Leavenworth, Lyon, Miami, Montgomery, Reno, Riley, Saline
Urban	150 or more persons per square mile	Douglas, Johnson, Sedgwick, Shawnee, Wyandotte

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