ARKANSAS

Cancer Facts & Figures 2011

Arkansas Department of Health
Keeping Your Hometown Healthy

TABLE OF CONTENTS

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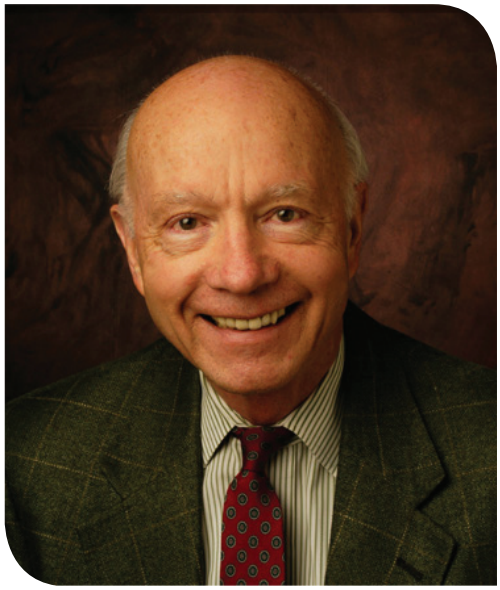
Updated 1/17/2012

a message from the deputy state health officer

August 1, 2011

Dear Colleagues,



The Arkansas Department of Health/Arkansas Central Cancer Registry (ACCR) is pleased to join with the Arkansas Cancer Coalition in presenting this new report, the second edition, Arkansas Cancer Facts and Figures 2011. The ACCR greatly appreciates this opportunity to make this report available to our partners working on eliminating cancer disparities, and cancer prevention and control in Arkansas.

Progress in cancer control demands accurate, timely and complete data. This report contains the most recent data available on cancer incidence and mortality in Arkansas. It identifies disparities in cancer incidence and mortality by race, gender, age, stage at diagnosis and geographic area. It also includes county-specific rates for the most commonly diagnosed cancers and those for which public health interventions exist to reduce the cancer burden in Arkansas.

This publication is intended to assist healthcare organizations, health professionals, community groups, research scientists and others who are working to reduce the burden of cancer in Arkansas. It will also be useful for policy-makers, advocates, and news organizations as they seek detailed, easy-to-read information about the impact of cancer on Arkansas. Much of these data would not be available were it not for the dedication of hospital cancer registrars, reporters, physicians, staff, and the many other people who make the ACCR work. We thank everyone for their participation in our cancer registry and other services that made this report possible. A special thanks to Dr. Robert Delongchamp, MPH, PhD for his expertise in analyzing the data.

It is our hope that this report will be a useful tool in cancer control efforts in Arkansas and the United States.

Sincerely,

Joseph H Bates

Joseph Bates, M.D.
Deputy State Health Officer
Chief Science Officer
Arkansas Department of Health
Associate Dean, UAMS College of Public Health

Executive Summary

The Arkansas Central Cancer Registry (ACCR) is a population-based registry designed to collect, analyze, research, and disseminate quality cancer data to help describe the burden of cancer, so evidence-based cancer prevention and control programs can be implemented to reduce cancer incidence and mortality in Arkansas.

The Cancer Registry data are used to identify populations at increased risk of cancer, investigate public concerns of suspected excesses of cancer due to environmental or other factors, and monitor trends in cancer incidence and mortality.

This report describes the invasive cancers in Arkansas in terms of new cancer cases and deaths due to cancer for the period 1997 through 2008. The most frequently diagnosed cancers were chosen for inclusion in the publication. For most of the cancers reported in this publication, there were more than 6,000 cases reported for each cancer site between 1997 and 2008.

Key Findings from This Report

- Cancer is the second leading cause of death in Arkansas and in the United States.[1]
- A reported 14,287 Arkansans were diagnosed with cancer, and 6,211 died from cancer in Arkansas in 2008.
- The age-adjusted incidence rates of all cancers in Arkansas have been at or below the national average during the period 1997 - 2008.
    - Incidence rates in Arkansas have been increasing during the same period.
    - Prostate and breast cancers remain the number one cancer diagnoses among men and women respectively in Arkansas and the United States.
- Cancer death rates in Arkansas during 1999 – 2008 were higher than the death rates in the United States; however, deaths from cancer are decreasing in both Arkansas and the United States.
    - For all cancer sites combined, men (both Black and White) had higher death rates than their female counterparts.
    - Lung cancer remains the leading cause of death due to cancers among men and women in Arkansas and the United States.
- Lifestyle factors such as cigarette smoking, consumption of foods with high fat and physical inactivity remain major risk factors for many cancers. [1]

Introduction

Cancer is a term used to describe cellular abnormalities with widely variable courses; some grow rapidly, others grow slowly, and others stop growing completely while some regress. The many types of cancers have different causes, population distributions, courses of illness and responses to treatment and survival.[1]

Cancer is influenced by inherited and environmental factors. According to the American Cancer Society, only 5% of cancers are caused by inherited genes[2]; i.e., cancers that are an end result of an inherited mutation or chromosome aberration. However, inherited contributions to cancer incidence and mortality are more common as many of our genes affect cancer risk by modifying the impact of environmental factors or by modifying the effect of interventions.

Most cancers are caused by damage to genes that occur over a lifetime. Genetic damage occurs from hormonal changes, changes in the metabolism of nutrients within cells, or from external environmental factors. Approximately 75 to 85 percent of cancer deaths are related to environmental factors, for example; tobacco use, alcohol use, poor nutrition, physical inactivity, exposure to sunlight and/or indoor tanning, obesity, certain infectious agents, and certain carcinogens from the water, air, and soil.[2] Often, it can take 10 or more years between exposure to environmental factors and the diagnosis of cancer.[2]

Cancers caused by environmental exposures are modifiable and can be prevented. The American Cancer Society estimates approximately 171,000 cancer deaths were related to tobacco use and one-third of the 569,490 cancer deaths were related to obesity and physical inactivity in the United States in 2010.[2] Deaths from cancers caused by infectious agents, such as Hepatitis B, human immunodeficiency virus (HIV), human papillomavirus (HPV), and Helicobacter pylori (H. pylori) etc. could have been prevented through behavioral changes, vaccinations, and antibiotics. Carcinogenic agents in occupational settings or communities account for a small portion of cancer deaths. Only 4% of cancer deaths are attributed to occupational exposures, and only 2% are attributed to naturally occurring or man-made pollutants.[2]

Cancer Estimates

Cancer is the second leading cause of death in Arkansas and the United States, and approximately 78% of cancer is diagnosed in persons over the age of 55. According to the American Cancer Society, 1 in 4 deaths are attributed to cancer.[2]

An alarming 1,529,560 new cancer cases were estimated to have been diagnosed and 569,490 people were estimated to have died due to cancer in the United States in 2010.[2] Approximately 14,287 Arkansans were diagnosed with cancer, and 6,211 died of cancer in Arkansas in 2008.[3] The reporting of Arkansas cancer incidence and mortality data for 2009 - 2011 has not been completed.

Costs of Cancer

The National Institutes of Health calculates costs of cancer by direct measures (total medical expenditures) and indirect costs (loss of productivity due to illness or premature death). The overall estimated cost of cancer in the United States in 2010 was $263.8 billion. [2] Approximately, $102.8 billion were from direct medical costs and $161.0 billion were from indirect costs.[2] The highest costs were associated with breast, colorectal, lymphoma, lung, and prostate cancer.[4]

Chapter 1: Invasive Cancer, All Sites

In 2008, a total of 14,287 Arkansans were diagnosed with cancer, and 6,211 died of cancer.

Figure 1.1 Percentage of Cancer Deaths in Arkansas, By Primary Site, 2003 - 2007*

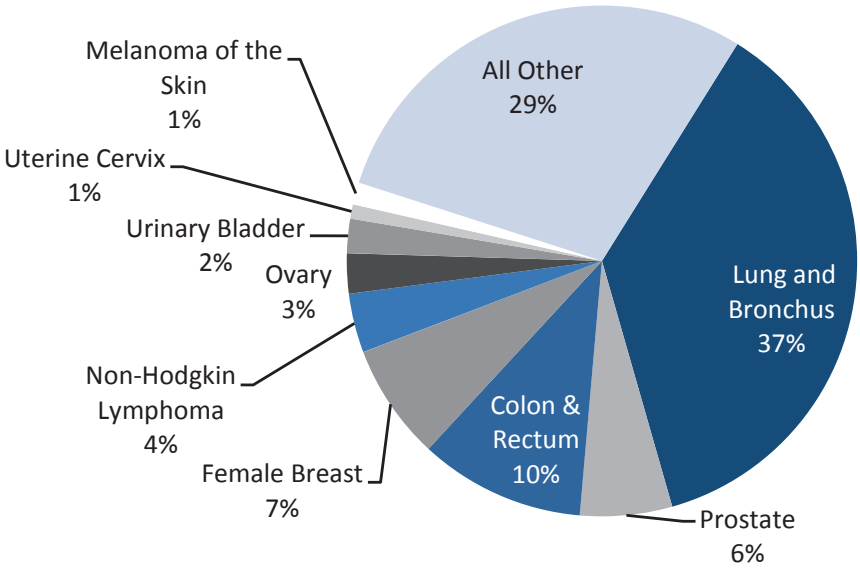
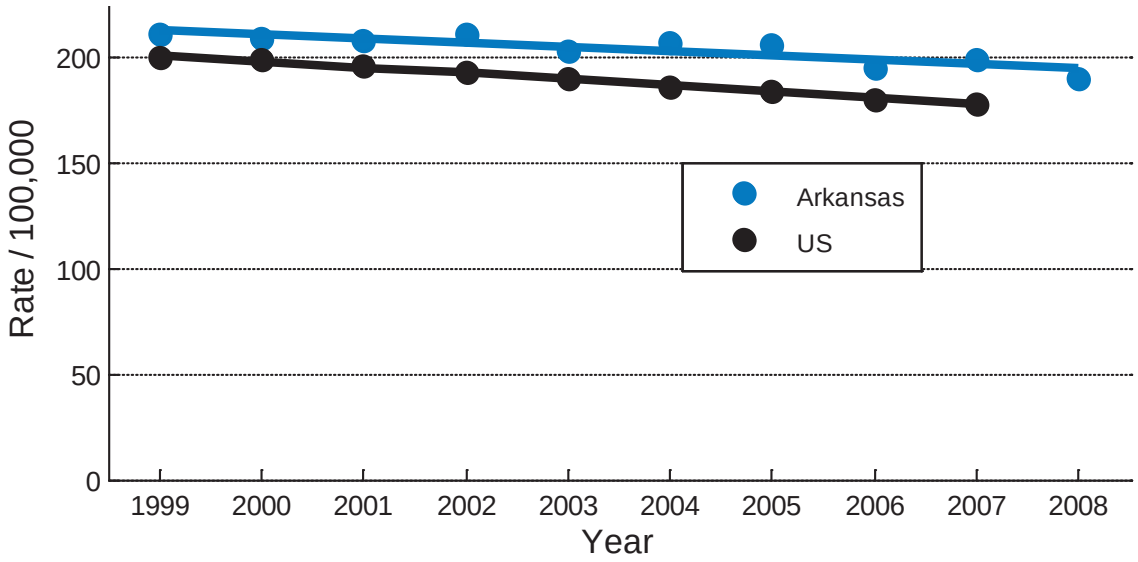


Table 1.1: Cancer Mortality Rates in Arkansas, Selected Cancers, All Genders, All Races, 2003-2007

Primary Cancer Site	Total Deaths	Age-adjusted Rate
Lung and Bronchus	10,384	67.0
Prostate (males)	1,653	27.0
Breast (females)	2,079	24.5
Colon & Rectum	2,964	19.1
Pancreas	1,671	10.8
Ovarian (females)	720	8.3
Non-Hodgkin Lymphoma	1,061	6.9
Liver and Intrahepatic Bile Duct	882	5.7
Kidney and Renal Pelvis	672	4.3
Urinary Bladder	613	3.9
Esophagus	595	3.9
Myeloma	556	3.6
Stomach	543	3.5
Uterine Cervix (females)	258	3.3
Myeloid and Monocytic Leukemia	472	3.1
Other Leukemia	432	2.8
Melanoma of the Skin	394	2.6

Note: All rates are per 100,000. Rates are age-adjusted to the 2000 U.S. Standard Million Population. Rates are based on deaths from malignant tumors.
Source: Arkansas Central Cancer Registry Query System: http://www.cancer-rates.info/ar/index.php

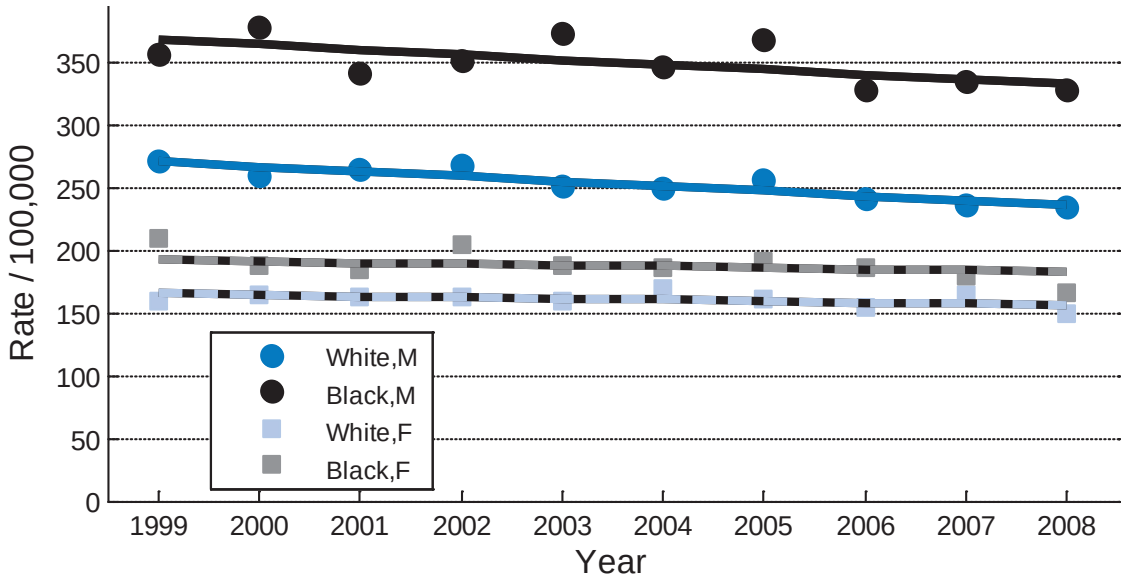
Figure 1.2: Age-Adjusted Cancer Mortality Trend, All Cancers, AR & US, 1999 – 2008*



* U.S. data not yet available for 2008

- From 1999 through 2008, Arkansas age-adjusted mortality rates were higher than the rates in the United States.
  - United States had 178.4 deaths per 100,000 in 2007.
  - Arkansas had 194.9 deaths per 100,000 in 2007.
- The changes in age-adjusted mortality rates over time were significant ($p < 0.01$).
  - Arkansas rates had an average annual decrease of 2 deaths per 100,000.
  - Rates in the United States had an average annual decrease of 3 deaths per 100,000.

Figure 1.3: Trends in Cancer Mortality, All Cancers, by Race and Sex in Arkansas, 1999 - 2008



- Age-adjusted mortality rates differed substantially by gender and race.
  - Males were much more likely to die from cancer than females.
  - Rates per 100,000 in 2008: White women, 150.2, Black women, 167.0, White men, 234.7, and Black men, 329.6.
- Over the 10-year period, Black men averaged 97.2 more deaths per 100,000 than White men, and Black women averaged 26.8 more deaths per 100,000 than White women.
- Rates for males of both races declined at an annual rate of 4.0 deaths per 100,000.
- Rates for females of both races declined at an annual rate of 1.1 deaths per 100,000.

Figure 1.4: Age-Adjusted Cancer Mortality, All Cancers, and 95% Confidence Intervals by Race and Sex, Arkansas, 2004 - 2008

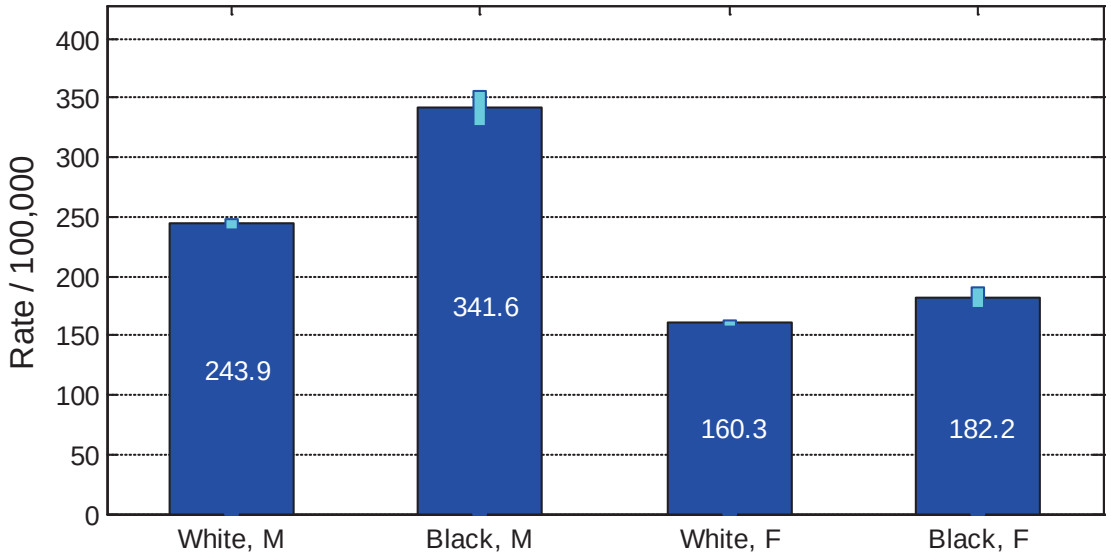
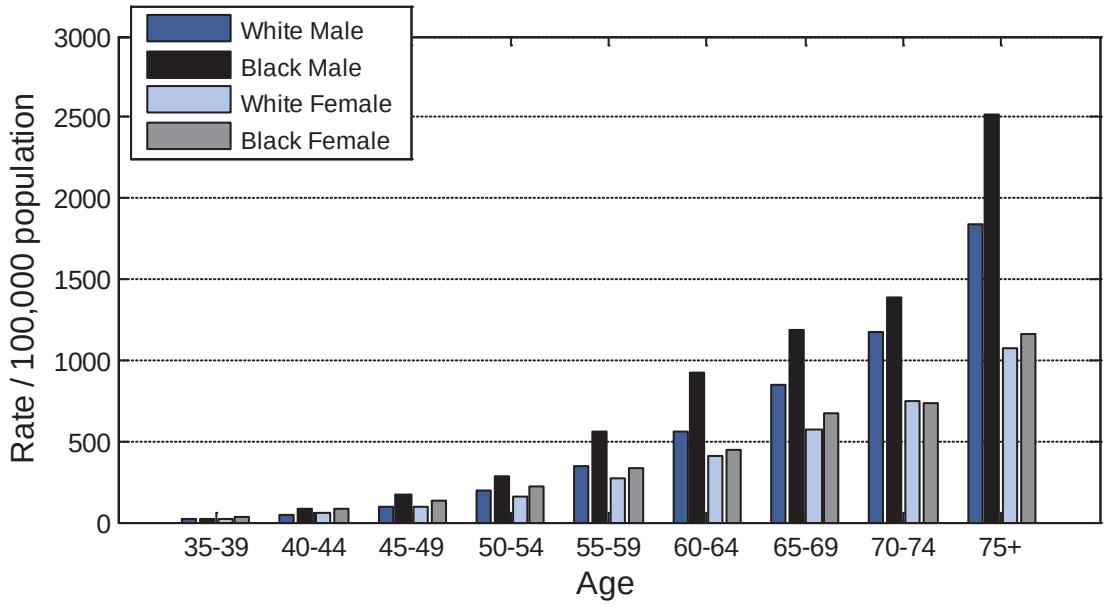
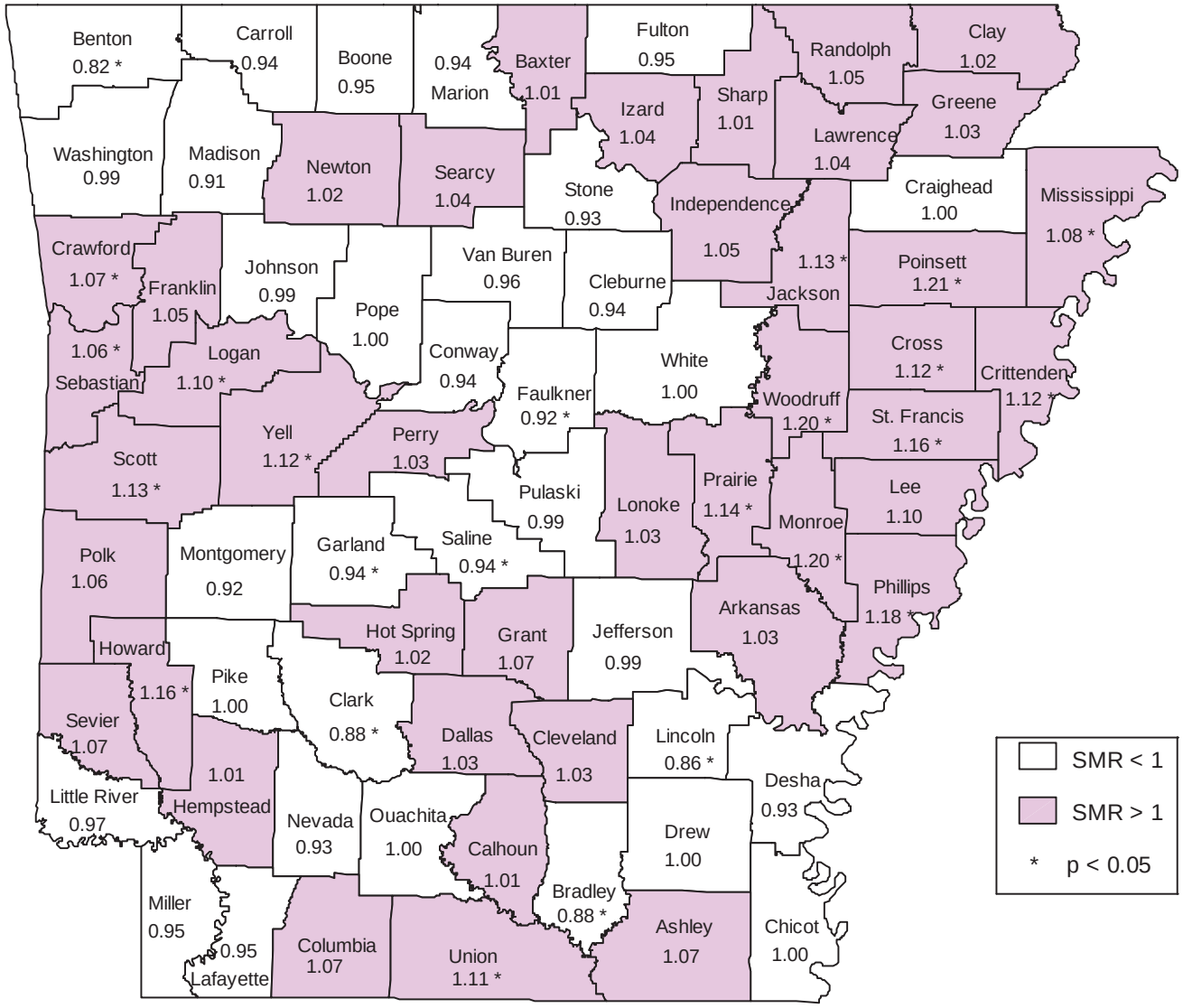


Figure 1.5: Age-Specific Cancer Mortality Rates, All Cancers, By Race and Sex, Arkansas, 2004 - 2008



- Age-specific death rates for all cancers combined increased steadily by age. Males, both Black and White, have greater increases by age group than females.
- The median age at death from cancer in Arkansas from 2004 through 2008 was 71 years.

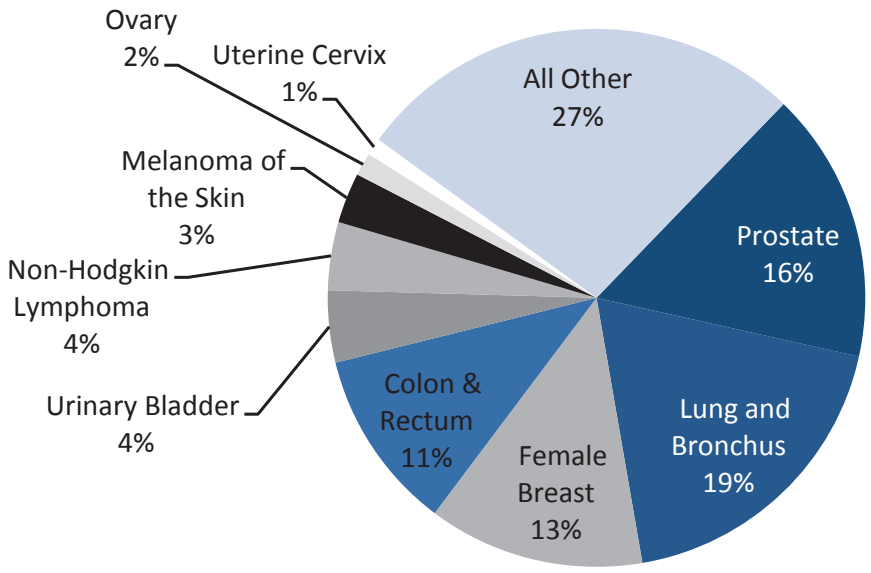
Figure 1.6: All Cancers: Standardized Mortality Ratio (SMR) by County, Arkansas, 1999 - 2008



Disclaimer: Counties with an '*' and SMR > 1 may have a population prevalence for a risk factor(s) which exceeds the state prevalence. It should be noted that it usually takes years for most types of cancer to develop so the relevant exposure(s) likely occurred years ago and possibly elsewhere.

- The counties shaded in pink have death rates for all cancers combined that exceed the statewide mortality rate.
- Counties with cancer rates that are 10% or higher than the statewide rate tended to be away from the state's population centers in the central part of the state and the northwest counties of Benton and Washington

1.7: Percentage of New Cancer Cases in Arkansas By Primary Site, 2004 - 2008*



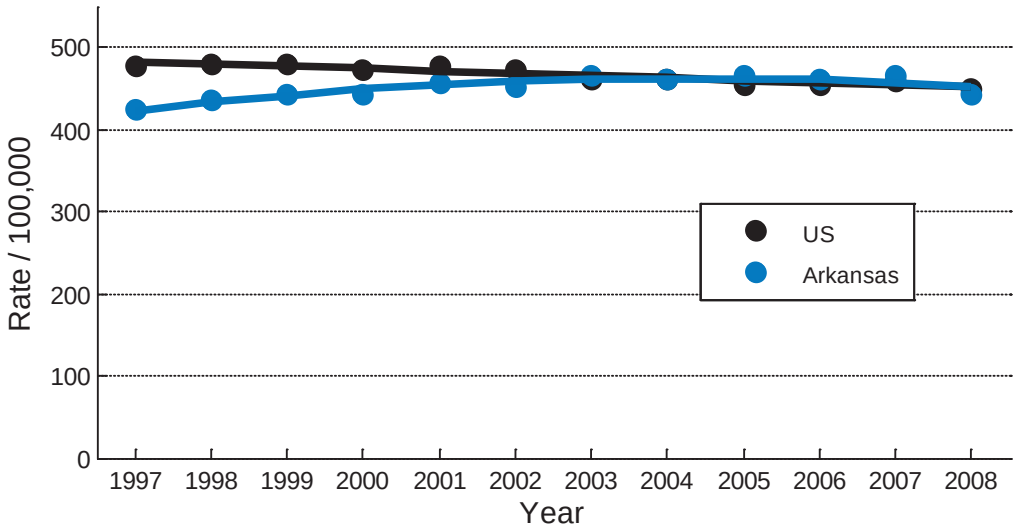
*Note: Excludes *in situ* tumors except for urinary bladder.

Table 1.2: Invasive Cancer Incidence Rates in Arkansas, Selected Cancers, All Genders, All Races, 2004-2008

Primary Cancer Site	Total Cases	Age-adjusted Rate
Prostate (males)	11,217	157.0
Invasive Breast (females)	8,937	108.9
Lung and Bronchus	12,935	81.9
Colon & Rectum	7,490	47.9
Urinary Bladder	2,977	18.9
Non-Hodgkin Lymphoma	2,825	18.2
Corpus Uteri (females)	1,488	17.7
Kidney and Renal Pelvis	2,476	16.0
Melanoma of the Skin	2,086	13.8
Ovarian (females)	955	11.4
Pancreas	1,709	10.9
Uterine Cervix	716	10.0
Thyroid	1,045	7.2
Brain	946	6.3
Stomach	910	5.8

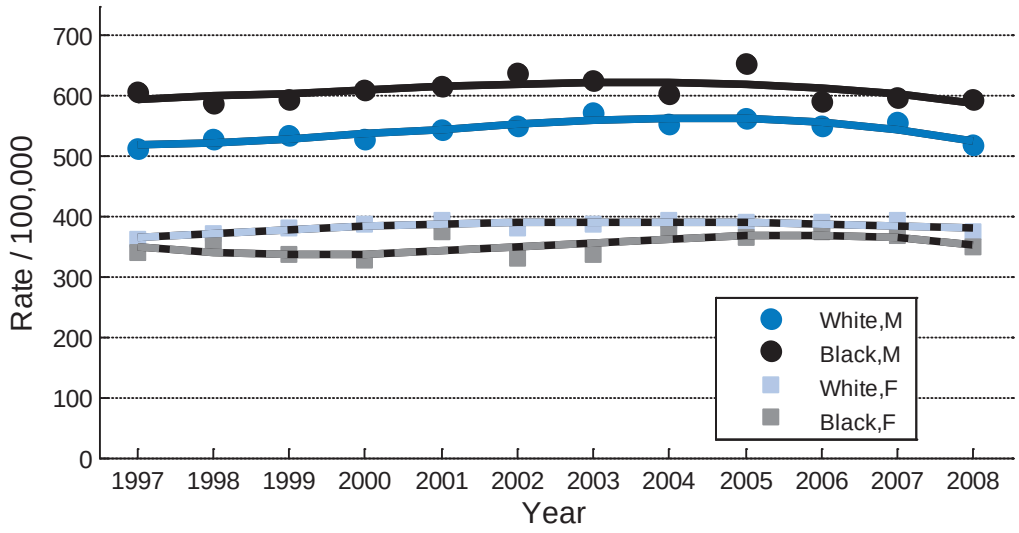
Note: All rates are per 100,000. Rates are age-adjusted to the 2000 U.S. Standard Million Population. Rates are based on number of invasive cancers, except for urinary bladder. Source: Arkansas Central Cancer Registry Query System: http://www.cancer-rates.info/ar/index.php

Figure 1.8: Age-Adjusted Cancer Incidence Trend, All Cancers, AR & US, 1997 - 2008



- Since 2002, Arkansas age-adjusted cancer incidence rates were virtually identical to the rates for the United States.
  - The 2008, the age-adjusted cancer incidence rate in the Arkansas was 443.9 cases per 100,000.
  - The 2008, the age-adjusted cancer incidence rate in the United States was 449.9 cases per 100,000.
- The change in rates over time from 1997 through 2008 are statistically significant ($p < 0.01$) with Arkansas rates increasing during the period 1997 through 2001, and then leveling off in 2003 through 2008.

Figure 1.9: Cancer Incidence Trends, All Cancers, By Race and Sex, Arkansas, 1997 - 2008



- In 2008, the age-adjusted incidence rates for all cancers combined by race were: White males, 520.9, Black males, 597.6, White females, 376.9, and Black females, 350.2.
- There was little difference between the incidence rates of Black women and White women.
- Rates have been relatively stable for the last five years reported.

Figure 1.10: Age-Adjusted Cancer Incidence, All Cancers, and 95% Confidence Intervals by Race and Sex, Arkansas, 2004 - 2008

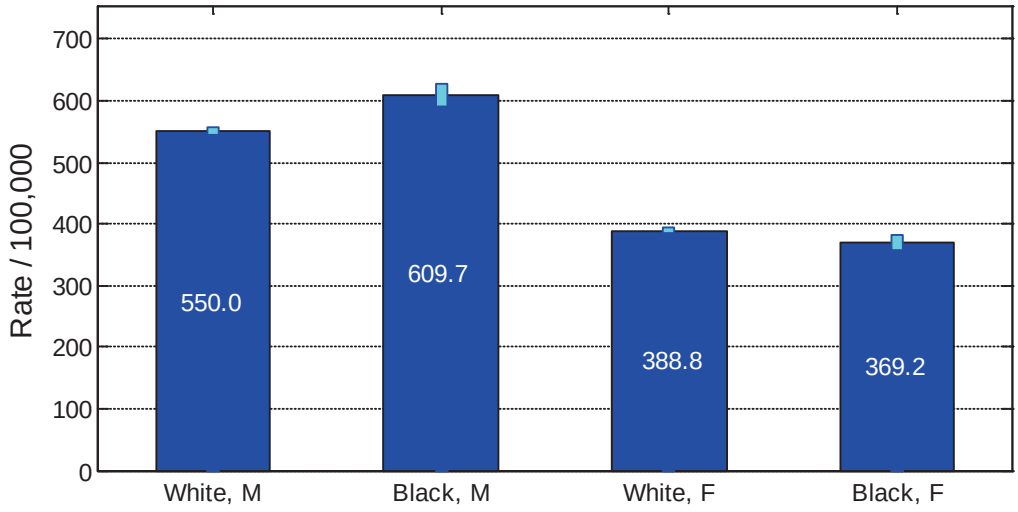
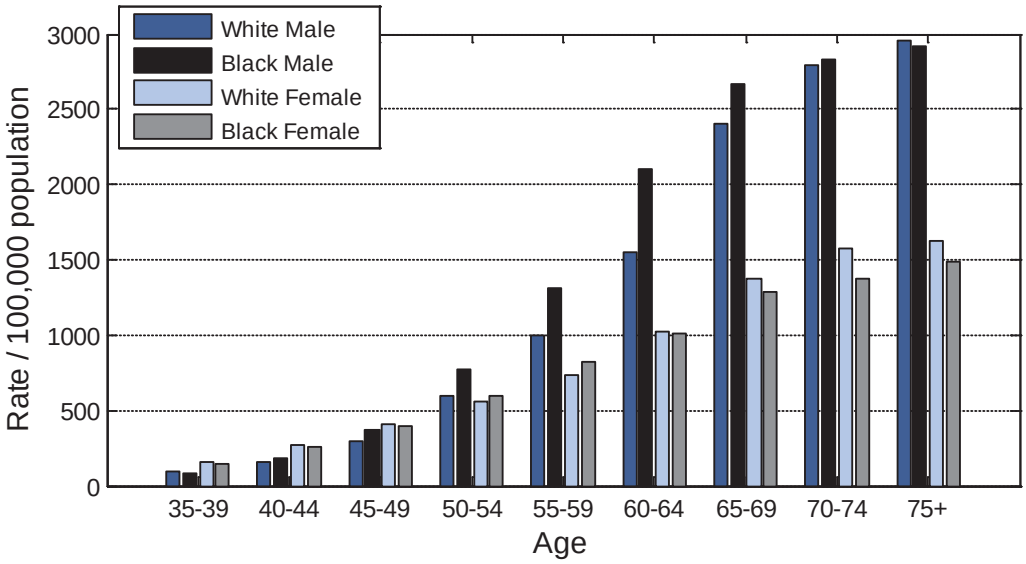
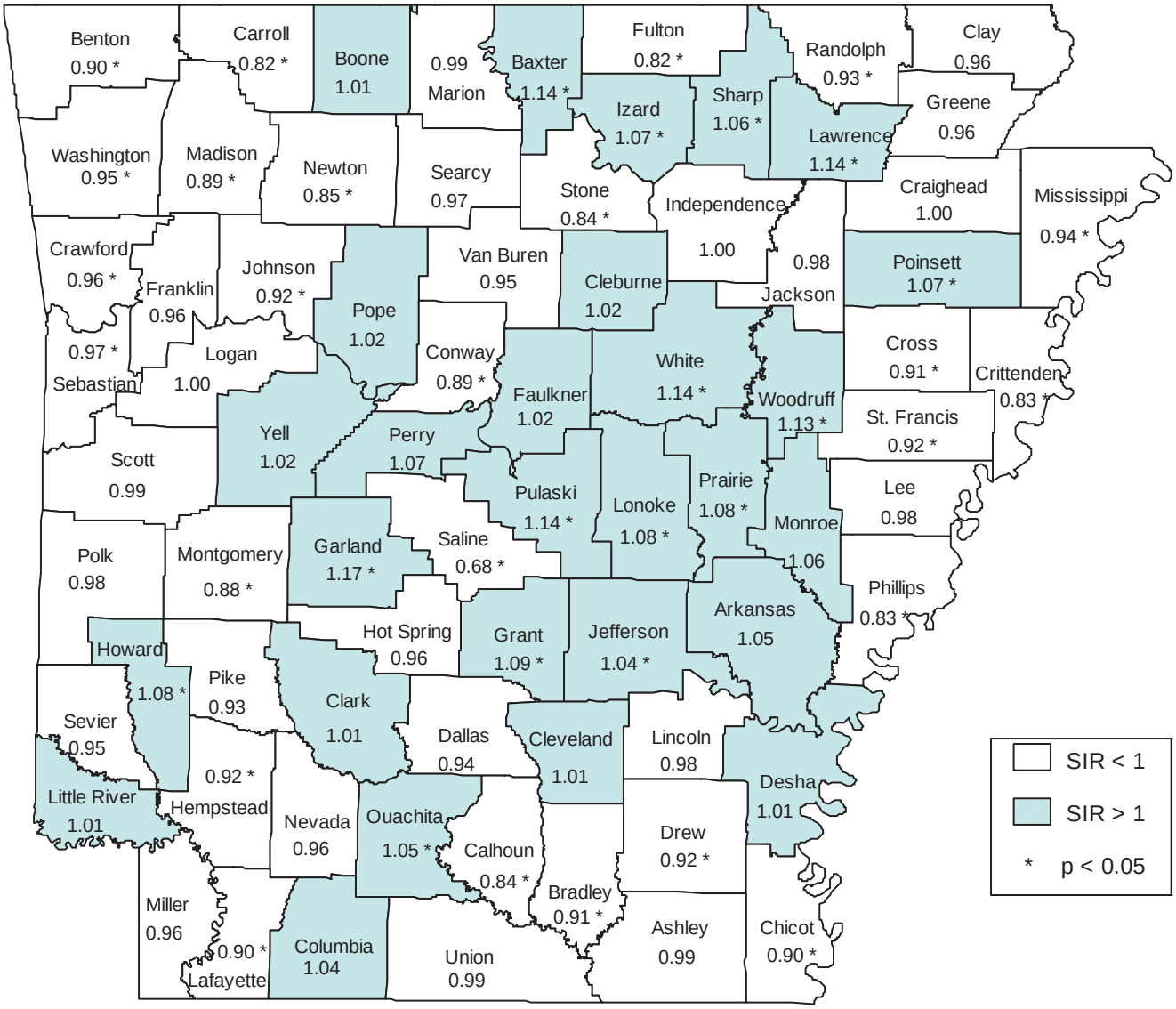


Figure 1.11: Age-Specific Cancer Incidence Rates, All Cancers, By Race and Sex, Arkansas, 2004 - 2008



- Median age at cancer diagnosis during 2004 through 2008 was 67 years of age.
- Figure 1.11 indicates that disease patterns at younger ages are somewhat different from patterns at older ages.
  - Young women (ages < 55) have incidence rates similar to men, whereas there is a large difference by sex at older ages.

Figure 1.12: All Cancers: Standardized Incidence Ratio (SIR) by County, Arkansas, 1997 – 2008



Disclaimer: Counties with an '*' and SIR > 1 may have a population prevalence for a risk factor(s) which exceeds the state prevalence. This booklet identifies the known risk factors for each cancer site. It should be noted that it usually takes years for most types of cancer to develop so the relevant exposure(s) likely occurred years ago and possibly elsewhere.

- The incidence of cancer (all sites combined) is higher in the central counties of the state relative to the statewide rate.

Chapter 2: Childhood Cancer, All Sites

In Arkansas during 1997 - 2008, the cancer registry accrued 1,409 new cancer cases among the population less than 20 years of age. In Arkansas during 1999 - 2008, there were 193 cancer deaths among the population less than 20 years of age.

According to the American Cancer Society, childhood cancers are rare and represent less than 1 percent of new cancers diagnosed annually. [2] Arkansas has maintained lower incidence and mortality trends of childhood cancer than the United States over time (see Figures 2.3 and 2.5). The most common types of cancer diagnosed among children aged 0 – 14 years were leukemia, brain and other central nervous system cancers, and cancer of the thymus (responsible for the production of T-cells). The most common cancers diagnosed among adolescents aged 15 – 19 years were leukemia, brain and central nervous system cancers, and cancers of the bone (see Figures 2.1 and 2.2).

Figure 2.1: Percentage of New Pediatric Cancer Cases, Arkansas 1997 - 2008*

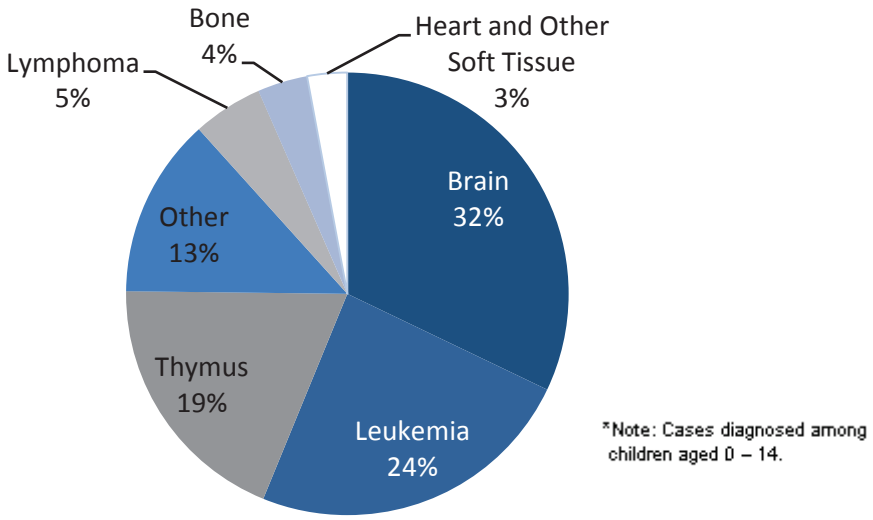


Figure 2.2: Percentage of New Adolescent Cancer Cases, Arkansas 1997 - 2008*

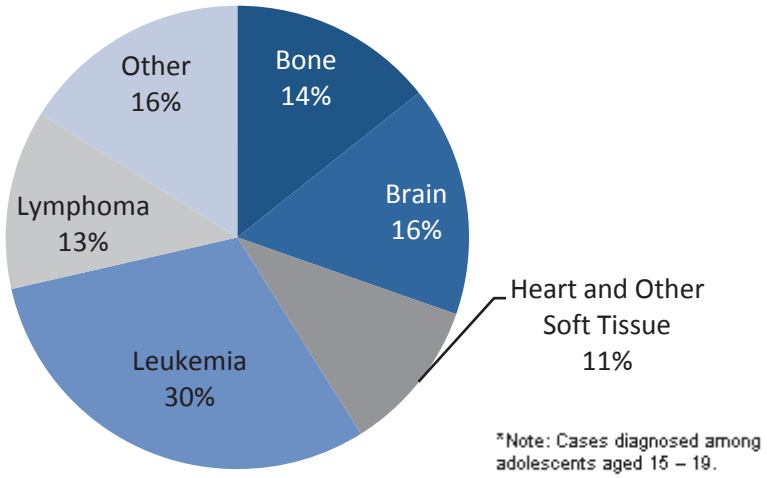
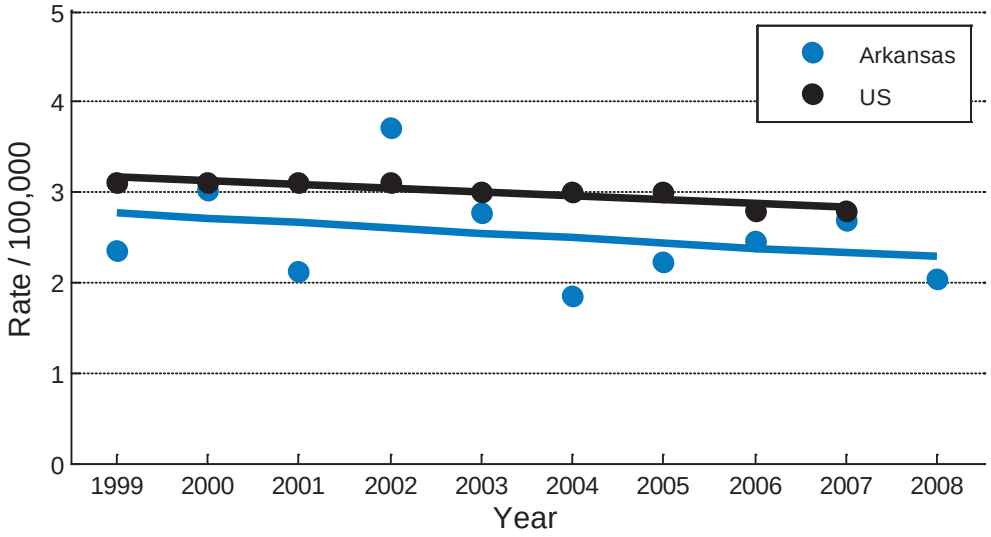


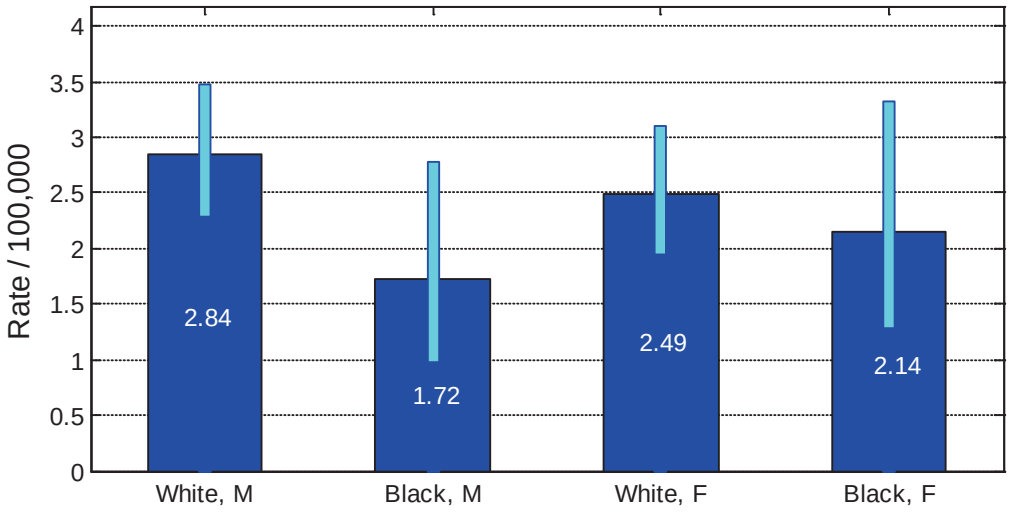
Figure 2.3: Crude Childhood* Cancer Mortality Trend, AR & US, 1999 – 2008**



* Note: ages 0 – 19 years
** U.S. data not yet available for 2008

- Arkansas maintains lower childhood cancer death rates than the United States.
- The average annual mortality rate in Arkansas was 2.5 (95% CI: 2.2, 2.9) deaths per 100,000. The average annual mortality rate in the United States was 3.0 (95% CI: 3.0, 3.1).
- Although it is not a statistically significant downward trend in Arkansas, the observed trend is consistent with the trend in the United States.

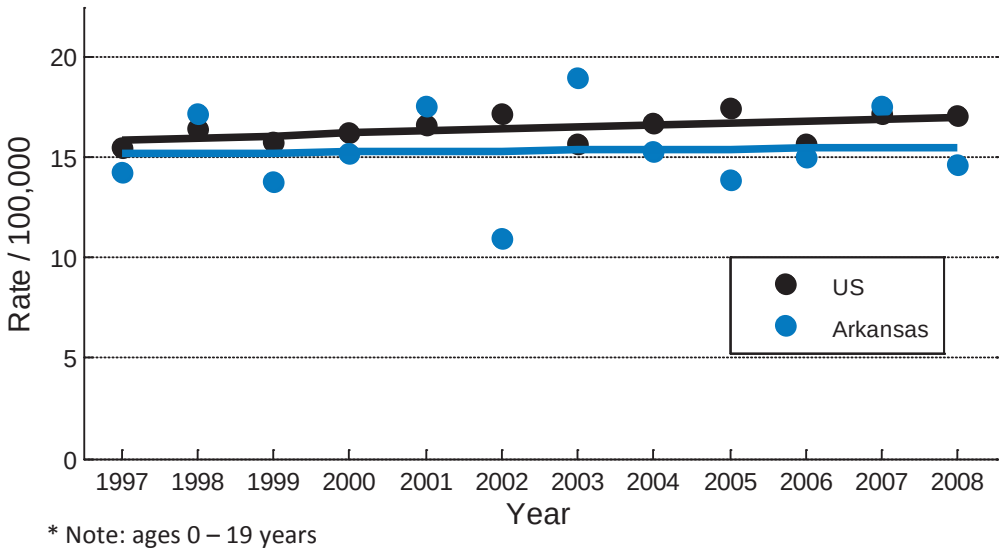
Figure 2.4: Crude Childhood* Cancer Mortality and 95% Confidence Intervals by Race and Sex, Arkansas, 1999 - 2008



* Note: ages 0 – 19 years

- Childhood cancer mortality rates were higher among White males and females relative to Black males and females, respectively.
- None of these differences between race and sex were statistically significant.

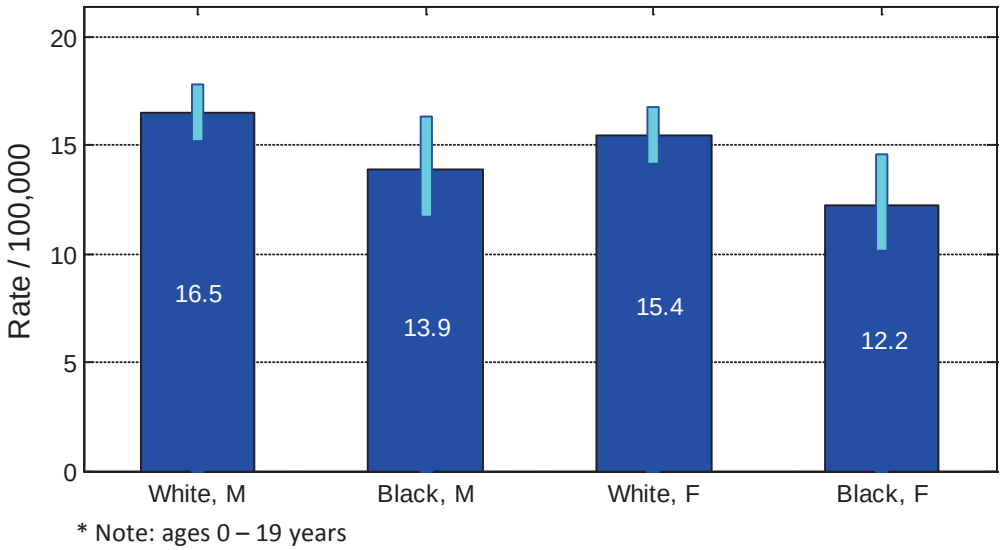
Figure 2.5: Crude Childhood* Cancer Incidence Trend, AR & US, 1997 - 2008



* Note: ages 0 – 19 years

- Arkansas rates over time from 1997 through 2008 did not demonstrate any change (p =0.78).

Figure 2.6: Crude Childhood* Cancer Incidence and 95% Confidence Intervals by Race and Sex, Arkansas, 2004 - 2008



* Note: ages 0 – 19 years

- Childhood cancer rates among White males and females combined were significantly higher than the rates among Black males and females (p < 0.01).
- When rates were calculated by race and gender, White male rates were higher than that of Black males and White female rates were higher than that of Black females. These differences were not statistically significant (p = 0.14).

Chapter 3: Female Breast Cancer

In 2008, a total of 1,738 women in Arkansas were diagnosed with invasive breast cancer, and an additional 402 were diagnosed with in situ breast cancer. There were 356 deaths from breast cancer in 2008. The median age at diagnosis for breast cancer among women in Arkansas from 2004 - 2008 was 62 years.

Signs and Symptoms [1, 2]

Early signs of breast cancer can be detected by mammogram. Some symptoms include:

- Painless mass or lump in the breast;
- Thickening, swelling, distortion, tenderness, redness, skin irritation of the breast; and
- Nipple abnormalities such as ulceration, retraction, or discharge.

Most breast pain results from benign conditions and is not an early sign of breast cancer.

Risk Factors [1, 2]

The risk of developing breast cancer increases with age. Other risk factors include family history, gene changes (BRCA1, BRCA2), breast changes such as atypical hyperplasia, high dose radiation to the chest (related to cancer treatments), high breast tissue density, and high bone mineral density. Reproductive risk factors include a long menstrual cycle (start early and/or end late in life), recent use of oral contraceptives, never having children, or having a first child after age 30. Modifiable risk factors include weight gain after age 18, being overweight or obese, use of combined estrogen and progestin MHT, physical inactivity, and one or more alcoholic drinks per day.

Prevention and Early Detection [2, 5]

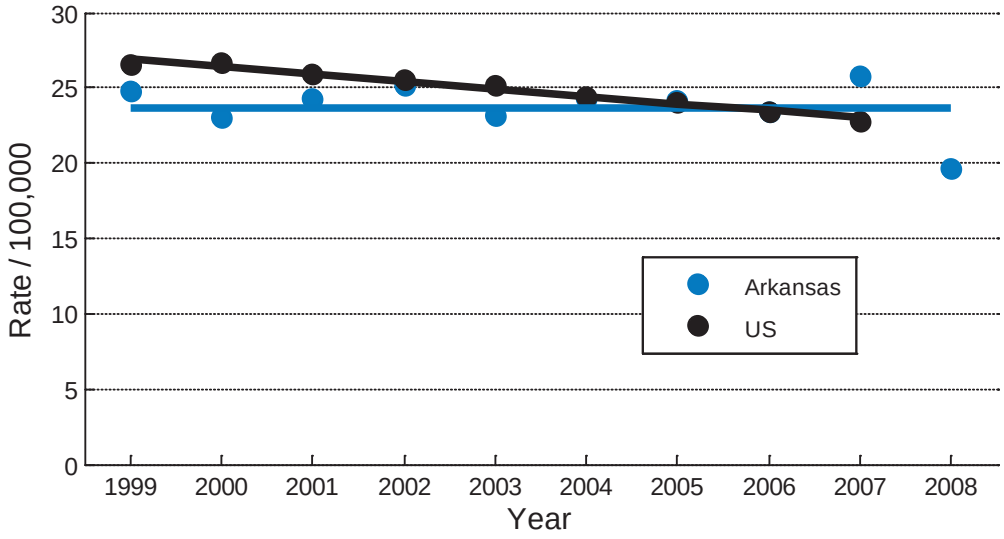
According to the U.S. Preventive Services Task Force (USPSTF), current evidence suggests film mammography screening reduces breast cancer mortality, with a greater absolute reduction for women aged 50 to 74 years of age. The strongest evidence for the greatest benefit is among women aged 60 to 69 years. There is insufficient evidence that mammography screening among women aged 75 years and older is beneficial. Adequate evidence suggests that teaching breast self-exams (BSE) does not reduce breast cancer mortality.

The USPSTF recommends biennial screening mammography for women aged 50 to 74 years. It is an individual's decision to start regular, biennial screening mammography before the age of 50 years. Other recommendations from the American Cancer Society (ACS) suggest annual mammography screening for women aged 40 and to continue as long as a woman is in good health.

Treatment [1, 2]

Depending on the tumor size, stage, and other characteristics, treatment may include lumpectomy (removal of tumor with clear margins) or mastectomy (removal of the breast), removal of the lymph nodes, radiation therapy, chemotherapy, or targeted therapy.

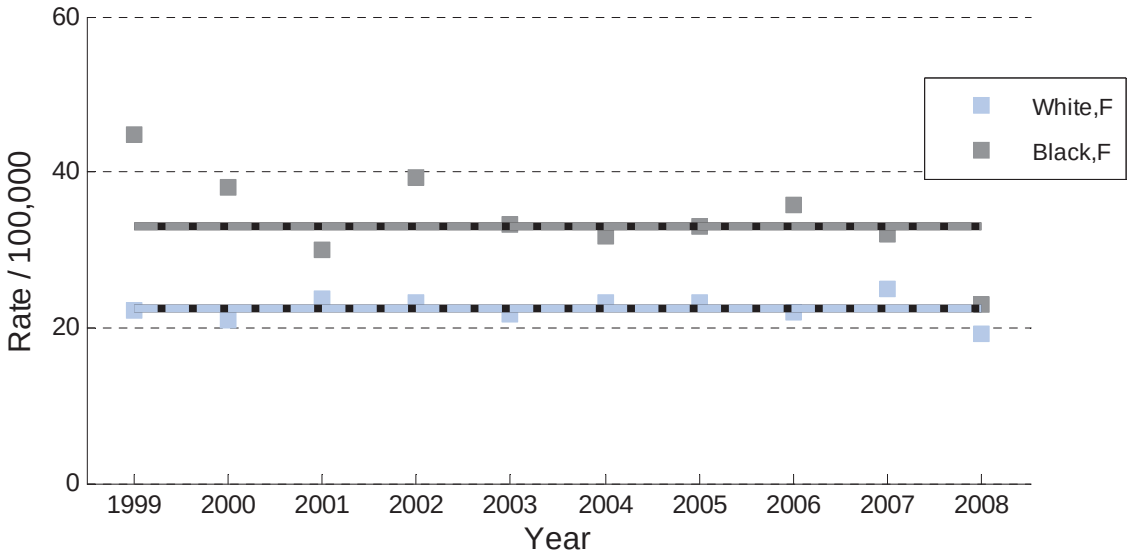
Figure 3.1: Age-Adjusted Female Breast Cancer Mortality Trend, AR & US, 1999 – 2008*



* U.S. data not yet available for 2008

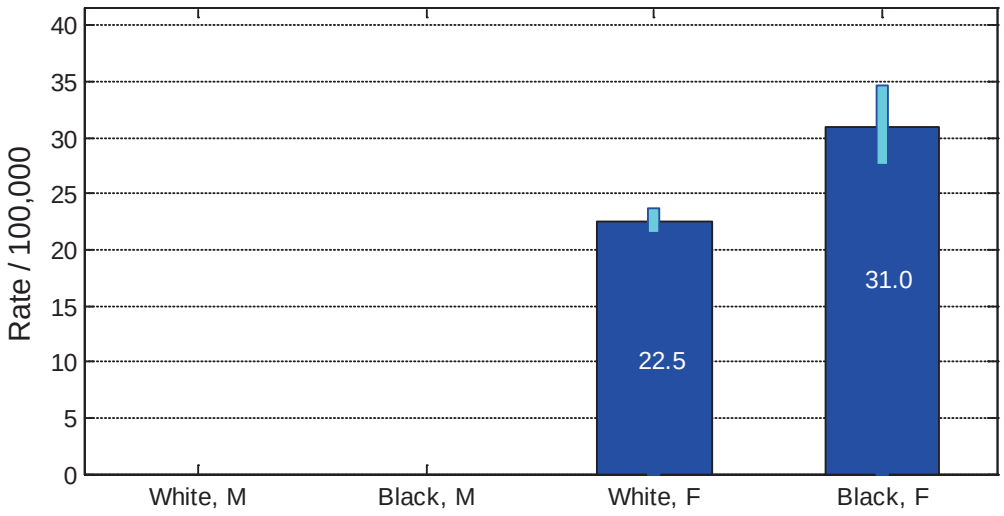
- From 1999 through 2008, the rates in the United States demonstrated a modest decrease while Arkansas rates remained level.
- The age-adjusted breast cancer mortality rate in 2007 for Arkansas females was 26.0 per 100,000, as compared to the rate in the United States for the same year, 22.9 per 100,000.

Figure 3.2: Trends in Female Breast Cancer Mortality By Race in Arkansas, 1999 - 2008



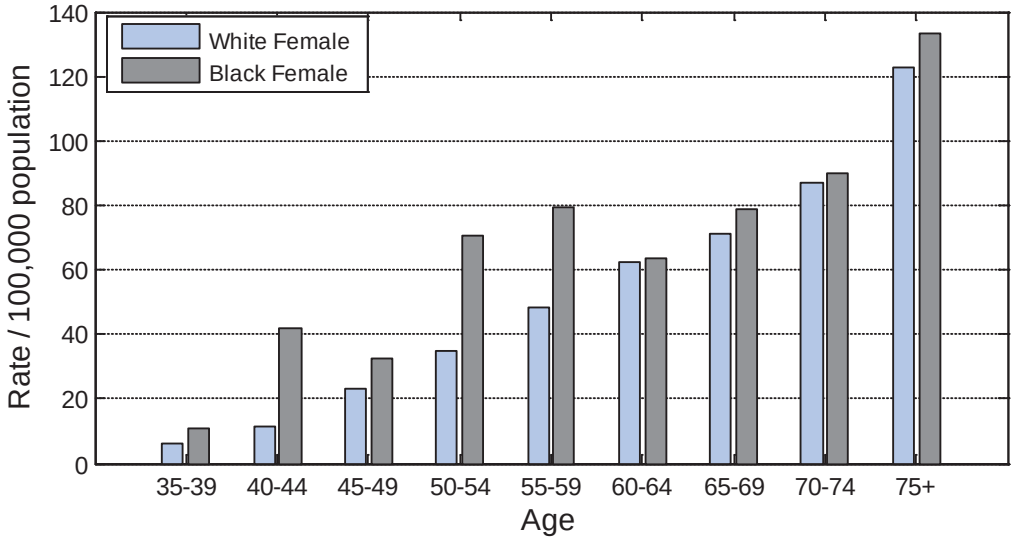
- Breast cancer rates among both Black and White females have remained stable over time. Any perceived fluctuations in mortality trends were not significant.
- Black women averaged higher mortality rates at 33.0 deaths per 100,000 over the period, which were 10.7 more deaths per 100,000 than White women.

Figure 3.3: Female Breast Cancer Mortality By Race in Arkansas, 2004 - 2008



- Black women averaged 31 deaths per 100,000 over a 5-year period (2004 – 2008) versus 22.5 deaths in White women over the same period. This difference was statistically significant.

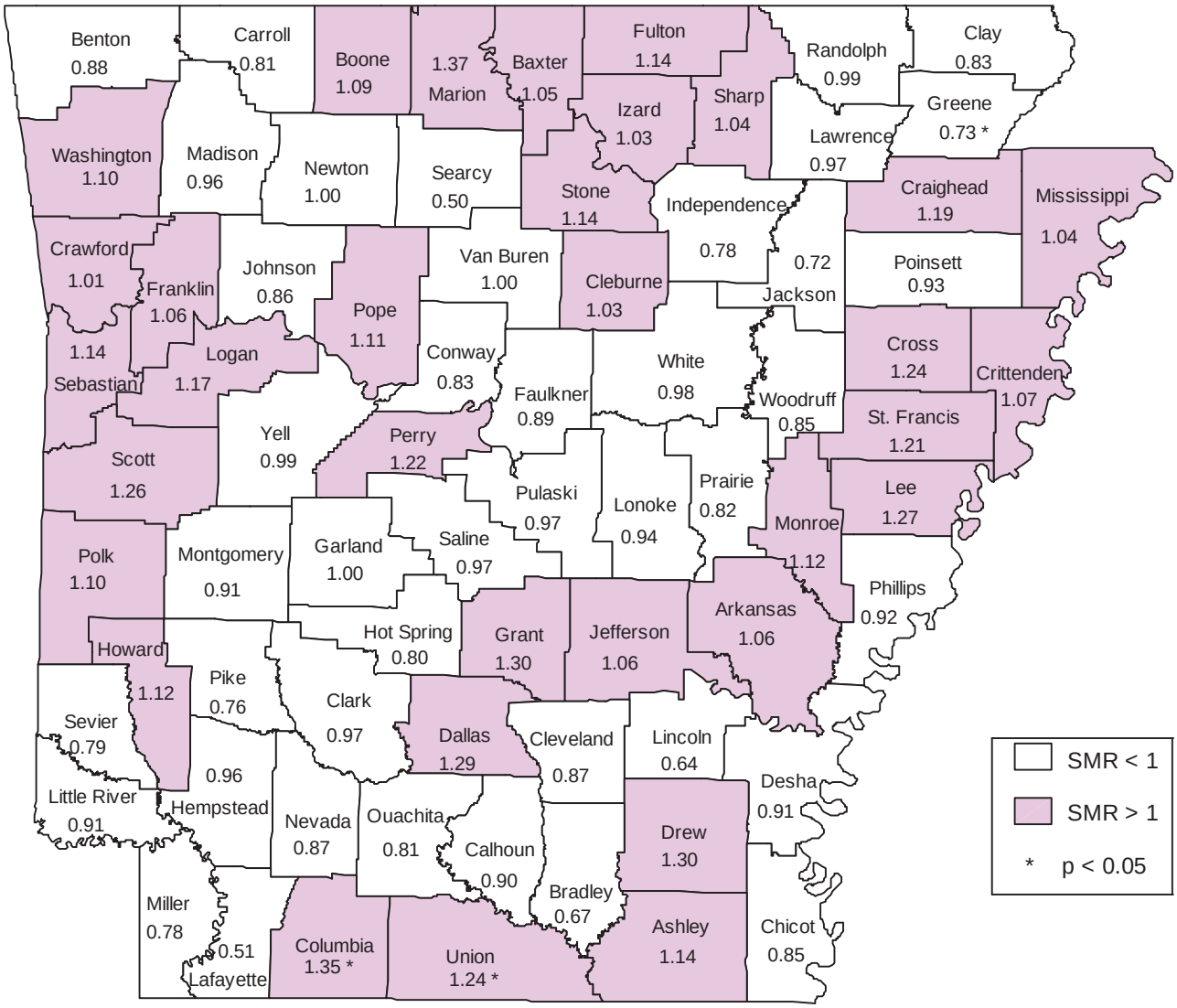
Figure 3.4: Age-Specific Female Breast Cancer Mortality Rates By Race, Arkansas, 2004 - 2008



- The median age at death from breast cancer in Arkansas during 2004 - 2008 was 67 years.
- Note that there is little racial disparity in mortality among women 60 years of age and older. However, Black women under age 60 have much higher mortality than White women.

The United States Preventive Services Task Force recommends biennial screening mammography for women aged 50 to 74 years.

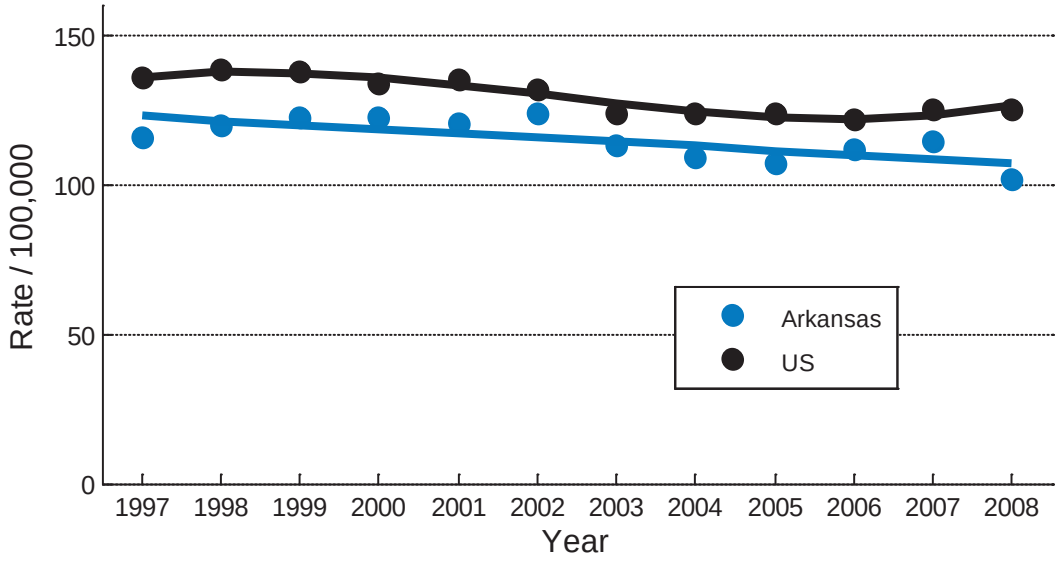
Figure 3.5: Female Breast Cancer, Standardized Mortality Ratio (SMR) By County, Arkansas, 1999-2008



Disclaimer: Counties with a '*' and SIR > 1 may have a population prevalence for a risk factor(s) which exceeds the state prevalence. This booklet identifies the known risk factors for each cancer site. It should be noted that it usually takes years for most types of cancer to develop so the relevant exposure(s) likely occurred years ago and possibly elsewhere.

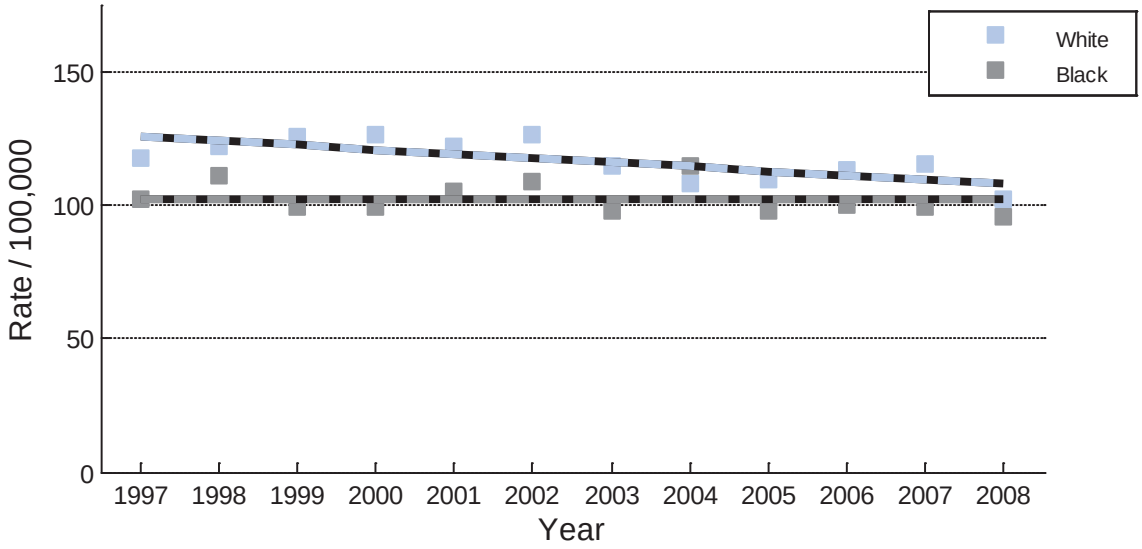
- Elevated breast cancer rates at least 10% higher than the statewide rate (SMR ≥ 1.10) were seen in the predominately Black rural counties on the east side of the state and in several predominately White rural counties on the western and northern borders of the state.

Figure 3.6: Age-Adjusted Female Invasive Breast Cancer Incidence Trends, AR & US, 1997-2008



- Arkansas age-adjusted invasive breast cancer incidence rates were lower than the rates for the United States.
  - The rate in Arkansas in 2008 was 102.2 per 100,000.
  - The rate in the United States in 2008 was 125.4 per 100,000.
- In Arkansas, the decline in incidence rates during 1997 - 2008 was significant ($p < 0.01$).
  - Yearly decline averaged 1.4 cases per 100,000.

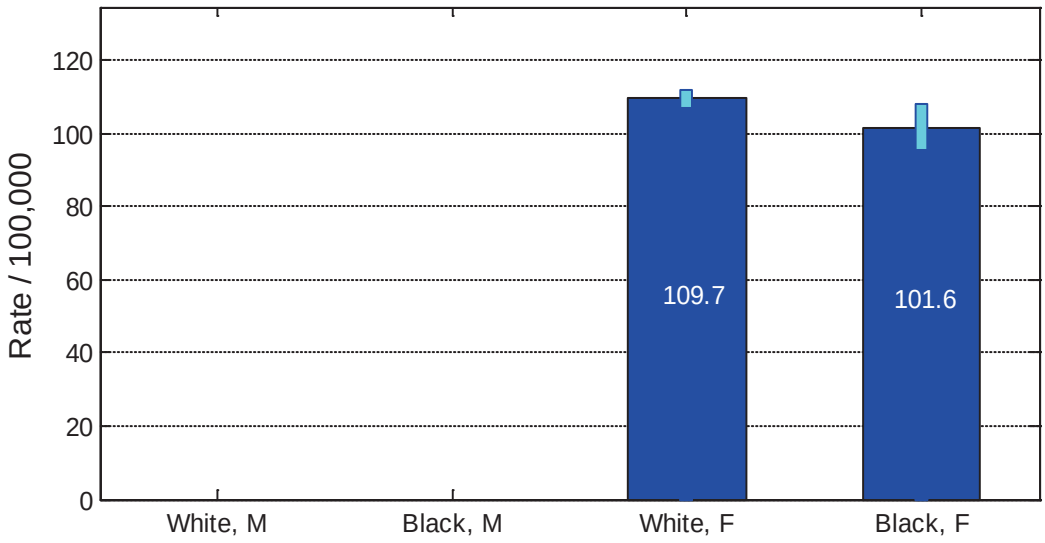
Figure 3.7: Female Invasive Breast Cancer Incidence Trends by Race, Arkansas, 1997 - 2008



- Black females had an average rate of 102.2 cases per 100,000.
- White females had an annual decline of 1.6 cases per 100,000 over the entire period to a modeled (trend line) rate of 107.6 cases per 100,000 in 2008.

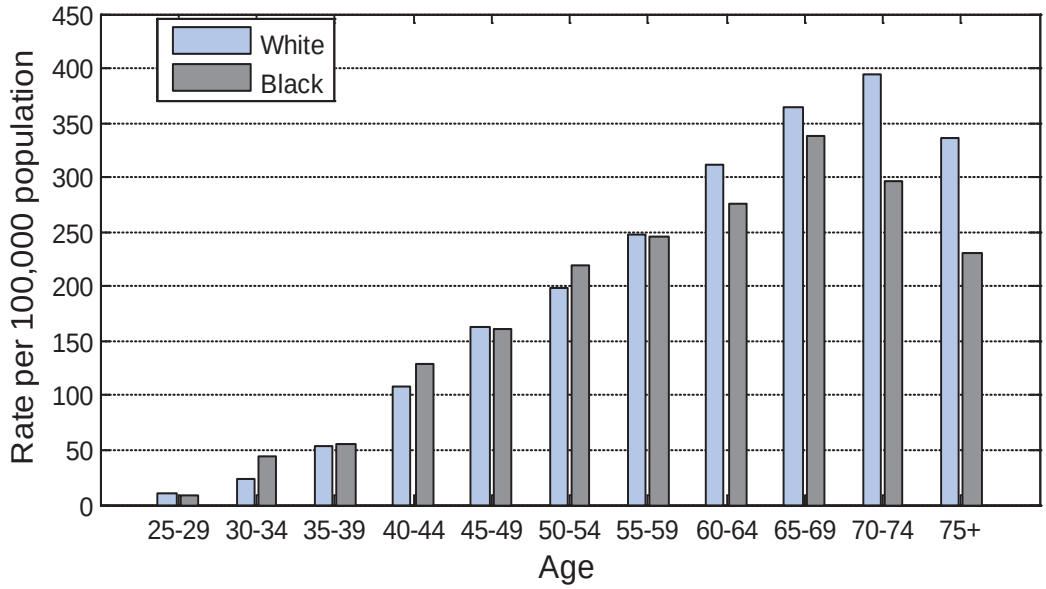
Errata: Prior calculation for Black females included other minorities. New rate includes Black females only.

Figure 3.8: Female Invasive Breast Cancer Incidence by Race, Arkansas, 2004 – 2008



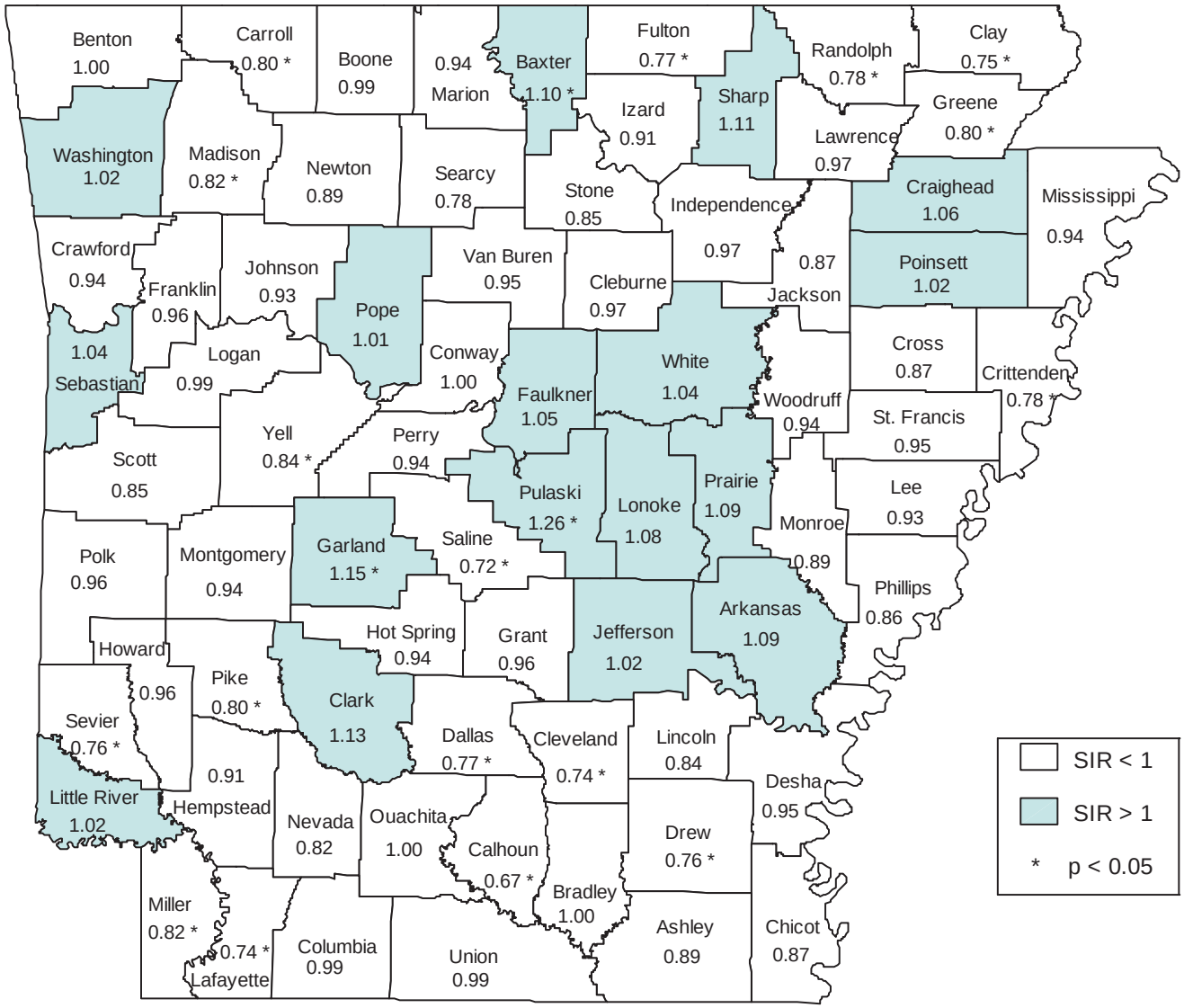
- The difference between Black and White female invasive breast cancer incidence rates, 8.1 per 100,000, over a 5-year period was statistically significant.

Figure 3.9: Age-Specific Incidence Rates of Female Invasive Breast Cancer By Race, Arkansas, 2004 - 2008



- Median age at diagnosis during 2004 - 2008 was 62 years.
- Figure 3.9 indicates that disease patterns at younger ages were somewhat different from patterns at older ages. At ages under 60, incidence rates were similar among Black and White women. However, White women have higher rates after 60 years of age.

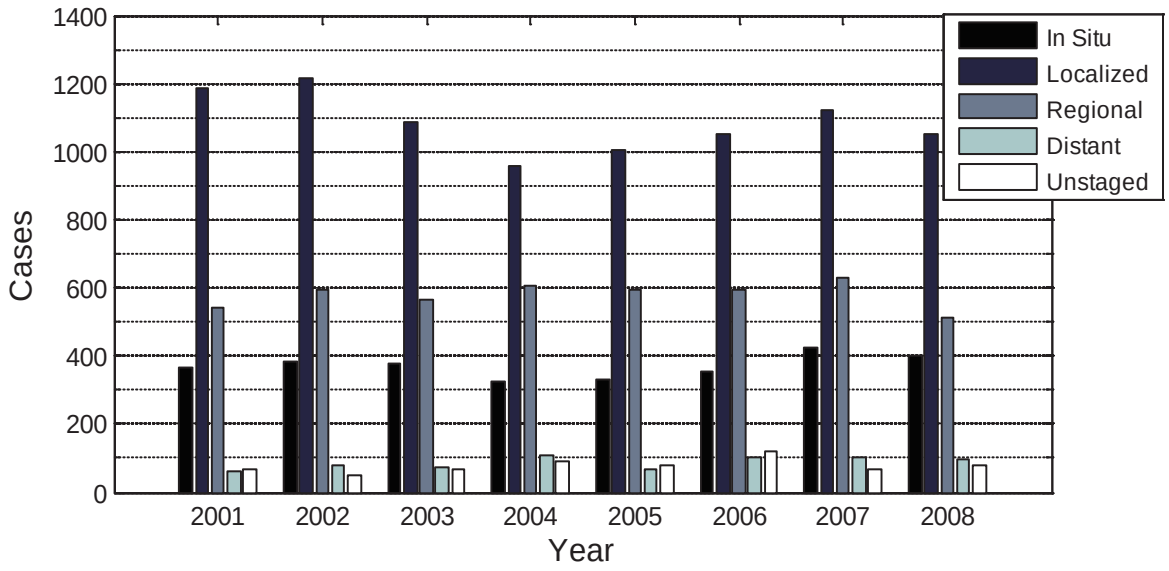
Figure 3.10: Female Invasive Breast Cancer, Standardized Incidence Ratio (SIR) by County, Arkansas, 1997 – 2008



Disclaimer: Counties with a '*' and SIR > 1 may have a population prevalence for a risk factor(s) which exceeds the state prevalence. This booklet identifies the known risk factors for each cancer site. It should be noted that it usually takes years for most types of cancer to develop so the relevant exposure(s) likely occurred years ago and possibly elsewhere.

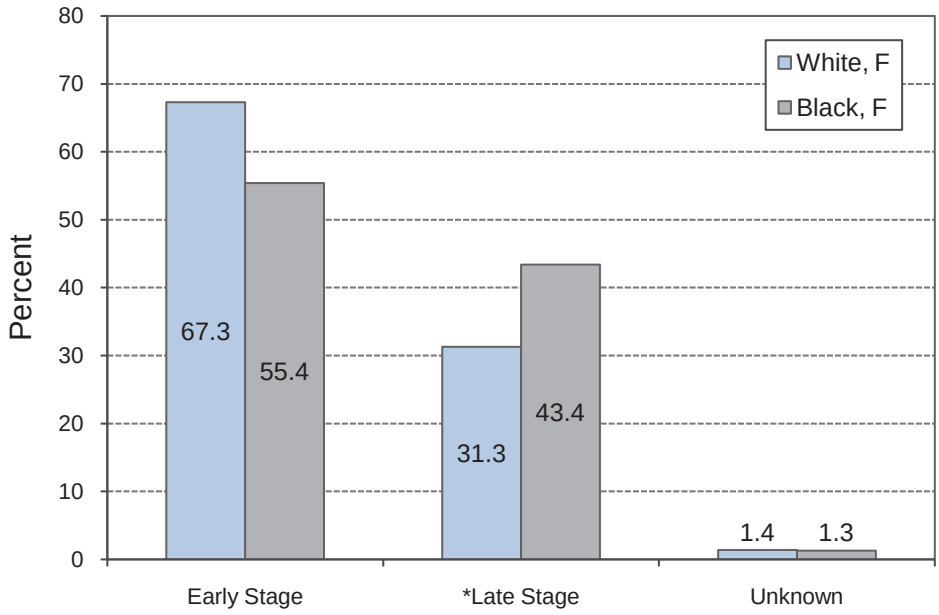
- Variation in breast cancer incidence demonstrated much less variation than mortality, (see Figure 3.5).
- Only five counties have rates 10% higher than the statewide incidence rate. Pulaski County had an incidence rate 26% higher than the statewide rate.

Figure 3.11: Female Breast Cancer, SEER 2000 Stage at Diagnosis



- The vast majority of breast cancers are diagnosed at early stages, in situ and localized.
- From 2001 through 2008 there has not been any significant shift in stage at diagnosis.

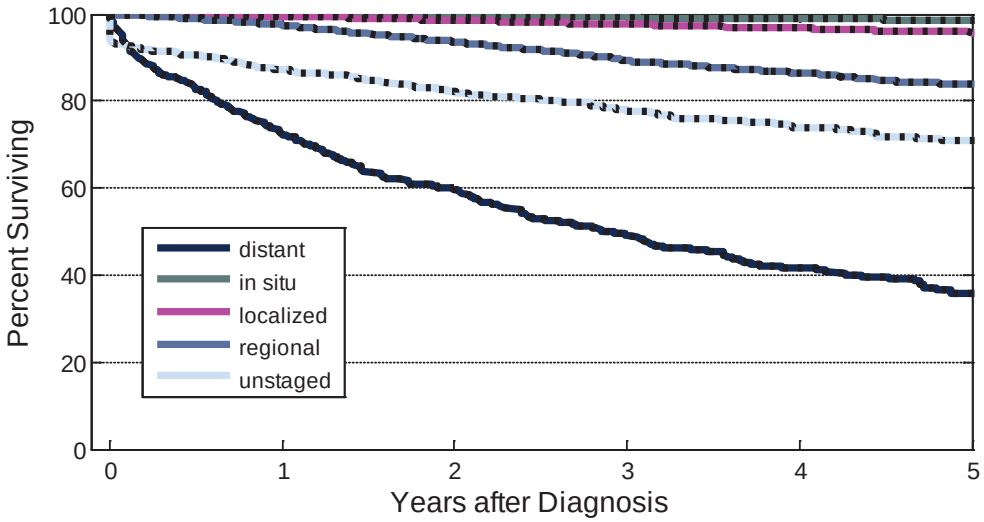
Figure 3.12: Female Breast Cancer, SEER 2000 Stage at Diagnosis, By Race, 2004 – 2008



*Note: Late stage includes regional and distant stages of disease.

- Black women were diagnosed at later stages of breast cancer than White women.

Figure 3.13: Female Breast Cancer, Five-Year Survival By Stage at Diagnosis, 2001 - 2008



- Breast cancer 5-year survival rates depend on stage-at-diagnosis. The more localized the cancer is at diagnosis, the better the survival.
  - In situ = 99 %
  - Localized = 96 %
  - Regional = 84 %
  - Distant = 36 %
  - Overall = 90 %

Chapter 4: Colon and Rectum (Colorectal) Cancer

Approximately 1,472 Arkansans were diagnosed with colorectal cancer, and 600 died of colorectal cancer in 2008. The median age at diagnosis for colorectal cancer in Arkansas from 2004 - 2008 was 69 years.

Signs and Symptoms [1, 2]

Early stages of colorectal cancer do not cause any obvious symptoms, but as the cancer progresses, common symptoms include:

- Rectal bleeding;
- Blood in the stool;
- Change in bowel habits (diarrhea or constipation for more than two weeks);
- Persistent cramping pain in the lower abdomen; and
- Unexplained weight loss and fatigue.

Risk Factors [1, 2]

The risk of developing colorectal cancer increases with age. Most colorectal cancers are identified in persons over the age of 50 years. Other common risk factors include obesity, physical inactivity, diet high in fat and low in fiber, heavy alcohol consumption, cigarette smoking, presence of colorectal polyps, ulcerative colitis or Crohn's disease, and a family history of the disease.

Prevention and Early Detection [5]

The U.S. Preventive Services Task Force recommends screening for colorectal cancer using fecal occult blood testing, sigmoidoscopy, or colonoscopy in adults beginning at age 50 years and continuing until age 75 years. The results of screening in the detection and removal of colorectal polyps before they become cancerous can reduce mortality.

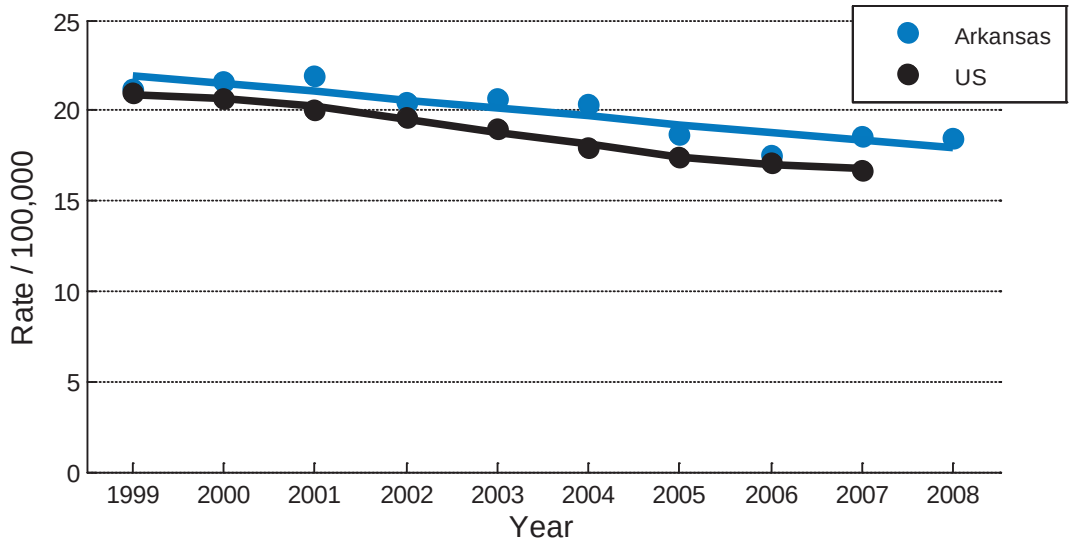
Treatment [1, 2]

Surgery is the most common treatment for tumors that have not spread, and removal can be curative. Other therapies include chemotherapy and radiation.

"Diets high in vegetables and fruits have been linked with lower risk of colon cancer."

– American Cancer Society

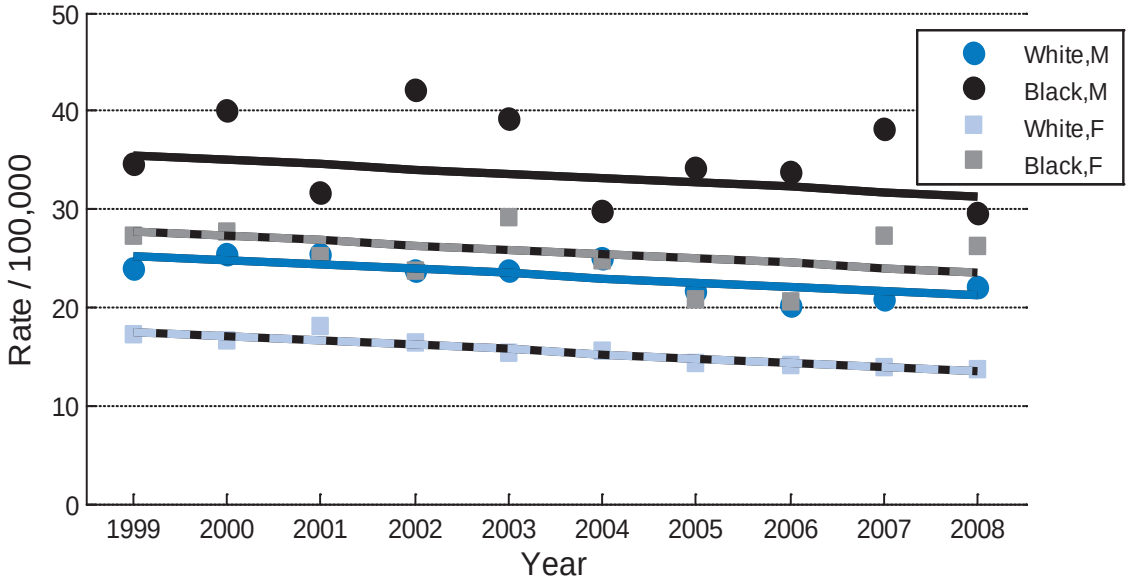
Figure 4.1 Age-Adjusted Colorectal Cancer Mortality Trends, AR & US, 1999 - 2008*



* U.S. data not yet available for 2008

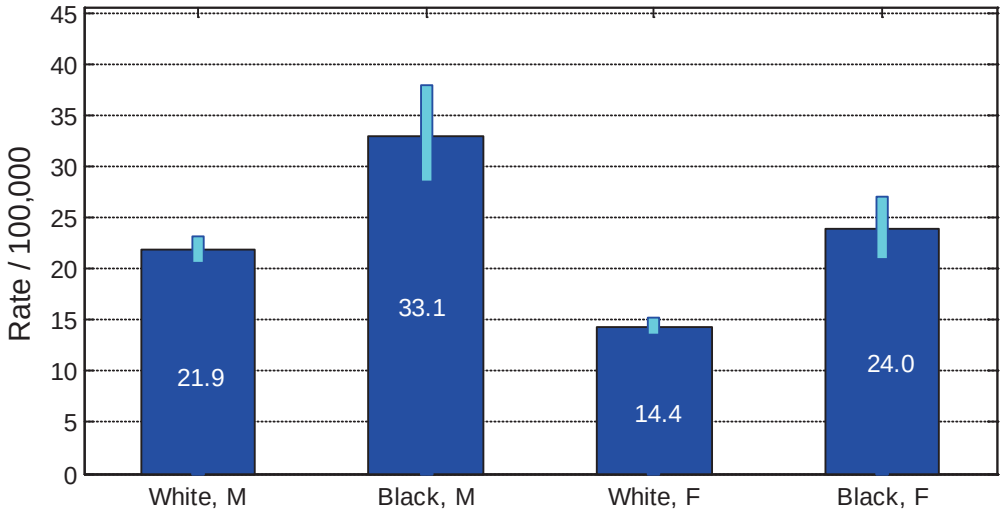
- From 1999 through 2008, Arkansas age-adjusted mortality rates were higher than the rates in the United States.
  - United States had 16.7 deaths per 100,000 in 2007.
  - Arkansas had 18.6 deaths per 100,000 in 2007.
- The decline in age-adjusted mortality rates over time in Arkansas was significant ($p < 0.01$).
  - The modeled (trend line) colorectal cancer mortality rate for Arkansas in 2008 was 17.9 per 100,000.
  - The annual decline in colorectal cancer deaths over time was 0.45 deaths per 100,000 and was equivalent to the decline in colorectal mortality rates for the United States.

Figure 4.2 Trends in Colorectal Cancer Mortality By Race and Sex Arkansas, 1999 - 2008



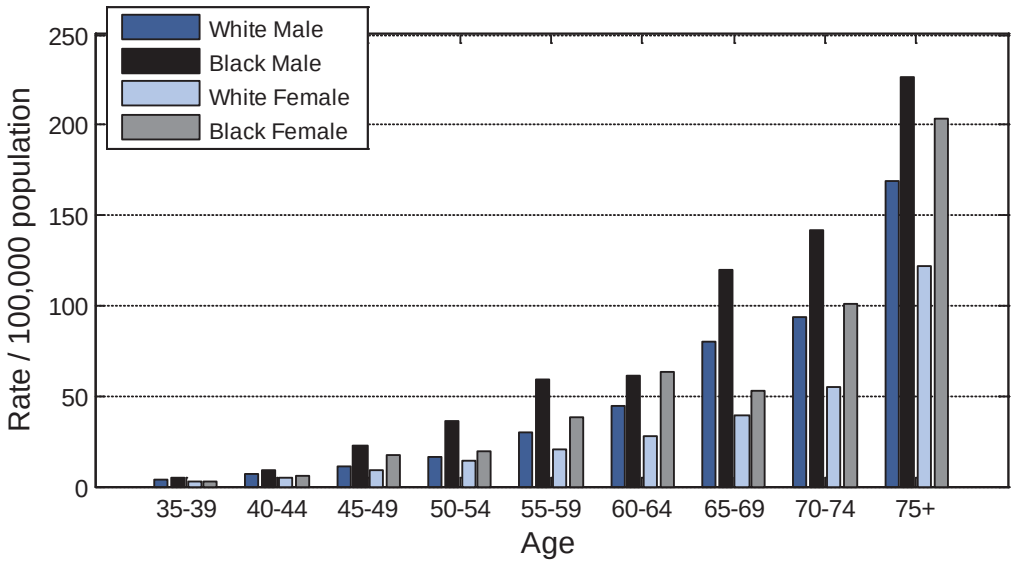
- In 2008, the age-adjusted colorectal cancer mortality rates by sex and race were: White males, 22.0, Black males, 29.5, White females, 13.8, and Black females, 26.3.
- Age-adjusted mortality rates differed between males and females.
  - Within races, female rates of colorectal cancer were 7.8 cases per 100,000 lower than corresponding males.
- White males and females had lower mortality rates than Black males and females.
  - The average difference between Black Arkansans and White Arkansans was 10.2 cases per 100,000.

Figure 4.3 Age-Adjusted Colorectal Cancer Mortality Rates and 95% Confidence Intervals by Race and Sex, Arkansas, 2004 - 2008



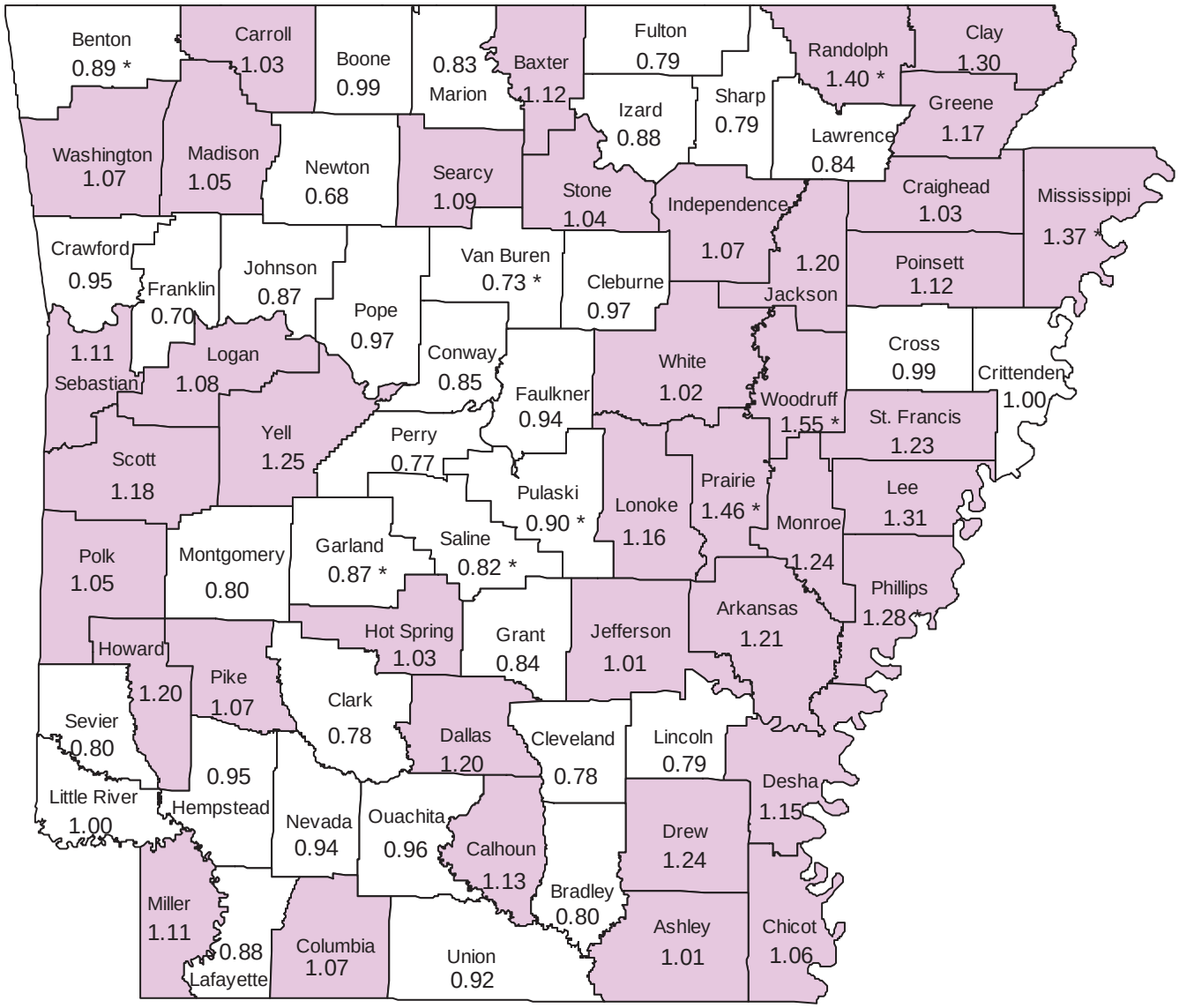
- White males and females had significantly lower rates than Black males and females, respectively ($p < 0.01$).
- Black and White males had significantly higher rates when compared to females of the same race ($p < 0.01$).

Figure 4.4: Age-Specific Colorectal Cancer Mortality Rates By Race and Sex, Arkansas, 2004 – 2008



- The median age at death from colorectal cancer in Arkansas from 2004 through 2008 was 73 years.
  - The rate of death increases with age.
- Black males have the highest incidence rates for all but one of the age groups examined.

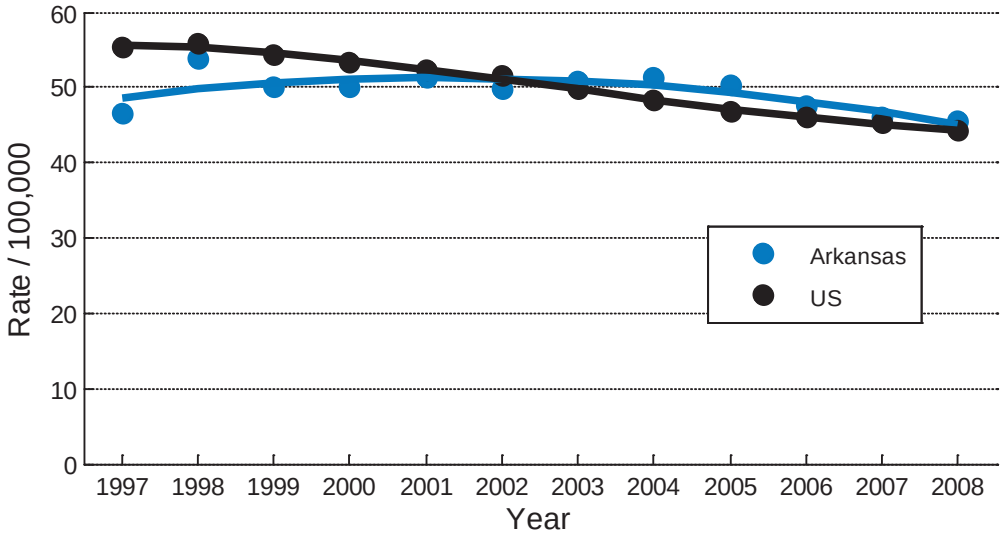
Figure 4.5: Colorectal Cancer; Standard Mortality Ratios (SMR) by County, Arkansas, 1999 - 2008



Disclaimer: Counties with a '*' and SMR > 1 may have a population prevalence for a risk factor(s) which exceeds the state prevalence. This booklet identifies the known risk factors for each cancer site. It should be noted that it usually takes years for most types of cancer to develop so the relevant exposure(s) likely occurred years ago and possibly elsewhere.

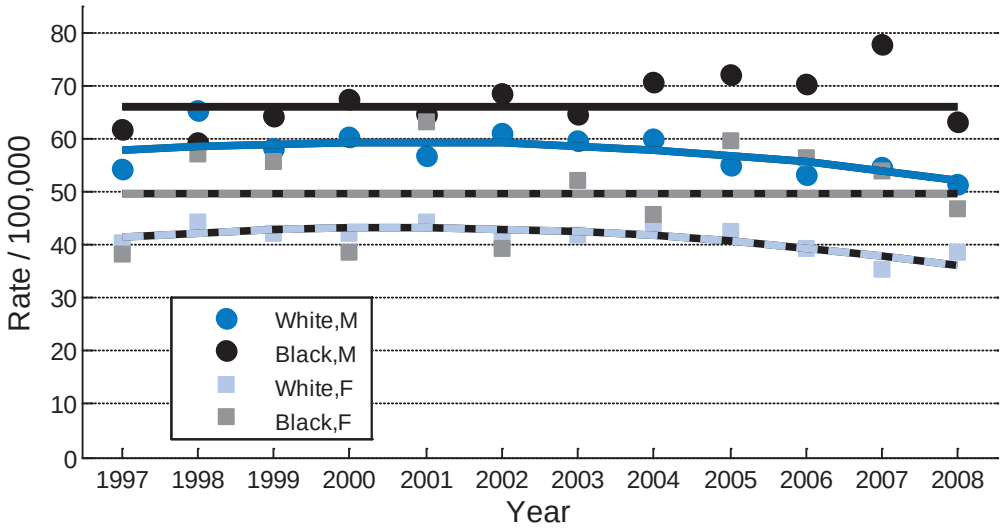
- The counties with mortality more than 10% higher than the statewide rates (SMR ≥ 1.10) are predominantly in the eastern part of the state and have larger Black population percentages.

Figure 4.6: Age-Adjusted Colorectal Cancer Incidence Trends, AR & US, 1997 - 2008



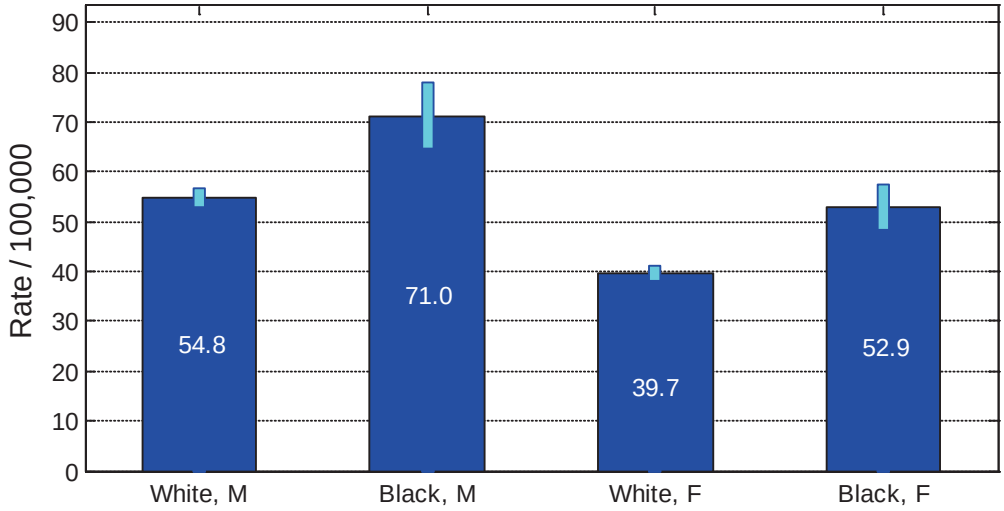
- For the past several years, Arkansas age-adjusted incidence rates of colorectal cancer were slightly higher than the rates in the United States.
  - The incidence rate of colorectal cancer in Arkansas in 2008 was 45.5 per 100,000.
  - The incidence rate of colorectal cancer in the United States in 2008 was 44.2 per 100,000.
- The change in rates over time from 1997 through 2008 was significant ($p < 0.01$).
  - Recently, Arkansas had a decline of approximately 2 cases per year. This mirrors the same decreasing trend as the United States.

Figure 4.7: Age-Adjusted Colorectal Cancer Incidence Trends By Race and Sex, Arkansas, 1997 - 2008



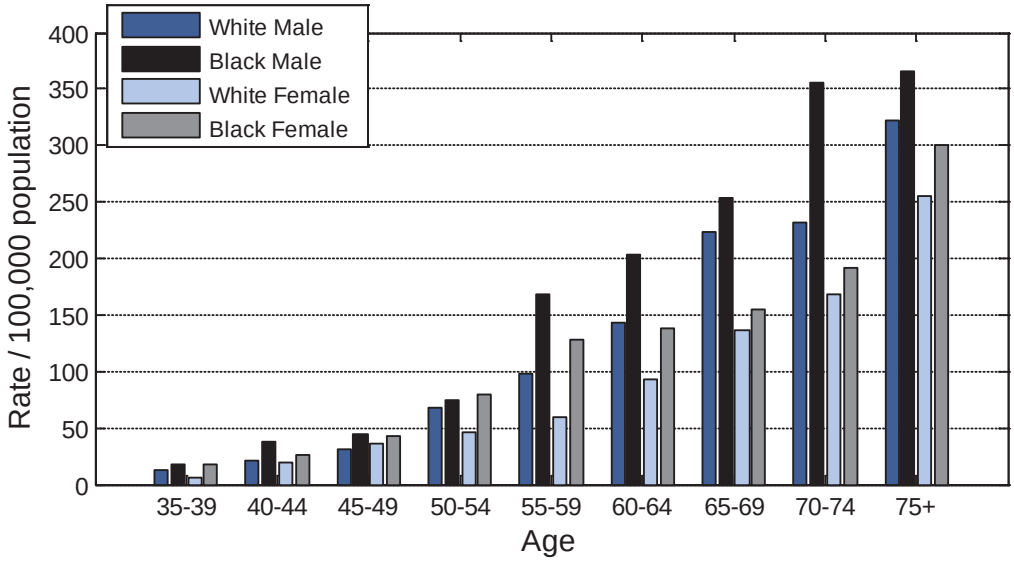
- In 2008, the age-adjusted colorectal cancer incidence rates by sex and race were: White males, 51.2, Black males, 63.2, White females, 38.7, Black females, 46.7.
  - Males had higher rates of colorectal cancer than females.
  - Within sexes, colorectal cancer incidence rates were higher among Blacks than Whites.
- There was no significant change in colorectal cancer incidence among Black males and Black females from 1997 - 2008.
  - Black males average 65.8 per 100,000 over the period.
  - Black females average 49.7 per 100,000 over the period.
- Among both White males and females, there was a significant downward trend of approximately 2 fewer cases per 100,000 beginning in 2002.

Figure 4.8 Age-Adjusted Colorectal Cancer Incidence Rates and 95% Confidence Intervals by Race and Sex, Arkansas, 2004 - 2008



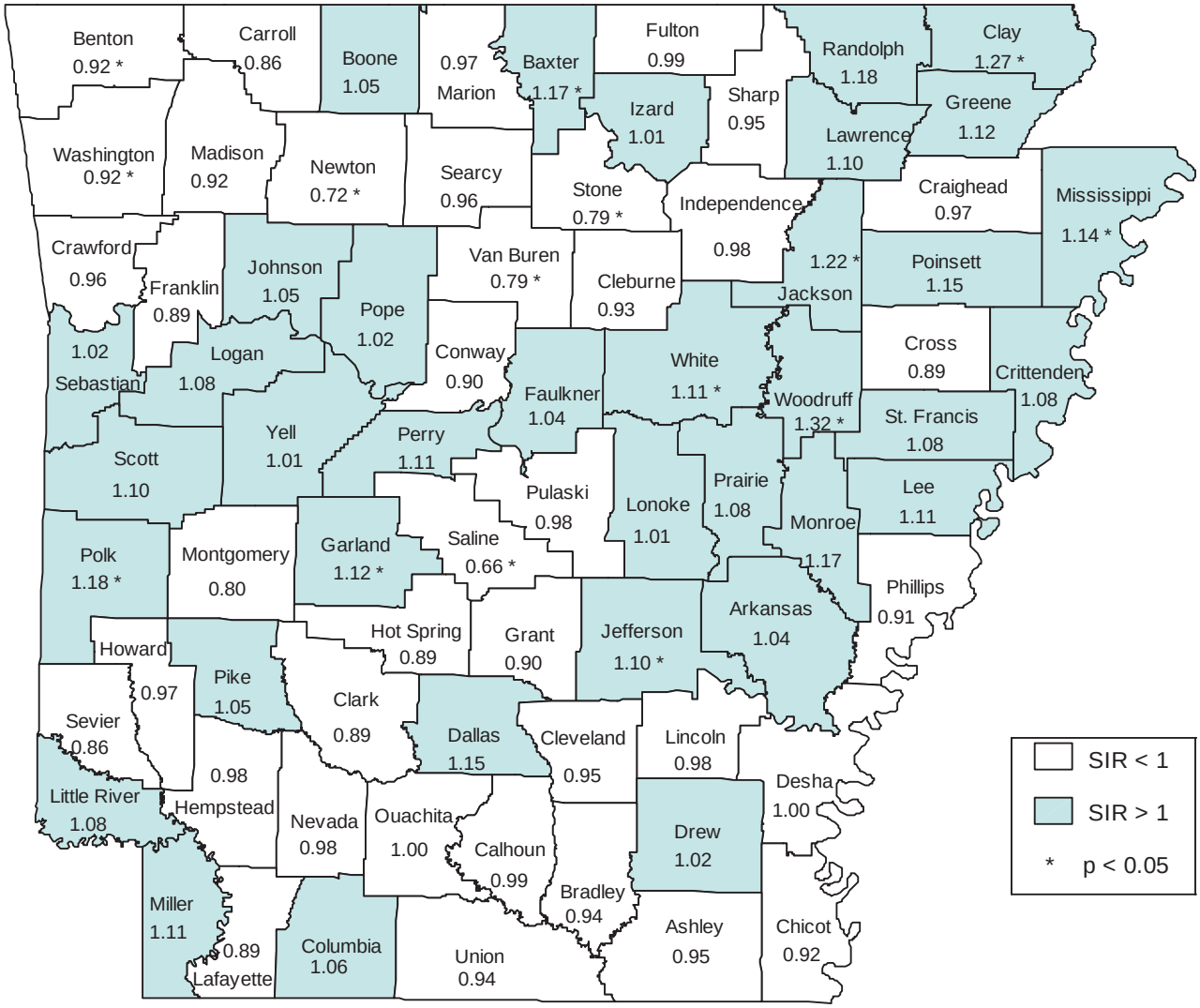
- White men and women had significantly lower rates than Black men and women, respectively ($p < 0.01$).
- Men had significantly higher rates than women ($p < 0.01$).

Figure 4.9: Age-Specific Colorectal Cancer Incidence Rates By Race and Sex, Arkansas, 2004 - 2008



- The median age at diagnosis for colorectal cancer from 2004 through 2008 was 69 years.
- The incidence rates of colorectal cancer increases as age increases.
- Black males had the highest incidence rates for all but one of the age groups examined.

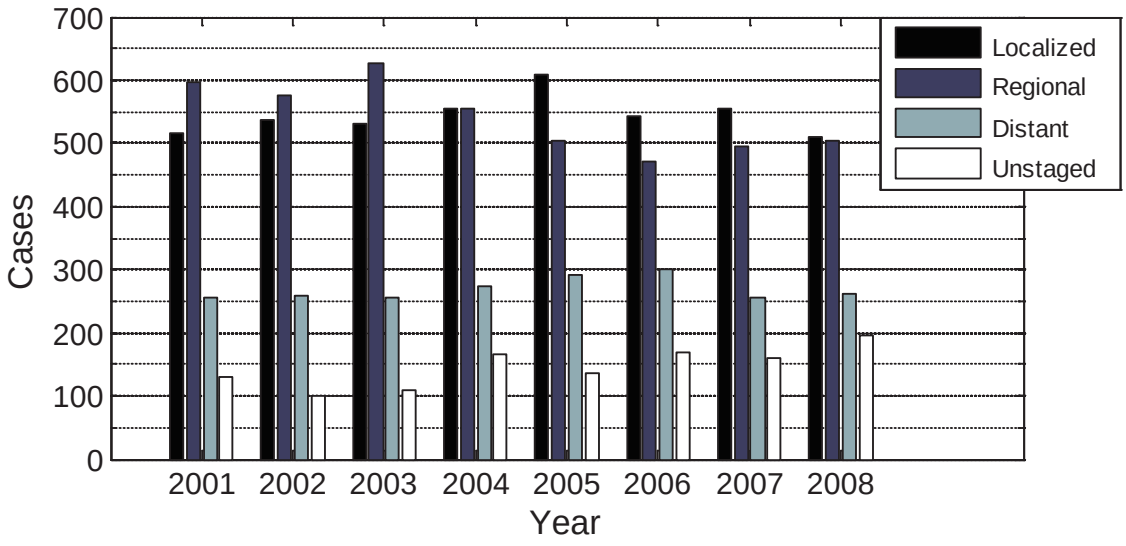
Figure 4.10: Colorectal Cancer; Standard Incidence Ratios (SIR) By County, Arkansas, 1999 - 2008



Disclaimer: Counties with a '*' and SMR > 1 may have a population prevalence for a risk factor(s) which exceeds the state prevalence. This booklet identifies the known risk factors for each cancer site. It should be noted that it usually takes years for most types of cancer to develop so the relevant exposure(s) likely occurred years ago and possibly elsewhere.

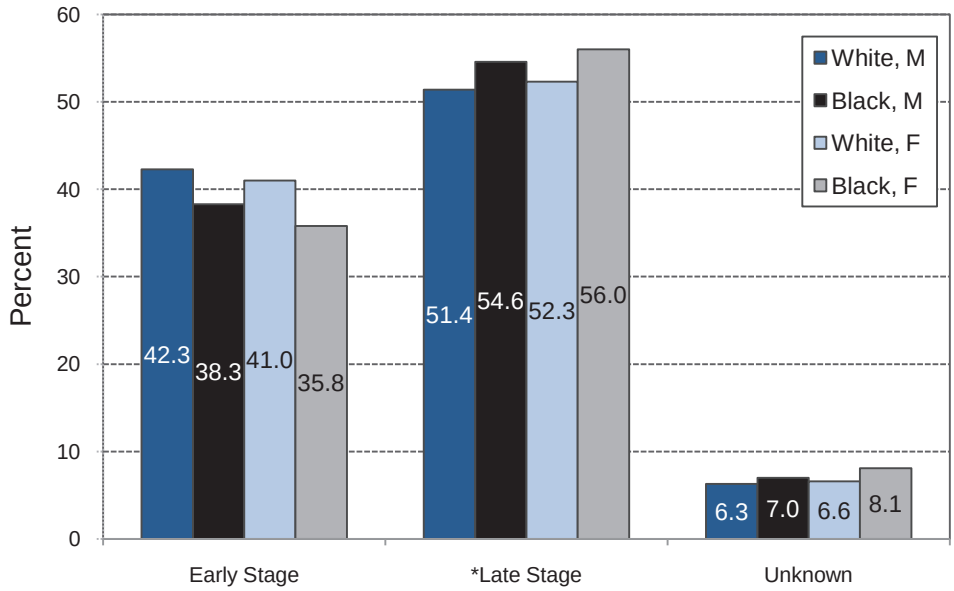
- The counties with incidence rates 10% higher than the statewide rate (SIR ≥ 1.10) are predominately rural, some with a high percentage of Black population.

Figure 4.11: Colorectal Cancer; SEER 2000 Stage at Diagnosis



- The vast majority of colorectal cases were diagnosed at localized or regional stages.
- From 2001 through 2008 there was a shift beginning in 2005 where more cases were diagnosed as localized.

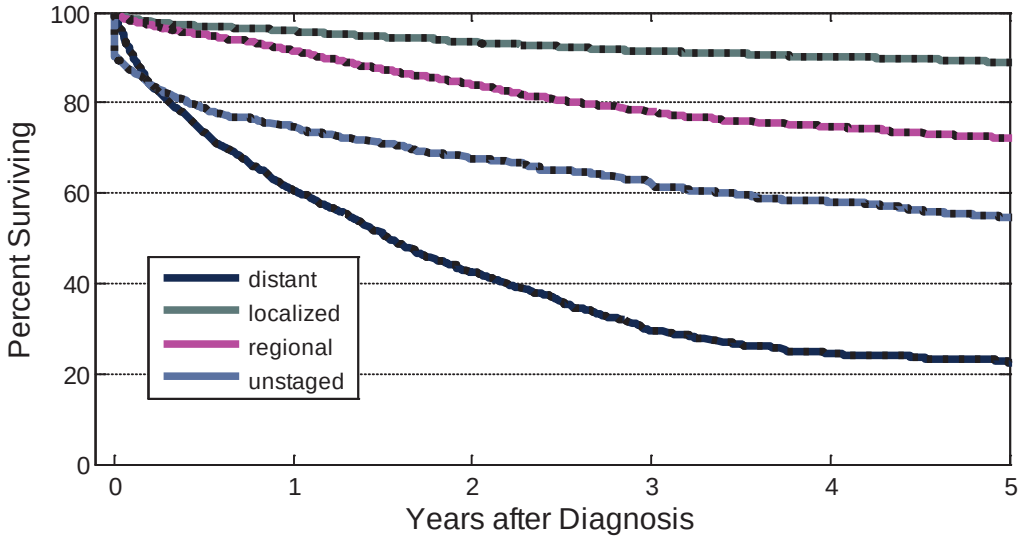
Figure 4.12: Colorectal Cancer, SEER 2000 Stage at Diagnosis, By Race and Sex, 2004 – 2008



*Note: Late stage includes regional and distant stages of disease.

- Black males and females were diagnosed at later stages of disease than White males and females.

Figure 4.13: Colorectal Cancer; Five-Year Survival By Stage at Diagnosis, 2001 - 2008



- Colorectal cancer survival rates depend on stage-at-diagnosis.
  - Localized = 89 %
  - Regional = 72 %
  - Distant = 23 %
  - Overall = 69 %

"Studies show that screening for colorectal cancer helps decrease the number of deaths from the disease."

- National Cancer Institute

Chapter 5: Lung and Bronchus Cancer

A total of 2,625 Arkansans were diagnosed with lung cancer, and 2,126 died of lung cancer in 2008. The median age at diagnosis for lung cancer in Arkansas from 2004 - 2008 was 68 years.

Signs and Symptoms[1, 2,]

Lung cancer is asymptomatic at the earliest stages. As the cancer progresses, common signs and symptoms are:

- Persistent cough;
- Sputum streaked with blood;
- Chest pain;
- Voice changes; and
- Recurrent pneumonia or bronchitis.

Risk Factors [1, 2, 6]

Cigarette smoking is the most common risk factor associated with lung cancer. Men who smoke are 23 times more likely to die of lung cancer than men who do not smoke, and women who smoke are 13 times more likely to die of lung cancer than women who do not smoke. Additional risk factors include occupational or environmental exposures to secondhand smoke, radon gas (radioactive breakdown of uranium rock found in soil and rock), asbestos, certain metals (chromium, cadmium, arsenic), history of tuberculosis, and a family history of lung cancer.

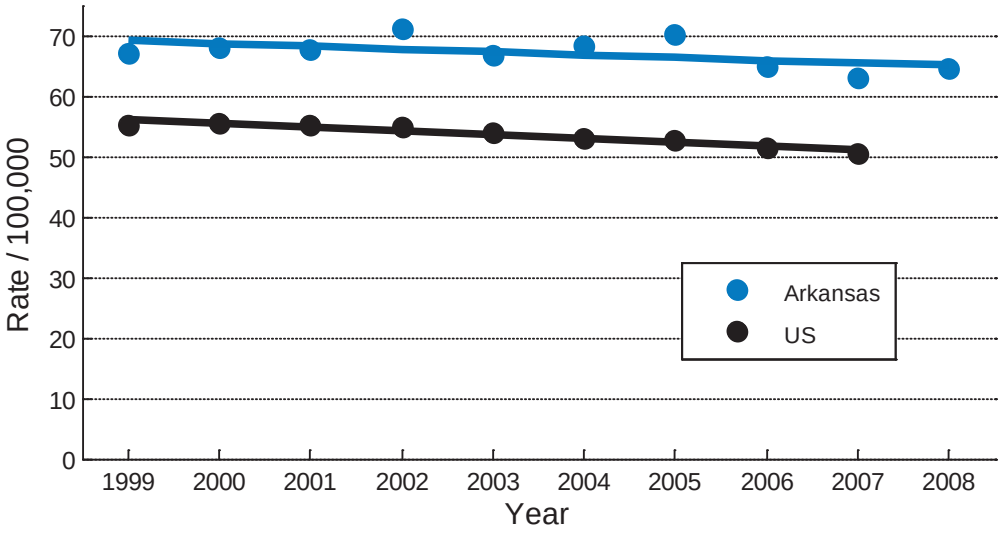
Prevention and Early Detection [5]

The U.S. Preventive Services Task Force concludes there is not sufficient evidence to recommend screening for lung cancer among asymptomatic cases using chest x-ray or sputum examination. Not smoking is the best way to prevent lung cancer.

Treatment [1, 2]

Most common treatment methods are surgery, radiation therapy, chemotherapy, and targeted therapy.

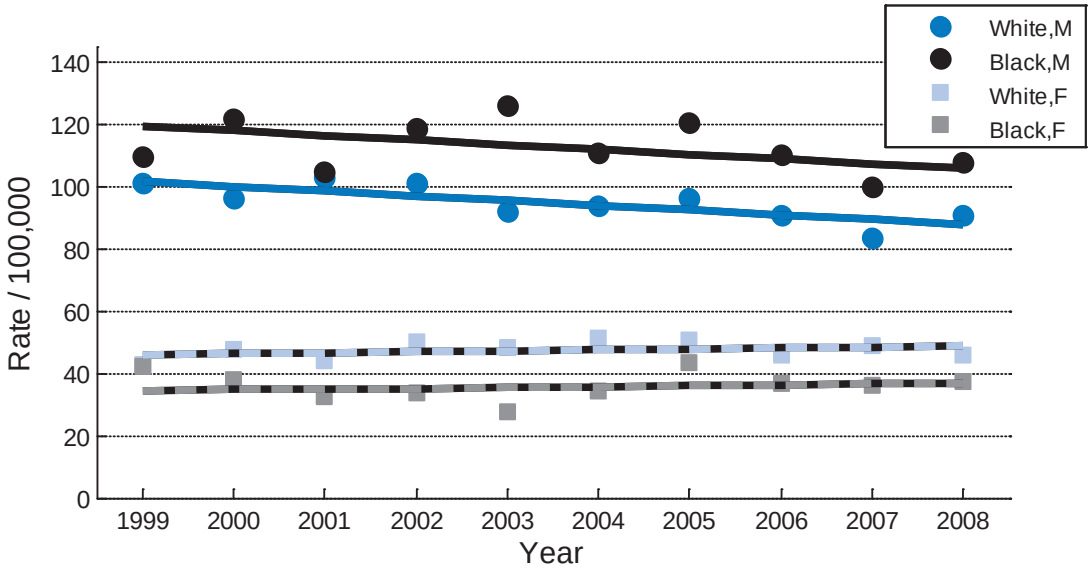
Figure 5.1: Age-Adjusted Lung Cancer Mortality Trends, AR & US, 1999 – 2008*



* U.S. data not yet available for 2008

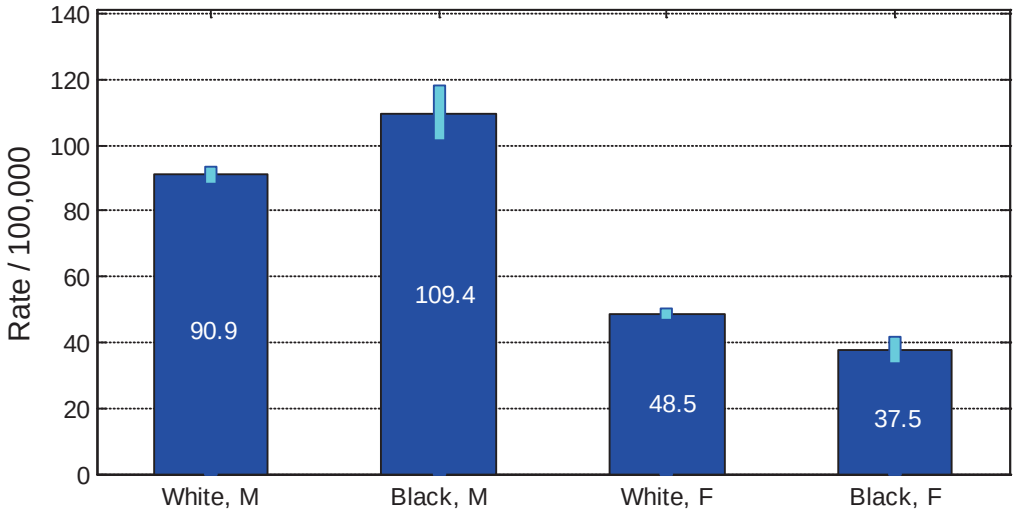
- From 1999 through 2008, Arkansas age-adjusted mortality rates were higher than the rates in the United States.
  - United States had 50.7 deaths per 100,000 in 2007.
  - Arkansas had 63.3 deaths per 100,000 in 2007.
- The observed decline in age-adjusted mortality rates over time in Arkansas were not significant (p = 0.10).
  - The average age-adjusted lung cancer mortality rate for the 10-year period in Arkansas was 67.3 per 100,000.

Figure 5.2: Trends in Lung Cancer Mortality By Race and Sex in Arkansas, 1999 - 2008



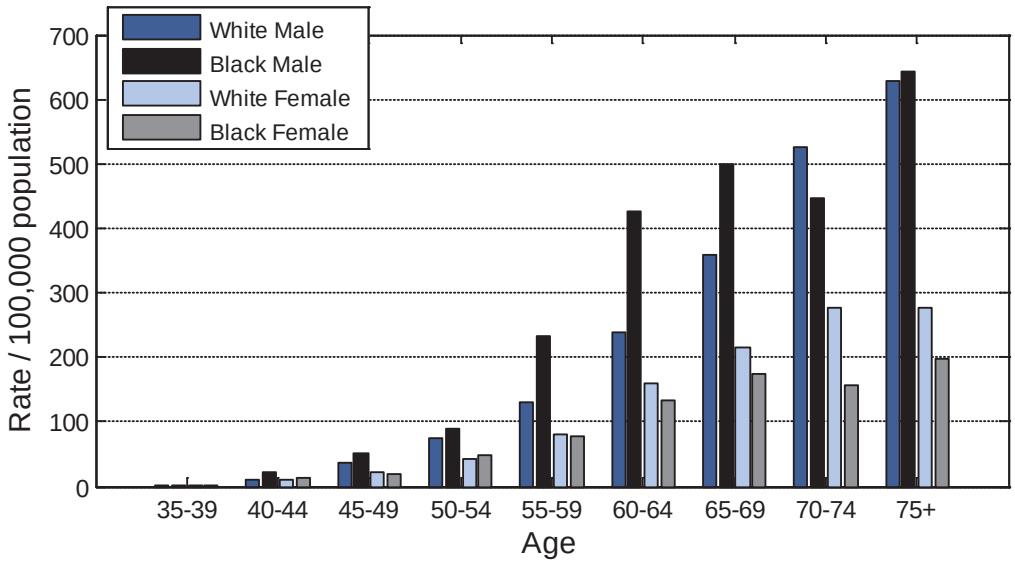
- In 2008, the age-adjusted lung cancer mortality rates by sex and race were: White males, 90.4, Black males, 107.6, White females, 45.6, Black females, 37.2.
- Age-adjusted mortality rates differed substantially between males and females.
  - Males were much more likely to die from lung cancer than females.
- As modeled (trend line) in Figure 5.2, males had a decreasing trend in lung cancer mortality ($p < 0.01$).
  - From 1999 - 2008, death rates from lung cancer among males have steadily declined. The 2008 rates were about 15.3 per 100,000 less than in 1999.
  - Over the period, Black men averaged 17.7 more deaths per 100,000 than White men.
- Lung cancer rates among Black and White females have remained stable over the same period. That is, females had a non-significant lung cancer mortality trend ($p = 0.23$).
  - Black women averaged 11.7 fewer deaths per 100,000 than White women.

Figure 5.3: Age-Adjusted Lung Cancer Mortality and 95% Confidence Intervals By Race and Sex, Arkansas, 2004 - 2008



- Age-adjusted lung cancer mortality rates in males were significantly higher than the rates in females.

Figure 5.4: Age-Specific Lung Cancer Mortality Rates by Race and Sex, Arkansas, 2004 - 2008

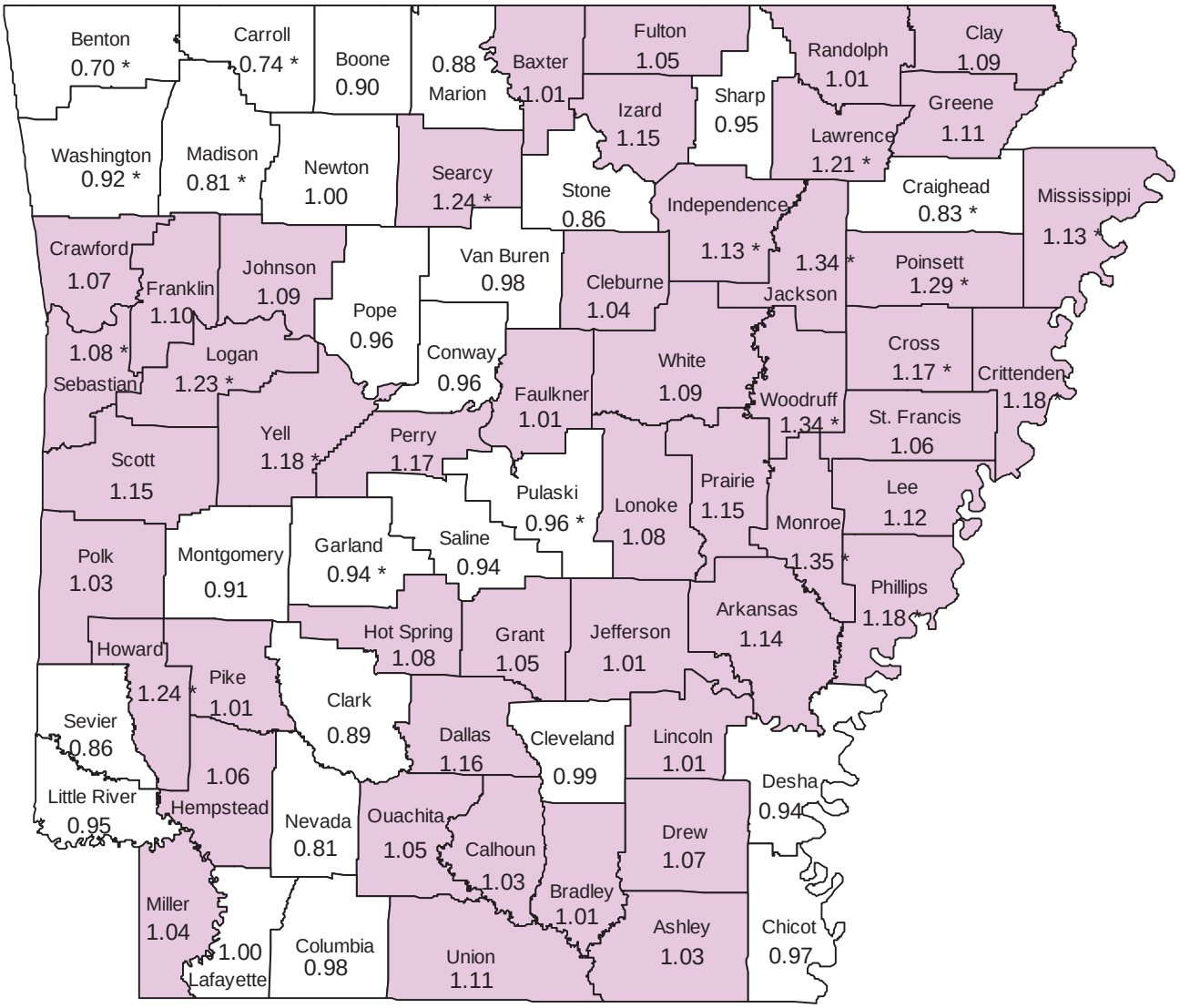


- The median age at death from lung cancer in Arkansas from 2004 through 2008 was 70 years.
- Black males had higher mortality rates for all age groups except ages 70 – 74.

Men who smoke are 23 times more likely to die of lung cancer than men who do not smoke, and women who smoke are 13 times more likely to die of lung cancer than women who do not smoke.

-Centers for Disease Control and Prevention

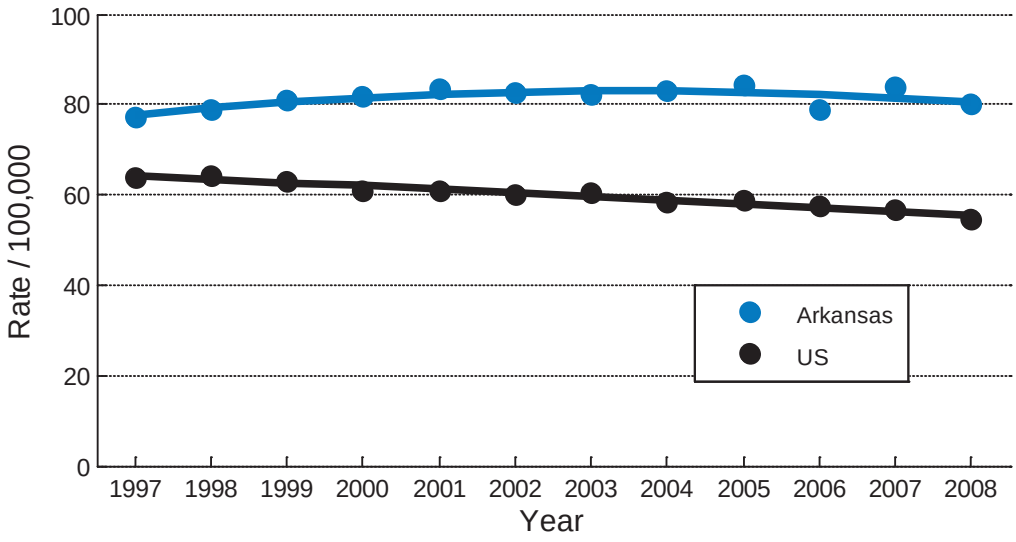
Figure 5.5: Lung Cancer; Standardized Mortality Ratio (SMR) by County, Arkansas, 1999 - 2008



Disclaimer: Counties with a '*' and SIR > 1 may have a population prevalence for a risk factor(s) which exceeds the state prevalence. This booklet identifies the known risk factors for each cancer site. It should be noted that it usually takes years for most types of cancer to develop so the relevant exposure(s) likely occurred years ago and possibly elsewhere. For example, lung cancer rates largely reflect the smoking prevalence; not so much present-day smoking prevalence but the prevalence decades ago.

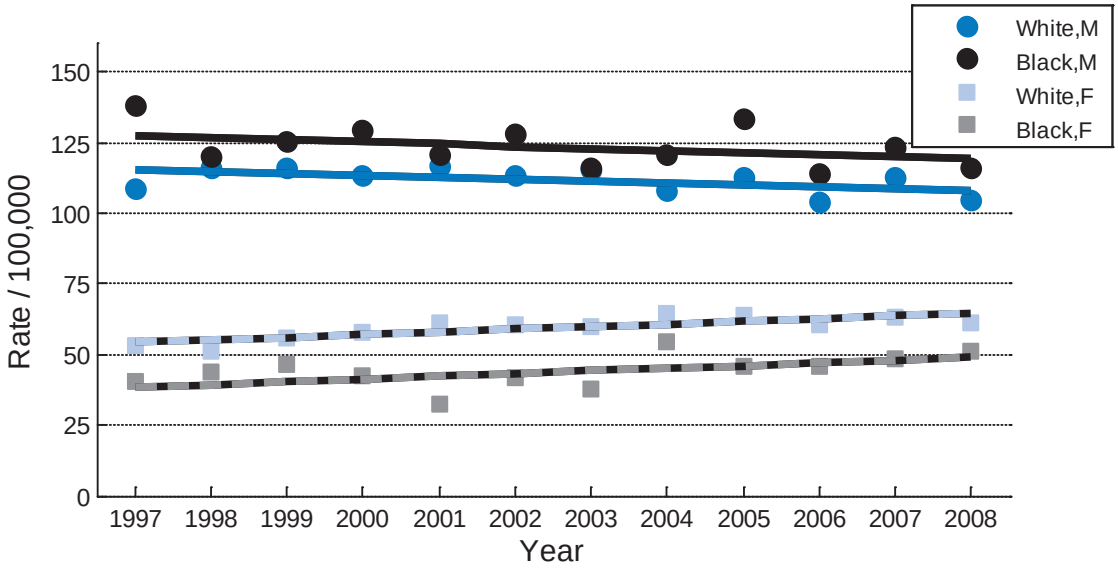
- Counties with lung cancer mortality rates 10% or higher than the statewide rate (SMR ≥ 1.10) included counties throughout many rural areas of the state with no distinctive clustering.

Figure 5.6: Age-Adjusted Lung Cancer Incidence Trends, AR & US, 1997 - 2008



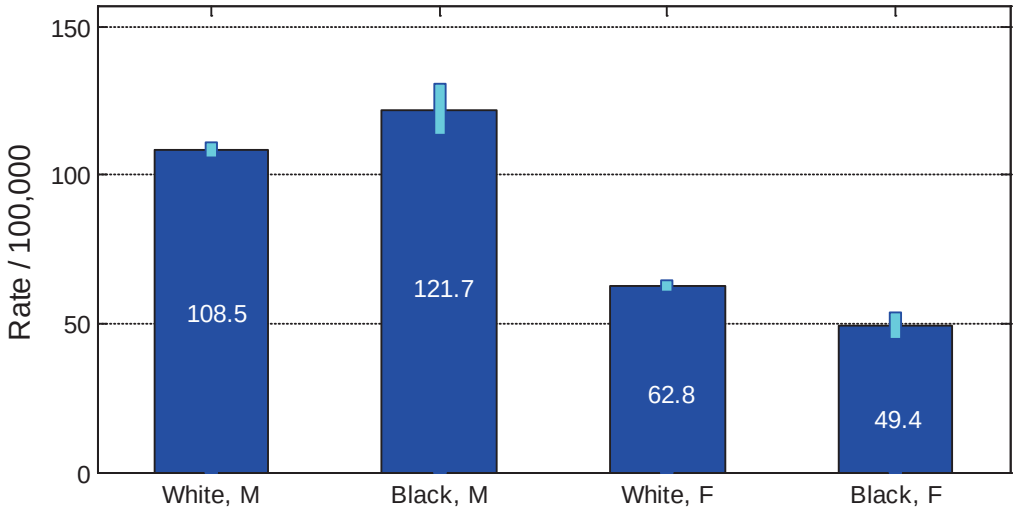
- Arkansas age-adjusted lung cancer incidence rates were higher than the rates for the United States.
  - Arkansas averaged 81.4 cases per 100,000 from 1997 – 2008, versus an average of fewer than 60 cases per 100,000 in the United States from 1997 – 2008.

Figure 5.7: Lung Cancer Incidence Trends By Race and Sex, Arkansas, 1997 - 2008



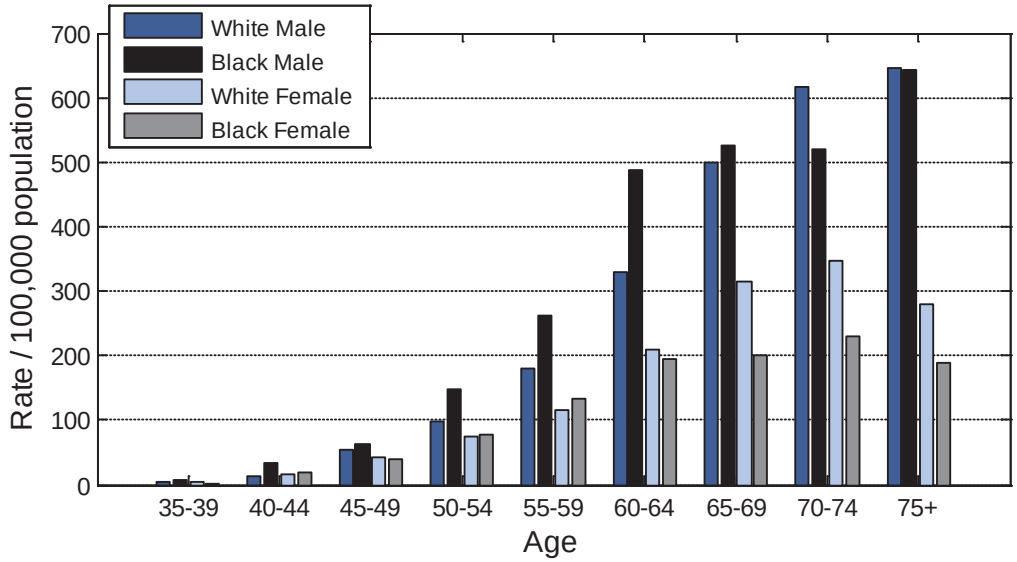
- In 2008, the age-adjusted lung cancer incidence rates by race were: White males, 104.7, Black males, 116.4, White females, 61.6, and Black females 51.1.
- From 1997 through 2008, Arkansas males (Black and White combined) had an annual decline of 0.71 lung cancer cases per 100,000.
- From 1997 through 2008, Black males had an average of 12.2 cases per 100,000 more than White males.
- Overall, Arkansas females (Black and White combined) had an annual increase of 0.95 lung cancer cases per 100,000.
- Black females averaged 15.7 cases per 100,000 less than White females from 1997 – 2008.

Figure 5.8: Age-Adjusted Lung Cancer Incidence and 95% Confidence Intervals by Race and Sex, Arkansas, 2004 - 2008



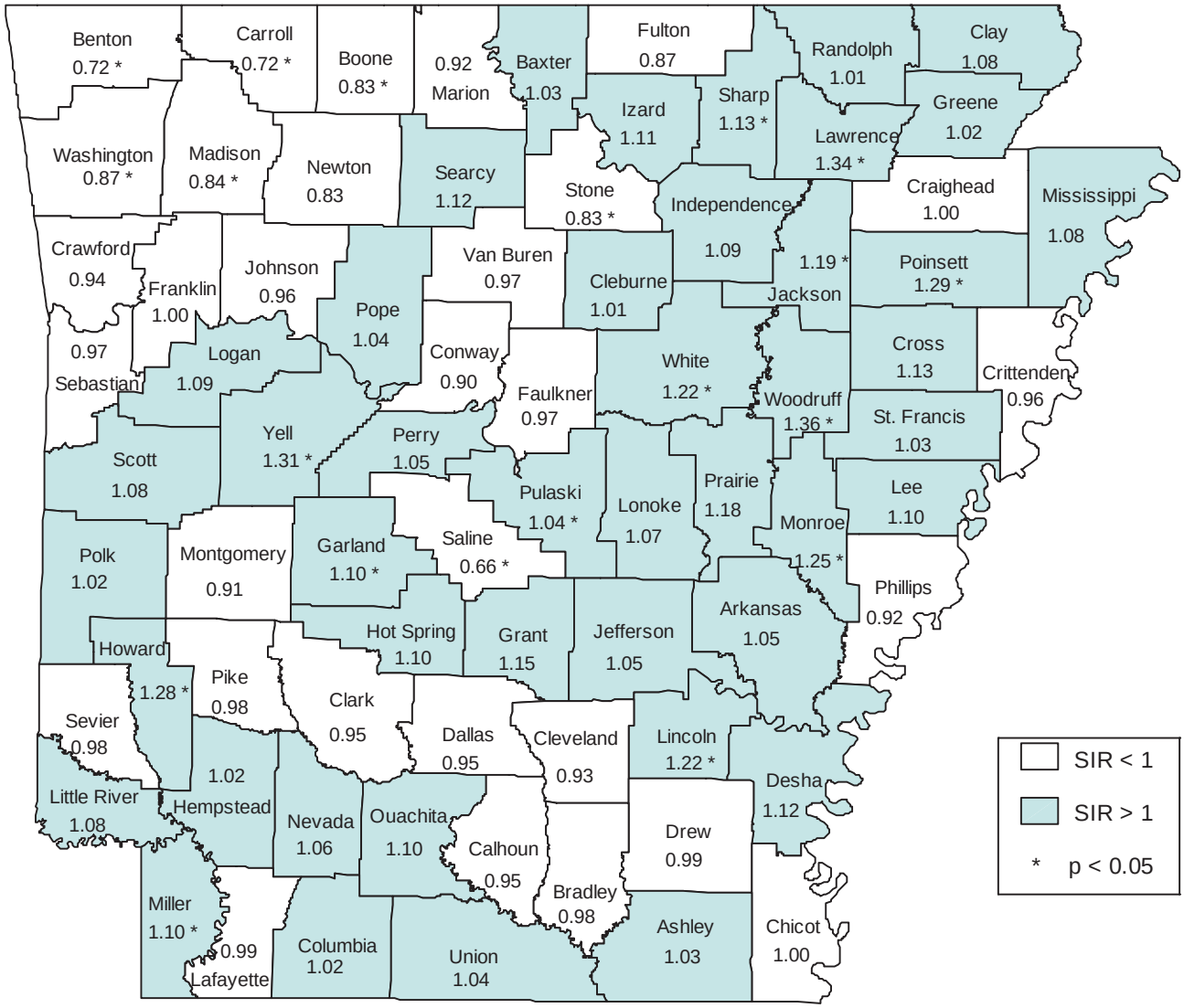
- Males had higher incidence rates of lung cancer than females over the 5-year period ($p < 0.01$).
- Black male incidence rates were significantly higher than that of White males.

Figure 5.9: Age-Specific Lung Cancer Incidence Rates By Race and Sex, Arkansas, 2004 - 2008



- Median age at diagnosis during 2004 through 2008 was 68 years of age.
- The disease patterns at younger ages were different from patterns at older ages.
  - The higher rate among Black males seen in Figure 5.8 was largely driven by the differences in rates at younger ages.
    - While rates for Black males from ages 40 to 64 were higher than that of White males, Black men 65 and older tended to have similar lung cancer rates as White men.
  - The pattern among Black and White females seen in Figure 5.8 was largely driven by the differences in rates at older ages.
    - White females had higher rates of lung cancer than Black females at older ages, but there was little difference in rates between the races among younger women.

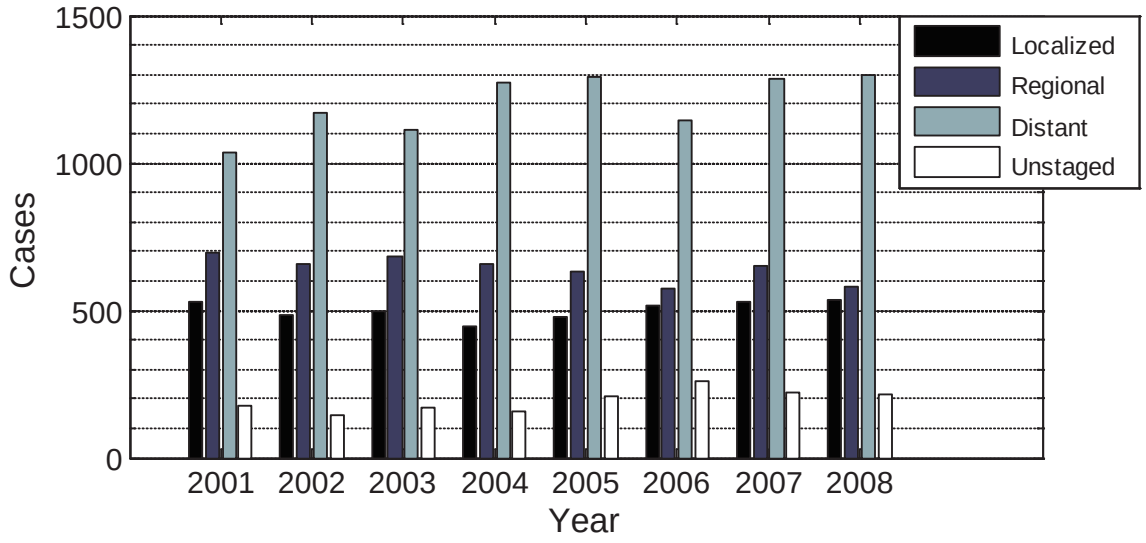
Figure 5.10: Lung Cancer; Standardized Incidence Ratio (SIR) by County, Arkansas, 1997 – 2008



Disclaimer: Counties with a '*' and SIR > 1 may have a population prevalence for a risk factor(s) which exceeds the state prevalence. This booklet identifies the known risk factors for each cancer site. It should be noted that it usually takes years for most types of cancer to develop so the relevant exposure(s) likely occurred years ago and possibly elsewhere. For example, lung cancer rates largely reflect the smoking prevalence; not so much present-day smoking prevalence but the prevalence decades ago.

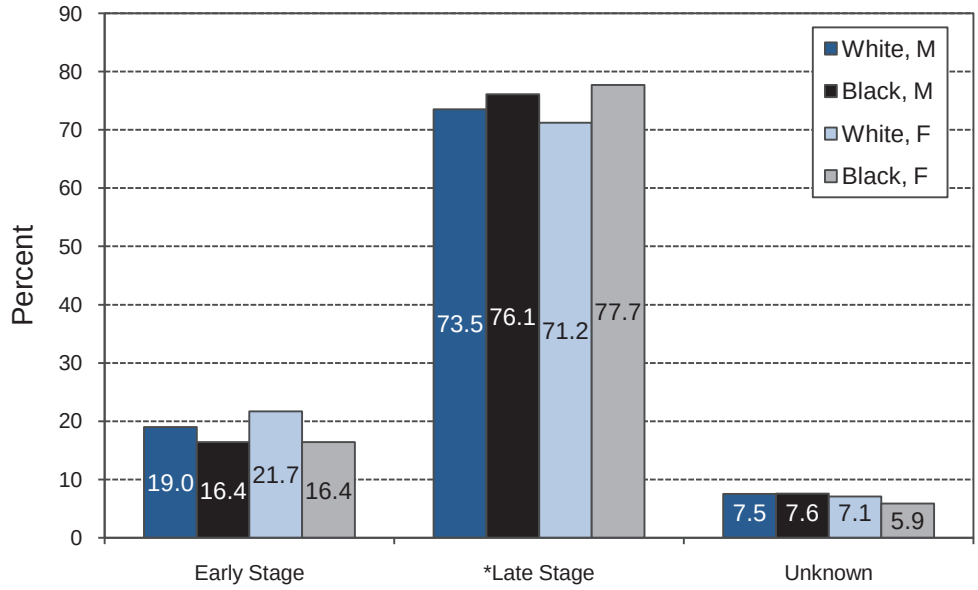
- Counties with lung cancer incidence rates 10% or higher than the statewide rate (SIR ≥ 1.10) were distributed through many rural areas of the state with no distinctive clustering.

Figure 5.11: Lung Cancer, SEER 2000 Stage at Diagnosis



- The vast majority (47%) were diagnosed at a distant stage which has a low survival rate (Figure 5.13).

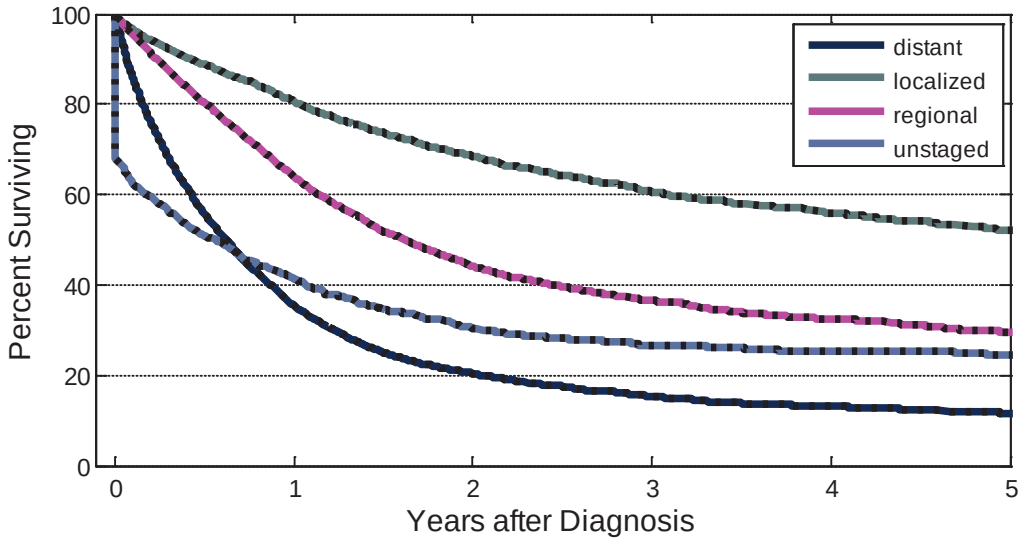
Figure 5.12: Lung Cancer, SEER 2000 Stage at Diagnosis, By Race and Sex, 2004 – 2008



*Note: Late stage includes regional and distant stages of disease.

- Black males and females were diagnosed at later stages of lung cancer than White males and females.

Figure 5.13: Lung Cancer, Five-Year Survival By Stage at Diagnosis, 2001 - 2008



- Lung cancer survival rates depend on stage at diagnosis.
  - Localized = 52 %
  - Regional = 30 %
  - Distant = 12 %
  - Overall = 26 %

Chapter 6: Lymphoma

A total of 629 men and women in Arkansas were diagnosed with lymphoma in 2008, including 552 cases of Non-Hodgkin Lymphoma (NHL) and 77 cases of Hodgkin lymphoma. For the same year, 192 deaths occurred from lymphoma, including 186 deaths from NHL and only 6 deaths from Hodgkin lymphoma. NHL is further analyzed in this report since it is the most prevalent type of lymphoma among adults in Arkansas and the United States. The median age at diagnosis for NHL in Arkansas from 2004 - 2008 was 68 years.

Signs and Symptoms [2, 7]

Non-Hodgkin Lymphoma comprises of a large group of cancers of the white blood cells (lymphocytes), and there are various types of lymphatic cancers. Non-Hodgkin Lymphoma is usually divided into two categories: aggressive (fast-growing) and indolent (slow-growing). The most common symptoms of the disease include:

- Swollen lymph nodes;
- Itching skin, night sweats, and fatigue; and
- Unexplained weight loss and sporadic fever.

Detection [2, 7]

Non-Hodgkin Lymphoma is diagnosed using blood tests to check white blood cell levels and a chest x-ray to check for swollen lymph nodes. A lymph node biopsy is performed for final determination.

Risk Factors [2, 7]

The risk of developing NHL increases with age. Being male and White are also factors associated with the disease. Causes of lymphoma are largely unknown; however, immune system abnormalities have been identified as a risk factor for NHL. Persons at higher risk include those with severe autoimmune disorders and those diagnosed with human immunodeficiency virus (HIV), human T-cell leukemia virus type I (HTLV-I), Epstein Barr virus (EBV), and Helicobacter pylori (H.pylori) infection. Persons taking immunosuppressant drugs after an organ transplant are also at increased risk.

Treatment [2, 7]

Non-Hodgkin Lymphoma is usually treated with chemotherapy and radiation. High dose chemotherapy with stem cell transplantation is used in recurrent disease or when NHL is persistent.

"Non-Hodgkin Lymphoma is slightly more common in men than in women. Whites are affected more often than African Americans or Asian Americans. A person's risk of getting NHL during his or her lifetime is about 1 in 50."

-American Cancer Society

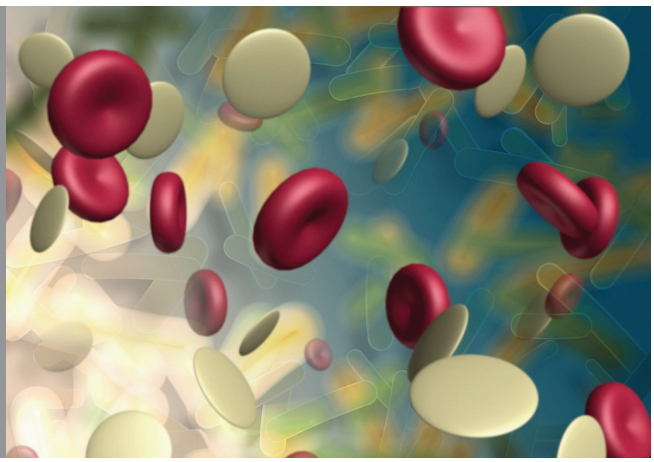
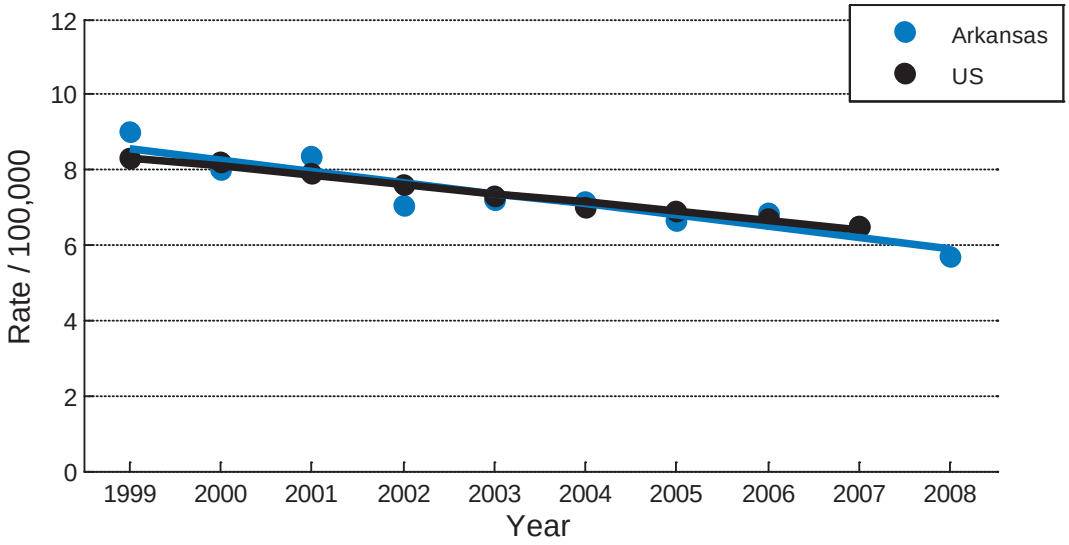


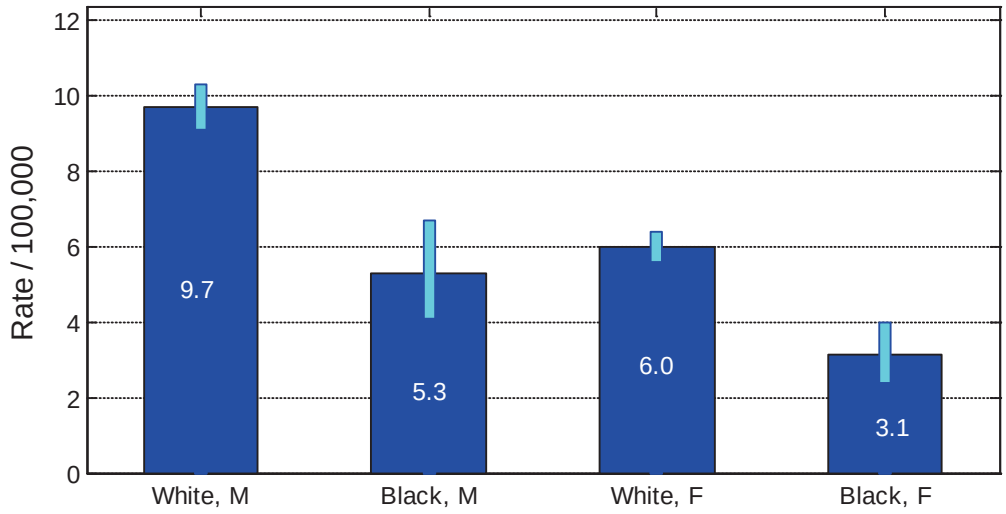
Figure 6.1: Trends in Age-Adjusted Mortality from Non-Hodgkin Lymphoma, AR & US, 1999 - 2008*



* U.S. data not yet available for 2008

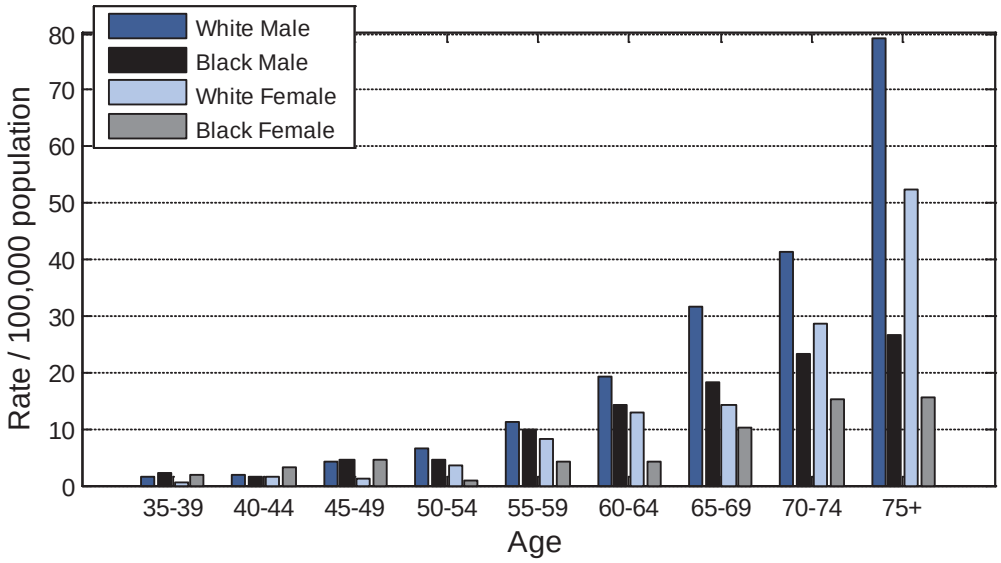
- From 1999 through 2008, Arkansas age-adjusted mortality rates for NHL were nearly identical to the United States.
  - United States had 6.5 deaths per 100,000 in 2007.
  - Arkansas also had 6.5 deaths per 100,000 in 2007.
- Arkansas rates have declined over the period ($p < 0.01$) at an annual rate of 0.3 deaths per 100,000 population.

Figure 6.2: Age-Adjusted Mortality Rates from Non-Hodgkin Lymphoma and 95% Confidence Intervals by Race and Sex, Arkansas, 1999 - 2008



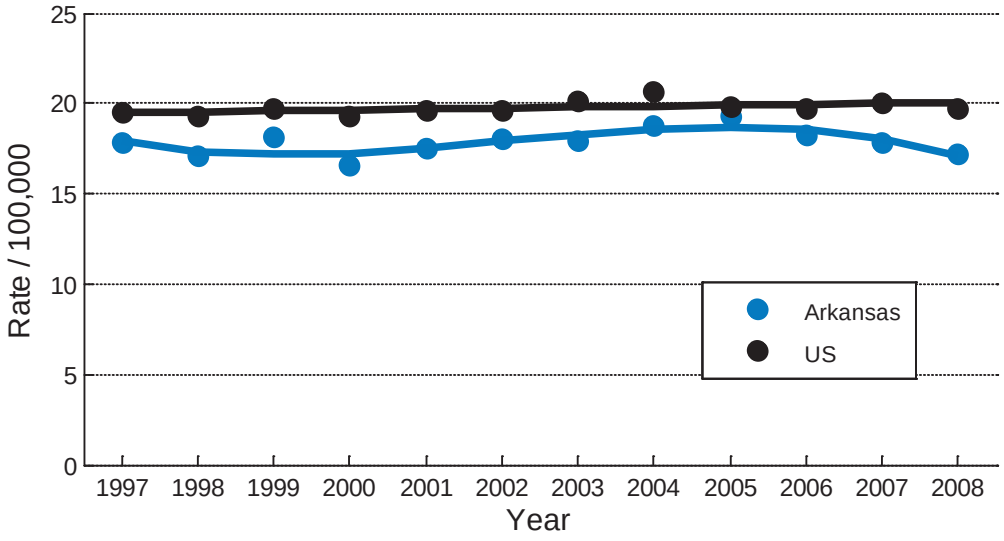
- Rates among White males and females were significantly higher than rates among the corresponding gender groups among Blacks ($p < 0.01$).
- White male rates are significantly higher than all other race and gender groups ($p < 0.01$).

Figure 6.3: Age-Specific Mortality Rates from Non-Hodgkin Lymphoma By Race and Sex, Arkansas, 1999 - 2008



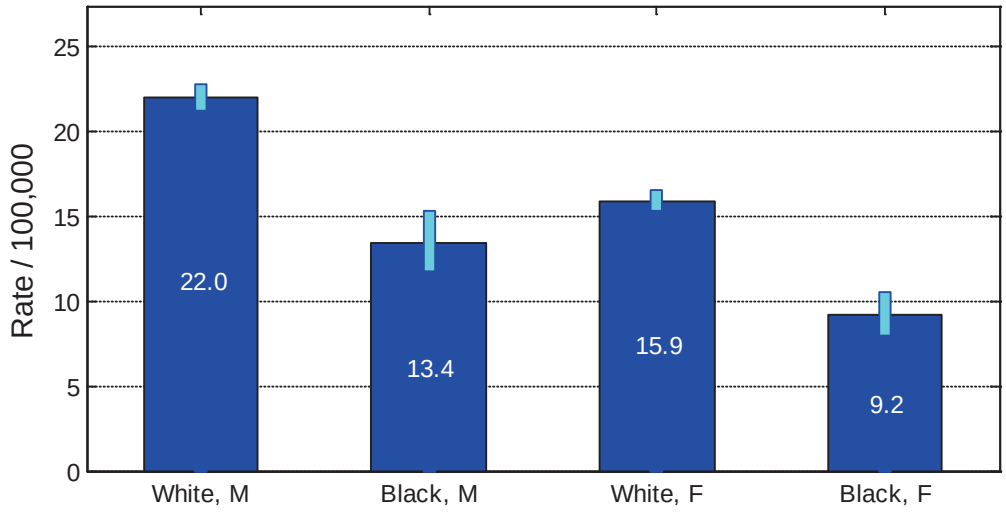
- Median age at death from Non-Hodgkin Lymphoma in Arkansas from 1999 through 2008 was 74 years.
  - The mortality rates increased with age.
- White males have substantially higher rates beginning in the 60-64 age group and continuing for all older age groups.

Figure 6.4: Trends in Age-Adjusted Incidence of Non-Hodgkin Lymphoma, AR & US, 1997 - 2008



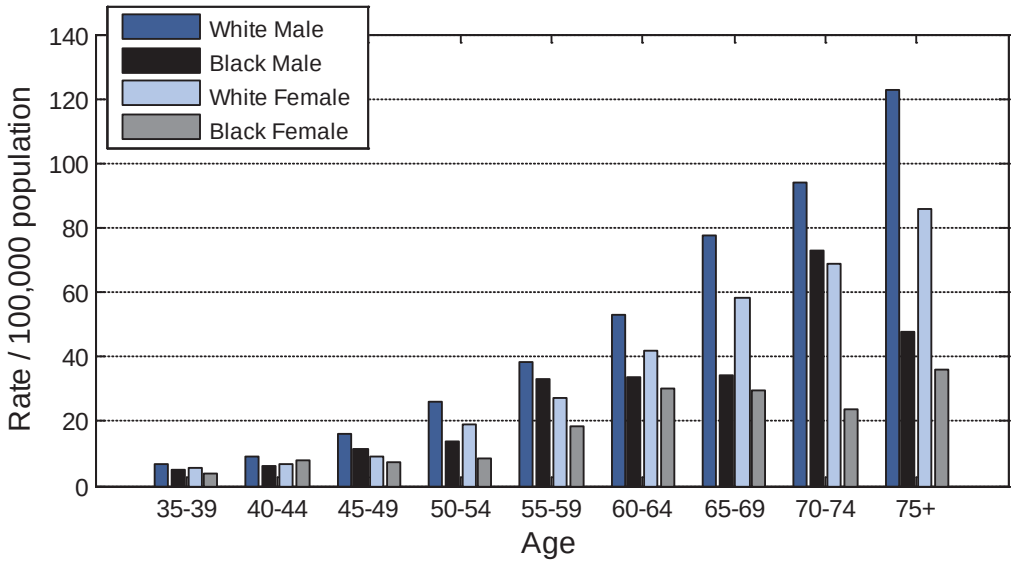
- Arkansas age-adjusted NHL rates were lower than the rates for the United States.
  - The rate in Arkansas in 2008 was 17.2 per 100,000.
  - The rate in the United States in 2008 was 19.7 per 100,000.
- In Arkansas, changes over time were relatively constant.

Figure 6.5: Age-Adjusted Incidence Rates of Non-Hodgkin Lymphoma and 95% Confidence Intervals by Race and Sex, Arkansas, 1999 - 2008



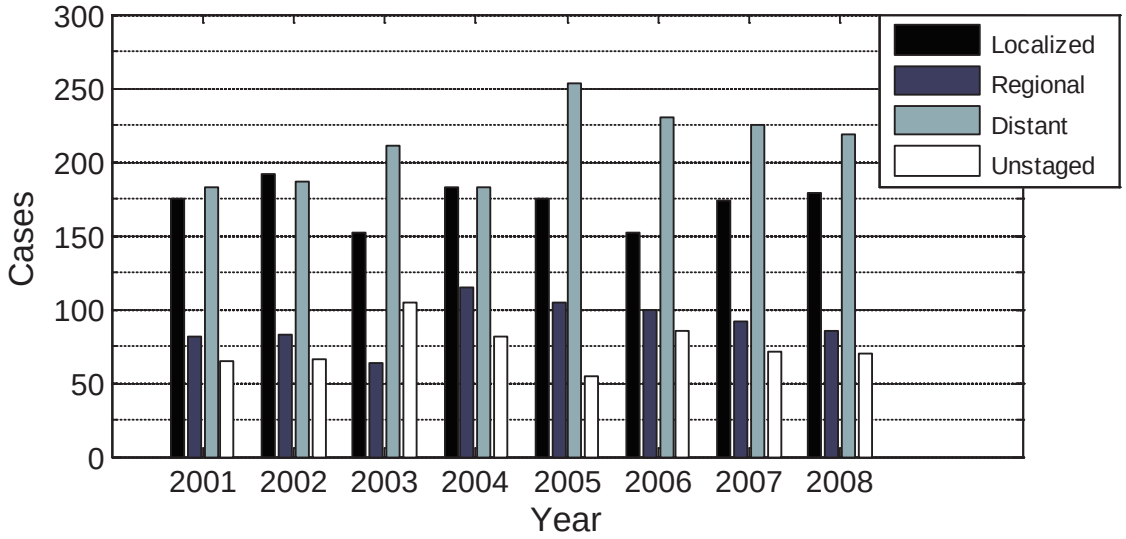
- Incidence rates among White males and females were significantly higher than the corresponding gender groups among Blacks.
- White male rates were significantly higher than all other race and gender groups.

Figure 6.6: Age-Specific Incidence Rates of Non-Hodgkin Lymphoma By Race and Sex, Arkansas, 1999 – 2008



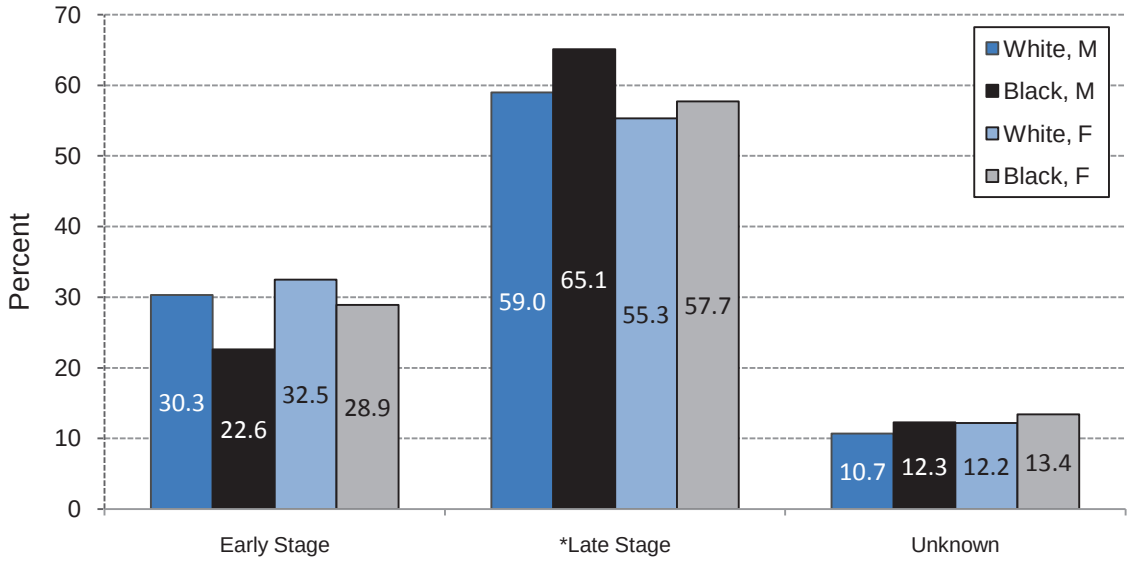
- Median age at diagnosis from 1999 through 2008 was 68 years.
- The overall higher rate among White males was attributable to substantially higher age-specific rates beginning in the 50 - 54 year age group and continuing and increasing with each older age group.

Figure 6.7: Non-Hodgkin Lymphoma, SEER 2000 Stage at Diagnosis



- Approximately one-third of the cases were diagnosed at localized stages while another one-third was diagnosed as distant stages.
- Beginning in 2005, there was a modest shift in stage at diagnosis with more cases being diagnosed as distant.

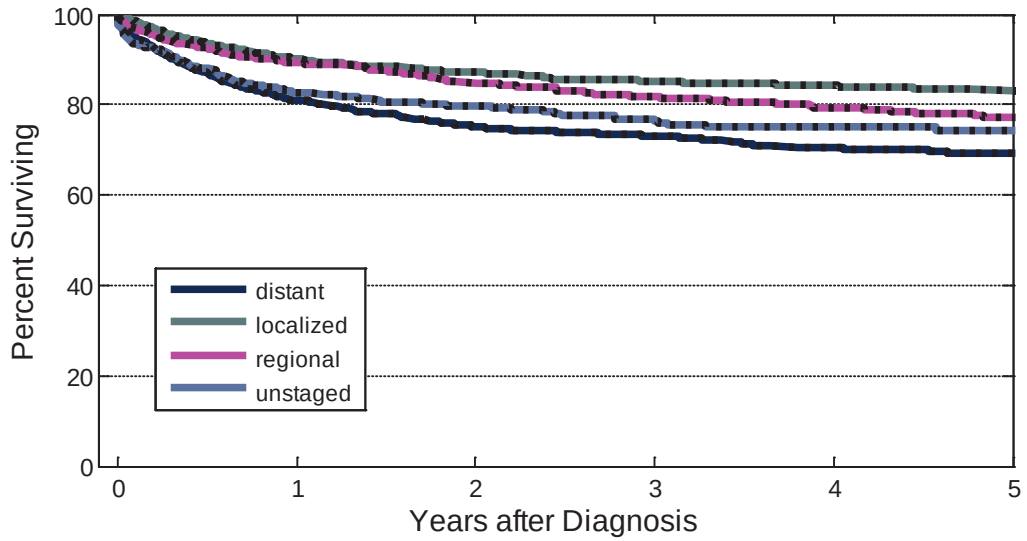
Figure 6.8: Non-Hodgkin Lymphoma, SEER 2000 Stage at Diagnosis, By Race and Sex, 2004 – 2008



*Note: Late stage includes regional and distant stages of disease.

- Black men and women were diagnosed at later stages of disease than White men and women respectively. Note that percentages for Blacks are based on a small numbers of cases.

Figure 6.9: Non-Hodgkin Lymphoma, Five-Year Survival By Stage at Diagnosis, 2001 - 2008



- Non-Hodgkin Lymphoma 5-year survival rates depend on stage-at-diagnosis.
  - Localized = 83%
  - Regional = 77%
  - Distant = 69%
  - Overall = 76%

Chapter 7: Melanoma of the Skin

A total of 420 men and women in Arkansas were diagnosed with melanoma (in addition, there were 205 in situ cases), and 78 died of melanoma in 2008. The median age at diagnosis for melanoma in Arkansas from 2004 - 2008 was 65 years. The occurrence of melanoma in the Black population was very low; only 39 cases have been recorded since 1997 compared to more than 6,000 in the White population. Therefore, the case counts among the black population were too small to analyze in this report. In addition, tumor staging information by race was omitted from this chapter.

Signs and Symptoms [2, 8]

Melanoma is a cancer of the melanocyte cells which are responsible for producing the skin color or pigment melanin. Melanoma usually occurs on the trunk of the body in men (head, neck, shoulders to hips), and on the legs and arms in women. It usually begins as small mole-like growths, and using the ABCD guidelines can help detect warning signs:

- A = Asymmetry (one side of mole does not match the other side);
- B = Border irregularity (edges of are ragged, notched, or blurred);
- C = Change in color (variability in the tan, brown, or black color of a mole); and
- D = Diameter is greater than 6 millimeters (size of a pencil eraser).

Risk Factors [2]

The risk factors for melanoma includes a personal or family history of the disease, occurrence of more than 50 moles, occurrence of atypical moles, history of excessive sun exposure or UV radiation exposure from tanning booths, and a suppressed immune system from other diseases.

Prevention and Early Detection [2]

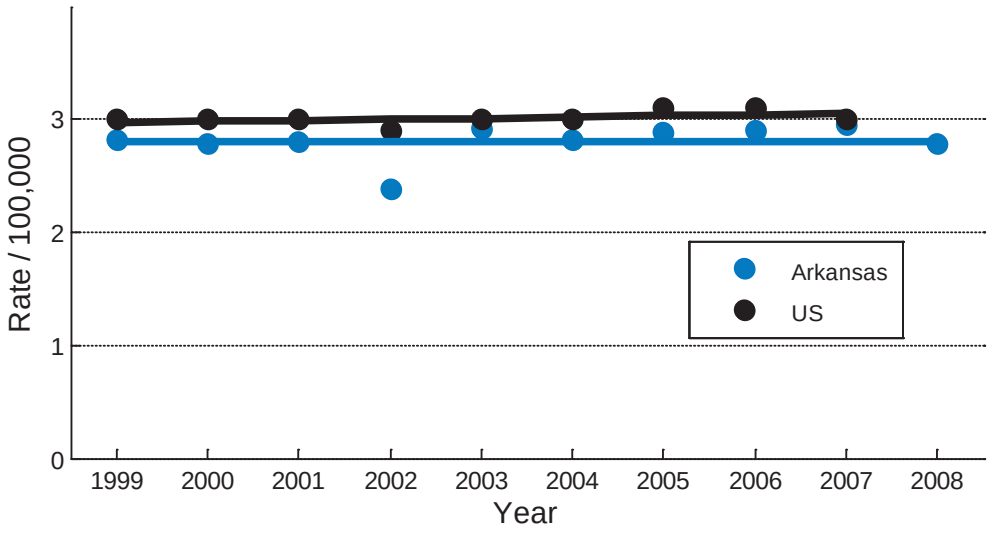
Protecting the skin from sun exposure is the best way to prevent melanoma. Wearing sunscreen with sun protective factor (SPF) of 15 or higher; and avoiding tanning salons and sunbathing; wearing clothing, sunglasses, and hats to cover the skin to protect against UV radiation exposures are suggested protective measures.

Examining the skin for changes to moles, new growths, or unusual skin appearances is the best way to detect skin cancer. Any noticeable changes should be promptly examined by a physician.

Treatment [2]

Malignant melanoma usually requires the removal of the primary site and surrounding tissue. A biopsy of the sentinel lymph node to detect the stage of melanoma may be needed. Melanoma that has spread usually requires additional surgery, immunotherapy, chemotherapy, and/or radiation therapy.

Figure 7.1: Age-Adjusted Melanoma Mortality Trends in Whites, AR & US, 1999 – 2008*



* U.S. data not yet available for 2008

- From 1999-2008, Arkansas age-adjusted mortality rates for melanoma were slightly below rates in the United States.
  - United States had 3.0 deaths per 100,000 in 2007.
  - Arkansas had 2.95 deaths per 100,000 in 2007.
- In Arkansas, the changes in age-adjusted mortality rates over time were not significant (p = 0.36).
  - The average age-adjusted melanoma mortality rate during this period was 2.8 per 100,000.

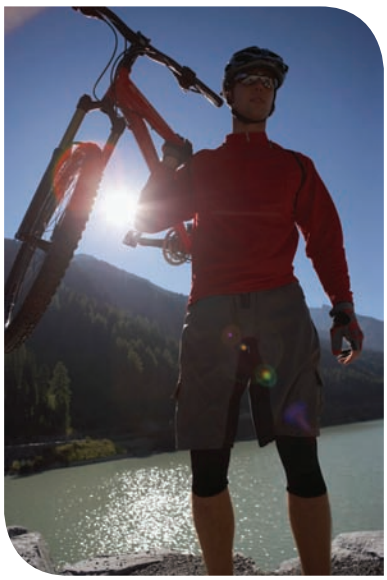
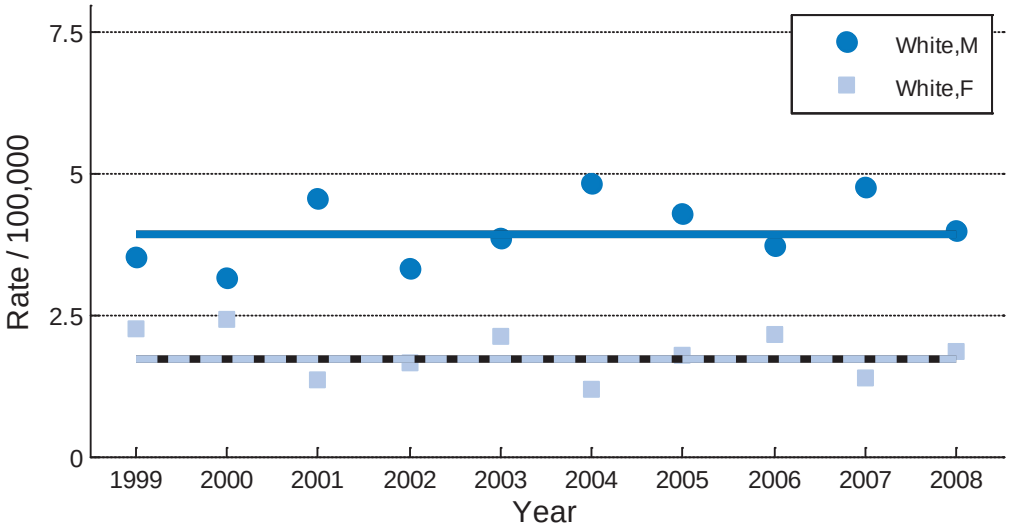
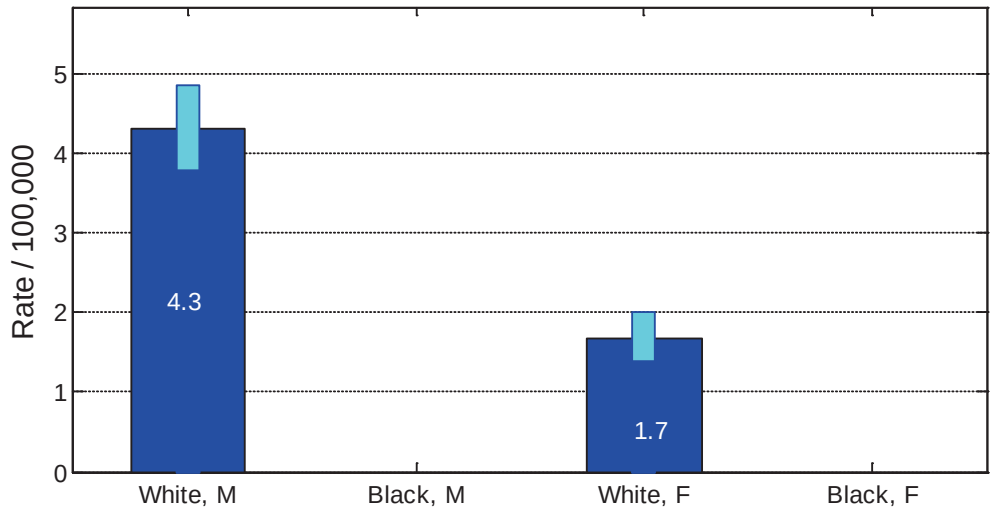


Figure 7.2: Trends in Melanoma Mortality by Sex in Arkansas, 1999 - 2008



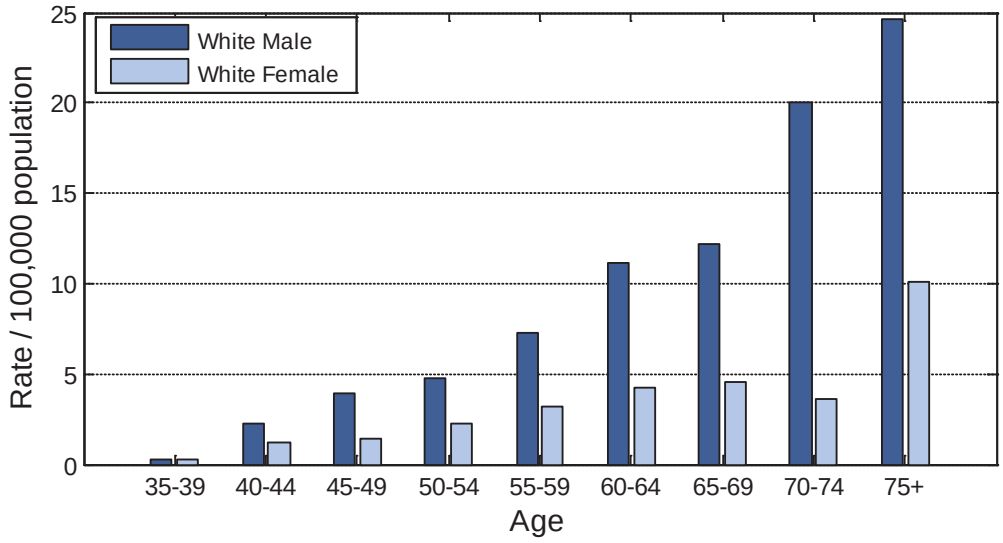
- Melanoma mortality rates for both White men and women have remained stable over time (p = 0.95).
  - From 1999 through 2008, White women averaged 1.7 deaths per 100,000, or 2.2 fewer deaths per 100,000 than White men.
  - The average mortality rate for White men from 1999 through 2008 was 3.9 deaths per 100,000.

Figure 7.3: Melanoma Mortality by Sex in Arkansas, 2004 - 2008



- White men averaged 4.3 deaths per 100,000 over a 5-year period (2004 - 2008) versus 1.7 deaths among White women over the same period.

Figure 7.4: Age-Specific Melanoma Mortality Rates By Race and Sex, Arkansas, 2004 - 2008



- The median age at death from melanoma in Arkansas from 2004 through 2008 was 68 years.
- White men have higher rates than White women at all ages.

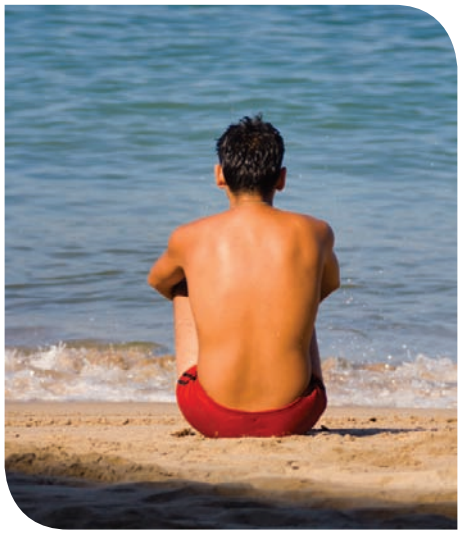
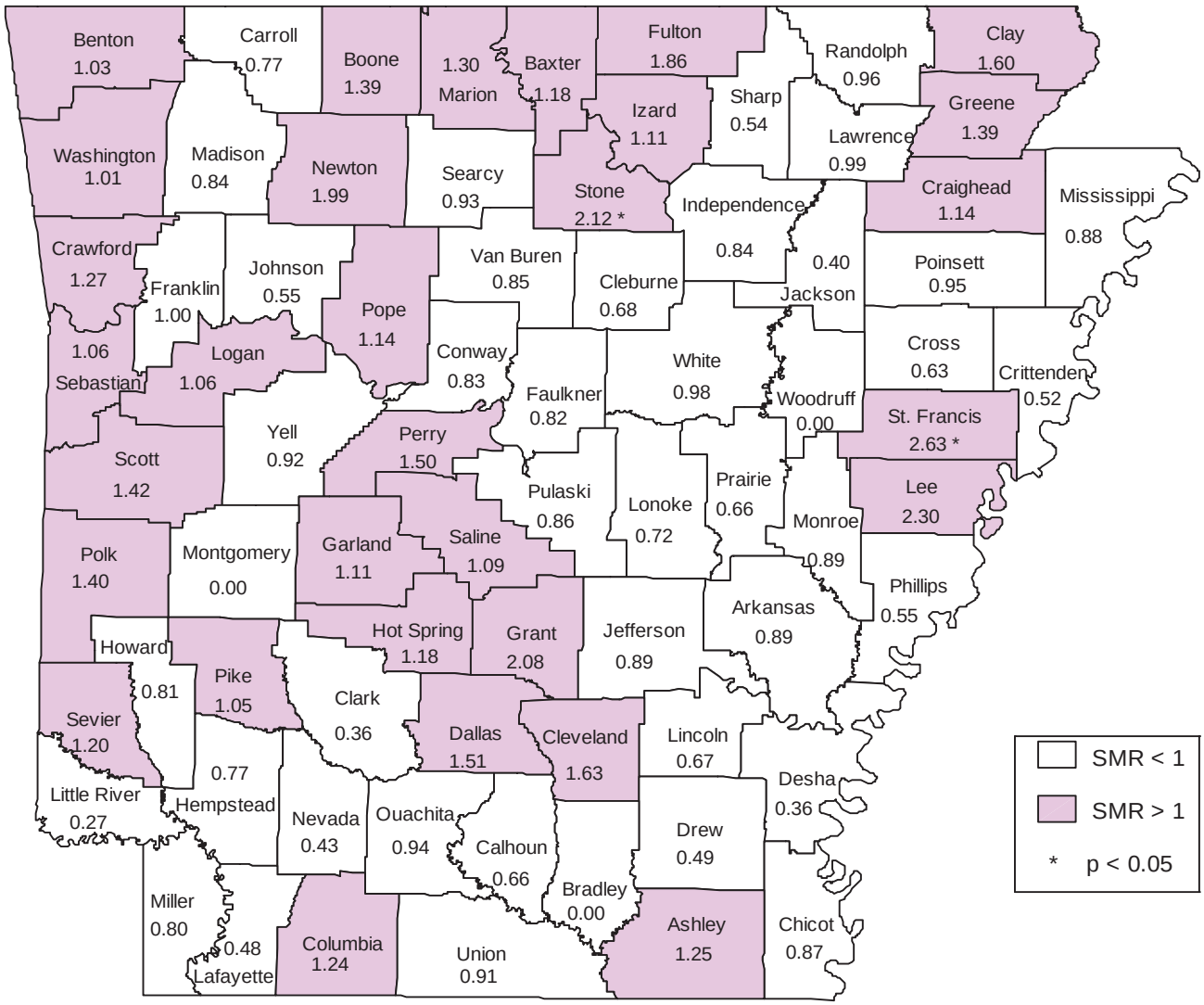


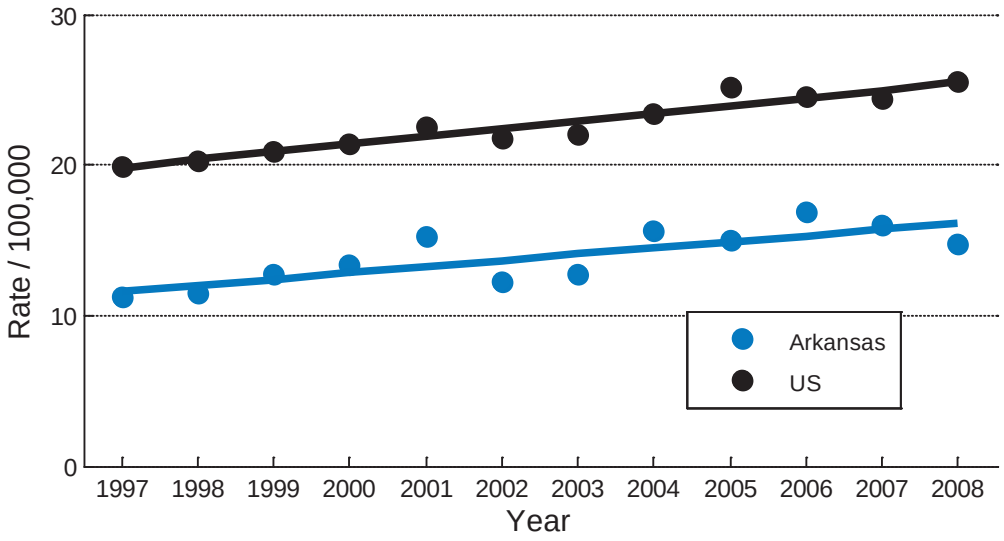
Figure 7.5: Melanoma in White Arkansans; Standardized Mortality Ratio (SMR) By County, Arkansas, 1999 - 2008



Disclaimer: Counties with an '*' and SMR > 1 may have a population prevalence for a risk factor(s) which exceeds the state prevalence. It should be noted that it usually takes years for most types of cancer to develop so the relevant exposure(s) likely occurred years ago and possibly elsewhere.

- The distribution of elevated melanoma death rates were concentrated in the western half of the state and the northern counties.

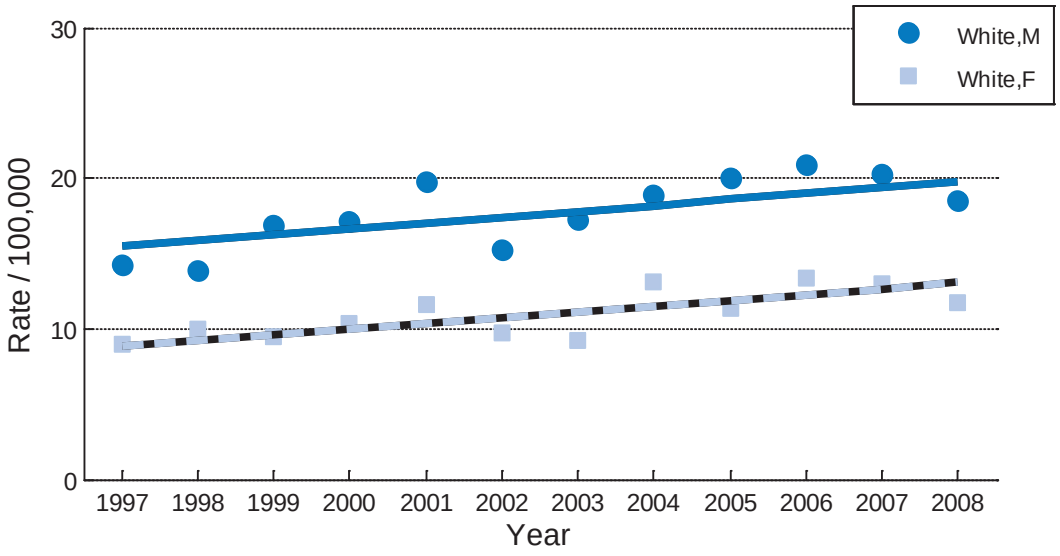
Figure 7.6: Age-Adjusted Melanoma Incidence Trends in Whites, AR & US, 1997-2008



- For all years shown, Arkansas age-adjusted melanoma incidence rates were lower than the rates for the United States.
  - The rate in Arkansas in 2008 was 14.8 per 100,000.
  - The rate in the United States in 2008 was 25.5 per 100,000.
- In Arkansas, the increase in incidence rates during 1997 through 2008 was significant ($p < 0.01$).
  - Yearly increase averaged 0.41 cases per 100,000.

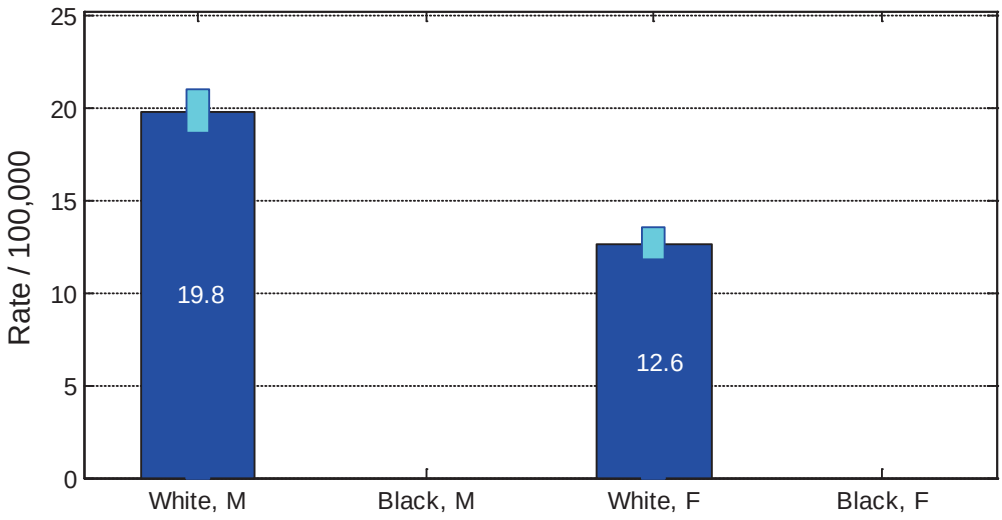
In 2009, the International Agency for Research on Cancer (IARC) designated indoor UV radiation tanning devices as carcinogenic to humans.

Figure 7.7: Melanoma Incidence Trends by Sex, Arkansas, 1997 - 2008



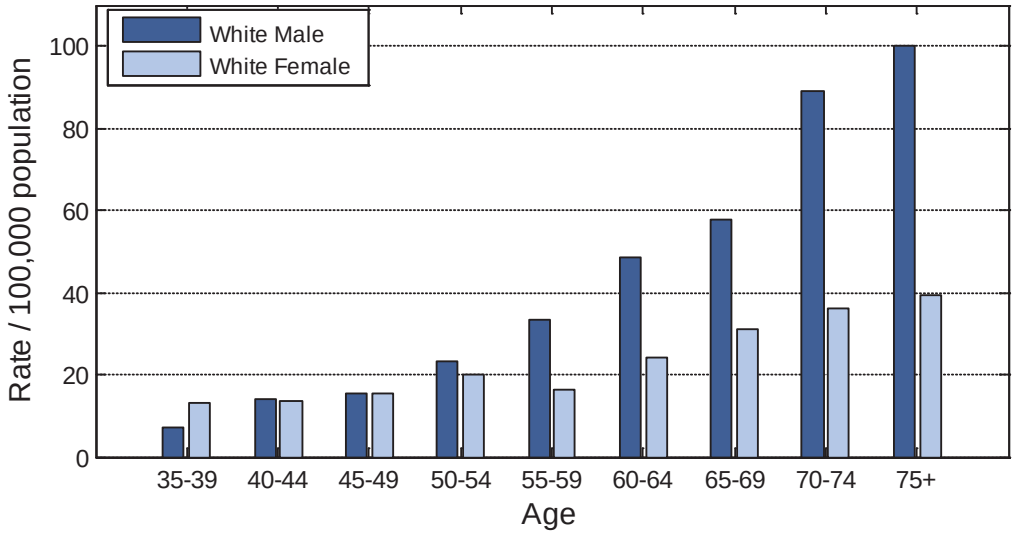
- The modeled trend demonstrated increasing incidence for both genders.

Figure 7.8: Melanoma Incidence by Sex, Arkansas, 2004 – 2008



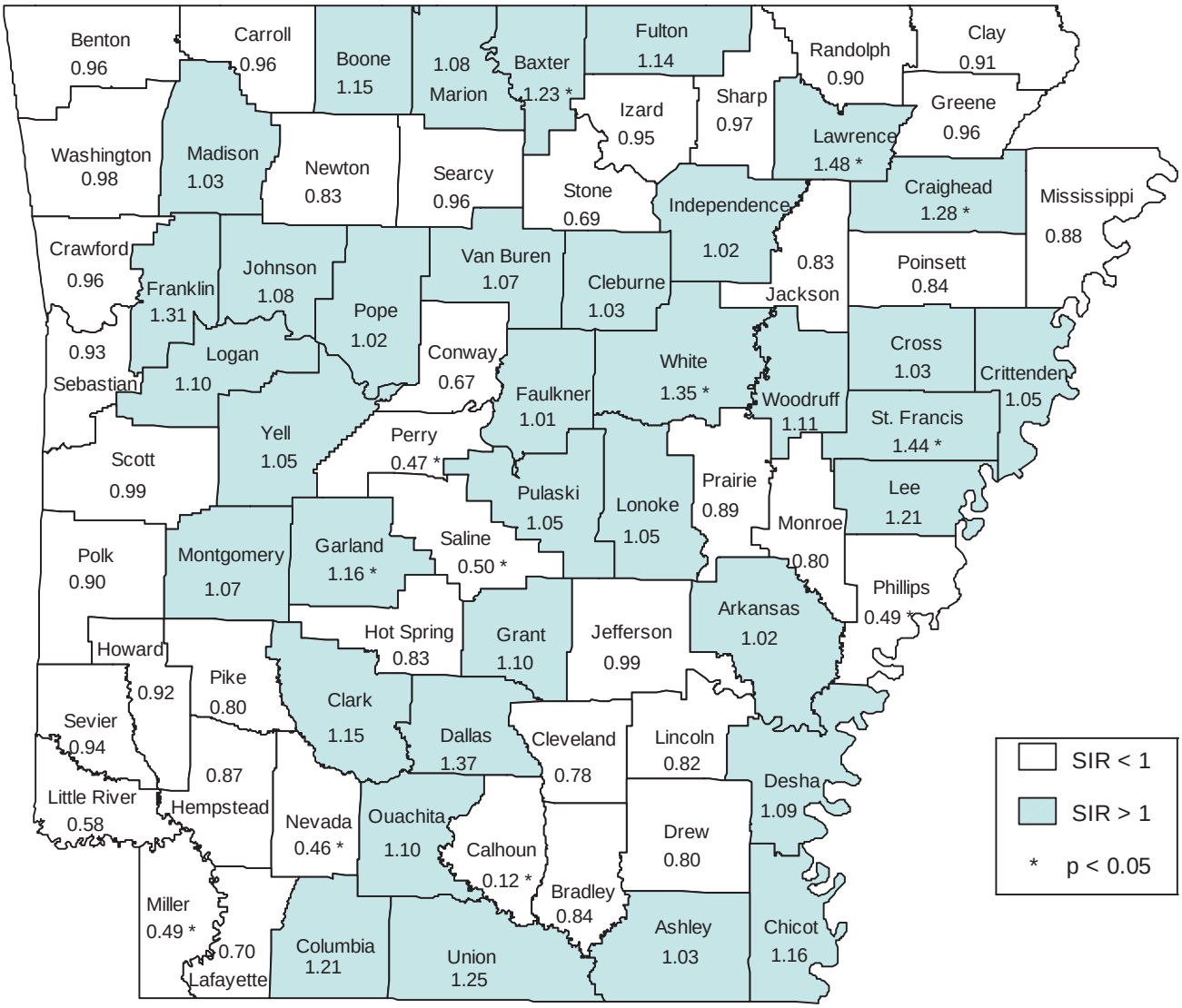
- White men had significantly higher incidence rates of melanoma than White women from 2004 – 2008 ($p < 0.01$).

Figure 7.9: Age-Specific Incidence Rates of Melanoma By Sex, Arkansas, 2004 - 2008



- Median age at diagnosis from 2004 - 2008 was 65 years.
- Figure 7.9 indicates that disease patterns at younger ages were somewhat different from patterns at older ages.
  - At ages under 55, incidence rates were similar for both sexes.

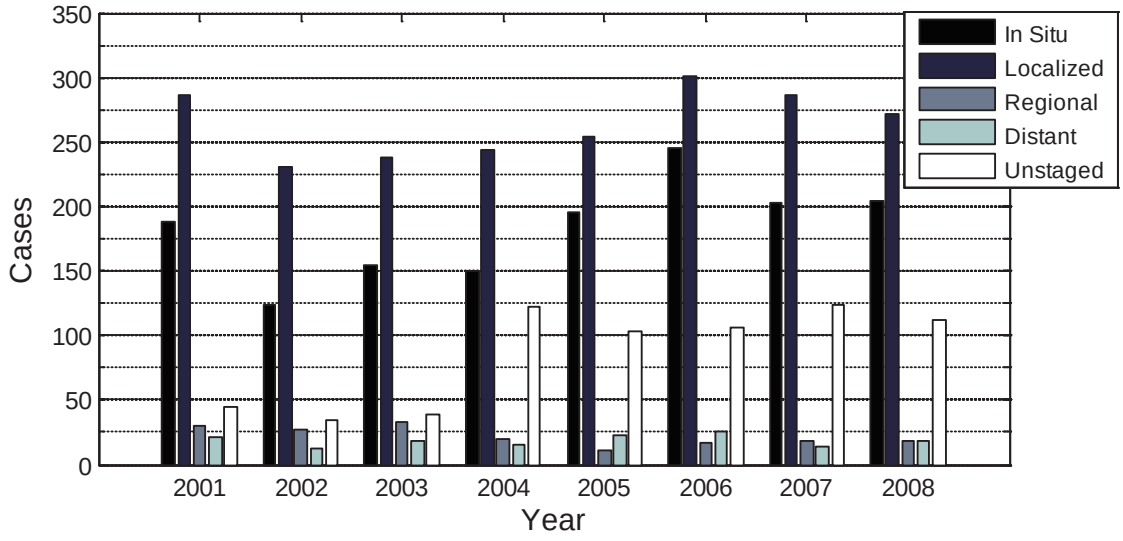
Figure 7.10: Melanoma in White Arkansans, Standardized Incidence Ratio (SIR) By County, Arkansas, 1997 – 2008



Disclaimer: Counties with an '*' and SIR > 1 may have a population prevalence for a risk factor(s) which exceeds the state prevalence. This booklet identifies the known risk factors for each cancer site. It should be noted that it usually takes years for most types of cancer to develop so the relevant exposure(s) likely occurred years ago and possibly elsewhere.

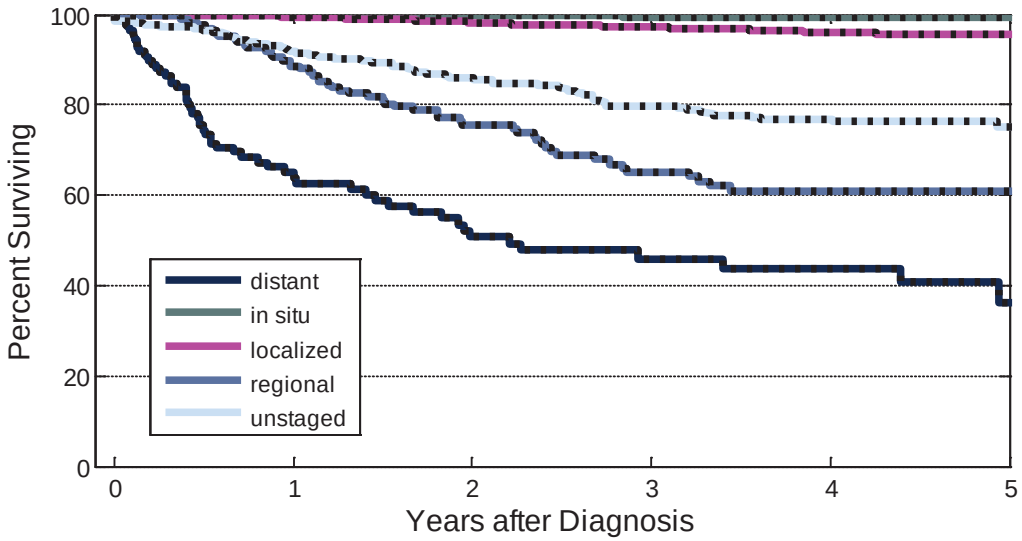
- Counties with elevated incidence are widely distributed throughout the state.

Figure 7.11: Melanoma, SEER 2000 Stage at Diagnosis



- Melanoma is generally diagnosed at early stages of disease.
- Beginning in 2004 there was an ongoing reporting issue where 20% of the reported cases were reported without staging information.

Figure 7.12: Melanoma, Five-Year Survival by Stage at Diagnosis, 2001 - 2008



- Figure 7.12 indicates that most melanoma cases are diagnosed at early stages, in situ or localized, and for these cases survival rates are high over the next 5 years.
- Melanoma 5-year survival rates depend on stage-at-diagnosis.
  - In situ = 99 %
  - Localized = 95 %
  - Regional = 61 %
  - Distant = 36 %
  - Overall = 91 %

Chapter 8: Ovary (Ovarian)

At total of 193 women in Arkansas were diagnosed with ovarian cancer, and 148 died of ovarian cancer in 2008. The median age at diagnosis for ovarian cancer among women in Arkansas from 1997 - 2008 was 65 years.

Signs and Symptoms [1, 2]

Early stages of ovarian cancer do not cause any obvious symptoms, but as the cancer progresses, common symptoms include:

- Persistent bloating, pelvic or abdominal pain;
- Difficulty eating or feeling full quickly; and
- Urinary urgency or frequency.
-

Women who experience these symptoms daily for more than a few weeks should consult a physician. The most common sign of ovarian cancer is an enlarged abdomen caused by the accumulation of fluid. Abnormal vaginal bleeding is rarely a symptom of ovarian cancer.

Risk Factors [1, 2]

The most common risk factor is a strong family history of breast or ovarian cancer. Women who have had breast cancer or test positive for the BRCA1 or BRCA2 genes are at increased risk. Those who use estrogen alone (without progesterone) for postmenopausal hormone therapy are at increased risk. Pregnancy, long-term use of oral contraceptives, and tubal ligation reduce the risk of developing ovarian cancer. Studies have shown preventive surgery to remove the ovaries and fallopian tubes in high risk women who test positive for the BRCA1 or BRCA2 mutations can decrease the risk of ovarian cancer.

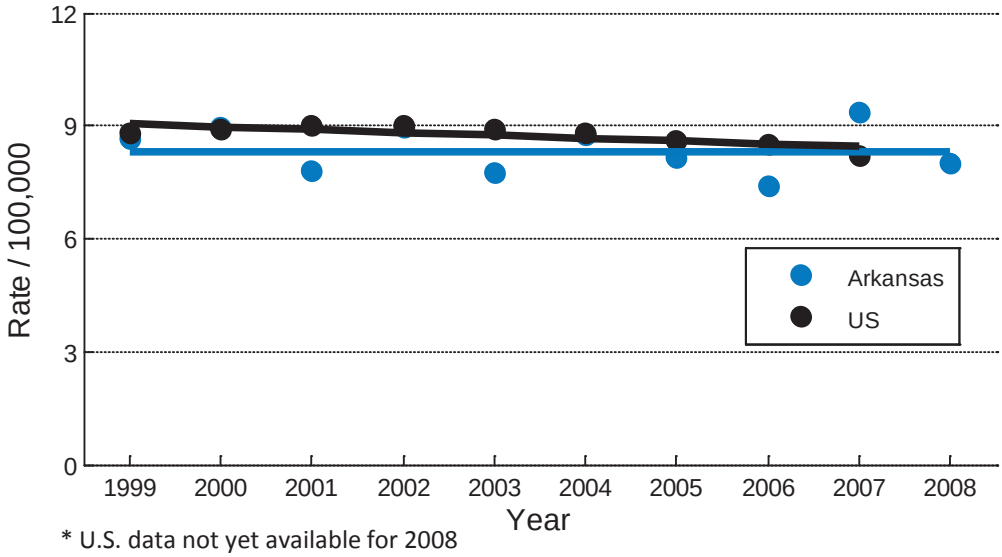
Prevention and Early Detection [2, 5]

The U.S. Preventive Services Task Force (USPSTF) recommends against screening for ovarian cancer. The combination of a thorough pelvic exam, transvaginal ultrasound, and a blood test for the tumor marker CA125 may be offered to women who are at high risk of ovarian cancer.

Treatment [1, 2]

Most common treatment methods are surgery and usually chemotherapy. Surgery involves removing one or both ovaries and fallopian tubes (salpingo-oophorectomy) and the uterus (hysterectomy).

Figure 8.1: Age-Adjusted Ovarian Cancer Mortality Trends, AR & US, 1999 – 2008*



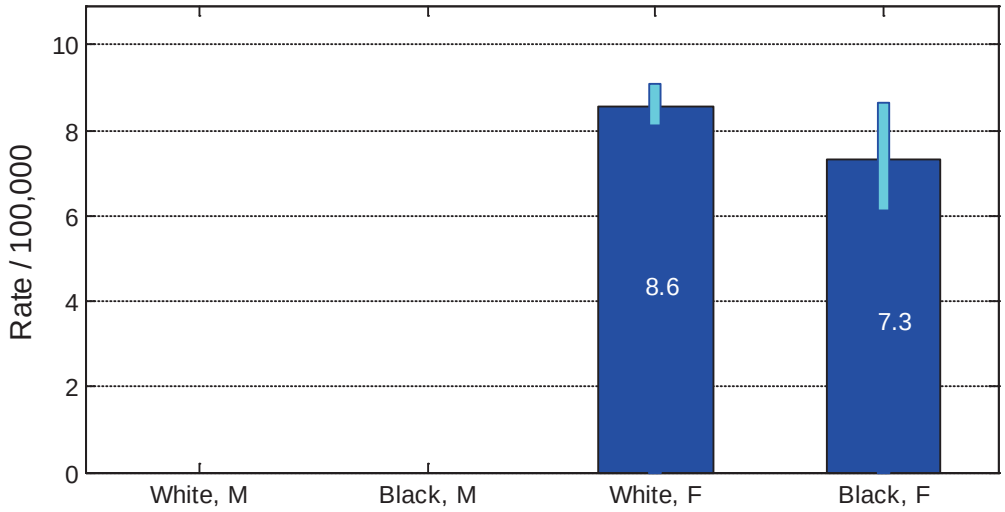
* U.S. data not yet available for 2008

- From 1999 through 2007, the age-adjusted mortality rates in Arkansas for ovarian cancer averaged slightly lower than rates in the United States. The Arkansas rate in 2007 was high, likely due to a random fluctuation.
  - United States had 8.2 deaths per 100,000 in 2007.
  - Arkansas had 9.3 deaths per 100,000 in 2007.
- In Arkansas, the changes in age-adjusted mortality rates over time were not significant (p = 0.94).
  - The average age-adjusted ovarian cancer mortality rate in Arkansas during this period was 8.3 per 100,000.
  - The average age-adjusted ovarian cancer mortality rate in the United States during this period was 8.7 per 100,000.

"The most important risk factor is a strong family history of breast or ovarian cancer."

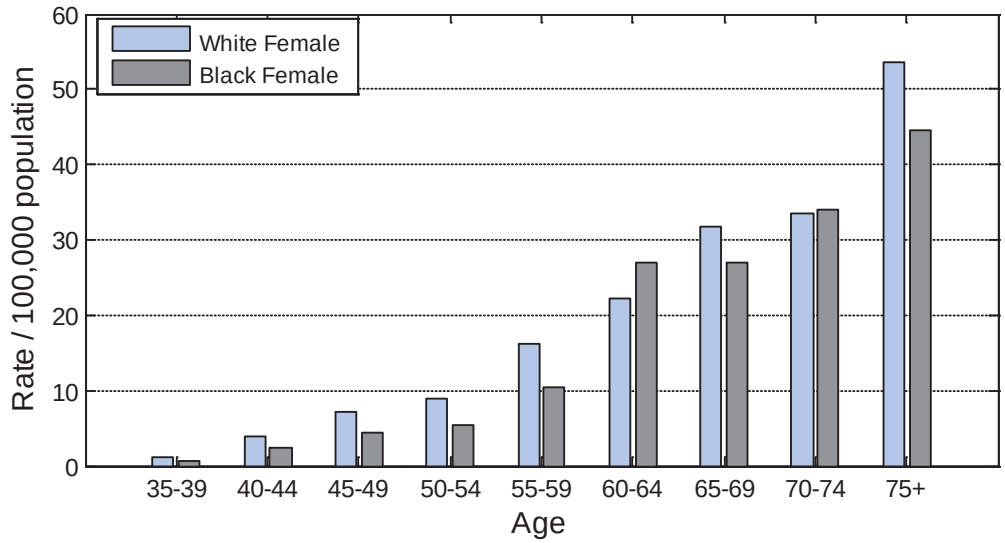
-American Cancer Society

Figure 8.2: Ovarian Cancer Mortality by Race in Arkansas, 1999 – 2008



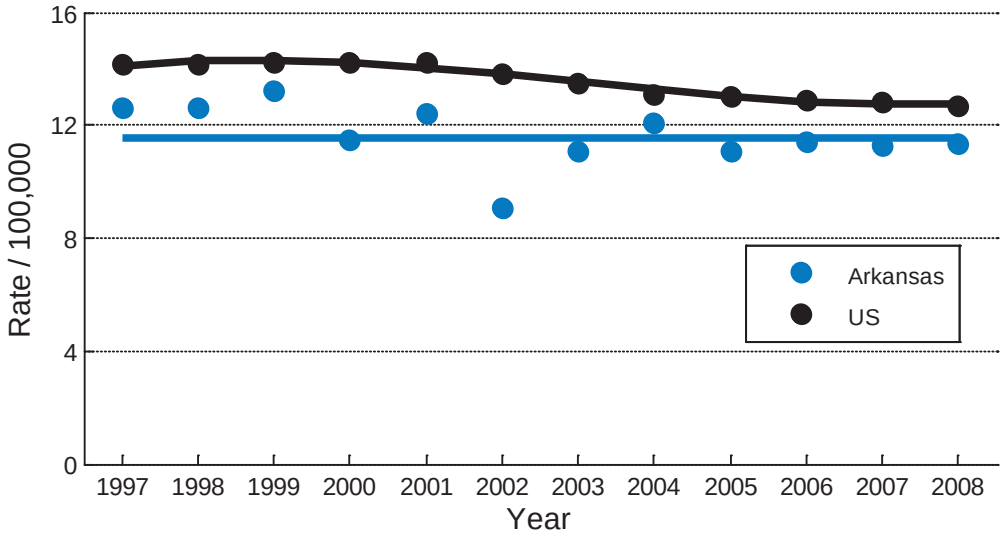
- Black women have lower mortality than White women although the difference is not statistically significant.

Figure 8.3: Age-Specific Ovarian Cancer Mortality Rates By Race, Arkansas, 1999 – 2008



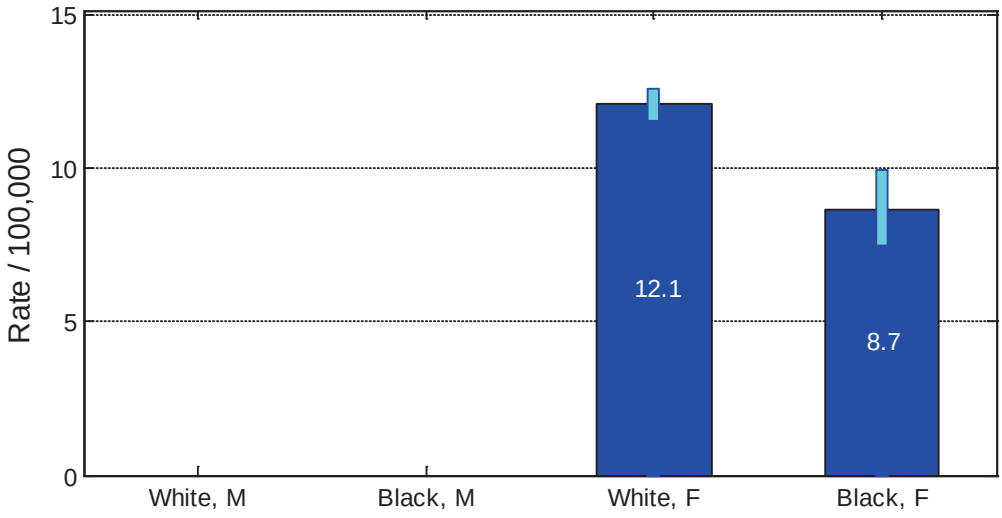
- Median age at death from ovarian cancer was 71 years.
- Rates in White women were generally higher than rates in Black women. Note that rates for Black women are based on a small numbers of cases.

Figure 8.4: Age-Adjusted Ovarian Cancer Incidence Trends, AR & US, 1997 – 2008



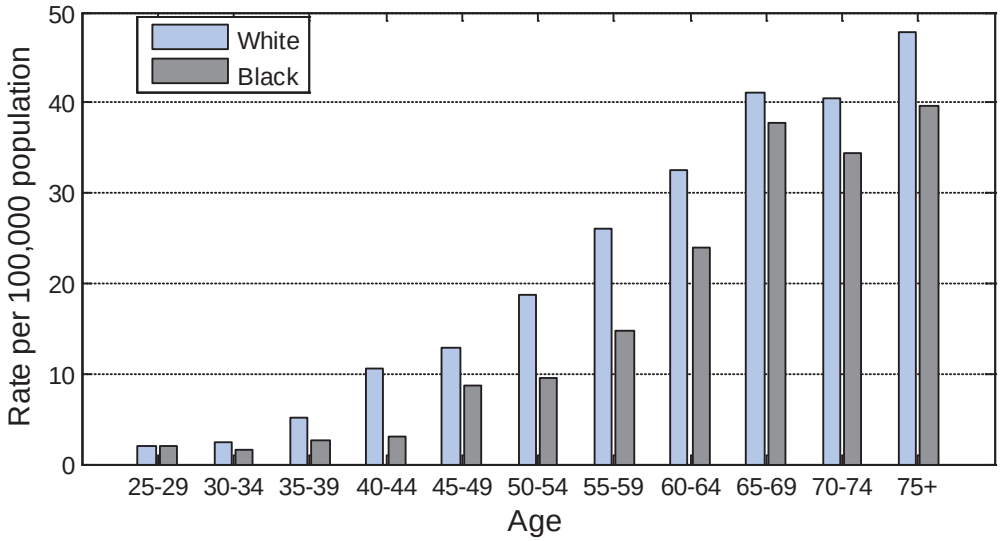
- Arkansas age-adjusted ovarian cancer incidence rates were lower than the rates for the United States.
  - The rate in Arkansas in 2008 was 11.3 per 100,000.
  - The rate in the United States in 2008 was 12.7 per 100,000.
- In Arkansas, changes in incidence rates during 1997 – 2008 were not significant (p = 0.19).
  - The average rate in Arkansas over the period was 11.5 per 100,000.

Figure 8.5: Ovarian Cancer Incidence by Race, Arkansas, 1997 – 2008



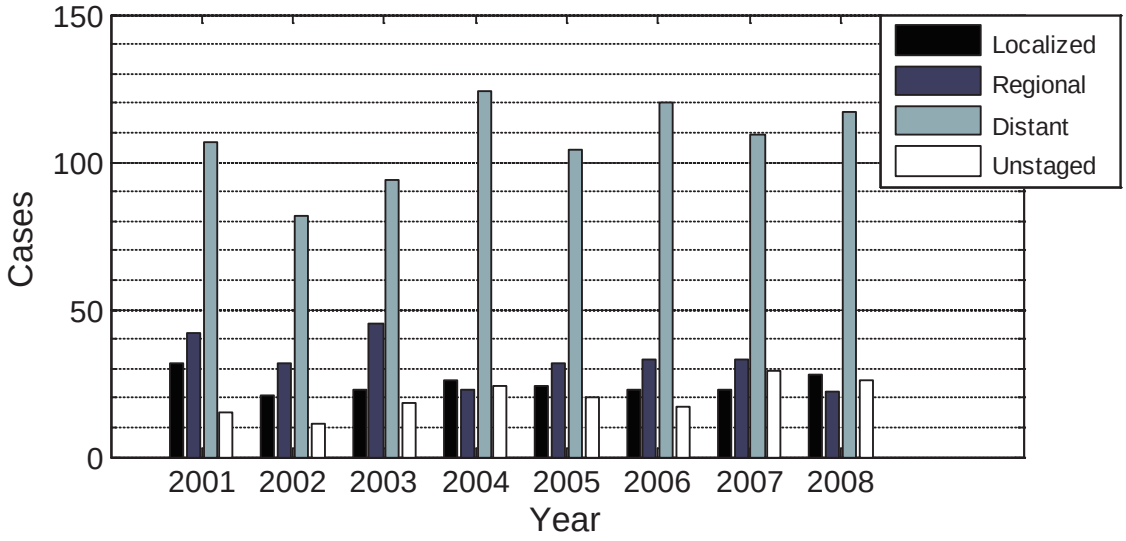
- Ovarian cancer incidence in Black women was significantly lower than rates in White women.

Figure 8.6: Age-Specific Incidence Rates of Ovarian Cancer By Race, Arkansas, 1997 – 2008



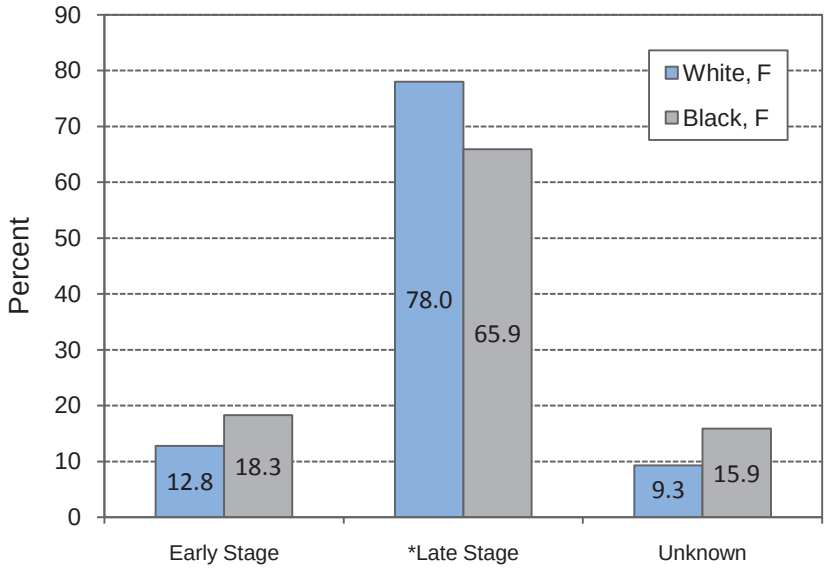
- Median age at diagnosis of ovarian cancer was 65 years.
- Rates were higher for White women for every age group from 30 years and older.

Figure 8.7: Ovarian Cancer, SEER 2000 Stage at Diagnosis



- Most ovarian cancer cases are diagnosed at the distant stage, where survival rates are low (Figure 8.9).

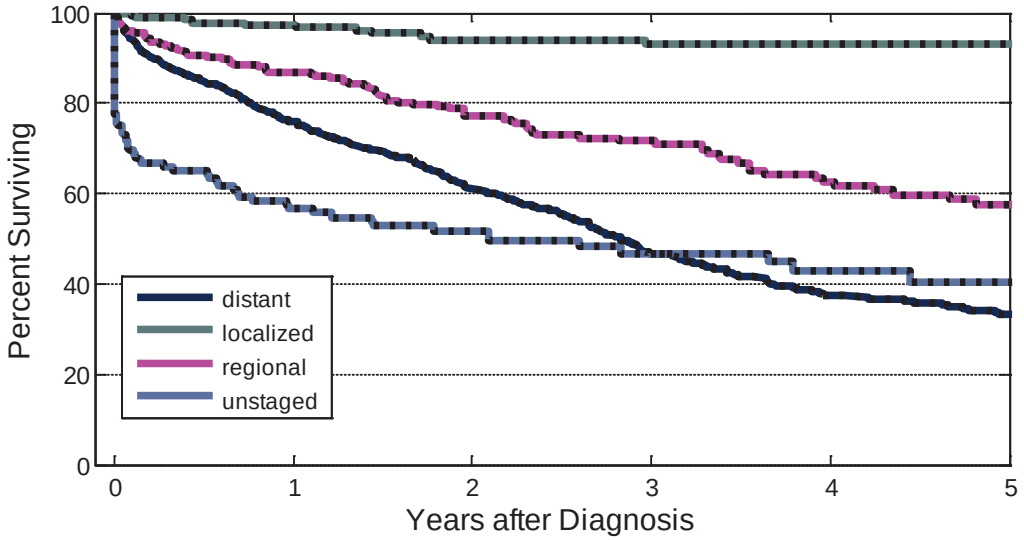
Figure 8.8: Ovarian Cancer, SEER 2000 Stage at Diagnosis, By Race, 2004 – 2008



*Note: Late stage includes regional and distant stages of disease.

- White women are diagnosed at a later stage of ovarian cancer than Black women. Note that percentages for Black women are based on a small number of cases.

Figure 8.9: Ovarian Cancer, SEER 2000 Stage at Diagnosis, By Race, 2004 – 2008



- Ovarian cancer 5-year survival rates depend on stage-at-diagnosis.
  - Localized = 93 %
  - Regional = 58 %
  - Distant = 33 %
  - Overall = 47 %

Chapter 9: Prostate Cancer

At total of 2,218 men in Arkansas were diagnosed with prostate cancer, and 285 died of prostate cancer in 2008. The median age at diagnosis for prostate cancer among men in Arkansas from 2004 - 2008 was 68 years.

Signs and Symptoms [1, 2]

Early stages of prostate cancer do not cause any obvious symptoms, but as the cancer progresses, common symptoms include:

- Weak or interrupted urine flow;
- Inability to urinate or difficulty starting or stopping urine flow;
- Need to urinate frequently, particularly at night;
- Blood in urine; and
- Pain or burning with urination.

These symptoms also occur in non-cancerous events, such as an enlarged prostate or infection. Distant stage prostate cancer often spreads to the bones and can cause pain in the hips, spine, ribs, and other areas.

Risk Factors [1, 2]

The risk of developing prostate cancer increases with age. Most prostate cancers are identified in men age 65 years or older. Black men are at increased risk of developing prostate cancer compared to other race groups. Other common risk factors include family history, genetic factors, nutrition, obesity, physical activity, sexually transmitted infection, and hormonal factors.

Prevention and Early Detection [2, 5]

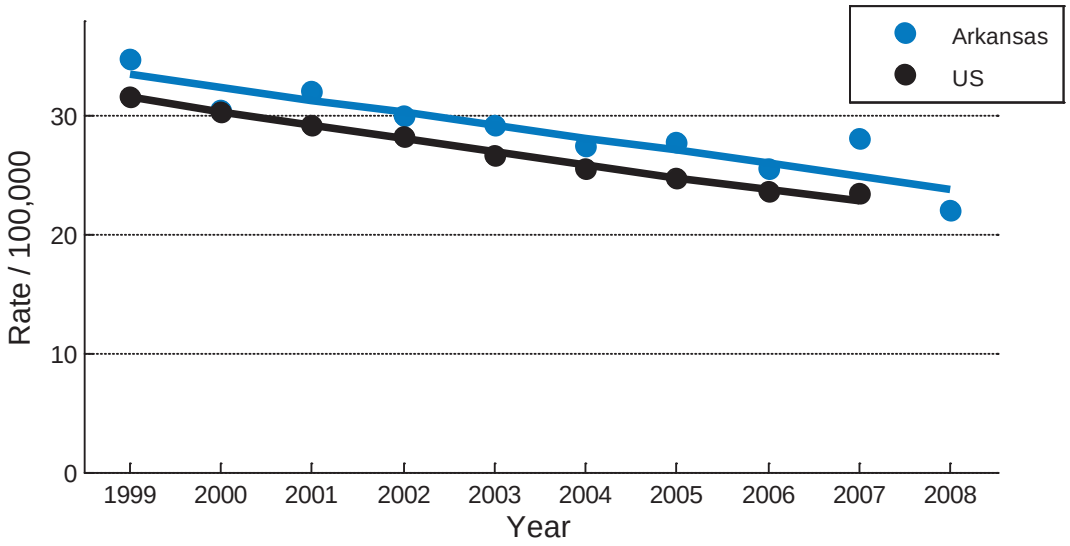
The prostate-specific antigen (PSA) blood test and digital rectal exam (DRE) are common methods for screening prostate cancer. In men younger than age 75 years, the U.S. Preventive Services Task Force (USPSTF) found inadequate evidence to determine whether treatment for prostate cancer detected by screening improves health outcomes compared with treatment after clinical detection. In men age 75 years or older, the USPSTF found adequate evidence that the benefits of treatment for prostate cancer detected by screening are small to none.

Other recommendations from the American Cancer Society (ACS) suggest asymptomatic men who have at least 10-years life expectancy have an opportunity to make an informed decision about screening with their health care provider.

Treatment [1, 2]

Most common treatment methods are active surveillance (monitoring course of disease with the intent to intervene if the cancer progresses), radical prostatectomy, radiation therapy, brachytherapy (small radioactive pellets implanted in prostate tissue), and androgen deprivation therapy (ADT).

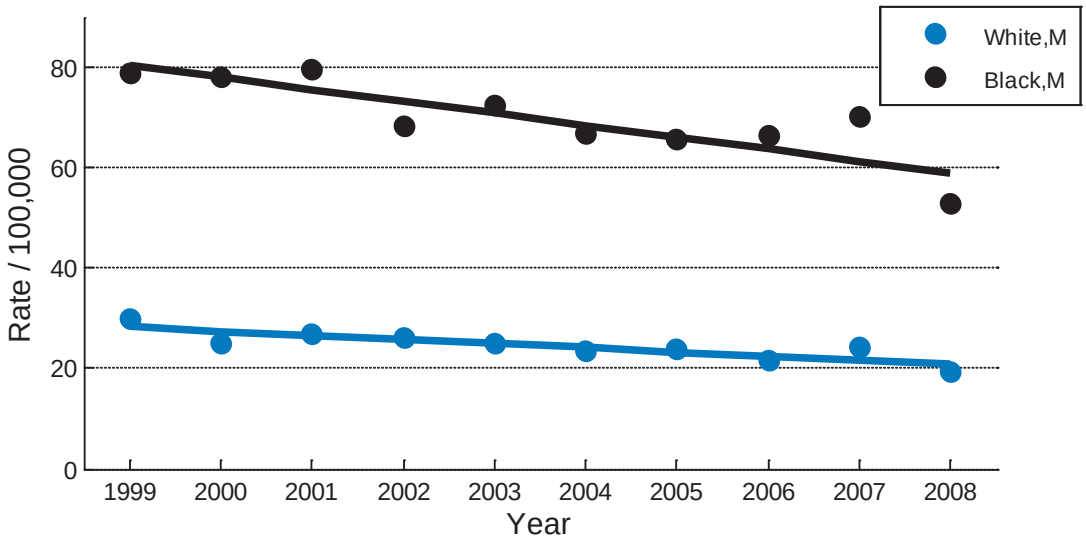
Figure 9.1: Age-Adjusted Prostate Cancer Mortality Trends, AR & US, 1999 – 2008*



* U.S. data not yet available for 2008

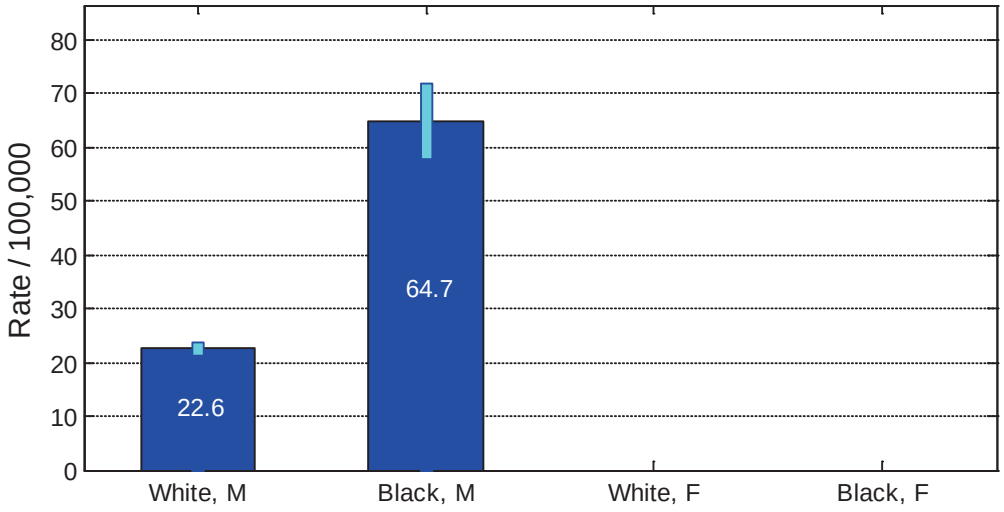
- From 1999 through 2008, Arkansas age-adjusted mortality rates were higher than rates in the United States.
  - The United States had 23.5 deaths per 100,000 in 2007.
  - Arkansas had 28.0 deaths per 100,000 in 2007.
  - Average difference between the United States and Arkansas was approximately 2 deaths per 100,000.
- Changes in age-adjusted mortality rates in Arkansas over time were significant ($p < 0.01$).
  - The age-adjusted prostate cancer mortality rate declined an annual average of 1.07 cases per 100,000, which is essentially the same as the decline in the United States.
  - Arkansas had 23.8 deaths per 100,000 in 2008.

Figure 9.2: Trends in Prostate Cancer Mortality By Race in Arkansas, 1999 - 2008



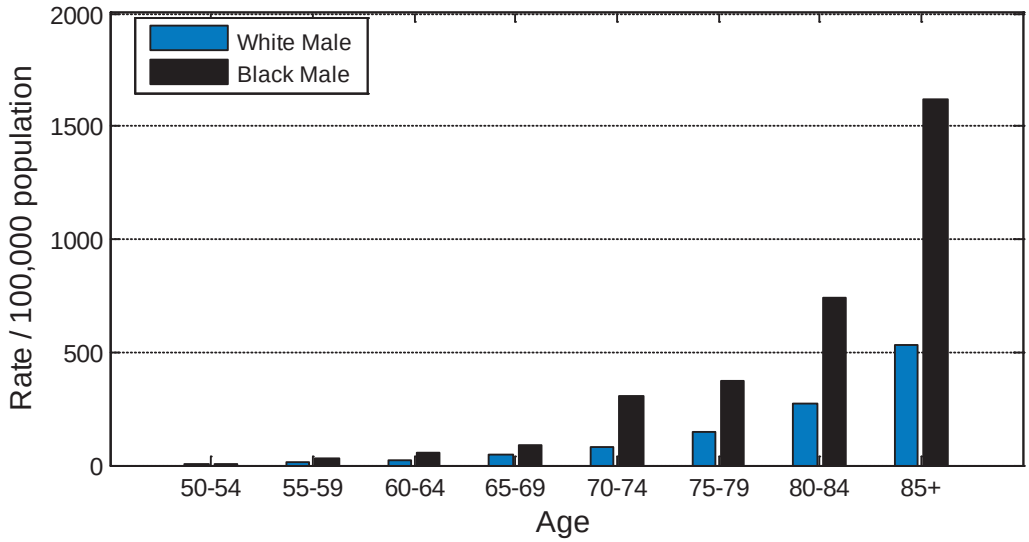
- Prostate cancer death rates have been declining ($p < 0.01$).
  - In Black men, the annual decline was 2.3 deaths per 100,000 to a rate of 59.5 deaths per 100,000 in 2008.
  - In White men, the annual decline was 0.8 deaths per 100,000 to a rate of 20.8 deaths per 100,000 in 2008.

Figure 9.3: Prostate Cancer Mortality by Race in Arkansas, 2004 – 2008



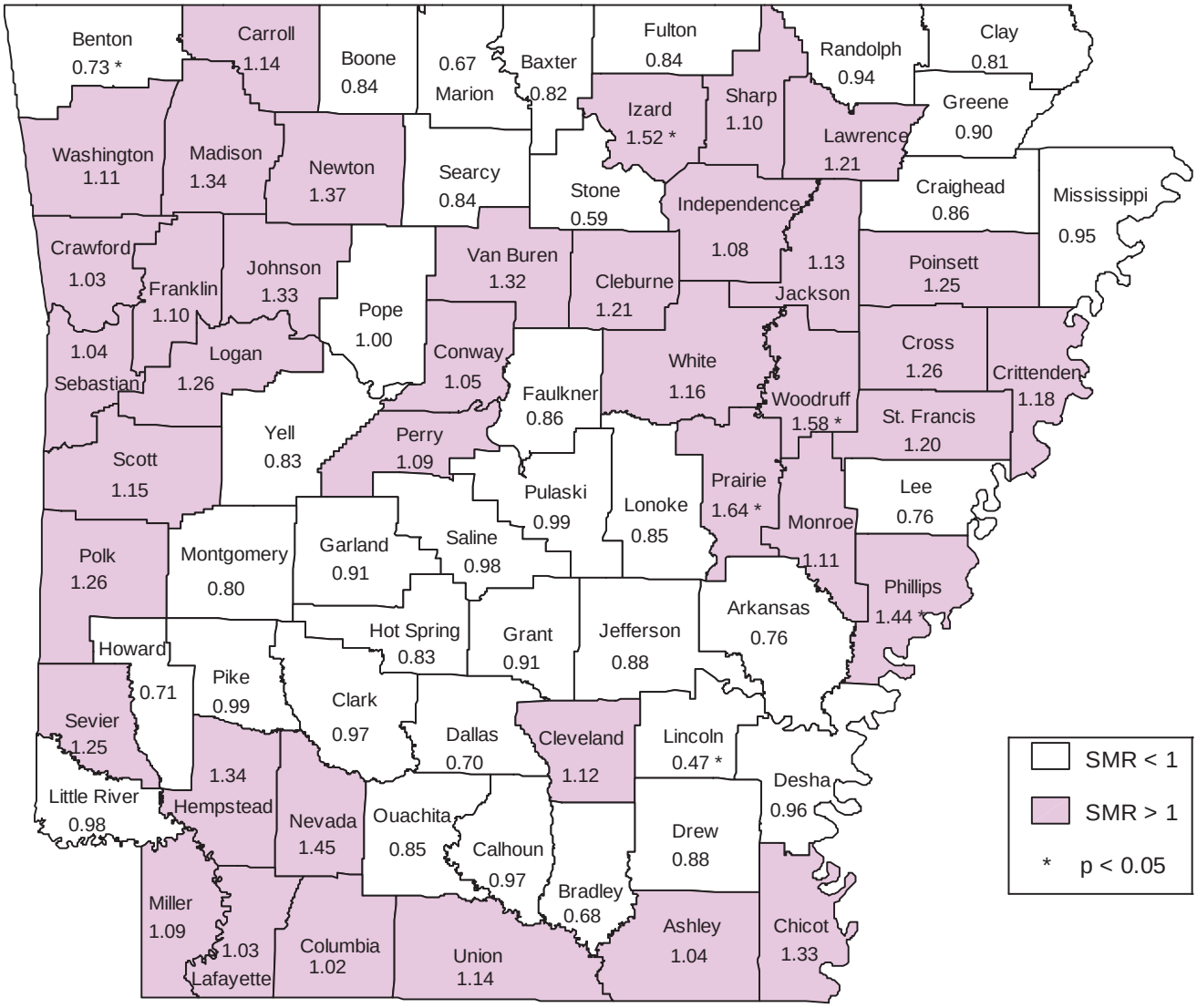
- Black men are almost 3 times more likely to die from prostate cancer as White men.

Figure 9.4: Age-Specific Prostate Cancer Mortality Rates By Race, Arkansas, 2004 - 2008



- The median age at death from prostate cancer in Arkansas during 2004 - 2008 was 80 years.
- During 2004 through 2008, there were 1,593 deaths from prostate cancer.
  - No deaths occurred in men under the age of 40 years.
  - Only 7 deaths occurred in men age 40-49 years.
- Black men have much higher mortality rates than White men, especially at older ages.

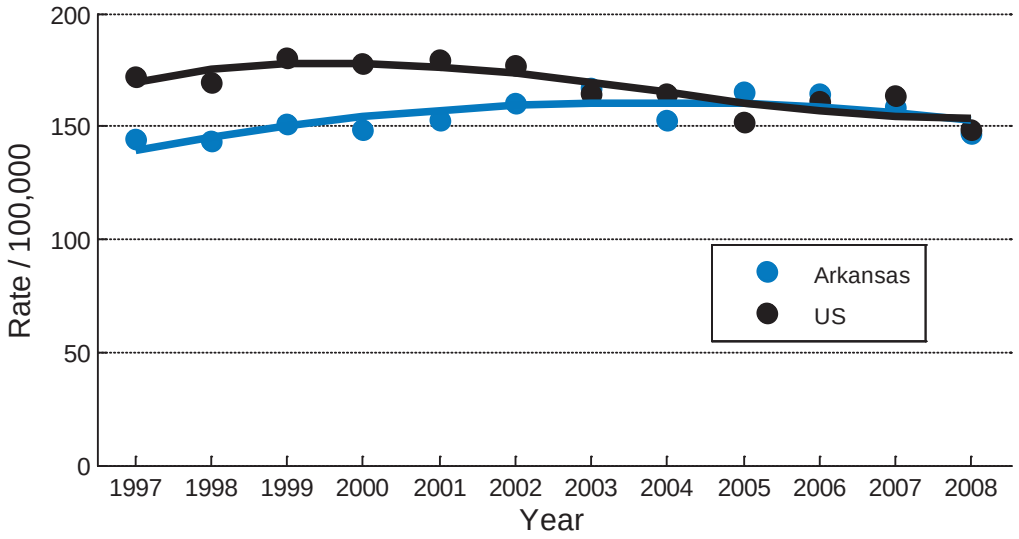
Figure 9.5: Prostate Cancer; Standardized Mortality Ratio (SMR) by County, Arkansas, 1999 - 2008



Disclaimer: Counties with an '*' and SMR > 1 may have a population prevalence for a risk factor(s) which exceeds the state prevalence. It should be noted that it usually takes years for most types of cancer to develop so the relevant exposure(s) likely occurred years ago and possibly elsewhere.

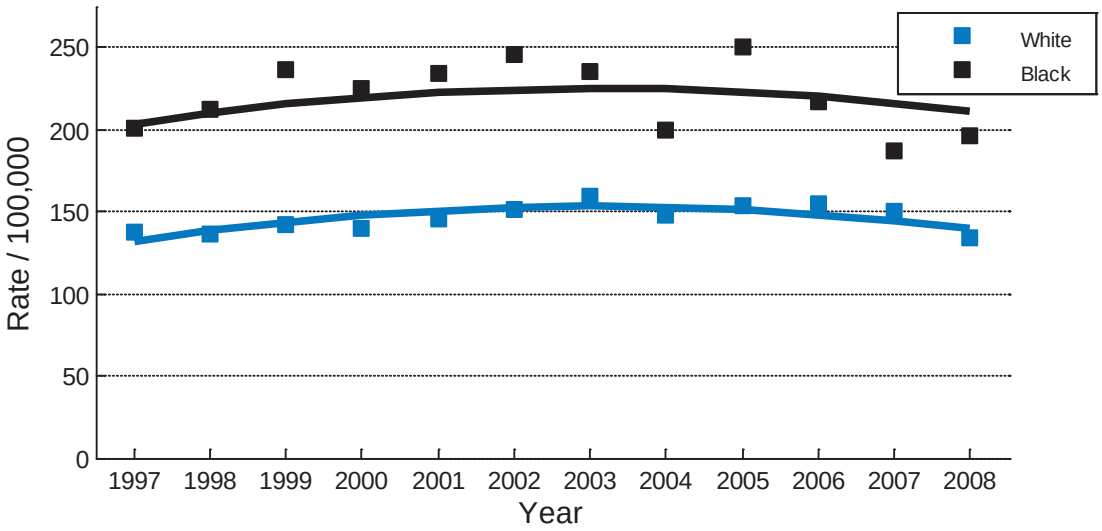
- Counties with elevated death rates are distributed widely throughout the state with no obvious clustering in counties with substantial percentages of their population being Black.

Figure 9.6: Age-Adjusted Prostate Cancer Incidence Trends, AR & US, 1997 - 2008



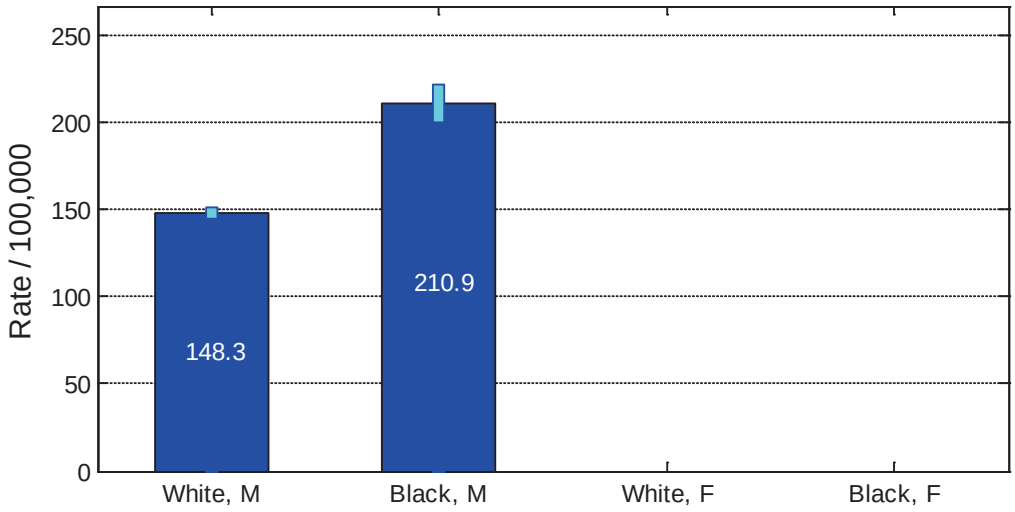
- In the last few years, age-adjusted prostate cancer incidence rates in Arkansas essentially match the rates for the United States.
  - In 2008, the observed rate in the United States was 148.4 cases per 100,000.
  - In 2008, the observed rate in Arkansas was 146.8 cases per 100,000.
- In Arkansas, changes in incidence rates over the period, 1997 through 2008, were significant ($p < 0.01$) and they suggest that rates may have begun to decline in 2003 after an increasing trend from 1997 through 2002.

Figure 9.7: Prostate Cancer Incidence Trends by Race, Arkansas, 1997 - 2008



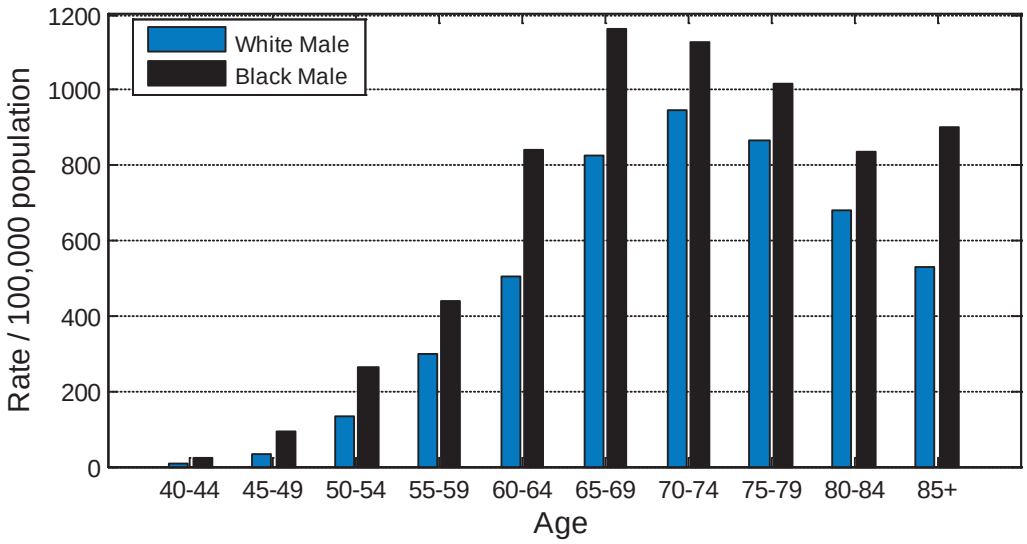
- In 2008, the incidence rate among Black men was 195.8 cases per 100,000. The rate among White men for the same year was 134.4 cases per 100,000.
  - Black men averaged 72.7 cases per 100,000 more than White men over the period from 1997 - 2008.
- Both races show a significant trend ($p < 0.01$), which appears to be declining in recent years.

Figure 9.8: Prostate Cancer Incidence by Race in Arkansas, 2004 – 2008



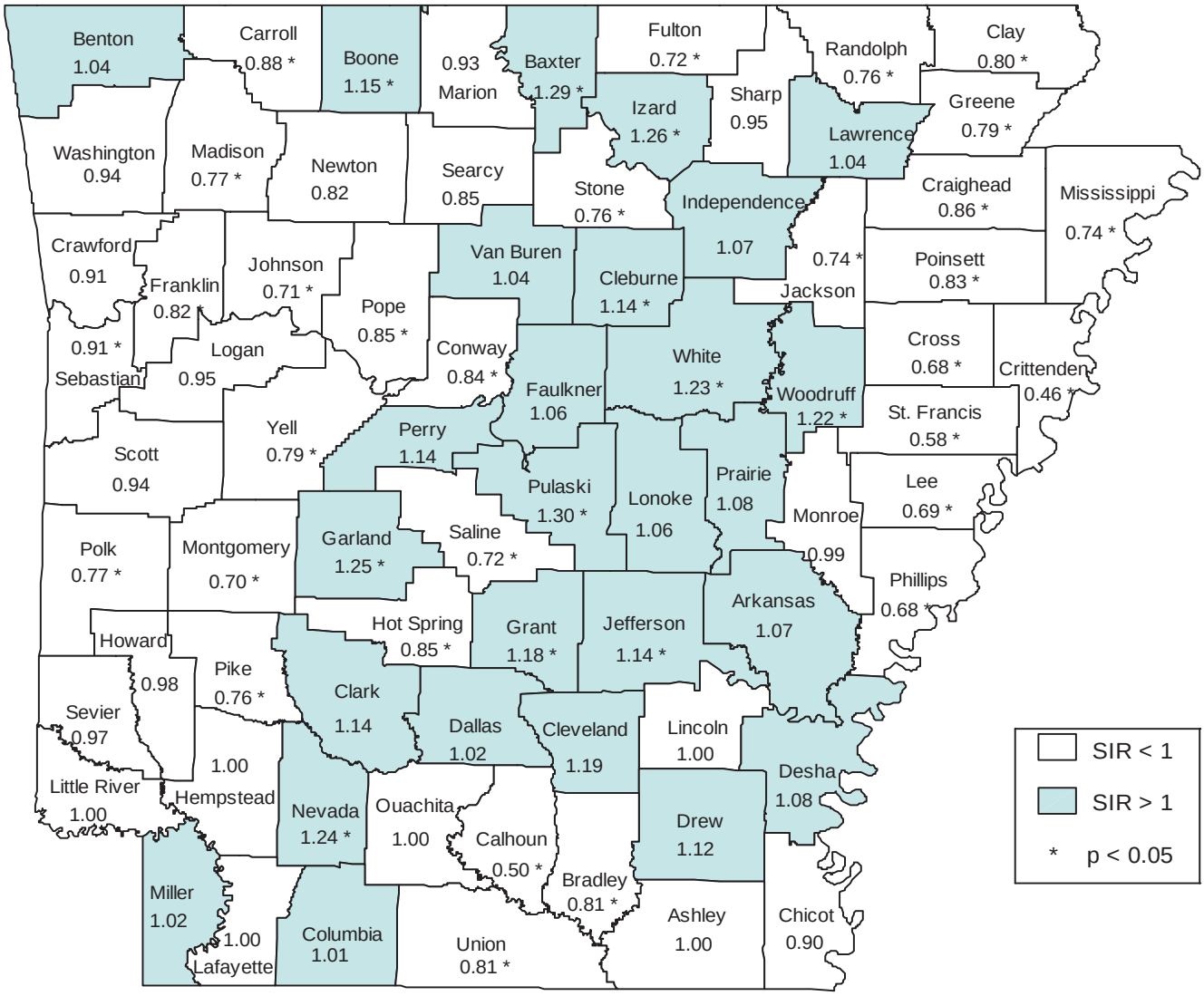
- The relative risk of prostate cancer in Black men was approximately 1.5 times higher than in White men. This relative risk is half that for mortality: (See Figure 9.3).

Figure 9.9: Age-Specific Incidence Rates of Prostate Cancer By Race, Arkansas, 2004 - 2008



- Median age at diagnosis during 2004 through 2008 was 68 years.
- The rate of prostate cancer diagnoses declined after age of 75 years.
  - This is most likely due to screening practices.

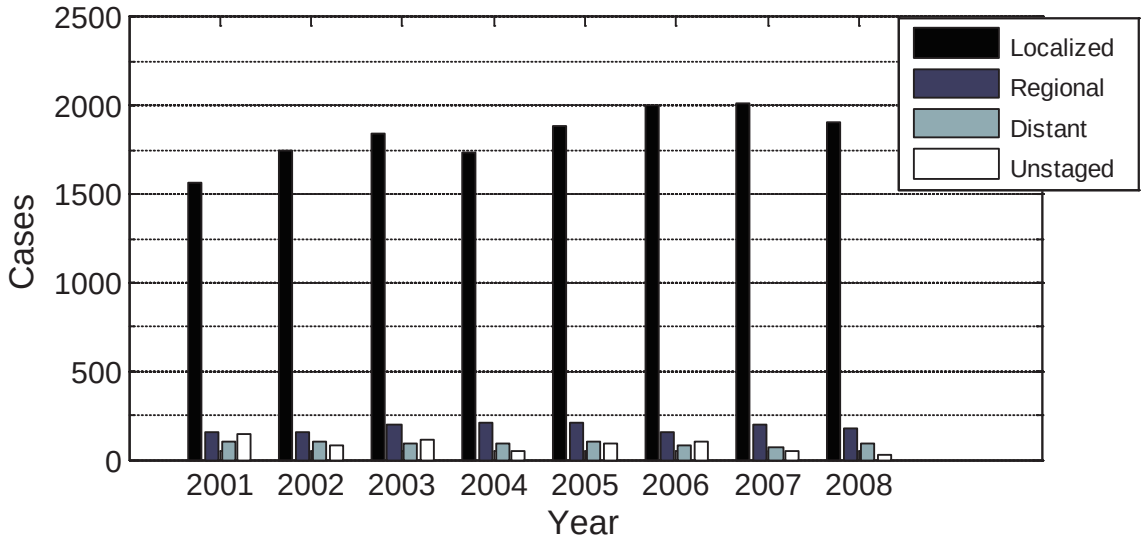
Figure 9.10: Prostate Cancer; Standardized Incidence Ratio (SIR) by County, Arkansas, 1997 – 2008



Disclaimer: Counties with an '*' and SIR > 1 may have a population prevalence for a risk factor(s) which exceeds the state prevalence. This booklet identifies the known risk factors for each cancer site. It should be noted that it usually takes years for most types of cancer to develop so the relevant exposure(s) likely occurred years ago and possibly elsewhere.

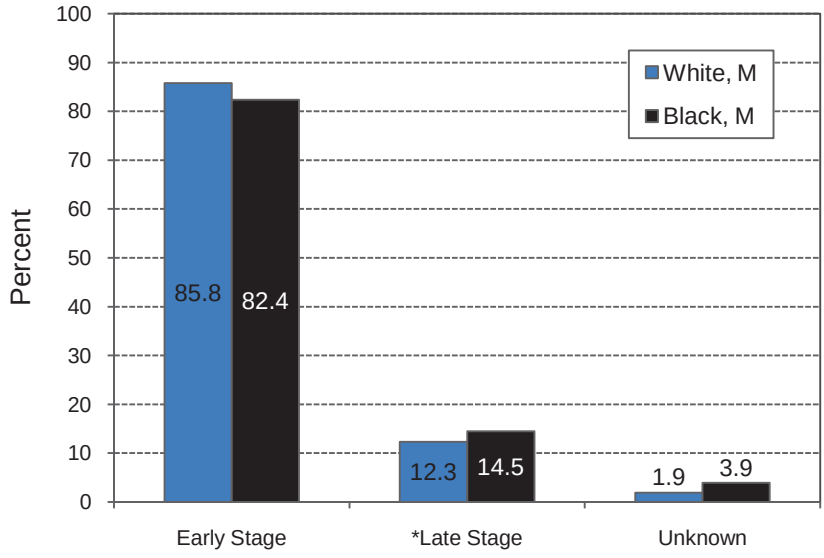
- Counties with elevated prostate cancer incidence are clustered in the central part of the state which does not correspond to racial population distributions.
- Counties with an SIR > 1 are clustered more centrally in urban areas compared to counties with a SMR > 1 (See Figure 9.5), which are more rural in nature.

Figure 9.11: Prostate Cancer, SEER 2000 Stage at Diagnosis



- Most prostate cancer cases were diagnosed at the localized stage, and for these cases 5-year survival rates are high.

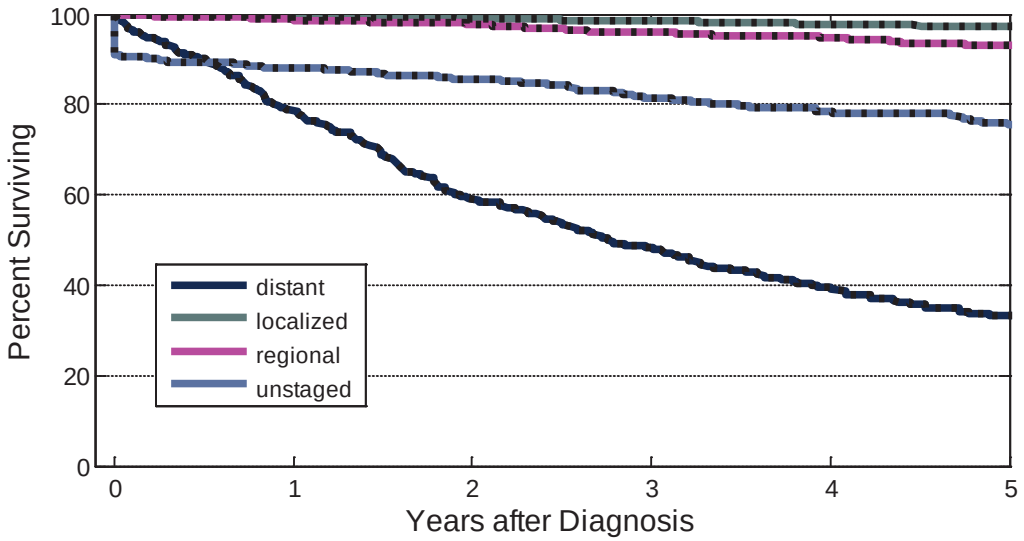
Figure 9.12: Prostate Cancer, SEER 2000 Stage at Diagnosis, By Race, 2004 – 2008



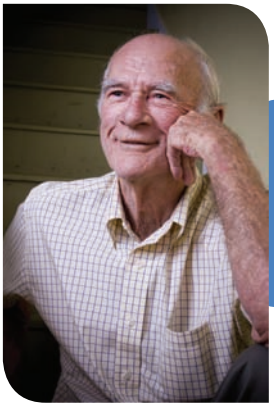
*Note: Late stage includes regional and distant stages of disease.

- Black men had a higher percentage of tumors diagnosed at a later stage than White men.

Figure 9.13: Prostate Cancer, Five-Year Survival By Stage at Diagnosis, 2001 - 2008



- Prostate cancer 5-year survival rates depend on stage-at-diagnosis.
  - Localized = 97 %
  - Regional = 93 %
  - Distant = 33 %
  - Overall = 93 %



"In the United States, the overall 10-year prostate cancer survival is 95%. Obesity and smoking are associated with an increased risk of dying from prostate cancer."

-American Cancer Society

Chapter 10: Urinary Bladder Cancer

A total of 596 in Arkansas were diagnosed with urinary bladder cancer, and 140 died of bladder cancer in 2008. The median age at diagnosis for urinary bladder cancer in Arkansas from 2004 - 2008 was 72 years.

Signs and Symptoms [2]

The most common symptom is blood in the urine. Other symptoms include:

- Frequency or urgency of urination; and
- Irritation during urination.

Risk Factors [1, 2, 9]

Cigarette smoking is the most common risk factor associated with urinary bladder cancer. Smokers are twice more likely to develop bladder cancer than non-smokers. Workers in the dye, leather, or rubber industries are at greater risk. Also, drinking water with high levels of arsenic or long-term use of catheters increases risks. Drinking plenty of fluids and eating vegetables may reduce risks of developing bladder cancer.

Prevention and Early Detection [2, 5]

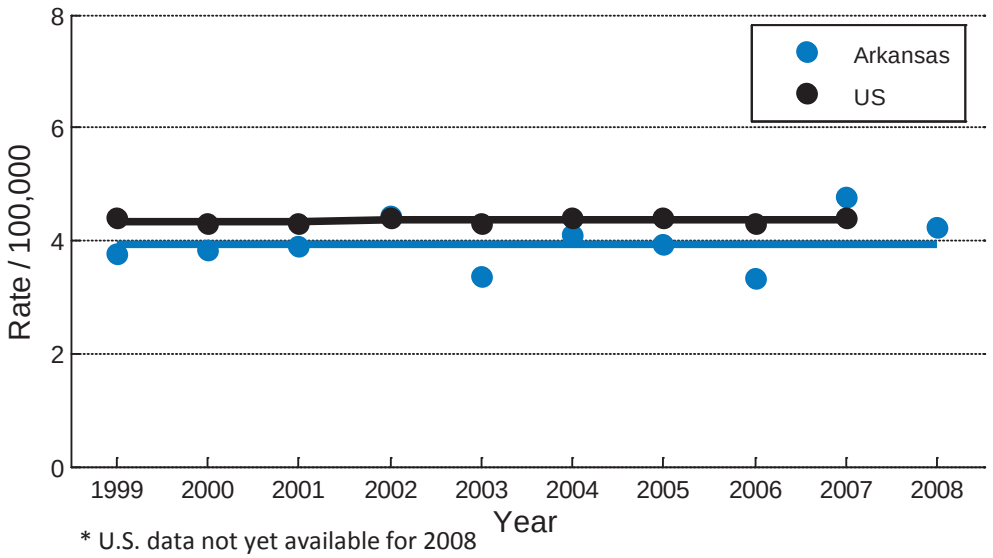
The U.S. Preventive Services Task Force (USPSTF) does not recommend routine screening for asymptomatic individuals. The following methods are used to detect bladder cancer in high risk individuals or those experiencing symptoms:

- Cystoscopy - a long thin lighted tube is inserted in the urethra to detect abnormal cells, and
- Urine Cytology - examination of abnormal cells in urine.

Treatment [1, 2]

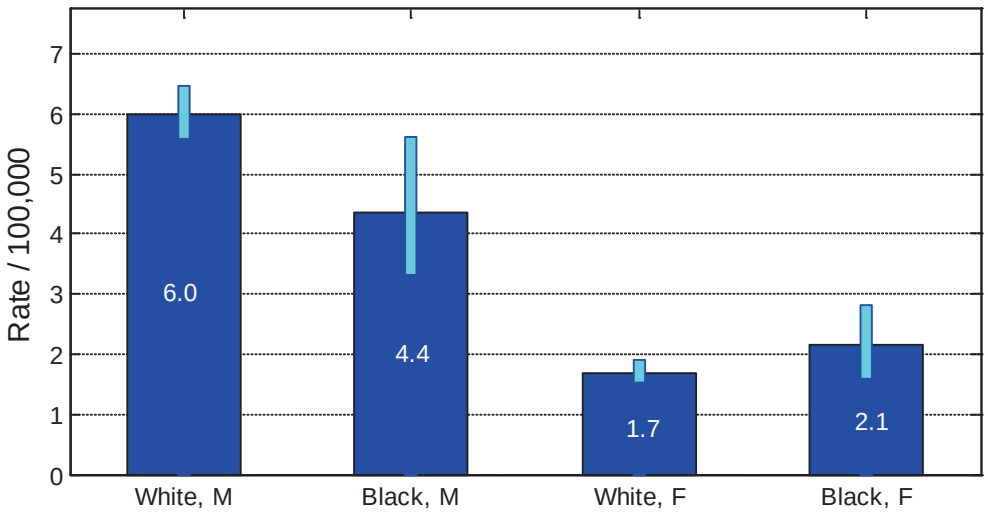
Surgery, immunotherapy, and chemotherapy directly administered to the bladder are common therapies. Treatment options often depend on the stage of the bladder cancer.

Figure 10.1: Trends in Age-Adjusted Urinary Bladder Cancer Mortality, AR & US, 1999 - 2008*



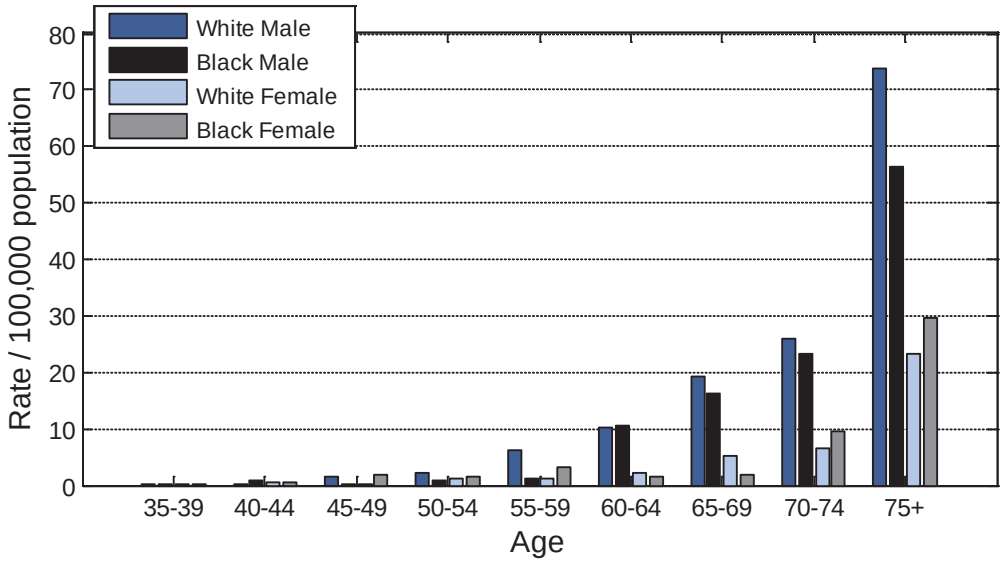
- Arkansas mortality rates averaged 3.9 per 100,000 over this period, which were slightly less than the corresponding United States rate of 4.3 per 100,000.
  - The United States had 4.4 deaths per 100,000 in 2007.
  - Arkansas had 4.8 deaths per 100,000 in 2007.
- Rates have been stable over the period.

Figure 10.2: Age-Adjusted Urinary Bladder Cancer Mortality Rates and 95% Confidence Intervals By Race and Sex, Arkansas, 1999 - 2008



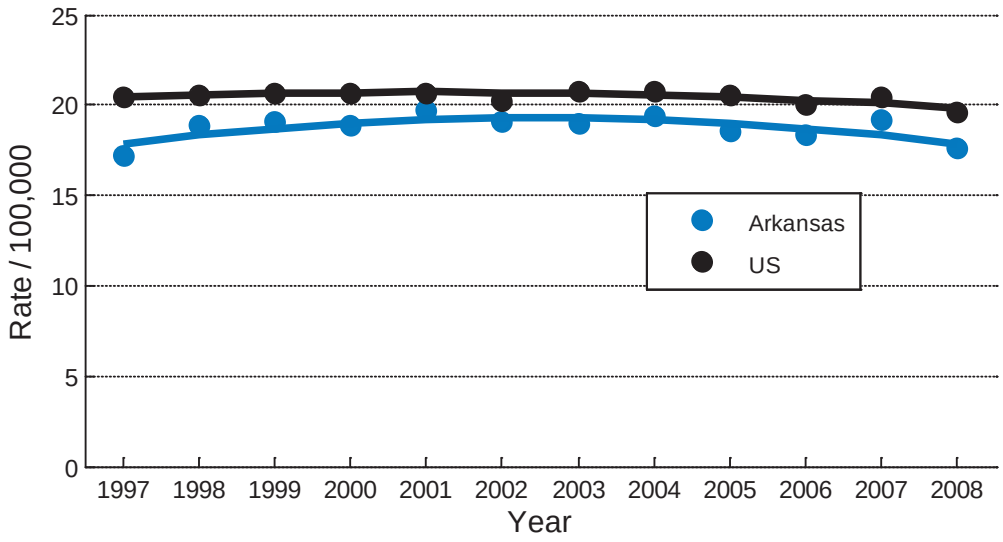
- Men had significantly higher rates of bladder cancer than women ($p < 0.01$).

Figure 10.3: Age-Specific Urinary Bladder Cancer Mortality Rates By Race and Sex, Arkansas, 1999 - 2008



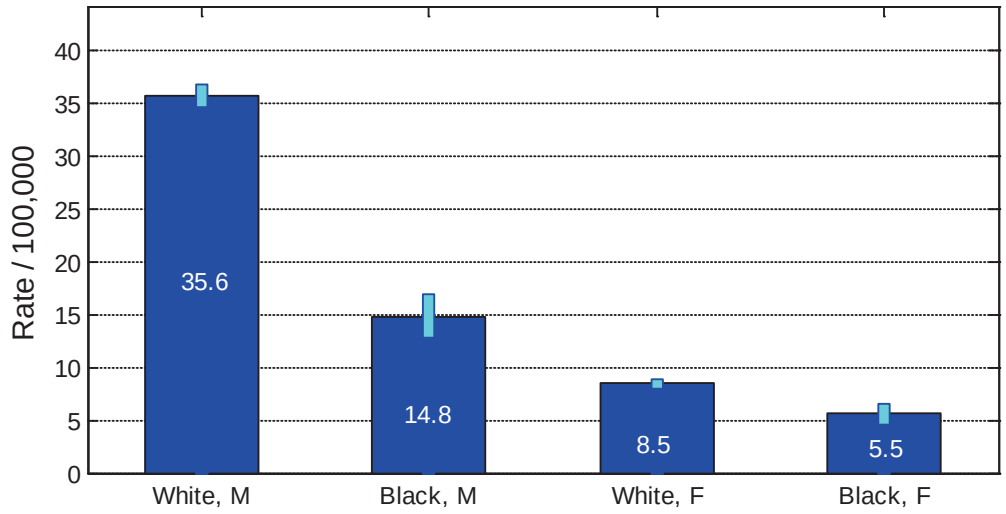
- Median age at death from urinary bladder cancer in Arkansas from 1999 through 2008 was 79 years.
- The mortality rates of urinary bladder cancer increases as age increases.

Figure 10.4: Trends in Age-Adjusted Urinary Bladder Cancer Incidence, AR & US, 1997 - 2008



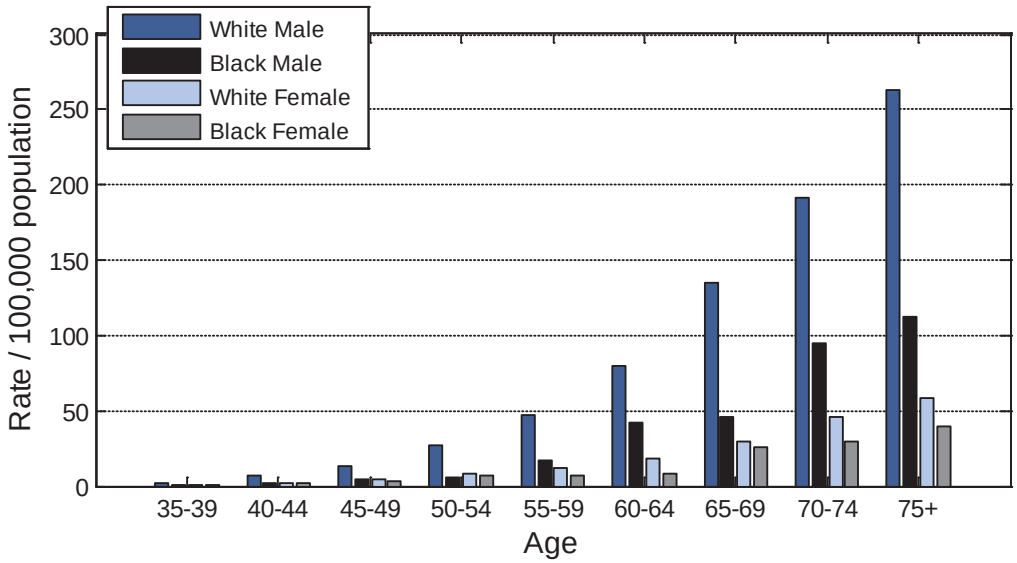
- From 1997 through 2008, the age-adjusted incidence rates of urinary bladder cancer in Arkansas were lower than rates in the United States.
  - The United States had 19.6 cases per 100,000 in 2008.
  - Arkansas had 17.7 cases per 100,000 in 2008.
- In Arkansas, changes over time were relatively constant.

Figure 10.5: Age-Adjusted Urinary Bladder Cancer Incidence Rates and 95% Confidence Intervals By Race and Sex, Arkansas, 1997 - 2008



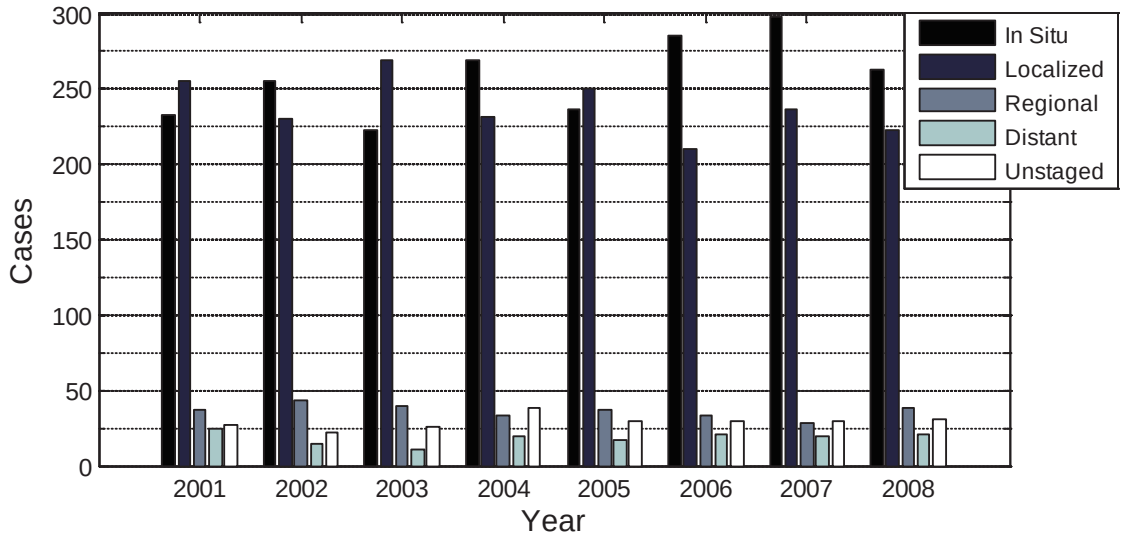
- All rates were significantly different.
  - Males had higher rates of urinary bladder cancer than females.
  - Overall, White males and females had higher incidence rates than Black males and females.

Figure 10.6: Age-Specific Incidence Rates of Urinary Bladder Cancer By Race and Sex, Arkansas, 1997 – 2008



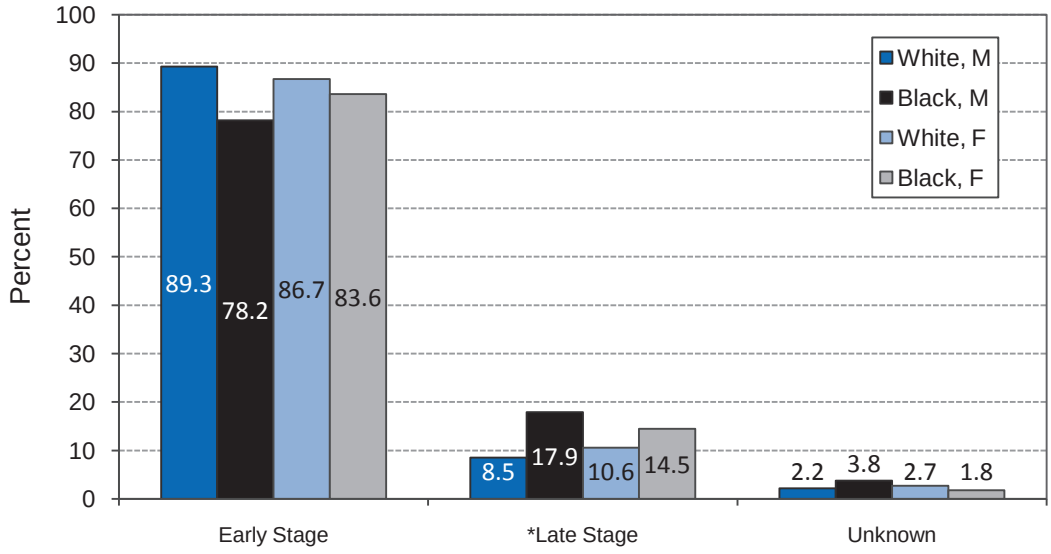
- Median age at diagnosis from 1997 through 2008 was 72 years.
- White males had higher rates than all other race and gender groups for every age group.

Figure 10.7: Urinary Bladder Cancer, SEER 2000 Stage at Diagnosis



- The majority of urinary bladder cancer cases were diagnosed at early stages, in situ or localized.

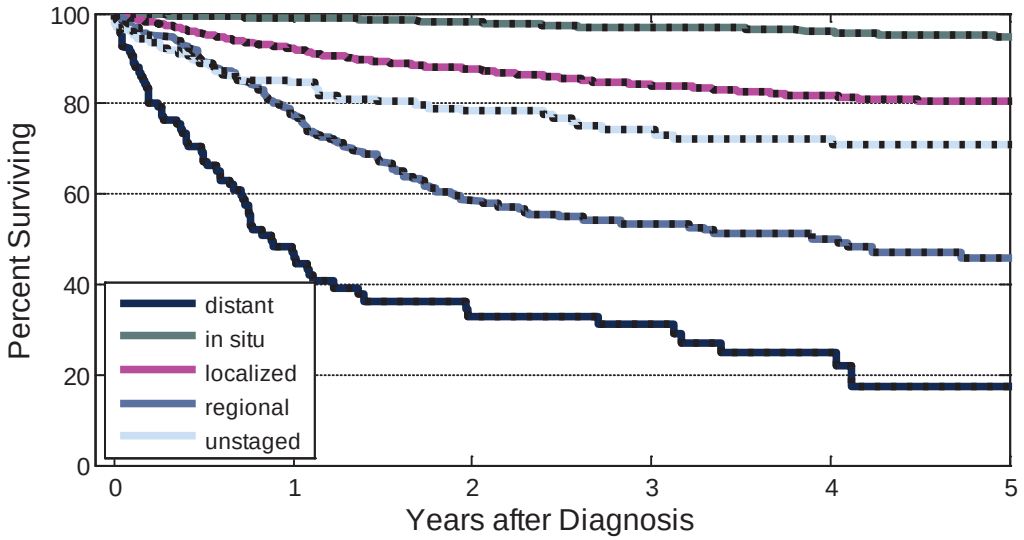
Figure 10.8: Urinary Bladder Cancer, SEER 2000 Stage at Diagnosis, By Race and Sex, 2004 – 2008



*Note: Late stage includes regional and distant stages of disease.

- Black men and women were diagnosed at later stages of disease than White men and women. Note that percentages for Blacks are based on a small number of cases.

Figure 10.9 Urinary Bladder Cancer, Five-Year Survival By Stage at Diagnosis, 2001 - 2008



- Urinary bladder cancer 5-year survival rates depend on stage-at-diagnosis.
  - In situ = 95%
  - Localized = 81%
  - Regional = 46%
  - Distant = 17%
  - Overall = 83%

"The best way to lower your risk for urinary bladder cancer is not to smoke. It's also important to follow good work safety habits if you work with chemicals called aromatic amines. A recent study has found that drinking plenty of fluids (mainly water) could lower the risk of bladder cancer."

-American Cancer Society

Chapter 11: Uterine Cervix (Cervical)

In 2008, a total of 157 women in Arkansas were diagnosed with cancer of the uterine cervix and 48 women died from cancer of the uterine cervix in 2008. The median age at diagnosis for uterine cervix (cervical) cancer in Arkansas from 2004 - 2008 was 48 years.

Signs and Symptoms [1, 2]

Symptoms of cervical cancer usually do not present until abnormal cells have become cancerous and invade surrounding tissue. The most common symptoms are:

- Abnormal vaginal bleeding;
- Bleeding after menopause; and
- Increased vaginal discharge.

Risk Factors [1, 2]

The primary cause of cervical cancer is infection with certain types of human papillomavirus (HPV). Females at risk of infection of HPV are those who begin having sex at an early age, or those who have had many sexual partners. HPV infections are prevalent in healthy women, and only rarely does HPV progress to cervical cancer. Persistent infections of HPV along with other factors (e.g. long-term use of birth control pills, having many children, immunosuppression, and cigarette smoking) can increase risk of cervical cancer.

Prevention and Early Detection [2, 5]

The best way to prevent the types of HPV infections that cause cervical cancer is through immunization. The vaccines cannot protect against already infected individuals, and it does not protect against all types of HPV. The FDA approved two types of HPV vaccines:

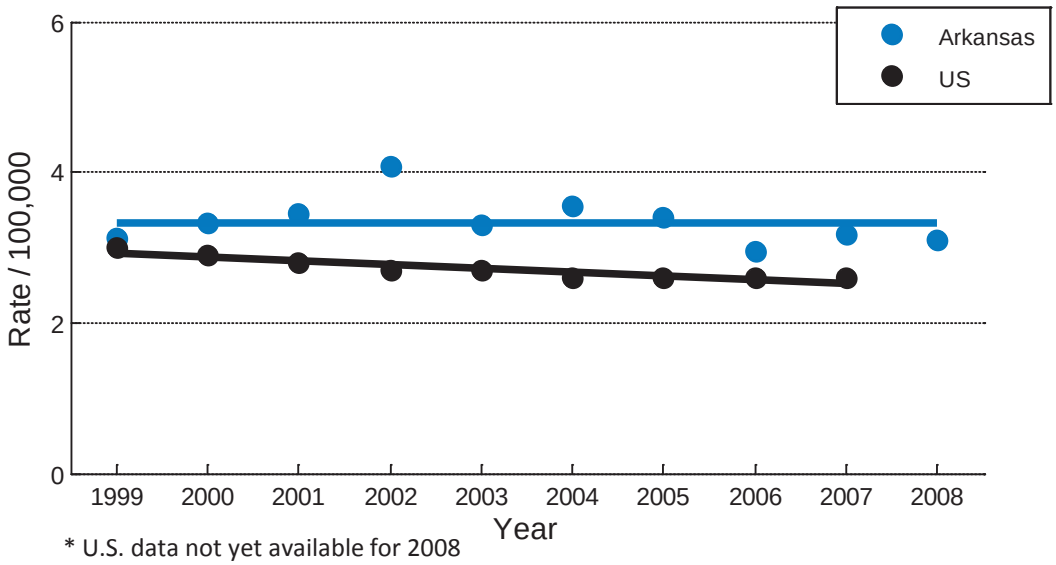
- Gardasil is approved for use in females aged 9 to 26 years.
- Cervarix is approved for use in females aged 10 to 25 years.

Screening using a Pap test can prevent cervical cancer by removing precancerous lesions. The U.S. Preventive Services Task Force (USPSTF) strongly recommends cervical cancer screening among females who are sexually active and have a cervix. The USPSTF does not recommend screening among women aged 65 and older who have had a recent normal Pap test and are not at high risk for developing cervical cancer.

Treatment [1, 2]

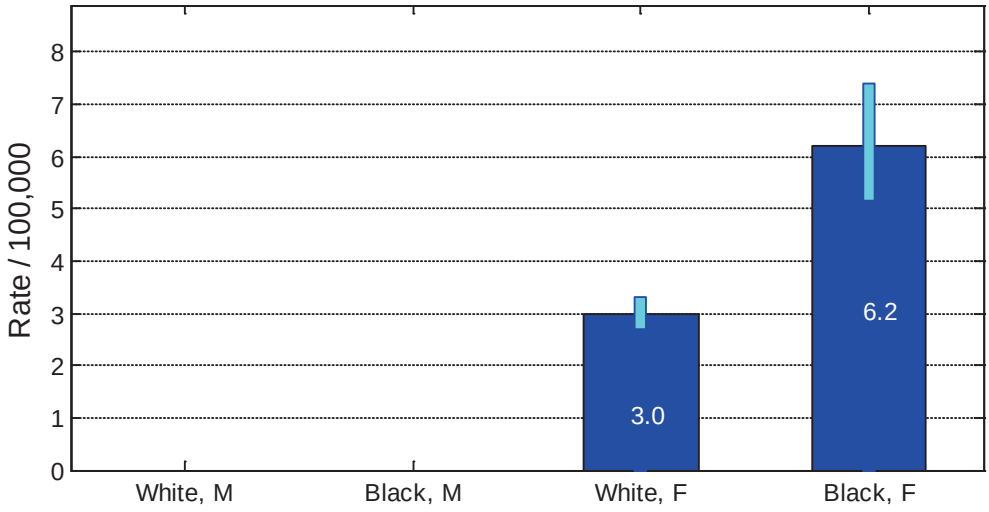
Cervical cancer that has not invaded nearby tissue can be treated using eletrocoagulation (destroys tissue using intense heat by electric current), cryotherapy (destroys cells using extreme cold), laser ablation, or surgery. Advanced cervical cancer is treated with surgery, radiation, and chemotherapy.

Figure 11.1: Age-Adjusted Uterine Cervix Cancer Mortality Trends, AR & US, 1999 – 2008*



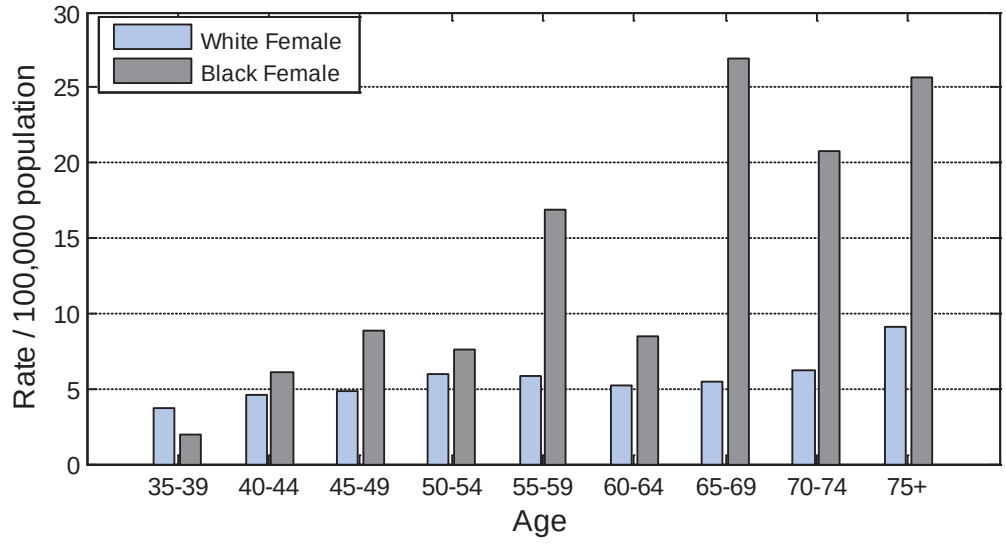
- From 1999 through 2008, Arkansas age-adjusted mortality rates for uterine cervix cancer were higher than rates in the United States.
  - United States had 2.4 deaths per 100,000 in 2007.
  - Arkansas had 3.2 deaths per 100,000 in 2007.
- In Arkansas, the changes in age-adjusted mortality rates over time were not significant (p = 0.14).
  - The average age-adjusted uterine cervix cancer mortality rate during this period was 3.3 per 100,000.

Figure 11.2: Uterine Cervix Cancer Mortality by Race in Arkansas, 1999 - 2008



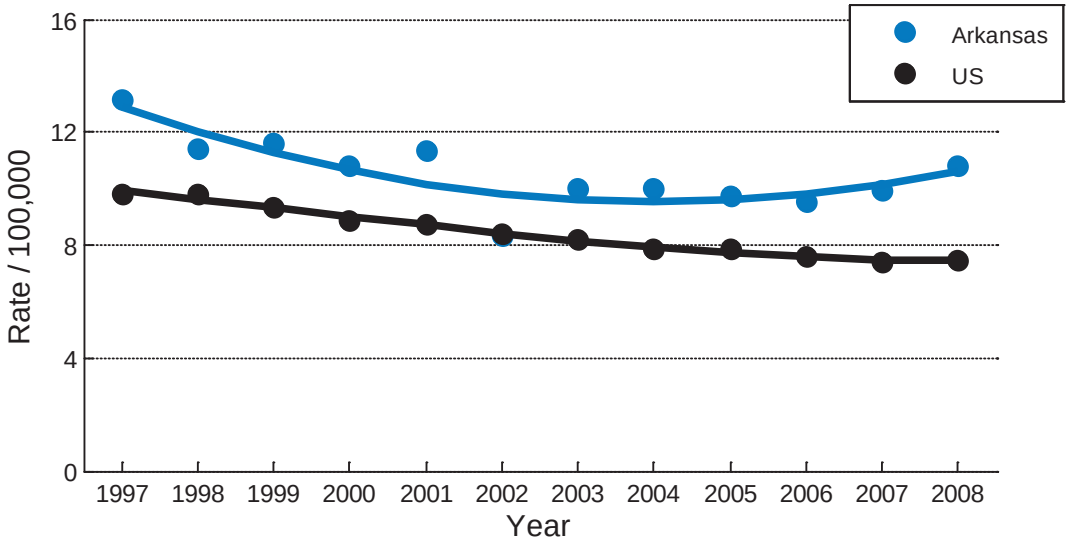
- Black women have much higher mortality than White women.

Figure 11.3: Age-Specific Uterine Cervix Cancer Mortality Rates By Race, Arkansas, 1999 - 2008



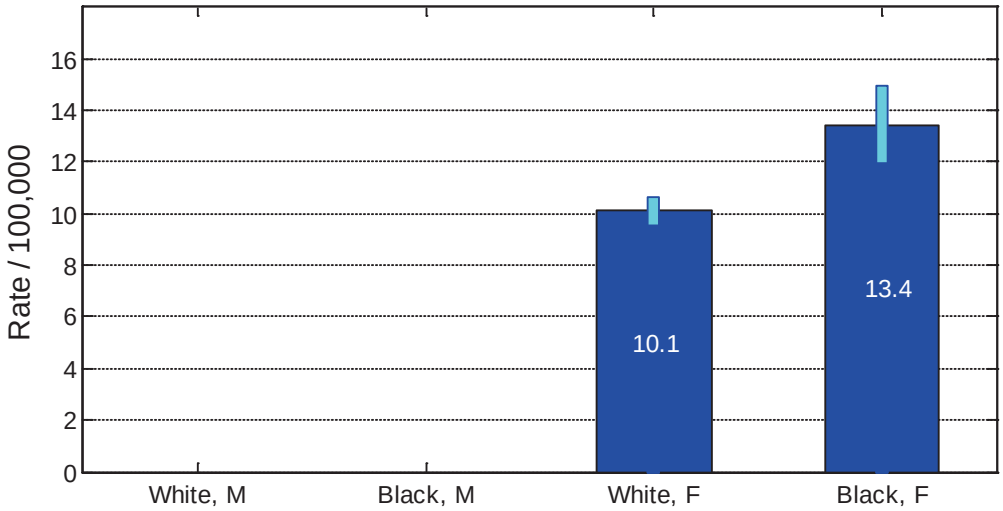
- The median age at death from uterine cervix cancer in Arkansas during 1999 through 2008 was 58 years.
- Black women have much higher mortality than White women.
  - Note that age-specific rates are based on a few cases so these estimates have large standard errors.

Figure 11.4: Age-Adjusted Uterine Cervix Cancer Incidence Trends, AR & US, 1997 - 2008



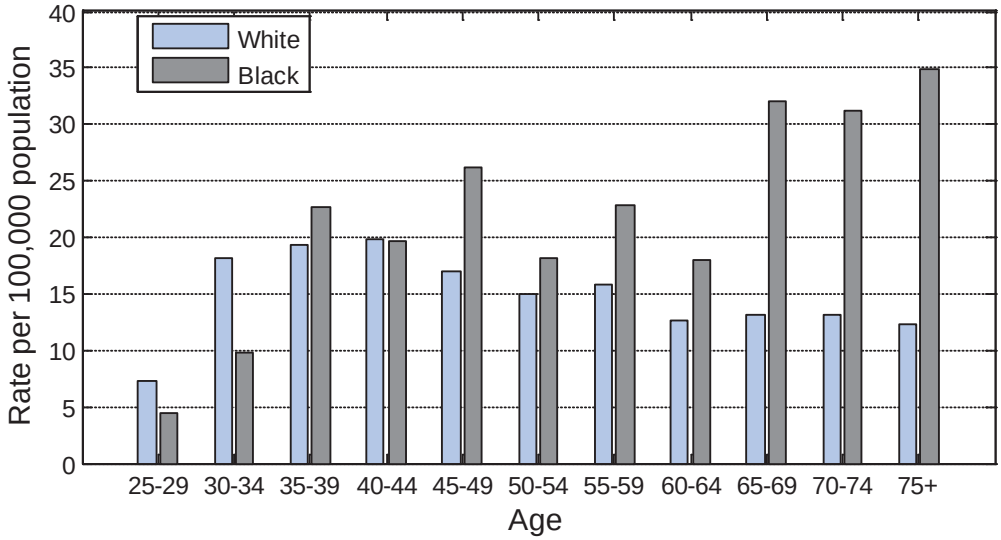
- Arkansas age-adjusted uterine cervix cancer incidence rates were higher than the rates for the United States.
  - The rate in Arkansas in 2008 was 10.8 per 100,000.
  - The rate in the United States in 2008 was 7.5 per 100,000.
- In Arkansas, there was a decline in incidence rates during 1997 – 2004, but the decline seems to have stalled since 2004 ($p < 0.01$).

Figure 11.5: Uterine Cervix Cancer Incidence by Race, Arkansas, 1997 – 2008



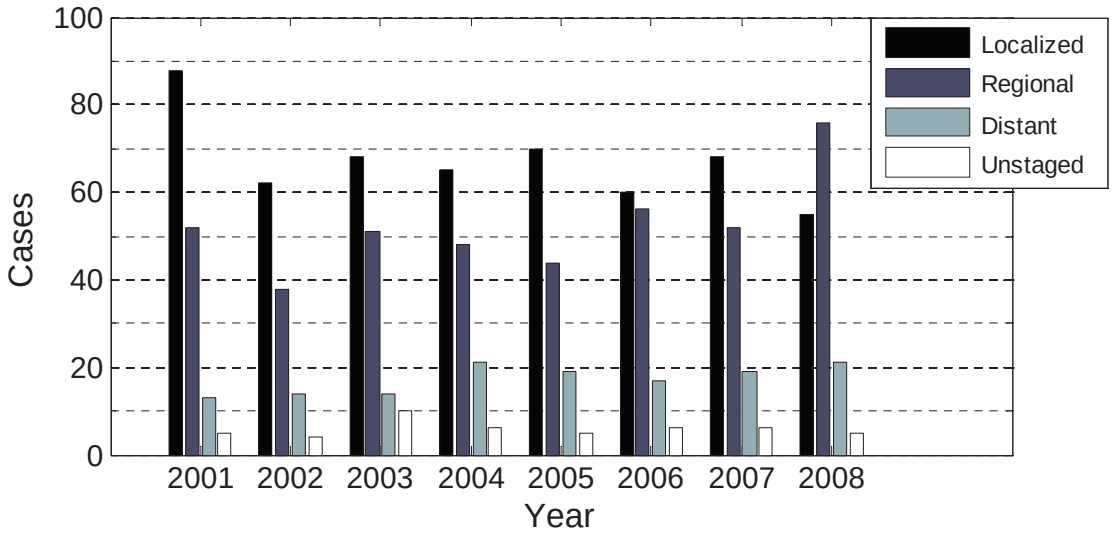
- Black women have higher incidence rates than White women.

Figure 11.6: Age-Specific Incidence Rates of Uterine Cervix Cancer By Race, Arkansas, 1997 - 2008



- Median age at diagnosis during 1997-2008 was 48 years.
- Age-specific rates are quite different for Black and White females.
  - White women have higher rates at younger ages with the highest rates from ages 35 to 44.
  - Black women have higher rates at older ages with the highest rates at ages over 65.

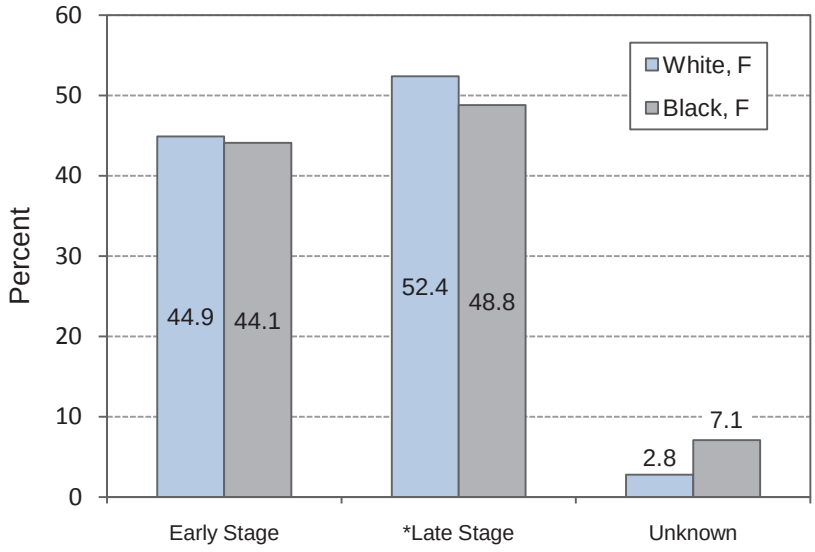
Figure 11.7: Uterine Cervix Cancer, SEER 2000 Stage at Diagnosis*



* Note: *In situ* carcinomas of the uterine cervix are not reportable to cancer registries.

- Over 80% of uterine cervix cancer cases are diagnosed at the localized or regional stage.

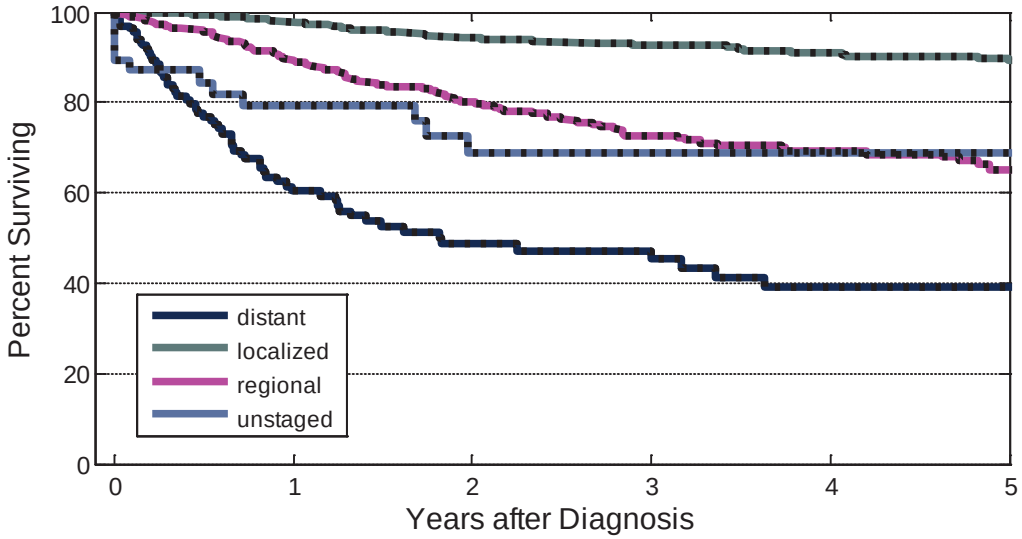
Figure 11.8: Uterine Cervix Cancer, SEER 2000 Stage at Diagnosis, By Race, 2004 – 2008



*Note: Late stage includes regional and distant stages of disease.

- White women were diagnosed at more advanced stages of cervical cancer than Black women. Note that percentages for Black women were based on a small number of cases.

Figure 11.9: Uterine Cervix Cancer, Five-Year Survival By Stage at Diagnosis*, 2001 - 2008



* Note: In situ carcinomas of the uterine cervix are not reportable to cancer registries.

- Uterine cervix cancer 5-year survival rates depend on stage-at-diagnosis.
  - Localized = 89 %
  - Regional = 65 %
  - Distant = 39 %
  - Overall = 75 %

References

1. Arkansas Central Cancer Registry. Cancer Facts & Figures, 1997 - 2005. Arkansas Department of Health; 2009.
2. American Cancer Society. Cancer Facts & Figures 2010. Atlanta, GA: American Cancer Society; 2010.
3. Arkansas Department of Health. Arkansas Central Cancer Registry. Little Rock, AR:. Available from: ***http://www.cancer-rates.info/ar/index.php***. Accessed 4/24/2011, 2011.
4. Cancer Costs Projections - National Institutes of Health (NIH) ***http://www.nih.gov/news/health/jan2011/nci-12.htm***. Accessed 4/24/2011, 2011.
5. U.S. Preventive Services Task Force. ***http://www.uspreventiveservicestaskforce.org/***.
6. Centers for Disease Control and Prevention. Smoking-attributable mortality, morbidity, and economic costs (SAMMEC). Available from: ***https://apps.nccd.cdc.gov/sammec/index.asp***. Accessed 4/24/2011, 2011.
7. Non-Hodgkin Lymphoma - National Cancer Institute. ***http://www.cancer.gov/cancertopics/types/non-hodgkin.*** Accessed 4/24/2011, 2011.
8. Melanoma - National Cancer Institute. ***http://www.cancer.gov/cancertopics/types/melanoma***. Accessed 4/24/2011, 2011.
9. Bladder Cancer - National Cancer Institute. ***http://www.cancer.gov/cancertopics/types/bladder***. Accessed 4/24/2011, 2011.

Table 3: Age-Adjusted Mortality Rates & Counts By Cancer Site & County, Arkansas, 2007

	All Sites Combined		Female Breast		Colon and Rectum		Lung and Bronchus		Non-Hodgkin Lymphoma	
County	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rage
Arkansas	48	186.9	~	15.2***	~	18.4***	16	61.0	~	3.4***
Ashley	66	245.3	6	41.3***	9	33.4***	20	76.6	0	0.0***
Baxter	154	195.4	9	19.0***	12	15.1	57	76.4	8	10.1***
Benton	333	164.4	20	17.9	35	17.1	95	47.1	13	6.2
Boone	92	183.7	7	23.2***	5	11.1***	33	65.2	5	9.3***
Bradley	31	189.0	~	10.9***	~	18.3***	8	50.2***	~	6.4***
Calhoun	14	207.9	~	24.3***	~	12.6***	6	90.4***	~	17.0***
Carroll	59	162.5	~	10.7***	6	17.5***	13	36.1	~	2.9***
Chicot	43	274.2	~	32.6***	5	31.9***	11	65.9	~	6.4***
Clark	47	183.1	~	26.5***	~	7.8***	19	72.2	~	6.2***
Clay	50	216.1	~	12.6***	7	29.4***	18	80.7	~	4.5***
Cleburne	92	231.5	6	31.6***	8	18.5***	39	93.4	~	4.9***
Cleveland	25	249.0	~	46.5***	~	20.3***	7	70.7***	0	0.0***
Columbia	59	198.1	~	21.1***	6	18.9***	17	56.0	~	2.8***
Conway	60	233.8	~	22.9***	~	14.8***	28	110.0	~	11.2***
Craighead	172	191.0	16	32.4	18	20.1	32	35.1	~	3.0***
Crawford	119	196.3	7	21.5***	8	14.3***	30	47.9	~	6.6***
Crittenden	99	220.1	8	29.1***	9	20.8***	30	64.7	~	5.6***
Cross	56	260.1	~	7.7***	8	36.4***	21	98.8	0	0.0***
Dallas	24	235.6	~	29.7***	~	31.6***	9	78.3***	~	13.9***
Desha	30	196.0	~	30.9***	~	19.0***	11	78.4	0	0.0***
Drew	53	267.0	7	70.8***	8	39.8***	16	78.9	0	0.0***
Faulkner	164	188.4	11	21.8	19	22.5	53	60.2	~	3.4***
Franklin	52	221.3	~	14.2***	~	7.8***	17	72.7	~	11.8***
Fulton	30	155.7	0	0.0***	~	5.3***	15	72.7	~	7.0***
Garland	275	185.1	18	24.0	22	15.2	88	59.7	5	3.0***
Grant	45	246.8	6	59.0***	5	27.5***	14	77.9	~	6.0***
Greene	97	221.0	6	23.1***	12	29.0	29	65.0	~	2.2***
Hempstead	55	215.5	5	35.0***	~	7.3***	23	91.2	~	16.7***
Hot Spring	80	209.9	~	4.1***	7	17.7***	30	80.6	~	4.9***
Howard	44	268.2	~	24.7***	5	28.2***	12	73.1	~	6.2***
Independence	81	191.9	5	22.3***	~	9.1***	31	72.8	~	3.9***
Izard	48	239.5	6	63.2***	~	18.8***	16	79.4	0	0.0***
Jackson	44	215.0	~	18.7***	6	30.8***	20	94.0	~	9.4***
Jefferson	173	201.2	18	39.2	17	19.3	59	66.8	~	5.2***
Johnson	52	187.7	~	21.0***	7	27.0***	16	56.0	~	11.7***
Lafayette	31	277.5	0	0.0***	~	23.6***	11	93.6	0	0.0***
Lawrence	35	155.9	~	13.2***	~	6.4***	14	67.0	~	11.3***
Lee	34	274.7	~	54.2***	7	56.4***	9	72.0***	~	7.1***
Lincoln	26	180.3	0	0.0***	~	7.8***	10	69.7	~	12.9***
Little River	38	224.7	~	36.9***	~	6.0***	13	73.0	~	11.2***
Logan	62	208.2	~	23.2***	~	10.9***	21	70.7	6	21.0***
Lonoke	107	185.4	9	29.4***	14	24.7	30	52.3	6	9.3***
Madison	32	153.0	~	19.4***	~	20.1***	12	56.9	0	0.0***
Marion	48	176.8	5	36.3***	5	18.2***	18	69.3	0	0.0***
Miller	102	206.4	6	20.5***	7	14.6***	39	78.3	~	1.7***
Mississippi	102	214.1	12	45.0	10	20.4	30	62.5	~	5.9***
Monroe	43	349.0	~	35.8***	6	47.3***	12	93.1	~	33.9***
Montgomery	26	185.9	~	37.0***	~	13.7***	11	76.3	~	7.8***
Nevada	24	190.7	~	16.0***	~	28.5***	~	23.4***	~	8.4***
Newton	25	221.1	~	12.2***	~	34.1***	7	72.1***	~	16.7***
Ouachita	81	231.9	11	56.0	11	34.5	17	46.5	~	3.0***
Perry	21	160.3	~	32.0***	0	0.0***	9	67.0***	0	0.0***
Phillips	64	261.5	~	36.2***	6	26.4***	19	74.7	~	11.9***
Pike	25	166.3	~	10.8***	~	27.3***	11	73.3	0	0.0***
Poinsett	85	291.6	~	25.0***	8	27.7***	31	103.3	~	6.2***
Polk	62	220.0	~	15.6***	8	26.7***	18	65.1	~	6.4***
Pope	123	190.1	11	30.4	11	16.1	43	68.4	~	6.0***
Prairie	21	152.7	~	18.9***	5	35.3***	~	28.1***	0	0.0***
Pulaski	763	198.2	54	23.9	73	18.7	191	50.2	34	9.2
Randolph	34	137.4	~	20.0***	~	7.5***	10	38.7	~	12.7***
St Francis	65	237.6	~	11.6***	10	37.4	18	64.7	~	7.0***
Saline	199	196.9	15	27.7	18	17.7	70	68.2	6	6.8***
Scott	26	190.8	~	47.3***	~	7.1***	12	87.2	~	7.2***
Searcy	22	181.4	0	0.0***	~	7.7***	9	76.1***	~	8.0***
Sebastian	277	213.7	23	32.8	21	15.8	94	72.1	9	7.3***
Sevier	40	236.6	~	10.7***	~	18.6***	11	68.1	~	7.0***
Sharp	49	164.7	5	30.7***	~	8.2***	17	55.7	~	3.4***
Stone	34	181.1	~	36.4***	~	4.3***	11	57.9	~	10.6***
Union	116	214.1	14	41.6	14	24.3	41	78.1	~	4.2***
Van Buren	49	181.1	~	12.3***	~	7.2***	16	60.8	~	7.2***
Washington	308	196.3	26	28.4	24	15.3	95	60.9	8	5.3***
White	163	197.6	14	31.8	15	17.0	63	77.1	7	8.8***
Woodruff	16	166.3	0	0.0***	~	9.7***	5	53.4***	0	0.0***
Yell	45	177.6	~	13.5***	~	4.6***	19	75.5	0	0.0***

Table 3: Age-Adjusted Mortality Rates & Counts By Cancer Site & County, Arkansas, 2007, continued

	Melanoma of the Skin		Prostate		Urinary Bladder		Uterine Cervix		Ovary	
County	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate
Arkansas	0	0.0***	~	24.1***	~	4.2***	0	0.0***	~	9.8***
Ashley	~	4.6***	~	22.3***	0	0.0***	~	8.1***	~	29.6***
Baxter	~	1.2***	~	10.0***	5	5.8***	0	0.0***	6	13.2***
Benton	~	0.9***	16	18.6	7	3.7***	~	1.9***	7	6.3***
Boone	~	4.4***	~	13.9***	~	5.5***	0	0.0***	~	8.9***
Bradley	0	0.0***	~	44.6***	~	6.2***	~	20.4***	0	0.0***
Calhoun	0	0.0***	0	0.0***	0	0.0***	0	0.0***	0	0.0***
Carroll	0	0.0***	~	25.6***	~	5.8***	~	7.6***	5	26.0***
Chicot	0	0.0***	~	47.1***	~	12.4***	0	0.0***	~	22.5***
Clark	0	0.0***	~	32.5***	~	6.8***	0	0.0***	0	0.0***
Clay	0	0.0***	~	12.8***	0	0.0***	0	0.0***	~	21.3***
Cleburne	~	5.9***	7	38.9***	~	4.0***	0	0.0***	~	3.7***
Cleveland	~	9.2***	~	56.0***	0	0.0***	0	0.0***	0	0.0***
Columbia	~	7.1***	~	22.6***	0	0.0***	0	0.0***	0	0.0***
Conway	0	0.0***	~	30.2***	0	0.0***	0	0.0***	~	7.6***
Craighead	~	4.6***	8	24.0***	8	9.4***	~	2.2***	~	6.9***
Crawford	~	5.1***	~	11.0***	7	11.6***	~	7.1***	~	3.1***
Crittenden	0	0.0***	11	64.1	0	0.0***	0	0.0***	~	4.7***
Cross	0	0.0***	~	45.5***	~	4.0***	~	7.7***	0	0.0***
Dallas	~	19.5***	~	26.0***	0	0.0***	0	0.0***	0	0.0***
Desha	0	0.0***	~	17.4***	0	0.0***	0	0.0***	~	9.5***
Drew	~	5.5***	5	63.5***	0	0.0***	0	0.0***	~	18.9***
Faulkner	~	3.4***	9	28.0***	6	7.4***	~	5.8***	~	8.4***
Franklin	0	0.0***	~	10.6***	~	3.7***	0	0.0***	~	18.3***
Fulton	0	0.0***	~	22.7***	~	10.1***	0	0.0***	~	22.0***
Garland	~	2.2***	21	31.7	7	4.4***	~	2.6***	6	6.8***
Grant	0	0.0***	~	56.4***	0	0.0***	0	0.0***	~	7.7***
Greene	~	4.5***	5	25.8***	~	4.6***	~	3.6***	~	16.1***
Hempstead	~	7.3***	~	45.1***	0	0.0***	~	4.5***	~	4.5***
Hot Spring	~	2.1***	~	19.2***	~	2.3***	~	12.5***	~	10.9***
Howard	~	12.2***	0	0.0***	~	5.5***	~	35.4***	~	10.2***
Independence	0	0.0***	6	38.5***	0	0.0***	0	0.0***	0	0.0***
Izard	~	7.3***	~	22.7***	~	4.8***	0	0.0***	~	8.6***
Jackson	0	0.0***	~	15.2***	~	4.7***	0	0.0***	0	0.0***
Jefferson	~	2.8***	6	19.7***	~	5.1***	~	2.9***	6	12.4***
Johnson	~	4.5***	5	41.2***	~	3.0***	~	16.0***	~	4.5***
Lafayette	0	0.0***	~	92.1***	0	0.0***	0	0.0***	0	0.0***
Lawrence	0	0.0***	~	18.8***	~	4.4***	~	8.9***	~	17.5***
Lee	~	7.1***	0	0.0***	~	7.1***	0	0.0***	~	16.4***
Lincoln	0	0.0***	~	15.9***	~	19.4***	0	0.0***	~	47.6***
Little River	0	0.0***	~	44.8***	0	0.0***	0	0.0***	0	0.0***
Logan	~	6.9***	~	23.3***	~	10.1***	~	17.8***	~	5.8***
Lonoke	~	2.9***	5	22.0***	~	2.0***	~	5.3***	0	0.0***
Madison	~	4.3***	~	9.1***	~	9.5***	0	0.0***	0	0.0***
Marion	0	0.0***	~	10.0***	~	6.9***	0	0.0***	~	5.3***
Miller	~	4.8***	9	47.6***	5	10.2***	0	0.0***	~	6.5***
Mississippi	0	0.0***	6	35.9***	~	4.1***	~	3.3***	~	7.0***
Monroe	0	0.0***	~	29.3***	0	0.0***	0	0.0***	~	47.6***
Montgomery	0	0.0***	~	34.0***	0	0.0***	0	0.0***	0	0.0***
Nevada	0	0.0***	6	129.5***	0	0.0***	0	0.0***	0	0.0***
Newton	~	11.3***	~	33.1***	0	0.0***	0	0.0***	0	0.0***
Ouachita	~	5.8***	~	20.3***	~	7.3***	~	14.2***	0	0.0***
Perry	0	0.0***	~	17.6***	~	7.7***	0	0.0***	0	0.0***
Phillips	~	3.8***	~	34.1***	~	12.1***	0	0.0***	0	0.0***
Pike	0	0.0***	~	14.5***	0	0.0***	0	0.0***	0	0.0***
Poinsett	~	3.7***	6	49.9***	~	6.8***	~	23.1***	~	17.4***
Polk	0	0.0***	~	32.9***	~	14.1***	0	0.0***	0	0.0***
Pope	~	2.9***	6	23.9***	~	6.3***	~	3.9***	~	5.0***
Prairie	~	8.8***	~	30.5***	0	0.0***	0	0.0***	0	0.0***
Pulaski	9	2.1***	42	31.7	18	4.5	7	2.9***	27	12.1
Randolph	~	3.7***	~	28.9***	0	0.0***	0	0.0***	~	22.4***
St Francis	~	3.4***	~	22.3***	~	3.6***	~	7.4***	0	0.0***
Saline	~	2.9***	8	20.2***	5	4.9***	~	4.2***	6	10.7***
Scott	0	0.0***	~	35.3***	~	7.2***	0	0.0***	0	0.0***
Searcy	~	13.8***	~	18.2***	~	6.5***	0	0.0***	~	16.2***
Sebastian	~	3.3***	14	26.9	8	5.9***	0	0.0***	15	21.7
Sevier	0	0.0***	5	82.8***	~	6.5***	0	0.0***	0	0.0***
Sharp	0	0.0***	~	32.8***	~	3.4***	~	7.2***	~	5.6***
Stone	~	10.1***	~	34.8***	0	0.0***	0	0.0***	~	30.6***
Union	0	0.0***	11	54.4	~	5.2***	~	1.8***	~	5.7***
Van Buren	0	0.0***	~	21.6***	0	0.0***	0	0.0***	~	12.8***
Washington	5	3.0***	17	27.1	~	2.4***	~	1.3***	8	8.9***
White	~	4.9***	5	15.1***	7	8.2***	~	4.6***	~	9.3***
Woodruff	0	0.0***	~	30.4***	0	0.0***	0	0.0***	~	17.9***
Yell	0	0.0***	~	40.6***	0	0.0***	0	0.0***	~	6.3***

Note: All rates are per 100,000. Rates are age-adjusted to the 2000 U.S. Standard Million Population. Rates are based on deaths from malignant tumors.
~ Counts are suppressed if fewer than 5 deaths were reported in the specified category.
*** Counts < 10 are too few to calculate a stable age-adjusted rate
Source: Arkansas Central Cancer Registry Query System: http://www.cancer-rates.info/ar/index.php
Based on data released October 27, 2010.

Table 4: Age-Adjusted Incidence Rates & Counts by Cancer Site & County, Arkansas, 2008

	All Sites Combined		Female Invasive Breast		Colon and Rectum		Lung and Bronchus		Non-Hodgkin Lymphoma	
County	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Arkansas	126	509.1	17	131.4	21	85.6	32	129.7	5	19.4***
Ashley	96	369.8	16	128.1	7	27.7***	17	64.3	6	22.2***
Baxter	387	504.8	47	141.4	37	47.6	66	77.0	14	22.8
Benton	747	349.8	105	93.2	79	37.4	95	45.0	25	11.7
Boone	236	480.7	29	104.6	30	60.5	36	71.9	11	22.9
Bradley	72	473.1	9	122.9***	8	48.6***	20	128.0	~	19.5***
Calhoun	22	320.8	~	29.9***	~	62.8***	5	65.0***	0	0.0***
Carroll	150	408.0	20	108.5	17	43.1	27	70.3	6	16.6***
Chicot	70	445.4	17	188.9	7	42.8***	8	51.3***	~	6.2***
Clark	127	493.2	17	123.9	10	36.3	24	91.3	~	10.8***
Clay	108	481.9	11	95.4	16	77.4	25	106.0	~	11.3***
Cleburne	179	444.2	15	84.4	16	44.6	46	115.4	5	10.5***
Cleveland	60	565.3	5	88.9***	5	50.9***	13	126.6	~	18.5***
Columbia	134	481.1	18	126.1	13	45.9	25	91.2	~	13.7***
Conway	106	414.8	13	88.8	13	52.6	21	81.9	7	27.4***
Craighead	375	408.4	46	90.3	31	34.0	75	81.9	11	11.3
Crawford	253	404.3	27	79.8	28	47.1	42	68.0	7	11.5***
Crittenden	192	393.9	21	74.9	33	69.9	34	71.6	7	15.4***
Cross	90	420.4	9	81.2***	17	78.4	23	106.0	~	10.5***
Dallas	48	460.7	9	184.6***	7	63.5***	11	107.3	~	11.5***
Desha	72	436.9	7	90.9***	10	59.3	11	62.4	~	10.4***
Drew	87	427.4	12	116.2	~	11.7***	15	76.0	~	13.0***
Faulkner	430	461.7	57	116.3	42	45.4	64	70.1	23	25.6
Franklin	84	378.2	9	74.9***	~	14.5***	18	82.2	5	21.0***
Fulton	68	385.0	8	86.3***	8	57.1***	18	92.6	~	9.8***
Garland	759	511.9	99	127.6	61	41.5	138	86.0	27	19.0
Grant	96	483.4	11	107.1	7	32.7***	24	121.7	6	28.8***
Greene	196	431.8	11	46.0	28	61.3	38	79.8	17	37.9
Hempstead	114	451.8	13	99.1	15	58.3	20	81.1	5	20.4***
Hot Spring	148	390.6	20	100.9	18	47.9	26	64.7	8	20.6***
Howard	76	476.5	10	119.5	11	64.7	14	93.7	~	19.2***
Independence	133	315.3	10	49.0	~	10.3***	28	62.3	~	9.4***
Izard	80	406.4	8	84.9***	7	35.3***	11	53.1	6	38.1***
Jackson	117	600.3	10	91.4	15	74.6	28	145.4	5	28.8***
Jefferson	412	471.9	52	113.4	44	48.8	64	72.4	20	23.0
Johnson	111	403.5	20	131.7	14	51.1	20	71.4	~	14.2***
Lafayette	34	334.6	~	54.8***	~	31.4***	10	95.1	0	0.0***
Lawrence	124	550.3	11	93.6	14	55.4	26	115.0	6	27.0***
Lee	66	526.1	7	88.4***	5	41.1***	9	70.7***	~	15.6***
Lincoln	66	467.7	8	125.4***	5	36.8***	12	83.9	0	0.0***
Little River	74	420.7	11	131.7	7	42.0***	19	100.7	5	28.5***
Logan	137	476.2	12	85.6	20	67.4	31	107.0	7	25.9***
Lonoke	322	511.2	27	80.1	26	43.1	55	91.0	16	26.1
Madison	78	391.0	9	83.9***	10	50.0	15	71.3	~	7.9***
Marion	106	381.7	10	73.3	5	23.8***	15	50.8	5	21.3***
Miller	188	383.0	18	63.4	21	43.7	40	82.1	~	8.3***
Mississippi	215	458.5	28	107.3	33	70.9	49	102.3	8	18.3***
Monroe	72	603.2	6	89.9***	6	45.4***	15	126.5	~	32.6***
Montgomery	70	524.0	7	94.4***	8	54.7***	16	108.1	~	36.2***
Nevada	58	523.8	~	66.9***	7	63.4***	18	150.4	~	9.3***
Newton	44	380.1	~	80.8***	~	25.3***	10	77.4	0	0.0***
Ouachita	157	464.4	14	83.6	15	42.3	27	75.9	~	12.0***
Perry	68	528.2	~	60.9***	9	68.8***	16	124.7	~	10.5***
Phillips	113	460.3	14	98.8	12	48.9	22	90.3	~	16.2***
Pike	61	419.9	6	79.0***	5	32.5***	15	98.9	~	21.1***
Poinsett	148	514.1	13	74.6	18	62.8	37	123.4	~	6.6***
Polk	110	385.1	16	115.9	14	46.3	23	74.9	~	13.4***
Pope	293	449.6	44	126.9	31	46.9	50	76.5	6	9.2***
Prairie	51	410.0	~	46.5***	5	34.1***	15	123.1	7	53.4***
Pulaski	1912	482.3	259	118.1	191	48.7	296	74.6	71	18.1
Randolph	114	481.5	14	113.6	12	49.9	26	110.6	~	13.1***
St Francis	139	509.3	15	116.9	19	65.3	25	90.4	5	19.4***
Saline	372	349.4	47	83.9	31	29.6	72	68.2	22	20.9
Scott	61	427.7	~	57.0***	10	74.6	13	85.4	~	31.1***
Searcy	72	544.9	7	120.7***	7	51.1***	16	114.5	~	8.6***
Sebastian	502	383.0	73	105.8	51	37.4	109	81.8	21	16.6
Sevier	76	466.8	12	146.7	7	45.4***	11	67.3	~	15.8***
Sharp	110	407.6	12	85.3	~	8.6***	27	84.8	~	17.8***
Stone	60	326.8	5	53.6***	5	24.8***	13	59.9	~	5.6***
Union	278	531.0	30	107.1	33	62.3	49	94.6	7	14.4***
Van Buren	118	462.6	12	93.7	11	55.4	26	88.8	6	19.9***
Washington	714	427.3	102	113.9	72	42.1	107	66.7	24	13.9
White	389	472.4	42	96.1	31	38.0	66	78.3	17	21.5
Woodruff	55	530.3	~	90.8***	10	89.3	12	110.1	0	0.0***
Yell	99	394.9	10	79.0	6	22.6***	27	108.0	6	23.0***

Table 4: Age-Adjusted Incidence Rates & Counts by Cancer Site & County, Arkansas, 2008, continued

	Melanoma of the Skin		Prostate		Urinary Bladder		Uterine Cervix		Ovary	
County	**Cases**	**Rate**	**Cases**	**Rate**	**Cases**	**Rate**	**Cases**	**Rate**	**Cases**	**Rate**
Arkansas	~	15.6***	18	166.2	~	16.3***	~	12.6***	~	7.3***
Ashley	~	10.6***	16	122.9	~	4.3***	~	10.6***	~	5.4***
Baxter	23	26.8	87	216.2	22	24.7	~	9.7***	5	15.5***
Benton	29	13.3	121	119.2	36	17.2	9	8.3***	9	8.3***
Boone	~	6.3***	43	186.7	14	29.1	~	14.2***	6	18.3***
Bradley	~	4.6***	7	94.9***	~	6.4***	0	0.0***	~	27.4***
Calhoun	0	0.0***	~	96.1***	~	21.2***	0	0.0***	0	0.0***
Carroll	5	15.5***	15	86.4	8	22.2***	~	10.4***	~	14.9***
Chicot	5	30.1***	7	105.2***	~	26.1***	~	36.8***	~	20.1***
Clark	5	18.2***	18	156.6	~	15.8***	~	24.6***	~	6.6***
Clay	5	23.2***	14	139.6	~	12.7***	~	15.4***	~	19.8***
Cleburne	~	1.9***	34	163.0	9	20.0***	~	6.7***	~	11.8***
Cleveland	0	0.0***	8	149.1***	~	22.8***	0	0.0***	~	36.4***
Columbia	~	10.5***	21	164.3	~	13.1***	0	0.0***	~	22.1***
Conway	~	3.6***	16	124.1	~	12.6***	0	0.0***	0	0.0***
Craighead	12	13.6	59	146.1	22	23.6	~	3.7***	7	13.8***
Crawford	9	14.0***	42	143.9	10	15.4	5	17.9***	5	14.5***
Crittenden	~	6.7***	17	79.8	7	14.8***	5	17.1***	~	3.4***
Cross	~	21.8***	12	121.9	~	3.4***	~	14.9***	~	7.9***
Dallas	~	7.1***	6	121.1***	0	0.0***	~	34.5***	0	0.0***
Desha	~	10.8***	15	190.5	6	35.7***	0	0.0***	~	14.9***
Drew	~	9.7***	19	211.1	~	14.9***	0	0.0***	0	0.0***
Faulkner	14	13.9	72	167.2	12	14.4	6	12.9***	8	14.6***
Franklin	~	11.8***	14	127.7	~	18.5***	~	14.6***	~	31.0***
Fulton	8	49.7***	9	87.5***	~	18.2***	~	26.0***	0	0.0***
Garland	27	18.7	107	147.0	47	30.0	6	13.2***	11	18.3
Grant	~	11.3***	12	130.7	~	21.5***	0	0.0***	~	10.7***
Greene	6	12.9***	33	161.2	10	21.7	0	0.0***	~	5.8***
Hempstead	~	7.6***	18	144.2	5	18.3***	~	28.2***	~	7.6***
Hot Spring	7	18.1***	15	83.1	8	20.0***	~	6.2***	~	15.3***
Howard	~	9.7***	9	129.9***	~	21.3***	~	9.3***	0	0.0***
Independence	7	17.3***	28	129.2	~	4.5***	~	28.4***	~	8.9***
Izard	~	14.6***	20	200.0	~	17.1***	0	0.0***	~	9.0***
Jackson	~	13.0***	17	188.6	5	24.8***	~	17.0***	~	9.6***
Jefferson	~	5.0***	78	191.9	10	12.0	~	8.9***	~	4.7***
Johnson	~	7.2***	13	98.3	6	23.4***	~	26.9***	~	23.2***
Lafayette	0	0.0***	~	54.8***	~	11.2***	0	0.0***	~	20.0***
Lawrence	6	27.5***	18	178.3	~	15.0***	~	6.8***	~	6.8***
Lee	0	0.0***	15	280.1	~	16.3***	~	14.0***	0	0.0***
Lincoln	0	0.0***	11	182.0	~	29.8***	~	11.2***	~	12.7***
Little River	~	6.1***	9	92.2***	~	4.3***	0	0.0***	0	0.0***
Logan	~	11.9***	18	128.2	5	18.0***	0	0.0***	~	20.9***
Lonoke	6	8.8***	47	154.3	10	15.3	8	24.1***	~	2.8***
Madison	~	17.2***	6	54.2***	~	13.8***	~	10.8***	0	0.0***
Marion	~	6.3***	21	136.9	7	26.8***	0	0.0***	~	10.5***
Miller	~	4.4***	41	177.8	7	13.8***	~	18.2***	5	20.9***
Mississippi	7	14.8***	14	64.7	10	21.0	6	29.9***	~	14.3***
Monroe	0	0.0***	12	235.5	~	23.5***	~	15.4***	0	0.0***
Montgomery	~	44.3***	7	96.5***	~	26.4***	0	0.0***	0	0.0***
Nevada	~	21.5***	7	125.9***	~	17.7***	~	30.2***	0	0.0***
Newton	~	12.5***	8	133.9***	~	8.8***	0	0.0***	0	0.0***
Ouachita	~	8.4***	33	211.4	7	19.5***	~	15.3***	~	16.5***
Perry	~	7.0***	10	156.2	~	24.4***	0	0.0***	0	0.0***
Phillips	~	11.3***	18	167.5	~	11.9***	~	8.7***	~	15.5***
Pike	~	19.9***	~	61.1***	~	21.2***	~	22.5***	~	34.3***
Poinsett	~	8.6***	20	153.1	6	21.8***	0	0.0***	~	15.3***
Polk	~	8.9***	12	89.9	5	15.9***	~	13.3***	~	6.9***
Pope	~	5.5***	48	155.0	8	12.5***	~	6.2***	6	16.7***
Prairie	0	0.0***	~	70.3***	0	0.0***	~	44.7***	~	16.8***
Pulaski	44	11.1	336	184.0	62	15.5	21	11.4	20	9.4
Randolph	~	11.8***	13	122.9	5	20.0***	0	0.0***	~	9.9***
St Francis	8	29.1***	16	138.8	9	33.9***	0	0.0***	~	14.6***
Saline	12	10.9	56	104.9	20	18.3	~	4.0***	~	6.9***
Scott	~	9.9***	10	170.2	5	32.2***	0	0.0***	~	22.8***
Searcy	~	32.5***	13	204.9	9	77.4***	0	0.0***	0	0.0***
Sebastian	17	13.5	51	86.9	22	16.7	5	7.1***	6	8.5***
Sevier	~	6.9***	11	138.3	~	24.1***	~	13.9***	~	13.1***
Sharp	5	18.6***	17	116.0	5	21.9***	5	54.6***	~	6.3***
Stone	~	4.7***	14	142.1	~	6.6***	~	23.1***	~	27.2***
Union	6	13.1***	53	222.1	8	15.2***	0	0.0***	5	16.7***
Van Buren	5	15.8***	14	97.1	5	15.6***	~	19.0***	~	12.4***
Washington	32	19.1	92	120.7	40	24.9	9	10.1***	12	13.3
White	12	14.5	63	161.3	13	15.2	~	11.2***	~	9.5***
Woodruff	~	9.8***	~	96.9***	0	0.0***	0	0.0***	~	13.8***
Yell	~	4.5***	14	130.9	~	8.3***	0	0.0***	~	14.0***

Note: All rates are per 100,000. Rates are age-adjusted to the 2000 U.S. Standard Million Population. Rates are based on number of invasive cancers, except for urinary bladder.
~ Counts are suppressed if fewer than 5 cases were reported in the specified category.
*** Counts < 10 are too few to calculate a stable Rate
Source: Arkansas Central Cancer Registry Query System: http://www.cancer-rates.info/ar/index.php
Based on data released February 08, 2011.

Technical Notes

Age-adjusted rates are calculated in a manner that allows for the comparisons of populations with different age distributions. They are usually calculated per unit of the population (100,000). For example, a county with a large proportion of persons over the age of 55 would have higher counts of cancer compared to other counties with younger populations. By using an age-adjusted calculation, we can adjust for this age-difference and compare the burden across different population groups.

The rates are based on case counts and population estimates. Cancer case counts change over time because new cases are discovered or other revisions. The Census Bureau estimates of population also change over time. Consequently, estimates reported here will differ slightly from previous reports and likely will differ from future reports.

Age-adjusted (standardized) rates were computed from age-specific rates for 19 age groups; <1, 1-4, 5-9, …, 80-84, and 85+. The age-adjusted rate is weighted by the US 2000 Standard Million average of these age-specific rates. Confidence limits are computed using a method given in Tiwari et al.[1]

Trends in age-adjusted rates were estimated by weighted polynomial regression; the inverse variance of the age-adjusted rate was the weight.[1]

Standard mortality/incidence ratio (SMR or SIR) for a county is the ratio of observed cases in the county during a period of time (SMR: 1999 through 2008, SIR: 1997 through 2008) to the expected cases. Expected cases are computed by applying the corresponding county population estimates to age-race-sex-year-specific rates for Arkansas. Confidence intervals for SMR or SIR are computed by Byar's approximation.[2]

The 5-year cause-specific survival estimates (Kaplan-Meier estimates)[3] are based on passive follow-up of mortality among incident cases using death certificates from ADH. This method of follow-up is known to under report mortality, since deaths are not reported for anyone who moves out of Arkansas after their diagnosis.
A note about the data presented in the report:

Incident cancer cases were obtained from the Arkansas Central Cancer Registry database on February 18, 2011. Cancer mortality cases were obtained from the Arkansas Vital Statistics, Death Certificates on January 28, 2011. Cancer incident cases from the United States were obtained from the Surveillance and Epidemiology End Results (SEER) web site, ***http://seer.cancer.gov/***, March 8, 2011. United States mortality data were obtained from CDC Wonder Cancer Mortality Files web site, ***http://wonder.cdc.gov/mortsql.html***, for 1999 – 2007, February 17, 2011. Population estimates were downloaded from SEER web site, ***http://seer.cancer.gov/popdata/***, on January 26, 2011.

- Cancer incidence data are based on primary site ICD-O-3 (International Classification of Diseases for Oncology, 3rd Edition) codes: 1997 – 2008.
- Cancer mortality data are based on underlying cause of death ICD-10 (International Classification of Diseases, 10th Revision) codes: 1999 – 2008.
- Cancer staging (survival by stage) was derived from using the SEER Summary Stage 2000 staging standard: 2001 – 2008.

1. Tiwari RC, Clegg LX, Zou Z: Efficient interval estimation for age-adjusted cancer rates. Statistical Methods in Medical Research 2006, 15:547-569.
2. Breslow NE, Day NE: Statistical Methods in Cancer Research: Volume II: The Design and Analysis of Cohort Studies Lyon, France: International Agency for Research on Cancer; 1987.
3. Cox DR, Oakes D: Analysis of Survival Data. London: Chapman & Hall; 1984.

Glossary of Terms

Age-adjusted rates: A rate calculated in a manner that allows for the comparison of populations with different age distributions.

Age-specific rates: The incidence or mortality rate of a specific age group, calculated per 100,000 people.

Incidence: The rate of new cases calculated by taking the number of new cases within a specified time period divided by the size of the population at risk.

In situ cancer: A noninvasive cancer in which abnormal cancer cells are found in the lining of the organ in which the cancer developed, but which have not spread to other tissues.

Invasive cancer: The abnormal cancer cells have spread to other tissues.

Median: The number in the middle of a distribution: half the values are above the median and half are below the median.

Mortality: The death rate calculated by taking the number of deaths within a specified time period divided by the size of the population during that time period.

Primary cancer site: The place in the body where the cancer originates.

Risk factor: A characteristic or behavior that is consistently associated with increased probability of a disease or event.

Stage at diagnosis: Stage provides a measure of disease progression, detailing the degree to which the cancer has advanced.

- Localized: Cancer that is limited to the organ in which it began, without evidence of spread.
- Regional: Cancer that has spread beyond the original (primary) site to nearby lymph nodes or organs and tissues.
- Distant: Cancer that has spread from the primary site to distant organs or distant lymph nodes.
- Unstaged: Cancer for which there is not enough information to indicate a stage.

Standardized Incidence Ratio (SIR): The ratio of the observed to the expected new cases of cancer.

Standardized Mortality Ratio (SMR): The ratio of the observed to the expected deaths due to cancer.

Survival (5-year Survival): The proportion of patients alive at a specified point in time after the diagnosis of their cancer.

ARKANSAS DEMOGRAPHICS

Arkansas, the Natural State, is home to 2.86 million people.

Some general information about Arkansas:
The following facts were obtained from the 2008 American Community Survey:

Total population	2,855,390
Females	51.0 %
Males	49.0 %
Age distribution	
Persons under 20 years	27.8 %
Persons 20 – 44 years	32.7 %
Persons 45 – 64 years	25.4 %
Persons 65 years and over	14.1 %
Racial/Ethnic distribution	
Whites	78.7 %
Blacks or African Americans	15.5 %
Hispanic or Latino (of any race)	5.5 %
Asian	1.0 %
American Indian/Native American	0.5 %
Other / more than one race	4.3 %
Median household income	$38,815
Persons below the poverty level as defined by the U.S. Census	17.3 %

ARKANSAS

Cancer Facts & Figures 2011

A Special Thank You To:

- All hospitals, clinics, and health care facilities and providers who report cancer cases to the Arkansas Central Cancer Registry;
- Arkansas Central Cancer Registry staff for collecting and disseminating quality cancer data; and
- The American Cancer Society for their long standing annual publication Cancer Facts and Figures. Arkansas patterned this state report after their publication.