

Cancer Disparities in Indiana: An Epidemiologic Profile

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From The Indiana University Melvin and Bren Simon Cancer Center:

The prime mission for the Indiana University Melvin and Bren Simon Cancer Center is to reduce the morbidity and mortality from cancer for the citizens of the state. This report goes a long way to assist us in creating a strategic approach to accomplish this goal by providing the important data regarding incidence and death rates by gender and race or ethnic groups, as well as county by county. Armed with this information, the cancer treatment, screening, and prevention programs can be more precisely targeted with greater opportunities for success. For our part, the IU Simon Cancer Center will be using this as a guide to our public health initiatives.

...Patrick J. Loehrer, Sr., M.D.

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From The American Cancer Society Great Lakes Division:

The American Cancer Society is the nationwide community-based voluntary health organization dedicated to eliminating cancer as a major health problem by preventing cancer, saving lives, and diminishing suffering from cancer through research, education, advocacy and service. In 1999, The American Cancer Society set ambitious challenge goals with the intent of accelerating the progress in trends experienced in the 1990s' decline in cancer rates. These challenge goals are: By 2015, Reduce the Incidence of Cancer by 25%, Reduce the Mortality of Cancer by 50%, and Measurably improve the Quality of Life. Although progress continues to be made, the American Cancer Society estimates 1.5 million people will be diagnosed with cancer in 2011. We know that if people would stop smoking, follow appropriate screening guidelines, maintain a healthy weight and exercise regularly, 60% of these cancers could be prevented. In recent years, the American Cancer Society determined that in order to truly reach these goals we would have to address the issue of growing health inequities among our communities. In 2005, the American Cancer Society decided to focus on narrowing overall efforts, thus we created four leadership areas in Research, Prevention / Early Detection, Information/Decision Making, and Quality of Life with a common thread of addressing disparities defined as those who are hard to reach generally with cultural/language barriers and more importantly those who are uninsured or underinsured. A pillar of strategic planning also included utilizing the influence of local, state and federal public policy issues woven throughout this framework. In 2007, the Office of Health Disparities was established in the American Cancer Society to address this focus with four overarching goals: 1. Increase trust and credibility of the American Cancer Society among disadvantaged segments of the population; 2. Ensure effective disparities-reducing practices through the provision of strategic guidance and resources; 3. Enhance and strengthen our capacity to enable community-based outreach in diverse and low income communities; and 4. Diversify our volunteer staff, leadership and donor base through all levels of the organization. In particular, efforts to increase access to care, advocating for more dollars to be invested in research at the federal level and making our states smoke free, have and will continue to be policy priorities. New and current American Cancer Society community programs are being reworked and intended to specifically reach audiences that have a higher than average cancer incidence and mortality rates. Each American Cancer Society initiative is intended to fit within a brand strategy of Stay Well, Get Well, Find Cures and Fight Back by either singularly addressing or collaborating with partners to achieve our 2015 goals and save more lives.

Executive Summary

Introduction

The findings of this report document the need for effective cancer prevention programs that will eradicate cancer disparities in Indiana, to reduce cancer incidence and mortality across Indiana populations to the lowest levels possible based on the most current scientific knowledge. The IU Simon Cancer Center and the Great Lakes Division of the American Cancer Society are dedicated to developing research and community interventions that will produce the greatest possible reduction in Indiana cancer disparities.

There are five primary objectives for this report:

- 1) to understand patterns of cancer incidence and mortality in Indiana;
- 2) to assess demographic cancer disparities in Indiana;
- 3) to determine similarities and differences in cancer disparities in Indiana compared with the United States;
- 4) to assess demographic disparities in risk factors associated with disparities in cancer incidence and mortality;
- 5) to establish priorities for research and community interventions directed towards reducing the disparities identified.

Data contained in this report were obtained from existing state and federal databases. These data include age-adjusted cancer incidence and mortality rates for Indiana and the U.S. for selected cancer sites. Prevalence data describing population cancer screening practices and selected risk factors for cancer also are presented in this report. Differences among sub-populations are shown by gender, race and ethnicity, county, and socioeconomic factors.

Cancer disparities among Indiana populations are summarized, including demographic disparities in selected cancer risk factors and screening for early detection of cancer. Highlighted findings are based upon comparisons of incidence and mortality rates which are statistically significant *and* have 20% or more excess risk.

Disparities in Cancer Incidence and Mortality in Indiana

Comparing age-adjusted rates in Indiana to *national rates for the same race and gender population*:

- Indiana's African-American women have higher incidence and mortality rates for lung cancer.
- Indiana's Hispanic women have higher incidence of lung cancer.
- Indiana's white women have higher mortality due to cancer of the kidney.
- Indiana's African-American men have higher mortality from multiple myeloma and liver cancer.
- Indiana's white men have higher incidence of lung cancer.

In comparison to other population groups *in Indiana*:

- Consistent with the pattern seen nationally, Indiana men have higher incidence and mortality from nearly all leading cancers compared to Indiana women. For the most part, these are cancers with established risks associated with tobacco use and alcohol abuse.
- African-American women, compared to white women, have higher incidence and mortality rates for colorectal, pancreatic, and stomach cancers as well as multiple myeloma. They also have significantly higher mortality from cancers of the breast, cervix, endometrium, colon and rectum, pancreas, and stomach and multiple myeloma.
- Hispanic women, compared to all women in Indiana, have higher incidence of invasive cervical cancer.
- White women, compared to African-American women, have higher incidence and mortality rates of brain cancer and non-Hodgkin's lymphoma. They also have higher incidence of leukemia, endometrial cancer, and thyroid cancer.
- African-American men, compared to white men, have higher incidence and mortality rates for colorectal, liver, lung, prostate, and stomach cancers and multiple myeloma.
- Hispanic men, compared to all men in Indiana, have higher incidence of liver cancer.

Disparities by County

- Indiana maps present county-level incidence and mortality rates for each of five selected cancers. These maps may be useful for targeting cancer prevention and screening programs and for developing research.
- Maps show differences among Indiana's 10 health planning regions for stage of cancer at diagnosis for selected cancer sites. These data identify areas that are high priority for improvements in screening, early diagnosis, and access to care.

Risk Factor Disparities

- Youth and adults in Indiana have high rates of tobacco use. Significantly more adults in Indiana are current smokers than is observed nationally, with the greatest disparity observed among adults who did not complete high school.
- The Indiana adult population has significantly higher rates of physical inactivity than observed nationally. More females, white adults, and those age 45 years and older within Indiana fail to meet the recommended activity levels than their national counterparts. Among Indiana youth, African-American and female youth have the highest proportion failing to meet activity guidelines.
- Significantly more adults in Indiana are obese than are observed nationally, but Indiana's youth obesity rates are similar to national rates. Disparities in obesity are greatest among Indiana's African-American adults, as well as male youth and African-American and Hispanic youth.
- Although there are no significant disparities in fruit and vegetable consumption when Indiana populations are compared with the U.S. population, prevalence is low in each of the race and gender sub-populations in Indiana.
- A significantly higher proportion of non-elderly adults in Indiana lack any type of health care coverage than observed nationally, with Hispanic and African-American adults more often uninsured than white adults. Coverage rates are highest in those lacking a high school education.

Cancer Screening Disparities

- Indiana's statewide cancer screening rates (for colorectal, cervical, prostate, and breast cancer) are lower than the U.S. rates for each of these screening modalities, except for PSA testing. For all screening methods, the Indianapolis MSA's screening rates are higher than the statewide rates. The Indianapolis MSA rates also exceed national rates, except for blood stool testing.
- White females in Indiana have lower rates of screening mammography than African-American females, while African-American men and women have lower rates of colorectal cancer screening using sigmoidoscopy or colonoscopy than white men and women.
- A declining trend in Pap testing was observed from 2002-2008, while increasing trends were observed for mammography in women 40+, for sigmoidoscopy/colonoscopy, and for PSA testing.

Recommendations

Cancer prevention and control programs are focused upon cancer disparities that can be reduced through primary prevention and screening. The data in this report suggest several areas of intervention that have the greatest potential for reducing disparities among Hoosiers:

- Prevent and reduce tobacco use among all Indiana adult and youth populations, with a specific emphasis on reducing cigarette smoking among African-American men;
- Reduce alcohol abuse among Indiana men;
- Increase colon cancer screening among all Indiana populations, highlighting the two Indiana health regions with the greatest frequency of colorectal cancers diagnosed as distant or unknown;
- Increase physical activity among all Indiana populations, especially African Americans and women;
- Reduce obesity among African-American and Hispanic adults and youth;
- Increase fruit and vegetable consumption among all Hoosiers;
- Further assess cancer incidence and mortality rates by county to identify those counties with the greatest potential for reductions in cancer disparities through prevention and screening programs.

Cancer Disparities in Indiana

Introduction

Health disparities have been defined by different groups in different ways. The Health Resources and Services Administration has defined health disparities as “population-specific difference(s) in the presence of disease, health outcomes, or access to care.”¹ The National Cancer Institute has specifically defined cancer health disparities as “differences in the incidence, prevalence, mortality, and burden of cancer and related adverse health conditions that exist among specific population groups in the United States.”² The related concepts of inequity, social determinants of health, and modifiable risk are important dimensions of health disparity. In this report, the focus is on disparities that can be reduced or eradicated through established effective methods of cancer prevention or screening. There is a need for immediate attention to the task of identifying the most effective approaches to reducing Indiana cancer disparities identified in this report. The IU Simon Cancer Center and the Great Lakes Division of the American Cancer Society are dedicated to developing community cancer prevention and screening interventions and research that will produce the greatest possible reduction in Indiana cancer disparities.

There are five primary objectives for this report:

- 1) to understand patterns of cancer incidence and mortality in Indiana;
- 2) to assess demographic cancer disparities in Indiana;
- 3) to determine similarities and differences in cancer disparities in Indiana compared with the United States;
- 4) to assess demographic disparities in risk factors associated with disparities in cancer incidence and mortality; and
- 5) to establish priorities for research and community interventions directed towards reducing the disparities identified.

¹ Carter-Pokras O and Baquet C. *What is a “Health Disparity”?* Public Health Reports 2002;117:426-434.

² National Cancer Institute, Center to Reduce Cancer Health Disparities. *Health Disparities Defined*. Available at <http://crchd.cancer.gov/disparities/defined.html> on 6/9/2010.

Data Sources & Analytical Methods

Data contained in this report were obtained from state and federal databases. These data include age-adjusted cancer incidence and mortality rates for Indiana and the U.S. cancer for selected cancers sites. Prevalence data describing population cancer screening practices and selected related risk factors also are presented in this report. Differences among sub-populations are shown by gender, race and ethnicity, geography, and socioeconomic factors. Statistical significance was assessed where appropriate. An asterisk indicates whether stated comparisons are statistically significant. Since single measures do not adequately assess cancer disparities, rate ratios also were calculated as a measure of relative disparity. The rate ratio is a commonly used method for understanding disparities, comparing each sub-population to a reference population for that measure³. For example, a colorectal cancer incidence rate of 61.3 in Indiana males compared to a rate of 45.2 in Indiana females results in a rate ratio of 1.36, showing that Indiana males have a 36% higher incidence of colorectal cancer than Indiana females.

The primary source utilized for U.S. and Indiana cancer statistics was “*United States Cancer Statistics: 1999-2007 Incidence and Mortality Web-Based Report*,” jointly published by the Centers for Disease Control and Prevention and the National Cancer Institute (www.cdc.gov/uscs). Cancer rates for racial and ethnic subgroups within Indiana and for the U.S. are presented for the most recent available time period, 2003-2007 [Appendix A, Tables 1-11]. Throughout the report, cancer incidence and mortality rates are per 100,000 persons and are age-adjusted to the 2000 U.S. standard population. The National Cancer Institute served as the source for cancer incidence and mortality maps for Indiana by county, using these same 5-year combined rates [Appendix B, Figures 1-5]. These “*State Cancer Profiles*” are found at <http://statecancerprofiles.cancer.gov/index.html>. Data comparing stage at diagnosis among Indiana’s Health Planning Regions [Appendix B, Tables 13-17] were obtained via direct request to the Indiana State Cancer Registry at the Indiana State Department of Health.

Data regarding selected cancer-related risk factors in adults were obtained from a nationwide survey conducted annually by the Centers for Disease Control, the Behavioral Risk Factor Surveillance System (www.cdc.gov/brfss/). These risk factors include smoking, inadequate physical activity, obesity, and lack of health care coverage. For these risk factors, the most recent year of measurement is presented [Appendix C]. Similarly, cancer-related risk factors in youth were also obtained from a well-established survey conducted every other year among 9-12th grade students, the Youth Risk Behavior Survey (<http://www.cdc.gov/HealthyYouth/yrbs/index.htm>). Youth risk factors include cigarette and smokeless tobacco use, inadequate physical activity, obesity, risky sexual behaviors, and lack of health care coverage. In addition, data regarding

³ Harper, S and Lynch J. *Methods for Measuring Cancer Disparities: Using Data Relevant to Healthy People 2010 Cancer Related Objectives*. NCI Cancer Surveillance Monograph Series, Number 6. Bethesda, MD: National Cancer Institute, 2005. NIH Publication No. 05-5777. Available at <http://seer.cancer.gov/publications/disparities/>

uninsured rates in adults and children under age 65 were supplemented by the Kaiser Family Foundation data (www.statehealthfacts.org) [Table 24].

Cancer screening rates in adults were obtained from the Behavioral Risk Factor Surveillance System as well, and these data are shown for the most recent years available (2002, 2004, 2006, 2008), to compare trends within the Indianapolis MSA, Indiana, and the U.S. (www.cdc.gov/brfss/) [Appendix D].

Gender Disparities

It is well known that males have higher cancer incidence and mortality than women. Comparing the Indiana age-adjusted cancer incidence and mortality rates of the 15 leading cancers that occur among both men and women, incidence and mortality were higher among males for 14 of the 15 sites [Table 1]. Cancers that are known to be associated with smoking, alcohol abuse, and poor diet either alone or in combination (esophagus, bladder, liver, oral cavity, and stomach) have the highest excess among men. Because these gender differences are so pervasive, are observed nationally as well as locally, and are modified by race and ethnicity, the focus of this report is on cancer disparities among racial, ethnic, and gender groups of the Indiana population.

Indiana Cancer Disparities by Race and Ethnicity

African-American Women

A comparison of age-adjusted cancer incidence and mortality rates among African-American females in Indiana to U.S. African-American women and to white females within the state reveals disparities, particularly in mortality, as shown below [Tables 2 and 3.]. The three cancer sites with highest incidence and mortality among African-American women in Indiana are breast, lung, and colorectal.

Lung & bronchial cancer incidence is 26% higher and mortality is 33% higher among Indiana's African-American women than among African-American women nationwide. Though African-American women in Indiana are diagnosed with lung and bronchial cancer at about the same rate

as white women, they are more likely to die from this cancer, with a mortality rate that is 10% higher among African-American women than among white women.

Colorectal cancer incidence is 11% higher among Indiana's African-American women than among African-American women nationally, and their mortality is 5% higher. When compared to white women in Indiana, the incidence of colorectal cancer is 29% higher and mortality is 43% higher among Indiana's African-American women.

Pancreatic cancer incidence is 8% higher and mortality is 15% higher among Indiana's African-American women than African-American women nationally. Indiana's African-American women have a 49% higher incidence and 57% higher mortality from pancreatic cancer than white women in the state.

Similar patterns are observed for **invasive cervical cancer, multiple myeloma, and stomach cancer**. Indiana's African-American women have lower incidence and mortality from these cancers than African-American women nationally. However, when compared to white women in Indiana, African-American women have higher incidence and mortality. When African-American women are compared to white women in Indiana: cervical cancer incidence is 23% higher and mortality is 56% higher; the incidence of multiple myeloma is 112% higher and mortality is 85% higher; and stomach cancer incidence is 112% higher and mortality is 142% higher.

Despite similar incidence rates of breast cancer, African-American women in Indiana experience 8% higher mortality rates due to breast cancer than is observed among African-American women nationally and 47% higher mortality than is seen among white women in Indiana.

Indiana African-American women have lower incidence of leukemia but 16% higher mortality than is observed among African-American women nationally.

Hispanic Women

A comparison of age-adjusted cancer incidence of Hispanic females in Indiana to U.S. Hispanic women and to all females in Indiana shows some disparities. Cancer mortality rates obtained from the NCI's United States Cancer Statistics are suppressed for nearly all cancers for Hispanic women in Indiana, due to very small numbers of cases (less than 16) [Tables 4 and 5.] Key disparities that were observed are noted below. The three most common cancers occurring among Indiana Hispanic women are breast, colorectal, and lung.

Comparing Indiana Hispanic women to U.S. Hispanic women, the Indiana age-adjusted cancer incidence rates are nearly identical for the two groups. When compared with all Indiana women, the age-adjusted cancer incidence rates of Hispanic women are lower for 6 of the 10 most frequently occurring cancers.

Lung & bronchial cancer incidence is 28% higher among Indiana's Hispanic women than among Hispanic women nationwide, yet their mortality rate is lower. However, the incidence and mortality of lung cancer is significantly lower among Indiana's Hispanic females than among all women in Indiana.

The incidence rate of invasive **cervical cancer** is similar among Indiana's Hispanic women and Hispanic women nationally; however, the incidence of cervical cancer among Indiana's Hispanic women is 64% higher than among all Indiana women.

White Women

Comparing age-adjusted cancer incidence and mortality rates among white females in Indiana to U.S. white women and to African-American females within the state, disparities among white women in Indiana are highlighted below [Tables 3 and 6]. The three cancer sites with highest incidence and mortality among white women in Indiana are breast, lung, and colorectal.

The incidence of cancers of the **kidney and renal pelvis** are 17% higher and mortality is 22% higher among Indiana's white women than among white women nationally.

Lung & bronchial cancer incidence is 12% higher and mortality is 14% higher among Indiana's white women than among white women nationally. Indiana's white women have a similar incidence rate and a lower mortality rate from these cancers compared to African-American women in the state.

Colorectal cancer incidence and mortality are higher among Indiana's white women than among white women nationally (6% higher incidence; 7% higher mortality). Indiana's white women have lower incidence and mortality from colorectal cancer than African-American women in the state.

Endometrial cancer incidence and mortality are higher among Indiana's white women than among white women nationally (7% higher incidence; 13% higher mortality). Incidence of these cancers among Indiana's white females is 31% higher than in Indiana's African-American women, but mortality is lower.

The incidence rates observed for several other cancers are higher among white women in Indiana than among African-American women in the state. These include **brain & ONS cancer** (106% higher incidence), **ovarian cancer** (22% higher), **non-Hodgkin's lymphoma** (43% higher), and **leukemia** (35% higher). The mortality rate in Indiana's white women is also higher than among Indiana's African-American women for brain and ONS cancer (105% higher), for ovarian cancer (23% higher), and for non-Hodgkin's lymphoma (55% higher).

African-American Men

A comparison of cancer incidence and mortality rates for African-American males in Indiana to African-American men throughout the U.S. and to white males within the state shows clear differences [Tables 7 and 8], identifying extensive and substantial cancer disparities. Even greater disparities are observed when Indiana African-American men are compared to white men in Indiana. The three cancer sites with the highest incidence and mortality rates among African-American men are **prostate, lung, and colorectal**.

Compared to African-American men throughout the U.S., African-American men in Indiana have higher incidence of several cancers: **cancers of the kidney and renal pelvis** (19% higher), **lung & bronchus** (18% higher), **colorectal** (11% higher), **liver** (8% higher), **urinary bladder** (3% higher) and **multiple myeloma** (6% higher). Mortality rates among Indiana's African American men are higher than U.S. mortality rates for African-American males for these cancers as well, with the exception of kidney cancer mortality. The mortality rate for multiple myeloma is 43% higher

in Indiana's African-American men than in African-American men nationally. Although Indiana's African-American men have a similar incidence of leukemia as African-American men nationally, they have a 20% higher mortality rate for leukemia.

Comparing cancer incidence and mortality between African-American men and white men in Indiana for 13 top cancer sites, incidence and/or mortality were higher among African-American men for most of those sites, as summarized below:

- Liver & IBD 106% higher incidence – 116% higher mortality
- Multiple Myeloma 100% higher incidence – 158% higher mortality
- Stomach 87% higher incidence – 146% higher mortality
- Prostate 58% higher incidence – 120% higher mortality
- Pancreas 27% higher incidence – 25% higher mortality
- Lung & Bronchus 20% higher incidence – 22% higher mortality
- Colon & Rectum 29% higher incidence – 38% higher mortality
- Kidney & Renal Pelvis 17% higher incidence – lower mortality
- Oral Cavity & Pharynx Similar incidence – 24% higher mortality
- Esophagus Similar incidence – 7% higher mortality

Hispanic Men

A comparison of the age-adjusted cancer incidence rates among Hispanic males in Indiana to Hispanic males throughout the U.S. and to all men in Indiana produced results described below. Many cancer mortality rates were suppressed due to small numbers of cases [Tables 9 and 10]. Among Indiana Hispanic men, the three cancer sites with the highest mortality and incidence rates are prostate, lung, and colorectal.

Multiple myeloma incidence is 20% higher among Indiana's Hispanic men than among Hispanic men nationwide. Mortality data were not available for the national comparison. Multiple myeloma incidence was similar among Indiana's Hispanic men compared to all Hoosier men combined.

While the incidence of **liver cancer** was lower among Indiana’s Hispanic men than among Hispanic men nationally, it was 97% higher than observed among all Indiana men combined. Related mortality also was 21% higher among these Hispanic men compared to all men of Indiana.

The incidence of **stomach cancer** was lower among Indiana’s Hispanic men than among Hispanic men nationally. However, when compared to all Indiana men, the incidence of stomach cancer was 44% higher among Hispanic men of Indiana. Stomach cancer mortality rates were suppressed due to small numbers.

White Men

Cancer incidence and mortality rates among white males in Indiana were compared to U.S. white males and to African-American males within the state [Tables 8 and 11]. For white males in Indiana, cancers of the prostate, lung and colon have the highest incidence and mortality rates.

Lung & bronchial cancer incidence is 20% higher and mortality is 22% higher among Indiana’s white men than is seen for white men nationally. However, Indiana’s white men have lower incidence and mortality from lung and bronchial cancers than African-American men in the state.

Age-adjusted incidence rates of selected other cancers is marginally higher among white men in Indiana than among white men nationwide. These include cancers of the **kidney and renal pelvis** (9% higher), cancer of the **esophagus** (10% higher), and **colorectal cancer (6% higher)**. For each of these cancer sites, the mortality rate is higher as well (12%, 10%, and 15% higher respectively). Despite similar incidence rates of **leukemias and non-Hodgkin’s lymphoma**, Indiana’s white men have 8% higher mortality for leukemia and 13% higher mortality for non-Hodgkin’s lymphoma than white men throughout the U.S.

Indiana’s white males have a lower incidence of **prostate cancer** than is observed for U.S. white males, yet they have a 6% higher mortality than white men nationwide. In comparison with African-American men in the state, white men have lower incidence and mortality rates for prostate cancer.

When cancer incidence and mortality are compared between white men and African-American men in Indiana for 13 leading cancer sites, incidence and mortality were higher among white men for 3 of the 13 sites, as follows:

- Urinary Bladder: 95% higher incidence – 65% higher mortality
- Non-Hodgkin’s Lymphoma: 69% higher incidence – 66% higher mortality
- Leukemia: 28% higher incidence – 7% higher mortality

Cancer Disparities in Indiana by County

Comparing geographic differences in cancer incidence, mortality, and stage at diagnosis across Indiana counties provides information that may be used to determine priorities for research, education, and intervention efforts.

State Maps of Cancer Rates by County

This section of the report presents Indiana maps showing age-adjusted, county-level incidence and mortality rates for 2003-2007, for the following five cancer sites: 1) lung & bronchus, 2) colorectal, 3) prostate, 4) breast, and 5) cervix (<http://statecancerprofiles.cancer.gov/index.html>); [Figures 1-5]. Maps are shaded by intervals to provide a visual overview of differences across Indiana counties in cancer incidence and mortality. Due to variability in the quality of reporting from county to county, it is important to consider county-level differences with caution. Individual county rates are not presented in table format in this report, but are available on the National Cancer Institute's State Cancer Profiles website (<http://statecancerprofiles.cancer.gov/index.html>).

There is no particular geographic pattern of **lung cancer** incidence or mortality in Indiana [Figures 1a-1b]. The statewide lung cancer incidence rate for the five-year period is 80.0 cases per 100,000, compared to the U.S. Rate of 68.0. There are 32 counties that have lung cancer incidence rates that are at least 25% higher than the U.S. age-adjusted rate. Four of these counties (Clark, Vigo, Marion, and Vanderburgh) have 100 or more cases per year. The statewide age-adjusted lung cancer mortality rate is 62.6 deaths per 100,000, compared to 52.5 for the U.S. Thirty-eight Indiana counties have age-adjusted mortality rates that are at least 25% higher than the U.S. rate, with three of those counties (Madison, Vanderburgh and Marion) having 100 deaths or more per year.

Colorectal cancer incidence and mortality rates show no geographic pattern of note [Figures 2a-2b]. The statewide colorectal cancer age-adjusted incidence rate is 52.1 cases per 100,000, compared to 48.8 for the U.S. Eleven of Indiana's counties have age-adjusted colorectal cancer incidence rates that are at least 25% higher than the U.S. rate and four of these counties' (Henry, Scott, Martin, and Switzerland) rates are at least 25% higher than the Indiana rate. The statewide age-adjusted colorectal cancer mortality rate is 19.2 deaths per 100,000, compared to 17.6 for the U.S. Twenty-three counties in Indiana have colorectal cancer mortality rates that are at least 25% higher than the U.S. and one of these (Vigo) has 20 or more deaths per year.

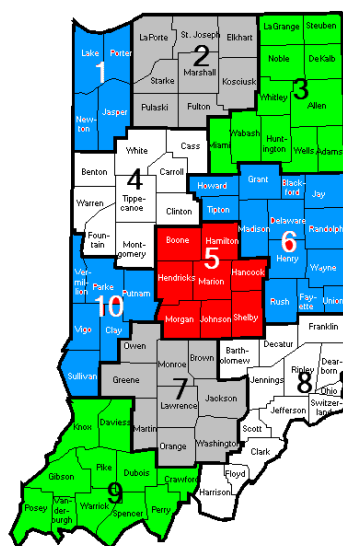
Age-adjusted **prostate cancer** incidence for Indiana is 137.2 per 100,000, compared to 153.5 for the U.S. One county (Benton) has an age-adjusted prostate cancer incidence rate that is at least 20% higher than the U.S. rate, and it has an average of 10 cases per year. The age-adjusted prostate cancer mortality statewide 25.6 deaths per 100,000, compared to 24.7 for the U.S. [Figures 3a-3b]. Eleven Indiana counties have age-adjusted prostate cancer mortality rates that are at least 25% higher than the U.S. rate and only one of these (Monroe) has 10 or more deaths per year due to prostate cancer.

The age-adjusted **breast cancer** incidence rate for Indiana is 113.8 per 100,000, compared to 120.6 for the U.S. One county (Putnam) has an average annual incidence rate that is 20% higher than the U.S., and that county has 29 cases per year. The statewide age-adjusted breast cancer average annual mortality rate is 24.5 deaths per 100,000 statewide, compared to 24.0 for the U.S. [Figures 4a-4b]. Ten Indiana counties have mortality rates that are at least 25% higher than the U.S. rate and two of these counties (Henry and Wayne) have 10 or more deaths per year.

Incidence and mortality rates for invasive **cervical cancer** are suppressed for most of Indiana's counties due to the small number of cases or deaths. The statewide age-adjusted invasive cervical cancer incidence rate is 8.0 cases per 100,000 women, compared to 8.1 for the U.S. Only 20 counties have enough cases to calculate incidence rates and three of those (Lake, Allen and Marion) have 15 or more cases per year. The age-adjusted invasive cervical cancer mortality rate for Indiana is 2.6 deaths per 100,000, compared to 2.4 for the U.S. [Figures 5a-5b]. Just four counties have enough deaths due to cervical cancer to calculate rates and two of those have 10 or more cases per year. One county (Lake) has an average annual cervical cancer death rate that is nearly twice the national rate.

Stage at Diagnosis by Health Planning Regions

Data for the frequency of stage at diagnosis in Indiana’s ten health planning regions were obtained from the Indiana State Cancer Registry for five cancer sites: lung & bronchus, colorectal, prostate, female breast, and cervix uteri. Stage at diagnosis frequencies are based upon incident cases for the years 2000-2005. [See map below and Table 12 for a list of the counties in each region.]



Lung cancer in Indiana is predominantly staged as distant at diagnosis (49%), with Region 2 having a somewhat larger proportion distant at diagnosis and Region 8 having a somewhat smaller proportion of lung cancer cases diagnosed at distant stage [Table 13].

Stage at diagnosis for **colorectal cancers** in Indiana is 39% localized and 36% regional. Region 5, which constitutes the Indianapolis MSA, has the largest percent of cases diagnosed as localized (42%), while Region 10 has the smallest percent (33%) that are localized at diagnosis [Table 14].

Overall, the stage of disease at diagnosis for **prostate cancer** in Indiana is predominantly localized—75%. Regions range from a low of 65% of prostate cancers localized at diagnosis in Region 3 to a high of 81% localized at diagnosis in Region 9 [Table 15].

Sixty-two percent of Indiana's **breast cancer** cases are localized at diagnosis. Regions range from a low of 56% of breast cancers localized at diagnosis in Region 1 to a high of 65% localized at diagnosis in Region 9 [Table 16].

For the invasive **cervical cancer** incidence, the largest proportion is diagnosed at the localized stage (49%) for Indiana as a whole. Region 9 has the largest percentage of invasive cervical cancer diagnosed as localized at 54%, while Region 7 has the smallest percentage diagnosed at this stage at 38% [Table 17].

Cancer Risk Factor Disparities

Tobacco Use

In 2009, Indiana had the 5th highest prevalence of adult smoking in the nation at nearly one in four or 23.1% [Table 18]. This smoking rate is significantly higher than the U.S. rate of 17.9%. Indiana males are more likely to be smokers than Indiana females, and African Americans in Indiana are more likely to smoke than white or Hispanic Indiana adults. Adult smoking prevalence declines as education level rises; the highest prevalence (42.1%) is observed among Hoosier adults who did not complete high school, while only 8.5% of college graduates are smokers (www.cdc.gov/brfss/).

Among Indiana youth (9th-12th grade students), smoking prevalence (23.9%) exceeds that observed nationally (19.5%) in 2009 [Table 19]. Among Hoosier adolescents, males are more likely to smoke than females, and African Americans are less likely to smoke than whites or Hispanics. Similarly, smokeless tobacco use is higher in Indiana (10.7%) than that observed nationally (8.9%), with males much more likely to use smokeless tobacco than females and white youth more likely to use smokeless tobacco than African American or Hispanic youth (<http://www.cdc.gov/HealthyYouth/yrbs/index.htm>).

Physical Activity

Physical inactivity is an important risk factor for which interventions may reduce the risk for colon and breast cancer, based on current research.

In 2009, Indiana ranked 15th highest in the U.S. for adult prevalence of insufficient physical activity (adults who do NOT get the recommended level of physical activity) at 52.0% [Table 20]. This is significantly higher than the national rate of 49.0%. More women are insufficiently active than men, and more African Americans and Hispanics are insufficiently active than white adults. The prevalence of inactivity increases with age, though it is high among even the youngest cohort aged 18-24 (38.1%). Indiana's adults age 45 and older have significantly higher rates of insufficient activity than is seen nationally. College graduates have a lower rate of inactivity than those with less education (www.cdc.gov/brfss/).

A lower percentage of Indiana youth (9th-12th grade students) failed to meet recommended physical activity levels than is observed nationally (59.4% vs 63.0% respectively) [Figure 6]. These rates of insufficient activity were lower than the U.S. for all groups except African Americans: males, females, white, and Hispanic youth. Indiana's female youth failed to meet physical activity recommendations more often than males, and African-American youth failed to meet the recommendations more often than white or Hispanic youth (<http://www.cdc.gov/HealthyYouth/yrbs/index.htm>).

Obesity

In 2009, Indiana's adult obesity prevalence was significantly higher than the U.S. prevalence, at 29.9% versus 26.9% respectively [Table 21]. The highest prevalence of Indiana adult obesity is among African-Americans at 34.4%. Nationally, higher education corresponds with lower obesity rates; however, obesity rates are similar across educational levels in Indiana (www.cdc.gov/brfss/). A 2005 survey of Marion County adults showed that obesity rates were highest among those with lowest income; as income level increased, obesity rates decreased.⁴ In the 2009 BRFSS survey, Indiana adults making less than \$50,000 had higher rates of obesity than those making more than \$50,000.

In 2009, Indiana's youth (9-12th grade students) had similar rates of obesity as their national counterparts, with both at approximately 12% [Figure 7]. Indiana male youths were more often obese than female youths, and Hoosier Hispanic or African-American youths were more often obese than white youths (<http://www.cdc.gov/HealthyYouth/yrbs/index.htm>). These rates from the Youth Risk Behavior Survey are self-

⁴ Marion County Health Department. 2005 Marion County, Indiana Adult Obesity Needs Assessment Results. Retrieved online 6/19/2008 at <http://www.mchd.com/obesitysurvey.htm>

reported, but actual measurements of > 90,000 public school students in Marion County were undertaken in 2005. The Marion County results indicate a higher rate of obesity overall at 22%, with the highest rates observed in Hispanic and American Indian students.⁵

Although there are no significant disparities in fruit and vegetable consumption when Indiana populations are compared with the U.S. population, prevalence is low in each of the race and gender sub-populations in Indiana. The BRFSS for 2009 shows that 17.3% of Indiana men and 23.7% of Indiana women consumed 5 or more servings of fruit and vegetables per day (www.cdc.gov/brfss/).

Sexual Behaviors

Youth sexual behavior impacts cervical cancer rates. In 2009, 13.7% of Indiana's female students (9-12th grade) reported having had sexual intercourse with ≥ 4 persons during their life, and 2.8% of females reported having had sexual intercourse for the first time before the age of 13 [Table 22]. Behavior varies by race/ethnicity, with African-American youth most sexually active, followed by Hispanic youth, then white youth (<http://www.cdc.gov/HealthyYouth/yrbs/index.htm>).

Health Care Coverage

In the 2009 BRFSS (www.cdc.gov/brfss/), 20.4% of Indiana adults aged 18-64 reported having no health care coverage, significantly higher than U.S. prevalence at 16.9% [Table 23]. This places Indiana 15th among the states. The proportion of Indiana's adults lacking coverage decreases sharply with education level; 41.5% of Indiana's adults who did not complete high school lacked health coverage in contrast with only 7.7% of college graduates.

The Kaiser Family Foundation reports that 13.4% of Indiana's population age 0-64 years were uninsured in 2007-2008, fewer than observed nationally (17.4%). More males are uninsured than females and more Hispanics than African Americans or white individuals. More adults than children are uninsured (16.8% vs 5.9% respectively). Uninsured rates are inversely proportional to income, with 28.7% of individuals in poverty uninsured (www.statehealthfacts.org) [Table 24].

⁵ Marion County Health Department. Child Health and Wellness Initiative Results. Retrieved online 6/19/2008 at www.mchd.com/CHWI_results_report.htm

Cancer Screening Disparities

Selected cancer screening rates for prostate, cervical, colorectal, and breast cancers are available through the BRFSS [(www.cdc.gov/brfss/)Table 25]. The BRFSS survey includes questions about cancer screening every two years; these data are derived from the most recent available results - 2008. Indiana's statewide screening rates were lower than the U.S. rates for each of the screening methods reported, except for PSA testing. For all screening methods, the Indianapolis MSA's screening rates are higher than the statewide rates. For all screening methods except blood stool testing, the Indianapolis MSA rates also exceed national rates.

Comparing screening rates between Indiana's white adults and African-American adults, African-Americans report higher rates for all tests except sigmoidoscopy/colonoscopy for colorectal cancer screening [Figure 8].

Certain screening rates were evaluated for trends across four survey points (2002, 2004, 2006, and 2008). A declining trend in Pap testing overall is observed, while increasing trends are observed for mammography in women 40+ as well as sigmoidoscopy/colonoscopy. It also was seen that PSA testing increased in the Indy MSA as well as Indiana, while remaining stable nationally [Figures 9a-9d].

Recommendations

Cancer prevention and control programs are focused upon cancer disparities than can be reduced through primary prevention and screening. The data in this report suggest several areas of intervention that have the greatest potential for reducing disparities among Hoosiers:

- Prevent and reduce tobacco use among all Indiana adult and youth populations, with a specific emphasis on reducing cigarette smoking among African-American men;
- Reduce alcohol abuse among Indiana men;
- Increase colon cancer screening among all Indiana populations, highlighting the two Indiana health regions with the greatest frequency of colorectal cancers diagnosed as distant or unknown;
- Increase physical activity among all Indiana populations, especially African Americans and women;
- Reduce obesity among African-American Hispanic adults and youth;
- Increase fruit and vegetable consumption among all Hoosiers;
- Further assess cancer incidence and mortality rates by county to identify those counties with the greatest potential for reductions in cancer disparities through prevention and screening programs.

Appendices

Appendix A: Age-Adjusted Cancer Incidence and Mortality Rates by Gender, Race, and Ethnicity

Table 1. Indiana Age-Adjusted Cancer Incidence and Mortality Rates by Site and Gender

| 2003-2007 Cancer Site ^a | Incidence Rates ^b | | | * | Mortality Rates ^b | | | * |
|---------------------------------------|------------------------------|-----------------|------------------------------|----------|------------------------------|-----------------|-----------------------------|----------|
| | Indiana Males | Indiana Females | Male /Female Incidence Ratio | | Indiana Males | Indiana Females | Male/Female Mortality Ratio | |
| Brain & ONS | 8.0 | 6.1 | 1.31 | * | 5.5 | 3.9 | 1.41 | * |
| Colon & Rectum | 61.3 | 45.2 | 1.36 | * | 24.0 | 15.7 | 1.53 | * |
| Esophagus | 9.6 | 2.0 | 4.80 | * | 8.6 | 1.7 | 5.06 | * |
| Kidney & Renal Pelvis | 22.3 | 12.5 | 1.78 | * | 6.7 | 3.3 | 2.03 | * |
| Leukemias | 15.6 | 9.2 | 1.70 | * | 10.7 | 5.8 | 1.84 | * |
| Liver & IBD | 7.5 | 2.7 | 2.78 | * | 6.8 | 2.9 | 2.34 | * |
| Lung & Bronchus | 102.4 | 63.9 | 1.60 | * | 83.9 | 47.6 | 1.76 | * |
| Melanomas of the Skin | 20.7 | 14.0 | 1.48 | * | 4.3 | 1.8 | 2.39 | * |
| Myeloma | 7.4 | 4.4 | 1.68 | * | 4.9 | 2.8 | 1.75 | * |
| Non-Hodgkin Lymphoma | 22.9 | 17.0 | 1.35 | * | 10.0 | 6.0 | 1.67 | * |
| Oral Cavity & Pharynx | 15.8 | 5.8 | 2.72 | * | 3.5 | 1.3 | 2.69 | * |
| Pancreas | 13.3 | 10.1 | 1.32 | * | 13.1 | 9.4 | 1.39 | * |
| Stomach | 7.9 | 3.6 | 2.19 | * | 4.3 | 2.1 | 2.05 | * |
| Thyroid | 4.6 | 12.9 | 0.36 | * | 0.5 | 0.4 | 1.25 | |
| Urinary Bladder | 37.2 | 9.4 | 3.96 | * | 7.7 | 2.3 | 3.35 | * |
| All Cancer Sites | 552.7 | 416.1 | 1.33 | * | 249.4 | 166.7 | 1.50 | * |

^a Includes the top ten sites for incidence and mortality among white males, white females, black males, and black females; excludes gender-specific cancer sites (prostate, breast, corpus & uterus, ovary, and cervix uteri).

^b Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. standard population.

*Indicates a statistically significant difference in the rate between males and females in Indiana, based upon 95% confidence intervals.

Source: U.S. Cancer Statistics Working Group. *United States Cancer Statistics: 1999-2007 Incidence and Mortality Web-Based Report*. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; 2010. Available at www.cdc.gov/uscs.

Table 2. Indiana and U.S. Age-Adjusted Cancer Incidence and Mortality Rates for African-American Females

| 2003-2007 Cancer Site ^a | Incidence Rates ^b | | | Mortality Rates ^b | | |
|---------------------------------------|----------------------------------|-------------------------------|-----------------------|----------------------------------|-------------------------------|-----------------------|
| | Indiana African American Females | U.S. African American Females | IN/US Incidence Ratio | Indiana African American Females | U.S. African American Females | IN/US Mortality Ratio |
| Breast | 110.2 | 114.6 | 0.96 | 35.1 | 32.4 | 1.08 |
| Cervix | 9.6 | 10.7 | 0.90 | 3.9 | 4.4 | 0.89 |
| Colon & Rectum | 56.5 | 50.7 | 1.11 | 22.0 | 21.0 | 1.05 |
| Corpus & Uterus | 19.7 | 21.3 | 0.92 | 6.3 | 7.2 | 0.88 |
| Kidney & Renal Pelvis | 11.3 | 11.0 | 1.03 | 2.8 | 2.7 | 1.04 |
| Leukemias | 6.8 | 7.6 | 0.89 | 5.8 | 5.0 | 1.16 |
| Lung & Bronchus | 65.0 | 51.6 | 1.26 | 52.5 | 39.6 | 1.33 |
| Myeloma | 8.7 | 9.6 | 0.91 | 5.0 | 5.8 | 0.86 |
| Non-Hodgkin Lymphoma | 11.9 | 11.5 | 1.03 | 4.0 | 3.9 | 1.03 |
| Ovary | 10.1 | 9.6 | 1.05 | 7.3 | 7.2 | 1.01 |
| Pancreas | 14.6 | 13.5 | 1.08 | 14.3 | 12.4 | 1.15 |
| Stomach | 7.0 | 8.3 | 0.84 | 4.6 | 5.0 | 0.92 |
| All Cancer Sites | 403.7 | 392.0 | 1.03 | 200.1 | 180.6 | 1.11 |

^a Includes the top ten sites for incidence and mortality among African American females in Indiana.

^b Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. standard population intervals.

Source: U.S. Cancer Statistics Working Group. *United States Cancer Statistics: 1999-2007 Incidence and Mortality Web-Based Report*. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; 2010. Available at www.cdc.gov/uscs.

Table 3. Age-Adjusted Cancer Incidence and Mortality Rates in Selected Cancer Sites among Indiana Females by Race

| 2003-2007 Cancer Site ^a | Incidence Rates ^b | | | | Mortality Rates ^b | | | |
|---------------------------------------|------------------------------|-------------------|--------------------------|---|------------------------------|-------------------|--------------------------|----------|
| | African American Female Rate | White Female Rate | AA/White Incidence Ratio | | African American Female Rate | White Female Rate | AA/White Mortality Ratio | |
| Brain & ONS | 3.1 | 6.4 | 0.48 | * | 2.0 | 4.1 | 0.49 | * |
| Breast | 110.2 | 113.4 | 0.97 | | 35.1 | 23.9 | 1.47 | * |
| Cervix | 9.6 | 7.8 | 1.23 | | 3.9 | 2.5 | 1.56 | * |
| Colon & Rectum | 56.5 | 43.9 | 1.29 | * | 22.0 | 15.4 | 1.43 | * |
| Corpus & Uterus | 19.7 | 25.9 | 0.76 | * | 6.3 | 4.4 | 1.43 | * |
| Kidney & Renal Pelvis | 11.3 | 12.4 | 0.91 | | 2.8 | 3.3 | 0.85 | |
| Leukemias | 6.8 | 9.2 | 0.74 | * | 5.8 | 5.9 | 0.98 | |
| Lung & Bronchus | 65.0 | 64.0 | 1.02 | | 52.5 | 47.6 | 1.10 | |
| Myeloma | 8.7 | 4.1 | 2.12 | * | 5.0 | 2.7 | 1.85 | * |
| Non-Hodgkin Lymphoma | 11.9 | 17.0 | 0.70 | * | 4.0 | 6.2 | 0.65 | * |
| Ovary | 10.1 | 12.3 | 0.82 | | 7.3 | 9.0 | 0.81 | |
| Pancreas | 14.6 | 9.8 | 1.49 | * | 14.3 | 9.1 | 1.57 | * |
| Stomach | 7.0 | 3.3 | 2.12 | * | 4.6 | 1.9 | 2.42 | * |
| Thyroid | 7.5 | 13.2 | 0.57 | * | ~ | 0.4 | NA | |
| All Cancer Sites | 403.7 | 413.7 | 0.98 | | 200.1 | 165.3 | 1.21 | * |

^a Includes the top ten sites for incidence and mortality among African American and white females except melanoma (whites).

^b Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. standard population.

*Indicates a statistically significant difference in the rate between African American and white females in Indiana, based upon 95% confidence intervals.

~Rate is suppressed; fewer than 16 cases reported

Source: U.S. Cancer Statistics Working Group. *United States Cancer Statistics: 1999-2007 Incidence and Mortality Web-Based Report*. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; 2010. Available at www.cdc.gov/uscs.

Table 4. Indiana and U.S. Age-Adjusted Cancer Incidence and Mortality Rates for Hispanic Females

| 2003-2007 Cancer Site ^a | Incidence Rates ^b | | | Mortality Rates ^b | | | | |
|---------------------------------------|--------------------------------|--------------------------|-----------------------------|--------------------------------|--------------------------|-----------------------------|------|---|
| | Indiana Hispanic Females | U.S. Hispanic Females | IN/US Incidence Ratio | Indiana Hispanic Females | U.S. Hispanic Females | IN/US Mortality Ratio | | |
| Breast | 87.1 | 89.3 | 0.98 | 10.4 | 15.3 | 0.68 | * | |
| Cervix | 13.1 | 12.4 | 1.06 | ~ | 3.1 | NA | | |
| Colon & Rectum | 34.6 | 34.5 | 1.00 | 9.0 | 10.5 | 0.86 | | |
| Corpus & Uterus | 23.5 | 19.0 | 1.24 | ~ | 3.0 | NA | | |
| Kidney & Renal Pelvis | 15.0 | 10.9 | 1.38 | ~ | 2.4 | NA | | |
| Leukemias | 8.8 | 8.2 | 1.07 | ~ | 3.9 | NA | | |
| Lung & Bronchus | 34.3 | 26.8 | 1.28 | * | 8.9 | 14.4 | 0.62 | * |
| Non-Hodgkin Lymphoma | 13.4 | 14.9 | 0.90 | ~ | 4.4 | NA | | |
| Ovary | 11.7 | 11.2 | 1.04 | ~ | 6.0 | NA | | |
| Thyroid | 15.2 | 14.7 | 1.03 | ~ | 0.6 | NA | | |
| All Cancer Sites | 335.8 | 326.7 | 1.03 | 70.9 | 102.2 | 0.69 | * | |

^a Includes the top ten sites for incidence and mortality among Hispanic females in Indiana.

^b Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. standard population.

*Indicates a statistically significant difference in the rate between Indiana Hispanic females and Indiana females of all races, based upon 95% confidence intervals.

~Rate is suppressed; fewer than 16 cases reported

Source: U.S. Cancer Statistics Working Group. *United States Cancer Statistics: 1999-2007 Incidence and Mortality Web-Based Report*. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; 2010. Available at www.cdc.gov/uscs.

Table 5. Age-Adjusted Cancer Incidence and Mortality Rates for Hispanic Females Compared to All Females in Indiana

| 2003-2007 Cancer Site ^a | Incidence Rates ^b | | | Mortality Rates ^b | | | | |
|---------------------------------------|-------------------------------------|-----------------------------------|------------------------------|-------------------------------------|-----------------------------------|------------------------------|------|---|
| | Indiana Hispanic Females (HF) | Indiana Females - All Races | HF/All Incidence Ratio | Indiana Hispanic Females (HF) | Indiana Females - All Races | HF/All Mortality Ratio | | |
| Breast | 87.1 | 113.8 | 0.77 | * | 10.4 | 24.5 | 0.42 | * |
| Cervix | 13.1 | 8.0 | 1.64 | * | ~ | 2.6 | NA | |
| Colon & Rectum | 34.6 | 45.2 | 0.77 | * | 9.0 | 15.7 | 0.57 | * |
| Corpus & Uterus | 23.5 | 25.5 | 0.92 | | ~ | 4.5 | NA | |
| Kidney & Renal Pelvis | 15.0 | 12.5 | 1.20 | | ~ | 3.3 | NA | |
| Leukemias | 8.8 | 9.2 | 0.96 | | ~ | 5.8 | NA | |
| Lung & Bronchus | 34.3 | 63.9 | 0.54 | * | 8.9 | 47.6 | 0.19 | * |
| Non-Hodgkin Lymphoma | 13.4 | 17.0 | 0.79 | | ~ | 6.0 | NA | |
| Ovary | 11.7 | 12.1 | 0.97 | | ~ | 8.9 | NA | |
| Thyroid | 15.2 | 12.9 | 1.18 | | ~ | 0.4 | NA | |
| All Cancer Sites | 335.8 | 416.1 | 0.81 | * | 70.9 | 166.7 | 0.43 | * |

^a Includes the top ten sites for incidence and mortality among Hispanic females in Indiana.

^b Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. standard population.

*Indicates a statistically significant difference in the rate between Indiana and US Hispanic females, based upon 95% confidence intervals.

~Rate is suppressed; fewer than 16 cases reported

Source: U.S. Cancer Statistics Working Group. *United States Cancer Statistics: 1999-2007 Incidence and Mortality Web-Based Report*. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; 2010. Available at www.cdc.gov/uscs.

Table 6. Indiana and U.S. Age-Adjusted Cancer Incidence and Mortality Rates for White Females

| 2003-2007 Cancer Site ^a | Incidence Rates ^b | | | Mortality Rates ^b | | |
|---------------------------------------|------------------------------|--------------------|-----------------------|------------------------------|--------------------|-----------------------|
| | Indiana White Females | U.S. White Females | IN/US Incidence Ratio | Indiana White Females | U.S. White Females | IN/US Mortality Ratio |
| Brain & ONS | 6.4 | 6.1 | 1.05 | 4.1 | 3.8 | 1.08 |
| Breast | 113.4 | 121.7 | 0.93 | 23.9 | 23.4 | 1.02 |
| Colon & Rectum | 43.9 | 41.3 | 1.06 | 15.4 | 14.4 | 1.07 |
| Corpus & Uterus | 25.9 | 24.3 | 1.07 | 4.4 | 3.9 | 1.13 |
| Kidney & Renal Pelvis | 12.4 | 10.6 | 1.17 | 3.3 | 2.7 | 1.22 |
| Leukemias | 9.2 | 9.8 | 0.94 | 5.9 | 5.6 | 1.05 |
| Lung & Bronchus | 64.0 | 57.0 | 1.12 | 47.6 | 41.6 | 1.14 |
| Melanomas of the Skin | 14.2 | 16.9 | 0.84 | 1.9 | 2.0 | 0.95 |
| Non-Hodgkin Lymphoma | 17.0 | 16.7 | 1.02 | 6.2 | 5.7 | 1.09 |
| Ovary | 12.3 | 13.3 | 0.92 | 9.0 | 8.9 | 1.01 |
| Pancreas | 9.8 | 9.9 | 0.99 | 9.1 | 9.1 | 1.00 |
| Thyroid | 13.2 | 15.8 | 0.84 | 0.4 | 0.5 | 0.80 |
| All Cancer Sites | 413.7 | 418.2 | 0.99 | 165.3 | 155 | 1.07 |

^a Includes the top ten sites for incidence and mortality among white females in Indiana.

^b Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. standard population.

*Indicates a statistically significant difference in the rate between Indiana and U.S. white females, based upon 95% confidence intervals.

~Rate is suppressed; fewer than 16 cases reported

Source: U.S. Cancer Statistics Working Group. *United States Cancer Statistics: 1999-2007 Incidence and Mortality Web-Based Report*. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; 2010. Available at www.cdc.gov/uscs.

Table 7. Indiana and U.S. Age-Adjusted Cancer Incidence and Mortality Rates for African-American Males

| 2003-2007 Cancer Site ^a | Incidence Rates ^b | | | | Mortality Rates ^b | | | |
|---------------------------------------|--------------------------------|-----------------------------|-----------------------|---|--------------------------------|-----------------------------|-----------------------|----------|
| | Indiana African American Males | U.S. African American Males | IN/US Incidence Ratio | | Indiana African American Males | U.S. African American Males | IN/US Mortality Ratio | |
| Colon & Rectum | 56.5 | 50.7 | 1.11 | * | 32.7 | 30.5 | 1.07 | |
| Esophagus | 10.0 | 10.1 | 0.99 | | 9.3 | 8.9 | 1.04 | |
| Kidney & Renal Pelvis | 25.7 | 21.6 | 1.19 | * | 6.2 | 6.0 | 1.03 | |
| Leukemias | 12.2 | 12.0 | 1.02 | | 10.1 | 8.4 | 1.20 | |
| Liver & IBD | 14.4 | 13.3 | 1.08 | | 13.8 | 11.1 | 1.24 | * |
| Lung & Bronchus | 121.8 | 103.5 | 1.18 | * | 102.0 | 87.5 | 1.17 | * |
| Myeloma | 14.0 | 13.2 | 1.06 | | 11.6 | 8.1 | 1.43 | * |
| Oral Cavity & Pharynx | 14.5 | 16.6 | 0.87 | | 4.2 | 6.3 | 0.67 | * |
| Pancreas | 16.7 | 16.4 | 1.02 | | 16.3 | 15.4 | 1.06 | |
| Prostate | 201.8 | 228.9 | 0.88 | * | 53.0 | 54.2 | 0.98 | |
| Stomach | 14.0 | 16.3 | 0.86 | | 9.6 | 10.7 | 0.90 | |
| Urinary Bladder | 19.2 | 18.6 | 1.03 | | 4.8 | 5.4 | 0.89 | |
| All Cancer Sites | 614.6 | 620.6 | 0.99 | | 321.1 | 296.5 | 1.08 | * |

^a Includes the top ten sites for incidence and mortality among African American males in Indiana.

^b Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. standard population.

*Indicates a statistically significant difference in the rate between Indiana and US African American males, based upon 95% confidence intervals.

Source: U.S. Cancer Statistics Working Group. *United States Cancer Statistics: 1999-2007 Incidence and Mortality Web-Based Report*. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; 2010. Available at www.cdc.gov/uscs.

Table 8. Age-Adjusted Incidence and Mortality Rates for Selected Cancer Sites among Indiana Males by Race

| 2003-2007 Cancer Site ^a | Incidence Rates ^b | | | | Mortality Rates ^b | | | |
|---------------------------------------|------------------------------|-----------------|--------------------------|----------|------------------------------|-----------------|--------------------------|----------|
| | African American Male Rate | White Male Rate | AA/White Incidence Ratio | | African American Male Rate | White Male Rate | AA/White Mortality Ratio | |
| Colon & Rectum | 56.5 | 43.9 | 1.29 | * | 32.7 | 23.7 | 1.38 | * |
| Esophagus | 10.0 | 9.6 | 1.04 | | 9.3 | 8.7 | 1.07 | |
| Kidney & Renal Pelvis | 25.7 | 22.0 | 1.17 | | 6.2 | 6.7 | 0.93 | |
| Leukemias | 12.2 | 15.6 | 0.78 | | 10.1 | 10.8 | 0.94 | |
| Liver & IBD | 14.4 | 7.0 | 2.06 | * | 13.8 | 6.4 | 2.16 | * |
| Lung & Bronchus | 121.8 | 101.4 | 1.20 | * | 102.0 | 83.4 | 1.22 | * |
| Myeloma | 14.0 | 7.0 | 2.00 | * | 11.6 | 4.5 | 2.58 | * |
| Non-Hodgkin Lymphoma | 13.7 | 23.2 | 0.59 | * | 6.2 | 10.3 | 0.60 | * |
| Oral Cavity & Pharynx | 14.5 | 15.8 | 0.92 | | 4.2 | 3.4 | 1.24 | |
| Pancreas | 16.7 | 13.1 | 1.27 | | 16.3 | 13.0 | 1.25 | |
| Prostate | 201.8 | 127.6 | 1.58 | * | 53.0 | 24.1 | 2.20 | * |
| Stomach | 14.0 | 7.5 | 1.87 | * | 9.6 | 3.9 | 2.46 | * |
| Urinary Bladder | 19.2 | 37.5 | 0.51 | * | 4.8 | 7.9 | 0.61 | * |
| All Cancer Sites | 614.6 | 539.6 | 1.14 | * | 321.1 | 246.7 | 1.30 | * |

^a Includes the top ten sites for incidence and mortality among African American and white males in Indiana except melanoma (whites).

^b Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. standard population.

*Indicates a statistically significant difference in the rate between African American and white males in Indiana, based upon 95% confidence intervals.

Source: U.S. Cancer Statistics Working Group. *United States Cancer Statistics: 1999-2007 Incidence and Mortality Web-Based Report*. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; 2010. Available at www.cdc.gov/uscs.

Table 9. Indiana and U.S. Age-Adjusted Cancer Incidence and Mortality Rates for Hispanic Males

| 2003-2007 Cancer Site ^a | Incidence Rates ^b | | | Mortality Rates ^b | | | |
|---------------------------------------|------------------------------|------------------------|-----------------------------|------------------------------|------------------------|-----------------------------|---|
| | Indiana Hispanic Males | U.S. Hispanic Males | IN/US Incidence Ratio | Indiana Hispanic Males | U.S. Hispanic Males | IN/US Mortality Ratio | |
| Colon & Rectum | 34.6 | 34.5 | 1.00 | 7.3 | 15.6 | 0.47 | * |
| Kidney & Renal Pelvis | 18.2 | 18.7 | 0.97 | ~ | 5.2 | NA | |
| Leukemias | 10.3 | 11.7 | 0.88 | ~ | 6.0 | NA | |
| Liver & IBD | 14.8 | 16.4 | 0.90 | 8.2 | 11.3 | 0.73 | |
| Lung & Bronchus | 42.8 | 47.7 | 0.90 | 20.8 | 32.5 | 0.64 | * |
| Myeloma | 7.8 | 6.5 | 1.20 | ~ | 3.3 | NA | |
| Non-Hodgkin Lymphoma | 13.6 | 19.3 | 0.70 | ~ | 6.3 | NA | |
| Pancreas | 7.2 | 11.3 | 0.64 | 6.0 | 9.1 | 0.66 | |
| Prostate | 114.4 | 125.6 | 0.91 | 15.4 | 18.8 | 0.82 | |
| Stomach | 11.4 | 14.1 | 0.81 | ~ | 8.0 | NA | |
| Urinary Bladder | 13.6 | 20.4 | 0.67 | ~ | 3.9 | NA | |
| All Cancer Sites | 362.1 | 420.6 | 0.86 | 101.4 | 150.4 | 0.67 | * |

^a Includes the top ten sites for incidence and mortality among Hispanic males in Indiana.

^b Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. standard population.

*Indicates a statistically significant difference in the rate between Indiana and US Hispanic males, based upon 95% confidence intervals.

~Rate is suppressed; fewer than 16 cases reported

Source: U.S. Cancer Statistics Working Group. *United States Cancer Statistics: 1999-2007 Incidence and Mortality Web-Based Report*.
Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; 2010.
Available at www.cdc.gov/uscs.

Table 10. Age-Adjusted Cancer Incidence and Mortality Rates for Hispanic Males Compared to All Males in Indiana

| 2003-2007 Cancer Site ^a | Incidence Rates ^b | | | | Mortality Rates ^b | | | |
|---------------------------------------|-----------------------------------|---------------------------------|------------------------------|---|-----------------------------------|---------------------------------|------------------------------|---|
| | Indiana Hispanic Males (HM) | Indiana Males - All Races | HM/All Incidence Ratio | | Indiana Hispanic Males (HM) | Indiana Males - All Races | HM/All Mortality Ratio | |
| Colon & Rectum | 34.6 | 45.2 | 0.77 | * | 7.3 | 24.0 | 0.30 | * |
| Kidney & Renal Pelvis | 18.2 | 22.3 | 0.82 | | ~ | 6.7 | NA | |
| Leukemias | 10.3 | 15.6 | 0.66 | | ~ | 10.7 | NA | |
| Liver & IBD | 14.8 | 7.5 | 1.97 | * | 8.2 | 6.8 | 1.21 | |
| Lung & Bronchus | 42.8 | 102.4 | 0.42 | * | 20.8 | 83.9 | 0.25 | * |
| Myeloma | 7.8 | 7.4 | 1.05 | | ~ | 4.9 | NA | |
| Non-Hodgkin Lymphoma | 13.6 | 22.9 | 0.59 | * | ~ | 10.0 | NA | |
| Pancreas | 7.2 | 13.3 | 0.54 | * | 6.0 | 13.1 | 0.46 | * |
| Prostate | 114.4 | 137.2 | 0.83 | * | 15.4 | 25.6 | 0.60 | * |
| Stomach | 11.4 | 7.9 | 1.44 | | ~ | 4.3 | NA | |
| Urinary Bladder | 13.6 | 37.2 | 0.37 | * | ~ | 7.7 | NA | |
| All Cancer Sites | 362.1 | 552.7 | 0.66 | * | 101.4 | 249.4 | 0.41 | * |

^a Includes the top ten sites for incidence and mortality among Hispanic males in Indiana.

^b Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. standard population.

*Indicates a statistically significant difference in the rate between Indiana Hispanic males and Indiana males of all races, based upon 95% confidence intervals.

~Rate is suppressed; fewer than 16 cases reported

Source: U.S. Cancer Statistics Working Group. *United States Cancer Statistics: 1999-2007 Incidence and Mortality Web-Based Report*.

Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; 2010. Available at www.cdc.gov/uscs.

Table 11. Age-Adjusted Indiana and U.S. Cancer Incidence and Mortality Rates for White Males

| 2003-2007 Cancer Site ^a | Incidence Rates ^b | | | | Mortality Rates ^b | | | |
|---------------------------------------|------------------------------|---------------------|-----------------------------|----------|------------------------------|---------------------|-----------------------------|----------|
| | Indiana White Males | U.S. White Males | IN/US Incidence Ratio | | Indiana White Males | U.S. White Males | IN/US Mortality Ratio | |
| Colon & Rectum | 43.9 | 41.3 | 1.06 | * | 23.7 | 20.6 | 1.15 | * |
| Esophagus | 9.6 | 8.7 | 1.10 | * | 8.7 | 7.9 | 1.10 | * |
| Kidney & Renal Pelvis | 22.0 | 20.2 | 1.09 | * | 6.7 | 6.0 | 1.12 | * |
| Leukemias | 15.6 | 16.3 | 0.96 | | 10.8 | 10.0 | 1.08 | * |
| Liver & IBD | 7.0 | 8.2 | 0.85 | * | 6.4 | 7.0 | 0.91 | * |
| Lung & Bronchus | 101.4 | 84.4 | 1.20 | * | 83.4 | 68.3 | 1.22 | * |
| Melanomas of the Skin | 20.9 | 25.5 | 0.82 | * | 4.6 | 4.5 | 1.02 | |
| Non-Hodgkin Lymphoma | 23.2 | 23.7 | 0.98 | | 10.3 | 9.1 | 1.13 | * |
| Oral Cavity & Pharynx | 15.8 | 16.0 | 0.99 | | 3.4 | 3.7 | 0.92 | |
| Pancreas | 13.1 | 13.0 | 1.01 | | 13.0 | 12.2 | 1.07 | * |
| Prostate | 127.6 | 143.5 | 0.89 | * | 24.1 | 22.8 | 1.06 | * |
| Urinary Bladder | 37.5 | 39.5 | 0.95 | * | 7.9 | 7.9 | 1.00 | |
| All Cancer Sites | 539.6 | 544.4 | 0.99 | * | 246.7 | 222.5 | 1.11 | * |

^a Includes the top ten sites for incidence and mortality among white males in Indiana.

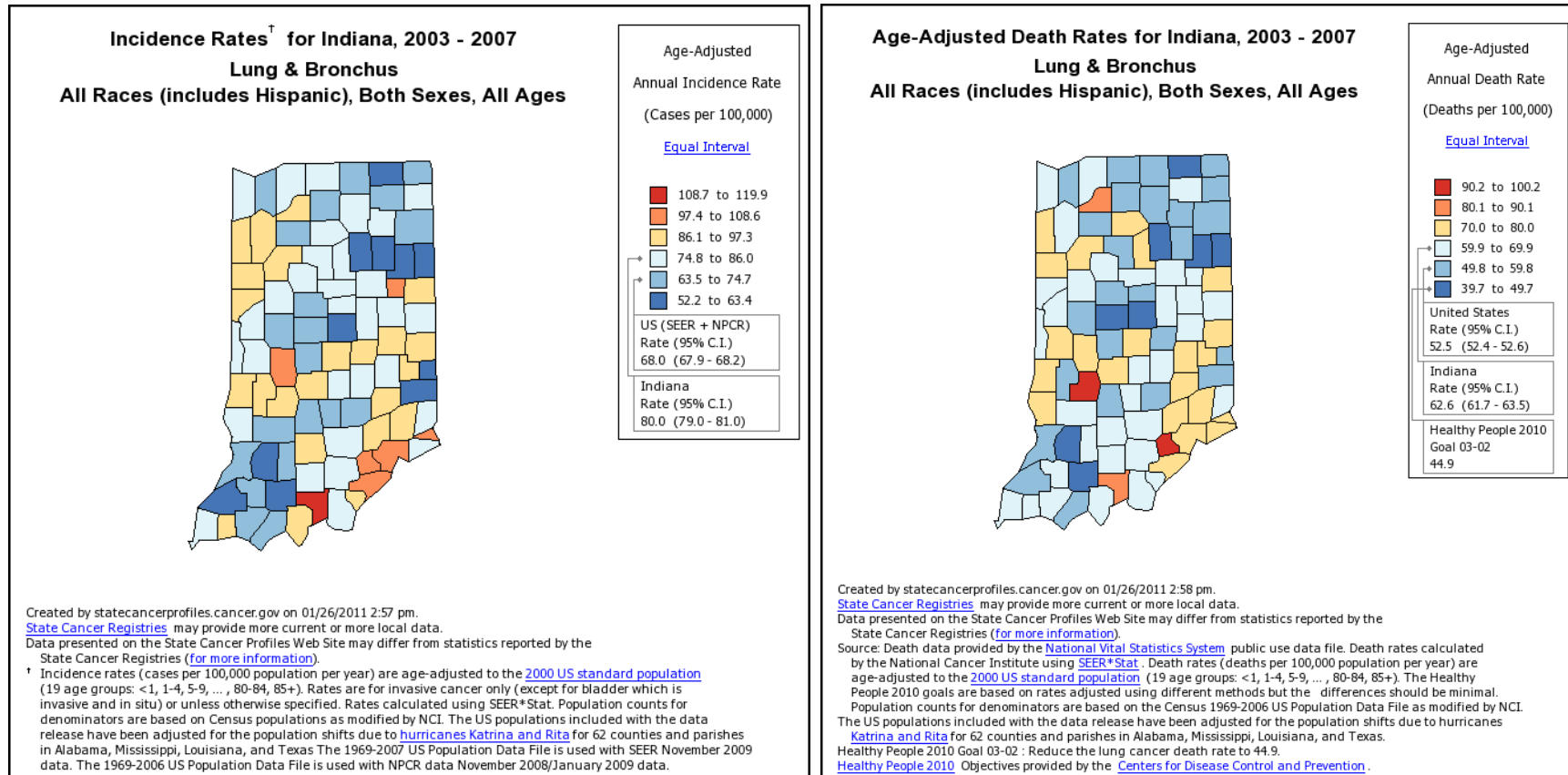
^b Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. standard population.

*Indicates a statistically significant difference in the rate between white males in Indiana and the U.S., based upon 95% confidence intervals.

Source: U.S. Cancer Statistics Working Group. *United States Cancer Statistics: 1999-2007 Incidence and Mortality Web-Based Report*. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; 2010. Available at www.cdc.gov/uscs.

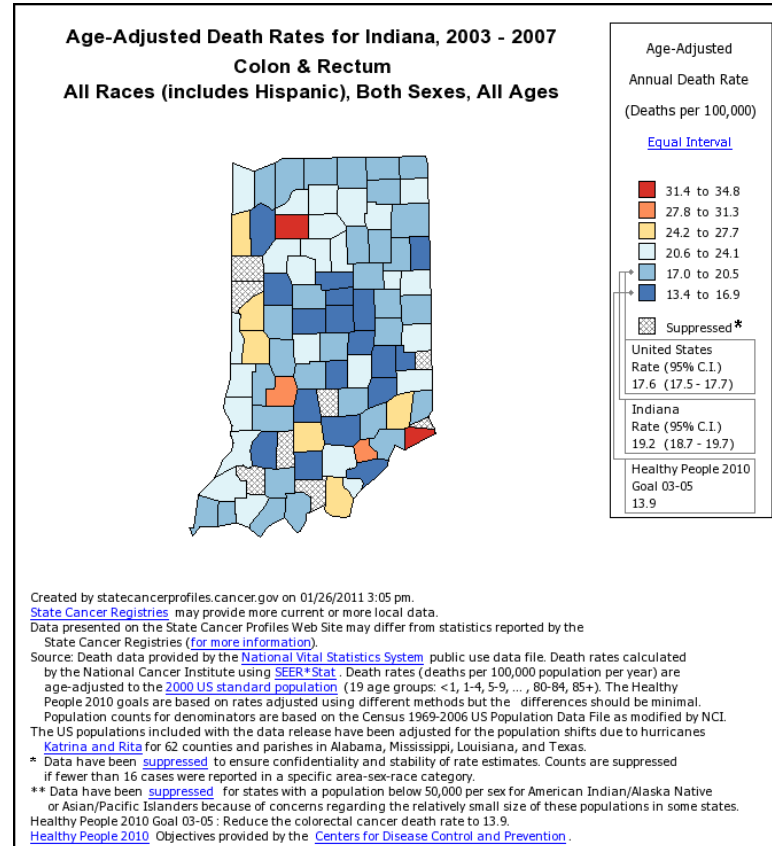
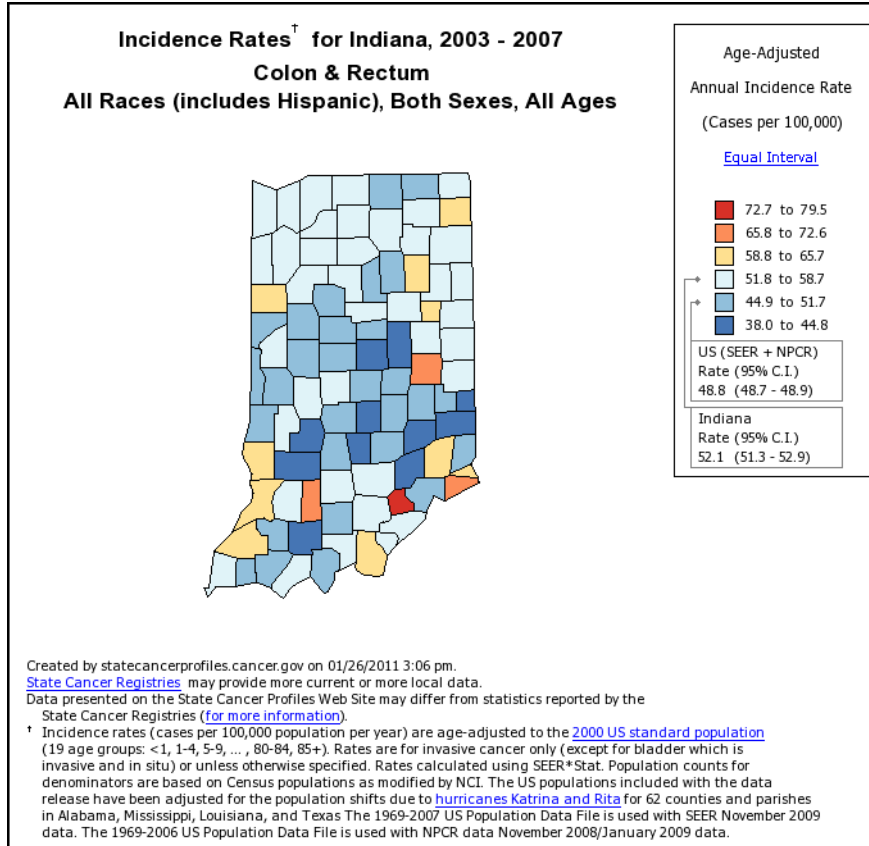
Appendix B: Geographic Cancer Statistics

Figures 1a-1b. Maps of Age-Adjusted Lung and Bronchial Cancer Incidence and Mortality Rates by Indiana Counties



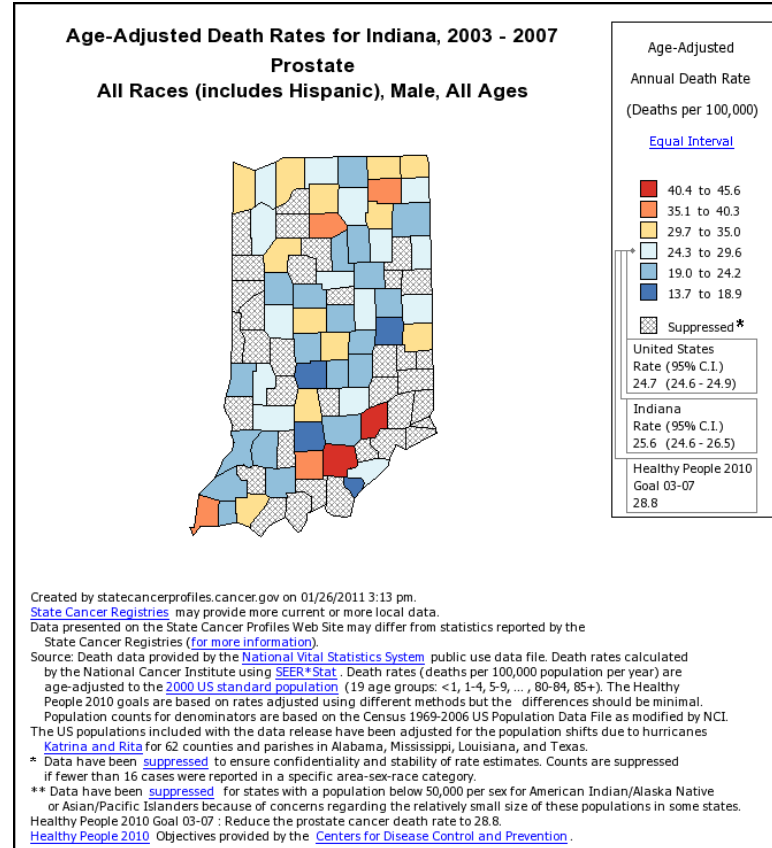
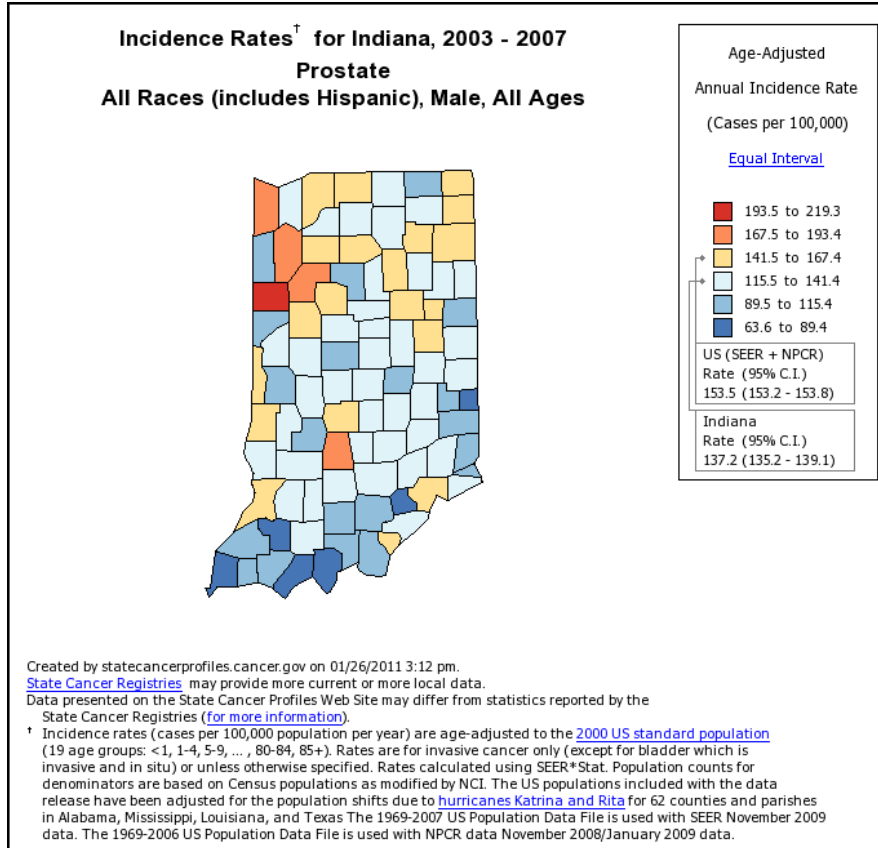
Figures 2a-2b.

Maps of Age-Adjusted Colorectal Cancer Incidence and Mortality Rates by Indiana Counties



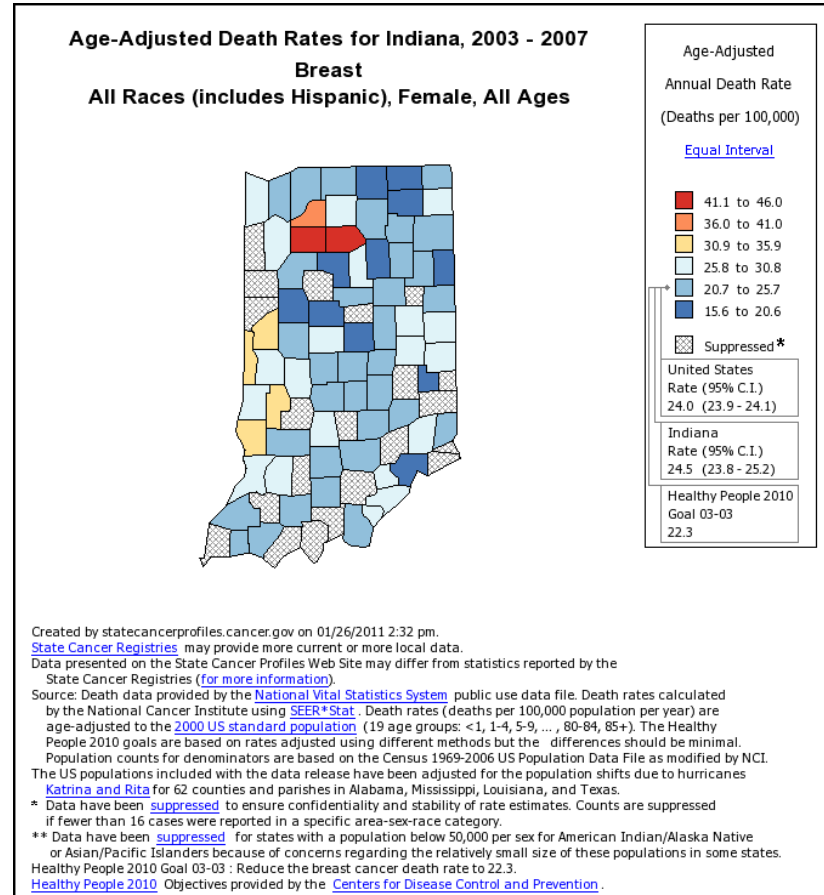
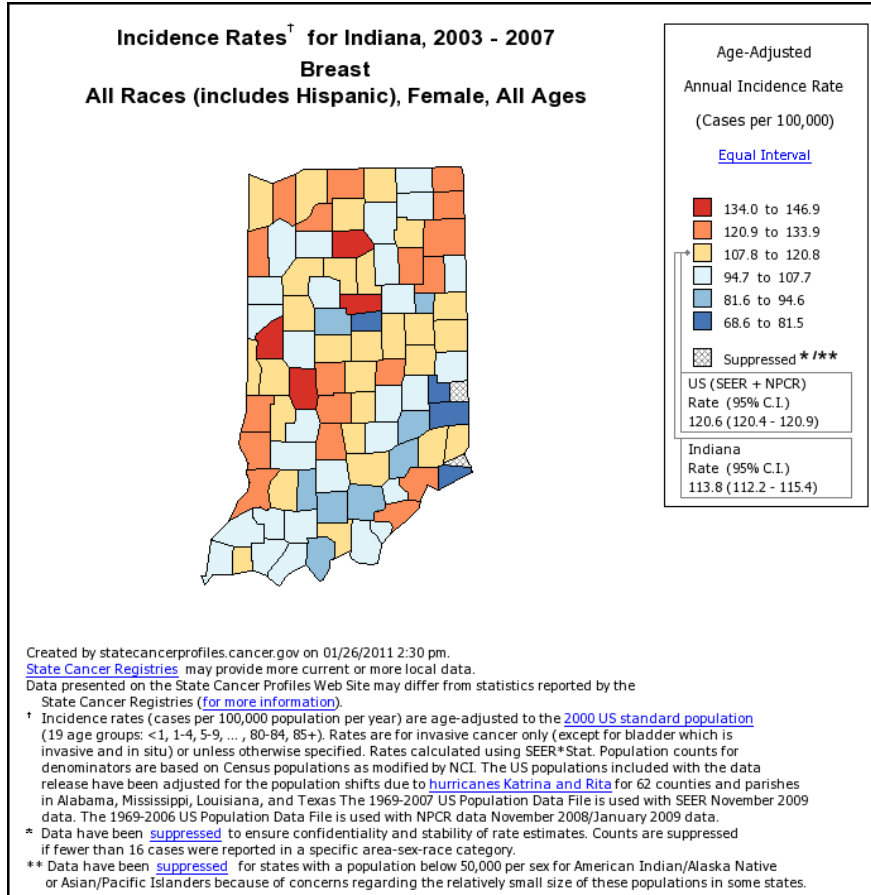
Figures 3a-3b.

Maps of Age-Adjusted Prostate Cancer Incidence and Mortality Rates by Indiana Counties



Figures 4a-4b.

Maps of Age-Adjusted Breast Cancer Incidence and Mortality Rates by Indiana Counties



Figures 5a-5b.

Maps of Age-Adjusted Invasive Cervical Cancer Incidence and Mortality Rates by Indiana Counties

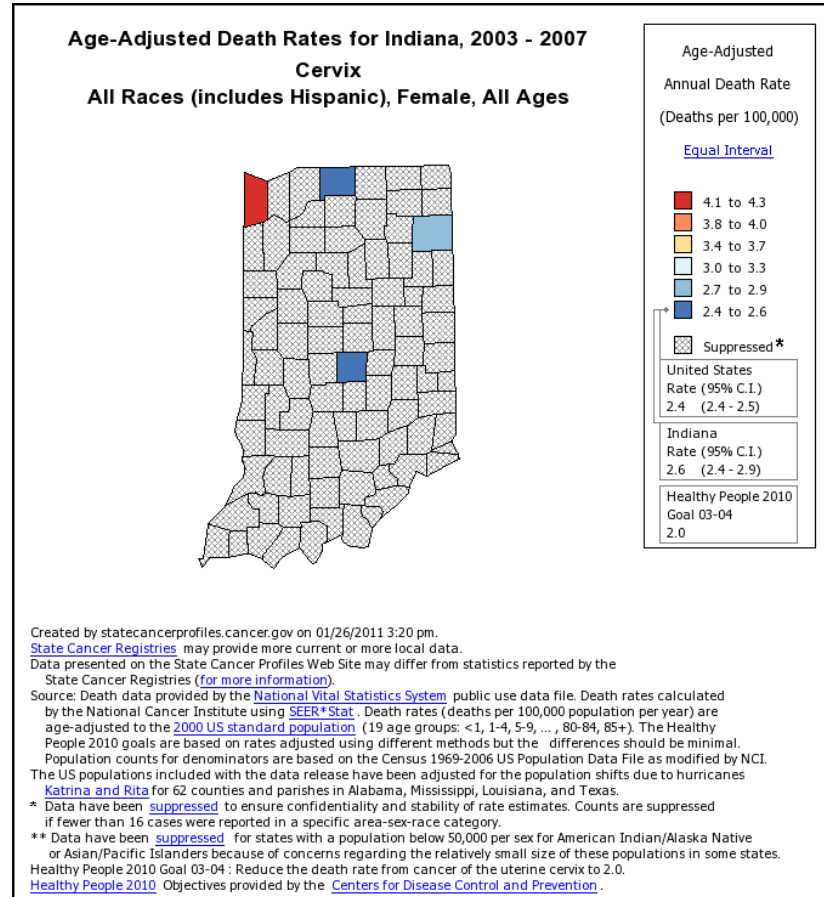
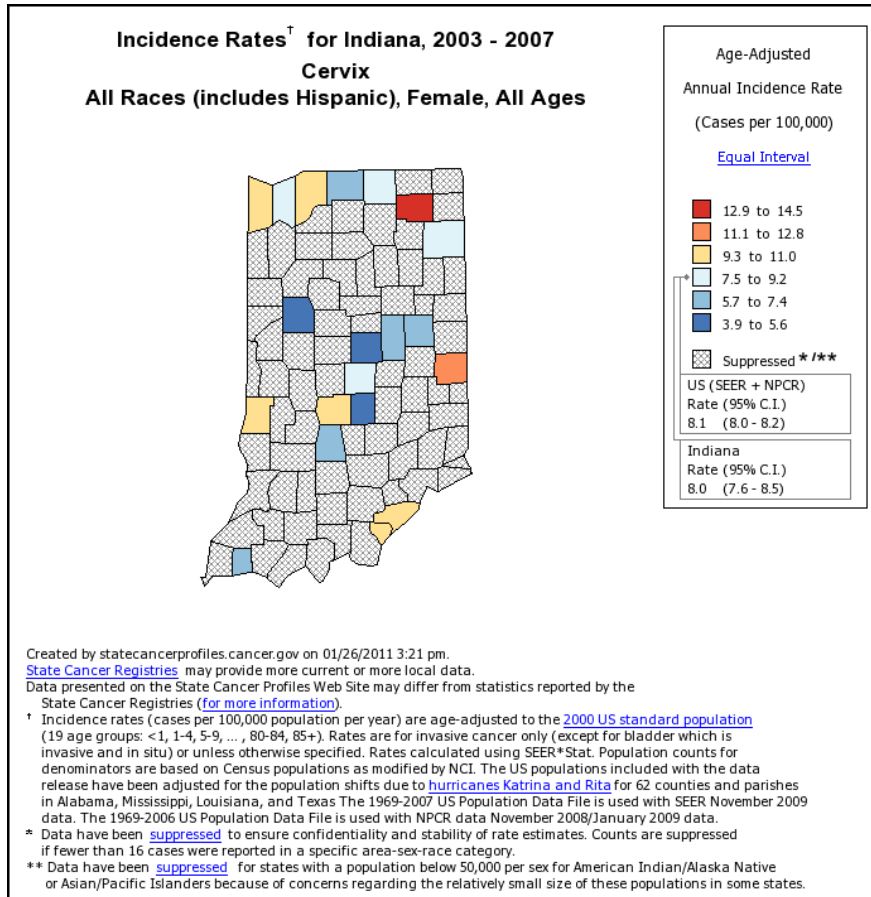


Table 12. Counties Included in Each of Indiana’s Ten Health Planning Regions

| Region | Counties |
|-----------|---|
| 1 | Lake, Porter, Newton, Jasper |
| 2 | LaPorte, St. Joseph, Elkhart, Starke, Marshall, Kosciusko, Pulaski, Fulton |
| 3 | LaGrange, Steuben, Noble, DeKalb, Whitley, Allen, Miami, Wabash, Huntington, Wells, Adams |
| 4 | Benton, White, Cass, Warren, Tippecanoe, Carroll, Fountain, Montgomery, Clinton |
| 5 | Boone, Hamilton, Hendricks, Marion, Hancock, Morgan, Johnson, Shelby |
| 6 | Howard, Tipton, Grant, Madison, Blackford, Jay, Delaware, Randolph, Henry, Wayne, Rush, Fayette, Union |
| 7 | Owen, Greene, Martin, Monroe, Lawrence, Orange, Brown, Jackson, Washington |
| 8 | Bartholomew, Decatur, Franklin, Jennings, Ripley, Dearborn, Scott, Jefferson, Ohio, Switzerland, Clark, Floyd, Harrison |
| 9 | Knox, Daviess, Gibson, Pike, Dubois, Posey, Vanderburgh, Warrick, Spencer, Perry, Crawford |
| 10 | Vermillion, Parke, Putnam, Vigo, Clay, Sullivan |

Table 13. Lung and Bronchus Cancer Stage at Diagnosis by Indiana Health Planning Region

| Lung & Bronchus Cancer Stage at Diagnosis, 2000-2005 | | | | | | |
|--|--------------|--------------|---------------------------------|--------------|-------------|----------------------------------|
| Region* | Local | Regional | Local + Regional Combined | Distant | Unknown | Distant + Unknown Combined |
| Region 9 | 15.7% | 21.7% | 37.3% | 47.6% | 15.1% | 62.7% |
| Region 3 | 17.4% | 20.9% | 38.3% | 46.0% | 15.7% | 61.7% |
| Region 7 | 14.5% | 23.9% | 38.4% | 51.8% | 9.8% | 61.6% |
| Region 2 | 17.8% | 22.5% | 40.3% | 52.0% | 7.7% | 59.7% |
| Region 1 | 17.5% | 23.1% | 40.6% | 46.9% | 12.5% | 59.4% |
| Indiana | 17.9% | 23.7% | 41.5% | 48.7% | 9.7% | 58.5% |
| Region 6 | 18.6% | 23.2% | 41.8% | 49.3% | 8.9% | 58.2% |
| Region 4 | 18.9% | 24.2% | 43.1% | 48.3% | 8.6% | 56.9% |
| Region 5 | 18.8% | 25.1% | 43.9% | 50.1% | 6.0% | 56.1% |
| Region 8 | 19.3% | 25.0% | 44.2% | 44.9% | 10.9% | 55.8% |
| Region 10 | 17.2% | 27.7% | 45.0% | 47.7% | 7.3% | 55.0% |

**Regions sorted in descending order of percent distant + unknown combined*

Source: Indiana State Cancer Registry, Indiana State Department of Health.

Table 14. Colorectal Cancer Stage at Diagnosis by Indiana Health Planning Region, 2000-2005

| Region* | Colon & Rectum Cancer Stage at Diagnosis, 2000-2005 | | | | | |
|----------------|---|--------------|---------------------------|--------------|-------------|----------------------------|
| | Local | Regional | Local + Regional Combined | Distant | Unknown | Distant + Unknown Combined |
| Region 3 | 38.2% | 34.0% | 72.2% | 18.5% | 9.3% | 27.8% |
| Region 1 | 39.4% | 33.2% | 72.6% | 19.6% | 7.8% | 27.4% |
| Region 10 | 33.1% | 40.8% | 73.8% | 19.8% | 6.3% | 26.2% |
| Region 4 | 33.7% | 40.3% | 74.0% | 19.5% | 6.5% | 26.0% |
| Region 8 | 40.5% | 33.5% | 74.0% | 18.9% | 7.1% | 26.0% |
| Region 5 | 42.1% | 32.0% | 74.1% | 19.6% | 6.3% | 25.9% |
| Indiana | 38.7% | 35.6% | 74.3% | 18.6% | 7.1% | 25.7% |
| Region 2 | 35.6% | 38.9% | 74.5% | 19.2% | 6.4% | 25.5% |
| Region 7 | 40.4% | 35.0% | 75.4% | 18.7% | 5.9% | 24.6% |
| Region 9 | 34.0% | 42.1% | 76.1% | 16.1% | 7.8% | 23.9% |
| Region 6 | 41.3% | 35.6% | 76.9% | 16.2% | 6.9% | 23.1% |

**Regions sorted in descending order of percent distant + unknown combined*

Source: Indiana State Cancer Registry, Indiana State Department of Health.

Table 15. Prostate Cancer Stage at Diagnosis by Indiana Health Planning Region, 2000-2005

| Region* | Prostate Cancer Stage at Diagnosis, 2000-2005 | | | | | |
|----------------|---|--------------|---------------------------|-------------|-------------|----------------------------|
| | Local | Regional | Local + Regional Combined | Distant | Unknown | Distant + Unknown Combined |
| Region 3 | 65.2% | 6.1% | 71.3% | 6.0% | 22.8% | 28.7% |
| Region 2 | 71.0% | 11.6% | 82.6% | 5.3% | 12.1% | 17.4% |
| Indiana | 75.1% | 10.8% | 85.9% | 5.0% | 9.1% | 14.1% |
| Region 7 | 74.4% | 12.0% | 86.4% | 5.0% | 8.6% | 13.6% |
| Region 8 | 78.2% | 8.4% | 86.6% | 4.5% | 8.9% | 13.4% |
| Region 5 | 73.1% | 14.5% | 87.6% | 4.6% | 7.8% | 12.4% |
| Region 6 | 78.6% | 9.3% | 87.9% | 5.3% | 6.7% | 12.1% |
| Region 1 | 78.3% | 10.5% | 88.8% | 4.9% | 6.3% | 11.2% |
| Region 9 | 80.7% | 8.8% | 89.5% | 3.8% | 6.8% | 10.5% |
| Region 10 | 79.0% | 11.1% | 90.2% | 5.5% | 4.3% | 9.8% |
| Region 4 | 79.9% | 11.0% | 90.9% | 4.7% | 4.5% | 9.1% |

**Regions sorted in descending order of percent distant + unknown combined*

Source: Indiana State Cancer Registry, Indiana State Department of Health.

Table 16. Female Breast Cancer Stage at Diagnosis by Indiana Health Planning Region, 2000-2005

| Region* | Female Breast Cancer Stage at Diagnosis, 2000-2005 | | | | | |
|----------------|--|--------------|---------------------------------|-------------|-------------|----------------------------------|
| | Local | Regional | Local + Regional Combined | Distant | Unknown | Distant + Unknown Combined |
| Region 1 | 56.1% | 33.0% | 89.2% | 6.5% | 4.3% | 10.8% |
| Region 2 | 59.5% | 30.1% | 89.6% | 6.5% | 3.9% | 10.4% |
| Region 3 | 59.0% | 31.0% | 89.9% | 4.5% | 5.5% | 10.1% |
| Region 10 | 63.2% | 27.1% | 90.3% | 5.2% | 4.4% | 9.7% |
| Region 7 | 63.6% | 26.9% | 90.4% | 5.9% | 3.7% | 9.6% |
| Indiana | 61.7% | 29.0% | 90.7% | 5.1% | 4.2% | 9.3% |
| Region 6 | 63.2% | 27.8% | 91.0% | 5.7% | 3.3% | 9.0% |
| Region 8 | 62.6% | 28.9% | 91.5% | 4.7% | 3.9% | 8.5% |
| Region 5 | 63.9% | 27.7% | 91.6% | 4.2% | 4.2% | 8.4% |
| Region 4 | 63.1% | 28.7% | 91.8% | 4.1% | 4.1% | 8.2% |
| Region 9 | 65.0% | 27.4% | 92.4% | 3.7% | 3.9% | 7.6% |

**Regions sorted in descending order of percent distant + unknown combined*

Source: Indiana State Cancer Registry, Indiana State Department of Health.

Table 17. Cancer of the Cervix, Stage at Diagnosis by Indiana Health Planning Region, 2000-2005

| Region* | Cervix Uteri Cancer Stage at Diagnosis, 2000-2005 | | | | | |
|----------------|---|--------------|---------------------------------|-------------|-------------|----------------------------------|
| | Local | Regional | Local + Regional Combined | Distant | Unknown | Distant + Unknown Combined |
| Region 10 | 43.8% | 29.2% | 72.9% | 18.8% | 8.3% | 27.1% |
| Region 7 | 37.5% | 43.8% | 81.3% | 13.8% | 5.0% | 18.8% |
| Region 2 | 45.9% | 36.2% | 82.1% | 10.2% | 7.7% | 17.9% |
| Region 9 | 53.6% | 29.5% | 83.0% | 11.6% | 5.4% | 17.0% |
| Region 8 | 50.6% | 32.5% | 83.1% | 9.1% | 7.8% | 16.9% |
| Region 1 | 45.0% | 39.2% | 84.2% | 8.1% | 7.7% | 15.8% |
| Indiana | 48.7% | 35.8% | 84.5% | 8.9% | 6.6% | 15.5% |
| Region 3 | 52.4% | 33.5% | 85.9% | 8.4% | 5.8% | 14.1% |
| Region 6 | 47.5% | 38.7% | 86.2% | 7.2% | 6.6% | 13.8% |
| Region 5 | 51.6% | 35.4% | 87.1% | 6.9% | 6.0% | 12.9% |
| Region 4 | 49.2% | 38.5% | 87.7% | 7.7% | 4.6% | 12.3% |

**Regions sorted in descending order of percent distant + unknown combined*

Source: Indiana State Cancer Registry, Indiana State Department of Health.

Appendix C: Cancer Risk Factors

Table 18. U.S. and Indiana Adults Who Are Current Smokers, 2009

| Adult Smokers, 2009 | Indiana Percent | U.S. Median Percent | |
|-------------------------|-----------------|---------------------|---|
| Gender | | | |
| Male | 24.8% | 19.6% | * |
| Female | 21.4% | 16.8% | * |
| Race/Ethnicity | | | |
| White | 22.2% | 17.2% | * |
| Black | 31.5% | 20.5% | * |
| Hispanic | 23.0% | 15.6% | |
| Education | | | |
| Less than High School | 42.1% | 31.4% | * |
| High School or G.E.D | 26.8% | 24.8% | |
| Some post-High School | 26.1% | 19.9% | * |
| College Graduate | 8.5% | 8.2% | |
| Overall Measures | | | |
| All Adults | 23.1% | 17.9% | * |
| Indiana Rank** | 5th | | |
| National Range | (9.8%-25.6%) | | |

*Indicates a statistically significant difference between Indiana and U.S. percents based on 95% confidence intervals.

**Rank from 1-51 among 50 States and D.C.; 1= highest

Source: Behavioral Risk Factor Surveillance System, 2009

Table 19. U.S. and Indiana Youth Tobacco Use, 2009

| Youth ^a Tobacco Use, 2009 | Current Cigarette Use* | | Current Smokeless Tobacco Use* | |
|--------------------------------------|------------------------|--------------|--------------------------------|--------------|
| | Indiana Percent | U.S. Percent | Indiana Percent | U.S. Percent |
| All Youth | 23.9% | 19.5% | 10.7% | 8.9% |
| Males | 24.3% | 19.8% | 17.9% | 15.0% |
| Females | 22.6% | 19.1% | 3.2% | 2.2% |
| White , non-Hispanic | 25.3% | 22.5% | 12.1% | 11.9% |
| Black, non-Hispanic | 11.3% | 9.5% | 2.8% | 3.3% |
| Hispanic | 23.2% | 18.0% | 5.6% | 5.1% |

^aYouth = 9th -12th grade students

*Differences between Indiana and U.S. percentages were not statistically significant, based on 95% confidence intervals.

Source: Youth Risk Behavior Survey, 2009

Table 20. U.S. and Indiana Adults Who Did Not Meet the Recommended Physical Activity Level, 2009^a

| Adults Insufficiently Active, 2009 | Indiana Percent | U.S. Median Percent | |
|---|------------------------|----------------------------|---|
| Gender | | | |
| Male | 47.3% | 46.6% | |
| Female | 56.3% | 51.4% | * |
| Race/Ethnicity | | | |
| White | 50.8% | 48.1% | * |
| Black | 61.9% | 56.9% | |
| Hispanic | 56.7% | 53.4% | |
| Age | | | |
| 18-24 | 38.1% | 38.5% | |
| 25-34 | 47.5% | 44.7% | |
| 35-44 | 50.8% | 47.9% | |
| 45-54 | 52.7% | 49.2% | * |
| 55-64 | 57.0% | 52.6% | * |
| 65+ | 62.6% | 59.7% | * |
| Education | | | |
| Less than High School | 59.9% | 60.0% | |
| High School or G.E.D. | 55.4% | 52.8% | |
| Some post-High School | 48.9% | 49.0% | |
| College Graduate | 47.7% | 45.3% | |
| Overall Measures | | | |
| All Adults | 52.0% | 49.0% | * |
| Indiana Rank** | 15th | | |
| National Range: | (39.3%-64.8%) | | |

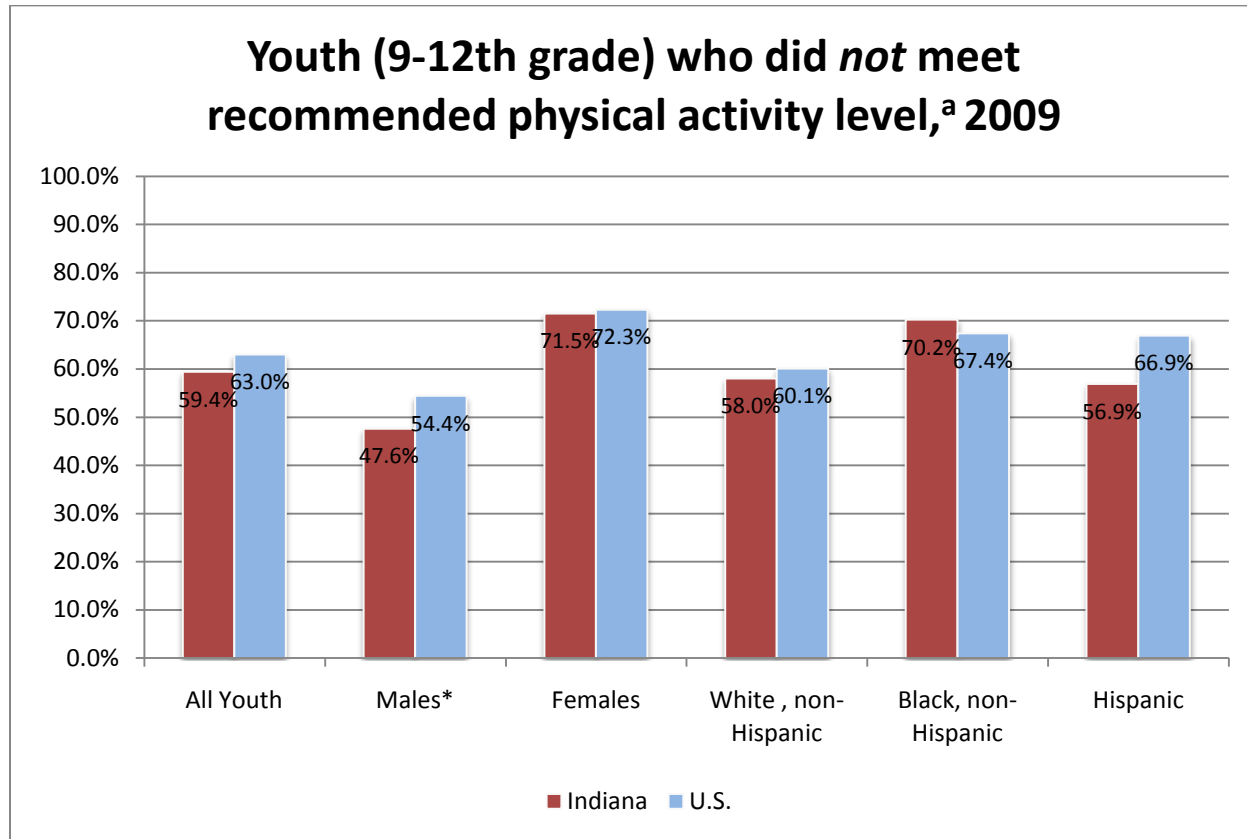
^aThe minimum recommended level of physical activity for adults is ≥ 30 minutes of moderate physical activity on ≥ 5 days per week OR ≥ 20 minutes of vigorous physical activity on ≥ 3 days per week.

*Indicates a statistically significant difference between Indiana and U.S. percents based on 95% confidence intervals.

**Rank from 1-51 among 50 States and D.C.; 1=highest

Source: Behavioral Risk Factor Surveillance System, 2009.

Figure 6. U.S. and Indiana Youth Who Did Not Meet the Recommended Physical Activity Level, 2009



^aThe recommended level of physical activity was defined as: Doing any kind of physical activity that increased their heart rate and made them breath hard some of the time for a total of at least 60 minutes per day on 5 or more days during the 7 days before the survey.

*Indicates a statistically significant difference between Indiana and U.S. percents based on 95% confidence intervals.

Source: Youth Risk Behavior Survey, 2009

Table 21. U.S. and Indiana Adult Obesity Prevalence, 2009

| Adult Obesity^a, 2009 | Indiana Percent | U.S. Median Percent | |
|--|------------------------|----------------------------|---|
| Gender | | | |
| Male | 29.7% | 28.5% | |
| Female | 30.2% | 26.0% | * |
| Race/Ethnicity | | | |
| White | 29.7% | 26.4% | * |
| Black | 34.4% | 38.7% | |
| Hispanic | 32.1% | 29.3% | |
| Education | | | |
| Less than High School | 30.5% | 31.7% | |
| High School or G.E.D | 30.7% | 30.4% | |
| Some post-High School | 29.6% | 29.4% | |
| College Graduate | 29.0% | 22.2% | * |
| Overall Measures | | | |
| All Adults | 29.9% | 26.9% | * |
| Indiana Rank** | 14th | | |
| National Range | (18.9%-35.3%) | | |

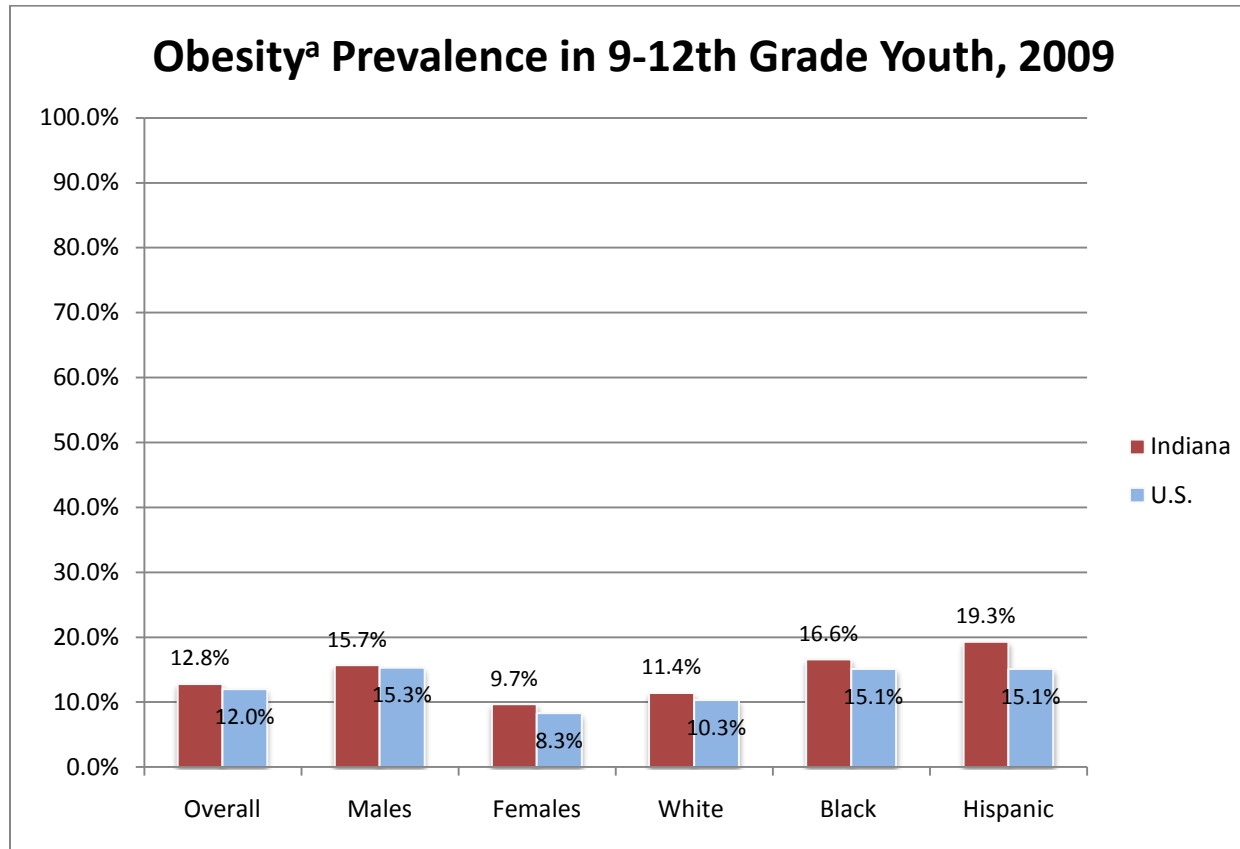
^aObesity is defined as a BMI \geq 30.0

*Indicates a statistically significant difference between Indiana and U.S. percents based on 95% confidence intervals.

**Rank from 1-51 among 50 States and D.C.; 1= highest

Source: Behavioral Risk Factor Surveillance System, 2009

Figure 7. U.S. and Indiana Youth Obesity Prevalence, 2009



^aObesity in youth was defined as a BMI which is at or above the 95th percentile for gender and age.

No differences between Indiana and U.S. percents were statistically significant based on 95% confidence intervals.

Source: Youth Risk Behavior Survey, 2009

Table 22. U.S. and Indiana Youth Sexual Behaviors, 2009

| Youth ^a Sexual Behaviors, 2009 | Had sexual intercourse with > 4 partners during their life* | | Had sexual intercourse for the first time before the age of 13* | |
|--|--|--------------|--|--------------|
| | Indiana Percent | U.S. Percent | Indiana Percent | U.S. Percent |
| All Youth | 13.7% | 13.8% | 4.5% | 5.9% |
| Males | 13.5% | 16.2% | 6.3% | 8.4% |
| Females | 13.7% | 11.2% | 2.8% | 3.1% |
| White , non-Hispanic | 12.0% | 10.5% | 2.7% | 3.4% |
| Black, non-Hispanic | 24.1% | 28.6% | NA | 15.2% |
| Hispanic | 13.2% | 14.2% | 8.1% | 6.7% |

^aYouth = 9th -12th grade students

*Differences between Indiana and U.S. percentages were not statistically significant based on 95% confidence intervals.

NA- Percentage not reported because there were fewer than 100 respondents for this subgroup

Source: Youth Risk Behavior Survey, 2009

Table 23. U.S. and Indiana Adults (Age 18-64 Years) Who Do Not Have Health Care Coverage, 2009

| Uninsured Nonelderly Adults, 2009 | Indiana Percent | U.S. Median Percent | |
|--|------------------------|----------------------------|---|
| Gender | | | |
| Male | 23.6% | 19.1% | * |
| Female | 17.1% | 14.9% | * |
| Race/Ethnicity | | | |
| White | 17.5% | 13.6% | * |
| Black | 32.8% | 23.4% | * |
| Hispanic | 42.8% | 36.9% | |
| Education | | | |
| Less than High School | 41.5% | 37.6% | |
| High School or G.E.D | 26.6% | 23.9% | |
| Some post-High School | 18.1% | 15.8% | |
| College Graduate | 7.7% | 6.4% | |
| Overall Measures | | | |
| All Adults | 20.4% | 16.9% | * |
| Indiana Rank** | 15th | | |
| National Range | (6.1%-29.1%) | | |

**Indicates a statistically significant difference between Indiana and U.S. percents based on 95% confidence intervals.*

***Rank from 1-51 among 50 States and D.C.; 1= highest*

Source: Behavioral Risk Factor Surveillance System, 2009

Table 24. Uninsured Rates for the Nonelderly in Indiana Compared to U.S. Rates, 2007-2008

| Uninsured, 2007-2008 | Indiana Percent | U.S. Percent |
|--|-----------------|--------------|
| Total Nonelderly Population^a | 13.4% | 17.4% |
| Gender | | |
| Male | 14.2% | 19.1% |
| Female | 12.6% | 15.7% |
| Race/Ethnicity | | |
| White | 12.3% | 12.7% |
| Black | 17.6% | 20.6% |
| Hispanic | 26.2% | 32.2% |
| Age | | |
| Children (\leq 18 years old) | 5.9% | 10.3% |
| Adults (19-64 years old) | 16.8% | 20.4% |
| Federal Poverty Level | | |
| Under 100% | 28.7% | 34.8% |
| 100-133% | 23.6% | 30.4% |
| 134%-300% | 16.4% | 22.0% |
| Over 300% | 10.8% | 14.5% |

^aNonelderly includes those aged 0-64.

Source: The Kaiser Family Foundation, statehealthfacts.org. Data Source: Urban Institute and Kaiser Commission on Medicaid and the Uninsured estimates based on the Census Bureau's March 2008 and 2009 Current Population Survey (CPS: Annual Social and Economic Supplements).

Appendix D: Cancer Screening

Table 25. Indianapolis, Indiana, and U.S. Cancer Screening Rates, 2008

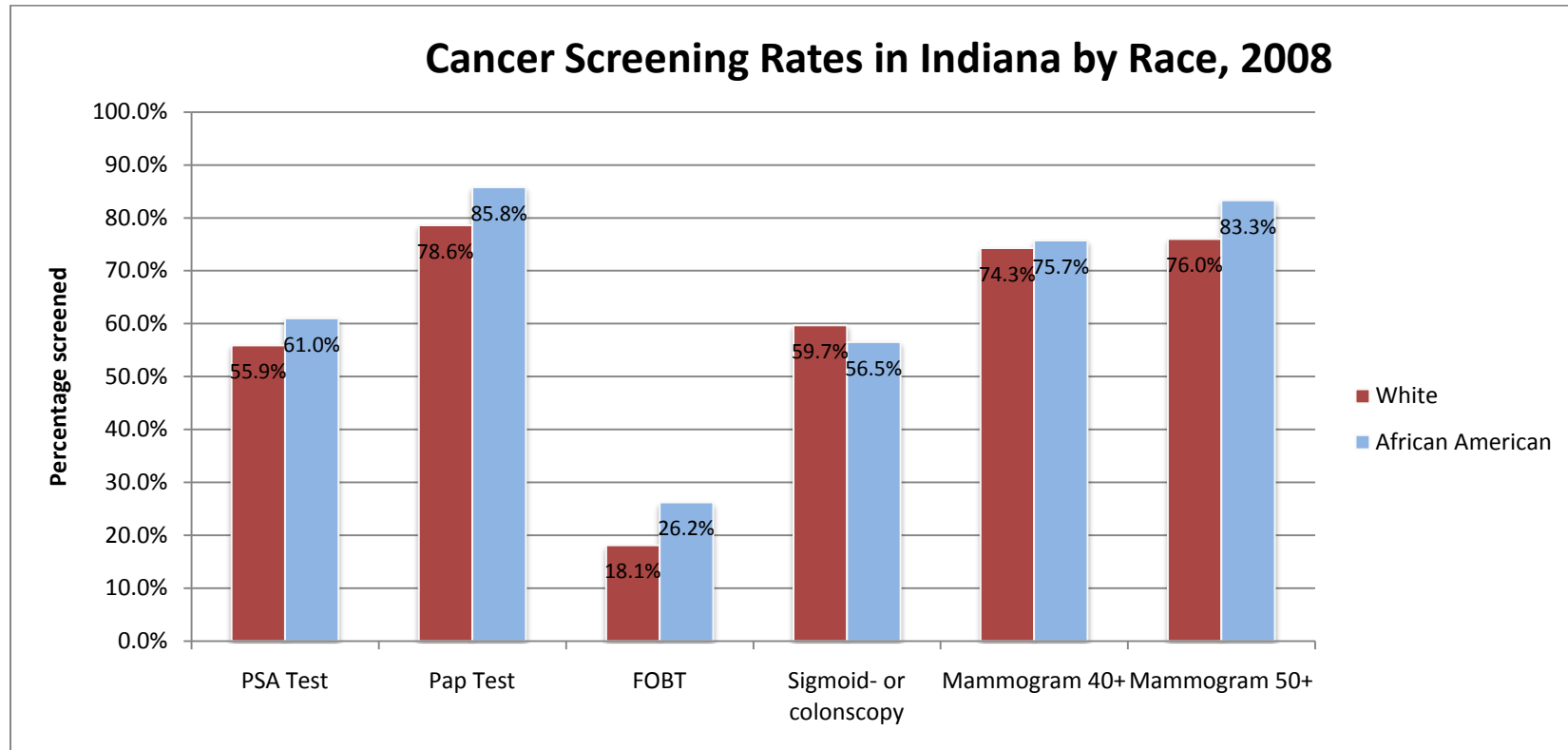
| Cancer Screening Tests, 2008 | Indianapolis MSA Percent | Indiana Percent | U.S. Median Percent | | Indiana Rank** and Range |
|---|--------------------------|-----------------|---------------------|---|--------------------------|
| Men aged 40+ who have had a PSA test within the past two years | 57.0% | 55.3% | 54.8% | | 23rd (44.9-64.6%) |
| Women aged 18+ who have had a pap test within the past 3 years | 84.8% | 78.7% | 82.9% | * | 47th (66.6-88.9%) |
| Adults aged 50+ who have had a blood stool test within the past two years | 20.3% | 18.2% | 21.0% | * | 43rd (9.1-29.0%) |
| Adults aged 50+ who have ever had a sigmoidoscopy or colonoscopy | 65.3% | 59.3% | 62.2% | * | 35th (52.6-74.3%) |
| Women aged 40+ who have had a mammogram within the past 2 years | 77.7% | 73.9% | 76.0% | | 36th (67.2-84.9%) |
| Women aged 50+ who have had a mammogram within the past 2 years | 81.0% | 75.5% | 79.5% | * | 39th (71.2-87.3%) |

**Indicates a statistically significant difference between Indiana and U.S. percents based on 95% confidence intervals. Indiana and Indianapolis MSA differences were not statistically significant.*

***Rank from 1-51 among 50 states and D.C.; 1= highest*

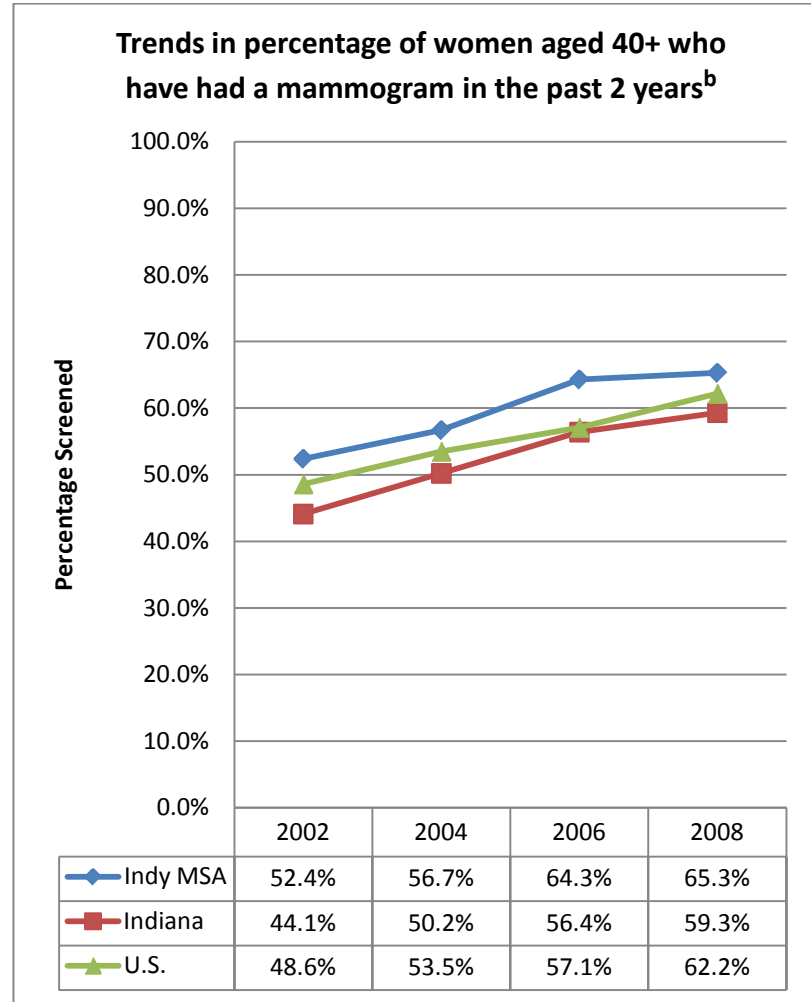
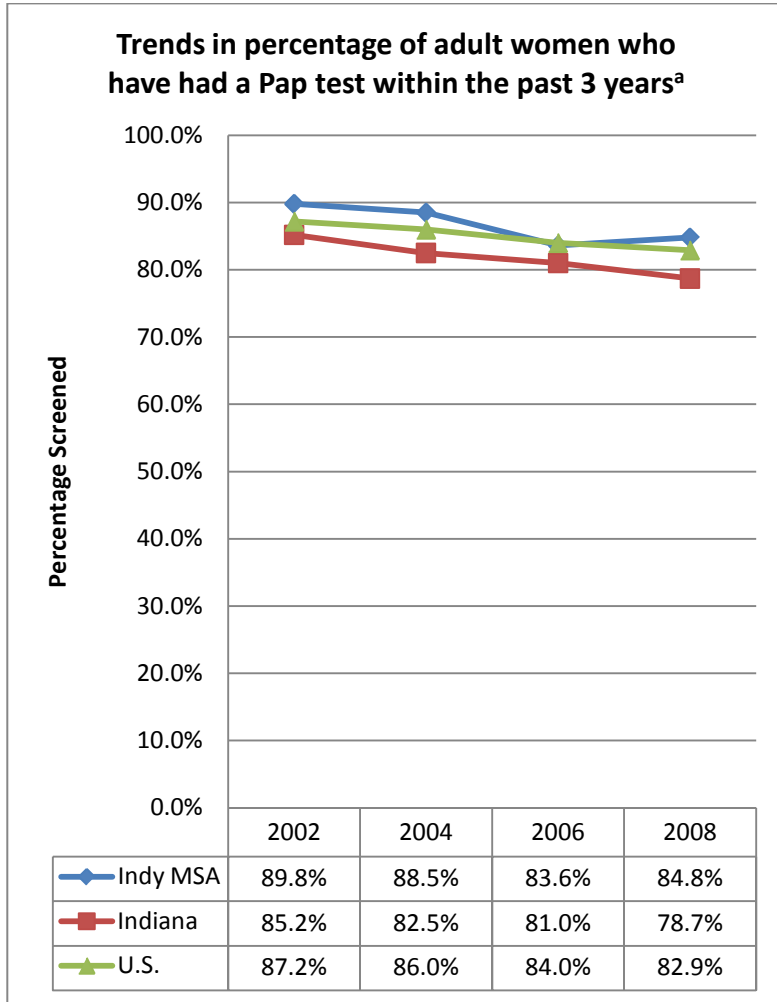
Source: Behavioral Risk Factor Surveillance System, 2008

Figure 8. Cancer Screening Rates in Indiana by Race, 2008



Source: Behavioral Risk Factor Surveillance System, 2008. Public use data file for 2008 was utilized to derive the percentages for blacks regarding FOBT and PSA testing, as these rates were suppressed at the BRFSS online portal.

Figures 9a-9d. Indianapolis, Indiana, and U.S. Cancer Screening Trends, 2002-2008

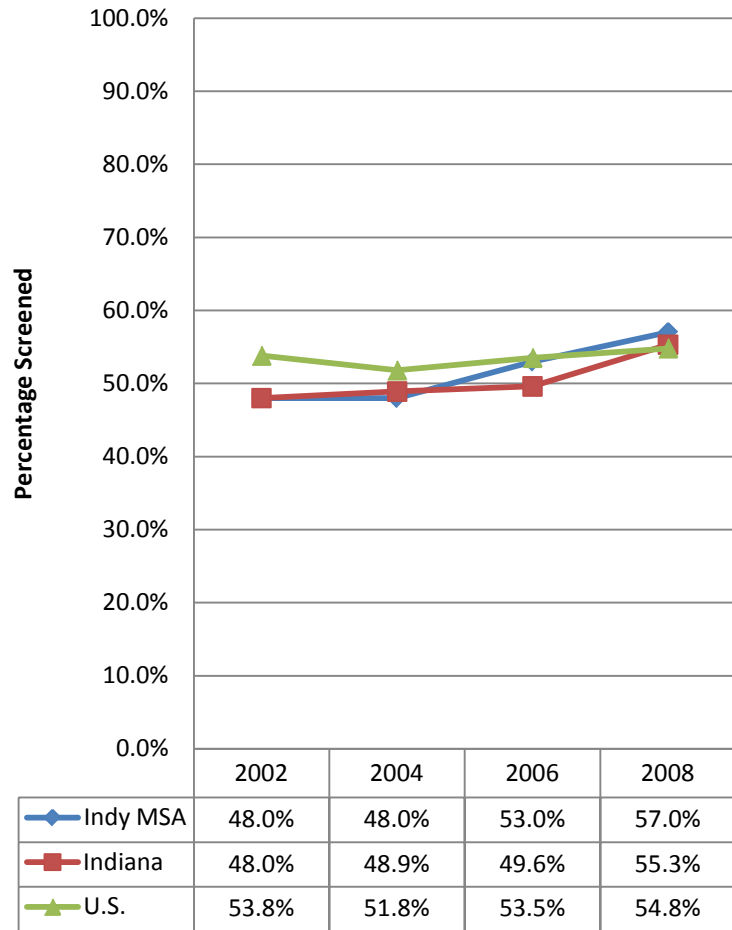


^a Indiana's Pap testing rates are significantly lower than the U.S. in all years shown.

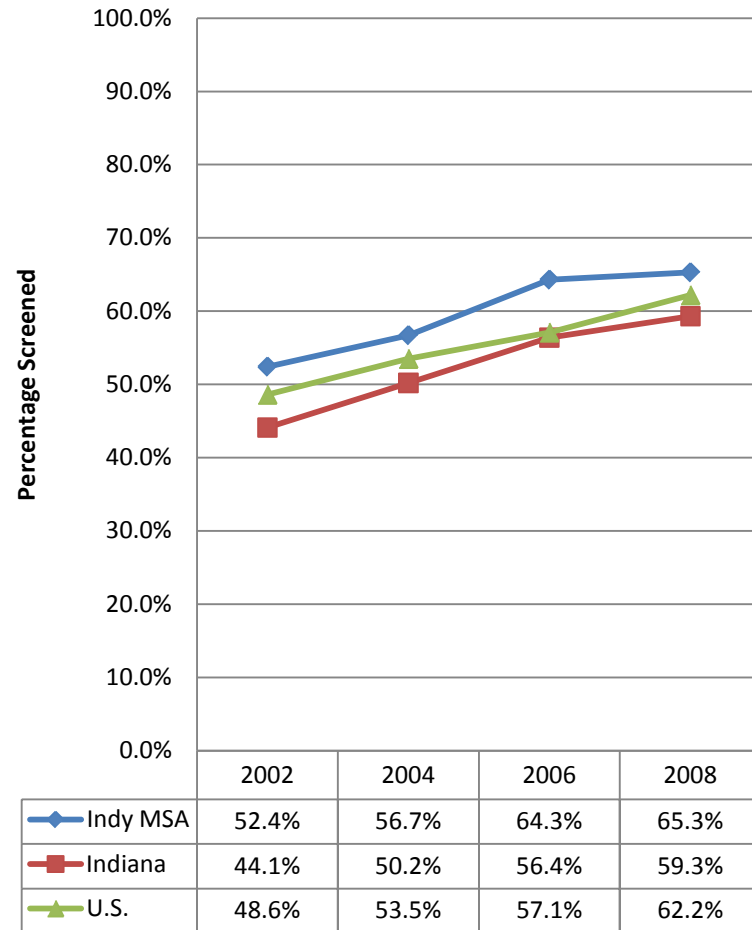
^b Indiana's mammography rates are significantly lower than the U.S. in all years except 2008.

Source: Behavioral Risk Factor Surveillance System and SMART BRFS, 2002-2006

Trends in percentage of men aged 40+ who have had a PSA test within the past 2 years^a



Trends in percentage of adults aged 50+ who have ever had a sigmoidoscopy or colonoscopy^b



^a Indiana's PSA testing rates are significantly lower than the U.S. in all years except 2008.

^b Indiana's sigmoid/colonoscopy rates are significantly lower than the U.S. in all year except 2006.

Source: Behavioral Risk Factor Surveillance System and SMART BRFS, 2002-2006