

# MISSISSIPPI'S CANCER BURDEN 2016-2020



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MISSISSIPPI STATE DEPARTMENT OF HEALTH

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# Executive Summary

This report highlights the cancer burden in Mississippi, detailing incidence and mortality rates across gender, race, and regional lines. The findings underscore the disparities in cancer outcomes within the state and inform future prevention and intervention strategies.

## Incidence Rates:

- **Gender and Race:** The incidence of overall cancer was significantly higher in males (537.14 per 100,000) than in females (412.54 per 100,000). Among racial groups, Black Mississippians experienced a slightly higher overall cancer incidence rate (474.76 per 100,000) than white Mississippians (463.15 per 100,000). Black males exhibited the highest overall cancer incidence rate (579.0 per 100,000).
- **Regional Variation:** The Northern Public Health District had the highest overall cancer incidence rate at 473 per 100,000, followed by the Appalachian region (469 per 100,000), which was slightly higher than the non-Appalachian region (464 per 100,000).
- **Specific Cancer Types:** The incidence of lung and bronchus cancer demonstrated a higher incidence-to-mortality ratio, indicating a substantial cancer burden in the state. Female breast cancer incidence rates were higher in urban areas (123 per 100,000) compared to rural areas (121 per 100,000). Prostate cancer incidence was highest in the Southern Cancer Coalition region (147 per 100,000 men). Additionally, Black males in the Delta Coalition reported the highest incidence rate of colorectal cancer (77 per 100,000). Melanoma incidence was higher among white Mississippians (29.6 per 100,000) compared to Black Mississippians (2.13 per 100,000).

## Mortality Rates:

- **Gender and Race:** Mortality was higher in males (225.98 per 100,000) than in females (148.49 per 100,000). Black Mississippians experienced higher cancer mortality (200.33 per 100,000) compared to white Mississippians (173.34 per 100,000).
- **Regional Mortality Rates:** The Delta Cancer Coalition region reported the highest overall cancer mortality rate (234 per 100,000). Within the Public Health Districts, the mortality rate for overall cancer was high (189 per 100,000) in Northern District. In the Appalachian region, mortality (184 per 100,000) slightly exceeded that in the non-Appalachian region (180 per 100,000).
- **Specific Cancer Types:** Breast cancer mortality was notably higher in rural areas (24 per 100,000) compared to urban areas (22.75 per 100,000). Prostate cancer mortality peaked in the Delta Coalition region (33 per 100,000 men), while the Coastal Coalition region reported the highest mortality rate for cervical cancer (4 per 100,000). Mortality from melanoma was also greater among white Mississippians (2.61 per 100,000) than Black Mississippians (0.35 per 100,000).

This summary emphasizes the impact of cancer across different demographic and regional segments in Mississippi and calls attention to the critical need for targeted interventions to reduce cancer disparities and improve health outcomes across the state.

## **Cancer Burden Document:**

The Cancer Burden Document lists the incidence and mortality rates for various important cancers in the state of Mississippi for the years 2016-2020. To address these conditions, the Mississippi State Department of Health (MSDH), Office of Preventive Health/MS Comprehensive Cancer Control Program, implements the National Cancer Prevention and Control Program. The overarching goal of this project is to implement a comprehensive and coordinated approach to support prevention and control activities, and support policy, system, and environmental change strategies to prevent and control cancer. The cancers of the lung and bronchus, female breast, prostate, colorectal, cervical, and skin are discussed with primary information on cancer definition, symptoms, risk factors, treatment, survival rate, and prevention strategies or screening recommendations from CDC. A ten-year trend graph for incidence and mortality rates for 100,000 individuals for each cancer type was included after the primary cancer information section followed by the specific cancer statistics. All the data listed in this document is extracted from the Mississippi Cancer Registry, 2023 for the years 2016-2020. The cancer data was displayed at various levels such as race, gender, and region. The data is listed at various regional classifications in Mississippi state such as Public Health Districts, Cancer Coalition regions, Delta vs. Non-Delta, Appalachian vs. Non-Appalachian, and Urban/Rural regions in the state of MS. This document aims at providing the baseline numbers and burden of cancer in the state of Mississippi to the public, health coalitions, and social organizations that are interested in promoting cancer awareness to improve the health of every Mississippian.

## **What is Cancer?**

Cancer is a large group of diseases characterized by uncontrolled growth and spread of abnormal cells. If the spread is not controlled, it can result in death. Cancer can be caused by external (chemicals, radiation, viruses), internal (hormones, immune conditions, genetics), and lifestyle (tobacco and alcohol use, unprotected sun exposure, poor nutrition, physical inactivity) factors.<sup>1</sup> Many cancers can be cured when detected and treated promptly, and many others can be prevented by lifestyle changes. Of the more than 32,700 cancer deaths in Mississippi during 2016- 2020, it is estimated that about one-third of them could have been prevented by avoiding tobacco use, and approximately one-fifth could have been averted by improving nutrition and maintaining normal body weight.

Cancer may strike at any age. However, most cancers affect adults beginning in middle age and occur more frequently with advancing age. There are differences in the incidence of cancer by sex as well as race/ethnicity. Disparities in cancer occurrence by race/ethnicity may reflect differences in risk due to lifestyle factors, genes, and/or access to and utilization of medical services.

## **Cancer Statistics in MS 2016-2020:**

During 2016-2020, there were about 88,546 new cancer cases in the state of MS with an age-adjusted incidence rate of 465.5 per 100,000 individuals. The incidence rate is about 25% higher among men (537 per 100,000) compared to women (412 per 100,000). There are no significant disparities observed in cancer incidence concerning race in Mississippi during 2016-2020. However, the cancer mortality in black individuals during these years was 15% higher than in white individuals in MS. The overall age-adjusted mortality of cancer in MS during 2016-2020 was 181 per 100,000 individuals. The mortality rate among men was 50% significantly higher than females with an adjusted mortality rate of 226 per 100,000. (Females: 148 per 100,000). The following table lists the overall cancer numbers and rates per 100,000 by gender and race for the years 2016-2020 in the state of Mississippi:

**All Cancer Incidence and Mortality in MS, 2016-2020**

2016-2020: All Cancers	New Cases	Incidence Rate/100,000	Deaths	Mortality Rate/100,000
White	56,098	463.15	21,771	173.34
Black	27,051	474.76	10,750	200.33
Female	39,250	412.54	14,897	148.49
Male	44,658	537.14	17,883	225.98
Total	83,908	465.40	32,780	181.04

Source: MS Cancer Registry

**Risk Factors of Cancer:**

Leading risk factors of cancer are smoking, UV radiation from the sun, being overweight or having obesity, drinking too much alcohol, reduced consumption of fruits and vegetables, and low physical activity. The table below lists some of the risk factors for cancer by gender and race in MS, 2021:

**Risk Factors for Cancers in MS, 2021 (All values are in percentage)**

Risk Factors	Smoking	Alcohol Consumption	Low-Fruit Consumption	Low-Vegetable Consumption	No Physical Activity	Obesity
White	19.6	6.1	50.4	19.9	59.3	34.7
Black	19.0	5.9	41.8	28.9	66.9	46.9
Female	18.5	5.4	44.8	21.9	63.7	41.4
Male	20.7	6.8	49.2	24.6	59.1	36.7
Total	19.6	6.0	46.8	23.2	61.5	39.1

Source: BRFSS, 2021, 2019. Smoking: Current Smoker, Alcohol Consumption: Heavy Drinking (14 drinks per week for men and 7 drinks per week for women), Low Fruit and Vegetable Consumption: Less than 1 serving a day, No Physical Activity (2019): Did not have 150 min of aerobic activity in the past week, Obesity: Body Mass Index (33.0 and above).

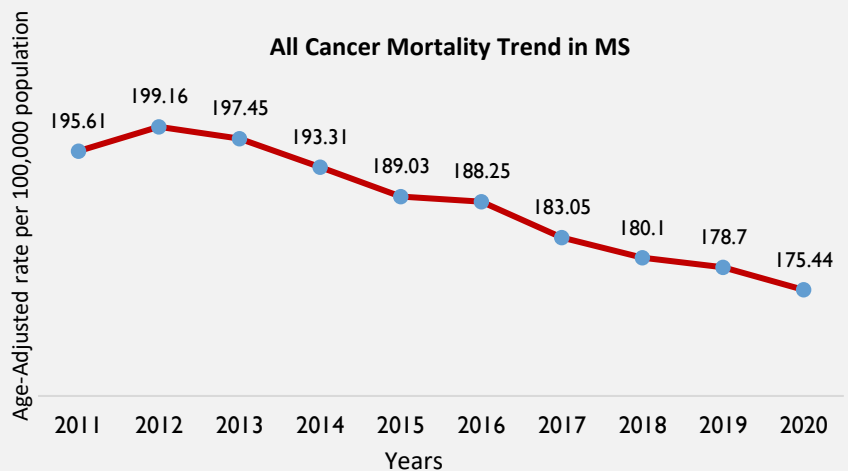
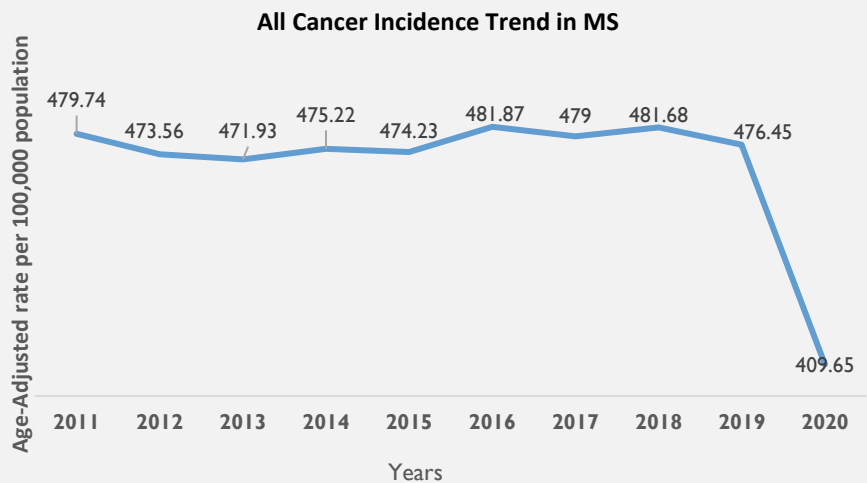
## All-Cancer Profile in Mississippi, 2016-2020:

Mississippi Statistically Automated Health Resource System (MSTAHRS), indicated that cancer was the second leading cause of death and accounted for 16.37% of all deaths in 2020. In 2020, around 15,145 individuals were diagnosed with cancer while the overall cancer mortality rate in Mississippi was 175.4 per 100,000 individuals (age-adjusted to the 2000 U.S. population), and 6,585 Mississippians died from cancer. Of those cancer deaths, 3,523 were men and 3,062 were women; 4,298 among whites, 2,234 among blacks, and 52 among other ethnicities. The cancers of the lung and bronchus, breast (female), prostate, colorectal, and cervical cancer together constitute Comprehensive Cancer. Other cancers such as skin cancer, oro-pharyngeal cancer, etc. contribute to a minimal extent when compared to the comprehensive cancers in Mississippi.

It is estimated that the state of MS would report 18,210 new cancer cases and 6,690 deaths with an age-adjusted incidence rate of 476 per 100,000 and a mortality rate of 181 per 100,000 individuals during 2023. (American Cancer Society, 2023). There is an estimation of 2,830 lung cancer cases, 2,790 prostate cancer cases, 2,610 female breast cancer cases, and 1,750 colorectal cancer cases during 2023. On the other hand, the estimated number of deaths attributable to respective cancers are lung and bronchus (1740), colorectum (640), female breast (470), pancreas (44), and prostate(370) in the state of MS during 2023. (Source: ACS)

## Cancer Incidence and Mortality trends in Mississippi, 2011 to 2020

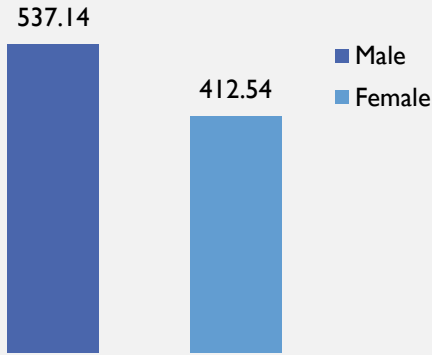
From 2011 to 2013, the all-Cancer incidence trend declined, gradually and showed an alternate rise and fall from 2014 to 2019 and markedly declined during 2020. In these 10 years, the highest reduction in Incidence rate was seen for 2020. The overall cancer mortality rate gradually declined from 2012 to 2020. In 2016, all cancer incidence showed the highest 10-year incidence rate of 481.87 per 100,000 while the highest 10-year all-cancer mortality rate of 199.16 per 100,000 individuals was in 2012.



Data Source: MS Cancer Registry

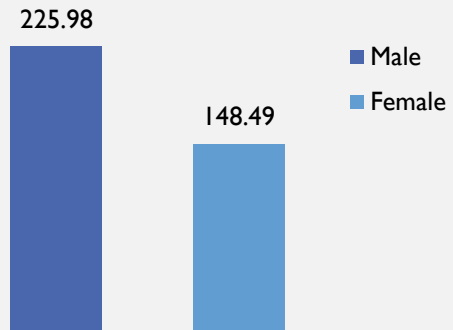


## All Cancer Incidence & Mortality Rates by Gender



**Incidence Rate per 100,000 individuals**

	Male		Female	
	Cases	Rate	Cases	Rate
<b>Incidence</b>	44658	537.14	39250	412.54

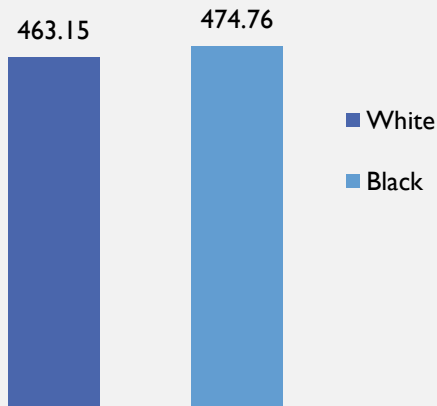


**Mortality Rate per 100,000 individuals**

	Male		Female	
	Cases	Rate	Cases	Rate
<b>Mortality</b>	17883	225.98	14897	148.49

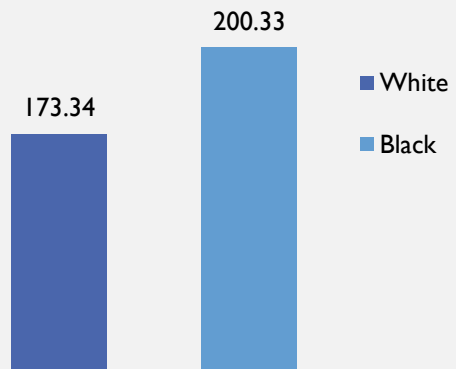
- The incidence rate of overall cancer was higher among males with a rate of 537.14 per 100,000 individuals while it was 412.54 per 100,000 individuals in females.
- The mortality rate was higher among males with a rate of 225.98 per 100,000 individuals compared to females (148.49 per 100,000 individuals).

## All Cancer Incidence & Mortality Rate by Race



**Incidence Rate per 100,000 individuals**

	White		Black	
	Cases	Rate	Cases	Rate
<b>Incidence</b>	56098	463.15	27051	474.76

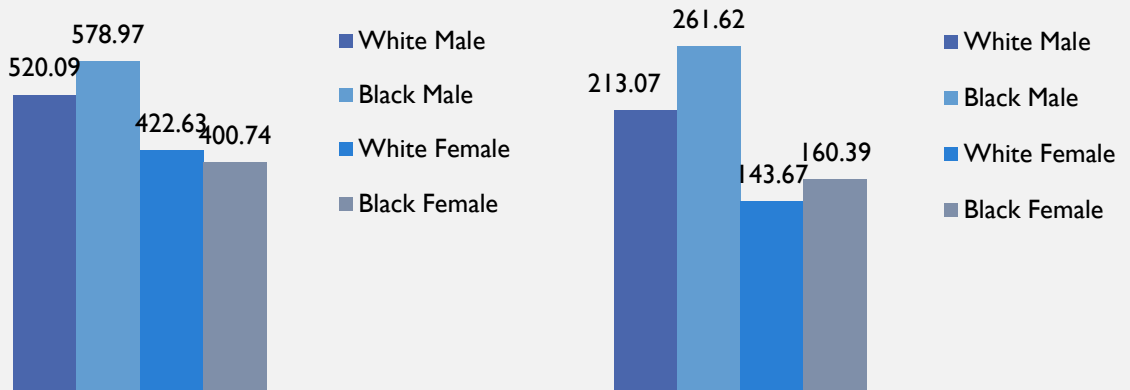


**Mortality Rate per 100,000 individuals**

	White		Black	
	Cases	Rate	Cases	Rate
<b>Mortality</b>	21771	173.34	10750	200.33

- Overall cancer showed a higher Incidence rate (474.45 per 100,000) in black individuals than whites (463.82 per 100,000).
- Similarly, black individuals showed a higher mortality rate (200.33 per 100,000) when compared to whites (173.34 per 100,000).

## All Cancer Incidence and Mortality Rates by Gender and Race



### Incidence Rate per 100,000 individuals

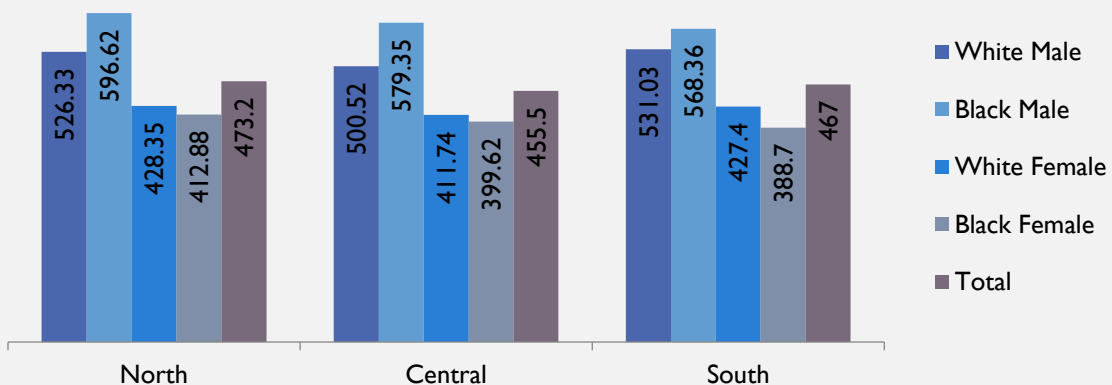
- Black males have the highest incidence rate of overall cancer (579 per 100,000 individuals).
- Black females have the lowest incidence rate of overall cancer (400.74 per 100,000 individuals).
- Among white individuals, males have a higher incidence rate of 520.09 per 100,000 individuals.

### Mortality Rate per 100,000 individuals

- The mortality rate of overall cancer was highest among black males, 261.62 per 100,000 individuals.
- White females have the lowest overall cancer mortality with a rate of 143.67 per 100,000 individuals.
- Among the white population, males have higher mortality than females with a rate of 213.07 per 100,000 individuals.

	White Male		Black Male		White Female		Black Female	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
<b>Incidence</b>	29910	520.09	14410	578.97	26188	422.63	12641	400.74
<b>Mortality</b>	11956	213.07	5796	261.62	9815	143.67	4954	160.39

## All Cancer Incidence Rate by Public Health District

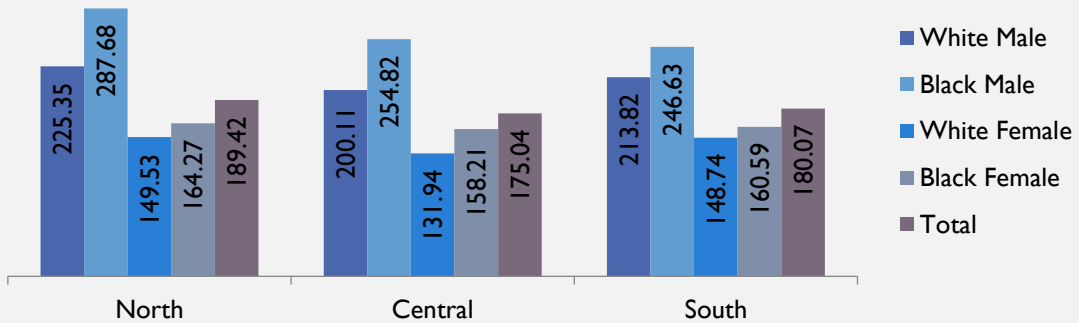


### Incidence Rate per 100,000 individuals

Public Health District	Male White		Male Black		Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
<b>North</b>	9454	526.33	4077	596.62	8438	428.35	3608	412.88	25724	473.20
<b>Central</b>	8928	500.52	3593	579.35	7962	411.74	6031	399.62	29970	455.50
<b>South</b>	11522	531.03	6739	568.36	9787	427.40	3002	388.7	28206	467.00

Black males in the north district reported the highest overall cancer incidence rate of 596.62 per 100,000 individuals while black females in the south district reported the lowest overall cancer incidence rate of 388.7 per 100,000 individuals. Among all three districts, black males had the highest incidence rates while black females had the lowest incidence rates. For all districts, white males have a higher incidence rate as compared to white females. The total incidence rate for overall cancer was higher in the north district.

### All Cancer Mortality Rate by Public Health District

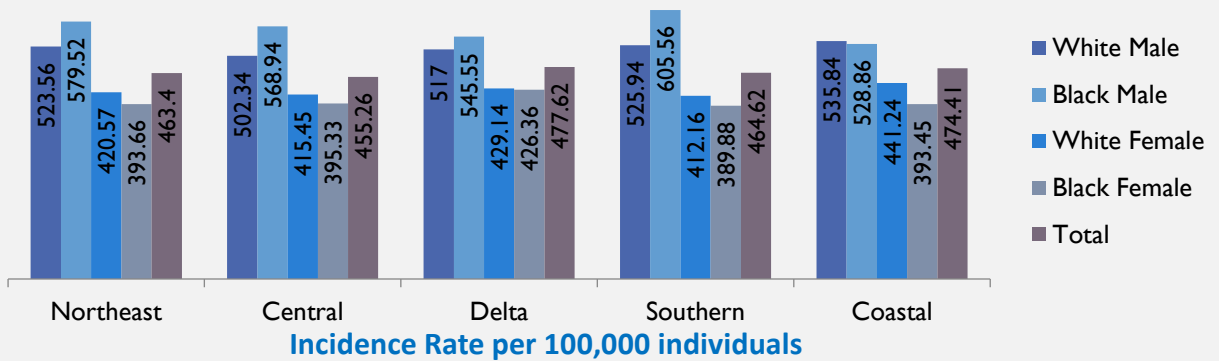


Mortality Rate per 100,000 individuals

Public Health District	Male White		Male Black		Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
<b>North</b>	3938	225.35	1735	287.68	3241	149.53	1393	164.27	10352	189.42
<b>Central</b>	3505	200.11	2712	254.82	2911	131.94	2350	158.21	11597	175.04
<b>South</b>	4513	213.82	1349	246.63	3663	148.74	1211	160.59	10831	180.07

Black males have a higher overall cancer mortality rate and white females have a lower mortality rate in all Public Health Districts. Among whites, females have a lower mortality rate compared to males. Black males in the north district have the highest mortality rate of 287.68 per 100,000 individuals while white females in the central district have the lowest mortality rate of 131.94 per 100,000 individuals.

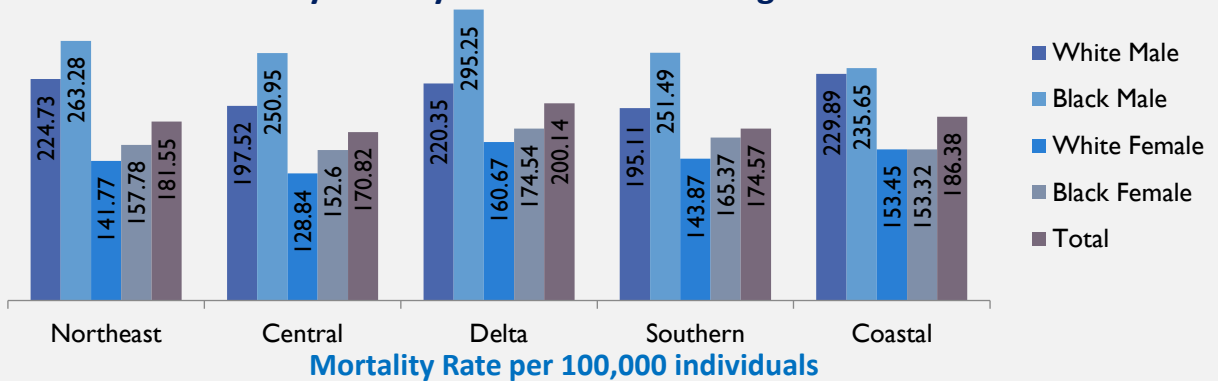
## All Cancer Incidence Rate by Cancer Coalition Region



Cancer Coalition Areas	White Male		Black Male		Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
<b>Northeast</b>	6777	523.56	2352	579.52	5979	420.57	2071	393.66	17252	463.40
<b>Central</b>	7266	502.34	5116	568.94	6526	415.45	4478	395.33	22663	455.26
<b>Delta</b>	4339	517.00	3348	545.55	3895	429.14	3090	426.36	14779	477.62
<b>Southern</b>	5055	525.94	2436	605.56	4198	412.16	1978	389.88	13732	464.62
<b>Coastal</b>	6467	535.84	1157	528.86	5589	441.24	1024	393.45	14474	474.41

Black males in the Southern Cancer Coalition area reported the highest incidence of overall cancer with a rate of 605.56 per 100,000 individuals. Black females in the Southern Cancer Coalition region reported the lowest incidence of overall cancer with a rate of 389.88 per 100,000. Black males reported the highest incidence rate of overall cancer in all cancer coalition areas, except the Coastal Coalition Region. Black females had the lowest incidence rate in all coalition regions. The total overall cancer incidence was higher in the Delta Coalition region with a rate of 477.62 per 100,000.

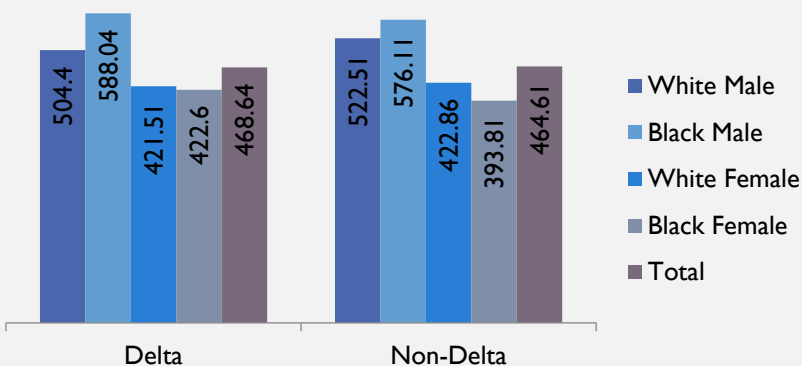
## All Cancer Mortality Rate by Cancer Coalition Region



Cancer Coalition Areas	White Male		Black Male		Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
<b>Northeast</b>	2838	224.73	968	263.28	2228	141.77	811	157.78	6867	181.55
<b>Central</b>	2793	197.52	2022	250.95	2302	128.84	1697	152.60	8919	170.82
<b>Delta</b>	1812	220.35	1457	295.25	1622	160.67	1235	174.54	6163	200.14
<b>Southern</b>	1849	195.11	896	251.49	1640	143.87	834	165.37	5232	174.57
<b>Coastal</b>	2664	229.89	453	235.65	2023	153.45	377	153.32	5599	186.38

The highest overall cancer mortality was seen among black males in Delta Cancer Coalition region with a rate of 295.25 per 100,000 individuals. The Central region had the lowest mortality among white females with a rate of 128.84 per 100,000 individuals. Except for the Coastal Coalition region, all coalition regions showed higher mortality among black males, while white females in all regions except the Coastal region showed a lower mortality rate. The total overall cancer mortality was highest in the Delta cancer coalition region with a rate of 200 per 100,000.

## All Cancer Incidence Rate by Delta vs Non-Delta Region

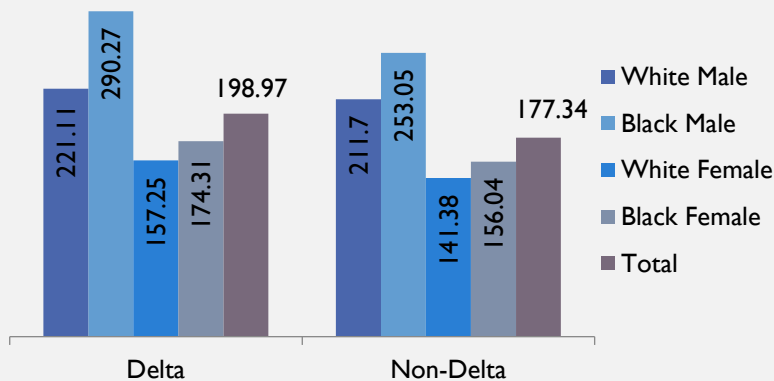


Incidence Rate per 100,000 individuals

Overall cancer incidence rate was highest in black males of the delta region (588.04 per 100,000). The lowest overall cancer incidence was reported in black females of the non-delta region (393.81 per 100,000). However, the overall cancer incidence rate was slightly higher in the delta region (468.64 per 100,000) when compared to the non-delta region (464.61 per 100,000).

Delta/ Non-Delta Region	Male White		Male Black		Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Delta	4326	504.39	3470	588.04	3792	421.51	3180	422.60	14784	468.64
Non-Delta	25668	522.54	10939	576.11	22395	422.86	9461	393.81	69116	464.61

## All Cancer Mortality Rate by Delta vs Non-Delta Region

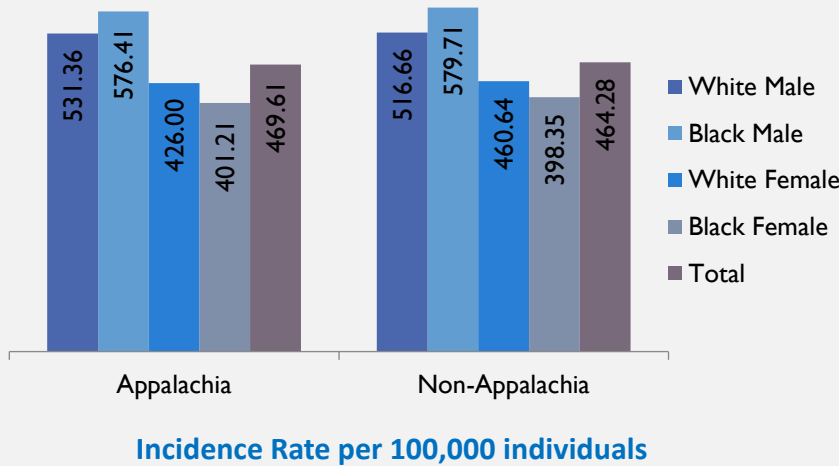


Mortality Rate per 100,000 individuals

Delta region has higher mortality rates for gender and race than that of non-delta region. Overall cancer mortality rate was highest among black males in the delta region (290 per 100,000). Overall cancer mortality was lowest among white females of the non-delta region (141.4 per 100,000). Among whites, males have a higher mortality rate than females.

Delta/ Non-Delta Region	Male White		Male Black		Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Delta	1810	221.11	1501	290.27	1577	157.25	1283	174.31	6211	198.97
Non-Delta	10146	211.70	4295	253.05	8238	141.38	3671	156.04	26569	177.34

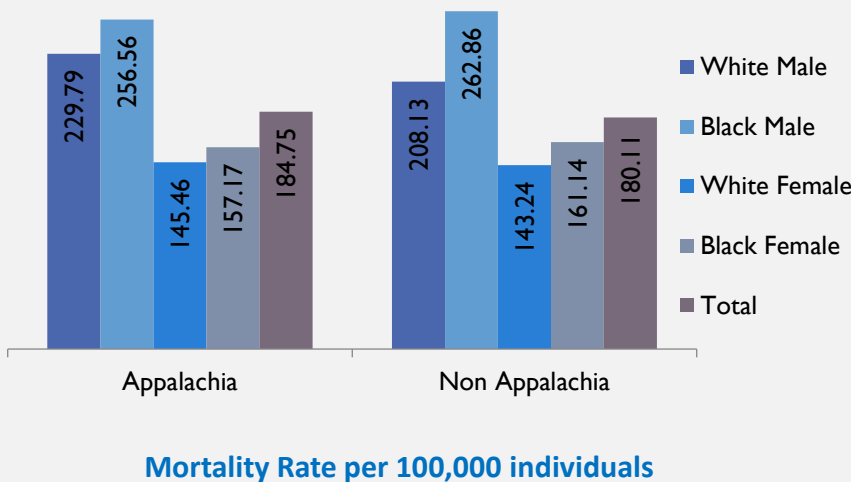
## All Cancer Incidence Rate by Appalachian vs Non-Appalachian Region



Overall cancer incidence rate was higher in black males of the Non-Appalachian region (579.7 per 100,000 individuals). Overall cancer incidence rate was lower in black females of the Appalachian region (401.2 per 100,000 individuals). A similar pattern of Incidence rate distribution was seen among gender & and race of both regions with slightly higher rates in the Non-Appalachian region. The total incidence of overall cancer was higher in the Appalachian region (469.6 per 100,000 individuals).

Region	Male White		Male Black		Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
<b>Appalachian Region</b>	7046	531.36	2672	576.41	6169	426.00	2340	401.21	18303	469.61
<b>Non-Appalachian Region</b>	22858	516.66	11737	579.71	20018	421.84	10301	398.35	65597	464.28

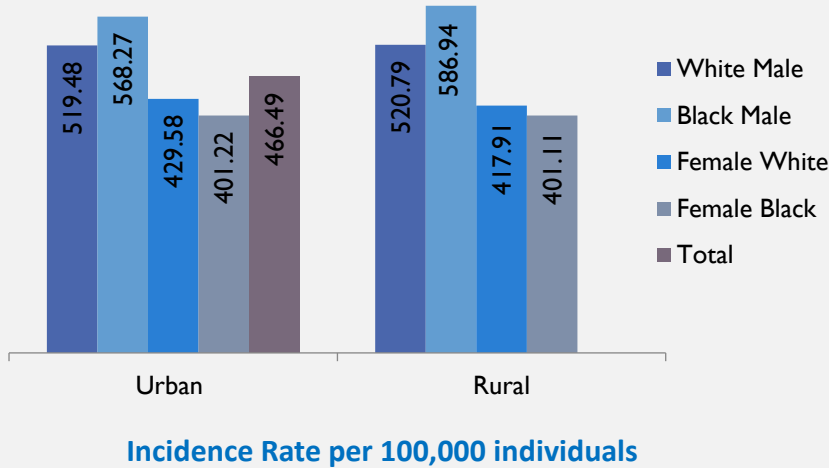
## All Cancer Mortality Rate by Appalachian vs Non-Appalachian Region



Overall cancer mortality rate was highest among black males (262.56 per 100,000 individuals) and lowest in white females (143.2 per 100,000) of the Non-Appalachian region. Among white individuals, males had higher mortality rates than females. Overall, the total mortality due to cancer was slightly higher in the Appalachian region (184.75 per 100,000) compared to the Non-Appalachian region (180.11 per 100,000).

Region	Male White		Male Black		Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
<b>Appalachian Region</b>	2992	229.79	1078	256.56	2338	145.46	913	157.17	7343	184.75
<b>Non-Appalachian Region</b>	8964	208.13	4718	262.86	7477	143.24	4041	161.14	25437	180.11

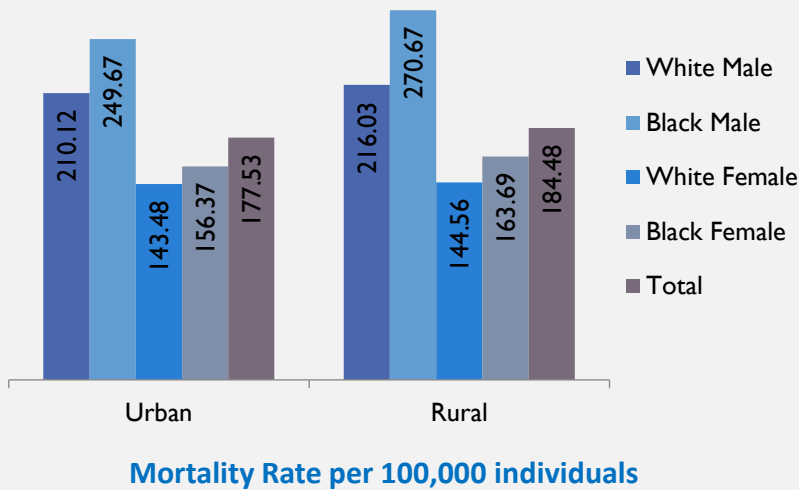
## All Cancer Incidence Rate by Urban vs Rural counties of MS



Black males in the rural region had a higher incidence rate of 586.94 per 100,000 individuals while black females in the rural region had a lower incidence rate of 401.11 per 100,000 individuals. Among the white individuals, males have a higher incidence rate than females. The total incidence rate in rural regions (465.18 per 100,000) was slightly lower than that of urban (466 per 100,000).

Region	Male White		Male Black		Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Urban	13645	519.48	5919	568.27	12319	429.58	5286	401.22	37600	466.49
Rural	16259	520.79	8490	586.94	13868	417.91	7355	401.11	46300	465.18

## All Cancer Mortality Rate by Urban vs Rural counties of MS



Black males in rural regions had a higher mortality rate of 270.67 per 100,000 individuals for overall cancer while white females in urban regions had a lower mortality rate of 143.48 per 100,000 individuals. Among white individuals, males have higher mortality compared to females. The total mortality rate was higher in rural regions (184.5 per 100,000), compared to urban regions (177.5 per 100,000).

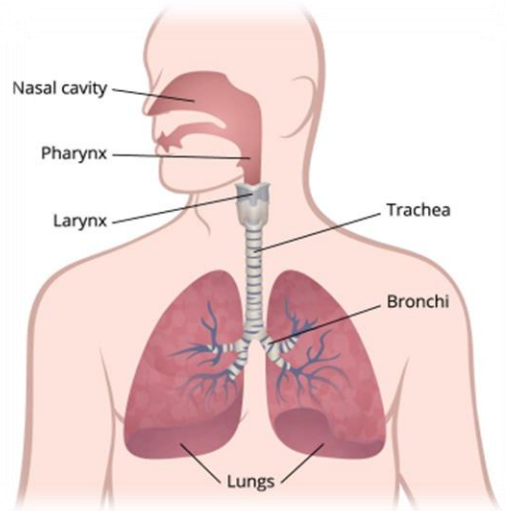
Region	Male White		Male Black		Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Urban	5316	210.12	2264	249.67	4441	143.48	1963	156.37	14123	177.53
Rural	6640	216.03	3532	270.67	5374	144.56	2991	163.69	18657	184.48

# LUNG & BRONCHUS CANCER

Lung cancer begins in the lungs and may spread to lymph nodes or other organs in the body, such as the brain. Cancer from other organs also may spread to the lungs. When cancer cells spread from one organ to another, they are called *metastases*.

Lung cancers usually are grouped into two main types called small cell and non-small cell (including adenocarcinoma and squamous cell carcinoma).

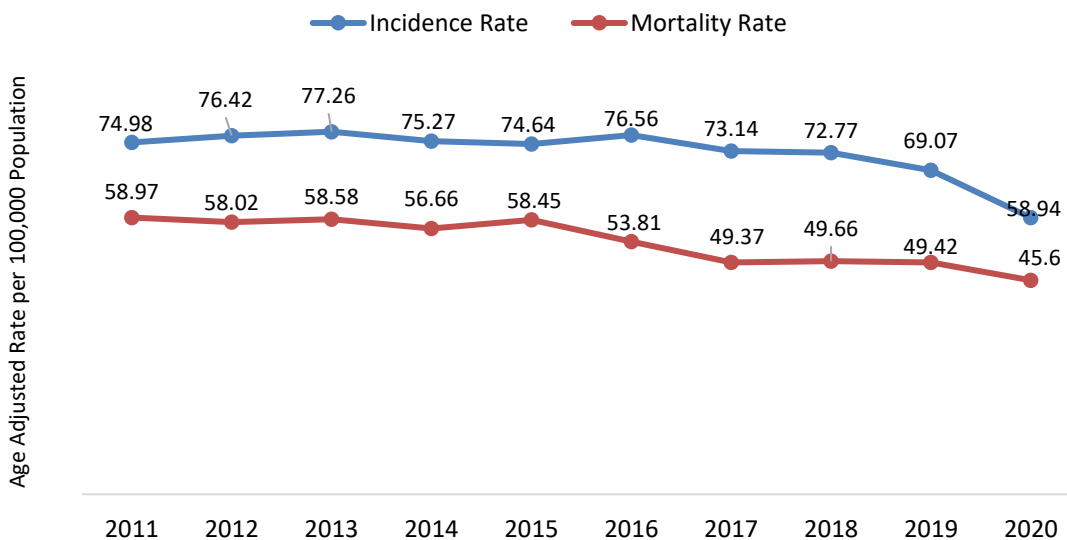
Among the Lung cancers, non-small cell lung cancer (NSCLC) accounts for 82% of small cell lung cancer (SCLC) for 14%.



**Incidence Trend:** Lung cancer incidence has been declining since the mid-1980s in men, but only since the mid-2000s in women because of gender differences in historical patterns of smoking uptake and cessation. From 2016 to 2020, a decrease in incidence cases is reported from 2742 to 2293 individuals.

**Mortality trend:** Lung cancer mortality rates have declined by 56% since 1990 in men and by 32% since 2002 in women with the steepest drop among Black men. The decline is largely due to reductions in smoking, with the pace accelerating in recent years due to major advances in treatment for NSCLC. From 2016 to 2020, the rate decreased by about 5% per year in men and 4% per year in women, with an overall 9322 deaths rate reported per 100,000 individuals. The disparity in lung cancer mortality among black versus white men dropped from 40% higher in the early 1990s to 14% higher during 2016-2020. Among women, lung cancer mortality rates continued to increase until the early or late 2000s in all racial and ethnic groups. With greater declines in smoking prevalence, mortality has declined among women in all racial & and ethnic groups, with the fastest pace among black women from 4% to 17%.

**Incidence and Mortality rates trend for Lung Cancer in MS**





**Risk Factor:** Cigarette smoking is by far the most important risk factor for lung cancer, with approximately 80% of lung cancer deaths in the US are still caused by smoking. Risk increases by 25-fold with both quantity and duration of smoking. Exposure to radon gas, which is released from soil and can accumulate in indoor air, is the second-leading cause of lung cancer in the US. Other factors associated with increased risk includes exposure to second hand smoke (2.7% of new cases, the equivalent of about 6,400 in 2022), asbestos (particularly among individuals who smoke), certain metals (chromium, cadmium, arsenic), some organic chemicals, radiation, air pollution, and diesel exhaust. Air pollution is estimated to account for about 1%-2% of lung cancer deaths in the US. Specific occupational exposures that increase risk include rubber manufacturing, paving, roofing painting and chimney sweeping. The lifetime risk of developing lung cancer is approximately 6.2% among men and 5.8% among women, or 1 in 16 men and 1 in 17 women during their lifetime.



smoking



Lung disease  
(like COPD)



chemical exposure



radon exposure



secondhand  
smoke



air pollution

**Sex:** Lung cancer incidence during 2016-2020 was 61% higher among men (89.16 per 100,000) than women (55.28 per 100,000), largely due to historically higher smoking prevalence in men.

**Race:** Lung cancer incidence is highest among Black men, whereas mortality is highest among both Black and American Indian and Alaska Native (AIAN) men. Lung cancer incidence and mortality among Asian American and Pacific Islander (AAPI) and Hispanic individuals is lower than that among other racial and ethnic groups due to historically lower smoking prevalence.

**Socioeconomic status:** The risk of lung cancer is greater in persons with lower socioeconomic status (SES). Lung cancer death rates in individuals ages 25-74 with  $\leq 12$  years of education are nearly 5 times higher in men and 4 times higher in women compared to those in persons with  $\geq 16$  years of education.

**Place:** The states with the highest lung cancer mortality rates are Kentucky, West Virginia, Mississippi, and Arkansas, all of which have the highest historical and current smoking prevalence.

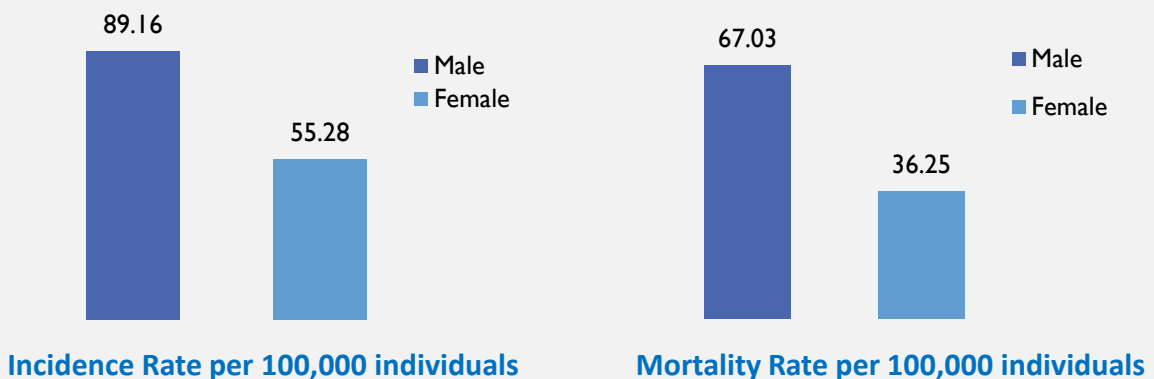
**Early detection & Diagnosis:** Lung cancer screening with low-dose spiral computed tomography (LDCT) has been shown to reduce lung cancer mortality.

**Signs and symptoms:** Symptoms, which usually do not appear until the cancer is advanced, can include persistent cough, sputum streaked with blood, chest pain, a hoarse voice, worsening shortness of breath, and recurrent pneumonia or bronchitis.

**Treatment:** Appropriate treatment is based on whether the tumor is NSCLC or SCLC. For early-stage NSCLC, surgery is the usual treatment for otherwise healthy individuals, sometimes with other treatments such as chemotherapy, targeted drugs, immunotherapy, and/or radiation therapy. Advanced-stage NSCLC is usually treated with chemotherapy, targeted drugs, and/or immunotherapy. Early-stage SCLC is usually treated with chemotherapy, alone or combined with radiation. Radiation to the brain (prophylactic cranial radiation) is sometimes given in early-stage SCLC to reduce the risk of brain metastases. Individuals with advanced SCLC might be treated with chemotherapy with or without immunotherapy; a large percentage of patients on this regimen experience temporary remission.

**Survival:** The 5-year relative survival rate for lung cancer is 22% overall (18% for men and 25% for women); 26% for NSCLC; and 7% for SCLC. Only 24% of lung cancers are diagnosed at a localized stage, for which the 5-year survival rate is 60%.

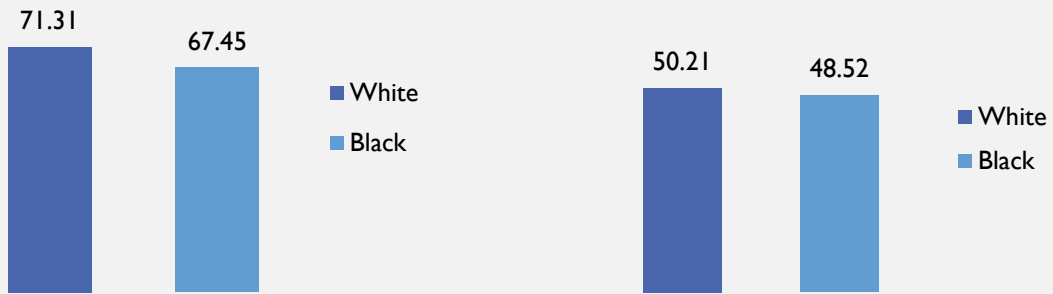
### Lung Cancer: Incidence and Mortality Rates by Gender



Lung Cancer	Male		Female	
	Cases	Rate	Cases	Rate
<b>Incidence</b>	7428	89.16	5683	55.28
<b>Mortality</b>	5629	67.03	3739	36.25

- The incidence rate of lung and bronchus cancer in Mississippi males (89.16 per 100,000 individuals) was higher compared to Mississippi females (55.28 per 100,000 individuals).
- The mortality rate was higher in males (67.03 per 100,000 individuals) when compared to females (36.25 per 100,000 individuals).

## Lung Cancer: Incidence and Mortality Rates by Race



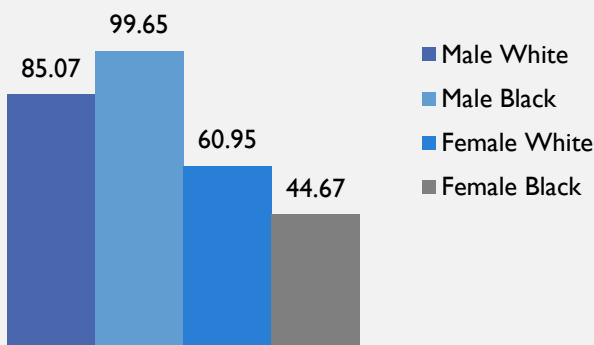
Incidence Rate per 100,000 individuals

Mortality Rate per 100,000 individuals

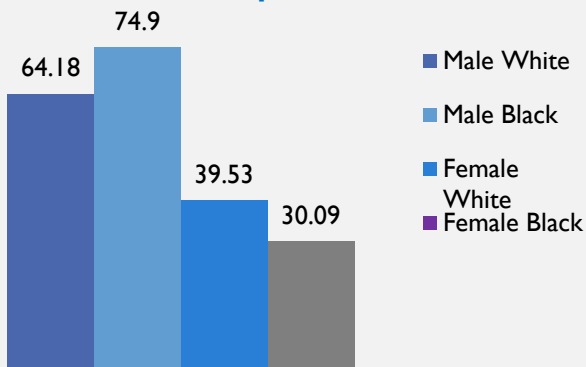
	White		Black	
	Cases	Rate	Cases	Rate
<b>Incidence</b>	9211	71.31	3817	67.45
<b>Mortality</b>	6470	50.21	2655	48.52

- Lung and bronchus cancer had a higher incidence rate of 71.31 per 100,000 individuals in white individuals than those 67.45 per 100,000 individuals in black.
- Similarly, a mortality rate of 50.21 per 100,000 individuals was seen as higher in white individuals compared to 48.52 per 100,000 individuals in black.

## Lung Cancer: Incidence and Mortality Rates by Gender and Race



Incidence Rate per 100,000 individuals

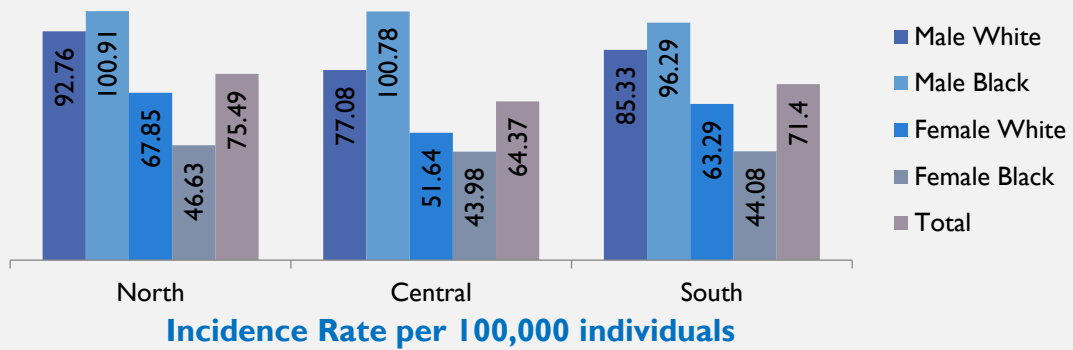


Mortality Rate per 100,000 individuals

- Black males had the highest incidence rates of lung and bronchus cancer in 2016-2020 with a rate of 99.65 per 100,000 individuals.
- Black females had the lowest of lung and bronchus Incidence rates of 44.67 per 100,000 individuals.
- Among white individuals, males had a higher incidence rate of 85.07 per 100,000 individuals.
- Black males had the highest mortality rate of lung and bronchus cancer (74.9 per 100,000 individuals).
- Black females had the lowest mortality of lung and bronchus cancer with a rate of 30.09 per 100,000 individuals.
- Among whites, males had higher mortality than females with a rate of 64.18 per 100,000 individuals.

	Male White		Male Black		Female White		Female Black	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
<b>Incidence</b>	5014	85.07	2380	99.65	4197	60.95	1437	44.67
<b>Mortality</b>	3695	64.18	1716	74.90	2775	39.53	939	30.09

## Lung Cancer: Incidence Rates by Public Health District

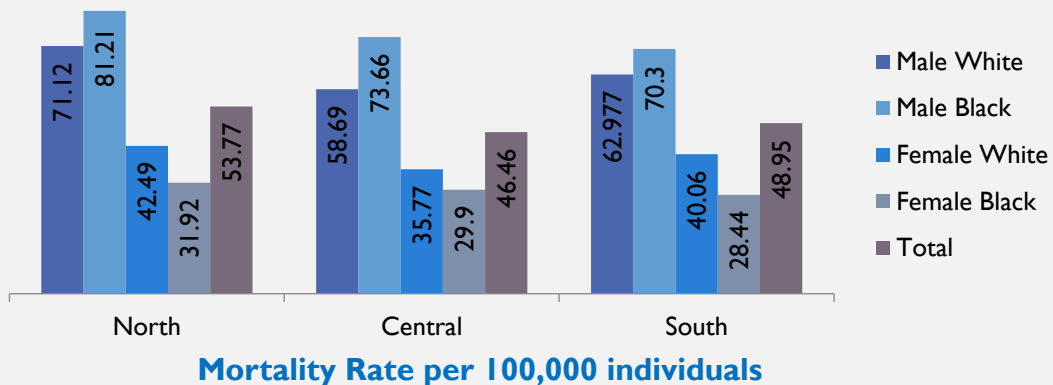


Public Health District	Male White		Male Black		Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
North	1716	92.76	667	100.91	1479	67.85	412	46.63	4283	75.49
Central	1411	77.08	1133	100.78	1146	51.64	682	43.98	4397	64.37
South	1892	85.53	584	96.29	1585	63.29	346	44.08	4456	71.40

Black males of the north district had the highest lung & and bronchus cancer incidence rate of 100.91 per 100,000 individuals while black females showed the lowest Incidence rate of 43.98 per 100,000 individuals.

In all three districts, black males showed higher incidence rates while black females showed lower incidence rates. Except for the north district, white females had a higher incidence rate compared to white males in the central & and south districts.

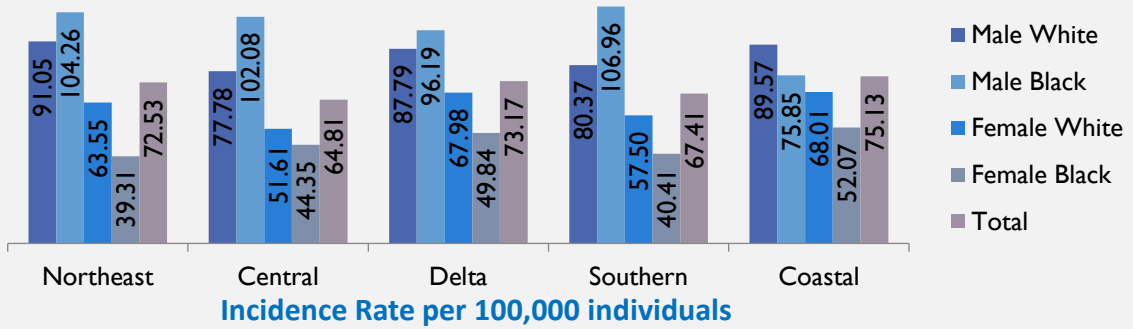
## Lung Cancer: Mortality Rates by Public Health District



Public Health District	Male White		Male Black		Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
North	1278	71.12	508	81.21	943	42.49	271	31.92	3008	53.77
Central	1049	58.69	803	73.66	815	35.77	453	29.90	3138	46.46
South	1368	62.97	405	70.30	1017	40.06	215	28.44	3022	48.95

Black males had a higher mortality rate of lung and bronchus cancer compared to black females in all public health districts. Among the white population, females had a low mortality rate compared to males. Black males in the north district have the highest mortality rate of 81.21 per 100,000 individuals while black females in the south district have the lowest mortality rate of 28.44 per 100,000 individuals.

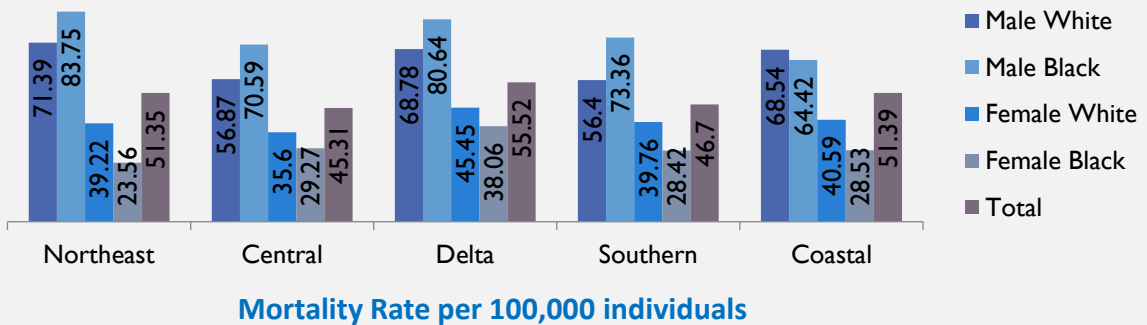
## Lung Cancer: Incidence Rates by Cancer Coalition Region



Cancer Coalition Areas	Male White		Male Black		Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Northeast	1213	91.05	401	104.26	986	63.53	214	39.31	2822	72.53
Central	1148	77.78	869	102.08	941	51.61	514	44.35	3490	64.81
Delta	766	87.79	527	96.19	692	67.98	364	49.84	2356	73.17
Southern	789	80.37	420	106.96	638	57.50	212	40.41	2070	67.41
Coastal	1099	89.57	162	75.85	940	68.01	133	52.07	2372	75.13

Black males in the Northeast Cancer Coalition area had the highest incidence rate of 104.26 per 100,000 individuals; black females in the region have shown the lowest incidence rate of 39.31 per 100,000 individuals. Overall, black males of all cancer coalitions except the coastal coalition region have shown the highest incidence rate for lung and bronchus cancer while black females have shown the lowest incidence rate. The total lung and bronchus cancer incidence rate was higher in the coastal cancer coalition region.

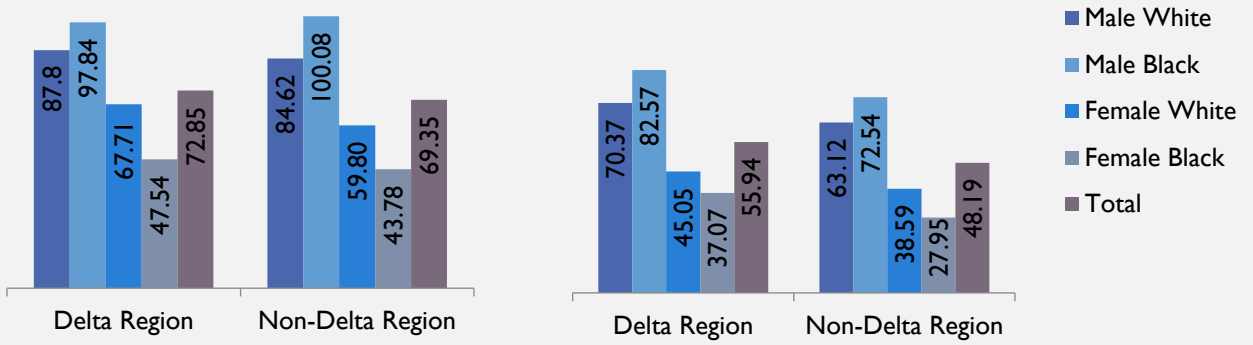
## Lung Cancer: Mortality Rates by Cancer Coalition Region



Cancer Coalition Areas	White Male		Black Male		Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Northeast	923	71.39	309	83.75	624	39.22	124	23.56	1983	51.35
Central	821	56.87	583	70.59	660	35.60	329	29.27	2408	45.31
Delta	583	68.78	419	80.64	474	45.45	271	38.06	1755	55.52
Southern	551	56.40	277	73.36	456	39.76	143	28.42	1428	46.70
Coastal	817	68.54	128	64.42	561	40.59	72	28.53	1594	51.39

The highest lung and bronchus cancer mortality is seen among black males of the northeast cancer coalition region with a rate of 83.75 per 100,000 individuals. The northeast region has the lowest Mortality among black females with a rate of 23.56 per 100,000 individuals. Except for the coastal coalition region, all coalition regions show higher mortality among black males. While all regions showed lower mortality rates for black females, the total mortality rate was higher in the delta cancer coalition region.

## Lung Cancer: Incidence and Mortality Rates by Delta Vs. Non-Delta

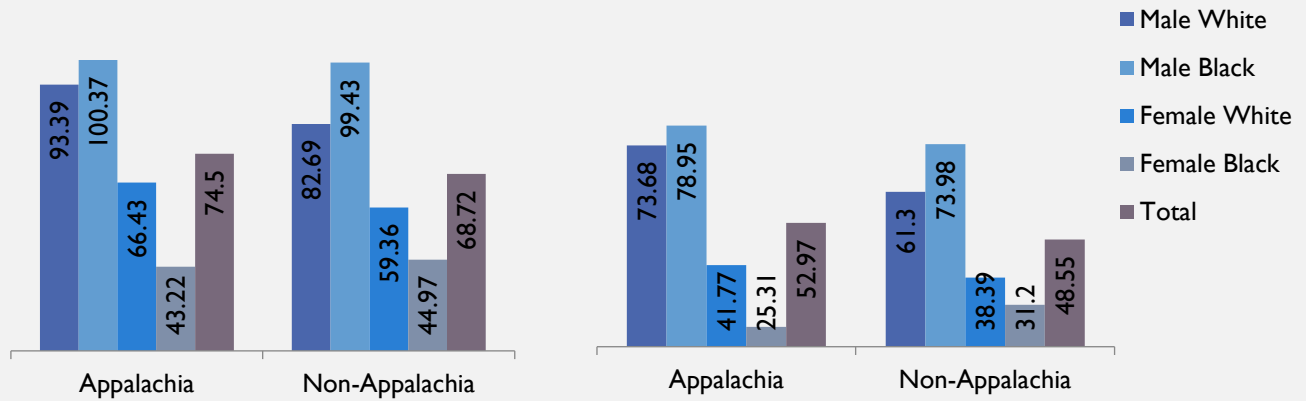


### Incidence Rate per 100,000 individuals      Mortality Rate per 100,000 individuals

Delta/ Non-Delta Region	Male White		Male Black		Female White		Female Black		Total	
<b>Delta (Incidence)</b>	756	87.80	560	97.84	687	67.71	363	47.54	2374	72.85
<b>Non-Delta (Incidence)</b>	4258	84.62	1819	100.08	3510	59.80	1074	43.78	10736	69.35
<b>Delta (Mortality)</b>	592	70.37	453	82.57	464	45.05	275	37.07	1793	55.94
<b>Non-Delta (Mortality)</b>	3103	63.12	1263	72.54	2311	38.59	664	27.95	7375	48.19

- In the non-delta region, black males have the highest incidence rate of lung and bronchus cancer (100.08 per 100,000 individuals). Black females of the non-delta region had a lower incidence rate of 43.78 per 100,000 individuals. In both regions, white males have higher incidence rates compared to white females. Overall, the delta and non-delta regions had similar patterns of distribution of incidence rates for lung and bronchus Cancer.
- Black males in the delta region had a higher mortality rate of 82.57 per 100,000 individuals and black females in the non-delta region have shown a lower Mortality rate of 27.95 per 100,000 individuals. Among the white population, males had higher mortality rates than females. Overall, the delta region had higher mortality rates for gender and race, than the non-delta region.

## Lung Cancer: Incidence and Mortality Rates by Appalachian and Non-Appalachian Region



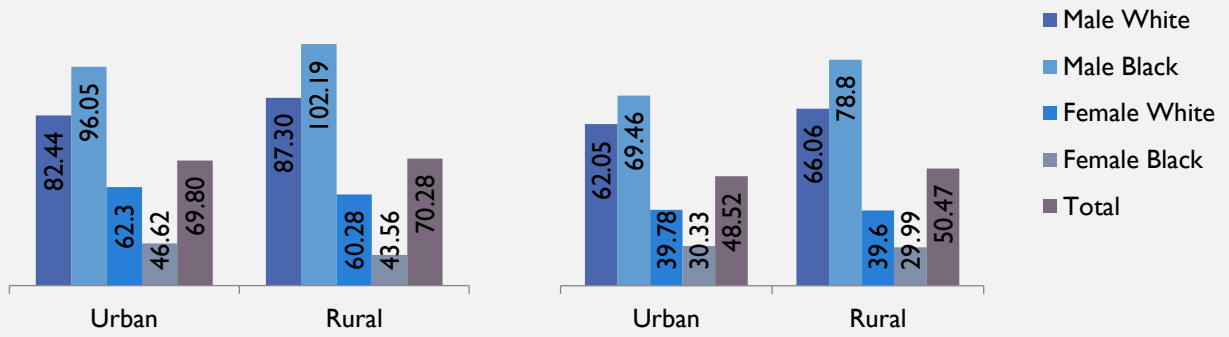
**Incidence Rate per 100,000 individuals    Mortality Rate per 100,000 individuals**

Region	Male White		Male Black		Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
<b>Appalachian (Incidence)</b>	1283	93.39	439	100.37	1058	66.43	260	43.22	3048	74.51
<b>Non-Appalachian (Incidence)</b>	3733	82.60	1940	99.43	3139	59.36	1177	44.97	10062	68.72
<b>Appalachian (Mortality)</b>	985	73.68	331	78.95	683	41.77	148	25.31	2150	52.97
<b>Non-Appalachian (Mortality)</b>	2710	61.30	1385	73.98	2092	38.89	791	31.20	7018	48.55

Black males in the Appalachian region had a higher incidence rate of lung and bronchus cancer rate (100.37 per 100,000 individuals), compared to black females (43.22 per 100,000 individuals). Overall, a similar pattern of distribution of incidence rate was seen among race and gender of Appalachian and Non-Appalachian regions with slightly higher rates in Appalachian. The total Incidence of lung and bronchus cancer was higher in the Appalachian region.

The highest lung and bronchus cancer mortality rate of 78.95 per 100,000 individuals was seen among black males of the Appalachian region. The lowest lung and bronchus cancer mortality rate of 25.31 per 100,000 individuals was found in black females of the Appalachian region. Among white individuals, males had a higher mortality rate than females and total mortality was seen higher in the Appalachian region.

## Lung Cancer: Incidence and Mortality Rates by Urban vs Rural Region



### Incidence Rate per 100,000 individuals

### Mortality Rate per 100,000 individuals

Region	Male White		Male Black		Female White		Female Black		Total	
<b>Urban (Incidence)</b>	2200	82.44	940	96.05	1972	62.30	604	46.62	5766	69.80
<b>Rural (Incidence)</b>	2814	87.30	1439	102.19	2225	60.28	833	43.52	7344	70.28
<b>Urban (Mortality)</b>	1607	62.05	645	69.46	1267	39.78	378	30.33	3924	48.52
<b>Rural (Mortality)</b>	2088	66.06	1071	78.80	1508	39.60	561	29.99	5244	50.47

For lung and bronchus cancer, black males in the rural region had a higher incidence rate of 102.48 per 100,000 individuals, and black females in the rural region showed a lower incidence rate of 43.56 per 100,000 individuals. Among the white individuals, males have higher Incidence rates than females. The total incidence rate in the rural region was higher than that of the urban region.

Black males in rural regions have shown a higher mortality rate of 78.80 per 100,000 individuals for lung and bronchus cancer while black females in rural regions have shown a lower mortality rate of 29.99 per 100,000 individuals. Among white individuals, males have high mortality as compared to females. Overall, the total mortality rate was higher in rural regions as compared to urban.

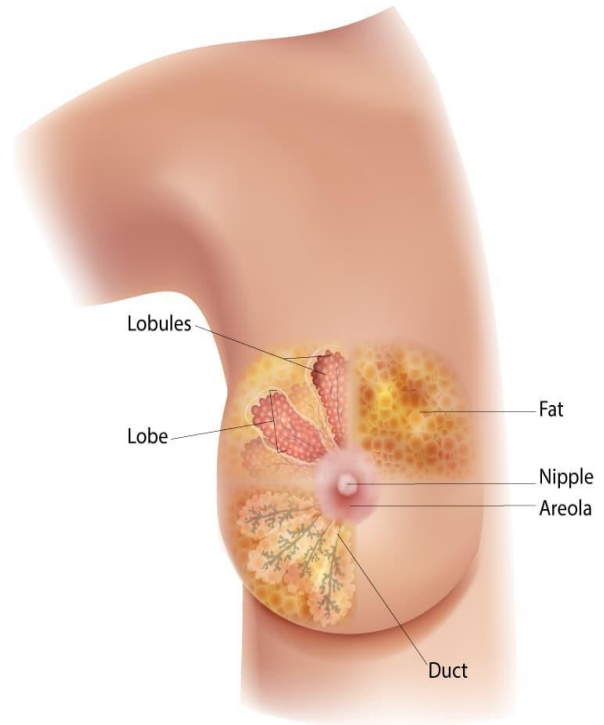


# FEMALE BREAST CANCER

*Breast cancer* is a disease in which cells in the breast grow out of control. There are different kinds of breast cancer. The kind of breast cancer depends on the type of cells effected in the breast.

Breast cancer can begin in different parts of the breast. A breast is made up of three main parts: lobules, ducts, and connective tissue. The lobules are the glands that produce milk. The ducts are tubes that carry milk to the nipple. The connective tissue (which consists of fibrous and fatty tissue) surrounds and holds everything together. Most breast cancers begin in the ducts or lobules.

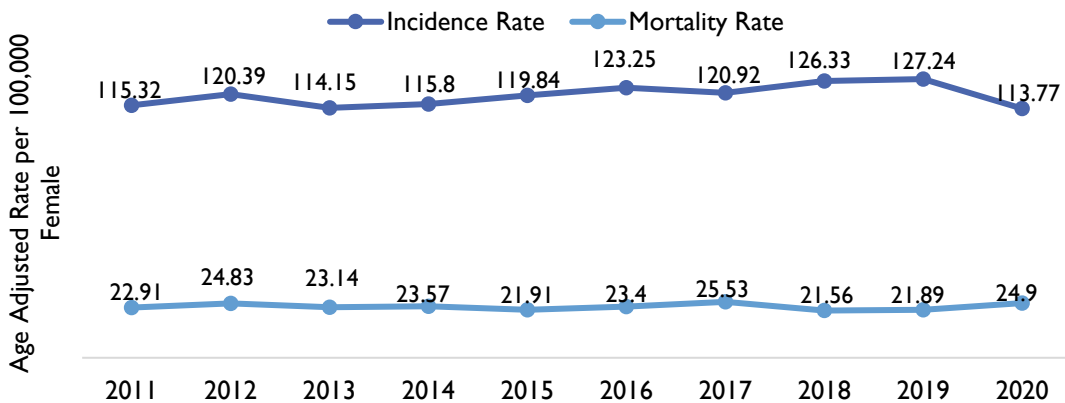
Breast cancer can spread outside the breast through blood vessels and lymph vessels. When breast cancer spreads to other parts of the body, it is said to have metastasized.



**Incidence Trend:** Female Breast cancer was the second leading cancer with an incidence rate of 122.3 per 100,000 individuals in Mississippi during 2016-2020, followed by Prostate cancer. Invasive female breast cancer incidence rates have been increasing by about 0.5% per year since the mid-2000s.

**Mortality trend:** The breast cancer death rate among females has declined by 42% as of 2019, mainly because of earlier detection through screening, as well as increased breast cancer awareness and improved treatment. This decrease has resulted in approximately 431,800 fewer breast cancer deaths in the US. However, mortality in Black women remains 41% higher than in White women, despite lower incidence.

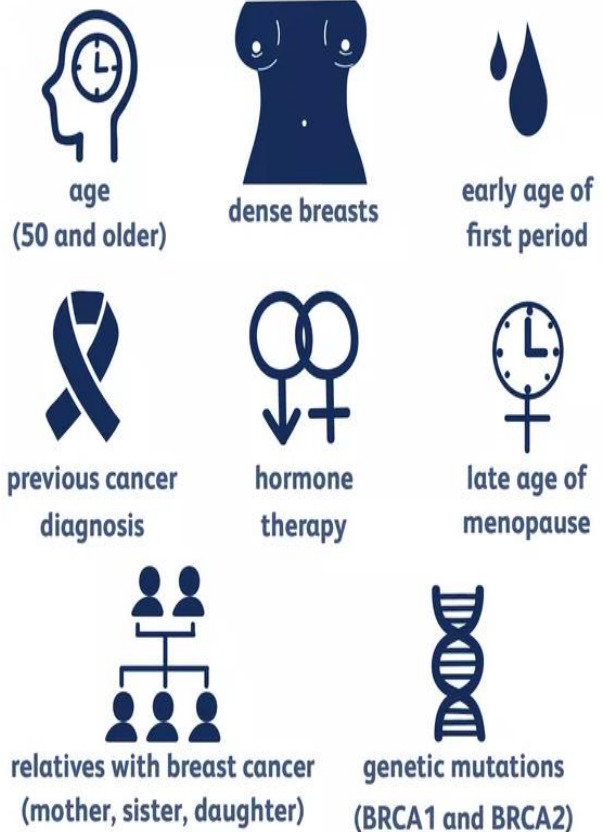
**Incidence and Mortality rates trend for Female Breast Cancer in MS**



## Risk Factors:

### Modifiable factors or factors that can be controlled

- Not being physically active.** Women who are not physically active have a higher risk of getting breast cancer.
- Being overweight or having obesity after menopause.** Older women who are overweight or obese have a higher risk of getting breast cancer than those at a healthy weight.
- Taking hormones.** Some forms of hormone replacement therapy (those that include both estrogen and progesterone) taken during menopause can raise the risk for breast cancer when taken for more than five years. Certain oral contraceptives (birth control pills) also have been found to raise breast cancer risk.
- Reproductive history.** Having the first pregnancy after age 30, not breastfeeding, and never having a full-term pregnancy can raise breast cancer risk.
- Drinking alcohol.** Studies show that a woman's risk for breast cancer increases with the more [alcohol](#) she drinks.



### Non-modifiable factors or factors that cannot be controlled:

- Getting older.** The risk for breast cancer increases with age. Most breast cancers are diagnosed after age 50.
- Genetic mutations.** Women who have inherited changes (mutations) to certain genes, such as [BRCA1 and BRCA2](#), are at higher risk of breast and ovarian cancer.
- Reproductive history.** Starting menstrual periods before age 12 and starting menopause after age 55 expose women to hormones longer, raising their risk of getting breast cancer.
- Having dense breasts.** Women with dense breasts are more likely to get breast cancer.
- Personal history of breast cancer or certain non-cancerous breast diseases.** Women who have had breast cancer are more likely to get breast cancer a second time. Some non-cancerous breast diseases such as atypical ductal hyperplasia or lobular carcinoma *in situ* are associated with a higher risk of getting breast cancer.
- Family history of breast or ovarian cancer.** Having a first-degree male relative with breast cancer also raises a woman's risk.
- Previous treatment using radiation therapy.** Women who had [radiation therapy](#) to the chest or breasts (for instance, treatment of Hodgkin's lymphoma) before age 30 have a higher risk of getting breast cancer later in life.

**Early detection:** Early diagnosis reduces the risk of death from breast cancer and increases treatment options. Mammography is a low-dose x-ray procedure used to detect breast cancer before it becomes symptomatic. However, like any screening tool, mammography is not perfect. Follow-up testing may cause anxiety and additional costs (e.g., medical, transportation).

**Signs and symptoms:** The most common signs/ symptoms of breast cancer are a lump or mass in the breast; persistent changes to the breast, including skin thickening, breast swelling, or skin redness, and nipple abnormalities such as spontaneous discharge (especially if bloody), scaliness, or retraction (drawing back within itself). Early-stage breast cancer often has no signs or symptoms seen.

**Treatment:** There are two general aspects of treatment for early-stage breast cancer – local therapy (surgical and radiation treatments to the breast, nearby lymph nodes, and chest) and systemic therapy (e.g., chemotherapy). Treatment of the breast usually involves either breast-conserving surgery (surgical removal of the tumour and a rim of surrounding normal tissue) with radiation or mastectomy (surgical removal of the entire breast). One or more underarm lymph nodes are usually evaluated to determine whether the tumour has spread beyond the breast. For early-stage breast cancer (no spread to the skin, chest wall, or distant organs), breast-conserving surgery plus radiation therapy results in long-term survival that is equivalent to mastectomy. Although most patients undergoing mastectomy do not need radiation, it is sometimes recommended for larger tumours or lymph node involvement. Women undergoing mastectomy who elect breast reconstruction have several options, including the type of tissue or implant used to restore breast shape.

**Survival:** The 5- and 10-year relative survival rates are 90% and 84%, respectively, for invasive breast cancer, partly because almost two-thirds of women (65%) are diagnosed with localized-stage disease. Although survival has improved over time, large inequalities remain, especially for Black women. For example, the survival rate is 10% lower (in absolute terms) for Black women (82%) than for White women (92%); Reducing this and other disparities is a focus of the American Cancer Society and many other national cancer organisations.

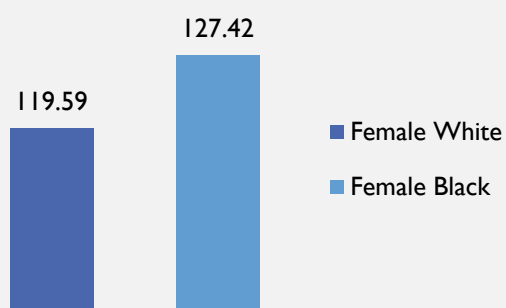
**Prevention:**

**Primary Prevention:** Education and Awareness campaigns.

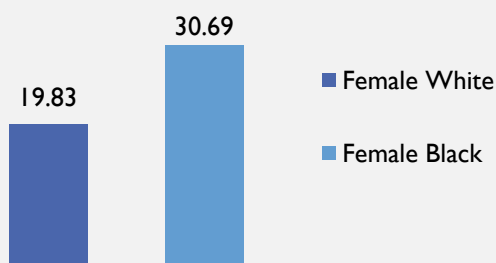
**Secondary Prevention:** Eating Healthy Food and maintaining a healthy diet.

**Tertiary Prevention:** Screening or preventive surgery (prophylactic mastectomy) to remove the breasts, which greatly reduces the risk of breast cancer.

### Breast Cancer: Incidence and Mortality Rates by Race



Incidence Rate per 100,000 Women



Mortality Rate per 100,000 Women

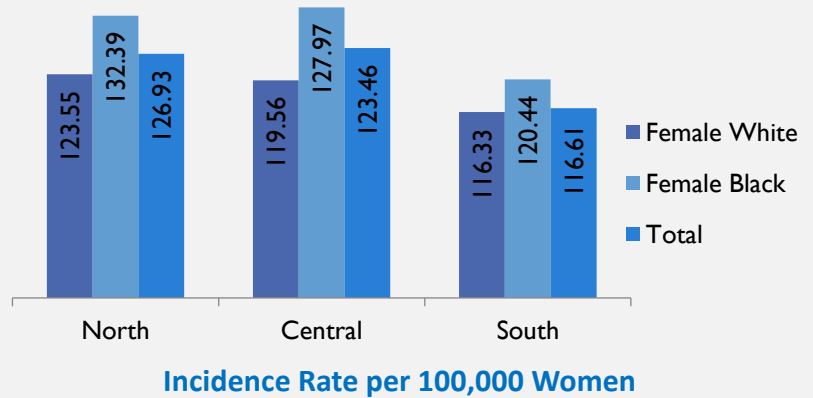
The female breast cancer incidence rate was higher (127.42 per 100,000 women) in black females compared to women in white (119.59 per 100,000).

Similarly, a high female breast cancer mortality rate of 30.69 per 100,000 women was seen in black females as compared to 19.83 per 100,000 in white females.

	White		Black	
	Cases	Rate	Cases	Rate
<b>Incidence</b>	7277	119.59	4008	127.42
<b>Mortality</b>	1309	19.83	950	30.69

## Breast Cancer: Incidence rates by Public Health District

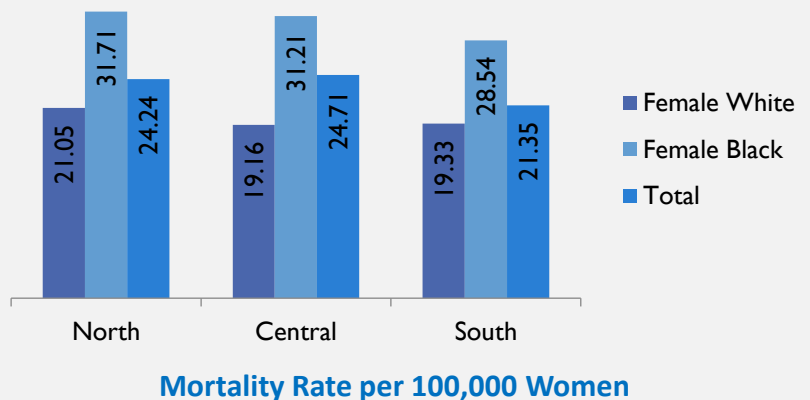
The highest female breast cancer incidence rate of 132.39 per 100,000 women was seen in black females of the north district and the lowest among white females in the south district (116.33 per 100,000 women). For all three districts, black females showed higher incidence rates while white females showed lower incidence rates., White females in the north district had a higher incidence rate (145.9 per 100,000 women), compared to the women in central and south districts.



Public Health District	Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate
<b>North</b>	2384	123.55	1153	132.39	3560	126.93
<b>Central</b>	2270	119.56	1928	127.97	4240	123.46
<b>South</b>	2623	116.33	927	120.44	3595	116.61

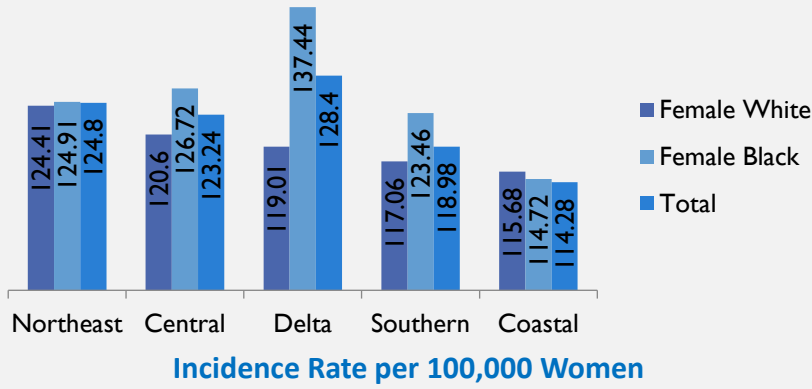
## Breast Cancer: Mortality rates by Public Health District

Black females have higher mortality rates for female breast cancer and white females have lower mortality rates in all public health districts. Among white females, the central district has lower mortality rates compared to other districts. Black females in the north district had the highest mortality rate of 31.74 per 100,000 women while white females in the central district showed the lowest mortality rate of 19.16 per 100,000 women.



Public Health District	Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate
<b>North</b>	447	21.05	269	31.74	716	24.24
<b>Central</b>	401	19.16	469	31.21	880	24.71
<b>South</b>	461	19.33	212	28.54	681	21.35

## Breast Cancer: Incidence Rates by Cancer Coalition Region

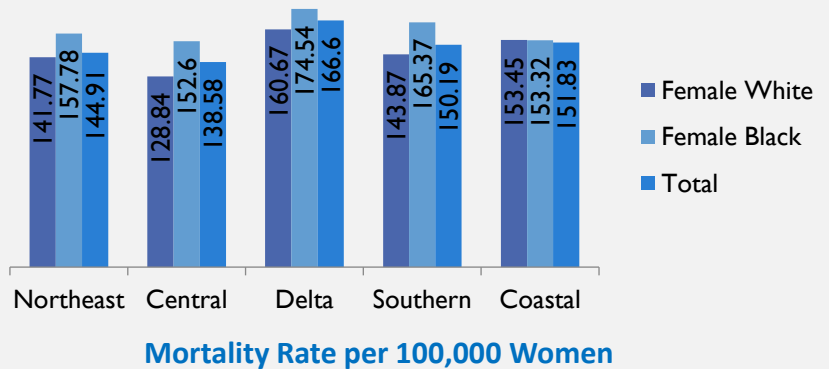


Black females of the Delta Cancer coalition area reported the highest female breast cancer incidence rate of 137.44 per 100,000 women. Black females of the coastal cancer coalition region had the lowest incidence rate of 114.72 per 100,000 women. Except for the coastal region, the black females of all other cancer coalition areas showed the higher incidence rate of female breast cancer. The total female breast cancer incidence rate is highest in the central cancer coalition region (128.40 per 100,000).

Cancer Coalition Areas	Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate
<b>Northeast</b>	1712	124.41	653	124.91	2378	124.8
<b>Central</b>	1873	120.60	1438	126.72	3350	123.24
<b>Delta</b>	1069	119.01	990	137.44	2072	128.40
<b>Southern</b>	1165	117.06	623	123.46	1799	118.98
<b>Coastal</b>	1458	115.68	304	114.72	1796	114.28

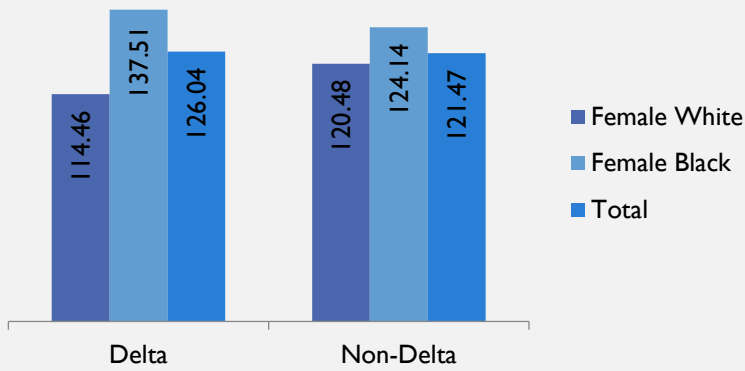
## Breast Cancer: Mortality rates by Cancer Coalition Region

The highest female breast cancer mortality was seen among black females of the Delta cancer coalition region with a rate of 174.54 per 100,000 women. The Central region has shown the lowest Mortality among white females with a rate of 128.84 per 100,000 women. All cancer coalition regions showed higher mortality among black females and lower mortality rates for white females. Overall, the total female Breast cancer mortality was higher in the Delta cancer coalition region than in other regions.



Cancer Coalition Areas	Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate
<b>Northeast</b>	2228	141.77	811	157.78	3051	144.91
<b>Central</b>	2302	128.84	1697	152.60	4043	138.58
<b>Delta</b>	1622	160.67	1235	174.54	2879	166.60
<b>Southern</b>	1640	143.87	834	165.37	2480	150.19
<b>Coastal</b>	2023	153.45	377	153.32	2444	151.83

## Breast Cancer: Incidence rates, Delta vs. Non-Delta



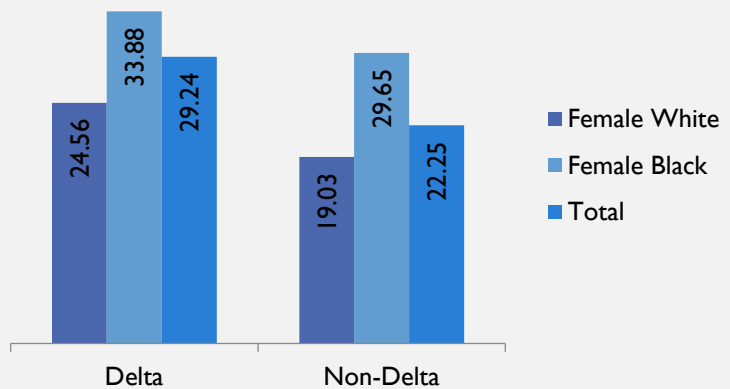
Incidence Rate per 100,000 Women

Black females in the Delta region have shown higher breast cancer incidence with a rate of 137.51 per 100,000 women compared to non-delta females (124.14 per 100,000 women). The total incidence rate of female breast cancer for Delta region was higher than that of non-delta region.

Delta/ Non-Delta Region	Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate
Delta	1019	114.46	1027	137.51	2060	126.04
Non-Delta	6258	120.48	2981	124.14	9335	121.47

## Breast Cancer: Mortality rates, Delta vs. Non-Delta

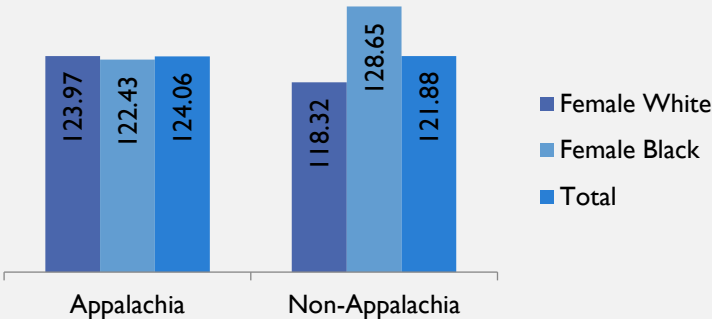
Black females showed a higher female breast cancer mortality rate of 33.88 per 100,000 women in the Delta region while black females of the Non-Delta region have shown a lower Mortality rate of 29.65 per 100,000 women. Among the white population, females of the Delta region have higher mortality rates than the Non-Delta Region. Overall, the Delta region had higher mortality rates than Non-Delta.



Mortality Rate per 100,000 Women

Delta/ Non-Delta Region	Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate
Delta	244	24.56	252	33.88	497	29.24
Non-Delta	1065	19.03	698	29.65	1780	22.25

# Breast Cancer: Incidence rates, Appalachia vs. Non-Appalachian Region



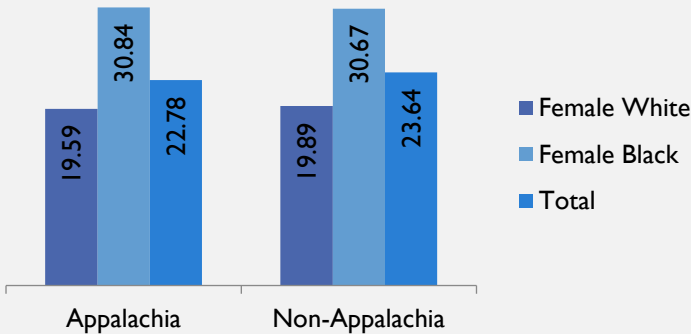
**Incidence Rate per 100,000 Women**

Region	Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate
Appalachian	1733	123.97	713	122.43	2461	124.06
Non-Appalachian	5544	118.32	3295	128.65	8934	121.88

A higher female breast cancer incidence rate of 128.65 per 100,000 women was seen in black females of the Non-Appalachian region while a lower incidence rate of 118.32 per 100,000 women was reported in white females of the Non-Appalachian region.

A similar range of incidence rates was seen among females of both black and white races in the Appalachian region with slightly higher rates in white females. The total incidence of female breast cancer was higher in Appalachian region than Non-Appalachian region.

# Breast Cancer: Mortality rates, Appalachian vs. Non-Appalachian Region

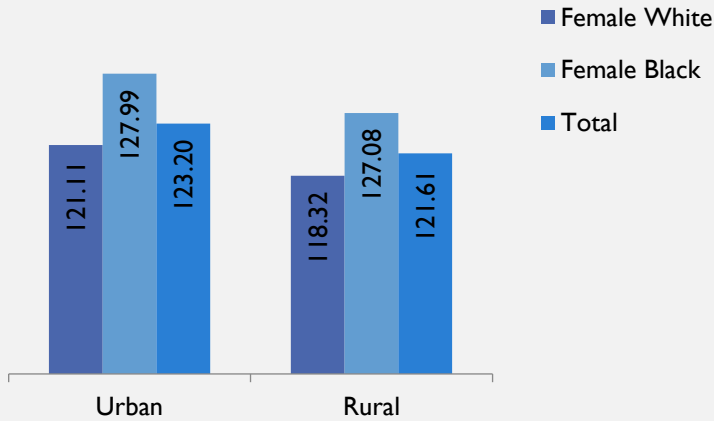


**Mortality Rate per 100,000 Women**

Region	Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate
Appalachian	302	19.59	175	30.84	479	22.78
Non-Appalachian	1007	19.89	775	30.67	1798	23.64

The highest female breast cancer mortality rate of 30.84 per 100,000 women was seen among black females in the Appalachian region. lowest female breast cancer mortality rate of 19.59 per 100,000 women was reported in white females of the Appalachian region. Among white individuals, Non-Appalachian females have shown slightly higher mortality rates than Appalachian females. Overall, the total mortality was nearly similar in Appalachian & and Non-Appalachian regions.

## Breast Cancer: Incidence rates, Urban vs Rural

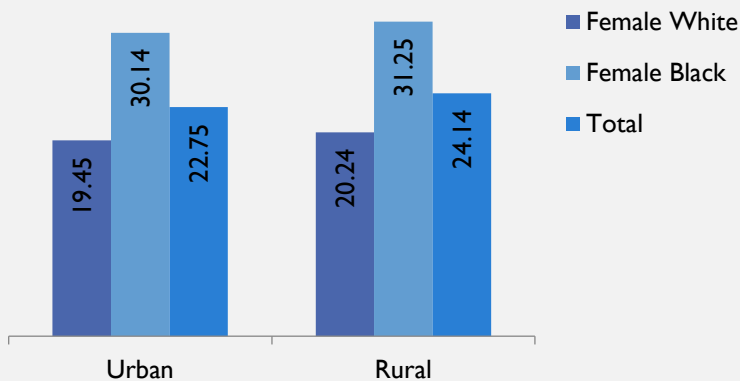


Incidence Rate per 100,000 Women

Region	Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate
Urban	3432	121.11	1708	127.99	5207	123.20
Rural	3845	118.32	2300	127.08	6188	121.61

Black females in urban regions have shown a higher female breast cancer incidence rate of 128 per 100,000 women while white females in rural regions have shown a lower Incidence rate of 118.32 per 100,000 women. Among white individuals, females in urban regions have a higher incidence rate as compared to rural regions. The total female breast cancer incidence rate was higher in the urban region than in the of rural region.

## Breast Cancer: Mortality rates, Urban vs Rural



Mortality Rate per 100,000 Women

Region	Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate
Urban	588	19.45	392	30.14	989	22.75
Rural	721	20.24	558	31.25	1288	24.14

Black females in the rural region had a higher female breast cancer mortality rate of 31.25 per 100,000 women while black females in the urban region had a lower mortality rate of 30.14 per 100,000 women. Among the white race, females in rural regions have a higher mortality than those in urban. The total female breast cancer mortality rate was higher in rural regions (24.14 per 100,000 women) than in urban (22.75 per 100,000 individuals).

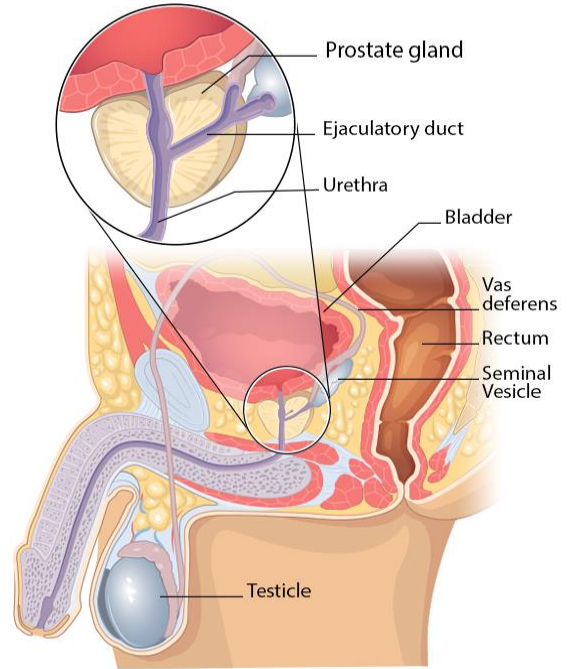


# PROSTATE CANCER

When cancer starts in the prostate, it is called *prostate cancer*. Prostate cancer is the most common cancer in American men.

The *prostate* is a part of the male reproductive system, which includes the penis, prostate, seminal vesicles, and testicles. The prostate is located just below the bladder and in front of the rectum<sup>8</sup>. It is about the size of a walnut and surrounds the urethra (the tube that empties urine from the bladder). It produces fluid that makes up a part of semen.

As a man ages, the prostate tends to increase in size. This can cause the urethra to narrow and decrease urine flow. This is called benign prostatic hyperplasia, and it is not the same as prostate cancer.



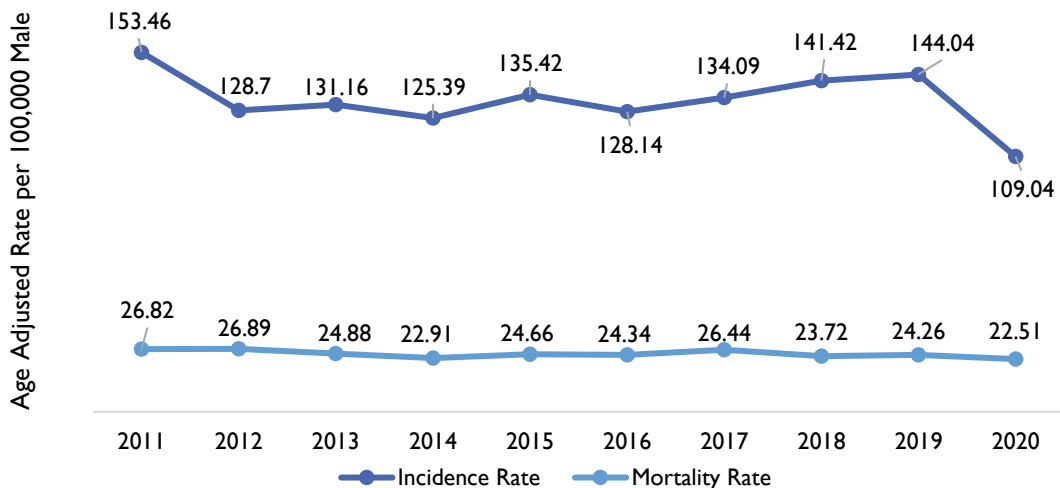
## Symptoms:

- Difficulty starting urination.
- Weak or interrupted flow of urine.
- Urinating often, especially at night.
- Trouble emptying the bladder completely.
- Pain or burning during urination.
- Blood in the urine or semen.
- Recurring pain in the back, hips, or pelvis.
- Painful ejaculation.

**Incidence Trend:** The incidence of prostate cancer is more than 70% higher in black men than in White men for reasons that remain unclear. From 2016 to 2020, the rate increased gradually till 2019, later dropping in 2020 from 144.04 to 109.04 per 100,000 men. The possible decline may be due to screening with the prostate-specific antigen (PSA) blood test, which mostly detects localized stage disease.

**Mortality trend:** The prostate cancer death rate declined due to earlier detection & and treatment. From 2016 to 2020, the rate decreased from 26.44 to 22.51.

**Incidence and Mortality rates trend for Prostate Cancer in MS**

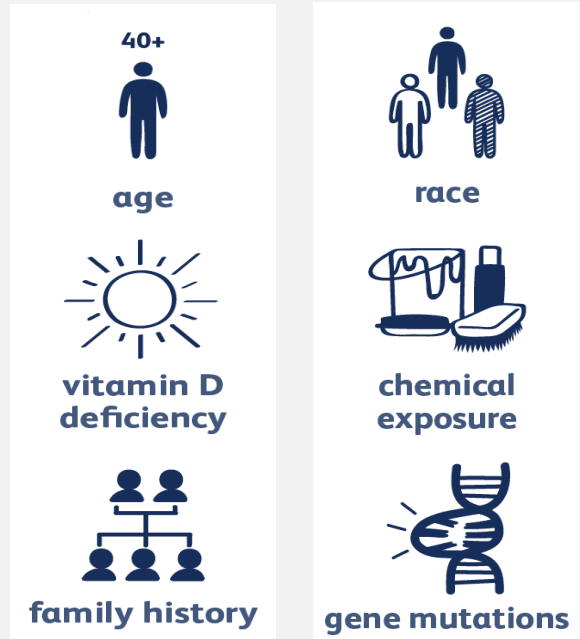


## Risk Factors:

All men are at risk for prostate cancer. Out of every 100 American men, about 13 will get prostate cancer during their lifetime, and about 2 to 3 men will die from prostate cancer. Genetic factors may put them at higher risk of prostate cancer. According to the CDC, **African American men** are more likely to get prostate cancer than other men.

They are twice as likely to die from prostate cancer as other men & tend to have prostate cancer at a younger age.

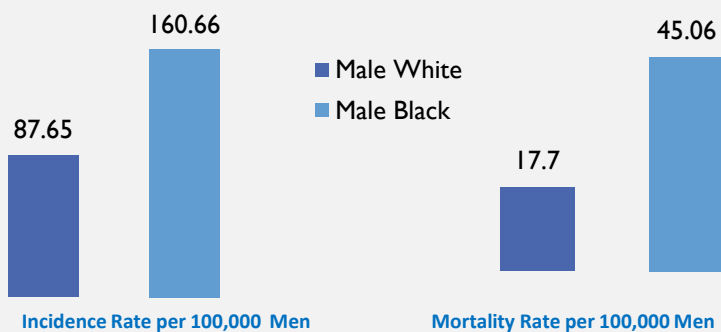
The most common risk factor is **age**. The older a man is, the greater the chance of getting prostate cancer.



**Treatment:** The main treatment options for early-stage disease include surgery, external beam radiation, or radioactive seed implants (brachytherapy). Focal therapies, in which only part of the prostate is treated, are being studied as well. Hormone therapy may be used along with surgery or radiation in locally advanced cases. Treatment often impacts a man's quality of life due to temporary or long-term side effects or complications, such as urinary and erectile difficulties. Current research is exploring new biologic markers for prostate cancer that could be used to minimize unnecessary treatment by distinguishing early-stage cancers that are more likely to progress if left untreated from those that are less likely to progress. Late-stage prostate cancer treatment options include hormonal therapy, chemotherapy, and/or radiation therapy.

**Survival:** The 5-year relative survival rate approaches 100% for most men diagnosed with localized- (70% of cases) or regional-stage prostate cancer (13% of cases), but it drops to 32% for those diagnosed with distant-stage disease. The 10-year survival rate for all stages combined is 98%.

## Prostate Cancer: Incidence and Mortality Rates by Race

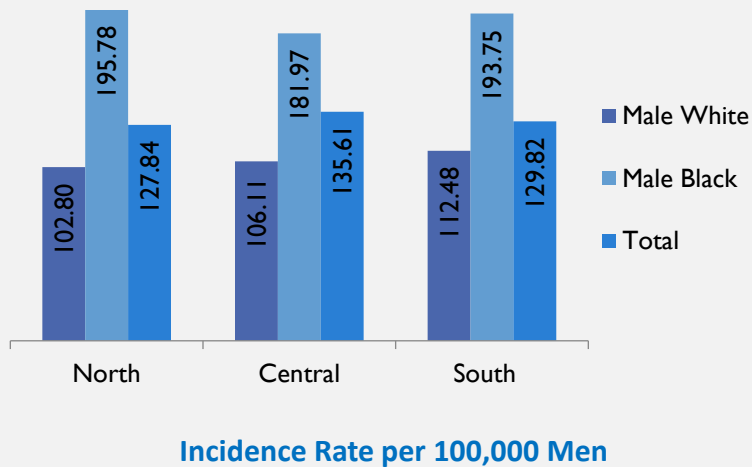


	White		Black	
	Cases	Rate	Cases	Rate
<b>Incidence</b>	6645	107.44	4992	188.66
<b>Mortality</b>	921	17.70	815	45.06

Black males had a higher prostate cancer incidence rate (188.66 per 100,000 men), compared to white males (107.44 per 100,000 men).

A higher prostate cancer mortality rate of 45.06 per 100,000 men was seen in black males and a mortality rate of 17.70 per 100,000 men was seen in white males.

## Prostate Cancer: Incidence Rates by Public Health District

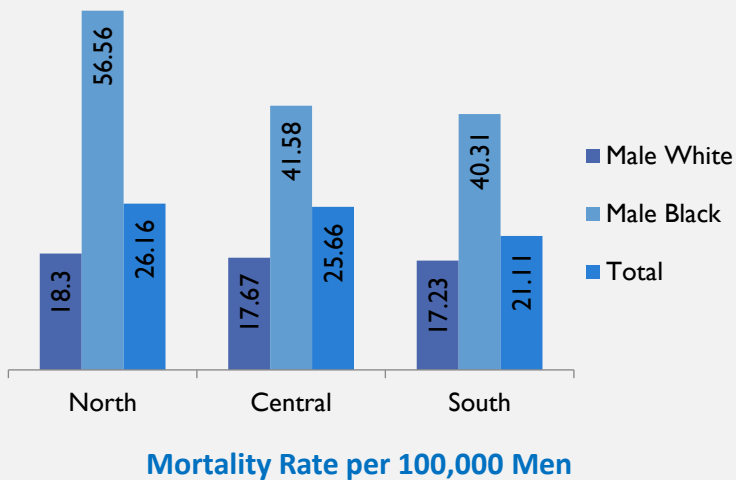


Black males of the north district had the highest prostate cancer incidence rate of 195.78 per 100,000 men. White males in the north district showed the lowest incidence rate of 102.80 per 100,000 men.

For all three districts, black males showed higher incidence rates while white males showed lower incidence rates. The probability of prostate cancer incidence in black males was nearly twice that of white males in each region.

Public Health District	Male White		Male Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate
North	1972	102.80	1408	195.78	3395	127.84
Central	2042	106.11	2302	181.97	4370	135.61
South	2630	112.48	1282	193.75	3944	129.82

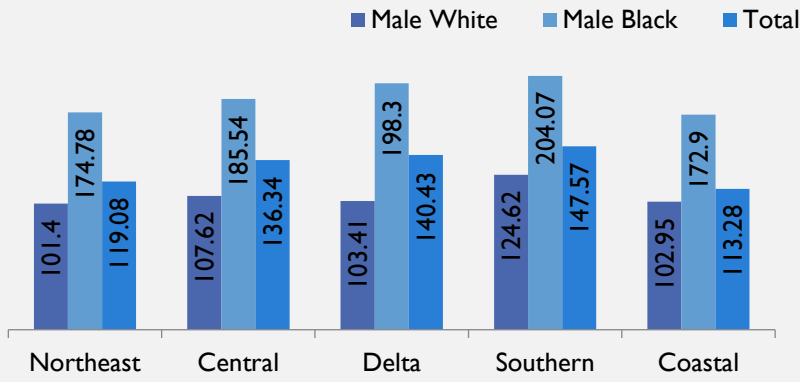
## Prostate Cancer: Mortality Rates by Public Health District



Overall black males had a higher mortality rate for prostate cancer and white males had lower mortality rate in all public health districts. Among white males, the north district had lower mortality rate compared to other districts. Black males of the north district have shown the highest mortality rates of 56.56 per 100,000 men and white males of the central district have shown the lowest mortality rate of 17.67 per 100,000 men.

Public Health District	Male White		Male Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate
North	297	18.30	262	56.56	560	26.16
Central	290	17.67	376	41.58	669	25.66
South	334	17.23	177	40.31	514	21.11

## Prostate Cancer: Incidence Rates by Cancer Coalition Region



Black males of the Southern Cancer coalition had the highest prostate Cancer incidence rate (204.07 per 100,000 men). White males of the northeast cancer coalition region had the lowest incidence rate (101.33 per 100,000 men).

Incidence Rate per 100,000 Men

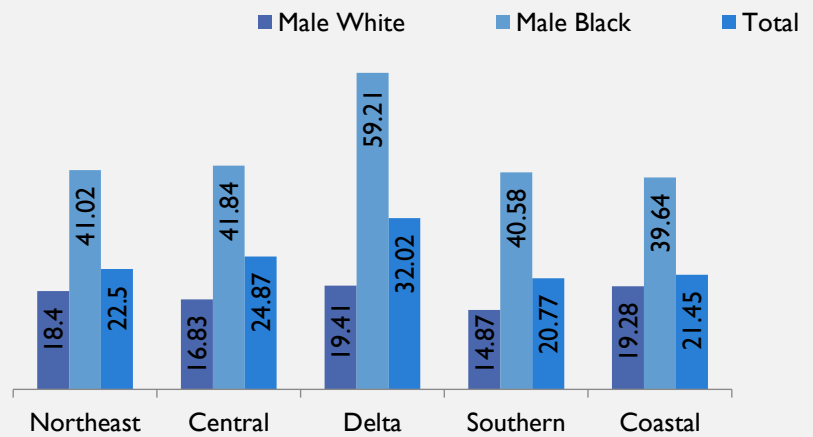
Cancer Coalition Areas	Male White		Male Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate
Northeast	1402	101.33	768	174.78	2175	119.08
Central	1682	107.62	1768	185.54	3472	136.34
Delta	930	103.41	1174	198.30	2118	140.43
Southern	1287	124.62	872	204.07	2167	147.57
Coastal	1343	102.95	410	172.90	1777	113.28

Black males had a higher prostate cancer incidence rate than white Males. The total prostate cancer incidence rate was higher in the southern cancer coalition (204.07 per 100,000) region compared with other regions.

## Prostate Cancer: Mortality Rates by Cancer Coalition Region

The highest prostate cancer mortality was seen in black males of the delta cancer coalition with a rate of 59.21 per 100,000 men. The southern region has shown the lowest mortality among white males with a rate of 14.87 per 100,000 men.

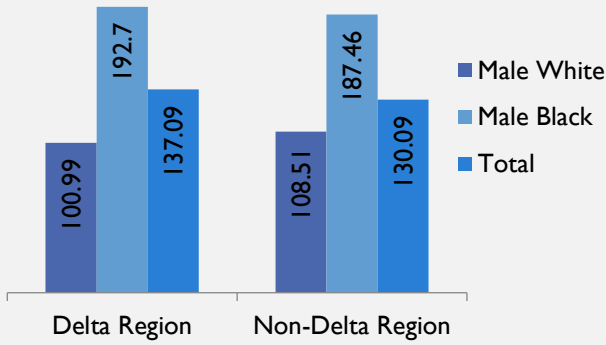
All cancer coalition regions show higher mortality among black males and lower mortality rates for white males. Overall, the total prostate cancer mortality rate is higher in the Delta cancer coalition region compared to other regions.



Mortality Rate per 100,000 Men

Cancer Coalition Areas	Male White		Male Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate
Northeast	220	18.40	121	41.02	341	22.50
Central	220	16.83	285	41.84	508	24.87
Delta	147	19.41	232	59.21	380	32.02
Southern	132	14.87	117	40.58	250	20.77
Coastal	202	19.28	60	39.64	264	21.45

## Prostate Cancer: Incidence Rates, Delta vs. Non-Delta



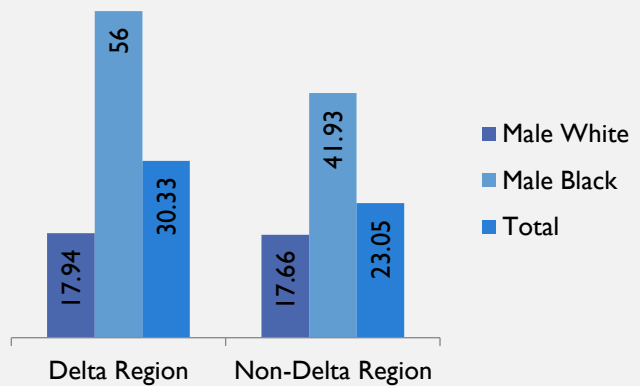
Black males of the delta region had a higher prostate cancer incidence rate of 192.70 per 100,000 men. White males of the Delta region had a lower incidence rate of 100.99 per 100,000 men. The total incidence rate of prostate cancer for the delta region was higher than that of the non-delta region.

**Incidence Rate per 100,000 Men**

Delta/ Non-Delta Region	Male White		Male Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate
<b>Delta</b>	913	100.99	1187	192.70	2112	137.09
<b>Non-Delta</b>	5731	108.51	3805	187.46	9597	130.09

## Prostate Cancer: Mortality Rates, Delta vs. Non-Delta

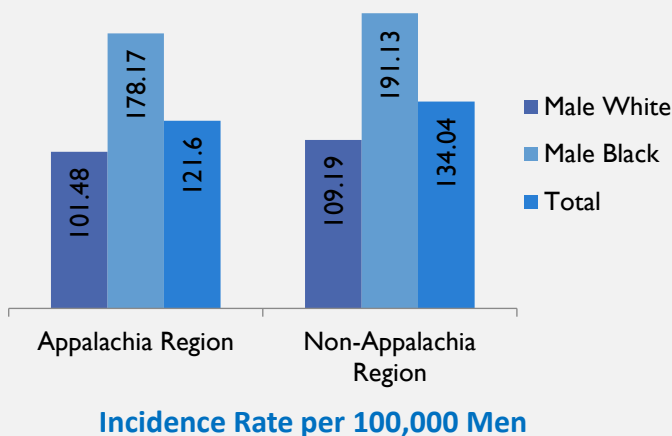
Black Males have shown a higher prostate cancer mortality rate of 56 per 100,000 men in the delta region while white males in the non-delta region have shown a lower mortality rate of 17.66 per 100,000 men. Among the white population, both regions delta and non-delta have shown a similar range of Mortality rates. Overall, the delta region had a higher Mortality rate than the non-delta region.



**Mortality Rate per 100,000 Men**

Delta/ Non-Delta Region	Male White		Male Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate
<b>Delta</b>	135	17.94	226	56.00	362	30.33
<b>Non-Delta</b>	786	17.66	589	41.93	1381	23.05

## Prostate Cancer: Incidence Rates, Appalachian vs Non-Appalachian Region

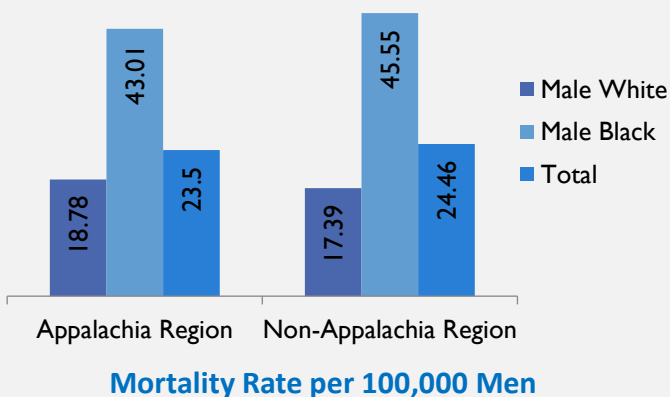


A higher prostate cancer incidence rate of 191.13 per 100,000 men was seen in black males of the Non-Appalachian region while a lower incidence rate of 101.48 per 100,000 men was reported in white males of the Appalachian region. Overall similar incidence rate was seen among both regions with slightly higher rates in the Appalachian region. The total incidence of prostate cancer was higher in the Non-Appalachian region than in the Appalachian region.

Region	Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate
Appalachian	1439	101.48	885	178.17	2331	121.60
Non-Appalachian	5206	109.19	4107	191.13	9379	134.04

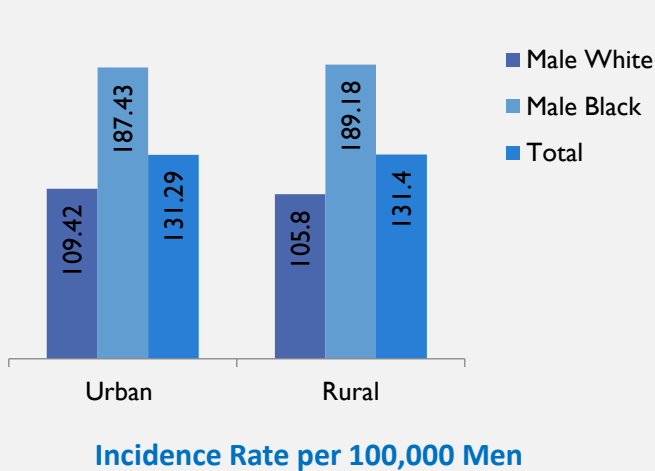
## Prostate Cancer: Mortality Rates, Appalachian vs Non-Appalachian Region

A higher prostate cancer mortality rate of 45.55 per 100,000 men was seen among black males of the Non-Appalachian region. A lower prostate cancer mortality rate of 43.01 per 100,000 men was reported in white males of the Appalachian region. Among White individuals, Non-Appalachian males have shown slightly higher mortality rates than Appalachian males. Overall, the total mortality rate is higher in Non-Appalachian than those in the Appalachian region.



Region	Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate
Appalachian	234	18.78	144	43.01	379	23.52
Non-Appalachian	687	17.39	671	45.55	1364	24.46

## Prostate Cancer: Incidence Rates, Urban vs. Rural

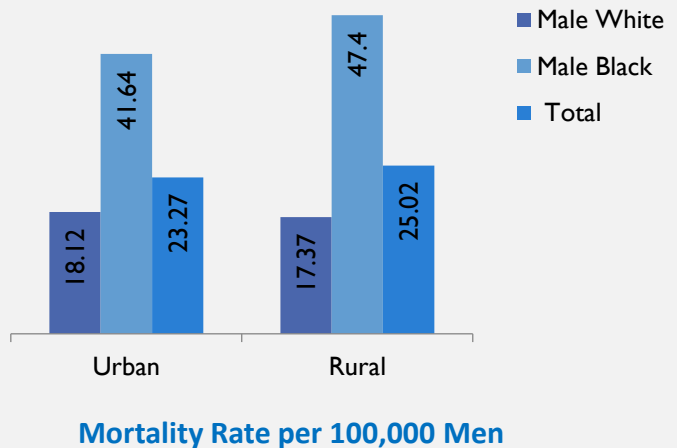


Black males in rural regions have shown a higher prostate cancer incidence rate of 189.18 per 100,000 men while white males in rural regions have shown a lower incidence rate of 105.80 per 100,000 men. Among white individuals, males in rural regions have a higher incidence rate compared to urban regions. The total Prostate Cancer Incidence rate was the same in Urban and Rural regions.

Region	Male White		Male Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate
Urban	3085	109.42	2109	187.43	5242	131.29
Rural	3560	105.80	2883	189.18	6468	131.40

## Prostate Cancer: Mortality Rates, Urban vs. Rural

Black males in rural regions have shown a higher prostate cancer mortality rate of 47.40 per 100,000 men while white males in rural regions have shown a lower mortality rate of 17.37 per 100,000 men. Among white individuals, males in Rural regions have low mortality compared to urban. The total prostate cancer mortality rate is higher in rural regions as compared to urban.



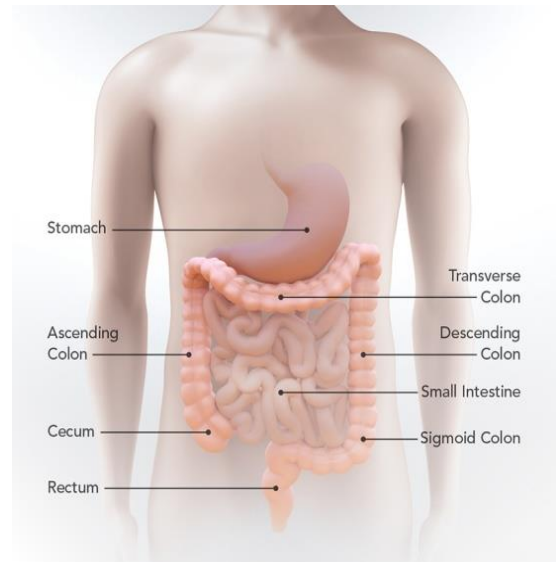
Region	Male White		Male Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate
Urban	417	18.12	305	41.64	726	23.27
Rural	205	17.37	510	47.40	1017	25.02

# COLORECTAL CANCER

*Colorectal cancer* is a disease in which cells in the colon or rectum grow out of control. Sometimes it is called *colon cancer*, for short. The colon is the large intestine or large bowel. The rectum is the passageway that connects the colon to the anus.

Sometimes abnormal growths, called *polyps*, form in the colon or rectum. Over time, some polyps may turn into cancer.

Colorectal cancer starts in the colon or the rectum. These cancers can also be called rectal cancer, depending on where they start. Colon cancer and rectal cancer are often grouped together.



## Modifiable Risk Factors

- Excess body weight
- Physical inactivity
- Long-term smoking
- High consumption of
- Red or processed meat
- Low calcium intake
- Heavy alcohol consumption
- Very low intake of fruits & vegetables and whole-grain fibres.

## Non-Modifiable Risk Factors

- Inherited genetic factors
- Family history
- Type II Diabetes
- Inflammatory Disease
- Chronic Bowels Diseases

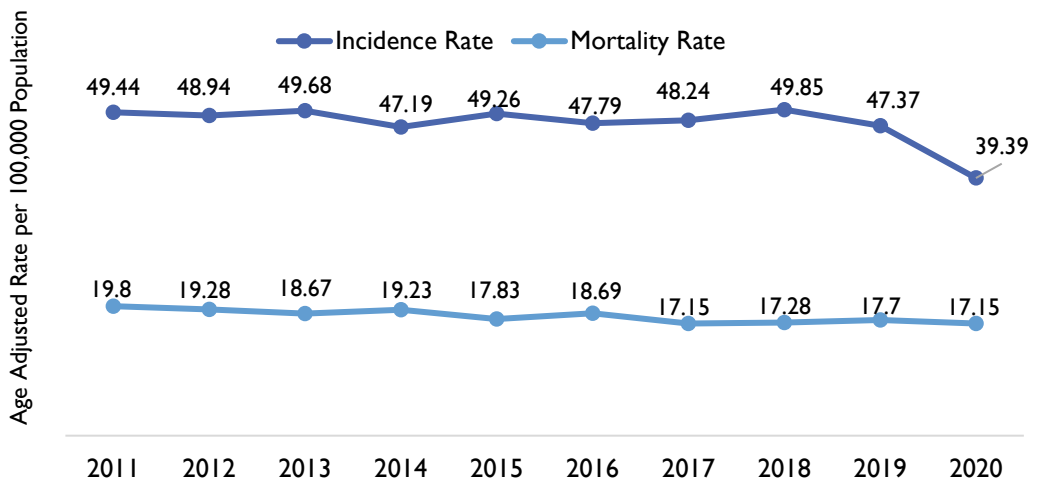
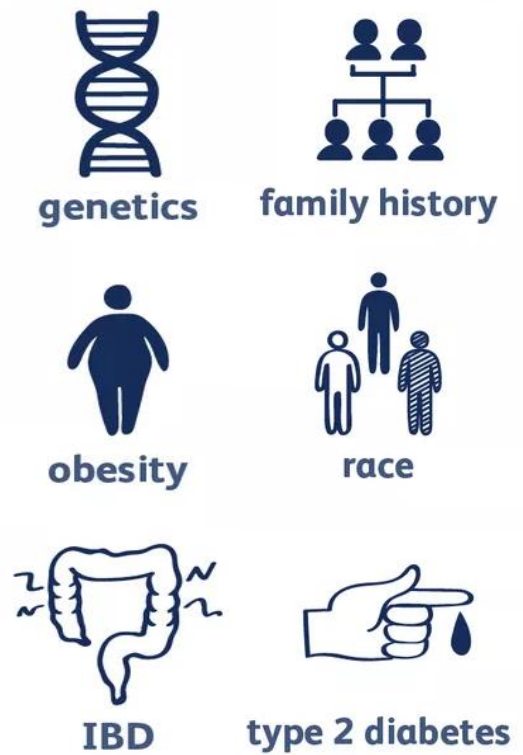
**Signs and symptoms:** The most common signs and symptoms are rectal bleeding, blood in the stool, constipation or diarrhea or stool shape (e.g., narrower than usual), the feeling that the bowel is not completely empty, abdominal cramping or pain, decreased appetite, and weight loss. In some cases, cancer causes blood loss resulting in anaemia (low red blood cell count) along with symptoms like weakness, fatigue, or shortness of breath. Early-stage colorectal cancer typically does not cause symptoms, which is why screening according to patient risk is so important.

**Treatment:** Surgery is the most common treatment for colorectal cancer that has not spread to distant sites. When cancer has penetrated the bowel wall deeply or spread to lymph nodes, colon cancer patients typically receive chemotherapy after surgery, whereas rectal cancer patients may receive chemotherapy before and/or after surgery, alone or in combination with radiation. For colorectal cancer that has spread to other parts of the body (metastatic colorectal cancer), treatments typically include chemotherapy and/or targeted therapy. Immunotherapy is a newer option that can be highly effective for a select group of advanced cancers.

**Survival:** The 5-year relative survival rate for colorectal cancer is 65% overall, but ranges from 91% for localized stage to 73% for regional-stage and 14% for distant stage disease.



**Prevention and early detection:** Screening can prevent colorectal cancer through the detection and removal of precancerous growths (polyps), and it can often detect cancer at an early stage, when treatment is usually more successful. Regular adherence to screening with either stool testing (fecal immunochemical tests [FIT], highly sensitive guaiac-based tests [hsFOBT], or a multi-target stool DNA test [mts DNA]) or structural exams (e.g., colonoscopy, flexible sigmoidoscopy, or computed tomography colonography) reduces the risk of colorectal cancer death. The American Cancer Society and the US Preventive Services Task Force recommend that individuals at average risk for colorectal cancer begin screening at age 45 and continue through age 75, with more individualized decision-making from ages 76 to 85 based on health status, life expectancy, patient preferences, and prior screening history. Individuals at increased risk because of a family history of the disease or for other reasons should talk to their doctor about screening earlier.

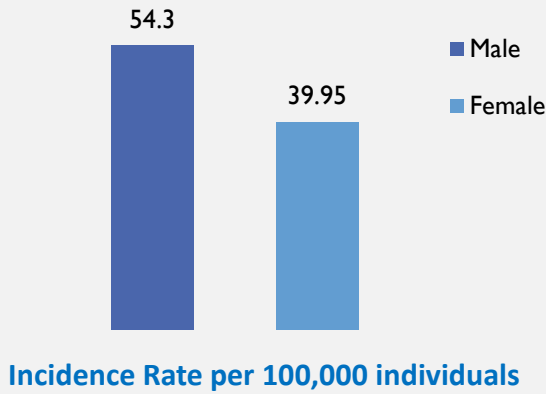


**Incidence and Mortality rates trend for Colorectal Cancer in MS**

**Incidence Trend:** Colorectal cancer incidence rates have generally declined since the mid-1980s, with the pace accelerating to 3%-4% annually during the 2000s due to widespread screening uptake among adults ages 50 and older, then slowing to 1% from 2011 to 2019. Year 2020 reported the lowest incidence rate ever for the CRC (39.39 per 100,000) in MS.

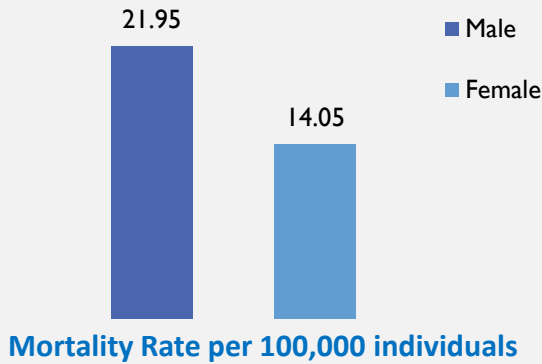
**Mortality trend:** Colorectal cancer mortality rates have dropped by 57%, from 29.2 (per 100,000) in 1970 to 12.6 in 2020, mostly due to earlier detection through screening and improvements in treatment; the death rate has declined steadily from 2% per year from 2012 to 2020.

## Colorectal Cancer: Incidence and Mortality Rates by Gender



The incidence rate of colorectal cancer was higher in males with a rate of 54.30 per 100,000 individuals and it was 39.95 per 100,000 individuals in females of Mississippi.

The mortality rate was also higher in males with a rate of 21.95 per 100,000 individuals as compared to females with a rate of 14.05 per 100,000 individuals.

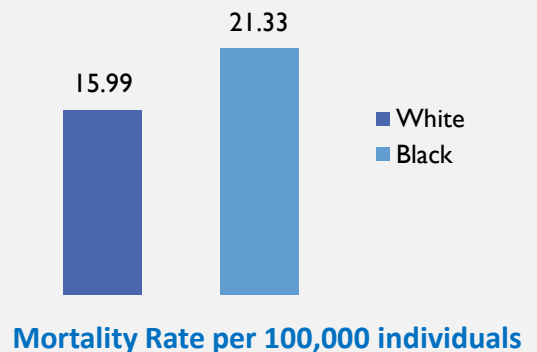
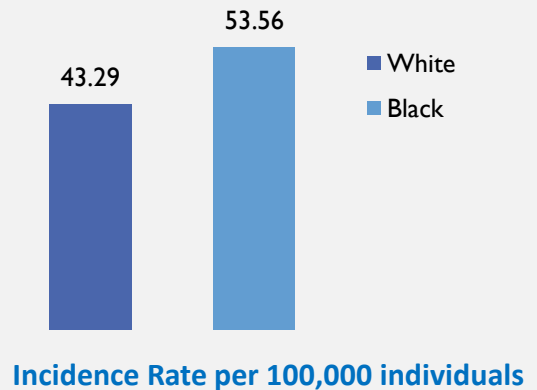


	Male		Female	
	Cases	Rate	Cases	Rate
<b>Incidence</b>	4420	54.3	3863	39.95
<b>Mortality</b>	1751	21.95	1408	14.05

## Colorectal Cancer: Incidence and Mortality Rates by Race

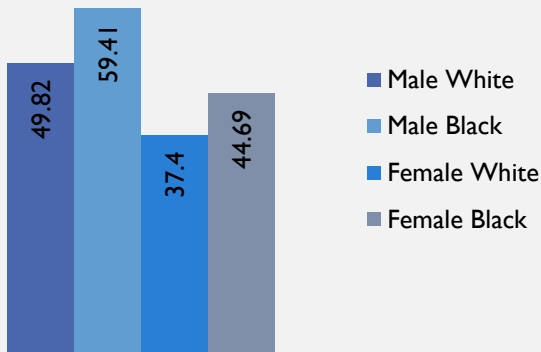
Colorectal cancer was found to have a higher incidence rate of 53.56 per 100,000 in black individuals as compared to individuals in white (43.29 per 100,000).

Similarly, Mortality rate of 21.33 per 100,000 individuals was seen higher in black individuals as compared to 15.99 per 100,000 individuals in whites.



	White		Black	
	Cases	Rate	Cases	Rate
<b>Incidence</b>	5169	43.29	3011	53.56
<b>Mortality</b>	1960	15.99	1163	21.33

## Colorectal Cancer: Incidence Rates by Gender and Race



**Black males had the highest incidence rates of colorectal cancer in 2016-2020 with the rate of 59.41 per 100,000 individuals.**

White females have the lowest colorectal cancer incidence rates of 37.50 per 100,000 individuals. Among whites, males had a higher incidence rate of 49.82 per 100,000 individuals.

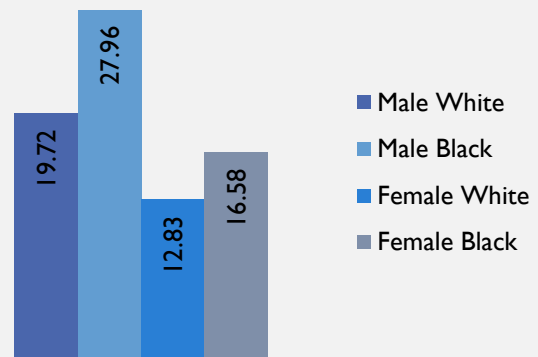
Incidence Rate per 100,000 individuals

	Male White		Male Black		Female White		Female Black	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
<b>Incidence</b>	2770	49.82	1599	59.41	2399	37.40	1412	44.69

## Colorectal Cancer: Mortality Rates by Gender and Race

**Black males had the highest mortality rate of Colorectal Cancer in 2016-2020 with a rate of 27.96 per 100,000 individuals.**

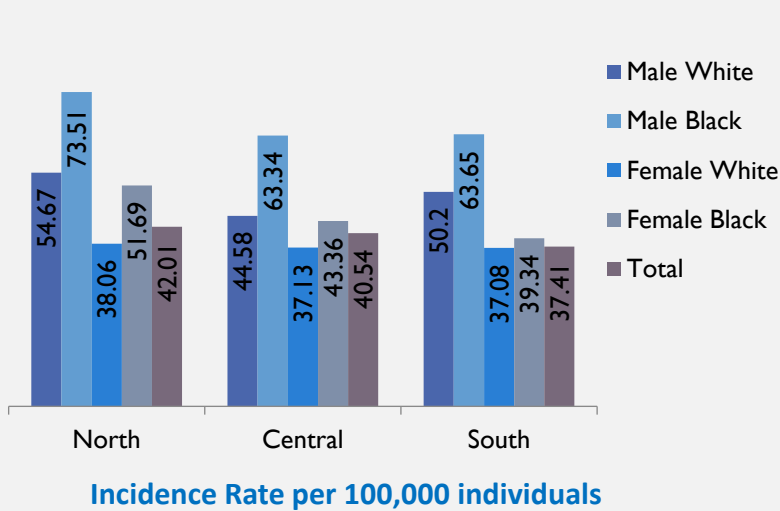
White females had the lowest colorectal cancer mortality rate of 12.83 per 100,000 individuals. Among whites, males had a higher mortality rate of 19.72 per 100,000 individuals.



Mortality Rate per 100,000 individuals

	Male White		Male Black		Female White		Female Black	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
<b>Mortality</b>	1088	19.72	647	27.96	872	12.83	516	16.58

## Colorectal Cancer: Incidence Rates by Public Health District

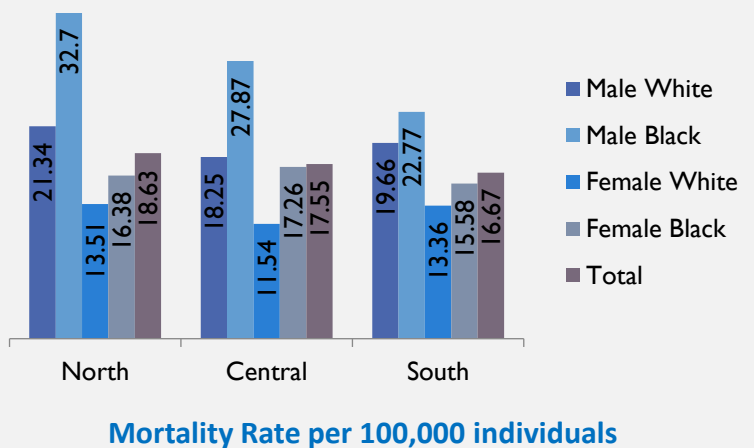


Black males in the north district have shown the highest colorectal cancer incidence rate of 75.02 per 100,000 individuals while white females in the north district showed the lowest incidence rate of 38.29 per 100,000 individuals. For all three districts, black males had higher incidence rates while white females showed lower incidence rates. White females had been shown to have almost the same distribution of colorectal cancer incidence rates for all public health districts.

Public Health District	Male White		Male Black		Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
North	960	54.67	496	73.51	775	38.06	449	51.69	1231	42.01
Central	762	44.58	719	63.34	753	37.13	655	43.36	1440	40.54
South	1048	50.20	384	63.65	871	37.08	308	39.34	1192	37.41

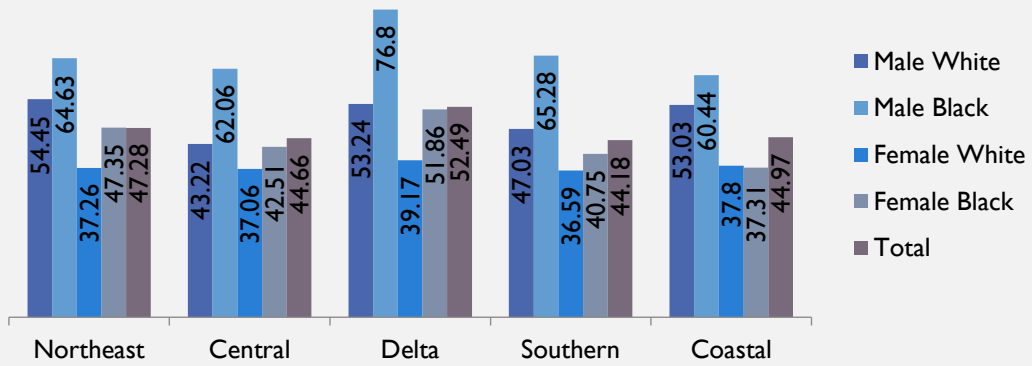
## Colorectal Cancer: Mortality Rates by Public Health District

Overall, black males in the north district had the highest mortality rate of 32.70 per 100,000 individuals, while white females in the central district had the lowest Mortality rate of 11.54 per 100,000 individuals in all public health districts. Among whites, females had lower mortality rates as compared to males. The total colorectal cancer mortality was seen higher in the north district as compared with other districts.



Public Health District	Male White		Male Black		Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
North	365	21.34	212	32.70	292	13.51	139	16.38	1012	18.63
Central	317	18.25	302	27.87	258	11.54	257	17.26	1157	17.55
South	406	19.66	133	22.77	322	13.36	120	15.58	990	16.67

## Colorectal Cancer: Incidence Rates by Public Health District

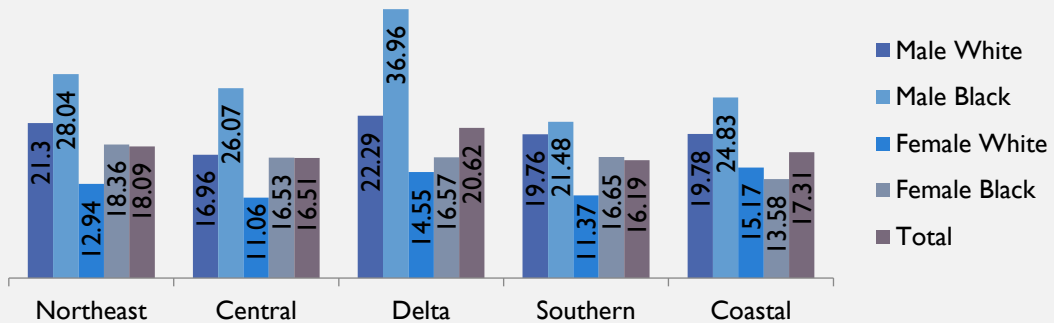


Incidence Rate per 100,000 individuals

Cancer Coalition Areas	White Male		Black Male		Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Northeast	689	54.45	248	64.63	551	37.26	250	47.35	1747	47.28
Central	603	43.22	542	62.06	610	37.06	478	42.51	2283	44.66
Delta	430	53.24	425	76.82	367	39.17	376	51.86	1615	52.49
Southern	437	47.03	257	65.28	391	36.59	211	40.75	1300	44.18
Coastal	611	53.03	127	60.44	480	37.80	97	37.31	1338	44.97

Black males in the Delta cancer coalition region had reported the highest colorectal cancer incidence rate of 76.82 per 100,000 individuals. White females of the coastal cancer coalition region have shown the lowest incidence rate of 37.31 per 100,000 individuals. The Total colorectal cancer incidence rate was higher in the Delta cancer coalition region as compared to other regions.

## Colorectal Cancer: Mortality Rates by Public Health District

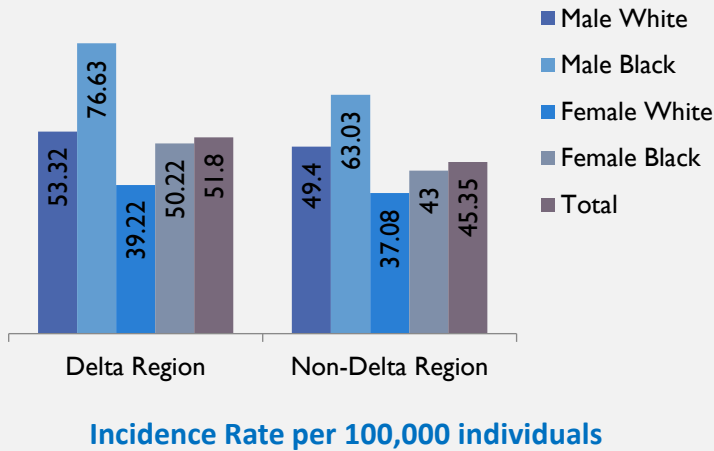


Mortality Rate per 100,000 individuals

Cancer Coalition Areas	White Male		Black Male		Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Northeast	262	21.30	110	28.04	207	12.94	96	18.36	681	18.09
Central	240	16.96	220	26.07	197	11.06	185	16.53	861	16.51
Delta	180	22.29	184	36.96	146	14.55	115	16.57	627	20.62
Southern	186	19.76	84	21.48	128	11.37	86	16.65	485	16.19
Coastal	220	19.78	49	24.83	194	15.17	34	13.58	505	17.31

Black males in the delta cancer coalition region had reported the highest mortality rate of 36.96 per 100,000 individuals. White females of the central cancer coalition region have shown the lowest Incidence rate of 11.06 per 100,000 individuals. Among white males, the Delta coalition region had higher colorectal cancer mortality rates. The total colorectal cancer mortality rate was higher in the delta cancer coalition region as compared with other regions.

## Colorectal Cancer: Incidence Rates by Delta vs. Non-Delta

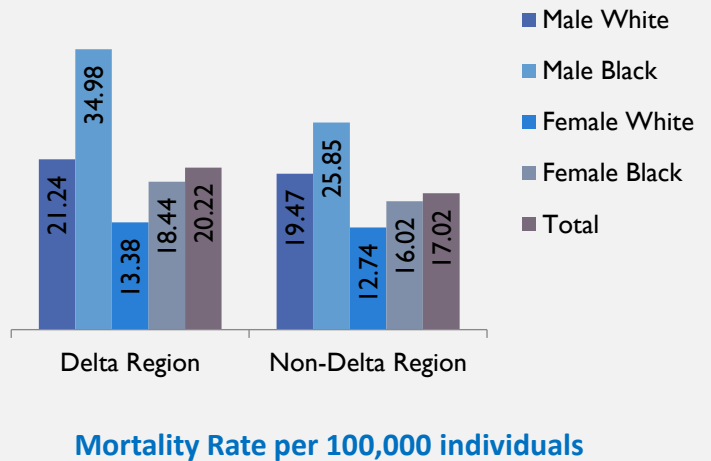


Black males of the delta region have shown a higher colorectal cancer incidence rate of 76.63 per 100,000 individuals. White females of the non-Delta region have shown a lower colorectal cancer incidence rate of 37.08 per 100,000 individuals. Among whites, males of the Delta region had a higher incidence rate as compared to females. The total colorectal cancer incidence of the Delta region was higher than that of non-Delta.

Delta/ Non-Delta Region	Male White		Male Black		Female White		Female Black		Total	
Delta	425	52.32	442	76.63	363	39.22	376	50.22	1623	51.8
Non-Delta	2345	49.40	1157	63.03	2036	37.08	1036	43	6660	45.35

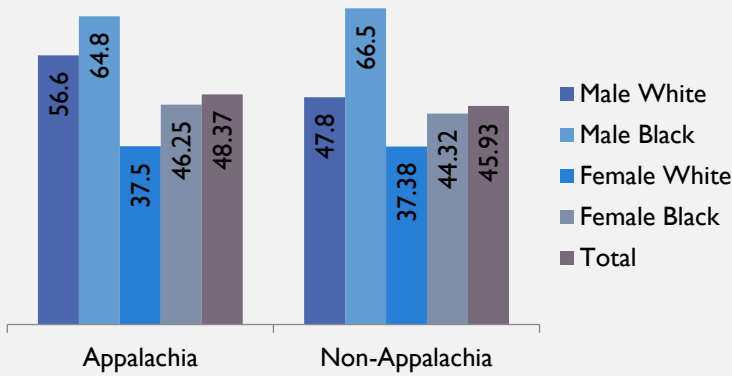
## Colorectal Cancer: Mortality Rates by Delta vs. Non-Delta

Black males in the delta region had a higher colorectal cancer mortality rate of 34.98 per 100,000 individuals while white females in the non-Delta region have shown a lower colorectal cancer mortality rate of 12.74 per 100,000 individuals. Among the white population, males in the delta region had higher mortality rates than females. Overall, the total mortality rate in the delta region was higher than that of non-Delta.



Delta/ Non-Delta Region	Male White		Male Black		Female White		Female Black		Total	
Delta	171	21.24	181	34.98	134	13.38	134	18.44	623	20.22
Non-Delta	917	19.47	466	25.85	738	12.74	382	16.02	2536	17.02

## Colorectal Cancer: Incidence Rates by Appalachian vs. Non-Appalachian



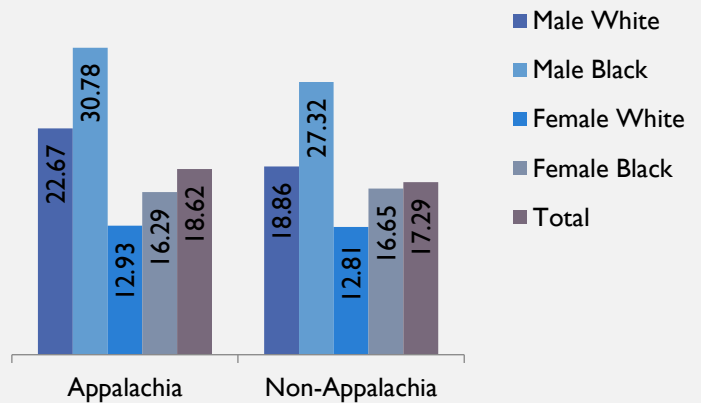
Incidence Rate per 100,000 individuals

A higher Colorectal cancer incidence rate of 66.5 per 100,000 individuals was seen in black males of the Non-Appalachian region while a lower incidence rate of 37.38 per 100,000 individuals was reported in white females of the Appalachian region. The total incidence was higher in the Appalachian region than Non-Appalachian.

Region	Male White		Male Black		Female White		Female Black		Total	
Appalachian Region	730	56.60	295	64.79	571	37.49	271	46.25	1875	48.37
Non-Appalachian Region	2040	47.79	1304	66.5	1828	37.38	1141	44.32	6408	45.93

## Colorectal Cancer: Mortality Rates by Appalachian vs. Non-Appalachian

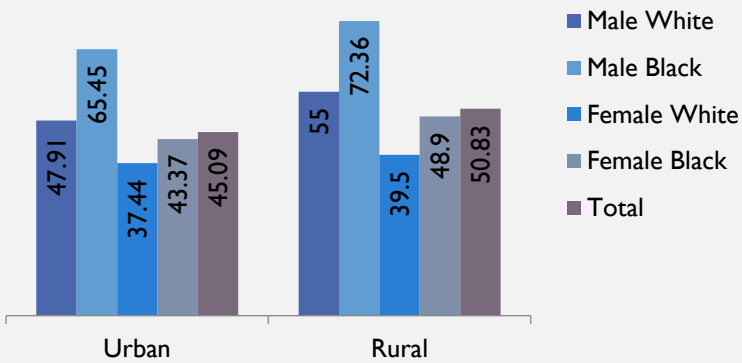
A higher colorectal cancer mortality rate of 30.78 per 100,000 individuals was seen among black males of the Appalachian region. A lower mortality rate of 12.81 per 100,000 individuals was reported in white females of Non-Appalachian region. Among white individuals, males have shown higher colorectal cancer mortality rates than females. Overall, the total mortality was higher in the Appalachian region than Non-Appalachian region.



Mortality Rate per 100,000 individuals

Region	Male White		Male Black		Female White		Female Black		Total	
Appalachian Region	284	22.67	138	30.78	210	12.93	97	16.29	734	18.62
Non-Appalachian Region	804	18.86	509	27.32	662	12.81	419	16.65	2425	17.29

## Colorectal Cancer: Incidence Rates, Urban vs. Rural



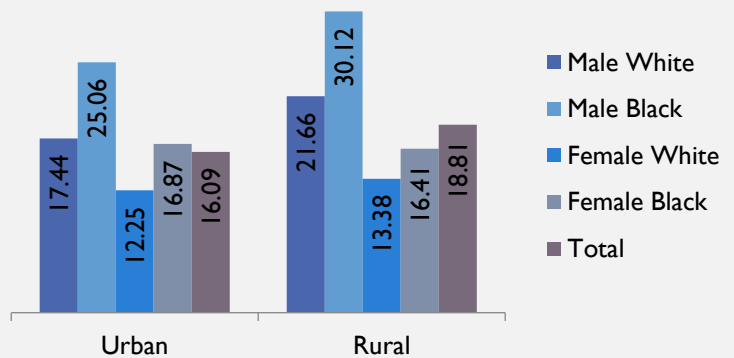
Incidence Rate per 100,000 individuals

Black males in rural regions have shown a higher colorectal cancer incidence rate of 72.36 per 100,000 individuals, and white females in the urban region have shown a lower incidence rate of 37.44 per 100,000 individuals. Among white individuals, males in rural regions had higher colorectal cancer incidence rates than Females. The total incidence rate in rural regions was high as compared to urban.

Region	Male White		Male Black		Female White		Female Black		Total	
Urban	1219	47.91	655	65.45	1094	37.44	569	43.37	3580	45.09
Rural	1665	55.00	1025	72.36	1374	39.50	906	48.90	5032	50.83

## Colorectal Cancer: Mortality Rates, Urban vs. Rural

Black males in rural regions have shown a higher colorectal cancer mortality rate of 30.12 per 100,000 individuals while white females in urban regions have shown a lower colorectal cancer mortality rate of 12.25 per 100,000 individuals. Among white individuals, males in rural regions have high mortality as compared to females. The total mortality rate is higher in Rural regions as compared to urban.



Mortality Rate per 100,000 individuals

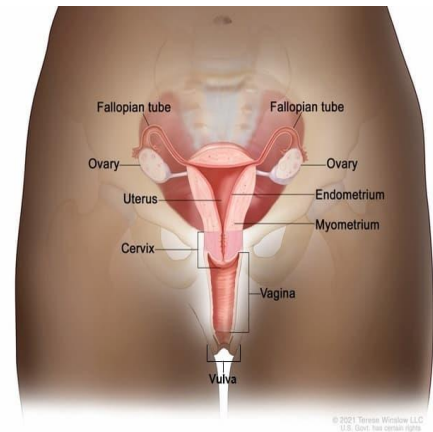
Region	Male White		Male Black		Female White		Female Black		Total	
Urban	437	17.44	241	25.06	376	12.25	212	16.87	1278	16.09
Rural	651	21.66	406	30.12	496	13.38	304	16.41	1881	18.81



# CERVICAL CANCER

Cervical Cancer is a type of Gynaecologic cancer is any cancer that starts in a woman's reproductive organs. Cancer is always named for the part of the body where it starts. Gynaecologic cancers begin in different places within a woman's pelvis, which is the area below the stomach and in between the hip bones.

Cervical cancer begins in the *cervix*, which is the lower, narrow end of the uterus. (The uterus is also called the womb).



HPV



smoking



family history



DES



immune  
deficiency



gene  
abnormalities

**Risk Factor:** Almost all cervical cancers are caused by persistent infection with certain types of human papillomavirus (HPV). Factors that are responsible for HPV infection potentially result in Cervical cancer indirectly. HPV infections are most common in individuals having multiple sex partners. The other factors related to HPV infection include a suppressed immune system, a high number of childbirths, and cigarette smoking. Long-term use of oral contraceptives is also associated with increased risk that gradually declines after cessation. The other risk factors include Smoking, Family history, DES medication, Immune deficiency, and gene abnormalities.

**Signs and Symptoms:** The most common symptom is abnormal vaginal bleeding, which may start and stop between regular menstrual periods or cause menstrual bleeding to last longer.

**Treatment:** Precancerous cervical lesions may be treated with a loop electrosurgical excision procedure (LEEP), cryotherapy (the destruction of cells by extreme cold); laser ablation (destruction of tissue using a laser beam); or conization (the removal of a cone-shaped piece of tissue containing the abnormal tissue). Early-stage cervical cancers are generally treated with surgery and/or radiation, sometimes combined with chemotherapy. Chemotherapy alone is often used to treat advanced disease. Immunotherapy may be another option for metastatic or recurrent cancer.

**Prevention:** HPV vaccination protects against the types of HPV that cause 90% of cervical cancers, as well as several other cancers and diseases. The American Cancer Society recommends routine vaccination between ages 9 and 12 years. Screening can prevent cervical cancer through the detection and treatment of precancerous lesions, which are detected far more frequently than invasive cancer. The HPV test can also identify individuals at risk for a type of cervical cancer called adenocarcinoma, which accounts for about 30% of cases and is more often missed by Pap tests than other subtypes.

**Survival:** The 5-year relative survival rate for cervical cancer is 67% overall and in White women, but 56% in Black women. Survival is also lower for older women: 46% for those 65 years of age and older versus 61% for women ages 50-64 and 77% for women under 50.

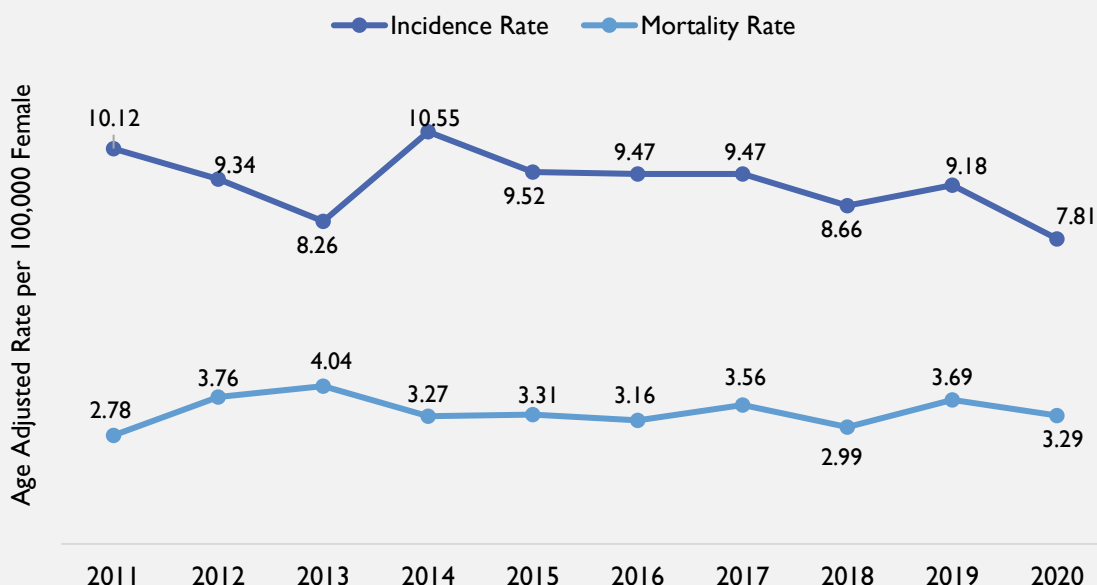
Long-lasting infection related to Human Papilloma Virus Infection is the main cause of Cervical cancer.

In Mississippi, the Cervical cancer Incidence rate for the period 2016-2020 was 8.9 per 100,000 women, while the mortality rate of Cervical cancer was 3.34 per 100,000 women.

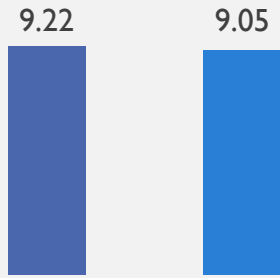
**Incidence Trend:** The Cervical Cancer Incidence trends in the US have decreased since the mid-2000's because of screening tests and Human Papilloma Virus vaccinations. Mississippi reported an incidence rate of 8.92 per 100,000 women during 2016-2020.

**Mortality trend:** Cervical cancer mortality rates have dropped by more than half because of prevention and early detection through screening. The rate is 65% higher in Black women than in White women. In Mississippi mortality rate of 3.34 per 100,000 women was reported.

**Incidence and Mortality rates trend for Cervical Cancer in MS**

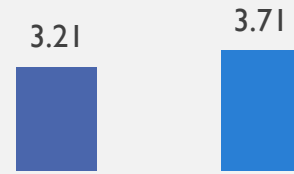


## Cervical Cancer: Incidence Rates by Race



■ White ■ Black

**Incidence Rate per 100,000 Women**



■ White ■ Black

**Mortality Rate per 100,000 Women**

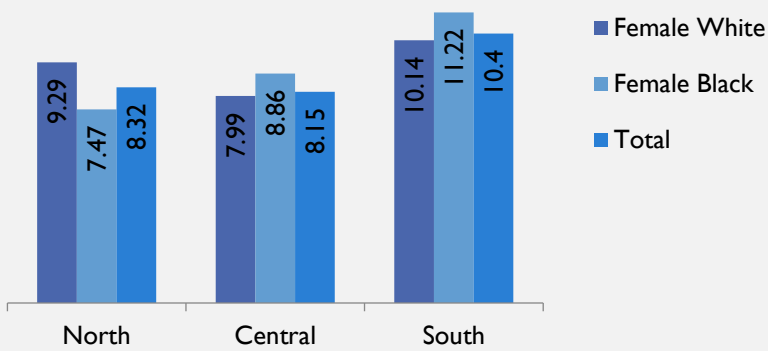
	White		Black	
	Cases	Rate	Cases	Rate
<b>Incidence</b>	417	9.22	268	9.05

	White		Black	
	Cases	Rate	Cases	Rate
<b>Mortality</b>	170	3.21	117	3.71

Cervical cancer was found to have a higher incidence rate of 9.22 per 100,000 women in the white race as compared to 9.05 per 100,000 black women. Overall similar range of incidence rates is seen among both race groups.

Similarly, a high cervical cancer mortality rate of 3.71 per 100,000 women was seen in the black race as compared to 3.21 per 100,000 women in white.

## Cervical Cancer: Incidence Rates by Public Health District



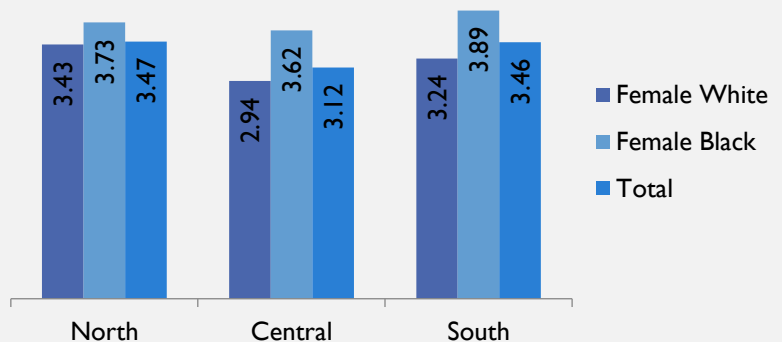
Incidence Rate per 100,000 Women

Public Health District	Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate
North	132	9.29	64	7.47	197	8.32
Central	114	7.99	123	8.86	241	8.15
South	171	10.14	81	11.22	258	10.40

Overall black females in the south district have shown the highest cervical cancer incidence rate of 11.22 per 100,000 women while black females in the north district showed the lowest incidence rate of 7.47 per 100,000 women. For central and south districts, black females showed higher incidence rates while white females showed high incidence rates in the north. The total cervical cancer incidence rate was highest in the south District.

## Cervical Cancer: Mortality Rates by Public Health District

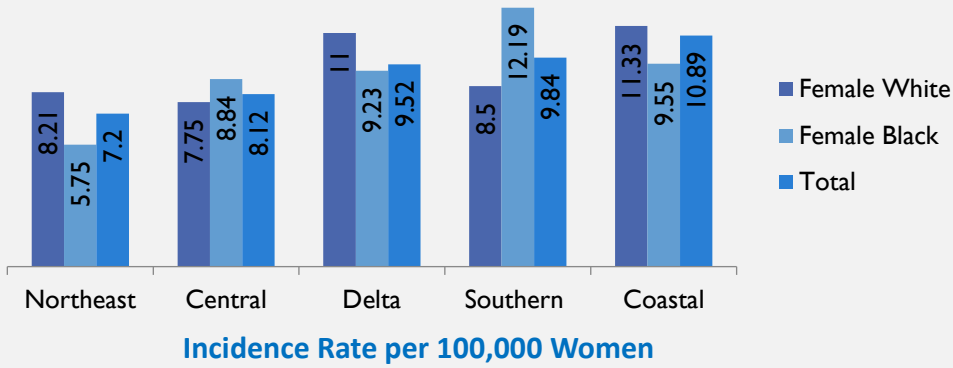
Black females in the south district have shown the highest mortality rate of 3.89 per 100,000 women while white females in central district have shown the lowest mortality rate of 2.94 per 100,000 women. Overall black females have higher mortality rates for cervical cancer while white females have lower mortality rates in all public health districts. Among white females, the central district had lower mortality rates as compared to other districts.



Mortality Rate per 100,000 Women

Public Health District	Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate
North	59	3.43	33	3.73	94	3.47
Central	48	2.94	54	3.62	103	3.12
South	63	3.24	30	3.89	95	3.46

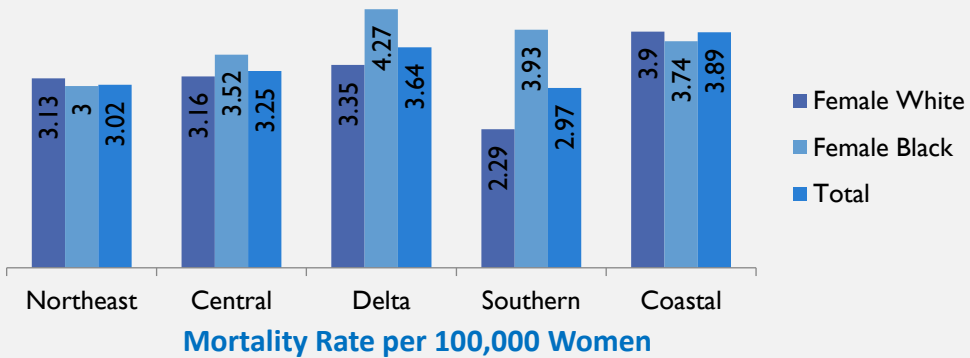
## Cervical Cancer: Incidence Rates by Cancer Coalition Region



Cancer Coalition Areas	Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate
<b>Northeast</b>	87	8.21	31	5.75	119	7.20
<b>Central</b>	91	7.75	92	8.84	187	8.12
<b>Delta</b>	68	11.00	64	9.23	132	9.52
<b>Southern</b>	67	8.50	55	12.19	123	9.84
<b>Coastal</b>	104	11.33	26	9.55	135	10.89

Black females of the southern cancer coalition region have reported the highest cervical cancer incidence rate of 12.19 per 100,000 women. Black females of the northeast cancer coalition region have shown the lowest incidence rate of 5.75 per 100,000 women. For the coastal, delta, & and northeast regions, white females showed higher incidence rates while the southern and central regions showed high incidence in black females. The total cervical cancer incidence rate was highest in the coastal coalition region.

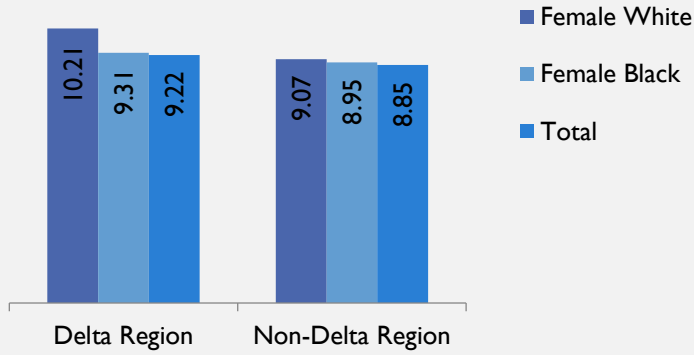
## Cervical Cancer: Mortality Rates by Cancer Coalition Region



Cancer Coalition Areas	Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate
<b>Northeast</b>	39	3.13	16	3.00	56	3.02
<b>Central</b>	43	3.16	39	3.52	83	3.25
<b>Delta</b>	25	3.35	32	4.27	58	3.64
<b>Southern</b>	25	2.29	19	3.93	44	2.97
<b>Coastal</b>	38	3.90	11	3.74	51	3.89

The highest cervical cancer mortality was seen among black females of the delta cancer coalition region with a rate of 4.27 per 100,000 women. The white females of the southern region have shown the lowest mortality with a rate of 2.29 per 100,000 women. Central, Delta, and Southern regions have shown higher mortality rates for black females while northeast and coastal regions have shown higher mortality rates for white females. Overall, the total cervical cancer mortality rate is higher in the coastal region.

## Cervical Cancer: Incidence Rates by Delta vs. Non-Delta Region



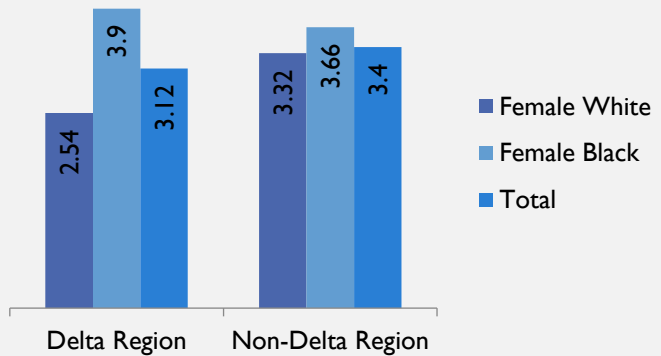
Incidence Rate per 100,000 Women

White females of the delta region have shown a higher cervical cancer incidence rate of 10.21 per 100,000 women. Black females of the non-delta region have shown a lower incidence rate of 8.95 per 100,000 women. The total incidence rate of cervical cancer for the delta region is higher than that of non-delta.

Delta/ Non-Delta Region	Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate
Delta	64	10.21	67	9.31	131	9.22
Non-Delta	353	9.07	201	8.95	565	8.85

## Cervical Cancer: Mortality Rates by Delta vs. Non-Delta Region

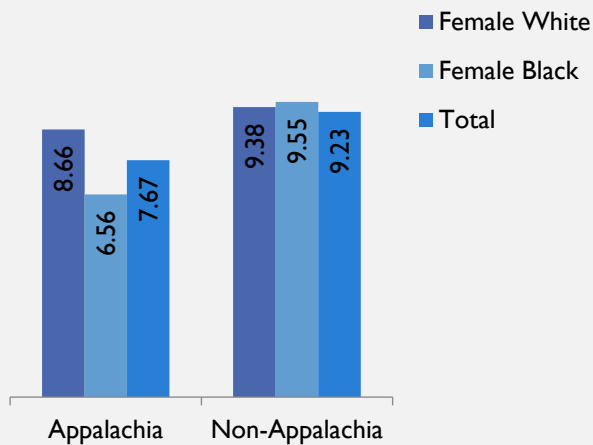
Black females in the delta region have shown a higher cervical cancer mortality rate of 3.90 per 100,000 women while white females of the delta region have shown a lower mortality rate of 2.54 per 100,000 women. Among the white population, females in the non-delta region have higher mortality rates than the delta region. The total mortality rate of the non-delta region is higher than the delta region.



Mortality Rate per 100,000 Women

Delta/ Non-Delta Region	Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate
Delta	20	2.54	30	3.90	51	3.12
Non-Delta	150	3.32	87	3.66	241	3.40

## Cervical Cancer: Incidence Rates, Appalachian vs Non-Appalachian Region



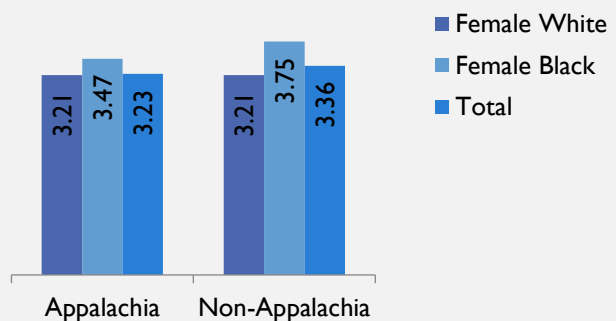
A higher cervical cancer incidence rate of 9.55 per 100,000 women was seen in black females of the Non-Appalachian region while a lower incidence rate of 6.56 per 100,000 women was reported in black females of the Non-Appalachian region. Among the whites, Non-Appalachian region, females showed a higher incidence rate for cervical cancer. The total incidence of cervical cancer was high in the Non-Appalachian region.

### Incidence Rate per 100,000 Women

Region	Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate
Appalachian	91	8.66	38	6.56	130	7.67
Non-Appalachian	326	9.38	230	9.55	566	9.23

## Cervical Cancer: Mortality Rates, Appalachian vs Non-Appalachian Region

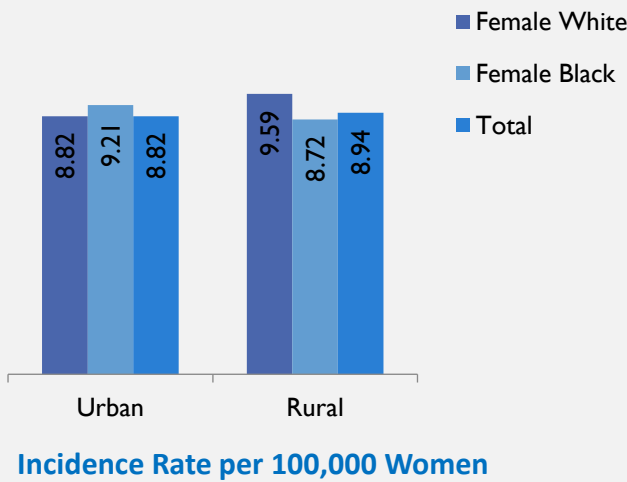
A higher cervical cancer mortality rate of 3.75 per 100,000 women was seen among black females of the Non-Appalachian region. The lowest mortality rate of 3.21 per 100,000 women was seen in white females of both Appalachian and Non-Appalachian. Among black individuals, Non-Appalachian females have shown higher mortality rates than Appalachian females. Overall, the total mortality was higher in Non-Appalachian region.



### Mortality Rate per 100,000 Women

Region	Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate
Appalachian	40	3.21	21	3.47	62	3.23
Non-Appalachian	130	3.21	96	3.75	230	3.36

## Cervical Cancer: Incidence Rates, Urban vs. Rural

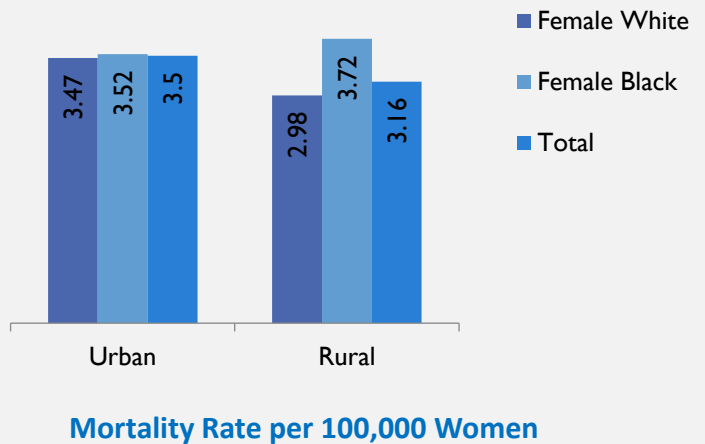


White females in rural regions have shown a higher cervical cancer incidence rate of 9.59 per 100,000 women while black females in rural regions have shown a lower Incidence rate of 8.72 per 100,000 women. Among the black race, females in urban regions have a higher incidence rate as compared to rural regions. The total cervical cancer incidence rate was almost the same in rural & and urban regions.

Region	Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate
Urban	187	8.82	117	9.21	312	8.82
Rural	230	9.59	151	8.72	384	8.94

## Cervical Cancer: Mortality Rates, Urban vs. Rural

Black females in the rural region have shown a higher cervical cancer mortality rate of 3.72 per 100,000 women while white females in the rural region have shown a lower mortality rate of 2.98 per 100,000 women. Overall urban regions showed a similar mortality rate trend for both white & and black races. The total cervical cancer mortality rate was higher in urban regions as compared to rural ones.



Region	Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate
Urban	87	3.47	48	3.52	138	3.50
Rural	83	2.98	69	3.72	154	3.16



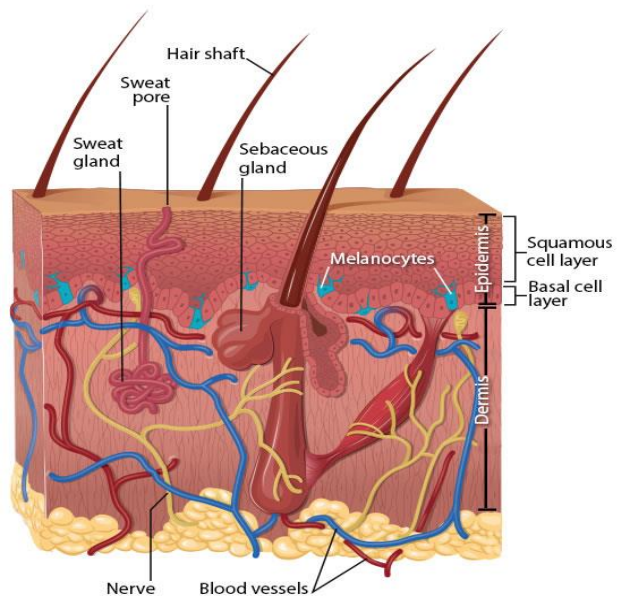
# Skin (Melanoma) Cancer

The skin is the body's largest organ. The skin has several layers, but the two main layers are the *epidermis* (upper or outer layer) and the *dermis* (lower or inner layer). Skin cancer begins in the epidermis, which is made up of three kinds of cells—

**Squamous cells:** Thin, flat cells that form the top layer of the epidermis.

**Basal cells:** Round cells under the squamous cells.

**Melanocytes:** Cells that make melanin and are found in the lower part of the epidermis. *Melanin* is the pigment that gives skin its color. When skin is exposed to the sun, melanocytes make more pigment and cause the skin to darken.



**Risk Factors:** Most cases of skin cancer are caused by overexposure to ultraviolet (UV) rays from the sun, tanning beds, or sunlamps. UV rays can damage skin cells. In the short term, this damage can cause a sunburn. Over time, UV damage adds up, leading to changes in skin texture, premature skin aging, and sometimes skin cancer. UV rays also have been linked to eye conditions such as cataracts.

A major risk factor for all types of skin cancer is light skin color, with melanoma incidence varying by about 4-fold among White individuals (e.g., rates are 3 times lower in those who are Hispanic versus non-Hispanic) and by almost 30-fold between White and Black or Asian/Pacific Islander individuals<sup>4</sup>. The risk of squamous cell carcinoma (SCC) is increased with a history of actinic keratosis (a common precancerous lesion caused by chronic sun exposure) or a weakened immune system, which also increases the risk of melanoma. Additional melanoma risk factors include advanced age; a family history of the disease; and the presence of atypical, large, or numerous (more than 50) moles.

**Treatment:** Melanoma, is a skin cancer, that begins in the melanocytes<sup>13</sup>. Of all types of skin cancer, melanoma causes the most deaths because of its tendency to spread to other parts of the body, including vital organs. Melanomas with deep invasion or that have spread to lymph nodes may be treated with surgery, immunotherapy, targeted drug therapy, and/or radiation therapy<sup>4</sup>. The treatment of advanced melanoma has changed greatly in recent years with the development of several new immunotherapy and targeted drugs that can be very effective. Traditional chemotherapy may be used but is usually much less effective than newer treatments.

**Early detection:** The best way to detect skin cancer early is to be aware of new or changing skin spots or growths, particularly those that look unusual<sup>4</sup>. Any new lesions, or a progressive change in a lesion's appearance (size, shape, color, new bleeding, etc.), should be evaluated promptly by a clinician. Periodic skin examination, preferably monthly and with the help of a partner for areas that are hard to see, may help identify changes.

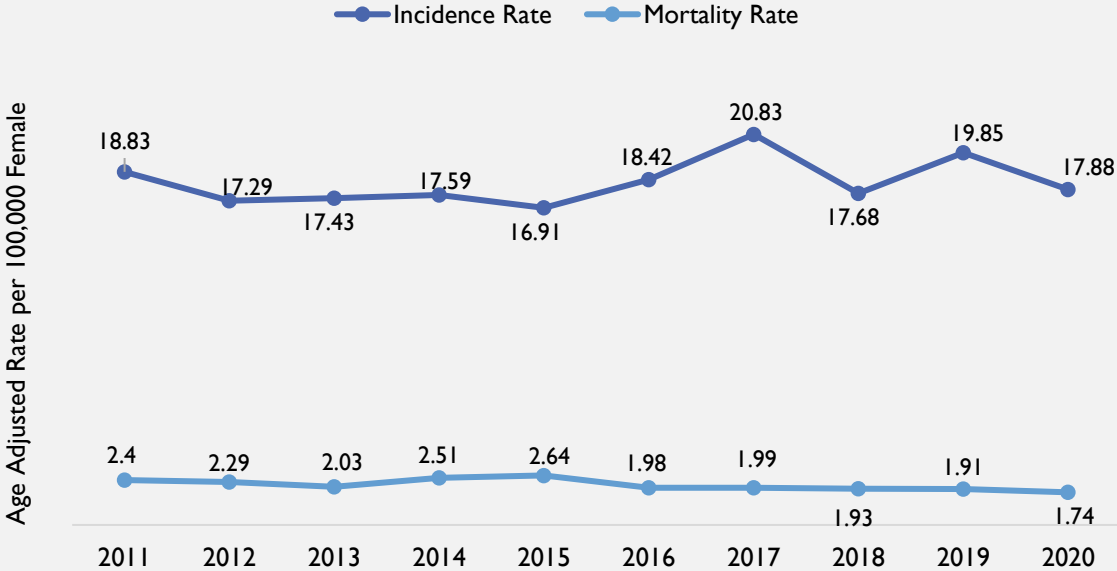
**Prevention:** Most skin cancer cases and deaths are caused by exposure to UV radiation, and thus are potentially preventable. Exposure to intense UV radiation can be minimized by wearing protective clothing (e.g., long sleeves, a wide-brimmed hat, etc.) and sunglasses that block UV rays; avoiding the sun at peak hours; applying broad-spectrum sunscreen that has a sun protection factor (SPF) of at least 30 to unprotected skin as directed; seeking shade; and not sunbathing or tanning indoors. Children and adolescents should be especially protected from excessive sun exposure (and indoor tanning), as severe sunburns early in life may particularly increase the risk of melanoma. Communities can help prevent skin cancer through educational interventions in schools and by providing shade in communities and at schools, recreational sites, and occupational settings.

**Survival:** Melanoma is also highly curable when detected in its earliest stages, it is more likely to spread to other parts of the body. The 5-year relative survival rate for melanoma overall is 94%, ranging from >99% for cases diagnosed at a localized stage (78% of cases) to 32% for distant-stage disease (5% of cases) Distant-stage disease survival has doubled since 2004 (15%) due to major advances in treatment.

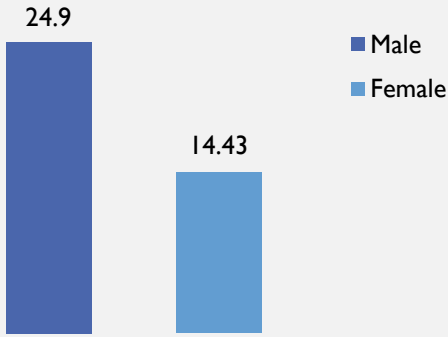
**Incidence trends:** Invasive melanoma incidence trends vary by age and sex; rates among individuals younger than age 50 have stabilized in women and declined by about 1% per year in men since the early 2000s, whereas in adults ages 50 and older, rates continue to increase in women by about 1% per year from 2015 to 2019 but have stabilized in men.

**Mortality trends:** In contrast to incidence, melanoma mortality rates declined rapidly over the past decade (2011 to 2020) because of advances in treatment, by about 5% per year in adults younger than age 50 and 3% per year in those 50 and older.

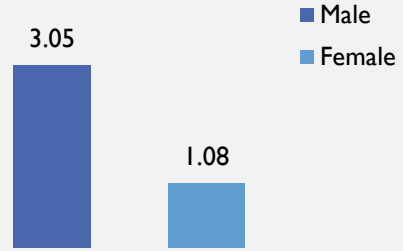
**Incidence and Mortality rates trend for Skin Cancer in MS**



## Skin Cancer: Incidence and Mortality Rates by Gender



Incidence Rate per 100,000 individuals

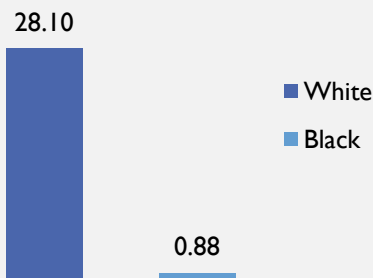


Mortality Rate per 100,000 individuals

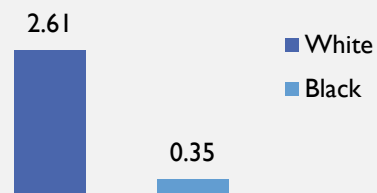
	Male		Female	
	Cases	Rate	Cases	Rate
<b>Incidence</b>	1943	24.90	1266	14.43
<b>Mortality</b>	229	3.05	105	1.08

The incidence rate of skin cancer (melanoma) was high in males with a rate of 24.9 per 100,000 individuals while it was 14.43 per 100,000 individuals in females of Mississippi. The mortality rate was higher in males with a rate of 3.05 per 100,000 individuals as compared to females with a rate of 1.08 per 100,000 individuals.

## Skin Cancer: Incidence and Mortality Rates by Race



Incidence Rate per 100,000 individuals



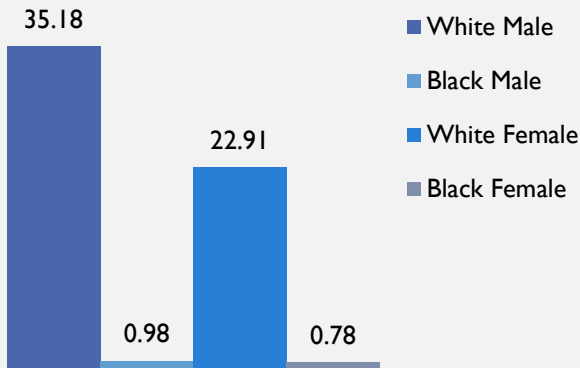
Mortality Rate per 100,000 individuals

Skin cancer showed a higher incidence rate of 28.10 per 100,000 individuals in white individuals than those of 0.88 per 100,000 individuals in black.

Similarly, a higher mortality rate of 2.61 per 100,000 individuals was seen in white individuals as compared to blacks 0.35 per 100,000 individuals.

	White		Black	
	Cases	Rate	Cases	Rate
<b>Incidence</b>	3151	28.10	49	0.88
<b>Mortality</b>	313	2.61	19	0.35

## Skin Cancer: Incidence Rates by Gender and Race



White males had the highest incidence rates of melanoma cancer in 2016-2020 with a rate of 35.18 per 100,000 individuals.

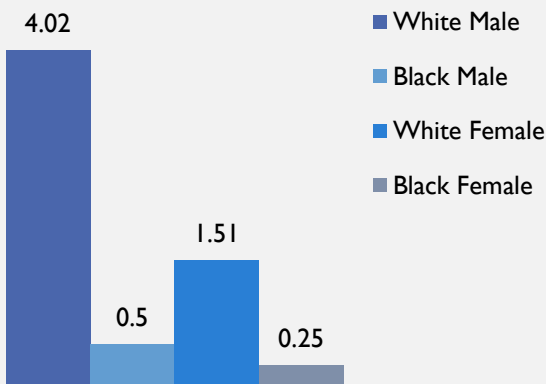
Black females had the lowest skin cancer incidence rates of 0.78 per 100,000 individuals.

### Incidence Rate per 100,000 individuals

Among black individuals, males have a higher incidence rate of 0.98 per 100,000 individuals.

	Male White		Male Black		Female White		Female Black	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
<b>Incidence</b>	1914	35.18	25	0.98	1237	22.91	24	0.78

## Skin Cancer: Mortality Rates by Gender and Race



In 2016-2020, white males had the highest mortality rates for skin cancer with a rate of 4.02 per 100,000 individuals.

Black females had the lowest skin cancer mortality with rates of 0.25 per 100,000 individuals.

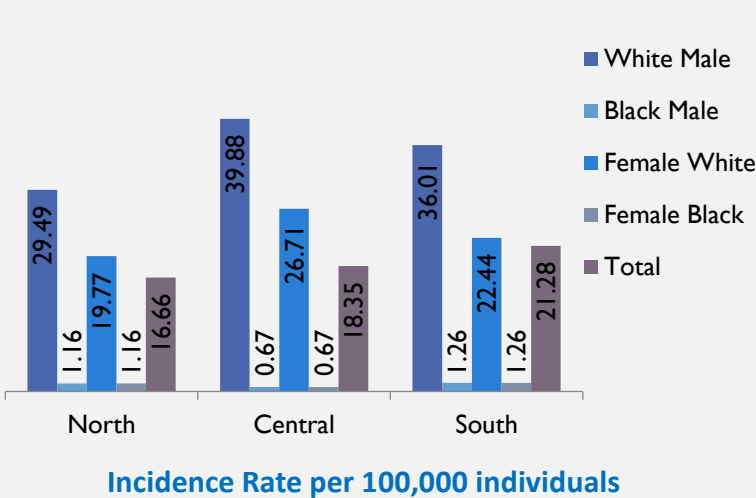
### Mortality Rate per 100,000 individuals

Among blacks, males have a higher mortality rate (0.5 per 100,000) than females (0.25 per 100,000 individuals).

	Male White		Male Black		Female White		Female Black	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
<b>Mortality</b>	216	4.02	11	0.50	97	1.51	8	0.25

A min of 15 cases are required to calculate a stable age-adjusted rate.

## Skin Cancer: Incidence Rates by Public Health District



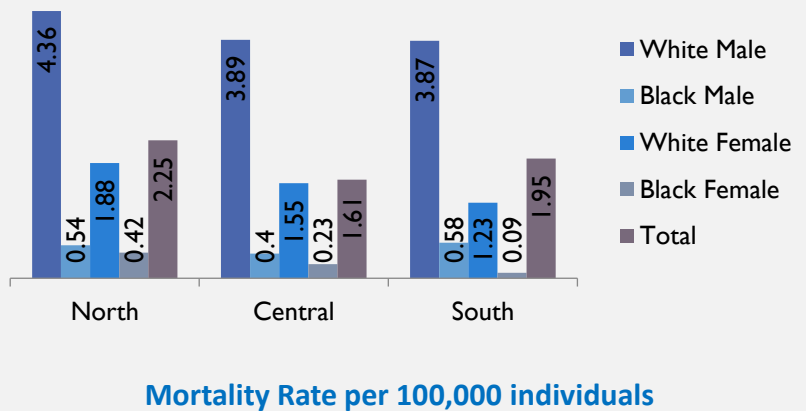
White males in the central district have shown the highest skin cancer incidence rate of 39.88 per 100,000 individuals while black females in the central district showed the lowest incidence rate of 0.67 per 100,000 individuals. For all three districts, white males showed higher incidence rates while black females showed lower incidence rates. White males had a higher incidence rate as compared to white females. The total incidence rate for skin cancer was higher in the south district.

Public Health District	Male White		Male Black		Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
North	500	29.49	9	1.16	328	19.77	9	1.16	848	16.66
Central	675	39.88	8	0.67	448	26.71	8	0.67	1147	18.35
South	737	36.01	8	1.26	461	22.44	8	1.26	1212	21.28

A min of 15 cases are required to calculate a stable age-adjusted rate.

## Skin Cancer: Mortality Rates by Public Health District

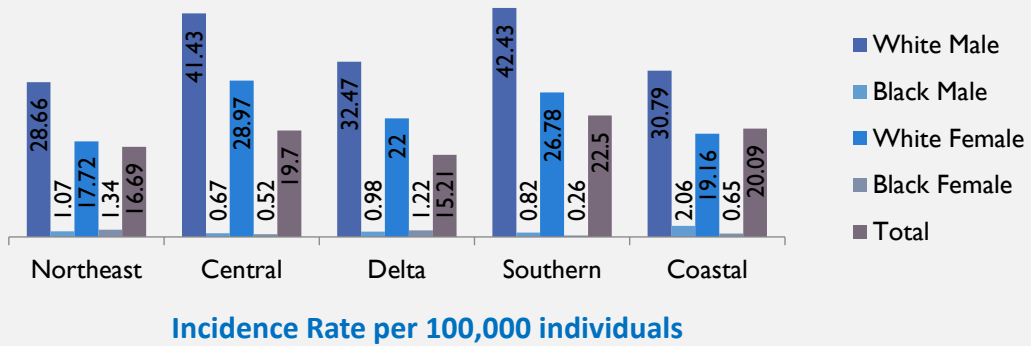
White males had higher mortality rates and black females had lower Mortality rates for melanoma, in all public health districts. Among the white race, females have low mortality rates as compared to white males. White males in the north district have the highest mortality rate of 4.36 per 100,000 individuals while black females in the south district have the lowest mortality rate of 0.09 per 100,000 individuals.



Public Health District	Male White		Male Black		Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
North	73	4.36	<5	0.54	38	1.88	<5	0.42	120	2.25
Central	65	3.89	<5	0.42	29	1.55	<5	0.23	101	1.61
South	78	3.87	<5	0.58	30	1.23	<5	0.09	113	1.95

A min of 15 cases are required to calculate a stable age-adjusted rate.

## Skin Cancer: Incidence Rates by Cancer Coalition Region

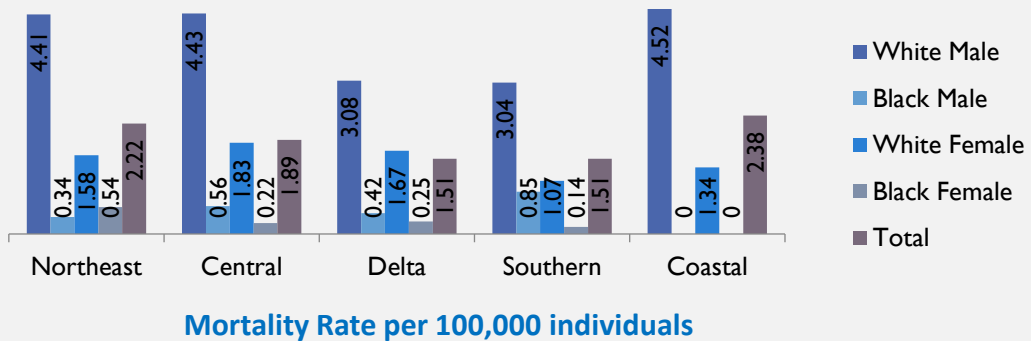


Cancer Coalition Areas	White Male		Black Male		Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Northeast	352	28.66	5	1.07	221	17.72	7	1.34	586	16.69
Central	568	41.43	6	0.67	389	28.97	6	0.52	973	19.70
Delta	255	32.47	6	0.98	166	22.00	8	1.22	436	15.21
Southern	383	42.43	-	0.82	242	16.78	-	0.26	630	22.5
Coastal	354	30.79	-	2.06	219	19.16	-	0.65	582	20.09

A min of 15 cases are required to calculate a stable age-adjusted rate.

Southern cancer coalition area have reported the highest Incidence rate of 22.09 per 100,000 individuals while; Delta cancer coalition region have shown the lowest incidence rate of 15.21 per 100,000 individuals. Overall, white males of all cancer coalition areas reported higher skin cancer incidence and black females have shown the lowest incidence rate in all of them.

## Skin Cancer: Mortality Rates by Cancer Coalition Region

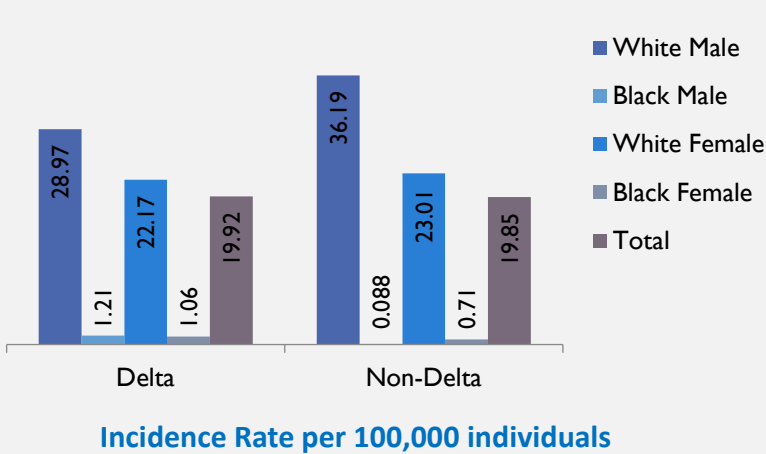


Cancer Coalition Areas	White Male		Black Male		Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Northeast	54	4.41	<5	0.34	23	1.58	<5	0.54	82	2.22
Central	59	4.43	<5	0.56	28	1.83	<5	0.22	93	1.89
Delta	25	3.08	<5	0.42	16	1.67	<5	0.25	46	1.51
Southern	26	3.04	<5	0.85	13	1.07	<5	0.21	43	1.51
Coastal	52	4.52	0	0.00	17	1.34	0	0.00	70	2.38

A min of 15 cases are required to calculate a stable age-adjusted rate.

The highest skin cancer mortality was seen among white males of the coastal cancer coalition region with a rate of 4.52 per 100,000 individuals. The central region showed no mortalities among black females and black males with no cases reported. Except for the coastal coalition region, all cancer regions showed lower mortality among black females. All regions except the central region showed lower mortality rates for white females. The total mortality rate was seen higher in coastal regions.

## Skin Cancer: Incidence Rates by Delta vs. Non-Delta



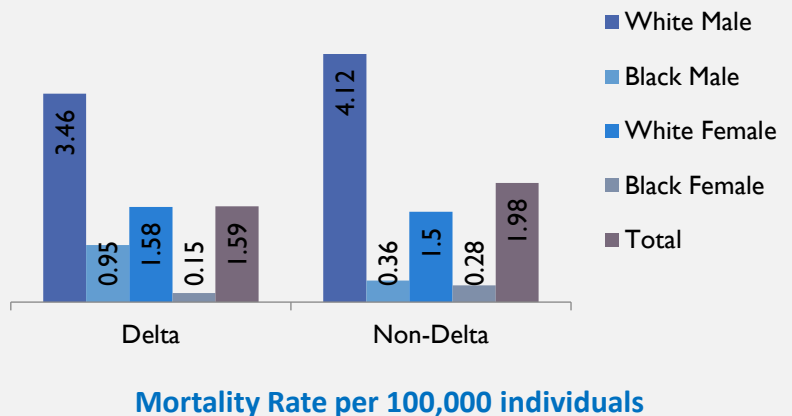
White males of the non-delta Region have shown a higher skin cancer incidence rate of 36.19 per 100,000 individuals. Black females of the non-delta region have shown a lower incidence rate of 0.71 per 100,000 individuals. The total incidence rate of skin cancer for the non-delta region was higher than the delta region.

Delta/ Non-Delta Region	Male White		Male Black		Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
<b>Delta</b>	231	28.97	7	1.21	167	22.17	7	1.06	413	13.92
<b>Non-Delta</b>	1681	36.19	18	0.88	1070	23.01	17	0.71	2794	19.85

A min of 15 cases are required to calculate a stable age-adjusted rate.

## Skin Cancer: Mortality Rates by Delta vs. Non-Delta

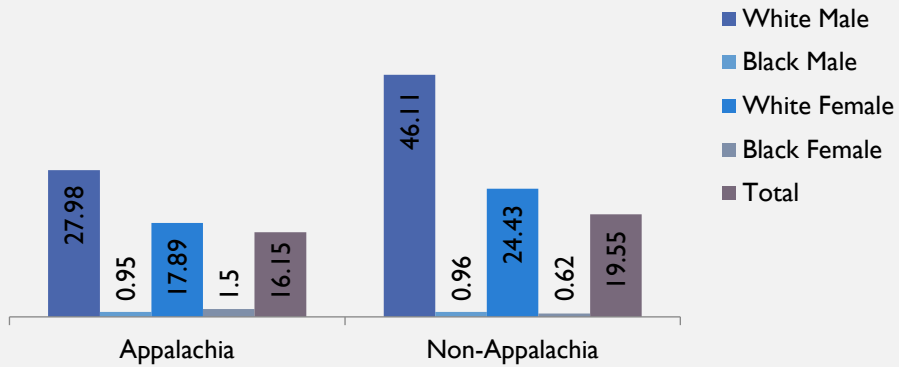
White males have shown a higher mortality rate of 4.12 per 100,000 individuals in the non-delta region while black females of the delta region have shown a lower Mortality rate of 0.15 per 100,000 individuals. Among the white population, males have higher mortality rates than females. Non-delta region have higher total mortality rates for gender and race variables, than the delta region.



Delta/ Non-Delta Region	Male White		Male Black		Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
<b>Delta</b>	27	3.46	<5	0.95	14	1.58	<5	0.15	47	1.59
<b>Non-Delta</b>	189	4.12	7	0.36	83	1.50	7	0.28	287	1.98

A min of 15 cases are required to calculate a stable age-adjusted rate.

## Skin Cancer: Incidence Rates by Appalachian vs. Non-Appalachian



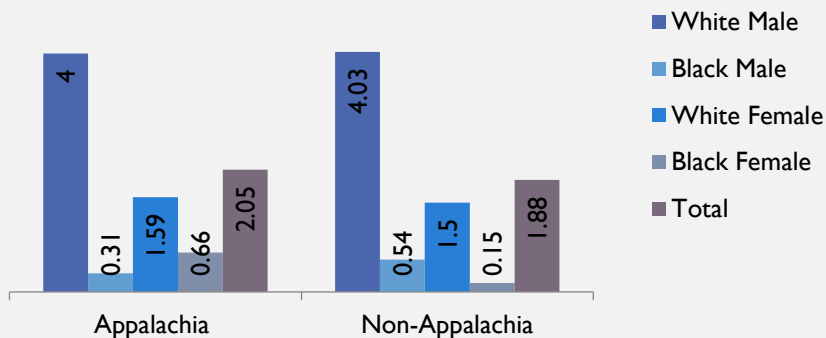
Incidence Rate per 100,000 individuals

Region	Male White		Male Black		Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Appalachian Region	351	27.98	5	0.95	225	17.89	9	1.5	591	16.15
Non-Appalachian Region	1561	46.11	20	0.96	1012	24.43	15	0.62	2616	19.55

A min of 15 cases are required to calculate a stable age-adjusted rate.

A higher skin cancer incidence rate of 46.11 per 100,000 individuals was seen in white males of the Non-Appalachian region while a lower incidence rate of 0.62 per 100,000 individuals was reported in black females of the Non-Appalachian region. Overall, a similar pattern of distribution of incidence rate is seen among gender and race of both Appalachian and Non-Appalachian regions with higher rates in Non-Appalachian. The total incidence of Skin(Melanoma) Cancer was seen higher in the Non-Appalachian region (19.55 per 100,000).

## Skin Cancer: Mortality Rates by Appalachian vs. Non-Appalachian



Mortality Rate per 100,000 individuals

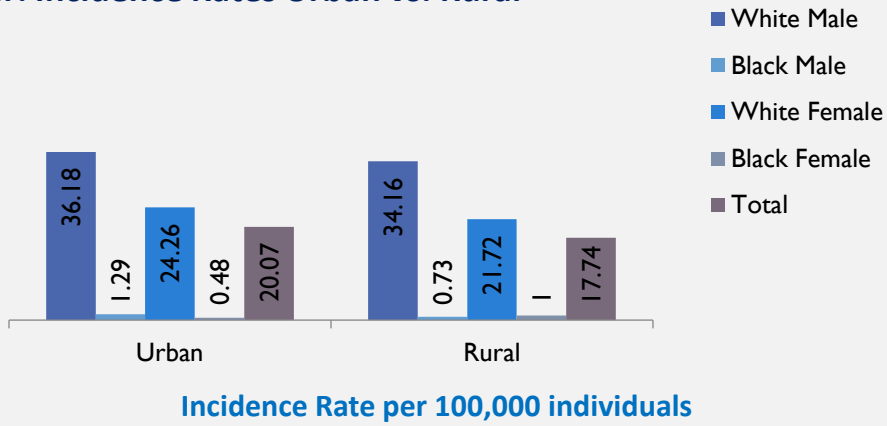
Region	Male White		Male Black		Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Appalachian Region	51	4.00	<5	0.31	23	1.59	<5	0.66	80	2.05
Non-Appalachian Region	165	4.03	9	0.54	74	1.50	<5	0.15	254	1.88

A min of 15 cases are required to calculate a stable age-adjusted rate.

The highest skin cancer Mortality rate of 4.03 per 100,000 individuals was seen among white males of the Non-Appalachian region while the lowest mortality rate of 0.15 per 100,000 individuals was reported in black females of the Non-Appalachian region. Among white individuals, males have shown higher mortality rates than females. Overall, the total mortality was higher in Non-Appalachian region.



## Skin Cancer: Incidence Rates Urban vs. Rural

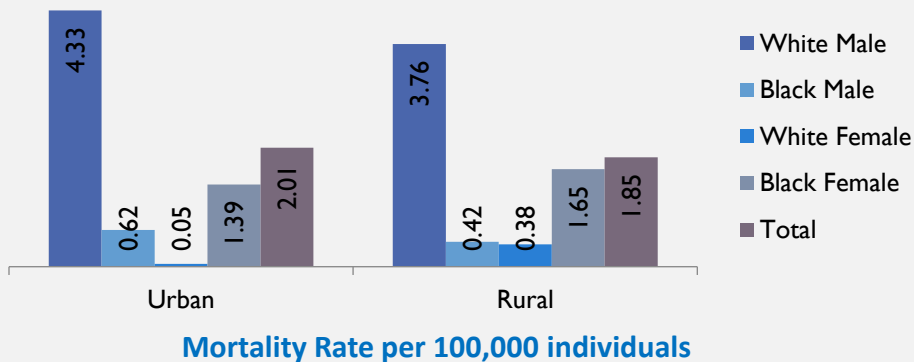


Region	Male White		Male Black		Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Urban	908	36.18	14	1.29	610	24.26	6	0.48	1544	20.07
Rural	1004	34.16	11	.73	627	21.72	18	1.00	1663	17.74

A min of 15 cases are required to calculate a stable age-adjusted rate.

For skin cancer, white males in the urban region have shown a higher incidence rate of 36.18 per 100,000 individuals while black males in the urban region have shown a lower incidence rate of 0.5 per 100,000 individuals. Among the white individuals, males have higher Incidence rates than females. The total Incidence rate in rural regions was lower than that of urban region.

## Skin Cancer: Mortality Rates Urban vs. Rural



Region	Male White		Male Black		Female White		Female Black		Total	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Urban	106	4.33	6	0.62	<5	0.05	43	1.39	157	2.01
Rural	110	3.76	5	0.42	7	0.38	54	1.65	177	1.85

A min of 15 cases are required to calculate a stable age-adjusted rate.

White males in the urban region have shown a higher mortality rate of 4.33 per 100,000 individuals for skin cancer while white females in the urban region have shown a lower mortality rate of 0.06 per 100,000 individuals. Among white individuals, males have high mortality as compared to females. The total mortality rate was seen higher in the urban region as compared to the rural region.

# Summary Tables:

These summary tables present age-adjusted incidence and mortality rates per 100,000 for all cancer types discussed in this document, categorized by gender, race, and the combination of gender and race across various geographical regions in Mississippi, covering the years 2016-2020.

**Note:** Breast cancer is only female breast cancer. Skin cancer is Melanoma of the skin. Since Melanoma is very rare in the black population, it is not included on the spreadsheets.

# Males 2016-2020

	Public Health Districts			Cancer Coalitions					Delta vs. Non-Delta		Urban vs. Rural		Appalachian vs. Non-Appalachian		Mississippi
	North	Central	South	Northeast	Central	Delta	Southern	Coastal	Delta	Non Delta	Urban	Rural	Appalachian	Non Appalachian	
<b>Incidence</b>															
Lung and Bronchus	94.7	85.7	87.9	93.8	86.2	90.7	88.0	87.9	91.5	88.6	85.9	91.8	94.9	87.6	89.2
Colorectal	59.5	51.6	52.6	56.2	50.3	62.1	51.7	53.7	61.7	52.8	50.1	57.7	58.2	53.2	54.3
Prostate	127.8	135.6	129.8	119.1	136.3	140.4	147.6	113.3	137.1	130.1	131.3	131.4	121.6	134.0	131.4
Melanoma (Skin)	21.8	24.3	28.2	22.1	25.7	20.4	30.4	26.1	17.7	26.4	26.2	23.8	21.1	25.9	24.9
All Cancer	545.1	526.9	540.3	536.8	526.9	546.3	548.2	533.5	535.5	537.1	532.3	541.4	543.9	535.3	537.1
<b>Mortality</b>															
Lung and Bronchus	73.6	64.1	64.3	74.0	61.6	72.8	61.1	67.5	75.0	65.4	63.8	69.7	74.8	64.8	67.0
Colorectal	24.1	21.8	20.3	22.6	20.4	27.3	20.2	20.5	26.2	21.1	19.3	24.1	24.4	21.3	22.0
Prostate	26.2	25.7	21.1	22.5	24.9	32.0	20.8	21.5	30.3	23.1	23.3	25.0	23.5	24.5	24.2
Melanoma (Skin)	3.5	2.6	3.2	3.5	3.0	2.3	2.4	3.9	2.6	3.1	3.4	2.8	3.1	3.0	3.1
All Cancer	240.1	220.4	219.4	232.8	216.8	246.6	209.0	229.8	245.6	221.9	219.6	231.6	235.7	223.4	226.0

Rates age-adjusted to the 2000 US Standard Million population

# Females 2016-2020

	Public Health Districts			Cancer Coalitions					Delta vs. Non-Delta		Urban vs. Rural		Appalachian vs. Non-Appalachian		Mississippi
	North	Central	South	Northeast	Central	Delta	Southern	Coastal	Delta	Non Delta	Urban	Rural	Appalachian	Non Appalachian	
<b>Incidence</b>															
Breast	126.9	123.5	116.6	124.8	123.2	128.4	119.0	114.3	126.0	121.5	123.2	121.6	124.1	121.9	122.3
Lung and Bronchus	61.0	48.1	58.1	56.9	48.6	59.8	51.7	64.8	58.6	54.6	67.4	54.0	59.3	54.2	55.3
Colorectal	42.0	40.5	37.4	40.1	40.0	44.7	37.8	37.4	43.9	39.1	37.9	41.7	40.1	39.9	40.0
Cervical	8.3	8.2	10.4	7.2	8.1	9.5	9.8	10.9	9.2	8.9	8.8	8.9	7.7	9.2	8.9
Melanoma (Skin)	16.0	14.1	16.0	12.7	15.5	11.7	16.9	15.2	11.4	15.1	15.5	13.5	12.5	15.0	14.4
All Cancer	421.0	404.0	414.4	410.7	404.1	426.2	402.8	427.2	419.4	411.1	417.7	409.3	415.2	411.9	412.5
<b>Mortality</b>															
Female Breast	24.2	24.7	21.4	22.4	23.5	28.7	22.0	20.8	29.2	22.3	22.8	24.1	22.8	23.6	23.5
Lung and Bronchus	39.0	33.4	36.9	34.9	33.1	42.2	35.7	38.3	41.5	35.2	36.8	36.0	36.9	36.1	36.3
Colorectal	14.3	14.2	13.7	14.5	13.6	15.3	12.9	14.6	15.6	13.7	13.5	14.5	13.9	14.1	14.1
Cervical	3.5	3.1	3.5	3.0	3.3	3.6	3.0	3.9	3.1	3.4	3.5	3.2	3.2	3.4	3.3
Melanoma (Skin)	1.4	1.0	1.0	1.3	1.1	1.0	0.8^	1.1	0.9	1.1	1.0	1.2	1.3	1.0	1.1
All Cancer	152.8	143.2	150.6	144.9	138.6	166.6	150.2	151.8	165.3	145.0	146.9	150.4	147.6	148.8	148.5

^ Rates based on less than 15 cases are unstable and should be interpreted with caution.

Rates age-adjusted to the 2000 US Standard Million population

# Whites, 2016-2020

	Public Health Districts			Cancer Coalitions					Delta vs. Non-Delta		Urban vs. Rural		Appalachian vs. Non-Appalachian		
	North	Central	South	Northeast	Central	Delta	Southern	Coastal	Delta	Non Delta	Urban	Rural	Appalachian	Non Appalachian	Mississippi
<b>Incidence</b>															
Female Breast	123.6	119.6	116.3	124.4	120.5	119.0	117.1	115.7	114.5	120.5	121.1	118.3	124.0	118.3	119.6
Lung and Bronchus	78.3	62.5	72.7	75.0	63.0	76.5	67.1	77.6	76.3	70.5	71.0	71.8	77.8	69.4	71.3
Colorectal	45.8	40.8	43.3	45.3	40.1	45.9	41.6	45.0	45.4	42.9	41.1	45.2	46.5	42.3	43.3
Prostate	102.8	106.1	112.5	101.3	107.6	103.4	124.6	103.0	101.0	108.5	109.4	105.8	101.5	109.2	107.4
Cervical	9.3	8.0	10.1	8.2	7.8	11.0	8.5	11.3	10.2	9.1	8.8	9.6	8.7	9.4	9.2
Melanoma (Skin)	23.8	32.2	28.4	22.4	34.1	26.2	33.3	24.4	24.8	28.6	29.4	27.0	22.2	29.9	28.1
All Cancer	468.7	447.6	471.8	462.6	450.1	466.3	459.6	482.7	455.8	464.3	466.9	460.7	469.6	461.3	463.2
<b>Mortality</b>															
Female Breast	21.1	19.2	19.3	18.8	18.6	24.8	18.9	19.7	24.6	19.0	19.5	20.2	19.6	19.9	19.8
Lung and Bronchus	54.8	45.6	50.1	52.7	44.8	55.9	46.8	53.2	56.2	49.2	49.5	51.0	55.3	48.7	50.2
Colorectal	17.0	14.7	16.3	16.7	13.7	18.1	15.3	17.3	17.0	15.8	14.6	17.2	17.4	15.6	16.0
Prostate	18.3	17.7	17.2	18.4	16.8	19.4	14.9	19.3	17.9	17.7	18.1	17.4	18.8	17.4	17.7
Cervical	3.4	2.9	3.2	3.1	3.2	3.4	2.3	3.9	2.5	3.3	3.5	3.0	3.2	3.2	3.2
Melanoma (Skin)	2.9	2.5	2.5	2.8	2.9	2.2	2.0	2.8	2.3	2.7	2.7	2.6	2.6	2.6	2.6
All Cancer	181.5	160.8	177.1	176.7	157.7	186.4	165.7	187.5	185.0	171.4	172.0	175.1	181.4	171.0	173.3

Sex-specific populations used to calculate rates for sex-specific cancers.

Rates age-adjusted to the 2000 US Standard Million population

# Blacks, 2016-2020

	Public Health Districts			Cancer Coalitions					Delta vs. Non-Delta		Urban vs. Rural		Appalachian vs. Non-Appalachian		Mississippi
	North	Central	South	Northeast	Central	Delta	Southern	Coastal	Delta	Non Delta	Urban	Rural	Appalachian	Non Appalachian	
<b>Incidence</b>															
Female Breast	132.4	128.0	120.4	124.9	126.7	137.4	123.5	114.7	137.5	124.1	128.0	127.1	122.4	128.7	127.4
Lung and Bronchus	69.0	67.2	65.9	65.8	68.1	69.1	67.8	62.6	68.5	67.1	67.2	67.8	66.8	67.6	67.5
Colorectal	60.7	51.5	49.6	54.2	50.5	62.2	50.9	47.4	61.1	51.3	50.1	56.1	54.1	53.4	53.6
Prostate	195.8	182.0	193.8	174.8	185.5	198.3	204.1	172.9	192.7	187.5	187.4	189.2	178.2	191.1	188.7
Cervical	7.5	8.9	11.2	5.8	8.8	9.2	12.2	9.6	9.3	9.0	9.2	8.7	6.6	9.6	9.1
All Cancer	488.7	469.4	469.2	470.7	467.0	495.6	478.8	454.0	490.8	469.7	471.1	477.9	473.3	475.1	474.8
<b>Mortality</b>															
Female Breast	31.7	31.2	28.5	32.3	29.8	33.3	28.9	28.3	33.9	29.7	30.1	31.3	30.8	30.7	30.7
Lung and Bronchus	52.0	47.7	46.2	47.7	46.2	55.4	47.3	44.0	55.8	46.3	46.6	50.0	47.1	48.9	48.5
Colorectal	23.3	21.6	18.6	22.5	20.5	24.9	18.6	18.6	25.1	20.2	20.3	22.1	22.5	21.1	21.3
Prostate	56.6	41.6	40.3	41.0	41.8	59.2	40.6	39.6	56.0	41.9	41.6	47.4	43.0	45.6	45.1
Cervical	3.7	3.6	3.9	3.0	3.5	4.3	3.9	3.7^	3.9	3.7	3.5	3.7	3.5	3.8	3.7
All Cancer	213.2	196.2	194.3	199.8	191.4	221.7	197.6	188.3	219.5	194.4	193.4	205.8	197.1	201.1	200.3

^ Rates based on less than 15 cases are unstable and should be interpreted with caution.

Sex-specific populations used to calculate rates for sex-specific cancers.

Rates age-adjusted to the 2000 US Standard Million population

# White Males, 2016-2020

	Public Health Districts			Cancer Coalitions					Delta vs. Non-Delta		Urban vs. Rural		Appalachian vs. Non-Appalachian		Mississippi
	North	Central	South	Northeast	Central	Delta	Southern	Coastal	Delta	Non Delta	Urban	Rural	Appalachian	Non Appalachian	
<b>Incidence</b>															
Lung and Bronchus	92.7	85.3	77.1	91.1	77.8	87.8	80.4	89.6	87.8	84.6	82.4	87.3	93.4	82.6	85.1
Colorectal	54.7	44.6	50.2	54.5	43.2	53.2	47.0	53.0	52.3	49.4	46.2	52.9	56.6	47.8	49.8
Prostate	102.8	106.1	112.5	101.3	107.6	103.4	124.6	103.0	101.0	108.5	109.4	105.8	101.5	109.2	107.4
Melanoma (Skin)	29.5	39.9	36.0	28.7	41.4	32.5	42.4	30.8	29.0	36.2	36.2	34.2	28.0	37.3	35.2
All Cancer	526.3	500.5	531.0	523.6	502.3	517.0	525.9	535.8	504.4	522.5	519.5	520.8	531.4	516.7	520.1
<b>Mortality</b>															
Lung and Bronchus	71.1	58.7	63.0	71.4	56.9	68.8	56.4	68.5	70.4	63.1	62.1	66.1	73.7	61.3	64.2
Colorectal	21.3	18.3	19.7	21.3	17.0	22.3	19.8	19.8	21.2	19.5	17.4	21.7	22.7	18.9	19.7
Prostate	18.3	17.7	17.2	18.4	16.8	19.4	14.9	19.3	17.9	17.7	18.1	17.4	18.8	17.4	17.7
Melanoma (Skin)	4.4	3.9	3.9	4.4	4.4	3.1	3.0	4.5	3.5	4.1	4.3	3.8	4.0	4.0	4.0
All Cancer	225.4	200.1	213.8	224.7	197.5	220.4	195.1	229.9	221.1	211.7	210.1	216.0	229.8	208.1	213.1

Rates age-adjusted to the 2000 US Standard Million population

# White Females, 2016-2020

	Public Health Districts			Cancer Coalitions					Delta vs. Non-Delta		Urban vs. Rural		Appalachian vs. Non-Appalachian		
	North	Central	South	Northeast	Central	Delta	Southern	Coastal	Delta	Non Delta	Urban	Rural	Appalachian	Non Appalachian	Mississippi
<b>Incidence</b>															
Female Breast	<b>123.6</b>	<b>119.6</b>	<b>116.3</b>	124.4	120.5	119.0	117.1	115.7	114.5	120.5	<b>121.1</b>	<b>118.3</b>	124.0	118.3	119.6
Lung and Bronchus	<b>67.7</b>	<b>51.5</b>	<b>63.0</b>	63.5	51.6	68.0	57.5	68.0	67.7	59.8	<b>62.3</b>	<b>60.3</b>	66.4	59.4	61.0
Colorectal	<b>38.1</b>	<b>37.1</b>	<b>37.1</b>	37.3	37.1	39.2	36.6	37.8	39.2	37.1	<b>36.4</b>	<b>38.4</b>	37.5	37.4	37.4
Cervical	<b>9.3</b>	<b>8.0</b>	<b>10.1</b>	8.2	7.8	11.0	8.5	11.3	10.2	9.1	<b>8.8</b>	<b>9.6</b>	8.7	9.4	9.2
Melanoma (Skin)	<b>19.8</b>	<b>26.7</b>	<b>22.4</b>	17.7	29.0	22.0	26.8	19.2	22.2	23.0	<b>24.3</b>	<b>21.7</b>	17.9	24.4	22.9
All Cancer	<b>428.4</b>	<b>411.7</b>	<b>427.4</b>	420.6	415.5	429.1	412.2	441.2	421.5	422.9	<b>429.6</b>	<b>417.9</b>	426.0	421.8	422.7
<b>Mortality</b>															
Female Breast	<b>21.1</b>	<b>19.2</b>	<b>19.3</b>	18.8	18.6	24.8	18.9	19.7	24.6	19.0	<b>19.5</b>	<b>20.2</b>	19.6	19.9	19.8
Lung and Bronchus	<b>42.5</b>	<b>35.8</b>	<b>40.1</b>	39.2	35.6	45.5	39.8	40.6	45.1	38.6	<b>39.8</b>	<b>39.6</b>	41.8	38.9	39.5
Colorectal	<b>13.5</b>	<b>11.5</b>	<b>13.4</b>	12.9	11.1	14.6	11.4	15.2	13.4	12.7	<b>12.3</b>	<b>13.4</b>	12.9	12.8	12.8
Cervical	<b>3.4</b>	<b>2.9</b>	<b>3.2</b>	3.1	3.2	3.4	2.3	3.9	2.5	3.3	<b>3.5</b>	<b>3.0</b>	3.2	3.2	3.2
Melanoma (Skin)	<b>1.9</b>	<b>1.6</b>	<b>1.2</b>	1.6	1.8	1.7	1.1^	1.3	1.6^	1.5	<b>1.4</b>	<b>1.7</b>	1.6	1.5	1.5
All Cancer	<b>149.5</b>	<b>131.9</b>	<b>148.7</b>	141.8	128.8	160.7	143.9	153.5	157.3	141.4	<b>143.5</b>	<b>144.6</b>	145.5	143.2	143.7

^ Rates based on less than 15 cases are unstable and should be interpreted with caution.

Rates age-adjusted to the 2000 US Standard Million population



## Black Males, 2016-2020

	Public Health Districts			Cancer Coalitions					Delta vs. Non-Delta		Urban vs. Rural		Appalachian vs. Non-Appalachian		
	North	Central	South	Northeast	Central	Delta	Southern	Coastal	Delta	Non Delta	Urban	Rural	Appalachian	Non Appalachian	Mississippi
	<b>Incidence</b>														
Lung and Bronchus	100.9	100.6	95.9	104.3	102.1	96.1	106.3	75.9	97.8	100.1	96.1	102.2	100.4	99.4	99.7
Colorectal	73.5	63.3	63.7	64.6	62.1	76.8	65.3	60.4	76.6	63.0	62.3	69.0	64.8	66.5	66.2
Prostate	195.8	182.0	193.8	174.8	185.5	198.3	204.1	172.9	192.7	187.5	187.4	189.2	178.2	191.1	188.7
All Cancer	596.6	568.4	579.4	579.5	568.9	594.3	605.6	528.9	588.0	576.1	568.3	586.9	576.4	579.7	577.0
<b>Mortality</b>															
Lung and Bronchus	81.2	73.7	70.3	83.8	70.6	80.6	73.4	64.4	82.6	72.5	69.5	78.8	79.0	74.0	74.9
Colorectal	32.7	27.9	22.8	28.0	26.1	37.0	21.5	24.8	35.0	25.9	25.1	30.1	30.8	27.3	28.0
Prostate	56.6	41.6	40.3	41.0	41.8	59.2	40.6	39.6	56.0	41.9	41.6	47.4	43.0	45.6	45.1
All Cancer	287.7	254.8	246.6	263.3	251.0	295.3	251.5	235.7	290.3	253.1	249.7	270.7	256.6	262.9	261.6

Rates age-adjusted to the 2000 US Standard Million population

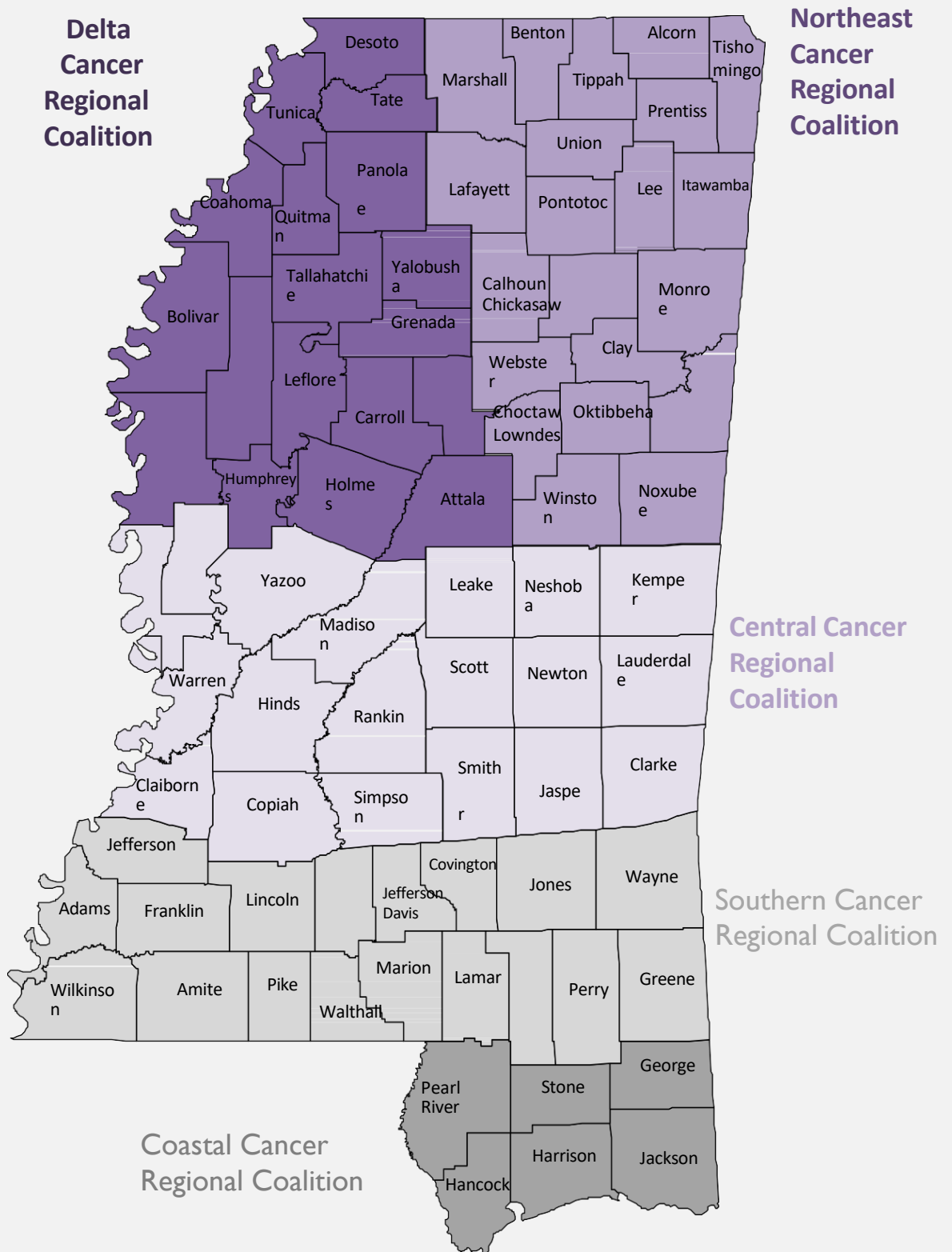
# Black Females, 2016-2020

	Public Health Districts			Cancer Coalitions					Delta vs. Non-Delta		Urban vs. Rural		Appalachian vs. Non-Appalachian		
	North	Central	South	Northeast	Central	Delta	Southern	Coastal	Delta	Non Delta	Urban	Rural	Appalachian	Non Appalachian	Mississippi
<b>Incidence</b>															
Breast	132.4	128.0	120.4	124.9	126.7	137.4	123.5	114.7	137.5	124.1	128.0	127.1	122.4	128.7	127.4
Lung and Bronchus	46.6	43.9	44.0	39.3	44.4	49.8	40.4	52.1	47.5	43.8	46.6	43.5	43.2	45.0	44.7
Colorectal	51.7	43.4	39.3	47.4	42.5	51.9	40.8	37.3	50.2	43.0	41.5	47.0	46.3	44.3	44.7
Cervical	7.5	8.9	11.2	5.8	8.8	9.2	12.2	9.6	9.3	9.0	9.2	8.7	6.6	9.6	9.1
All Cancer	412.9	399.6	388.7	393.7	395.3	426.4	389.9	393.5	422.6	393.8	401.2	401.1	398.4	401.2	400.7
<b>Mortality</b>															
Female Breast	31.7	31.2	28.5	32.3	29.8	33.3	28.9	28.3	33.9	29.7	30.1	31.3	30.8	30.7	30.7
Lung and Bronchus	31.9	29.9	28.4	23.6	29.3	38.1	28.4	28.5	37.1	28.0	30.3	30.0	25.3	31.2	30.1
Colorectal	16.4	17.3	15.6	18.4	16.5	16.6	16.7	13.6	18.4	16.0	16.9	16.4	16.3	16.7	16.6
Cervical	3.7	3.6	3.9	3.0	3.5	4.3	3.9	3.7^	3.9	3.7	3.5	3.7	3.5	3.8	3.7
All Cancer	164.3	158.2	160.6	157.8	152.6	174.5	165.4	153.3	174.3	156.0	156.4	163.7	157.2	161.1	160.4

^ Rates based on less than 15 cases are unstable and should be interpreted with caution.

Rates age-adjusted to the 2000 US Standard Million population

# Mississippi Partnership for Comprehensive Cancer Control (MP3C) Coalition Regional Map



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