



# DEFINING THE BURDEN OF HEART DISEASE AND STROKE IN LOUISIANA

2008



# ACKNOWLEDGEMENTS

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## EXECUTIVE SUMMARY

It is evident that the burden of heart disease and stroke in Louisiana is quite significant. Heart disease and stroke are the leading causes of death in Louisiana, killing more than 13,000 people each year. Although there has been a gradual decrease in the death rates for heart disease and stroke, they remain the first and third causes of death, respectively, in Louisiana. Louisiana has the fifth highest mortality rate for heart disease and the seventh highest mortality rate for stroke in the United States. The social and economic costs to the state must serve as a call to action for citizens to move toward healthier lifestyles

### Key findings of the report:

- Heart disease was the primary cause of death, accounting for 25% (11,008) of all deaths in 2005.
- In 2005, stroke was the third leading cause of death accounting for 6% (2,469) of all deaths.
- One-third (31%) of the deaths in Louisiana were due to CVD in 2005.
- Louisiana had the fifth highest mortality rate for heart disease (252 per 100,000 population) in 2005.
- For 2005, Louisiana had the 7th highest mortality rate for stroke (57 per 100,000 population).
- CVD killed more women (7,554) than men (6,958) in 2005, however the age-adjusted mortality rates were higher in men (395 per 100,000 population) than for women (283 per 100,000 population).
- In 2005, the heart disease mortality rate was highest among African-American men (354.9 per 100,000 population).
- African-American women showed the highest stroke mortality of 78.6 per 100,000 population in 2005.
- In 2007, nearly 1 in 4 (22.1%) adults reported having high blood pressure in Louisiana.
- In 2007, 33.7% of adults reported being diagnosed with high blood cholesterol in Louisiana.
- Prevalence of current smokers was 22.6% for Louisiana in the year 2007.
- Two-thirds (65.2%) of Louisiana adults were overweight or obese in 2007.
- Generally, Louisiana residents who are older, poorer, have lower education or are African-American have higher CVD prevalence, are more prone for risk factors, and are at a higher risk of dying due to cardiovascular disease.
- 81% of Louisiana adults recognized chest pain as a symptom of heart attack in 2007.
- 86% of Louisiana adults recognized numbness or weakness of the arm/leg/face as a symptom of stroke in 2007.
- Cost of cardiovascular disease has increased significantly over the past few years.

# INTRODUCTION

Cardiovascular disease (CVD) is an abnormal function of the heart or blood vessels. It can cause an increase in risk for heart attack, heart failure, sudden death, stroke and cardiac rhythm problems, thus resulting in decreased quality of life and decreased life expectancy.

Cardiovascular disease is defined as all diseases of the heart and blood vessels, including coronary heart disease, cerebrovascular disease (stroke), congestive heart failure, myocardial infarction and rheumatic heart disease. Cardiovascular disease is defined by ICD-10 codes I00-I99.

Cardiovascular disease, principally heart disease and stroke, is the nation's leading killer for both men and women among all racial and ethnic groups.

Almost 1 million Americans die of CVD each year, which adds up to 37% of all deaths.

Causes of cardiovascular disease range from structural defects to infection, inflammation, environment and genetics.

There are multiple risk factors which lead to the development of CVD. Modifiable risk factors are high blood pressure, high blood cholesterol, diabetes, obesity, smoking, physical inactivity, unhealthy food habits and sedentary life style. Non-modifiable risk factors include age, gender, race and family history of cardiovascular disease.

The purpose of this report is to:

- Describe the status of cardiovascular disease along with its two major components [i.e., heart disease (ICD-10 codes I00-09, I11, I13, I20-51) and stroke (ICD-10codes I60-I69)] in Louisiana
- Describe the prevalence of CVD in Louisiana and compare it with the national rates
- Give an overview of the mortality rates over the past 10 years, regional and parish-level data, and the prevalence of CVD risk factors.

The report also discusses the awareness of the signs and symptoms of heart attack and stroke among Louisiana residents.

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## OBJECTIVES

The objectives of this burden report are :

- 1) To describe the leading causes of deaths and the trends of age-adjusted mortality rates in Louisiana associated with heart disease and stroke.
- 2) To describe the trend in prevalence of heart disease and stroke and report the prevalence by age, gender and race in Louisiana.
- 3) To report the health disparities and regional information associated with the burden of heart disease and stroke in Louisiana.
- 4) To provide age-adjusted mortality rates for heart disease and stroke for Louisiana.
- 5) To describe the percentage of adults with access to CVD care and quality of life with CVD in Louisiana.
- 6) To describe the proportion of adults with CVD modifiable risk factors in Louisiana.
- 7) To report the percentage of Louisiana residents who recognize the symptoms of heart attack and stroke.
- 8) To describe the number and cost of hospitalizations due to heart disease and stroke for Louisiana residents.

# DEMOGRAPHICS

**Table 1 : Demographic characteristics of Louisiana, 2006**

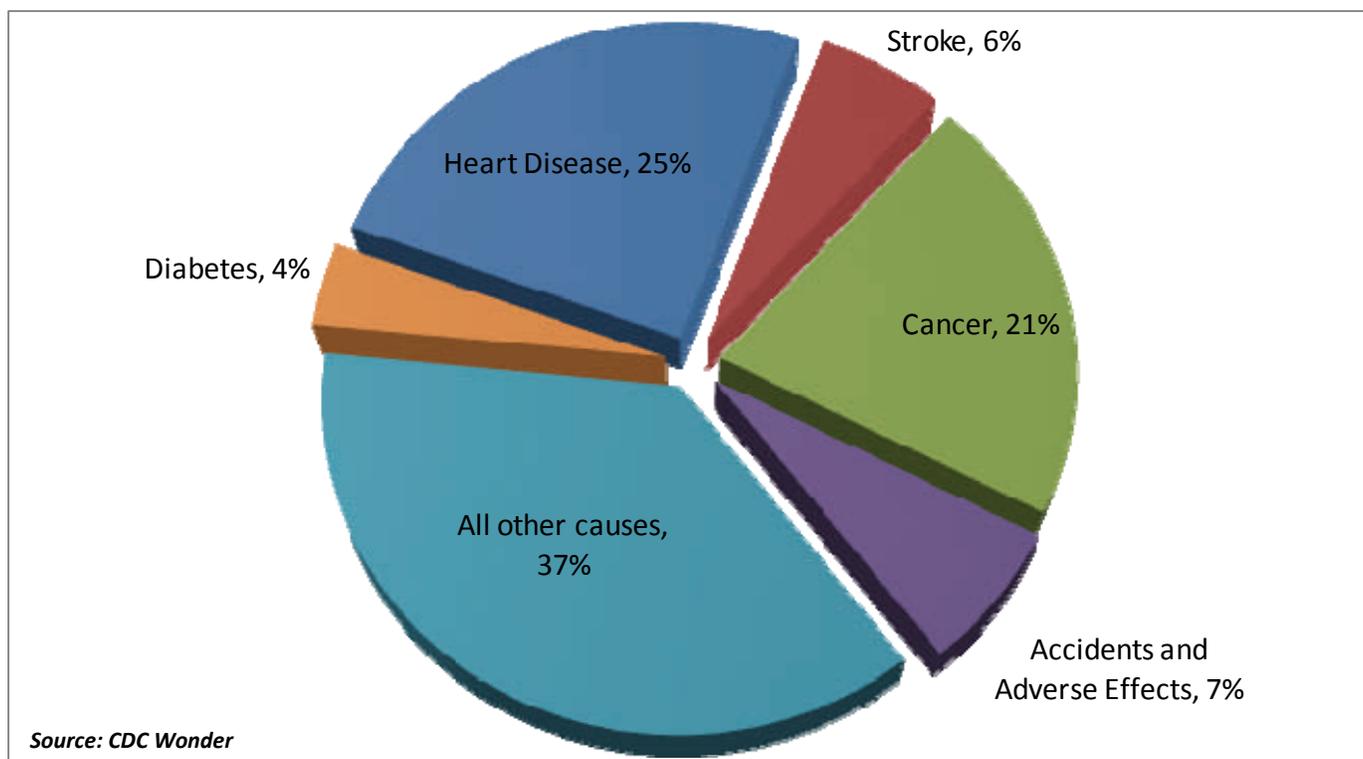
	LA (#)*	LA (%)	U.S.
Total population	4,287,768		299,398,485
Male	2,078,914	48.5%	49.2%
Female	2,208,854	51.5%	50.8%
Median age (years)	35.6		36.4
Under 5 years	301,198	7.0%	6.8%
18 years and over	3,198,771	74.6%	75.4%
65 years and over	522,874	12.2%	12.4%
One race	4,246,242	99.0%	98.0%
White	2,760,233	64.4%	73.9%
Black or African-American	1,356,981	31.6%	12.4%
American Indian or Alaska Native	24,018	0.6%	0.8%
Asian	57,084	1.3%	4.4%
Some other race	47,211	1.1%	6.3%
Two or more races	41,526	1.0%	2.0%
Hispanic or Latino (of any race)	123,281	2.9%	14.8%
High school graduate or higher		79.4%	84.1%
Bachelor's degree or higher		20.3%	27.0%
Civilian veterans (civilian population 18 years and over)	324,880	10.2%	10.4%
Disability status (population 5 years and over)	729,191	18.7%	15.1%
Foreign born	125,204	2.9%	12.5%
Male, married, except separated (population 15 years and over)	811,237	50.0%	52.4%
Female, married, except separated (population 15 years and over)	793,075	45.0%	48.4%
Speak a language other than English at home (population 5 years and over)	336,509	8.4%	19.7%

Source: U.S. Census Bureau, 2006

\*Numbers estimated

## LEADING CAUSES OF DEATH

Figure 1: Leading causes of death in Louisiana, 2005

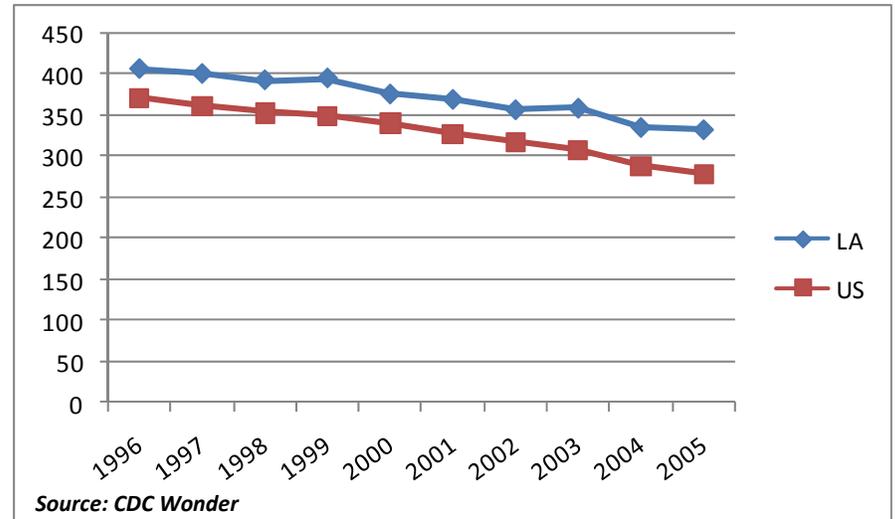


- Cardiovascular disease is the leading cause of death and disability both in Louisiana and the United States.
- Heart disease is the primary cause of death in Louisiana and kills over 10,000 residents each year. One out of every four deaths in Louisiana is due to heart disease. Death rates from heart disease in Louisiana have decreased gradually over the past five years, but are consistently higher than the national average.
- 25% of the deaths in Louisiana were due to heart disease and 6% were due to stroke in 2005.
- Stroke is the third leading cause of death, killing more than 2,000 people each year.
- The age-adjusted mortality rate for heart disease in Louisiana was 252 per 100,000 population in 2005, accounting for 11,008 deaths .
- The age-adjusted mortality rate for stroke was 57 per 100,000 population in 2005, accounting for 2,469 deaths in Louisiana.

# CARDIOVASCULAR DISEASE

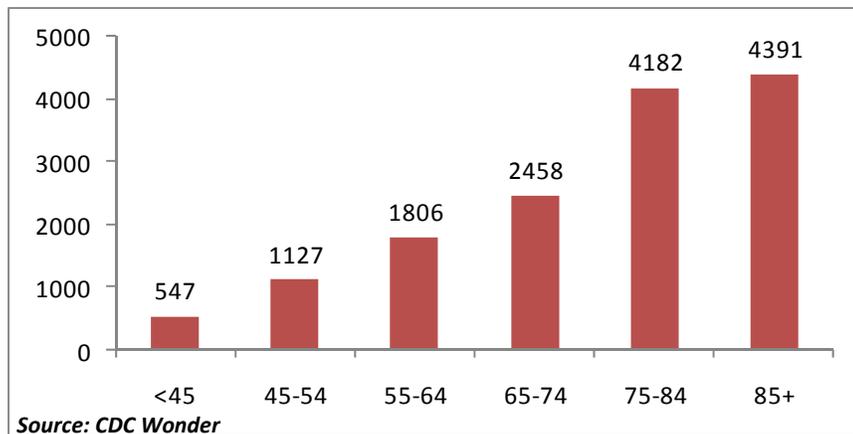
Cardiovascular Disease (CVD) includes dysfunctional conditions of the heart, arteries, and veins that supply oxygen to vital life-sustaining areas of the body like the brain, the heart itself, and other vital organs. If oxygen does not arrive, the tissue or organ will die. Cardiovascular disease is the leading cause of death and disability in the United States and Louisiana. About one-third (34%) of adult Americans have some form of CVD.

**Figure 2 : Age-adjusted death rate for Cardiovascular disease, LA and US, 1996-2005**

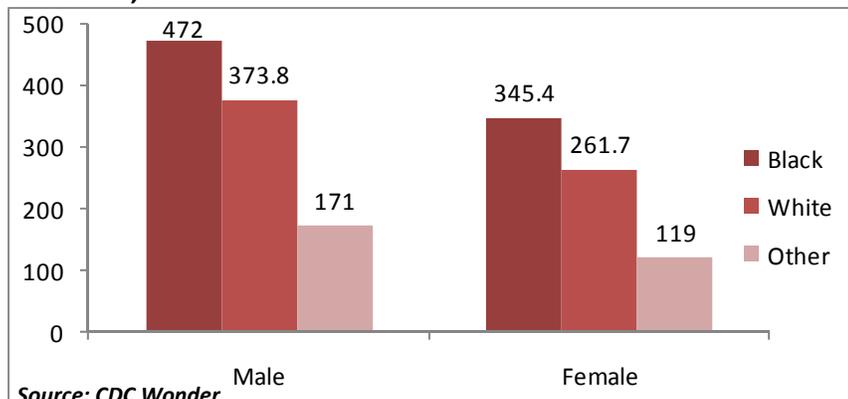


- CVD age-adjusted death rates in Louisiana exceeded the comparable rates for the US over the past 10 years.

**Figure 3 : Cardiovascular deaths by age group, Louisiana, 2005**



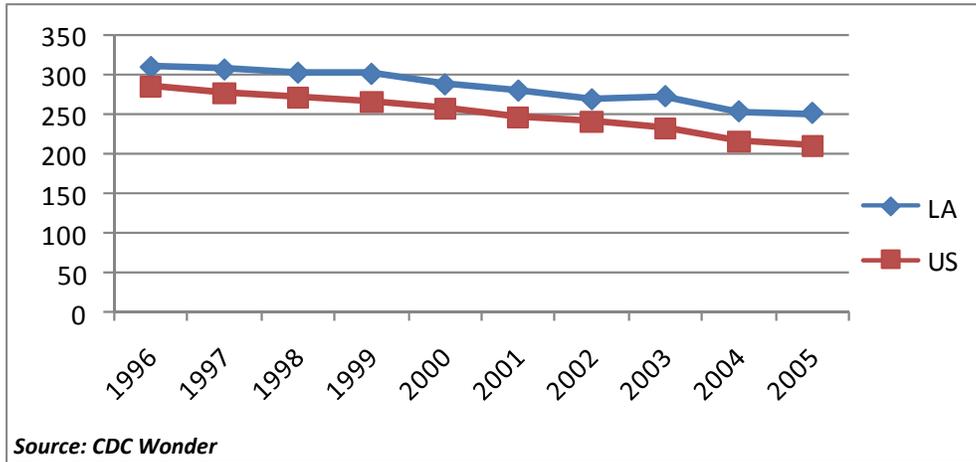
**Figure 4 : Age-adjusted death rates for CVD by gender and race, Louisiana, 2005**



- CVD age-adjusted mortality has declined gradually in the US (25% decrease) and in LA (18% decrease) since 1996.
- In 2005, the age-adjusted death rate for LA was 332.4 per 100,000 population (Fig.2).
- Age is a non-modifiable risk factor for CVD. The number of CVD deaths increases as age increases.
- Deaths from CVD occurred more often in those over the age of 75 years.
- One out of four deaths from CVD occurred in those below the age of 65 in 2005. (Fig.3)
- In 2005, the age-adjusted death rate was highest among black males (472/100,000 population).
- Males' risk of dying due to CVD was 1.4 times higher than females in 2005 (Fig.4).

# HEART DISEASE

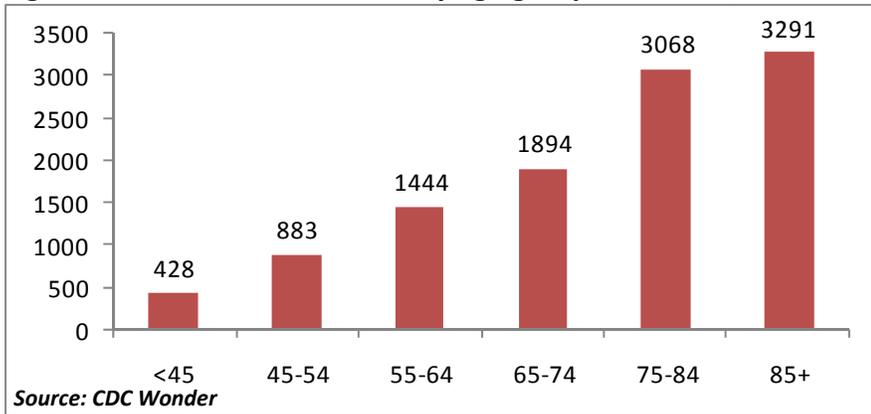
**Figure 5 : Age-adjusted death rate for Heart Disease, LA and US, 1996-2005**



Heart disease is a grouping of various conditions of the heart like coronary heart disease, congestive heart failure, heart attack, etc. It is the leading cause of death for both men and women. Over 600,000 people die of heart disease each year in the United States. The most common heart disease in the United States is coronary heart disease, which can lead to heart attack.

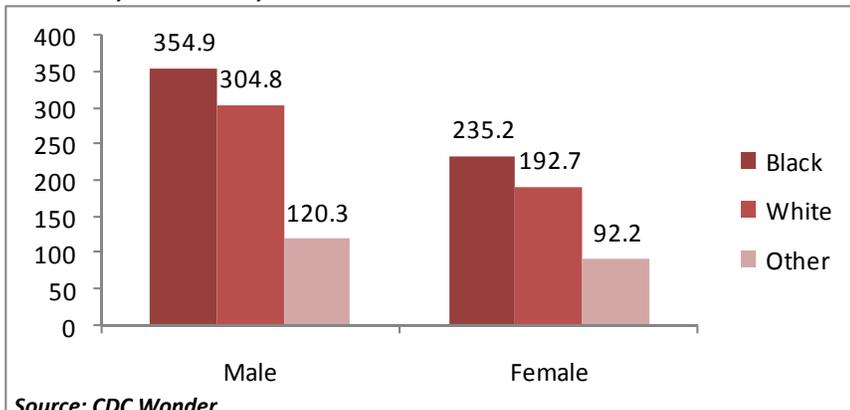
- In 2005, the age-adjusted mortality rate for heart disease was 251.7 per 100,000 population in Louisiana and 211.1 per 100,000 population in the US.
- Death rates were consistently higher for the state of Louisiana from 1996 to 2005 compared to national rates (Fig.5).

**Figure 6 : Heart Disease deaths by age group, Louisiana, 2005**



- Deaths from heart disease increased with the increase in age group.
- A total of 11,008 people died from heart disease in Louisiana during 2005.
- 25% of the deaths occurred in those below the age of 65 years (Fig.6).

**Figure 7 : Age-adjusted death rates for Heart Disease by gender and race, Louisiana, 2005**

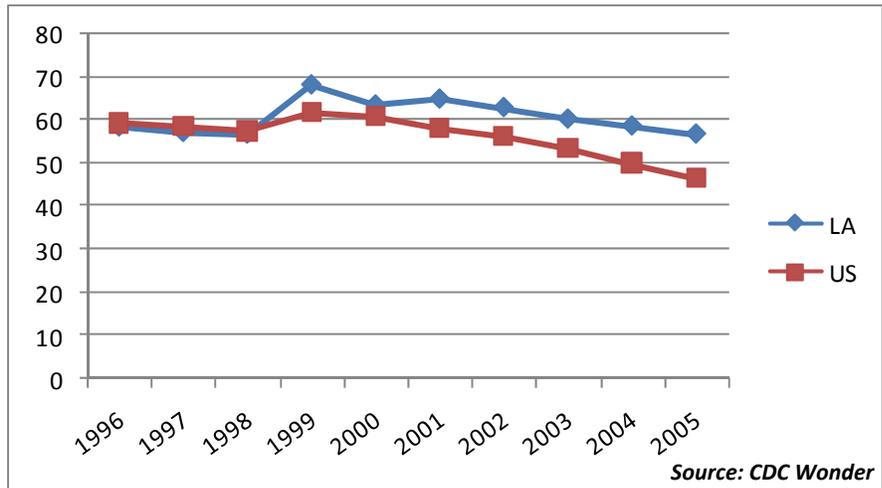


- In 2005, the age-adjusted mortality rate for heart disease was highest among black males with a rate of 354.9 per 100,000 population.
- Risk of death from heart disease was higher among males (Fig.7).

# STROKE

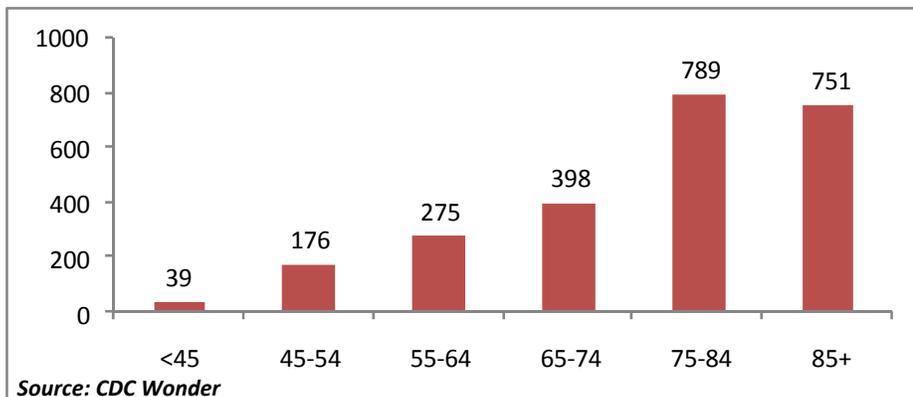
A stroke, or cerebrovascular accident (CVA), occurs when blood supply to part of the brain is disrupted, causing brain cells to die. When blood flow to the brain is impaired, oxygen and glucose cannot be delivered to the brain. There are two forms of stroke: ischemic - blockage of a blood vessel supplying the brain, and hemorrhagic - bleeding into or around the brain. The blockage of an artery in the brain by a clot (thrombosis) is the most common cause of a stroke.

**Figure 8 : Age-adjusted death rate for Stroke, LA and US, 1996-2005**



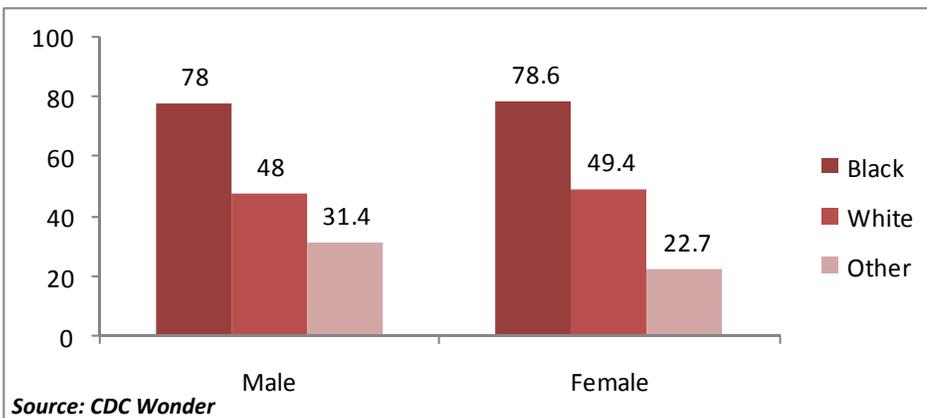
- Stroke mortality rate has declined over the past few years both in Louisiana and the US.
- In 2005, Louisiana’s rate was 17% above the national median rate.
- Age-adjusted mortality rates were 56.7 per 100,000 population for Louisiana and 46.6 per 100,000 population for the US in 2005. (Fig.8 )

**Figure 9 : Stroke deaths by age group, Louisiana, 2005**



- Deaths from stroke occurred more often in those over the age of 65.
- 2,428 deaths occurred from stroke in 2005.
- 17% of the stroke deaths occurred in those below the age of 65 (Fig.9 ).

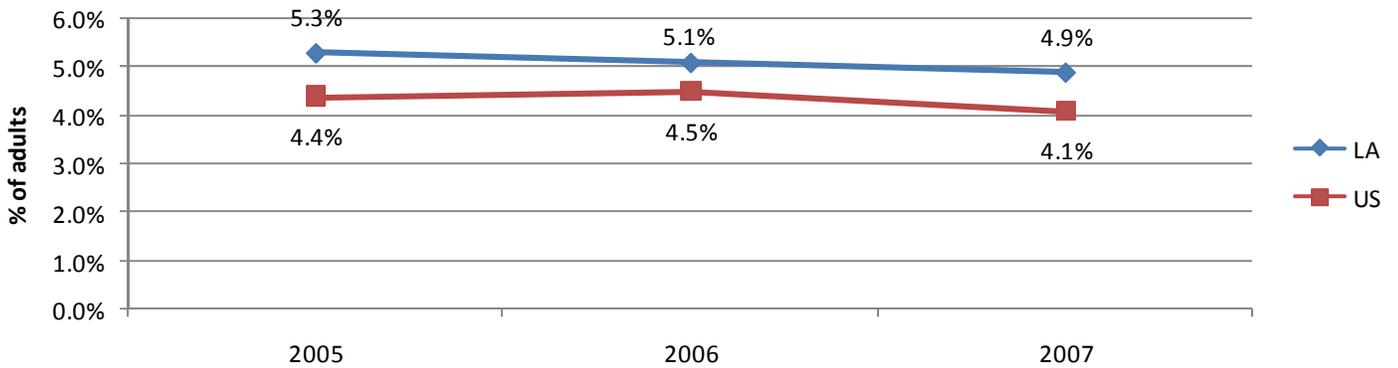
**Figure 10 : Age-adjusted death rates for Stroke by gender and race, Louisiana, 2005**



- In 2005, black females showed the highest stroke death rate of 78.6 per 100,000 population followed by black males with the rate of 78 per 100,000 .
- For stroke, race is a better predictor of death than gender. (Fig.10 )

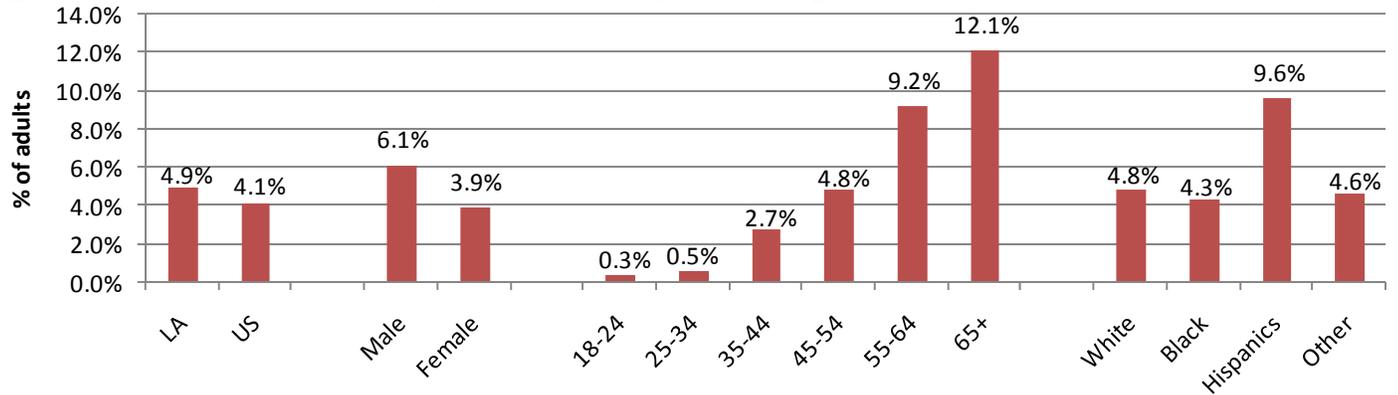
# PREVALENCE OF CORONARY HEART DISEASE

**Figure 11 : Prevalence of Coronary Heart Disease, LA and US, 2005 - 2007**



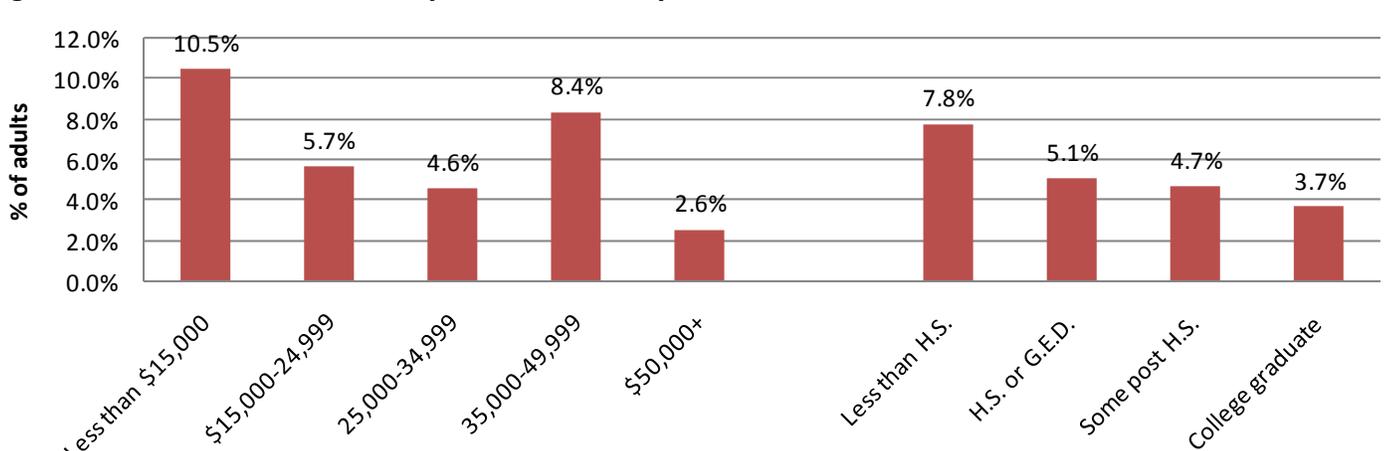
Source : BRFSS

**Figure 12 : Prevalence of Coronary Heart Disease by Gender, Age and Race, LA, 2007**



Source : BRFSS

**Figure 13 : Prevalence of Coronary Heart Disease by Income and Education, LA, 2007**

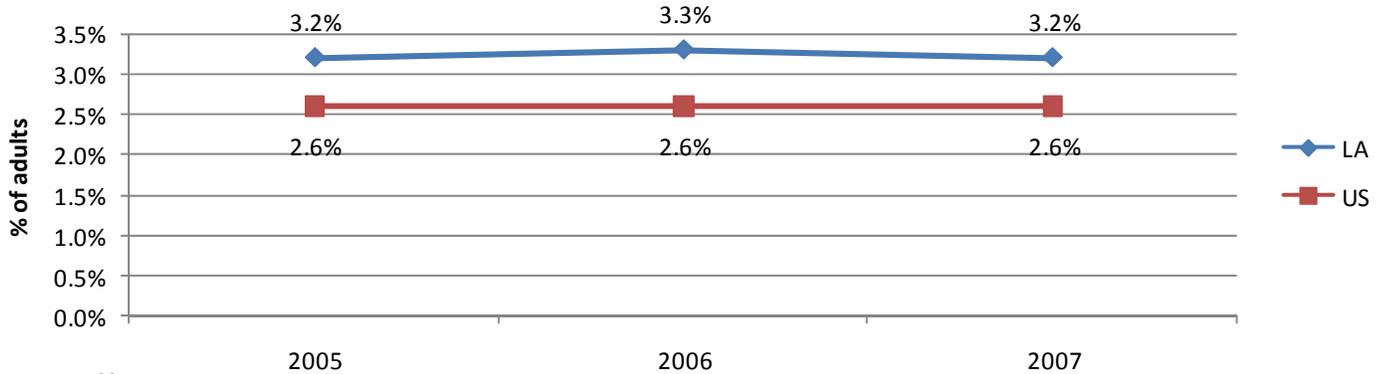


Source : BRFSS

- In 2007, the prevalence of heart disease was slightly higher in Louisiana compared to the US.
- The risk of developing heart disease was 1.5 times higher for males than females.
- Among race/ethnic groups, Hispanics and whites showed a significantly higher risk compared to blacks and others.
- Heart disease prevalence showed a significant increase with increase in age.
- Overall, the higher the income and education level, the lower the prevalence of heart disease.

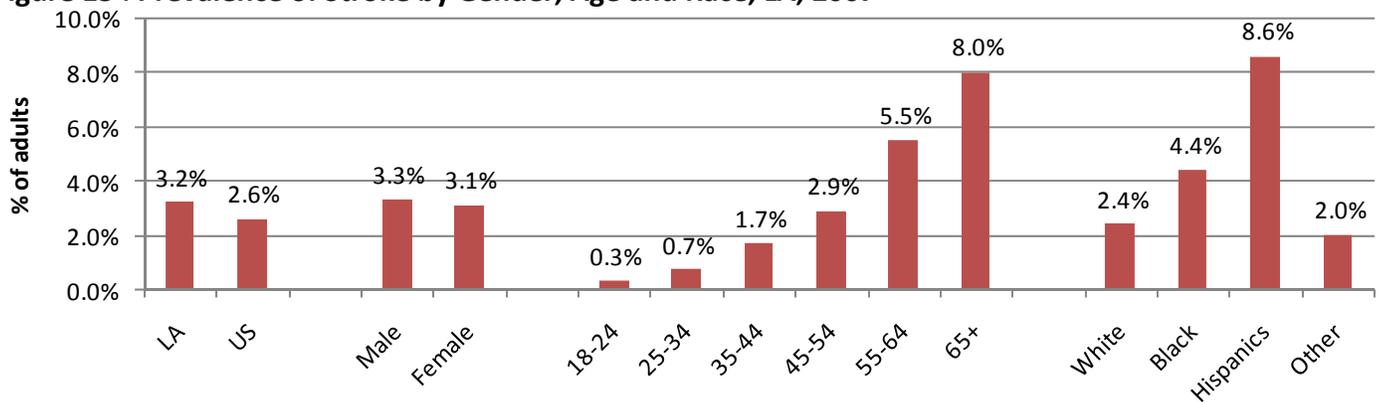
# PREVALENCE OF STROKE

**Figure 14 : Prevalence of Stroke, LA and US, 2005 - 2007**



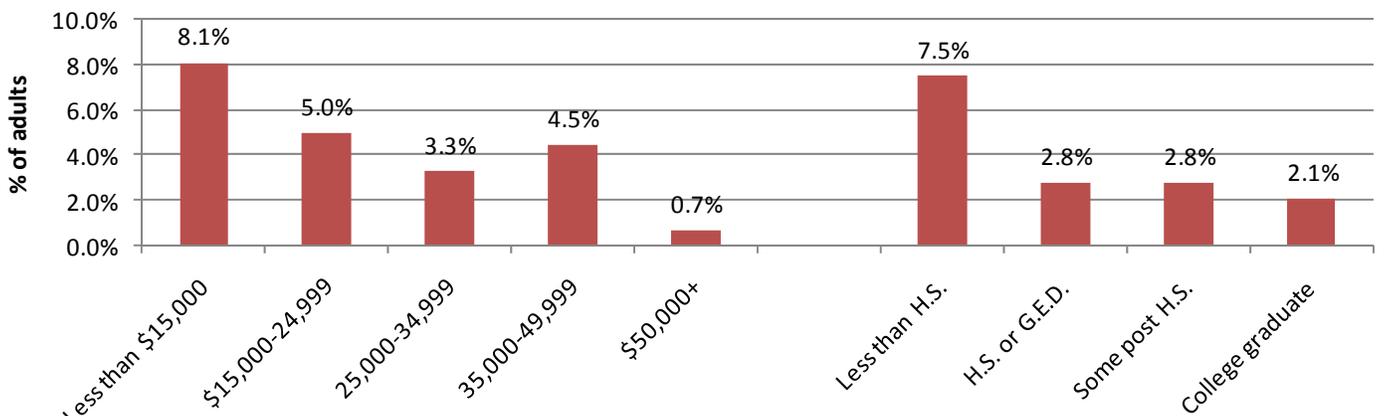
Source : BRFSS

**Figure 15 : Prevalence of Stroke by Gender, Age and Race, LA, 2007**



Source : BRFSS

**Figure 16 : Prevalence of Stroke by Income and Education, LA, 2007**

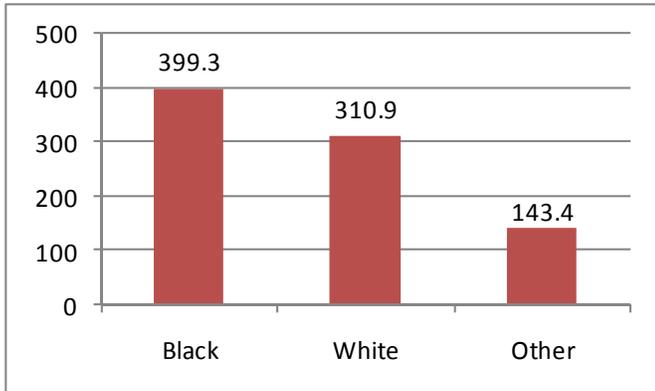


Source : BRFSS

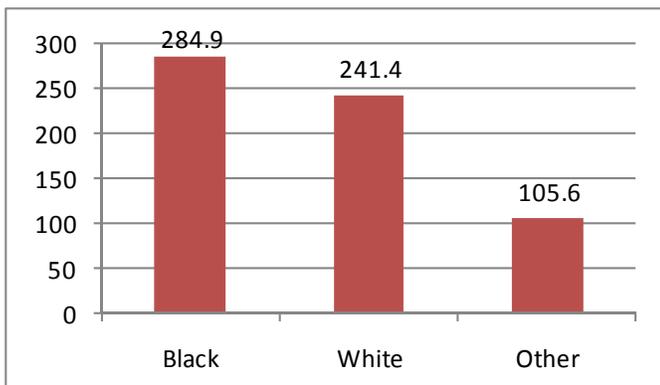
- The prevalence of stroke in Louisiana has remained consistently higher than the US from 2005 to 2007.
- Males had a similar prevalence rate of stroke compared to females.
- Among race/ethnic groups, Hispanics and blacks showed a significant increase compared to whites and others.
- Increase in age showed a significant increase of stroke prevalence, particularly after the age of 65.
- Lower income and lower education is highly associated with an increased risk of stroke.

# HEALTH DISPARITIES

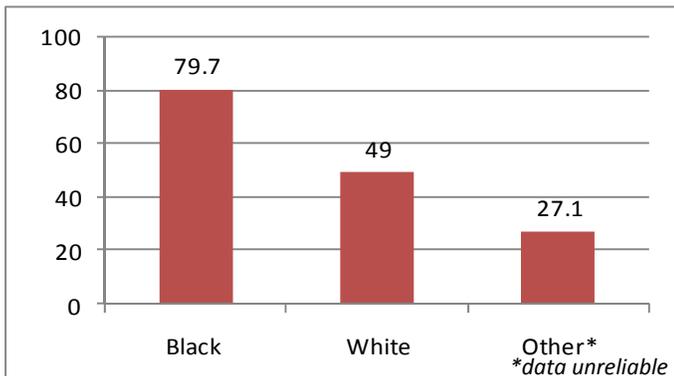
**Figure 17: Age-adjusted death rates for CVD by race, Louisiana, 2005**



**Figure 18: Age-adjusted death rates for HD by race, Louisiana, 2005**

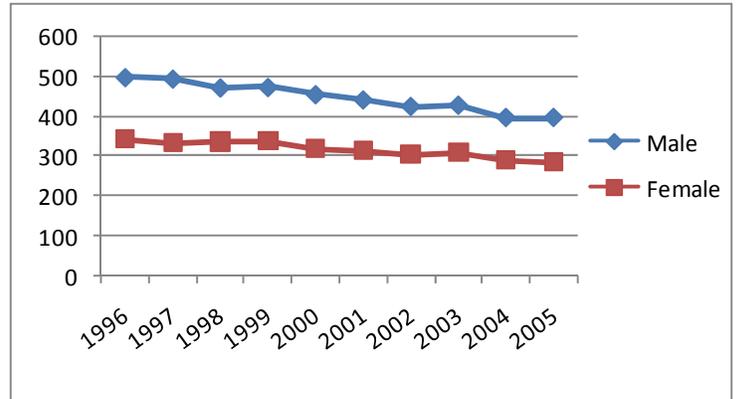


**Figure 19: Age-adjusted death rates for stroke by race, Louisiana, 2005**

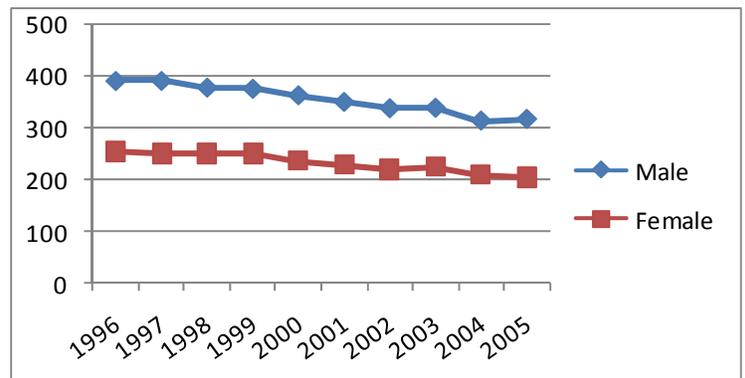


Source: CDC Wonder

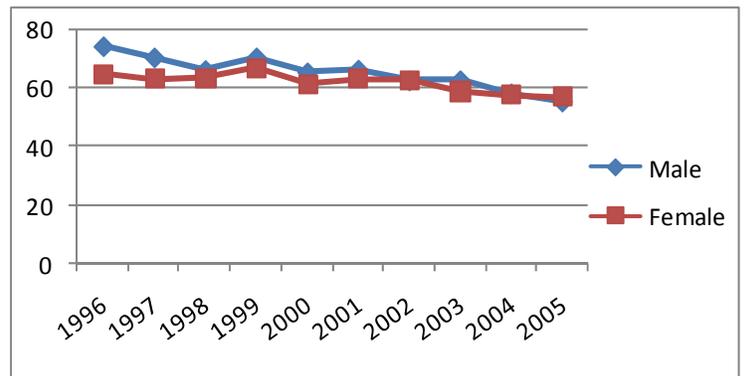
**Figure 20: Age-adjusted death rate for CVD by gender, Louisiana, 1996-2005**



**Figure 21: Age-adjusted death rate for HD by gender, Louisiana, 1996-2005**

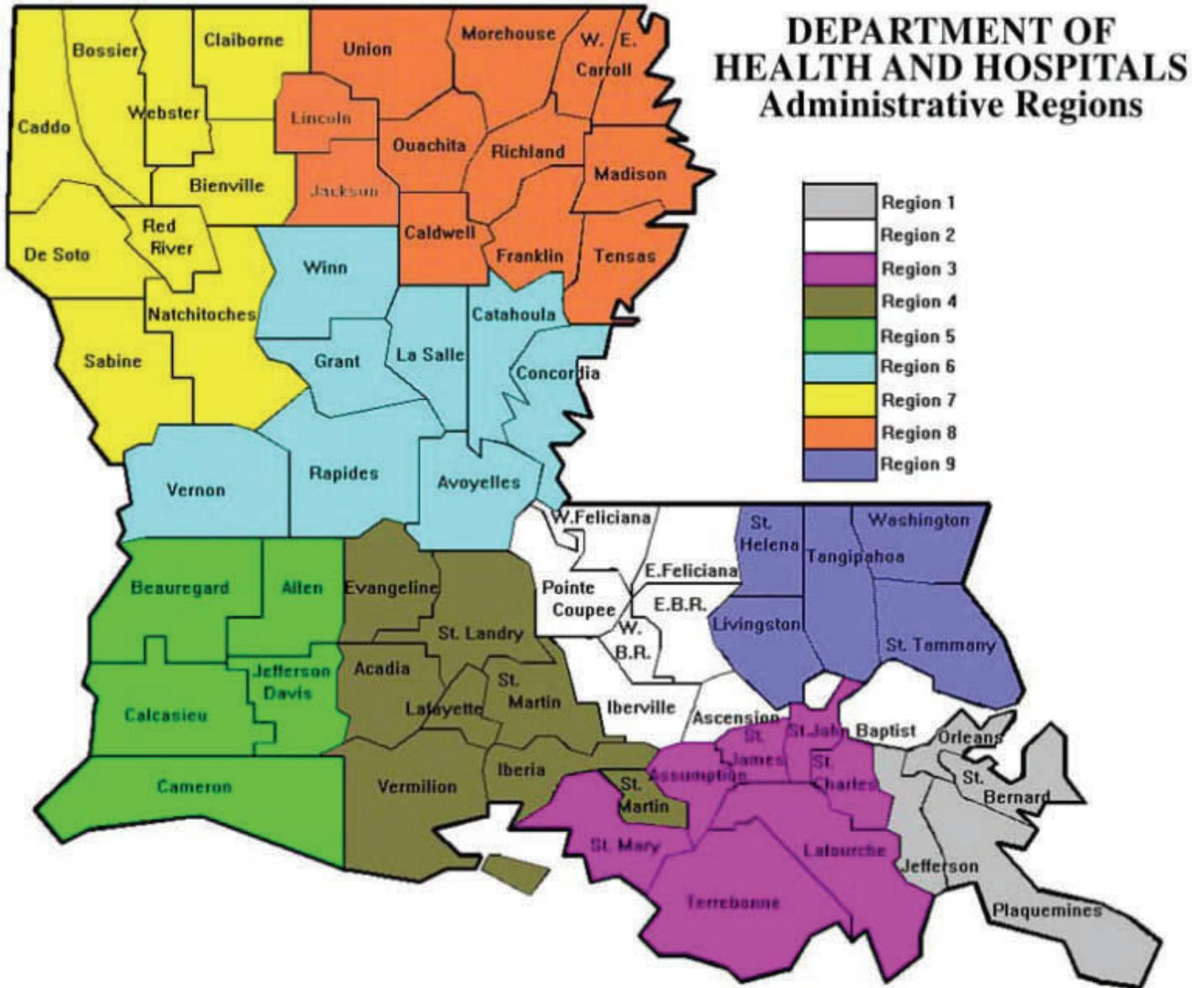


**Figure 22: Age-adjusted death rate for Stroke by gender, Louisiana, 1996-2005**



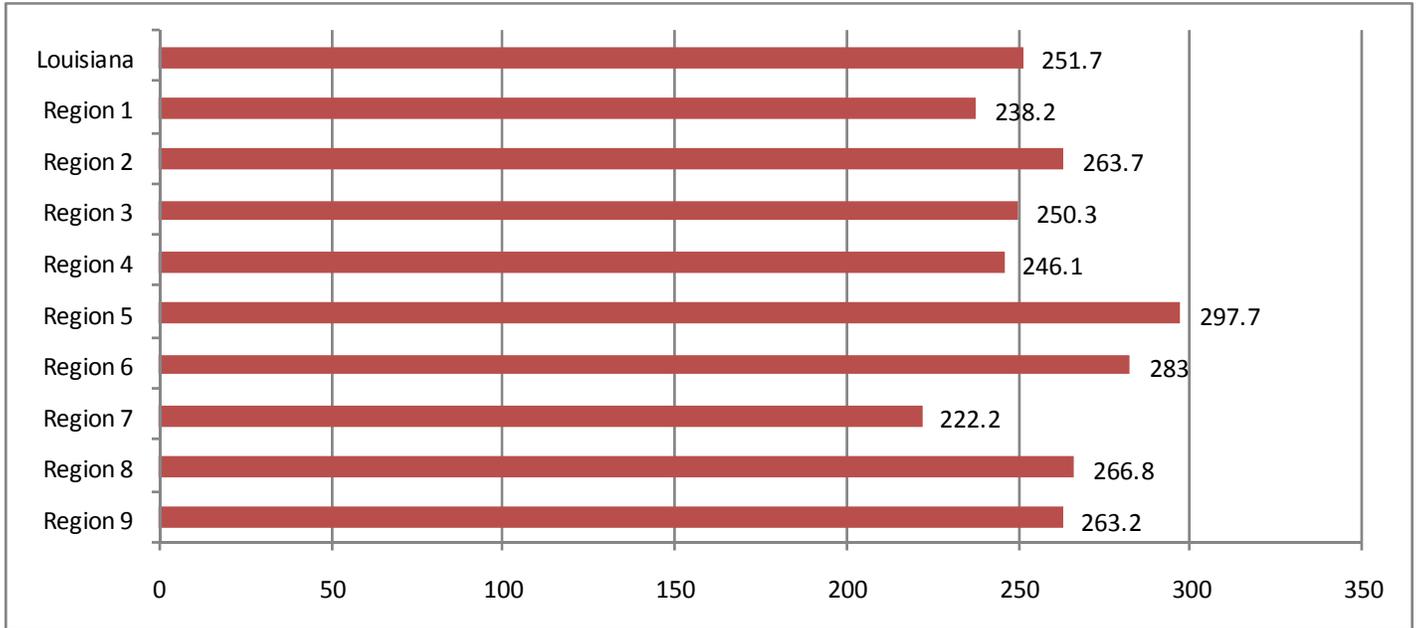
- In 2005, the age-adjusted mortality rate was 1.4 times higher in males than females for CVD.
- African-American males had the highest age-adjusted mortality rate for CVD (472 per 100,000 population) compared to other race/gender combinations.
- Males showed consistently higher rates of CVD deaths over the past 10 years.
- For stroke, females were at a slightly higher risk compared to males.
- Males showed a higher decrease in age-adjusted stroke death rates compared to females over the past 10 years.

# REGIONAL INFORMATION



# REGIONAL INFORMATION: MORTALITY RATES

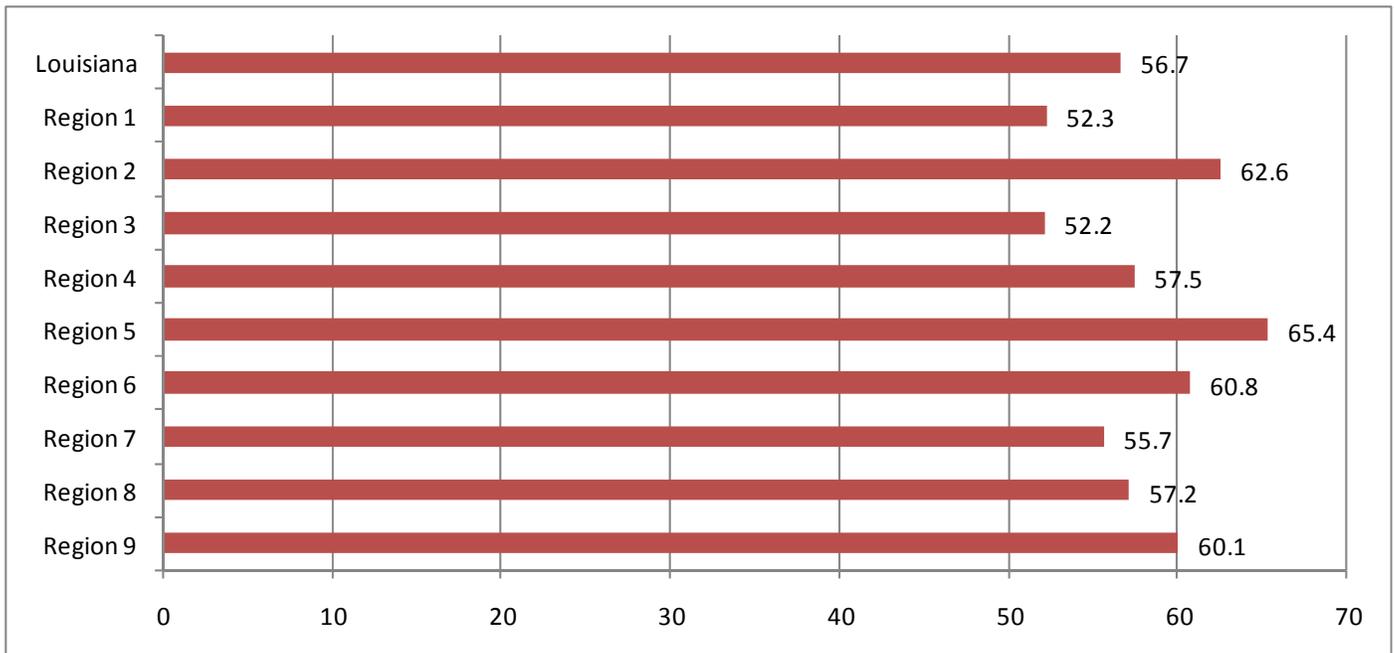
**Figure 23 : Heart Disease age-adjusted mortality rate\* by Region, 2005**



Source : CDC Wonder

\* Per 100,000 Population

**Figure 24: Stroke age-adjusted mortality rate\* by Region, 2005**

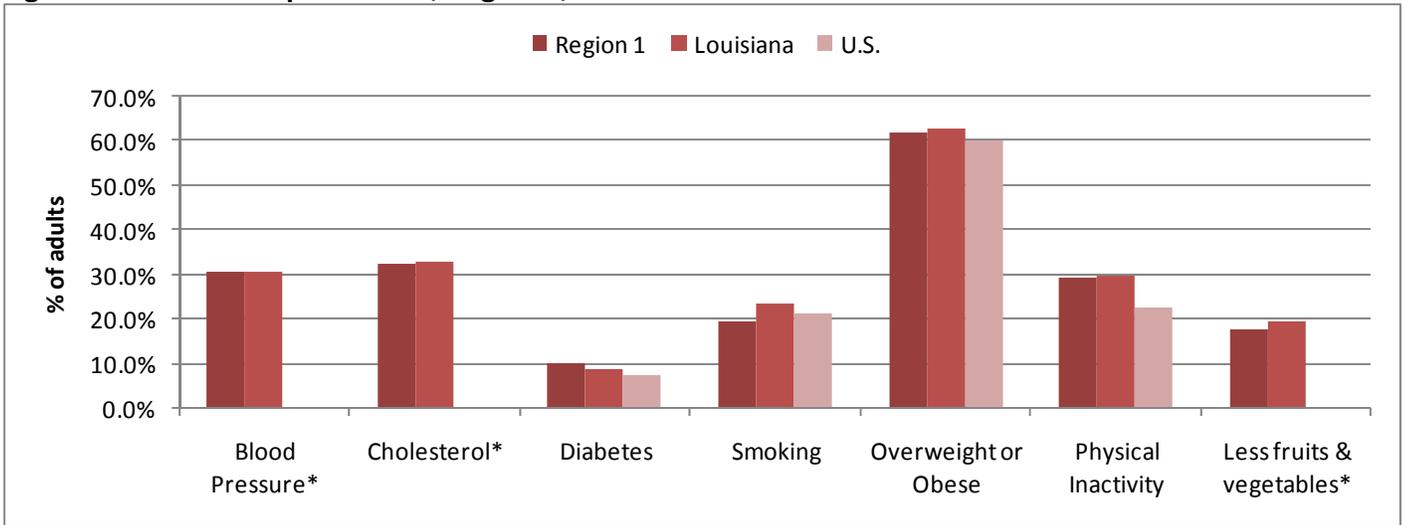


Source : CDC Wonder

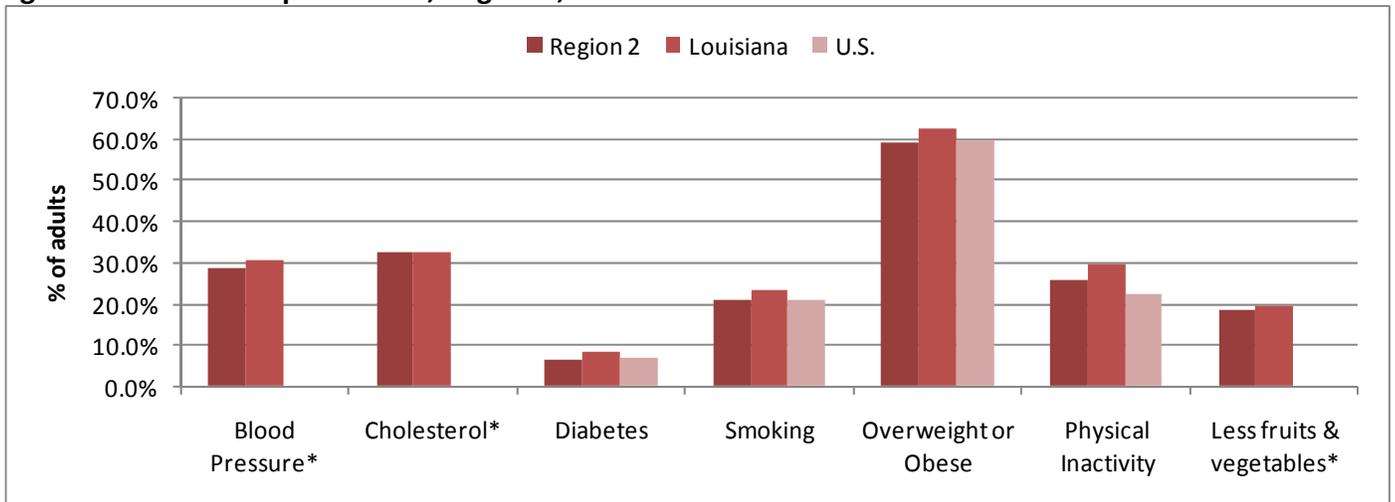
\* Per 100,000 Population

# REGIONAL INFORMATION: RISK FACTORS

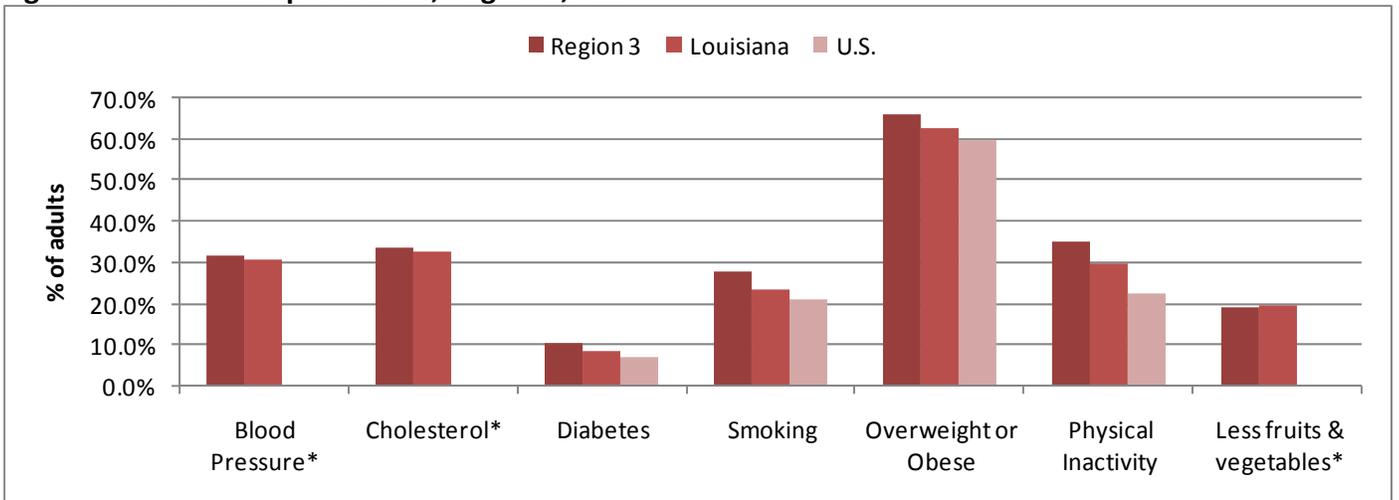
**Figure 25: Risk factor prevalence, Region 1, 2004**



**Figure 26: Risk factor prevalence, Region 2, 2004**



**Figure 27: Risk factor prevalence, Region 3, 2004**

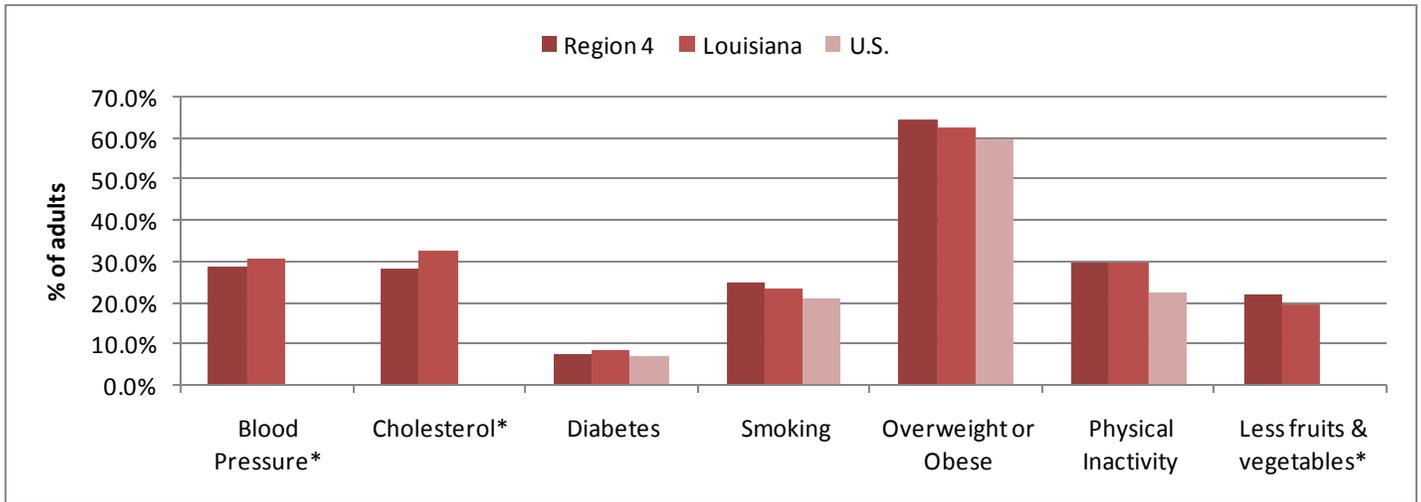


Source: BRFSS

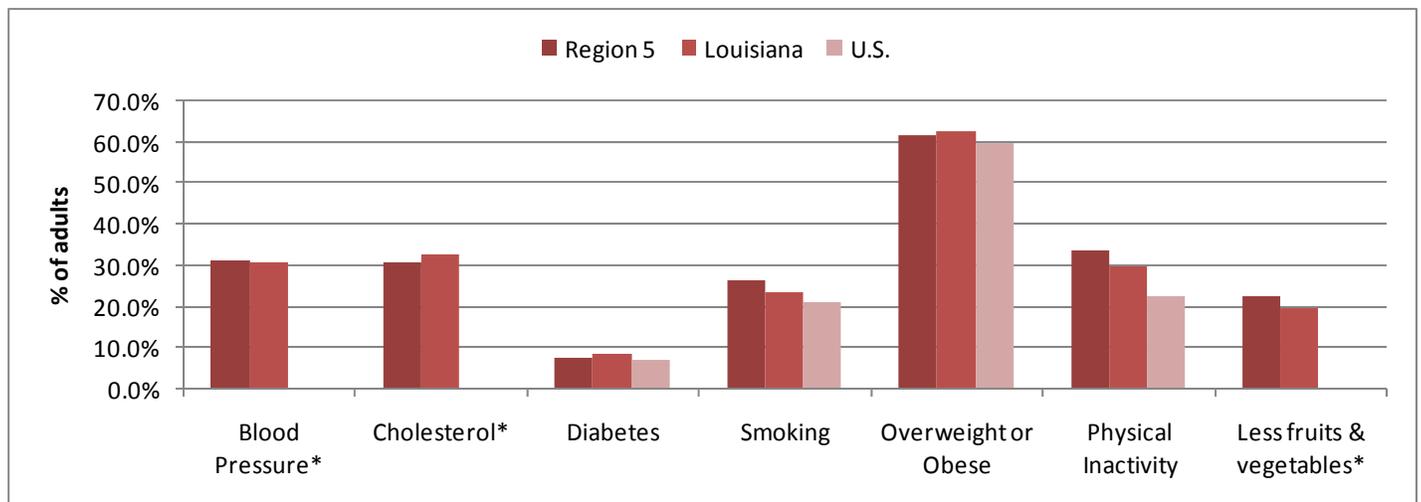
\* US rates are not available

# REGIONAL INFORMATION: RISK FACTORS

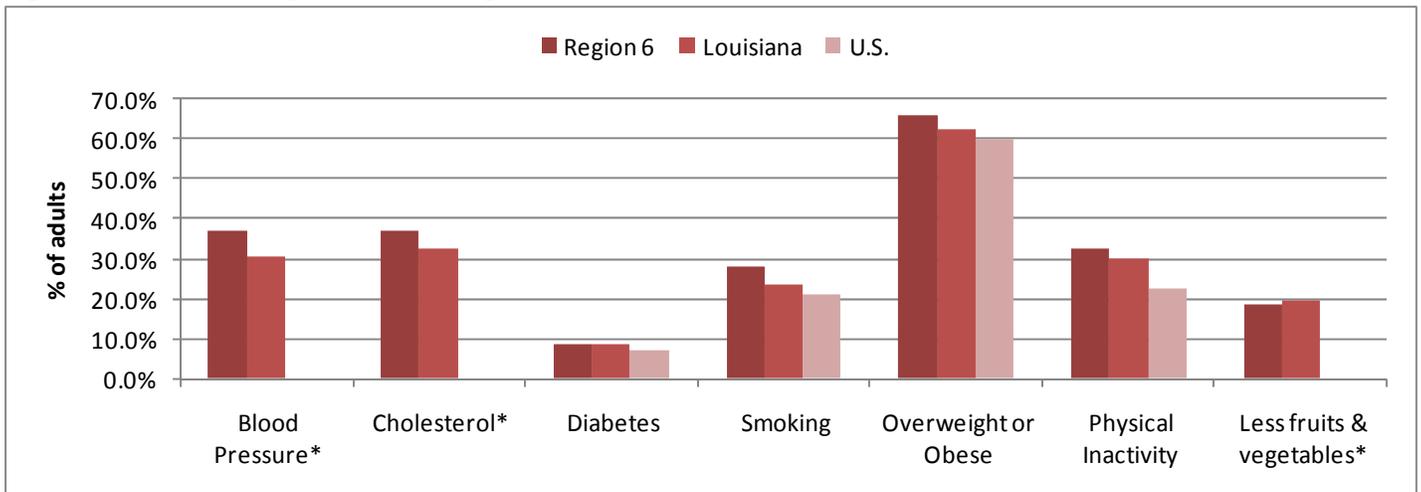
**Figure 28: Risk factor prevalence, Region 4, 2004**



**Figure 29: Risk factor prevalence, Region 5, 2004**



**Figure 30: Risk factor prevalence, Region 6, 2004**

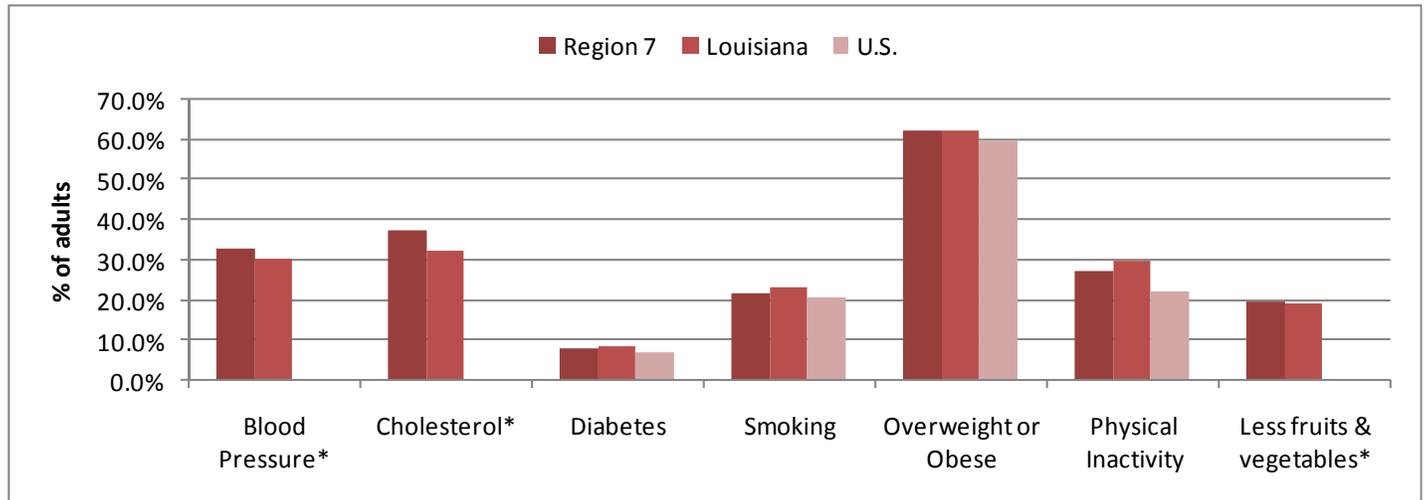


Source: BRFSS

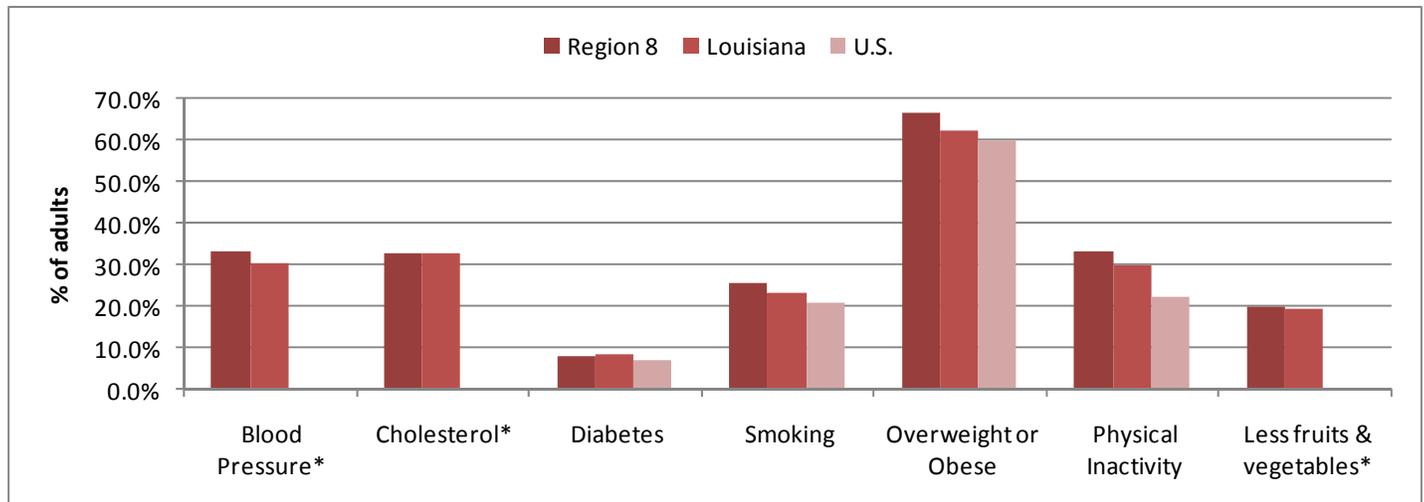
\* US rates are not available

# REGIONAL INFORMATION: RISK FACTORS

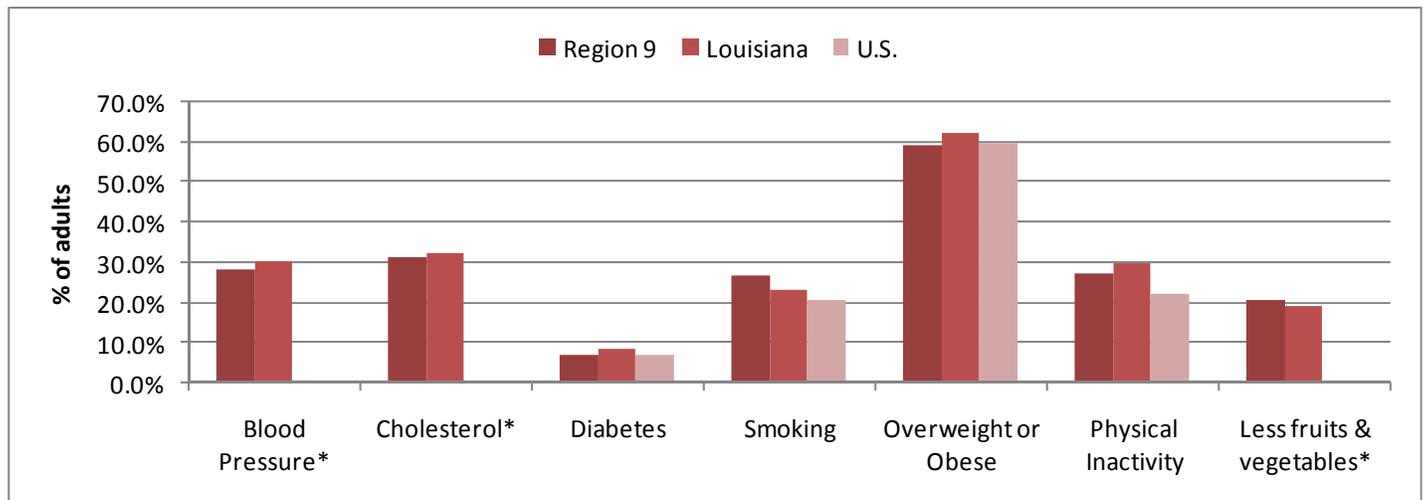
**Figure 31: Risk factor prevalence, Region 7, 2004**



**Figure 32: Risk factor prevalence, Region 8, 2004**



**Figure 33: Risk factor prevalence, Region 9, 2004**

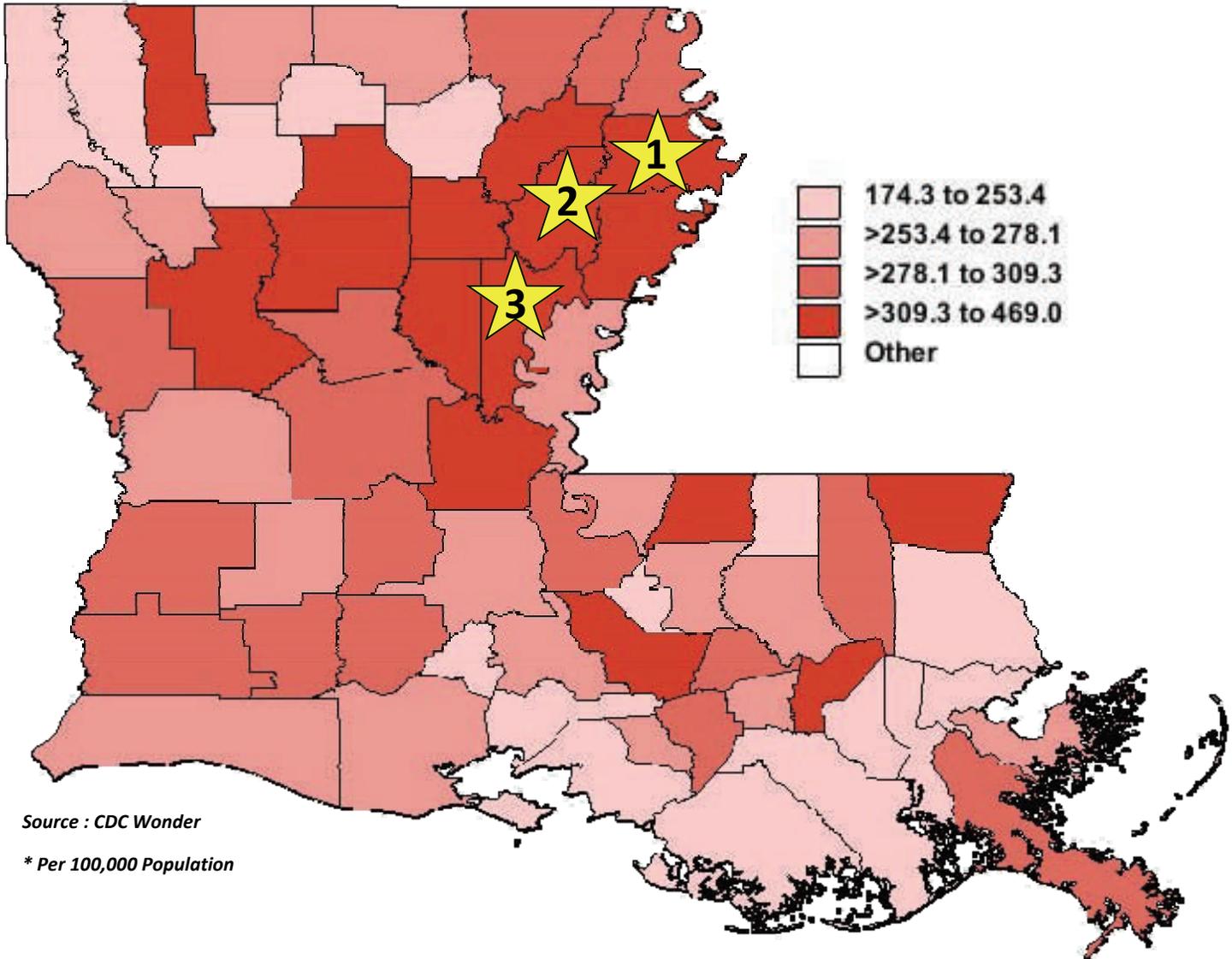


Source: BRFSS

\* US rates are not available

## CARDIOVASCULAR DISEASE BY PARISH

**Figure 34: Age-Adjusted Heart Disease Death Rates\* by Parish, Louisiana, 2001-2005**



- Recent age-adjusted mortality rates for heart disease were higher in the northern regions and along the northeastern borders of the state.
- Madison Parish had the highest death rate of 469 per 100,000 population.
- Franklin Parish and Catahoula Parish ranked 2nd and 3rd with death rates of 422.7 and 410.2, respectively, per 100,000 population.

## CARDIOVASCULAR DISEASE BY PARISH

**Table 2: Age-Adjusted Heart Disease Death Rates by Parish, Louisiana, 2001-2005**

	Count	% of All Deaths	Age-Adjusted Rate per 100,000	Rank
Louisiana	56,059	26%	265.6	-
Acadia Parish	819	26%	283.4	30
Allen Parish	308	26%	258.1	47
Ascension Parish	804	30%	301.5	23
Assumption Parish	323	32%	305.3	19
Avoyelles Parish	764	31%	338.5	10
Beauregard Parish	475	29%	302.4	22
Bienville Parish	269	24%	242.2	55
Bossier Parish	988	24%	232.8	60
Caddo Parish	3,227	24%	231.5	61
Calcasieu Parish	2,666	30%	309.3	17
Caldwell Parish	196	32%	336.1	11
Cameron Parish	112	30%	268.7	39
Catahoula Parish	240	37%	410.2	3
Claiborne Parish	310	31%	266.3	42
Concordia Parish	291	26%	255.3	48
De Soto Parish	389	27%	270.9	38
East Baton Rouge	4,713	28%	271.5	37
East Carroll Parish	136	28%	305.1	20
East Feliciana Parish	355	30%	375.3	4
Evangeline Parish	501	25%	282.4	32
Franklin Parish	539	40%	422.7	2
Grant Parish	267	27%	284.6	28
Iberia Parish	836	25%	241	56
Iberville Parish	479	28%	334.1	12
Jackson Parish	367	35%	372.4	5
Jefferson Davis Parish	454	27%	282.8	31
Jefferson Parish	5,360	25%	244.4	54
Lafayette Parish	1,681	23%	219.8	63
Lafourche Parish	1,021	27%	245.8	53
La Salle Parish	278	32%	341.9	8
Lincoln Parish	354	21%	174.3	64
Livingston Parish	996	27%	276.8	34

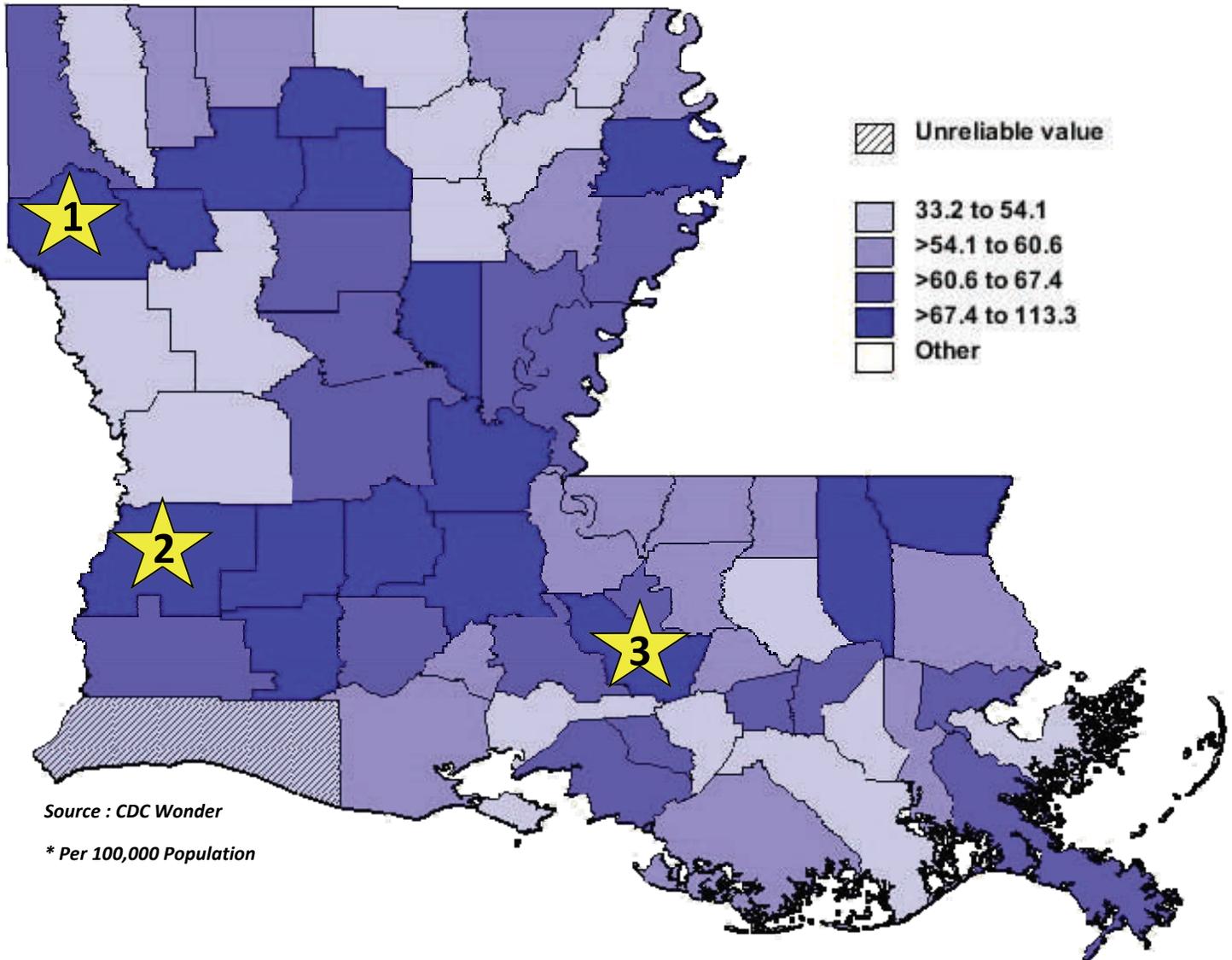
Table 2 cont.

	Count	% of All Deaths	Age-Adjusted Rate per 100,000	Rank
Madison Parish	293	36%	469	1
Morehouse Parish	519	28%	292.1	25
Natchitoches Parish	607	32%	320.3	15
Orleans Parish	5,647	22%	248	51
Ouachita Parish	1,721	25%	248	52
Plaquemines Parish	296	26%	290.4	27
Pointe Coupee Parish	356	30%	283.7	29
Rapides Parish	1,904	28%	290.7	26
Red River Parish	140	25%	262.3	45
Richland Parish	412	32%	339.4	9
Sabine Parish	428	32%	296.6	24
St. Bernard Parish	913	23%	271.8	36
St. Charles Parish	447	26%	240.8	57
St. Helena Parish	121	24%	240	58
St. James Parish	257	28%	263.2	43
St. John the Baptist	473	29%	312.1	16
St. Landry Parish	1,248	27%	267.9	41
St. Martin Parish	577	28%	278.1	33
St. Mary Parish	605	23%	253.4	49
St. Tammany Parish	1,904	24%	226.4	62
Tangipahoa Parish	1,356	27%	308.7	18
Tensas Parish	134	35%	347.9	6
Terrebonne Parish	1,015	24%	234.7	59
Union Parish	347	27%	261.1	46
Vermilion Parish	823	30%	275.3	35
Vernon Parish	435	25%	263.1	44
Washington Parish	798	29%	326.7	13
Webster Parish	854	32%	323.6	14
West Baton Rouge Parish	216	24%	249.7	50
West Carroll Parish	237	32%	304.6	21
West Feliciana Parish	142	28%	268.7	40
Winn Parish	316	31%	346.5	7

Source : CDC Wonder

## CARDIOVASCULAR DISEASE BY PARISH

Figure 35: Age-Adjusted Stroke Death Rates\* by Parish, Louisiana, 2001-2005



- Age-adjusted mortality rates for stroke were higher in the central, northwest and southwest regions of the state.
- Desoto Parish reported the highest death rate in the state at 113.3 per 100,000 population.
- Beaufort Parish and Iberville Parish ranked 2nd and 3rd with death rates of 86.3 and 85.1 per 100,000 population, respectively .

## CARDIOVASCULAR DISEASE BY PARISH

**Table 3: Age-Adjusted Stroke Death Rates by Parish  
Louisiana, 2001-2005**

	Count	% of All Deaths	Age-Adjusted Rate per 100,000	Rank
Louisiana	12,717	6%	60.6	-
Acadia Parish	184	6%	63.5	22
Allen Parish	89	7%	76.1	5
Ascension Parish	145	5%	54.8	47
Assumption Parish	57	6%	54.1	49
Avoyelles Parish	162	7%	71.8	9
Beauregard Parish	131	8%	86.3	2
Bienville Parish	79	7%	69.4	11
Bossier Parish	223	5%	53.7	54
Caddo Parish	847	6%	60.7	32
Calcasieu Parish	529	6%	61.4	30
Caldwell Parish	27	4%	46.2	62
Cameron Parish*	14	4%	33.2	64
Catahoula Parish	38	6%	64.7	20
Claiborne Parish	68	7%	60.6	34
Concordia Parish	69	6%	60.9	31
De Soto Parish	165	11%	113.3	1
East Baton Rouge Parish	989	6%	57.2	41
East Carroll Parish	25	5%	57.1	43
East Feliciana Parish	54	5%	58.7	37
Evangeline Parish	122	6%	68.5	15
Franklin Parish	76	6%	59	36
Grant Parish	57	6%	61.9	28
Iberia Parish	175	5%	50.7	59
Iberville Parish	124	7%	85.1	3
Jackson Parish	67	6%	70	10
Jefferson Davis Parish	117	7%	72.6	8
Jefferson Parish	1,230	6%	57	45
Lafayette Parish	426	6%	57.1	42
Lafourche Parish	212	6%	52.6	57
La Salle Parish	56	7%	69.1	13

\*Data unreliable

Table 3 cont.

	Count	% of All Deaths	Age-Adjusted Rate per 100,000	Rank
Lincoln Parish	144	8%	69.1	12
Livingston Parish	183	5%	52.8	55
Madison Parish	50	6%	80.5	4
Morehouse Parish	97	5%	54.6	48
Natchitoches Parish	101	5%	53.7	53
Orleans Parish	1,544	6%	67.4	17
Ouachita Parish	374	5%	54	50
Plaquemines Parish	63	6%	63.4	23
Pointe Coupee Parish	71	6%	57	44
Rapides Parish	432	6%	66.2	18
Red River Parish	41	7%	74.8	7
Richland Parish	60	5%	50.9	58
Sabine Parish	51	4%	35.9	63
St. Bernard Parish	176	4%	53.8	51
St. Charles Parish	98	6%	53.7	52
St. Helena Parish	29	6%	58.4	38
St. James Parish	60	7%	63	25
St. John the Baptist	94	6%	65.4	19
St. Landry Parish	318	7%	68.4	16
St. Martin Parish	128	6%	63.3	24
St. Mary Parish	151	6%	64.5	21
St. Tammany Parish	469	6%	58	40
Tangipahoa Parish	324	6%	75.3	6
Tensas Parish	24	6%	62.9	26
Terrebonne Parish	253	6%	60.6	33
Union Parish	69	5%	52.6	56
Vermilion Parish	176	6%	59.2	35
Vernon Parish	79	5%	47.6	61
Washington Parish	168	6%	68.5	14
Webster Parish	154	6%	58	39
West Baton Rouge Parish	54	6%	61.9	27
West Carroll Parish	37	5%	49.7	60
West Feliciana Parish	31	6%	56.4	46
Winn Parish	57	6%	61.6	29

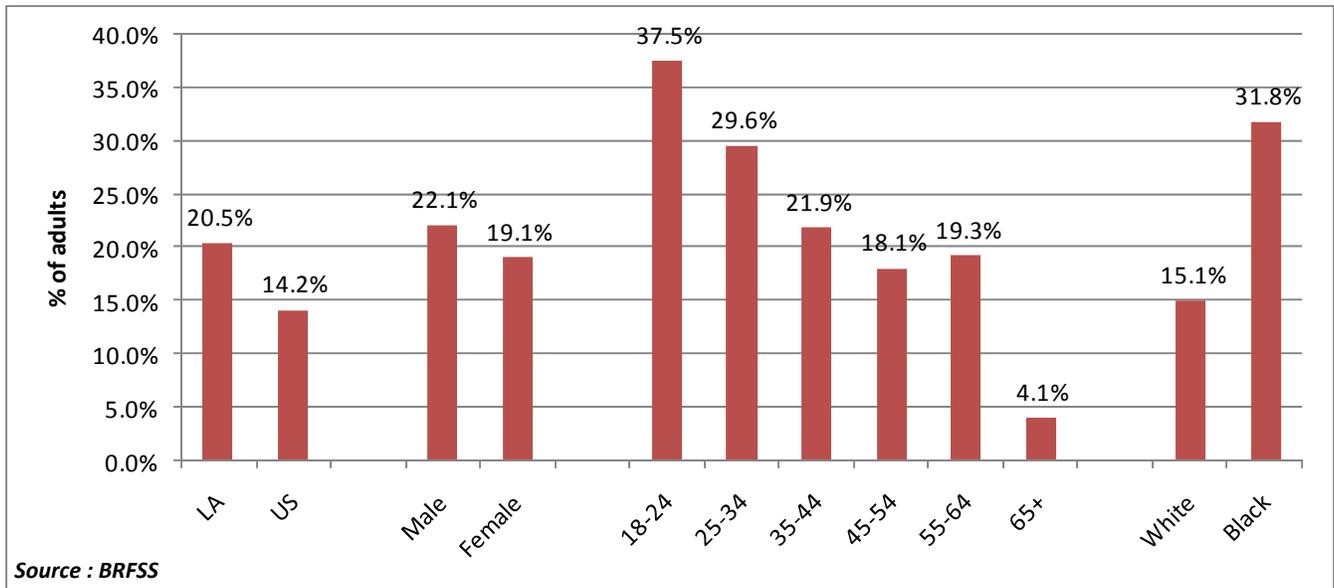
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## HOSPITALIZATION

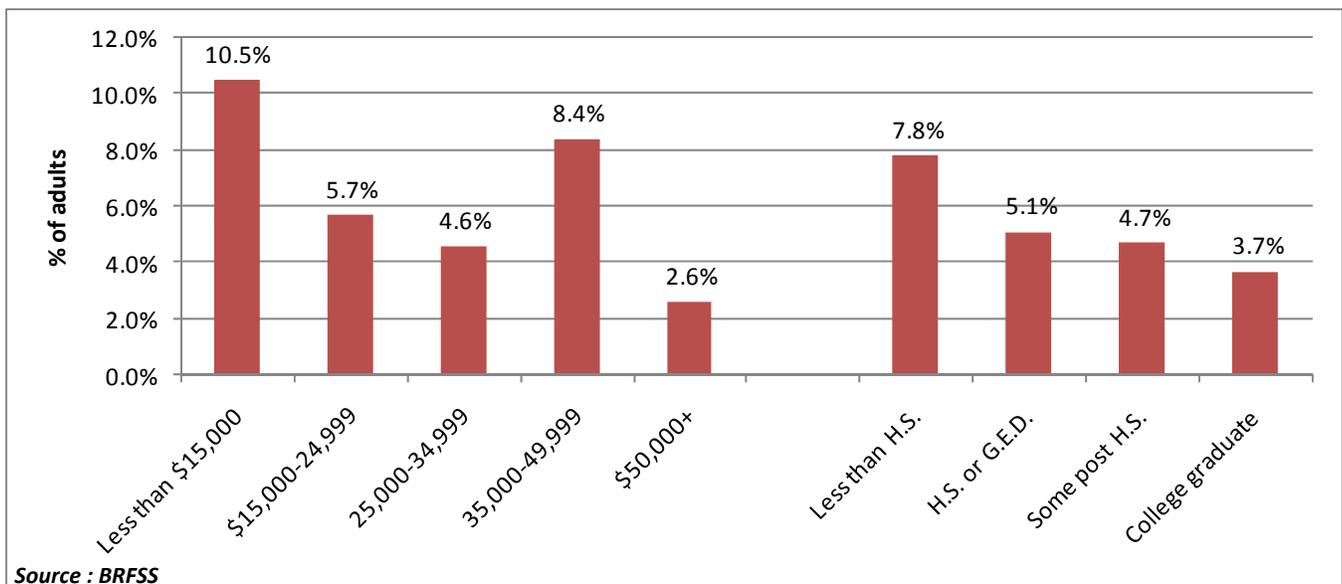
- In 2004, patients with heart disease averaged a four day length of stay in the hospital, and average charge per patient was \$38,036.
- The average length of stay in the hospital for stroke patients was 6.4 days, and the average charge per patient was \$26,146 in 2004.
- The average rate among Louisiana residents discharged with coronary heart disease was 50.3 per 10,000 population and with stroke was 20.8 per 10,000 population in 2004.
- The total number of discharges for coronary heart disease was 22,673 and 23,292 for those with congestive heart failure.
- 9,388 patients were discharged from the hospital with a diagnosis of cerebrovascular disease (stroke) in 2004.
- In 2004, for those patients having the late effects of cerebrovascular disease (like paralysis of the arms or legs), the average charge was \$31,915 per patient and the average length of stay of such patients was 16 days.
- Cerebrovascular disease was ranked 6th among the top 10 principal diagnoses with the longest average hospital stay in Louisiana.
- Among the top 10 principal diagnoses admitted through the emergency room by age group, heart attack was ranked 6th and stroke was ranked 7th in the age group 65-84.
- For 2004, in the top 3 principal diagnoses with corresponding top 5 principal procedures like percutaneous coronary angioplasty, diagnostic cardiac catheterization (coronary arteriography) and coronary artery bypass graft (CABG), coronary atherosclerosis was ranked 3rd with an average charge of per stay of \$37,226, average length of stay of 3.4 days in the hospital and total number of 1,192,392 patients.
- Among the top 10 charges for principal diagnosis, heart attack was ranked 4th with an aggregate charge of \$430,436,585 in Louisiana in 2004.

# ACCESS TO CVD CARE AND QUALITY OF LIFE

**Figure 36 : No health insurance by gender, age and race, Louisiana, 2007**



**Figure 37 : No health insurance by income and education, Louisiana, 2007**



- In 2007, the percentage of adults reporting they do not have health insurance were significantly higher in Louisiana compared to the US.
- Males were more likely to be uninsured than females.
- The percentage of uninsured people in Louisiana decreased with the increase of age.
- Those with lower incomes were more likely to be uninsured than those with higher incomes, however the percentages of uninsured were significantly higher in the \$35,000-\$49,999 group.
- People having less than a high school diploma were more likely to be uninsured.

## ACCESS TO CVD CARE AND QUALITY OF LIFE

**Table 4 : Health Related Quality of Life Indicators by CHD, Heart Attack and Stroke status, Louisiana, 2007**

HRQL Indicators	Total (%)	With CHD (%)	Without CHD (%)	With Heart Attack (%)	Without Heart Attack (%)	With Stroke (%)	Without Stroke (%)
General health fair to poor	19	56	17	55	17	57	18
Physical health not good for 5 or more days	56	83	53	82	53	80	54
Mental health not good for 5 or more days	64	85	62	84	62	86	62
Kept from doing usual activities for 5 or more days	16	45	14	42	15	48	14
Currently employed	59	28	62	28	61	22	61
<b>Education</b>							
Less than HS	12	19	12	24	12	30	12
HS grad/GED	32	33	32	29	32	27.5	32
Some college/ College Grad	56	48	56	47	56	42.5	56

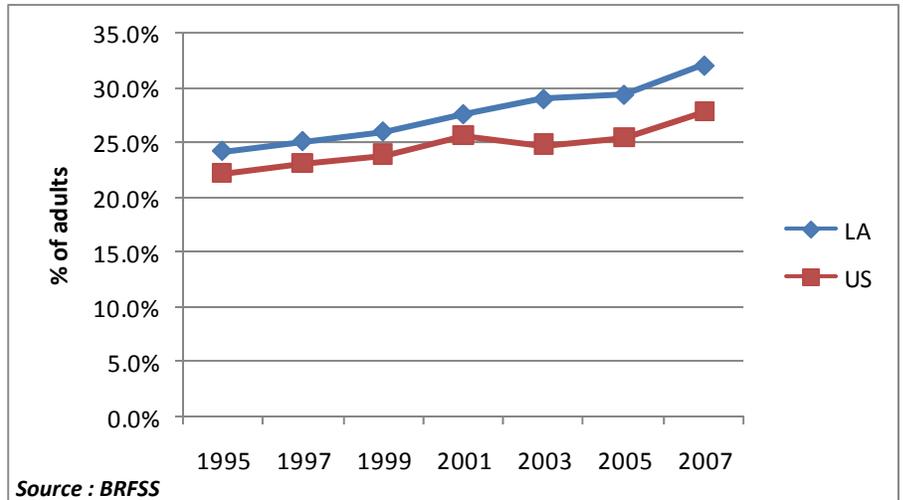
Source : BRFSS

- In 2007, more than 50% of Louisiana residents reported that their general health was fair to poor among those who have cardiovascular disease.
- Physical health was reported as “not good for 5 or more days” in those having CVD by 80% or more respondents.
- Approximately 85% of the adults with CVD reported that their mental health was not good for 5 or more days.
- “Could not participate in usual activity “was seen more in those having CVD (45%) than without CVD (14%).
- The rate of employment was 24% among those having CVD compared to 61% of those without CVD.
- Among different levels of education, 24% of adults with CVD reported having less than a high school education compared to 12% without CVD. 30% of those with CVD reported having a high school diploma compared to 32% without CVD, and 46% with CVD reported having a graduate degree compared to 56% without CVD.

## CVD RISK FACTORS: HIGH BLOOD PRESSURE

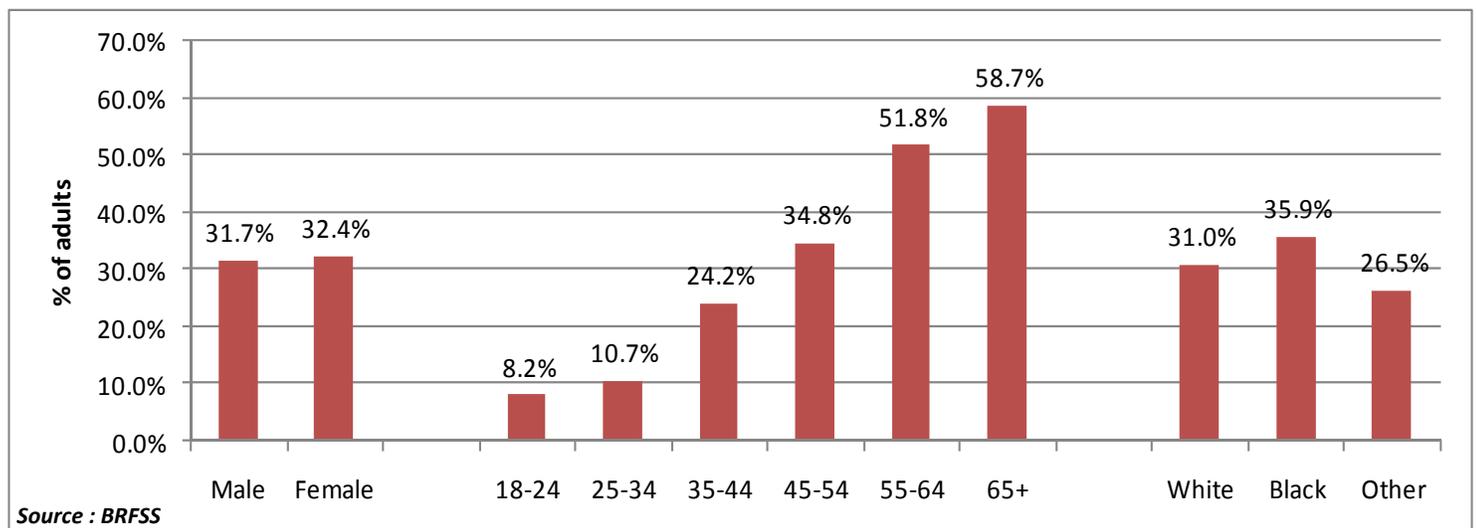
High blood pressure or hypertension is common in the United States, with approximately one in three individuals being at risk of developing it. Hypertension increases the risk of heart attack, stroke or congestive heart failure. It can be easily detected and can be treated by simple life style changes like exercise, reduced intake of salt, stopping smoking, weight loss.

**Figure 38 : Prevalence of reported high blood pressure, Louisiana and US, 1995-2007**



- The prevalence of high blood pressure in LA has increased from 24.1% to 32.1% over the past 13 years. It has increased continuously from 1995 to 2007. The percentages have remained consistently above the national average rate.
- Almost one in three adults in LA reported having high blood pressure in 2007 (Fig.38).

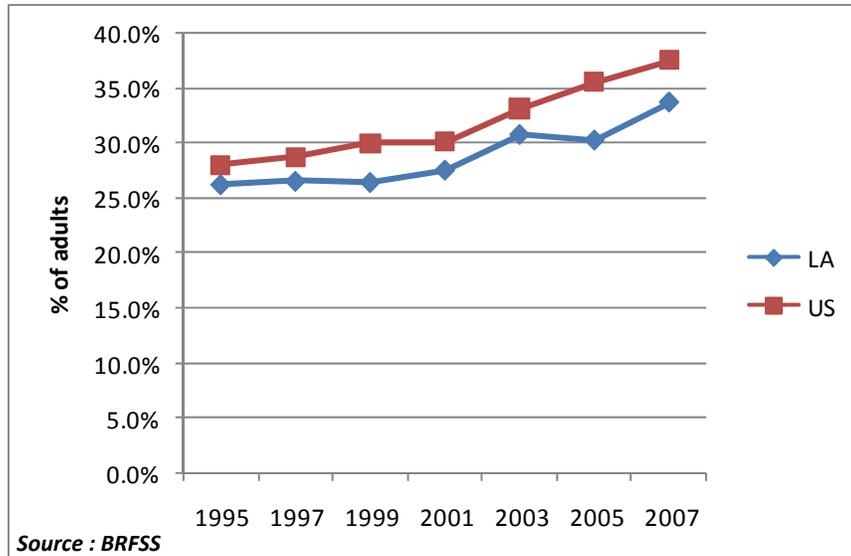
**Figure 39 : Prevalence of reported high blood pressure, 2007**



- Males had a similar average rate of high blood pressure as females in Louisiana.
- There was a significant increase of reported high blood pressure with increasing age.
- Among race/ethnic groups, blacks had the highest prevalence compared to whites and others (Fig. 39).

# CVD RISK FACTORS: HIGH BLOOD CHOLESTEROL

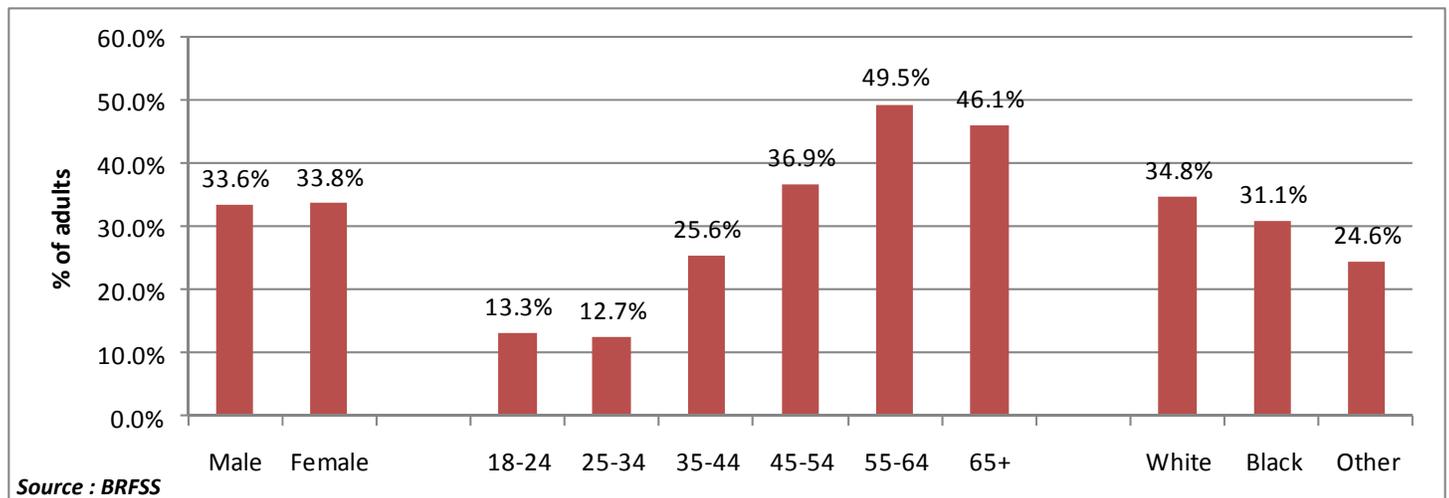
**Figure 40 : Prevalence of reported high blood cholesterol, Louisiana and US, 1995-2007**



Cholesterol is a fat-like substance or lipid present in the cell membrane. It travels in the blood through distinct particles in the form of lipoprotein which contains lipid and protein. There are three types of lipoproteins, high density lipoprotein (HDL), low density lipoprotein (LDL) and very low density lipoprotein (VLDL). HDL is known as “good cholesterol” and LDL and VLDL are known as bad “cholesterol.” LDL plays an important role in the development of atherosclerosis, heart disease and stroke.

- Almost 33.7% of Louisiana adults reported they were diagnosed with high blood cholesterol in 2007, while 37.6% were reported in the US during the same time period.
- The prevalence rate for high blood cholesterol was consistently lower among Louisiana residents compared to the national average rates from 1995-2007 (Fig. 40).

**Figure 41 : Prevalence of reported high blood cholesterol, 2007**

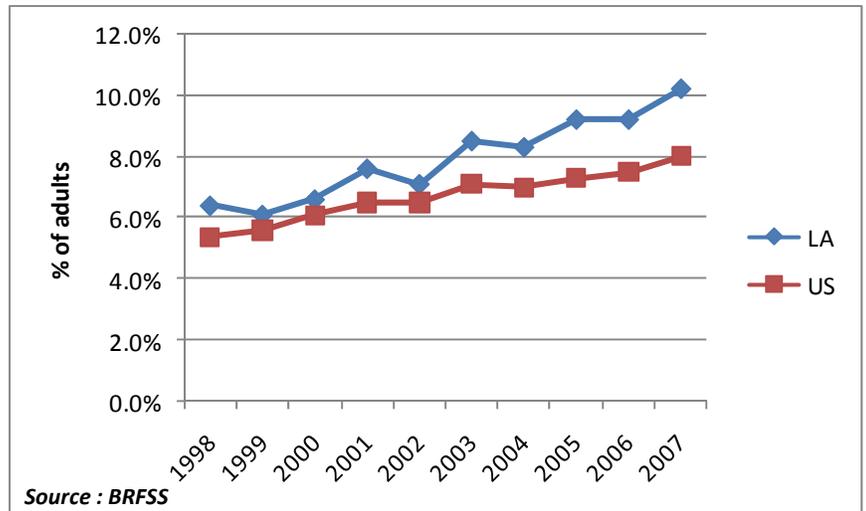


- Males had similar rates compared to females for high blood cholesterol in Louisiana.
- The high blood cholesterol rate increased with increasing age, up to the 55-64 age group, and then showed a decrease in the 65+ age group.
- Among race/ethnic groups, blacks reported having the highest rate of 34.8% (Fig. 41).

## CVD RISK FACTORS: DIABETES

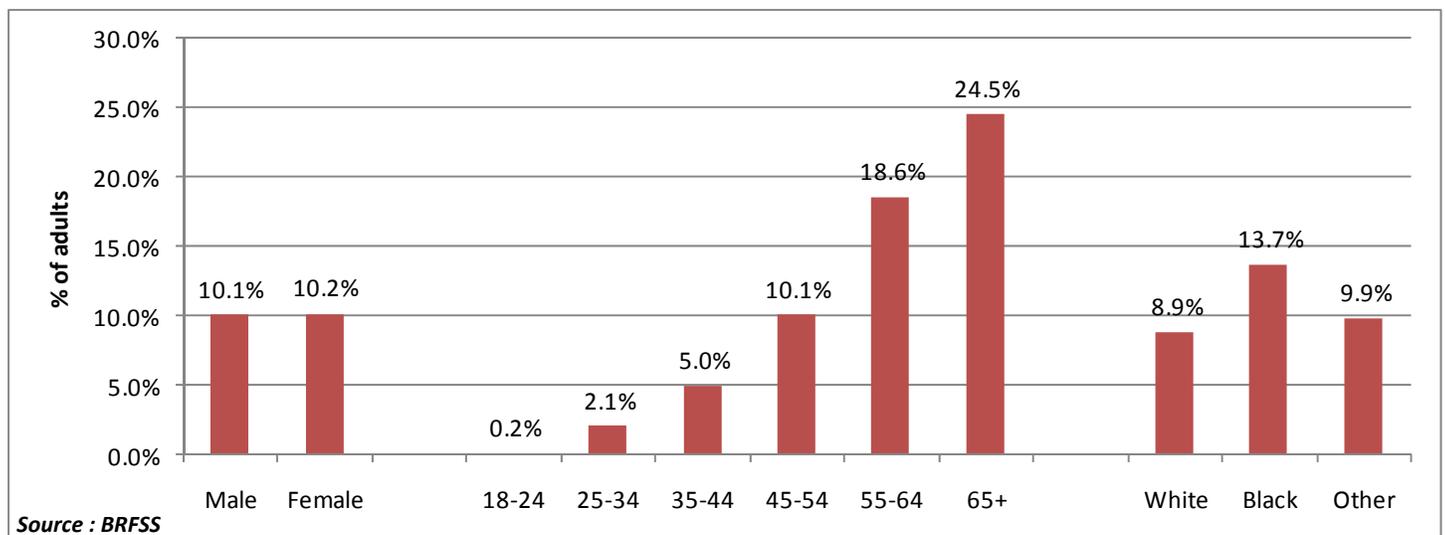
Diabetes is a disease in which the body does not produce or properly use insulin. There are 23.6 million children and adults in the United States, or 7.8% of the population, who have diabetes. While an estimated 17.9 million have been diagnosed with diabetes, unfortunately, 5.7 million people (or nearly one quarter) are unaware that they have the disease. There are two major types of diabetes. Type 1 diabetes results from the body's failure to produce insulin and Type 2 diabetes results from insulin resistance (a condition in which the body fails to properly use insulin), combined with relative insulin deficiency.

**Figure 42 : Prevalence of adults diagnosed with diabetes, LA and US, 1998-2007**



- Prevalence of diagnosed diabetes has increased by 3.8% for Louisiana and 2.6% for the US from 1998 to 2007.
- In 2007, the percentage of adults diagnosed with diabetes was 2.2% higher among Louisiana residents than the national average rate.
- The rates were consistently higher for Louisiana from 1998-2007 (Fig. 42).

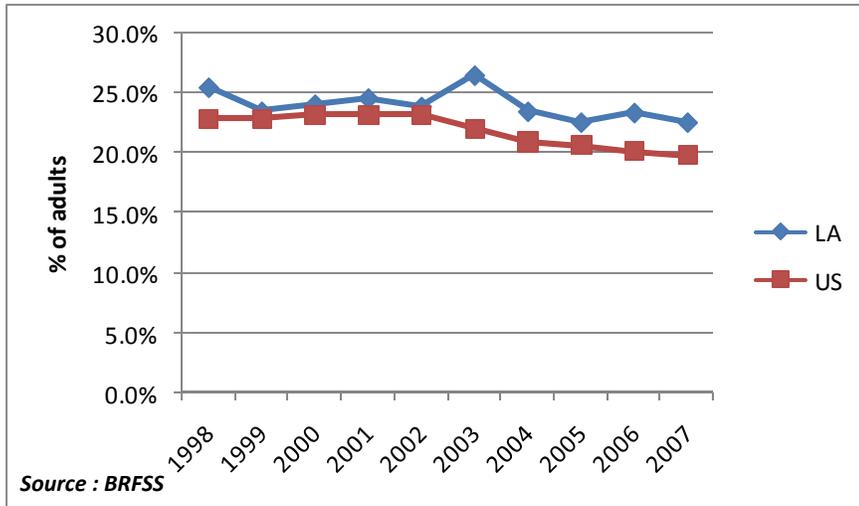
**Figure 43 : Prevalence of adults diagnosed with diabetes, 2007**



- The prevalence of adults diagnosed with diabetes was similar in males and females.
- There was a significant increase in the percentage of diabetics with increase in age .
- Blacks showed the highest rate among race/ethnic groups than whites and other groups (Fig. 43).

## CVD RISK FACTORS: SMOKING

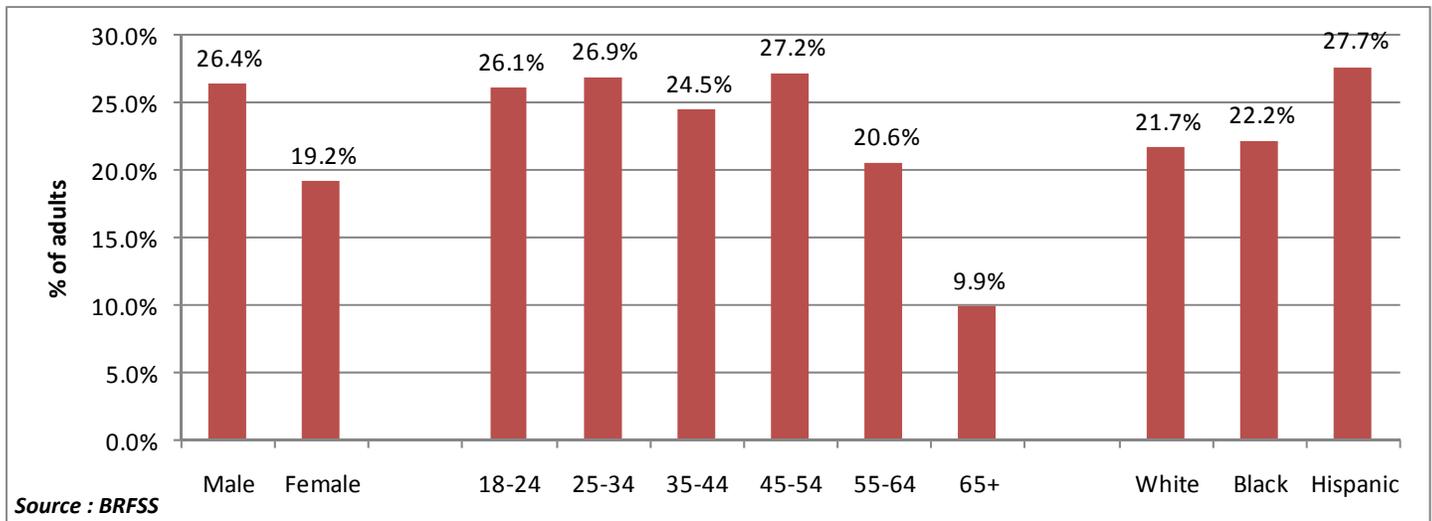
**Figure 44 : Prevalence of current smokers, Louisiana and US, 1998-2007**



Cigarette smoking is a major cause of heart disease and stroke. It increases the clotting factors in the blood, damages the linings of the blood vessels and decreases HDL in the blood. Smokers have twice the risk of heart attack than non smokers. Nearly one-fifth of all deaths from CVD in the United States, or about 190,000 deaths a year, are smoking-related. It is the single largest preventable cause of heart disease in the United States.

- The prevalence of current smokers has decreased over the period of 10 years both in Louisiana by 2.9% and in the US by 3.1%.
- Louisiana’s rates of current smokers were consistently higher than the national average rates from 1998-2007.
- 22.6% of Louisiana residents reported that they smoke currently in 2007 (Fig. 44).

**Figure 45 : Prevalence of current smokers, 2007**

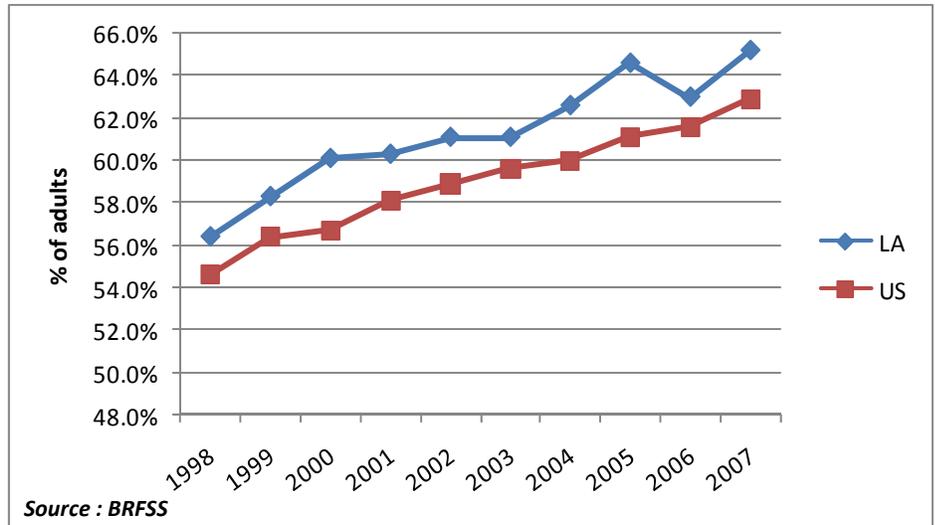


- Males were significantly more likely to be current smokers than females.
- The prevalence rate among adults remained almost the same up to the 45-54 age group and then showed a significant decrease in the 65+ age group.
- The rates were relatively higher among Hispanics than whites and blacks (Fig. 45).

## CVD RISK FACTORS: OVERWEIGHT AND OBESITY

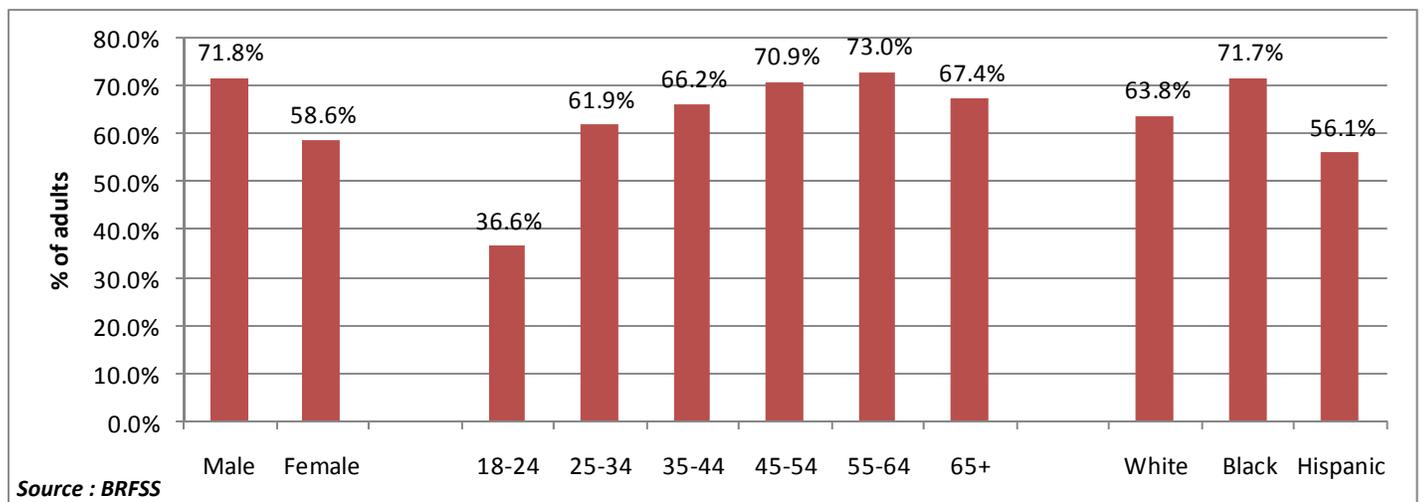
Overweight (defined as body mass index of 25.0-29.9 kg/m<sup>2</sup>) and obesity (defined as body mass index  $\geq$  30.0 kg/m<sup>2</sup>) are the most common factors contributing to the risk of heart disease and stroke. Overweight and obese individuals are also more likely to have other risk factors for heart disease and stroke, specifically high blood pressure, high cholesterol, high triglycerides, and diabetes.

**Figure 46 : Prevalence of overweight and obese, Louisiana and US, 1998-2007**



- The prevalence of overweight and obesity has increased significantly for the state of Louisiana by 10% from 1998 to 2007. The trend followed almost the same pattern as that of the US, except there was a slight decrease from 2005-2006 in Louisiana.
- In 2007, the prevalence of reported overweight and obese people was 2.3% more than the national average rate (Fig. 46).

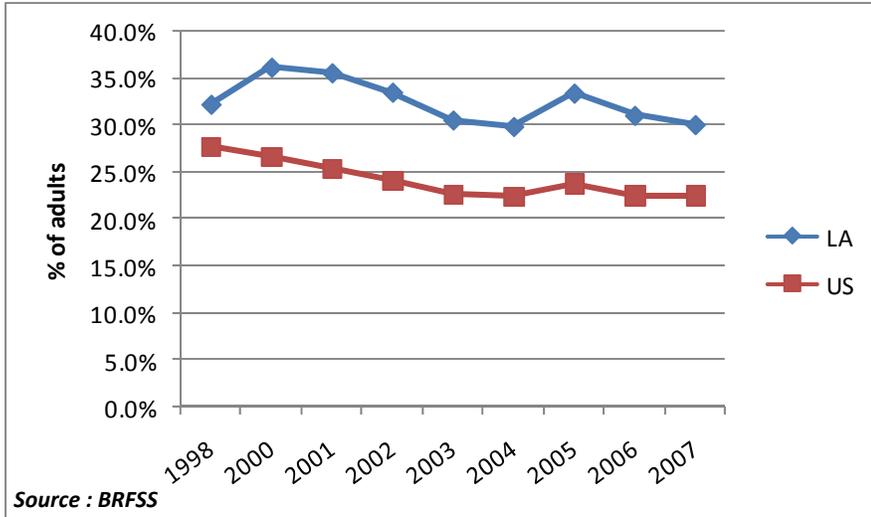
**Figure 47 : Prevalence of overweight and obese, 2007**



- The prevalence rate for males was significantly higher than females in Louisiana.
- Overweight and obesity increases with increase in age, with a significant increase of 25.3% from the 18-24 to the 25-34 age group.
- Among race/ethnic groups, blacks were reported having the highest prevalence in 2007 (Fig. 47).

## CVD RISK FACTORS: PHYSICAL INACTIVITY

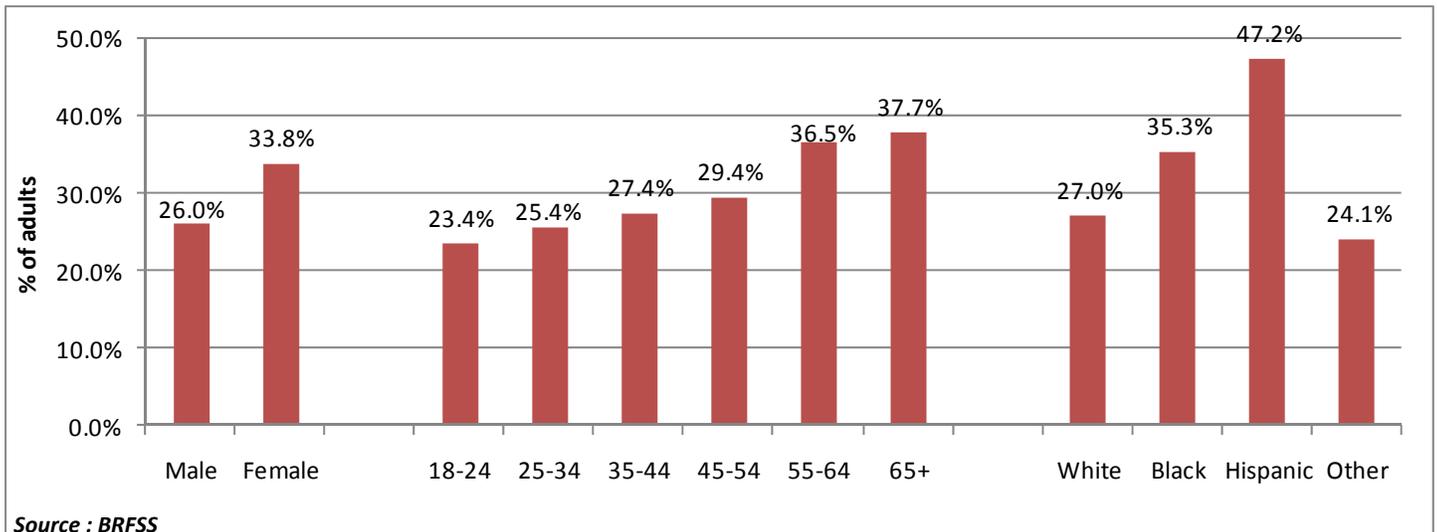
**Figure 48 : Prevalence of physical inactivity, Louisiana and US, 1998-2007**



Regular physical activity can help to decrease the chances of developing heart disease and stroke. The risk of heart disease is 1.5 to 2.5 times higher among those who are physically inactive compared to those who are physically active. Exercise reduces the development of high blood pressure, controls diabetes, lowers weight and decreases high blood cholesterol.

- In Louisiana, the prevalence of physical inactivity has remained almost the same over the past 10 years.
- There was a significant decrease of 5.1% in physical inactivity among US adults compared to only a 2.2 % decrease in Louisiana adults from 1998 to 2007.
- Prevalence rates are consistently higher among Louisiana residents than US residents (Fig. 48).

**Figure 49 : Prevalence of physical inactivity, 2007**

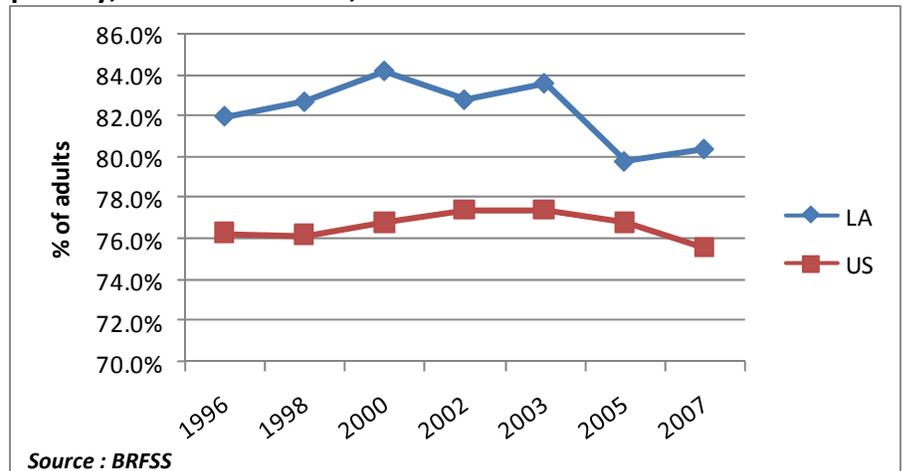


- In Louisiana, females were more likely to be physically inactive than males.
- The prevalence rate of physical inactivity increases with an increase in age.
- Among the race/ethnic groups, Hispanics and blacks had significantly higher prevalence rates of physical inactivity when compared to whites and others (Fig. 49).

## CVD RISK FACTORS: FRUIT & VEGETABLE CONSUMPTION

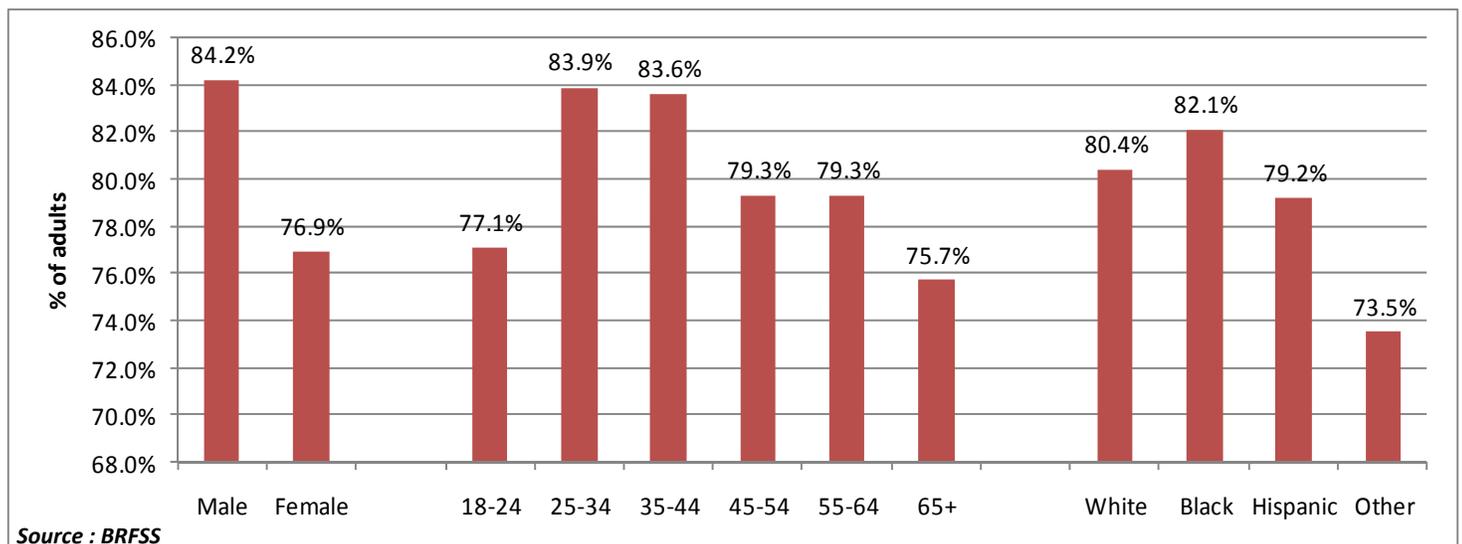
A daily consumption of 5-10 fresh fruits and vegetables is associated with a reduced risk of heart disease and stroke. The consumption of enough fruits and vegetables results in the intake of antioxidants, natural vitamins and fiber. Those who do not consume enough fruits and vegetables are associated with the development of several CVD risk factors, particularly hypertension, high blood cholesterol, overweight, and diabetes.

**Figure 50 : Prevalence of less than 5 servings of fruits & vegetables per day, Louisiana and US, 1996-2007**



- The prevalence of not consuming enough fruits and vegetables has not changed significantly for the state of Louisiana in the past 13 years.
- The rate has almost remained constant (76%) for the nation as well (Fig. 50).

**Figure 51 : Prevalence of less than 5 servings of fruits & vegetables per day, 2007**



- According to the 2007 BRFSS, there is a significant difference of 4.8% in the consumption of less than 5 daily servings of fruits and vegetables among Louisiana residents and the US.
- Males were more likely to consume less than 5 servings per day of fruits and vegetables than females.
- Among different age groups, the 25-34 and 35-44 age groups did not consume enough fruits and vegetables in 2007.
- Among race/ethnic groups, there were no significant differences among whites, blacks and Hispanics (Fig.51).

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# SIGNS & SYMPTOMS OF HEART ATTACK AND STROKE

Awareness of the signs and symptoms of heart attack and stroke is critical to reduce the time interval between onset of symptoms and initiation of treatment. Almost half of the deaths from heart disease and stroke occur before patients reach a hospital, clinic or other medical facility. Early recognition of the symptoms and immediate action would decrease mortality among Louisiana residents for heart disease and stroke.

## **Heart Attack (Myocardial Infarction or MI) Symptoms:**

- o Discomfort, pressure, heaviness, or pain in the chest
- o Discomfort radiating to the back, jaw, throat or arm
- o Fullness, indigestion or choking feeling (may feel like heartburn)
- o Sweating, nausea, vomiting or dizziness
- o Extreme weakness, anxiety or shortness of breath
- o Rapid or irregular heartbeats

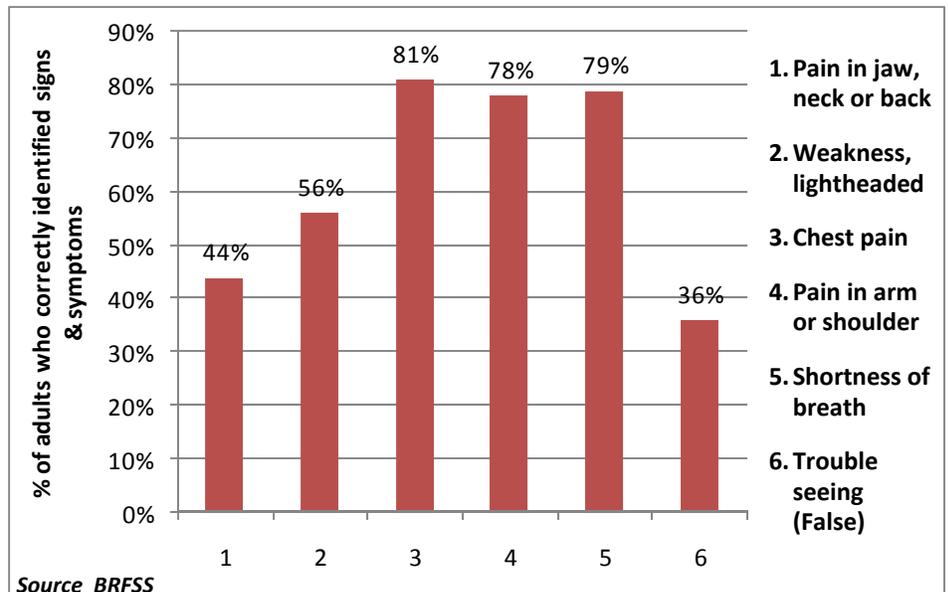
## **Stroke (Cerebrovascular Disease) Symptoms:**

- o Sudden weakness or numbness in your face, body, arms or legs, especially on one side
- o Sudden trouble seeing in one or both eyes
- o Sudden confusion, difficulty to speak or understand what others are saying
- o Sudden dizziness, instability or inability to stand or walk
- o Sudden severe headache with no know cause

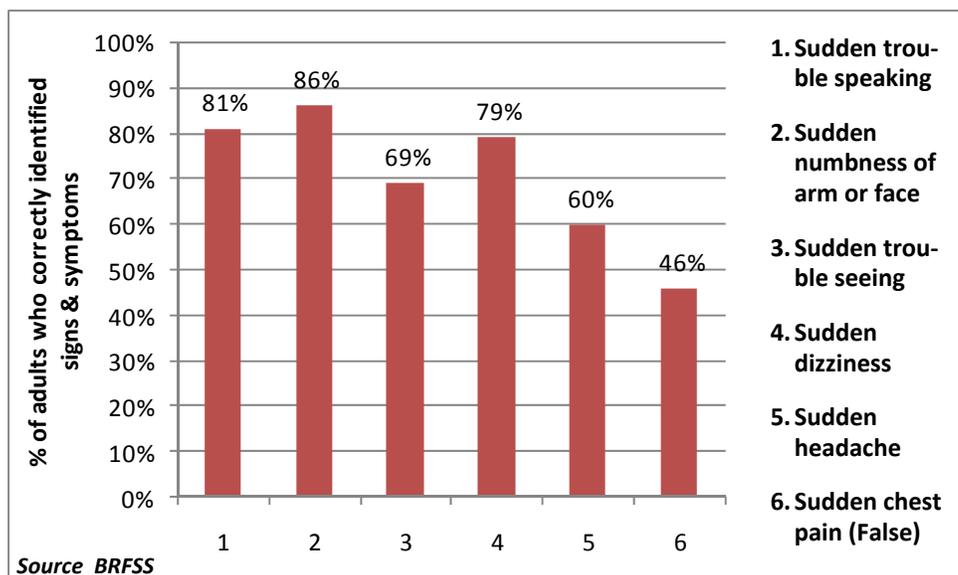
# SIGNS & SYMPTOMS OF HEART ATTACK AND STROKE

According to the 2007 BRFSS, 81% of Louisiana residents recognized chest pain or discomfort as symptoms of a heart attack. The majority of them also recognized pain in the arm or shoulder (78%) and shortness of breath (79%) as heart attack symptoms. Fewer people recognized pain in the jaw, neck or back (44%) as symptoms. Additionally, nearly one third of them incorrectly identified trouble seeing in one or both eyes as a symptom of a heart attack

**Figure 52: Awareness of signs and symptoms of heart attack, Louisiana, 2007**



**Figure 53: Awareness of signs and symptoms of stroke, Louisiana, 2007**



In 2007, 86% of adults recognized sudden numbness or weakness of the arm/face/leg as a symptom of stroke. Approximately the same percentage of individuals recognized sudden trouble speaking (81%) and sudden dizziness (79%) as stroke symptoms. Only 46% identified incorrectly sudden chest pain as a symptom of stroke.

## SIGNS & SYMPTOMS OF HEART ATTACK AND STROKE

Table 5. Percentage of adults recognizing the symptoms of heart attack, Louisiana, 2007

	Pain in jaw, neck, or back  (%)	Weakness, lightheaded, fainting  (%)	Chest pain  (%)	Pain/ discomfort in arm or shoulder  (%)	Shortness of Breath  (%)	Trouble see- ing in one or both eyes (False)  (%)
<b>Total</b>	44	56	81	78	79	36
<b><u>Age (years)</u></b>						
< 45	38	58	82	79	78	40
45-64	51	59	84	80	81	35
65-74	53	52	76	75	74	31
75-84	40	41	63	59	62	21
85+	29	44	58	66	63	20
<b><u>Gender</u></b>						
Male	38	57	80	76	76	38
Female	49	55	82	79	78	36
<b><u>Race/Ethnicity</u></b>						
White	48	60	85	83	80	35
Black	33	50	73	67	71	36
<b><u>Education</u></b>						
< High school	27	45	63	58	58	29
High school Grad	38	50	76	74	75	34
Some college/ College graduate	51	62	87	84	83	39
<b><u>Income</u></b>						
<25,000	36	47	72	69	70	36
25,000-34,999	40	53	77	76	74	36
35,000+	50	62	88	86	85	40

Source: 2007 Behavioral Risk Factor Surveillance System, Louisiana.

Some discrepancy existed regarding the recognition of signs and symptoms of heart attack among Louisiana residents. Generally, there was less recognition of pain in the jaw, neck or back as a symptom of a heart attack among males, blacks, people older than 74, people with less than a high school education and those with low income. A lower percentage of people who were female, black, ages 75-84, had less than a high school education or had low income recognized weakness, lightheadedness or fainting as a symptom. Chest pain or discomfort recognition was lower among men, blacks, people with lower income and those with less than a high school education. Pain in the arm or shoulder and shortness of breath was less recognized among men, blacks, those with a low income and people with less than a high school education.

## SIGNS & SYMPTOMS OF HEART ATTACK AND STROKE

Table 6. Percentage of adults recognizing the symptoms of stroke, Louisiana, 2007

	Sudden confusion or trouble speaking (%)	Numbness or weakness of arm/face/leg (%)	Sudden trouble seeing with one or both eyes (%)	Sudden dizziness (%)	Sudden severe unexplained headache (%)	Sudden Chest pain or discomfort (False) (%)
<b>Total</b>	81	86	69	79	60	46
<b>Age (years)</b>						
< 45	82	87	71	82	60	48
45-64	85	89	72	80	63	46
65-74	80	81	65	75	61	44
75-84	63	69	49	62	43	42
85+	59	67	42	54	37	46
<b>Gender</b>						
Male	80	85	70	79	58	49
Female	83	87	69	80	64	45
<b>Race/Ethnicity</b>						
White	86	90	73	83	62	45
Black	71	80	63	71	56	54
<b>Education</b>						
< High school	61	70	53	63	46	49
High school Grad	76	83	62	75	54	50
Some college/ College graduate	88	91	77	85	66	44
<b>Income</b>						
<25,000	72	78	60	71	52	50
25,000-34,999	76	84	67	77	60	52
35,000+	88	92	77	86	66	44

Source: 2007 Behavioral Risk Factor Surveillance System, Louisiana.

There were also differences in the recognition of the symptoms of stroke by age, gender, race, education level and income among Louisiana residents in 2007. Blacks, males, people with less than a high school education, people over the age of 75 and those with lower income were less likely to recognize the signs and symptoms of stroke. Sudden, severe, unexplained headache was less recognized as a symptom of stroke than other signs and symptoms of stroke. In 2007, 46% of the people identified incorrectly that sudden chest pain was a symptom of stroke.

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## CONCLUSION

This report summarizes the most recent information available describing the prevalence, mortality and cost burden for cardiovascular disease in Louisiana. Although the mortality rates for cardiovascular disease have declined over the past few years, heart disease and stroke are still the leading causes of death in Louisiana. Over the past decade, death rates from heart disease and stroke have decreased more slowly in Louisiana than in the US. Moreover the death rates are consistently higher for the state of Louisiana when compared to the US rates during the same time period.

Large disparities exist between racial and ethnic groups regarding the frequency of cardiovascular disease risk factors. Similar disparities exist among gender, age, socio-economic status and geographical locations.

The prevalence rates of modifiable risk factors such as high blood pressure, high blood cholesterol, obesity and diabetes have been increasing among Louisiana residents; however, the prevalence of current smokers has decreased over the past few years both in Louisiana and the US. Louisiana has failed to increase the consumption of fruits and vegetables among residents. Physical inactivity among Louisiana residents has not shown any significant changes over the past few years.

Awareness of the signs and symptoms of heart attack and stroke varied among Louisiana residents. In general, blacks, older adults, people with less education and people with low socio-economic status were less aware of the signs and symptoms of heart attack and stroke. Increasing the awareness of these signs and symptoms among high risk groups will help decrease the mortality and morbidity rates of cardiovascular disease in Louisiana.

Further, collaborative efforts are needed to improve the health status of Louisiana residents by collective information on the incident rates, clinical information of the risk factors, and regional and parish level data on cardiovascular disease with proper utilization and dissemination of resources.

# APPENDIX

## I. Mortality

From 1990 to 1998, coding of mortality data was based on the International Classification of Diseases, Ninth Revision (ICD-9). Codes for mortality data from 1999 to present are based on the International Classification of Diseases, Tenth Revision (ICD-10). The rates were age-adjusted to the US 2000 standard population. US mortality data were obtained through the use of the National Center for Health Statistics website. For cardiovascular disease, the comparability ratios between ICD-9 and ICD-10 are close to 1. The following table shows the codes used to define the disease categories in this report:

Disease	ICD-10	ICD-9
Cardiovascular	I00-I99	I390-459
Disease of the heart	I00-09, 11, 13, 20-51	I390-398, 402, 404, 410-429
Stroke	I60-69	I430-434, 436-438
Acute Myocardial Infarction (Heart attack)	I21-22	I410
Coronary Heart Disease	I20-25	I402, 410-414, 429.2
Heart Failure	I50	I428

## II. Modifiable CVD risk factors

Risk factors for CVD, which includes high blood pressure, high blood cholesterol, diabetes, smoking, physical inactivity and inadequate consumption of fruits and vegetables were reported from the Behavioral Risk Factor Surveillance System (BRFSS).

BRFSS is an ongoing, state-based, telephone survey used to gather information on health risk behaviors, preventive health practices, and health care access of non-institutionalized adults (18 years of age and older) that contribute to the leading causes of diseases in the state. For many states, BRFSS is the only available source of timely, accurate data on health-related behaviors.

### Sample BRFSS questions regarding risk factors:

Diabetes: Have you ever been told by a doctor that you have diabetes?

High Blood Pressure: Have you ever been told by a doctor, nurse, or other health professional that you have high blood pressure?

High Cholesterol: Have you ever been told by a doctor, nurse, or other health professional that your blood cholesterol is high?

Smoking:

Have you smoked at least 100 cigarettes in your entire life?

Do you now smoke cigarettes every day, some days, or not at all?

Weight (BMI is calculated using answers):

About how tall are you without shoes?

About how much do you weigh without shoes?

Physical Inactivity: During the past month, other than your regular job, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise?

Fruits and Vegetables:

Not counting juice, how often do you eat fruit?

How often do you eat green salad?

**Limitations:** The accuracy of self-reported information is affected by the ability to fully recall past behaviors or health screening results. Respondents may have a tendency to under-report behaviors that are socially undesirable, unhealthy or illegal (e.g., drinking and driving, smoking), while over-reporting desirable behaviors (e.g., exercise and healthy eating). Telephone surveys exclude households without telephones, which may result in a biased survey population due to under-representation of certain segments of the population.

### **III. Sign and symptoms of heart attack and stroke**

The 2007 BRFSS contained questions that assessed the knowledge of heart attack and stroke signs and symptoms. One series of questions asked the participants if they thought each of the symptoms given was a sign of a heart attack. Another series of questions asked the participants if they thought each of the symptoms given was a sign of stroke. Participants could answer yes, no, don't know, or not sure.

**Heart attack warning signs BRFSS question include:**

Do you think pain or discomfort in the jaw, neck, or back are symptoms of a heart attack?

Do you think feeling weak, lightheaded, or faint is a symptom of a heart attack?

Do you think chest pain or discomfort is a symptom of a heart attack?

Do you think sudden trouble seeing in one or both eyes is a symptom of a heart attack?

Do you think pain or discomfort in the arms or shoulder is a symptom of a heart attack?

Do you think shortness of breath is a symptom of a heart attack?

**Stroke warning signs BRFSS question include:**

Do you think sudden confusion or trouble speaking are symptoms of a stroke?

Do you think sudden numbness or weakness of face, arm, or leg, especially on one side are symptoms of a stroke?

Do you think sudden trouble seeing in one or both eyes is a symptom of a stroke?

Do you think sudden chest pain or discomfort is a symptom of a stroke?

Do you think sudden trouble walking, dizziness, or loss of balance is a symptom of a stroke?

Do you think severe headache with no known cause is a symptom of a stroke?

## IV. Definitions

### **CVD risk factors assessed by the BRFSS include the following:**

**Previous cardiovascular disease:** Defined as ever having been told by a doctor or a health professional that they had a heart attack or myocardial infarction, angina or coronary heart disease, or a stroke.

**High blood pressure:** Defined as ever having been told by a doctor, nurse, or health professional that their blood pressure was high among those who had their blood pressure checked.

**High blood cholesterol:** Defined as ever having been told by a doctor, nurse, or health professional that their blood cholesterol level was high among those who had their blood cholesterol checked.

**Diabetes:** Defined as ever having been told by a doctor or a health professional that they have diabetes.

**Current smoker:** Defined as someone who has smoked at least 100 cigarettes in their lifetime and smokes now.

**Overweight:** Defined as a body mass index (BMI) greater than 25.0kg/m<sup>2</sup>. BMI equals weight (in kilograms) divided by height (in centimeters) squared. Using weight (in pounds) and height (in inches), BMI equals 705 times weight divided by height squared.

**Obese:** Defined as a body mass index (BMI) greater than 30.0kg/ m<sup>2</sup>.

**Meet the recommendation for physical activity:** Adults who engage in vigorous-intensity physical activity 3 or more days per week for 20 or more minutes per occasion, or engage in moderate-intensity physical activity for 30 minutes on 5 or more days per week.

**Daily serving of fruits and vegetables:** Number of servings of fruit, fruit juice, green salad, potatoes, carrots, and other vegetables consumed per day based on reports for consumption during the past day, week, month, or year.

### **Abbreviations**

CVD: Cardiovascular disease

CHD: Coronary Heart Disease

BMI: Body Mass Index

HDL: High-Density Lipoprotein

LDL: Low-Density Lipoprotein

ICD-9: The International Classification of Diseases, 9th Revision

ICD-10: The International Classification of Diseases, 10th Revision

CDC: Center for Disease Control and Prevention

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## USEFUL WEB SITES

- Louisiana Heart Disease & Stroke Prevention Program: [www.laheart.dhh.louisiana.gov](http://www.laheart.dhh.louisiana.gov)
- American Heart Association: [www.americanheart.org](http://www.americanheart.org)
- CDC's Division of Heart Disease and Stroke Prevention: [www.cdc.gov/dhdsp](http://www.cdc.gov/dhdsp)
- Louisiana State Center for Health Statistics, Department of Health and Hospitals, Office of Public Health. <http://www.dhh.louisiana.gov/offices/?ID=275>
- Mortality Data: <http://wonder.cdc.gov>
- BRFSS: <http://www.cdc.gov/brfss>

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