

Hepatitis B

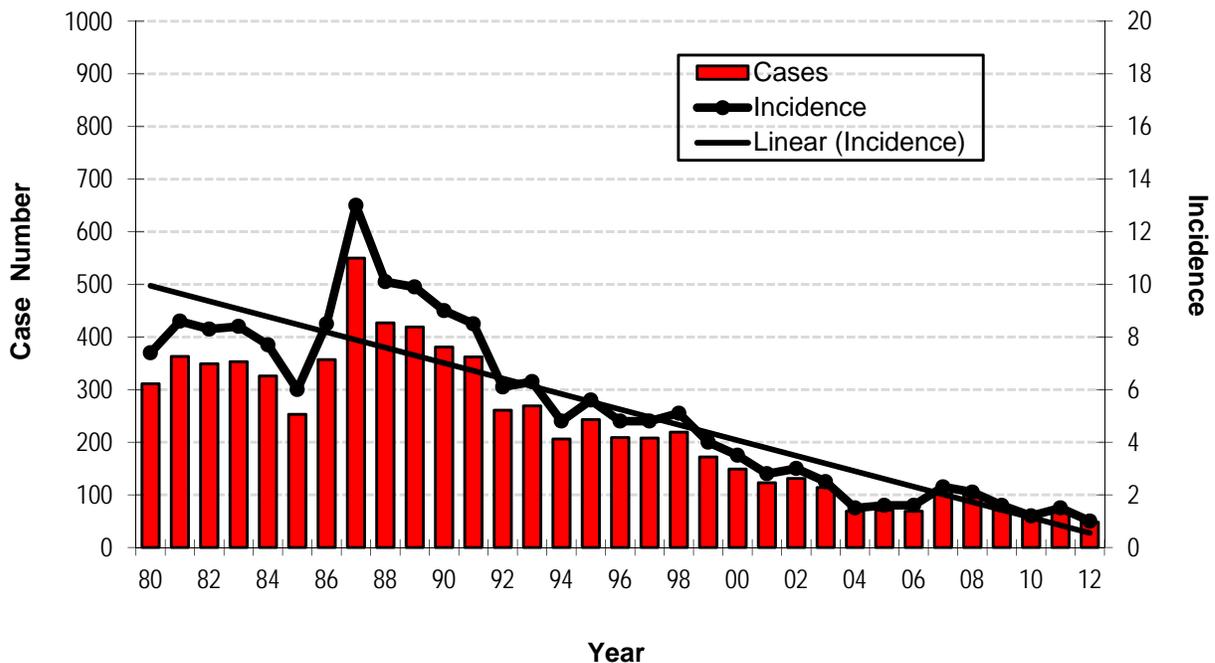
Hepatitis B acute illness, carriage and pregnancy and perinatal infection are class B diseases and must be reported to the state within one business day. Hepatitis B carriage other than in pregnancy is a class C disease and must be reported to the state within five business days.

1. Acute Hepatitis B

Incidence / Prevalence

Using national statistics from the Centers of Disease Control and Prevention (CDC), it is estimated that there were about 1,300 new hepatitis B virus (HBV) infections per year in 2000, down from 5,000 per year in 1980. The introduction of the vaccine in 1982 and the generalization of immunizations have resulted in a steady decline in the number of reported cases of hepatitis B over the past 25 years. Approximately 5% of the U.S. population has been infected by HBV; in Louisiana this would represent some 225,000 people. The number of new, acute cases reported in Louisiana was 158 in 2000 and 48 in 2012. This is an incidence of 1.0 new cases of HBV per population of 100,000 in 2012 (Figure 1).

Figure 1: Number of new cases and incidence of HBV infection reported - Louisiana, 1980-2012



Age Group / Race Distribution

The age group distribution of HBV infections shows very low rates among children and a sharp increase in early adulthood. The increase continues in adults until ages 25 to 34 years in both males and females. Because hepatitis B is transmitted by blood and body fluids, adult males are at higher risk of infection; 61% of all reported cases occur among males because of intravascular drug abuse and homosexual contact. Female rates start increasing at a younger age than males, a pattern that is commonly observed for sexually transmitted diseases (Figure 2).

Figure 2: Incidence of new cases by age and gender - Louisiana, 2005-2012

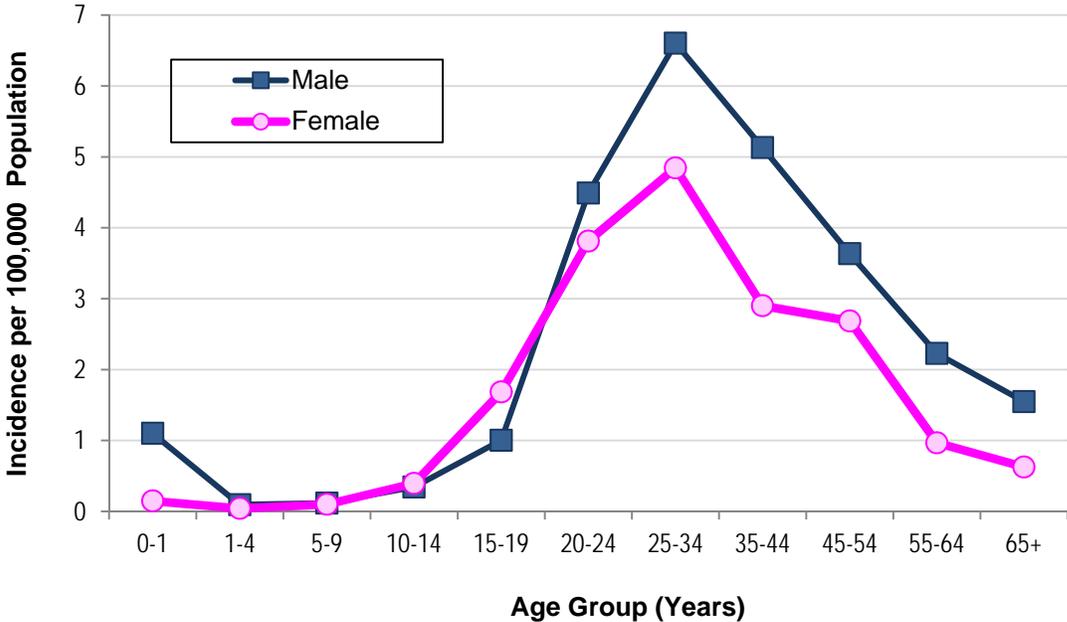


Table 1 shows a comparison of the HBV rates by age and sex between two periods: 1991 to 2000; 2001 to 2010 and for 2010-2012. The main differences are:

- large reductions among the younger age groups (75% to 100% for males) in the latest period, attributable to universal immunization of infants
- more modest reduction in young adults and some increases in older adults
- an increase in the rate of HBV infection in females aged 45 to 54 years

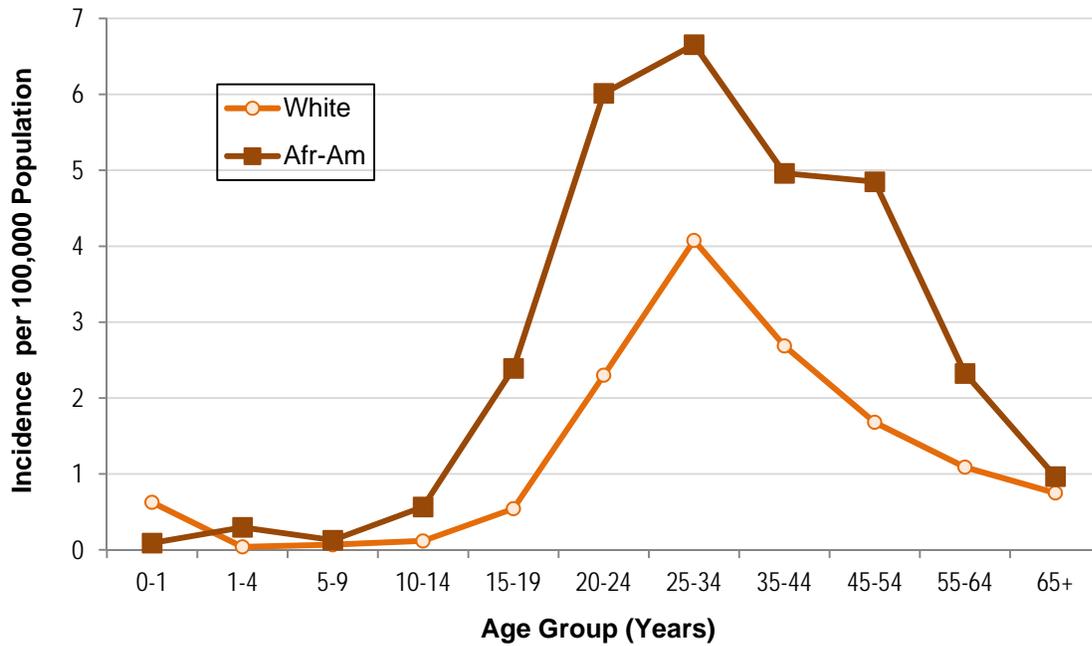
Table 1: HBV incidence rates by sex – Louisiana, 1991-2000, 2001-2010 and 2010-2012

Age		1991-2000	2001-2010	% Change		1990-2000	2001-2010	% Change
0-1	Male	4.4	0.3	↓93%	Female	1.0	0.0	↓100%
1-4		0.6	0.1	↓88%		0.2	0.1	↓67%
5-9		0.7	0.0	↓100%		0.7	0.1	↓91%
10-14		1.4	0.2	↓88%		1.3	0.2	↓86%
15-19		3.7	0.7	↓82%		8.4	1.1	↓87%
20-24		10.5	5.2	↓51%		9.0	3.3	↓63%
25-34		12.7	5.5	↓56%		8.4	4.2	↓50%
35-44		9.2	4.6	↓50%		5.4	2.5	↓54%
45-54		6.2	3.9	↓38%		2.7	2.6	↑20%
55-64		3.3	3.0	↓10%		2.2	0.9	↓57%
65+		3.1	1.1	↓64%		1.8	0.7	↓60%

Age		2010-2012		2010-2012
0-1	Male	0.0	Female	0.0
1-4		0.0		0.0
5-9		0.0		0.0
10-14		0.0		0.0
15-19		0.0		0.0
20-24		0.4		0.8
25-34		4.6		3.0
35-44		4.0		1.6
45-54		2.3		2.0
55-64		1.5		0.4
65+		0.8		0.0

In the very young age groups, universal immunization protects all children regardless of race. In young adult age groups, racial differences can be explained by a higher prevalence of risky behaviors among African-Americans involving contact with blood and body fluids. African-Americans between 15 and 64 years of age are disproportionately affected by acute hepatitis B (Figure 3).

Figure 3: Incidence of new cases by age and race - Louisiana, 2005-2012



Geographical Distribution

The geographical distribution shows that urban centers such as Orleans and Caddo parishes have high rates because of a higher prevalence of African-Americans and persons with risky behaviors living there. Some rural parishes, such as Morehouse, have high rates because their population is small (Table 2).

Table 2: Acute hepatitis B cases and incidence rates by parish per 100,000
Louisiana, 2010-2012 and 1990-2009

Region	Parish	2010-2012		1990-2009	
		Avg. No. of Cases	Avg. Rate	Avg. No. of Cases	Avg. Rate
1	Orleans	5.7	1.6	40.1	11.6
1	Jefferson	2.0	0.5	13.1	3.0
1	Plaquemines	0.0	0.0	1.2	5.0
1	St. Bernard	1.7	4.6	2.5	7.0
2	E. Baton Rouge	6.3	1.4	17.4	3.9
2	W. Baton Rouge	0.3	1.4	0.4	1.5
2	E. Feliciana	1.0	4.9	0.5	2.5
2	W. Feliciana	0.0	0.0	0.5	3.2
2	Ascension	0.7	0.6	1.7	1.5
2	Iberville	0.0	0.0	1.0	2.8
2	Pointe Coupee	0.0	0.0	1.2	5.0
3	Lafourche	0.7	0.7	1.8	1.9
3	Terrebonne	0.7	0.6	1.2	1.0
3	St. Mary	0.3	0.6	0.9	1.6
3	St. John	0.3	0.7	0.8	1.7
3	St. Charles	0.7	1.3	1.2	2.2
3	St. James	0.3	1.5	0.2	0.9
3	Assumption	1.0	4.3	0.5	2.1
4	Lafayette	4.0	1.8	6.0	2.7
4	St. Martin	1.0	1.9	1.1	2.0
4	Iberia	0.3	0.5	2.7	3.7
4	Acadia	0.7	1.1	1.6	2.6
4	Vermilion	0.0	0.0	2.4	4.1
4	Evangeline	0.0	0.0	1.0	2.8
4	St. Landry	0.3	0.4	3.3	3.9
5	Calcasieu	1.0	0.5	5.9	3.1
5	Cameron	0.0	0.0	0.3	3.7
5	Beauregard	0.0	0.0	0.4	1.1
5	Jeff. Davis	0.7	2.1	0.9	2.8
5	Allen	0.0	0.0	0.6	2.1
6	Rapides	1.0	0.8	2.8	2.1
6	Avoyelles	0.3	0.8	1.1	2.5

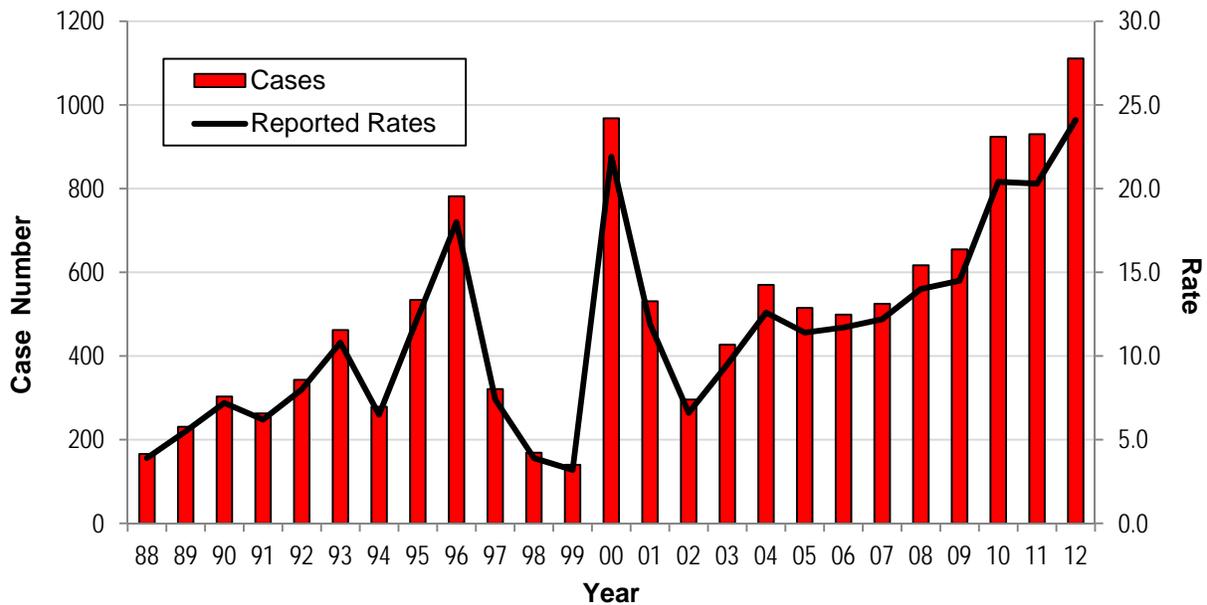
Region	Parish	2010-2012		1990-2009	
		Avg. No. of Cases	Avg. Rate	Avg. No. of Cases	Avg. Rate
6	Vernon	0.0	0.0	0.7	1.2
6	Grant	0.0	0.0	0.3	1.1
6	Winn	0.0	0.0	0.4	2.3
6	La Salle	0.0	0.0	0.3	2.0
6	Catahoula	0.3	3.2	0.2	1.9
6	Concordia	0.0	0.0	0.1	0.5
7	Caddo	3.0	1.2	12.7	5.0
7	De Soto	0.0	0.0	0.5	1.9
7	Sabine	0.0	0.0	0.7	2.7
7	Bossier	0.3	0.3	3.6	3.1
7	Webster	0.0	0.0	1.0	2.3
7	Claiborne	0.0	0.0	0.5	2.6
7	Bienville	0.0	0.0	0.3	1.7
7	Red River	0.0	0.0	0.3	2.7
7	Natchitoches	0.3	0.8	1.4	3.4
8	Ouachita	1.0	0.7	6.5	4.2
8	Union	0.0	0.0	0.3	1.3
8	Lincoln	0.0	0.0	0.7	1.5
8	Jackson	0.0	0.0	0.2	0.9
8	Morehouse	1.7	0.6	1.6	5.7
8	Caldwell	1.0	9.9	0.2	2.0
8	Richland	0.3	1.6	0.5	2.2
8	E. Carroll	0.0	0.0	0.1	1.3
8	W. Carroll	0.0	0.0	0.2	1.3
8	Madison	0.0	0.0	0.3	2.5
8	Franklin	0.0	0.0	0.1	0.5
8	Tensas	0.3	6.3	0.1	1.9
9	St. Tammany	3.0	1.3	3.2	1.4
9	Tangipahoa	4.0	3.3	7.2	5.9
9	Washington	9.3	19.8	2.8	5.9
9	St. Helena	0.0	0.0	0.5	4.5
9	Livingston	1.7	1.3	2.0	1.6

2. Chronic Hepatitis B (Carriers)

The incidence of new infections has decreased as a result of the hepatitis B vaccine, but the prevalence of chronic hepatitis B remains high. In 2010, there was a 41% increase in chronic hepatitis B cases reported to Louisiana. This increase is likely due to improved electronic reporting systems.

According to the CDC, in 2007, an estimated 800,000 to 1.4 million persons in the United States have chronic HBV infections. Of the 200 to 500 infants born to female carriers of HBV annually, approximately 15 become infected with the virus due to prevention failure. The great majority of infants infected at birth will become chronic carriers. Cases of chronic hepatitis B reported to the Office of Public Health (OPH) are not new infections but are newly detected chronic infections (Figure 4).

Figure 4: Number of cases newly reported and reporting rates of HBV chronic infection Louisiana 1988-2012



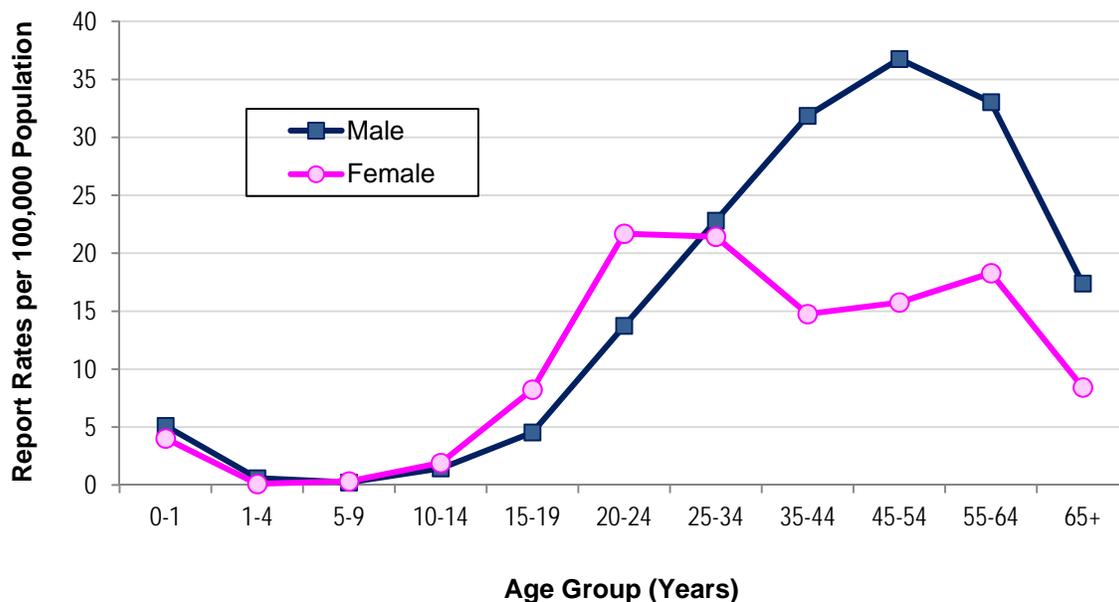
Approximately 0.5% of the population of Louisiana (21,000 people) are estimated to be chronic carriers of HBV, meaning that they are chronically infected with the virus.

Chronic carriers of HBV are easily diagnosed by the presence of the Hepatitis surface antigen in the blood (HBsAg+). A case of chronic Hepatitis B infection is confirmed when HBsAg is detected in the blood twice, at least six months apart. Among those chronically infected with HBV, some 5% to 10% (1,000 to 2,000 people) develop chronic liver disease during their lifetime. The peaks and troughs displayed throughout the past decades are very likely reporting and documentation artifacts.

Age Group / Race Distribution

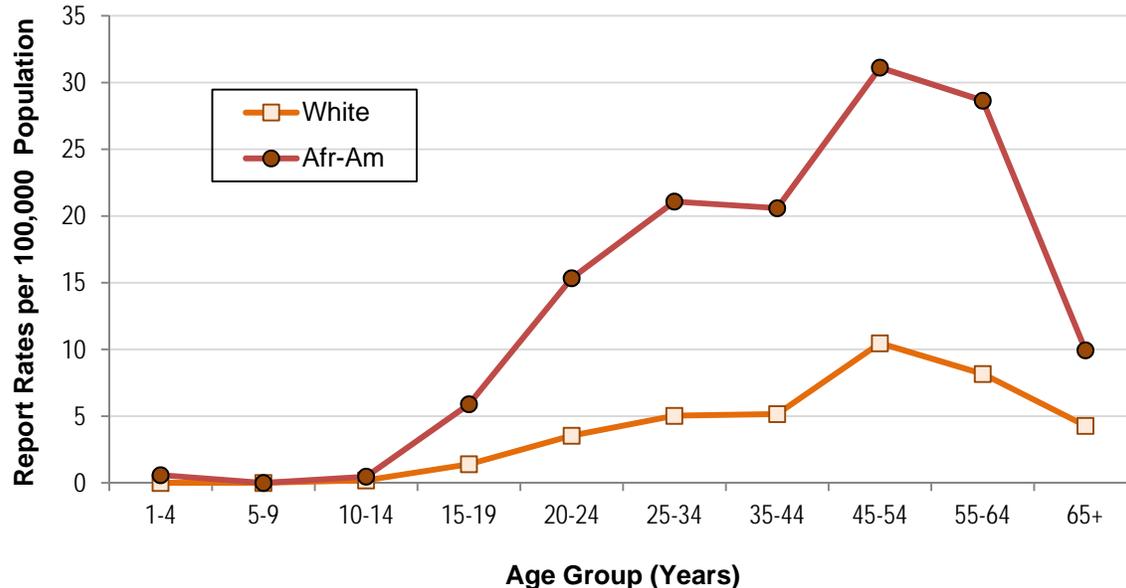
The reporting rates of chronic hepatitis B infections by age and gender and race and gender look very similar to the incidence rates of acute hepatitis B. Reporting rates for women between the ages of 10 and 24 years of age are higher than for men the same age. After the age of 24, the reporting rates for women decrease. Rates for men increase steadily from 10 years of age to 54 years with the highest rate being in the 45 to 54-year old age group (Figure 5).

Figure 5: Newly reported chronic hepatitis B cases by age and gender - Louisiana, 2005-2012



As with acute hepatitis B, the very young age groups are protected from hepatitis B infection by universal immunizations, but in the young adult age groups, racial differences can be explained by a higher prevalence of risky behaviors among African-Americans involving contact with blood and bloody fluids (Figure 6).

Figure 6: Newly reported chronic hepatitis B cases by age and race - Louisiana, 2005-2012



African-Americans between 15 and 64 years of age are disproportionately infected with chronic hepatitis B compared to Whites of the same age.

Geographical Distribution

The same geographical distribution as seen with acute hepatitis B is seen with chronic hepatitis B, showing higher rates in urban centers (greater New Orleans and Shreveport). Orleans and Caddo parishes have the highest rates of reporting. As with the geographical distribution of acute hepatitis B, rural parishes with high rates have few numbers and a low population which gives a higher rate (Table 3).

Table 3: Chronic hepatitis B average rate of reporting by parish per 100,000 population
Louisiana, 2010-2012 and 1990-2009

Region	Parish	2010-2011		1990-2009	
		Avg. No. of Cases	Avg. Rate	Avg. No. of Cases	Avg. Rate
1	Orleans	168.3	49.0	101.9	29.6
1	Jefferson	73.0	16.9	44.5	10.3
1	Plaquemines	3.0	13.0	2.0	8.7
1	St. Bernard	9.3	26.0	5.3	14.8
2	E. Baton Rouge	105.0	23.9	49.6	11.3
2	W. Baton Rouge	2.7	11.2	1.9	8.0
2	E. Feliciana	3.3	16.4	2.1	10.1
2	W. Feliciana	4.3	27.7	1.6	9.9
2	Ascension	11.3	10.6	3.7	3.4
2	Iberville	18.7	55.9	3.4	10.0
2	Pointe Coupee	3.0	13.2	2.1	9.0
3	Lafourche	13.0	13.5	3.9	4.0
3	Terrebonne	19.0	17.0	7.7	6.8
3	St. Mary	11.3	20.7	3.3	5.9
3	St. John	4.3	9.4	3.0	6.4
3	St. Charles	7.0	13.3	1.3	2.4
3	St. James	1.0	4.5	0.8	3.4
3	Assumption	3.3	14.2	1.3	5.6
4	Lafayette	53.0	23.9	30.3	13.7
4	St. Martin	4.3	8.3	5.8	11.0
4	Iberia	17.7	24.1	8.9	12.2
4	Acadia	9.3	15.1	6.1	9.8
4	Vermilion	16.3	28.2	6.3	10.8
4	Evangeline	2.0	5.9	2.0	5.7
4	St. Landry	25.3	30.4	10.9	13.0
5	Calcasieu	41.3	21.4	12.5	6.5
5	Cameron	0.0	0.0	0.3	4.4
5	Beauregard	2.0	5.6	0.3	0.8
5	Jeff. Davis	5.0	15.8	1.9	5.9
5	Allen	5.3	20.7	1.3	5.0
6	Rapides	21.7	16.5	6.1	4.6
6	Avoyelles	4.7	11.1	1.3	3.1

Region	Parish	2010-2011		1990-2009	
		Avg. No. of Cases	Avg. Rate	Avg. No. of Cases	Avg. Rate
6	Vernon	6.0	11.5	1.7	3.2
6	Grant	3.3	14.9	0.4	1.6
6	Winn	1.3	8.7	1.7	11.1
6	La Salle	4.3	29.1	0.5	3.0
6	Catahoula	1.0	9.6	0.3	2.4
6	Concordia	2.3	11.2	0.7	3.1
7	Caddo	97.0	38.0	40.5	15.9
7	De Soto	4.7	17.5	1.5	5.4
7	Sabine	2.7	11.0	1.2	5.0
7	Bossier	20.0	17.1	7.0	6.0
7	Webster	4.3	10.5	2.3	5.5
7	Claiborne	3.3	19.4	2.0	11.6
7	Bienville	1.7	11.6	0.5	3.1
7	Red River	0.3	3.7	0.3	3.3
7	Natchitoches	5.7	14.3	2.0	5.1
8	Ouachita	44.0	28.6	18.2	11.8
8	Union	5.0	22.0	0.9	4.0
8	Lincoln	4.7	10.0	1.2	2.6
8	Jackson	0.7	4.1	1.1	6.5
8	Morehouse	10.7	38.1	2.5	8.9
8	Caldwell	1.7	16.4	0.4	3.5
8	Richland	2.7	12.9	0.8	3.6
8	E. Carroll	2.0	25.8	0.6	7.1
8	W. Carroll	2.0	17.2	0.3	2.2
8	Madison	0.7	5.5	1.3	10.3
8	Franklin	2.7	12.8	0.8	3.9
8	Tensas	1.0	19.0	0.5	9.5
9	St. Tammany	27.0	11.6	11.0	4.7
9	Tangipahoa	24.3	20.1	14.5	12.0
9	Washington	16.0	33.9	5.3	11.2
9	St. Helena	0.7	6.0	0.3	2.7
9	Livingston	10.0	7.8	4.0	3.1

3. Hospitalizations

In 1997, the Louisiana Legislature mandated the reporting of hospital discharge data. The Louisiana Hospital Discharge Database (LaHIDD) serves as the state registry containing inpatient discharge data submitted to the Department of Health and Hospitals (DHH), OPH by Louisiana hospitals. Yearly LaHIDD datasets contain parish, age, admit date, demographic and diagnosis information on all inpatients. These datasets are a tremendous resource allowing epidemiologists to examine absolute numbers and trends due to infectious diseases, for example, hepatitis related disease (Table 4).

Table 4: Hepatitis B-related hospitalizations (main and secondary diagnoses)
Louisiana, 1999-2012

1999	676	15.5	391	285	57.8%
2000	796	17.8	433	363	54.4%
2001	955	21.3	567	388	59.4%
2002	835	18.6	455	380	54.5%
2003	895	19.9	525	370	58.7%
2004	937	20.8	533	404	56.9%
2005	818	18.1	468	350	57.2%
2006	635	14.8	360	275	56.7%
2007	739	17.2	437	302	59.1%
2008	1,003	22.7	608	395	60.6%
2009	991	21.9	592	399	59.7%
2010	961	21.2	597	364	62.1%
2011	952	20.7	581	371	61.0%
2012	613	13.3	363	250	59.2%

The ICD-9 codes for HBV are:

070.2 viral hepatitis B with hepatic coma

070.20 viral hepatitis B with hepatic coma without mention of hepatitis delta

070.21 viral hepatitis B with hepatic coma with hepatitis delta

070.3 viral hepatitis B without mention of hepatic coma

070.30 viral hepatitis B without mention of hepatic coma without mention of hepatitis delta

070.31 viral hepatitis B without mention of hepatic coma with hepatitis delta

V02.61 hepatitis B carrier.

HBV hospital discharge rates have increased by over 50% since 2005 and peaked in 2008 with a rate of 22.7 per 100,000 population. The increase is likely due to higher rates of testing for

HBV. Males have made up the majority of the hospital admissions related to HBV in the period from 1999 to 2011.

4. Mortality

According to the CDC, from 2,000 to 4,000 deaths each year in the United States is attributed to hepatitis B.

The ICD-10 codes for hepatitis B-related deaths are:

B16.0, B16.1, B16.2 and B16.9 for acute hepatitis B

B18.0 and B 18.1 for chronic hepatitis B.

The number of acute hepatitis B-related deaths in Louisiana has decreased since 1999 (Table 5). There are very few chronic hepatitis B-related deaths each year in Louisiana.

Table 5: Hepatitis B related deaths-Louisiana 1999-2012

1999	56	3
2000	53	1
2001	45	9
2002	45	5
2003	43	1
2004	39	3
2005	31	4
2006	23	2
2007	25	2
2008	25	2
2009	25	2
2010	10	1
2011	2	0
2012	8	1