

Hepatitis B

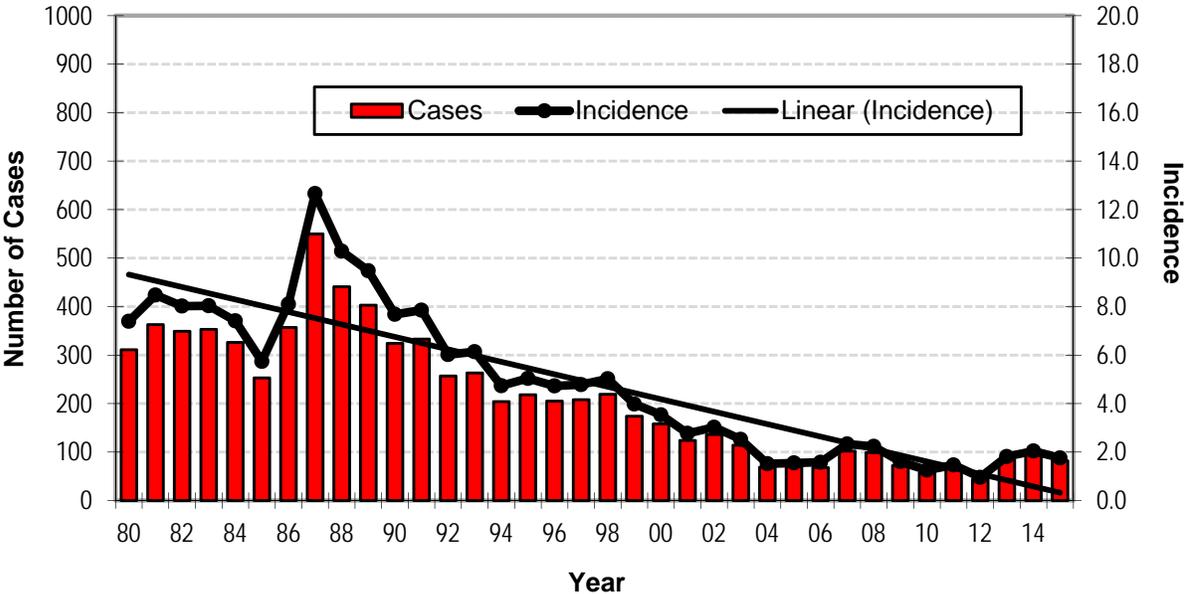
Hepatitis B acute illness, carriage and pregnancy and perinatal infection are class B diseases and must be reported to the state within one business day. Hepatitis B carriage other than in pregnancy is a class C disease and must be reported to the state within five business days.

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 82 in 2015. This is an incidence of 1.8 new cases of HBV per population of 100,000 in 2015 (Figure 1).

Figure 1: Number of New Cases and Incidence of HBV Infection Reported - Louisiana, 1980-2015



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; 56% of all reported cases occur among males because of intravenous drug abuse and homosexual contact (Figure 2).

Figure 2: Incidence of New Cases by Age and Gender - Louisiana, 2005-2015

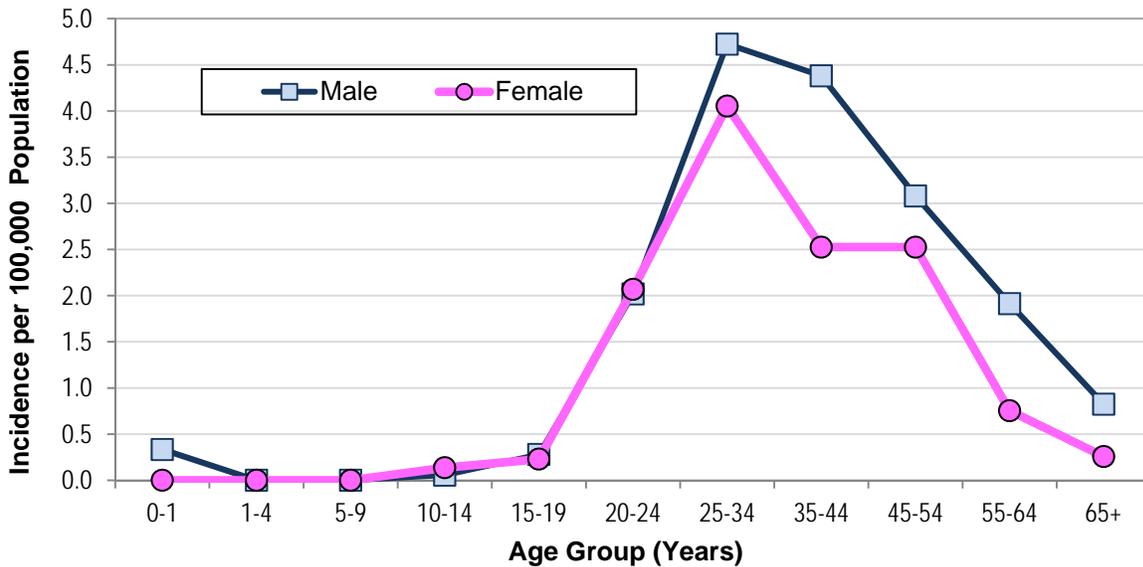


Table 1 shows a comparison of the HBV rates by age and sex between two periods: 1991 to 2000; 2001 to 2010 and for 2011-2015. The main differences are:

- 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

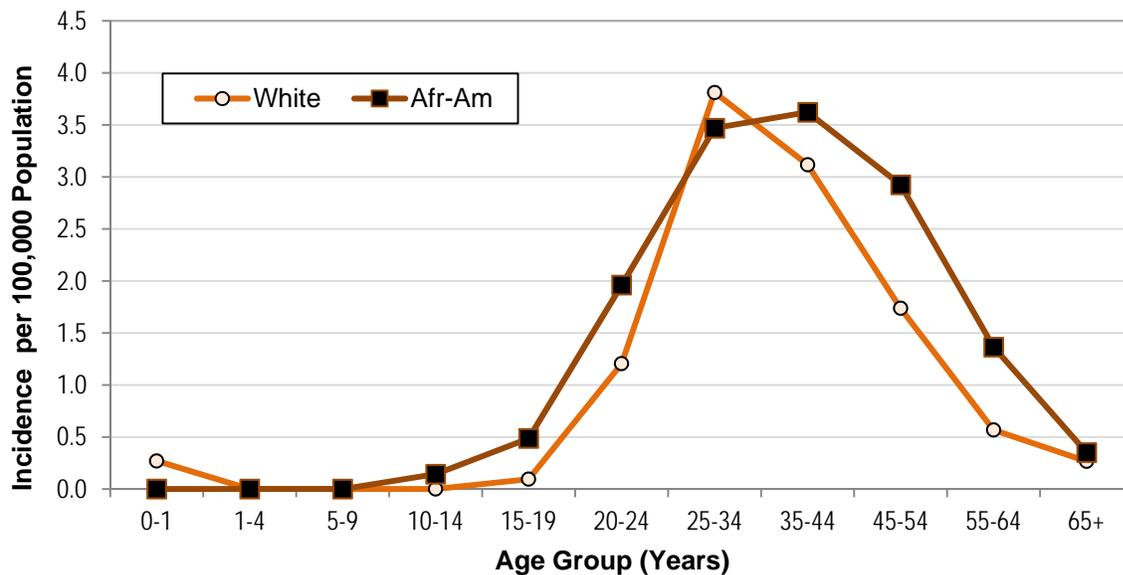
Table 1: HBV Incidence Rates by Sex - Louisiana, 1991-2000, 2001-2010 and 2011-2015

Age	1991-2000	2001-2010	% Change	1990-2000	2001-2010	% Change
0-1	4.4	0.3	↓92%	1.0	0.0	↓100%
1-4	0.6	0.1	↓88%	0.2	0.1	↓68%
5-9	0.7	0.0	↓100%	0.7	0.1	↓91%
10-14	1.4	0.2	↓88%	1.3	0.2	↓85%
15-19	3.7	0.7	↓80%	8.4	1.1	↓87%
20-24	10.5	5.1	↓51%	9.0	3.5	↓61%
25-34	12.7	5.6	↓55%	8.4	4.3	↓49%
35-44	9.2	4.7	↓49%	5.4	2.5	↓53%
45-54	6.2	3.9	↓38%	2.7	2.8	↑4%
55-64	3.3	3.0	↓10%	2.2	0.8	↓64%
65+	3.1	1.1	↓63%	1.8	0.7	↓60%

Age	2011-2015		2011-2015	
0-1		0.0		0.0
1-4	Male	0.0	Female	0.0
5-9		0.0		0.0
10-14		0.0		0.0
15-19		0.1		0.0
20-24		0.7		1.0
25-34		4.1		3.3
35-44		5.3		3.2
45-54		2.6		2.1
55-64		1.0		1.1
65+		0.5		0.2

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, 2005-2015



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, 2011-2015 and 1991-2010

Region	Parish	2011-2015		1991-2010	
		Avg. No. of Cases	Avg. Rate	Avg. No. of Cases	Avg. Rate
1	JEFFERSON	3.6	0.8	12.0	2.6
1	ORLEANS	3.4	0.9	37.5	8.1
1	PLAQUEMINES	0.2	0.8	1.1	4.3
1	ST. BERNARD	1.2	2.9	2.4	4.3
2	ASCENSION	2.0	1.7	1.7	2.4
2	E BATON ROUGE	10.2	2.3	16.1	4.0
2	EAST FELICIANA	1.0	5.0	0.5	2.2
2	IBERVILLE	1.2	3.6	0.7	2.2
2	POINT COUPEE	0.0	0.0	1.2	5.1
2	W BATON ROUGE	0.6	2.4	0.4	1.9
2	WEST FELICIANA	0.0	0.0	0.4	3.0
3	ASSUMPTION	0.4	1.7	0.6	2.4
3	LAFOURCHE	0.2	0.2	1.7	1.9
3	ST. CHARLES	0.4	0.8	1.1	2.3
3	ST. JAMES	0.2	0.9	0.2	0.7
3	ST. JOHN	0.2	0.5	0.8	1.9
3	ST. MARY	0.4	0.7	0.7	1.2
3	TERREBONNE	2.6	2.3	1.1	1.0
4	ACADIA	0.6	1.0	1.5	2.6
4	EVANGELINE	0.2	0.6	0.9	2.7
4	IBERIA	0.4	0.5	2.2	3.1
4	LAFAYETTE	3.8	1.6	5.2	2.8
4	ST. LANDRY	0.6	0.7	2.7	3.2
4	ST. MARTIN	0.8	1.5	1.0	2.2
4	VERMILION	0.8	1.3	2.3	4.4
5	ALLEN	0.2	0.8	0.6	2.2
5	BEAUREGARD	0.2	0.5	0.4	1.3
5	CALCASIEU	1.0	0.5	5.7	3.2
5	CAMERON	0.0	0.0	0.3	2.7
5	JEFFERSON DAVIS	0.4	1.3	1.0	3.2
6	AVOUELLES	0.4	1.0	1.0	2.5
6	CATAHOULA	0.4	3.9	0.3	2.4

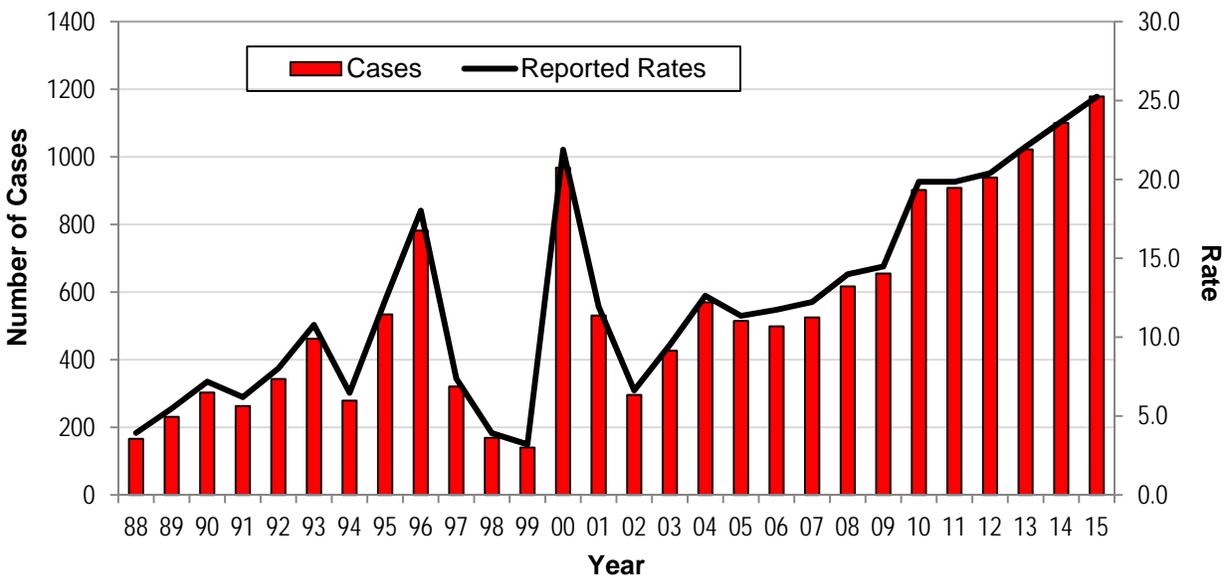
Region	Parish	2011-2015		1991-2010	
		Avg. No. of Cases	Avg. Rate	Avg. No. of Cases	Avg. Rate
6	CONCORDIA	0.2	1.0	0.1	0.2
6	GRANT	0.2	0.9	0.2	1.0
6	LA SALLE	0.2	1.3	0.2	1.4
6	RAPIDES	0.6	0.5	2.4	1.9
6	VERNON	1.2	2.3	0.6	1.1
6	WINN	0.2	1.4	0.3	1.8
7	BIENVILLE	0.2	1.4	0.2	1.3
7	BOSSIER	0.6	0.5	3.3	3.6
7	CADDO	1.2	0.5	11.8	4.8
7	CLAIBORNE	0.0	0.0	0.5	2.6
7	DESOTO	0.0	0.0	0.4	1.6
7	NATCHITOCHE	0.2	0.5	1.3	3.4
7	RED RIVER	0.0	0.0	0.2	2.1
7	SABINE	0.0	0.0	0.6	2.6
7	WEBSTER	0.2	0.5	0.9	2.2
8	CALDWELL	0.8	8.0	0.2	1.9
8	EAST CARROLL	0.2	2.7	0.1	1.1
8	FRANKLIN	0.2	1.0	0.1	0.4
8	JACKSON	0.0	0.0	0.2	1.0
8	LINCOLN	0.2	0.4	0.7	1.5
8	MADISON	0.2	1.7	0.3	2.0
8	MOREHOUSE	1.4	5.2	1.7	5.5
8	OUACHITA	1.8	1.2	6.6	4.4
8	RICHLAND	0.4	1.9	0.5	2.2
8	TENSAS	0.2	4.0	0.1	0.8
8	UNION	0.0	0.0	0.3	1.4
8	WEST CARROLL	0.0	0.0	0.2	1.2
9	LIVINGSTON	12.8	9.5	2.1	2.2
9	ST. HELENA	0.0	0.0	0.5	5.0
9	ST. TAMMANY	2.4	1.0	3.2	1.7
9	TANGIPAHOA	4.4	3.5	6.7	6.7
9	WASHINGTON	6.8	14.5	3.0	6.6

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 U.S. 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 Louisiana Department of Health (LDH), 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, 1988-2015



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.

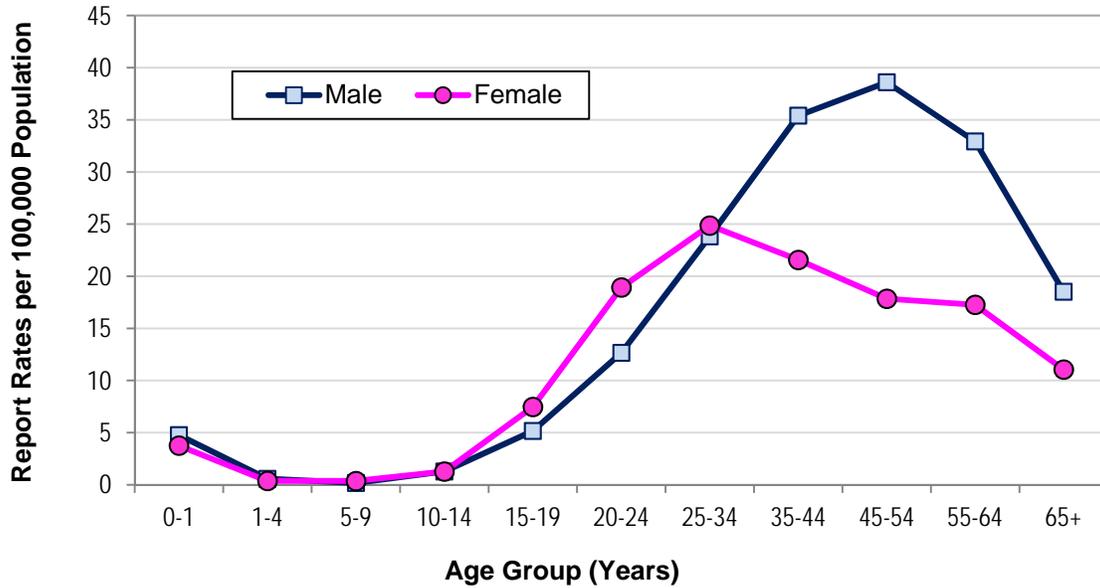
Chronic carriers of HBV are easily diagnosed by the presence of the Hepatitis surface antigen in the blood (HBsAg+). A case of chronic Hepatitis B infection is confirmed when HBsAg is detected in the blood twice, at least six months apart. Among those chronically infected with HBV, some 5% to 10% (1,000 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

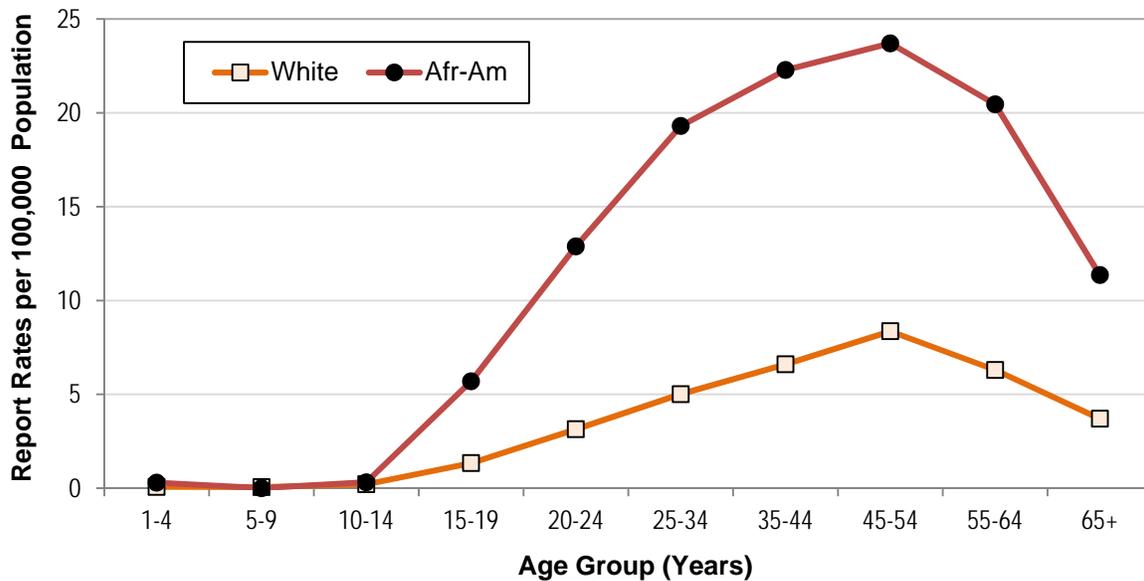
reporting rates for women decrease. Rates for men increase steadily from 10 years of age to 54 years with the highest rate being in the 45 to 64-year old age group (Figure 5).

Figure 5: Newly Reported Chronic Hepatitis B Cases by Age and Gender - Louisiana, 2005-2015



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, 2005-2015



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, 2011-2015 and 1991-2010

Region	Parish	2011-2015		1991-2010	
		Avg. No. of Cases	Avg. Rate	Avg. No. of Cases	Avg. Rate
1	JEFFERSON	3.6	0.8	12.0	2.6
1	ORLEANS	3.4	0.9	37.5	8.1
1	PLAQUEMINES	0.2	0.8	1.1	4.3
1	ST. BERNARD	1.2	2.9	2.4	4.3
2	ASCENSION	2.0	1.7	1.7	2.4
2	E BATON ROUGE	10.2	2.3	16.1	4.0
2	EAST FELICIANA	1.0	5.0	0.5	2.2
2	IBERVILLE	1.2	3.6	0.7	2.2
2	POINT COUPEE	0.0	0.0	1.2	5.1
2	W BATON ROUGE	0.6	2.4	0.4	1.9
2	WEST FELICIANA	0.0	0.0	0.4	3.0
3	ASSUMPTION	0.4	1.7	0.6	2.4
3	LAFOURCHE	0.2	0.2	1.7	1.9
3	ST. CHARLES	0.4	0.8	1.1	2.3
3	ST. JAMES	0.2	0.9	0.2	0.7
3	ST. JOHN	0.2	0.5	0.8	1.9
3	ST. MARY	0.4	0.7	0.7	1.2
3	TERREBONNE	2.6	2.3	1.1	1.0
4	ACADIA	0.6	1.0	1.5	2.6
4	EVANGELINE	0.2	0.6	0.9	2.7
4	IBERIA	0.4	0.5	2.2	3.1
4	LAFAYETTE	3.8	1.6	5.2	2.8
4	ST. LANDRY	0.6	0.7	2.7	3.2
4	ST. MARTIN	0.8	1.5	1.0	2.2
4	VERMILION	0.8	1.3	2.3	4.4
5	ALLEN	0.2	0.8	0.6	2.2
5	BEAUREGARD	0.2	0.5	0.4	1.3
5	CALCASIEU	1.0	0.5	5.7	3.2
5	CAMERON	0.0	0.0	0.3	2.7
5	JEFFERSON DAVIS	0.4	1.3	1.0	3.2
6	AVOYELLES	0.4	1.0	1.0	2.5
6	CATAHOULA	0.4	3.9	0.3	2.4

Region	Parish	2011-2015		1991-2010	
		Avg. No. of Cases	Avg. Rate	Avg. No. of Cases	Avg. Rate
6	CONCORDIA	0.2	1.0	0.1	0.2
6	GRANT	0.2	0.9	0.2	1.0
6	LA SALLE	0.2	1.3	0.2	1.4
6	RAPIDES	0.6	0.5	2.4	1.9
6	VERNON	1.2	2.3	0.6	1.1
6	WINN	0.2	1.4	0.3	1.8
7	BIENVILLE	0.2	1.4	0.2	1.3
7	BOSSIER	0.6	0.5	3.3	3.6
7	CADDO	1.2	0.5	11.8	4.8
7	CLAIBORNE	0.0	0.0	0.5	2.6
7	DESOTO	0.0	0.0	0.4	1.6
7	NATCHITOCHE	0.2	0.5	1.3	3.4
7	RED RIVER	0.0	0.0	0.2	2.1
7	SABINE	0.0	0.0	0.6	2.6
7	WEBSTER	0.2	0.5	0.9	2.2
8	CALDWELL	0.8	8.0	0.2	1.9
8	EAST CARROLL	0.2	2.7	0.1	1.1
8	FRANKLIN	0.2	1.0	0.1	0.4
8	JACKSON	0.0	0.0	0.2	1.0
8	LINCOLN	0.2	0.4	0.7	1.5
8	MADISON	0.2	1.7	0.3	2.0
8	MOREHOUSE	1.4	5.2	1.7	5.5
8	OUACHITA	1.8	1.2	6.6	4.4
8	RICHLAND	0.4	1.9	0.5	2.2
8	TENSAS	0.2	4.0	0.1	0.8
8	UNION	0.0	0.0	0.3	1.4
8	WEST CARROLL	0.0	0.0	0.2	1.2
9	LIVINGSTON	12.8	9.5	2.1	2.2
9	ST. HELENA	0.0	0.0	0.5	5.0
9	ST. TAMMANY	2.4	1.0	3.2	1.7
9	TANGIPAHOA	4.4	3.5	6.7	6.7
9	WASHINGTON	6.8	14.5	3.0	6.6

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 LDH, 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, 1999-2014

Year	Hospitalizations	Rate per 100,000	Males	Females	Percent Males
1999	676	15.5	391	285	57.8%
2000	796	18.0	433	363	54.4%
2001	955	21.5	567	388	59.4%
2002	835	18.7	455	380	54.5%
2003	895	19.9	525	370	58.7%
2004	937	20.8	533	404	56.9%
2005	818	18.0	468	350	57.2%
2006	635	14.9	360	275	56.7%
2007	739	17.2	437	302	59.1%
2008	1,003	22.7	608	395	60.6%
2009	1,018	22.5	613	405	60.2%
2010	986	21.7	616	370	62.5%
2011	1,124	24.6	697	427	62.0%
2012	824	17.9	484	340	58.7%
2013	824	17.5	476	346	57.8%
2014	879	18.3	515	364	58.6%

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 2011 with a rate of 24.5 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 2014.

4. Mortality

According to the CDC, from 2,000 to 4,000 deaths each year in the U.S. 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 1999-2014

Year	Acute Hepatitis B	Chronic Hepatitis B
1999	56	3
2000	53	1
2001	55	9
2002	45	5
2003	43	1
2004	39	3
2005	24	4
2006	23	2
2007	27	2
2008	27	2
2009	27	2
2010	30	2
2011	21	0
2012	39	1
2013	27	2
2014	48	2