

Respiratory Syncytial Virus (RSV)

Respiratory Syncytial virus (RSV) infections are not reportable to the state of Louisiana.

Respiratory syncytial virus (RSV) causes acute respiratory tract infections in persons of all ages. In infants and young children, RSV is the most important cause of bronchiolitis and pneumonia. Illness usually begins with fever, runny nose, cough, and sometimes wheezing. During their first RSV infection, between 25% and 40% of infants and young children have signs or symptoms of bronchiolitis or pneumonia, and 0.5% to 2% require hospitalization. RSV pneumonia causes few deaths among infants and children in Louisiana, and most children recover from the illness within eight to 15 days. RSV is extremely common and almost all children are infected at least once by the time they are two years of age. Re-infection throughout life is common. In older children and adults, RSV infection manifests as upper respiratory tract illness, but more serious disease can develop in elderly and immunocompromised persons.

RSV is spread via respiratory secretions through direct or close contact with contaminated secretions, which may be via droplet or through contact with contaminated surfaces or objects. RSV can remain infective for many hours on environmental surfaces and for a half-hour or more on hands. Infection occurs when infectious materials contact mucous membranes of the eyes, mouth, or nose, and possibly through the inhalation of droplets generated by sneezing and coughing.

RSV infections usually occur in annual epidemics during winter and early spring, and often last four to six months in temperate climates. The timing and severity of outbreaks varies from year-to-year. Spreading among household and child care contacts is common. There is currently no vaccine for RSV. The best prevention of RSV is thorough and frequent handwashing or use of alcohol-based hand rubs. Children hospitalized with RSV should be placed under contact isolation. In high-risk children immunoprophylaxis with palivizumab decreases the rate of hospitalization due to RSV bronchiolitis. This recombinant monoclonal antibody is administered as an intramuscular injection just prior to RSV season, and is continued monthly for a total of five doses. Palivizumab has been shown to decrease the rate of RSV associated hospitalizations; however, this biological offers no significant decrease in mortality and has not been shown to be cost effective for use in all at-risk children.

For high-risk children, prophylaxis is only required for the RSV season before the child reaches the age of one year. RSV infection is more likely to lead to hospitalization if the child attends day care, has school-age siblings, exposure to environmental air pollution, congenital abnormalities of airways, or severe neuromuscular disease. These risk factors are additive, so the cost and benefits of prophylaxis should be considered individually for each patient.

Because palivizumab prophylaxis must be initiated before RSV season begins, it is important for physicians to be familiar with the timing of RSV season in areas served.

Hospitalization Numbers, Rates and Trends

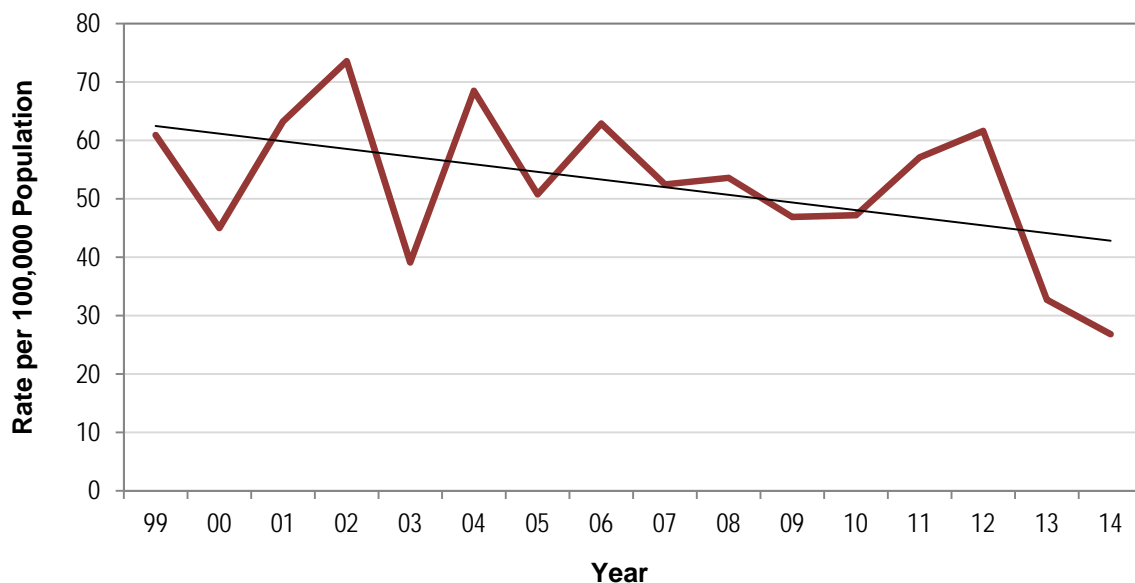
Hospitalization surveillance is based on Louisiana Hospital Inpatient Discharge Data (LaHIDD). In 1997, the Louisiana legislature mandated the reporting of hospital discharge data. LaHIDD serves as the state registry for hospital discharge data submitted to the Louisiana Department of Health (LDH). The Office of Public Health (OPH) is responsible for providing the data to OPH sections as needed. The Infectious Disease Epidemiology Section uses these data sets for surveillance of infectious diseases in hospitals. The data is available after a delay of two years. LaHIDD data sets contain demographic information (names, gender, age, date of birth, address), admit diagnosis, discharge diagnoses (main diagnosis plus eight additional diagnoses), procedures (main plus five), charges, length of stay and hospital name. The diagnoses and procedures are coded with ICD-9 codes. Repeat hospitalizations are not included in the analysis. The data are based on the years 1999 to 2014.

Records of patients with RSV were extracted from LaHIDD using the ICD9 codes of 480.1, 079.6 and 466.11, whether the codes were found in the main diagnosis or in the eight additional secondary diagnoses. Readmissions within 60 days of a hospitalization were excluded from the statistics.

Over the entire period the number of yearly hospitalizations from RSV related illness ranged from 1,289 to 3,304 annually; rates ranged from 2.4 to 5.9 per 1,000 total hospitalizations.

Examining the hospitalization case rate on a total population basis as opposed to a total hospitalization basis, the hospitalization case rate was 52.6 per 100,000 population. Since these data represent all the hospitalizations occurring in Louisiana, it is reasonable to assume that these data correlate to population based data, and rates can be utilized to gauge trends in the entire Louisiana population. The yearly case rates calculated per 100,000 population ranged from 26.8 to 73.6. There was a slight decreasing trend; however, there appear to have been numerous increases and decreases throughout the years (Figure 1).

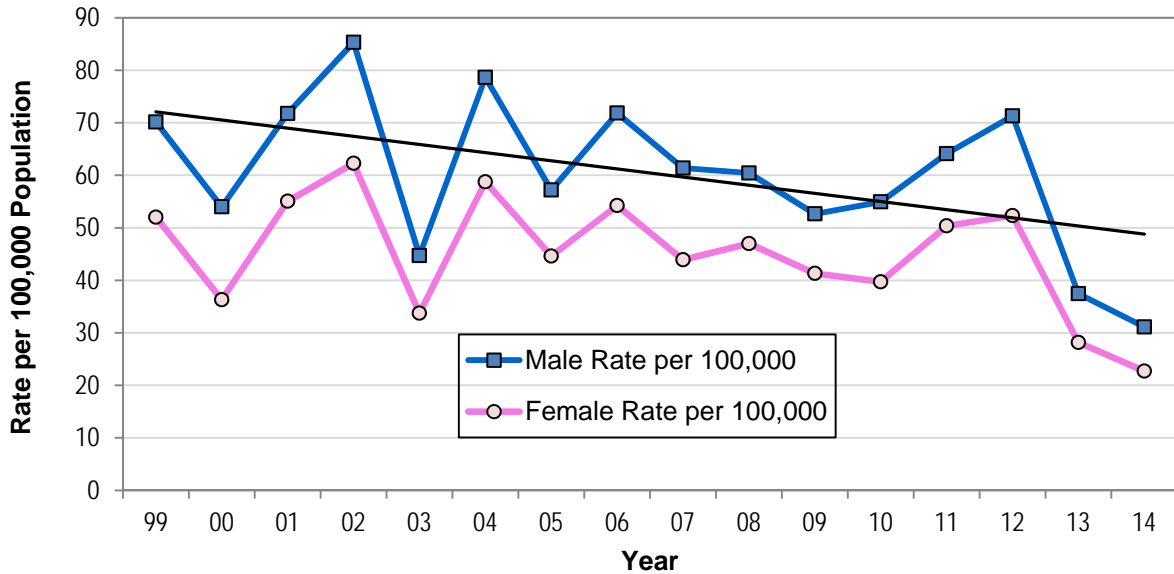
Figure 1: Hospitalized case rates per 100,000 population – Louisiana, 1999-2014



Age, Sex and Race Distribution

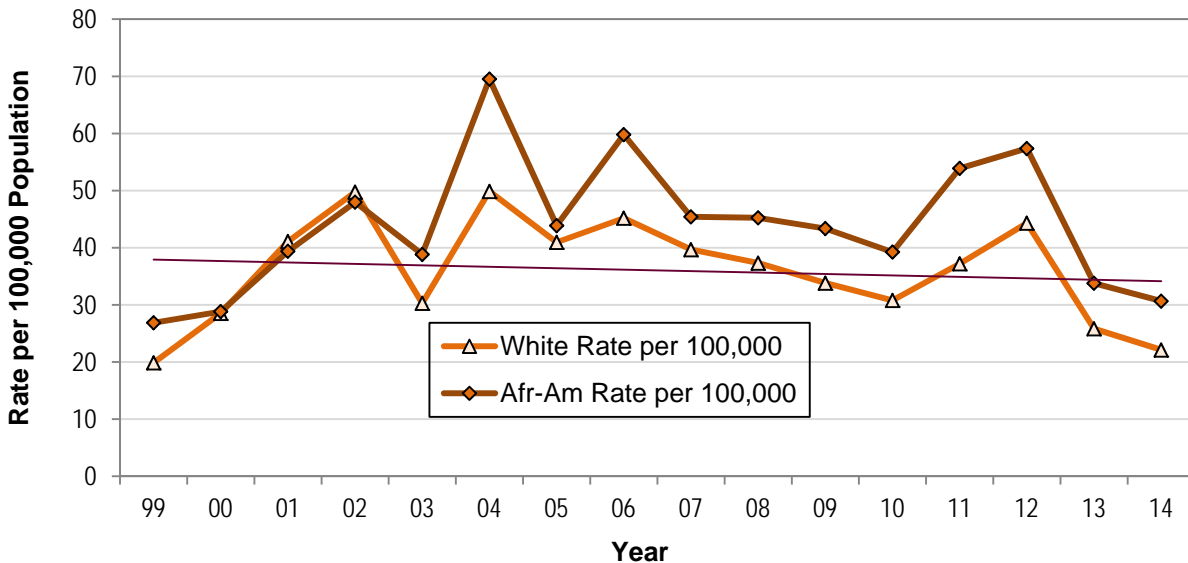
The overall rates of RSV hospitalizations were 63.55 for males and 47.39 for females per 100,000 population; therefore, rates appear to have been higher in males (Figure 2).

Figure 2: Hospitalized case rates per 100,000 population by gender – Louisiana, 1999-2014



Rates were calculated for Whites and African-Americans only. Numbers for other race and ethnic groups were small and the population estimates were often inaccurate. Rates based on race were likely underestimates of actual rates since a good proportion of cases did not report race or ethnicity. The overall rates of RSV hospitalization were 37.2 per 100,000 for Whites and 44.0 per 100,000 for African-Americans (Figure 3).

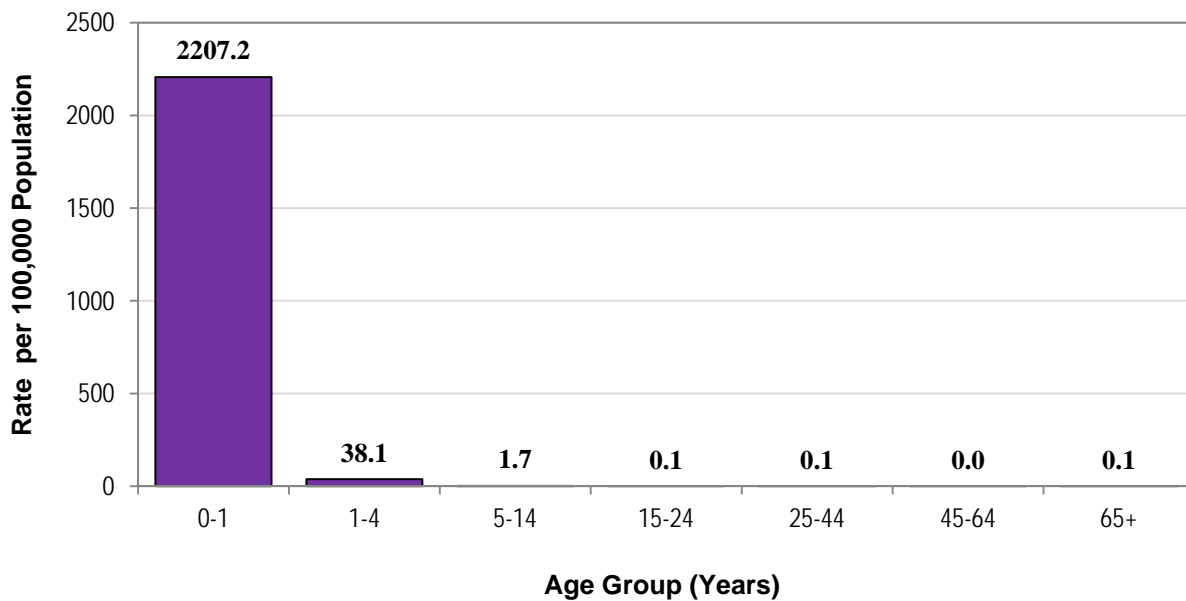
Figure 3: Hospitalized case rates by race - Louisiana, 1999-2014



Almost all children will have had an RSV infection by their second birthday. When infants and children are exposed to RSV for the first time, 25% to 40% exhibit signs or symptoms of bronchiolitis or pneumonia, and 0.5% to 2% require hospitalization. Most children that are hospitalized for RSV infection are younger than six months of age.

The rates of hospitalization for RSV were significantly higher for infants newborn to one year of age (2,207.2 per 100,000), as well as for those in ages one to four years of age (38.1 per 100,000). The rates dropped off dramatically after those ages, with remaining age group rates between 0.0 and 1.7 per 100,000 (Figure 4).

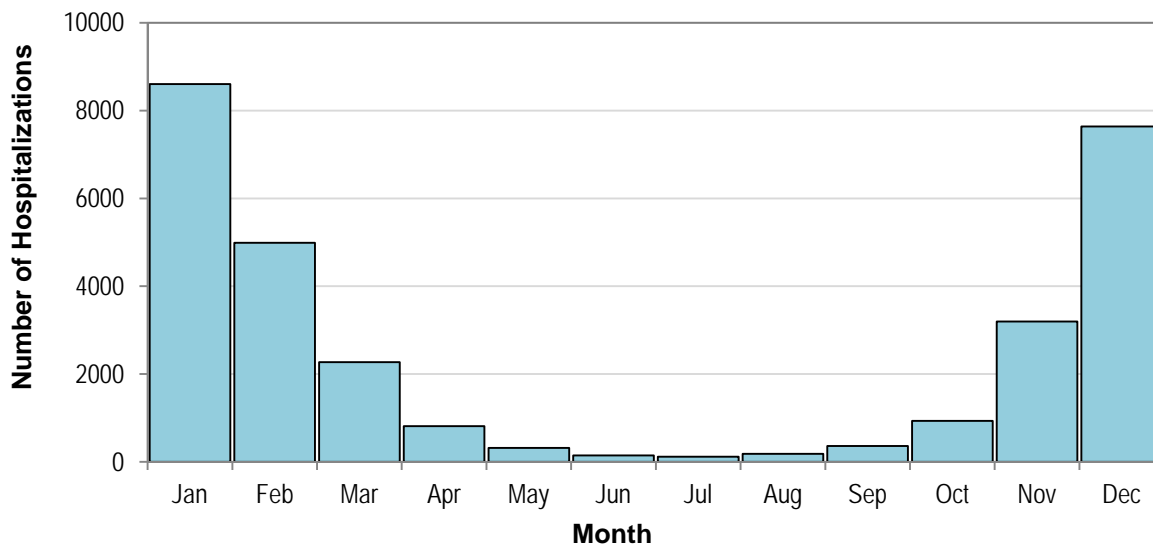
Figure 4: Age group distribution – Louisiana, 1999-2014



Seasonality

As mentioned previously, RSV cases showed a distinct seasonal trend, with the highest number of cases recorded in December, January, and February. The number decreased in the spring, and the least number of cases occurred in the summer months of June, July, and August. Case numbers then rose again in the fall. Year after year, the seasonality remained constant (Figure 5).

Figure 5: Seasonality of RSV – Louisiana, 1999-2014



Mortality

The mortality rate for RSV among hospitalized patients was very low, with only 35 deaths occurring between the years 1999 to 2014. (Table 1)

Table 1. RSV mortality – Louisiana, 1999-2014

Year	Hospitalizations	Deaths	Percent Deaths
1999	2,706	1	0.0
2000	2,010	0	0.0
2001	2,833	1	0.0
2002	3,304	3	0.1
2003	1,758	0	0.0
2004	3,092	4	0.1
2005	2,298	1	0.0
2006	2,695	1	0.0
2007	2,252	2	0.1
2008	2,363	1	0.0
2009	2,120	1	0.0
2010	2,138	3	0.1
2011	2,612	2	0.1
2012	2,835	5	0.2
2013	1,538	4	0.3
2014	1,289	6	0.5