

STREPTOCOCCUS PNEUMONIAE IN NEVADA, 2003-2012

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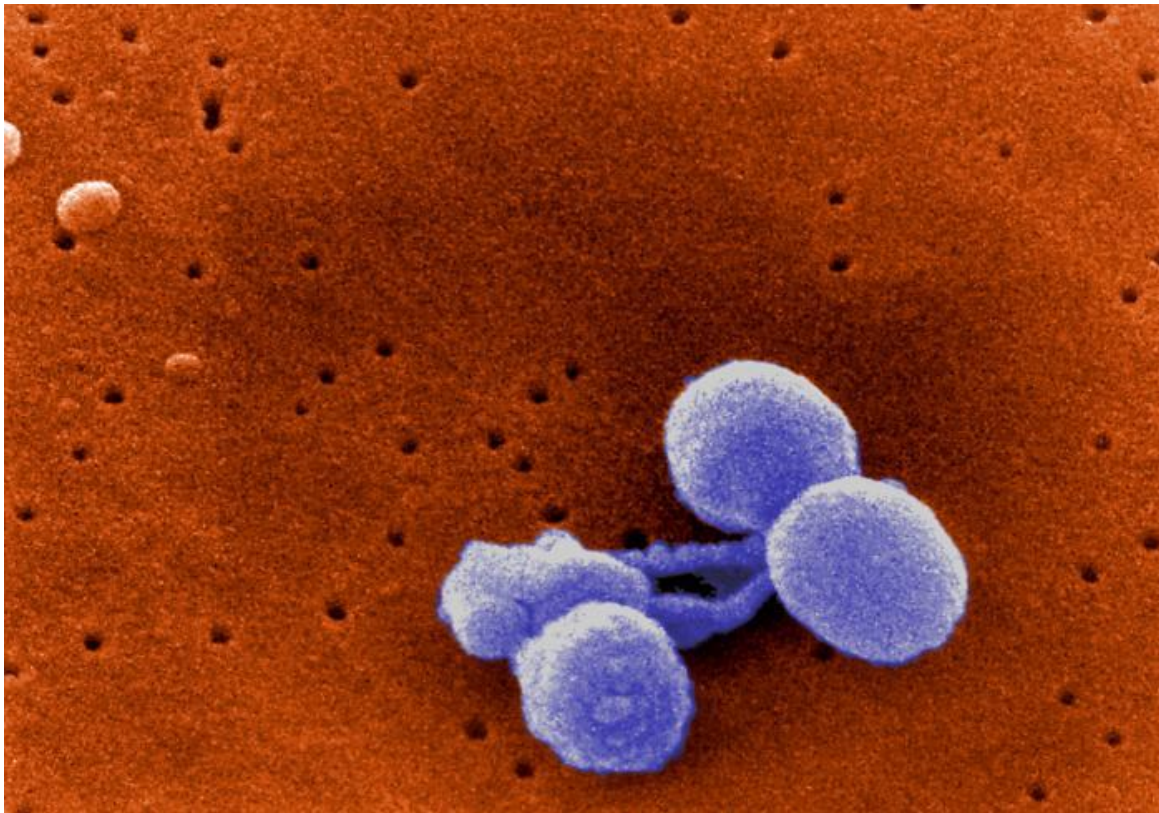


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Purpose

The purpose of this report is to provide a general overview of the incidence and recent trends of invasive *Streptococcus pneumoniae* among Nevada residents. The report also includes Healthy People 2010 objectives, Healthy People 2020 objectives, and Nevada data collected from cases of invasive *Streptococcus pneumoniae* from 2003 to 2012. *Streptococcus pneumoniae* is listed as one of Nevada's reportable diseases pursuant to [NRS 441A](#) (1), and reporting is further regulated by [NAC 441A.6945](#) (2).

Streptococcus pneumoniae

Streptococcus pneumoniae, sometimes known as pneumococcus, is a bacteria which causes pneumococcal disease. Many illnesses may be caused by *Streptococcus pneumoniae* infection, and some can be life-threatening. These illnesses include pneumonia (infection of the lungs), ear infections, sinus infections, meningitis (infection of the covering around the brain and spinal cord), and bacteremia (blood stream infection). Meningitis and bacteremia are considered invasive diseases because the bacteria invades parts of the body that are normally free of bacteria. Invasive disease is typically severe and can lead to hospitalization or death (3). This report only includes cases of invasive *Streptococcus pneumoniae*.

Streptococcus pneumoniae is spread person-to-person by direct contact with respiratory secretions such as saliva or mucus. Children at higher risk for pneumococcal disease are those younger than 2 years of age, in group child care, with certain illnesses (such as sickle cell disease, HIV infection, and chronic heart or lung conditions), with cochlear implants, or with cerebrospinal fluid leaks (escape of the fluid that surrounds the brain and spinal cord). According to Centers for Disease Control and Prevention (CDC), some American Indian, Alaska Native, and African American children may also be at increased risk. Adults at higher risk for pneumococcal disease are those 65 years of age or older, with chronic illnesses (lung, heart, liver, or kidney disease; asthma; diabetes; or alcoholism), conditions that weaken the immune system (HIV/AIDS, cancer, or damaged or absent spleen), living in nursing homes or long-term care facilities, with cochlear implants, with cerebrospinal fluid leaks, or who smoke cigarettes. Many persons have the bacteria in their nose or throat at some time in their lives without becoming ill. This is known as carriage, and it is not known why carriage rarely leads to sickness (3).

Pneumonia is the most common form of serious pneumococcal disease with patients possibly exhibiting fever and chills, cough, rapid breathing or difficulty breathing, or chest pain, and older adults possibly experiencing confusion or a low level of alertness. Patients with meningitis may exhibit stiff neck, fever and headache, pain when looking into bright lights, or confusion, and infants may have decreased appetite, low alertness, or vomiting. Patients with bacteremia may exhibit fever, chills, or a low level of alertness. Symptoms of middle ear infections (otitis media) include ear pain, red swollen ear drums, and sometimes fever and sleepiness (3).

Early diagnosis and treatment are very important for invasive pneumococcal disease, and diagnosis is made by collecting blood or cerebrospinal fluid for laboratory testing. Laboratory testing allows healthcare providers to confirm the presence of *Streptococcus pneumoniae* and decide which antibiotic is most appropriate to treat the infection. For non-invasive pneumococcal disease, like ear and sinus infections, diagnosis is typically through clinical findings and a history consistent with pneumococcal infection (3).

Pneumococcal disease can be prevented through vaccination. There are two recommended vaccines: the pneumococcal conjugate vaccine (PCV13 or Prevnar 13®) and the pneumococcal polysaccharide vaccine (PPSV23 or Pneumovax 23®). The PCV13 is intended for children and protects against the 13 types of pneumococcal bacteria which cause most of the severe illness in children. For adults 65 years and older or anyone older than 2 years at high risk of the disease, PPSV23 is recommended. CDC also recommends receiving the influenza vaccine every year, because the chance of getting pneumococcal disease increases when having the flu (3).

Summary

From 2003 to 2012, the annual number of reported invasive *Streptococcus pneumoniae* infections in Nevada ranged from a low of 2 cases in 2003 to a high of 124 cases in 2011. Over the ten years, a total of 670 cases were reported. The annual crude incidence rates of invasive *Streptococcus pneumoniae* were lowest in 2004 and highest in 2011 (0.7 and 4.6 cases per 100,000 population, respectively). Overall, Nevada's crude incidence rate of invasive *Streptococcus pneumoniae* slowly increased, with statistically significantly higher annual rates for 2007 to 2012 than those for 2004 to 2006. The crude incidence rate from 2003 to 2012 was 2.6 per 100,000 population.

Healthy People 2010 and 2020 objectives were not set for the entire population; however, objectives were set for children under 5 years of age and for persons 65 years and older. From 2003 to 2010, Nevada's crude incidence rate of laboratory-confirmed invasive *Streptococcus pneumoniae* in children less than 5 years of age ranged from 3.5 to 6.0 cases per 100,000 population, which was statistically significantly lower than the Healthy People 2010 objective (46 cases of laboratory-confirmed invasive pneumococcal infection per 100,000 population) (4). Rates for 2003, 2004, and 2006 were not calculated due to low case counts. During the same time period, Nevada's crude incidence rate of laboratory-confirmed invasive *Streptococcus pneumoniae* in adults aged 65 years and older ranged from 3.2 to 10.8 cases per 100,000 population, which was statistically significantly lower than the Healthy People 2010 objective (42 cases of laboratory-confirmed invasive pneumococcal infection per 100,000 population) (4). The rate for 2003 was not calculated due to low case counts.

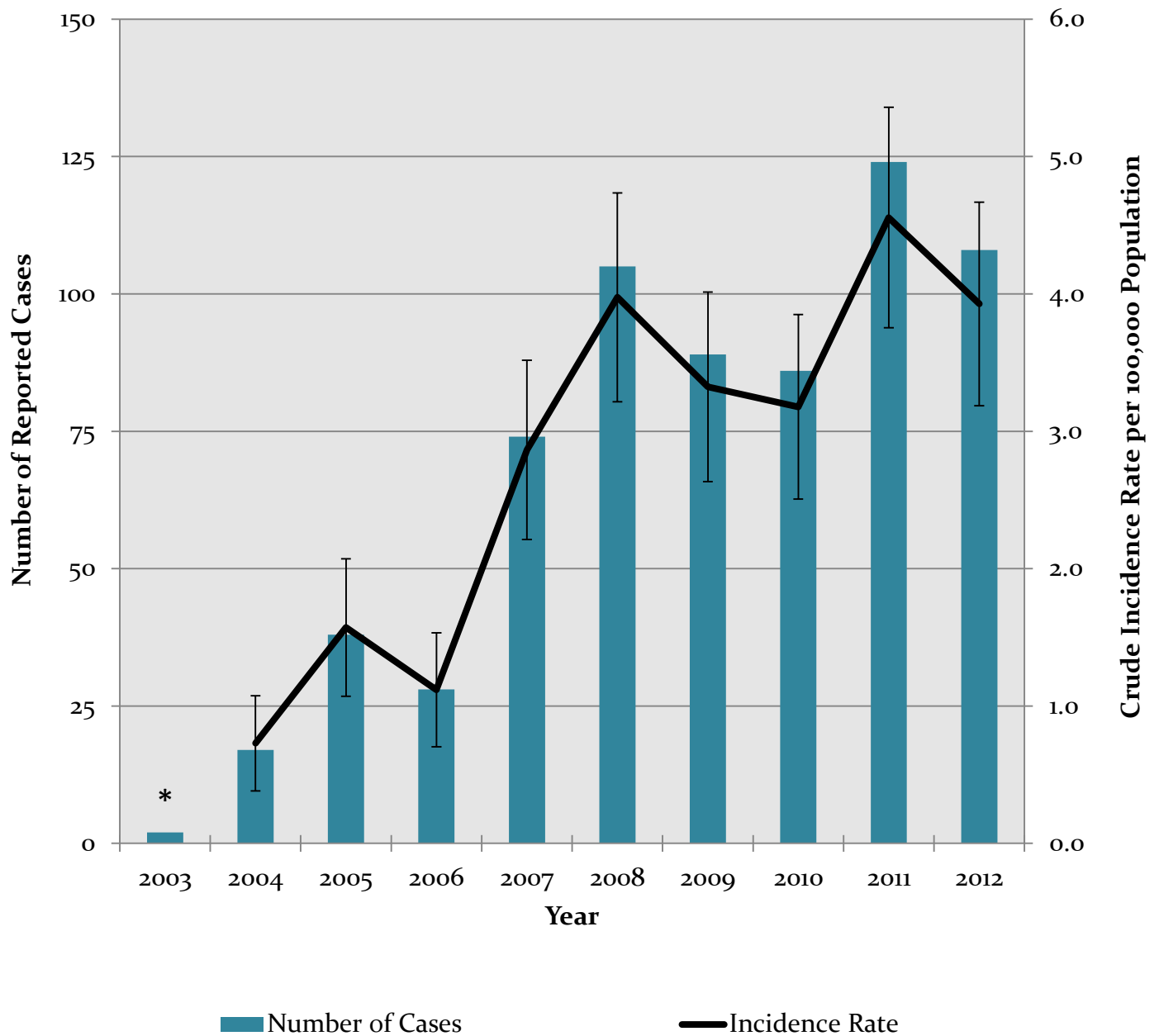
During 2011 and 2012, Nevada's crude incidence rate of laboratory-confirmed invasive *Streptococcus pneumoniae* in children less than 5 years of age was 3.1 and 4.6 cases per 100,000 population, respectively, which was statistically significantly lower than the Healthy People 2020 objective (12 cases of laboratory-confirmed invasive pneumococcal infection per 100,000 population) (5). During the same time period, Nevada's crude incidence rate of laboratory-confirmed invasive *Streptococcus pneumoniae* in adults aged 65 years and older was 14.2 and 11.1 cases per 100,000 population, respectively, which was statistically significantly lower than the Healthy People 2020 objective (31 cases of laboratory-confirmed invasive pneumococcal infection per 100,000 population) (5).

From 2003 to 2012, Washoe County Health District's age-adjusted incidence rate (7.0 cases per 100,000 population) was significantly higher than the age-adjusted incidence rate for the entire state (2.6 cases per 100,000 population). Washoe County Health District also had a significantly higher age-adjusted incidence rate compared to Southern Nevada Health District, Carson City Health and Human Services, and the rural and frontier counties (1.7, 1.0, and 3.6 cases per 100,000 population, respectively). The age-adjusted incidence rates for Southern Nevada Health District and Carson City Health and Human Services were also significantly lower than the rate for the entire state and the rate for the rural and frontier counties.

From 2008 to 2012 (years for which monthly data is available), the number of reported cases typically increased during the winter months, with the highest number of cases typically seen between November and February. The number of reported cases ranged between 0 and 17 cases per month, depending on the year.

Children under 2 years of age and adults 65 years of age and older are at higher risk for pneumococcal disease (3). From 2003 to 2012, infants under 1 year of age and adults 65 years of age and older had significantly higher incidence rates (5.2 and 7.9 cases per 100,000 population, respectively) compared to the 5-14, 15-24, and 25-39 year old age groups (0.4, 0.4, and 0.8 cases per 100,000 population, respectively). Adults 65 years of age and older also had a higher incidence rate compared to the 1-4 and 40-64 year old age groups (2.8 and 3.7 cases per 100,000 population, respectively). The 1-4 and 40-64 age groups also had higher incidence rates compared to the 5-14, 15-24, and 25-39 year old age groups.

Figure 1. Number of Reported Cases and Crude Incidence Rates of Invasive *Streptococcus pneumoniae* in Nevada: 2003-2012



* Rate not presented due to low case count

The crude incidence rate in Nevada from 2003 to 2012 was 2.6 cases per 100,000 population.

Figure 2. Crude Incidence Rates of Laboratory Confirmed *Streptococcus pneumoniae* in Nevada, Children Under 5 Years of Age, Compared to Healthy People Objectives: 2003-2012

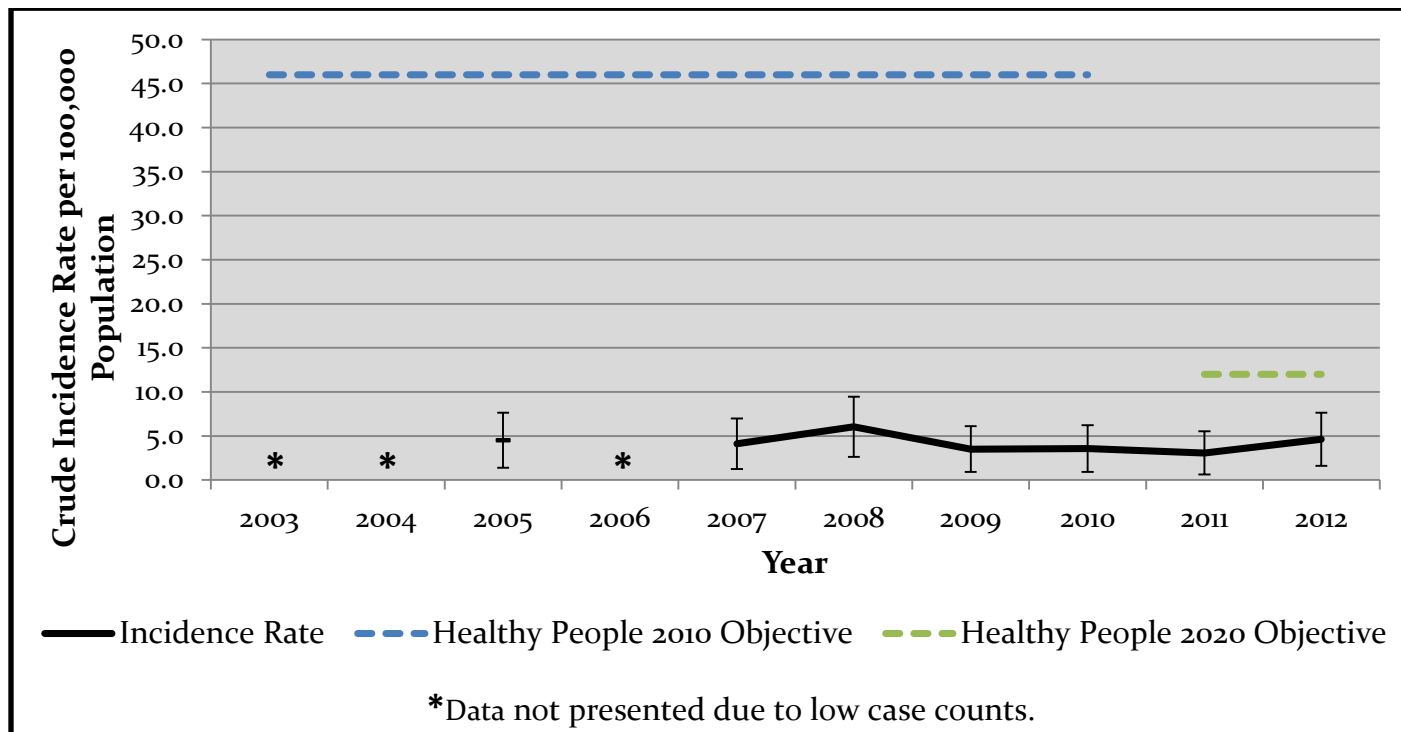


Figure 3. Crude Incidence Rates of Laboratory Confirmed *Streptococcus pneumoniae* in Nevada, Adults 65 Years of Age and Older, Compared to Healthy People Objectives: 2003-2012

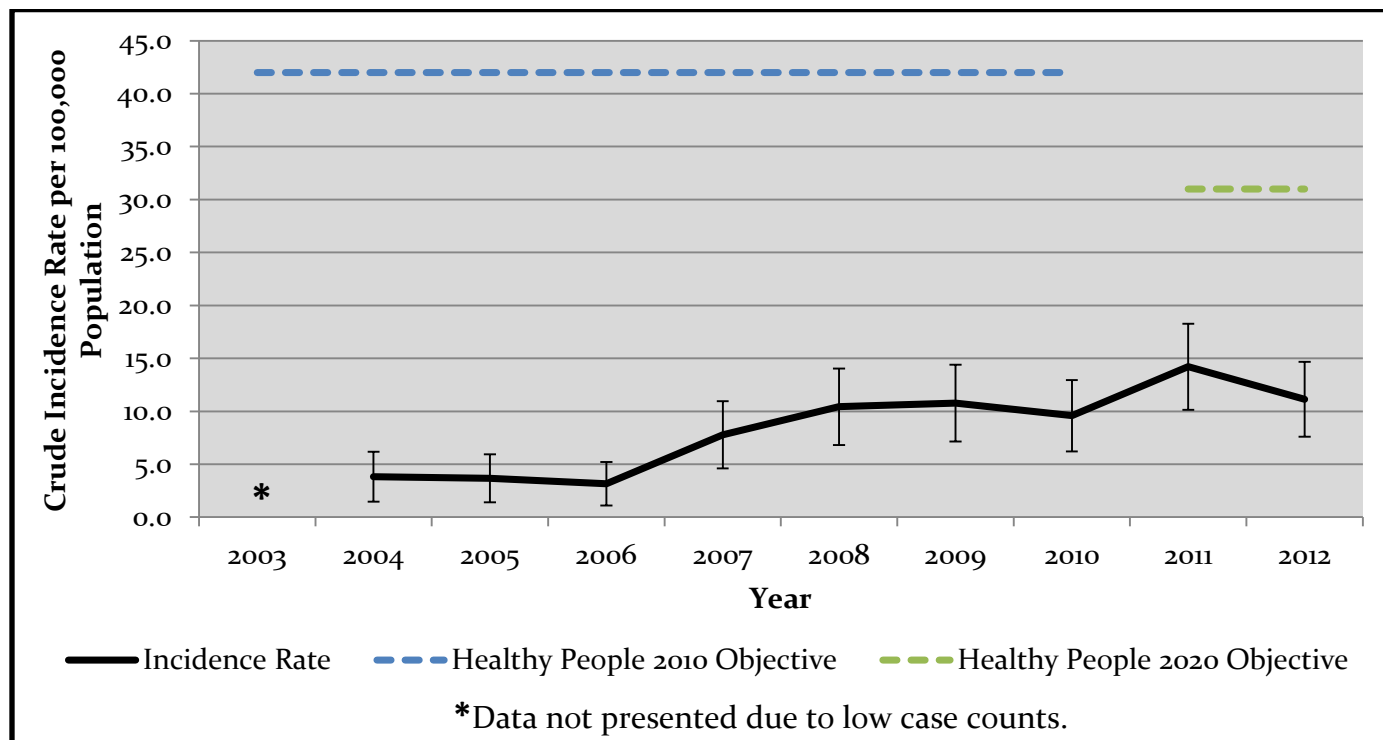


Figure 4. Age-Adjusted Incidence Rates of Invasive *Streptococcus pneumoniae* in Nevada and Nevada Health Districts: 2003-2012

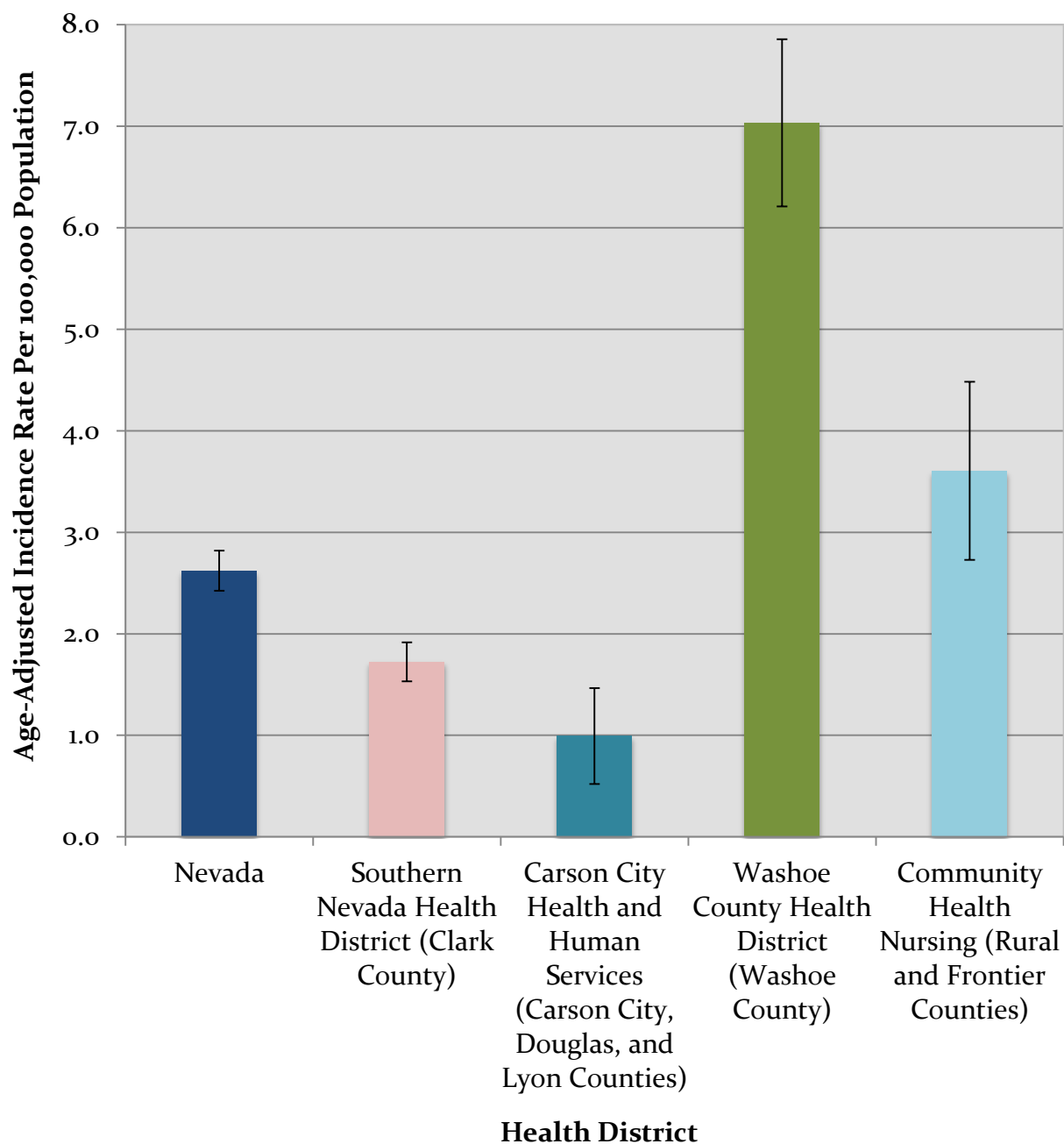


Figure 5. Number of Invasive *Streptococcus pneumoniae* Cases Reported in Nevada by Month: 2008-2012

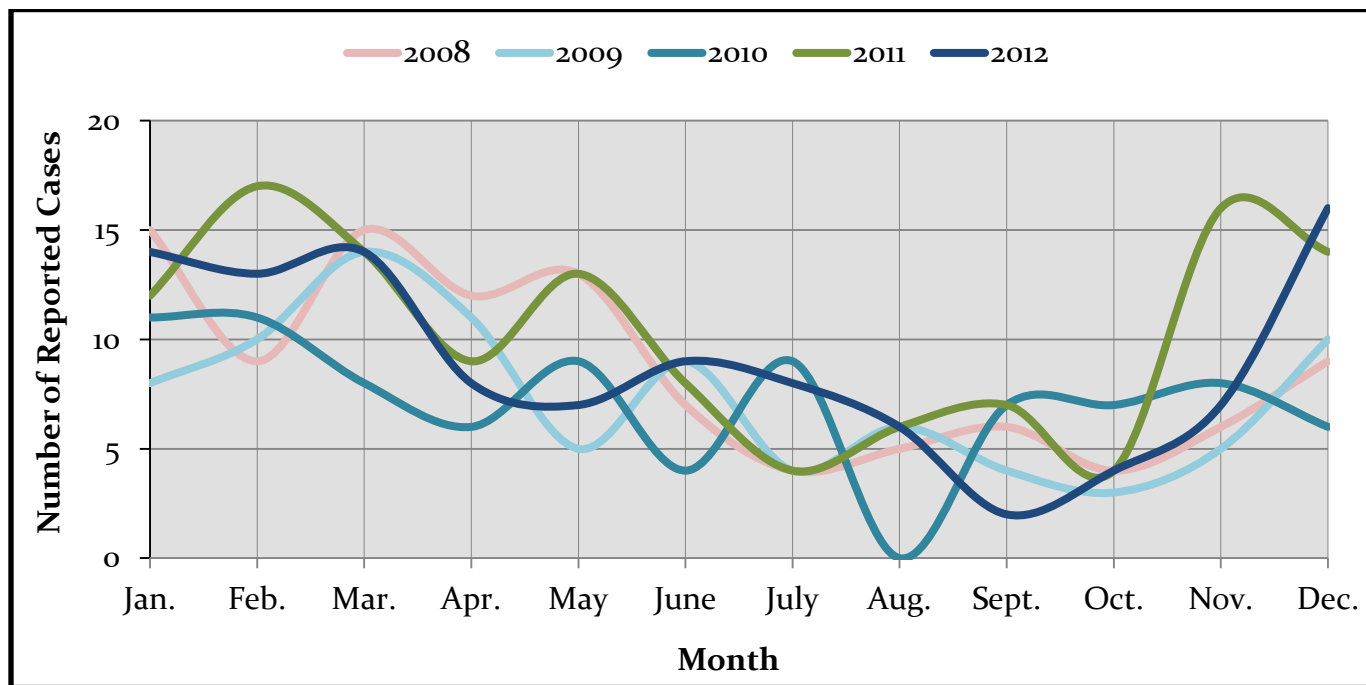
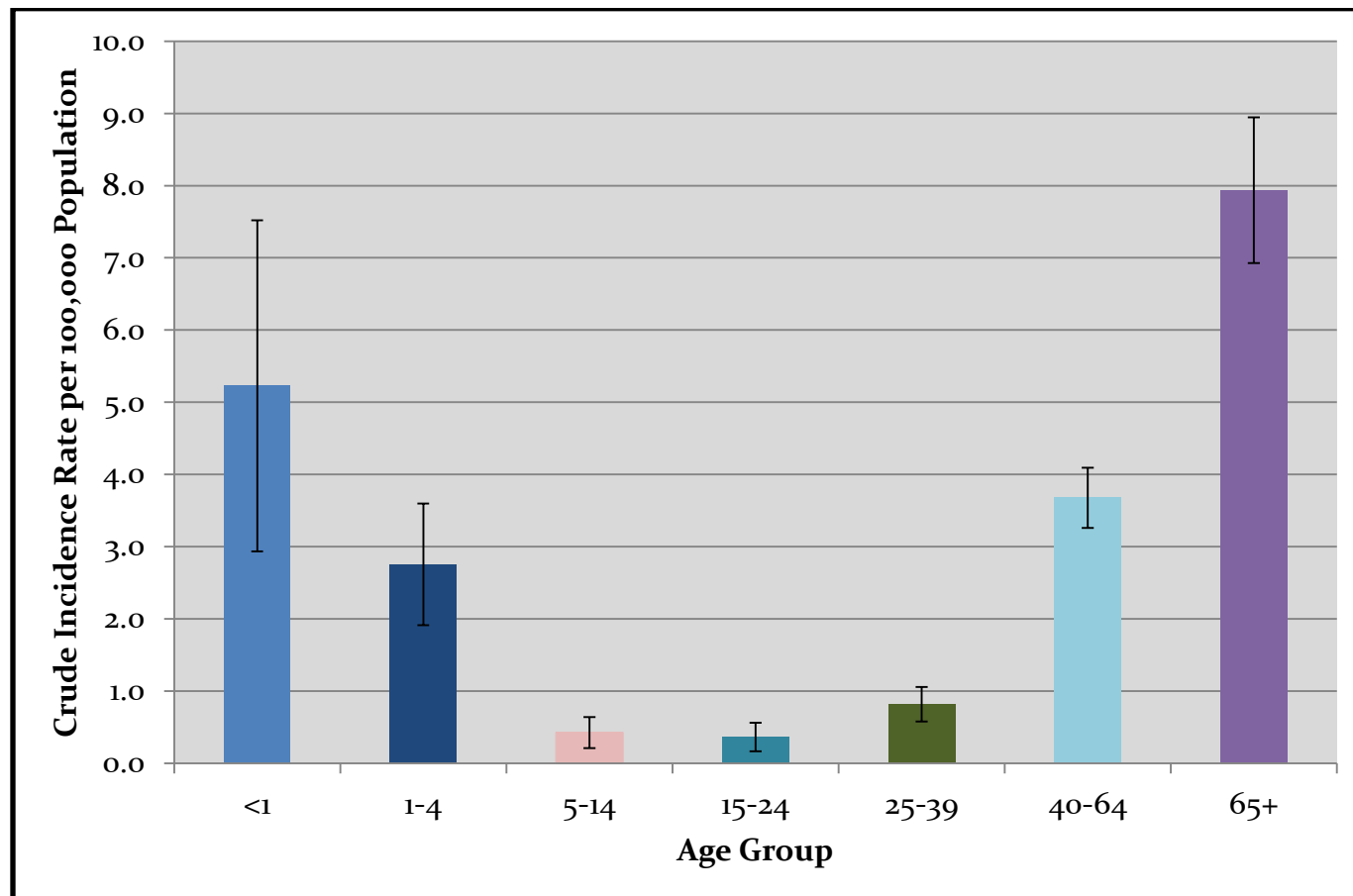


Figure 6. Crude Incidence Rates of Invasive *Streptococcus pneumoniae* in Nevada by Age Group: 2003-2012



Technical Notes

All Nevada data from 2003 to 2012 came from reported cases of invasive *Streptococcus pneumoniae* among Nevada residents (6, 7). The Centers for Disease Control and Prevention and the Council of State and Territorial Epidemiologists case definition of invasive *Streptococcus pneumoniae* encompasses all cases classified as suspect and confirmed; all cases of invasive *Streptococcus pneumoniae* used for this report follow this definition (8). Population estimates were obtained from Nevada State Demographer's Office (8). Age-adjusted rates per 100,000 population were calculated using the 2000 U.S. standard population. Sufficient case counts were not available to obtain age-adjusted incidence rates for racial/ethnic groups; therefore, racial/ethnic distributions of incidence are not presented in this report. Cases with unknown ages were excluded from the age-adjusted rate calculations; one such case had to be excluded. When used for rates, error bars represent 95% confidence intervals. The Keyfitz method was used to calculate confidence intervals of age-adjusted rates (10). Due to their inherent unreliability, rates were not calculated for case counts lower than five.

Sources

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