

## **Haemophilus influenzae Infection, Invasive**

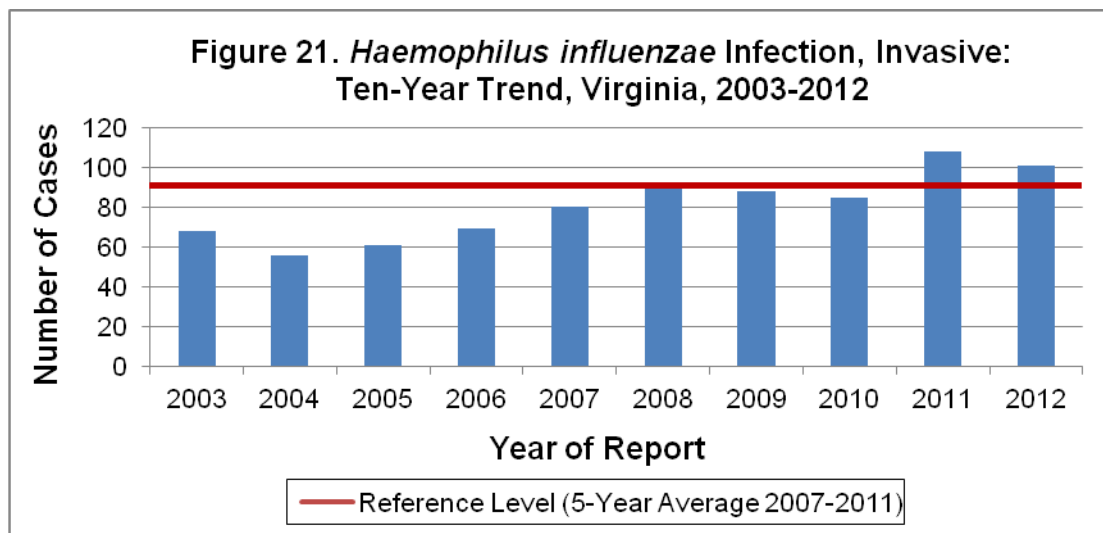
**Agent:** *Haemophilus influenzae* (bacteria)

**Mode of Transmission:** Person-to-person transmission by inhalation of respiratory droplets or direct contact with nose and throat secretions from an infected person or an asymptomatic carrier.

**Signs/Symptoms:** Inflammation of the lining of the brain and spinal cord (i.e., meningitis), inflammation of the epiglottis which may lead to blockage of upper airway and death, pneumonia, deep skin infection, arthritis, or bloodstream infection.

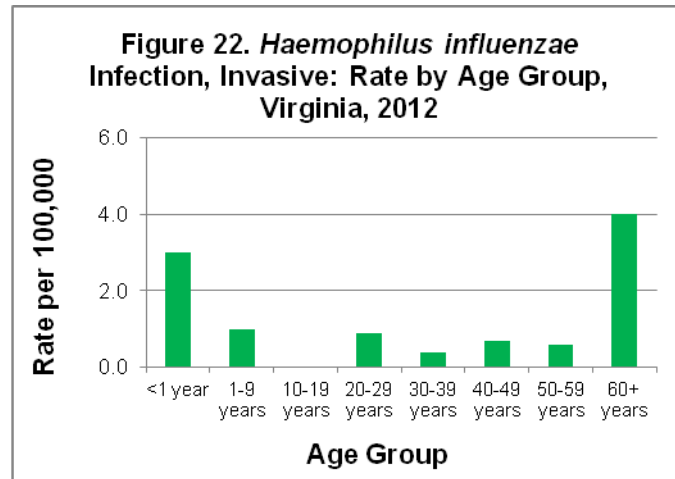
**Prevention:** Vaccination with a 3-4 dose series (depending on manufacturer) of conjugate *Haemophilus influenzae* type b (Hib) vaccine beginning at 2 months of age and concluding with a booster at 12 to 15 months of age. If vaccination is delayed, children 7 months of age and older may not require a full series of three or four doses. The total number of doses a child needs to complete the series depends on the child's age at the time the first dose is administered.

**Other Important Information:** *Haemophilus influenzae* is categorized into two major groupings: encapsulated and non-encapsulated. Encapsulated strains are more virulent and produce a polysaccharide capsule which is further characterized into six antigenically distinct serotypes (types a through f). Nontypable serotype results indicate a non-encapsulated strain. Vaccine is currently only available for one serotype, type b. In the prevaccine era, type b organisms accounted for 95% of all strains that caused invasive disease. Since the licensure of conjugate Hib vaccine in the late 1980s, the incidence of invasive Hib disease in the U.S. has declined by more than 99% compared with the prevaccine era.



One hundred one cases of invasive *H. influenzae* infection were reported in Virginia during 2012. This is a 6% decrease from the 108 cases reported in 2011, and an 11% increase from the five-year average of 90.6 cases per year (Figure 21). The general increase in cases that is shown in Figure 21 is thought to be primarily related to the aging population, as most cases occur in older populations. This is supported by the 58% of cases reported in the 60 year and older age group in 2012.

Overall, incidence rates were highest in the youngest and oldest age groups (Figure 22). Children less than one year of age had a rate of 3.0 per 100,000, and adults in the 60 year and older age group had a rate of 4.0 per 100,000. All other age groups had rates ranging from 0.0 to 1.0 per 100,000.



Race information was unknown for 7% of reported cases. Among those for which race information was available, rates were similar in the

black and white populations (1.0 and 1.3 per 100,000, respectively). Rates among males and females were also similar (1.2 and 1.3 per 100,000, respectively). Incidence varied only slightly between regions, with the southwest region reporting the highest rate (1.9 per 100,000) and the northern region the lowest (0.7 per 100,000). Cases occurred throughout the year with the highest proportion of cases (31%) occurring in the second quarter and the smallest proportion (15%) in the third quarter. Two outbreaks attributed to *H. influenzae* infection were reported in 2012. Both were reported from the central region and involved nursing homes.

The serotype was identified and reported in 93 (92%) of the cases. One case was confirmed as type b, the serotype addressed by the vaccine. The case occurred in an adult, an age group for which routine vaccination is not recommended. Among all other cases with an identified serotype, 60% were reported to be nontypable from the non-encapsulated strains, 22% were type f, 7% were type e, and 2% were type a.

Among cases reported in 2012, seven deaths were attributed to invasive *H. influenzae* infection. All but one death occurred in persons from the 60 year and older age group.