

Haemophilus influenzae Infection, Invasive

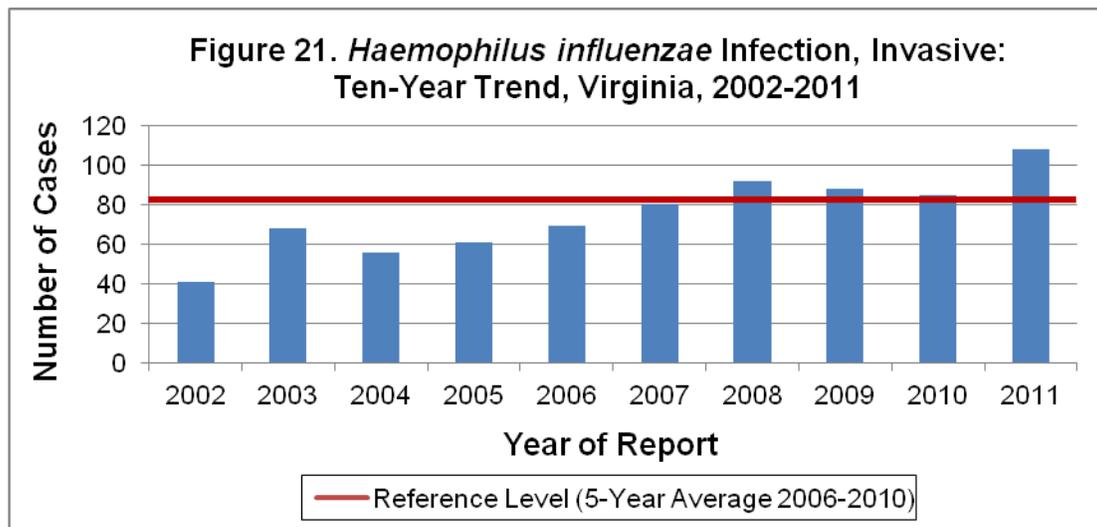
Agent: *Haemophilus influenzae* (bacteria)

Mode of Transmission: Person-to-person transmission by inhalation of respiratory droplets or direct contact with nose and throat discharge during the infectious period.

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 conjugate *Haemophilus influenzae* type b (Hib) with 3-4 dose vaccine series (depending on manufacturer) should be administered beginning at 2 months of age and concluding with a booster at 12 to 15 months of age.

Other Important Information: 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 pre-vaccine era. *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.



One hundred eight cases of invasive *H. influenzae* infection were reported in Virginia during 2011. This is a 27% increase from the 85 cases reported in 2010, and a 30% increase from the five-year average of 82.8 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 reflected by 61% of 2011 cases being reported in the 60 year and older age group.

Overall, incidence rates were highest in the youngest and oldest age groups (Figure 22). Children <1 year of age had a rate of 2.0 per 100,000, and adults in the 60 years and older age group had a rate of 4.7 per 100,000. All other age groups had rates ranging from 0.1 to 1.3 per 100,000.

Race information was unknown for 9% of the reported cases. Among those for which race information was available, rates were similar

between the white and black populations (1.4 and 1.2 per 100,000, respectively). Incidence in females was higher than in males (1.6 and 1.0 per 100,000, respectively). Incidence varied only slightly between regions, with the eastern region reporting the highest rate (1.9 per 100,000) and the northern region the lowest (1.0 per 100,000). Cases occurred throughout the year with the highest proportion of cases (30%) occurring in the first quarter and the smallest proportion (14%) occurring in the fourth quarter.

The serotype was identified and reported in 98 (91%) of the cases. Three cases (3%) were confirmed as type b, the serotype addressed by the vaccine. Among all other cases with an identified serotype, 67% were reported to be nontypable from the non-encapsulated strains, 24% were type f, 4% were type e, and 1% was type a. Among the three cases known to have been caused by serotype b, all were adults for whom vaccine is not routinely recommended.

Among cases reported in 2011, 16 deaths were attributed to invasive *H. influenzae* infection. All occurred in persons from the 60 year and older age group.

