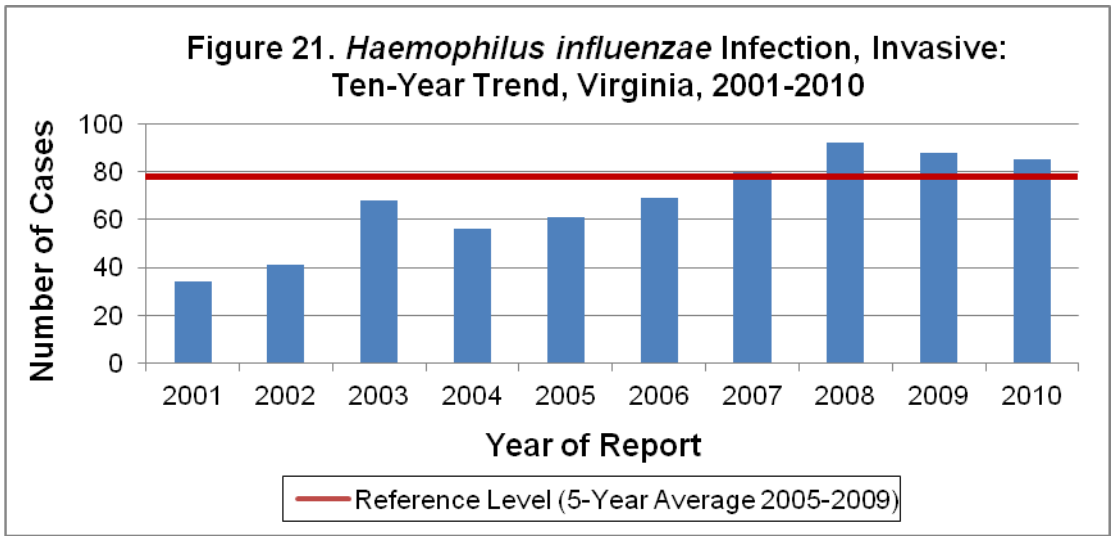
***Haemophilus influenzae* Infection, Invasive**

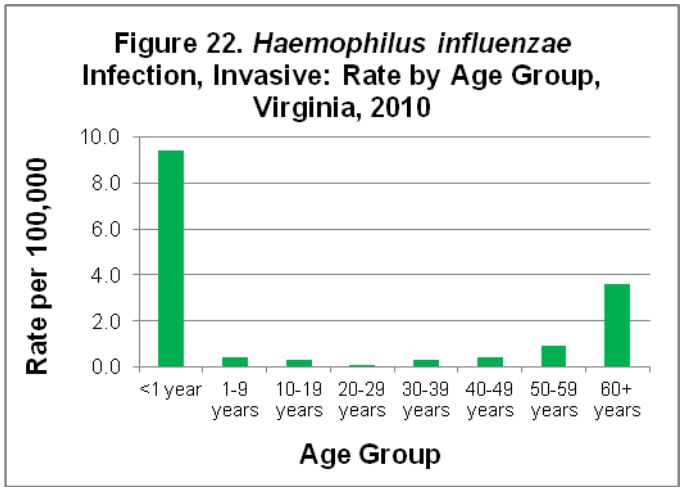
Agent: *Haemophilus influenzae* (bacteria)
Mode of Transmission: Person-to-person transmission by inhalation of respiratory droplets or direct contact with nose and throat discharge during the infectious period.
Signs/Symptoms: Inflammation of the lining of the brain and spinal cord (i.e., meningitis), 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 though 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.

Eighty-five cases of invasive *H. influenzae* infection were reported in Virginia during 2010. This is a 3% decrease from the 88 cases reported in 2009, and a 9% increase from the five-year average of 78.0 cases per year (Figure 21).



Incidence rates were highest in the youngest and oldest age groups (Figure 22). Children less than 1 year of age had a rate of 9.4 per 100,000, and adults in the 60 years and older age group had a rate of 3.6 per 100,000. All other age groups had rates ranging from 0.1 to 0.9 per 100,000. Race information was unknown for 24% of the reported cases; among those for which race information was available, rates were similar between the white and black populations (0.9 and 0.8 per 100,000, respectively). No cases were reported from the "other" race population. Incidence in females was higher than in males (1.3 and 0.9 per

100,000, respectively). The southwest region had the highest rate (1.6 per 100,000), followed by the eastern region (1.5 per 100,000). The other regions had rates ranging from 0.6 to 1.1 per 100,000. Cases occurred throughout the year with a slightly higher (32%) proportion occurring in the second quarter.



The serotype was identified and reported in 68 (80%) of the cases; three cases (5%) were confirmed as type b, the serotype addressed by the vaccine. Among all other cases with an identified serotype, 51 (75%) were reported to be nontypable from the non-encapsulated strains, 11 (16%) were type f, and 3 (5%) were type e. Among the three cases known to have been caused by serotype b, one was an adult in the 30-39 year age group and two were infants less than one year of age. One of the infants was too young to be vaccinated; the other had received three age-appropriate doses of vaccine. Vaccine is not routinely recommended for adults.

Among cases reported in 2010, four deaths were attributed to invasive *H. influenzae* infection, all of which occurred in persons in the 60 year and older age group.