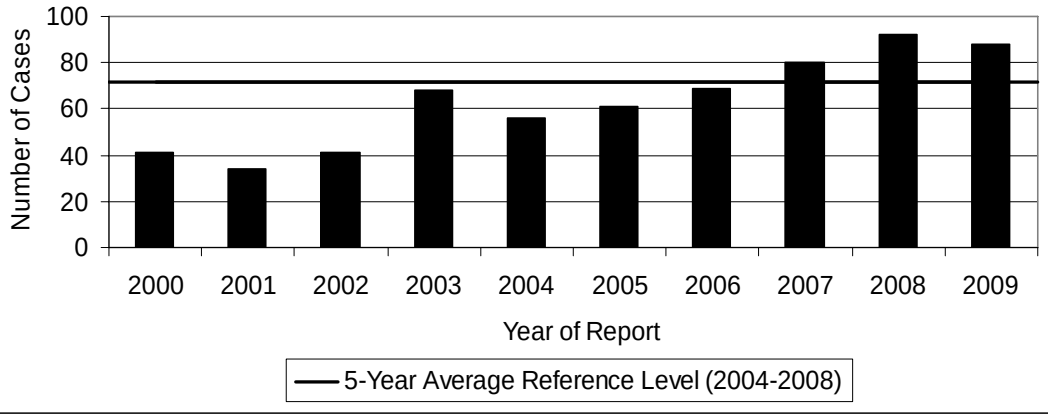
***Haemophilus influenzae* Infection, Invasive**

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) vaccine beginning at 2 months of age and including 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.

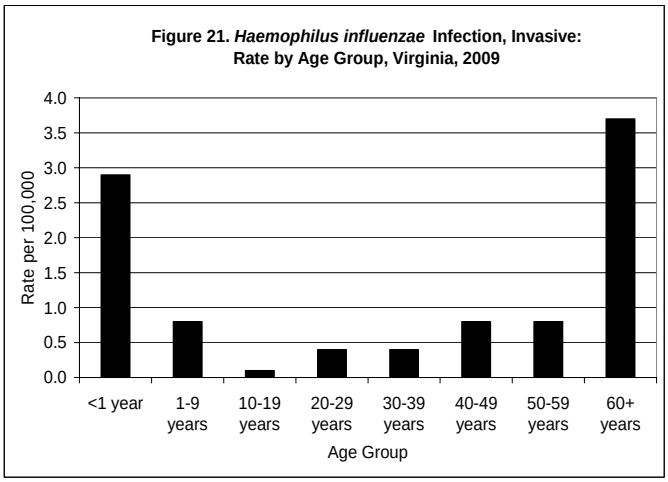
Eighty-eight cases of invasive *H. influenzae* infection were reported in Virginia during 2009. This is a 4% decrease from the 92 cases reported in 2008, and a 23% increase from the five-year average of 71.6 cases per year (Figure 20).

Figure 20. *Haemophilus influenzae* Infection, Invasive: Ten-Year Trend, Virginia, 2000-2009



Incidence rates were highest in the oldest and youngest age groups. Adults in the 60 years and older age group had a rate of 3.7 per 100,000, while children less than 1 year of age had a rate of 2.9 per 100,000 (Figure 21). The other age groups had rates ranging from 0.1 to 0.8 per 100,000. Race information was unknown for 22% of the reported cases. Among those for which race information was

Figure 21. *Haemophilus influenzae* Infection, Invasive: Rate by Age Group, Virginia, 2009



available, the white population had a higher rate than the black population (1.0 and 0.7 per 100,000, respectively). No cases were reported from the “other” population. Incidence in females and males was the same, 1.1 per 100,000. The northwest region had the highest rate (2.0 per 100,000), followed by the southwest region (1.6 per 100,000). The other regions had rates ranging from 0.7 to 0.9 per 100,000. Cases occurred throughout the year with a slightly higher (30%) proportion occurring in the first quarter.

Vaccination status at time of disease was known for 6 (67%) of the 9 children under five years of age. Four of these children were age-appropriately vaccinated with three doses each and two of the children were too young to be vaccinated at the time of onset. The serotype for individual isolates was reported for 68 (77%) of the cases; one of these isolates was confirmed as type b, the serotype addressed by the vaccine, and occurred in an adult from the 30-39 year age group. For all other isolates with an identified serotype, 40 (59%) were reported to be nontypable from the non-encapsulated strains, 14 (21%) were type f, eight (12%) were type e, four (6%) were non-type b, and one isolate was type d. Among cases reported in 2009, six deaths were attributed to invasive *H. influenzae* infection, all of which occurred in persons greater than 60 years of age.