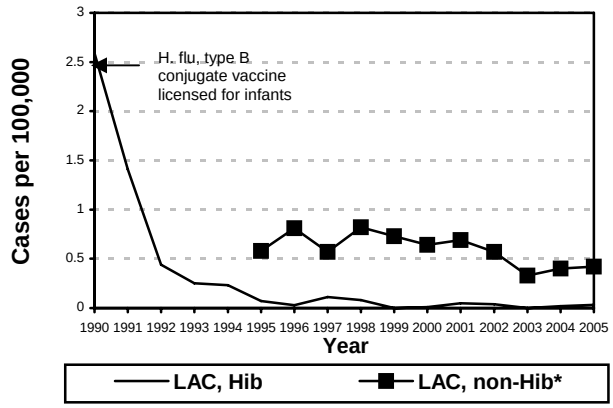
HAEMOPHILUS INFLUENZAE INVASIVE DISEASE

CRUDE DATA	
Number of Cases	75
Annual Incidence[a]	
LA County	0.78
California	0.19[b]
United States	
Age at Diagnosis	
Mean	57.2
Median	69.0
Range	<1–99.0
Case Fatality	
LA County	8.0%
United States	

[a] Cases per 100,000 population.
[b] Cases per 100,000 persons, aged less than 30 years. In California, *H. influenzae* among persons > 29 years of age is not reportable.

Figure 1
H. influenzae Invasive Disease
Incidence Rates by Year
LAC, 1990–2005

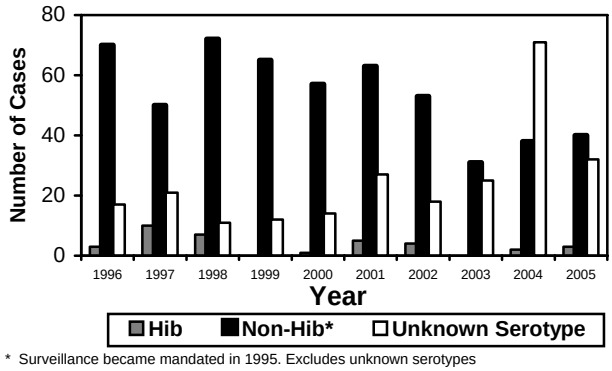


* Surveillance became mandated in 1995. Excludes unknown serotypes

DESCRIPTION

Haemophilus influenzae is a Gram-negative coccobacillus that can cause both invasive and non-invasive disease. *H. influenzae* invasive disease includes meningitis, sepsis, pneumonia, cellulitis, and septic arthritis. Currently, the disease primarily affects infants and the elderly, as well as immunocompromised individuals and those who have abnormal splenic function. *H. influenzae* can be transmitted by respiratory secretions of individuals colonized in the oropharynx with the organism. There are six encapsulated, typeable strains (a–f) and unencapsulated, nontypeable strains of *H. influenzae*. Prior to the introduction of the H. *influenzae* type b (Hib) conjugate vaccine in 1990, most cases of invasive disease in children were caused by type b. *H. influenzae* type b is the only serotype that is vaccine-preventable and for which chemoprophylaxis is effective.

Figure 2
H. influenzae Invasive Disease
Cases by Year of Onset
LAC, 1996–2005



* Surveillance became mandated in 1995. Excludes unknown serotypes

DISEASE ABSTRACT

- The widespread use of the Hib vaccine since 1990 has dramatically decreased the incidence of *H. influenzae* type b disease in LAC (Figures 1, 2).
- Of the 3 Hib cases identified in 2005, only one case was completely vaccinated.
- The epidemiology of H. *influenzae* invasive disease is now being shaped by non-Hib and unknown serotypes (Table 1, Figure 2, Figure 3).

Table 1: *H. influenzae* Crude Data by Serotype, 2005 vs. Previous 5-Year Average

	B		Non-Hib		Unknown type	
	2005	Previous 5-Year Average	2005	Previous 5-Year Average	2005	Previous 5-Year Average
Number of Cases	3	2.4	40	47.8	32	33.0
Age at Onset						
Mean	25.7	36.2	49.0	39.3	70.5	61.8
Median	7.0	31.4	54.5	35.5	76.0	67.8
Range	1.0 – 69.0	20.0 – 62.5	Birth – 94.0	Birth - 93.0	21.0 – 99.0	6.0 – 98.0
LAC Case Fatality	0%	16.7%	10%	5.8%	6.3%	6.8%

IMMUNIZATION RECOMMENDATIONS

- All infants, including those born prematurely, can receive a primary series of conjugate Hib vaccine beginning at 2 months of age. The number of doses in the series depends on the brand of vaccine used. A booster is recommended at 12-15 months regardless of which brand of vaccine is used for the primary series.
- Individuals older than 59 months of age do not need Hib vaccination unless they have a health condition that puts them at increased risk for invasive Hib disease.

Figure 3
H. influenzae Invasive Disease
Percent Cases by Serotype
LAC, 2005 (N=75)

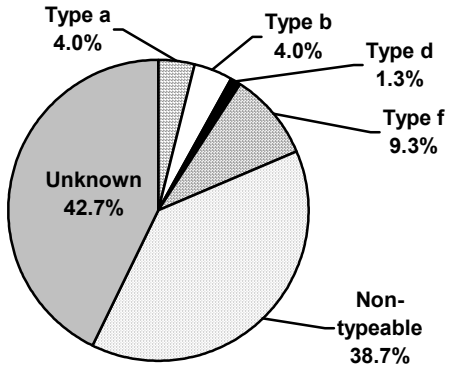
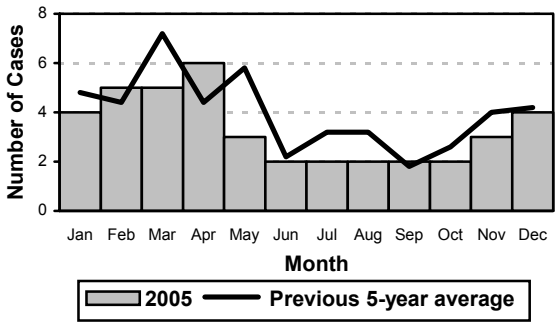


Figure 4
H. influenzae Invasive Disease
Cases Due to Non-Hib Serotype
by Month of Onset
LAC, 2005 (N=40)



STRATIFIED DATA

Seasonality: The 3 Hib cases had disease onset in January, March, and October. Similar to previous years a temporal pattern has been evidenced in LAC, with a peak in non-Hib cases during the months of January to April. These four months accounted for 50% (n=20) of the non-Hib cases (Figure 4).

Sex: The male-to-female ratio of Hib, non-Hib, and unknown serotype cases was 2:1, 1:1, and 1:1.4, respectively.

Age: The 3 Hib cases were 1, 7, and 69 years of age. The number of non-Hib cases by age in 2005 followed the trend of the previous five years – the 65+ age group (48%, n=19) remaining the most affected by non-Hib invasive disease (Figure 5). Only 23% (n=9) of non-Hib cases were under the age of 5. Of the 32 cases with unknown serotype, 97% (n=31) were over the age of 30 and were not actively investigated for serotype as detailed in LAC's priority investigation criteria. In addition, 63% (n=20) of these unknown serotype cases were in the 65+ age group.

Race/Ethnicity: Two of the Hib cases were Hispanic and one was White. Among the non-Hib cases where the race/ethnicity was known (n=29), Whites accounted for 45% (n=13) of the cases, followed by

Hispanics (n=10; 35%). Among the unknown serotype cases of whom race/ethnicity was identified (n=23), 61% were among Whites (n=14), followed by Hispanics (n=4; 17%) (Figure 6.)

Location: The 3 Hib cases resided in SPA 2, SPA 4, and SPA 5. The number of non-Hib cases per SPA ranged from 1 to 11. San Fernando Valley (SPA 2) accounted for 11 cases. San Gabriel Valley (SPA 3) and South (SPA 6) accounted for 6 non-Hib cases each. Metro (SPA 4) had 5 cases while East (SPA 7) and South Bay (SPA 8) had 3 cases each. West (SPA 5) reported the fewest cases (n=1). An additional 13% (n=5) of non-Hib cases had no identified SPA. The number of unknown serotype cases per SPA ranged from 2 to 6, with SPA 2 and SPA 4 accounting for 6 cases each and SPA 5 with 2 cases. SPA 7 accounted for 5 cases while SPA 3 and SPA 6 had 4 cases each. SPA 8 had 3 cases. An additional 6% (n=2) of the unknown serotype cases did not have a residence indicated. SPA 1 did not report any Hib, non-Hib, or unknown serotype cases.

Figure 5
H. influenzae Invasive Disease
Serotype Non-Hib Cases by Age Group
LAC, 2005 (N=40)

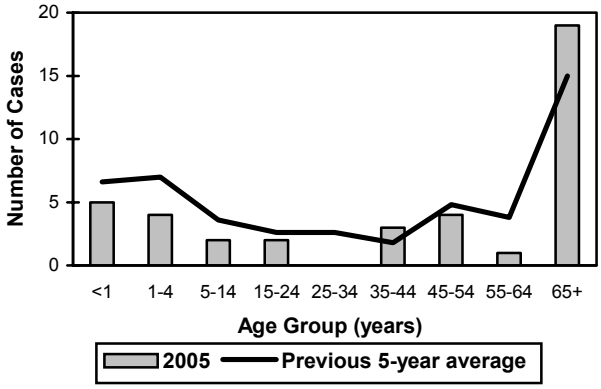
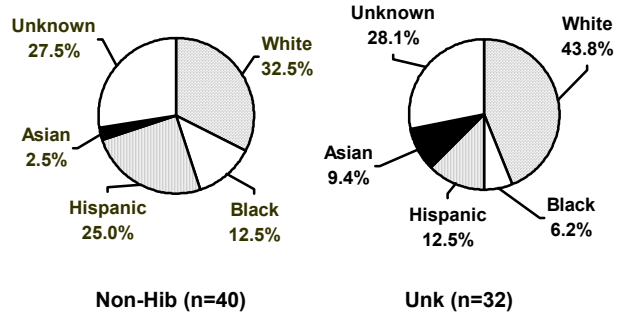


Figure 6
H. influenzae Invasive Disease
Percent Cases by Race/Ethnicity
LAC, 2005



COMMENTS

The only cases of *H. influenzae* disease investigated in LAC are those in persons less than 30 years of age. Contacts of these cases are investigated and chemoprophylaxis is given when appropriate.

Rates of invasive Hib disease in children have decreased to extremely low levels since Hib vaccines became available in 1990. Among the 75 H. *influenzae* cases, only 3 (4%) were Hib cases. None of the cases had any known exposure to a confirmed/suspected case. All 3 Hib cases were hospitalized, two for pneumonia and one for meningitis.

Although the 7-year-old Hib case had documented evidence of being up to date with the Hib vaccination for his age, invasive Hib disease in a completely vaccinated child is very rare. More than 95% of children will develop protective antibody levels after a primary series of 2 or 3 doses. Clinical efficacy has been estimated at 95% to 100%.

Case Fatalities: There were six fatalities among *H. influenzae* cases: four were non-Hib cases and two were unknown serotypes. One of the fatalities was a premature baby that died on the second day of life. The other five fatalities (83%) were in persons over the age of 30 so the cases were not investigated for further details. Information on complications was provided for two cases. Both cases had pneumonia. Females accounted for five of the six (83.3%) case fatalities. Two of the fatalities were White, two were Black, one was Asian, and one was of unknown race/ethnicity.

ADDITIONAL RESOURCES

Information about immunization is available through the National Immunization Program at www.cdc.gov/nip and the Immunization Action Coalition at www.immunize.org.

Information specific to LAC is available from LAC DHS Immunization Program at www.lapublichealth.org/ip and from ACDC at www.lapublichealth.org/acd/procs/b73/b73index.htm.