

Invasive *Haemophilus influenzae* Infections Among New Mexico Residents— 2004–2011

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2012 Arizona Infectious Disease Training & Exercise

August 1, 2012

Active Bacterial Core Surveillance Program
New Mexico Department of Health



Background

- ❑ **Formerly called Pfeiffer's bacillus**
 - Described during influenza pandemic in 1892
- ❑ **In 1930, two major categories of *H. influenzae*:**
 - Un-encapsulated strains (non-typeable)
 - Encapsulated strains (types a-f)
 - Capsule allows bacteria to resist phagocytosis and complement-mediated lysis in the non-immune host
- ❑ **Mistakenly considered to be the cause of influenza until 1933**

Haemophilus influenzae Transmission

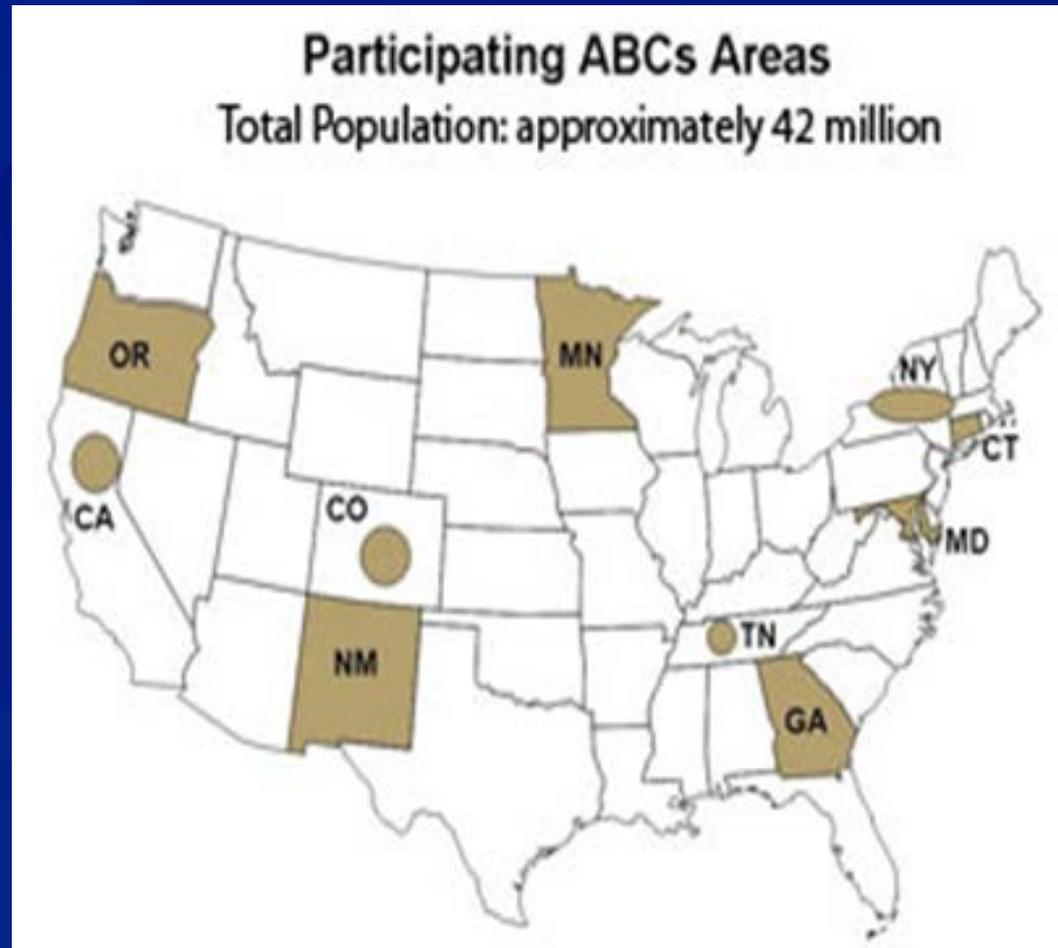
- Person-to-person transmission by inhalation of respiratory droplets
 - People can become colonized with bacteria
 - Invasive infection can develop if respiratory mucosa compromised
- Direct contact with nose and throat discharge during the infectious period

Haemophilus influenzae Epidemiology in the U.S.

- ❑ Causes disease and death in children and adults with underlying conditions, including compromised immune systems
 - Mean annual incidence 1.6/100,000
- ❑ Rates of invasive disease are highest among infants (9.5/100,000) and those aged ≥ 65 years (6.3/100,000)
- ❑ Vaccine for serotype B (Hib) introduced in 1985
 - Resulted in dramatic decline in incidence of Hib-related disease
- ❑ Rates of invasive disease higher among American Indians and Alaska Natives

Rates of Invasive *Haemophilus influenzae*, New Mexico (2004–2011) and U.S. (1999–2008)

- **New Mexico**
 - 2.1/100,000
- **U.S. Estimate**
 - 1.6/100,000



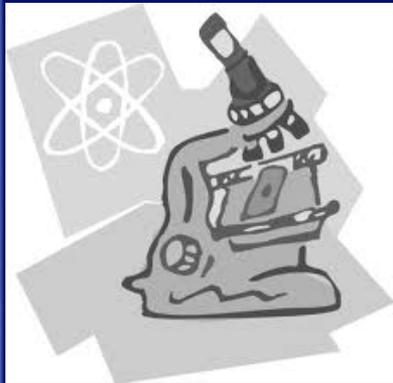
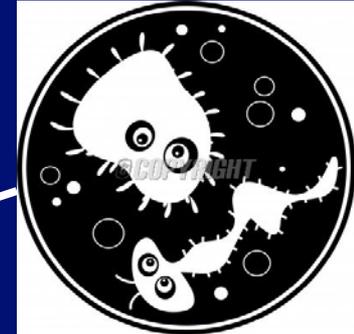
Person becomes ill



Person seeks medical care



Sample is taken, bacteria grow



Bacteria ID at State Lab



Report to Health Department



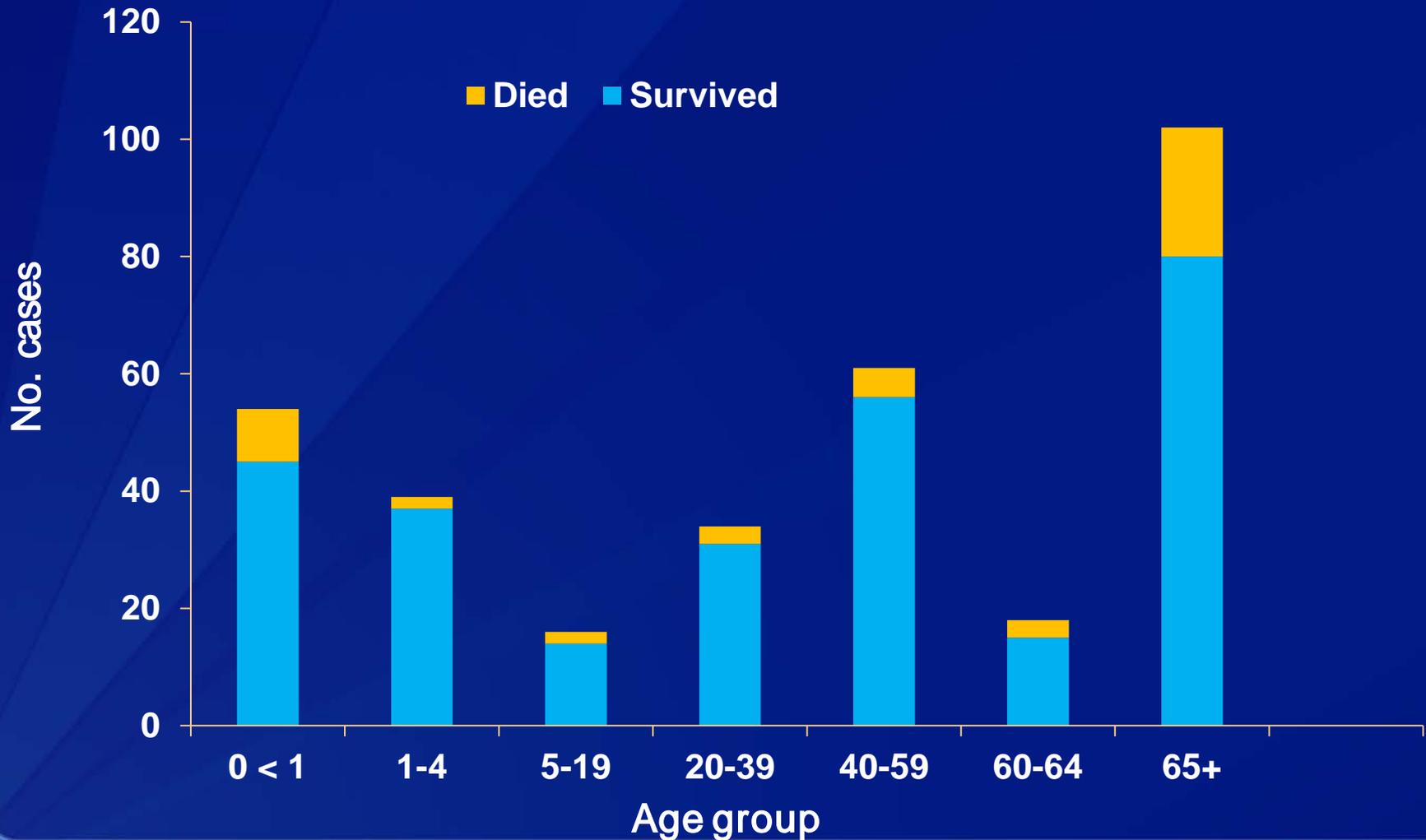
Medical Record Review and Data Collection



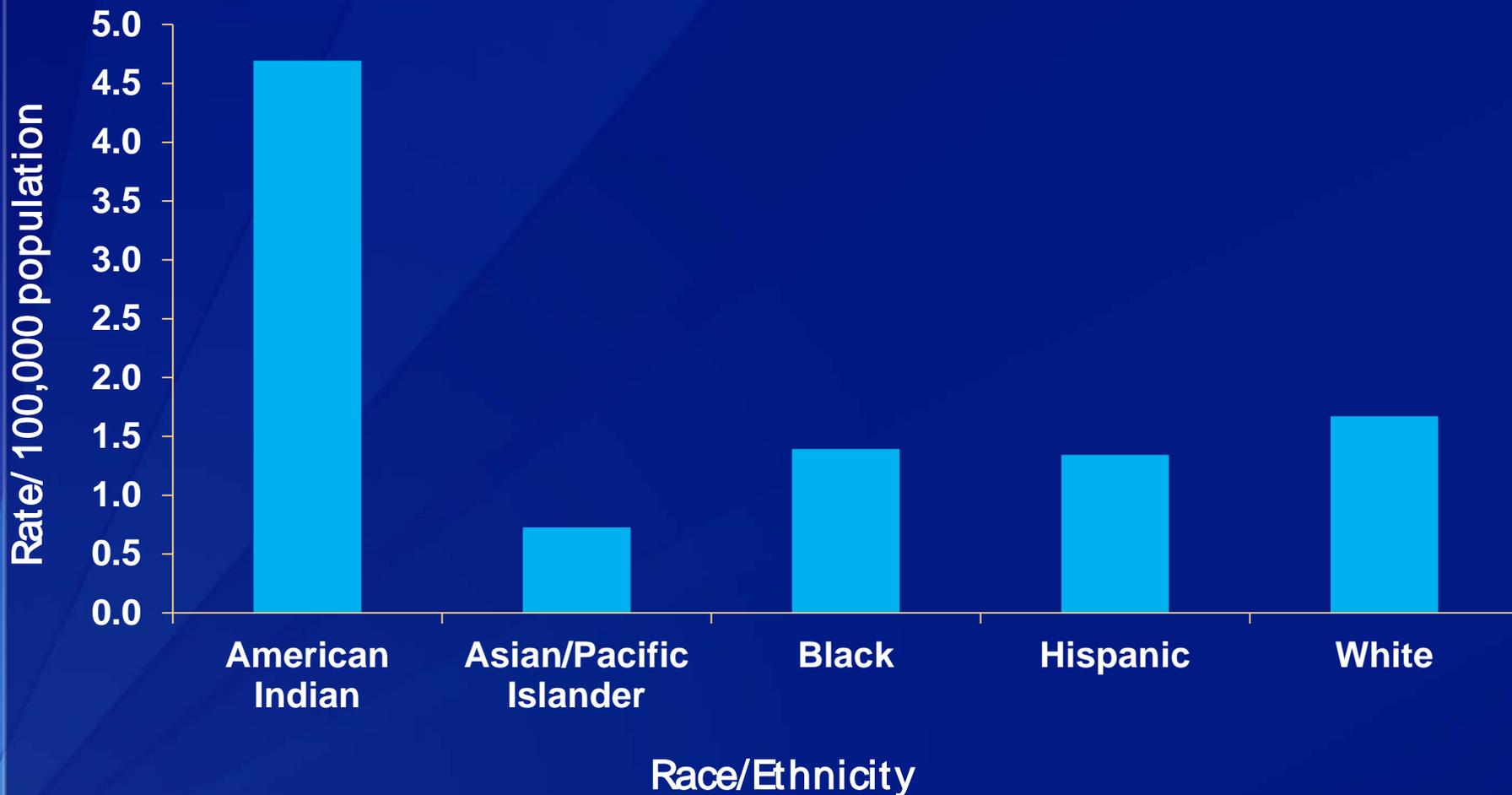
Selected Variables for *Haemophilus influenzae* Cases, New Mexico, 2004–2011 (n=328)

	N (%)
Case-Fatality Ratio:	46 (14%)
Syndrome:	
Bacteremia	101 (31%)
Pneumonia	157 (48%)
Meningitis	38 (12%)
Sex (Male)	165 (50%)

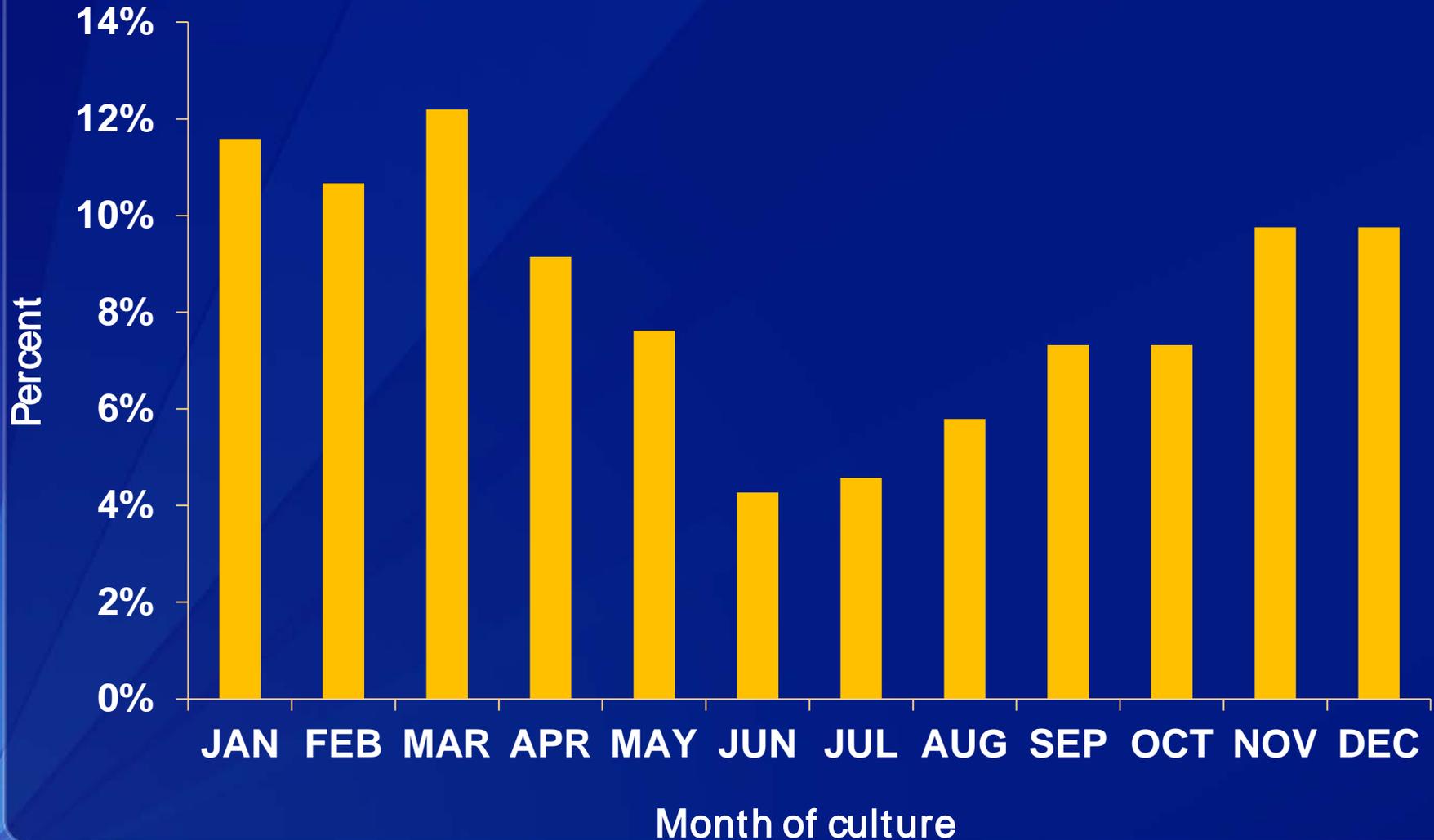
Haemophilus influenzae Mortality by Age Group, New Mexico, 2004–2011



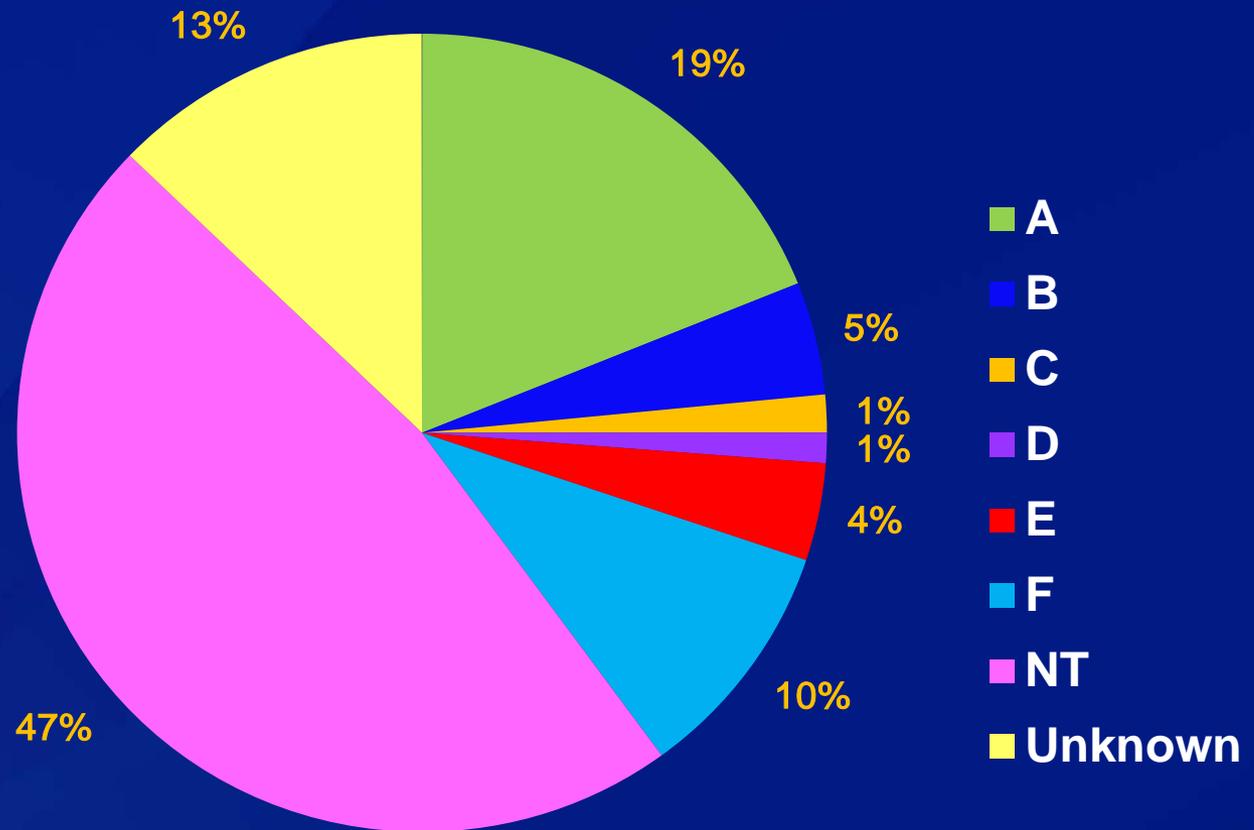
Rate of *Haemophilus influenzae* by race/ethnicity, New Mexico, 2004–2011



Cases by Month of Culture, New Mexico, 2004–2011 (n=328)



Haemophilus influenzae Serotypes Among New Mexico Residents, 2004–2011



Cluster of *Haemophilus influenzae*, type A (Hia),
New Mexico, 2009–2010

Cluster of *Haemophilus influenzae*, type A (Hia), New Mexico, 2009–2010

- ❑ September–March
 - 11 reports of invasive Hia disease
 - 2–5 Hia reports expected per season
- ❑ American Indians (AI)
- ❑ Children aged <5 years
- ❑ Invasive Hia reportable

Epidemiologic Investigation Objectives

- ❑ Characterize cases through epidemiologic and laboratory methods
- ❑ Identify secondary cases
- ❑ Quantify apparent increase in cases

Case Definition

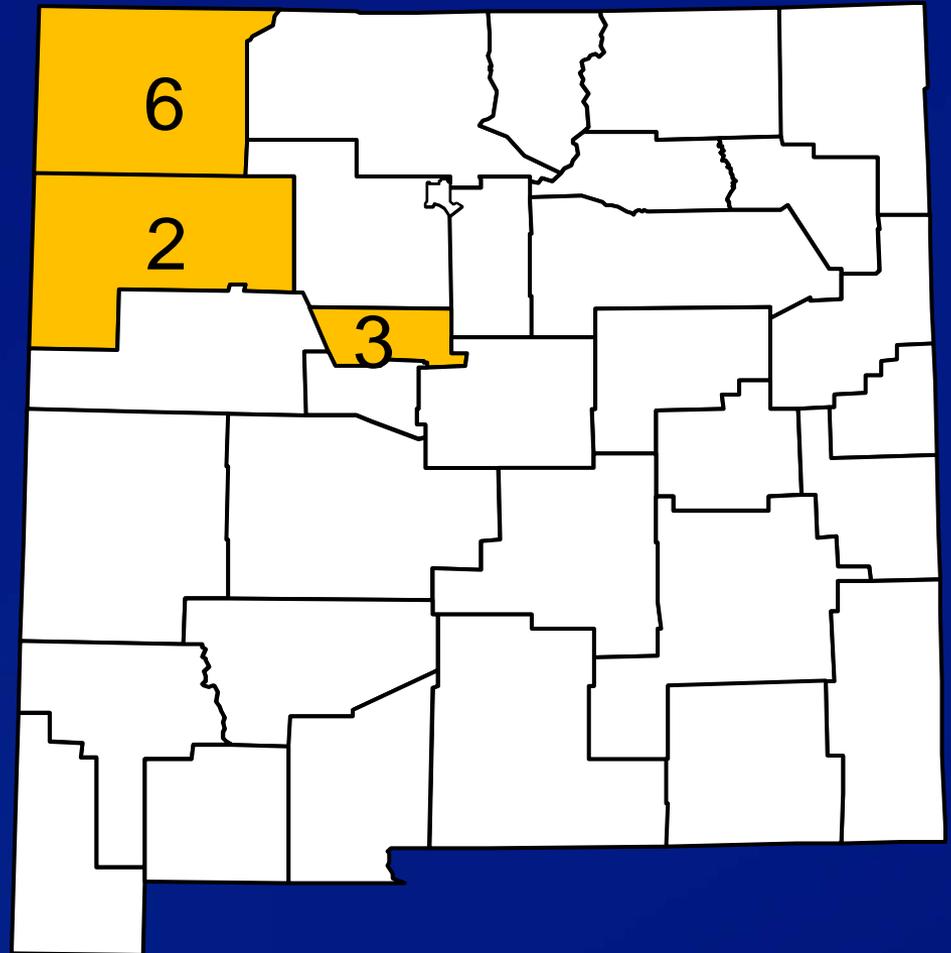
- ❑ **Hia isolate from sterile site**
 - Blood
 - Cerebrospinal fluid (CSF)
 - Joint fluid
- ❑ **Children aged <5 years**
- ❑ **Cultured in New Mexico (NM)**

Methods

- ❑ Interviewed caretakers of cases
- ❑ Reviewed medical charts
- ❑ Compared isolates by pulsed-field gel electrophoresis (PFGE)

Results

- ❑ No epidemiologic links between cases
- ❑ No secondary cases



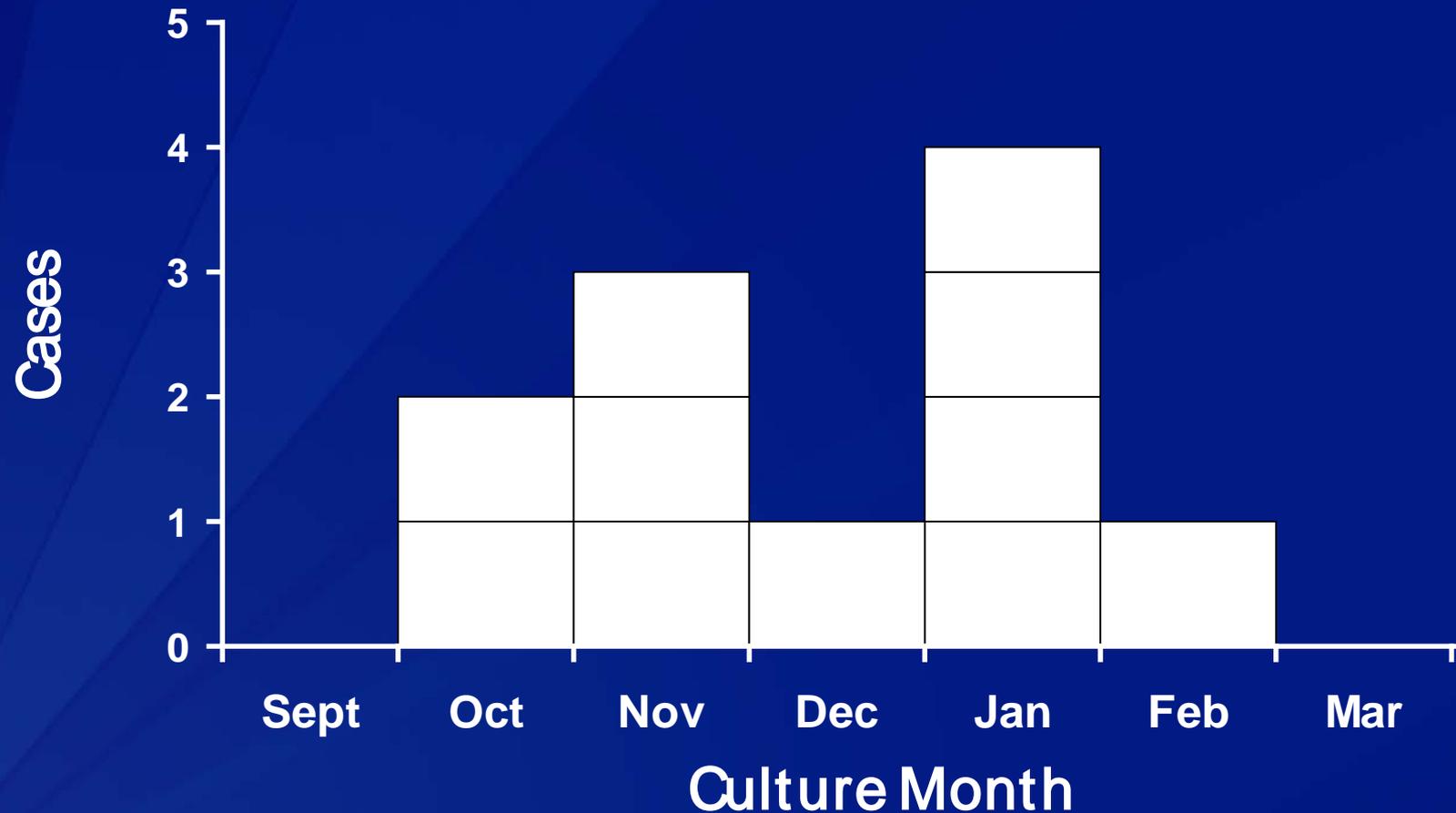
Data Summary

Demographics

Age, median (range)	13 mos	(3 mos–25mos)
Male, no. (%)	5	(45%)
Race / Ethnicity, no. (%)		
American Indian	8	(73%)
White, Hispanic	2	(18%)
White, Non-Hispanic	1	(9%)
Death	2	(18%)

Hia Cases by Month of Culture

September 2009–March 2010 (n=11)



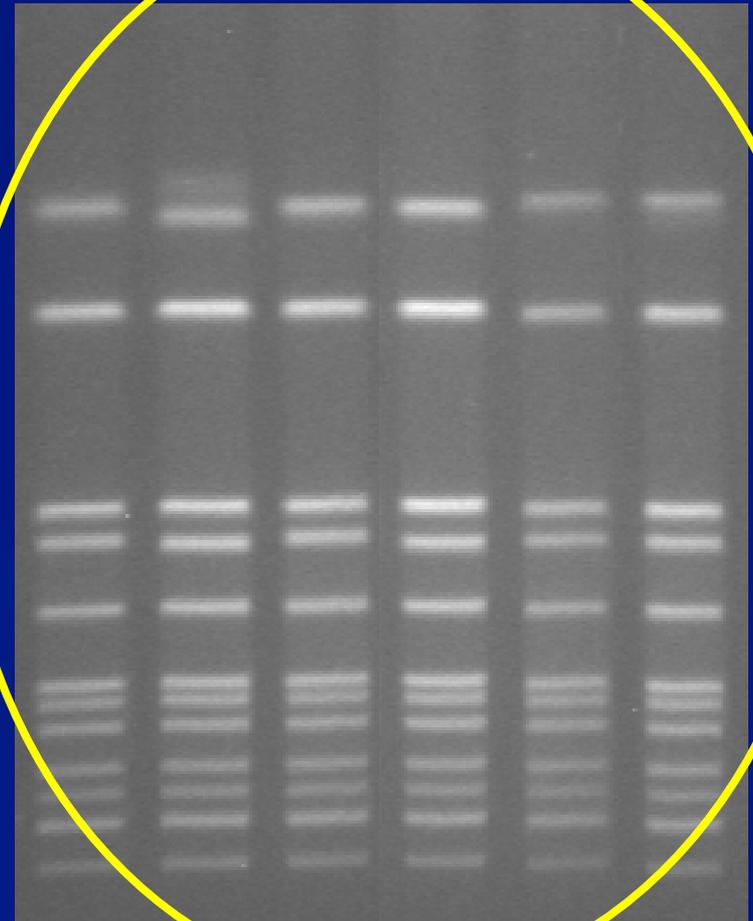
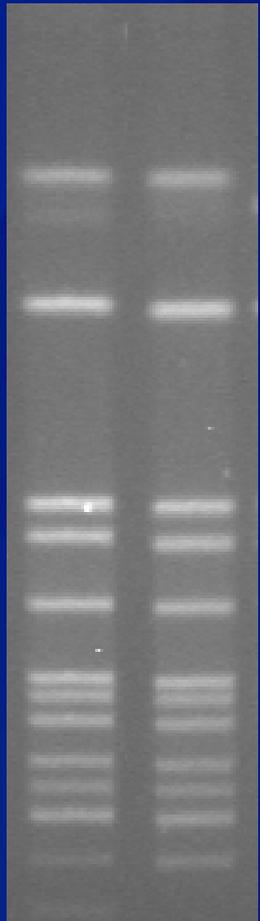
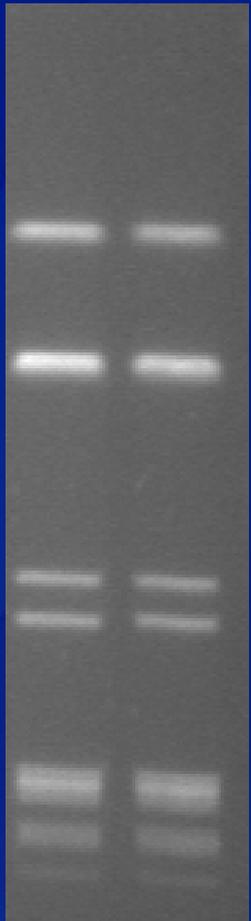
Pulsed-field gel electrophoresis (PFGE)

Hia 1

Hia 2

Hia 3

Hia 4



County: Bernalillo

San Juan

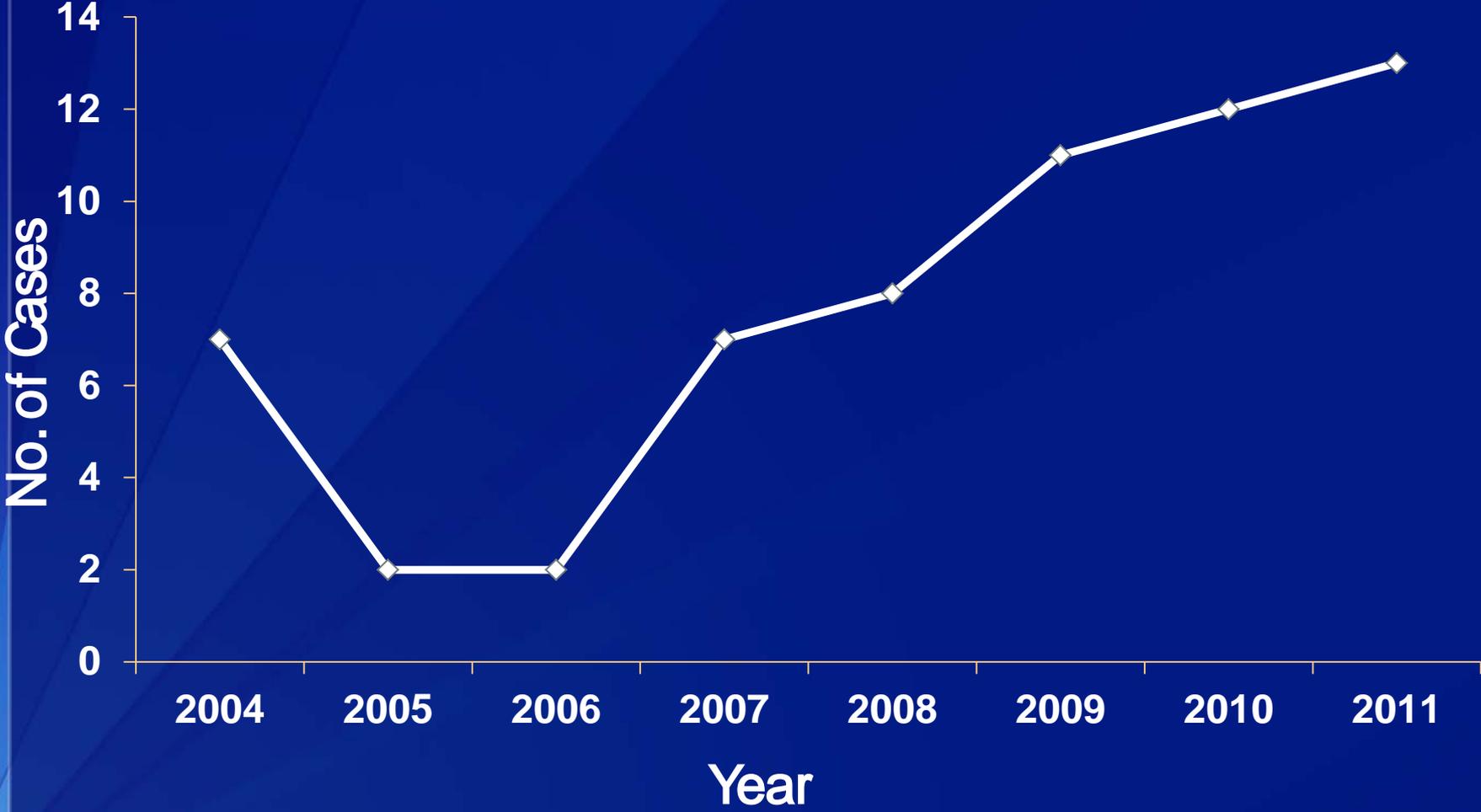
San Juan and McKinley

County: Bernalillo

San Juan

San Juan and McKinley

Hia Cases by Year, New Mexico, 2004–2011



Discussion

- ❑ Epidemiology of *Haemophilus influenzae* changed since introduction of vaccine against serotype B
- ❑ Other serotypes still cause invasive disease
- ❑ All children aged <5 years are at higher risk for invasive disease than other populations
- ❑ Further study of changing epidemiology of other serotypes, including type a

QUESTIONS?



From : www.nmeip.org

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