8:00 – 10:00 am
Saturday, April 30

Concurrent Mini-Plenary Session

Infectious Diseases: Immunizations, RSV, and Pneumococcal Disease

Katherine O'Brien, MD

Streptococcus pneumoniae among Native Americans

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Native Americans

- > 500 tribes in the United States
- Divergent ethnic, anthropologic origins
- What do we mean by "Native American" ?
- What are the goals of investigating pneumococcal disease ?

What are we studying and why ?

- Groups at high risk of disease
- Defining common features of the group
- Heterogeneity within the group
- Risk factors for disease within the group and among individuals
- Prevention tools/activities

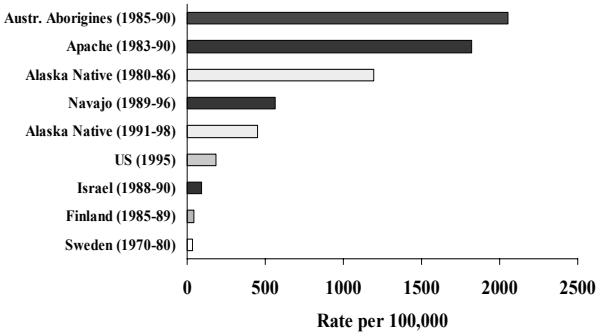
Understanding Pneumococcal Disease and Prevention Among Children

- Disease characteristics prior to introduction of conjugate pneumococcal vaccine
- Conjugate pneumococcal vaccine efficacy
- Disease characteristics in the conjugate pneumococcal vaccine era

Understanding Pneumococcal Disease and Prevention Among Children

- Disease characteristics prior to introduction of conjugate pneumococcal vaccine
  - High rates of disease
  - Serotype distribution may differ from general US
  - Antimicrobial resistance rates
  - Risk factors for disease

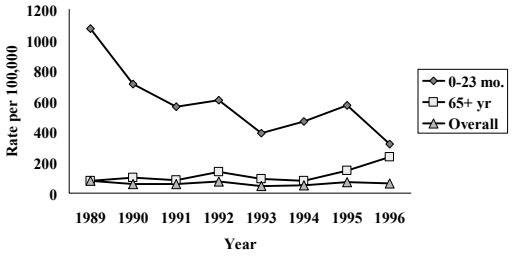
Invasive Pneumococcal Disease Rates, Children < 2 years old



What does this graph mean ?

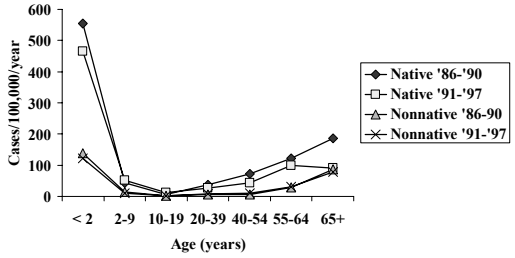
- Navajo, Apache and Alaska Natives
  - Relationships between these groups
- Population based data in other settings
  - other AI tribes
  - AI not living on reservations
  - State wide surveillance of AN
- Generalizability of existing data to "Native Americans" is limited

Trend in Pneumococcal Disease Rate, Navajo, 1989-96



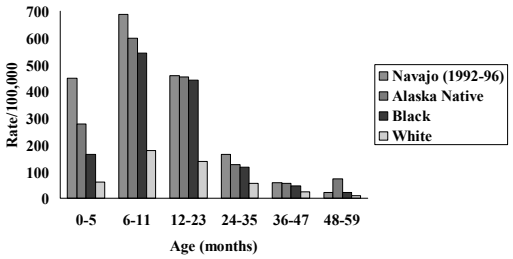
Invasive Pneumococcal Disease, Alaska Natives and Nonnatives

1986-1990 and 1991-1997

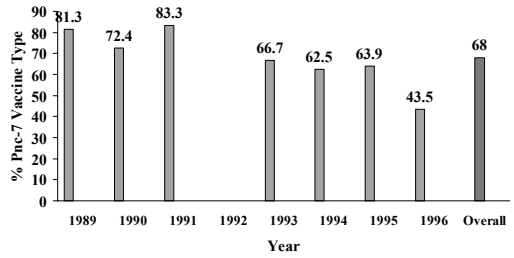


Personal communication, Butler JC

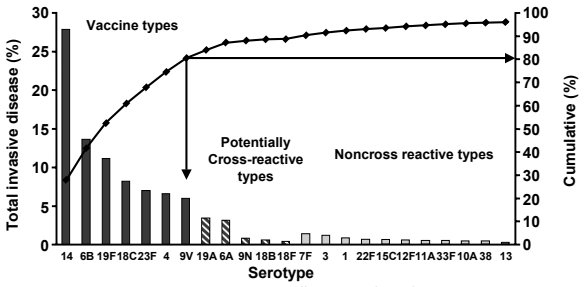
Rates of Invasive Pneumococcal Disease in US Children by Ethnic Group, 0-59 months of age



Pneumococcal Serotype Distribution, Navajo 0-23 mo, 1989-1996

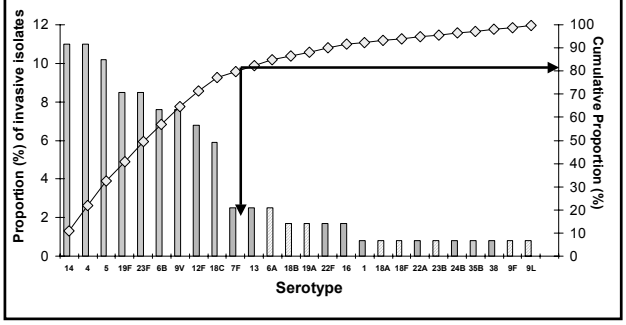


Invasive Pneumococcal Disease: Frequently Associated Serotypes in North American Young Children

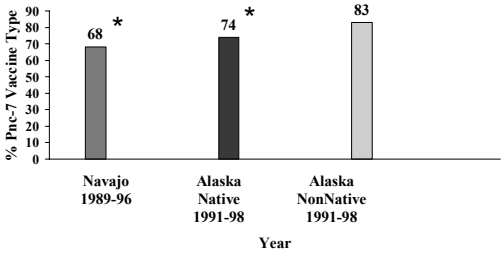


Hausdorff WP et al. *Clin Infect Dis.* 2000;30:100-121.
Hausdorff WP et al. Unpublished data, 1999.

Serotype Distribution of Invasive Pneumococcal Isolates, Navajo 0-23 mo, 1993-1997



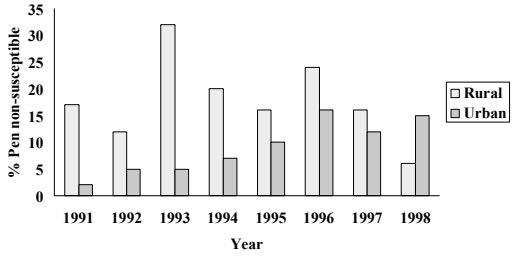
Pneumococcal Serotype Distribution, 0-23 mo, Navajo and Alaska



* *P* < .05 compared with Alaska NonNatives

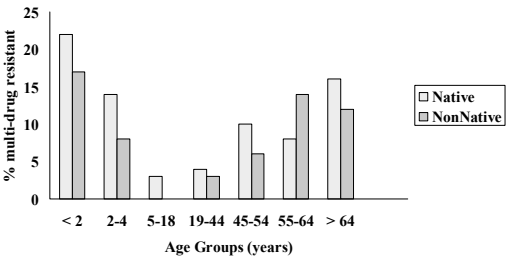
Rudolph KM JID

Penicillin non-susceptible invasive pneumococcal isolates by year, Alaska



Rudolph KM JID

Proportion of multidrug-resistant invasive pneumococcal isolates by ethnicity, Alaska 1991-98



Rudolph KM JID

Risk Factors for Disease Among Alaska Native Children

- 35% of pediatric cases had underlying disease (Davidson JID 1994;170:368-76)
  - Anemia (15%)
  - Chronic lung disease (7%)
  - Congenital abnormality (7%)
  - Low birth weight/prematurity (7%)
- AN < 2 yo, case-control study (Gessner PIDJ 1995;14:123-8)
  - Group child care (OR 98.6)
  - Chewing tobacco in household (OR 20.6)
  - Breast feeding (OR 0.1)

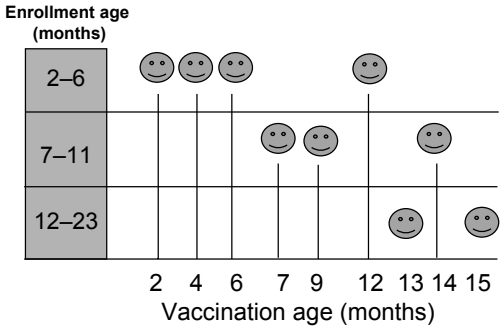
Prevention: Existing Tools

- 23- PS vaccine
- Influenza vaccine
- Judicious antimicrobial use
- Reduction of known risk factors
  - Daycare attendance
  - Smoke exposure
  - Crowding (household size)
- Increase known protective factors
  - Breast feeding
  - Promote perinatal health (birth weight, gestational age)

Understanding Pneumococcal Disease and Prevention Among Children

- Conjugate pneumococcal vaccine efficacy trial among Navajo and WMA
  - Invasive disease
  - Otitis media
  - Pneumonia
  - NP colonization

Vaccine Schedules



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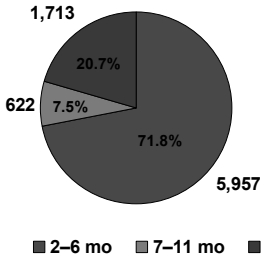
Enrollment Summary



Eligible	14,000
Contacted	10,864
Enrolled	8,292 (76.5%)
Declined	2,330 (21.3%)
Excluded	242 (2.2%)

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Primary Efficacy Results Vaccine Serotype Invasive Disease*

	PNCRM7 (n=2,974)	MnCC (n=2,818)	Efficacy (95% CI)
Per protocol	2	8	76.8% (-9.4, 95.1)
Intent to treat†	2	11	82.6% (21.4, 96.1)

† Received at least 1 dose of vaccine.
* May 31, 2000.

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Intent to Treat† Efficacy Against Invasive Disease*, Enrolled at < 2 yo

	PNCRM7 (n=2,974)	MnCC (n=2,818)	Efficacy (95% CI)
Vaccine types	2	14	86.4% (40.3, 96.9)
All types	9	18	46.3% (-16.5, 75.3)

† Received at least 1 dose of vaccine.
* cases through May 31, 2000.

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U.S. Recommendations for Use of Pneumococcal Conjugate Vaccine

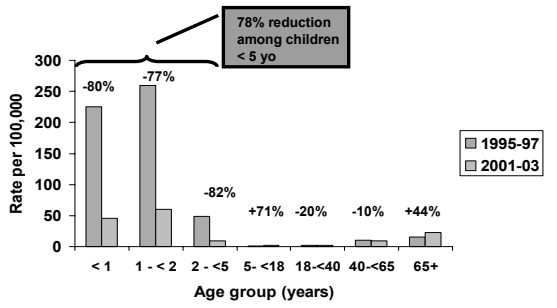
- **All children <2 years**
- **Children 2-4 years with**
  - **Certain chronic illnesses**
  - **Immunocompromising conditions**
- **Consider for all children 2-4 with priority to those**
  - **24-35 months**
  - **Alaska Native, American Indian, African American**
  - **Attending day care**

Advisory Committee on Immunization Practices. MMWR 2000

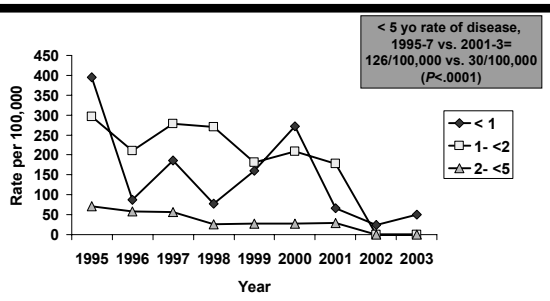
Understanding Pneumococcal Disease and Prevention Among Children

- Disease characteristics in the conjugate pneumococcal vaccine era
  - Rates of disease among immunized groups
  - Serotype distribution

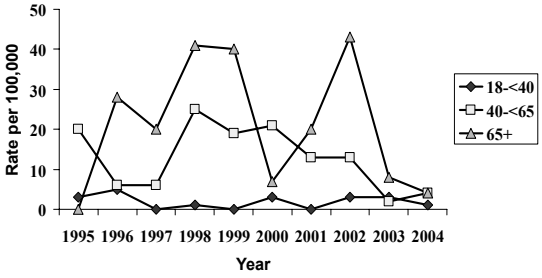
Change in Rate of VT IPD, Navajo 1995-2003



Rate of VT IPD, Navajo children less than 5 years of age, by year

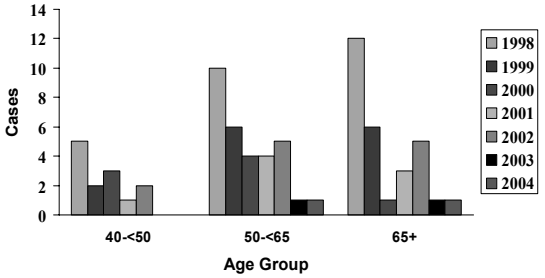


Rate of 7VT IPD, Navajo adults, 1995-2004



Mar 24-05 analysis

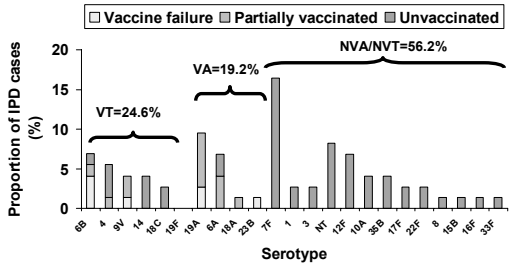
IPD Case Counts, 7-valent, Navajo/WMA Adults, 1998-2004



Mar 24-05 Analysis

* Of 446 cases total, 90% were serotyped

Serotypes causing disease in 2001-2003, < 5 yo by vaccine status for that serotype



Investigators

- Center for American Indian and Alaskan Native Health, JHU
  - Mathuram Santosham, Ray Reid, James Watt, Bob Weatherholtz
- Arctic Investigations Program, CDC
  - Jay Butler, Alan Parkinson, Tom Hennessey
- Centers for Disease Control and Prevention (Atlanta)
  - Richard Facklam, Cyndy Whitney, Anne Schuchat