What We Do: The Center for American Indian Health (CAIH) actively monitors serious diseases caused by the bacteria *Streptococcus pneumoniae* (*S. pneumoniae*), *Haemophilus influenzae*, *Neisseria meningitidis*, and *Staphylococcus aureus* in people living on and around the Navajo and White Mountain Apache tribal lands. American Indians have higher rates of disease caused by these bacteria compared to the general US population. In this issue of the newsletter, we provide an update on surveillance for invasive disease and ear infections (acute otitis media) caused by *S. pneumoniae*.

Vaccine Impact:
For over 20 years, CAIH has conducted surveillance for *S. pneumoniae*, a cause of serious invasive diseases including pneumonia, meningitis and blood stream infections. Use of pneumococcal conjugate vaccines (PCV7 and PCV13) as part of the routine infant immunization schedule has led to a dramatic reduction in invasive disease caused by the serotypes contained in these vaccines. PCV7, also called Prevnar 7, was introduced in late 2000. An additional 6 serotypes were added in PCV13 (Prevenar 13), which replaced PCV7 for use in children in 2010 and was recommended for adults 65 years and older in late 2014. Over the course of three periods from 1995-2016 that includes pre-PCV use and post-PCV7 and PCV13 introduction, rates of disease caused by *S. pneumoniae* types in PCV13 (PCV13-types) dropped 95% in children <5 years, 71% in adults 18-64, and 76% in adults 65 years of age and older (Figure 1).

Comparison to the General US Population:
While PCV use has resulted in a marked decline in invasive *S. pneumoniae* disease, rates among the Navajo and White Mountain Apache populations remain four times higher than the general US population (Figure 2). Other interventions (e.g. reducing risk factors, vaccines covering additional serotypes) may be necessary to address the disparity.

Ear Infections:
Ear infections are experienced by many children. In addition to being painful and often requiring antibiotic treatment, ear infections can cause hearing problems and can require surgery. *S. pneumoniae* is a common cause of ear infections. Use of PCV has reduced the occurrence of pneumococcal ear infections. The percent of draining ear infections positive for PCV13-type pneumococcus decreased by 68% from the PCV7 period (2007-2009) to the PCV13 periods (2010-2016). Ear infections caused by PCV13-types (1, 3, 7F, 19A, and 19F) persist, some occurring among children fully vaccinated with PCV13. Different vaccination strategies and higher antibody concentrations may be required for optimal protection against draining ear infections.

![Figure 1: Comparison of *S. pneumoniae* PCV13-type invasive disease rates in Navajo and White Mountain Apache children and adults Pre-PCV, Post-PCV7, and Post-PCV13](image1)

![Figure 2: Invasive pneumococcal disease among Navajo and White Mountain Apache children and adults and in the general US population*, 2011-2015](image2)

*US rates from CDC Active Bacterial Core Surveillance program*
What bacterial isolates do we look for?

- Streptococcus pneumoniae
- Haemophilus influenzae
- Neisseria meningitidis
- Staphylococcus aureus

Isolated from normally sterile body sites such as:

- Blood
- Cerebrospinal Fluid (CSF)
- Joint Fluid (Synovial Fluid)
- Middle Ear (S. pneumoniae only)
- Bone
- Pleural Fluid
- Peritoneal Fluid
- Pericardial Fluid

We request ONE slant of the *S. pneumoniae, H. influenzae, N. meningitidis*, or *S. aureus* isolate. CAIH will provide the chocolate agar slants upon request. Isolates are sent to our reference labs for additional testing.

*Please maintain the isolate in your lab until you receive confirmation from us that the isolate was viable.*

If you have any questions about Active Bacterial Surveillance, please contact us

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The **mission** of Johns Hopkins Center for American Indian Health is:

to work in partnership with American Indian and Alaska Native communities to improve the health status, self-sufficiency, and health leadership of Native people. This mission is accomplished through three core activities:

- Research
- Training/Education
- Service