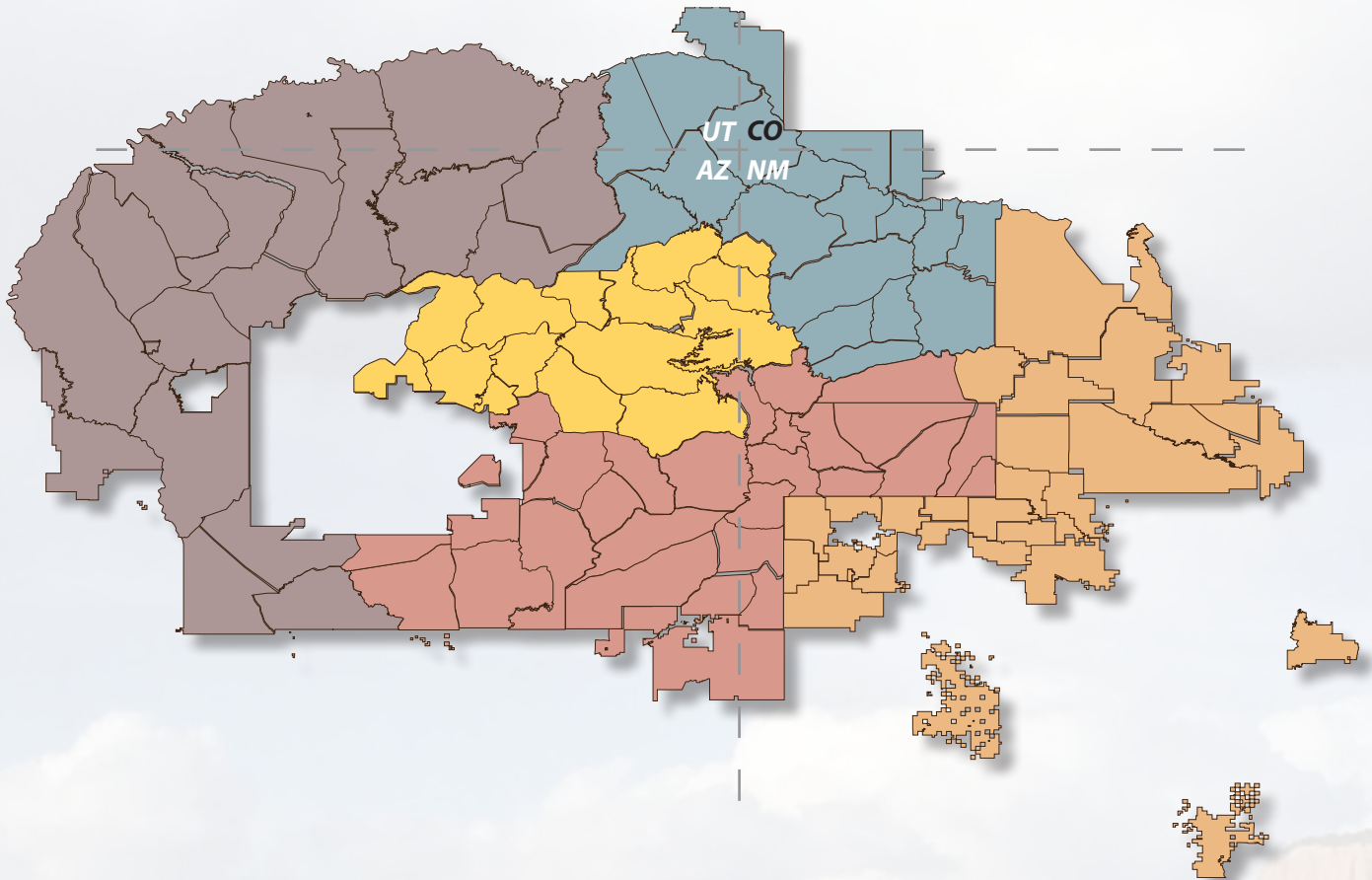




Navajo Nation Active Bacterial Surveillance Report

February 8, 2024



In partnership with the Johns Hopkins Center for Indigenous Health

Active Bacterial Surveillance

NNHRRB #: NNR-19.343 & NNR-16.238

The 'Active Bacterial Surveillance' project, or 'ABS' was initiated over three decades ago in response to the disproportionately high burden of invasive bacterial disease (e.g., meningitis, pneumonia, sepsis) experienced by Indigenous communities. ABS provides population-wide estimates of disease burden for Navajo Nation as a whole. It is modeled after the Centers for Disease Control and Prevention's [Active Bacterial Core surveillance](#), which provides disease burden estimates for the general United States. By monitoring invasive bacterial infections over time, ABS allows for evaluation of the impact of interventions, like vaccines, and guides vaccine recommendations that are most beneficial to Indigenous communities.

Methods

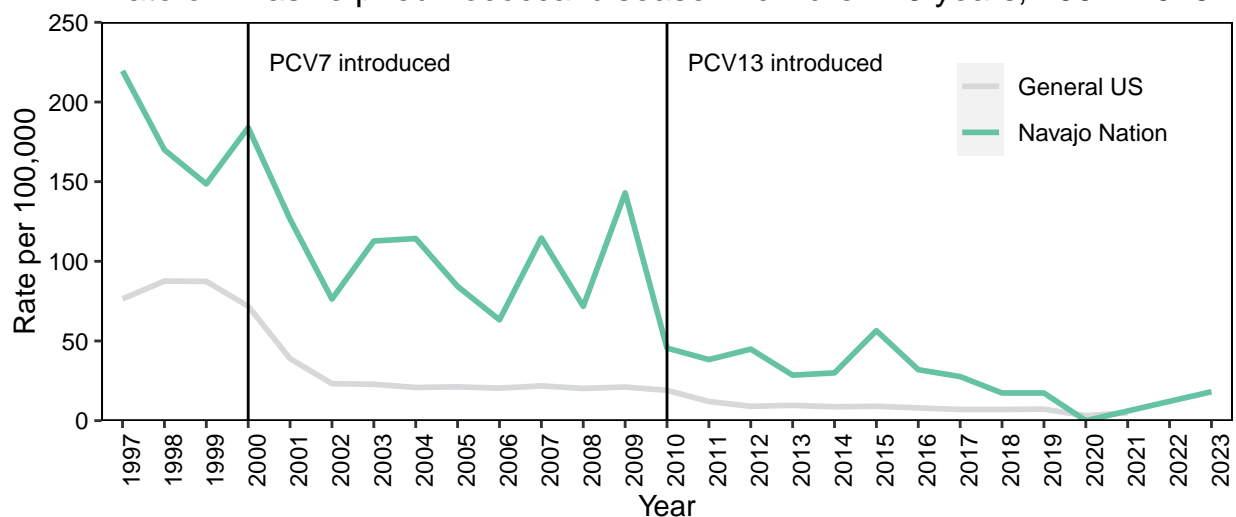
With approval from the Navajo Nation Human Research Review Board and in collaboration with the Navajo Epidemiology Center, Arizona and New Mexico Departments of Health, and 21 Indian Health Service, Tribal, and private health facilities serving the Navajo Nation, the Johns Hopkins Center for Indigenous Health team conducts active, laboratory-based surveillance for invasive bacterial disease caused by *Streptococcus pneumoniae*, *Haemophilus influenzae*, *Neisseria meningitidis*, *Staphylococcus aureus*, and group A *Streptococcus*. Cases of invasive disease caused by these bacteria are included if the individual is an Indigenous person living in or near the Navajo Nation and receiving care at a participating facility. ABS is laboratory-based with no contact with patients.

What to know

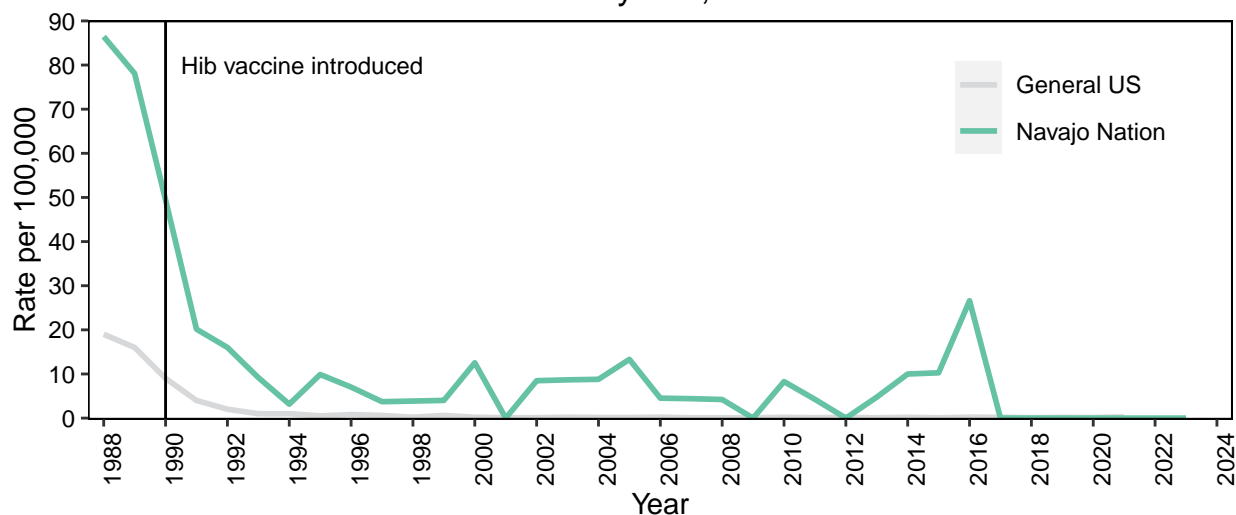
Since there are many different types of *S. pneumoniae* and *H. influenzae* that cause disease, vaccines have been developed to protect against the types that have historically been the most common or caused the most severe cases. The number in the name of the pneumococcal vaccine indicates how many types of *S. pneumoniae* it protects against. So, PCV7 protects against 7 different types of *S. pneumoniae* while PCV13 protects against 13 types. There is also a *H. influenzae* type b, or Hib, vaccine that has been in use since the early 1990s. Pneumococcal and Hib vaccines are part of the routine immunization schedule for children and are recommended for elders as well as adults with certain underlying medical conditions. Getting vaccinated is an effective and easy way to protect yourself and your loved ones against these diseases.

Pneumococcal and Hib vaccines have both been successful at decreasing the burden of invasive disease in Navajo Nation and across the US. When we talk about disease burden, we like to look at rates which show us how common the disease is within a specific group or population. Using rates instead of case counts allows us to make comparisons of how common the disease is even if the size of the populations we're looking at is very different. The graphs below show the decrease in disease rates after pneumococcal and Hib vaccines were added into the routine childhood immunization schedule. Data on rates for the general U.S. population were taken from the Centers for Disease Control and Prevention's [Active Bacterial Core surveillance reports](#) (available through 2021). As you can see, the vaccines were effective at reducing the rate of disease in Navajo children and reducing the disparities in disease burden between Navajo Nation and the general U.S. population. Despite the substantial positive impact that vaccines have had in reducing disease, disparities still persist largely due to strains of bacteria that are not covered by the currently available vaccines. It is important to continue monitoring bacterial infections and seeking ways to further reduce the number of cases.

Rate of invasive pneumococcal disease in children <5 years, 1997–2023



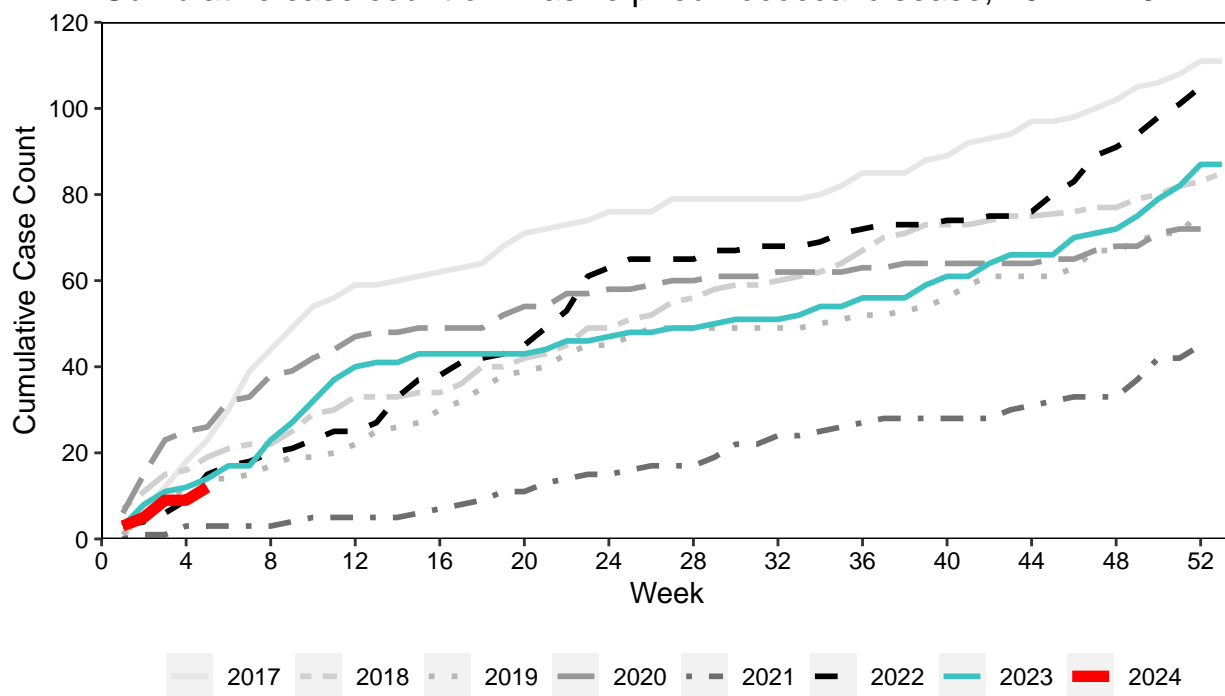
Rate of Hib disease in children <5 years, 1988–2023



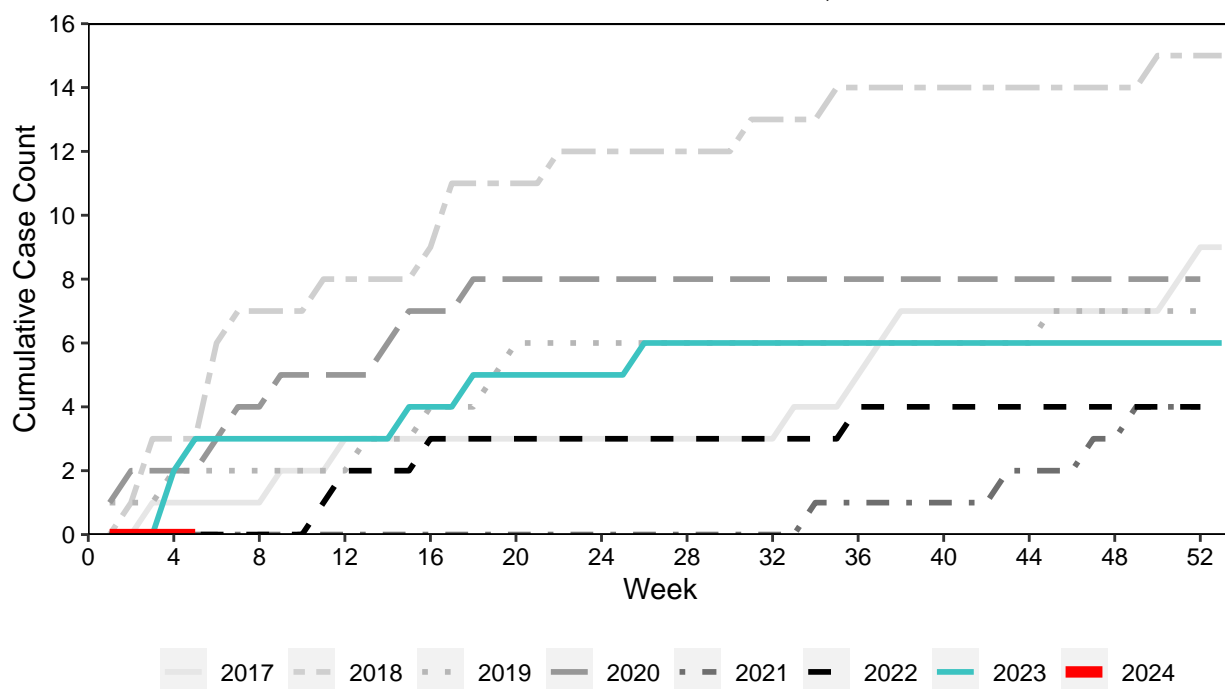
Current status

Below are graphs showing the cumulative annual case counts of invasive pneumococcal disease, invasive *H. influenzae* disease, invasive *S. aureus* disease, and invasive group A *Streptococcus* disease occurring among Indigenous people living in or near the Navajo Nation. The curves are a running tally of the new cases that occur each week of the year. When viewing the cumulative case count graphs, each line represents a different year and the height of the line shows how many cases have occurred through that week of the year. So if you're looking at week 4 on the 2022 line, it's showing the total number of cases that were detected during the first 4 weeks of 2022. The height of the line at week 52 is the total number of cases for a given year, which allows for comparison between years. Surveillance for group A *Streptococcus* was added to ABS in 2023, so no historical data is available for that pathogen. Additionally, data from the current year is subject to change as cases are continually added and reviewed throughout the year.

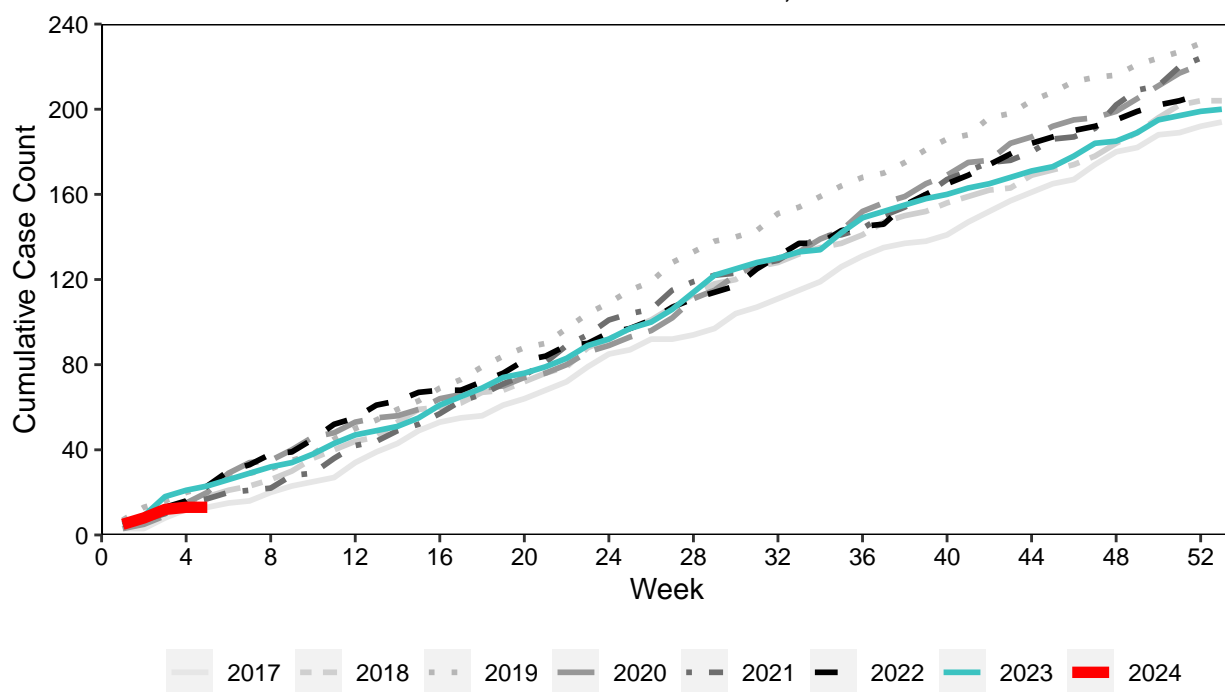
Cumulative case count of invasive pneumococcal disease, 2017 – 2024



Cumulative case count of invasive *H. influenzae*, 2017 – 2024



Cumulative case count of invasive *S. aureus*, 2017 – 2024



Cumulative case count of invasive group A *Streptococcus*, 2023 – 2024

