

# Pneumococcal Disease and Its Prevention in Alaska

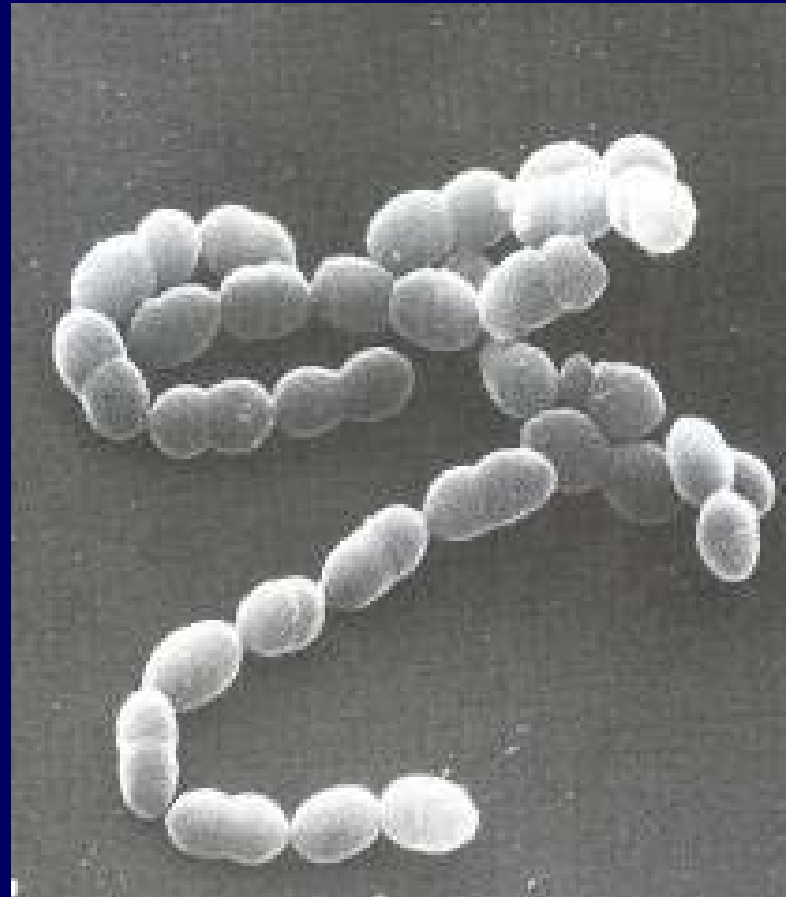
Tammy Zulz, MPH  
Ros Singleton, MD, MPH  
Jay Wenger, MD

Arctic Investigations Program  
Centers for Disease Control and Prevention  
Anchorage, Alaska  
907-729-3404  
[jdw2@cdc.gov](mailto:jdw2@cdc.gov)

The CDC logo is located in the bottom right corner. It consists of the letters "CDC" in a white, bold, sans-serif font, set against a blue rectangular background. The background has a subtle pattern of thin, white, diagonal lines.

# Pneumococcus (Pneumo)

- Pneumococcus is a bacteria



*Pneumo bacteria*

# Pneumococcus (Pneumo)

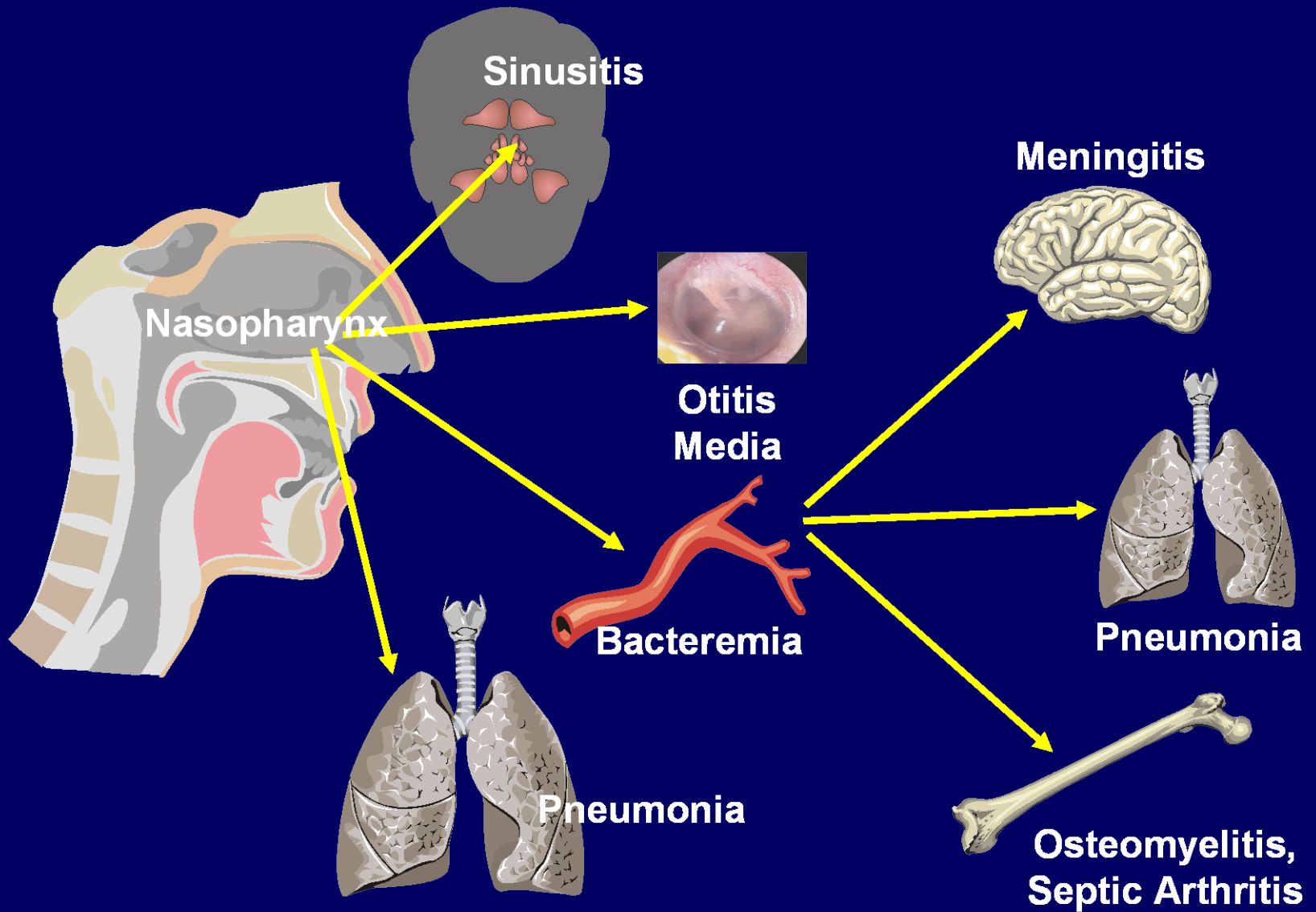
*Pneumonia –  
lung infections*



- A major cause of serious infections:
  - ◆ Bacterial meningitis
  - ◆ Blood infections
  - ◆ Pneumonia

*Brain:  
meningitis*

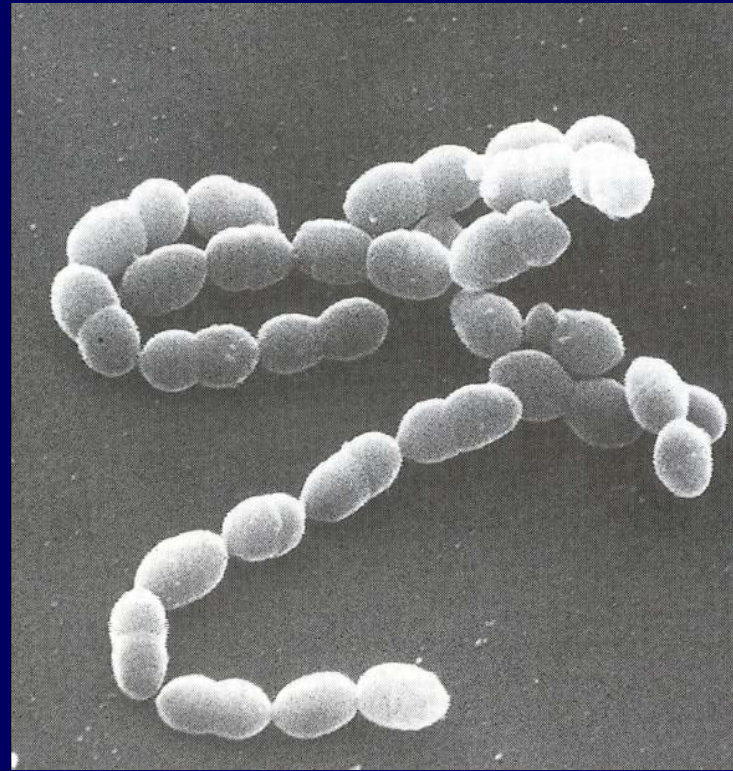




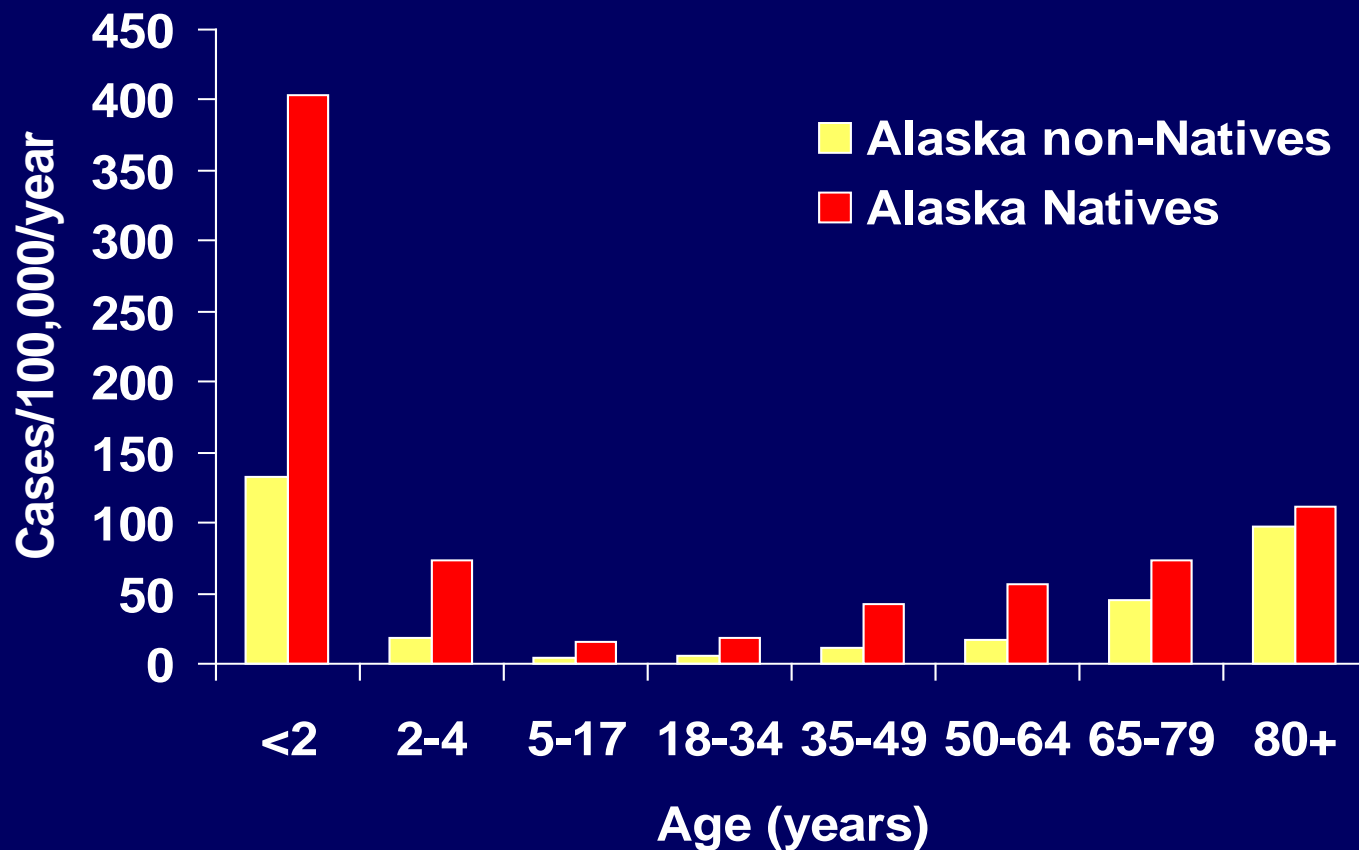
# *Streptococcus pneumoniae*

## “Pneumo”

- Over 90 flavors, or serotypes, based on outer surface of the bacteria
- Before conjugate vaccine, 7 serotypes caused
  - ◆ ~ 75% of serious pneumococcal disease
  - ◆ Most antibiotic resistant infections



# Invasive Pneumo Disease in Alaska, 1996-2000



# Polysaccharide vaccine

- Made of material from 23 of the most common serotypes
- Produces protective antibody in adults, but not much in children
- Recommended in Alaska for
  - ◆ All adults 65 years old or older
  - ◆ Alaska Native adults 50 years and older
  - ◆ Others 2 years and older with specific risk factors for pneumo disease

# Solution to the problem?

## A conjugate vaccine

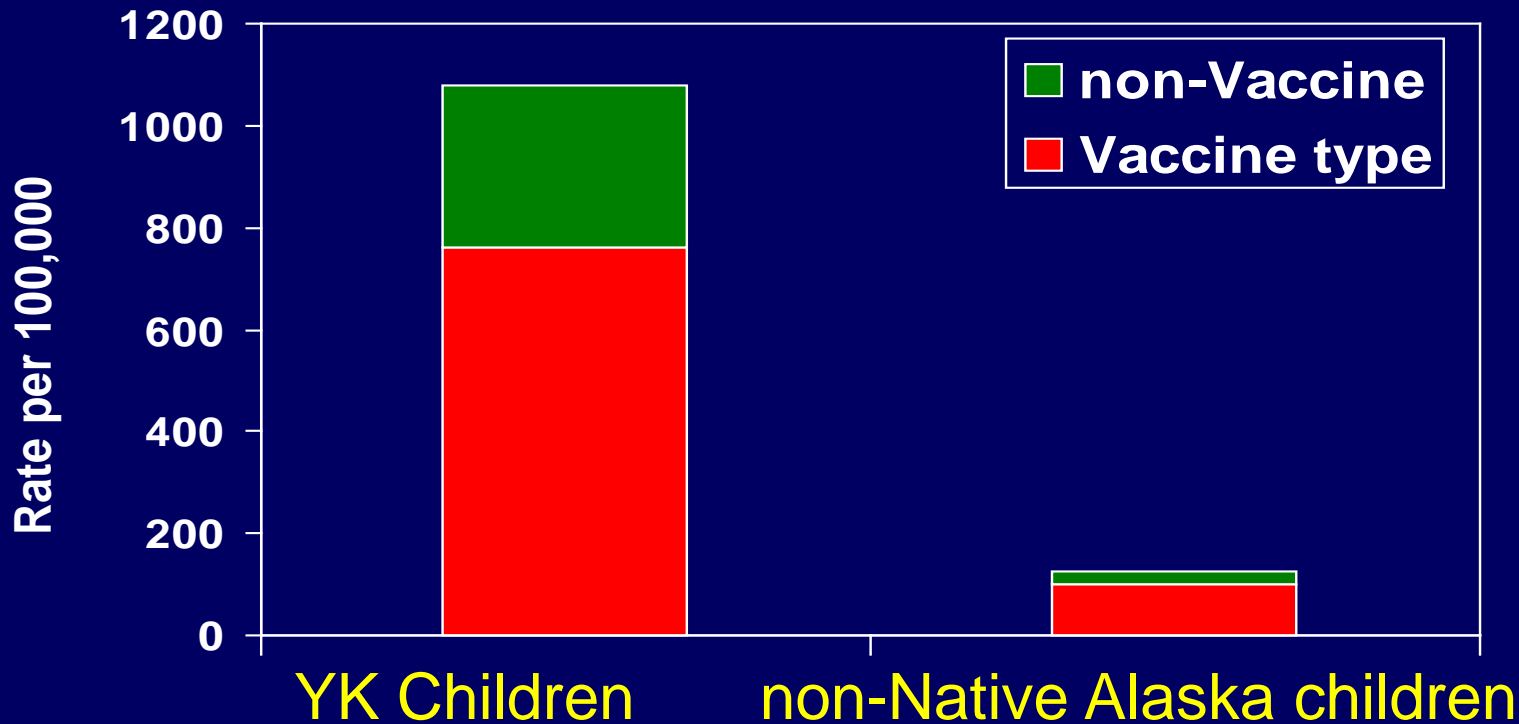
- Attach something children do respond to (protein) to the polysaccharides
- Put the most common serotypes in the vaccine



# Solution to the problem?

## Conjugate vaccine with 7 serotypes

Eighty percent of infections in Alaskan children were caused by strains in the vaccine

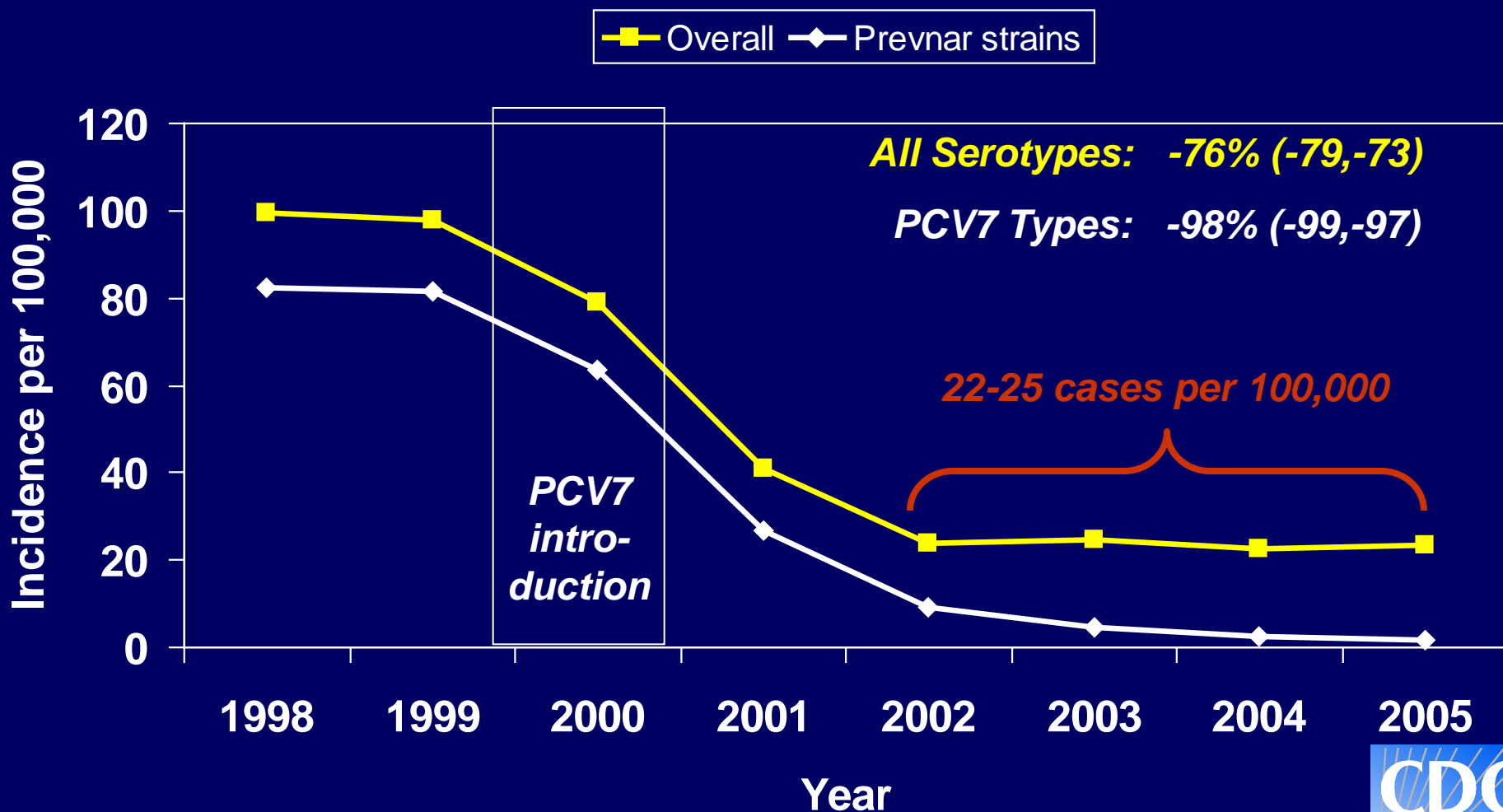


# Pneumo conjugate vaccine schedule

- Introduced in 2001
- Primary series
  - ◆ 2, 4 and 6 months of age
  - ◆ With other childhood vaccines
- Booster dose at 12-15 months

# Vaccine Impact:

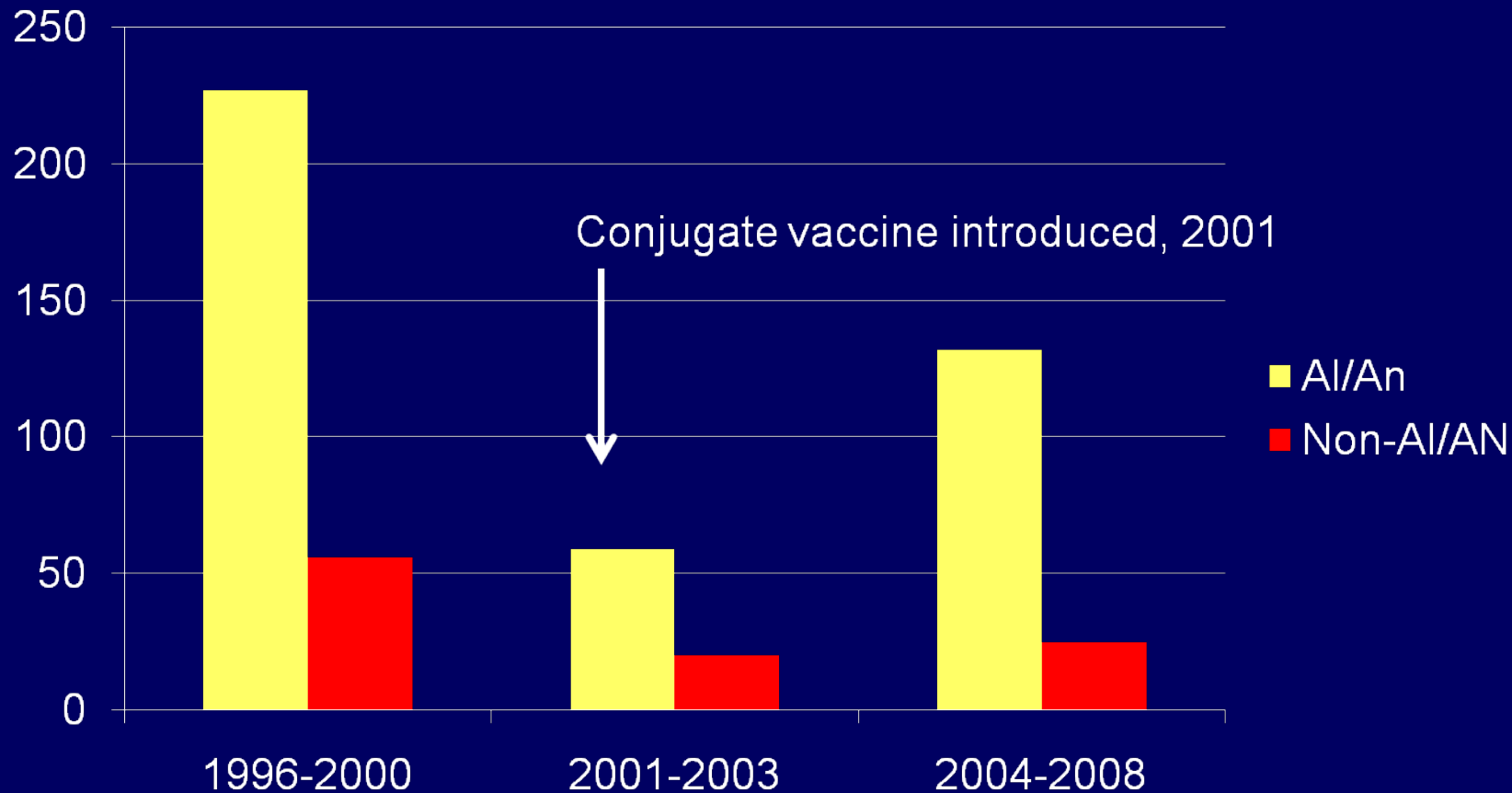
## Decrease in Pneumo Disease in US children



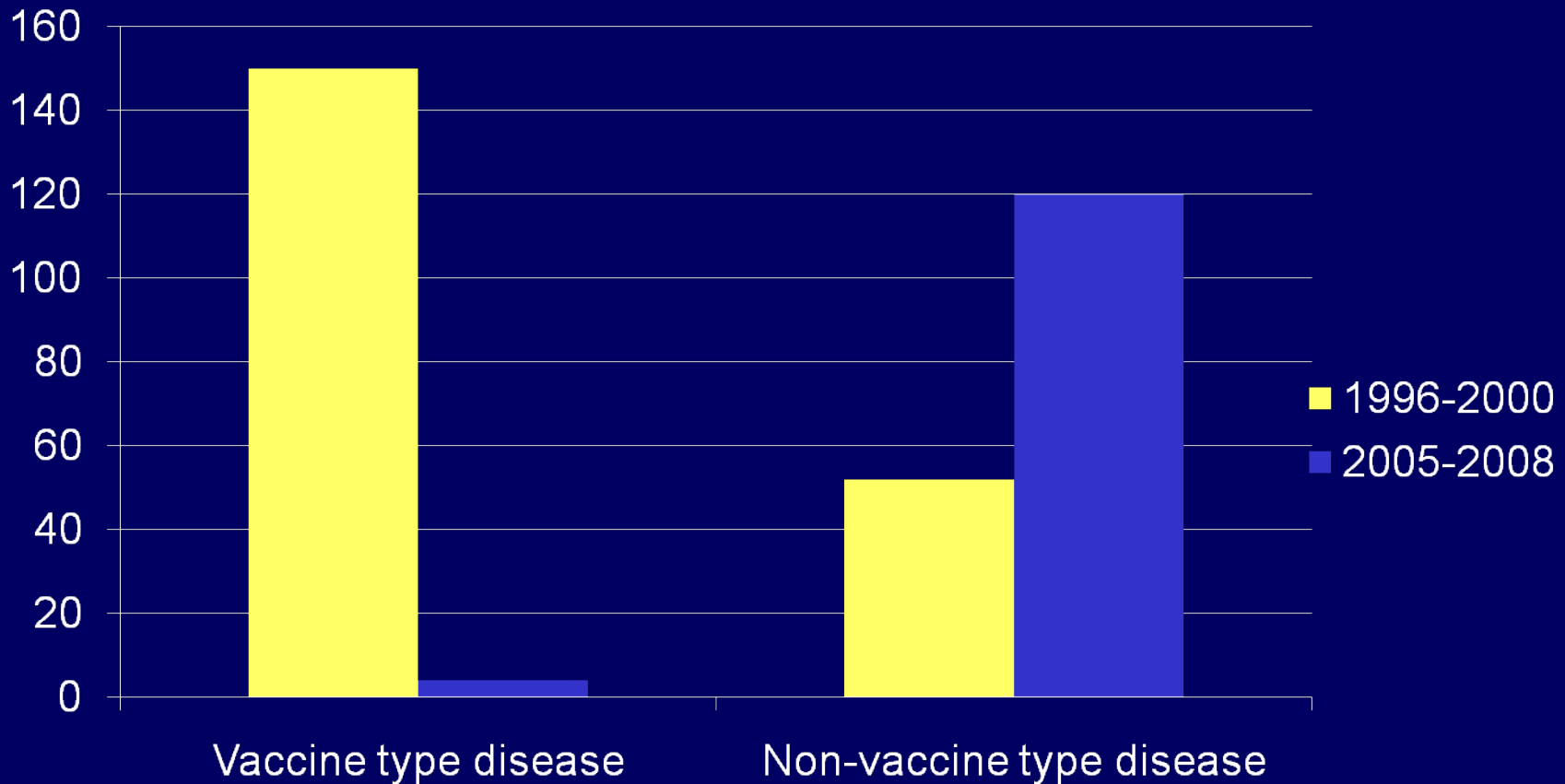
# Conjugate Vaccine Impact in the US

- 75% decrease in invasive pneumo infections in US children.
- In 2006 in the U.S. there were 30,000 fewer cases of invasive pneumo disease than before vaccine

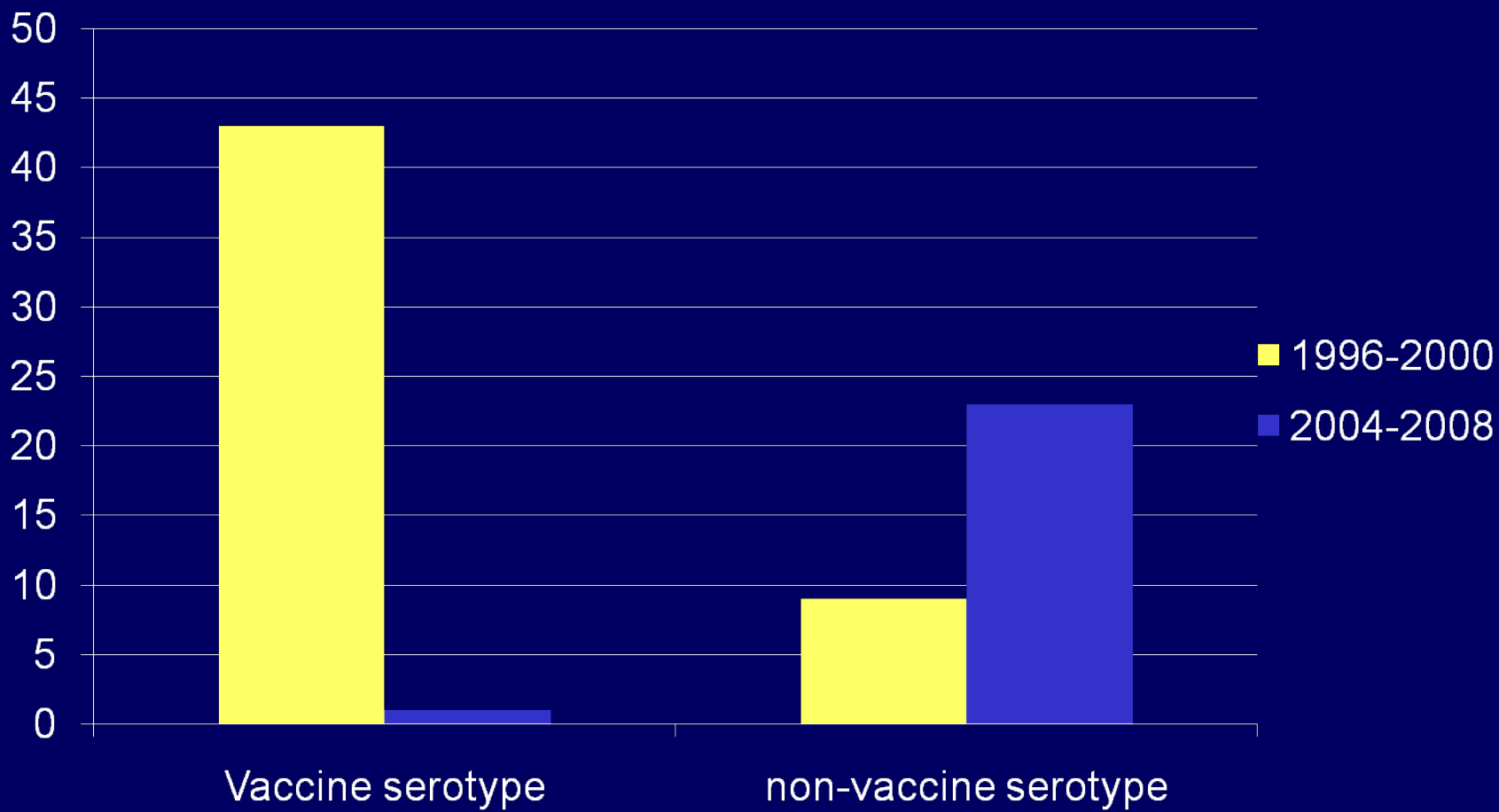
# Invasive pneumo disease in children < 5 in Alaska



# Pneumo disease in AI/AN children <5, pre and post conjugate vaccine



# Pneumo disease in non-AI/AN children <5, pre and post conjugate vaccine



# Impact of pneumococcal conjugate vaccine

- Pneumo disease in the US went down a lot, but some disease caused by other types of pneumo
- In Alaska, a lot of disease caused by a few other pneumo, although not up to baseline, so we ended up preventing disease
- But we could do better . . . .



# So, what do we do now?

- A new vaccine - 13 serotype pneumo conjugate vaccine
- Covers serotypes causing 69% of disease
- Licensed in February, 2010
- Has replaced 7serotype vaccine across the US

# Why should it work better this time?

- Pneumo serotypes vary in ability to cause serious disease
- Two main types are causing disease now, and they were just behind the 7 included in the old vaccine
- Remaining ones UNLIKELY to cause much disease

# Summary

- **Original conjugate vaccine highly successful decreasing serious vaccine-type pneumo disease**
- **Increase in non-vaccine types reduced the gains from vaccine**
- **Introduction of new vaccine this year expected to decrease disease further.**