

Community-acquired Pneumonia Guidelines : Unique aspects in Alaska children

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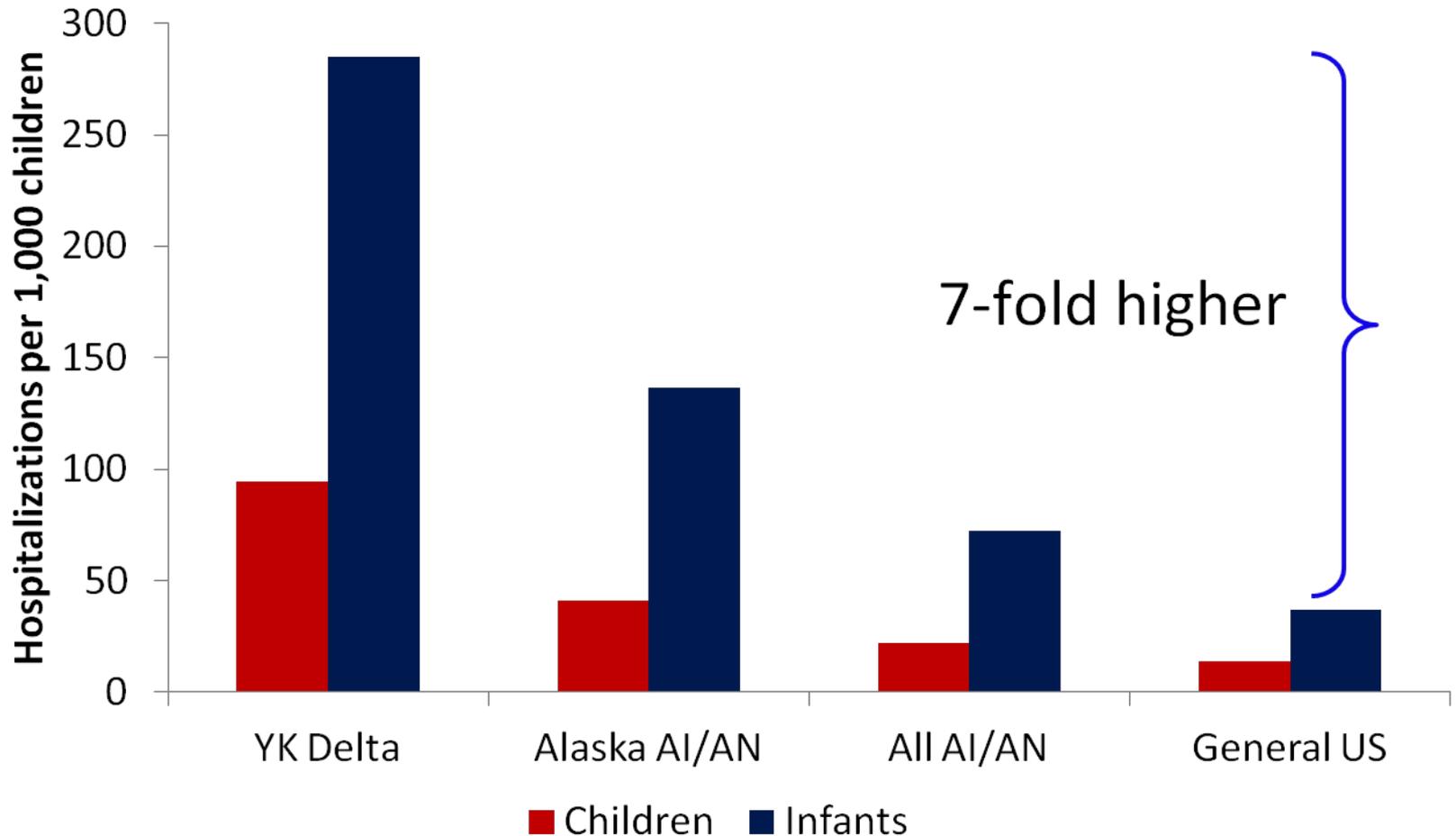
Disclosure for Dr. Singleton

- I conducted a research study of 13-valent pneumococcal conjugate vaccines sponsored by Pfizer during 2009-2010
- I will not discuss unlicensed or off-label use of any drug or product.

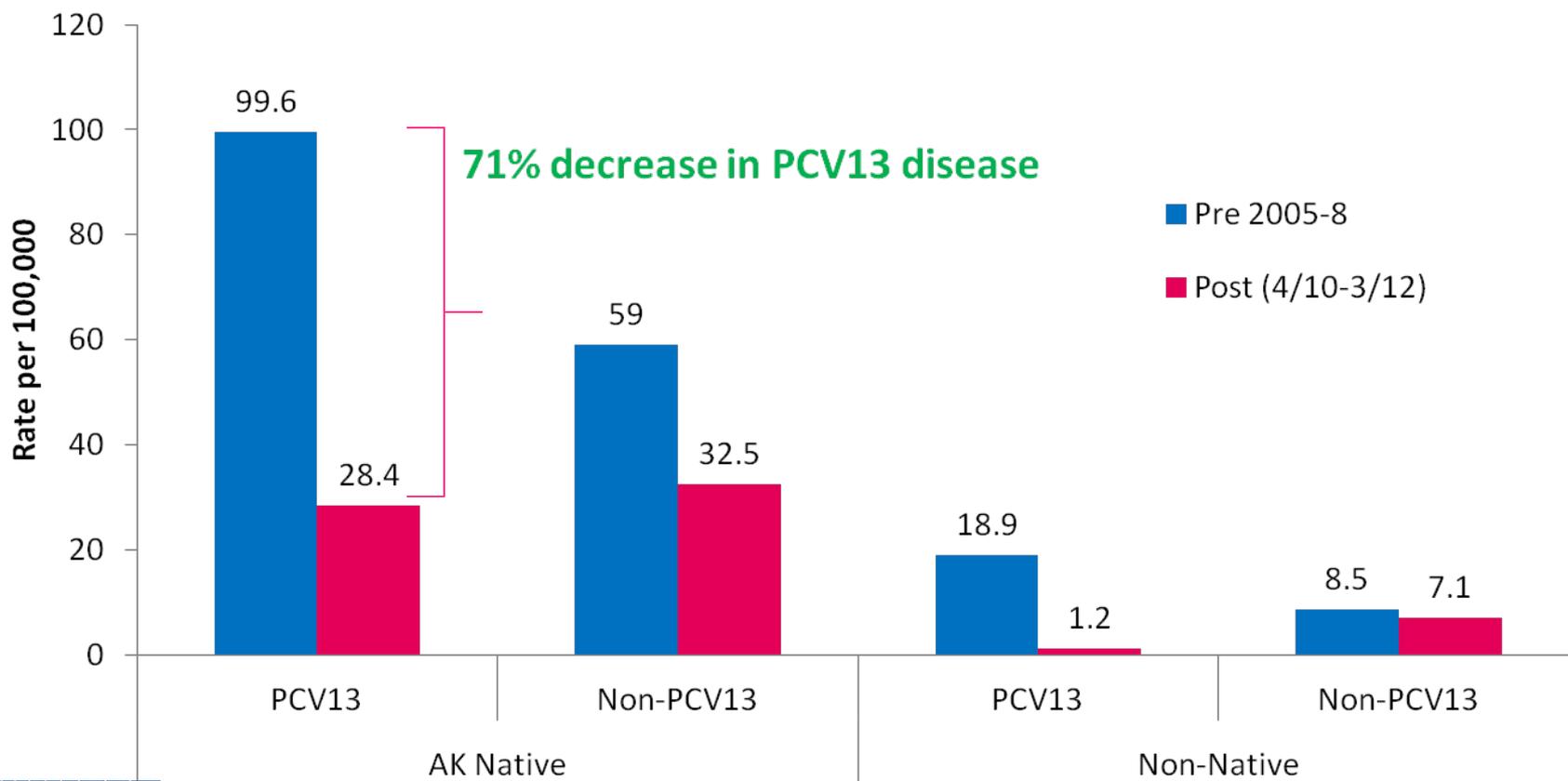
CAP Guidelines: Alaska Native considerations

- High rate of pneumonia in rural AK Natives
 - YK Delta pneumonia-coded hospitalizations in infants 10 fold higher than US general infant population
 - 58% of children with x-ray confirmed pneumonia
- High rate of complicated pneumonia, especially empyema
- High rate of Tuberculosis in children
- High proportion (55%) of infiltrates in infants hospitalized with RSV
- High rate of persistent and recurrent infiltrates
- High rate of bronchiectasis in YK Delta children
 - 10-20/1000 births compared with 4/100,000 in US.

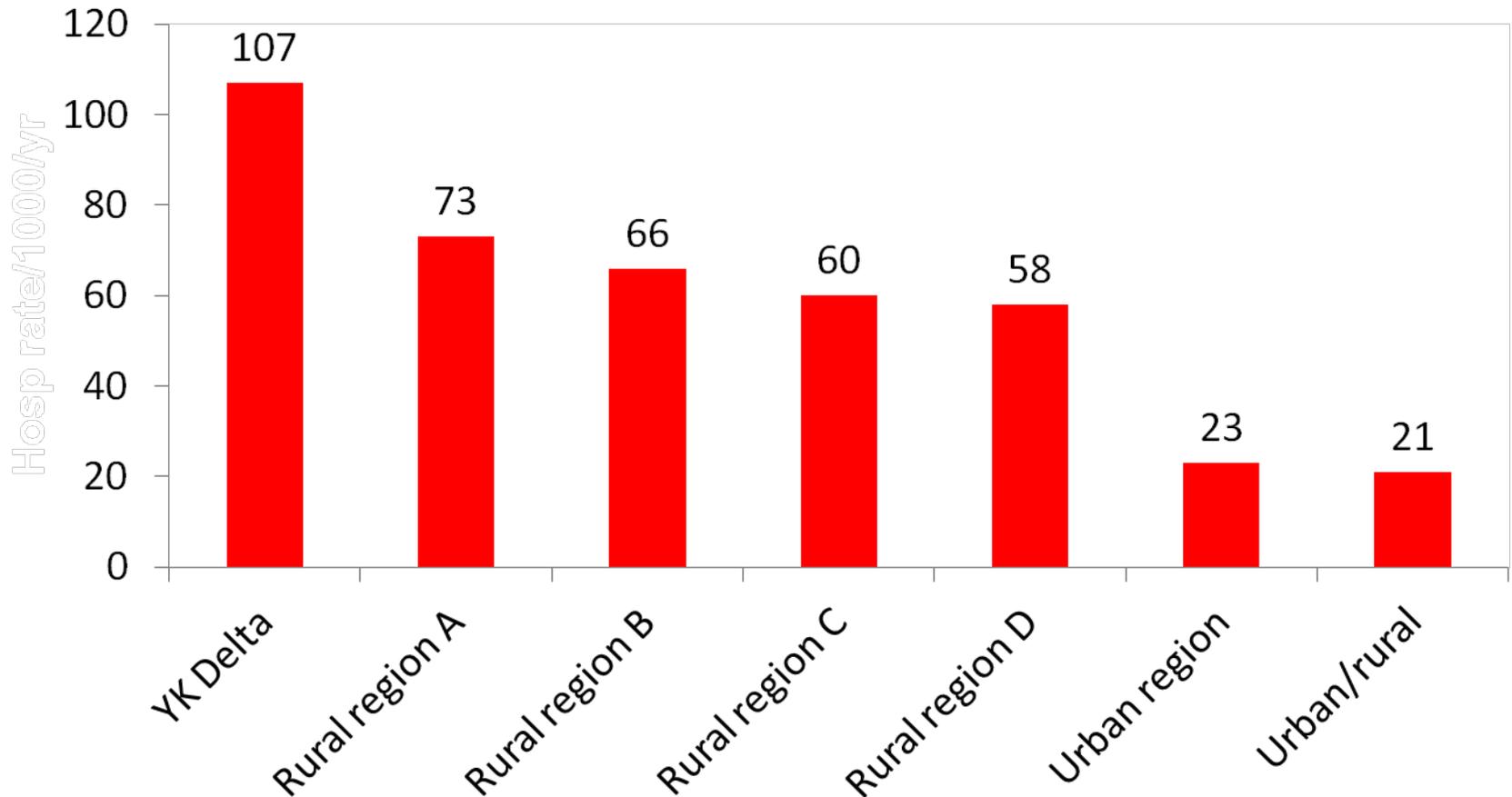
Lower Respiratory Infection Hospitalization Rate 2006-2008: YK, all AI/AN, US



Invasive Pneumococcal Disease Rates, Pre- and Post-13-valent pneumococcal conjugate vaccine (PCV13) Children <5 years, Alaska



RSV-coded Hospitalization Rate/1000/yr: Alaska Native infants by region, 2002-2008



Indian Health Service, National Patient Information Reporting System



Deaths Related to 2009 Pandemic Influenza A (H1N1) Among American Indian/Alaska Natives --- 12 States, 2009

“ AI/ANs in the 12 had an H1N1 mortality rate four times higher than persons in all other racial/ethnic populations combined. Reasons for this disparity in death rates are unknown...; however, they might include a high prevalence of chronic health conditions (e.g., diabetes and asthma) among AI/ANs, poverty (e.g., poor living conditions), and delayed access to care”

http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5848a1.htm?s_cid=mm5848a1_e

State Epi Bulletin: H1N1 in Anchorage

Anchorage H1N1 hospitalization rate for Alaska Natives 5 times higher than for Whites

http://www.epi.hss.state.ak.us/bulletins/docs/b2009_30.pdf

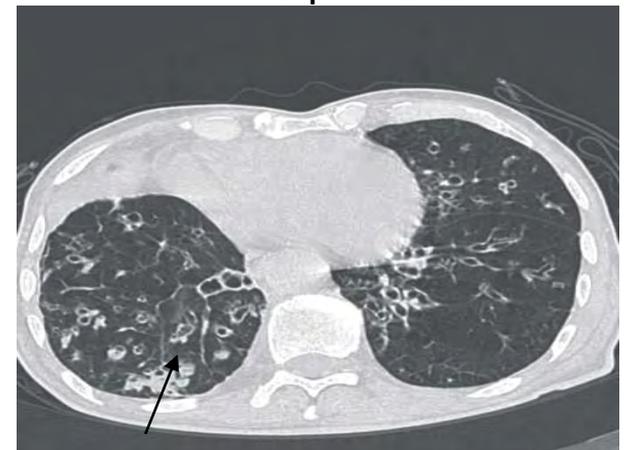
Long-term Chronic Respiratory Disease Non-CF Bronchiectasis in YK Delta

Alaska Natives (YK)	11-20 per 1,000 births
Australian Aborigines	14.7 per 1,000 children
<i>Compared with:</i>	
Non-indigenous Finland	0.4 per 100,000 children

- Alaska Native children from YK Delta and other indigenous children have extremely high rates of non-CF bronchiectasis
- Early/Recurrent pneumonias in childhood is the major risk factor



Infant pneumonia



Saccular Bronchiectasis

CAP Guidelines: When to hospitalize

- Moderate/severe pneumonia: respiratory distress, hypoxemia (SpO_2),
- <3-6 mos w/ suspected bacterial pneumonia
- Suspected virulent organism (eg. MRSA)
- Concern about home observation, compliance

CAP Guidelines: Blood Culture?

- **Outpatient**– not routine, obtain for children who fail to improve
- **Inpatient** – obtain if presumed bacterial CAP
- **Repeat blood culture** – not required if improved, unless *S. aureus*
- **Sputum culture**: obtain on inpatients who can produce sputum
- **Urinary antigen detection tests** not recommended

CAP Guidelines: Viral Testing

- Influenza/RSV – Yes, use sensitive/specific tests in inpatient/outpatient
- Antibiotics not necessary in Flu+ children without evidence of bacterial co-infection*

* Caution in Alaska Native children:

1. Flu tests have been unreliable in some facilities
2. Higher risk of bacterial pneumonia co-infection

CAP Guidelines: Test for Atypical Bacteria

- Children with suspected *mycoplasma pneumoniae* should be tested to help guide antibiotic selection#

Local issues:

1. *Mycoplasma* testing has poor specificity
2. Results not available for several days
3. Therefore: clinicians need to rely on clinical judgment in treating suspected *Mycoplasma*

CAP Guidelines: Other Testing

- CBC – not needed in outpatient
- ESR/CRP –
 - can't be sole determinant of viral vs. bacterial
 - May use in inpatient with clinical findings to assess response to therapy
- Pulse Oximetry: use with suspected hypoxemia
- * **Alaska Specific:**
 - TB testing – always consider TB, especially with prolonged symptoms

CAP Guidelines: Chest X-rays

- Outpatient –
 - routine x-ray not necessary
 - obtain Chest PA and Lat in pts with suspected hypoxemia/respiratory distress, failed therapy
- Inpatient –
 - Obtain PA and Lat in all inpatients with CAP
 - Follow-up Chest x-rays not routinely required
 - Repeat in children who fail to improve in 48-72 hrs
 - Daily x-ray not needed for effusion with chest tube doing well
 - Repeat x-ray 4wk in recurrent pneumonia same lobe and in lobar collapse

CAP Guidelines: Tests for severe CAP

- Tracheal aspirates for gram stain/culture at time of ET tube placement
- Bronchoscopic/blind brush sampling/BAL/percutaneous lung aspiration/open lung bx – reserve for immunocompetent child with severe CAP and initial negative tests

CAP Guidelines: Outpatient Treatment

- Antibiotic therapy not routinely required in pre-school children with CAP because most have viral etiology.
 - **Alaska Natives : be aware of high rate of bacterial pneumonia**
- Amoxicillin is first-line therapy for healthy immunized infants/pre-school children
- Amoxicillin is first line for school-aged children with mild-mod CAP. *Mycoplasma* should also be considered.
- Azithromycin for outpatients with CAP findings compatible with atypical pathogens
- Influenza antivirals ASAP in children with mod/severe CAP consistent with Flu during Flu season
- Duration: 10 days (shorter courses may be effective for mild cases)

CAP Guidelines: Inpatient Treatment

- Ampicillin. Ceftriaxone/Cefotaxime for fully immunized infant/school-aged child with CAP if local epidemiology shows high-level resistance
- Empiric combination therapy with macrolide in addition to β -lactam if *Mycoplasma* consideration
- Vancomycin (or clindamycin) added to β -lactam if consistent with *S. aureus*.
- Influenza antivirals ASAP in children with mod/severe CAP consistent with Flu during Flu season.
- Duration: 10 days, longer treatment for CA-MRSA

CAP Guidelines: Factors for determining whether to drain effusion

- Size on lat decubitus:
 - <10mm – No
 - >10mm but < ½ hemithorax – Thoracentesis. No, if no resp compromise and fluid not empyema
 - > ½ hemithorax – Yes
- Degree of respiratory compromise: drainage indicated if respiratory compromise
- Both Chest Tube placement with fibrinolytics and VATS are effective – choice depends on local expertise. In patients with mod/large free flowing effusions Chest Tube without fibrinolytics is reasonable first option.

References

- Nair H et al. Global Burden of ALRI due to RSV. *Lancet* 2010;375:1545-55
- Karron R et al. Severe RSV disease in Alaska Native children. *JID*. 1999;180:41-9
- Peck et al. Lower Respiratory Tract Hospitalizations in AI/AN and US children. *Pediatric Infect Dis J* 2005; 24:342-351.
- Holman RC et al. RSV hospitalizations among AI/AN infants and the general US population. *Pediatrics* 2004;114:e437-e444
- Bulkow LR et al. Risk Factors for severe RSV infection among Alaska Native children. *Pediatrics* 2002;109:210-216
- Singleton RJ et al. Decline in RSV hospitalizations in a region with high hospitalization rates and prolonged season *Pediatr Infect Dis J* 2006;25:1116-1122.
- Hennessy TW et al. The relationship between in-home water service and the risk of respiratory tract, skin, and gastrointestinal tract infections among rural Alaska Natives. *AJPH* 2008;98:1-7
- Singleton R et al. Viral respiratory infections in hospitalized and community control children in Alaska. *J Med Virol* 2010;82:1282-90
- Singleton et al. Maternal and birth-related risk factors for lower respiratory tract infection death among infants in the United States, 1999-2004. *PEDIATRICS* 2009;124:e768-e776
- Gessner et al. Lack of piped water and sewage service is associated with pediatric lower respiratory tract infection in Alaska. *J Pediatr* 152:2008:666-70