



### Symposium 11.3

## Pneumococcal vaccination

**Keith P Klugman**

Hubert Department of Global Health  
Emory University, Atlanta, GA, USA.

Pneumococcal conjugate vaccine as currently formulated affords protection against invasive pneumococcal disease (IPD) due to the 7 most common serotypes causing IPD among children less than 2 years of age prior to vaccine introduction in the USA. This formulation is not optimal for many developing countries where serotypes such as 1 and 5 are important. Second generation vaccines that may have a global application therefore include at least 10 serotypes. The importance of prevention of pneumococcal disease extends beyond IPD to pneumonia, meningitis, otitis media, prevention of antibiotic – resistant infections, and even prevention of mortality in young infants. Conjugate pneumococcal vaccine has been shown to prevent between 25% and 37% of all cause X-ray confirmed pneumonias and this implies a level of protection against pneumococcal pneumonia due to vaccine serotypes in excess of 70%. This reduction in pneumonia has translated into a reduction in all cause mortality due to the vaccine of 16% in rural Africa. The major preventable burden of disease in Africa may be among HIV infected children where the vaccine has also been shown to reduce pneumonia burden. An innovative aspect of the vaccine is the fact that it may reduce the pneumococcal super infections that follow viral respiratory infections, such as influenza, and conjugate vaccination of children may thus be a useful adjunct to pandemic influenza planning preparedness. The interruption of carriage of vaccine serotypes has been shown to reduce IPD in adults in the US due to herd immunity so the population benefit in an influenza pandemic may extend beyond protection just of immunized children. Herd immunity has also recently been shown to protect young un-immunized infants from IPD. The conjugation of pneumococcal polysaccharides to *Haemophilus influenzae* protein D has allowed the development of a more efficacious vaccine against otitis media. There has been a dramatic reduction in antibiotic resistance among vaccine serotypes causing IPD in the USA, in both children and adults, but resistance, driven by continuing high levels of antibiotic use, is now selecting resistance in non – vaccine serotypes. In particular, multiresistant global clones of serotype 19A are now dominant in the USA and a 13 - valent vaccine formulation including serotype 19A is under development.