



Prevention of ST-1 pneumococcal outbreaks in the meningitis belt

Panel Discussion

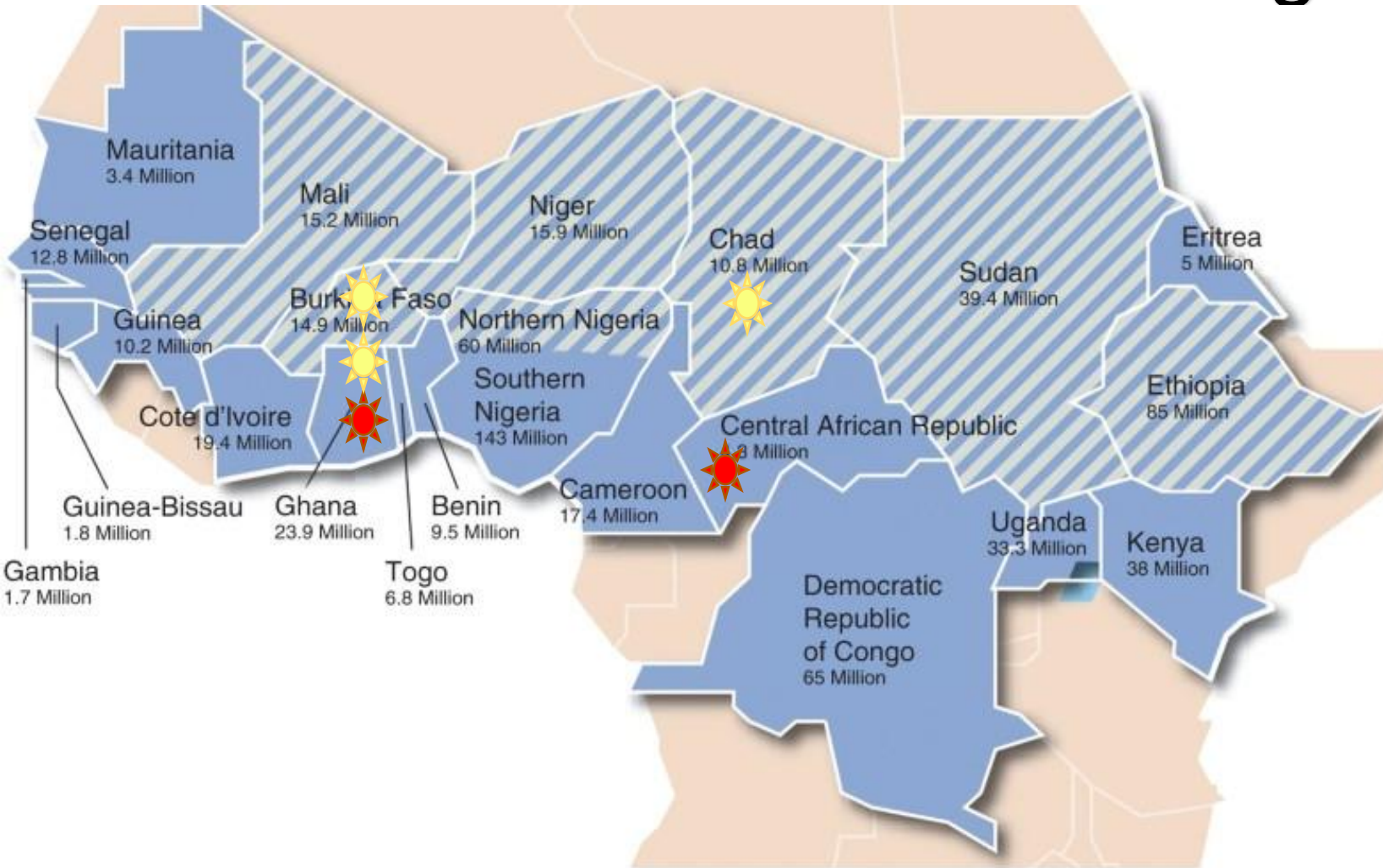
Optimal schedules for control of pneumococcal infection in countries with high and low carriage

Meningitis Research Foundation 2021 13th International Conference
Wednesday 3rd November

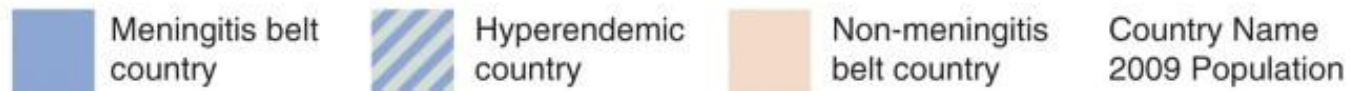


Brenda Anna Kwambana Adams

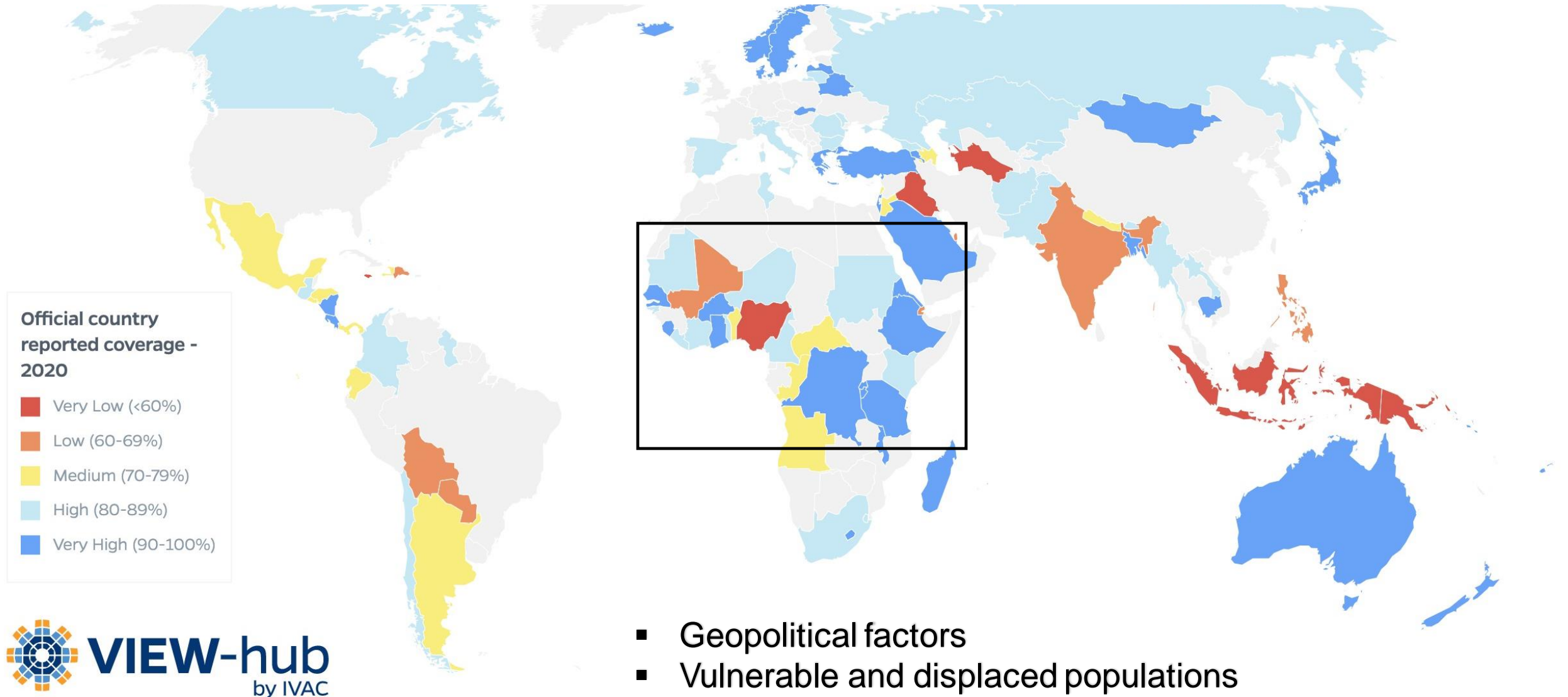
The African Meningitis Belt



Key

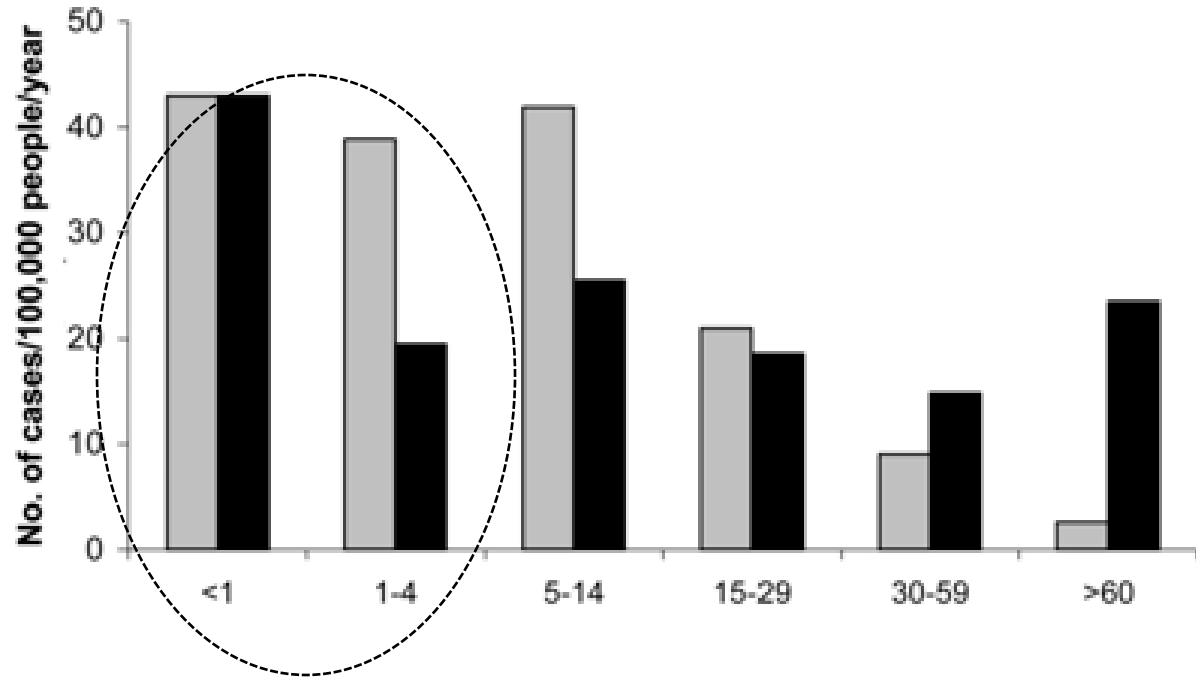


Sub-optimal PCV Coverage

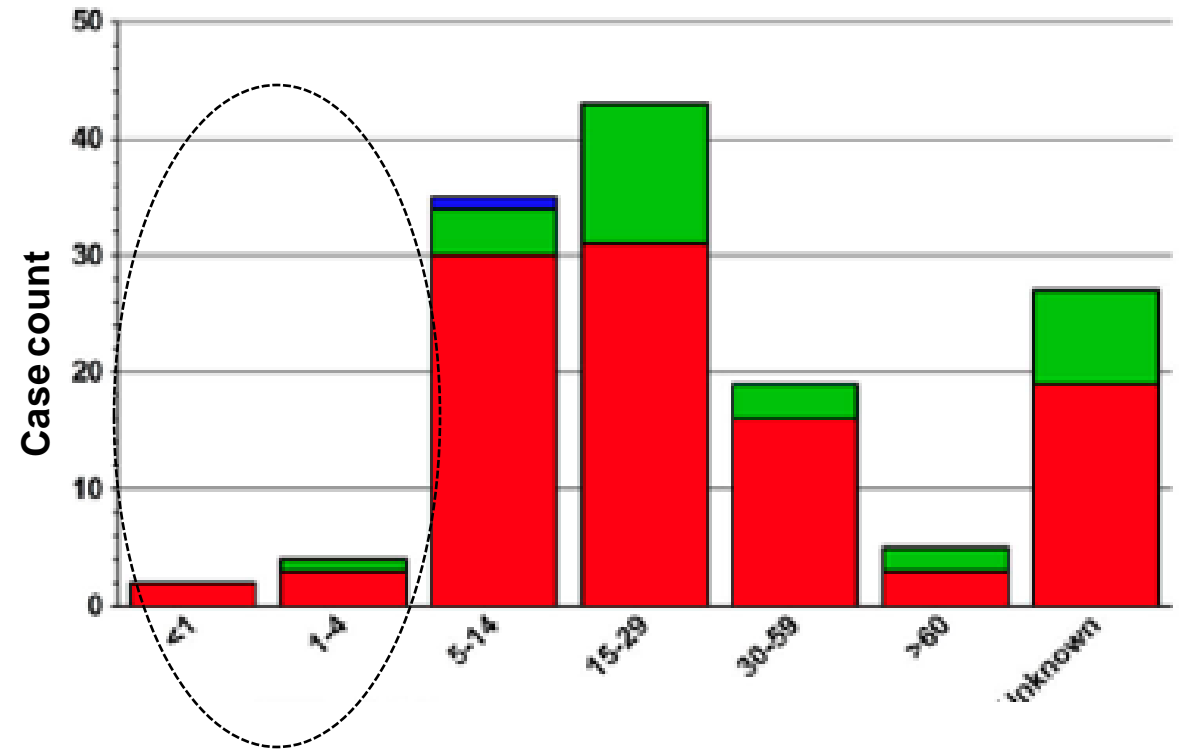


- Geopolitical factors
- Vulnerable and displaced populations
- Disruptions to immunization programmes

Is there inadequate herd protection?

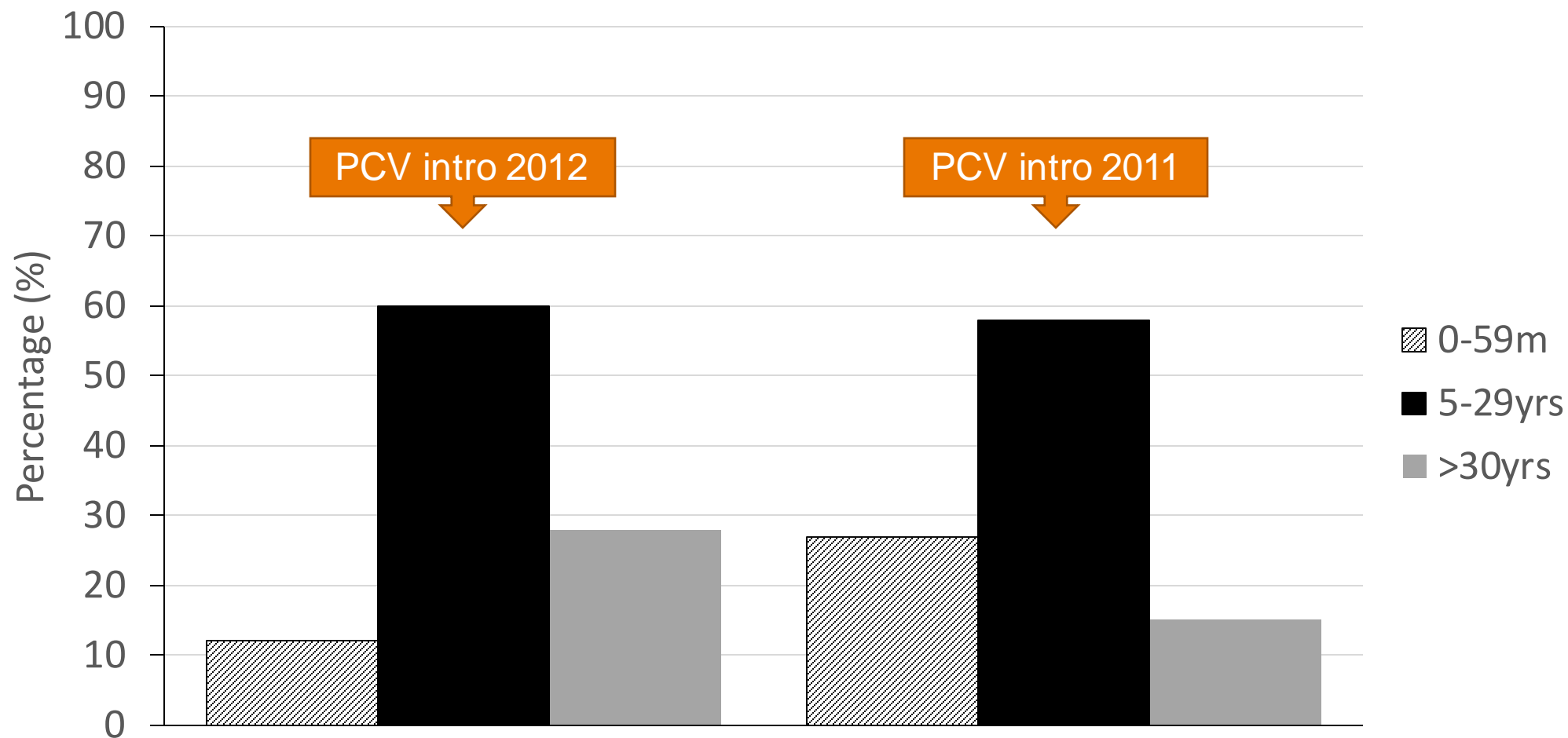


Ghana pneumococcal meningitis outbreak pre-PCV introduction 2000 – 2003, **Leimkugel et al. 2005**



Ghana pneumococcal meningitis outbreak post-PCV introduction 2016, **Kwambana-Adams et al. 2016**

Coverage vs. direct protection

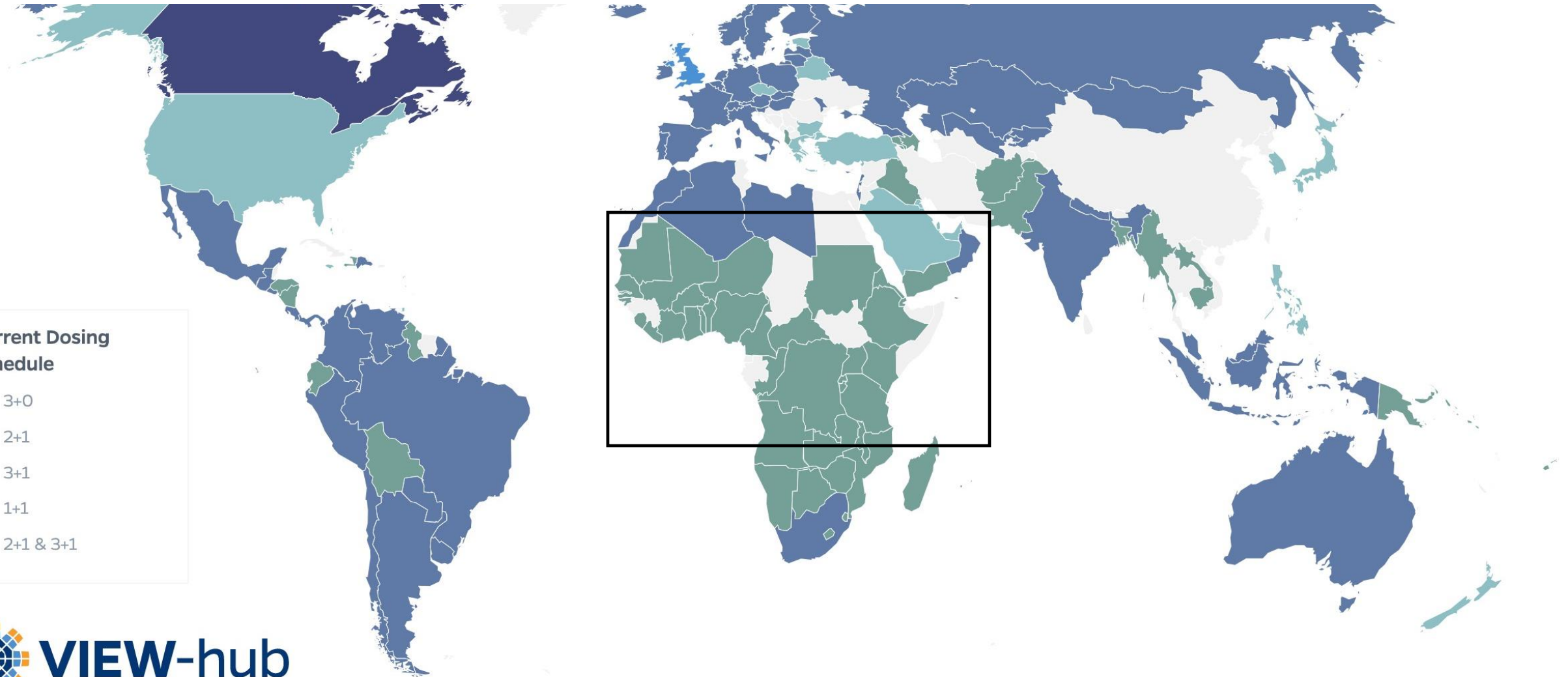


Northern Ghana
88-93% PCV coverage
(2015-2017)

Central African Republic
47% PCV coverage
(2017)

Adapted from Franklin
et al. 2021

PCV Scheduling without booster



Current Dosing Schedule

- 3+0
- 2+1
- 3+1
- 1+1
- 2+1 & 3+1

Research to probe Spn1 basic biology

Immunobiology 217 (2012) 420–429



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PLOS ONE

Genome Analysis of a Highly Virulent Serotype 1 Strain of *Streptococcus pneumoniae* from West Africa

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Abstract

Streptococcus pneumoniae is a leading cause of pneumonia, meningitis, and bacteremia, estimated to cause 2 million deaths

The Journal of Infectious Diseases

MAJOR ARTICLE



Comparative Genomic Analysis and In Vivo Modeling of *Streptococcus pneumoniae* ST3081 and ST618 Isolates Reveal Key Genetic and Phenotypic Differences Contributing to Clonal Replacement of Serotype 1 in The Gambia

Laura Bricio-Moreno,^{1,4} Chinelo Ebruke,^{2,4} Chrispin Chaguzo,^{1,5} Jennifer Cornick,^{1,5} Brenda Kwambana-Adams,^{2,4} Marie Yang,¹ Grant Mackenzie,^{2,4} Brendan W. Wren,² Dean Everett,^{1,5} Martin Antonio,^{2,3,4,b} and Aras Kadioglu^{1,b}

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Protection against *Streptococcus pneumoniae* serotype 1 acute infection shows a signature of Th17- and IFN- γ -mediated immunity

Juan M. Marqués^{a,1}, Analía Rial^{a,1}, Natalia Muñoz^a, Francois-Xavier Pelly^b, Laurye Van Maele^{c,d,e},



ARTICLE



<http://dx.doi.org/10.1038/s42003-020-01290-9>

OPEN

Bacterial genome-wide association study of hyper-virulent pneumococcal serotype 1 identifies genetic variation associated with neurotropism

Chrispin Chaguzo et al.^{*}

Hyper-virulent *Streptococcus pneumoniae* serotype 1 strains are endemic in Sub-Saharan Africa and frequently cause lethal meningitis outbreaks. It remains unknown whether genetic var-

Implications for the prevention of pneumococcal outbreaks

- **Improving PCV access and coverage**

Chad, South Sudan, Guinea and Somalia yet to introduce PCVs

- **Reactive vaccination campaigns likely to be of limited benefit** (*Cooper et al., 2019*)

- **Schedules including a booster protection?**

Schedules with a booster dose (e.g 2+1)

- **PCV programmes with catch-up campaigns**

Targeting the remaining burden of disease (5-29 years old)

- **“Bacterial Meningitis Conjugate Vaccine”**

Pentavalent Men + Spn1

- **Strengthening of surveillance systems and vaccine impact monitoring**

Rapid response and efficient data collection