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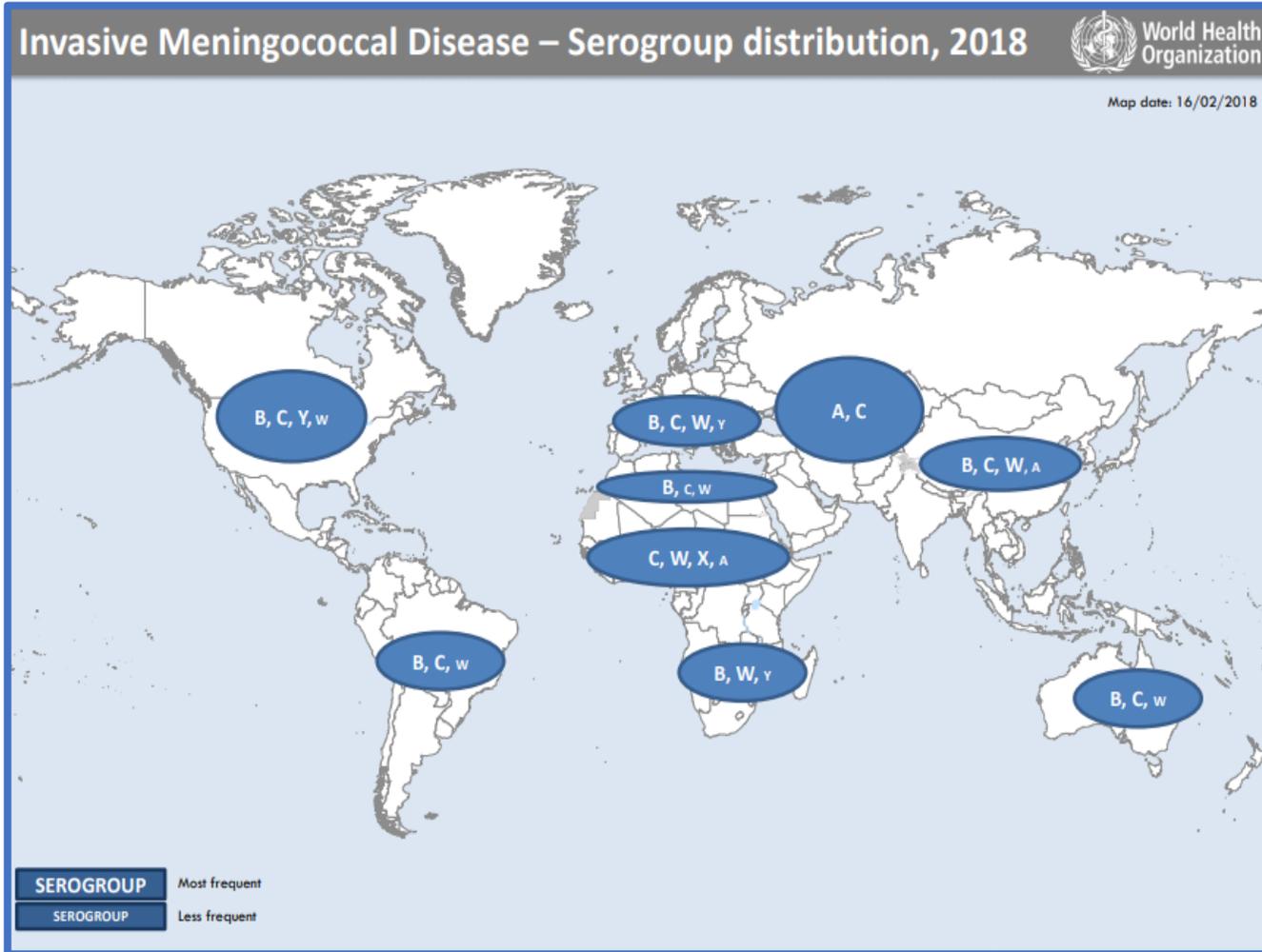
# Natural Immunity in the African Meningitis Belt to *Neisseria meningitidis* Serogroup X: A Seroprevalence Study

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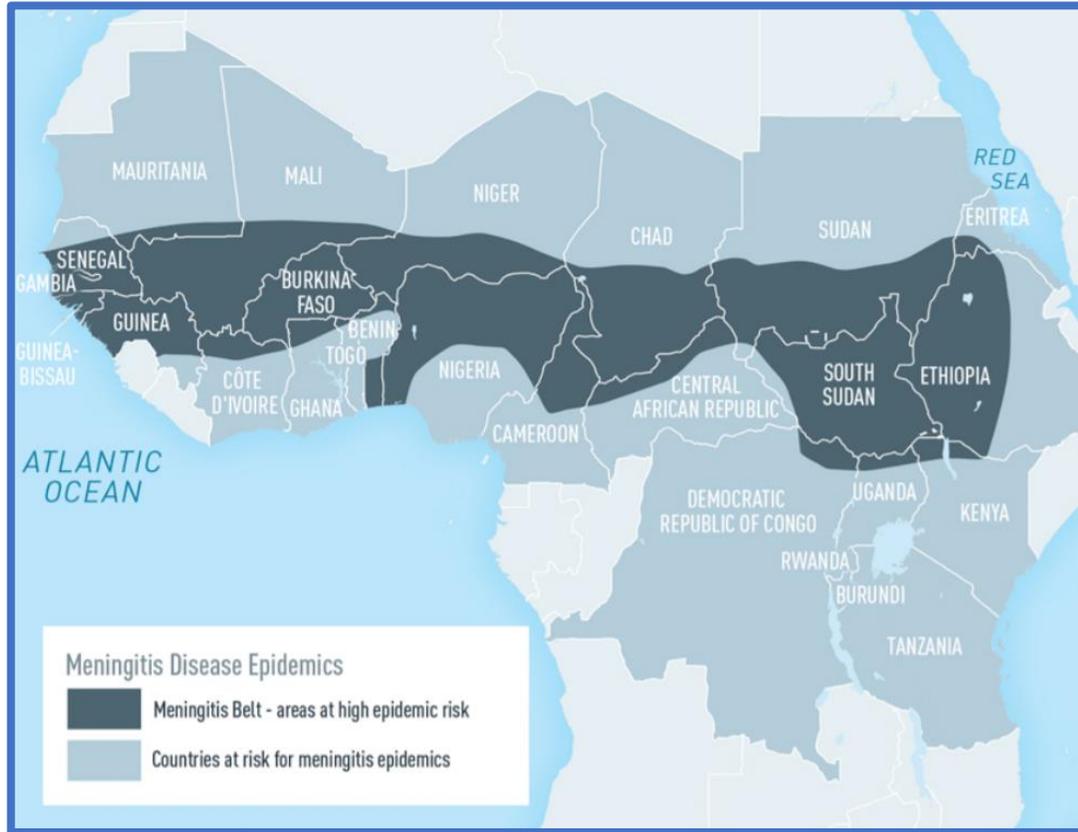
# Introduction



**Figure 1:** Distribution of IMD by causative serogroup and geographical location. A, serogroup A meningococcus; B, serogroup B meningococcus; C, serogroup C meningococcus; W, serogroup W meningococcus; Y, serogroup Y meningococcus; X, serogroup X meningococcus. Large font - most prevalent causative organism, small font – less prevalent.

- 1.2 million worldwide cases, annually
- 6 meningococcal serogroups are responsible for outbreaks: A, B, C, Y, W and X.
- Serogroup A outbreaks have been mostly eliminated in the African meningitis belt due to the successful implementation of MenAfriVac.
- Other serogroups now pose a risk in the African meningitis belt: C, W and X.

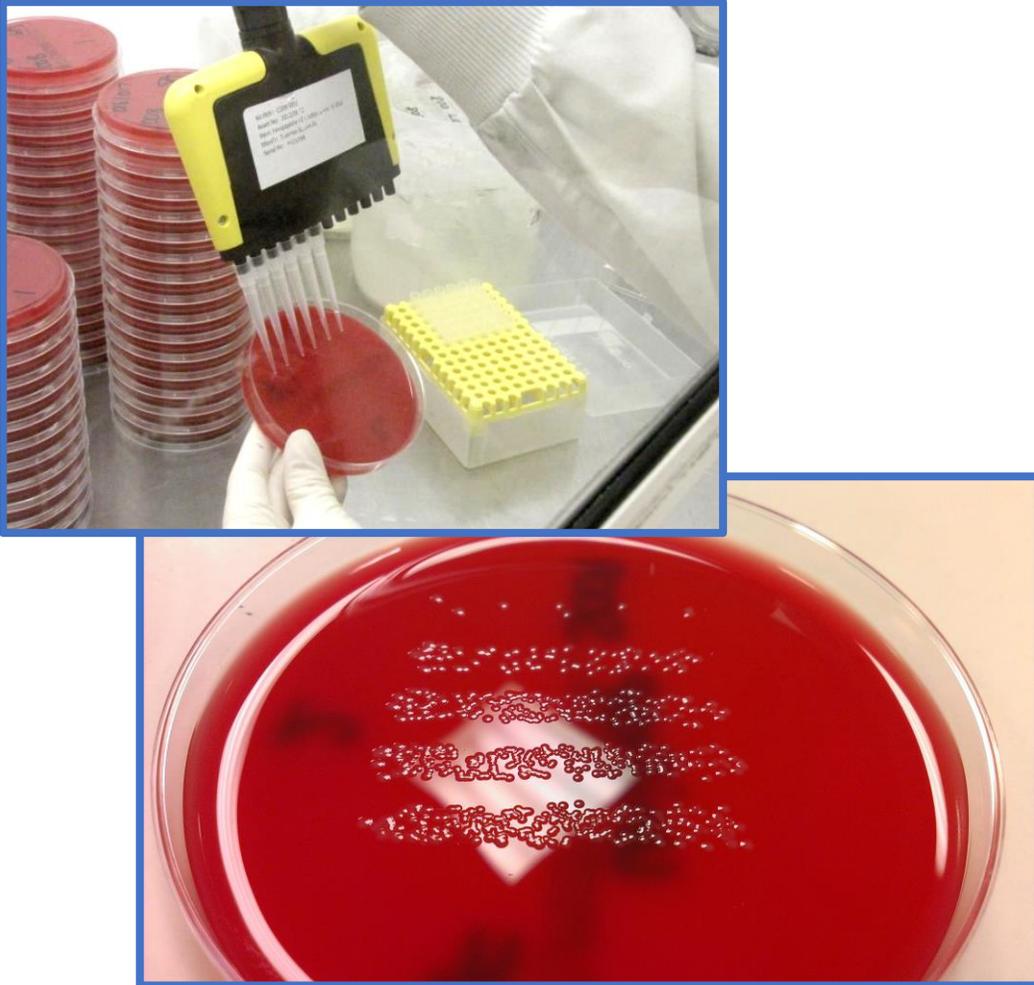
# Study Aims



**Figure 2:** Distribution of sub-Saharan meningitis belt, Africa. Areas shaded in dark blue are at high epidemic risk of IMD, areas shaded in blue are at epidemic risk of IMD.

- Assess natural immunity to serogroup X within a community in Niger, West Africa using a Serum Bactericidal Antibody (SBA) assay.
- Provide data prior to the introduction of a pentavalent ACYWXX conjugate vaccine, NmCV-5 (Serum Institute of India).

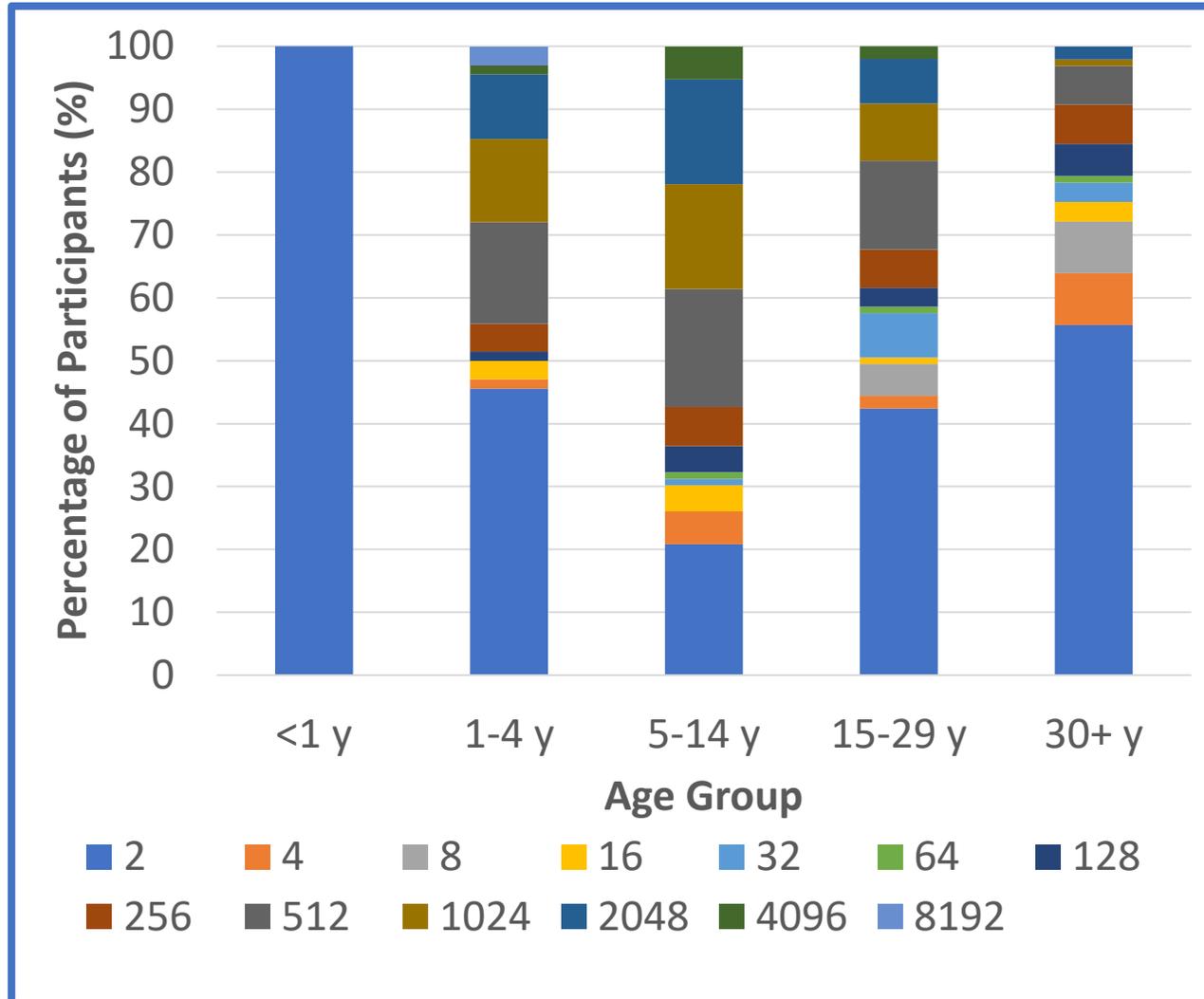
# Methods



- 377 serum samples selected from the previous MenAfriCar study, conducted at the VEU (UKHSA).
- SBA assay measured the level of circulating antibody to serogroup X in serum samples.
- A putative protective SBA titre is defined as  $\geq 8$ .
- Data obtained were analysed to quantify the level of natural immunity to serogroup X, prior to the introduction of NmCV-5.

**Figure 3/4:** Figure 3 shows pipetting technique used in the SBA assay to transfer a mixture of sera, complement, bacterial working stock and buffer to blood agar plates. Figure 4 demonstrates meningococcal colonies after 16-24 hour incubation.

# Results



- Natural immunity to serogroup X was present in 52.3% of study participants.
- Highest putative protective titres were seen in age group 5-14 years-old (73.9%).
- Lack of protection to serogroup X (SBA titre of <4) was shown in each of the age groups (<1 year: 100%, 1-4 years: 45.6%, 5-14 years: 20.8%, 15-29 years: 42.4%, 30+ years: 55.7%).

**Figure 5:** Study participants (n=377) organised by age group, stratified by SBA titre to *N. meningitidis* serogroup X

# Further Studies

- Data obtained provide a natural baseline of immunity to serogroup X in Niger, West Africa.
- Seroprevalence data support the requirement for implementation of NmCV-5 ACYWXX conjugate vaccine into the sub-Saharan meningitis belt.
- Following implementation of NmCV-5 ACYWXX conjugate vaccine, a follow-up seroprevalence study could be completed which will determine the impact of the NmCV-5 vaccine.

# Acknowledgements

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