

# Case Study: Hookworm Malaria Combo Vaccine

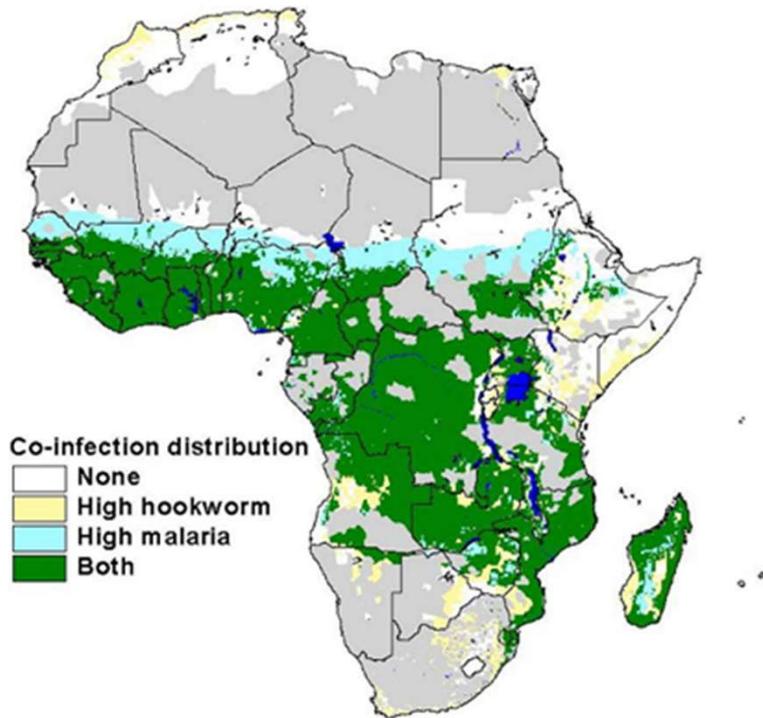
## Overview for 2025 DCVMN Annual Meeting

Maria Elena Bottazzi, PhD

Non-Confidential Summary  
October 2025

## Hookworm drives significant global disease burden, and together with malaria are leading causes of anemia

### HOOKWORM DISEASE BURDEN & MALARIA CO-INFECTION



- Hookworms are widespread **soil-transmitted helminths** that can reside in the small intestine and feed on a host's blood
- Hookworm infections affect **~500 million people worldwide** and contribute to **>4 million disability-adjusted life-years (DALYs)** lost annually, especially in low-socioeconomic regions
- Hookworm and malaria are **leading causes of anemia** (~1.9B cases globally), posing serious risks to maternal and child health
- High degree of hookworm **co-infection with malaria, predominantly in sub-Saharan Africa**

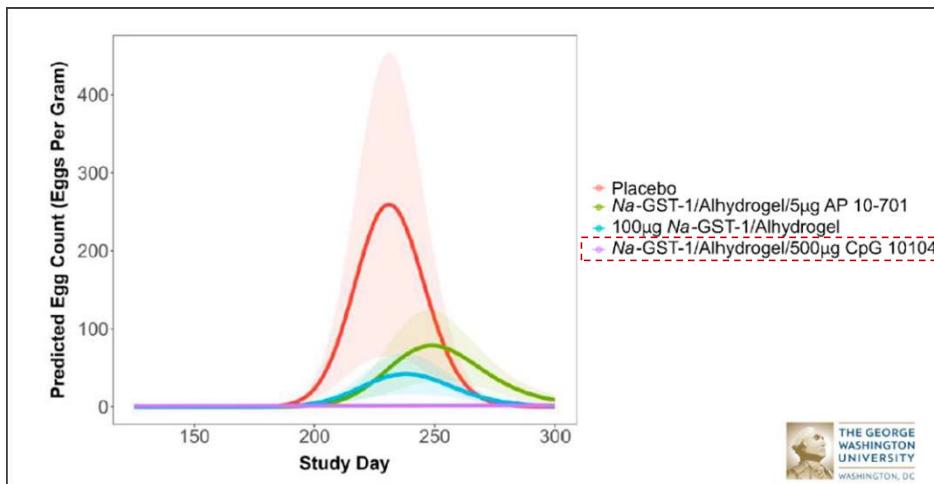
**The AMR Context: Limitations of Control Efforts**  
**(periodic mass drug administration with mebendazole and/or albendazole - single dose)**

- Emerging evidence of drug resistance
- Temporary infection reduction; does not prevent reinfection
- Does not reduce disease burden or prevalence of anemia

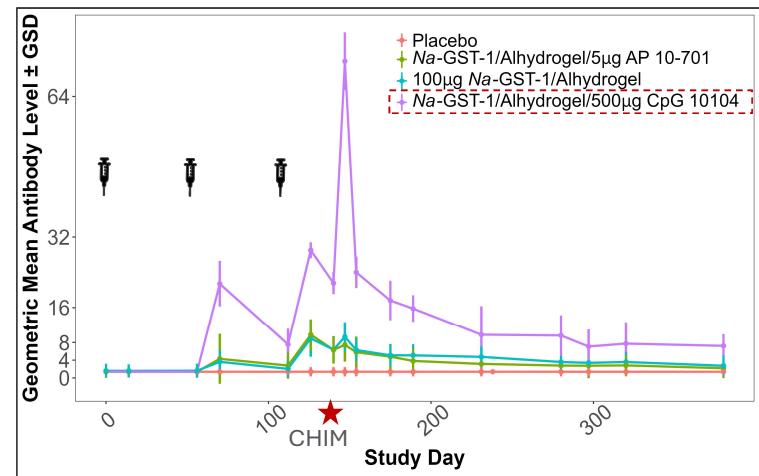
## A recombinant protein Na-GST-1 hookworm vaccine demonstrates significant protection against hookworm infection and induces IgG antibody responses in a clinical Ph.2 POC using a controlled human infection model

### HOOKWORM VACCINE DATA PACKAGE – PHASE 2

**Significant protection** (fecal egg count) in Ph.2 controlled human infection model (CHIM) in hookworm-naïve adults (N = 38)\*



Addition of **CpG** to the **GST-Alum** formulation induces significantly higher IgG, which is associated with the protection from challenge



Note: \* NCT03172975; CHIM study in healthy U.S. adults

## Combining hookworm with a malaria vaccine represents a market opportunity for 20 countries in Africa, addressing co-endemicity and syndromic overlap

### RATIONALE FOR COMBINING WITH MALARIA VACCINE



#### Combining hookworm and malaria vaccines is an attractive opportunity



Malaria and hookworm have extensive **co-endemicity and syndromic overlap** (i.e., anemia), particularly in sub-Saharan Africa



Opportunity to **align hookworm with malaria TPP**



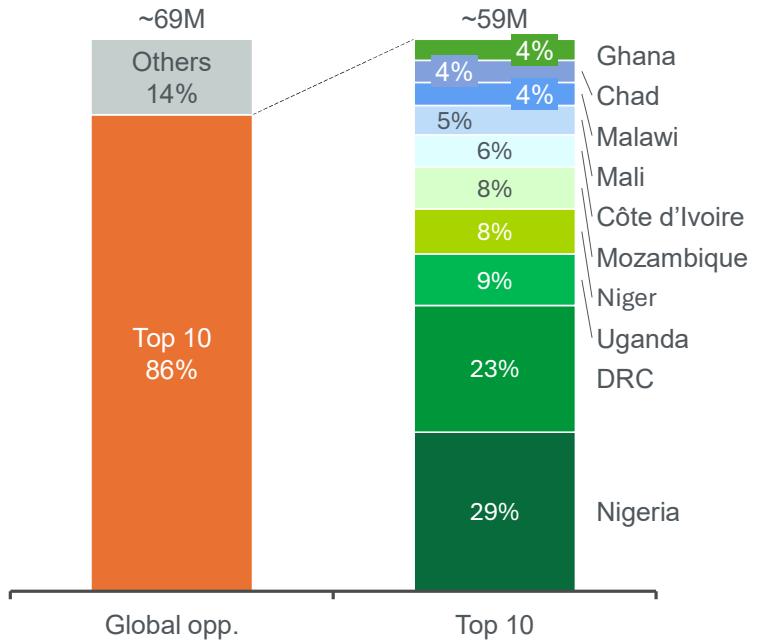
Malaria is on **WHO's list of priority endemic pathogens** where improved vaccines need to be further developed



Developing a combination vaccine is more attractive commercially given **existing funding and public-private commitment to malaria R&D**

### TOP COUNTRIES WITH HIGH CO-ENDEMICITY

Total malaria vaccine demand  
% contribution



**The combination vaccine represents a ~\$300M annual market opportunity, assuming a slight premium (~0.50c) over the cost of currently licensed malaria vaccines - targeting a price of <\$5 / dose**

### EST. REVENUE OPPORTUNITY

Est. combined vaccine total addressable market  
Millions of USD

**~70M doses**

\$300M

20 priority markets\*  
(100% adoption)

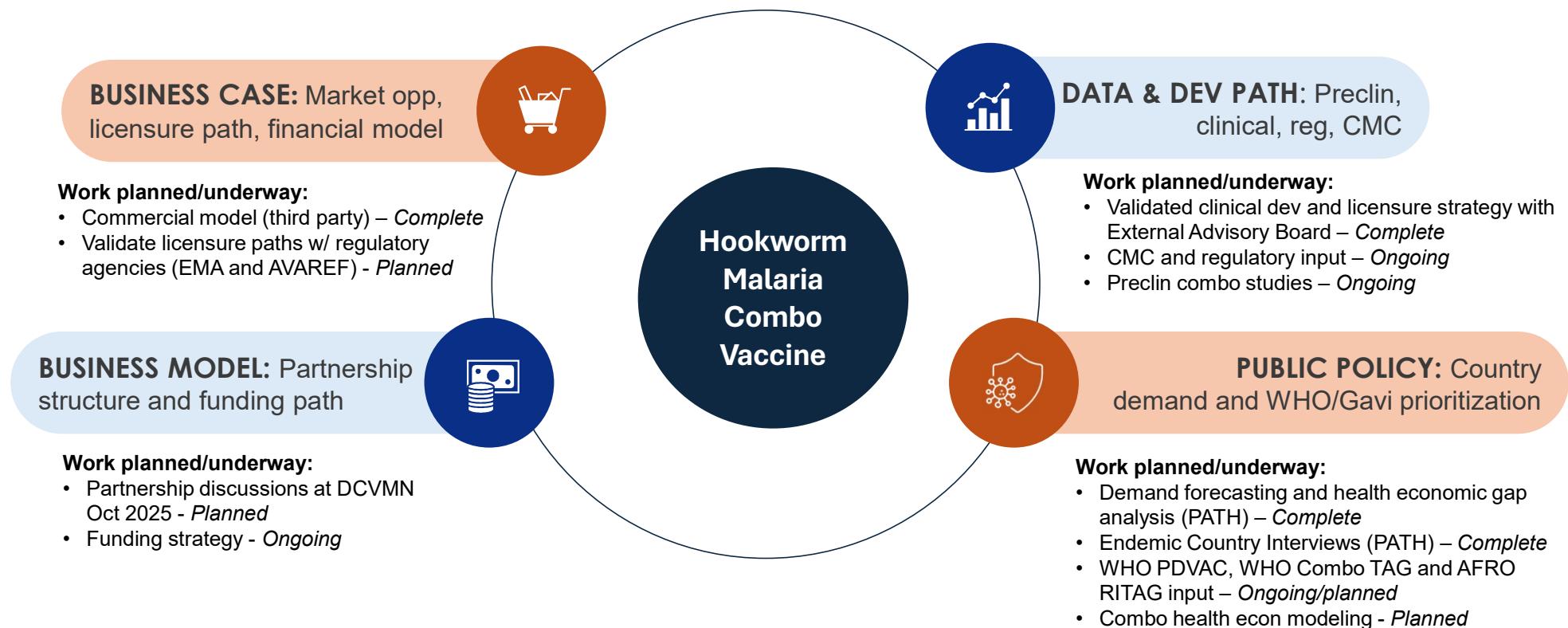
### PRICE PER DOSE ASSUMPTION OF LICENSED MALARIA VACCINES

Vaccine	Price / dose (2025)
Malaria RTS,S/AS01	Under \$5 by 2028
Malaria R21/Matrix-M	\$3.9
Reasonable price range	US \$4 – 5

Note: \* Priority countries with high malaria (PfPR > 10%) and hookworm burden (80<sup>th</sup> percentile endemicity): Benin, Burundi, Central African Republic, Chad, Cote d'Ivoire, Democratic Republic of the Congo, Ghana, Guinea, Guinea-Bissau, Liberia, Malawi, Mali, Mozambique, Niger, Nigeria, Sierra Leone, South Sudan, Togo, Uganda, Zambia

Source: PATH demand forecast; External KOL interviews

## We are seeking strategic partnerships with DCVMs to the advance combo hookworm malaria vaccine for licensure



# Contributors

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Note: Additional external KOLs consulted, including a third-party analysis that can be provided upon request