Stubborn Enemy: The Persistence of Malaria in Sub-Saharan Africa

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by

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On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

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Preface

Preventable and treatable diseases still annually kill millions worldwide. Children under five years old are especially vulnerable. Malnutrition is a great contributor, making children susceptible to common afflictions like diarrhea, pneumonia and malaria. How can death from preventable disease in children be reduced?

Endemic malaria persists in tropical and subtropical regions, and especially in Sub-Saharan Africa. The Oxford R21 malaria vaccine meets the World Health Organization's 2020 75 percent efficacy goal. Given the vaccine's early success in clinical trials, the project team has developed a proposed process plant to manufacture the R21 virus-like particle responsible for the immune response against malaria. The process design incorporates upstream fermentation, downstream purification, formulation and vial filling. The R21 vaccine includes Matrix-M adjuvant by Novavax; because this component would be sourced from an outside supplier, the proposed process plant would not manufacture it. Affordable and efficient production of this vaccine may contribute to prevention and control of malaria wherever it is still endemic.

Sub-Saharan Africa bears the greatest burden of global malaria deaths. International NGOs, IGOs, national health agencies, and local caregivers have made a notable impact on the global prevalence of malaria since the year 2000. Yet, despite billions in global spending against malaria, elimination goals set by the World Health Organization have not been met. Interruptions by COVID-19, inaccessibility of healthcare and poor allocation of resources are major contributors to the setbacks in progress. Updated antimalarial methods are required to get back on track with WHO's elimination timeline. Continuous evaluation of the effectiveness of these strategies will improve the outlook on timely malaria elimination.