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Estimating the potential effectiveness of wide-scale implementation of intermittent preventive therapy in infants in Southern Nigeria

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Nigeria accounts for 23% of malaria deaths globally with the highest burden in children under the age of five and in infants. Intermittent preventive therapy in infants (IPTi) aims to reduce clinical malaria episodes and deaths in infants and is recommended in moderate to high, non-seasonal, malaria transmission areas. Around 304-374 local government areas (LGAs) in the southern part of Nigeria have been identified as eligible for IPTi. However, the impact of IPTi is highly uncertain and will depend on the achievable coverage in each of the areas.

This study uses a scalable modeling approach to provide estimates of IPTi impact per LGA in Southern Nigeria. The effectiveness of IPTi was estimated using the effect size from clinical trials and malaria burden predictions for 2020-2025 that were obtained from a mathematical transmission model previously calibrated for each LGA in Nigeria that included varying case management and insecticide treated bed net coverage scenarios. A literature search was conducted to identify clinical trials of IPTi and extract IPTi's protective efficacy on clinical malaria cases, malaria prevalence, anemia, and malaria-attributed deaths. Since the implementation of IPTi is likely to be paired with the Expanded Immunization Program, pentavalent vaccine coverage from the 2018 demographic health surveys were used to inform the average IPTi coverage for all doses. The IPTi coverage was ranged from 10 to >90% and was assumed to stay constant during the future time period. Across the southern LGAs, the additional impact of IPTi among infants was estimated at around 15%, 24% and 5% reduction in incidence, prevalence, and mortality respectively over the five-year period of 2020-2025 with the highest number of total cases and death averted in highly populated areas. Combining IPTi protective efficacy, LGA-specific estimates of achievable coverage, and LGA-specific predictions of future malaria burden, our estimations of malaria-related outcomes account for differences in transmission intensity and intervention impact across different LGAs in Southern Nigeria.

The results suggest that while relative reductions in mortality are low, the total number of cases averted can be considerable and supports the implementation of IPTi given the protective efficacy as seen in clinical trials and high coverage. To obtain more up to date predictions more recent data would be beneficial.

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