RESEARCH

Assessing a Primaquine intervention in Cambodia 2020–2025: A modelling study

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Abstract

Background: Elimination targets for *Plasmodium vivax* are approaching, with the Cambodian target 2025. Quantitative tools can help determine if proposed new strategies will be sufficient to meet those targets.

Methods: We calibrated the Optima malaria transmission model reported case data from 2011–2018 for six Provinces with different transmission levels. The model had two human populations: with males 15 years plus, and everyone else. We used the calibrated model to explore for best and worst case interpretations of the available case data, and of the Primaquine intervention.

Results: We found elimination is unlikely to be reached in Provinces with fairly high burdens of *Plasmodium vivax*, such as Pursat, by only targetting adult males with Primaquine. However, it will substantially reduce transmission. As such, we identify how many tests will need to be conducted to have 99% confidence of detecting at least one case, given the lower incidence by 2025.
it might be the 95%.

Conclusions: A primaquine intervention targetting adult males is likely to have a substantial impact on transmission of *P. vivax*, though it is not likely to result in elimination from all Provinces by the 2025 target. The surveillance requirements to ensure the resulting lower incidence is detected as Cambodia approaches elimination may be infeasible, e.g. for Takeo, especially as all Provinces will see a decrease in case counts as the intervention is Nationwide.

Keywords: Malaria; *Plasmodium vivax*; Transmission; Primaquine; Radical cure; Mathematical model

Background

Text and results for this section, as per the individual journal's instructions for authors.

Methods

Data synthesis to assess disease burden

Epidemic model

Programmatic response considered

Model calibration

Sensitivity analysis

Results

Current burden of disease in Cambodia

Model calibration and validation

Primaquine impact on burden of disease in Cambodia

Discussion

Conclusions

List of abbreviations

Competing interests

The authors declare that they have no competing interests.

Author's contributions

PN, RIH, RMH, AD, DJP and JMM conceived of the project and oversaw the design. PN and RIH curated the data. RMH and RIH developed the transmission model and code implementation, and calibrated the model. RIH, DJP, JMM wrote the surveillance decision support model. RIH, RMH, DJP, AD, JAS, FJIF, JMM, PN prepared the manuscript. All authors read and approved the final manuscript.

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Figures

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Figure 2 Sample figure title. Figure legend text.

Tables

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A3	..	.	.

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Additional file descriptions text.