Rapid response modelled estimates of the effect of the US global aid freeze on President's Malaria Initiative impact in sub-Saharan Africa

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This report provides an illustrative summary of the potential speed and severity of malaria rebounds following the reduction or cessation of core interventions due to funding cuts. Given the significant uncertainties and fast pace of change in the current global funding landscape, these results should be interpreted as purely indicative rather than predictive.

Summary

The current freeze on US global aid has the potential to disrupt critical live-saving activities of the President's Malaria Initiative (PMI). Disruptions or cessation of planned PMI activities in 2025, with no mitigation, could result in an estimated additional 84,200 (95% CI: 69,300, 98,100) malaria deaths in sub-Saharan Africa over the course of 2025. Empirical observations and modelled scenarios highlight the speed at which malaria can resurge following the cessation of core interventions.

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Results

The impact of additional malaria deaths is distributed across countries receiving PMI investments, with the highest burden observed in countries with both significant malaria burden and substantial PMI support (Figure 1).

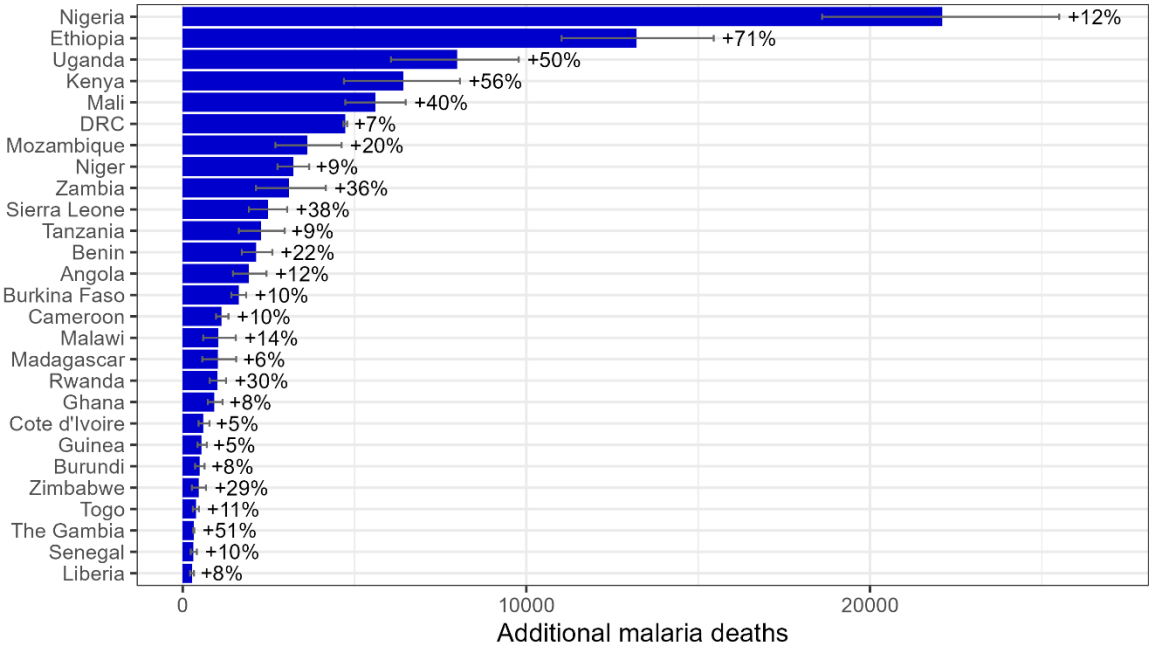

Figure 1. The estimated impact of removing PMI-funded malaria control intervention across countries in sub-Saharan Africa. The estimated additional deaths (blue bars) and associated 95% confidence intervals (grey error bars) resulting from removing PMI-funded malaria interventions over the course of 2025. Percentages by each bar indicate the % increase in deaths compared to the estimated number of malaria deaths as reported in the 2024 World Malaria Report[1]. Estimates are summarised over a range of methods and scenarios, reflecting the high degree of uncertainty currently faced.

Historical[2] and more recent[3] empirical evidence highlights the speed and severity with which malaria resurgence can occur when existing intervention coverage is reduced or removed. Illustrative modelling of the scale-up followed by the cessation of indoor residual spraying (IRS) demonstrates how cases can rebound within a year, peaking above pre-intervention levels due to reduced population-level immunity (Figure 2). In this illustrative scenario, within nine months of IRS cessation clinical cases quadrupled and, within two years incidence peaked at twice the pre-intervention level.

[1] World Malaria Report 2024 https://www.who.int/teams/global-malaria-programme/reports/world-malaria-report-2024

[2] Cohen, Justin M, David L Smith, Chris Cotter, Abigail Ward, Gavin Yamey, Oliver J Sabot, and Bruno Moonen. 'Malaria Resurgence: A Systematic Review and Assessment of Its Causes'. Malaria Journal 11, no. 1 (2012): 122.

[3] Namuganga, Jane F., Adrienne Epstein, Joaniter I. Nankabirwa, Arthur Mpimbaza, Moses Kiggundu, Asadu Sserwanga, James Kapisi, et al. 'The Impact of Stopping and Starting Indoor Residual Spraying on Malaria Burden in Uganda'. Nature Communications 12, no. 1 (11 May 2021): 2635.

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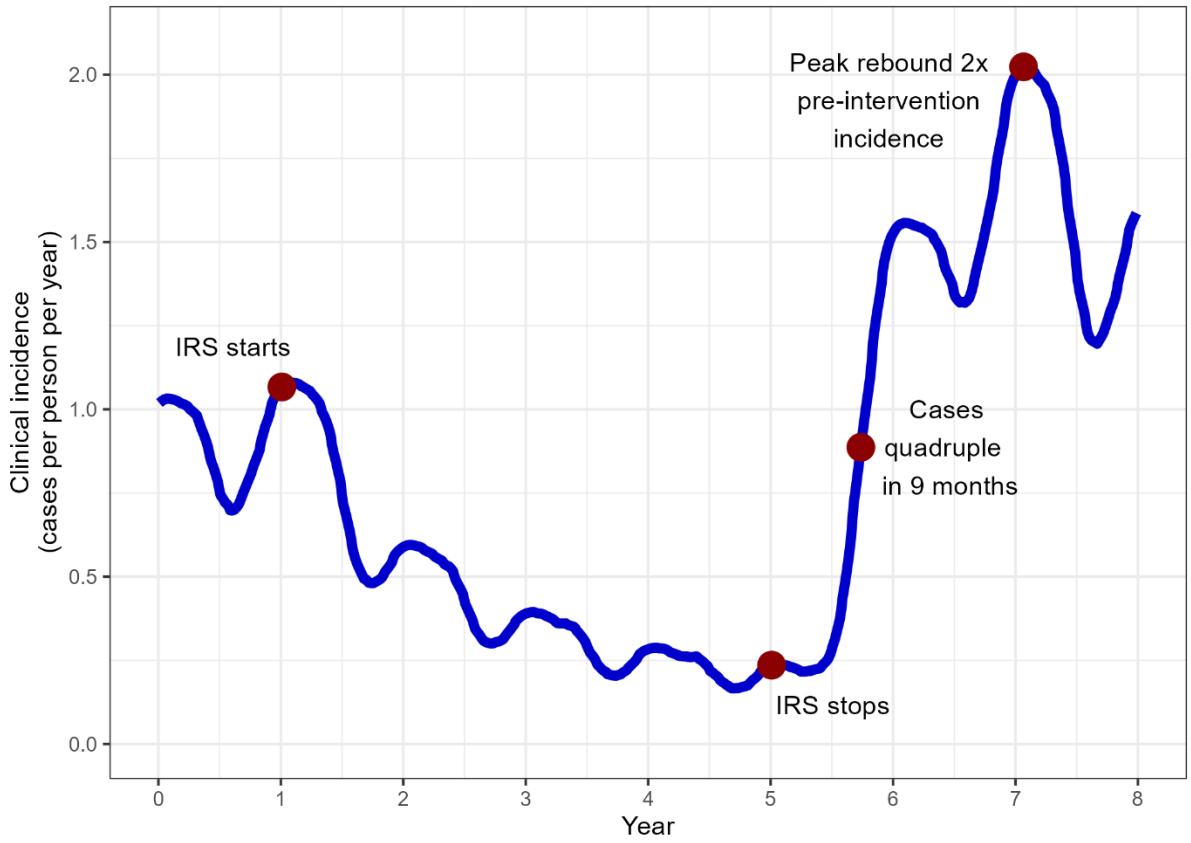

Figure 1. Modelled schematic illustrating the speed and severity of malaria resurgence following cessation of Indoor Residual Spraying (IRS). An IRS intervention campaign is scaled up over 4 years in a high-transmission seasonal setting then stopped. Modelled cases quadruple within 9 months post cessation and the peak rebound exceeds pre-intervention incidence of clinical cases.

Methods

The analysis combines two approaches: (1) inflation-adjusted country level spend-efficiency estimates (US$ per death averted) for the period 2013-2015 from a study published in 2017 [4] and applying them to PMI's 2024 budgets, and (2) extracting estimates of the impact of malaria control disruption due to COVID-19 [5] in PMI-supported countries, assuming PMI's impact scales proportionally to its share of the malaria control budget. This previous modelling captured the indirect impacts of COVID-19 on malaria via the interruption to malaria intervention programmes. These scenarios included four possible timescales of disruption ranging from 40 days to one year, with impact beginning in April 2025. Long-lasting insecticide nets mass distribution campaigns were assumed to either continue as normal or be delayed for a year. Clinical case treatments and seasonal malaria chemoprevention remain as planned, are reduced (50% of the normal coverage level) or are halted for the period of interruption.

[4] Winskill, P., Slater, H. C., Griffin, J. T., Ghani, A. C. & Walker, P. G. T. The US President's Malaria Initiative, Plasmodium falciparum transmission and mortality: A modelling study. *PLoS Medicine* **14**, 1–14 (2017).
[5] Sherrard-Smith, E. *et al.* The potential public health consequences of COVID-19 on malaria in Africa. *Nature Medicine* **26**, 1411–1416 (2020).

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Estimates across all scenarios and methodological approaches, which cover a range of timescales and disruption severities, are combined using a bootstrapping approach, resampling 1000 times and estimating the median and 95% CIs. Additional budget data is sourced from PMI Malaria Operational Plans [6] and the World Malaria Report 2024 [7].

The *malariasimulation* model was run to illustrate the speed and severity of malaria resurgence following the cessation of indoor residual spraying (IRS) in a seasonal high-transmission setting. IRS was chosen as a demonstrative, preventative vector control intervention and that has historically been supported by PMI. A population of 10,000 individuals was simulated with IRS implemented annually over four years at increasing coverage levels (to a maximum of 50%) before being halted. The model tracked clinical incidence for 3 years post cessation of IRS.

Key Limitations

Extrapolation of spend-efficiency estimates: The analysis relies on estimates of PMI spend-efficiency estimates ($ per death averted) from Winskill et al. (2017), assuming they remain applicable to 2025. However, changes in PMI activities, including shifts in intervention mix, broader malaria control efforts, and cost structures, may affect the impact in ways not captured here.

Scenario comparability: The assumed relationship between malaria control impact and funding reductions is based on scenarios of COVID-19-related disruption, which may not fully reflect the nature, timeline, or severity of impact of the US global aid freeze on PMI activities. The analysis assumes a linear relationship between PMI funding reductions and malaria burden, which may not account for non-linear effects or programmatic adaptations.

Uncertainty in the evolving situation: The funding landscape is rapidly changing, with uncertainty around disruption and activity timelines, severity, and potential mitigation measures. The estimates should therefore be interpreted as indicative rather than predictive.

Impact outside of modelled countries: The impact of PMI activities outside of sub-Saharan Africa was not modelled.

Speed and severity of resurgence: The modelling is illustrative and does not capture all possible real-world dynamics. Actual outcomes will depend on baseline transmission levels, continued use of other interventions, potential mitigation activities, and other factors such as human behaviour, and healthcare system responses.

[6] https://www.pmi.gov/resources/malaria-operational-plans-mops/ (offline as of February 2025)
[7] https://www.who.int/teams/global-malaria-programme/reports/world-malaria-report-2024

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