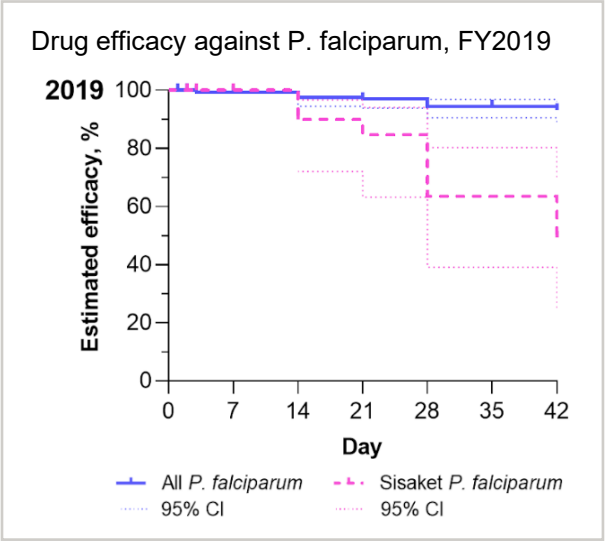
INFORM ASIA: USAID'S HEALTH RESEARCH PROGRAM
INTEGRATED DRUG EFFICACY SURVEILLANCE IN THAILAND

The Greater Mekong Subregion (GMS) is the global epicenter of antimalarial drug resistance. Since 2000 with support from the United States Agency for International Development (USAID), Thailand's Division of Vector Borne Diseases (DVBD) has been implementing therapeutic efficacy studies to track how well current malaria medicines are working in treating patients. However, as malaria burden continued to decline, Thailand in 2017 launched a pioneering integrated drug efficacy surveillance (iDES) approach to systematically collect this information as part of routine care. Each patient is followed up four times to ensure complete cure, and the DVBD uses resulting evidence to respond to the threat of drug-resistant parasites.

The DVBD and Inform Asia: USAID's Health Research Program recently published an analysis of routine patient data from fiscal years (FY) 2018–2020. For malaria caused by *Plasmodium falciparum*, treatment failure was defined as parasite reappearance within 42 days after taking the recommended medicine. For *P. vivax*, which can remain dormant in the human body for a long time and requires a different medicine, patients are followed up for 90 days. The higher the patient follow-up rate, the stronger evidence for the treatment efficacy. Patient follow-up rates for both species have steadily improved over time, with 61.5% of *P. falciparum* patients presenting on day 42 and 57.2% of *P. vivax* patients presenting on day 28 in FY2020.

For *P. falciparum* malaria,

- Drug efficacy on day 42 of treatment with dihydroartemisinin-piperaquine + primaquine was 92.4% in FY2018, 93.3% in FY2019, and 98.0% in FY2020.
- *P. falciparum* recurrences occurred disproportionately in Sisaket Province, with day 42 efficacy rates of 75.9% in FY2018 and 49.4% in FY2019.



These results suggested that resistance to the drug is growing, leading the DVBD to change the medicine to pyronaridine-artesunate in Sisaket and neighboring Ubon Ratchathani provinces the following year. These provinces are in eastern Thailand, along the border with Cambodia.

For *P. vivax* malaria,

- Day 28 efficacy was at least 98% across all years, suggesting excellent clinical efficacy for chloroquine.
- Day 90 efficacy (i.e., primaquine efficacy) was 94.8%, 96.3%, and 97.1%, respectively, although these rates remained sub-optimal in Sisaket.

These results show that current *P. vivax* drugs are working well but should continue to be monitored.

iDES can be a useful approach for malaria elimination in Thailand by ensuring that all malaria patients are followed-up to receive appropriate treatment and are ultimately cured of malaria. A robust case-based surveillance system with regular data review, integration with other health

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system processes, supporting biomarker collection and molecular analyses, and cross-border collaboration may maximize the potential of iDES and help Thailand reach its malaria elimination goal in 2024 and to prevent reintroduction thereafter.