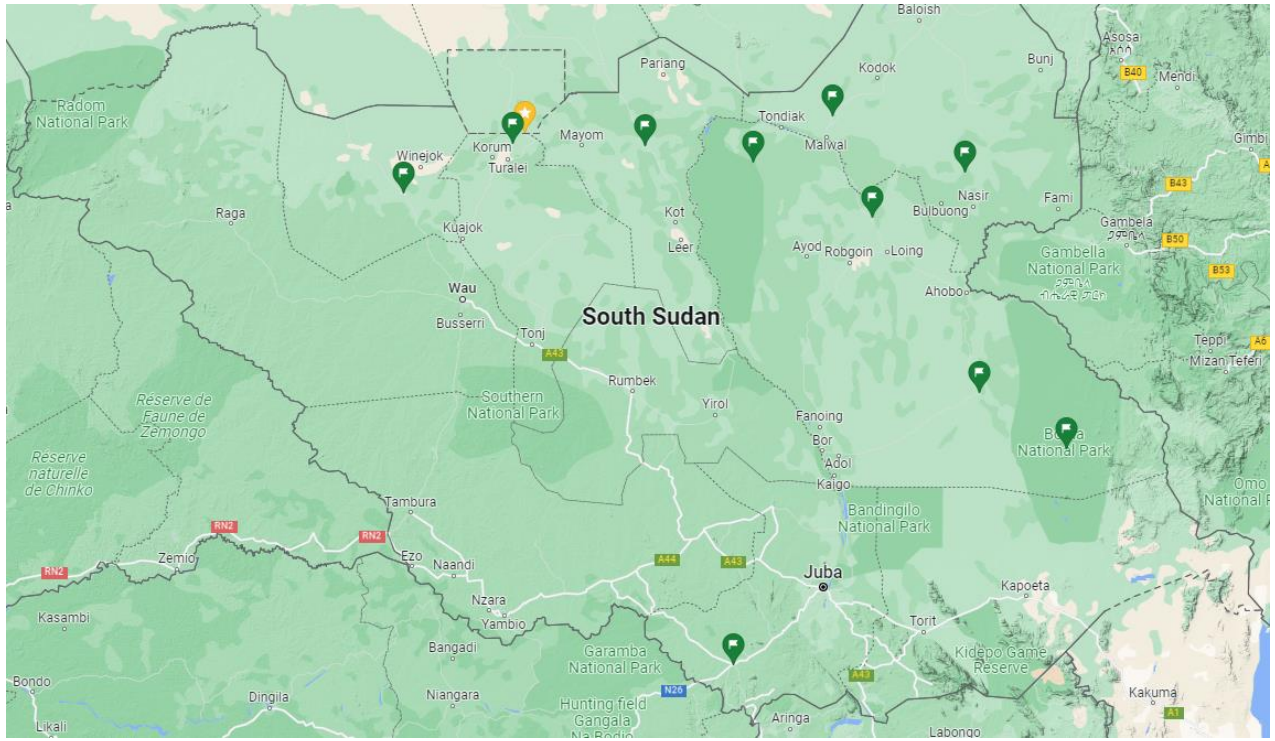
Prevalence of pfhrp2/3 deletions in South Sudan: results of a 10-site survey



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Conflicts of Interest

All authors declare no competing interests.

Ethics

This study was approved by the South Sudan Ministry of Health Research Ethics Review Board (ERB) (Ref: MOH/RERB/A/32/2023), the Médecins Sans Frontières ERB (Ref: 2310a), and the Australia Departments of Defence and Veterans' Affairs Human Research Ethics Committee (Ref: 518-23).

RDTs purchased by MSF in 2024 > 7 million

Malaria-RDTs

Detect the parasite's antigens in the blood:

-**Histidine rich protein 2 (HRP2)**
-Lactate dehydrogenase (LDH)
-Aldolase

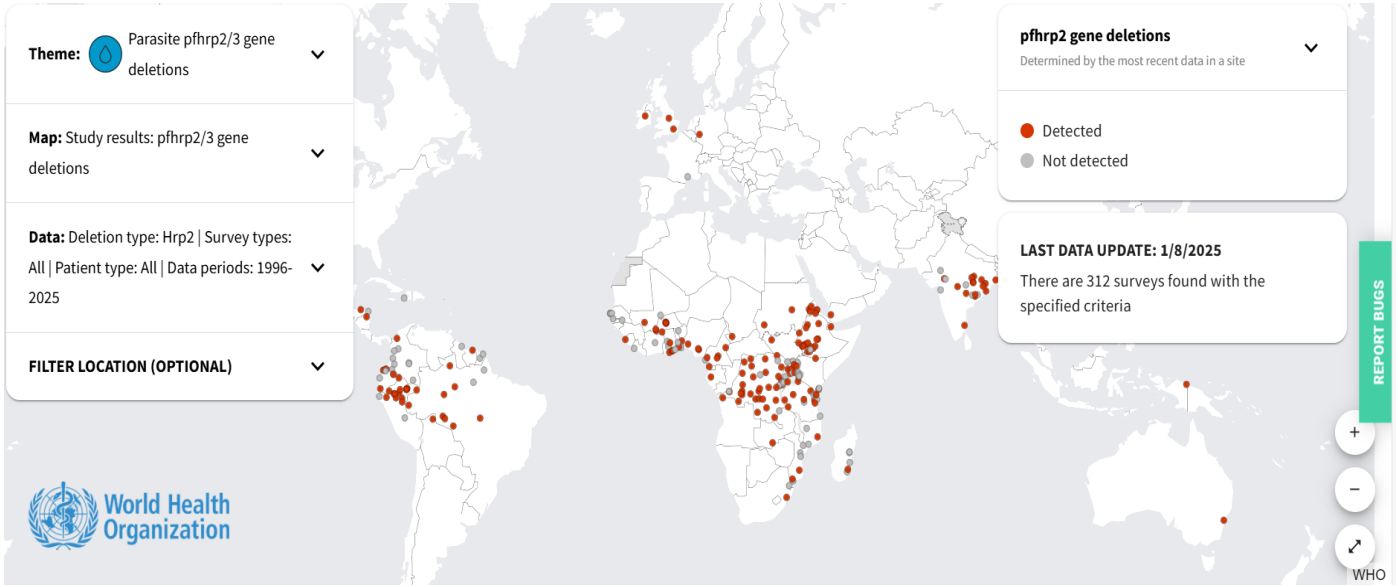
Strains with pfhrp2 and pfhrp3 gene deletions are undetectable by HRP2 RDTs

False negative results

WHO recommends that countries with more than 5% of false negative results due to HRP 2/3 deletion, implement non-PfHRP-2 based RDT.

Why do an HRP 2/3 deletion survey in South Sudan?

- High endemicity
- > 97% of cases by *P. falciparum*
- Neighboring countries with documented pfhrp2/3 deletions
- Suspicion of false negative HRP2-mRDT at field level
- Data on South Sudan extremely scarce
- MSF has large operational footprint



Objectives and methodology

Primary objective: Estimate prevalence of pfhrp2/3 deletions

- Cross-sectional survey at 10 sites (5 MSF Operational Centers)

- Done in collaboration with MoH South Sudan, WHO, ADFMIDI

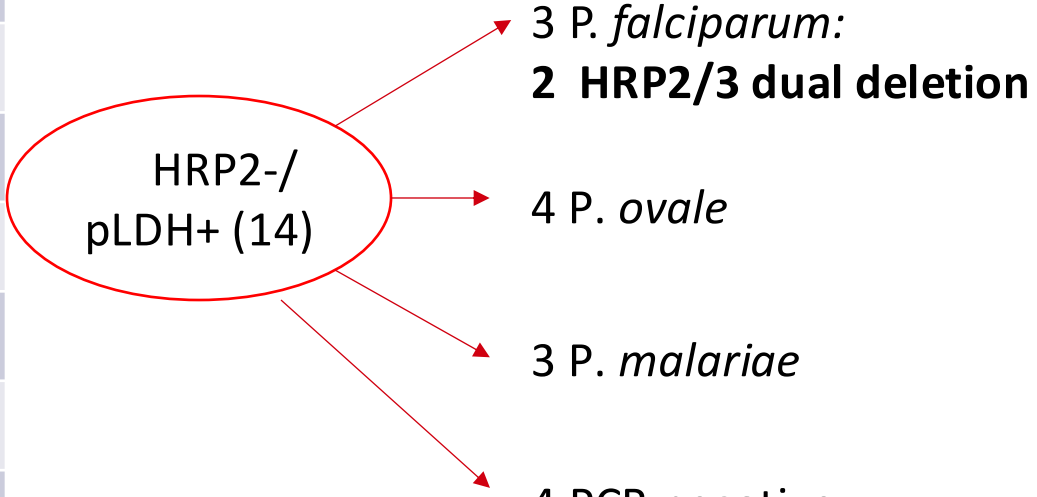
- Patients < 15 years with suspected malaria

- 2 RDTs in parallel: HRP2 and PfpLDH-based

- DBS for molecular testing

Results

Site	samples	HRP2+/ pLDH+	HRP2- /pLDH+	HRP2+/ pLDH-	HRP2- /pLDH-
Lankien	190	51	**2**	18	77
Malakal	200	93	**2**	19	128
Aweil	184	59	**0**	22	103
Kajo Keji	183	84	**2**	9	89
Gomgoi	200	44	**0**	18	137
Bentiu	196	22	**1**	3	170
Ulang	201	55	**3**	25	117
Old Fangak	197	70	**1**	13	42
Maruwa	199	35	**2**	6	156
Yei	156	52	**1**	27	75
Total	1832	565	**14**	160	1094



Implications

- Prevalence of HRP2/3 deletion causing false negative results = 0.35% (95%CI 0.04-1.24)

HRP2-based RDT still suitable in our sites in South Sudan

- Results considered by NMCP for next order of RDTs
- First report of new generation Pf-pLDH-based mRDT detecting non-P. falciparum species → not encouraging!
- **The study has direct implications for the National Malaria Control Programme and health actors working in South Sudan, it contributes to the global surveillance of HRP 2/3 deletion and aligns with MSF's quality of care goals.**

Thanks to all patients and staff

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