PAKISTAN

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FEVER DIAGNOSTIC PRACTICES

PATIENT FLOW

PATIENT FLOW FOR INITIAL FEBRILE ILLNESS DIAGNOSTICS*

RURAL		100 PATIENTS		URBAN
~59				~41
~16	PUBLIC		PUBLIC	~9
~4		RURAL OR BASIC HEALTH UNIT (OR LOWER LEVELS)		<1
~12		PUBLIC HOSPITAL		~9
~43	PRIVATE		PRIVATE	~32
~39		PRIVATE GP OR CLINIC		~29
~4		PRIVATE HOSPITAL		~3
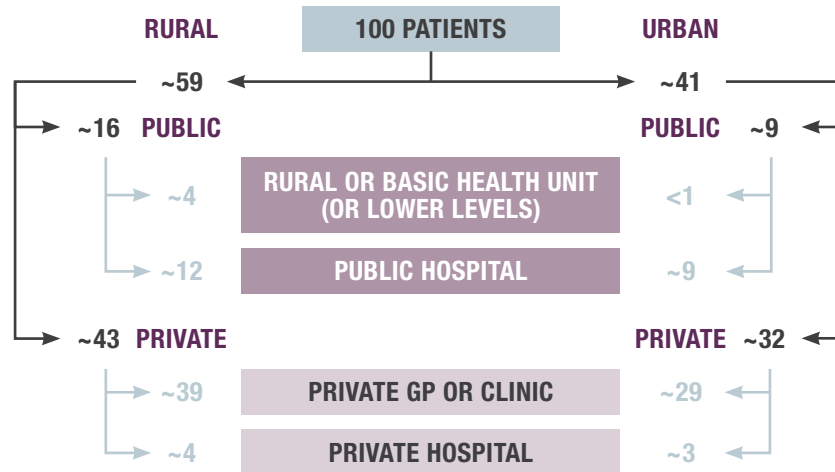
COMMENTS

Informal and traditional practitioners are commonly consulted for advice during the early stages of febrile illnesses, in particular in rural or slum areas

- These practitioners are a mix of people with some prior medical training (nurses, laboratory assistants, pharmacy salespeople) and people with training in traditional or faith-based practices
- These practitioners almost never test, and prescribe treatments that can vary both from guidelines and generally accepted medical practice

For fevers that persist after 3-5 days, patients typically visit recognized private GPs or clinics for diagnosis

- "GPs are the main providers of diagnosis, most patients go to them both in rural and urban settings." IRD Global, Malaria Program Director for Pakistan

> The vast majority of patients visit private GPs, both in rural and urban settings

Note: (*) Excluding self-diagnosis and informal practitioners. Sources: WHO, World Bank, Pakistan Bureau of Statistics, Advention

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FEVER AND MALARIA DIAGNOSTIC ALGORITHM AND PRACTICES

DIAGNOSTIC GUIDELINES

All suspected cases of malaria should be tested

Microscopy is preferred over RDTs

All public health centers should be equipped with microscopy equipment capable of diagnosing malaria, including sub-health centers

Type of RDT used: Pf + Pv

TREATMENT GUIDELINES

Severe malaria is treated with injected Artesunate + Artemether

Uncomplicated malaria should not be treated until confirmation

Pf: Sulfadoxine Pyrimethamine + Artesunate

Pv: Chloroquine + Primaquine

Mixed infections are treated as Pf

COMPLIANCE WITH INTERNATIONAL GUIDELINES ⊖

Treatment is compliant with international guidelines
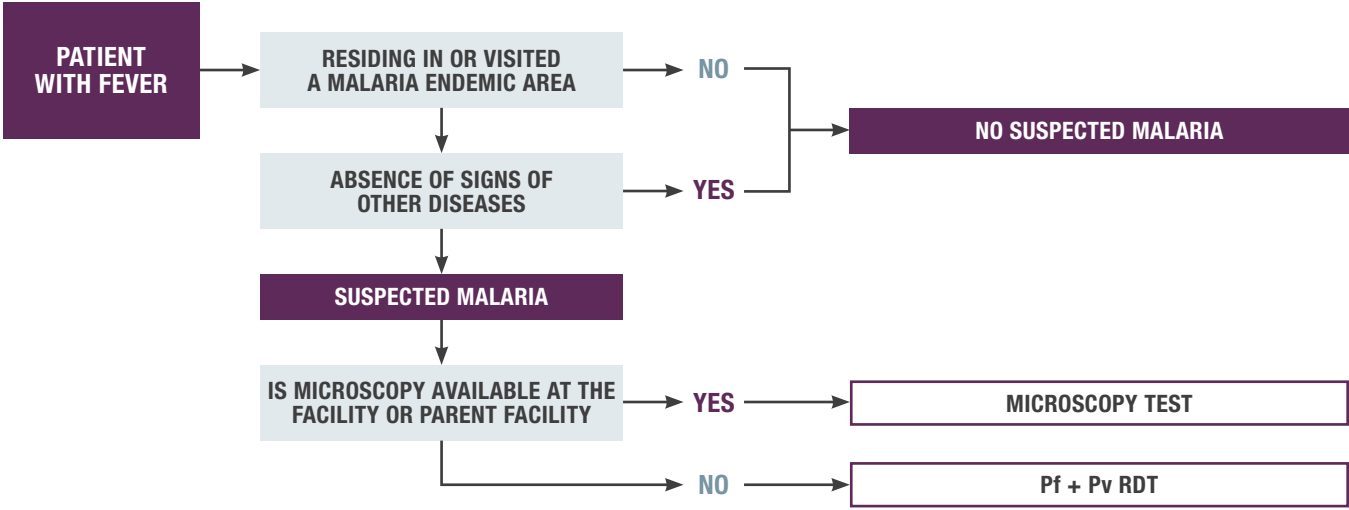
Diagnostic guidelines have some differences:

- CHWs do not provide malaria tests as per the iCCM guidelines
- The iCCM and IMCI/IMAI recommend testing all fevers for malaria

LEGEND

✔ FULLY ALIGNED

⊖ GENERALLY ALIGNED

✖ RARELY OR NOT ALIGNED

FEBRILE ILLNESS DIAGNOSTIC ALGORITHM

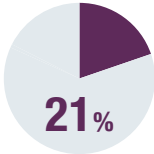Guideline algorithm for all health providers (public and private) for all patients

PATIENT WITH FEVER → **RESIDING IN OR VISITED A MALARIA ENDEMIC AREA** → NO

ABSENCE OF SIGNS OF OTHER DISEASES → YES

→ **NO SUSPECTED MALARIA**

SUSPECTED MALARIA

IS MICROSCOPY AVAILABLE AT THE FACILITY OR PARENT FACILITY → YES → **MICROSCOPY TEST**
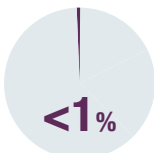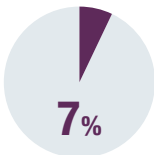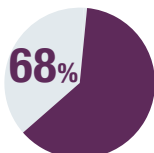
→ NO → **Pf + Pv RDT**

Malaria diagnosis practices in Pakistan favor microscopy testing, and do not recommend testing all febrile patients for malaria

Sources: WHO, Directorate of Malaria Control, interviews, Advention

MALARIA TESTING PRACTICES AT DIFFERENT HEALTH FACILITY LEVELS

HEALTH FACILITY	NUMBER OF FACILITIES	SHARE OF FEVER PATIENTS (EST.)	PREFERRED MALARIA DIAGNOSTIC TOOL	LEVEL OF RDT USE (MALARIA DIAGNOSTIC)
PUBLIC				
Public Hospital (Tehesil HQ, District HQ or Teaching)	427	21%	Microscopy	None / Limited
Rural Health Center	638	2%	Microscopy	None / Limited, mainly in Global Fund supported districts
Basic Health Center	4,996	2%	Microscopy	Moderate, mainly in Global Fund supported districts
Facilities Dependent on Rural or Basic Health Centers	4,413	<1%	Microscopy	None / Limited
PRIVATE				
Private Hospital	~725	7%	Microscopy	None / Limited
Private GP or clinic	~50K*	68%	Microscopy	None / Limited, mainly in Global Fund supported districts

RDTs are mostly used in districts supported by the Global Fund, but remain vastly less common than microscopy tests

Note: (*) estimate based on the number of board certified physicians. Sources: interviews, National MoH, Advention

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MALARIA TESTING LANDSCAPE

		PRIORITY COUNTRIES*						
		VIET NAM	CAMBODIA	S. AFRICA	INDIA	PAKISTAN	MYANMAR	THAILAND
HEALTHCARE INFRASTRUCTURE	Population (M)	95	16	56	1,324	193	53	69
	Healthcare expenditures per capita ($)	115-120	65-70	84	60-70	35-40	55-59	217-225
	Health insurance coverage	~70%	–	~16% => NHI	~5-10%	~19%	Negligible	~98%
	Universal health coverage index	73	55	67	56	40	60	75
	Patients with fever being tested (%)**	80%	69%	82%	71%	68%	55%	83%
	Main distribution network	NIMPE	CNM	NDOH	State MoHs	Mix public/ private	NVBDCP/ CMSD	BVBD
MALARIA DIAGNOSTIC FUNDING & PROCUREMENT	Last year total malaria funding ($M)	16	20	24	226	38	78	21
	Share of government funding (%)	~18%	~3%	~100%	~73%	~58%	~8%	~40%
	Main procurement decision maker	NMCP	CNM/ UNOPS	NDOH / Malaria programme	National and state MoHs	GF / NMCP	NMCP/ PMI	NMCP
	Procurement concentration level	High	High	High	Low	Medium	Medium	High
MALARIA DIAGNOSTIC PRACTICES	Health facilities performing RDTs	Health posts	Lower level facilities	Lower level facilities	Sub-Health/ Primary HC	GPs, clinics	Lower level facilities, clinics	Lower level facilities
	Share of RDT in malaria diagnostic (% of patients)	~19%	~74%	~63%	~13%	~20%	~96%	~5%
	Community HCW RDT knowledge	Yes	Yes	Yes	No	Yes	Yes	Yes
	Quality management system performance	High	Medium	High	Medium	Medium	Low	High

NIMPE: National Institute of Malaria, Parasitology, and Entomology (also CNM); **NDOH**: National Department of Health; **MoH**: Ministry of Health;
NVBDCP: National Vector Borne Disease Control Programme; **CMSD**: Central Medical Store Depot; **BVBD**: Bureau of Vector-Borne Disease;
NMCP: National Malaria Control Programme; **UNOPS**: United Nations Office for Project Services; **GF**: The Global Fund; **PMI**: Project Management Institute

Notes: (*) Last available year; (**) As per Advention's assumption based on interviews (base case scenario). Sources: WHO, World Bank, GF, interviews, Advention
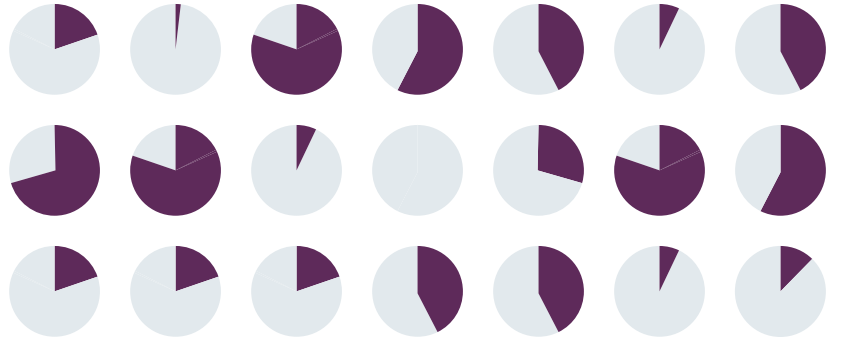
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MALARIA RDT STAKEHOLDERS MAP

	VIET NAM	CAMBODIA	S. AFRICA	INDIA	PAKISTAN	MYANMAR	THAILAND

WHO IS PAYING FOR MALARIA RDTs?

	VIET NAM	CAMBODIA	S. AFRICA	INDIA	PAKISTAN	MYANMAR	THAILAND
Ministry of Health							
Donors							
Patients / Private insurances							

WHO IS SELECTING MALARIA RDTs?

	VIET NAM	CAMBODIA	S. AFRICA	INDIA	PAKISTAN	MYANMAR	THAILAND
Ministry of Health / NMCP	++ ★	++ ★	++	++	++ ★	++ ★	++ ★
Donors	+	++			++	++	++
Private sector	+	+	+	++		+	+
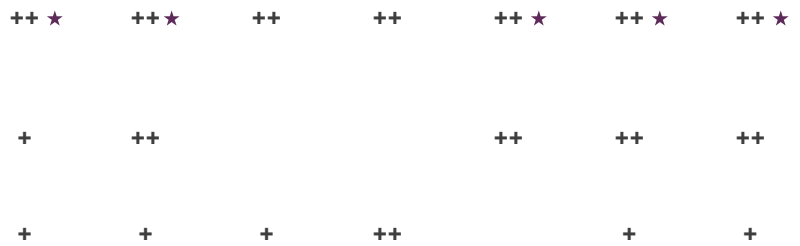
WHO ARE THE MAIN INFLUENCERS REGARDING MALARIA RDT SELECTION?

← WHO →

← MoHs/NMCPs →

Local manufacturers
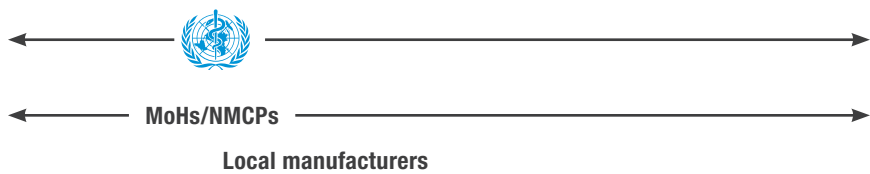
LEGEND

★ HEAVY USE OF DONOR'S PROCUREMENT POOLING SYSTEM   ☆ USE OF DONOR'S PROCUREMENT POOLING SYSTEM

Malaria RDTs are mostly financed by international donors, except in India, Pakistan and South Africa
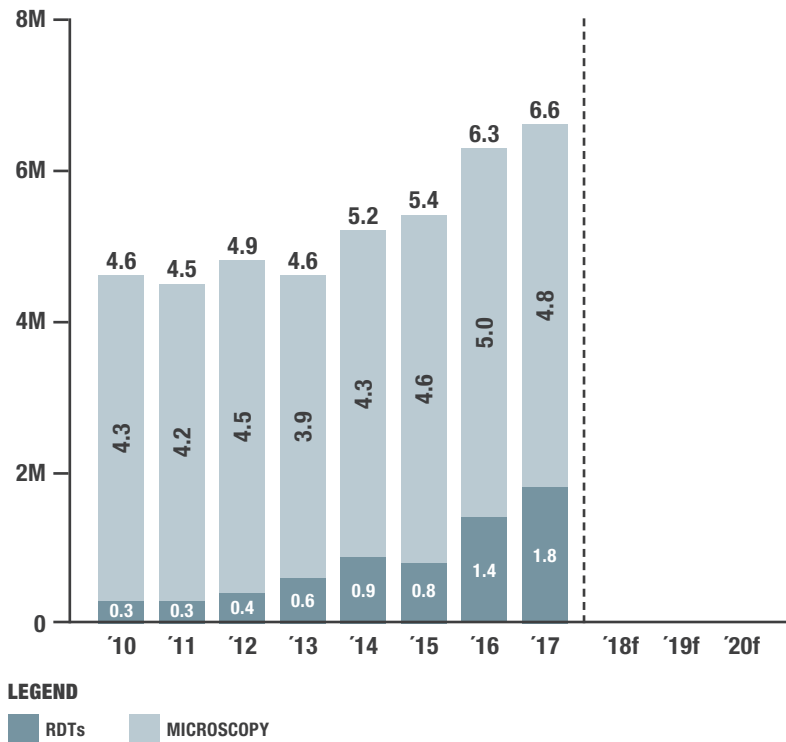
NMCPs are key decision makers regarding RDT selection in all countries

Source: Advention

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MALARIA TESTING PRACTICES

MALARIA TESTS PERFORMED

Chart: Malaria Tests Performed (0 to 8M), years '10–'20f

Year	RDTs	Microscopy	Total
'10	0.3	4.3	4.6
'11	0.3	4.2	4.5
'12	0.4	4.5	4.9
'13	0.6	3.9	4.6
'14	0.9	4.3	5.2
'15	0.8	4.6	5.4
'16	1.4	5.0	6.3
'17	1.8	4.8	6.6

LEGEND

RDTs MICROSCOPY

IDENTIFIED MALARIA RDTs USED

CareStart Malaria HRP2 / pLDH (P.f. / P. v.) Combo

Pf-HRP2	0.22$ / test
Pv-pLDH	>700K RDTs since 2015

ACCESSBIO

CareStart Malaria HRP2 / pLDH (P.f. / P. pan.) Combo

Pf-HRP2	0.27$ / test
Any malaria with pLDH-pan	>600K RDTs since 2014

ACCESSBIO

SD Bioline Malaria Ag. P.f. / P.f. / P.v.

Pf-HRP2 and pLDH-pf	~0.25$ / test
Pv-pLDH	>500K RDTs since 2017

Abbott

Malaria testing is mainly performed by microscopy, but the number of RDTs used has increased significantly in recent years as the Global Fund increased operations

Tests used are all combo tests to discern Pf and Pv for case management

Sources: WHO, National MoH, Global Fund, Advention

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OTHER FEBRILE ILLNESSES TESTING PRACTICES

ARBOVIRUSES	**Dengue**	Most large hospital labs perform dengue tests in-house, especially in epidemic areas Dengue is the most tested arbovirus in the country Patients tested for dengue are usually first tested for malaria Most dengue tests are concentrated during the peak season (monsoon)
	Chikungunya	Testing for chikungunya appears to be rare Chikungunya tests are performed for patients already screened for dengue and malaria, as it is considered less likely and less dangerous than dengue or malaria Due to the low demand for chikungunya tests, availability is limited and cost of testing is high
	Zika	Zika tests are very rare and appear to be performed only by research hospitals Testing appears to be done with PCR or ELISA
BACTERIAL FEVER-INDUCING PATHOGENS	**Melioidosis**	Melioidosis is almost never tested for, in both the public and private sector Tests for melioidosis appear generally to be performed using ELISA
	Leptospira	Leptospirosis is almost never tested for, in both the public and private sector Tests for leptospirosis appear generally to be performed using ELISA
	Scrub typhus	Diagnosis is usually clinical and based on the apparition of characteristic eschars Tests for scrub typhus appear generally to be performed using ELISA
	Murine typhus	Diagnosis is usually clinical and supported by blood test results Tests for murine typhus appear generally to be performed using ELISA

> Testing practices in Pakistan are generally limited, with a strong emphasis on clinical diagnosis for febrile illnesses, malaria and dengue being the main pathogens tested

Sources: interviews, Advention