

Managing illness through better diagnosis of malaria

- ▶ Extending access to affordable, early and accurate diagnosis of malaria is a strategic priority for Malaria Consortium.
- ▶ Since 2010, the World Health Organization has recommended that all suspected cases of malaria should receive a diagnostic test before starting treatment.
- ▶ Over 1 billion diagnostic tests are needed each year to achieve universal access by 2015 and efforts to achieve this must be maintained.
- ▶ Both national governments and development partners should have a critical role in the achievement of universal diagnosis of malaria.

▶ A child is tested for malaria using a rapid diagnostic test at a health clinic in Uganda

The importance of malaria diagnosis

Diagnosis is the process by which a health provider identifies the disease. By ensuring patients receive the right treatment at the right time, an early and accurate diagnosis can save lives and reduce the severity and duration of illness, reduce wastage of medicines and reduce costs to patients and their families.

Diagnosis of malaria requires an analysis of the patient's blood to detect the presence of malaria parasites or antigens. Diagnostic tools need to be accurate, easy to use, affordable and give rapid results. Two tools are routinely used for diagnosing malaria: microscopy and rapid diagnostic tests (RDTs).

Moving towards the universal diagnosis of malaria

In many endemic countries, patients with fever have typically been treated presumptively for malaria on the basis of symptoms alone. However, control efforts over the last decade, including the mass distribution of long lasting insecticidal nets, have significantly reduced the burden of malaria and the proportion of fever cases attributable to the disease has, correspondingly, fallen. The continued practice of presumptive treatment was therefore leading to the wastage of expensive antimalarial drugs (thereby also increasing the risk of resistance), under-diagnosis and delays in treating illnesses.

In 2010, the World Health Organization (WHO) recommended that all suspected cases of malaria, including children below five years of age, should be confirmed by microscopy or RDT before starting treatment. Only in cases where testing is not accessible within two hours of the patient

Tools for malaria diagnosis

Rapid diagnostic tests (RDTs) detect specific antigens (proteins) produced by malaria parasites that are present in the blood of infected individuals. Some RDTs detect a single species (either *Plasmodium falciparum* or *Plasmodium vivax*), some detect multiple species (*P. falciparum*, *P. vivax*, *Plasmodium malariae* and *Plasmodium ovale*) and some further distinguish between *P. falciparum* and non-*P. falciparum* infection, or between species. RDTs are as accurate as microscopy but different antigens have different sensitivity to detect parasites and they can be affected by poor storage and transportation conditions.

Microscopy is the identification of malaria parasites in blood films examined by light microscopy. It is an established, relatively simple technique that is familiar to most laboratory technicians in endemic countries. Blood slide microscopy makes it possible to count the number of parasites and is more useful than RDTs for monitoring the effectiveness of malaria treatment, but they do require a level of skill often not available in many malaria-endemic countries, especially in remote rural areas, where most malaria transmission occurs.

presenting at a point of care, should presumptive treatment be given. This move from presumptive treatment to parasitological testing for malaria represents a major shift in what has been a familiar practice for both patients and healthcare workers.

Many endemic countries are now implementing WHO's recommendation, with 90 adopting and rolling out a national policy for all age groups. According to available data, in 2013 almost two-thirds of patients with suspected malaria who attended a public facility received a diagnostic test, with the proportion tested in Africa increasing significantly over the last three years, up to 62 percent. For the first time, more diagnostic tests were provided at public health facilities in Africa than artemisinin-based combination therapies distributed, indicating a prominent shift away from presumptive treatment¹. Despite this progress, many endemic countries are far from achieving universal access to malaria diagnosis.

In 2015, the WHO launched the Global Technical Strategy for Malaria which set up one of three core pillars to achieve progress in the fight against malaria by 2030 as ensuring universal access to malaria prevention, diagnosis and treatment for all populations at risk. These ambitious targets, along with WHO's 'Test, Treat and Track' initiative launched in 2012, have been key drivers in extending access to affordable and accurate malaria

Malaria diagnosis in numbers

- ▶ In 2013, **197 million** suspected malaria cases were tested by microscopy
- ▶ The reported number of microscopic examinations in the WHO African Region increased from 33 million in 2010 to **50 million** in 2013
- ▶ Africa has seen the largest increase in the proportion of suspected cases tested, from 47% in 2010 to **62%** in 2013
- ▶ In Africa, the use of RDTs has doubled since 2010 and accounted for **52%** of all cases tested in 2013
- ▶ The volume of RDT sales to the public and private sectors of endemic countries has increased from 46 million in 2008 to **319 million** in 2013
- ▶ Around **40%** of patients with suspected malaria seek treatment in the private sector. Available data indicates that access to testing is lower in the private sector than in the public sector

Diagnosing malaria early and accurately

Consistent, accurate diagnosis is critical in allowing:

- ▶ Malaria to be detected early and distinguished from other conditions that cause fever
- ▶ Appropriate treatment to be selected and promptly given
- ▶ Monitoring the effectiveness of treatment
- ▶ Surveillance data to be improved to give better estimates of the burden of disease and quantification of medicines and other control materials

Malaria Consortium's response

- ▶ **Shifting to universal parasite-based diagnosis:** Malaria Consortium promotes WHO's policy that all suspected cases of malaria should be confirmed by diagnostic test, either microscopy or RDT, before treatment is started.
- ▶ **Working with national governments and ministries of health:** Malaria Consortium works together with national governments to advocate for the shift and provide evidence to support changes in malaria diagnostic regulations.
- ▶ **Diagnosing and managing febrile illnesses:** Malaria Consortium promotes an integrated approach to the managing of different illnesses, so that patients presenting with fever can be correctly diagnosed and receive the appropriate treatment.
- ▶ **Extending access to diagnostic testing for malaria through multiple channels:** Malaria Consortium works to extend access to diagnosis for malaria through multiple channels – in the public and private sectors and at community level, so that patients receive an early and accurate diagnosis at their nearest point of care.
- ▶ **Strengthening systems for diagnosis across the continuum of care:** Malaria Consortium works to strengthen systems for referral, diagnosis and treatment of malaria and other febrile illnesses through every stage of the continuum of care, from household to hospital, so that patients receive appropriate care at the time and place it is needed.
- ▶ **Delivering high quality malaria diagnosis and testing:** Malaria Consortium supports national programmes to develop and implement feasible, cost effective quality assurance systems for microscopy and RDTs, and promotes a programme of training and supportive supervision for health workers at all levels of the healthcare system.
- ▶ **Selecting appropriate diagnostic technology:** Malaria Consortium promotes the selection and use of diagnostic technology that is suited to the specific country context, healthcare system and service level.
- ▶ **Promoting acceptability and usage:** Malaria Consortium invests in public health communication and sensitisation activities for communities and health workers, and views this as critical to successfully transition from presumptive to parasitological confirmation-based treatment of malaria.
- ▶ **Tackling resistance and overuse of drugs:** Accurate diagnosis is central to promoting the rational use of drugs and tackling drug resistance. Malaria Consortium focuses on measures that encourage the effective, appropriate and economically viable use of antimalarial drugs and antibiotics.
- ▶ **Having the right information at the right time:** Malaria Consortium considers that information about confirmed malaria cases and diagnostic test results from all levels of the healthcare system should be integrated into routine health information systems through strong surveillance systems.

Key messages

National governments in endemic countries play a critical role in the achievement of universal diagnosis of malaria by:

- ▶ Updating national policies in order to implement a strategy for universal access to malaria diagnosis
- ▶ Ensuring the regulatory environment is effective so that standards in terms of products and practices are achieved and maintained
- ▶ Promoting the selection and use of diagnostic technology that is suited to the specific country context, healthcare system and service level
- ▶ Promoting quality management to address the accuracy of diagnostic tools and healthcare worker performance
- ▶ Retaining skilled microscopists and maintaining funding for staff and laboratory facilities
- ▶ Making malaria diagnosis available at all levels of the health system, so that patients receive appropriate care at the time and place it is needed
- ▶ Working with the private sector to promote universal diagnosis
- ▶ Capturing all confirmed cases of malaria to ensure effective surveillance and responses
- ▶ Integrating information about confirmed malaria cases and diagnostic test results from all levels of the healthcare system into routine health information systems

Development partners are essential in providing support and resources for national and international efforts to promote universal diagnosis of malaria. These partners should ensure their advocacy strategies reflect this by:

- ▶ Ensuring health providers and patients recognise the importance of providing and receiving the most appropriate treatment for the diagnosed illness
- ▶ Advocating for the use of reliable and accurate diagnostic tests in order to build trust in and confidence of the health worker
- ▶ Expanding access in the private sector to ensure that high standards of products and practices are achieved and better services are delivered
- ▶ Maintaining diagnosis capacity in low transmission settings by ensuring skilled technicians are retained to administer the tests
- ▶ Investing in public health communication and sensitisation activities for communities and health workers, and views this as critical to successfully transition from presumptive to parasitological confirmation-based treatment of malaria
- ▶ Developing new diagnostic technologies to improve the accuracy or simplify the process of malaria diagnosis and tests to be used when the result is negative



► Blood samples are reviewed under a microscope in Uganda to detect the presence of malaria parasites in the blood

References

1. World Health Organization (2014). *World Malaria Report 2014*. Geneva, WHO.
2. World Health Organization (2014). *Global Technical Strategy for Malaria 2015-2030*. Geneva, WHO.
3. World Health Organization (2012). *T3: Test. Treat. Track Initiative*. Scaling up diagnostic testing, treatment and surveillance for malaria. Geneva, WHO.

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About Malaria Consortium

Malaria Consortium is one of the world's leading international non-governmental organisations dedicated to comprehensive malaria control in Africa and Asia. While malaria control is at the heart of our strategy, we also undertake complementary work on child health including integrated community case management of childhood illness, severe acute malnutrition and the control of neglected tropical diseases. Our mission is to improve lives in Africa and Asia through sustainable, evidence-based programmes that combat targeted diseases and promote child and maternal health. We undertake programmes in prevention, diagnosis, treatment, surveillance, operational research and health system strengthening in Nigeria, Uganda, Ethiopia, South Sudan, Mozambique, Burkina Faso, Chad, Thailand, Cambodia, Myanmar, Lao PDR and Vietnam.

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