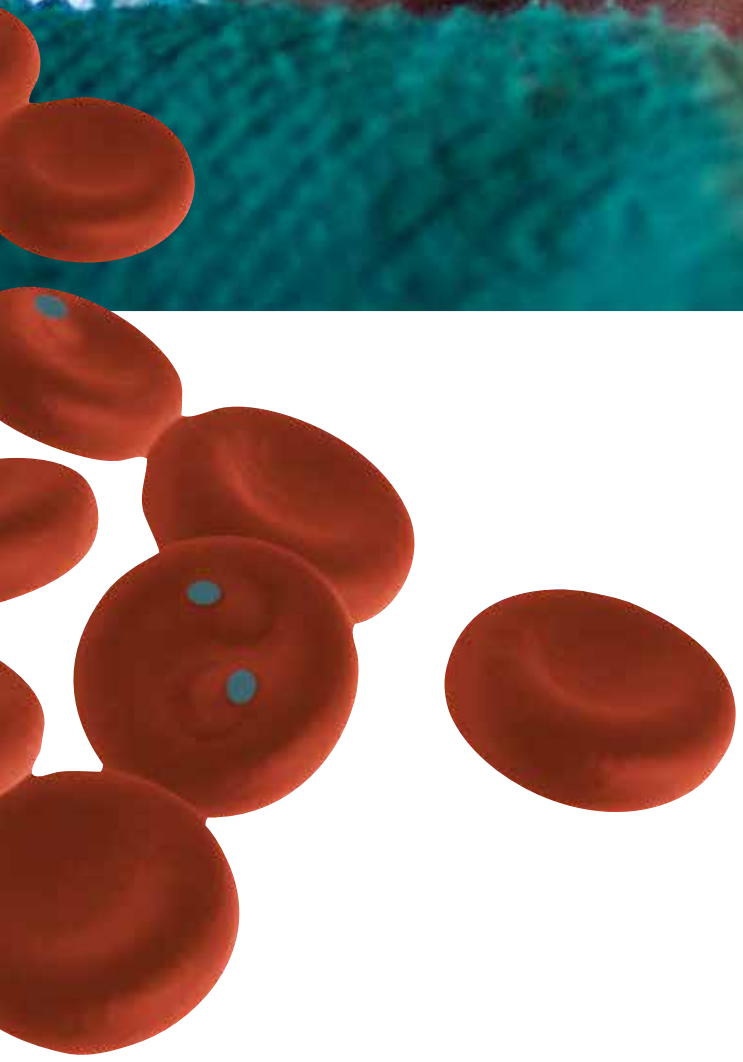

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World Health Organization

WHO GLOBAL MALARIA PROGRAMME

WORLD MALARIA REPORT 2014

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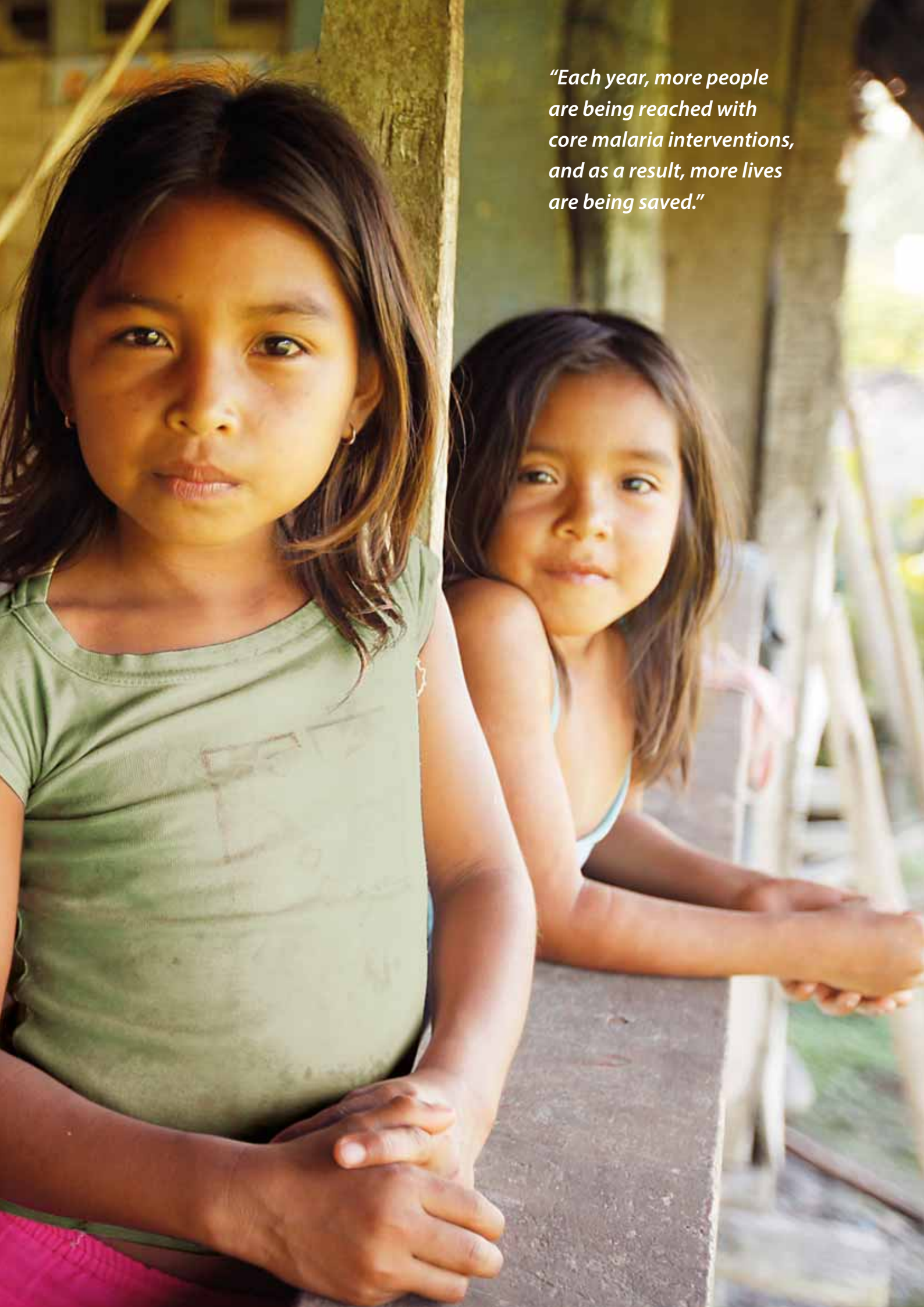

"Each year, more people are being reached with core malaria interventions, and as a result, more lives are being saved."

Foreword

Dr Margaret Chan
Director-General
World Health Organization

The findings in this year's *World Malaria Report* demonstrate that the world is continuing to make impressive progress in reducing malaria cases and deaths. Each year, more people are being reached with core malaria interventions, and as a result, more lives are being saved. The malaria target under Millennium Development Goal 6 has been met, and 55 countries are on track to reduce their malaria burden by 75%, in line with the World Health Assembly's target for 2015.

In 2013, we saw a major expansion in the use of diagnostic testing and the deployment of artemisinin-based combination therapies (ACTs). For the first time, more diagnostic tests were provided at public health facilities in Africa than ACTs distributed, indicating a prominent shift away from presumptive treatment. Major progress has been documented in vector control as well: in 2014, a record number of long-lasting insecticidal nets were delivered to endemic countries in Africa.

The report shows that malaria mortality rates decreased by an impressive 47% between 2000 and 2013 globally, and by 54% in the WHO African Region. It also reveals that these trends are accompanied by a gradual and substantial reduction in parasite prevalence rates across Africa. This means that every year, fewer people get infected or carry asymptomatic infections – a sign that malaria interventions have an even larger impact than previously thought.

These tremendous achievements are the result of improved tools, increased political commitment, the burgeoning of regional initiatives, and a major increase in international and domestic financing. WHO is grateful for the engagement and long-standing commitment of the global health community, and inspired by the growing desire to accelerate efforts towards malaria elimination.

But we must not be complacent. Most malaria-endemic countries are still far from achieving universal coverage with life-saving malaria interventions; many biological and systemic challenges threaten to slow us down.

Available funding is far less than what is required to protect everyone at risk. An estimated 278 million people in Africa still live in households without a single insecticide-treated bed net, and about 15 million pregnant women remain without access to preventive treatment for malaria. Malaria is still responsible for over 430 000 child deaths in Africa every year. Emerging drug- and insecticide-resistance continues to pose a major threat, and if left unaddressed, could trigger an upsurge in deaths.

The Ebola outbreak has had a devastating impact on basic health service delivery in the most severely affected countries, including the ability to control malaria. In Guinea, Liberia, and Sierra Leone, the collapse of health systems has affected all core malaria interventions and is threatening to reverse recent gains. WHO is working closely with countries and partners to prevent a worsening of the malaria situation and reduce the pool of fever cases.

This Ebola outbreak is a global tragedy that is rewriting the history of public health. It has served as a wake-up call for governments and the global development community, urging a major global rethink about the importance of strengthening health systems and building resilience.

All global health efforts will benefit from a strengthening of health systems, including efforts to control and eliminate malaria. Such investments will help us close the coverage gap, strengthen disease surveillance and research, and support the development and roll-out of new tools and approaches. They will make malaria and other public health responses more effective and more sustainable.

Recent progress in reducing the human suffering caused by malaria has shown us that, with adequate investments and the right mix of strategies, we can indeed make remarkable strides against this complicated enemy. We should act with urgency and resolve, and remain focused on our shared goal: to create a world in which no one dies of malaria, a world entirely clear of this scourge.

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ABBREVIATIONS

ABER	annual blood examination rate
ACD	active case detection
ACT	artemisinin-based combination therapy
AIDS	acquired immunodeficiency syndrome
AL	artemether-lumefantrine
ALMA	African Leaders Malaria Alliance
AMFm	Affordable Medicine Facility–malaria
ANC	antenatal care
API	annual parasite index
AQ	amodiaquine
AS	artesunate
AT	atovaquone
CDC	United States Centers for Disease Control and Prevention
CIDA	Canadian International Development Agency
Co-B	co-blister
DDT	dichloro-diphenyl-trichloroethane
DFID	United Kingdom of Great Britain and Northern Ireland Department for International Development
DIPI	domestic investment priority index
EPI	Expanded Programme on Immunization
FDC	fixed-dose combination
G6PD	glucose-6-phosphate dehydrogenase
Global Fund	Global Fund to Fight AIDS, Tuberculosis and Malaria
GMAP	Global Malaria Action Plan
GMP	Global Malaria Programme, WHO
GPARC	Global Plan for Artemisinin Resistance Containment
GPIRM	Global Plan for Insecticide Resistance
IM	intramuscular
IMF	International Monetary Fund
IPTi	intermittent preventive treatment for infants
IPTp	intermittent preventive treatment in pregnancy
IQR	interquartile range
IRS	indoor residual spraying
ITN	insecticide-treated mosquito net
LLIN	long-lasting insecticidal net
MAP	Malaria Atlas Project
MDG	Millennium Development Goal
MPAC	Malaria Policy Advisory Committee
MQ	mefloquine
NMCP	national malaria control programme
OECD	Organisation for Economic Co-operation and Development
P.	*Plasmodium*
*Pf*PR	*P. falciparum* parasite rate
PMI	United States President's Malaria Initiative
RBM	Roll Back Malaria
RDT	rapid diagnostic test
SMC	seasonal malaria chemoprevention
SP	sulfadoxine-pyrimethamine
SPR	slide positivity rate
TES	therapeutic efficacy studies
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WHO	World Health Organization

Abbreviations of WHO Regions and Offices

AFR	WHO African Region
AFRO	WHO Regional Office for Africa
AMR	WHO Region of the Americas
AMRO	WHO Regional Office for the Americas
EMR	WHO Eastern Mediterranean Region
EMRO	WHO Regional Office for the Eastern Mediterranean
EUR	WHO European Region
EURO	WHO Regional Office for Europe
SEAR	WHO South-East Asia Region
SEARO	WHO Regional Office for South-East Asia
WPR	WHO Western Pacific Region
WPRO	WHO Regional Office for the Western Pacific

KEY POINTS

The *World malaria report 2014* summarizes information received from 97 malaria-endemic countries and other sources, and updates the analyses presented in 2013. It assesses global and regional malaria trends, highlights progress made towards global targets, and describes opportunities and challenges in controlling and eliminating the disease. Most of the data presented in this report are for 2013.

The public health challenge posed by malaria

Malaria transmission occurs in all six WHO regions. Globally, an estimated 3.2 billion people are at risk of being infected with malaria and developing disease, and 1.2 billion are at high risk (>1 in 1000 chance of getting malaria in a year). According to the latest estimates, 198 million cases of malaria occurred globally in 2013 (uncertainty range 124–283 million) and the disease led to 584 000 deaths (uncertainty range 367 000–755 000). The burden is heaviest in the WHO African Region, where an estimated 90% of all malaria deaths occur, and in children aged under 5 years, who account for 78% of all deaths.

Expansion of malaria funding

International and domestic funding for malaria control and elimination totalled US$ 2.7 billion in 2013. Although this represented a threefold increase since 2005, it is still significantly below the estimated US$ 5.1 billion that is required to achieve global targets for malaria control and elimination. Total malaria funding will only match resource needs if international and domestic funders prioritize further investments for malaria control.

Overall, funding for countries in the WHO African Region accounted for 72% of the global total. Between 2005 and 2013, international disbursements for malaria for this region increased at an annual rate of 22%. During the same period, the average annual rate of increase for domestic funding in the region was 4%.

Globally, domestic funding for malaria was estimated to be US$ 527 million in 2013. This represents 18% of the total malaria funding in 2013. In regions outside Africa, the annual rate of domestic funding has not increased in recent years.

Progress in vector control

During the past 10 years, coverage with vector control interventions increased substantially in sub-Saharan Africa. In 2013, almost half of the population at risk (49%, range 44–54%) had access to an insecticide-treated mosquito net (ITN) in their household, compared to 3% in 2004. An estimated 44% (range 39–48%) of the population at risk were sleeping under an ITN in 2013, compared to 2% in 2004. Pregnant women and children were more likely than the general population to sleep under an ITN.

In terms of long-lasting insecticidal net (LLIN) delivery, 2014 has been the strongest year so far. A total of 214 million nets are projected to be delivered to countries in sub-Saharan Africa by the end of 2014, bringing the total number of LLINs delivered to that region since 2012 to 427 million.

Globally, 123 million people were protected from malaria through the use of indoor residual spraying. This represents 3.5% of the global population at risk. In the WHO African Region, 55 million people, or 7% of the population at risk, were protected. This has decreased from 11% in 2010; the decline is due to a withdrawal or downsizing of spraying programmes in some countries.

In sub-Saharan Africa, the proportion of the population protected by at least one vector control method has increased in recent years, and it reached 48% in 2013 (range 44–51%). Globally, 38 countries reported the use of larval control to complement core vector control methods.

Insecticide resistance in malaria vectors has been reported in 49 of 63 reporting countries around the world since 2010. Of these, 39 have reported resistance to two or more insecticide classes. The most commonly reported resistance is to pyrethroids, the most frequently used insecticide in malaria vector control.

WHO has established a system to track insecticide resistance globally, and recommends annual monitoring. In 2013, some 82 countries report undertaking insecticide resistance monitoring. However, only 42 of these countries provided WHO with resistance data for 2013, suggesting that many countries do not monitor insecticide resistance annually.

Trends in the administration of preventive therapies

The proportion of women who receive intermittent preventive treatment in pregnancy (IPTp) for malaria has been increasing over time, although the levels remain below programme targets. IPTp has been adopted in 37 countries and 57% of pregnant women in those countries received at least one dose of IPTp in 2013. However, only nine of those countries have reported to WHO on the recommended number of three or more doses of IPTp, and within those countries, only 17% of pregnant women received three or more doses.

In most countries, attendance rates at antenatal care services are much higher than current levels of IPTp administration. This suggests that there are missed opportunities to expand access to this life-saving intervention.

The adoption and implementation of preventive therapies for children aged under 5 years and for infants has been slower than expected. As of 2013, six of the 16 countries recommended by WHO to adopt seasonal malaria chemoprevention for children aged under 5 years have done so. Only one country has adopted intermittent preventive treatment for infants, but has not yet implemented the treatment.

Scaling up diagnostic testing

The proportion of patients suspected of having malaria who receive a malaria diagnostic test has increased substantially since 2010, when WHO recommended testing of all suspected malaria cases. In 2013, 62% of patients with suspected malaria in public health facilities in the WHO African Region received a diagnostic test, compared to 40% in 2010.

The total number of rapid diagnostic tests (RDTs) distributed by national malaria control programmes increased from fewer than 200 000 in 2005 to more than 160 million in 2013. Of these, 83% were delivered to countries in the WHO African Region. The quality of RDTs has improved substantially since the start of the RDT product testing programme in 2008. In the latest round of product testing, nearly all tested products met WHO standard of detection at parasite levels commonly seen in endemic areas.

In 2013, the number of patients tested by microscopic examination remained unchanged from the previous year, at 197 million. The global total of microscopic examinations is dominated by India, which accounted for over 120 million slide examinations in 2013.

In 2013, for the first time, the total number of diagnostic tests provided in the WHO African Region in the public health sector exceeded the number of artemisinin-based combination therapies (ACTs) distributed. This is an encouraging sign and, given that fewer than half of patients tested will require treatment, the ratio of diagnostic tests to ACTs should eventually reach two to one.

Expanding access to treatment

By the end of 2013, ACTs had been adopted as national policy for first-line treatment in 79 of 88 countries where *Plasmodium* (*P.*) *falciparum* is endemic. Chloroquine was being used in 9 Central American and Caribbean countries where it remains efficacious.

The number of ACT courses procured from manufacturers – for both the public and private sectors – rose from 11 million in 2005 to 392 million in 2013. This increase has been largely driven by procurements for the public sector.

Public health facilities had enough ACT in 2013 to treat more than 70% of patients with malaria who presented for care. However, the estimated proportion of all children with malaria who received ACTs was estimated at between 9–26% This is because a substantial proportion of these patients do not seek care, and not all those who seek care receive antimalarial treatment.

Antimalarial drug resistance

P. falciparum resistance to artemisinin has been detected in five countries of the Greater Mekong subregion: Cambodia, the Lao People's Democratic Republic, Myanmar, Thailand and Viet Nam. In many areas along the Cambodia–Thailand border, *P. falciparum* has become resistant to most available antimalarial medicines.

The number of countries that allow marketing of oral artemisinin-based monotherapies has declined rapidly. As of November 2014, only eight countries allow the marketing of oral monotherapies. However, 24 pharmaceutical companies, mostly in India, continue to market oral monotherapies.

Therapeutic efficacy studies remain the gold standard for guiding drug policy, and should be undertaken every 2 years. Studies of first- or second-line antimalarial treatments were completed in 72% of countries where *P. falciparum* efficacy studies were feasible.

Gaps in intervention coverage

Despite impressive increases in malaria intervention coverage, it is estimated that, in 2013, 278 million of the 840 million people at risk of malaria in sub-Saharan Africa lived in households without even a single ITN, 15 million of the 35 million pregnant women did not receive even a single dose of IPTp, and between 56 and 69 million children with malaria did not receive an ACT. Poverty and low levels of education are significant determinants of lack of access to these essential services. More can be done to ensure all those at risk receive appropriate preventive measures, diagnostic testing and treatment.

Changes in malaria incidence and mortality

Reported malaria cases

Of the 106 countries that had ongoing malaria transmission in 2000, reported data in 66 were found to be sufficiently complete and consistent to reliably assess trends between 2000 and 2013.

Based on an assessment of trends in reported malaria cases, a total of 64 countries are on track to meet the Millennium Development Goal target of reversing the incidence of malaria.

Of these, 55 are on track to meet Roll Back Malaria and World Health Assembly targets of reducing malaria case incidence rates by 75% by 2015.

In 2013, two countries reported zero indigenous cases for the first time (Azerbaijan and Sri Lanka), and eleven countries succeeded in maintaining zero cases (Argentina, Armenia, Egypt, Georgia, Iraq, Kyrgyzstan, Morocco, Oman, Paraguay, Turkmenistan and Uzbekistan). Another four countries reported fewer than 10 local cases annually (Algeria, Cabo Verde, Costa Rica and El Salvador).

The 55 countries that recorded decreases of >75% in case incidence accounted for only 13 million (6%) of the total estimated cases of 227 million in 2000. Only five countries with more than 1 million estimated cases in 2000 (Afghanistan, Bangladesh, Brazil, Cambodia, and Papua New Guinea) are projected to achieve a reduction of 75% or more in malaria case incidence. This is partly because progress has been faster in countries with lower numbers of cases, but also because of poorer quality surveillance data being submitted by countries with larger estimated numbers of cases, particularly in sub-Saharan Africa.

Malaria infections

A new analysis of data reveals that the prevalence of malaria parasite infection, including both symptomatic and asymptomatic infections, has decreased significantly across sub-Saharan Africa since 2000. In sub-Saharan Africa, average infection prevalence in children aged 2–10 years fell from 26% in 2000 to 14% in 2013 – a relative decline of 48%.

Although declines in malaria parasite infection were seen across the African continent, they were particularly pronounced in Central Africa. Even with a large growth of populations in stable transmission areas, the number of infections at any one time across Africa fell from 173 million in 2000 to 128 million in 2013 – a reduction of 26% in the number of people infected.

Estimated malaria cases and deaths

Between 2000 and 2013, estimated malaria mortality rates decreased by 47% worldwide and by 54% in the WHO African Region. They are estimated to have decreased by 53% in children aged under 5 years globally, and by 58% in the WHO African Region. If the annual rate of decrease that has occurred over the past 13 years is maintained, then by 2015 malaria mortality rates are projected to decrease by 55% globally, and by 62% in the WHO African Region. In children aged under 5 years, by 2015 they are projected to decrease by 61% globally and by 67% in the WHO African Region.

Estimated malaria cases and deaths averted

It is estimated that, globally, 670 million fewer cases and 4.3 million fewer malaria deaths occurred between 2001 and 2013 than would have occurred had incidence and mortality rates remained unchanged since 2000. Of the estimated 4.3 million deaths averted between 2001 and 2013, 3.9 million (92%) were in children aged under 5 years in sub-Saharan Africa. These 3.9 million averted deaths accounted for 20% of the 20 million fewer under 5 deaths that would have occurred between 2001 and 2013 had under-5 mortality rates for 2000 applied for each year between 2001 and 2013. Thus, reductions in malaria deaths have contributed substantially to progress towards achieving the target for MDG 4, which is to reduce, by two thirds, the under-5 mortality rate between 1990 and 2015.

KEY STATISTICS

Since the year 2000

Average malaria infection prevalence declined **48%** in children aged 2–10, from 26% to 14% in 2013.

The number of malaria infections at any one time dropped **26%**, from 173 million to 128 million in 2013.

Malaria mortality rates have decreased by **47%** worldwide and by **54%** in the WHO Africa Region.

In 2013

Only US$ **2.7 billion**
of the US$ 5.1 billion required to achieve global malaria control and elimination targets were available through international and domestic funds.

49%
of the at-risk population in sub-Saharan Africa had access to an ITN in their household.

44%
of the population at risk in sub-Saharan Africa were sleeping under an ITN, indicating that 90% of people used the nets available to them.

278 million
of the 840 million people at risk of malaria in sub-Saharan Africa lived in households without even a single ITN.

57%
of pregnant women received at least one dose of IPTp, and **17%** received three or more doses in the nine reporting countries.

15 million
of the 35 million pregnant women did not receive a single dose of IPTp.

197 million
patients worldwide were tested for malaria by microscopic examination.

62%
of patients with suspected malaria cases in the WHO African Region received a diagnostic test in public health facilities.

70% of malaria patients could be treated with ACTs distributed to public facilities in Africa; however, because not all children with fever are brought for care, less than 26% of all children with malaria received an ACT.

56–69 million
children with malaria did not receive an ACT.

584 000
malaria deaths (range 367 000–755 000) occurred worldwide; 78% of malaria deaths occurred in children aged under 5 years.

528 000
malaria deaths (range 315 000–689 000), 90% of the global total, occurred in the WHO African Region.

By 2015

If the annual rate of decrease over the past 13 years is maintained, malaria mortality rates are projected to decrease by **55%** globally and by **62%** in the WHO Africa Region.

Malaria mortality rates in children aged under 5 years are projected to decrease by **61%** globally and **67%** in the WHO Africa Region.

1. INTRODUCTION

DATA WERE ASSEMBLED FROM 97 COUNTRIES AND TERRITORIES WITH ONGOING MALARIA TRANSMISSION, AND AN ADDITIONAL SIX COUNTRIES WORKING TO PREVENT REINTRODUCTION.

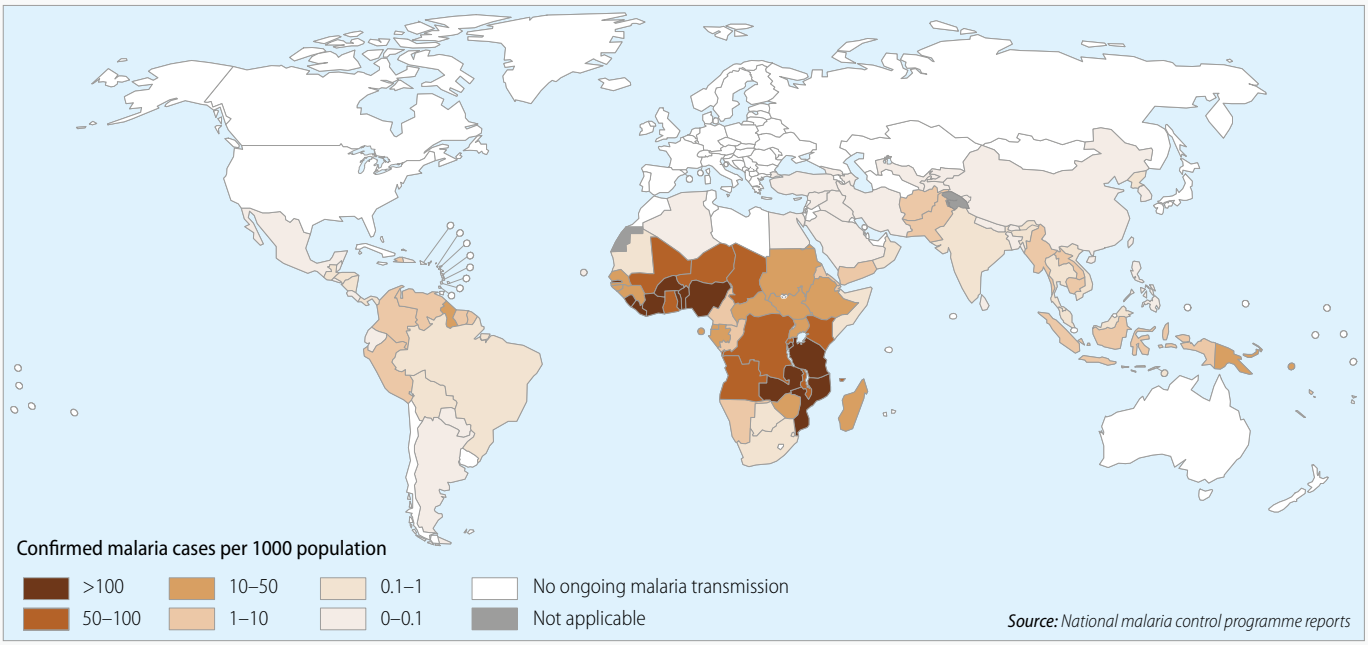
The *World malaria report 2014* summarizes the status of global efforts to control and eliminate malaria. The report is produced every year by the WHO Global Malaria Programme, with the help of WHO regional and country offices, ministries of health in endemic countries, and a broad range of other partners. Data for this year's report were assembled from 97 countries and territories with ongoing malaria transmission, and an additional six countries that are working to prevent reintroduction.

This section outlines the public health burden posed by malaria, the strategies that can be used to reduce that burden, and the goals, targets and indicators that have been set for 2015. The report then reviews global progress towards the goals and targets in relation to funding (**Section 2**), intervention coverage (**Sections 3–7**), and malaria cases and deaths (**Section 8**). The review is followed by **Regional profiles** that summarize trends in each WHO region. **Country profiles** are provided both for countries with ongoing malaria transmission and for those recently achieving zero local cases. Finally, **annexes** provide sources of data, details of the methodology used in the analysis, and tables containing country and regional data.

1.1 The public health challenge posed by malaria

Malaria transmission occurs in all six WHO regions. Globally, an estimated 3.2 billion people in 97 countries and territories are at risk of being infected with malaria and developing disease (**Figure 1.1**), and 1.2 billion are at high risk (>1 in 1000 chance of getting malaria in a year). According to the latest estimates, 198 million cases of malaria occurred globally in 2013 (uncertainty range 124–283 million) and the disease led to 584 000 deaths (uncertainty range 367 000–755 000), representing a decrease in malaria case incidence and mortality rates of 30% and 47% since 2000, respectively. The burden is heaviest in the WHO African Region, where an estimated 90% of all malaria deaths occur, and in children aged under 5 years, who account for 78% of all deaths.

Figure 1.1 Countries with ongoing transmission of malaria, 2013



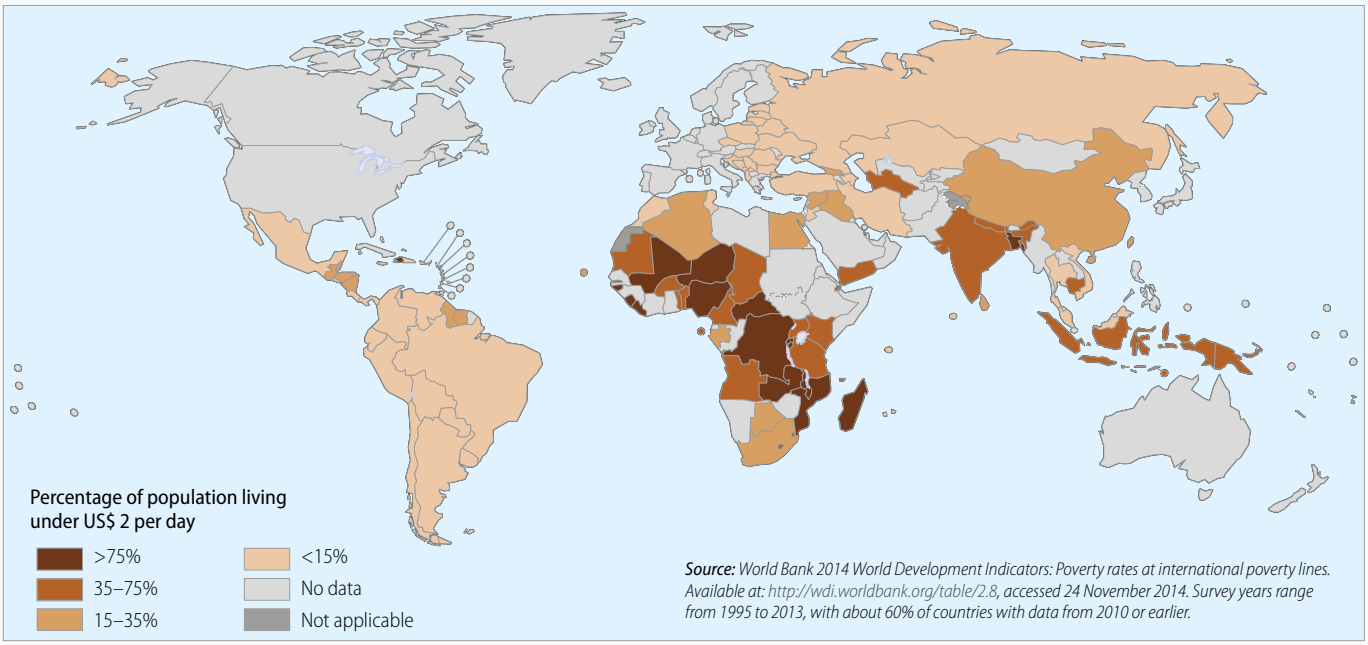
AN ESTIMATED 3.3 BILLION PEOPLE ARE AT RISK OF BEING INFECTED WITH MALARIA AND DEVELOPING DISEASE, AND 1.2 BILLION ARE AT HIGH RISK.

Malaria exacts a heavy burden on the poorest and most vulnerable communities. It primarily affects low- and lower-middle income countries (**Figure 1.2**). Within endemic countries, the poorest and most marginalized communities are the most severely affected, having the highest risks associated with malaria, and the least access to effective services for prevention, diagnosis and treatment. Thus, malaria control and ultimately its elimination is inextricably linked with health system strengthening, infrastructure development and poverty reduction.

Malaria is caused by five species of the parasite belonging to the genus *Plasmodium*. Four of these – *P. falciparum*, *P. vivax*, *P. malariae* and *P. ovale* – are human malaria species, which are spread from one person to another by female mosquitoes of the genus *Anopheles*. There are about 400 different species of Anopheles mosquitoes, but only 30 of these are vectors of major importance. In recent years human cases of malaria have also been recorded due to *P. knowlesi* – a species that causes malaria among monkeys, and occurs in certain forested areas of South-East Asia.

***P. falciparum* and *P. vivax* malaria pose the greatest public health challenge.** *P. falciparum* is most prevalent on the African continent, and is responsible for most deaths from malaria. *P. vivax* has a wider geographic distribution than *P. falciparum* because it can develop in the Anopheles mosquito vector at lower temperatures, and can survive at higher altitudes and in cooler climates. It also has a dormant liver stage (known as a hypnozoite) that enables it to survive for long periods as a potential reservoir of infection. The hypnozoites can activate months later to cause a relapse. Although *P. vivax* can occur throughout Africa, the risk of infection with this species is quite low, because of the absence in many African populations of the Duffy gene, which produces a protein necessary for *P. vivax* to invade red blood cells. In many areas outside Africa, infections due to *P. vivax* are more common than those due to *P. falciparum*.

Figure 1.2 Percentage of population living under US$ 2 per day, 1995–2013



Source: *World Bank 2014 World Development Indicators: Poverty rates at international poverty lines. Available at: http://wdi.worldbank.org/table/2.8, accessed 24 November 2014. Survey years range from 1995 to 2013, with about 60% of countries with data from 2010 or earlier.*

MALARIA CAN BE PREVENTED AND CURED BY HIGHLY COST-EFFECTIVE INTERVENTIONS.

1.2 Strategies to control and eliminate malaria

Malaria interventions are highly effective and affordable. The main interventions – summarized here and discussed in detail in Sections 3–7 – comprise vector control (which reduces transmission by the mosquito vector from humans to mosquitoes and then back to humans), achieved using insecticide-treated mosquito nets (ITNs) or indoor residual spraying (IRS); chemoprevention (which prevents the blood stage infections in humans); and case management (which includes diagnosis and treatment of infections).

ITNs are estimated to reduce malaria mortality rates by 55% in children under 5 years of age in sub-Saharan Africa (*1*). Their public health impact is due to a reduction in malaria deaths and to reductions in child deaths from other causes that are associated with, or exacerbated by, malaria (e.g. acute respiratory infection, low birth weight and malnutrition). ITNs have have been shown to reduce the incidence of malaria cases by 50% in a variety of settings (*2*). When the nets are used by pregnant women, they are also efficacious in reducing maternal anaemia, placental infection and low birth weight. Historical and programme documentation has established a similar impact for IRS, although randomized trial data are limited (*3*).

Chemoprevention is particularly effective in pregnant women and young children. Intermittent preventive treatment in pregnancy (IPTp) (i.e. administration of sulfadoxine-pyrimethamine [SP] during the second and third trimester of pregnancy) has been shown to reduce severe maternal anaemia (*4*), low birth weight (*5*) and perinatal mortality (*6*). Seasonal malaria chemoprevention (SMC) with amodiaquine plus SP (AQ+SP) for children aged 3–59 months could avert millions of cases and thousands of deaths in children living in areas of highly seasonal malaria transmission in Africa's Sahel subregion; SMC works by maintaining therapeutic antimalarial drug concentrations in the blood during periods of greatest malaria risk (*7*). Intermittent preventive treatment for infants (IPTi) with SP, delivered at routine childhood immunization clinics, provides protection in the first year of life against clinical malaria and anaemia; it reduces hospital admissions for infants with malaria and admissions for all causes (*8*).

Confirmation of malaria infection directs care to those most in need, and for those in need, current medicines against malaria are highly effective. In most malaria-endemic areas, less than half of patients with suspected malaria infection are actually infected with a malaria parasite. Parasitological diagnostic tests for malaria – examination of a blood smear by microscopy or rapid diagnostic test (RDT) – confirm infection in suspected cases of malaria, indicating which patients should be treated for malaria and for which patients another cause of fever should be sought. In relation to treatment, artemisinin-based combination therapy (ACT) treatment of uncomplicated *P. falciparum* malaria has been estimated to reduce malaria mortality in children aged 1–23 months by 99% (range: 94–100%), and in children aged 24–59 months by 97% (range: 86–99%) (*9*).

WHO recommendations on the deployment of these interventions are continually reviewed and updated. Current recommendations are summarized on the WHO website (*10*). WHO's evidence-based policy-setting work is supported by the Malaria Policy Advisory Committee (MPAC), established in 2011. The MPAC brings together some of the world's foremost experts on malaria, and is supported by technical expert groups and evidence review groups that focus on specific thematic areas. During 2014, WHO issued several new recommendations and guidance documents on malaria control and elimination (see Box 1.1).

Box 1.1 Recommendations and guidance documents issued by WHO in 2014

New guidance issued by WHO in line with MPAC recommendations

In 2014, WHO produced revised guidance on vector control, including management of long-lasting insecticidal nets, alone and in combination with indoor residual spraying, tackling residual transmission and malaria diagnostics:

- *Guidance for countries on combining indoor residual spraying and long-lasting insecticidal nets* (*11*)
- *Recommendations on the sound management of old long-lasting insecticidal nets* (*12*)
- *Guidance note on the control of residual malaria parasite transmission* (*13*)
- *Policy recommendation on malaria diagnostics in low transmission settings* (*14,15*).

Additional technical documents, evaluations and assessments

WHO also produced or collaborated on other materials, including a new manual, modelling software, and updates on rapid diagnostic tests and artemisinin resistance:

- *From malaria control to malaria elimination: a manual for elimination scenario planning* (*16*)
- *Malaria Tools* (malaria transmission modelling software) (*17*)
- *Malaria rapid diagnostic test performance. Results of WHO product testing of malaria RDTs, Round 5* (*18*)
- *Information note on recommended selection criteria for procurement of malaria rapid diagnostic tests* (*19*)
- *WHO updates on artemisinin resistance* (*20*).

MALARIA CONTROL IS ONE OF THE HIGHEST PRIORITIES ON THE INTERNATIONAL HEALTH AGENDA.

1.3 Global goals and targets for malaria

Malaria control is critical to achieving the Millennium Development Goals (MDGs). MDG 6 (to halt by 2015 and begin to reverse the incidence of malaria and other major diseases) specifically addresses malaria; malaria control also contributes to the achievement of other MDGs. Given that malaria accounted for an estimated 13% of post-neonatal child deaths globally in 2010, and 21% in sub-Saharan Africa (*21*), malaria control is also central to MDG 4 (to achieve a two thirds reduction in the mortality rate among children aged under 5 years between 1990 and 2015). Malaria efforts are additionally expected to contribute to achieving MDG 1 (eradicate extreme poverty and hunger), MDG 2 (achieve universal primary education), MDG 3 (promote gender equality and empower women), MDG 5 (improve maternal health) and MDG 8 (develop a global partnership for development).

Malaria is the focus of World Health Assembly and Roll Back Malaria (RBM) targets. In 2005, the World Health Assembly set as a target the reduction of malaria cases and deaths by 75% by 2015. In 2011, the RBM Partnership updated the objectives and targets that had been set out in the Global Malaria Action Plan in 2008 (*22*). The update shares the Assembly's objective of reducing malaria cases by 75% by 2015, but has a new and more ambitious objective to reduce malaria deaths to near zero by 2015 (see Table 1.1). A further objective is to eliminate malaria by the end of 2015 in 8–10 new countries (since 2008) and in the WHO European Region. The objectives of mortality and morbidity reduction are linked to targets for malaria intervention coverage.

Indicators of progress provide a means to monitor the success of international control efforts in achieving these updated goals and targets. A list of recommended indicators against each objective and target is shown in Table 1.1. Indicators that can be generated from household surveys are shown in bold. In some cases, the indicators generated by household surveys do not measure a target directly (e.g. all-cause under-5 mortality rate is not a direct measure of malaria mortality), but the indicator is in widespread use and has therefore been placed alongside the most appropriate RBM target.

In 2015, WHO aims to launch a new technical strategy for 2016–2030. Following a proposal by the MPAC in 2012, WHO began coordinating the development of a Global Technical Strategy for Malaria for the post-2015 period. This strategy will set milestones and goals for burden reduction and elimination beyond 2015. It has been developed in close collaboration with the RBM Partnership's Global Malaria Action Plan 2 (GMAP 2), which will focus on global advocacy, resource mobilization, partner harmonization and the engagement of non-health sectors for the implementation of the technical strategy.

The WHO vision is for "A world free of malaria". This can be achieved through country-by-country (and later regional) elimination of malaria infection, followed by global malaria eradication. Malaria *elimination* refers to the reduction of the incidence of infection to zero in a defined geographical area as a result of deliberate efforts. The official recognition of malaria-free status is granted by WHO once it has been proven beyond reasonable doubt that the chain of local human malaria transmission by *Anopheles* mosquitoes has been interrupted in an entire country for 3 consecutive years. Malaria *eradication* is the permanent reduction to zero of the worldwide incidence of infection caused by a particular malaria parasite species. Intervention measures will no longer be needed once eradication has been achieved.

Table 1.1 Roll Back Malaria objectives, targets for 2015 and indicators for measuring progress (*23*)

GMAP Objective or Target	Key Indicator	Further Analysis	Supporting Indicator
Objective 1 Reduce global malaria deaths to near zero* by end 2015	Inpatient malaria deaths per 1000 persons per year	Has health facility reporting completeness changed over time?	Completeness of monthly health facility reports
	All-cause under 5 mortality rate	What factors are responsible?	**Programme coverage indicators in this table (detailed below)**
Target 1.1 Achieve universal access to case management in the public sector	Proportion of suspected malaria cases that receive a parasitological test		
	Proportion of children under 5 years old with fever in the last two weeks who had a finger or heel stick	Are people seeking advice or treatment for fever and from where?	**Proportion of children under 5 years old with fever in the last two weeks for whom advice or treatment was sought**
Target 1.2 Achieve universal access to case management, or appropriate referral, in the private sector	Proportion of confirmed malaria cases that receive first-line antimalarial treatment according to national policy	Are adequate quantities of antimalarial medicines available?	Proportion of health facilities without stock-outs of key commodities by month
Target 1.3 Achieve universal access to community case management (CCM) of malaria	**Proportion receiving first-line treatment among children under 5 years old with fever in the last two weeks who received any antimalarial drugs**		
Objective 2 Reduce global malaria cases by 75% by end 2015 (from 2000 levels)	Confirmed malaria cases (microscopy or RDT) per 1000 persons per year	Has diagnostic effort changed over time?	Annual blood examination rate
		Has health facility reporting completeness changed over time?	Completeness of monthly health facility reports
		Have test positivity rates changed over time?	Malaria test positivity rate
	Parasite prevalence: proportion of children aged 6–59 months with malaria infection	Is there other evidence of morbidity change?	**Proportion of children aged 6–59 months with a hemoglobin measurement of <8 g/dL**
Target 2.1 Achieve universal access to and utilization of prevention measures**	**Proportion of population with access to an ITN within their household**	How many households have at least one ITN?	**Proportion of households with at least one ITN**
		How many households have enough ITNs for each occupant?	**Proportion of households with at least one ITN for every two people**
		Were enough ITNs delivered to ensure at least one ITN per two people at risk?	Proportion of population at risk potentially covered by ITNs distributed
		Are specific risk groups receiving ITNs?	Proportion of targeted risk group receiving ITNs
	Proportion of population that slept under an ITN the previous night	Are specific population groups using ITNs?	**Proportion of children under 5 years old who slept under an ITN the previous night**
			Proportion of pregnant women who slept under an ITN the previous night
Target 2.2 Sustain universal access to and utilization of prevention measures**		Are available ITNs being used?	**Proportion of existing ITNs used the previous night**
	Proportion of population protected by IRS within the last 12 months		
	Proportion of households with at least one ITN for every two people and/or sprayed by IRS within the last 12 months	How many households have been reached with at least one vector control method?	**Proportion of households with at least one ITN and/or sprayed by IRS within the last 12 months**
	Proportion of women who received at least three or more doses of IPTp during ANC visits during their last pregnancy	Is IPTp received by all pregnant women at each scheduled ANC visit?	**Proportion of women who received at least one, two or four doses of IPTp during ANC visits during their last pregnancy**
			Proportion of women attending antenatal care (ANC) who received at least one, two, three or four doses of IPTp
Target 2.3 Accelerate development of surveillance systems	Percent of districts reporting monthly numbers of suspected malaria cases, number of cases receiving a diagnostic test and number of confirmed malaria cases		
Objective 3 Eliminate malaria by end 2015 in 10 new countries (since 2008) and in the WHO European Region	Number of new countries in which malaria has been eliminated	What are the trends in malaria cases?	Number of active foci reported per year
			Number of cases by classification (indigenous, introduced, imported, induced)
		How strong are surveillance systems?	Proportion of private facilities reporting to national malaria surveillance system

Indicators derived from household surveys are in bold.

* In areas where public health facilities are able to provide a parasitological test for all suspected malaria cases, near zero malaria deaths is defined as no more than 1 confirmed malaria death per 100 000 population at risk.

** Universal access to and utilization is defined as every person at risk sleeping under a quality insecticide-treated net or in a space protected by indoor residual spraying and every pregnant woman at risk receiving a dose of IPTp at each ANC visit after the first trimester (in settings where IPTp is appropriate).

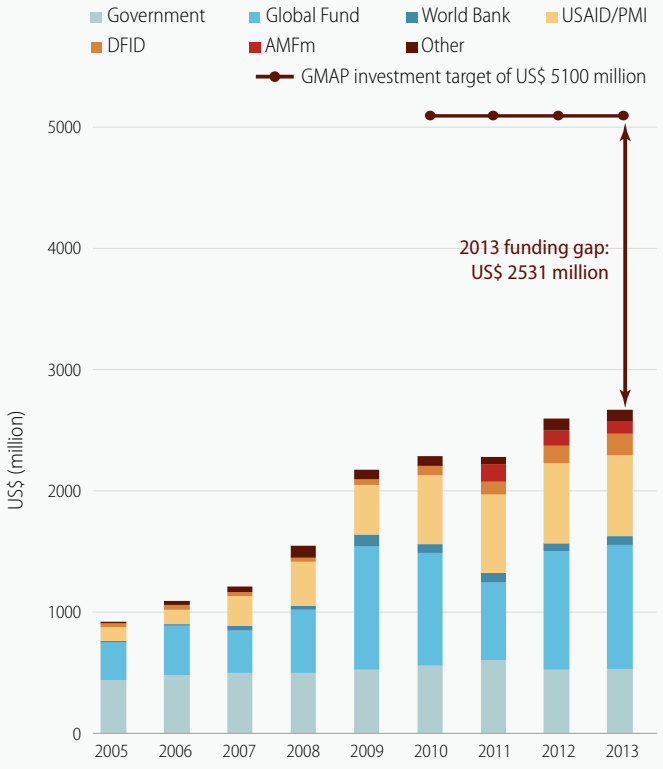
2. FINANCING FOR MALARIA PROGRAMMES

2.1 Growth in annual funding for malaria

Annual funding for malaria control and elimination totalled US$ 2.7 billion in 2013, almost three times the amount spent in 2005. International investments represented 82% of total malaria funding in 2013 (**Figure 2.1**), totalling US$ 2.18 billion. Domestic funding for malaria reached US$ 527 million. However, domestic funding tallied here excludes expenditures for health-worker salaries and other shared costs of diagnosing and treating patients; therefore, it does not reflect the full contribution of endemic country governments to malaria control. Compared to 2012, total malaria funding in 2013 increased by 3%. Although the 2013 total exceeds that of any previous year, it represents just 52% of the annual estimated requirement of US$ 5.1 billion[1] to attain international targets for malaria control and elimination (*24*).

Growth of funding has been greatest in the WHO African Region, where the disease burden is greatest. International investments grew at an annual average rate of 22% per year between 2005 and 2013 in the WHO African Region, compared to 15% across all other WHO regions (**Figure 2.2**). During the same period, domestic investments grew at an annual average rate of 4% in the WHO African Region, compared to 2% in other WHO regions. In 2013, the WHO African Region accounted for 72% of total malaria funding, compared to 50% in 2005; also, international investments accounted for 91% of the total investments in the WHO African Region, compared to 41% in other WHO regions. Funding for malaria has not grown in the other WHO regions since 2010.

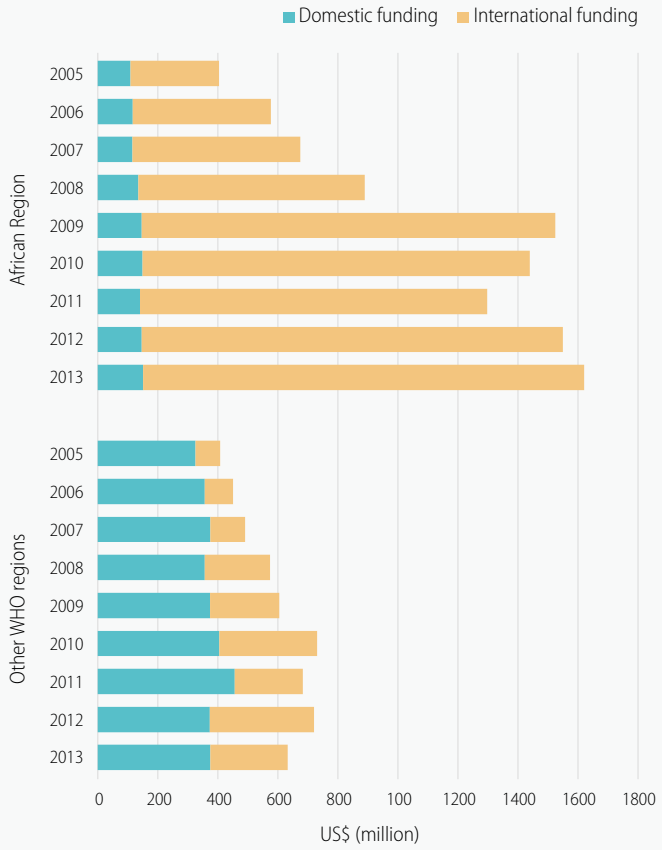
Figure 2.1 Trends in total funding for malaria control and elimination 2005–2013, and 2013 estimated funding gap



AMFm, Affordable Medicine Facility–malaria; DFID, United Kingdom Department for International Development; Global Fund, Global Fund to Fight AIDS, Tuberculosis and Malaria; GMAP, Global Malaria Action Plan; PMI, United States President's Malaria Initiative; USAID, United States Agency for International Development

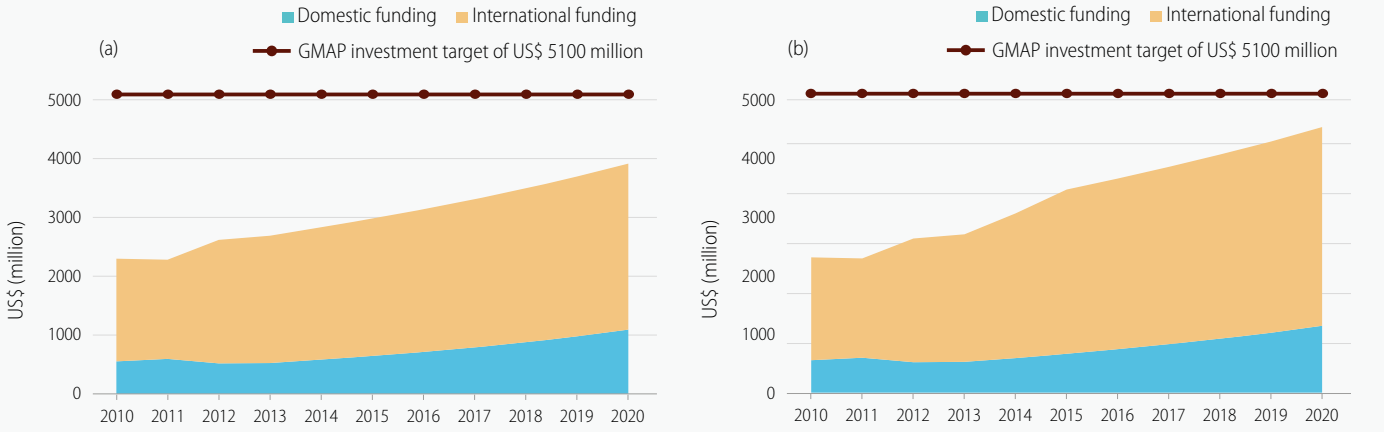
Source: *National malaria control programmes; Global Fund, USAID and Centers for Disease Control and Prevention (CDC) websites; Organisation for Economic Co-operation and Development (OECD) creditor reporting system; and Roll Back Malaria 2008 GMAP*

Figure 2.2 Trends in domestic and international funding in the WHO African Region and other WHO regions, 2005–2013



Source: *National malaria control programmes; Global Fund to Fight AIDS, Tuberculosis and Malaria and President's Malaria Initiative websites; OECD creditor reporting system; and Roll Back Malaria 2008 Global Malaria Action Plan*

Figure 2.3 Anticipated funding if a) domestic and international investments increase in line with total government expenditure growth estimated by the IMF for 2014–2020, and b) funders prioritize further investments in malaria control



GMAP, Global Malaria Action Plan; IMF, International Monetary Fund

Source: *National malaria control programmes; Global Fund; PMI; OECD Development Assistance Committee database; International Monetary Fund forecast growth rates of government expenditures and revenue; and Roll Back Malaria 2008 GMAP*

FUNDING GAPS CAN BE NARROWED IF GOVERNMENTS OF BOTH MALARIA-ENDEMIC AND DONOR COUNTRIES GIVE HIGHER PRIORITY TO INVESTMENTS IN MALARIA CONTROL.

2.2 Future funding directions

Total malaria funding can increase significantly if investments increase in line with forecasted total government expenditures, and if domestic and international funders prioritize further investments for malaria control. Two scenarios for future funding were explored to assess the prospects of achieving the targeted annual estimated requirement of US$ 5.1 billion between 2014 and 2020.

- Scenario 1 assumes that domestic and international investments towards malaria control increase at the International Monetary Fund (IMF) forecast of total government expenditures for both endemic and donor countries. This scenario shows that total funding could reach US$ 3.8 billion by 2020, but still results in an estimated annual resource gap of US$ 1.3 billion in 2020 – equivalent to a cumulative funding gap of US$ 13.3 billion for 2014–2020. The contribution of domestic funding to total global malaria funding would nevertheless increase from 20% in 2013 to 29% in 2020 (**Figure 2.3a**).
- Scenario 2 assumes that for international sources (i) malaria funding between 2013 and 2015 increases in line with a targeted expansion of total development budgets to an internationally agreed target of 0.7% of gross national income (GNI) by 2015 (*25,26*) and (ii) malaria funding from 2016 to 2020 continues to grow in line with the average IMF forecast of total government expenditures for donor countries over the same period. Scenario 2 also assumes that governments of endemic countries increase the priority they give to malaria funding, and assumes that governments that show a below average value of a domestic investment priority index (DIPI) for malaria (see **Annex 1**) increase their DIPI to the median level of endemic countries. Under this scenario, total funding for malaria control would increase to US$ 4.3 billion by 2020, leaving an annual funding gap of US$ 774 million in 2020, equivalent to a cumulative total funding gap of US$ 10 billion for 2014–2020. Domestic funding would account for 26% of total malaria funding by 2020 (**Figure 2.3b**).

Under both scenarios, substantial additional funds would be mobilized for malaria control and elimination. However, the total amount available in 2020 would still fall short of the annual estimated US$ 5.1 billion required to achieve international targets.

1. Excludes research and development (R&D) annual required investments estimated at US$ 750–900 million.

3. VECTOR CONTROL FOR MALARIA

AN INCREASING PROPORTION OF THE POPULATION IN SUB-SAHARAN AFRICA IS PROTECTED BY ITNs.

3.1 Insecticide-treated mosquito nets

Most malaria-endemic countries have adopted policies to promote universal access to ITNs. WHO recommends that, in areas targeted for ITNs, all those at risk should be protected. Most of the 97 countries with ongoing malaria transmission distribute ITNs free of charge, and 83 distribute ITNs or LLINs to all age groups (**Table 3.1**). In 67 countries, ITNs are distributed to all age groups through mass campaigns. In the WHO African Region – which has the highest proportion of the population at high risk of malaria, and in which the characteristics of the malaria vectors in most areas make them amenable to intervention with ITNs – mass campaigns are supplemented by distribution of ITNs to pregnant women at antenatal care (ANC) clinics in 34 countries, and to infants through expanded programme on immunization (EPI) clinics in 26 countries.

The proportion of the population with access to an ITN and sleeping under one has increased markedly in sub-Saharan Africa over the past 10 years. Based on data from household surveys, and reports on ITNs delivered by manufacturers and distributed by national malaria control programmes (NMCPs), an estimated 49% (range 44–54%) of the population at risk had access to an ITN in their household in 2013, compared to 3% in 2004 (**Figure 3.1a**). An estimated 44% (39–48%) were sleeping under an ITN in 2013 compared to 2% in 2004. ITNs are used by a high proportion of those who have access to them (90%); therefore, the population sleeping under an ITN closely tracks the proportion with access to an ITN.

Not all households have enough nets to protect all household members and achieve universal ITN access. The proportion of households owning at least one ITN has increased markedly over the past decade, from 5% in 2004 to 67% (61–74%) in 2013 (**Figure 3.1b**). However, in 2013, only 29% (27–32%) of households had enough ITNs for all household members, limiting attainment of universal ITN access. Moreover, one third of households did not own even a single ITN. It is critical to reach all households with ITNs, and supply enough ITNs for all household members, to ensure that all those at risk are protected from malaria.

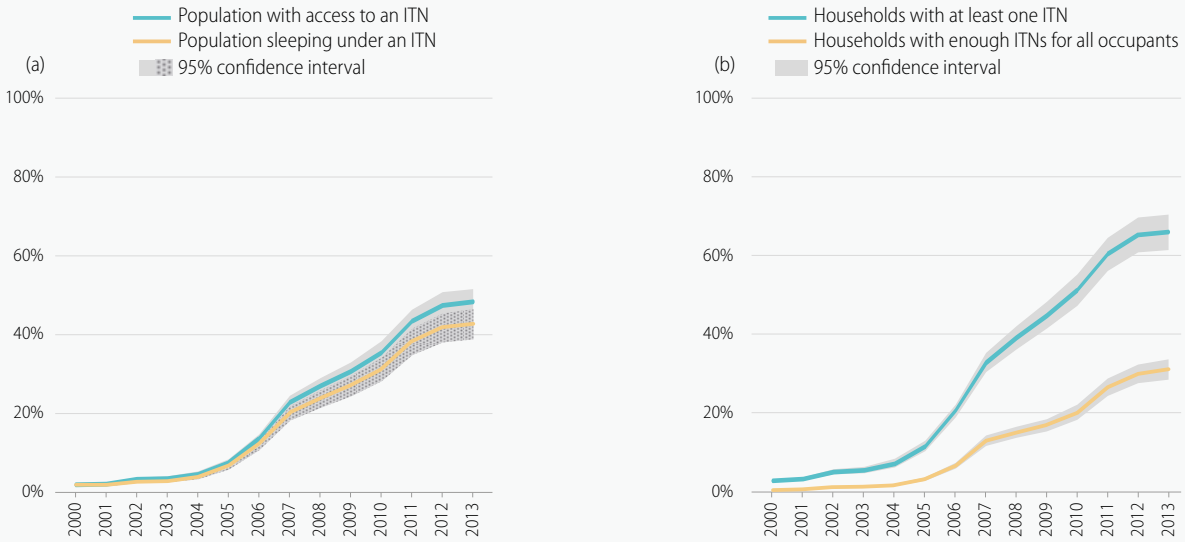
Table 3.1 Adoption of policies for ITN programmes, by WHO region, 2013

Policy	AFR	AMR	EMR	EUR	SEAR	WPR	Total
ITNs/ LLINs are distributed free of charge	41	19	8	2	10	10	90
ITNs/ LLINs are sold at subsidized prices	14	1				2	16
ITNs/ LLINs are distributed to all age groups	38	18	7	1	10	9	83
ITNs/ LLINs are distributed through mass campaigns to all age groups	36	15	6		7	6	67
ITNs/ LLINs are distributed through antenatal clinics	34	3	3		4	5	49
ITNs/ LLINs are distributed through EPI clinics	26		1		1	1	29
Countries/areas with ongoing malaria transmission	**45**	**21**	**8**	**3**	**10**	**10**	**97**

AFR, African Region; AMR, Region of the Americas; EMR, Eastern Mediterranean Region; EPI, Expanded Programme on Immunization; EUR, European Region; ITN, insecticide-treated mosquito net; LLIN, long-lasting insecticidal net; SEAR, South-East Asia Region; WPR, Western Pacific Region

Source: *National malaria control programme reports*

Figure 3.1 a) Proportion of population with access to an ITN and proportion sleeping under an ITN, b) Proportion of households with at least one ITN and proportion of households with enough ITNs for all persons, sub-Saharan Africa, 2000–2013



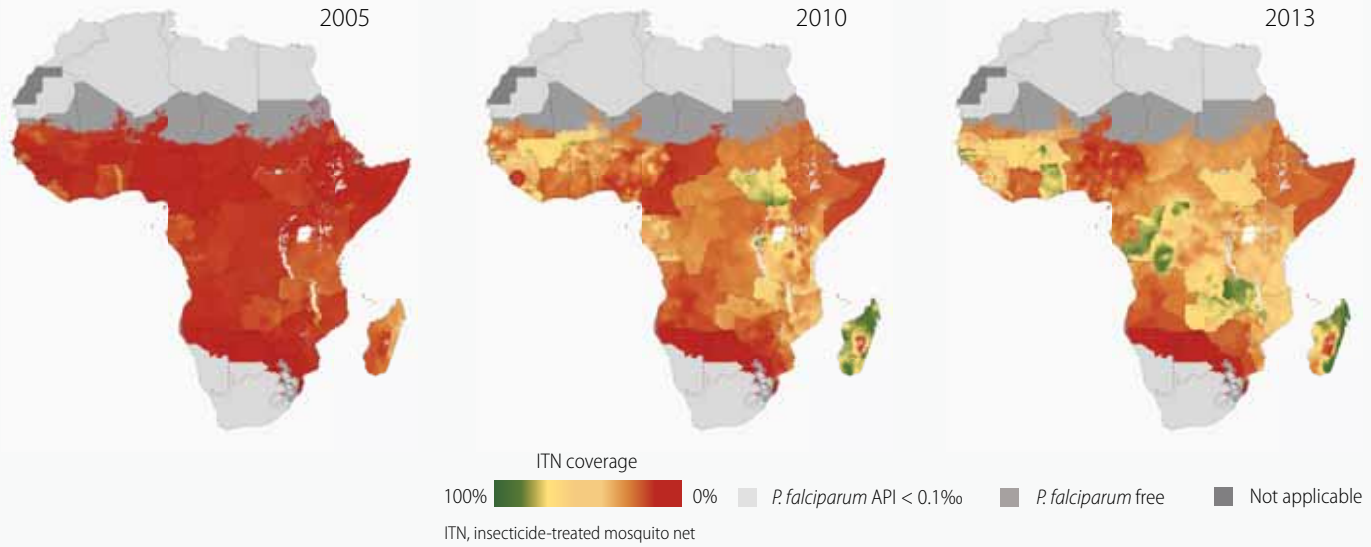
ITN, insecticide-treated mosquito net

Source: *ITN coverage model from the Malaria Atlas Project (based at the University of Oxford)*

IN 15 AFRICAN COUNTRIES OVER HALF THE POPULATION AT RISK WAS PROTECTED BY ITNs.

Improvements in access to ITNs and their use vary considerably between different geographical areas. In 2005, the proportion of the population sleeping under an ITN was generally low, with only six countries achieving coverage levels greater than 20% (**Figure 3.2**). Coverage remained low during the next several years, in particular in large countries with a high burden of malaria. By 2010, substantial progress had been made, although few areas had more than half of the population protected by ITNs. Progress in ITN coverage continued and, by 2013, in several high-transmission countries in West and Central Africa, over half the at-risk population was protected with ITNs. High ITN coverage is linked to mass campaigns, and in countries where campaigns have not occurred recently a lower proportion of the population is protected with ITNs.

Figure 3.2 Proportion of population sleeping under an ITN, sub-Saharan Africa



ITN, insecticide-treated mosquito net

Source: *Insecticide-treated mosquito net coverage model from Malaria Atlas Project*

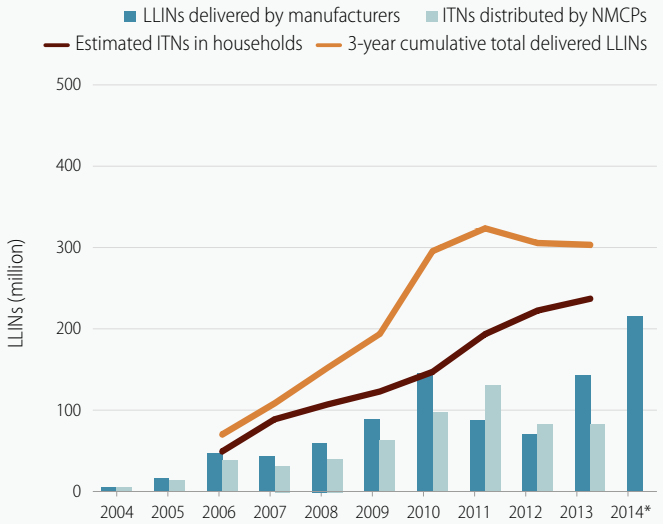
THE NUMBER OF LLINs DELIVERED TO COUNTRIES HAS INCREASED DRAMATICALLY OVER THE PAST 2 YEARS.

3.2 Delivery and distribution of nets

The number of LLINs delivered to sub-Saharan African countries and distributed by national programmes increased in 2013 and 2014. This increased procurement and distributions of nets has led to an increase in the proportion of the population sleeping under an ITN. In recent years, all distributed nets, and therefore most of the available nets, have been LLINs. Over 142 million LLINs were delivered to countries in sub-Saharan Africa by manufacturers in 2013; a total of 214 million are projected to be delivered in 2014, the largest number of LLINs ever delivered in one year (**Figure 3.3**). Adding these nets to the 70 million delivered in 2012, a cumulative total of 427 million will have been delivered to countries in sub-Saharan Africa between 2012 and 2014. However, a comparison of the estimated number of LLINs available in households with the reported number of net deliveries suggests that allocation of LLINs during distribution is not 100% efficient (because some households receive additional nets before their existing nets have expired); it also suggests that over half of distributed ITNs are lost from households within 24 months. Consequently, not all of the 427 million delivered nets were available in households in 2014.

Improvements in net distribution and LLIN durability could reduce the number of LLINs needed per year to achieve universal access. If allocations of nets to households were 100% efficient, and a higher proportion of distributed nets were retained in households after 3 years (e.g. if nets had a 3-year half-life), then deliveries of 200 million ITNs per year would be sufficient to give 90% of the population at risk access to an ITN in their household. However, with current distribution patterns and loss rates for nets, nearly 300 million ITNs would be needed per year for 90% of the population at risk to have access to an ITN in their household (**Figure 3.4**).

Figure 3.3 Number of LLINs delivered, distributed and estimated in households, sub-Saharan Africa, 2004–2014

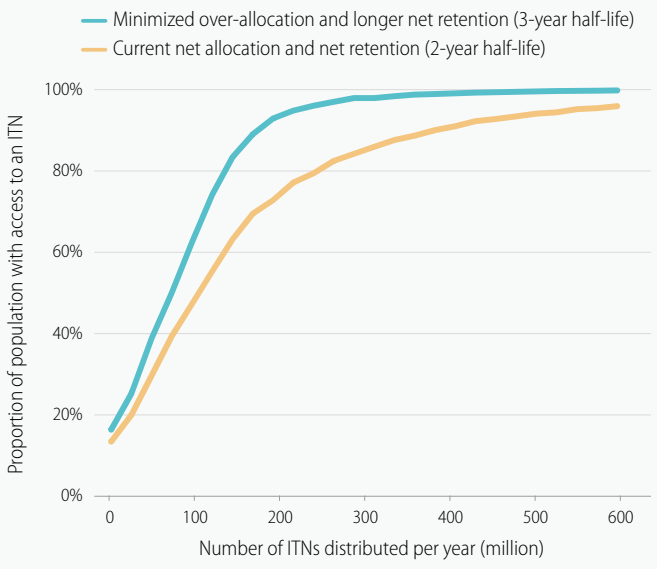


ITN, insecticide-treated mosquito net; LLIN, long-lasting insecticidal net; NMCP, national malaria control programme

*LLIN deliveries in 2014 projected from the report for the third quarter of the year

Source: *NMCP reports, Malaria Atlas Project and John Milliner (Milliner Global Associates)*

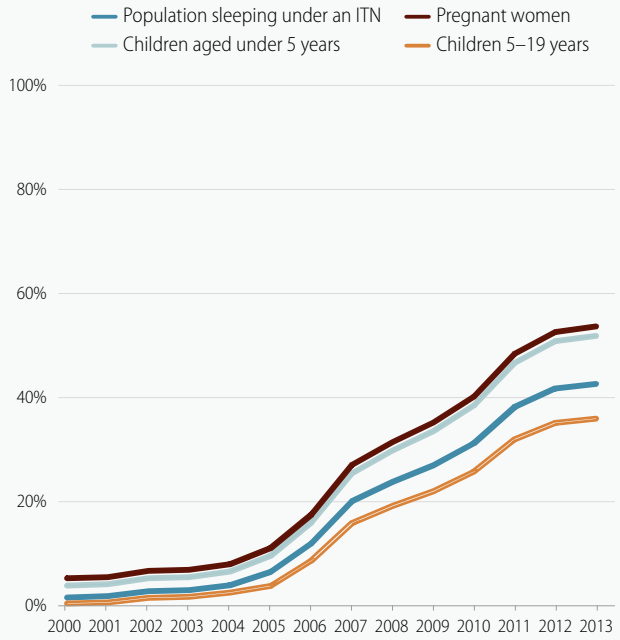
Figure 3.4 Estimated proportion of population with access to an ITN compared to the number of ITNs distributed per year, by net allocation efficiency and net retention



ITN, insecticide-treated mosquito net

Source: *Insecticide-treated mosquito net coverage model from Malaria Atlas Project*

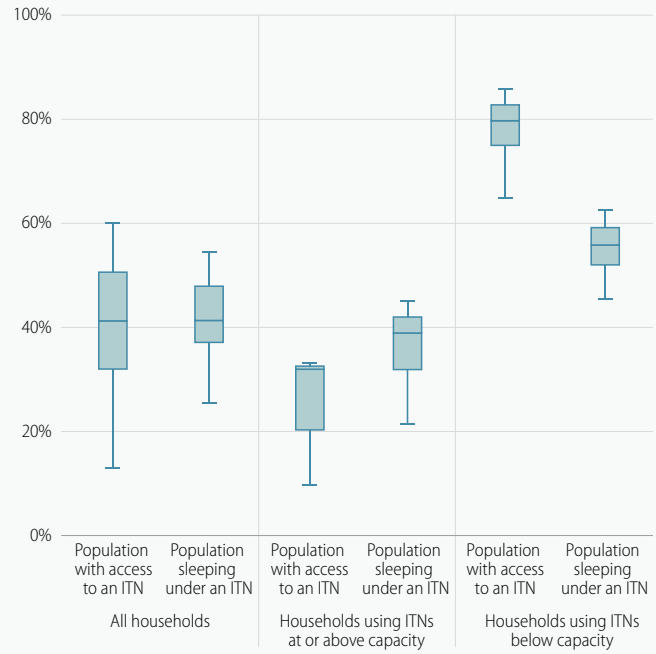
Figure 3.5 Proportion of population sleeping under an ITN, by selected subpopulations, sub-Saharan Africa, 2000–2013



ITN, insecticide-treated mosquito net

Source: *Insecticide-treated mosquito net coverage model from Malaria Atlas Project; household surveys*

Figure 3.6 Proportion of population with access to an ITN and proportion sleeping under an ITN, by household use of available ITNs, 13 countries, sub-Saharan Africa, 2012–2013



ITN, insecticide-treated mosquito net

Source: *Household surveys*

COMMUNICATION ON ITN USE MAY NEED TO BE FURTHER TARGETED TO ENSURE FULL USE OF AVAILABLE NETS.

Use of ITNs among vulnerable groups such as young children and pregnant women is higher than in the population as a whole. Use of available nets by the population with access to them has been consistently high during the time that access to ITNs has been steadily increasing. Consequently, the proportion of children aged under 5 years and the proportion of pregnant women sleeping under an ITN has increased steadily over the past decade, and is even greater than the proportion of the population as a whole sleeping under a net (**Figure 3.5**). However, children aged 5–19 years are sleeping under ITNs at a lower rate than the population as a whole.

Some households may need more than one net per two persons to ensure all household members are able to sleep under an ITN. The high level of ITN use among the population with access to nets includes households using their available nets at or beyond the assumed capacity of two persons per net, and households using nets below their full capacity. Analysis of household surveys from 11 countries during 2013–2014 shows that, in a median of 79% (range 3–30%) households, the proportion of the population sleeping under an ITN was equal to or greater than the proportion with access to a net (**Figure 3.6**). In approximately 21% (range 70–97%) of households, nets were used below their capacity, with only 65% of the population with access to an ITN sleeping under one. Due to household sleeping arrangements, more than one net per two persons may be needed in these households to ensure all household members are protected by an ITN.

IRS IS USED BY MOST MALARIA-ENDEMIC COUNTRIES, BUT GENERALLY PROTECTS ONLY A SMALL PROPORTION OF THE POPULATION AT RISK.

3.3 Spraying and larval control for malaria

IRS for vector control has been widely adopted. It is applicable in many epidemiological settings, provided that policy and programming decisions take into account the operational and resource feasibility of IRS. For programmes conducting IRS, WHO recommends the spraying of at least 80% (ideally 100%) of houses, structures and units in the target area in any round of spraying. In areas where IRS is the main form of vector control, the insecticide used for IRS should be rotated annually to preserve the effectiveness of current compounds. IRS for vector control has been adopted as policy for the control of malaria in 88 countries worldwide, including 42 of 45 malaria-endemic countries in the WHO African Region (Table 3.2).

The WHO African Region has the highest coverage rates for IRS, but the proportion of the at-risk population protected has decreased in recent years. While national programmes may target different proportions of the at-risk populations for IRS, comparison of the number of persons protected by IRS among the total population at risk allows for comparison of the extent to which IRS is used across countries and regions. National programmes reported that 123 million people, representing 3.5% of the global population at risk, were protected by IRS in 2013, decreasing from more than 5% in 2010 (Figure 3.7). Aside from the WHO European Region, in which populations at risk are small, the WHO African Region had the highest proportion of the population at risk protected by IRS. That proportion increased substantially during 2006–2008, and reached 11% in 2010, but it decreased during 2010–2012; in 2013, 55 million people were protected, representing 7% of the population at risk. The recent regional decrease is accounted for by changes in a few countries, in particular Ethiopia, which accounted for 42% of the population protected by IRS in the region in 2013. The proportion of the population at risk protected by IRS did not change substantially in other regions.

Pyrethroids were the primary class of insecticide used by countries implementing IRS. Among 63 countries providing information on insecticides used for IRS, 53 reported using pyrethroids in 2013. Carbamates were used by 12 countries, and 13 countries reported using an organophosphate. Of the 48 countries that reported on insecticides used for the past 3 years, seven changed from use of a pyrethroid to a non-pyrethroid insecticide; changing to an insecticide class with a different mode of action is one component of a comprehensive insecticide resistance management programme (see Section 3.4).

Larval control is used by 38 countries. Larval control involves vector habitat modification and manipulation, larviciding and biological control.

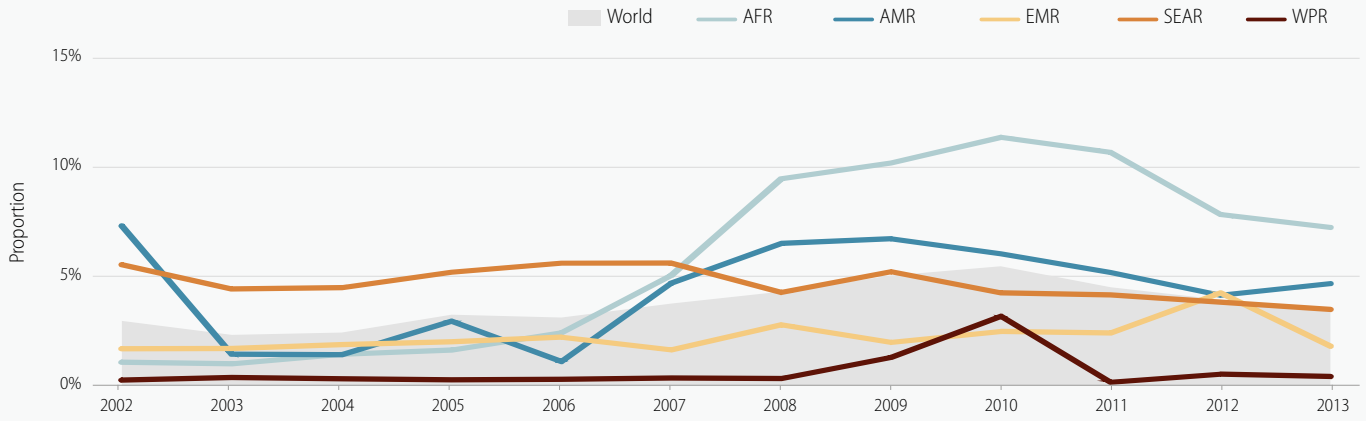
Table 3.2 Adoption of policies for IRS programmes, by WHO region, 2013

Policy	AFR	AMR	EMR	EUR	SEAR	WPR	Total
IRS is recommended by malaria control programme	42	18	8	3	10	7	88
IRS is used for the prevention and control of epidemics	15	9	4		4	6	38
IRS and ITNs are used together for malaria control in at least some areas	31	11	4		5	6	57
DDT is used for IRS	9				1		11
Insecticide resistance monitoring is undertaken	37	5	6	3	3	2	56
Number of countries/areas with ongoing malaria transmission	**45**	**21**	**8**	**3**	**10**	**10**	**97**
Number of countries/areas with ongoing *P. falciparum* transmission	**44**	**18**	**8**		**9**	**9**	**88**

AFR, African Region; AMR, Region of the Americas; EMR, Eastern Mediterranean Region; DDT, dichloro-diphenyl-trichloroethane; EPI, Expanded Programme on Immunization; EUR, European Region; IRS, indoor residual spraying; ITN, insecticide-treated mosquito net; LLIN, long-lasting insecticidal net; SEAR, South-East Asia Region; WPR, Western Pacific Region

Source: *National malaria control programme reports*

Figure 3.7 Proportion of population at risk protected by IRS, by WHO region, 2002–2013



AFR, African Region; AMR, Region of the Americas; EMR, Eastern Mediterranean Region; IRS, indoor residual spraying; SEAR, South-East Asia Region; WPR, Western Pacific Region

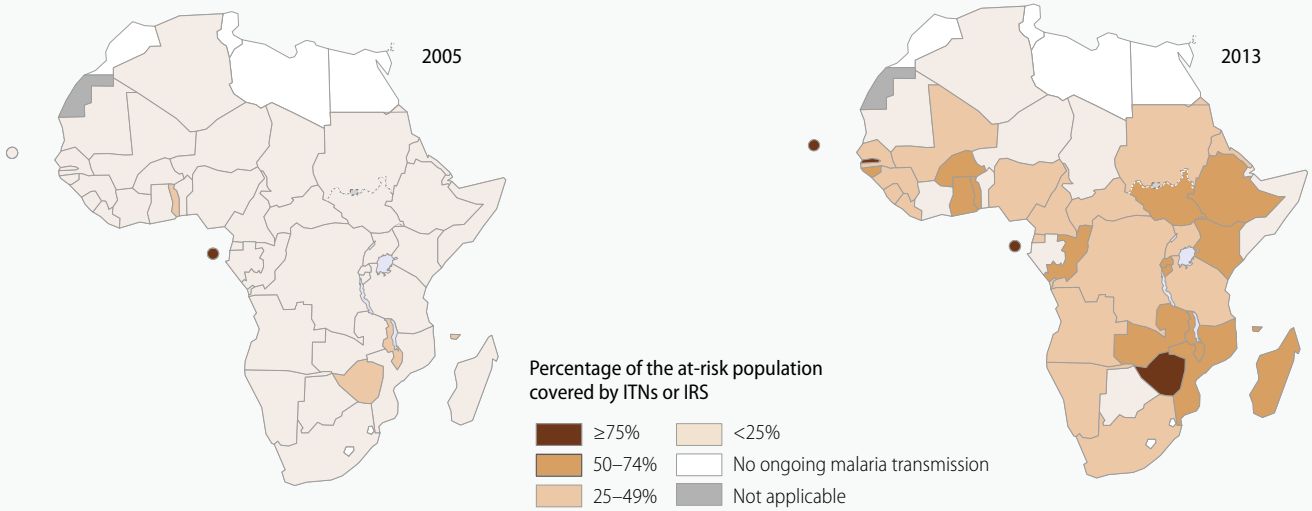
Source: *National malaria control programme reports*

IN AFRICA, THE PROPORTION OF THE POPULATION PROTECTED BY AT LEAST ONE VECTOR CONTROL METHOD HAS INCREASED IN RECENT YEARS, AND WAS 48% (44–51%) IN 2013.

WHO recommends larviciding only in settings where mosquito breeding sites are few, fixed and findable, and where these sites are easy to identify, map and treat. In 2013, 38 countries provided information on the use of larval control. Use of vector habitat manipulation (temporary changes) was reported by 11 countries, habitat modification (long-lasting transformation) by 10; larval control through chemical larviciding by 27, and biological control by 28. These reports give an indication of the range of larval control methods employed, although the scale of the efforts was not quantified and their impact cannot easily be measured.

The proportion of the population in sub-Saharan Africa protected by at least one of the core vector control interventions (ITNs and IRS) has increased substantially since 2000. This increase is evident from combining information on the proportion of the population protected by IRS reported by NMCPs with the modelled estimates of the proportion of the population sleeping under an ITN (**Figure 3.8**). In 2013, nearly 50% of the population in sub-Saharan Africa was protected by at least one vector control intervention. More than 75% of the population at risk was protected by either ITNs or IRS in Cabo Verde, the Gambia, Sao Tome and Principe and Zimbabwe.

Figure 3.8 Proportion of the population at risk protected by ITNs or IRS, in sub-Saharan Africa, 2005 and 2013



IRS, indoor residual spraying; ITN, insecticide-treated mosquito net

Source: *NMCP reports, insecticide-treated mosquito net coverage model from Malaria Atlas Project*

INSECTICIDE RESISTANCE MONITORING AND REPORTING ARE KEY COMPONENTS OF INSECTICIDE RESISTANCE MANAGEMENT STRATEGIES.

3.4 Insecticide resistance management

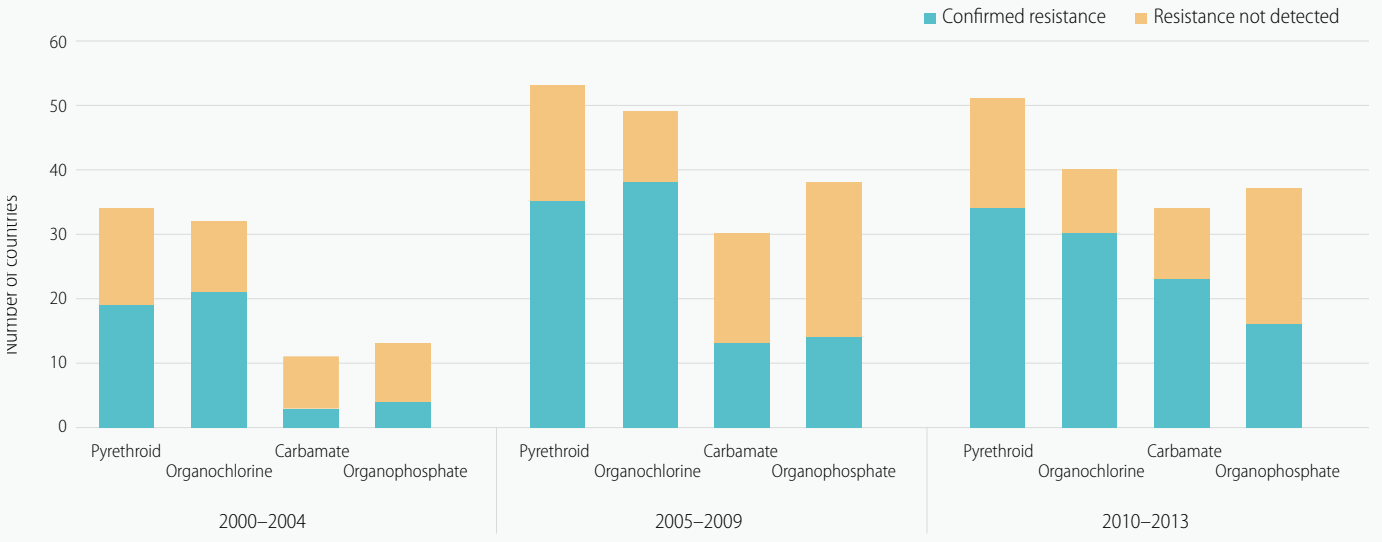
The effectiveness of vector control is threatened as malaria mosquitoes develop resistance to the insecticides used in ITNs and IRS. Current global malaria control efforts rely heavily on a single insecticide class: pyrethroids. This is the only class used in LLINs, and it is also applied in many IRS programmes (although three other insecticide classes are also used in IRS). Resistance of malaria vectors to insecticides has the potential to compromise the gains achieved through malaria vector control, and limit any further success.

Recognizing the threat posed by insecticide resistance, WHO released the *Global plan for insecticide resistance management in malaria vectors* (GPIRM) (*27*). The GPIRM emphasises five strategies: undertake resistance monitoring; implement insecticide resistance management strategies; fill knowledge gaps on mechanisms of insecticide resistance and the impact of resistance management; develop new vector control tools; and ensure that key enabling mechanisms are in place.

A system has been established to track insecticide resistance globally in line with the GPIRM. WHO is coordinating international reporting of resistance data using a standardized tool. Bioassay data have been reported by 81 countries. Challenges include a lack of consolidated data at the national level, incomplete reporting of available data, and limited information on resistance mechanisms.

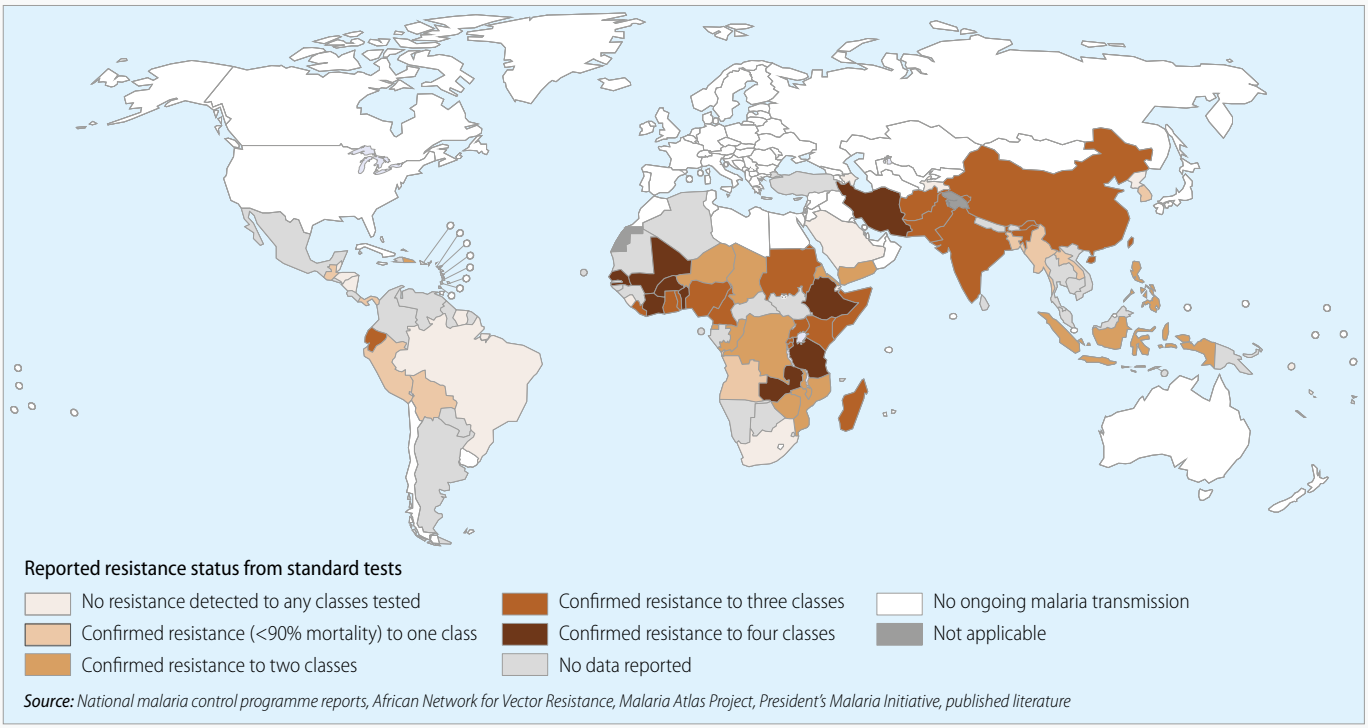
Many countries using insecticides for vector control were not monitoring insecticide resistance in 2013. Among the 96 countries that reported adopting policies for vector control with ITNs or IRS in 2013, only 82 reported that monitoring of insecticide resistance is undertaken, and only 42 countries provided resistance data for 2013, suggesting that monitoring is not conducted annually, as recommended in the GPIRM (**Figure 3.9**). Monitoring activities have increased since 2000, particularly in the WHO African Region. Few countries consistently test all insecticides against all local species of malaria vectors at each monitoring site. Pyrethroids are the most commonly tested, because of their extensive use in LLINs and IRS.

Figure 3.9 Number of countries reporting insecticide resistance monitoring results, by insecticide class and years of monitoring activity



Source: *National malaria control programme reports, African Network for Vector Resistance, Malaria Atlas Project, President's Malaria Initiative, published literature*

Figure 3.10 Countries reporting resistance since 2010, by number of insecticide classes



Source: *National malaria control programme reports, African Network for Vector Resistance, Malaria Atlas Project, President's Malaria Initiative, published literature*

SINCE 2010, INSECTICIDE RESISTANCE HAS BEEN REPORTED IN 49 COUNTRIES.

Insecticide resistance, especially to pyrethroids, is widespread in malaria vectors. Of the 63 countries reporting any monitoring data for 2010–2013, 49 reported resistance to at least one insecticide in one malaria vector from one collection site (**Figure 3.10**), and 39 countries reported resistance to two or more insecticide classes. Pyrethroid resistance was the most commonly reported (**Figure 3.9**); in 2013, two thirds of the countries monitoring this class reported resistance.

Recommendations of the GPIRM are slowly being implemented at the country level. In 2013, 14 of 63 countries reported the use of multiple insecticides of different classes for IRS. Seven countries that used pyrethroids for IRS in 2011 or 2012 used an alternative class with a different mode of action in 2013. In six cases this change was associated with a decline in IRS coverage, possibly due to the higher cost of the alternative. The GPIRM recommends that country programmes develop long-term plans for insecticide resistance monitoring and management that include full costing of activities. Development of these plans has only just begun: seven countries in the WHO African Region have such plans in place while there has been limited progress in development of plans in other WHO regions.

International initiatives in support of GPIRM have commenced. In 2013, WHO established a Vector Control Advisory Group to facilitate the development of new tools, approaches and technologies, and to shorten the process of bringing these to market. To improve affordability of existing and new tools, initiatives such as pooled procurements, improved global forecasting, long-term contracts and tax incentives are being explored. WHO is also supporting the development of comprehensive regional and national databases on insecticide resistance. Information will be used to inform locally appropriate vector control, guide policy for managing insecticide resistance and facilitate resource mobilization for implementation.

4. PREVENTIVE THERAPIES FOR MALARIA

THE PROPORTION OF PREGNANT WOMEN RECEIVING AT LEAST ONE DOSE OF IPTp INCREASED MARKEDLY FROM 2000–2007 AND AT A SLOWER PACE THEREAFTER.

Malaria can have devastating consequences in pregnant women and in children. In areas of high transmission, WHO recommends targeting these high-risk groups with chemoprevention strategies. Three safe and cost-effective strategies are available: IPTp with SP, delivered at each scheduled ANC visit after the first trimester; SMC with AQ+SP for children aged 3–59 months in areas of highly seasonal malaria transmission across the Sahel subregion; and IPTi with SP, delivered at the time of the second and third diphtheria–tetanus–pertussis (DTP) and measles vaccination. IPTi is only recommended in areas with moderate to high transmission (entomological inoculation rate ≥10), where resistance to SP is low, and where SMC is not concurrently implemented (*28*). WHO is also evaluating the results of clinical trials of vaccines to reduce malaria incidence in young children.

4.1 Chemoprevention in pregnant women

Impressive increases in the proportion of pregnant women receiving IPTp have been limited by missed opportunities to deliver IPTp during ANC visits. IPTp has been adopted in 37 countries in sub-Saharan Africa and in Papua New Guinea, in the WHO Western Pacific Region (Table 4.1). The proportion of pregnant women attending ANC clinics and the proportion receiving IPTp can be estimated from data reported by NMCPs and from household surveys. In data reported by NMCPs for 2013, a median 89% of pregnant women in 31 reporting countries attended ANC at least once, while 57% received at least one dose of IPTp among 30 reporting countries (Figure 4.1). A median of 43% of pregnant women received two doses of IPTp among 31 reporting countries, and 17% of all pregnant women received three or more doses of IPTp among nine reporting countries. The large difference between the proportion of women attending ANC clinics at least once and the proportion receiving the first dose of IPTp suggests a number of missed opportunities for delivery of IPTp at ANC clinics. The proportion of pregnant women receiving at least one dose of IPTp increased markedly from 2000–2007, and at a slower pace thereafter (Figure 4.2).

Table 4.1 Adoption of policies for national chemoprevention, by WHO region, 2013

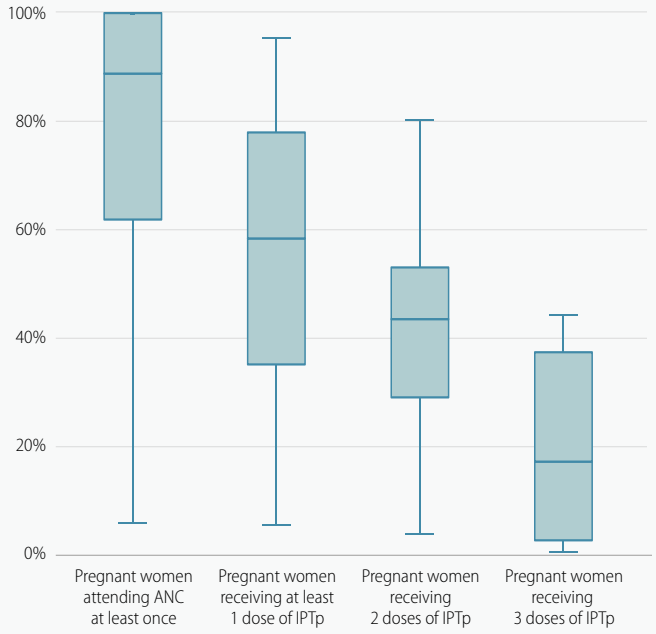
Policy	AFR	AMR	EMR	EUR	SEAR	WPR	Total
Intermittent preventive treatment in pregnancy	34	–	2	–	–	1	37
Intermittent preventive treatment for infants	1	–	–	–	–	–	1
Seasonal malaria chemoprevention	6	–	–	–	–	–	6
Number of countries with ongoing malaria transmission	**45**	**21**	**8**	**3**	**10**	**10**	**97**

AFR, African Region; AMR, Region of the Americas; EMR, Eastern Mediterranean Region; EPI, Expanded Programme on Immunization; EUR, European Region; ITN, insecticide-treated mosquito net; LLIN, long-lasting insecticidal net; SEAR, South-East Asia Region; WPR, Western Pacific Region

–, not applicable

Source: *National malaria control programme reports*

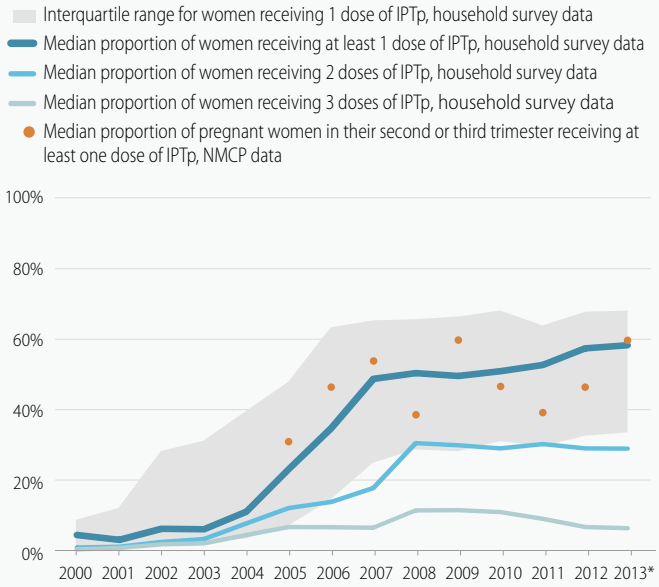
Figure 4.1 Proportion of pregnant women attending ANC and proportion receiving IPTp, by dose, among sub-Saharan countries reporting, 2013



ANC, antenatal care; IPTp, intermittent preventive treatment in pregnancy

Source: *National malaria control programme reports, UN population estimates*

Figure 4.2 Proportion of pregnant women receiving IPTp, by dose, by year of pregnancy in survey and by reporting year for NMCP, Africa, 2000–2013



IPTp, intermittent preventive treatment in pregnancy; NMCP, national malaria control programme

* Median proportions using household data are based on six-year trend analyses

Source: *Demographic health surveys, malaria indicator surveys, multiple indicator cluster surveys and other household survey data, NMCP reports, UN population estimates*

INCREASES IN THE DELIVERY OF IPTp HAVE BEEN IMPRESSIVE, DESPITE MISSED OPPORTUNITIES FOR DELIVERY DURING ANC CLINIC VISITS.

4.2 Chemoprevention in children and infants

Effective implementation of SMC requires adequate resources. As of 2013, six of the 16 countries in which SMC may be appropriate – Chad, Congo, Mali, the Niger, Senegal and Togo – had adopted national SMC policies. An adequate drug supply and proper training is needed to distribute SP to the target population during the rainy season year after year. Recently, the financial resources needed to support SMC implementation have been mobilized, exemplified by an initiative to approve Global Fund grant proposals to support SMC implementation for the 2015–2017 rainy seasons across the Sahel subregion (*29*). Consequently, more countries may be able to implement SMC in the future.

Adoption and implementation of IPTi has been slow. Despite the WHO IPTi policy recommendation in 2010 (*30*) and the *IPTi Implementation field guide*, published in 2011 (*31*), only Burkina Faso has adopted IPTi as national policy, and the country has not begun implementation. Reasons for the slow progress are unclear, but may be related to the difficultly in coordinating an intervention across health programmes, the complexity of recommendations, and concerns about parasite resistance to SP.

Four malaria vaccines are undergoing field trials. As of July 2014, three candidate vaccines are in Phase 2B clinical trials and one has completed Phase 3, with a total 25 projects in the pipeline (*32*). The results from the 18-month follow-up Phase 3 clinical trial for RTS,S/AS01 were released in July 2014. The reduction in severe malaria incidence in vaccine recipients was 46% among children and 27% among infants who received all planned doses of RTS,S/AS01, compared to their control group counterparts (*33*). A WHO decision regarding a policy recommendation for use is expected in 2015, after review of the booster dose data, additional research, and expert consultations.

5. DIAGNOSTIC TESTING FOR MALARIA

THE PROPORTION OF SUSPECTED MALARIA CASES RECEIVING A DIAGNOSTIC TEST HAS INCREASED MARKEDLY SINCE THE 2010 INTRODUCTION OF WHO'S RECOMMENDATION TO TEST ALL SUSPECTED MALARIA CASES.

5.1 Adoption of 2010 recommendations from WHO

Most malaria-endemic countries have adopted WHO's policy to test all patients with suspected malaria. WHO recommends that all persons in all epidemiological settings with suspected malaria should be examined for evidence of infection with malaria parasites by either microscopy or RDT (*34*). This policy has been adopted by 89 of the 99 countries with ongoing malaria transmission, and diagnostic testing is free of charge in the public sector in 86 countries (**Table 5.1**). Combination RDTs, which can detect more than one species of *Plasmodium*, are available in the public sector in 40 of 47 countries endemic for both *P. falciparum* and *P. vivax*.

The proportion of suspected malaria cases receiving a malaria diagnostic test has increased markedly since 2010, especially in Africa. The proportion of suspected cases receiving a parasitological test in the public sector can be calculated from information on testing and malaria cases reported by NMCPs. The proportion of suspected cases tested is highest in the WHO Region of the Americas and the WHO European Region, followed by the WHO South-East Asia Region, the WHO Western Pacific Region and the WHO Eastern Mediterranean Region. The WHO African Region has seen the largest increase in the proportion of suspected cases tested, from 47% in 2010 – when WHO's recommendation to test all suspected malaria cases was introduced – to 62% in 2013 (**Figure 5.1**). The recent increase in testing in the WHO African Region is mainly due to an increase in the use of RDTs, which has doubled since 2010 and accounted for 52% of all cases tested in 2013. The reported testing rate may overestimate the true extent of diagnostic testing in the public sector, because it depends on factors that may be lacking, such as accurate reporting of presumed malaria cases. However, reporting bias, whereby countries with higher testing rates have a greater propensity to report, appears to be limited. In the WHO African Region, for example, the proportion of suspected cases tested among seven countries reporting consistently since 2001 was only slightly higher (67%) than the proportion among 31 countries reporting inconsistently since 2001 (60%).

Table 5.1 Adoption of policies for malaria diagnosis, by WHO region, 2013

Policy	AFR	AMR	EMR	EUR	SEAR	WPR	Total
Patients of all ages should undergo diagnostic test	41	21	8	3	8	8	89
Malaria diagnosis is free of charge in the public sector	37	21	7	3	10	8	86
Combination RDTs are available in public sector	17	9	1		6	7	40
RDTs used at community level	26	8	2		7	5	48
Number of countries/areas with ongoing malaria transmission	**45**	**21**	**8**	**3**	**10**	**10**	**97**

AFR, African Region; AMR, Region of the Americas; EMR, Eastern Mediterranean Region; EPI, Expanded Programme on Immunization; EUR, European Region; ITN, insecticide-treated mosquito net; LLIN, long-lasting insecticidal net; RDT, rapid diagnostic test; SEAR, South-East Asia Region; WPR, Western Pacific Region

Source: *National malaria control programme reports*

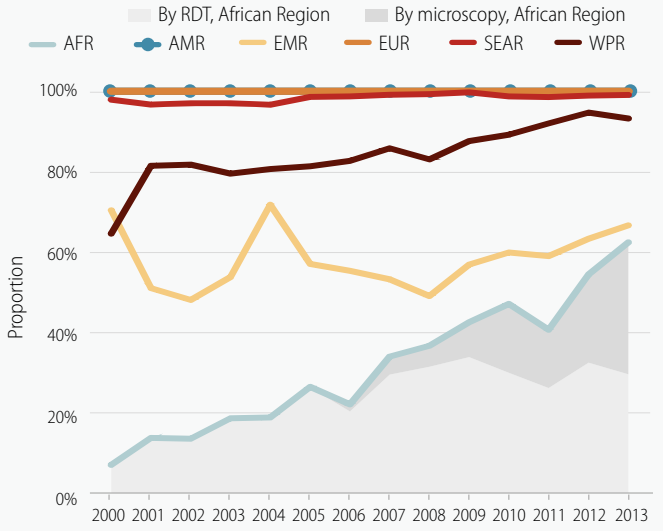
DESPITE IMPRESSIVE INCREASES IN DIAGNOSTIC TESTING, THE PRIVATE HEALTH SECTOR LAGS BEHIND THE PUBLIC SECTOR.

5.2 Testing in the private and public sector

The proportion of suspected cases receiving a diagnostic test is lower among patients seeking care in the private sector compared to the public sector. Data reported by NMCPs on the number of patients examined by microscopy or RDTs generally cover the public sector only. However, worldwide, about 40% of patients with suspected malaria seek treatment in the private sector (which includes private health facilities, pharmacies and other retail outlets). Information on the extent of parasitological testing in the private sector can be derived from household surveys. Among 41 household surveys conducted during 2009–2013, the proportion of children aged under 5 years who received a blood test for fever (a proxy for suspected malaria) was lower in the private sector (median across surveys 9%, interquartile range [IQR] 6–18%) than in the public sector (median across surveys 31%, IQR 17–43%) (**Figure 5.2**). Overall, a large proportion of children with fever in surveyed countries did not seek care (median 34%, IQR 29–38%), and therefore were not tested. Consequently, only a minority (median 17%, IQR 9–27%) of all febrile children received a parasitological test for malaria among countries surveyed during 2009–2013.

The extent of diagnostic testing for malaria in the public sector measured through a household survey is not directly comparable to that reported by NMCPs, in part because surveys are usually confined to children aged under 5 years, whereas NMCPs report on suspected cases in patients of all ages. However, in most surveys, the proportion of febrile children seeking care in the public sector who received a blood test fell within the range of suspected cases receiving a malaria diagnostic test as reported by NMCPs (**Figure 5.2**). Although only a few household surveys are conducted each year, the median proportion of febrile children receiving a diagnostic test was higher in the 16 surveys conducted during 2012–2013 (31%) than in the 17 surveys conducted during 2009–2010 (17%).

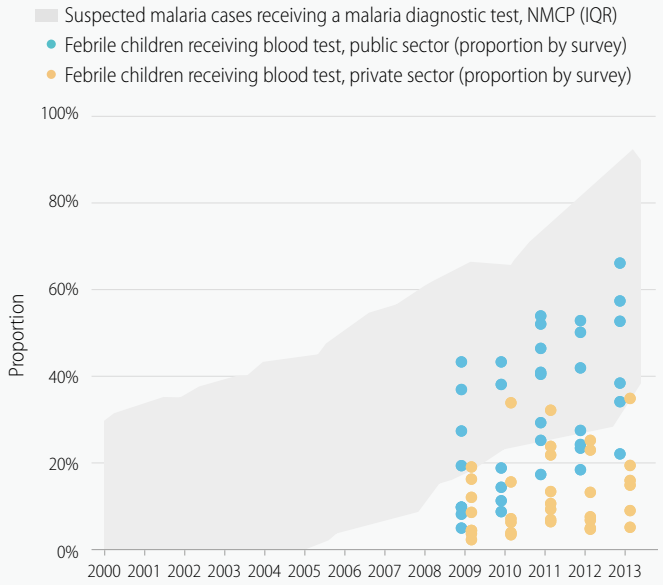
Figure 5.1 Proportion of suspected malaria cases attending public health facilities that receive a diagnostic test, by WHO region, 2000–2013



AFR, African Region; AMR, Region of the Americas; EMR, Eastern Mediterranean Region; EUR, European Region; RDT, rapid diagnostic test; SEAR, South-East Asia Region; WPR, Western Pacific Region

Source: *National malaria control programme reports*

Figure 5.2 Proportion of febrile children receiving a blood test, by health sector, in household surveys, and proportion of suspected malaria cases receiving a parasitological test in NMCP reports, sub-Saharan African countries with available data, 2000–2013



IQR, interquartile range; NMCP, national malaria control programme

Source: *NMCP reports and household surveys*

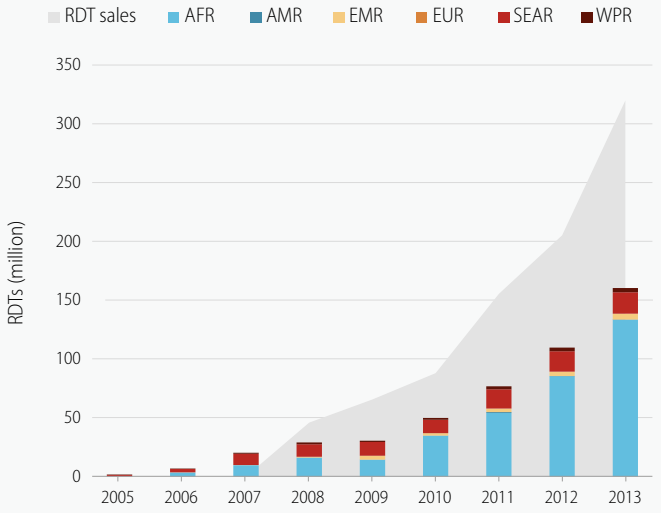
SALES AND DISTRIBUTIONS OF MALARIA RDTs HAVE INCREASED DRAMATICALLY IN THE PAST 5 YEARS.

5.3 Availability and quality of malaria diagnostic tests

Increased testing of suspected malaria cases is supported by a greater number of RDTs supplied by manufacturers and distributed by NMCPs. Sales of RDTs reported by manufacturers reached 319 million in 2013 (up from 46 million in 2008), of which 59% were for *P. falciparum*-specific tests and 39% for combination tests (i.e. those that can detect more than one species). RDT sales reported by manufacturers represent global totals for both the public and private sector. The reported number of RDTs distributed by NMCPs provides information on the numbers of RDTs distributed in the public sector only; however, it also provides information on where the tests are used. The total number of RDTs distributed by NMCPs increased rapidly, from fewer than 200 000 in 2005 to more than 160 million in 2013 (**Figure 5.3**). Most of the RDTs delivered in 2013 (83%) were used in the WHO African Region, followed by the WHO South-East Asia Region (11%) and the WHO Eastern Mediterranean Region (3%). These totals underestimate the total quantity of RDTs distributed, because data were missing from seven of the 44 countries in the WHO African Region with ongoing malaria transmission in 2013. There is also likely to be a time lag between sale, delivery and distribution. However, the upward trend in RDT distributions by NMCPs mirrors that of RDT sales reported by manufacturers.

Increased testing of suspected malaria cases is due in part to a higher number of patients tested by microscopy, both in the WHO African Region and globally. The global total of 197 million microscopic examinations performed was dominated by India, which accounted for over 120 million slide examinations in 2013. The reported number of microscopic examinations in the WHO African Region increased from 33 million in 2010 to 50 million in 2013. Among 28 countries in Africa supplying information on microscopy consistently since 2010, 22 reported an increase in microscopic examinations performed in 2013 compared to 2010 (**Figure 5.4**).

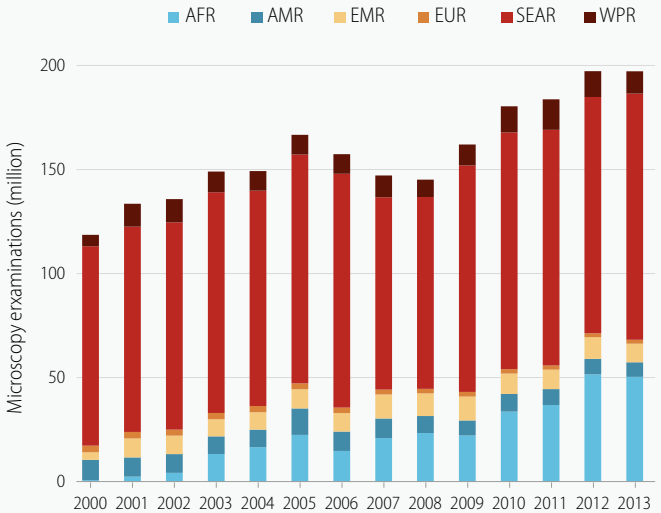
Figure 5.3 Number of RDT sales to public and private sectors and number of RDTs distributed by NMCPs, by WHO region, 2005–2013



AFR, African Region; AMR, Region of the Americas; EMR, Eastern Mediterranean Region; EUR, European Region; NMCP, national malaria control programme; RDT, rapid diagnostic test; SEAR, South-East Asia Region; WPR, Western Pacific Region

Source: *Data provided by manufacturers eligible for the WHO Foundation for Innovative New Diagnostics/ US Centers for Disease Control and Prevention Malaria Rapid Diagnostic Test Product Testing Programme*

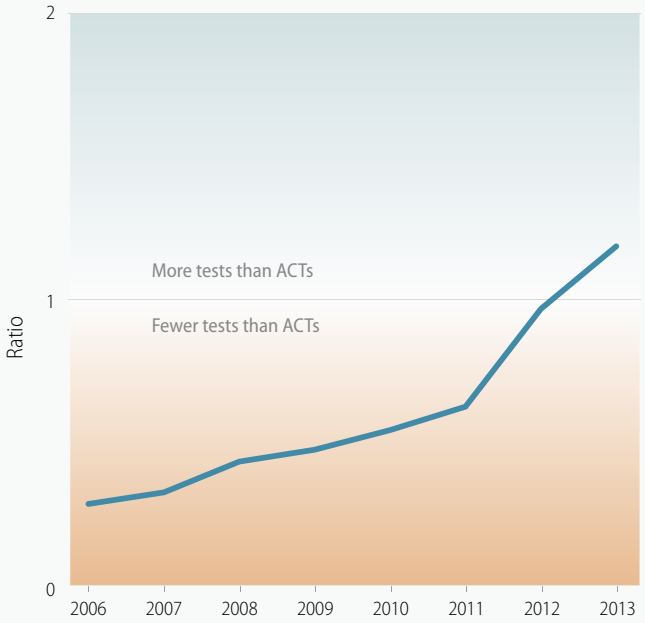
Figure 5.4 Number of microscopic examinations performed for malaria, by WHO region, 2000–2013



AFR, African Region; AMR, Region of the Americas; EMR, Eastern Mediterranean Region; EUR, European Region; SEAR, South-East Asia Region; WPR, Western Pacific Region

Source: *National malaria control programme reports*

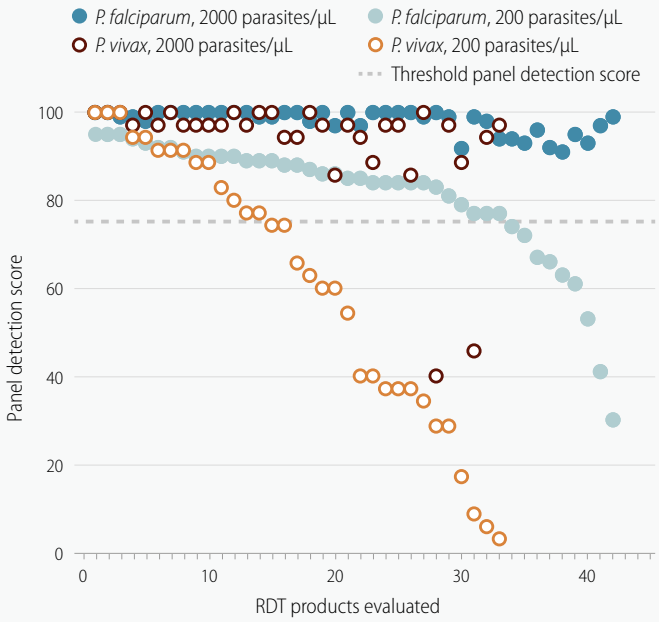
Figure 5.5 Ratio of malaria diagnostic tests (RDTs and microscopy) provided to ACTs distributed by NMCPs, WHO African Region, 2006–2013



ACT, artemisinin-based combination therapy; NMCP, national malaria control programme; RDT, rapid diagnostic test

Source: *NMCP reports*

Figure 5.6 Panel detection score of RDT products evaluated in Round 5 RDT product testing programme



RDT, rapid diagnostic test

Source: *WHO 2014 (17)*

THE NUMBER OF DIAGNOSTIC TESTS FOR MALARIA IN THE PUBLIC SECTOR IS OVERTAKING THE NUMBER OF ACTs DISTRIBUTED.

In 2013, for the first time, the total number of diagnostic tests provided exceeded the number of ACTs distributed in the public sector in the WHO African Region (Figure 5.5). This result is encouraging since most patients tested for malaria will not require treatment; hence, the number of diagnostic tests required should always exceed the number of treatments. Given that test positivity rates in most areas of Africa are below 50%, the ratio of diagnostic tests to ACTs should be at least two if all suspected cases of malaria receive a diagnostic test. Thus, while substantial progress has been made, there remains further scope to increase diagnostic testing through RDTs and microscopy, both in the public and private sector. Increased malaria diagnostic testing requires appropriate planning, budgeting and procurement. NMCPs and their supporting donors should aim to procure an appropriate number of RDTs and ACTs, in accordance with WHO procurement guidance (*35*).

The quality of available RDTs continues to be high. RDT product quality testing has been conducted since 2008 by WHO, the Foundation for Innovative New Diagnostics (FIND), the Special Programme for Research and Training in Tropical Diseases (TDR) and the Centers for Disease Control and Prevention (CDC). RDT products are assessed against samples of known malaria parasite species and density, with each product assigned a panel detection score that is based on the sensitivity and reliability of the results. Product quality testing undertaken in 2013 showed that most products had a high rate of detection of *P. falciparum* at parasite densities of 2000 parasites/µL; the same was true of most products for *P. vivax* (**Figure 5.6**). At low parasite densities (200 parasites/µL), 76% of *P. falciparum* products but only 42% of *P. vivax* products had acceptable panel detection scores. Work is ongoing to improve RDT quality control, including development of positive control wells that will help ensure test results are appropriately interpreted at the point of care.

6. MALARIA TREATMENT

ACTs ARE WIDELY USED FOR TREATMENT OF MALARIA, AND AN INCREASING PROPORTION OF MALARIA CASES ARE BEING TREATED WITH ACTs IN BOTH THE PUBLIC AND PRIVATE SECTORS.

6.1 Use of artemisinin-based combination therapy

Most countries with *P. falciparum* malaria have adopted ACTs as a first-line treatment. WHO recommends that uncomplicated *P. falciparum* malaria should be treated with an ACT (*34*). In areas where chloroquine is still effective, *P. vivax* malaria should be treated with this drug. Where resistance to chloroquine has been documented, *P. vivax* malaria should be treated with an appropriate ACT. To prevent relapses, both chloroquine and ACT should be combined with a 14-day course of primaquine, subject to consideration of the risk of haemolysis in patients with glucose-6-phosphate dehydrogenase (G6PD) deficiency. In areas where there is a threat of artemisinin resistance and in areas targeted for malaria for *P. falciparum* elimination, a single primaquine dose (0.25 mg/kg) should be given to all patients with confirmed *P. falciparum* on the first day of their ACT treatment. In 2013, ACTs had been adopted as national policy for first-line treatment in 79 of 88 countries where *P. falciparum* is endemic (Table 6.1); chloroquine is used in 10 Central American and Caribbean countries where it remains efficacious. A single dose of primaquine was being used for gametocidal treatment of *P. falciparum* cases in 37 low-transmission countries to further reduce malaria transmission. In 55 of 56 countries with transmission of *P. vivax* malaria, primaquine was being used for treatment of the hypnozoite stage of *P. vivax* malaria.

The proportion of children in sub-Saharan Africa with *P. falciparum* malaria receiving an ACT has increased markedly since 2005, but remained below 20% in 2013. Although household surveys only record whether a child has a fever, the results of RDTs performed at the time of the survey (to estimate parasite prevalence in children) can be used as a proxy for malaria parasite infection in the preceding 2 weeks. Data obtained from the same household survey can indicate whether the patient received an ACT. In sub-Saharan Africa, the estimated proportion of children aged under 5 years with confirmed *P. falciparum* malaria that received an ACT increased steadily from less than 5% in 2005, though it remains low, reaching a range of 9–26% in 2013 (Figure 6.1). Among children who were brought for care at public health facilities, the proportion with confirmed *P. falciparum* malaria who received ACT was higher than the overall total for sub-Saharan Africa, and ranged from 16 to 41% in 2013.

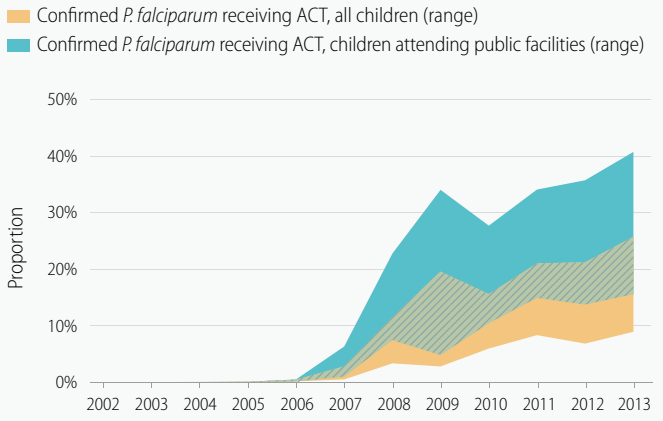
Table 6.1 Adoption of policies for malaria treatment, by WHO region, 2013

Policy	AFR	AMR	EMR	EUR	SEAR	WPR	Total
ACT is used for treatment of *P. falciparum*	43	9	8	1	9	9	79
Pre-referral treatment with quinine/artemether IM/artesunate suppositories	40	4	5		5	3	57
Single dose primaquine used as gametocidal for *P. falciparum*	3	19	4	1	7	3	37
Primaquine is used for radical treatment of *P. vivax* cases	7	20	6	3	10	9	55
Directly observed treatment with primaquine is undertaken	3	11	2	3	3	4	27
G6PD test is recommended before treatment with primaquine	5		4		2	6	17
Number of countries/areas with ongoing malaria transmission	**45**	**21**	**8**	**3**	**10**	**10**	**97**
Number of *P. falciparum* endemic countries/areas	**44**	**18**	**8**	**0**	**9**	**9**	**88**
Number of *P. vivax* endemic countries/areas	**7**	**20**	**6**	**3**	**10**	**10**	**56**
Number of countries/areas endemic for both *P. falciparum* and *P. vivax*	**6**	**17**	**6**	**0**	**9**	**9**	**47**

ACT, artemisinin-based combination therapy; AFR, African Region; AMR, Region of the Americas; EMR, Eastern Mediterranean Region; EUR, European Region; G6PD, glucose-6-phosphate dehydrogenase; IM, intramuscular; SEAR, South-East Asia Region; WPR, Western Pacific Region

Source: *National malaria control programme reports*

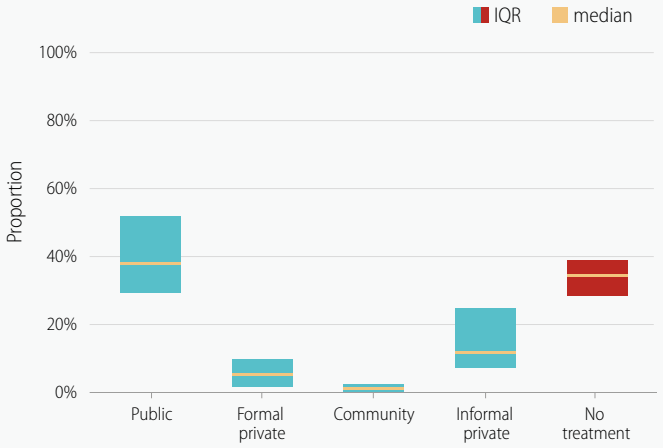
Figure 6.1 Estimated proportion of children aged under 5 years with confirmed *P. falciparum* malaria who received ACTs, sub-Saharan Africa, 2002–2013



ACT, artemisinin-based combination therapy

Source: *Household survey data modelled by Tulane University and University of California, San Francisco*

Figure 6.2 Proportion of febrile children presenting for treatment, by health sector, WHO African Region, 29 countries, 2000–2013



IQR, interquartile range

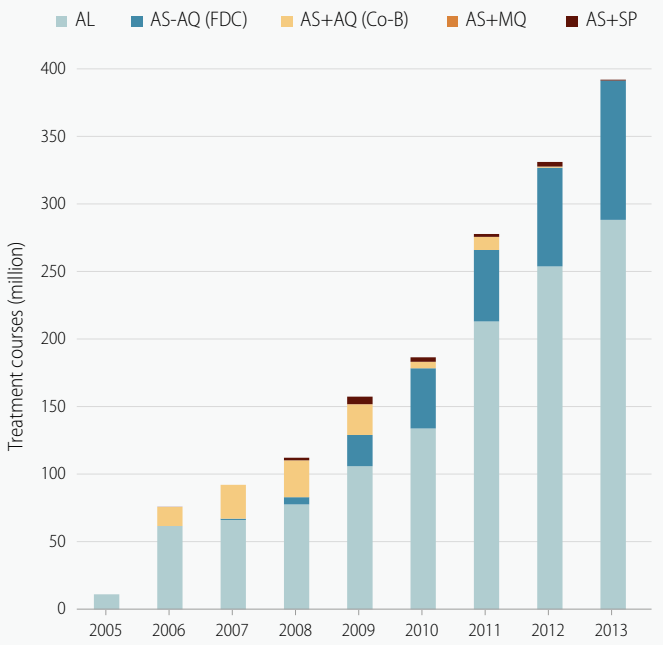
Source: *Household surveys*

THE PROPORTION OF CHILDREN WITH MALARIA RECEIVING AN ACT IN SUB-SAHARAN AFRICA IS LOW, PARTLY BECAUSE ONLY A SMALL PROPORTION SEEK CARE AT FORMAL HEALTH FACILITIES.

The low proportion of children in sub-Saharan Africa with malaria receiving an ACT is due in large part to febrile children not being brought for care. Information from household surveys conducted during the last decade in sub-Saharan Africa indicates that approximately 40% of children with fever do not present for treatment; also, of those who are brought for care, approximately 20% seek attention in the informal private sector (pharmacies and shops) where rates of malaria diagnostic testing are low and where ACT treatments are less likely to be available (**Figure 6.2**). Most children who are brought for care attend public health facilities, and a small proportion seek care in the formal private sector (clinics and other regulated facilities), where rates of malaria diagnostic testing and appropriate treatment are higher than in the informal private sector. Efforts to increase access to treatment in the community are ongoing, but only a small proportion of febrile children in sub-Saharan Africa seek care there. Access to malaria treatment and efforts to encourage caregivers to bring children to health-care facilities need to increase, to ensure all patients with malaria are appropriately treated.

The increasing proportion of malaria cases treated with ACTs is supported by increased numbers of ACT treatment courses delivered by manufacturers. The number of ACT treatment courses procured from manufacturers by both public and private sectors has increased greatly, rising from 11 million in 2005 to 392 million in 2013 (**Figure 6.3**). Artemether-lumefantrine (AL) accounts for the largest volume of ACTs procured (73% in 2013), followed by artesunate plus amodiaquine (26%). Fixed-dose combination ACTs, with the two medicines combined in the same tablet, are preferred because of improved patient adherence to the recommended regimen; such ACTs accounted for nearly 100% of all ACT sales. The increase in the number of ACTs procured in 2013 was largely due to increased procurements from the public sector.

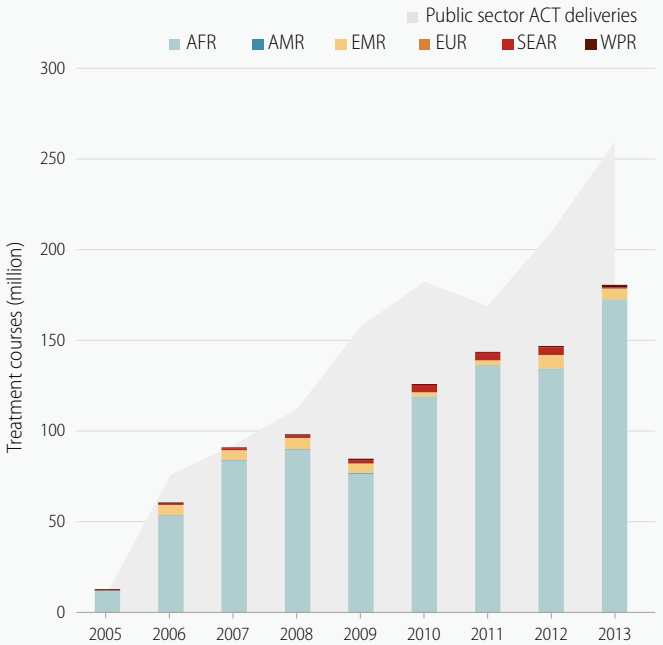
Figure 6.3 ACT deliveries from manufacturers to the public and private sectors, by drug and presentation, 2005–2013



ACT, artemisinin-based combination therapy; AL, artemether-lumefantrine; AMFm, Affordable Medicine Facility–malaria; AQ, amodiaquine; AS, artesunate; Co-B, co-blister; FDC, fixed-dose combination; MQ, mefloquine; SP, sulfadoxine-pyrimethamine

Source: *ACT deliveries (2005–2013*), data provided by eight companies eligible for procurement by WHO/UNICEF.*
**2005–2009 data reflects public sector only; 2010– 2013 data includes public sector plus AMFm (public and private sectors).*

Figure 6.4 Number of ACT treatment courses distributed by NMCPs, by WHO region, and ACT treatment courses delivered to the public sector, 2005–2013



ACT, artemisinin-based combination therapy; AFR, African Region; AMFm, Affordable Medicine Facility–malaria; AMR, Region of the Americas; EMR, Eastern Mediterranean Region; EUR, European Region; NMCP, national malaria control programme; SEAR, South-East Asia Region; WPR, Western Pacific Region

Source: *NMCP data and ACT deliveries (2005–2013*), data provided by eight companies eligible for procurement by WHO/UNICEF.*
**2005–2009 data reflects public sector only; 2010– 2013 data includes public sector plus AMFm (public and private sectors).*

THE PROPORTION OF MALARIA CASES TREATED WITH ACTs IS INCREASING AS MANUFACTURERS DELIVER GREATER NUMBERS OF TREATMENT COURSES.

Increasing quantities of ACTs are being distributed by ministries of health worldwide, and particularly in Africa. Manufacturer procurement data describes the total number and type of ACTs delivered, whereas the number of ACTs distributed reported by NMCPs provides information on where ACTs procured are deployed by the public sector. The number of ACTs distributed increased from 98 million in 2009 to 181 million in 2013 (**Figure 6.4**). The WHO African Region accounted for 172 million of 181 million treatments distributed worldwide in 2013. The totals reported by NMCPs do not match the number of ACTs delivered by manufacturers to the public sector, which totalled 259 million treatments in 2013. This discrepancy is reduced if ACT procurements from international donor reports for countries with missing NMCP data are taken into account, but more work is needed to understand differences between the sources of data.

The number of ACTs distributed reported by NMCPs is progressively nearing the number of malaria patients attending public health facilities. The number of ACT treatments distributed, when compared to presumed and confirmed *P. falciparum* cases at public health facilities, has increased over time, reaching 70% in 2013 (IQR 51–88%) among 31 countries in the WHO African Region that reported sufficient information (**Figure 6.5**).

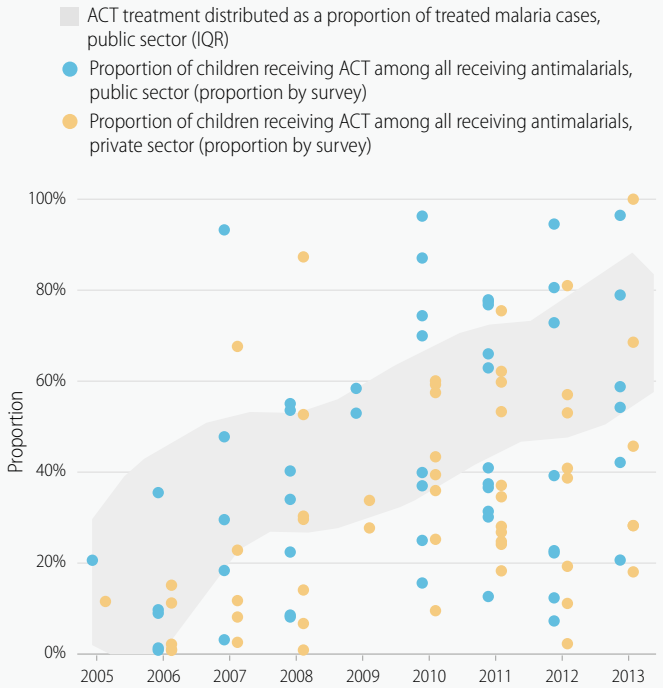
A similar calculation comparing the number of treatment courses of primaquine for radical treatment of *P. vivax* to the estimated number of *P. vivax* cases attending health facilities shows that, in 2013, more than half (18/32) of reporting programmes from all WHO regions distributed sufficient primaquine courses to treat all *P. vivax* cases.

MALARIA TREATMENTS NEED TO BE BETTER DIRECTED TO TARGET PATIENTS WITH POSITIVE DIAGNOSTIC TEST RESULTS.

ACTs have been progressively replacing other antimalarial treatments in both the public and private sectors. Information on ACT treatments obtained from household surveys also provides information on malaria treatment received by febrile children seeking care in both the public and private health sectors, and among those who are not brought for care. The proportion of patients receiving ACTs, among all patients who received antimalarial medicines, has varied over time for patients receiving care in both the public and private sectors (**Figure 6.5**). In a substantial proportion of household surveys, the proportion of treated malaria patients receiving ACTs in the public sector falls within the range of that estimated through NMCP reports.

Increased malaria diagnostic testing could help direct available ACTs to more patients with malaria parasite infection. By considering the proportion of malaria patients that could be treated with distributed ACTs, the proportion of suspected malaria cases tested and the malaria test positivity rate, it is possible to estimate the number of ACT treatments received by those patients with or without confirmed malaria (**Figure 6.6**). For patients attending public health facilities, the estimated proportion of confirmed malaria cases receiving ACTs has increased steadily since 2005. At the same time, however, due to the large number of patients treated presumptively without a malaria diagnostic test, the proportion of patients without malaria receiving an ACT has also risen. If diagnostic testing were increased further, and providers adhered to the test results, the ACT treatments saved would be sufficient to treat the confirmed malaria cases that currently do not receive ACTs.

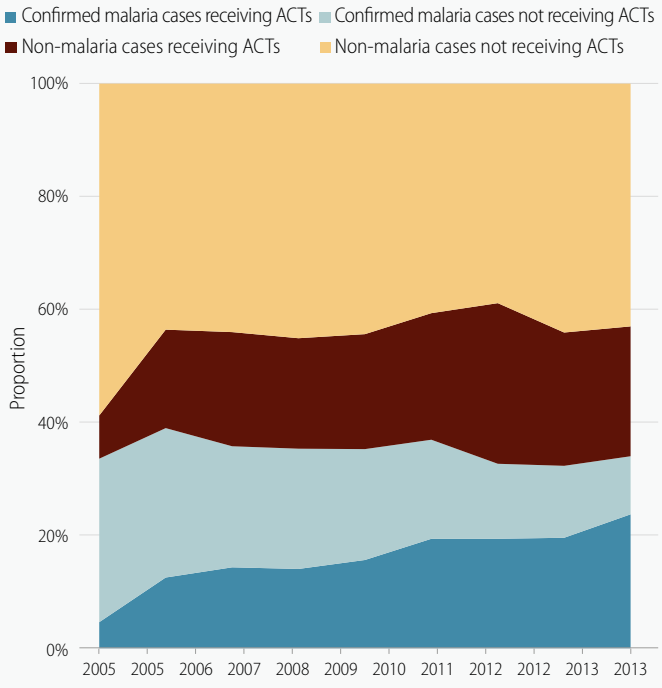
Figure 6.5 Proportion of children receiving ACT among all receiving antimalarials, by public and private sector, in household surveys, and proportion of ACT treatment courses distributed as a proportion of treated malaria cases in public sector, from NMCP reports, sub-Saharan Africa, 2005–2013



ACT, artemisinin-based combination therapy; IQR, interquartile range; NMCP, national malaria control programme

Source: *NMCP and household survey data*

Figure 6.6 Estimated ACT treatments received among malaria cases at public health facilities, WHO African Region, 2005–2013



ACT, artemisinin-based combination therapy

Source: *NMCP*

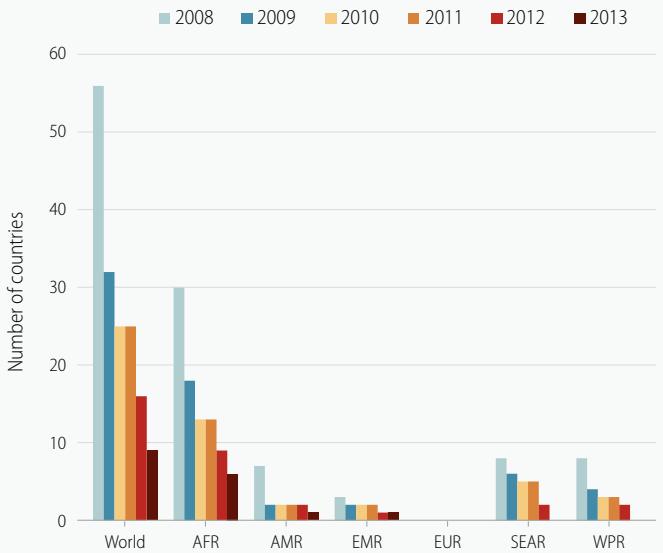
EFFECTIVE MANAGEMENT OF ANTIMALARIAL DRUG RESISTANCE INCLUDES BANNING MONOTHERAPIES, AND MONITORING ANTIMALARIAL EFFECTIVENESS REGULARLY.

6.2 Antimalarial drug resistance

The number of countries that allow marketing of oral artemisinin-based monotherapy medicines has declined rapidly. The use of such therapies threatens the long-term usefulness of ACTs, because it fosters the spread of resistance to artemisinin. WHO recommends that oral artemisinin-based monotherapies be withdrawn from the market and that marketing of these therapies should cease. The number of countries that allow the marketing of oral artemisinin-based monotherapies has dropped markedly since the World Health Assembly adopted a resolution supporting the ban in 2007 (**Figure 6.7**). As of December 2014, marketing of artemisinin-based monotherapies was allowed by only eight countries: Angola, Cabo Verde, Colombia, Equatorial Guinea, the Gambia, Sao Tome and Principe, Somalia and Swaziland. Also, as of December 2014, 24 pharmaceutical companies, half located in India, continued to market oral artemisinin monotherapies.

An increasing number of countries have conducted therapeutic efficacy studies (TES) for antimalarial medicines. Such studies remain the gold standard for guiding antimalarial treatment policy; WHO recommends that studies of first- and second-line antimalarial medicines be conducted once every 2 years at sentinel sites within each country. For the most recent 2-year period with available information, studies of first- or second-line antimalarial treatments were completed in 48 of 67 (72%) countries where *P. falciparum* efficacy studies were feasible (i.e. there were enough cases to test), an increase from 41% of countries that conducted studies during 2008–2009 (**Figure 6.8**). The proportion of patients who are parasitaemic on day 3 of treatment is the indicator used during routine monitoring to identify suspected artemisinin resistance in *P. falciparum*. Recently, a molecular marker of artemisinin resistance was identified: specific mutations in the Kelch 13 (K13)-propeller domain were found to be associated with delayed parasite clearance. This may open new possibilities for tracking resistance to artemisinin.

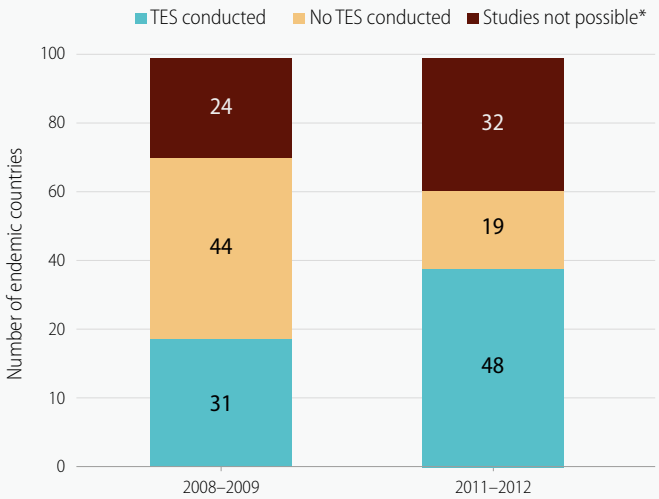
Figure 6.7 Number of countries allowing marketing of oral artemisinin-based monotherapies by WHO region, 2008–2013



AFR, African Region; AMR, Region of the Americas; EMR, Eastern Mediterranean Region; EUR, European Region; SEAR, South-East Asia Region; WPR, Western Pacific Region

Source: *http://www.who.int/malaria/monotherapy_NDRAs.pdf*

Figure 6.8 Status of therapeutic efficacy monitoring in countries with ongoing malaria transmission, 2008–2012



TES, therapeutic efficacy study

*TES studies are impractical in countries with low malaria transmission or transmission of *P. vivax* only

Source: *WHO Global Malaria Programme database on antimalarial therapeutic efficacy monitoring by country, November 2014*

Figure 6.9 Areas, or tiers, of differing risks of artemisinin resistance, South-East Asia, November 2014

Tier 1 are areas where there is credible evidence of artemisinin resistance;

Tier 2 are areas with significant inflows of people from Tier 1 areas, including those immediately bordering Tier 1;

Tier 3 are areas with no evidence of artemisinin resistance and limited contact with Tier 1 areas

PDR, People's Democratic Republic

Source: *Global Malaria Programme, WHO, November 2014*

RESISTANCE OF *P. FALCIPARUM* TO MULTIPLE ANTIMALARIAL MEDICINES HAS BEEN DETECTED IN AREAS AT THE BORDER OF CAMBODIA AND THAILAND.

Resistance of *P. falciparum* to artemisinin has been detected in five countries in the Greater Mekong subregion. Drug efficacy studies have detected resistance of *P. falciparum* to artemisinins in Cambodia, the Lao People's Democratic Republic, Myanmar, Thailand and Viet Nam (**Figure 6.9**). Despite changes in parasite sensitivity to artemisinins in these countries, ACTs have generally remained clinically and parasitologically efficacious, provided the partner drug remains efficacious. Resistance in *P. falciparum* to most currently available antimalarial medicines has been detected in areas at the border of Cambodia and Thailand, complicating the choice of effective treatment for medical practitioners. *P. falciparum* resistance to artemisinins has not been detected outside of the Greater Mekong subregion. Reports of an increased proportion of day-3 positive patients after treatment with ACTs in TES conducted in two South American countries are still being investigated. Confirmed chloroquine resistance in *P. vivax*, which requires measurement of drug blood levels, has been detected in 10 countries; ACTs are now recommended for the treatment of chloroquine-resistant *P. vivax*.

The identification of multidrug resistance, including artemisinin resistance, in the Greater Mekong subregion makes elimination of *P. falciparum* transmission in this region an important goal. As a follow-up to the *Global plan for artemisinin resistance containment* (GPARC) (*36*), launched in 2011, WHO released the Emergency response to artemisinin resistance in the Greater Mekong subregion: A regional framework for action 2013–2015 (ERAR) (*37*) in 2013. The emergency plan provides further guidance for field implementation of the containment activities outlined in the GPARC. The confirmation of independent emergence of *P. falciparum* resistance to artemisinins in different locations in the Greater Mekong subregion, and the development of resistance to most available antimalarial medicines at the border between Cambodia and Thailand, highlight the importance of eliminating *P. falciparum* transmission in the region. Such elimination is considered technically and operationally feasible, and was endorsed as a goal by the MPAC in September 2014.

7. GAPS IN INTERVENTION COVERAGE

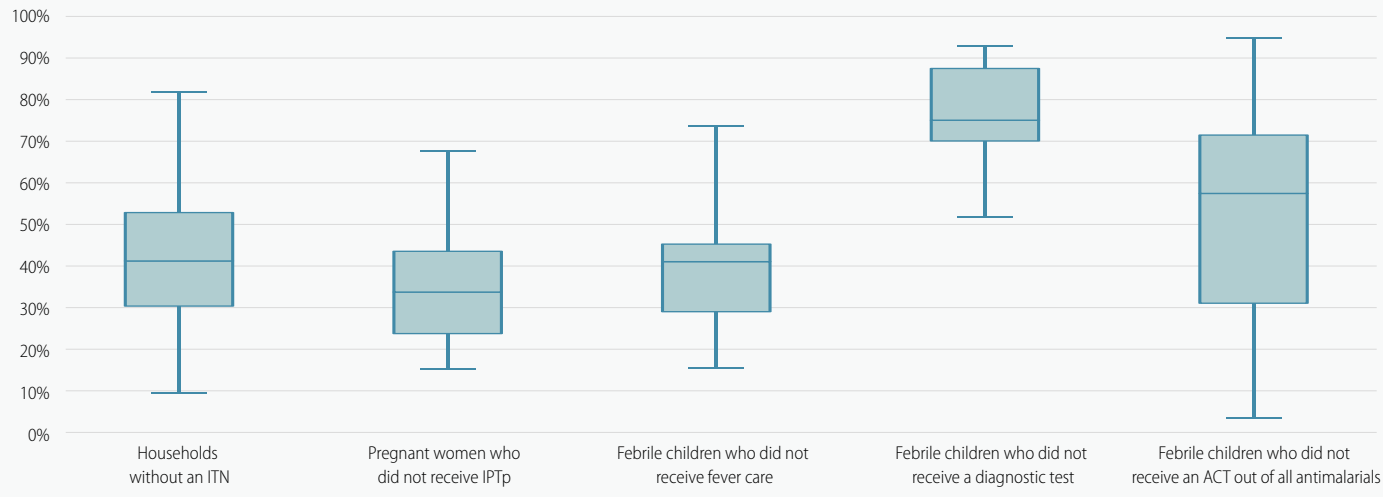
IN SUB-SAHARAN AFRICA IN 2013, AN ESTIMATED 278 MILLION PEOPLE LIVED IN HOUSEHOLDS WITHOUT AN ITN, 15 MILLION PREGNANT WOMEN DID NOT RECEIVE IPTp, AND 56–69 MILLION CHILDREN WITH MALARIA DID NOT RECEIVE AN ACT.

Despite impressive increases in malaria intervention coverage, millions of people still do not receive the services they need. Based on the results presented in **Sections 3–6** of this report, it can be estimated that, in sub-Saharan Africa in 2013, some 278 million of the 840 million people at risk of malaria lived in households without an ITN, 15 million of the 35 million pregnant women at risk did not receive IPTp, and between 56 and 69 million of the 76 million children with malaria did not receive an ACT. Gaps in service coverage are evident in all countries that have NMCPs. To design programmes that can fill these gaps, it is important to have a good understanding of the factors responsible for low intervention coverage. Some insight can be gained by examining household surveys (which document the characteristics of people who do not receive services), and by decomposing the explained variance in regression models (which aim to identify the factors that are most strongly associated with gaps in service coverage) (see **Annex 1**).

Poverty and low education are significant predictors of coverage gaps for ITNs, IPTp, fever care, diagnostic testing and receipt of ACTs. Based on nationally representative household survey data for countries in sub-Saharan Africa, in 2011–2013, a median 41% of households did not have an ITN (IQR 30–53%, **Figure 7.1**). Being poor (i.e. in the lowest wealth quintile) was the most important predictor of living in a household without an ITN (**Figure 7.2**). Other important factors were the household not having a child aged under 5 years or a pregnant woman, being in a rural area, and having a head of household with no formal education.

Poverty was the strongest factor associated with being among the 33% of pregnant women that did not receive IPTp (IQR 23–43%) (**Figure 7.2**). Other factors that were significant were having previously given birth, being aged under 20 years, having no formal education or living in a rural area. For children that did not receive any care for fevers (median 41%, IQR 29–45%), strong predictors for not receiving care were being an older child (aged >1 year of age) or having a household head with no formal education. Predictors for not receiving a diagnostic test (75% of children with fever, IQR 70–87%) were living in a rural area and poverty, whereas the strongest predictor for not receiving an ACT (57% of children with fever, IQR 31–71%), was low educational attainment, followed by living in a rural area and being poor.

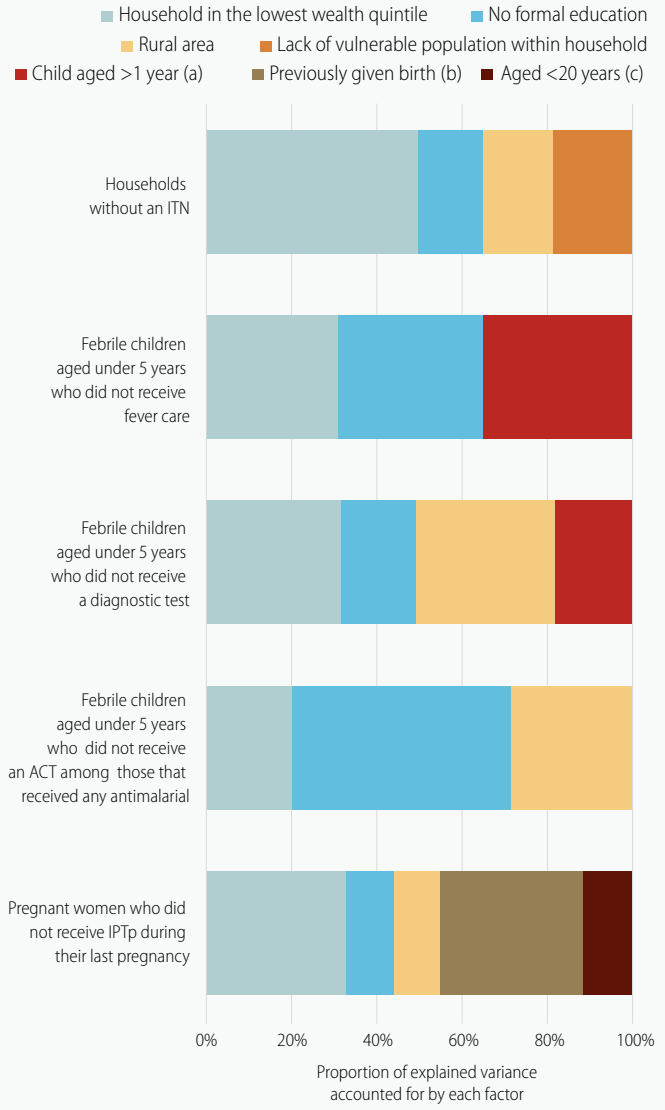
Figure 7.1 Proportion of households, women or children not covered by interventions, 2011–2013



ACT, artemisinin-based combination therapy; IPTp, intermittent preventive treatment in pregnancy; ITN, insecticide-treated mosquito net

Source: *Household surveys*

Figure 7.2 Factors associated with gaps in intervention coverage

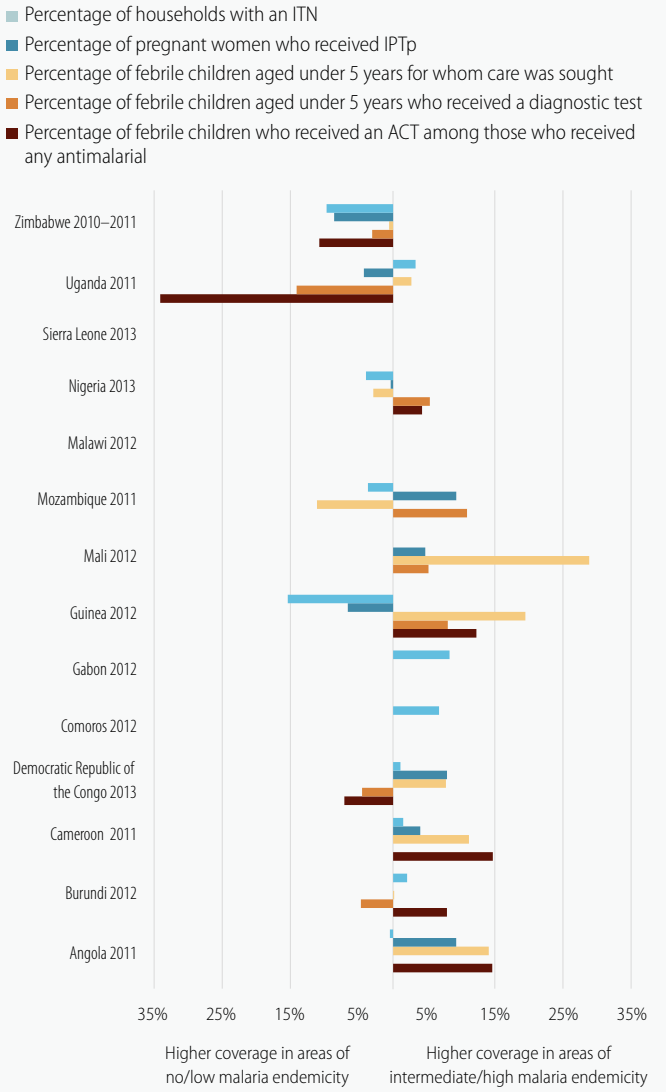


a) only in household-level analysis; b) only in child-level analysis; c) only in woman-level analysis

ACT, artemisinin-based combination therapy; IPTp, intermittent preventive treatment in pregnancy; ITN, insecticide-treated mosquito net

Source: *Household surveys*

Figure 7.3 Difference in intervention coverage between areas of intermediate to high malaria risk, and low to no malaria, 2011–2013



ACT, artemisinin-based combination therapy; IPTp, intermittent preventive treatment in pregnancy; ITN, insecticide-treated mosquito net

*Missing bars indicate that there was no difference in coverage or that all of the households surveyed were from one endemicity level

Source: *Household surveys*

FOR SOME INTERVENTIONS AND COUNTRIES, THOSE LIVING IN AREAS OF HIGH OR INTERMEDIATE MALARIA RISK ARE LESS LIKELY TO HAVE MALARIA INTERVENTIONS THAN THOSE LIVING IN AREAS WITH LOW OR NO MALARIA RISK.

Some of those without services live in the most endemic areas. The consequences of not having services can vary according to malaria endemicity, and it is particularly important to protect populations that have higher rates of morbidity and mortality. However, for some interventions and countries, those living in areas of high or intermediate malaria risk (parasite prevalence of ≥5% among children aged 2–9 years) are less likely to have malaria interventions than those living in areas with low or no malaria risk (parasite prevalence of <5% among children aged 2–9 years) (**Figure 7.3**). To build upon the impressive progress of the past decade, and reach populations not currently benefiting from interventions, it is important to identify and fill specific gaps in service coverage, particularly in areas with the highest malaria transmission intensity. Monitoring of malaria interventions should include not only a report of progress to date, but also an assessment of where future gains are possible.

8. TRENDS IN INFECTIONS, CASES AND DEATHS

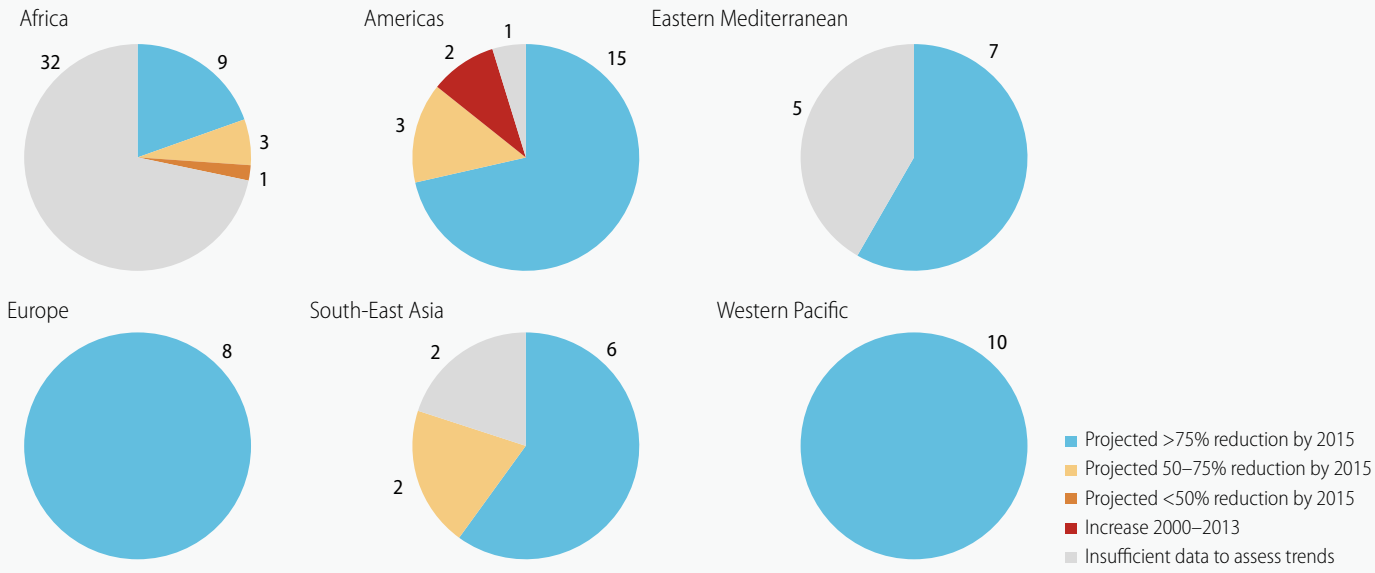
FIFTY-FIVE COUNTRIES ARE ON TRACK TO MEET RBM AND WORLD HEALTH ASSEMBLY TARGETS OF REDUCING MALARIA CASE INCIDENCE RATES BY 75% BY 2015.

8.1 Reported cases

The reported number of confirmed malaria cases is a core indicator for tracking progress towards the MDGs and the World Health Assembly and RBM Partnership targets for 2015. For many high-burden countries in the WHO African Region, many patients do not receive a diagnostic test; hence, it is not possible to assess trends in confirmed cases. Instead, attempts are made to evaluate such trends using the reported numbers of malaria admissions (inpatient cases) and deaths. A description of the strategy used to analyse trends is provided in **Annex 1**. In brief, the strategy aims to exclude data-related factors (e.g. incomplete reporting or changes in diagnostic practice) as explanations for a change in the reported incidence of disease. However, if changes in diagnostic testing or reporting are large, then it may not be possible to draw inferences about trends in malaria. Of the 106 countries that had ongoing malaria transmission in 2000, 66 were judged to have submitted data that were sufficiently complete and consistent to reliably assess trends between 2000 and 2013.

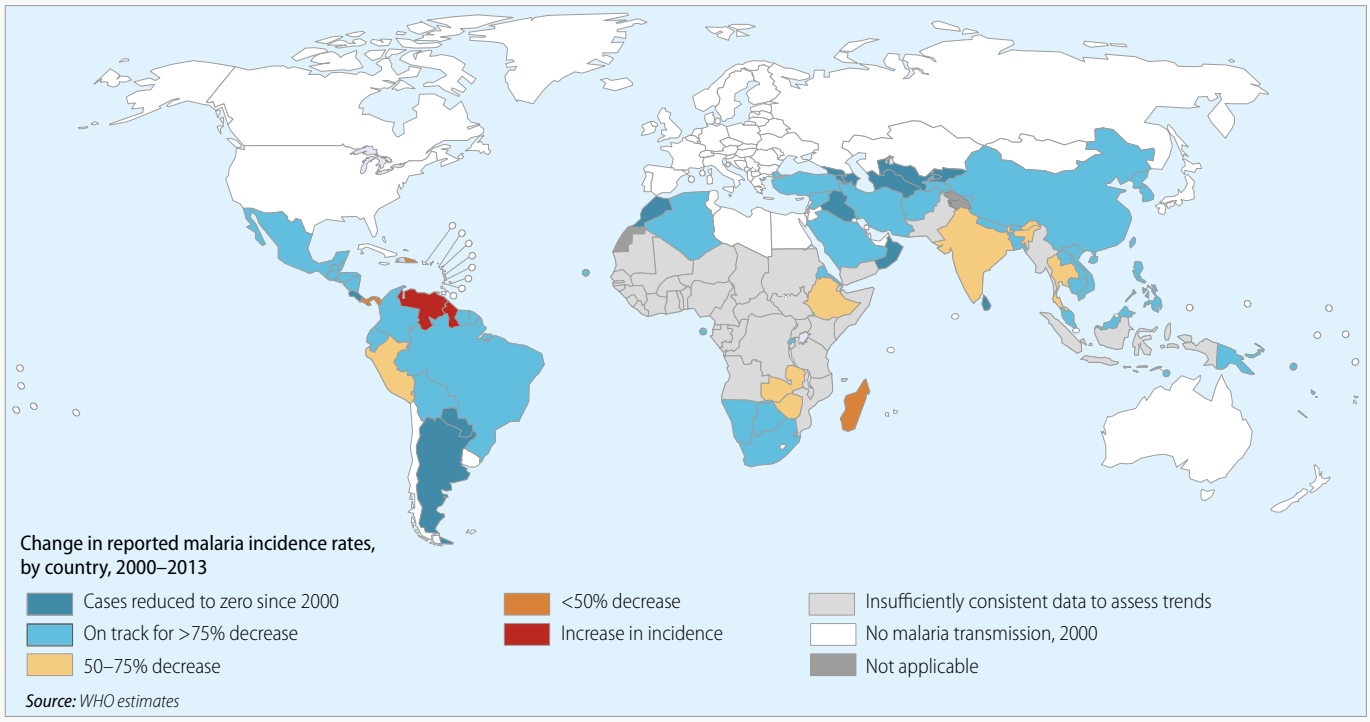
Based on an assessment of trends in reported malaria cases, a total of 64 out of 106 countries with ongoing transmission of malaria in 2000 are meeting the MDG target of reversing the incidence of malaria. Of these 64 countries, 55 are on track to meet RBM and World Health Assembly targets of reducing malaria case incidence rates by 75% by 2015 (**Figures 8.1** and **8.2**, and **Regional profiles**). However, most of those 55 countries had low numbers of cases in 2000; in fact, they accounted for only 13 million (6%) of the total estimated cases of 227 million in 2000. Only five countries with more than 1 million estimated cases in 2000 (Afghanistan, Bangladesh, Brazil, Cambodia and Papua New Guinea) are projected to achieve a reduction in malaria case incidence of 75% or more. This is partly because progress has been faster in countries with lower numbers of cases, but also because countries with higher numbers of cases are less likely to submit sufficiently consistent data for assessing trends. In such countries, it is necessary to draw inferences about trends using studies of parasite prevalence (**Section 8.2**) or estimated numbers of cases (**Section 8.3**) rather than surveillance data.

Figure 8.1 Number of countries with decreases in reported malaria case incidence rates 2000–2013, by WHO region



Source: *National malaria control programme data*

Figure 8.2 Change in reported malaria incidence rates, by country, 2000–2013



TWELVE COUNTRIES WITH TRANSMISSION OF MALARIA IN 2000 REPORTED ZERO INDIGENOUS CASES IN 2013.

An increasing number of countries are moving towards elimination of malaria. In 2013, two countries reported zero indigenous cases for the first time (Azerbaijan and Sri Lanka), and eleven succeeded in maintaining zero cases (Argentina, Armenia, Egypt, Iraq, Georgia, Kyrgyzstan, Morocco, Oman, Paraguay, Turkmenistan and Uzbekistan). Another four countries reported fewer than 10 local cases in that year (Algeria, Cabo Verde, Costa Rica and El Salvador). As of December 2014, 19 countries are in the pre-elimination or elimination phase, and seven in the prevention of malaria reintroduction phase (**Table 8.1**, see **Annex 1** for definitions of elimination and pre-elimination stages). Argentina and Kyrgyzstan have asked WHO to start the process for certifying their achievement of malaria elimination.

Table 8.1 Classification of countries by stage of elimination

Region	Pre-elimination	Elimination	Prevention of reintroduction	Malaria free
AFR	Cabo Verde	Algeria		
AMR	Belize Costa Rica Ecuador El Salvador Mexico Paraguay	Argentina		
EMR		Iran (Islamic Republic of) Saudi Arabia	Egypt Iraq Oman Syrian Arab Republic	Morocco – 2010 United Arab Emirates – 2007
EUR		Turkey Azerbaijan Tajikistan	Georgia Kyrgyzstan Uzbekistan	Turkmenistan – 2010 Armenia – 2011
SEAR	Bhutan Democratic People's Republic of Korea	Sri Lanka		
WPR	Malaysia	Republic of Korea		

AFR, African Region; AMR, Region of the Americas; EMR, Eastern Mediterranean Region; EUR, European Region; SEAR, South-East Asia Region; WPR, Western Pacific Region

Source: *National malaria control programme data*

IN SUB-SAHARAN AFRICA, AVERAGE INFECTION PREVALENCE IN CHILDREN AGED 2–10 YEARS DECLINED BY 48% BETWEEN 2000 AND 2013.

8.2 Malaria infections in sub-Saharan Africa

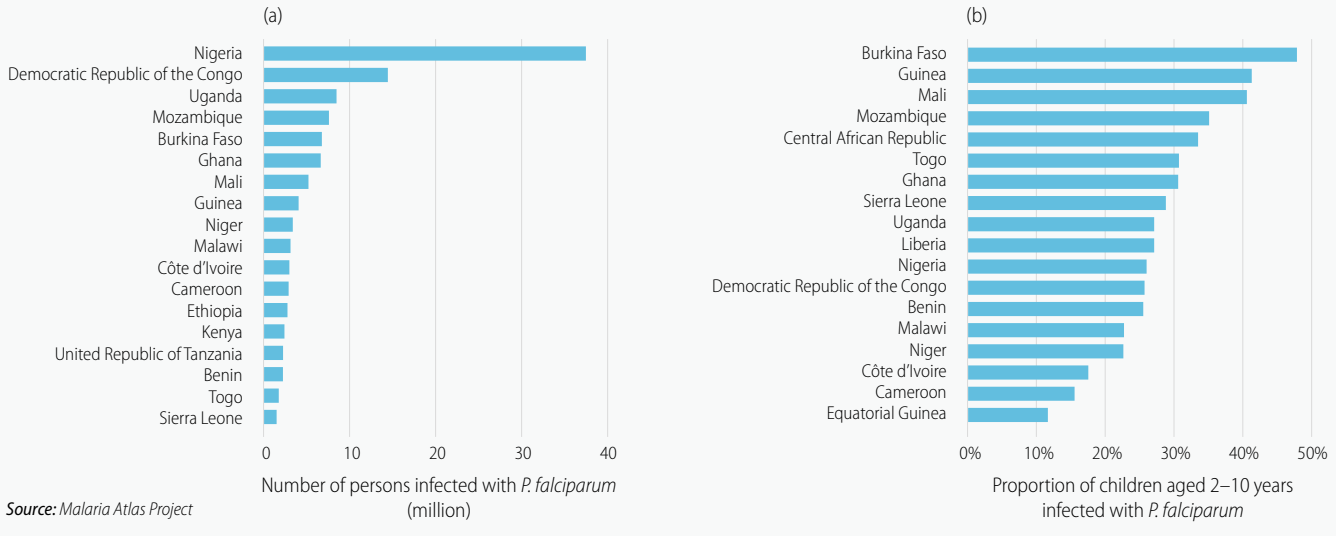
Because of the inadequacy of malaria case data from many sub-Saharan African countries, population infection prevalence can be used to enhance understanding of the level of malaria transmission and how it has changed over time. Nationally representative surveys of *P. falciparum* infection prevalence (or parasite rate, *Pf*PR) are increasingly being undertaken in sub-Saharan Africa. Large numbers of surveys can be brought together in a geospatial model to facilitate mapping of *Pf*PR and analysis of trends over time (see **Annex 1**). This modelling can help to estimate the proportion of the population at risk that are infected at any one time, and the total number of people infected.

During 2013, an estimated 128 million people were infected with *P. falciparum* in sub-Saharan Africa at any one time. In total, 18 countries account for 90% of infections in sub-Saharan Africa; 37 million infections (29%) arose in Nigeria and 14 million (11%) in the Democratic Republic of the Congo, the two countries with the highest numbers of infections (**Figure 8.3a**). These figures only include patent infections (i.e. those detectable using routine microscopy or rapid diagnostic tests). The numbers of low-density subpatent infections across Africa are considerably higher.

Infection prevalence varied greatly across Africa in 2013. Estimated rates of infection, standardized to children aged 2–10 years, were highest in West Africa, with countries in this region accounting for 7 of the 10 highest values of $Pf PR^{2-10}$ (**Figure 8.3b**). In total, 15 endemic sub-Saharan African countries had an infection prevalence in children of above 20%, a further 16 countries of 5–20%, and 16 countries and areas of below 5%.

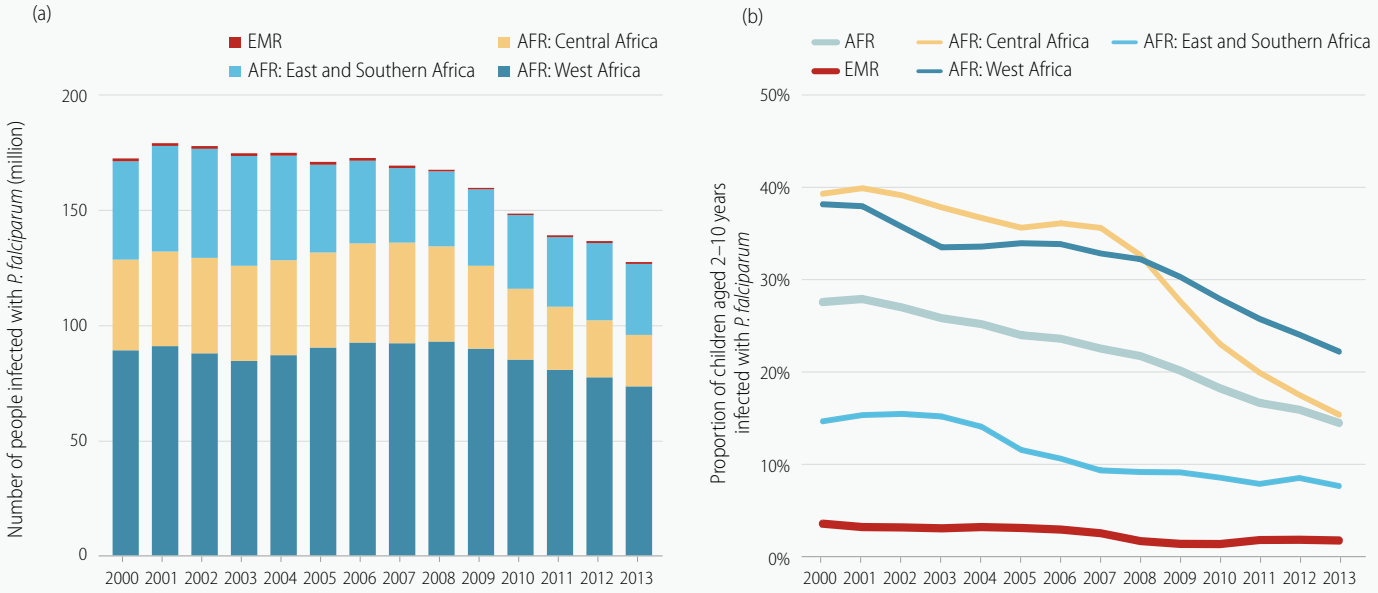
Infection prevalence fell dramatically in sub-Saharan Africa during the period 2000–2013. Across the African continent, average infection prevalence in children aged 2–10 years fell from 26% in 2000 to 14% in 2013 (and from 35% in 2000 to 18% in regions of stable transmission), a relative decline of 48% (**Figure 8.4b**). Even with a large growth in underlying populations, this resulted in a 26% drop in the number of people infected, from an average of 173 million concurrent infections in 2000 to 128 million in 2013 (**Figure 8.4a**). Falls were particularly pronounced in central Africa.

Figure 8.3 a) Countries accounting for 90% of the estimated number of *P. falciparum* infections in sub-Saharan Africa, 2013, ranked by number of infections in all ages, and b) countries ranked by the proportion of children aged 2–10 years infected with *P. falciparum*



Source: *Malaria Atlas Project*

Figure 8.4 Change in a) estimated number of *P. falciparum* infections in sub-Saharan Africa 2000–2013 and b) proportion of children aged 2–10 years infected with *P. falciparum* 2000–2013

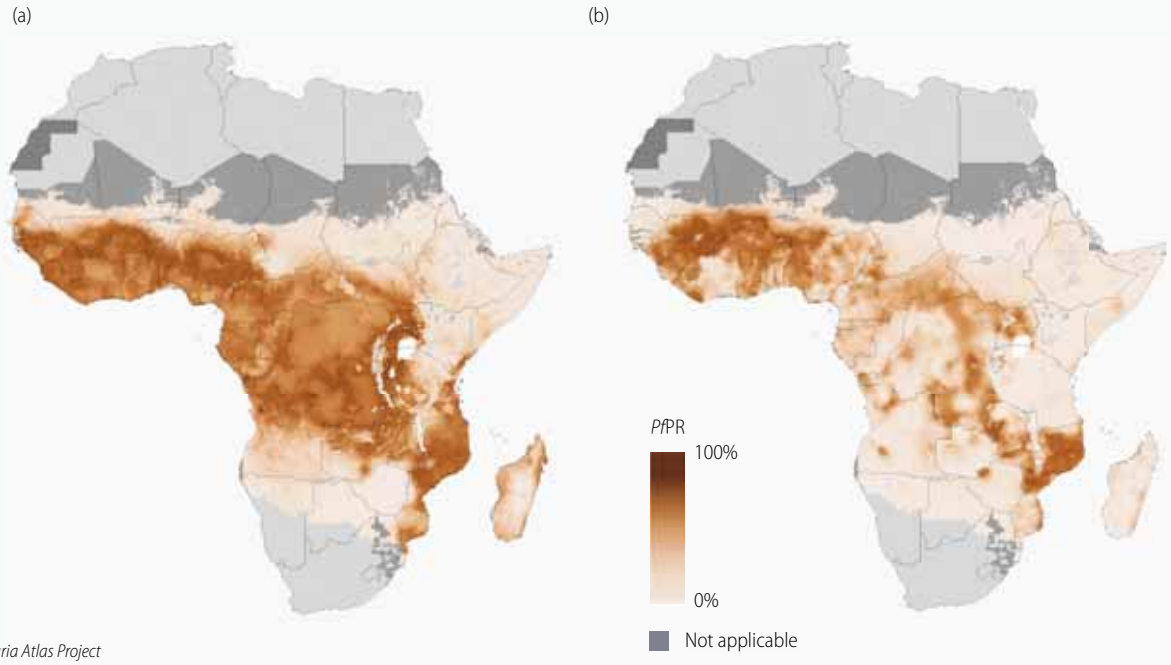


AFR, African Region; EMR, Eastern Mediterranean Region

Source: *Malaria Atlas Project*

Eight sub-Saharan countries are estimated to have achieved declines of >75% in *Pf*PR, and 14 countries achieved declines of >50% between 2000 and 2013. The biggest absolute reductions in numbers of people infected were in high-burden countries with large populations and substantial *Pf*PR declines. Despite population growth, Nigeria saw an estimated 20% decline in the average number of concurrent infections, from 47 million in 2000 to 37 million in 2013.

Figure 8.5 Proportion of children aged 2–10 years infected with *P. falciparum*, comparison between a) 2000 and b) 2013



Source: *Malaria Atlas Project*

AN ESTIMATED 198 MILLION CASES OF MALARIA AND 584 000 MALARIA DEATHS OCCURRED IN 2013.

8.3 Estimated cases and deaths, 2013

As outlined in **Section 8.1**, because surveillance systems do not capture all malaria cases and deaths occurring in a country, and the data reported to WHO are not reliable for some countries, it is necessary to use estimates of cases or deaths occurring in countries to make inferences about trends in malaria cases and deaths globally. The methods for producing estimates either adjust the number of reported cases to take into account the estimated proportion of cases that are not captured by a surveillance system, or model the relationship between malaria transmission intensity and case incidence or mortality (the latter method is used for countries in sub-Saharan Africa with insufficient surveillance data). These estimates help to make numbers more comparable between countries, and fill gaps where data are missing. However, the estimates are limited in that they rely on relationships between variables that are uncertain, and draw upon data that may have been imprecisely measured, or project forward from data measured in previous years. Thus, estimates of the number of malaria cases or deaths are accompanied by a large degree of uncertainty, and inferences concerning trends are less certain than those made directly from high-quality surveillance data. In 2014, an evidence review group on malaria burden estimation advised WHO on what approaches to use to estimate the number of malaria cases and deaths. These recommendations are being adopted and will be fully implemented in the *World malaria report 2015*. For this report, the methods used are detailed in Annex 1.

In 2013, an estimated 198 million cases of malaria occurred worldwide (95% uncertainty interval, 124–283 million). Most of these cases (82%) were in the WHO African Region, followed by the WHO South-East Asia Region (12%) and the WHO Eastern Mediterranean Region (5%). About 8% of estimated cases globally are due to *P. vivax*, although outside the African continent this proportion increases to 47% (**Table 8.2a**).

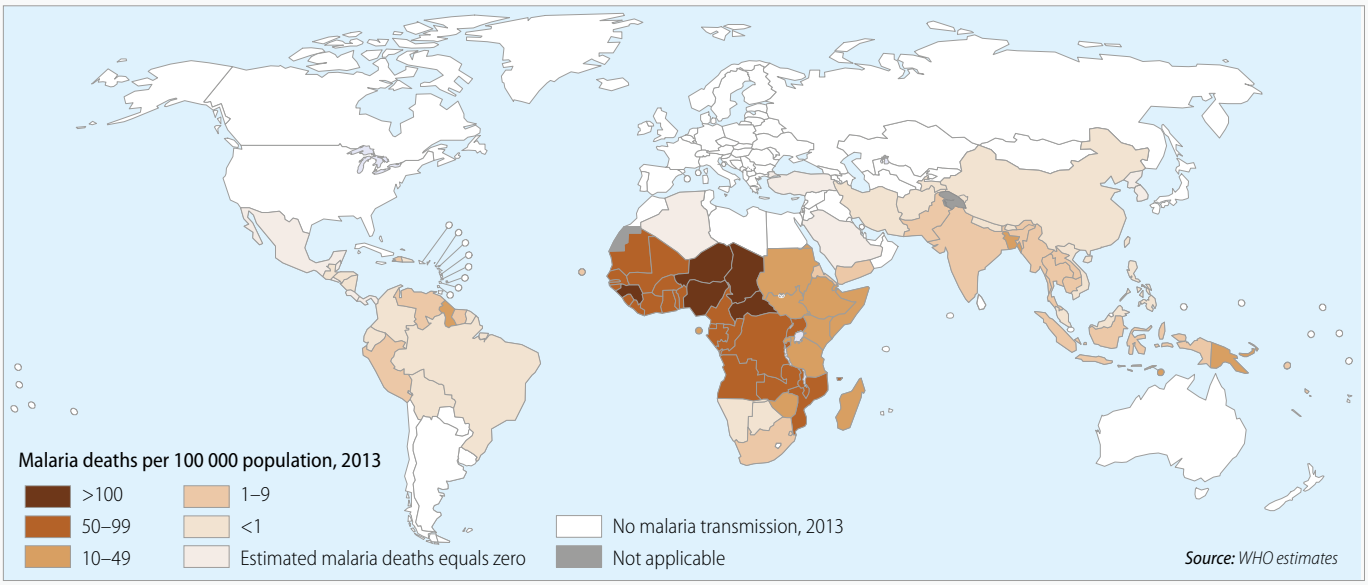
Table 8.2 Estimated number of a) malaria cases and b) malaria deaths by WHO region, 2013

(a)	Estimated cases ('000s)			Estimated *P. vivax* cases ('000s)			*P. vivax* as % of total cases
Region	Estimate	Lower	Upper	Estimate	Lower	Upper	
Africa	163 000	90 000	243 000	1 400	1 000	1 700	1%
Americas	700	600	900	500	400	600	62%
Eastern Mediterranean	9 000	6 000	14 000	3 000	2 300	3 800	33%
Europe	2	2	2	2	2	2	43%
South-East Asia	24 000	17 000	36 000	11 000	7 000	17 000	44%
Western Pacific	1 000	1 000	2 000	200	100	400	16%
World	**198 000**	**124 000**	**283 000**	**15 800**	**11 900**	**22 000**	**8%**
Outside sub-Saharan Africa	30 000	22 400	41 500	14 200	10 200	20 300	47%

(b)	Estimated deaths			Estimated deaths <5			Deaths <5 as % of total
Region	Estimate	Lower	Upper	Estimate	Lower	Upper	
Africa	528 000	315 000	689 000	437 000	324 000	544 000	83%
Americas	800	500	1 200	220	190	290	28%
Eastern Mediterranean	11 000	5 000	23 000	3 900	3 000	4 900	40%
Europe	0	0	0	0	0	0	49%
South-East Asia	41 000	23 000	69 000	11 000	7 000	17 000	29%
Western Pacific	3 300	1 700	5 600	1 600	700	2 600	49%
World	**584 000**	**367 000**	**755 000**	**453 000**	**341 000**	**630 000**	**78%**
Outside sub-Saharan Africa	47 000	29 000	75 000	13 000	8 000	21 000	28%

Source: *WHO estimates*

Figure 8.6 Malaria deaths per 100 000 population, 2013

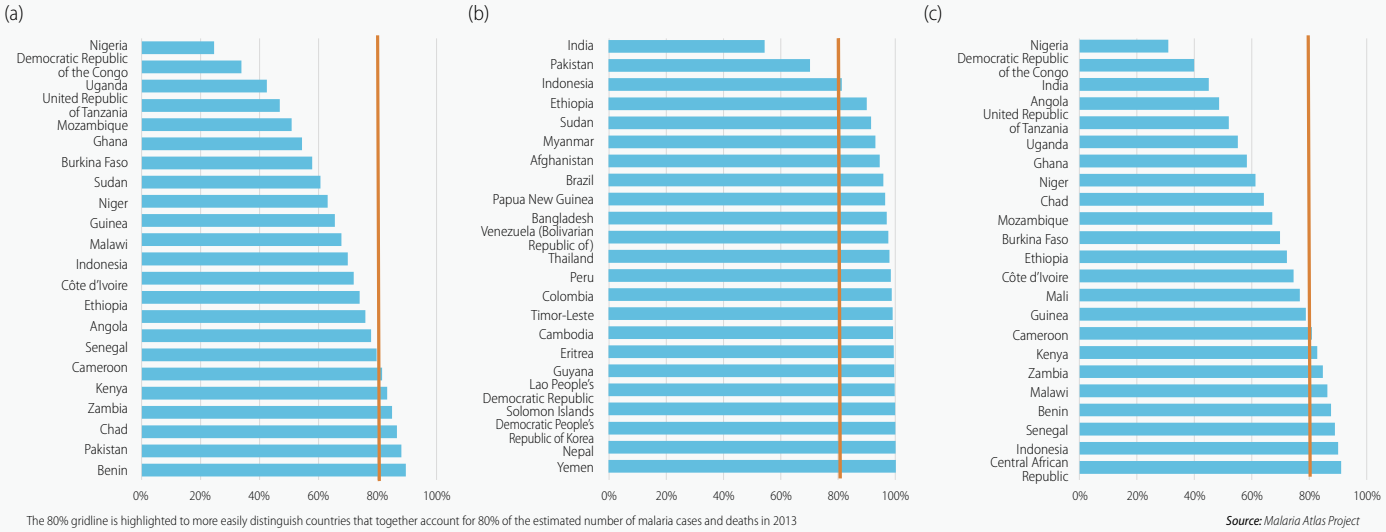


THE GLOBAL BURDEN OF MALARIA MORTALITY IS DOMINATED BY COUNTRIES IN SUB-SAHARAN AFRICA.

In 2013, there were an estimated 584 000 malaria deaths worldwide (95% uncertainty interval, 367 000–755 000) (Table 8.2b). It is estimated that most (90%) of these deaths were in the WHO African Region, followed by the WHO South-East Asia Region (7%) and the WHO Eastern Mediterranean Region (2%). About 453 000 malaria deaths (uncertainty interval, 341 000–630 000) were estimated to occur in children aged under 5 years, equivalent to 78% of the global total. An estimated 437 000 of deaths occurred in children aged under 5 years in the WHO African Region (uncertainty interval, 324 000–544 000).

About 80% of estimated malaria cases in 2013 occurred in just 18 countries, and 80% of deaths in 16 countries (Figures 8.3 and 8.4). For *P. vivax* cases, three countries (India, Indonesia and Pakistan) accounted for more than 80% of estimated cases. The global burden of mortality and morbidity was dominated by countries in sub-Saharan Africa: the Democratic Republic of the Congo and Nigeria together accounted for 39% of the global total of estimated malaria deaths and 34% of cases in 2013. International targets for reducing cases and deaths will not be attained unless considerable progress can be made in these two countries.

Figure 8.7 Cumulative proportion of the global estimated cases and deaths accounted for by the countries with the highest number of a) total cases, b) *P. vivax* cases and c) deaths in 2013



The 80% gridline is highlighted to more easily distinguish countries that together account for 80% of the estimated number of malaria cases and deaths in 2013

Source: *Malaria Atlas Project*

MALARIA MORTALITY RATES DECREASED BY 53% BETWEEN 2000 AND 2013 IN CHILDREN AGED UNDER 5 YEARS.

8.4 Changes in estimated cases and deaths, 2000–2013

The estimated number of malaria cases fell from 227 million in 2000 to 198 million in 2013 (Table 8.3a). During the same period, the population at risk for malaria increased by 25% globally and by 43% in the WHO African Region. Consequently, the estimated number of cases per 1000 persons at risk of malaria, which takes into account population growth, showed a 30% reduction in case incidence globally between 2000 and 2013, and a 34% reduction in the WHO African Region. Decreases were greatest in the WHO European Region (100%), the WHO Region of the Americas (76%) and the WHO Western Pacific Region (69%). If the rate of decline that has occurred over the past 13 years is sustained, then malaria case incidence is projected to decrease by 35% globally and 40% in the WHO African Region by 2015.

The estimated number of deaths fell in all regions between 2000 and 2013, although there was some fluctuation year by year (Table 8.3b). Malaria mortality rates (which take into account population growth over time) are estimated to have declined by 47% globally between 2000 and 2013 and by 54% in the WHO African Region (Figure 8.8b). In children aged under 5 years malaria mortality rates are estimated to have fallen by 53% globally and by 58% in the WHO African Region. If the annual rate of decrease that has occurred over the past 13 years is maintained, then by 2015, malaria mortality rates across all age groups will fall by 55% globally, and by 62% in the WHO African Region. In children aged under 5 years they are projected to decrease by 61% globally and by 67% in the WHO African Region by 2015.

Table 8.3 Estimated number of a) malaria cases and b) malaria deaths by WHO region, 2000, 2005, and from 2010 to 2013

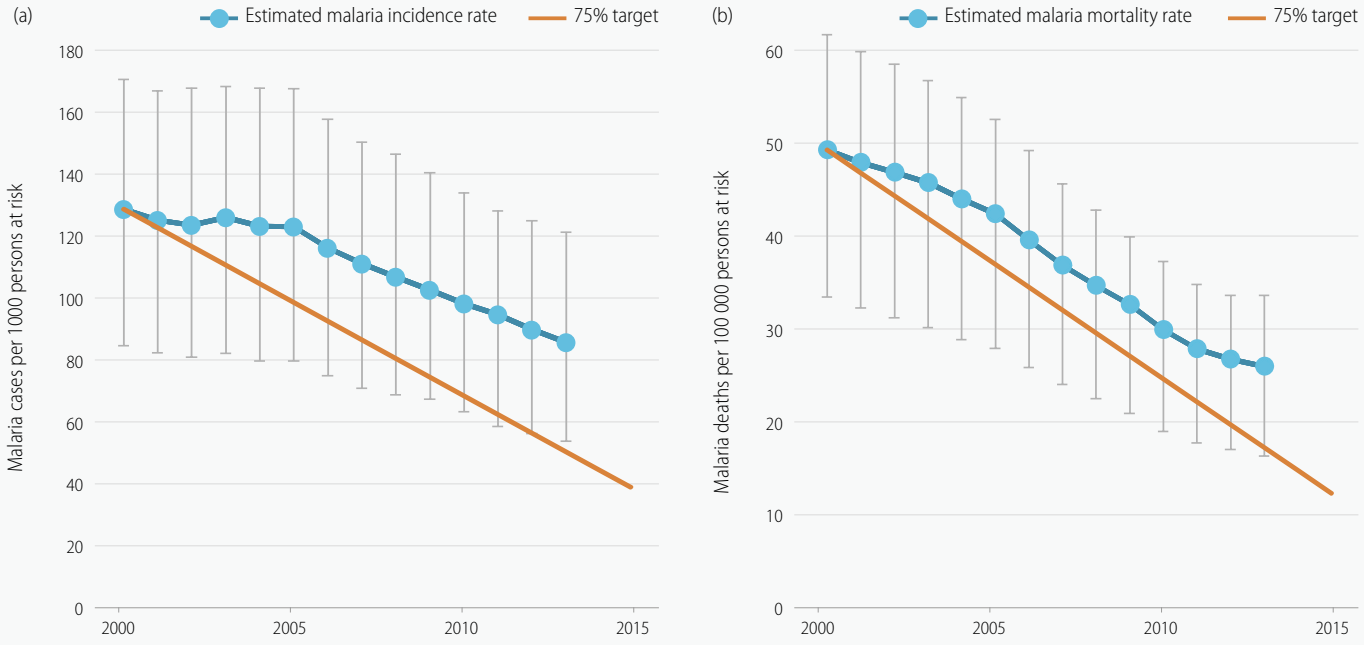
(a) Number of cases (000's)	2000	2005	2010	2011	2012	2013
Africa	174 000	192 000	167 000	163 000	163 000	163 000
Americas	2 500	1 700	1 100	800	800	700
Eastern Mediterranean	14 000	10 000	9 000	11 000	10 000	9 000
Europe						
South-East Asia	33 000	34 000	28 000	28 000	27 000	24 000
Western Pacific	4 000	2 000	2 000	1 000	1 000	1 000
World	**227 000**	**240 000**	**207 000**	**203 000**	**202 000**	**198 000**
Lower bound	150 000	155 000	133 000	129 000	127 000	124 000
Upper bound	304 000	328 000	287 000	282 000	281 000	283 000

(b) Number of deaths	2000	2005	2010	2011	2012	2013
Africa	801 000	761 000	576 000	543 000	530 000	528 000
Americas	2 300	1 800	1 300	1 000	900	800
Eastern Mediterranean	17 000	13 000	12 000	13 000	12 000	11 000
Europe	3					
South-East Asia	53 000	50 000	46 000	44 000	43 000	41 000
Western Pacific	9 500	4 700	3 900	3 300	3 500	3 300
World	**882 000**	**830 000**	**639 000**	**605 000**	**590 000**	**584 000**
Lower bound	599 000	547 000	405 000	384 000	376 000	367 000
Upper bound	1 104 000	1 029 000	795 000	755 000	742 000	755 000

Source: *WHO estimates*

Estimated numbers of cases for 2012 and previous years differ slightly from those reported in the *World malaria report 2013*, owing to the use of an updated ITN model in the calculation of case estimates in Africa, and the updating of previous datasets on reported cases. Similarly, estimated numbers of deaths differ slightly from those reported previously, owing to revisions to the under-5 mortality envelope by the UN Inter-agency Group for Child Mortality Estimation (*38*) (see **Annex 1**).

Figure 8.8 Change in a) Estimated malaria case incidence rate, 2000–2013 and b) Estimated malaria mortality rate, 2000–2013



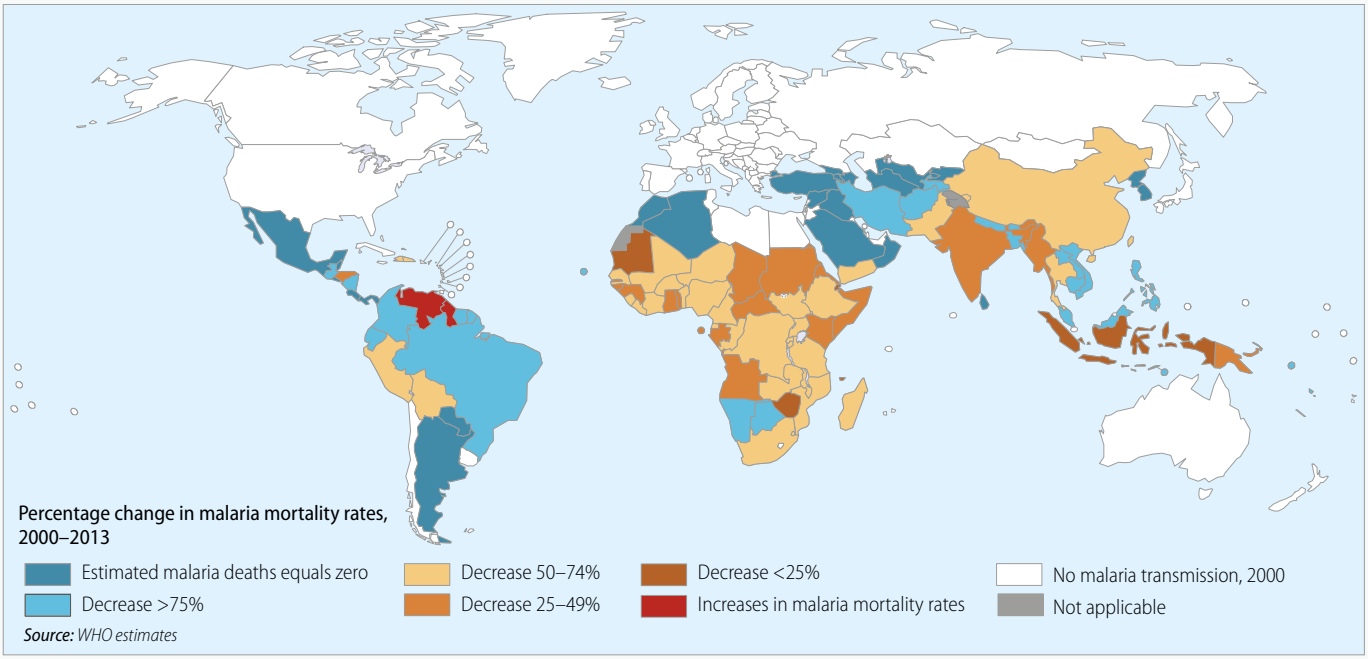
Source: *WHO estimates*

SIXTY COUNTRIES ARE PROJECTED TO ACHIEVE >75% REDUCTIONS IN MALARIA MORTALITY RATES BY 2015.

The pace of decline in estimated malaria incidence and mortality rates was initially slow, but accelerated from 2005 (**Figure 8.8b**). Considerable uncertainty is associated with the calculated reductions in incidence and mortality rates, since they are based on the estimated numbers of cases and deaths, which have wide uncertainty intervals. Nonetheless, it appears that the rate of decline in malaria in incidence and mortality rates was initially slow but accelerated after 2005, and, for mortality, the rate from 2005 to 2010 was sufficiently fast to achieve a 75% reduction over 15 years (the plotted points are parallel to the target line in Figure 8.8). However, the decrease in malaria mortality rates was slower between 2011 and 2013. This more recent reduced rate of decline is associated with a reduced rate of increase in ITN coverage in sub-Saharan Africa in 2012 and 2013 (**Section 3.1**), a factor that is taken into account in estimates of cases and deaths. The number of ITNs distributed in sub-Saharan Africa in 2014 exceeded any previous year, and is expected to lead to increases in the rate of mortality decline in 2014 and 2015.

Of the 106 countries that had ongoing transmission in 2000, 56 are projected to achieve reductions in malaria mortality rates of >75% in 2015, or to maintain zero malaria deaths.

Figure 8.9 Percentage change in malaria mortality rates, 2000–2013



REDUCTIONS IN MALARIA DEATHS HAVE CONTRIBUTED SUBSTANTIALLY TO PROGRESS TOWARDS ACHIEVING THE TARGET FOR MDG 4, WHICH IS TO REDUCE THE UNDER-5 MORTALITY RATE BY TWO THIRDS.

8.5 Estimated cases and deaths averted, 2001–2013

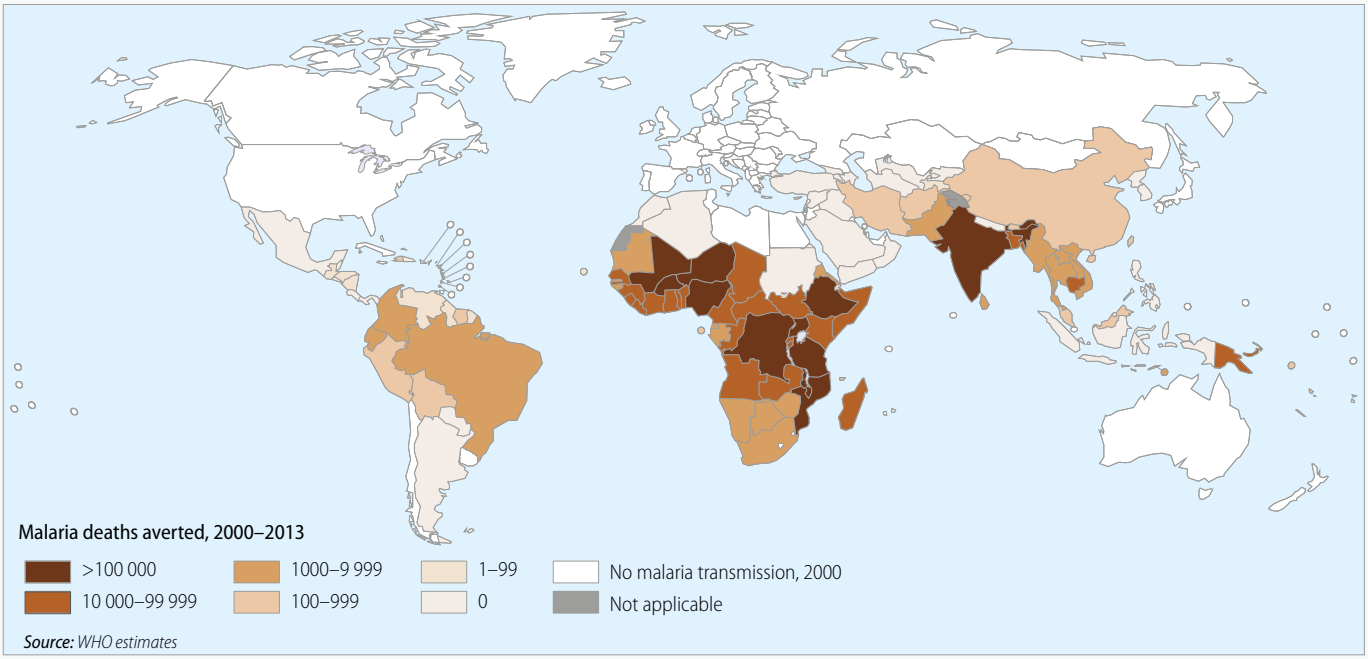
It is estimated that, globally, 625 million fewer cases and 4.3 million fewer malaria deaths occurred between 2001 and 2013 than would have occurred had incidence and mortality rates remained unchanged since 2000 (Table 8.4). Of the estimated 4.3 million deaths averted between 2001 and 2013, 3.9 million (92%) were in children aged under 5 years in sub-Saharan Africa. These 3.9 million averted deaths accounted for 20% of the 20 million fewer deaths that would have occurred in sub-Saharan Africa between 2001 and 2013 had under-5 mortality rates for 2000 applied for each year between 2001 and 2013. Thus, reductions in malaria deaths have contributed substantially to progress towards achieving the target for MDG 4 in sub-Saharan Africa, which is to reduce the under-5 mortality rate by two thirds between 1990 and 2015.

Table 8.4 Estimated cases and deaths averted by reduction in incidence and mortality rates between 2001 and 2013

Region	Cases averted		Deaths averted		Deaths averted <5	
	2001–2013 (million)	Percentage of total	2001–2013 (million)	Percentage of total	2001–2013 (million)	Percentage of total
African	444	66%	3.93	92%	3.92	95%
Region of the Americas	19	3%	0.01	0%	0.00	0%
Eastern Mediterranean	72	11%	0.08	2%	0.04	1%
European	0.3	0%	0.00	0%	0.00	0%
South-East Asia	106	16%	0.17	4%	0.09	2%
Western Pacific	30	4%	0.08	2%	0.06	1%
World	**670**	**100%**	**4.28**	**100%**	**4.11**	**100%**

Source: WHO estimates

Figure 8.10 Malaria deaths averted, 2001–2013



Most of the malaria cases averted (66%) and lives saved (92%) have been in the WHO African Region (Table 8.4). Larger percentage decreases in case incidence and mortality rates were seen in countries with the lowest estimated malaria burdens in 2000. However, although progress in reducing incidence and mortality rates has been faster in countries with smaller estimated numbers of malaria cases and deaths, this does not imply a lack of impact in higher burden countries. In fact, many cases and deaths were averted during 2001–2013 in countries with high malaria burdens. The ten countries with the highest estimated malaria burden in 2000 accounted for 57% of malaria cases and 68% of malaria deaths averted between 2001–2013.

Not all of the cases and deaths averted can be attributed to malaria interventions implemented by malaria programmes. Some progress is likely to be related to increased urbanization and overall economic development, which lead to improvements in housing and nutrition.

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REGIONAL PROFILES

African Region

West Africa

Algeria
Benin
Burkina Faso
Cabo Verde
Côte d'Ivoire
Gambia
Ghana
Guinea
Guinea-Bissau
Liberia
Mali
Mauritania
Niger
Nigeria
Senegal
Sierra Leone
Togo

Central Africa

Angola
Burundi
Cameroon
Central African Republic
Chad
Congo
Democratic Republic of the Congo
Equatorial Guinea
Gabon
Sao Tome and Principe

East Africa and high-transmission areas in Southern Africa

Comoros
Eritrea
Ethiopia
Kenya
Madagascar
Malawi
Mozambique
Rwanda
South Sudan
Uganda
United Republic of Tanzania
Zambia

Low-transmission Southern African countries

Botswana
Namibia
South Africa
Swaziland
Zimbabwe

Region of the Americas

Argentina
Belize
Bolivia (Plurinational State of)
Brazil
Colombia
Costa Rica
Dominican Republic
Ecuador
El Salvador
French Guiana, France
Guatemala
Guyana
Haiti
Honduras
Mexico
Nicaragua
Panama
Paraguay
Peru
Suriname
Venezuela (Bolivarian Republic of)

Eastern Mediterranean Region

Afghanistan
Djibouti
Iran (Islamic Republic of)
Iraq
Pakistan
Saudi Arabia
Somalia
Sudan
Yemen

European Region

Azerbaijan
Georgia
Kyrgyzstan
Tajikistan
Turkey
Uzbekistan

South-East Asia Region

Bangladesh
Bhutan
Democratic People's Republic of Korea
India
Indonesia
Myanmar
Nepal
Sri Lanka
Thailand
Timor-Leste

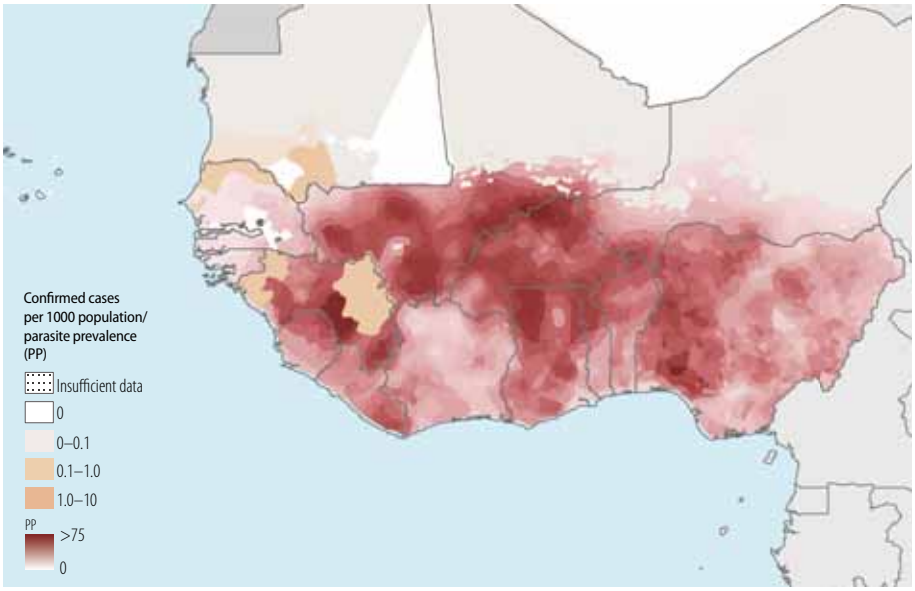
Western Pacific Region

Cambodia
China
Lao People's Democratic Republic
Malaysia
Papua New Guinea
Philippines
Republic of Korea
Solomon Islands
Vanuatu
Viet Nam

WEST AFRICA

BETWEEN 2000 AND 2013, TWO COUNTRIES OUT OF 17 REPORTED DECREASES IN CASE INCIDENCE OF >75%. SURVEILLANCE DATA WERE INSUFFICIENTLY CONSISTENT TO ASSESS TRENDS IN OTHER COUNTRIES.

A. Confirmed malaria cases per 1000 population/parasite prevalence, 2013



Population at risk: About 333 million people in the 17 countries of this subregion are at some risk for malaria, with 322 million at high risk. Cabo Verde is in the pre-elimination programme phase, and Algeria in the elimination phase. Malaria cases are almost exclusively due to *P. falciparum* (**Figure F**).

Financing: Funding for malaria control rose from US$ 89 million in 2005 to US$ 557 million in 2013 (**Figure B**). During 2011–2013 it exceeded US$ 4 per capita per year in three countries: Cabo Verde, the Gambia and Liberia (**Figure C**).

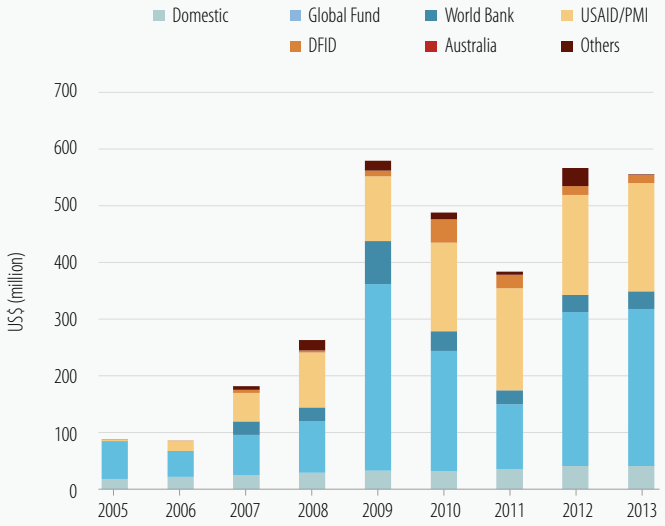
Interventions: In 2013, the proportion of the population at risk estimated to have access to an insecticide-treated mosquito net (ITN) in their household exceeded 50% in seven countries (Burkina Faso, the Gambia, Ghana, Guinea-Bissau, Mali, Senegal and Togo) (**Figure D**). Cabo Verde and the Gambia protected more than 40% of their population at risk using indoor residual spraying (IRS), whereas Benin, Ghana, Liberia, Mali and Senegal used IRS on a more limited scale. Eight countries (Burkina Faso, Cabo Verde, the Gambia, Ghana, Liberia, Mali, the Niger and Sierra Leone) delivered enough antimalarial medicines to treat >80% of the population. Benin and Guinea-Bissau did not report on delivery of artemisinin-based combination therapy (ACT) (**Figure E**). Algeria and Cabo Verde implemented active case detection (ACD), case investigation and a quality assurance system for malaria diagnostic testing (guided by the national reference laboratory), and a radical treatment policy with primaquine for *P. vivax* and gametocytocidal treatment for *P. falciparum*.

Trends in cases and deaths: Both Algeria and Cabo Verde achieved a >75% decrease in case incidence between 2000 and 2013. Algeria is in the elimination phase and reported only 16 indigenous cases, six introduced cases and one relapsing case in 2013; a sharp decrease compared to 2012, when 59 indigenous and three introduced cases were reported (the number of imported cases also fell from 825 in 2012 to 595 in 2013). Cabo Verde has been in the pre-elimination phase since 2010. It reported 22 indigenous cases in 2013 compared with one case in 2012. In the 15 remaining countries, it was not possible to assess trends in cases or admissions owing to inconsistent reporting, or changes in diagnostic testing or access to health services (**Figure G**).

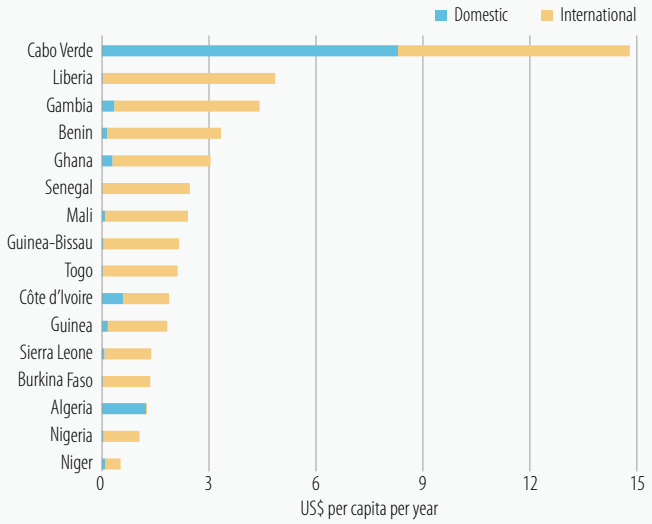
A review of trends in 83 hospitals in Ghana between 2005 and 2013 showed an increase in confirmed malaria cases, admissions and deaths in all age groups, although malaria deaths in children aged under 5 years fell by 29% (WHO, unpublished results). The increase appeared to be related to expanded diagnostic testing and increased access to health services. The slide positivity rate (SPR) remained stable at 34%. A review of trends in 186 hospitals in Nigeria between 2005 and 2013 indicated an increase or no change in confirmed malaria cases, admission and deaths across all age groups, and a stable SPR (59%) (WHO, unpublished results).

Subnational decreases in morbidity and mortality have been reported from Burkina Faso (*1*), Senegal (*2,3*) and Togo (*4,5*) but these findings are insufficient to draw conclusions about national trends.

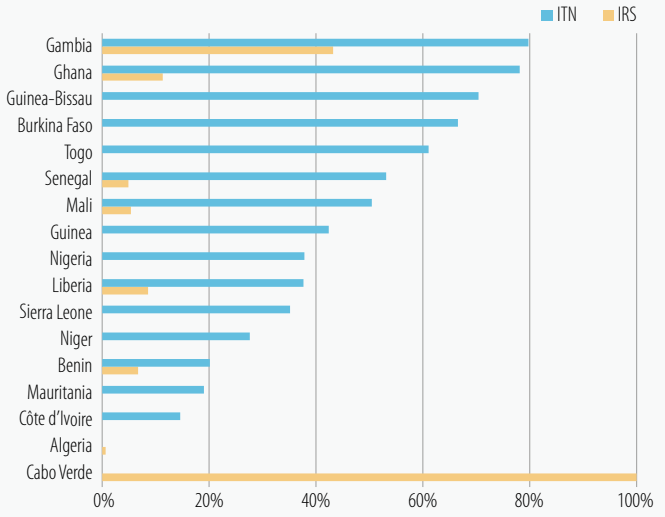
B. Financial contribution for malaria control by source, 2005–2013



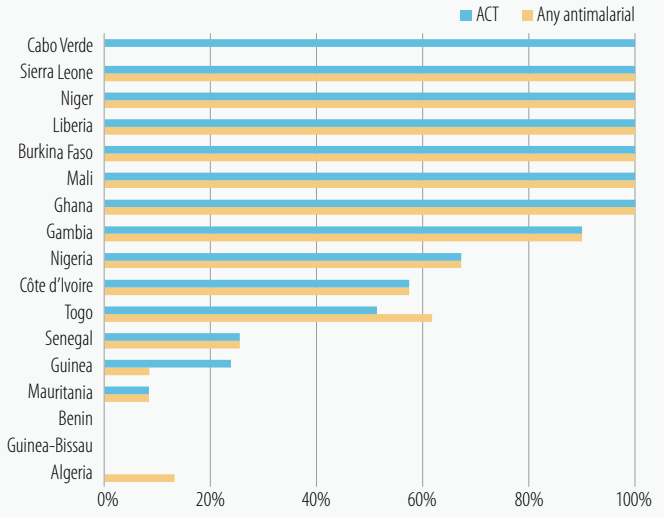
C. US$ per capita for malaria control, 2011–2013



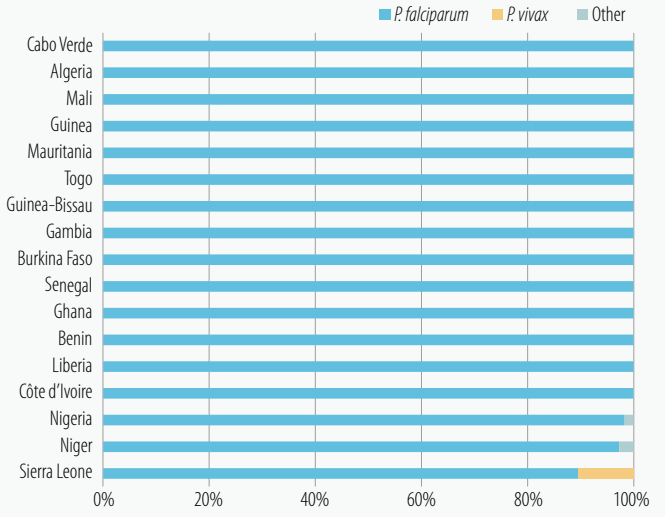
D. Percentage of population at risk with access to an ITN and percentage protected with IRS, 2013



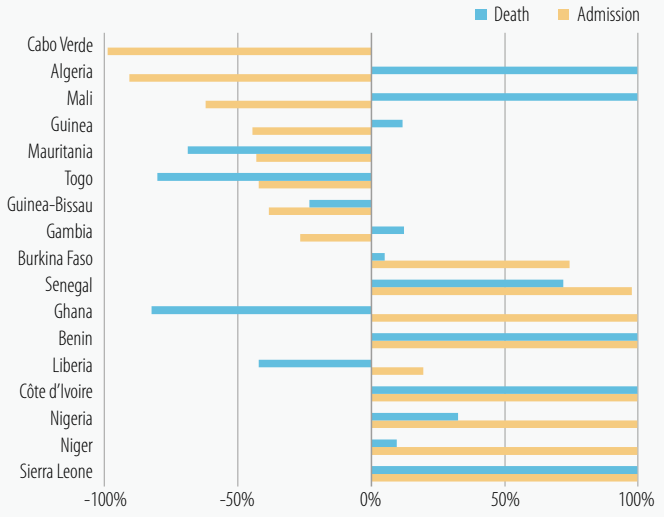
E. Antimalarial treatment courses distributed as a proportion of estimated malaria cases in the public sector, 2013



F. Percentage of cases due to *P. falciparum* and *P. vivax*, 2009–2013



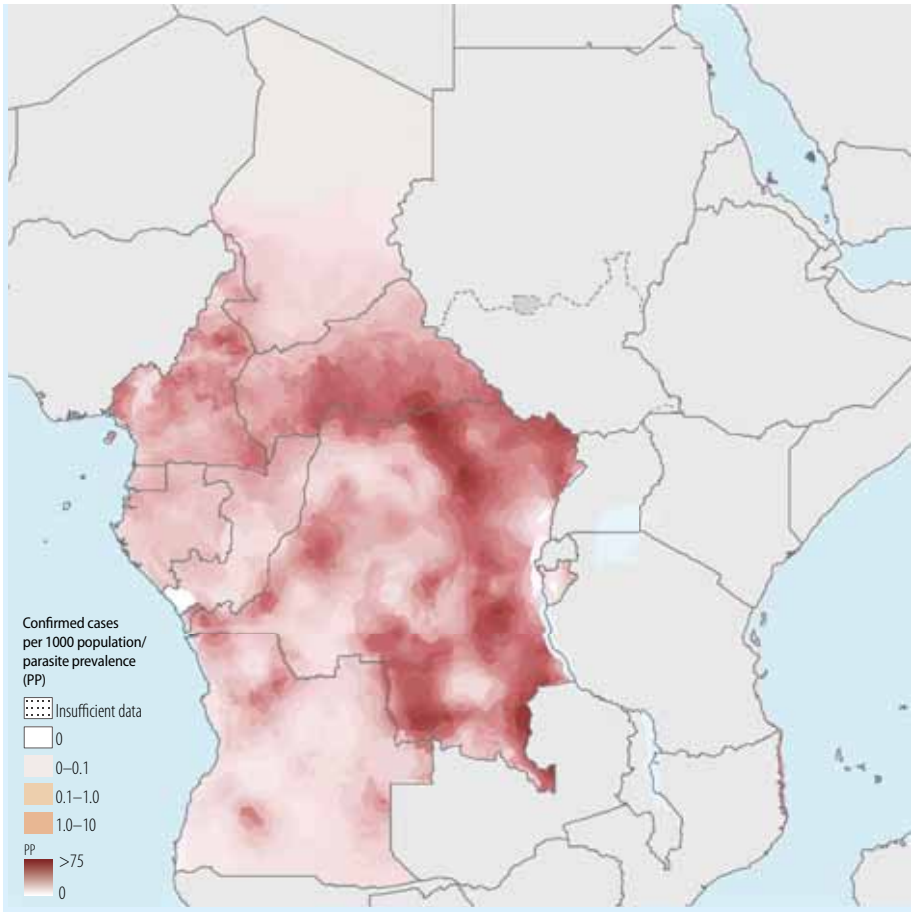
G. Change in admission and death rates, 2000–2013



CENTRAL AFRICA

OF THE 10 COUNTRIES IN THIS SUBREGION, ONLY ONE REPORTED DECREASES IN CASE INCIDENCE OF >75%. SURVEILLANCE DATA WERE INSUFFICIENTLY CONSISTENT TO ASSESS TRENDS IN OTHER COUNTRIES.

A. Confirmed malaria cases per 1000 population/parasite prevalence, 2013



Population at risk: About 144 million people in the 10 countries of this subregion are at some risk for malaria, with 127 million at high risk (**Figure A**). Cases are almost exclusively due to *P. falciparum* (**Figure F**).

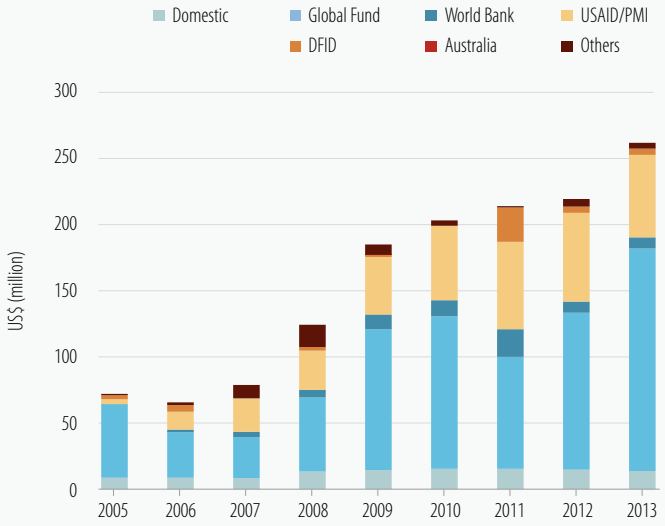
Financing: Funding for malaria control in the subregion rose from US$ 72 million in 2005 to US$ 263 million in 2013 (**Figure B**). Malaria financing exceeded US$ 4 per capita per year in Equatorial Guinea and Sao Tome and Principe during 2011–2013 (**Figure C**).

Interventions: In 2013, the proportion of the population at risk estimated to have access to an ITN in their household exceeded 50% in five countries (Burundi, Chad, Congo, the Democratic Republic of the Congo, and Sao Tome and Principe) (**Figure D**). Sao Tome and Principe also reported that >60% of the population at risk were protected with IRS. Four countries (Angola, Burundi, the Democratic Republic of the Congo and Sao Tome and Principe) reported distributing sufficient ACTs to treat >50% of estimated malaria cases attending public health facilities in 2013. Congo and Gabon did not report on delivery of ACT (**Figure E**).

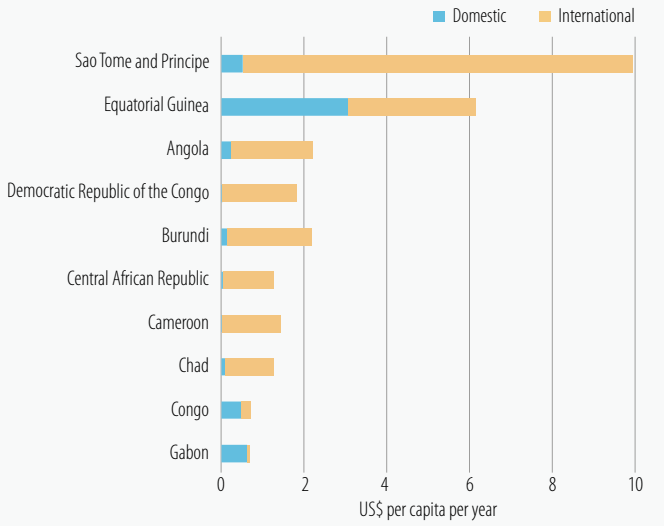
Trends in cases and deaths: Between 2000 and 2013, only Sao Tome and Principe achieved a >75% decrease in case incidence; it also reported >90% decrease in malaria admission and death rates. However, the number of cases and admissions in 2011–2013 was higher than in the previous 4 years, suggesting minimal progress in recent years.

In the nine remaining countries, it was not possible to assess trends owing to incomplete reporting or changes in health service access or diagnostic testing. In several countries, the number of confirmed malaria cases and admissions increased in recent years, possibly reflecting improved reporting or improved access to health services (**Figure G**). Subnational decreases in malaria morbidity and mortality have been reported in the Island of Bioko in Equatorial Guinea (*6*) (although high transmission persists in some foci) (*7*), Cameroon (*8*) and Gabon (*9*).

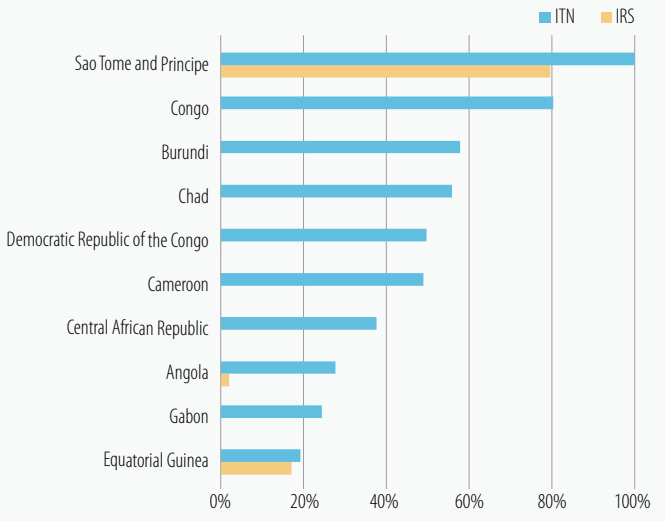
B. Financial contribution for malaria control by source, 2005–2013



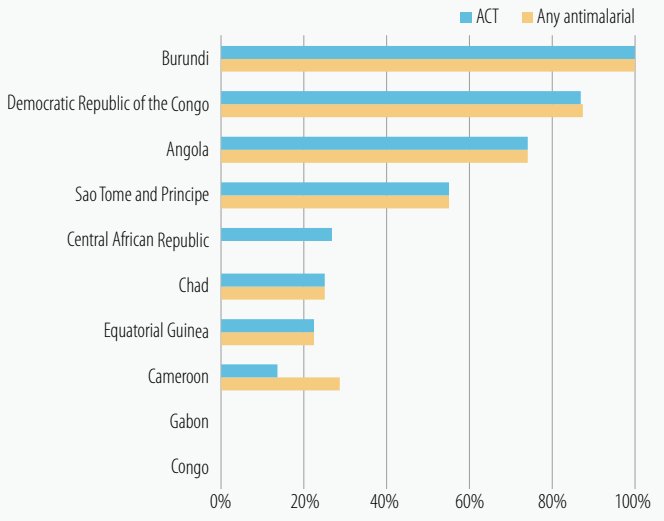
C. US$ per capita for malaria control, 2011–2013



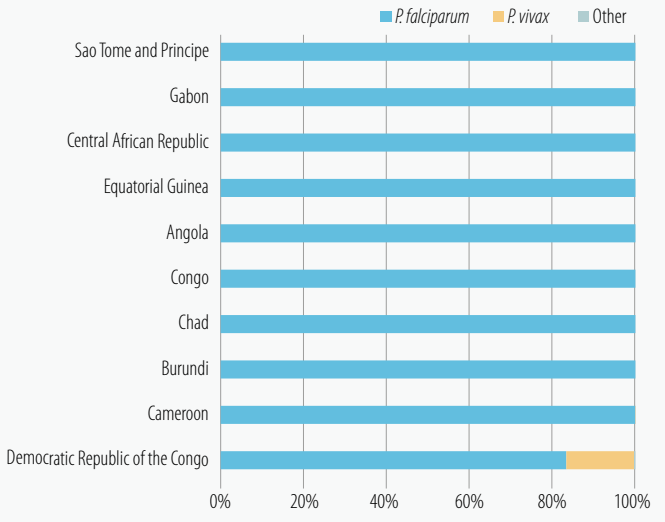
D. Percentage of population at risk with access to an ITN and percentage protected with IRS, 2013



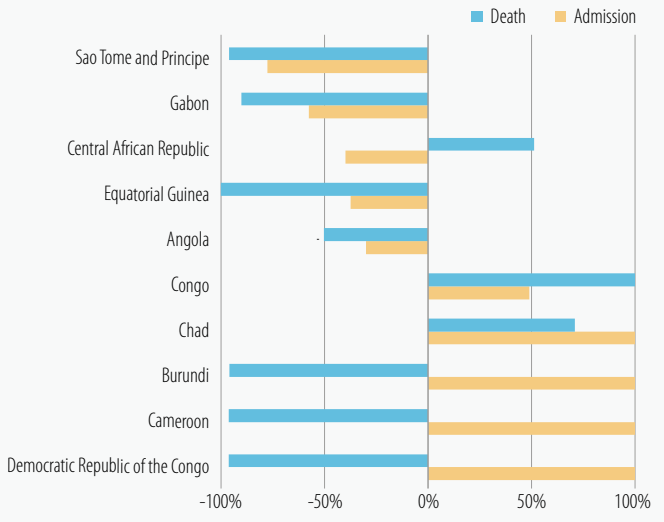
E. Antimalarial treatment courses distributed as a proportion of estimated malaria cases in the public sector, 2013



F. Percentage of cases due to *P. falciparum* and *P. vivax*, 2009–2013



G. Change in admission and death rates, 2000–2013

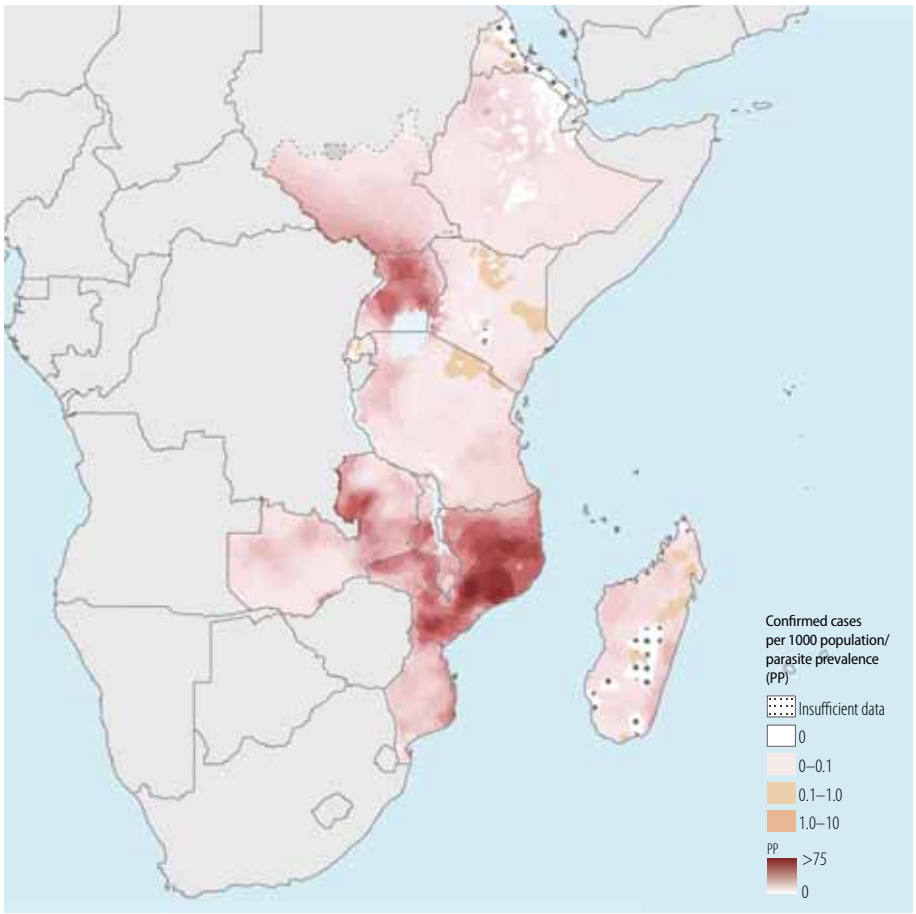


EAST AND SOUTHERN AFRICA

(excluding low-transmission countries in Southern Africa)

THREE COUNTRIES AND AREAS ACHIEVED >75% DECREASE IN MALARIA ADMISSION RATES BETWEEN 2000 AND 2013. TWO COUNTRIES ARE ON TRACK TO REDUCE MALARIA ADMISSION RATES BY 50–75% BY 2015.

A. Confirmed malaria cases per 1000 population/parasite prevalence, 2013



Population at risk: About 293 million people in the 12 countries in this subregion are at some risk for malaria, with 179 million at high risk. About 25% of the population of Ethiopia and Kenya live in areas that are free of malaria. *P. falciparum* is the dominant species, except in Eritrea and Ethiopia, where *P. vivax* accounts for about 38% of reported cases (**Figure F**).

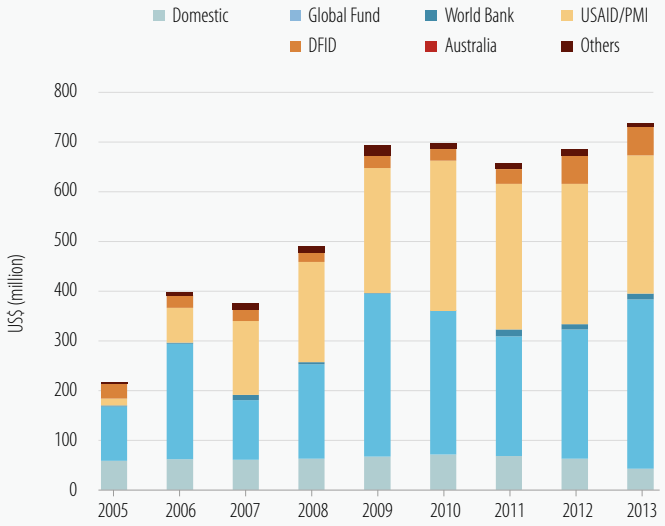
Financing: Funding for malaria control in the subregion increased from US$ 217 million in 2005 to US$ 741 million in 2013. Malaria financing was less than US$ 4 per capita per year during 2011–2013 in all countries but exceeded US$ 3 per capita in six (Ethiopia, Kenya, Madagascar, Malawi, Rwanda and Zambia) (**Figure C**).

Interventions: In 2013, the proportion of the population at risk estimated to have access to an ITN in their household exceeded 50% in nine countries (Comoros, Ethiopia, Kenya, Madagascar, Malawi, Mozambique, Rwanda, South Sudan and Zambia), and in Zanzibar in the United Republic of Tanzania (**Figure D**). IRS was also used in 10 countries, with the proportion of the at-risk population protected reaching >37% in Ethiopia and Mozambique. In 2013, all countries except Comoros and Madagascar reported distribution of sufficient ACTs to treat all patients attending public health facilities (Malawi and Rwanda did not report) (**Figure E**).

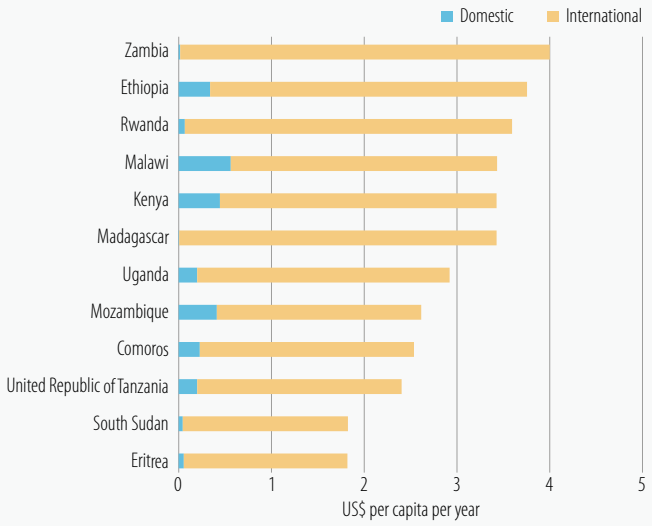
Trends in cases and deaths: Between 2000 and 2013, malaria admission rates decreased by >75% in Eritrea, Rwanda and in Zanzibar, in the United Republic or Tanzania (consistent with a previous study (*10*)) (**Figure G**). In Rwanda, confirmed malaria cases and admissions doubled between 2012 and 2013 (483 000 to 962 000 and 5306 to 9508, respectively), while testing remained unchanged. Malaria admission rates are projected to decrease by 50–75% by 2015 in Ethiopia (based on a study in 41 hospitals (*11*)) and in Zambia. Decreases in malaria admissions were also seen in Mozambique, but no comparable data from earlier than 2007 are available. Recent increases in admissions and deaths in Madagascar reflect the fragility of the gains achieved if control efforts are not maintained.

For the seven remaining countries (Comoros, Kenya, Malawi, Mozambique, United Republic of Tanzania [Mainland], South Sudan and Uganda), it was not possible to assess trends owing to inconsistent reporting, changes in health service accessibility or diagnostic testing. Evidence of subnational reductions in morbidity and mortality have been reported in the United Republic of Tanzania (Mainland) (*12*), Kenya (*13*), Uganda (*14,15*) and Zambia (*16,17*) (mixed results) but these results are insufficient to make inferences about national trends.

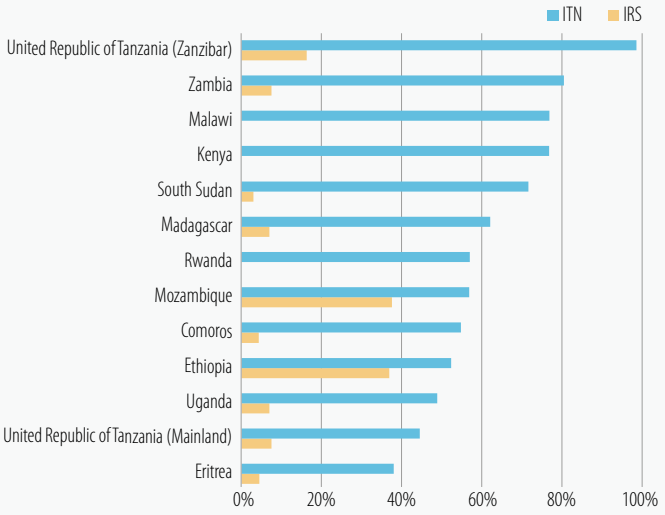
B. Financial contribution for malaria control by source, 2005–2013



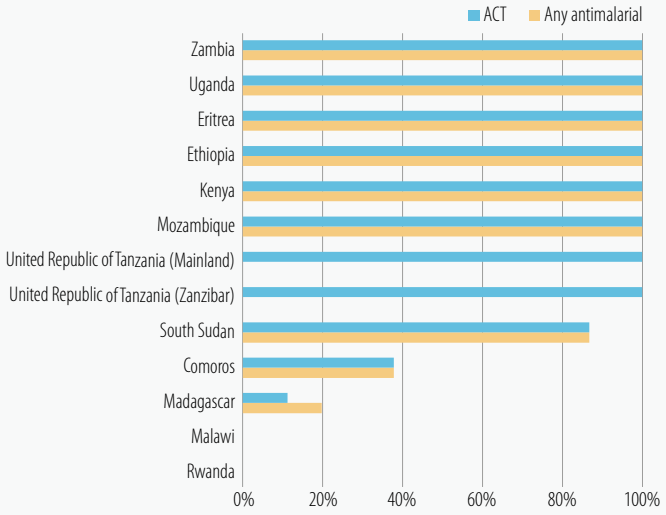
C. US$ per capita for malaria control, 2011–2013



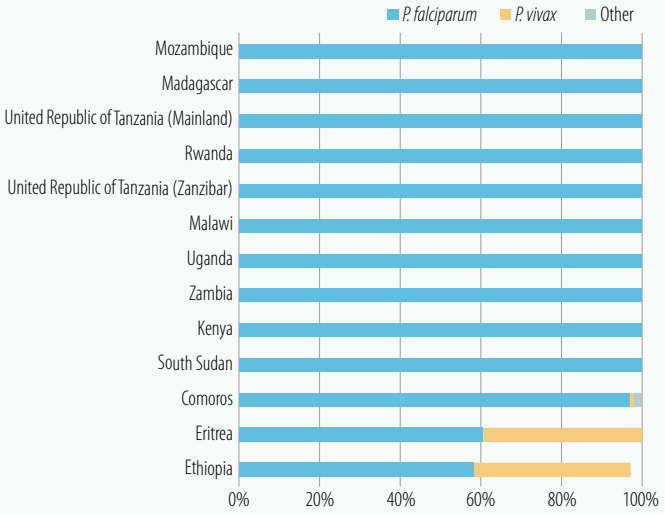
D. Percentage of population at risk with access to an ITN and percentage protected with IRS, 2013



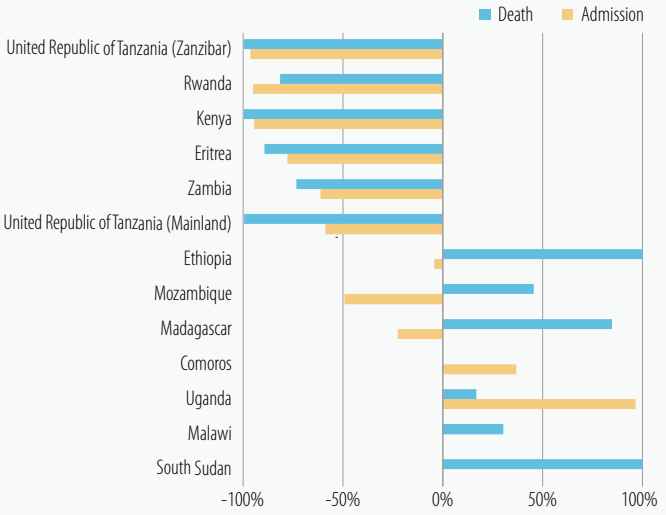
E. Antimalarial treatment courses distributed as a proportion of estimated malaria cases in the public sector, 2013



F. Percentage of cases due to *P. falciparum* and *P. vivax*, 2009–2013



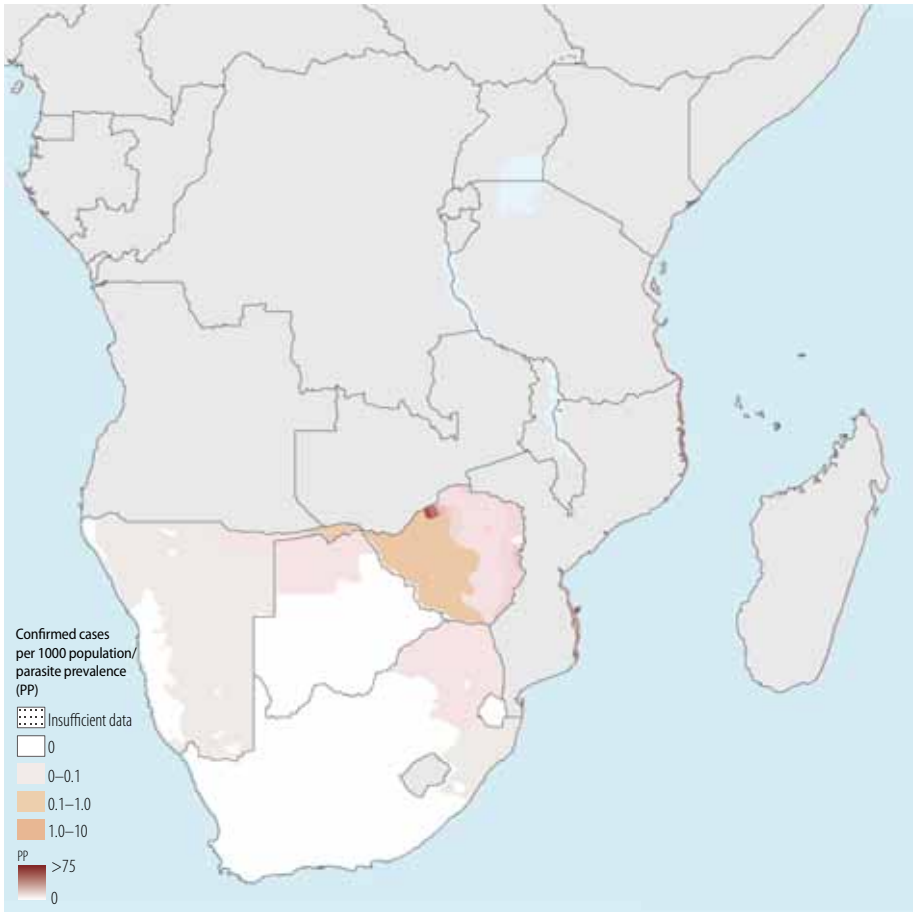
G. Change in admission and death rates, 2000–2013



LOW-TRANSMISSION SOUTHERN AFRICAN COUNTRIES

FOUR OUT OF FIVE COUNTRIES ACHIEVED >75% DECREASE IN CASE INCIDENCE IN 2013, AND ONE COUNTRY IS ON TRACK TO REDUCE INCIDENCE BY 50–75% BY 2015.

A. Confirmed malaria cases per 1000 population/parasite prevalence, 2013



Population at risk: About 15 million people in the five countries of this subregion are at some risk for malaria, with 11 million at high risk (**Figure A**). About 80%, or 60 million people, live in areas that are free of malaria. Malaria transmission is highly seasonal. Most malaria cases are caused by *P. falciparum* (**Figure F**).

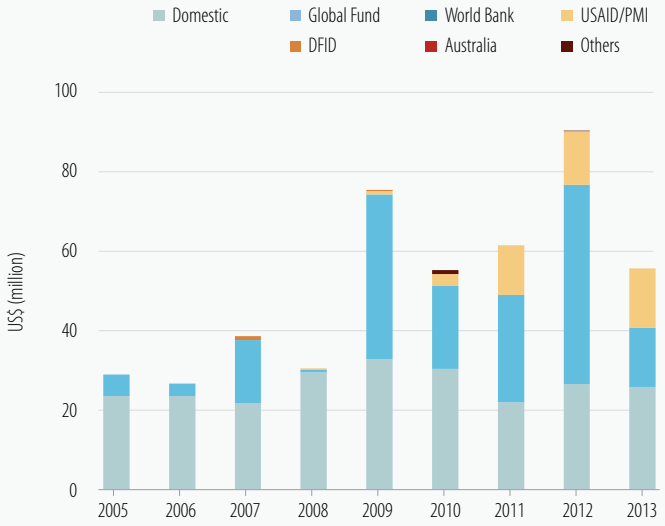
Financing: Funding for malaria control in this subregion increased from US$ 29 million in 2005 to US$ 56 million in 2013 (**Figure B**). During 2011–2013, it exceeded US$ 4 per capita per year in all countries of the subregion except Botswana (**Figure C**).

Interventions: In 2013, the population at risk estimated to have access to an ITN in their household exceeded 50% in Zimbabwe; although IRS was extensively used, countries protected <50% of their population at high risk with IRS (**Figure D**). In South Africa, where IRS is the main vector control measure, the proportion of the population at risk protected in 2013 was almost half of what was reported in 2012. All five countries delivered sufficient antimalarial medicines to treat >80% of malaria cases attending public health facilities (**Figure E**).

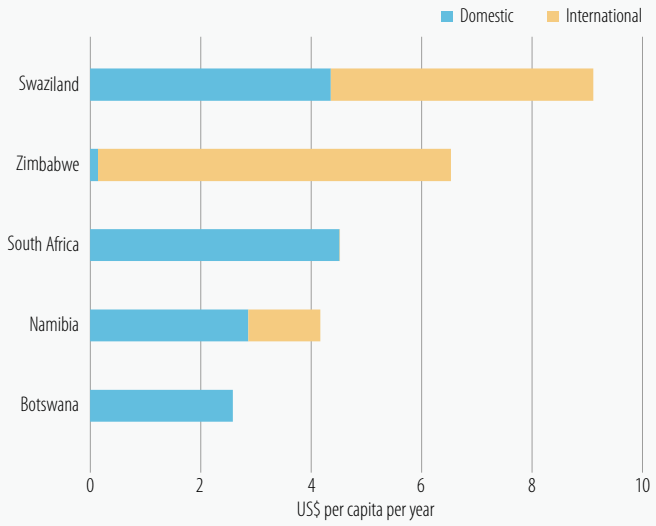
Trends in cases and deaths: Four of the five countries in this subregion (Botswana, Namibia, South Africa and Swaziland) achieved >75% decrease in case incidence between 2000 and 2013 (**Figure G**). Reported malaria mortality rates also fell by >75%. However, the number of reported cases in these four countries more than doubled between 2012 and 2013. The increase in reported cases may be due to higher testing rates. In Zimbabwe, the number of diagnostic tests performed increased fivefold between 2004 and 2013, with rapid diagnostic tests (RDTs) increasingly replacing microscopy. It is therefore not possible to assess trends using nationally reported cases. However, a review of data from 45 hospitals indicated a decrease in malaria admissions and mortality rates of 64% and 71% between 2003 and 2012, suggesting the country is on track to achieve a decrease in admission rates of 50–75% and mortality rates of >75% by 2015. Another subnational study also showed a decrease in malaria case incidence in a district of Zimbabwe (*18*).

All five countries in the subregion, together with Angola, Mozambique and Zambia, are signatories to the Elimination Eight (E8) regional initiative launched in March 2009, a goal of which is to achieve the eventual elimination of malaria in the region, and to achieve elimination in four countries – Botswana, Namibia, South Africa and Swaziland – by 2020. Despite relatively low numbers of confirmed malaria cases in 2013, unconfirmed cases were also recorded among the total number of cases reported, comprising 10% of the total in Botswana, 2% in South Africa and 5% in Swaziland. With sustained investments in malaria control, and improving diagnostic capacity, it is expected that these countries will continue to progress towards elimination.

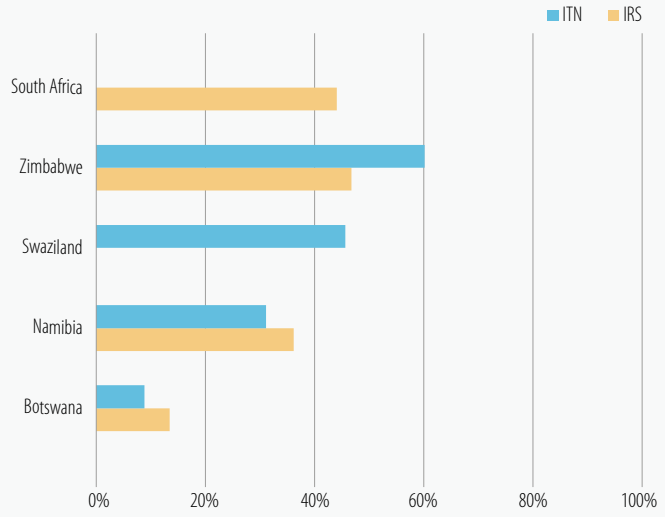
B. Financial contribution for malaria control by source, 2005–2013



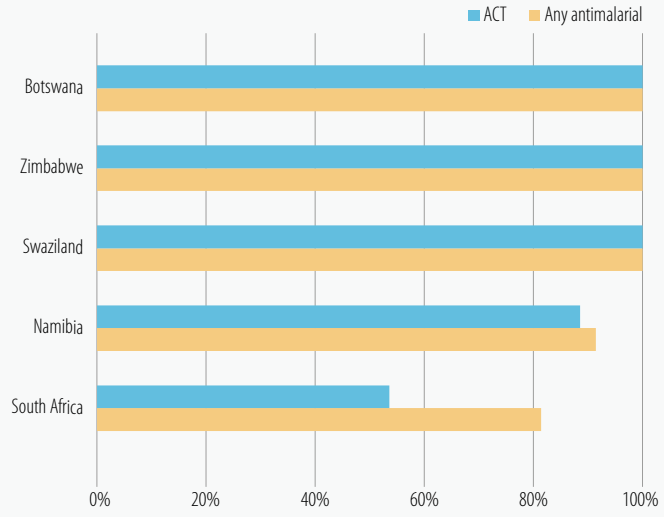
C. US$ per capita for malaria control, 2011–2013



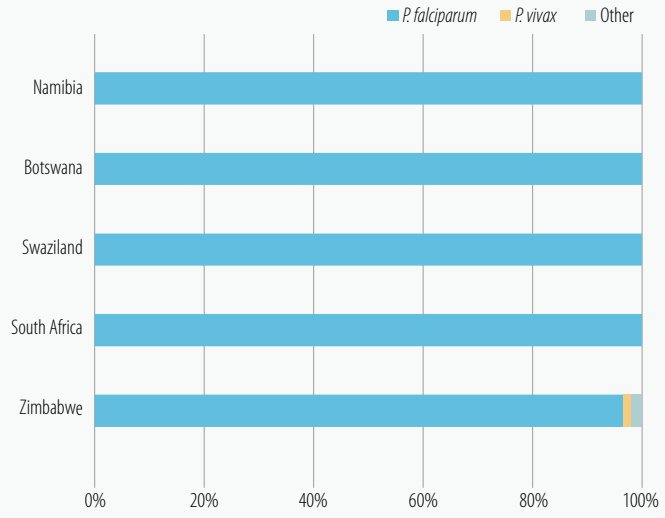
D. Percentage of population at risk with access to an ITN and percentage protected with IRS, 2013



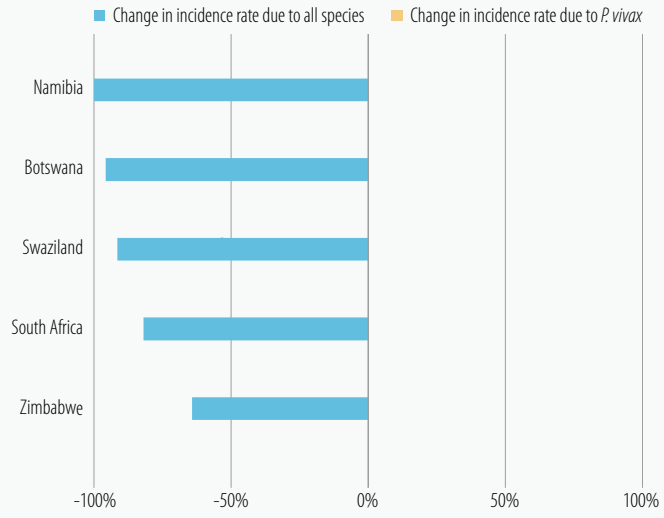
E. Antimalarial treatment courses distributed as a proportion of estimated malaria cases in the public sector, 2013



F. Percentage of cases due to *P. falciparum* and *P. vivax*, 2009–2013



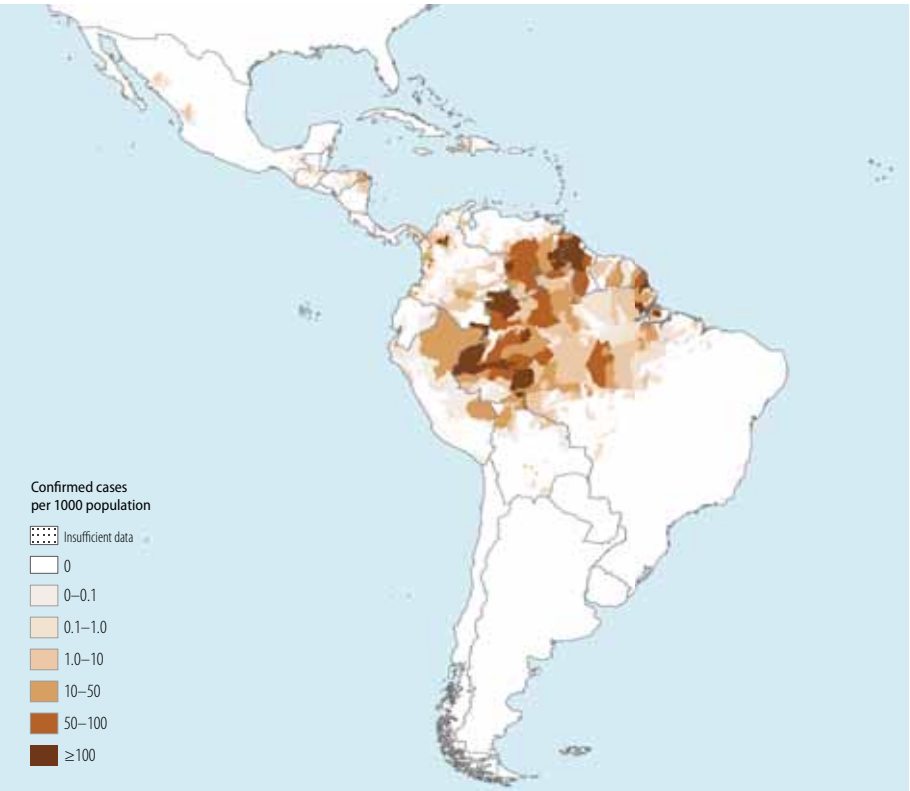
G. Change in case incidence of microscopically confirmed cases, 2000–2013



REGION OF THE AMERICAS

FIFTEEN OUT OF 21 COUNTRIES ARE ON TRACK TO REDUCE INCIDENCE BY 75% BY 2015, AND THREE COUNTRIES BY 50–75%. ARGENTINA AND PARAGUAY REPORTED ZERO INDIGENOUS CASES IN 2013.

A. Confirmed malaria cases per 1000 population, 2013



Population at risk: In the WHO Region of the Americas, about 120 million people in 21 countries are estimated to be at some risk for malaria, with 25 million at high risk. *P. falciparum* is responsible for <30% of malaria cases overall, although the proportion is >50% in Guyana and Suriname, and almost 100% in the Dominican Republic and Haiti.

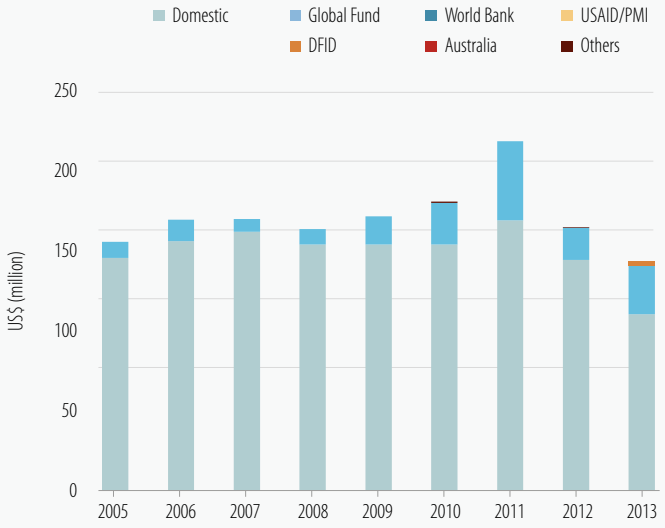
Financing: Funding for malaria control in the region increased from US$ 153 million in 2005 to US$ 214 million in 2011, but decreased to US$ 140 million in 2013 (**Figure B**). In five of the 21 countries, financing for malaria control exceeded US$ 4 per capita per year during 2011–2013 (Costa Rica, El Salvador, Mexico, Paraguay and Suriname) (**Figure C**).

Interventions: All the 21 countries or overseas territories of the region apply IRS or ITNs (or both) in focal areas with ongoing transmission. In 2011–2013, four countries distributed enough ITNs to protect more than 60% of the population at high risk, of which one (Nicaragua) also protected >60% of its population at risk with IRS (**Figure D**). All the countries distributed sufficient antimalarial medicines to treat all patients attending public health facilities (**Figure E**). All the seven countries in pre-elimination and elimination phases (Argentina, Belize, Costa Rica, Ecuador, El Salvador, Mexico and Paraguay) undertake ACD, case investigation, radical treatment of *P. vivax* and quality assurance of microscopy services.

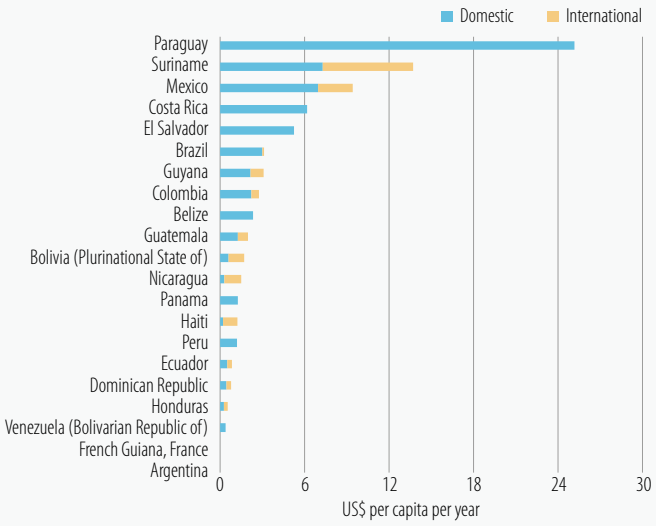
Trends in cases and deaths: The number of confirmed malaria cases in the region decreased from 1.2 million in 2000 to 427 000 cases in 2013. Three countries accounted for 72% of cases in 2013: Brazil (42%), Bolivarian Republic of Venezuela (18%) and Colombia (12%). Reductions of >75% in the incidence of microscopically confirmed malaria cases were reported in 13 out of 21 countries and areas with ongoing transmission between 2000 and 2013 (Argentina, Belize, Plurinational State of Bolivia, Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Paraguay, Suriname and French Guiana, France). Two countries (Brazil and Colombia) are on track to achieve a 75% decrease in case incidence by 2015. Three countries (the Dominican Republic, Panama and Peru) are on track for a 50–75% decrease in case incidence by 2015. Increases in numbers of cases between 2000 and 2013 were reported by two countries (Guyana and the Bolivarian Republic of Venezuela). In Haiti, the number of reported malaria cases increased, but it is unclear whether the rise is real, or is simply due to changes in the extent of diagnostic testing and reporting (**Figure G**). The region reported 82 deaths due to malaria in 2013, a 79% decline compared with 2000. Brazil accounts for half of the deaths due to malaria in the region.

Argentina, which is in the elimination phase, has reported zero indigenous cases since 2011, and has initiated the process of certification of malaria elimination. Paraguay, in the pre-elimination phase, has reported zero indigenous cases and 11 imported cases since 2012. Costa Rica reported two cases of relapse in 2013 (one *P. vivax* and and one *P. malariae*) and four imported cases; Costa Rica and Paraguay are expected to join Argentina in the elimination phase. Four other countries in the pre-elimination phase reported fewer than 1000 cases in total (Belize – 20 *P. vivax* cases; Ecuador – 360 *P. vivax* and *P. falciparum*; El Salvador – five *P. vivax*; and Mexico – 495 *P. vivax*). Ten countries in Central America and the Caribbean have joined a regional initiative that aims to eliminate malaria by 2020, with the support of the Global Fund to Fight AIDS, Tuberculosis and Malaria (Belize, Costa Rica, the Dominican Republic, El Salvador, Guatemala, Haiti, Honduras, Mexico, Nicaragua and Panama).

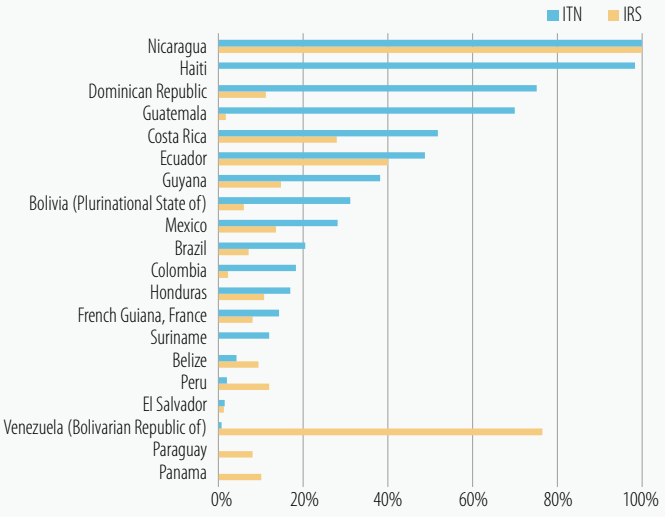
B. Financial contribution for malaria control by source, 2005–2013



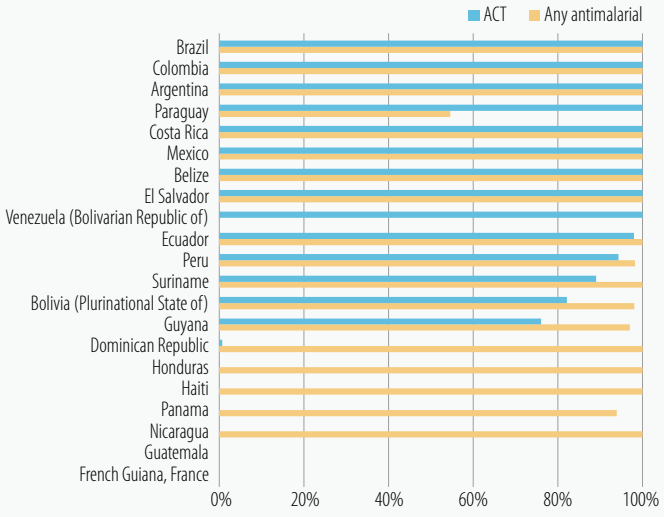
C. US$ per capita for malaria control, 2011–2013



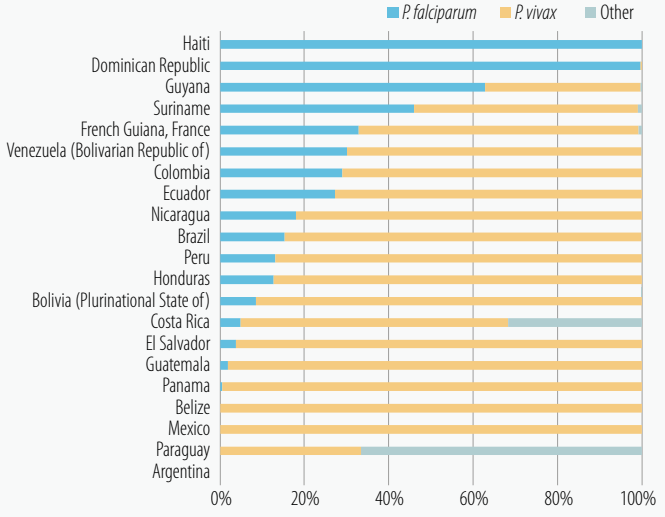
D. Percentage of high-risk population potentially protected with distributed ITNs and percentage protected with IRS, 2013



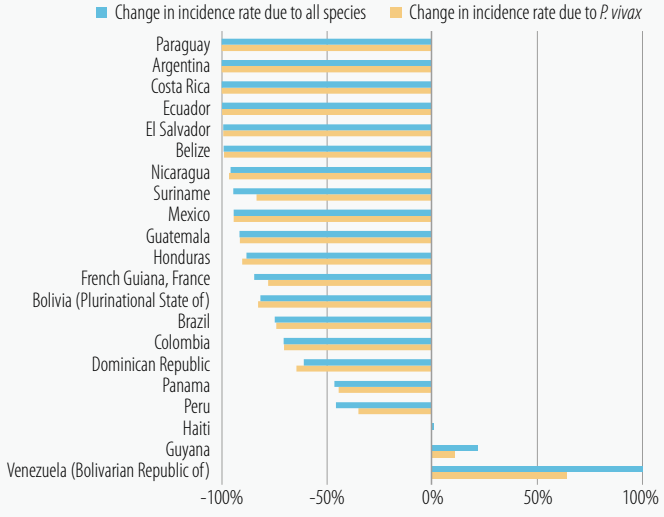
E. Antimalarial treatment courses distributed as a proportion of estimated malaria cases in the public sector, 2013



F. Percentage of cases due to *P. falciparum* and *P. vivax*, 2009–2013



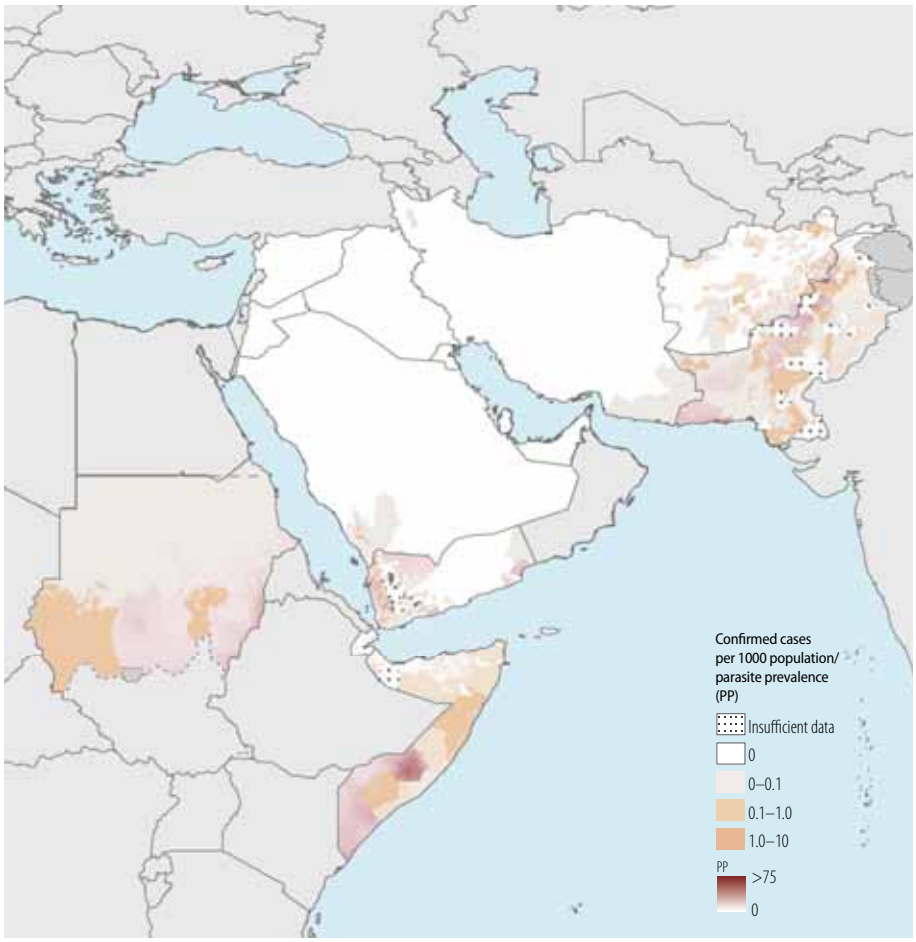
G. Change in case incidence of microscopically confirmed cases, 2000–2013



EASTERN MEDITERRANEAN REGION

OF 12 COUNTRIES WITH ONGOING MALARIA TRANSMISSION IN 2000, SEVEN ACHIEVED >75% DECREASE IN CASE INCIDENCE BETWEEN 2000 AND 2013. SAUDI ARABIA REPORTED ONLY 34 INDIGENOUS CASES IN 2013. IRAQ CONTINUES TO REPORT ZERO LOCAL CASES.

A. Confirmed malaria cases per 1000 population/parasite prevalence, 2013



Population at risk: In 2013, about 280 million people in eight countries in the region were at some risk of malaria, with 104 million at high risk. Six countries have areas of high malaria transmission (Afghanistan, Djibouti, Pakistan, Somalia, the Sudan and Yemen); transmission is focal in Iran (Islamic Republic of) and Saudi Arabia. Most cases are due to *P. falciparum* except in Afghanistan, Iran (Islamic Republic of) and Pakistan, where *P. vivax* predominates (**Figure F**).

Financing: Funding for malaria control in the region rose from US$ 50 million in 2005 to US$ 194 million in 2012 but fell to US$ 136 million in 2013 (**Figure B**). It exceeded US$ 4 per capita per year in Iran (Islamic Republic of) and Saudi Arabia during 2011–2013. Domestic financing for malaria control in 2013 accounted for 100% in Saudi Arabia and 59% in Iran (Islamic Republic of).

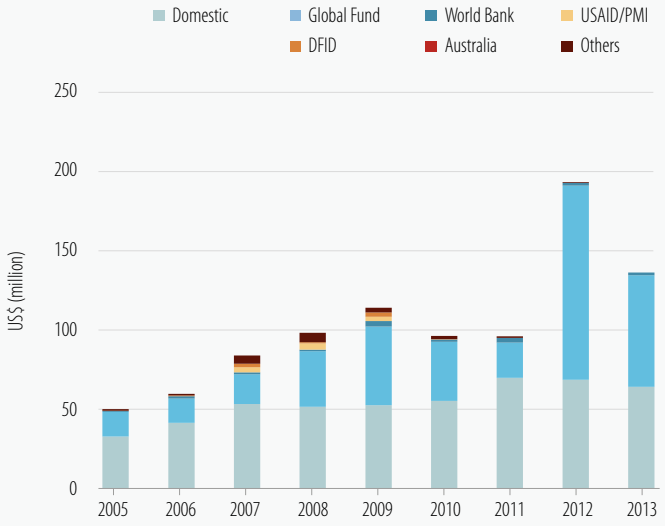
Interventions: Afghanistan, Iran (Islamic Republic of) and Saudi Arabia distributed sufficient ITNs in 2011–2013 to protect >60% of their population at high risk (**Figure D**). Vector control interventions in Iran (Islamic Republic of) and Saudi Arabia were applied in targeted foci. These two countries reported delivering sufficient antimalarial medicines, including ACTs, to treat all cases attending public health facilities (**Figure E**).

Trends in cases and deaths: The number of confirmed malaria cases reported in the region decreased from 2 million in 2000 to 1 million in 2013. Two countries accounted for 84% of cases in 2013: the Sudan (57%) and Pakistan (27%). Seven countries achieved >75% decrease in the incidence of microscopically confirmed cases between 2000 and 2013 (Afghanistan, Iran [Islamic Republic of], Morocco, Oman, Saudi Arabia and the Syrian Arab Republic) (**Figure G**). Iran (Islamic Republic of) and Saudi Arabia reported only 519 and 34 local cases, respectively, in 2013 (50% and 30% decrease, respectively, compared to 2012). Iraq has not reported any indigenous cases since 2009. An assessment of trends was not possible for Djibouti, Pakistan, Somalia, the Sudan and Yemen, owing to inconsistent reporting.

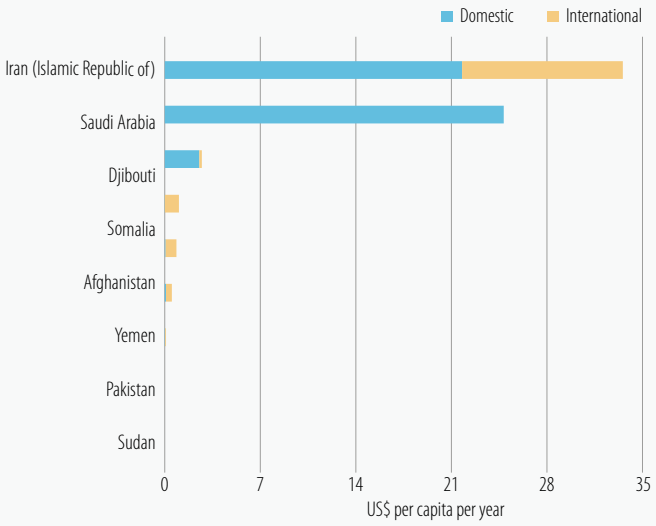
The number of deaths due to malaria in the region fell from 2166 in 2000 to 1027 in 2013. Two countries accounted for >90% of the deaths in 2013: the Sudan (67%) and Pakistan (24%).

In addition to Iraq, three countries in the region are in the prevention of reintroduction phase (Egypt, since 1998; Oman, since 2004; and the Syrian Arab Republic, since 2005). Morocco was certified as free of malaria in 2010. Egypt reported 22 locally acquired cases in a recent outbreak (May–June 2014) in a village 20 km north of Aswan. The outbreak was successfully controlled using preventive measures, prompt treatment, and ACD and case investigation of foci covering 16 villages. Oman has been battling small outbreaks related to importation of parasites since 2007; the country reported 1440 imported and 11 introduced *P. vivax* cases in 2013. The Syrian Arab Republic reported 22 imported cases in 2013 (including 21 *P. falciparum*). However, due to the current situation in the country, the actual numbers cannot be verified.

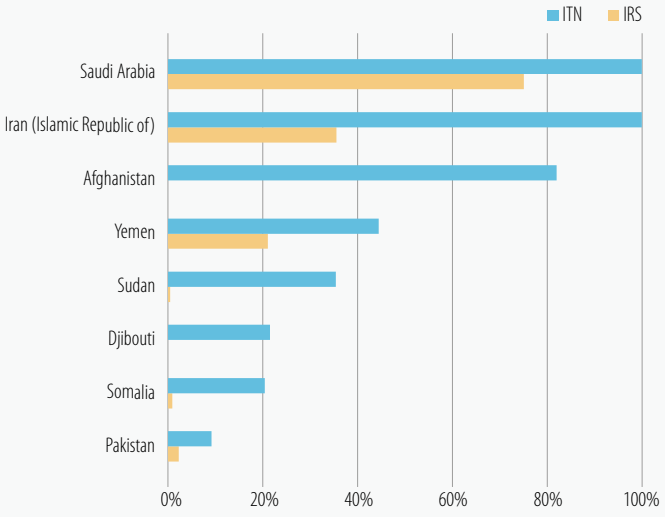
B. Financial contribution for malaria control by source, 2005–2013



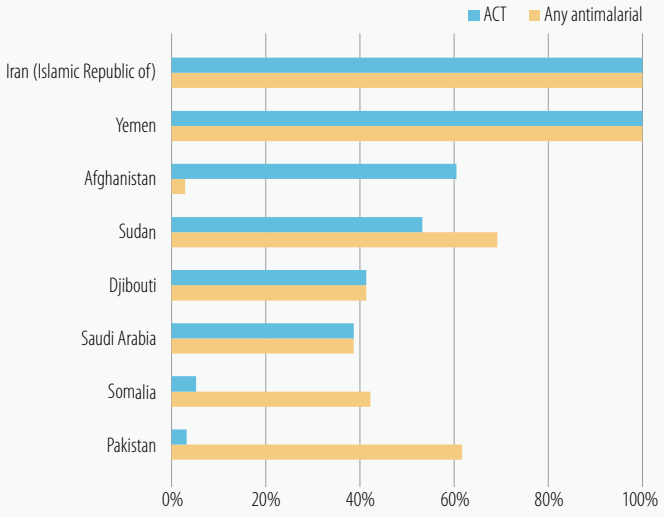
C. US$ per capita for malaria control, 2011–2013



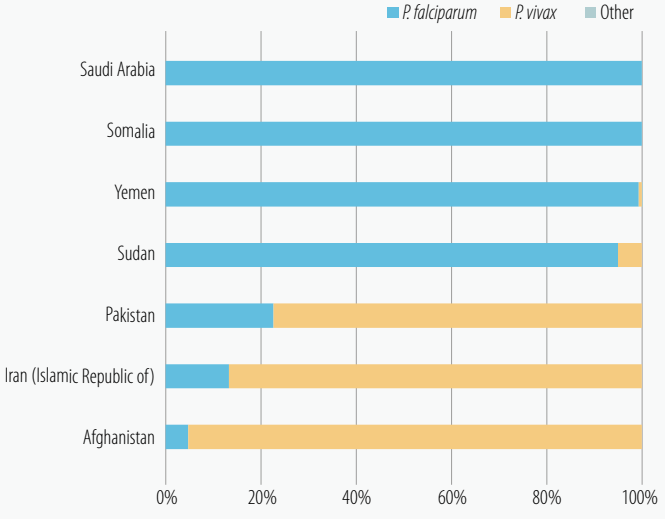
D. Percentage of high-risk population potentially protected with distributed ITNs and percentage protected with IRS, 2013



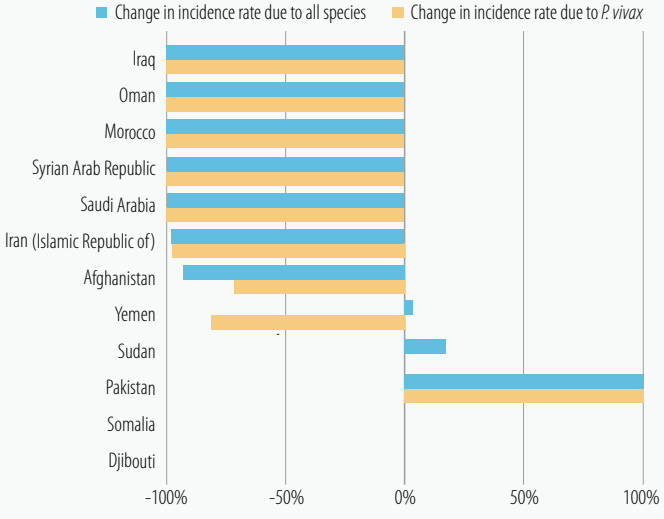
E. Antimalarial treatment courses distributed as a proportion of estimated malaria cases in the public sector, 2013



F. Percentage of cases due to *P. falciparum* and *P. vivax*, 2009–2013



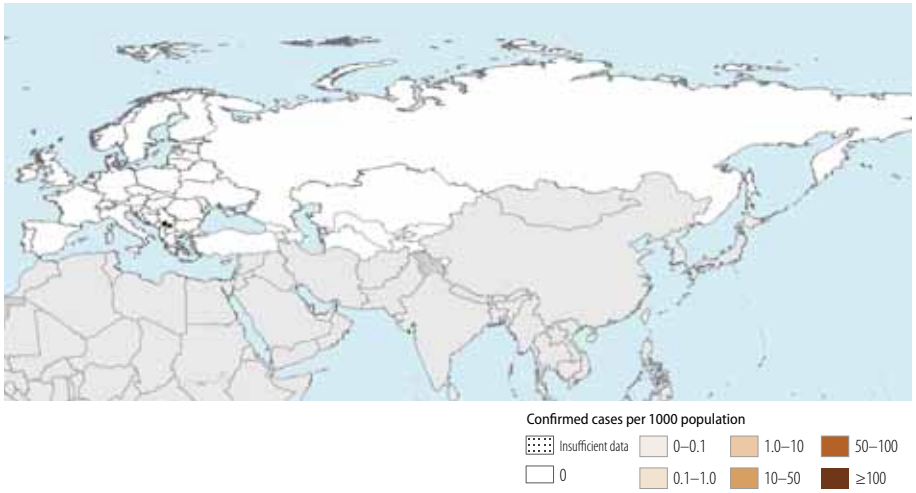
G. Change in case incidence of microscopically confirmed cases, 2000–2013



EUROPEAN REGION

THE NUMBER OF LOCALLY ACQUIRED MALARIA CASES FELL FROM 32 405 IN 2000 TO ONLY 41 IN 2013. THE REGION IS CLOSE TO ATTAINING THE GOAL OF ELIMINATING MALARIA BY 2015.

A. Confirmed malaria cases per 1000 population, 2013



Population at risk: In 2000, eight countries in the European Region (Armenia, Azerbaijan, Georgia, Kyrgyzstan, Tajikistan, Turkey, Turkmenistan and Uzbekistan) had local transmission of malaria; however, in 2013, local transmission was confined to just two countries (Tajikistan and Turkey), in which two million people were living in areas with some risk for malaria. All locally acquired cases were due to *P. vivax* (**Figure F**).

Financing: Funding for malaria control in the region rose from about US$ 35 million in 2005 to US$ 54 million in 2009, but decreased to US$ 32 million in 2013 (**Figure B**). Financing per capita per year ranged from US$ 1.86 in Tajikistan to US$ 2600 per capita in Turkey between 2011 and 2013 (**Figure C**).

Interventions: In all countries in the region, malaria is a notifiable disease. Each case and focus is epidemiologically investigated and classified; there are national quality assurance programmes for microscopy and radical treatment of *P. vivax* cases, and adequate access to antimalarial medicines (**Figures E and F**). IRS and ITNs are undertaken in targeted malaria focal areas.

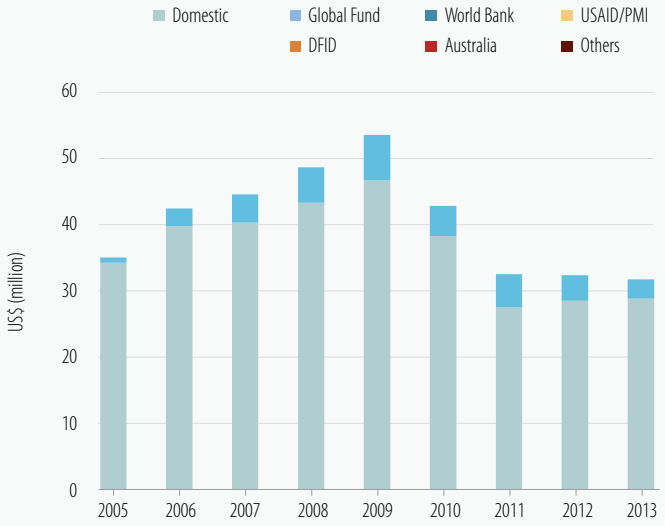
Trends in cases and deaths: All countries in the region achieved >75% decrease in case incidence between 2000 and 2013 (**Figure G**). Among the eight countries with local transmission in 2000, the number of locally acquired confirmed malaria cases decreased from 32 405 in 2000 to only 41 cases in 2013, all *P. vivax*. Of the 41 cases, 34 were from Turkey (all relapsing from infections that occurred in 2012) and seven from Tajikistan (three indigenous and four introduced). Turkey contained the 2012 outbreak (219 local cases) through intensive control and surveillance efforts (IRS, ACD, and case-based surveillance).

Azerbaijan reported zero local cases in 2013 for the first time. Three other countries have reported zero indigenous cases for the past 3 years or more, and are in the prevention of reintroduction phase (Georgia, Kyrgyzstan and Uzbekistan). Georgia, which had one introduced case in 2011 and one in 2012 (both from migrant workers), reported zero cases in 2013. In 2014, Kyrgyzstan successfully passed the first WHO evaluation for certification as a malaria-free country. Two countries have been certified as free of malaria (Turkmenistan in 2010 and Armenia in 2011).

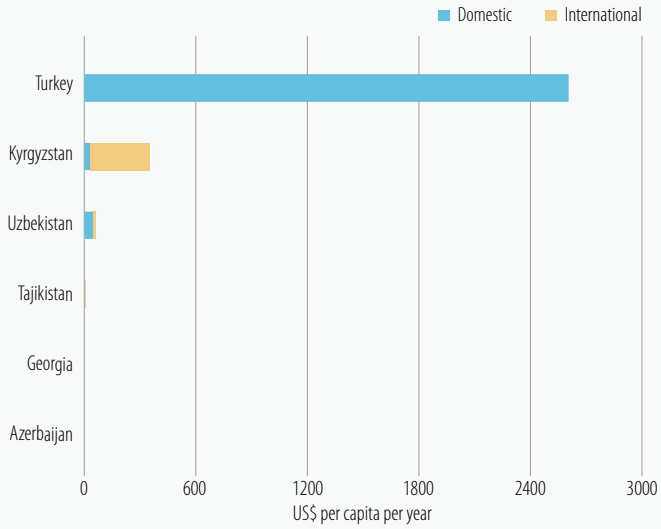
Greece, which had remained malaria free between 1974 and 2010, reported three locally acquired *P. vivax* cases in 2010, 40 in 2011, 20 in 2012 and three in 2013. These cases originated from migrant workers. The resurgence clustered in the Lakonia region in the south of mainland Greece was successfully contained through intensified control efforts, with only two locally acquired *P. vivax* cases detected in the Municipality of Alexandroupolis, Evros, and one in the Municipality of Sofades, Karditsa, in 2013. During 2014, Greece reported zero locally acquired cases.

The WHO European Region is close to attaining the goal of interruption of local malaria transmission by 2015, as set out in the 2005 Tashkent Declaration. Nonetheless, the experience of Greece and Turkey highlights the persistent threat of reintroduction and the need for continued vigilance to ensure that any resurgence is rapidly detected and contained.

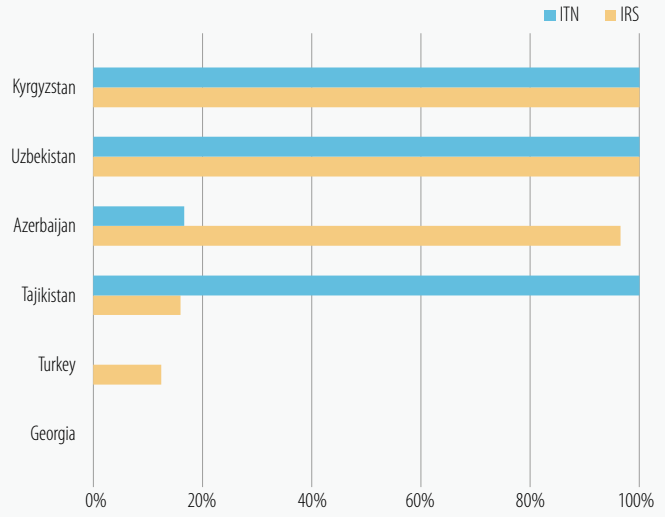
B. Financial contribution for malaria control by source, 2005–2013



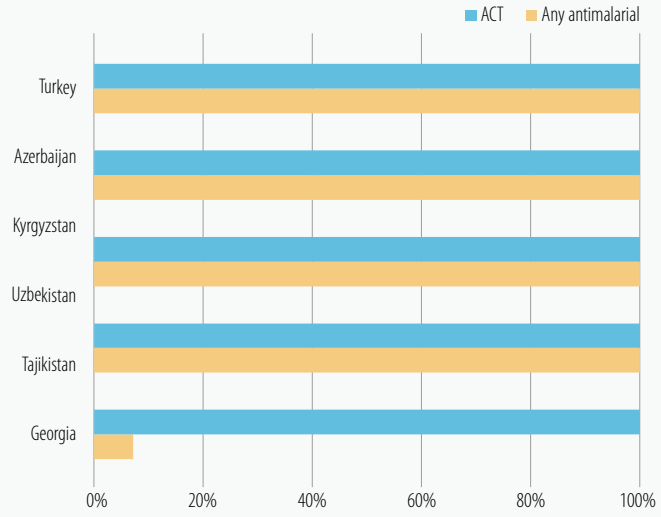
C. US$ per capita for malaria control, 2011–2013



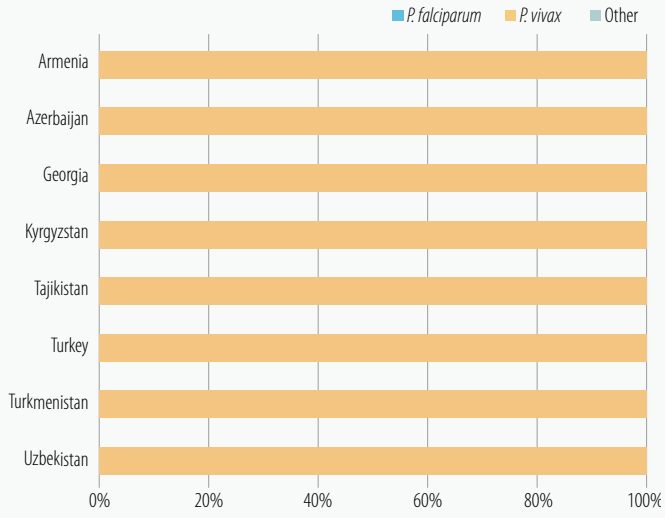
D. Percentage of high-risk population potentially protected with distributed ITNs and percentage protected with IRS, 2013



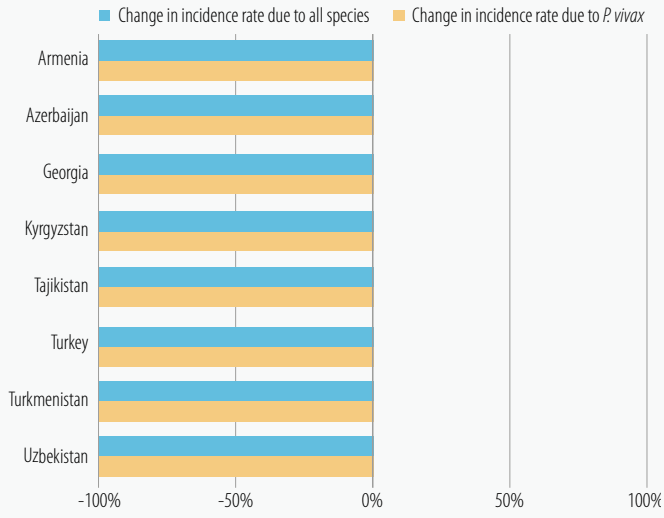
E. Antimalarial treatment courses distributed as a proportion of estimated malaria cases in the public sector, 2013



F. Percentage of cases due to *P. falciparum* and *P. vivax*, 2009–2013



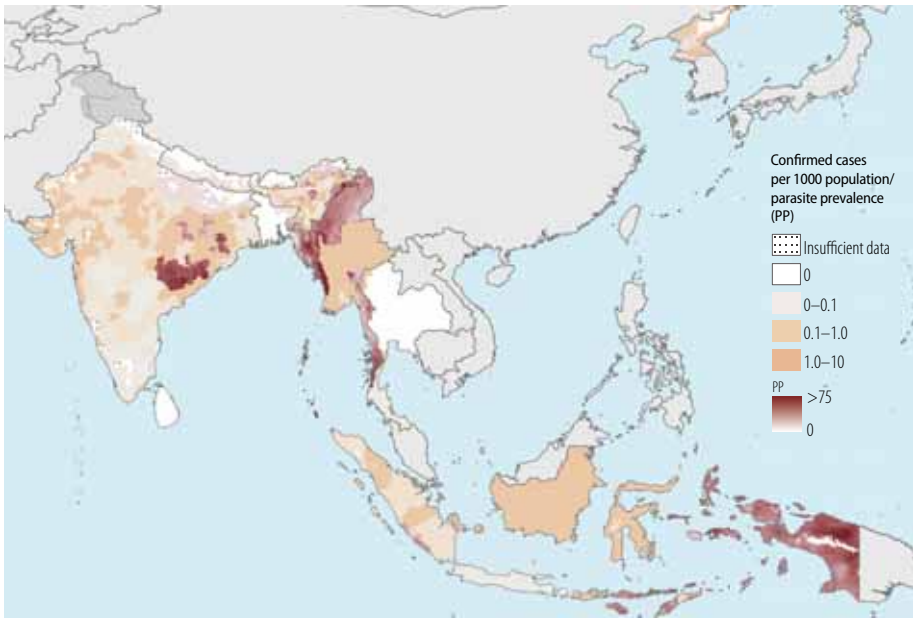
G. Change in case incidence of microscopically confirmed cases, 2000–2013



SOUTH-EAST ASIA REGION

SIX COUNTRIES OUT OF 10 ACHIEVED >75% DECREASE IN CASE INCIDENCE BETWEEN 2000 AND 2013. SRI LANKA REPORTED ZERO LOCALLY ACQUIRED CASES FOR THE FIRST TIME. BHUTAN REPORTED ONLY 15 CASES.

A. Confirmed malaria cases per 1000 population/parasite prevalence, 2013



Population at risk: About 1.4 billion people are at some risk for malaria in the 10 malaria-endemic countries, with 352 million at high risk. The proportion of cases due to *P. falciparum* varies greatly within the region, and cases are exclusively due to *P. vivax* in the Democratic People's Republic of Korea (**Figure F**).

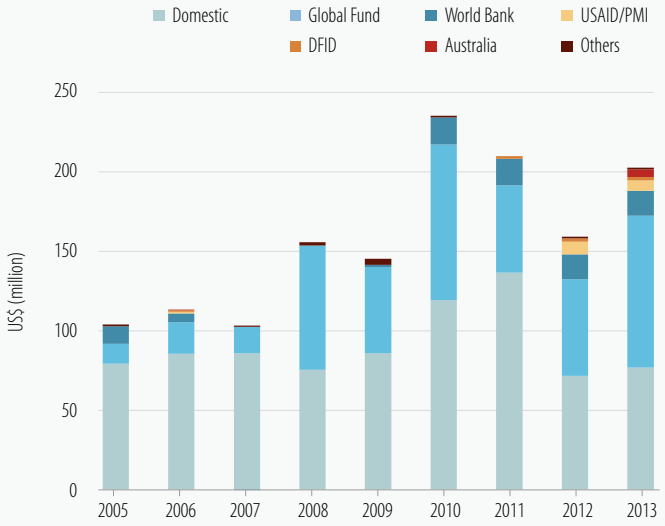
Financing: Funding for malaria control in the region increased from US$ 104 million in 2005 to US$ 236 million in 2010, but then fell to US$ 203 million in 2013 (**Figure B**). It exceeded US$ 4 per capita per year in Timor-Leste during 2011–2013 (**Figure C**). Funding is lowest in countries with the largest populations at risk, possibly because of the challenge of providing adequate financing for large population sizes, but possibly also because populations at risk are estimated less precisely and overestimated. In other words, populations at risk may be defined according to comparatively large administrative units in which the entire population may be classified as being at high risk, even if malaria is confined to a limited area.

Interventions: In 2011–2013, five countries (Bangladesh, Bhutan, the Democratic People's Republic of Korea, Nepal and Timor-Leste) reported delivering sufficient ITNs or undertook sufficient IRS to protect >60% of their populations at high risk (**Figure D**). In 2013, Bangladesh, Bhutan, the Democratic People's Republic of Korea and Timor-Leste reported delivering sufficient quantities of antimalarial medicines, including ACTs, to treat all reported cases in public health facilities (**Figure E**). Sri Lanka, Bhutan and the Democratic People's Republic of Korea carried out compulsory notification of cases, case and focus investigation, radical treatment of *P. vivax* cases, gametocytocidal treatment of *P. falciparum* cases, and quality assurance of microscopy services.

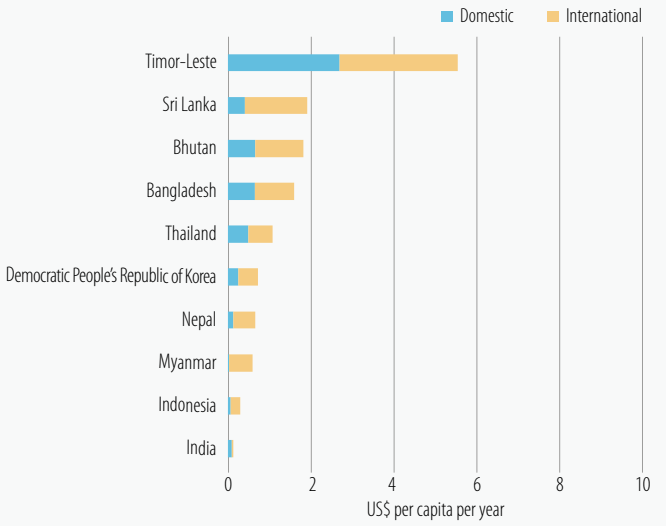
Trends in cases and deaths: The number of confirmed malaria cases reported in the region decreased from 2.9 to 1.5 million between 2000 and 2013. Three countries accounted for 96% of cases in 2013: India (58%), Myanmar (22%) and Indonesia (16%). Six countries reported >75% decrease in the incidence of microscopically confirmed cases between 2000 and 2013 (Bangladesh, Bhutan, the Democratic People's Republic of Korea, Nepal, Timor-Leste and Sri Lanka) (**Figure G**). Two countries (India and Thailand) are on track to achieve a decrease of 50–75% in case incidence by 2015. The decrease in Thailand may be underestimated, as 2012 and 2013 data include cases reported by nongovernmental organizations working on the borders of Cambodia and Myanmar. It was not possible to discern the direction of trends in Indonesia and Myanmar owing to changes in diagnostic testing and reporting over time. Reported malaria deaths in the region decreased from 5500 to 776 between 2000 and 2013 (**Annex 6E**). Nepal has reported no deaths from malaria since 2012.

Sri Lanka, in the elimination phase, reported zero locally acquired cases in 2013 for the first time, a rapid decrease from 124 cases in 2011 and 23 in 2012. Bhutan, which is in the pre-elimination phase, reported only 15 indigenous and 30 introduced cases (compared with 82 indigenous cases in 2012). The Democratic People's Republic of Korea, also in the pre-elimination phase, reported 14 407 cases (compared with 21 850 in 2012).

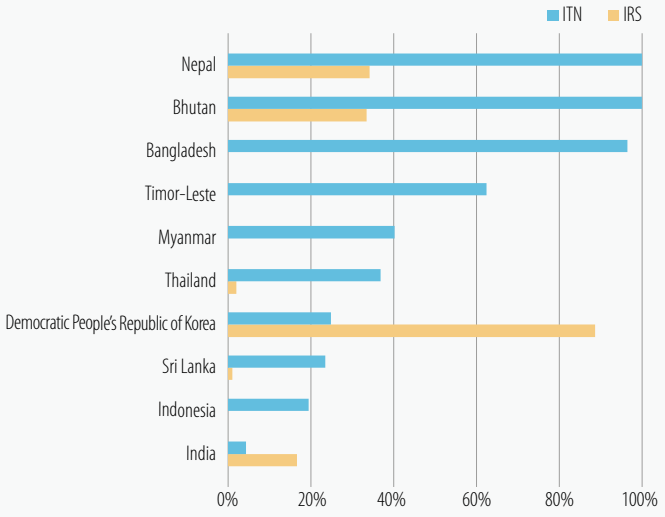
B. Financial contribution for malaria control by source, 2005–2013



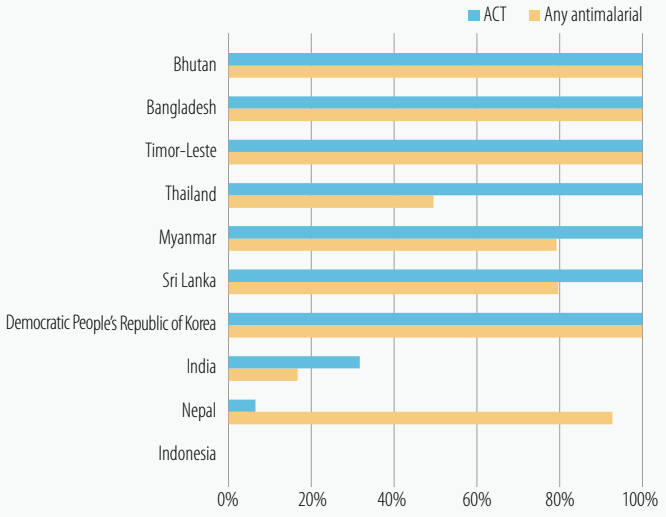
C. US$ per capita for malaria control, 2011–2013



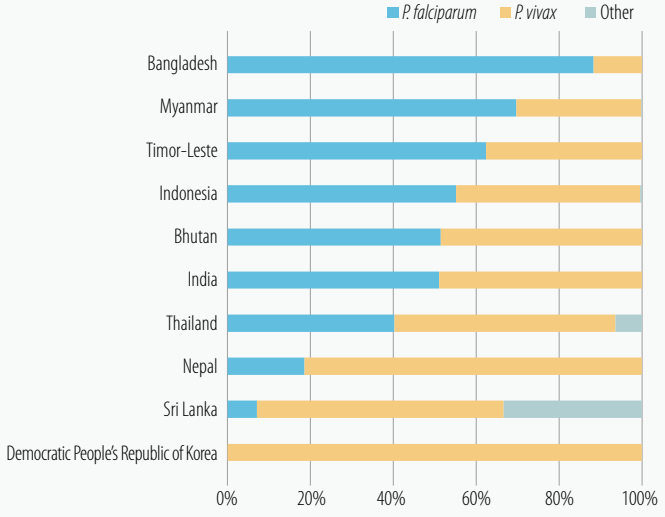
D. Percentage of high-risk population potentially protected with distributed ITNs and percentage protected with IRS, 2013



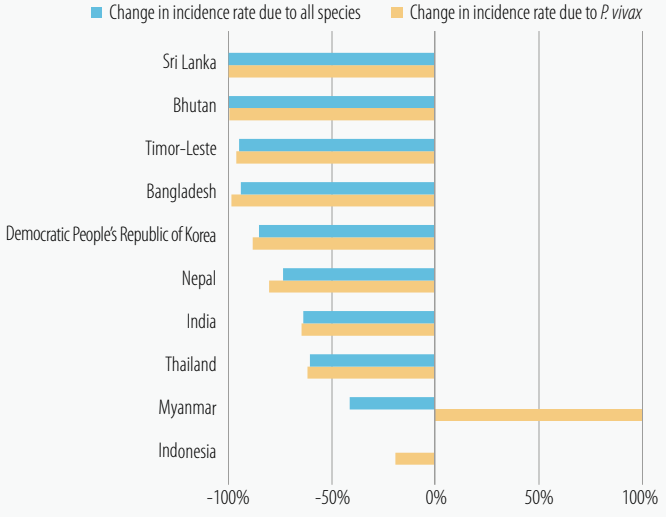
E. Antimalarial treatment courses distributed as a proportion of estimated malaria cases in the public sector, 2013



F. Percentage of cases due to *P. falciparum* and *P. vivax*, 2009–2013



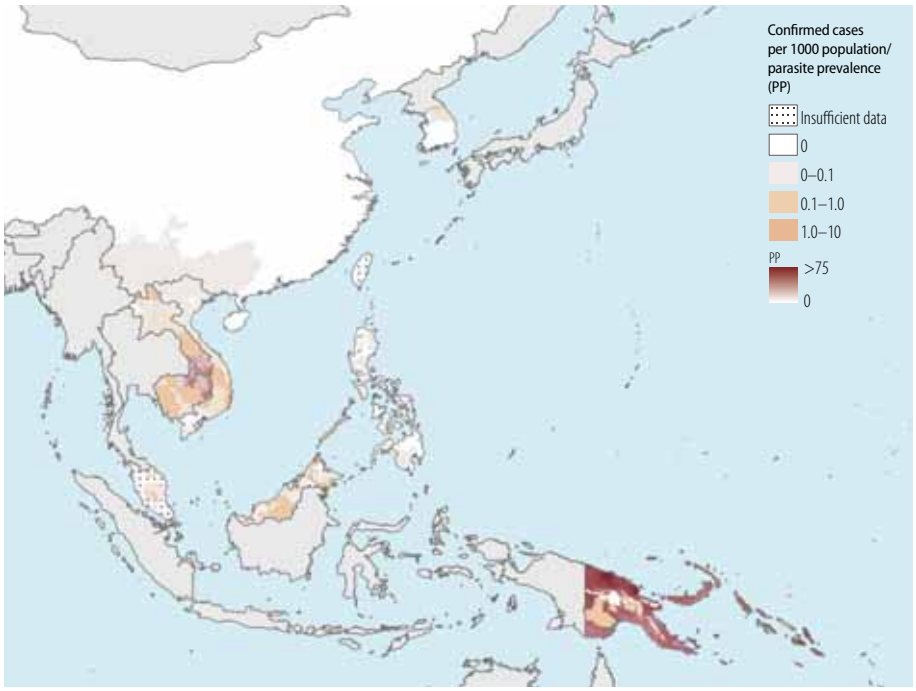
G. Change in case incidence of microscopically confirmed cases, 2000–2013



WESTERN PACIFIC REGION

NINE OUT OF 10 COUNTRIES IN THIS REGION ACHIEVED >75% DECREASE IN CASE INCIDENCE BETWEEN 2000 AND 2013. ANOTHER COUNTRY IS ON TRACK TO REDUCE INCIDENCE BY 25–50% BY 2015.

A. Confirmed malaria cases per 1000 population/parasite prevalence, 2013



Population at risk: About 717 million people in the region are at some risk for malaria, with 41 million at high risk. Malaria transmission is most intense in Papua New Guinea, Solomon Islands and Vanuatu, but is much more focal in other countries in the region, disproportionately affecting ethnic minorities and migrant workers. Both *P. falciparum* and *P. vivax* are prevalent, but cases are entirely due to *P. vivax* in the Republic of Korea and in central areas of China (**Figure F**). In recent years, *P. knowlesi* has accounted for an increasing number of cases, especially in Malaysia.

Financing: Funding for malaria control in the region increased from US$ 63 million in 2005 to US$ 169 million in 2010, but dropped to US$ 123 million in 2013 (**Figure B**). Malaria funding exceeded US$ 4 per capita per year during 2011–2013 in two countries (Malaysia and Solomon Islands) (**Figure C**).

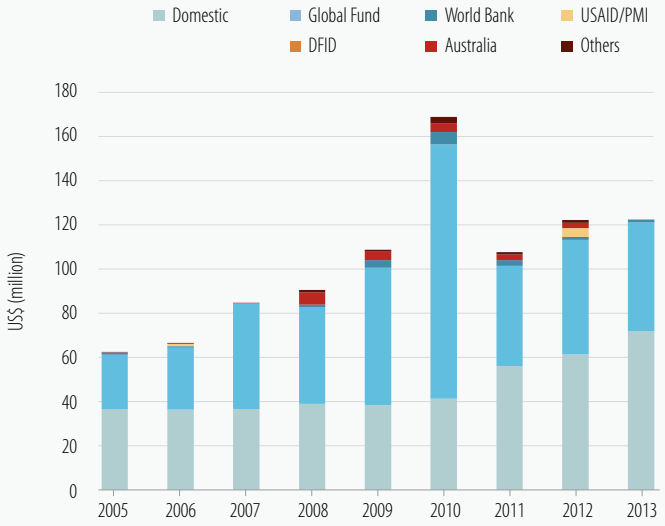
Interventions: In 2011–2013, the number of ITNs delivered was sufficient to protect more than 60% of the population at high risk in seven countries, two of which (China and Malaysia) also protected >60% of the population with IRS (**Figure D**). Nationally representative surveys in Papua New Guinea showed an increase in the proportion of the population with access to a long-lasting insecticidal net (LLIN) in their household from 44% in 2011 to 68% in 2014, while the proportion of RDT positive cases receiving an ACT rose from 0% to 78%. The Republic of Korea reported low levels of vector control coverage, possibly due to the focal nature of the disease, except around the Korean Demilitarized Zone. All countries reported delivering sufficient antimalarial medicines to treat >80% of patients attending public health facilities. The Republic of Korea and Malaysia undertake ACD, case investigation, radical treatment of *P. vivax* and quality assurance of microscopy services.

Trends in cases and deaths: Three countries accounted for >85% of reported confirmed cases in 2013: Papua New Guinea (70%), the Lao People's Democratic Republic (9%) and Solomon Islands (6%). All countries except Papua New Guinea achieved >75% decrease in the incidence of microscopically confirmed cases between 2000 and 2013 (**Figure G**). The Lao People's Democratic Republic reported a twofold increase in cases in 2012 and 2013, but case incidence remains <75% of 2000 levels. Papua New Guinea had a twofold increase in confirmed cases in 2013 compared with 2012, resulting from an increase in diagnostic testing with RDTs. However, nationally representative household surveys indicated a drop in parasite prevalence from 12.4% to 1.8% between 2009 and 2014, while the incidence of malaria at four sentinel surveillance sites fell from 205/1000 to 48/1000. These data are consistent with a reduction in malaria case incidence of >75%.

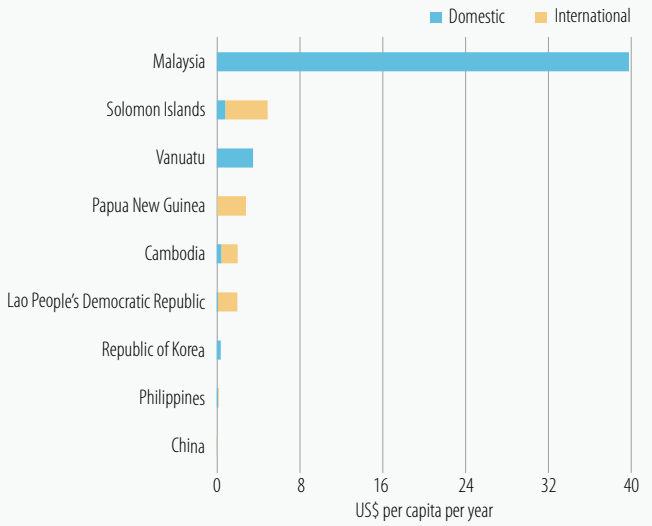
Reported malaria deaths in the region decreased by 93% from 2360 to 406 between 2000 and 2013. In 2013, two countries accounted for 83% of all reported deaths: Papua New Guinea (76%) and the Lao People's Democratic Republic (7%) (**Annex 6E**). Vanuatu has reported zero deaths from malaria since 2012.

Malaysia is in the pre-elimination phase, and it continues to progress towards elimination, reporting 2979 locally acquired cases in 2013. The number of active foci (3027) and people living within them (>1 million) remain high. Malaria transmission occurs primarily in the districts of Sabah and Sarawak. In the Republic of Korea, which is in the elimination phase, the number of indigenous cases dropped to 383 in 2013. China reported just nine indigenous cases of *P. falciparum* malaria in 2013 and 71 of *P. vivax* and is aiming to eliminate malaria nationally by 2020. The Philippines is proceeding with a subnational elimination approach, and by 2013 had declared 28 of its 80 provinces malaria free. The most malaria-affected provinces are Maguindanao, Palawan and Tawi-Tawi.

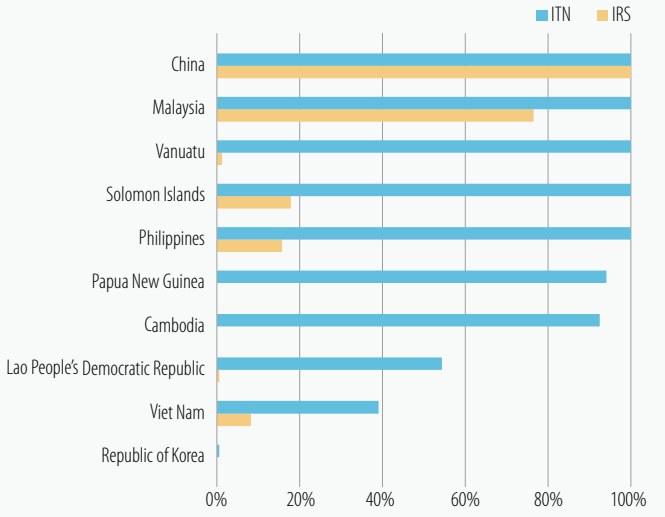
B. Financial contribution for malaria control by source, 2005–2013



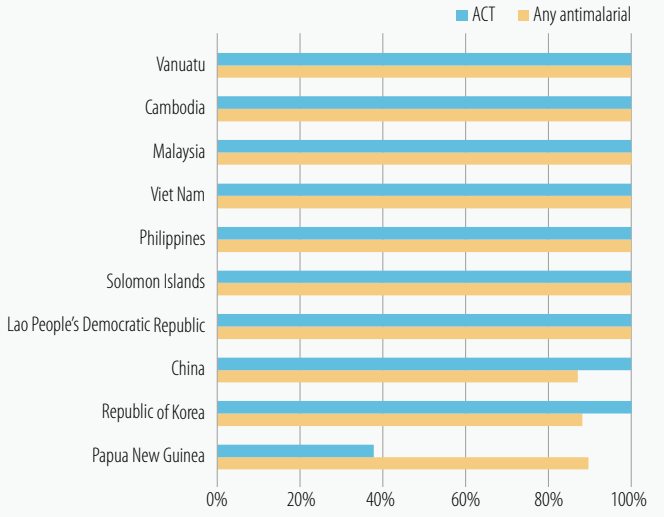
C. US$ per capita for malaria control, 2011–2013



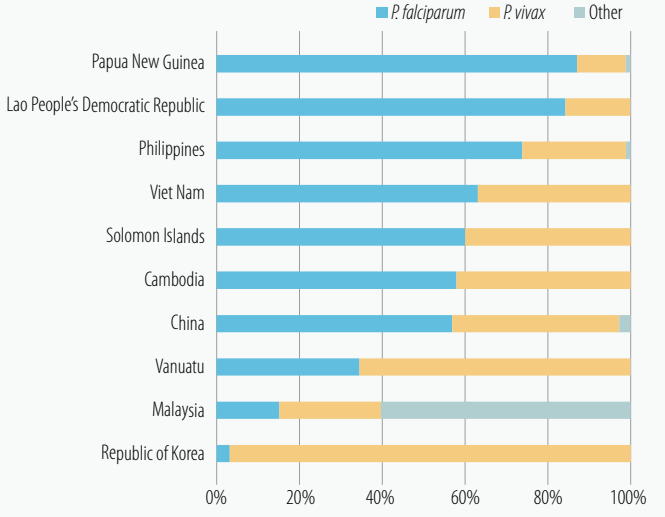
D. Percentage of high-risk population potentially protected with distributed ITNs and percentage protected with IRS, 2013



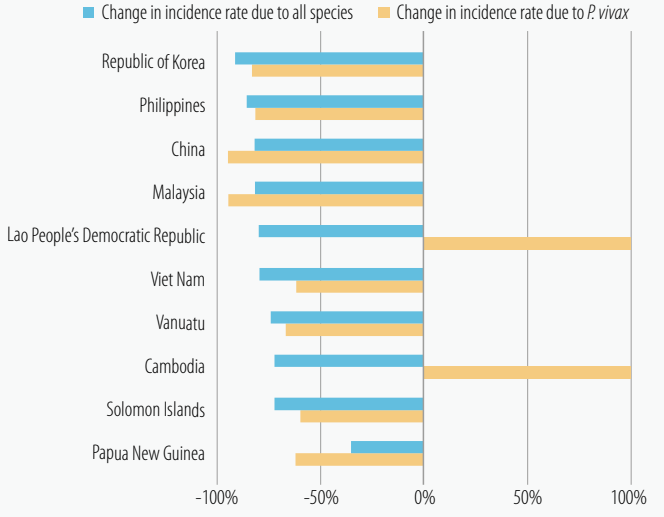
E. Antimalarial treatment courses distributed as a proportion of estimated malaria cases in the public sector, 2013



F. Percentage of cases due to *P. falciparum* and *P. vivax*, 2009–2013



G. Change in case incidence of microscopically confirmed cases, 2000–2013



WHO region	On track for ≥75% decrease in incidence 2000–2015		50%–75% decrease in incidence projected 2000–2015	<50% decrease in incidence projected 2000–2015	Increase in incidence 2000–2013	Insufficiently consistent data to assess trends	
African	**Algeria** **Botswana** **Cabo Verde** **Eritrea** **Namibia** **Rwanda** **Sao Tome and Principe** **South Africa** **Swaziland**		Ethiopia Zambia Zimbabwe	Madagascar		Angola Benin Burkina Faso Burundi Cameroon Central African Republic Chad Comoros Congo Côte d'Ivoire Democratic Republic of the Congo Equatorial Guinea Gabon Gambia Ghana	Guinea Guinea-Bissau Kenya Liberia Malawi Mali Mauritania Mayotte, France Mozambique Niger Nigeria Senegal Sierra Leone Togo Uganda United Republic of Tanzania
Region of the Americas	**Argentina*** **Belize** **Bolivia (Plurinational State of)** **Costa Rica** **Ecuador** **El Salvador** **French Guiana, France**	**Guatemala** **Honduras** **Mexico** **Nicaragua** **Paraguay*** **Suriname** Brazil Colombia Peru	Dominican Republic Panama		Guyana Venezuela (Bolivarian Republic of)	Haiti	
Eastern Mediterranean	**Afghanistan** **Iran (Islamic Republic of)** **Iraq*** **Morocco***	**Oman*** **Saudi Arabia** **Syrian Arab Republic**				Djibouti Pakistan Somalia	Sudan Yemen
European	**Armenia*** **Azerbaijan*** **Georgia*** **Kyrgyzstan***	**Tajikistan** **Turkey** **Turkmenistan*** **Uzbekistan***					
South-East Asia	**Bangladesh** **Bhutan** **Democratic People's Republic of Korea**	**Nepal** **Sri Lanka*** **Timor-Leste**	India Thailand			Indonesia Myanmar	
Western Pacific	**Cambodia** **China** **Lao People's Democratic Republic** **Malaysia** **Papua New Guinea**	**Philippines** **Republic of Korea** **Solomon Islands** **Vanuatu** **Viet Nam**					

Source: National malaria control programme reports
Countries in prevention of reintroduction phase are not included in this table
Countries in bold achieved ≥75% decrease in case incidence by 2013
*Country reported zero indigenous cases in 2013.

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Annexes

Annex 1 – Data sources and methods

Sections 1–8

Section 1: Introduction

Figure 1.1 The map shows the estimated incidence of malaria cases per 1000 population in 2013. See notes for Figures 8.3–8.5 for estimation of malaria cases per 1000 population.

Figure 1.2 The map shows the proportion of a country's population that lives on less than US$ 2 per day, as estimated by the World Bank.[1]

Section 2: Financing for malaria programmes

Figures 2.1 and 2.2 *International financing data* were obtained from three sources. The Global Fund supplied information on disbursements for malaria control to WHO up to 2013. Information on funding from the United States Agency for International Development (USAID) was obtained from ForeignAssistance.gov.[2] Malaria funding for the United States Centers for Disease Control was obtained from Congressional Justifications and Operating Plans (*1*).[3] For other development agencies, information on disbursements was available up to and including 2012, through the Organisation for Economic Co-operation and Development (OECD) Development Co-operation Directorate database on official development assistance (ODA).[4] Contributions from the Department for International Development (DFID), United Kingdom of Great Britain and Northern Ireland (UK) were assumed to have increased in 2013 in line with 2010–2012 disbursements. For other agencies, funding for 2013 was assumed to have remained at 2012 levels.

Domestic financing data were obtained from national malaria control programmes (NMCPs). Data included government total malaria budget and expenditures, broken down by programme components including malaria commodities, programme supervision and management, training, and behavioural change interventions. Where domestic financing data were not available, data from previous years were used. Domestic financing data do not include the cost of the time that health workers spend testing, treating and tracking malaria patients; capital costs (e.g. infrastructure or vehicles); and household spending on malaria prevention and treatment.

Figures 2.3 and 2.4 The potential for increasing global (domestic and international) malaria investments between 2014 and 2020 was explored through two financing scenarios:

- Global investments from endemic and donor countries increase at the projected rate of total government expenditures estimated by the International Monetary Fund (IMF) for 2014–2020.[5] In the case of multilateral donors such as the Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund), the average growth rate of government expenditures for all the countries contributing to the Global Fund over the 2014–2020 period was used.[6] For the European Union (EU), which is a Global Fund contributor, the average government expenditure growth rate of EU countries contributing to the Global Fund's budget in 2011–2013 was used.
- Data on net ODA from countries that participated in funding malaria control and elimination activities between 2010 and 2013 were used to calculate a donor investment effort for 2012,[7] as the percentage of the donor country's gross national income (GNI) allocated to ODA. The 2012 global average donor investment effort was then compared to the 0.7% target of GNI for ODA by 2015 (*2, 3*), and the necessary rate of increase was calculated for the 2012 global investment effort to reach the 2015 target of 0.7%. The rate of increase was then applied to international investments in malaria control until 2015. It was assumed that, after 2015, investments in malaria control and elimination would match the rate of increase of total government expenditures estimated by the IMF for 2016–2020. This second scenario also assumed that governments of endemic countries increase the priority they give to malaria funding. Levels of investment priority for malaria were estimated using the domestic investment priority index (DIPI), calculated as (government spending on malaria/government revenue) × (total population/population at risk). Countries were then classified into quartiles depending on their DIPI. Countries in the lowest quartile, Q1 (i.e. with DIPI ≤25th percentile), were assumed to increase their investment in malaria to reach the level of priority of countries in Q2. Similarly, countries in Q2 were assumed to increase their investments to the level of the next quartile (Q3). Countries in Q3 or Q4 were assumed to increase their investments in malaria control and elimination at the same rate of growth as their total government expenditures (as under scenario 2). For countries with insufficient data available for calculating the DIPI, it was assumed that spending increased at the same rate as government expenditures; for countries for which there were no IMF data, it was assumed that domestic funding remained constant.

Section 3: Vector control for malaria

Tables 3.1 and 3.2 Policies regarding vector control interventions were reported to WHO by NMCPs.

1 http://data.worldbank.org/products/wdi
2 http://www.foreignassistance.gov/web/default.aspx
3 http://www.cdc.gov/fmo/topic/Budget%20Information/
4 http://stats.oecd.org/Index.aspx?datasetcode=CRS1#
5 http://www.imf.org/external/pubs/ft/weo/2014/02/weodata/weoselgr.aspx
6 http://www.theglobalfund.org/en/partners/governments/
7 http://www.oecd.org/dac/stats/documentupload/ODA%202013%20Tables%20and%20Charts%20En.pdf

Figures 3.1 and 3.2 Estimates of insecticide-treated mosquito net (ITN) coverage were derived from a model developed by the Malaria Atlas Project (MAP), University of Oxford. The model built on two earlier studies that sought to model aspects of ITN delivery, distribution and coverage – a study by Flaxman et al. (*4*) and the work of Killian, which culminated in the NetCALC tool (*5*) – and a series of related publications (*6*). A two-stage process was followed. First, a mechanism was defined for estimating net crop – that is, the total number of ITNs in households in a country at a given point in time – taking into account inputs to the system (e.g. deliveries of ITNs to a country) and outputs (e.g. the discard of worn ITNs from households). Second, empirical modelling was used to translate estimated net crops into resulting levels of coverage (e.g. access within households).

Sources of data for the models

- *Long-lasting insecticidal nets (LLINs) delivered to countries:* Milliner Global Associates provided data to WHO by on the number of LLINs delivered by approved manufacturers to each country each year (7). The data were complete for each country from 2000 to 2013 inclusive.
- *ITNs distributed within countries:* NMCPs provided data to WHO on the number of conventional ITNs and LLINs distributed annually within each country. Data were available for 400 of the 616 country-years addressed in the study.
- *Nationally representative household surveys:* a total of 93 national surveys from 39 sub-Saharan African countries from 2001 to 2013 were assembled, covering 15% of all possible country-years since 2000. For 89 of the 93 surveys, it was possible to access the underlying data; for the remaining four surveys, data from the survey reports were used.

Countries and populations at risk

The main analysis covered 40 of the 47 (*8*) malaria endemic countries or areas of sub-Saharan Africa. The islands of Mayotte (for which no ITN delivery or distribution data were available) and Cabo Verde (which does not distribute ITNs) were excluded, as were the low-transmission countries of Namibia, Sao Tome and Principe, South Africa and Swaziland, for which ITNs make up a small proportion of vector control. Analyses were limited to populations categorized by NMCPs as being at risk.

Estimating national net crops through time

As outlined in Flaxman et al. (*4*), national ITN systems were represented using a discrete time stock-and-flow model. Nets delivered to a country by manufacturers were modelled as first entering a "country stock" compartment (i.e. stored in-country but not yet distributed to households). Nets were then available from this stock for distribution to households by the NMCP or other distribution channels. To accommodate uncertainty in net distribution, we specified the number of nets distributed in a given year as a range, with all available country stock (i.e. the maximum nets that could be delivered) as one extreme and the NMCP-reported value (i.e. the assumed minimum distribution level) as the other. New nets reaching households joined older nets remaining from earlier time-steps to constitute the total household net crop, with the duration of net retention by households governed by a loss function. Rather than fitting the loss function to a small external dataset, as was done by Flaxman et al., the loss function was fitted directly to the distribution and net crop data within the stock-and-flow model itself. Loss functions were fitted on a country-by-country basis, allowed to vary through time, and defined separately for conventional ITNs and LLINs. The fitted loss functions were compared to existing assumptions about rates of net loss from households. The stock-and-flow model was fitted using Bayesian inference and Markov chain Monte Carlo (MCMC) methods, providing time-series estimates of national household net crop for conventional ITNs and LLINs in each country, together with evaluation of under-distribution, all with posterior credible intervals.

Estimating national ITN access and use indicators from net crop

Rates of ITN access within households depend not only on the total number of ITNs in a country (i.e. net crop), but also on how those nets are distributed between households. One aspect that is known to strongly influence the relationship between net crop and the distribution of household ownership of nets is the size of households found in different countries (*6*), which varies greatly across sub-Saharan Africa.

Many recent national surveys report the number of ITNs observed in each surveyed household. These data make it possible not only to estimate net crop, but also to generate a histogram that summarizes the net ownership pattern (i.e. the proportion of households with zero nets, one net, two nets and so on). In this way, the size of the net crop can be linked to distribution patterns among households, taking into account household size, making it possible to generate ownership distributions for each household size stratum. The bivariate histogram of net crop to distribution of nets among households by household size allowed for calculation of the proportion of households with at least one ITN. Also, because the number of both ITNs and people in every household can be triangulated, this histogram allowed for the direct calculation of two additional indicators: the proportion of households with at least one ITN for every two people, and the proportion of the population with access to an ITN within their household.

For the final ITN indicator – the proportion of the population who slept under an ITN the previous night – the relationship between ITN use and each of the three access indicators was explored in 74 of the 93 national surveys for which sufficient data were available. The proportion of the population with access to an ITN within their household displayed the largest correlation (adjusted $R2 = 0.96$). This relationship was fitted using a simple Bayesian regression model, which was used to predict a time series of ITN use for every country.

Estimating ITN requirements to achieve universal access

The two-stage modelling framework represented the pathway from ITN delivery from manufacturers through to resulting levels of net access and use in households. It also accounted for two potential factors that may reduce access levels (i.e. the efficiency of allocation of nets to households during distribution, and the loss of nets from households over time), and allowed these to be quantified through time for each country. Using this architecture, it was possible to simulate delivery of any volume of ITNs to a given country over a given future time period, to predict the levels of access and use that would result, and to examine the impact of different amounts of allocation efficiency and net loss. The model was used to estimate the levels of access likely to be achieved by 2016 under a broad spectrum of LLIN delivery levels across the 4-year period. These simulations were run under two scenarios: the first being "business-as-usual", where current levels were maintained for allocation efficiency and net loss (~a 2-year median retention time), and the second using maximized allocation efficiency and a 3-year median retention time.

Figure 3.3 The number of ITNs available in households was derived from the ITN coverage model described above. The number of ITNs (LLINs and conventional ITNs) distributed within countries were reported by NMCPs to WHO. The number of LLINs delivered to malaria endemic countries was reported by the seven World Health Organization Pesticide Evaluation Scheme (WHOPES)-approved manufacturers.

Figure 3.4 Estimates of the number of ITNs needed for different levels of access to nets in the population were derived from the ITN coverage model described above.

Figure 3.5 A total of 50 household surveys from 31 countries, conducted between 2000 and 2013, were analysed to establish a relationship between the proportion of different subpopulations sleeping under ITNs (children aged under 5 years, children aged 5–19 years and pregnant women) and the total population sleeping under an ITN. The results of the linear regression were then applied to estimates of the proportion of the total population sleeping under an ITN, produced by the model described above.

Figure 3.6 The proportion of households using ITNs below, at or above the standard capacity of two persons per net was calculated by comparing the number of persons with access to an ITN in each household to the number of persons who slept under an ITN as recorded in household surveys. Households in which the number of persons sleeping under an ITN was the same or greater than the number of persons who could have slept under an available ITN were categorized as using ITNs at or above capacity. Households in which the number of persons sleeping under an ITN was less than the number of persons who could have slept under an ITN were categorized as using ITNs below standard capacity.

Figure 3.7 The number of persons protected by indoor residual spraying (IRS) and the population at risk of malaria was reported by NMCPs to WHO.

Figure 3.8 See notes for Figures 3.1, 3.2 and 3.7 for derivation of the population at risk with access to an ITN in their household, and the proportion benefitting from IRS. Analysis of household-survey data indicates that about half of the people in IRS-sprayed households are also protected by ITNs (*9*). Therefore, the proportion of the population protected by either ITNs or IRS was estimated by adding half the proportion of the population protected by IRS to the proportion with access to an ITN. The coverage estimate is for June 30, 2013.

Figures 3.9 and 3.10 Insecticide resistance monitoring results were collected from NMCP reports to WHO, the African Network for Vector Resistance, the MAP, the PMI and the published literature. In these studies, confirmed resistance was defined as mosquito mortality of <90% on bioassay test.

Section 4: Preventive therapies for malaria

Table 4.1 Policies regarding preventive therapies were reported by NMCPs to WHO. The number of countries where seasonal malaria chemoprevention, intermittent preventive treatment in pregnancy (IPTp) and intermittent preventive treatment in infants (IPTi) are appropriate was based on criteria described in published WHO guidance for these interventions (*10*).

Figure 4.1 The number of pregnant women who attended an antenatal care clinic at least once and who received one, two or three doses of IPTp was derived from NMCP reports to WHO. The number of pregnant women receiving IPTp beyond their first trimester was calculated using the population at risk of malaria and the crude birth rate adjusted for still births and spontaneous abortions after the first trimester, published by the United Nations (UN) Development Programme (*8*):

> 2013 population at risk (country-specific) × crude birth rate (country-specific) × (1.023 [to account for all still births] × 1.004 [to account for spontaneous abortions after the first trimester])

For countries that reported on at least one of the IPTp data elements for 2013, having no visible bar for a data element denotes missing data. The Central African Republic, Gabon, Namibia, Nigeria and Somalia did not report on any IPTp data elements for 2013.

Figure 4.2 The proportion of pregnant women in the population receiving IPTp was derived from both NMCP-reported data and household survey data.

- Using NMCP reports and expected number of pregnancies in the population, as described above, the median value of the proportion of pregnant women who were receiving one dose of IPTp was calculated for each year, among reporting countries, from 2000 to 2013.
- For the estimates based on household survey data, the proportion of pregnant women receiving one, two or three or more doses of IPTp was calculated by approximate year of pregnancy, as determined by child-birth date in the household member roster. Most household surveys collected information on pregnancies during the 3–5 years before the survey date. IPTp indicators recommended by WHO and the Roll Back Malaria (RBM) Partnership Monitoring and Evaluation Reference Group (MERG) were reported by household survey year; the indicators include births within

2 years of the survey date, in an attempt to reduce recall bias regarding pregnancies that occurred more than 2 years before the survey. Calculating receipt of IPTp by year of pregnancy for all years covered by the survey increases the amount of information available to assess trends across countries. The observations for all surveys with data for a given year were combined and reweighted, based on type of survey, survey sampling design and country-year population estimates. The country-year point estimates were recalculated using the new weights. The median and interquartile range were then calculated among countries that had point estimates each year from 2000 to 2013.

- Since few surveys with 2013 data were available, the estimates from 2013 household survey data for the first, second and third dose of IPTp shown in Figure 4.2 are projections from 6-year linear trend analyses. The NMCP data-derived estimates for first-dose IPTp (also shown in Figure 4.2) were not a projection; they provide the most recent and comprehensive estimates of IPTp coverage across countries implementing IPTp in Africa.

Section 5: Malaria diagnostic testing

Table 5.1 Policies regarding diagnostic testing were reported by NMCPs to WHO.

Figure 5.1 The proportion of suspected malaria cases receiving a malaria diagnostic test in public facilities was calculated from NMCP reports to WHO. The number of malaria diagnostic tests performed included the number of rapid diagnostic tests (RDTs) and microscopic slide examinations. Few countries reported the number of suspected malaria cases as an independent value. For countries reporting the total number of malaria cases as presumed malaria cases (i.e. cases classified as malaria without undergoing malaria parasitological testing) and confirmed malaria cases, the number of suspected cases was calculated by adding the number of negative diagnostic tests to the number of presumed and confirmed cases. Using this method for countries that reported only confirmed malaria cases for the total number of malaria cases, the number of suspected cases was equal to the number of cases tested. Such data are not informative when determining the proportion of suspected cases tested; therefore, countries were excluded from the regional calculation for those years in which they reported only confirmed cases for total malaria cases.

Figure 5.2 The proportion of children aged under 5 years with fever who received a finger or heel stick, and where they were brought for care, were calculated from available household survey data for 2000–2014 (the most recent surveys from 29 countries). Places of care that were included in the public sector health management information system were categorized as public facilities, and included public clinics and hospitals. Private facilities included private clinics, pharmacies and shops.

Figures 5.3, 5.4 and 5.5 Manufacturers reporting the number of RDT sales included 41 manufacturers that participate in RDT product testing by WHO, the Foundation for Innovative New Diagnostics (FIND), the United States Centers for Disease Control and Prevention (CDC) and the Special Programme for Research and Training in Tropical Diseases (TDR). The number of RDTs reported by manufacturers represents total sales to the public and private sector worldwide. The number of RDTs and artemisinin-based combination therapies (ACTs) distributed within countries by national programmes are reported by NMCPs to WHO, as are the number of microscopic examinations of blood slides performed for malaria parasites and number of RDTs performed.

Figure 5.6 Results of RDT product testing conducting by WHO, FIND, CDC and TDR were taken from *Malaria rapid diagnostic test performance: Results of WHO product testing of malaria RDTs: Round 5* (*11*). The panel detection score used to quantify RDT performance is an index that measures test positivity as well as inter-test and inter-lot consistency. The score is the frequency with which all RDTs tested on a sample in the evaluation panel are positive (two RDTs from each of two lots positive against 200 parasite/µl sample, and one RDT from each lot positive for 2000–5000 parasite/µl sample). Therefore, for a sample at 200 parasites/µl, four of four tests have to be positive for that sample to be considered detected by RDT; for a sample at 2000–5000 parasites/µl two of two tests have to be positive for that sample to be considered detected by RDT.

Section 6: Malaria treatment

Table 6.1 Policies regarding malaria treatment were reported by NMCPs to WHO.

Figure 6.1 The proportion of children with uncomplicated malaria (defined as fever in the 2 weeks preceding the survey and parasite infection measured by an RDT at the time of the survey) receiving an ACT was estimated for all countries in sub-Saharan Africa in 2003–2012, using a three-step modelling approach:

1. **Fitting a model to predict whether a child with fever has a malaria infection:** For 37 countries with a demographic and health survey (DHS) or malaria indicator survey (MIS), the malaria parasite infection status of a child was assessed from an RDT given at the time of the survey. It was assumed that a positive RDT provides a reasonable measure of a 2-week prevalence of infection (*12-14*). A logistic regression model was created to predict malaria parasite infection amongst febrile children in surveys in which RDT testing was not performed. Covariates in the model included the child's age and sex, household wealth quintile, ITN ownership, facility type where treatment was sought (public or other), urban or rural status, and malaria transmission intensity, as measured by the *Plasmodium falciparum* parasite rate (PfPR) of children aged 2–10 years (PfPR2–10).
2. **Predicting the infection status of children in surveys in which RDTs were not used**: Coefficients estimated from the logistic regression model in Step 1 were used to obtain predictions of infection status among all children with a fever from DHS and multiple indicator cluster surveys (MICS) in which RDT testing had not been performed (66 surveys). The national survey-weighted proportion of febrile children with a malaria parasite infection (RDT measured or imputed) aged under 5 years who received an ACT was then calculated for all surveys.
3. **Estimating the proportion of children with malaria that received an ACT:** ACT distribution data reported by NMCPs were used to calculate a predicted ACT "availability" per person at risk for *P. falciparum* malaria in each country. A linear model was then created to predict the proportion of children with malaria receiving an ACT, using ACT availability per capita in the current and previous year as a covariate. Additional covariates,

obtained from the World Bank dataset,[8] included national ITN coverage (by year), measles vaccination coverage, GNI and the proportion of births with a skilled birth attendant. The model was run in a Bayesian framework using MCMC methods, and included uncorrelated random effects for each country and correlated (autoregressive) random effects for each year. For non-survey years, the proportion of children who received ACT for each country and year (2003–2012) was imputed based on the relationship between ACT coverage and ACT availability across countries.

Publicly available sources of population-based survey data were considered if they included a module assessing fever treatment for children aged under 5 years, categorized by type of antimalarial received. For the period 2003–2012, 16 MIS, 55 DHS and 20 MICS were included. Estimates of mean *Pf*PR2–10, as well as the total population at risk of malaria, were ascertained from the MAP for 2010. Population growth rates were derived from the UN Population Prospects database.[9]

Figure 6.2 The proportion of children aged under 5 years brought for care, and where they were brought for care, were calculated from the most recent household survey undertaken for each country in sub-Saharan Africa (a total of 29 surveys). Public sector places of care included hospitals, health centres and health posts. The formal private sector included private clinics and doctors. The informal private sector included pharmacies, drug stores, shops and traditional healers. Community included care provided by community health workers.

Figures 6.3 and 6.4 Data on ACT sales were provided by eight manufacturers eligible for procurement by WHO/United Nations Children's Fund (UNICEF). ACT sales were categorized as either to the public sector or to the private sector, and products were grouped according to type of ACT and product presentation (i.e. co-formulated and co-blistered). Data on ACTs distributed within countries through the public sector were taken from NMCP reports to WHO.

Figure 6.5 The availability of ACTs in public sector health facilities was measured as the ratio of distributed ACTs reported by NMCPs to the estimated number of presumed and confirmed malaria cases attending public sector health facilities. For countries outside Africa and countries in Africa with consistent reporting, the estimated number of presumed and confirmed cases in the public sector was derived from NMCP reports, corrected for reporting completeness. For countries in Africa with inconsistent reporting, the estimated number of presumed and confirmed cases in the public sector was derived from the estimated number of confirmed malaria cases (see Section 8.3); the proportion of suspected cases tested; and the slide positivity rate (SPR), where:

estimated presumed case = 1 – (% suspected cases tested × estimated confirmed cases / SPR)

The proportion of children aged under 5 years with fever who received ACT among those who received any antimalarial treatment was calculated from available household survey data for countries in sub-Saharan Africa for 2005–2013. Definitions of public sector and private places of care were as described in the diagnostic testing section. Places of care that were included in the public sector health management information system were categorized as public facilities, and they included public clinics and hospitals. Private facilities included private clinics, pharmacies and shops. For recent surveys for which the dataset was not available but a written report had been released, the proportion of ACTs among any antimalarial treatment given was imputed based on the relationship between the indicator for all febrile children and for those children in the public and private sector in other household surveys.

Figure 6.6 The proportions of children aged under 5 years, attending public facilities and with confirmed malaria, who received ACT or did not receive ACT were derived from the ACT treatment model described above. Similarly, the proportion of children without malaria receiving ACT and the proportion not receiving ACT were also derived from the model, as was the proportion of febrile patients attending public facilities with confirmed malaria, defined as a positive RDT at the time of the household survey.

Section 7: Gaps in intervention coverage

Figure 7.1 Data on intervention coverage were derived from nationally representative household survey data from MICS, MIS and DHS conducted in 2011–2013. In total, 21 surveys included data about households without nets; 20 surveys included data on pregnant women who did not receive IPTp; and 23 surveys included data on febrile children aged under 5 years who did not seek treatment and did not receive an ACT, 20 of which also included data on febrile children who did not receive a diagnostic test. For each survey, the proportions of households or children aged under 5 years not covered by a given intervention were calculated over the entire population and within various subpopulations, taking into account the sampling design. The median de facto household population size within each survey was calculated for inclusion in the final analysis. The quartile estimates and interquartile ranges were calculated across all of the country-level proportions.

Figure 7.2 The proportions of the subpopulations not covered by a given intervention within each survey were assembled and used to fit linear regression models for each service, to predict the overall lack of coverage. The choices of subpopulations were based on published literature reviews that identified the factors most likely to influence coverage estimates. For the household-level analysis, the subpopulations included levels of wealth, presence (or lack) of at least one pregnant woman or child aged under 5 years, education level of the household head, type of residence and relative household size. For the child-level analyses, the subpopulations included levels of household wealth, type of residence, education level of the mother, age of the child, gender of the child and relative household size. Model selection was based on the optimal R2, Akaike information criterion and Bayesian information criterion scores for all possible predictor combinations. The decomposition of the R2 goodness-of-fit estimator for linear models has been suggested as a method to describe the

8 http://data.worldbank.org/products/wdi
9 http://esa.un.org/unpd/wpp/unpp/panel_population.htm

relative contribution of predictors across the entire distribution of a continuous outcome (*15*). In this analysis, the decompositions of the goodness-of-fit estimators for each linear model, presented as Owen decomposition values, describe the degree to which different factors contributed to the observed lack of coverage across the surveys. This does not necessarily imply a causal relationship, and the contributions of the individual factors do not necessarily reflect their level of statistical significance in any given country.

Figure 7.3 The country-specific differences in coverage between levels of endemicity were examined by calculating the absolute difference between the intermediate-to-high malaria risk coverage estimates and the no-to-low malaria risk coverage estimates. The malaria endemicity level was determined by extracting the raster values from the data layers of MAP's forthcoming 2000–2013 time series of *Pf*PR at all available survey cluster locations, and classifying those within each cluster as having no-to-low risk or intermediate-to-high risk of malaria. The cluster-level extraction data from *Pf*PR raster values were provided by the MAP. The household-level analysis used cluster-level classifications based on *Pf*PRs for the year 2000 to take into account the impact of ITNs on the parasite rate. In the other analyses, endemicity classifications were based on the *Pf*PRs for the survey year.

Section 8: Trends in infections, cases and deaths

Figures 8.1 and 8.2 The main source of information on reported numbers of malaria cases and deaths are the disease surveillance systems operated by ministries of health. Data from such systems have three strengths: (i) case reports are recorded continuously over time and can thus reflect changes in the implementation of interventions or other factors; (ii) routine case and death reports are often available for all geographical units of a country; and (iii) the data reflect the burden that malaria places on the health system. Changes in the numbers of cases and deaths reported by countries do not, however, necessarily reflect changes in the incidence of disease in the general population, for several reasons. First, not all health facilities report each month; hence, variations in case numbers may reflect fluctuations in the number of health facilities reporting rather than a change in underlying disease incidence. Second, routine reporting systems often do not include patients attending private clinics or morbidity treated at home, so disease trends in health facilities may not reflect trends in the entire community. Finally, not all malaria cases reported are confirmed by microscopy or RDT; hence, some of the cases reported as malaria may actually be other febrile illnesses (*16, 17*).

When reviewing data supplied by ministries of health in malaria endemic countries, the following strategy was used to minimize the influence of these sources of error and bias:

- **Focusing on confirmed cases (by microscopy or RDT) to ensure that malaria (not other febrile illnesses) was tracked.** For high-burden countries in the WHO African Region, where there is little confirmation of cases, the numbers of malaria admissions (in-patient cases) and deaths were reviewed, because the predictive value of malaria diagnosis for an admitted patient is considered to be higher than that of an outpatient diagnosis. In such countries, the analysis may be heavily influenced by trends in cases of severe malaria rather than trends in all cases.
- **Monitoring the number of laboratory tests undertaken.** It is useful to measure the annual blood examination rate (ABER), to ensure that potential differences in diagnostic effort or completeness of reporting are taken into account. To discern decreases in malaria incidence, the ABER should ideally remain constant or be increased. In addition, it is useful to monitor the percentage of suspected malaria cases that are examined with a parasite-based test. Some authorities recommend that the ABER should be >10%, to ensure that all febrile cases are examined; however, the observed rate depends partly on how the population at risk is estimated, and trends may still be valid if the rate is <10%. A value of 10% may not be sufficient to detect all febrile cases. In Solomon Islands, a highly endemic country, the ABER exceeds 60%, with an SPR of 25%, achieved solely through passive case detection.
- **Monitoring trends in the SPR or RDT positivity rate.** This rate should be less severely distorted by variations in the ABER than trends in the number of confirmed cases.
- **Monitoring malaria admissions and deaths.** For high-burden African countries, when reviewing the number of malaria admissions or deaths, it is also informative to examine the number of admissions from all causes, which should remain constant or be increased. If the total number of admissions fluctuates, then it may be preferable to examine the percentage of admissions or deaths due to malaria, because this proportion is less sensitive to variation in reporting rates than the number of malaria admissions or deaths.
- **Monitoring the number of cases detected in the surveillance system in relation to the total number of cases estimated to occur in a country.** Trends derived from countries with high case detection rates are more likely to reflect trends in the broader community. When examining trends in the number of deaths, it is useful to compare the total number of deaths occurring in health facilities with the total number of deaths estimated to occur in the country.
- **Examining the consistency of trends.** Unusual variation in the number of cases or deaths that cannot be explained by climate or other factors, or inconsistency between trends in cases and in deaths, can suggest deficiencies in reporting systems.
- **Monitoring changes in the proportion of cases due to *P. falciparum* or the proportion of cases occurring in children aged under 5 years.** Decreases in the incidence of *P. falciparum* malaria may precede decreases in *P. vivax* malaria, and there may be a gradual shift in the proportion of cases occurring in children aged under 5 years; however, unusual fluctuations in these proportions may point to changes in health-facility reporting or to errors in recording.

These procedures help to rule out data-related factors (e.g. incomplete reporting or changes in diagnostic practice) as explanations for a change in the incidence of disease. The aim is to ensure that trends in health-facility data reflect changes in the wider community, which is more likely in situations where changes in disease incidence are large; coverage with public health services is high; and interventions promoting change, such as use of ITNs, are delivered throughout the community rather than being restricted to health facilities.

Where data reported by NMCPs were sufficiently complete and consistent to reliably assess trends between 2000 and 2013, a country was classified as being on track to achieve, by 2015, a decrease in case incidence of >75%, 50–75% or <50%, or to experience an increase in case incidence by 2015, using 2000 as the baseline. A 75% reduction in malaria case incidence is equivalent to a 5% reduction per year between 2000 and 2015. Thus, to achieve a reduction of 75% by 2015, countries need to have reduced the incidence of malaria by at least 65% between 2000 and 2013. Countries that reduced malaria incidence rates by 43–65% between 2000 and 2013 are projected to achieve reductions in malaria case incidence of 50–75% in 2015.

Table 8.1 The criteria used to classify countries according to programme phase were updated in 2012 to facilitate tracking of progress over time (*18*). The updated criteria are based on an evaluation of three main components: the malaria epidemiological situation, case-management practices and the state of the surveillance system (as shown in Table A.1). The evaluation concentrates on the situation in those districts of the country reporting the highest annual parasite index (API). Other components – for example, the stated programme goal, vector control and malaria prevention practices, and health systems and financing – are also important for tracking progress towards elimination; however, they are less specific and are therefore not included as classification criteria.

Table A.1 Criteria for classifying countries according to malaria programme phase

	Pre-elimination	Elimination	Prevention of reintroduction
Malaria situation in areas with most intense transmission			**(1) Recently endemic country with zero local transmission for at least 3 years; or (2) country on the register or supplementary list that has ongoing local transmission[a]**
Test positivity rate	<5% among suspected malaria patients (PCD) throughout the year		
API in the district with the highest number of cases/1000 population/ year (ACD and PCD),[b] averaged over the past 2 years	<5 (i.e. fewer than 5 cases/1000 population)	<1 (i.e. fewer than 1 case/1000 population)	
Total number of reported malaria cases nationwide		A manageable number (e.g. <1000 cases, local and imported) nationwide	
Case management			**Imported malaria. Maintain capacity to detect malaria infection and manage clinical disease**
All cases detected in the private sector are microscopically confirmed	National policy being rolled out	Yes	Yes
All cases detected in the public sector are microscopically confirmed	National policy being rolled out	Yes	Yes
Nationwide microscopy quality assurance system covers public and private sector	Initiated	Yes	Yes
Radical treatment with primaquine for *P. vivax*	National policy being updated	National policy fully implemented	Yes
Treatment with ACT plus single-dose primaquine for *P. falciparum*	National policy being updated	National policy fully implemented	Yes
Surveillance			**Vigilance by the general health services**
Malaria is a notifiable disease nationwide (<24–48 hours)	Laws and systems being put in place	Yes	Yes
Centralized register on cases, foci and vectors	Initiated	Yes	Yes
Malaria elimination database	Initiated	Yes	Certification process (optional)
Active case detection in groups at high risk or with poor access to services (proactive case detection)	Initiated	Yes	In residual and cleared-up foci, among high-risk population groups
Case and foci investigation and classification (including reactive case detection and entomological investigation)	Initiated	Yes	Yes

ABER: annual blood examination rate; ACD: active case detection; API: annual parasite index; PCD: passive case detection.

[a] Ongoing local transmission = 2 consecutive years of local *P. falciparum malaria transmission, or 3 consecutive years of local P. vivax malaria transmission, in the same locality or otherwise epidemiologically linked.*

[b] The API has to be evaluated against the diagnostic activity in the risk area (measured as the ABER). Low values of ABER in a district raise the possibility that more cases would be found with improved diagnostic efforts.

Figures 8.3–8.5

Maps of *P. falciparum* infection prevalence (*Pf*PR_{2-10}) and associated national-level estimates of average *Pf*PR_{2-10} for countries in sub-Saharan Africa were derived from a geostatistical modelling framework developed by the MAP. The model drew on three categories of data:

- Geopositioned community-based survey measurements of *Pf*PR were identified through periodic literature searches for published data sources, direct communication with malaria specialists for unpublished data sources, and national household surveys. Surveys were primarily conducted in children aged under 5 years, although those based on any defined age range of individuals were included. Most surveys were conducted using microscopy or RDTs to identify infected individuals. After checks for consistency, completeness and duplication, a final assembly was defined for subsequent modelling consisting of 28 361 spatio-temporally unique observations at time points between 1995 and 2014.
- Input data layers were also assembled, to represent levels of intervention coverage. For ITNs, national-level trends in ITN use were taken from the coverage model described earlier (see Section 3). This was used in conjunction with a geostatistical model to generate a continuous space-time "cube" predicting the proportion of individuals sleeping under an ITN the previous night for every 5 × 5 km pixel, and expressed as an annual mean. For IRS, annual reports from NMCPs were assembled, detailing the proportion of the population at risk targeted for coverage each year (note: this does not necessarily represent the proportion ultimately receiving and protected by the intervention). For ACTs, national household survey data were assembled from 93

surveys on the proportion of children with fever accessing an ACT; this was used as a proxy for access to effective antimalarial drugs in clinical malaria cases across the population as a whole. To estimate this coverage in country-years for which no was survey available, an empirical model was built that related coverage levels to the number of ACT courses distributed per capita in each country each year. The latter variable was available from NMCP reported data, and was largely complete for the period 2000–2013.

- A suite of 20 environmental and sociodemographic geospatial input layers were also developed and used as covariates in the *Pf*PR model. Existing approaches to constructing and selecting covariates for this purpose are crucial, but have often been subjective and ad hoc (e.g. a huge variety of covariates are used in modelling with little quantitative justification). To address this, we undertook an exhaustive covariate construction and selection process. First, a literature review was conducted to establish a comprehensive list of variables that have been used as covariates in malaria mapping. Second, a large library of covariate data was assembled to reflect this list, including the construction of dynamic versions where possible. Third, the resulting set of 33 base covariates was leveraged to create more than 50 million possible covariate terms via factorial combinations of different spatial and temporal aggregations, transformations and pair-wise interactions. Fourth, the expanded set of covariates was tested via successive selection criteria to yield an optimum covariate subset that maximized out-of-sample predictive accuracy. The final subset included predominately dynamic covariates; it substantially out-performed earlier sets used in global malaria risk maps from the MAP.

These data sources were then used in a space–time Bayesian geostatistical model that was a more sophisticated version of an earlier approach constructed by the MAP (*19*). The new model included mechanisms to adjust the *Pf*PR survey data by the age range of individuals observed, the season of each survey and the type of diagnostic used. The impact of interventions was modelled by fitting flexible functional forms to capture the separate effects of ITNs, IRS and ACTs on declining *Pf*PR as a function of coverage reached, and the starting (pre-intervention) *Pf*PR in the year 2000. The model was used to predict a spatio-temporal cube of age-specific *Pf*PR at 5 × 5 km resolution across Africa for each year from 2000 to 2013. Detailed maps of year-specific human population density from the WorldPop project[10] were used, in conjunction with the *Pf*PR cube, to calculate population-weighted mean $PfPR_{2\text{-}10}$ for each country and each year. The average number of contemporaneous infections in each country and year was calculated by multiplying the annual mean all-age *Pf*PR by the population in each pixel, then summing across all pixels in each country.

Tables 8.2 and 8.3, and Figures 8.6–8.8 The methods for producing estimates of malaria cases and deaths in 2000–2013 either adjusted the number of reported cases to take into account the proportion of cases that were not captured by a surveillance system or, for countries with insufficient surveillance data, produced estimates using a modelled relationship between malaria transmission, case incidence or mortality, and intervention vector control coverage, as outlined below.

10 http://www.worldpop.org.uk/

Cases The number of malaria cases was estimated by one of two methods:

- For countries outside the WHO African Region and low-transmission countries in Africa: estimates of the number of cases were made by adjusting the number of reported malaria cases for completeness of reporting, the likelihood that cases are parasite-positive and the extent of health-service use. The procedure, which is described in the *World malaria report 2008* (*16, 20*), combines data reported by NMCPs (reported cases, reporting completeness, likelihood that cases are parasite-positive) with those obtained from nationally representative household surveys on health-service use. If data from more than one household survey were available for a country, estimates of health-service use for intervening years were imputed by linear regression. If only one household survey was available, then health-service use was assumed to remain constant over time; analyses summarized in the *World malaria report 2008* indicated that the percentage of fever cases seeking treatment in public sector facilities varies little over time in countries with multiple surveys. Such a procedure results in an estimate with wide uncertainty intervals around the point estimate.
- For countries in the WHO African Region: for some African countries, the quality of surveillance data did not permit a convincing estimate to be made from the number of reported cases. For these countries, an estimate of the number of malaria cases was derived from an estimate of the number of people living at high, low or no risk of malaria. Malaria incidence rates for these populations were inferred from longitudinal studies of malaria incidence recorded in the published literature. Incidence rates were adjusted downwards for populations living in urban settings, and for the expected impact of ITN and IRS programmes. The procedure was initially developed by the RBM MERG in 2004 (*21*) and also described in the *World malaria report 2008*.

Deaths The number of malaria deaths was estimated by one of two methods:

- For countries outside the WHO African Region and for low-transmission countries in Africa:[11] the number of deaths was estimated by multiplying the estimated number of *P. falciparum* malaria cases by a fixed case fatality rate for each country, as described in the *World malaria report 2008*. This method was used for all countries outside the WHO African Region and for countries within the WHO African Region where estimates of case incidence were derived from routine reporting systems and where malaria causes less than 5% of all deaths in children aged under 5 years, as described in the *Global Burden of Disease 2004 update* (*22*). A case fatality rate of 0.45% was applied to the estimated number of *P. falciparum* cases for countries in the WHO African Region, and a case fatality rate of 0.3% for *P. falciparum* cases in other regions. In situations where the fraction of all deaths due to malaria is small, the use of a case fatality rate in conjunction with estimates of case incidence was considered to provide a better guide to the levels of malaria mortality than attempts to estimate the fraction of deaths due to malaria.

11 Botswana, Cabo Verde, Eritrea, Madagascar, Namibia, South Africa, Swaziland and Zimbabwe

- For countries in the WHO African Region: child malaria deaths were estimated using a verbal autopsy multi-cause model developed by the WHO Child Health Epidemiology Reference Group to estimate causes of death for children aged 1–59 months in countries with less than 80% of vital registration coverage (*23-25*). A total of 128 data points from 95 verbal autopsy studies and 37 countries that met the inclusion criteria were included. Among them, 47 data points were either new or updated from the previous estimates of malaria deaths published in the *World malaria report 2012*. Mortality estimates were derived for seven causes of post-neonatal death (pneumonia, diarrhoea, malaria, meningitis, injuries, pertussis and other disorders), causes arising in the neonatal period (prematurity, birth asphyxia and trauma, sepsis, and other conditions of the neonate) and other causes (e.g. malnutrition). Deaths due to measles, unknown causes and HIV/AIDS were estimated separately. The resulting cause-specific estimates were adjusted country by country to fit the estimated 1–59 month mortality envelopes (excluding HIV and measles deaths) for corresponding years. Estimates were then further adjusted for intervention coverage; that is, pneumonia and meningitis estimates were adjusted for the use of *Haemophilus influenzae* type b vaccine, and malaria estimates were adjusted for the use of ITNs.

The bootstrap method was employed to estimate uncertainty intervals by re-sampling from the study-level data to in turn estimate the distribution of the predicted percentage of deaths due to each cause. Deaths in those above the age of 5 years were inferred from a relationship between levels of malaria mortality in different age groups and the intensity of malaria transmission (*26*); thus, the estimated malaria mortality rate in children aged under 5 years was used to infer malaria-specific mortality in older age groups.

Malaria incidence and mortality rates were estimated using "total population at risk for malaria" as a denominator. Projections to 2015 were based on a linear extrapolation of the trend in incidence and mortality rates from 2000 to 2013.

Table 8.4, Figures 8.9 and 8.10 The number of cases averted and lives saved between 2001 and 2012 was estimated by calculating the number of cases and deaths that would have occurred if incidence and mortality rates had remained at 2000 levels until 2013 (i.e. had there been no progress). The calculated number of cases and deaths was compared with the estimated number of cases and deaths presented above. The lower numbers of cases and deaths in 2013 compared to 2000 may be due in part to factors other than the expansion of malaria programmes. Some progress is likely to be related to increased urbanization and overall economic development, which lead to improvements in housing and nutrition.

Regional profiles

Figure A. Incidence rates are derived from reports of confirmed malaria cases in 2013 (by microscopy or RDT) from ministries of health to WHO, and from the number of people living at risk for malaria in each geographical unit as reported by NMCPs. Incidence rates are corrected for reporting completeness by dividing by the proportion of health-facility reports received in 2013 by the number expected. If subnational data on population or malaria cases were lacking, an administrative unit was labelled "no data" on the map. In some cases, the subnational data provided by the NMCP did not correspond to a mapping area known to WHO, either because of modifications to administrative boundaries, or the use of names not verifiable by WHO. The maps for countries in sub-Saharan Africa display a combination of: cases per 1000 per year, and parasite prevalence in areas with >10 cases per 1000 population per year. To obtain a measure of combined parasite prevalence for both *P. falciparum* and *P. vivax*, the sum of the two independent parasite rates (*19, 27*) was calculated at each point (~5 km2). Data on environmental suitability for malaria transmission were used to identify areas that would be free of malaria.

Figure B. Sources of data for the financial contributions are as described for Figure 3.1.

Figure C. Sources of data for international and domestic contributions are as described in the notes for Figure 3.1. Funding per capita at risk was calculated by giving populations at low risk for malaria (i.e. those living in areas with fewer than one case reported per 1000 per year) half the weight of populations at high risk (i.e. those living in areas with one or more cases reported per 1000 per year). This procedure was followed to ensure that countries with populations at low risk for malaria could be included in the analysis, and also to take into account the greater need for malaria programmes and funds in countries with larger proportions of their population at high risk for malaria.

Figure D. For the WHO African Region and for Djibouti, Somalia and the Sudan in the WHO Eastern Mediterranean Region, the proportion of the population with access to an ITN is derived from a model that takes into account household survey data, ITNs distributed by NMCPs, and ITNs delivered by manufacturers (see methods for Figures 3.1 and 3.2). For other countries, the proportion of the population protected with ITNs is estimated from the number of ITNs delivered by NMCPs in the past 3 years divided by the population at high risk. It is assumed that each net delivered can cover on average 1.8 people, that conventional nets are re-treated regularly, and that nets have a lifespan of 3 years. The denominator is the population living at high risk for malaria, since it is assumed that, in countries with lower levels of transmission, ITNs will be preferentially targeted to populations at higher risk. IRS coverage is calculated as the total number of people protected with IRS, divided by the population at high risk. There are limited data on the extent to which these interventions overlap, so the two bars simply represent the percentage of populations protected by the respective interventions individually.

Figure E. Few countries have information systems that record treatments given to individual patients. It is therefore necessary to use aggregate information on numbers of treatment courses delivered to public health facilities, and relate this information to the number of malaria cases among patients attending such facilities. For countries in the WHO African Region, the number of treatment courses available is calculated as the total number

of ACT courses distributed by a ministry of health, divided by the estimated number of presumed cases recorded as malaria (without a diagnostic test having been performed) plus confirmed *P. falciparum* malaria cases at public health facilities. In other WHO regions, the number of treatment courses available is shown as a percentage of confirmed malaria cases plus presumed malaria cases reported in the public sector, correcting for reporting completeness. The bars for any antimalarial treatment show the number of all treatment courses supplied in relation to all malaria cases of any plasmodium species, including the ACT to treat *P. falciparum*.

Figure F. The percentage of confirmed cases in which *P. falciparum* or a mixed infection was detected was calculated as the total number of *P. falciparum* and mixed infections between 2009 and 2013, divided by the number of confirmed cases over that period. For countries in the elimination phase, only locally acquired *P. falciparum* cases and mixed infections were considered.

Figure G. Analysis of changes in malaria incidence rates focuses on confirmed cases (by microscopy or RDT) reported by ministries of health, to ensure that malaria (not other febrile illnesses) is tracked. For countries in the WHO African Region, the figure shows percentage reductions in the rate of hospital admissions and deaths (except for Algeria, Botswana, Cabo Verde, Namibia, Sao Tome and Principe, South Africa, Swaziland and Zimbabwe) and in the rate of reported malaria deaths. Although the diagnosis of admitted patients is not always confirmed with a diagnostic test, the predictive value of diagnosis undertaken for an admitted patient is considered to be higher than for outpatient diagnosis. See notes for Figures 8.1 and 8.2 for more details of analysis undertaken.

Country profiles

I. Epidemiological profile

Maps: The procedures used for the map of confirmed cases per 1000 population divided by parasite prevalence were the same as those used for Figure A of the regional profiles. For the map showing the proportion of cases due to *P. falciparum*, the total number of cases due to *P. falciparum* was divided by the total number of confirmed malaria cases. If no data were available for a subnational geographical area, or there were too few cases to calculate a reliable proportion, the area was highlighted as such. For areas where parasite prevalence was used, the total number of infections due to *P. falciparum* was divided by the total of *P. falciparum* and *P. vivax* infections. Data on environmental suitability for malaria transmission were used to identify areas that would be free of malaria.

Population: The total population of each country was taken from the 2012 revision of the *World population prospects*.[12] The country population was subdivided into three levels of malaria endemicity, as reported by the NMCP: (i) areas of high transmission, where the reported incidence of confirmed malaria due to all species was >1 per 1000 population per year in 2013; (ii) areas of low transmission, where the reported malaria case incidence from all species was ≤1 per 1000 population per year in 2013, but >0 (transmission in these areas is generally highly seasonal, with or without epidemic peaks); and (iii) malaria free areas, where there is no continuing local mosquito-borne malaria transmission, and all reported malaria cases are imported. An area is designated "malaria free" when no cases have occurred for several years. Areas may be naturally malaria free because of factors that are unfavourable for malaria transmission (e.g. altitude or other environmental factors), or they may become malaria free as a result of effective control efforts. In practice, malaria free areas can be accurately designated by NMCPs only after the local epidemiological situation and the results of entomological and biomarker investigations have been taken into account.

In cases where an NMCP did not provide the number of people living in high- and low-risk areas, the numbers were inferred from subnational case incidence data provided by the programme. The population at risk is the total population living in areas where malaria is endemic (low and high transmission), excluding the population living in malaria free areas. The population at risk is used as the denominator in calculating the coverage of malaria interventions, and is therefore used in assessing current and future needs for malaria control interventions, taking into account the population already covered. For countries in the pre-elimination and elimination stages, "population at risk" is defined by the countries, based on the resident populations in foci where active malaria transmission occurs.

Parasites and vectors: The species of mosquito responsible for malaria transmission in a country, and the species of *Plasmodium* involved, are listed according to information provided by WHO regional offices. The proportion of malaria cases due to *P. falciparum* was estimated from the number of *P. falciparum* and mixed infections detected by microscopy, divided by the total number of malaria cases confirmed by microscopy in 2013.

II. Intervention policies and strategies

Intervention policy: The policies and strategies adopted by each country were reported by NMCPs to WHO. They vary according to the epidemiological setting, socioeconomic factors and the capacity of the NMCP or the country's health system. Adoption of policies does not necessarily imply immediate implementation, nor does it indicate full, continuous implementation nationwide.

Antimalarial treatment policy: Antimalarial treatment policies were reported by NMCPs to WHO.

Therapeutic efficacy tests: Data on therapeutic efficacy were extracted from the WHO global database on antimalarial drug efficacy. The data originated from three main sources: published data, unpublished data and regular monitoring data from surveillance studies conducted according to the WHO standard protocol. The percentage of treatment failures is the total number of failures (early treatment failures + late clinical failures + late parasitological failures), divided by the total number of patients who completed the study follow-up. The number of studies included in the analysis and the years during which the studies were conducted are shown for each antimalarial medicine. The minimum, median and maximum describe the range of treatment failures observed in the studies for each antimalarial medicine.

12 http://esa.un.org/unpd/wpp/unpp/panel_population.htm

III. Financing

Sources of financing: The data shown are those reported by NMCPs. The government contribution is usually the declared government expenditure for the year. In cases where government expenditure was not reported by the programme, the government budget was used. External contributions are those allocated to the programme by external agencies; however, such contributions may or may not be disbursed. Additional information about contributions from specific donor agencies, as reported by these agencies, is given in Annex 2. All countries were asked to convert their local currencies to US$ for reporting on sources of financing.

Expenditure by intervention in 2013: The pie chart shows the proportion of malaria funding from all sources that was spent on ITNs, insecticides and spraying materials, IRS, diagnosis, antimalarial medicines, monitoring and evaluation, human resources, technical assistance and management. There are differences in the completeness of data between countries, and the activities for which expenditures are reported do not necessarily include all items of expenditure. For example, government expenditures usually only include expenditures specific to malaria control, and do not take into account costs related to health facility staff, infrastructure and so on.

IV. Coverage

ITN and IRS coverage: Indicators are shown according to data availability:

- *With access to an ITN (survey)* – the proportion of all individuals that could be covered by available ITNs in each household, assuming each ITN can be shared by two people. The indicator is calculated from nationally representative household surveys such as DHS, MICS and MIS.
- *All ages who slept under an ITN (survey)* – the proportion of all individuals who spent the previous night in surveyed households who slept under an ITN, as measured in a nationally representative household survey such as DHS, MICS or MIS.
- *With access to an ITN (model)* – For high-transmission countries in the WHO African Region, a model was used to estimate the proportion of the population with access to an ITN within their household for years in which household survey results were not available. The methods used to estimate the indicator were the same as those described for Figures 3.1 and 3.2.
- *At high risk protected by ITNs* – For countries in WHO regions other than the African Region, nationally representative household surveys are not undertaken sufficiently frequently to allow an assessment of levels and trends in ITN coverage. Therefore, the number of ITNs distributed by NMCPs is used. The proportion of the population potentially protected with ITNs is calculated as:

1.8 × (number of LLINs distributed in the past 3 years + number of conventional ITNs distributed or retreated in the past year) / the population at high risk for malaria

LLINs are considered to have an average useful lifespan of 3 years and conventional ITNs 1 year; also, each net is assumed to protect two people. The ratio of 1.8 is used in the formula to allow for only one person sleeping under some ITNs in households with an odd number of inhabitants. The population at high risk is used as the denominator since it is assumed that populations at high risk will be preferentially targeted to receive an ITN. For countries in the elimination phase, those residing in foci are considered to be the population at risk.

- *At high risk protected by IRS* – calculated as the number of people living in a household where IRS has been applied during the preceding 12 months, divided by the population at risk (the sum of populations living in low- and high-transmission areas). For areas outside Africa, the population at high risk is used as the denominator. The percentage of people protected by IRS is a measure of the extent to which IRS is implemented and the extent to which the population at risk benefits from IRS nationwide. The data show neither the quality of spraying nor the geographical distribution of IRS coverage in a country.

Cases tested and cases treated in the public sector

Suspected cases tested – the number of suspected cases examined by microscopy or by RDT, divided by the total number of suspected malaria cases. For countries that do not report the number of suspected cases independently, the number of suspected malaria cases is derived from the number of presumed and confirmed cases, the number tested and the number of positive tests. This indicator reflects the extent to which a programme can provide diagnostic services to patients attending public health facilities. It does not consider patients attending privately run health facilities, and therefore does not reflect the experience of all patients seeking treatment. In many situations, health facilities in the private sector are less likely to provide a diagnostic test than those in the public sector. The indicator may also be biased if those health facilities that provide a diagnostic test (e.g. hospitals) are more likely than other facilities to submit monthly reports.

Under 5 with fever with finger/heel stick (survey) – the proportion of children aged under 5 years with fever in the past weeks who had a finger or heel stick, as measured in a nationally representative household survey such as DHS, MICS or MIS.

Antimalarial medicines distributed versus cases – Few countries have information systems that are able to record the treatments given to individual patients. Instead, data on the numbers of antimalarial medicines distributed by the country's ministry of health are used to calculate proxy indicators of access to treatment. Three indicators are shown:

- *Antimalarials distributed versus all malaria cases* – the number of first-line treatment courses distributed, divided by the estimated number of malaria cases attending public sector health facilities.
- *ACTs distributed versus P. falciparum malaria cases* – the number of ACT treatment courses distributed, divided by the estimated number of *P. falciparum* malaria cases attending public sector health facilities.

- *Primaquine distributed versus P. vivax malaria cases* – the number of primaquine treatment courses distributed, divided by the estimated number of *P. vivax* malaria cases attending public sector health facilities.

For high-transmission countries in the WHO African Region, the estimated number of malaria cases attending public sector health facilities is used as a denominator. For other countries, the denominator is the number of confirmed cases plus the number of presumed cases, adjusted for reporting completeness. These indicators can provide information on whether the NMCP delivers sufficient antimalarial medicines to treat all malaria patients who seek treatment in the public sector. It is not a direct measure of the proportion of patients with malaria cases that have received treatment.

ACTs as percentage of all antimalarials received (survey) – children aged under 5 years with fever in the past 2 weeks who received ACTs as a proportion of children aged under 5 years with fever who received any antimalarial.

Cases tracked

Reporting completeness – calculated as the total number of health facility reports received by a ministry of health during a year, divided by the total number of facility reports that were expected in that year. The expected number of facility reports is the number of health facilities multiplied by the frequency of reporting; that is, if 100 facilities are expected to report each month, 1200 reports would be expected during a year.

Percentage fever cases <5 seeking treatment at public health facility (survey) – the proportion of children aged under 5 years with fever in the past 2 weeks who sought treatment at a public health facility, derived from a nationally representative household survey such as DHS, MICS or MIS (for programmes in the control phase only).

Cases investigated – the proportion of reported confirmed malaria cases that are investigated for additional information on the characteristics of the case; most importantly, whether the case was imported or locally acquired (for programmes in the pre-elimination and elimination phase only).

Foci investigated – the proportion of foci of malaria transmission that are investigated for additional information on the characteristics of transmission of malaria, including evidence of local malaria transmission and entomological information such as vector breeding sites within the transmission focus (for programmes in the pre-elimination and elimination phase only).

V. Impact

Test positivity

SPR – the number of microscopically positive cases divided by the total number of slides examined.

RDT positivity rate – the number of positive RDT tests divided by the total number of RDT tests carried out. The RDT positivity rate and SPR are derived from the number of parasitologically positive cases per 100 cases examined by RDT or microscopy. They measure the prevalence of malaria parasites among people who seek care and are examined in health facilities. Trends in these indicators may be less distorted by variations in the ABER than trends in the number of confirmed cases.

Parasite prevalence (survey) – the proportion of people tested for malaria parasites in a survey (most often children aged under 5 years) who have malaria parasites (programmes in control phase only).

Confirmed malaria cases per 1000 and ABER

ABER (microscopy and RDT) – the number of parasitological tests (by microscopy or RDT) undertaken per 100 population at risk per year. The numbers of parasitological tests were derived from reports by NMCPs to WHO. The ABER provides information on the extent of diagnostic testing in a population. It can be useful to take into account when interpreting trends in confirmed cases. To discern changes in malaria incidence, the ABER should ideally remain constant (see notes for Figures 8.1 and 8.2). There is no set threshold or target for ABER; rather, it is the trend in ABER in relation to reported case incidence that is most informative.

Cases (all species) – the total number of confirmed malaria cases (by microscopy or RDT) divided by the population at risk. The numbers of confirmed cases were derived from reports by NMCPs to WHO. The indicator is useful in assessing changes in the incidence of malaria over time, provided that there has been consistency in patient attendance at facilities, diagnostic testing and case reporting over time.

Cases (P. vivax) – the total number of confirmed *P. vivax* malaria cases (by microscopy or RDT) divided by the population at risk. The numbers of confirmed *P. vivax* cases were derived from reports by NMCPs to WHO (the numbers exclude mixed infections).

For countries in the pre-elimination or elimination phases, the total number of indigenous cases (acquired within the country) and imported cases were also plotted.

Malaria admissions and deaths (for countries in the control phase)

Numbers for malaria admissions and deaths for countries in the control phase were derived from reports by NMCPs to WHO.

Admissions (all species) – the number of patients admitted for malaria with malaria as the primary discharge diagnosis, divided by the population at risk.

Admissions (P. vivax) – the number of patients admitted for malaria with *P. vivax* malaria as the primary discharge diagnosis, divided by the population at risk.

Deaths (all species) – the number of patients dying in health facilities with malaria as the primary cause of death, divided by the population at risk.

Deaths (P. vivax) – the number of patients dying in health facilities with *P. vivax* malaria as the primary cause of death, divided by the population at risk.

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Annex 2A – Recommended policies and strategies for malaria control, 2013

WHO region	Country/area	Programme Phase	Insecticide-treated nets			Indoor residual spraying		Treatment									Malaria in pregnancy	
			ITNs/ LLINs are distributed for free	ITNs/ LLINs are distributed to all age groups	ITNs/ LLINs distributed through mass campaigns to all age groups	IRS is recommended by malaria control program	DDT is used for IRS	ACT policy adopted	Patients of all ages should get diagnostic test	Malaria diagnosis is free of charge in the public sector	RDTs used at community level	Pre-referral treatment with quinine or artemether IM or artesunate suppositories	Single dose of primaquine is used as gametocidal medicine for *P. falciaprum*[1]	Primaquine is used for radical treatment of *P. vivax* cases	G6PD test is recommened before treatment with primaquine	Directly observed treatment with primaquine is undertaken	IPTp used to prevent malaria during pregnancy	Seasonal malaria chemoprevention (SMC or IPTc) is used
African	Algeria	Elimination	N	N	-	Y	N	NA	-	Y	-	-	Y	Y	N	Y	-	-
	Angola	Control	Y	N	Y	Y	N	Y	Y	Y	N	Y	N	Y	Y	N	Y	N
	Benin	Control	Y	N	Y	Y	N	Y	Y	Y	Y	Y	N	N	-	N	Y	N
	Botswana	Control	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	N	N	N	N	N
	Burkina Faso	Control	Y	Y	Y	Y	N	Y	Y	Y	N	Y	N	N	N	N	Y	N
	Burundi	Control	Y	N	N	Y	N	Y	Y	N	Y	Y	N	N	N	N	N	N
	Cabo Verde	Pre-elimination	N	N	N	Y	N	Y	Y	Y	Y	N	Y	N	-	Y	N	-
	Cameroon	Control	Y	N	N	Y	N	Y	Y	N	Y	Y	N	N	-	-	Y	N
	Central African Republic	Control	Y	Y	Y	Y	N	Y	Y	N	Y	Y	N	N	N	N	Y	N
	Chad	Control	Y	N	Y	Y	N	Y	Y	Y	N	Y	N	N	N	N	Y	Y
	Comoros	Control	Y	Y	Y	Y	N	Y	Y	Y	N	Y	N	N	-	N	Y	N
	Congo	Control	Y	Y	N	Y	N	Y	Y	N	N	Y	N	N	N	N	Y	Y
	Côte d'Ivoire	Control	Y	N	Y	Y	N	Y	-	Y	Y	Y	N	-	-	-	Y	-
	Democratic Republic of the Congo	Control	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	Y	N
	Equatorial Guinea	Control	Y	N	Y	Y	N	Y	Y	Y	N	N	N	N	Y	N	-	N
	Eritrea	Control	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	N	Y	N	N	N	N
	Ethiopia	Control	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	N	N	N	N	N	N
	Gabon	Control	N	Y	Y	Y	N	Y	Y	N	Y	Y	N	N	N	N	Y	N
	Gambia	Control	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	-	-	-	-	Y	-
	Ghana	Control	Y	Y	Y	Y	N	Y	Y	N	Y	Y	N	N	N	N	Y	N
	Guinea	Control	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	N	N	N	N	Y	N
	Guinea-Bissau	Control	Y	N	Y	N	N	Y	Y	Y	N	Y	N	N	N	N	Y	N
	Kenya	Control	Y	Y	Y	Y	N	Y	Y	Y	N	Y	N	-	-	-	Y	N
	Liberia	Control	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	N	N	N	N	Y	N
	Madagascar	Control	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	N	N	N	Y	N
	Malawi	Control	Y	Y	Y	Y	N	Y	Y	N	N	Y	N	N	N	N	Y	N
	Mali	Control	Y	N	Y	Y	N	Y	Y	Y	Y	Y	N	N	-	N	Y	Y
	Mauritania	Control	Y	N	-	N	N	Y	Y	Y	Y	Y	N	Y	Y	N	Y	N
	Mayotte, France	Elimination	Y	Y	-	-	N	-	-	Y	-	-	N	Y	Y	Y	-	-
	Mozambique	Control	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	-	-	-	-	Y	-
	Namibia	Control	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	Y	N	N	Y	N
	Niger	Control	Y	N	N	Y	N	Y	Y	Y	N	Y	N	N	-	N	Y	Y
	Nigeria	Control	Y	Y	Y	Y	N	Y	Y	Y	N	Y	N	N	N	N	Y	N
	Rwanda	Control	Y	N	Y	Y	N	Y	Y	N	Y	Y	N	N	N	N	N	N
	Sao Tome and Principe	Control	Y	Y	Y	Y	N	Y	Y	Y	N	Y	Y	Y	N	Y	Y	N
	Senegal	Control	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	N	N	N	N	Y	Y
	Sierra Leone	Control	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	N	N	N	N	Y	N
	South Africa	Control	N	N	N	Y	Y	Y	Y	Y	Y	Y	N	N	Y	N	N	N
	South Sudan	Control	Y	Y	Y	Y	N	Y	Y	Y	N	Y	N	N	N	N	Y	N
	Swaziland	Control	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N
	Togo	Control	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	N	N	-	-	Y	Y
	Uganda	Control	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	N	N	N	N	Y	N
	United Republic of Tanzania	Control	Y	Y	Y	Y	N	Y	Y	Y	N	Y	-	-	-	-	Y	-
	United Republic of Tanzania (Mainland)	Control	Y	N	N	Y	N	Y	Y	Y	N	Y	N	N	N	N	Y	N
	United Republic of Tanzania (Zanzibar)	Control	Y	Y	Y	Y	N	Y	Y	Y	N	Y	N	N	N	N	Y	N
	Zambia	Control	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	Y	N
	Zimbabwe	Control	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	Y	N

WHO region	Country/area	Programme Phase	Insecticide-treated nets			Indoor residual spraying		Treatment									Malaria in pregnancy	
			ITNs/ LLINs are distributed for free	ITNs/ LLINs are distributed to all age groups	ITNs/ LLINs distributed through mass campaigns to all age groups	IRS is recommended by malaria control program	DDT is used for IRS	ACT policy adopted	Patients of all ages should get diagnostic test	Malaria diagnosis is free of charge in the public sector	RDTs used at community level	Pre-referral treatment with quinine or artemether IM or artesunate suppositories	Single dose of primaquine is used as gametocidal medicine for *P. falciaprum*[1]	Primaquine is used for radical treatment of *P. vivax* cases	G6PD test is recommened before treatment with primaquine	Directly observed treatment with primaquine is undertaken	IPTp used to prevent malaria during pregnancy	Seasonal malaria chemoprevention (SMC or IPTc) is used
Eastern Mediterranean	Afghanistan	Control	Y	Y	Y	Y	N	Y	Y	Y	-	Y	N	Y	Y	Y	NA	NA
	Djibouti	Control	Y	Y	Y	Y	N	Y	Y	Y	N	N	Y	Y	N	N	N	N
	Iran (Islamic Republic of)	Elimination	Y	Y	Y	Y	N	Y	Y	Y	-	-	Y	Y	N	Y	NA	NA
	Pakistan	Control	Y	N	N	Y	N	Y	Y	Y	N	Y	Y	Y	Y	N	NA	NA
	Saudi Arabia	Elimination	Y	Y	-	Y	N	Y	Y	Y	-	-	Y	Y	Y	N	NA	NA
	Somalia	Control	Y	Y	Y	Y	N	Y	Y	Y	N	Y	N	N	N	N	-	N
	Sudan	Control	Y	Y	Y	Y	N	Y	Y	N	Y	Y	N	Y	N	N	N	N
	Yemen	Control	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	N	Y	Y	N	NA	NA
European	Azerbaijan	Elimination	Y	N	-	Y	N	NA	-	Y	-	-	N	Y	N	Y	NA	NA
	Kyrgyzstan	Prevention of re-introduction	Y	Y	-	Y	N	-	-	Y	-	-	Y	Y	N	Y	NA	NA
	Tajikistan	Elimination	Y	Y	-	Y	N	Y	-	Y	-	-	Y	Y	N	Y	NA	NA
	Turkey	Elimination	N	N	-	Y	N	NA	-	Y	-	-	N	Y	N	Y	NA	NA
	Uzbekistan	Prevention of re-introduction	Y	Y	-	Y	N	-	-	Y	-	-	Y	Y	N	Y	NA	NA
Region of the Americas	Argentina	Elimination	N	N	N	Y	N	NA	Y	Y	N	N	Y	Y	N	Y	NA	NA
	Belize	Pre-elimination	Y	Y	Y	Y	N	NA	Y	Y	N	N	Y	Y	N	Y	NA	NA
	Bolivia (Plurinational State of)	Control	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y	Y	N	N	NA	NA
	Brazil	Control	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	N	N	NA	NA
	Colombia	Control	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	N	Y	N	N	NA	NA
	Costa Rica	Elimination	Y	Y	Y	Y	N	NA	Y	Y	N	N	Y	Y	N	Y	NA	NA
	Dominican Republic	Control	Y	Y	N	Y	N	NA	Y	Y	N	N	Y	Y	N	Y	NA	NA
	Ecuador	Pre-elimination	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y	Y	N	Y	NA	NA
	El Salvador	Pre-elimination	Y	Y	N	Y	N	NA	Y	Y	N	N	Y	Y	N	Y	NA	NA
	French Guiana, France	Control	Y	Y	Y	Y	N	NA	Y	Y	N	N	Y	Y	-	-	NA	NA
	Guatemala	Control	Y	Y	Y	Y	N	NA	Y	Y	Y	N	Y	Y	N	N	NA	NA
	Guyana	Control	Y	Y	Y	Y	N	Y	Y	Y	N	N	Y	Y	N	N	NA	NA
	Haiti	Control	Y	Y	Y	N	N	NA	Y	Y	N	N	Y	Y	N	N	NA	NA
	Honduras	Control	Y	Y	Y	Y	N	NA	Y	Y	Y	N	Y	Y	N	N	NA	NA
	Mexico	Pre-elimination	Y	Y	Y	N	N	NA	Y	Y	N	N	Y	Y	N	Y	NA	NA
	Nicaragua	Control	Y	Y	Y	Y	N	NA	Y	Y	Y	N	Y	Y	N	Y	NA	NA
	Panama	Control	Y	N	N	Y	N	NA	Y	Y	N	N	Y	Y	N	Y	NA	NA
	Paraguay	Elimination	N	N	N	Y	N	Y	Y	Y	N	N	Y	Y	N	-	NA	NA
	Peru	Control	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	N	Y	N	Y	NA	NA
	Suriname	Control	Y	Y	N	N	N	Y	Y	Y	Y	Y	Y	Y	N	N	NA	NA
	Venezuela (Bolivarian Republic of)	Control	Y	Y	Y	Y	N	Y	Y	Y	N	N	Y	Y	N	Y	NA	NA
South-East Asia	Bangladesh	Control	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	N	N	NA	NA
	Bhutan	Pre-elimination	Y	Y	Y	Y	N	Y	Y	Y	N	N	Y	Y	N	N	NA	NA
	Democratic People's Republic of Korea	Pre-elimination	Y	Y	-	Y	N	NA	-	Y	-	-	N	Y	N	Y	NA	NA
	India	Control	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	NA	NA
	Indonesia	Control	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	N	N	NA	NA
	Myanmar	Control	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	N	N	NA	NA
	Nepal	Control	Y	Y	Y	Y	N	Y	Y	Y	Y	N	-	Y	N	-	NA	NA
	Sri Lanka	Elimination	Y	Y	-	Y	N	Y	-	Y	-	-	Y	Y	Y	Y	NA	NA
	Thailand	Control	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y	Y	N	Y	NA	NA
	Timor-Leste	Control	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	N	Y	N	N	NA	NA
Western Pacific	Cambodia	Control	Y	Y	Y	N	N	Y	Y	Y	Y	N	N	Y	Y	N	NA	NA
	China	Control	Y	Y	Y	Y	N	Y	Y	N	N	N	N	Y	N	Y	NA	NA
	Lao People's Democratic Republic	Control	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	N	Y	N	NA	NA
	Malaysia	Pre-elimination	Y	Y	-	-	N	Y	-	Y	-	-	Y	Y	Y	Y	NA	NA

Annex 2A – Recommended policies and strategies for malaria control, 2013 (continued)

WHO region	Country/area	Programme Phase	Insecticide-treated nets			Indoor residual spraying		Treatment									Malaria in pregnancy	
			ITNs/ LLINs are distributed for free	ITNs/ LLINs are distributed to all age groups	ITNs/ LLINs distributed through mass campaigns to all age groups	IRS is recommended by malaria control program	DDT is used for IRS	ACT policy adopted	Patients of all ages should get diagnostic test	Malaria diagnosis is free of charge in the public sector	RDTs used at community level	Pre-referral treatment with quinine or artemether IM or artesunate suppositories	Single dose of primaquine is used as gametocidal medicine for *P. falciaprum*[1]	Primaquine is used for radical treatment of *P. vivax* cases	G6PD test is recommened before treatment with primaquine	Directly observed treatment with primaquine is undertaken	IPTp used to prevent malaria during pregnancy	Seasonal malaria chemoprevention (SMC or IPTc) is used
Western Pacific	Papua New Guinea	Control	Y	Y	Y	Y	N	Y	Y	Y	N	Y	N	Y	N	N	Y	N
	Philippines	Control	Y	Y	N	Y	N	Y	Y	Y	Y	N	Y	Y	Y	Y	NA	NA
	Republic of Korea	Elimination	Y	N	-	-	N	NA	-	Y	-	-	N	Y	N	N	NA	NA
	Solomon Islands	Control	Y	Y	N	Y	N	Y	Y	Y	N	Y	N	Y	Y	N	NA	NA
	Vanuatu	Control	Y	Y	Y	Y	N	Y	Y	N	Y	Y	N	Y	Y	Y	NA	NA
	Viet Nam	Control	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y	Y	N	N	NA	NA

(Y) = Actually implemented.
(N) = Not implemented.
(-) = Question not answered or not applicable.
1 Single dose of primaquine (0.75mg base/kg) for countries in the Region of the Americas

Annex 2B – Antimalarial drug policy, 2013

WHO region	Country/area	*P. falciparum*				*P.vivax*
		Uncomplicated unconfirmed	Uncomplicated confirmed	Severe	Prevention during pregnancy	Treatment
African	Algeria	-	-	-	-	CQ
	Angola	AL	AL	QN	SP(IPT)	-
	Benin	AL	AL	QN	SP(IPT)	-
	Botswana	AL	AL	QN	CQ+PG	-
	Burkina Faso	AL ;AS+AQ	AL ;AS+AQ	QN	SP(IPT)	-
	Burundi	AS+AQ	AS+AQ	QN	-	-
	Cabo Verde	AL	AL	QN	CQ	-
	Cameroon	AS+AQ	AS+AQ	AM ;QN	SP(IPT)	-
	Central African Republic	AL	AL	AM ;QN	SP(IPT)	-
	Chad	AL ;AS+AQ	AL ;AS+AQ	AM ;QN	SP(IPT)	-
	Comoros	AL	AL	QN	SP(IPT)	-
	Congo	AS+AQ	AS+AQ	QN	SP(IPT)	-
	Côte d'Ivoire	AS+AQ	AS+AQ	QN	SP(IPT)	-
	Democratic Republic of the Congo	AS+AQ	AS+AQ	QN	SP(IPT)	-
	Equatorial Guinea	AS+AQ	AS+AQ	QN	-	-
	Eritrea	AS+AQ	AS+AQ	QN	-	AS+AQ+PQ
	Ethiopia	AL	AL	QN	-	CQ
	Gabon	AS+AQ	AS+AQ	QN	SP(IPT)	-
	Gambia	AL	AL	QN	SP(IPT)	-
	Ghana	AS+AQ	AL ;AS+AQ	QN	SP(IPT)	-
	Guinea	AS+AQ	AS+AQ	QN	SP(IPT)	-
	Guinea-Bissau	AL	AL	QN	SP(IPT)	-
	Kenya	AL	AL	QN	SP(IPT)	-
	Liberia	AS+AQ	AS+AQ	QN	SP(IPT)	-
	Madagascar	AS+AQ	AS+AQ	QN	SP(IPT)	-
	Malawi	AL	AL	QN	SP(IPT)	-
	Mali	AS+AQ	AL ;AS+AQ	QN	SP(IPT)	-
	Mauritania	AS+AQ	AL ;AS+AQ	QN	-	-
	Mayotte, France	-	AL	-	-	CQ+PQ
	Mozambique	AL	AL	QN	SP(IPT)	-
	Namibia	AL	AL	QN	SP(IPT)	AL
	Niger	AL	AL	QN	SP(IPT)	-
	Nigeria	AL ;AS+AQ	AL ;AS+AQ	AM ;AS ;QN	SP(IPT)	-
	Rwanda	AL	AL	AS	SP(IPT)	-
	Sao Tome and Principe	AS+AQ	AS+AQ	QN	SP(IPT)	-
	Senegal	AS+AQ	AL ;AS+AQ	QN	SP(IPT)	-
	Sierra Leone	AS+AQ	AL ;AS+AQ	AM ;QN	SP(IPT)	-
	South Africa	-	AL ;QN+CL ;QN+D	QN	CQ+PG	AL+PQ ;CQ+PQ
	South Sudan	AS+AQ	AS+AQ	AM ;AS ;QN	SP(IPT)	AS+AQ+PQ
	Swaziland	-	AL	QN	CQ+PG	-
	Togo	AL ;AS+AQ	AL ;AS+AQ	QN	SP(IPT)	-
	Uganda	AL	AL	QN	SP(IPT)	-
	United Republic of Tanzania	AL ;AS+AQ	AL ;AS+AQ	QN	SP(IPT)	-
	Mainland	AL	AL	QN	SP(IPT)	-
	Zanzibar	AS+AQ	AS+AQ	QN	SP(IPT)	-
	Zambia	AL	AL	QN	SP(IPT)	-
	Zimbabwe	AL	AL	QN	SP(IPT)	-
Eastern Mediterranean	Afghanistan	CQ	AS+SP+PQ	AM ;AS ;QN	-	CQ+PQ(8w)
	Djibouti	AL	AL+PQ	QN	-	CQ+PQ (14 days)
	Iran (Islamic Republic of)	-	AS+SP ;AS+SP+PQ	AS ;QN+D	-	CQ+PQ(14d & 8w)
	Pakistan	CQ	AS+SP+PQ	AS ;QN	-	CQ+PQ(14d)
	Saudi Arabia	-	AS+SP+PQ	AM ;AS ;QN	-	CQ+PQ(14d)
	Somalia	AS+SP	AS+SP	AS ;QN	-	CQ+PQ
	Sudan	AS+SP	AS+SP	AM ;QN	-	AL+PQ(14d)
	Yemen	AS+SP	AS+SP	AM ;QN	-	CQ+PQ(14d)

WHO region	Country/area	*P. falciparum*				*P.vivax*
		Uncomplicated unconfirmed	Uncomplicated confirmed	Severe	Prevention during pregnancy	Treatment
European	Azerbaijan	AS+SP	AS+SP	AS ;QN	-	CQ+PQ(14d)
	Kyrgyzstan	-	-	-	-	CQ+PQ(14d)
	Tajikistan	-	AL	QN	-	CQ+PQ(14d)
	Turkey	-	-	-	-	CQ+PQ(14d)
	Uzbekistan	-	-	-	-	CQ+PQ(14d)
Region of the Americas	Argentina	-	AL+PQ	-	-	CQ+PQ
	Belize	-	CQ+PQ (1d)	AL ;QN	-	CQ+PQ(14d)
	Bolivia (Plurinational State of)	-	AS+MQ+PQ	QN	-	CQ+PQ(7d)
	Brazil	-	AL+PQ(1d) ;AS+MQ+PQ(1d)	AM+CL ;AS+CL ;QN+CL	-	CQ+PQ(7d)
	Colombia	-	AL	AS ;AL	-	CQ+PQ(14d)
	Costa Rica	-	CQ+PQ(1d)	QN	-	CQ+PQ(7d);CQ+PQ(14d)
	Dominican Republic	-	CQ+PQ(1d)	CQ ;QN	-	CQ+PQ(14d)
	Ecuador	-	AL+PQ	QN	-	CQ+PQ(14d)
	El Salvador	-	CQ+PQ(1d)	QN	-	CQ+PQ(14d)
	French Guiana, France	-	AL ;AT+PG	AS ;QN+D	-	CQ+PQ
	Guatemala	-	CQ+PQ(3d)	QN	-	CQ+PQ(14d)
	Guyana	-	AL+PQ(1d)	AM	-	CQ+PQ(14d)
	Haiti	-	CQ+PQ(1d)	QN	-	CQ+PQ(14d)
	Honduras	-	CQ+PQ(1d)	QN	-	CQ+PQ(14d)
	Mexico	-	CQ+PQ	AL	-	CQ+PQ
	Nicaragua	-	CQ+PQ(1d)	QN	-	CQ+PQ(7d)
	Panama	-	AL+PQ(1d)	QN	-	CQ+PQ(7d);CQ+PQ(14d)
	Paraguay	-	AL+PQ	AS	-	CQ+PQ
	Peru	-	AS+MQ	AS+MQ	-	CQ+PQ
	Suriname	-	AL+PQ	AS	-	CQ+PQ(14d)
	Venezuela (Bolivarian Republic of)	-	AS+MQ+PQ	AM ;QN	-	CQ+PQ(14d)
South-East Asia	Bangladesh	-	AL	AM ;QN	-	CQ+PQ(14d)
	Bhutan	-	AL	AM ;QN	-	CQ+PQ(14d)
	Democratic People's Republic of Korea	-	-	-	-	CQ+PQ(14d)
	India	CQ	AS+SP+PQ	AM ;AS ;QN	-	CQ+PQ(14d)
	Indonesia	-	AS+AQ ;DHA-PP+PQ	AM ;AS ;QN	-	AS+AQ ;DHA-PP+PQ(14d)
	Myanmar	-	AL ;AM ;AS+MQ ;DHA-PPQ ;PQ	AM ;AS ;QN	-	CQ+PQ(14d)
	Nepal	CQ	AL+PQ	AS ;QN	-	CQ+PQ(14d)
	Sri Lanka	-	AL+PQ	QN	-	CQ+PQ(14d)
	Thailand	-	AS+MQ	QN+D	-	CQ+PQ(14d)
	Timor-Leste	-	AL	AM ;AS ;QN	-	CQ+PQ(14d)
Western Pacific	Cambodia	-	AS+MQ ;DHA-PPQ+PQ	AM ;QN	-	DHA-PPQ
	China	-	ART+NQ ;ART-PPQ ;AS+AQ ;DHA-PPQ	AM ;AS ;PYR	-	CQ+PQ(8d)
	Lao People's Democratic Republic	-	AL	AS+AL	SP(IPT)	AL
	Malaysia	-	AS+MQ	QN+T	-	CQ+PQ(14d)
	Papua New Guinea	-	AL	AM ;AS	SP(IPT)	AL+PQ
	Philippines	AL	AL+PQ	QN+T	SP(IPT)	CQ+PQ(14d)
	Republic of Korea	CQ	-	-	-	CQ+PQ(14d)
	Solomon Islands	AL	AL	AL ;AS	CQ	AL+PQ(14d)
	Vanuatu	-	AL	QN	CQ(weekly)	AL+PQ(14d)
	Viet Nam	-	DHA-PPQ	AS ;QN	CQ(weekly)	CQ+PQ(14d)

AL=Artemether-lumefantrine
AM=Artemether
AQ=Amodiaquine
ART=Artemisinin
AS=Artesunate
AT= Atovaquone
CL=Clindamycline
CQ=Chloroquine
D=Doxycycline
DHA=Dihydroartemisinin
MQ=Mefloquine
NQ=Naphroquine
PG=Proguanil
PPQ=Piperaquine
PQ=Primaquine
PYR=Pyronaridine
QN=Quinine
SP=Sulphadoxine-pyrimethamine
T=Tetracycline

1 In May 2013 South Sudan was reassigned to the Who African Region (WHA resolution 66.21 http://apps.who.int/gb/ebwha/pdf_fi les/WHA66/A66_R21-en.pdf). Nonetheless, since most data in this report precede 2013, South Sudan is placed in Eastern Mediterranean Region

Annex 3 – Funding for malaria control, 2011–2013

WHO Region	Country/Area	Year	Contributions reported by donors				Contributions reported by countries							
			Global Fund[1]	PMI/ USAID[2]	The World Bank[3]	DFID[4]	Government	Global Fund	The World Bank	PMI/ USAID	Other bilaterals	WHO	UNICEF	Other contributions[5]
African	Algeria	2011	-	-	-	-	31 477 010	0	-	-	0	17 000	-	0
		2012	-	-	-	-	98 151 555	0	-	-	0	33 000	-	0
		2013	-	-	-	-	0[4]	-	-	-	-	-	-	0
	Angola	2011	0	30648 000	70 700	0	66 637 986[4]	-	-	30 614 000	-	-	-	-
		2012	7070 000	30199 300	0	0	57 415 819[4]	2 135 717	-	30 750 000	1 000 000	-	-	1 000 000
		2013	24410 000	28550 000	0	0	64 047 348[4]	19 286 339	-	27 200 000	-	-	3 555 239	-
	Benin	2011	5470 000	18477 300	2019 107	0	200 000[4]	18 060 813	0	21 000 000	0	660 000	248 540	0
		2012	5533 925	17900 000	-	-	1 500 000[4]	9 011 888	-	16 100 000	-	660 000	123 571	-
		2013	27650 000	16650 000	30 000	0	-	-	-	-	-	-	-	-
	Botswana	2011	-	-	-	-	2 250 933	-	-	-	1 171 250	-	-	1 171 250
		2012	-	-	-	-	1 921 908	-	-	-	250 000	-	-	250 000
		2013	0	0	0	0	1 947 775	0	0	0	0	-	0	0
	Burkina Faso	2011	10500 000	-	-	-	6 482 938	2 546 429	0	2 072 216	34 903	99 027	140 253	0
		2012	38000 000	-	-	-	11 380 472	4 834 000	0	2 698 000	16 600	29 500	14 000	0
		2013	10860 000	0	1980 000	0	58 920 267	40 645 351	0	8 552 723	0	37 800	521 760	942 955
	Burundi	2011	6149 217	-	-	-	147 422[4]	8 661 526	-	5 988 000	94 000	266 540	708 425	94 000
		2012	1018 766	-	-	-	22 000[4]	4 382 754	-	8 000 000	1 031 803	94 294	1 540 000	2 602 730
		2013	22940 000	0	0	0	22 000[4]	4 419 879	-	9 260 000	-	65 000	373 532	-
	Cabo Verde	2011	-	-	-	-	604 871[4]	-	-	-	-	-	-	-
		2012	364 436	-	-	-	481 264[4]	-	-	-	-	-	-	-
		2013	890 000	0	0	0	397 920	555 169	-	-	-	130 448	-	-
	Cameroon	2011	66200 000	-	-	-	5 150 943[4]	55 336 850	0	0	0	313 300	-	0
		2012	1551 732	-	-	-	3 178 626[4]	11 655 745	0	0	0	449 000	1 196 800	0
		2013	10900 000	0	0	0	5 246 883[4]	15 293 706	-	-	5 415 537	904 218	118 341	5 415 537
	Central African Republic	2011	723 324	-	-	-	34 000[4]	481 345	0	0	0	100 000	-	0
		2012	3578 002	-	-	-	371 463[4]	-	0	0	74 535	-	219 747	0
		2013	12060 000	0	0	0	160 000	5 342 710	0	0	-	-	2 000 000	-
	Chad	2011	4208 387	-	-	-	600 000 000[4]	-	-	-	-	-	-	-
		2012	-	-	-	-	-	-	-	-	-	-	-	-
		2013	34670 000	0	0	0	4 600 000 000[4]	-	-	-	-	-	-	-
	Comoros	2011	1106 246	-	-	-	114 215[4]	773 425	0	0	0	137 000	-	0
		2012	127 142	-	-	-	225 621[4]	-	0	0	0	20 000	-	-
		2013	4100 000	0	0	0	137 147	499 000	0	0	0	40 000	5 576	0
	Congo	2011	1262 613	-	-	-	-	3 982 625	-	-	-	-	-	-
		2012	1035 856	-	-	-	6 956 815[4]	4 740 367	-	-	-	-	-	-
		2013	740 000	0	0	0	0	0	0	0	0	45 000	10 000	0
	Côte d'Ivoire	2011	14300 000	-	-	-	34 964 064[4]	27 941 028	-	-	244 000	2 605 303	69 012	307 749
		2012	17900 000	-	-	-	-	-	-	-	336 278	-	-	-
		2013	52150 000	0	0	0	4 663 194[4]	74 853 096	-	-	244 000	36 338	49 780	244 000
	Democratic Republic of the Congo	2011	2106 190	35700 000	-	25900 000	7 812 690	33 775 293	58 805 836	18 000 000	36 765 988	-	2 389 964	36 765 988
		2012	105000 000	37000 000	-	-	303 835	64 140 129	73 719 913	34 930 000	45 000	520 000	5 584 965	12 575 325
		2013	58210 000	34000 000	8460 000	4750 000	7 812 690	86 281 277	2 952 042	37 001 000	0	0	1 790 452	35 020 370
	Equatorial Guinea	2011	2599 520	-	-	-	5 251 694[4]	3 425 062	-	-	3 135 452	-	-	3 135 452
		2012	-	-	-	-	2 659 791[4]	-	-	-	5 319 581	-	-	5 319 581
		2013	0	0	0	0	2 582 747[4]	0	-	-	4 490 030	-	-	4 490 030
	Eritrea	2011	4908 106	-	-	-	-	10 722 859	0	0	0	0	0	0
		2012	8229 050	-	-	-	-	11 157 713	0	0	0	0	0	0
		2013	15930 000	0	0	0	-	15 871 769	-	-	-	-	-	-
	Ethiopia	2011	51900 000	41400 000	-	-	-	32 231 572	-	-	-	171 357	27 243	-
		2012	23800 000	41500 000	-	-	-	42 424 919	-	-	-	0	-	-
		2013	114020 000	43770 000	0	0	19 705 028	85 723 876	-	29 370 000	-	111 677	-	15 000 000
	Gabon	2011	-	-	-	-	-	-	-	-	-	-	-	-
		2012	-	-	-	-	-	-	-	-	-	-	-	-
		2013	0	0	0	0	226 596	0	0	0	0	11 276	0	-

WHO Region	Country/Area	Year	Contributions reported by donors				Contributions reported by countries							
			Global Fund[1]	PMI/ USAID[2]	The World Bank[3]	DFID[4]	Government	Global Fund	The World Bank	PMI/ USAID	Other bilaterals	WHO	UNICEF	Other contributions[5]
African	Gambia	2011	7119 980	-	-	-	613 412	8 835 940	0	0	89 000	40 000	4 800	0
		2012	5393 233	-	-	-	597 812	4 107 095	-	-	119 149	134 306	-	119 149
		2013	9290 000	0	0	0	726 578	4 919 685	0	0	0	16 000	26 229	100 000
	Ghana	2011	-	30400 000	-	8566 783	6 663 582	53 169 328	400 000	34 000 000	250 000	300 000	2 000 000	16 100 000
		2012	24600 000	30800 000	-	-	7 700 154	34 668 998	0	27 010 000	581	200 000	79 490	7 911 545
		2013	67800 000	28550 000	3480 000	2010 000	8 736 726	67 804 357	0	27 000 000	38 817	47 050	0	-
	Guinea	2011	-	9985 000	-	-	-	-	-	-	-	49 500	-	-
		2012	20100 000	10000 000	-	-	50 880	1 705 505	-	10 000 000	6 773 166	41 060	15 736	6 773 166
		2013	4600 000	12370 000	0	0	3 015 335	-	-	10 000 000	-	-	-	-
	Guinea-Bissau	2011	2922 931	-	-	-	79 269 000[4]	1 070 641	0	0	99 750	68 000	7 238	0
		2012	255 313	-	-	-	-	18 177	0	0	0	124 135	436 945	0
		2013	8220 000	0	0	0	0	701 363	0	0	-	73 734	218 811	-
	Kenya	2011	12200 000	36400 000	-	17400 000	2 635 294	38 141 176	6 423 529	35 964 706	20 338 983	-	-	20 338 983
		2012	10900 000	35900 000	-	-	2 635 294	9 353 875	8 790 698	35 604 651	232 558	-	337 209	13 111 111
		2013	33310 000	34260 000	0	17520 000	1 372 093	29 089 771	1 127 907	32 400 000	23 457 627	-	0	23 457 627
	Liberia	2011	5198 534	13000 000	-	-	-	16 400 946	-	12 000 000	-	19 675	304 750	-
		2012	12200 000	12000 000	-	-	-	14 243 081	0	12 000 000	500 000	73 333	0	500 000
		2013	5890 000	12000 000	0	0	284 306[4]	14 026 642	0	12 000 000	-	44 890	340 647	-
	Madagascar	2011	18400 000	28700 000	-	-	90 900	19 557 627	0	33 900 000	47 250	153 000	422 624	0
		2012	25500 000	26700 000	-	-	95 000	31 371 350	0	28 742 000	51 000	111 315	875 717	0
		2013	22650 000	26030 000	0	0	15 286	29 994 536	0	27 000 000	369 500	299 000	737 588	0
	Malawi	2011	45000 000	26500 000	-	-	-	-	-	-	-	-	-	-
		2012	2473 270	24200 000	-	-	720 000	9 720 000	-	21 600 000	3 240 000	-	-	720 000
		2013	10070 000	24080 000	0	0	-	-	-	-	-	-	-	-
	Mali	2011	-	33000 000	-	-	2 737 186[4]	2 858 296	0	4 737 692	319 404	92 000	0	319 404
		2012	-	26500 000	-	-	1 259 872	0	-	5 298 930	-	52 584	-	-
		2013	13850 000	25010 000	0	0	1 871 915	18 180 392	0	25 500 000	0	92 000	3 092 000	0
	Mauritania	2011	-	-	-	-	11 000 000	0	0	0	0	-	-	0
		2012	-	-	-	-	170 000	0	0	0	0	-	-	0
		2013	0	0	0	0	1 130 593	-	-	-	-	11 767	42 583	-
	Mayotte, France	2011	-	-	-	-	-	-	-	-	-	-	-	-
		2012	-	-	-	-	-	-	-	-	-	-	-	-
		2013	-	-	-	-	-	-	-	-	-	-	-	-
	Mozambique	2011	7683 006	33000 000	-	2526 054	2 006 991	-	-	-	-	-	-	-
		2012	29700 000	29800 000	-	-	65 800 000	-	-	-	-	-	-	-
		2013	12830 000	29020 000	1880 000	0	65 800 000	2 497 243	-	29 000 000	-	100 000	2 668 555	-
	Namibia	2011	1298 393	-	-	-	4 466 719	589 694	0	0	0	0	0	0
		2012	1243 974	-	-	-	4 500 000	926 804	0	0	0	0	0	0
		2013	3610 000	0	0	0	14 811 934	882 630	0	-	0	100 000	-	0
	Niger	2011	3300 846	-	-	-	500 000[4]	529 956	0	0	0	4 500	586 204	0
		2012	441 165	-	-	-	2 115 926[4]	225 901	60 000	38 000	0	16 000	816 535	0
		2013	8560 000	0	0	0	7 849 962	19 000 000	0	0	-	27 000	4 000 000	-
	Nigeria	2011	29900 000	51100 000	-	15400 000	2 493 181	73 332 766	-	43 000	-	-	-	-
		2012	123000 000	55900 000	-	-	1 740 000	83 083 666	5 492 349	43 600 000	18 908 794	-	35 000	18 908 794
		2013	47430 000	73270 000	25330 000	12750 000	5 541 401	48 592 984	7 040 569	73 271 000	101 837	-	1 000 000	-
	Rwanda	2011	17000 000	18700 000	-	-	-	-	-	-	-	-	-	-
		2012	26000 000	18100 000	-	-	-	-	-	-	-	-	-	-
		2013	23220 000	18000 000	0	0	-	-	-	-	-	-	-	-
	Sao Tome and Principe	2011	1571 589	-	-	-	52 941	1 521 822	0	0	0	54 428	3 000	0
		2012	-	-	-	-	128 502	926 494	459 294	0	2 000	47 962	3 000	1 022 740
		2013	3700 000	0	0	0	107 238	1 002 778	0	0	1 050 830	32 512	0	2 000
	Senegal	2011	1118 536	24500 000	-	-	118 000	9 620 506	-	21 758 440	-	372 518	617 113	-
		2012	20700 000	23800 000	-	-	-	21 567 732	-	-	-	30 117	443 356	-
		2013	3690 000	24120 000	60 000	0	213 986[4]	4 675 836	-	24 500 000	-	12 490	200 000	-
	Sierra Leone	2011	13800 000	-	-	-	404 235[4]	-	-	-	10 478	43 261	286 406	10 478
		2012	2991 631	-	-	-	1 231 395[4]	11 763 088	-	-	-	430 000	2 812	-
		2013	6210 000	0	0	0	26 898	13 216 219	1 952 807	-	112 855	64 000	7 874 921	112 855

Annex 3 – Funding for malaria control, 2011–2013 (continued)

WHO Region	Country/Area	Year	Contributions reported by donors				Contributions reported by countries							
			Global Fund[1]	PMI/ USAID[2]	The World Bank[3]	DFID[4]	Government	Global Fund	The World Bank	PMI/ USAID	Other bilaterals	WHO	UNICEF	Other contributions[5]
African	South Africa	2011	-	-	-	-	13 162 365	-	-	-	8 571 428	-	-	8 571 428
		2012	-	-	-	-	24 291 216	-	-	-	254 869	-	-	254 869
		2013	0	0	0	0	125 660 300	-	-	-	-	-	-	-
	South Sudan[7]	2011	21800 000	69 200	-	-	530 000[4]	15 361 962	-	3 000 000	6 664 162 036	750 000	-	1 300 000
		2012	27000 000	-	-	-	-	38 496 269	-	9 600 000	192 057 566	2 934 000	842 791	1 300 000
		2013	9190 000	0	0	0	0[4]	46 437 577	-	6 900 000	0	2 934 000	1 000 000	4 108 159
	Swaziland	2011	-	-	-	-	1 002 947	1 924 448	0	0	0	0	0	0
		2012	1116 084	-	-	-	685 739	1 376 584	-	-	-	-	-	-
		2013	1350 000	0	0	0	556 245	640 867	0	0	132 445	20 250	0	0
	Togo	2011	21000 000	-	-	-	223 897	-	0	0	14 090	23 832	8 674	14 090
		2012	239 270	-	-	-	225 535	884 398	0	0	0	88 490	0	8 747
		2013	920 000	0	0	0	-	-	-	-	-	-	-	-
	Uganda	2011	9465 369	35300 000	-	914 725	-	56 141 986	-	34 366 813	40 000	317 816	2 545 396	40 000
		2012	83100 000	34600 000	-	-	-	83 701 649	-	33 000 000	-	-	-	-
		2013	19510 000	33000 000	0	27080 000	-	20 146 401	-	33 781 000	-	-	-	-
	United Republic of Tanzania[6]	2011	-	49900 000	-	59 400	260 823	18 509 587	0	79 898	43 953	122 388	4 898	52 388
		2012	-	48000 000	-	-	554 417	18 031 872	2 281 500	4 288 680	138 140	490 000	138 140	138 140
		2013	56410 000	46060 000	0	8160 000	952 652	142 485 233	0	40 602 700	0	0	41 153	2 528 703
	Mainland	2011	42500 000	-	-	-	260 823	17 701 499	0	75 000	0	70 000	0	0
		2012	15200 000	-	-	-	553 167	18 031 872	0	165 480	0	360 000	0	0
		2013	-	-	-	-	937 500	140 356 602	0	37 117 700	0	0	0	2 487 550
	Zanzibar	2011	1363 902	-	-	-	0	808 088	0	4 898	43 953	52 388	4 898	52 388
		2012	-	-	-	-	1 250	0	2 281 500	4 123 200	138 140	130 000	138 140	138 140
		2013	-	-	-	-	15 152	2 128 631	0	3 485 000	-	-	41 153	41 153
	Zambia	2011	-	-	-	-	279 788	5 282 152	29 401 235	24 000 000	7 215 019	130 000	75 000	7 215 019
		2012	-	-	-	-	402 975	12 105 399	3 612 027	24 000 000	1 850 000	130 000	50 000	7 161 185
		2013	31110 000	24030 000	10450 000	4830 000	185 325	19 361 732	0	24 000 000	3 500 000	204 466	27 318	0
	Zimbabwe	2011	-	-	-	-	1 200 000	10 063 628	-	12 000 000	0	0	18 250	0
		2012	-	-	-	-	906 000	19 069 239	-	12 000 000	2 000	0	42 000	2 000
		2013	60 000	15030 000	0	0	706 200	7 460 006	-	13 000 000	-	90 060	-	-
Region of the Americas	Argentina	2011	-	-	-	-	1 082 700[4]	0	-	-	-	-	-	-
		2012	-	-	-	-	1 082 700[4]	0	-	-	-	-	-	-
		2013	0	0	0	0	1 082 700[4]	0	-	-	-	0	-	-
	Belize	2011	-	-	-	-	215 224[4]	0	0	-	0	0	0	0
		2012	-	-	-	-	250 000[4]	0	0	29 500	0	0	0	0
		2013	0	0	0	0	261 500[4]	0	-	14 223	-	0	-	-
	Bolivia (Plurinational State of)	2011	1525 890	-	-	-	1 110 000[4]	1 400 635	0	177 000	0	0	0	0
		2012	3423 745	-	-	-	1 110 097[4]	1 909 295	0	72 000	0	0	0	0
		2013	2110 000	0	0	0	1 110 097[4]	365 193	0	0	-	0	0	-
	Brazil	2011	7641 225	-	-	-	78 565 078[4]	17 851 837	0	151 079	0	0	0	0
		2012	-	-	-	-	61 378 194[4]	0	0	56 126	0	0	0	0
		2013	280 000	0	0	0	73 291 509[4]	0	0	18 700	-	0	0	-
	Colombia	2011	4615 661	-	-	-	20 157 754[4]	5 347 470	0	176 651	0	52 000	0	0
		2012	3133 235	-	-	-	22 898 987[4]	5 959 287	0	121 177	0	45 000	0	0
		2013	6760 000	0	0	0	23 100 498[4]	4 832 745	0	142 406	-	0	0	-
	Costa Rica	2011	-	-	-	-	5 270 000[4]	0	0	0	0	0	0	0
		2012	-	-	-	-	5 350 000[4]	0	-	0	0	0	0	0
		2013	0	0	0	0	4 830 000[4]	-	-	-	-	-	-	-
	Dominican Republic	2011	1423 587	-	-	-	2 153 141[4]	1 823 682	0	46 155	0	0	0	0
		2012	1475 716	-	-	-	2 068 141[4]	2 323 120	0	0	0	0	0	20 776
		2013	1430 000	0	0	0	1 966 812[4]	1 158 508	0	0	-	21 930	0	-
	Ecuador	2011	1939 571	-	-	-	3 314 143[4]	327 863	0	71 590	0	0	0	0
		2012	1690 157	-	-	-	2 003 620[4]	150 820	-	3 595	0	0	0	0
		2013	1110 000	0	0	0	1 852 740[4]	735 047	-	19 719	-	50 000	-	-

WHO Region	Country/Area	Year	Contributions reported by donors				Contributions reported by countries							
			Global Fund[1]	PMI/ USAID[2]	The World Bank[3]	DFID[4]	Government	Global Fund	The World Bank	PMI/ USAID	Other bilaterals	WHO	UNICEF	Other contributions[5]
Region of the Americas	El Salvador	2011	-	-	-	-	3 513 000[4]	0	0	0	0	-	0	0
		2012	-	-	-	-	3 688 650[4]	0	-	0	0	-	0	0
		2013	0	0	0	0	2 854 844[4]	0	-	-	-	56 948	-	-
	French Guiana, France	2011	-	-	-	-	-	0	0	0	-	-	-	-
		2012	-	-	-	-	-	0	0	0	-	-	-	-
		2013	-	-	-	-	-	0	0	0	-	-	-	-
	Guatemala	2011	8917 396	-	-	-	10 600 000[4]	3 596 431	0	25 000	0	0	0	0
		2012	2821 516	-	-	-	5 637 645[4]	2 780 074	0	10 561	0	5 260	0	0
		2013	2090 000	0	0	0	1 385 919[4]	3 498 024	0	105 373	-	0	0	-
	Guyana	2011	612 352	-	-	-	1 107 340[4]	-	0	120 000	0	14 000	0	4 000
		2012	425 717	-	-	-	1 075 952[4]	799 527	0	150 000	0	20 000	0	0
		2013	380 000	0	0	0	904 858[4]	809 474	0	297 569	-	15 899	0	-
	Haiti	2011	18400 000	-	-	-	-	1 160 658	-	-	-	25 000	-	-
		2012	4516 089	-	-	-	-	1 327 642	-	64 222	-	205 000	-	-
		2013	960 000	0	0	0	2 433 241	1 248 119	-	-	-	169 000	-	-
	Honduras	2011	572 711	-	-	-	990 876[4]	842 438	0	80 278	0	11 856	0	0
		2012	1288 990	-	-	-	592 631[4]	970 940	0	58 936	0	14 546	0	0
		2013	950 000	0	0	0	971 742[4]	1 106 404	0	99 330	-	0	0	-
	Mexico	2011	-	-	-	-	23 741 789[4]	0	0	0	0	0	0	0
		2012	-	-	-	-	24 285 354[4]	0	-	0	0	0	0	0
		2013	0	0	0	0	25 256 768[4]	0	-	-	-	0	-	-
	Nicaragua	2011	2331 302	-	-	-	320 053[4]	2 032 089	0	43 163	0	5 433	0	0
		2012	803 339	-	-	-	439 258[4]	1 747 908	0	43 163	0	6 001	0	0
		2013	2430 000	0	0	0	980 326[4]	2 075 252	0	37 630	-	0	0	-
	Panama	2011	-	-	-	-	3 798 322[4]	0	0	110 000	0	0	0	0
		2012	-	-	-	-	7 919 505[4]	0	0	23 951	0	15 209	0	0
		2013	0	0	0	0	7 220 410[4]	0	0	32 136	-	-	0	-
	Paraguay	2011	-	-	-	-	1 813 409[4]	0	-	0	0	0	0	0
		2012	-	-	-	-	2 115 436[4]	0	-	0	0	5 635	0	0
		2013	0	0	0	0	5 145 662[4]	0	-	-	-	0	-	-
	Peru	2011	-	-	-	-	76 268 653[4]	0	0	0	0	-	0	0
		2012	-	-	-	-	125 155 514[4]	0	0	77 438	0	-	0	0
		2013	0	0	0	0	429 285[4]	0	0	56 703	-	0	0	-
	Suriname	2011	710 949	-	-	-	-	500 000	0	119 989	0	-	0	-
		2012	355 313	-	-	-	-	355 000	0	19 625	0	-	0	-
		2013	550 000	0	0	0	1 500 000[4]	550 000	-	140 000	-	100 000	0	-
	Venezuela (Bolivarian Republic of)	2011	-	-	-	-	1 938 592[4]	0	0	0	-	-	-	-
		2012	-	-	-	-	790 292[4]	0	0	0	-	-	-	-
		2013	0	0	0	0	800 000[4]	0	0	0	-	-	-	-
Eastern Mediterranean	Afghanistan	2011	1161 128	-	-	-	-	7 535 557	-	802 371	65 236	30 000	-	65 236
		2012	11800 000	-	-	-	-	10 613 985	-	-	-	116 291	-	-
		2013	18170 000	0	1730 000	0	0[4]	16 651 753	-	-	-	109 068	-	-
	Djibouti	2011	112 748	-	-	-	84 745[4]	206 939	420 117	-	-	-	-	-
		2012	44 923	-	-	-	1 050 000[4]	48 527	8 413	-	-	55 782	142 000	-
		2013	0	0	0	0	0[4]	0	0	0	0	121 616	200 563	9 200
	Iran (Islamic Republic of)	2011	2350 551	-	-	-	12 500 000	1 474 935	-	-	-	12 500	-	-
		2012	8256 054	-	-	-	8 000 000	5 238 195	-	-	-	12 500	-	-
		2013	3180 000	0	0	0	5 000 000	0	-	-	-	56 000	-	-
	Pakistan	2011	1185 971	-	-	-	-	1 185 971	-	-	-	-	-	-
		2012	19000 000	-	-	-	-	15 231 843	-	-	-	-	-	-
		2013	5910 000	0	0	0	-	8 057 177	0	0	0	93 467	0	-
	Saudi Arabia	2011	-	-	-	-	26 357 709	0	-	-	-	99 000	-	-
		2012	-	-	-	-	29 000 000	-	-	-	0	99 000	-	0
		2013	0	0	0	0	29 000 000	-	-	-	-	99 000	-	0
	Somalia	2011	2594 870	-	-	-	46 321	5 685 340	-	-	3 642 882	86 000	-	3 642 882
		2012	22100 000	-	-	-	63 250	11 904 217	-	-	200 000	103 400	-	200 000
		2013	2420 000	0	0	0	64 515	15 062 018	0	0	0	138 400	-	-

Annex 3 – Funding for malaria control, 2011–2013 (continued)

WHO Region	Country/Area	Year	Contributions reported by donors				Contributions reported by countries							
			Global Fund[1]	PMI/ USAID[2]	The World Bank[3]	DFID[4]	Government	Global Fund	The World Bank	PMI/ USAID	Other bilaterals	WHO	UNICEF	Other contributions[5]
Eastern Mediterranean	Sudan	2011	14900 000	-	-	-	26 724 830	19 418 808	0	0	363 495	114 575	553 635	1 041 351
		2012	51800 000	-	-	-	26 709 969	38 398 132	0	0	1 680 907	641 921	494 000	0
		2013	12930 000	0	0	0	24 704 352	34 938 594	0	0	0	475 893	140 000	0
	Yemen	2011	-	-	-	-	1 012 076	880 150	-	-	9 084 589	240 000	-	80 000
		2012	-	-	-	-	1 136 852	8 908 540	-	-	5 807 093	-	-	5 807 093
		2013	5970 000	0	0	0	1 611 627	6 256 730	-	-	-	200 000	-	1 986 444
European	Azerbaijan	2011	280 163	-	-	-	3 738 835	610 905	-	-	0	35 000	-	0
		2012	548 346	-	-	-	5 000 968	462 920	-	-	0	35 000	-	0
		2013	550 000	0	0	0	4 827 461	432 570	-	-	-	35 000	-	0
	Kyrgyzstan	2011	1016 966	-	-	-	70 000	1 114 124	-	-	0	0	-	0
		2012	496 411	-	-	-	70 000	850 061	-	-	0	0	-	0
		2013	580 000	0	0	0	65 000	434 351	-	-	-	25 000	-	0
	Tajikistan	2011	3305 782	-	-	-	412 825[4]	3 403 673	-	-	0	15 000	-	0
		2012	2114 927	-	-	-	416 753[4]	2 068 376	-	-	0	20 000	-	0
		2013	1310 000	0	0	0	633 740	1 714 393	-	-	-	35 000	-	-
	Turkey	2011	-	-	-	-	21 821 901	0	-	-	0	0	-	0
		2012	-	-	-	-	22 927 000	0	-	-	0	0	-	0
		2013	0	0	0	0	-	0	-	-	-	0	-	0
	Uzbekistan	2011	-	-	-	-	1 529 810	583 446	-	-	0	0	-	0
		2012	-	-	-	-	1 208 161	448 627	-	-	0	0	-	0
		2013	540 000	0	0	0	1 480 992	288 060	-	-	-	0	-	0
South-East Asia	Bangladesh	2011	8873 006	-	-	-	8 686 483[4]	8 890 744	-	-	-	118 000	-	-
		2012	3304 342	-	-	-	4 761 717	7 505 444	439 490	-	-	98 000	-	-
		2013	15770 000	0	0	0	4 134 615	8 033 087	-	-	-	399 189	-	-
	Bhutan	2011	260 267	-	-	-	222 222	-	-	-	22 600	22 600	-	22 600
		2012	440 259	-	-	-	213 595	292 324	-	-	146 759	27 898	-	146 759
		2013	480 000	0	0	0	-	-	-	-	-	-	-	-
	Democratic People's Republic of Korea	2011	4756 310	-	-	-	1 875 000	2 500 899	-	-	-	23 000	-	-
		2012	3163 494	-	-	-	1 882 000	6 568 434	-	-	-	5 000	-	-
		2013	2710 000	0	0	0	1 895 000	2 706 329	-	-	-	25 000	-	-
	India	2011	3260 689	-	-	-	99 525 920	6 496 121	30 898 403	-	-	-	-	-
		2012	11500 000	-	-	-	47 240 020	7 863 868	16 696 978	-	-	-	-	-
		2013	3650 000	0	15800 000	0	51 336 600	4 811 540	4 299 233	-	-	-	-	-
	Indonesia	2011	18800 000	-	-	-	-	40 573 846	0	0	0	222 222	3 111 111	0
		2012	18800 000	-	-	-	-	11 072 851	0	0	0	51 141	471 362	0
		2013	1640 000	0	0	0	-	34 580 791	0	0	0	400 000	3 525 000	0
	Myanmar	2011	-	-	-	1814 419	1 259 002	5 900 000	-	-	-	-	-	-
		2012	19800 000	-	-	-	1 000 000	10 513 382	-	5 500 000	1 757 475	142 500	948 890	870 441
		2013	15030 000	0	0	2340 000	1 028 807	14 863 117	-	5 400 000	-	142 500	1 000 000	-
	Nepal	2011	-	-	-	-	192 361	1 907 500	0	0	0	46 500	0	3 559 305
		2012	6182 591	-	-	-	726 465	2 960 440	-	-	-	46 500	-	-
		2013	4920 000	0	0	0	1 910 485	3 110 685	-	-	-	46 500	-	-
	Sri Lanka	2011	4384 546	-	-	-	1 800 000	5 316 488	-	-	-	18 000	-	-
		2012	2618 112	-	-	-	572 945	1 442 758	-	-	-	7 400	-	-
		2013	3880 000	0	0	0	601 528	1 382 732	-	-	-	10 000	-	-
	Thailand	2011	13800 000	-	-	-	15 252 969	3 002 074	-	77 541	566 115	61 408	-	566 115
		2012	7152 655	-	-	-	7 098 780	16 246 556	-	-	79 772	104 979	-	79 772
		2013	11330 000	0	0	0	5 893 255	9 937 671	-	278 311	-	139 166	-	70 833
	Timor-Leste	2011	774 076	-	-	-	2 278 680	3 902 662	0	0	0	41 920	0	0
		2012	5040 394	-	-	-	2 687 572	5 375 143	0	0	80 000	25 000	0	0
		2013	2670 000	0	0	0	2 981 432	4 372 545	-	-	-	65 012	-	120 000
Western Pacific	Cambodia	2011	15300 000	-	-	-	3 127 120	39 422 203	0	0	0	380 347	0	60 000
		2012	1441 288	-	-	-	3 427 795	22 685 407	0	456 796	640 741	201 718	0	0
		2013	15310 000	0	0	0	3 484 029	13 240 888	0	3 996 624	0	431 792	0	-

WHO Region	Country/Area	Year	Contributions reported by donors				Contributions reported by countries							
			Global Fund[1]	PMI/ USAID[2]	The World Bank[3]	DFID[4]	Government	Global Fund	The World Bank	PMI/ USAID	Other bilaterals	WHO	UNICEF	Other contributions[5]
Western Pacific	China	2011	4782 175	-	-	-	-	24 430 525	-	-	-	-	-	-
		2012	12800 000	-	-	-	-	33 697 258	-	-	-	-	-	-
		2013	3560 000	0	0	0	16 812 725	0	0	0	0	0	0	0
	Lao People's Democratic Republic	2011	7010 161	-	-	-	470 764	4 326 267	0	0	0	46 000	0	0
		2012	6394 182	-	-	-	1 361 672	3 745 346	0	271 773	620 000	20 000	0	2 500
		2013	3440 000	0	410 000	0	1 122 915	4 038 937	0	120 132	0	20 000	0	0
	Malaysia	2011	-	-	-	-	37 844 710	0	-	-	0	0	-	0
		2012	-	-	-	-	44 424 578	-	-	-	-	-	-	-
		2013	0	0	0	0	39 845 997	-	-	-	-	0	-	0
	Papua New Guinea	2011	10600 000	-	-	-	190 200	23 842 245	0	0	0	200 000	0	8 968 127
		2012	22900 000	-	-	-	584 290[4]	-	-	-	-	-	-	-
		2013	22970 000	0	0	0	388 000	25 311 547	0	0	-	-	0	-
	Philippines	2011	1665 107	-	-	-	3 969 519[4]	12 322 318	0	0	75 000	-	0	2 501 000
		2012	4271 657	-	-	-	3 939 519[4]	7 224 199	0	0	0	-	0	0
		2013	4810 000	0	0	0	5 235 686	8 612 874	0	0	0	315 326	0	22 220
	Republic of Korea	2011	-	-	-	-	712 000	0	-	-	0	0	-	0
		2012	-	-	-	-	681 674	0	-	-	0	0	-	0
		2013	0	0	0	0	519 102	0	-	-	-	0	-	0
	Solomon Islands	2011	-	-	-	-	840 284	1 537 685	0	0	0	697 890	0	6 229 231
		2012	-	-	-	-	269 486	1 696 290	0	0	0	706 000	0	5 432 362
		2013	0	0	0	0	270 180	1 305 840	0	0	1 987 523	852 472	0	674 896
	Vanuatu	2011	-	-	-	-	943 619	2 052 359	0	0	0	287 615	0	2 050 753
		2012	-	-	-	-	812 377[4]	2 446 418	0	0	0	287 615	0	1 178 215
		2013	0	0	0	0	812 377[4]	1 162 890	0	0	1 692 091	287 615	0	0
	Viet Nam	2011	-	-	-	-	5 229 083	5 648 842	0	0	0	108 500	0	0
		2012	-	-	-	-	4 615 385	3 961 323	0	0	0	156 804	0	0
		2013	-	-	-	-	4 523 810	5 254 143	0	0	0	410 000	0	-

1 Source: The Global Fund website (malaria specifi c grants)
2 Source: USAID internal database, The President's Malaria Initiative, Sixth Annual Report to Congress, April 2012; Seventh Annual Report to Congress, April 2013
3 Source: OECD Database
4 Budget not expenditure
5 Other contributions as reported by countries: NGOs, foundations, etc.
6 Where national totals for the United Republic of Tanzania are unavailable, refer to the sum of Mainland and Zanzibar.
7 South Sudan became a separate State on 10 July 2011 and a Member State of WHO on 27 September 2011. South Sudan and Sudan have distinct epidemiological profi les comprising high-transmission and low-transmission areas respectively. For this reason data up to June 2011 from the high-transmission areas of Sudan (10 southern states which correspond to South Sudan) and low-transmission areas (15 northern states which correspond to contemporary Sudan) are reported separately
* Negative disbursements refl ect recovery of funds on behalf of the fi nancing organization DFID, Department for International Development; PMI, President's Malaria Initiative; UNICEF, United Nations Children's Fund; USAID, United States Agency for International Development

Annex 4 – Intervention coverage estimated from routinely collected data, 2011–2013

WHO region	Country/area	Year	No. of ITN + LLIN sold or delivered	No. of LLIN sold or delivered	No. of ITN sold or delivered	% of population potentially protected by ITNs delivered	Modelled % of population with access to an ITN	No. of people protected by IRS	% IRS coverage	Any 1st-line treatment courses delivered (including ACT)	ACT treatment courses delivered	% Antimalarials distributed vs reported cases	% ACTs distributed vs reported *P. f.* cases[2]
African	Algeria	2011	0	0	0		-	0	0	191	0	65	0
		2012	0	0	0		-	13000	0	887	0	65	0
		2013	0	0	0		-	17407	1	603	0	13	0
	Angola	2011	1720738	1720738	0	39	21	689638	3	3898070	3898070	100	100
		2012	477044	477044	0	34	26	676090	3	3747190	3747190	99	99
		2013	1182519	1182519	0	28	28	419353	2	2814900	2814900	74	74
	Benin	2011	5135942	5135942	0	100	67	426232	4	1911338	1911338	64	64
		2012	708643	708643	0	100	44	694729	7			-	-
		2013	584285	584285	0	100	20	694729	7			-	-
	Botswana	2011	12000	12000	0	18	-	207991	16	10149	10149	100	100
		2012	52500	52500	0	21	-	163647	13	4606	4606	100	100
		2013	0	0	0	9	-	176887	13	3953	3953	100	100
	Burkina Faso	2011	774344	774344	0	99	74	116708	1	5918783	5703335	100	100
		2012	264432	264432	0	87	60	115638	1	5720987	5720987	100	100
		2013	9959820	9959820	0	100	67	0	0	5797938	5797938	100	100
	Burundi	2011	2869433	2869433	0	100	59	224496	3	2343078	1791325	100	100
		2012	703699	703699	0	100	63	59300	1	2183228	2183228	100	100
		2013	731981	731981	0	98	58	0	0	3836437	3836437	100	100
	Cabo Verde	2011	0	0	0		-	282265	100			-	-
		2012	0	0	0		-	282265	100	6960	3960	100	100
		2013	0	0	0		-	298475	100	4824	3144	100	100
	Cameroon	2011	8115879	8115879	0	71	22	0	0	1234405	1234405	29	29
		2012	217600	217600	0	71	62	0	0	762338	760375	21	21
		2013		0	0	67	49	0	0	1048811	497022	29	14
	Central African Republic	2011	0	0	0	38	45					-	-
		2012	30000	30000	0	39	32	0	0			-	-
		2013	150000	150000	0	7	38	0	0		420000	-	27
	Chad	2011	3495086	3495086	0	58	36			122879	122879	4	4
		2012		0	0	56	54					-	-
		2013	1234177	1234177	0	67	56			814449	814449	25	25
	Comoros	2011	9896	9896	0	69	71	31922	5	117620	117620	74	74
		2012	666	666	0	68	48					-	-
		2013	377252	377252	0	95	54	31150	4	60868	60868	38	38
	Congo	2011	507763	507763	0	22	21	0	0	113705	113705	8	8
		2012	1203982	1203982	0	71	56	0	0	202402	202402	14	14
		2013	14005	14005	0	70	81	0	0		0	-	0
	Côte d'Ivoire	2011	8135784	8135784	0	86	48			2349795	2349795	56	56
		2012		0	0	75	36					-	-
		2013	1821267	1821267	0	88	15			2358567	2358567	57	57
	Democratic Republic of the Congo	2011	12033092	12033092	0	62	31	111972	0	15240702	15240702	89	89
		2012	18644449	18644449	0	90	48	103497	0	11693982	11693982	68	68
		2013	7947747	7947747	0	100	50	36126	0	14941450	7112841	87	42
	Equatorial Guinea	2011	2798	2798	0	1	39			27319	27319	13	13
		2012	4431	4431	0	2	28	148092	20	40199	40199	22	22
		2013	8397	8397	0	4	19	129000	17	40911	40911	22	22
	Eritrea	2011	992779	992779	0	45	45	274143	5	197403	197403	100	100
		2012	83943	83943	0	35	48	298734	5	219793	219793	100	100
		2013	86597	86597	0	33	38	275857	4	182911	182911	100	100
	Ethiopia	2011	4279165	4279165	0	60	52	20865542	35	5058582	5058582	100	100
		2012	6260000	6260000	0	71	49	5721331	9	9000000	9000000	100	100
		2013	11709780	11709780	0	64	52	23150388	37	12800000	9164641	100	100
	Gabon	2011		0	0		34				850000	-	100
		2012		0	0		29					-	-
		2013	21666	0	21666	2	24	0	0			-	-

WHO region	Country/area	Year	No. of ITN + LLIN sold or delivered	No. of LLIN sold or delivered	No. of ITN sold or delivered	% of population potentially protected by ITNs delivered	Modelled % of population with access to an ITN	No. of people protected by IRS	% IRS coverage	Any 1st-line treatment courses delivered (including ACT)	ACT treatment courses delivered	% Antimalarials distributed vs reported cases	% ACTs distributed vs reported *P. f.* cases[4]
African		2011	734063	734063	0	93	60	747485	43	549830	549830	100	100
	Gambia	2012	275042	275042	0	100	81	484086	27	484901	484901	93	93
		2013	138149	138149	0	100	80	800290	43	468767	468767	90	90
		2011	4151906	4151906	0	39	35	926699	4	14493253	14493253	100	100
	Ghana	2012	7874094	7874094	0	93	60	2117240	8	4170828	4170828	60	60
		2013	1926300	1926300	0	97	78	2936037	11	8330784	8330784	100	100
		2011	48942	48942	0	2	41			924025	924025	21	21
	Guinea	2012	90188	90188	0	3	28			902516	802110	21	18
		2013	5268245	5268245	0	83	42			370771	1402400	8	32
		2011	170442	170442	0	26	38					-	-
	Guinea-Bissau	2012	73819	73819	0	34	60					-	-
		2013	116268	116268	0	38	71					-	-
		2011	9058461	9058461	0	73	60	1832090	6			-	-
	Kenya	2012	4226261	4226261	0	79	80	2435836	7	12000000	12000000	100	100
		2013	1641982	1641982	0	80	76	0	0	8300000	7000000	100	100
		2011	830000	830000	0	100	38	834671	20	6059525	4581525	100	100
	Liberia	2012		0	0	74	43	960000	23	6507544	5064014	100	100
		2013	0	0	0	35	38	367930	9	1332055	443900	100	38
		2011	510275	510275	0	62	63	10012822	46	256452	256452	30	30
	Madagascar	2012	3939740	3939740	0	76	53	1597374	7	2026100	2026100	100	100
		2013	6947498	6947498	0	89	62	1579521	7	266000	266000	20	20
		2011	1037395	1037395	0	41	38	321919	2	7199047	7202530	100	100
	Malawi	2012	6742108	6742108	0	100	49	1873056	12	6956821	6956821	100	100
		2013	636318	636318	0	93	76					-	-
		2011	4173156	4173156	0	65	58	697512	5	1719974	1719974	49	49
	Mali	2012	1935348	1935348	0	86	63	758021	5	3842790	3842790	100	100
		2013	636465	636465	0	79	51	826386	5	3080130	3080130	100	100
		2011	139690	139690	0	55	35			64078	64078	10	10
	Mauritania	2012	13000	13000	0	54	28					-	-
		2013	105000	105000	0	13	19			56015	56015	8	8
		2011	2543	2543	0	18	-	23559	51			100	-
	Mayotte, France	2012	40988	40988	0	100	-	4339	9			100	-
		2013	39400	39400	0	100	-	381	1			100	-
		2011	3244164	3244164	0	44	41	8532525	35	9391810	9391810	100	100
	Mozambique	2012	2669244	2669244	0	53	49	1789110	7	5106570	5106570	73	73
		2013	3315727	3315727	0	64	57	9647202	37	13477650	13477650	100	100
		2011	87900	87900	0	30	-	599939	38	110031	110031	100	100
	Namibia	2012	93900	93900	0	30	-	559305	34	22313	22313	100	100
		2013	104249	104249	0	31	-	598901	36	90377	87520	91	88
		2011	516550	516550	0	14	41	186603	1	3199290	3199290	73	73
	Niger	2012	541550	541550	0	19	35	192761	1	3500243	3500243	74	74
		2013	409400	409400	0	15	28			6556070	6556070	100	100
		2011	18141631	18141631	0	62	32	177235	0	7648896	7648896	16	16
	Nigeria	2012	14448634	14448634	0	55	36	2415540	1	12877360	12877360	27	27
		2013	6215476	6215476	0	40	38	0	0	32568349	32568349	67	67
		2011	816915	816915	0	90	64	1571625	14	288508	284788	48	48
	Rwanda	2012	1675233	1675233	0	100	53	1080889	9	619786	611482	95	93
		2013	5249761	5249761	0	100	57					-	-
		2011	4985	4985	0	85	-	115610	63	11546	11546	100	100
	Sao Tome and Principe	2012	105312	105312	0	100	-	146773	78	10703	10703	85	85
		2013	14596	14596	0	100	-	153514	80	8752	8752	55	0
		2011	2465770	2465770	0	72	38	887315	7	675707	675707	19	19
	Senegal	2012	267482	267482	0	44	47	1095093	8	713344	713344	19	19
		2013	3902145	3902145	0	85	53	690090	5	976840	976840	25	25
		2011	45833	45833	0	100	65	851000	15	1873610	1873610	100	100
	Sierra Leone	2012	139391	139391	0	100	27	986898	17	2004308	2004308	100	100
		2013	441859	441859	0	19	35	0	0	2201370	2201370	100	100

Annex 4 – Intervention coverage estimated from routinely collected data, 2011–2013 (continued)

WHO region	Country/area	Year	No. of ITN + LLIN sold or delivered	No. of LLIN sold or delivered	No. of ITN sold or delivered	% of population potentially protected by ITNs delivered	Modelled % of population with access to an ITN	No. of people protected by IRS	% IRS coverage	Any 1st-line treatment courses delivered (including ACT)	ACT treatment courses delivered	% Antimalarials distributed vs reported cases	% ACTs distributed vs reported *P. f.* cases[2]
African	South Africa	2011		0	0		-	5000000	96	7620	7620	77	0
		2012		0	0		-	5000000	95	3897	3897	57	0
		2013		0	0		-	2318129	44	8272	5444	81	54
	South Sudan[3]	2011	386563	386563	0	100	73					-	-
		2012	1036109	1036109	0	60	61	170440	2	4333150	4333150	100	100
		2013	3144818	3144818	0	73	71	332968	3	3125448	3125448	87	93
	Swaziland	2011	47857	47857	0	63	-			1750	1750	100	100
		2012	40612	40612	0	83	-			350	350	47	47
		2013	0	0	0	46	-			1352	1352	100	100
	Togo	2011	2547606	2547606	0	78	53	0	0	659800		39	-
		2012	329999	329999	0	85	74	0	0	812911	914218	52	58
		2013	468575	468575	0	88	61	0	0	964927	802904	62	51
	Uganda	2011	709000	709000	0	46	47	2543983	7	19579200	19579200	100	100
		2012	1000747	1000747	0	45	39	2543983	7	23864320	23864320	100	100
		2013	13219306	13219306	0	72	49	2581839	7	24375450	24375450	100	100
	United Republic of Tanzania	2011	14481950	14481950	0	-	-	7189920	-	16775381	16775381	-	-
		2012	2208293	2208293	0	-	-	6774050	-	10175160	10175160	-	-
		2013	2547391	2547391	0	-	-	3761997	-	20382485	20382485	-	-
	Mainland	2011	14452674	14452674	0	100	61	6095891	14	16727880	16727880	100	100
		2012	1535867	1535867	0	95	65	6518120	14	10128060	10128060	100	100
		2013	2489536	2489536	0	69	44	3537097	7	20377410	20377410	100	100
	Zanzibar	2011	29276	29276	0	48	-	1094029	83	47501	47501	100	100
		2012	672426	672426	0	97	-	255930	19	47100	47100	100	100
		2013	57855	57855	0	98	-	224900	16	5075	5075	100	100
	Zambia	2011	3532137	3532137	0	81	54	7542497	56	6957420	6957420	100	100
		2012	2688575	2688575	0	94	77	4250000	31	4289743	4289743	100	100
		2013	3362588	3362588	0	100	80	1063460	7	15926301	15926301	100	100
	Zimbabwe	2011	0	0	0	52	58	3299058	52	2079657	2079657	100	100
		2012	457000	457000	0	46	39	3106659	48	1236958	1236958	100	100
		2013	2010000	2010000	0	67	60	3106659	47	815260	815260	100	100
Region of the Americas	Argentina	2011		0	0		-	23068	11	100		100	100
		2012		0	0		-	26712	13	50		100	100
		2013		0	0		-	24636	12	50		100	100
	Belize	2011	0	0	0	2	-	31363	14	79	1	100	100
		2012	3000	3000	0	2	-	20052	9	37	1	100	100
		2013	2324	2324	0	4	-	21413	9	26	0	100	100
	Bolivia (Plurinational State of)	2011	42800	42800	0	4	-	45214	1	7200	923	100	100
		2012	24526	24526	0	5	-	28000	1	7400	350	100	100
		2013	20965	20965	0	4	-	30280	1	7342	959	100	100
	Brazil	2011	13739	13739	0	1	-	714128	2	445531	114081	100	100
		2012	361241	361241	0	2	-	369103	1	905010	141410	100	100
		2013	147736	147736	0	2	-	324477	1	452990	122290	100	100
	Colombia	2011	274682	262732	11950	7	-	1032000	10	92518	27698	100	100
		2012	313398	313398	0	11	-	359100	3	171342	50398	100	100
		2013	146196	146196	0	12	-	154000	1	68879	48285	100	100
	Costa Rica	2011	4000	4000	0	1	-	48000	3	170	0	100	100
		2012	3000	3000	0	1	-	22000	1	50	0	100	100
		2013	7000	7000	0	1	-	13560	1	20	0	100	100
	Dominican Republic	2011	70437	70437	0	3	-	78236	1	1608	8	100	-
		2012	62095	62095	0	4	-	61557	1	947	5	100	-
		2013	54139	54139	0	4	-	49510	1	579	4	100	-
	Ecuador	2011	30022	30022	0	4	-	105234	1	13979	8999	100	100
		2012	13502	13502	0	2	-	83357	1	4720	548	100	100
		2013	20337	20337	0	1	-	94321	1	378	161	100	98

WHO region	Country/area	Year	No. of ITN + LLIN sold or delivered	No. of LLIN sold or delivered	No. of ITN sold or delivered	% of population potentially protected by ITNs delivered	Modelled % of population with access to an ITN	No. of people protected by IRS	% IRS coverage	Any 1st-line treatment courses delivered (including ACT)	ACT treatment courses delivered	% Antimalarials distributed vs reported cases	% ACTs distributed vs reported *P. f.* cases[4]
Region of the Americas	El Salvador	2011	0	0	0		-	26167	2	109635	0	100	-
		2012	0	0	0		-	16905	1	124753	0	100	-
		2013	10000	10000	0	1	-	15076	1	10865	0	100	-
	French Guiana, France	2011		0	0		-	18895	8			-	-
		2012	13969	13969	0	10	-	16625	7			-	-
		2013	2880	2880	0	12	-	16932	7			-	-
	Guatemala	2011	0	0	0	0	-	42555	1	6822	0	100	-
		2012	618803	618803	0	16	-	65390	1	7966	0	100	-
		2013	282788	282788	0	23	-	37450	1			-	-
	Guyana	2011	14550	14550	0	7	-	19320	3	29471	20299	100	100
		2012	16800	16800	0	10	-	20700	3	31601	20291	100	100
		2013	27921	27921	0	14	-	41000	6	31479	13655	100	100
	Haiti	2011	0	0	0		-	0	0	113958	0	100	-
		2012	2987653	2987653	0	53	-	0	0	117293	0	100	-
		2013	0	0	0	52	-			109625		100	-
	Honduras	2011	8798	8798	0	1	-	126858	2	65019	1	100	-
		2012	30630	30630	0	1	-	104495	2	45926	1	100	-
		2013	66920	66920	0	3	-	121121	2	37248	2	100	-
	Mexico	2011	0	0	0	15	-	69331	2	6747	3	-	-
		2012	52766	52766	0	17	-	42985	1	5002	2	-	-
		2013	4500	4500	0	2	-	49401	1	2974	4	100	-
	Nicaragua	2011	14300	14300	0	4	-	200448	7	206511	1	100	-
		2012	18350	18350	0	3	-	87446	3	218419	1	100	-
		2013	17100	17100	0	3	-	126403	4	49256	0	100	-
	Panama	2011	0	0	0		-	23766	1	420	0	100	-
		2012	0	0	0		-	21071	1	920	0	100	-
		2013	0	0	0		-	17055	1	705	0	100	-
	Paraguay	2011	0	0	0		-	34736	15	10	0	100	100
		2012	0	0	0		-	40126	17	15	0	100	100
		2013	0	0	0		-	19425	8	11	2	100	100
	Peru	2011		0	0		-	55595	1			-	-
		2012	9900	9900	0	0	-	51630	1			-	-
		2013	4600	4600	0	1	-	162600	3	42670	6504	99	94
	Suriname	2011	712	712	0	33	-					-	-
		2012		0	0	32	-					-	-
		2013	4892	4892	0	12	-			800	300	100	0
	Venezuela (Bolivarian Republic of)	2011	1665	1665	0	1	-	3589089	65			-	-
		2012	515	515	0	0	-	3637795	65			-	-
		2013	467	467	0	0	-	4369755	76	27659	27659	35	100
Eastern Mediterranean	Afghanistan	2011	3352326	3352326	0	38	-	0	0			-	-
		2012	37551	37551	0	34	-	0	0			-	-
		2013	359622	359622	0	29	-	0	0	11135	11135	3	61
	Djibouti	2011	100	100	0	37	26					-	-
		2012	26400	26400	0	23	29	0	0			-	-
		2013	25700	25700	0	22	26	0	0	8920	8920	41	41
	Iran (Islamic Republic of)	2011	60000	60000	0	61	-	84484	11	5976	3417	100	100
		2012	243728	243728	0	98	-	204224	26	5670	3100	100	100
		2013	169084	169084	0	100	-	281203	36	6230	3400	100	100
	Pakistan	2011		0	0	0	-					-	-
		2012	439181	439181	0	0	-	4584426	3	2280000	596600	65	91
		2013	2238300	2238300	0	3	-	1161825	1	2150000	590840	62	90
	Saudi Arabia	2011	100000	100000	0	35	-	2600000	100	2724	2724	98	98
		2012	767000	767000	0	75	-	2210000	98	1283	1283	38	38
		2013	750000	750000	0	100	-	1736400	75	974	974	39	39
	Somalia	2011	210231	210231	0	15	12	429514	4			-	-
		2012	455000	455000	0	14	12	240558	2	18868	9268	3	1
		2013	525000	525000	0	20	20	90060	1	292000	292000	42	42

Annex 4 – Intervention coverage estimated from routinely collected data, 2011–2013 (continued)

WHO region	Country/area	Year	No. of ITN + LLIN sold or delivered	No. of LLIN sold or delivered	No. of ITN sold or delivered	% of population potentially protected by ITNs delivered	Modelled % of population with access to an ITN	No. of people protected by IRS	% IRS coverage	Any 1st-line treatment courses delivered (including ACT)	ACT treatment courses delivered	% Antimalarials distributed vs reported cases	% ACTs distributed vs reported *P. f.* cases[2]
Eastern Mediterranean	Sudan	2011	882901	882901	0	27	39	2947155	8	2546884	2512852	51	53
		2012	782901	782901	0	14	34	3967730	11	2478038	2462470	49	51
		2013	5803319	5803319	0	35	40	3352581	9	2630400	2077204	69	58
	Yemen	2011	21831	21831	0	7	-	1480416	9	273180	273180	100	100
		2012	1209215	1209215	0	19	-	1886500	12	179000	166500	66	0
		2013	1350309	1350309	0	28	-	2204429	13	303847	303847	100	0
European	Azerbaijan	2011	10000	10000	0	34	-	309162	100	10	2	100	100
		2012	10000	10000	0	25	-	211500	99	4	1	100	100
		2013	0	0	0	17	-	209004	97	4	4	100	100
	Kyrgyzstan	2011	48600	48600	0	100	-	223000	100	5	0	100	100
		2012	35000	35000	0	100	-	146466	100	3	0	100	100
		2013	35000	35000	0	100	-	100633	100	4	0	100	100
	Tajikistan	2011	117041	117041	0	14	-	644136	25	78	5	100	100
		2012	100000	100000	0	17	-	503156	19	31	2	94	100
		2013	100000	100000	0	21	-	437436	16	1	1	7	100
	Turkey	2011	0	0	0		-	221225	100	205	105	100	82
		2012	0	0	0		-	50	0	600	235	100	100
		2013	0	0	0		-	2120	12	400	350	100	100
	Uzbekistan	2011	50000	50000	0	100	-	300543	100	1	0	100	100
		2012	20000	20000	0	100	-	375605	100	1	1	100	100
		2013	0	0	0	100	-	328020	100	3	3	100	100
South-East Asia	Bangladesh	2011	2890013	1391953	1498060	55	-	0	0	68540	48540	100	0
		2012	85976	20052	65924	23	-	0	0	94810	71040	100	0
		2013	717000	612000	105000	25	-	0	0	42390	42390	100	0
	Bhutan	2011	8942	8942	0	43	-	148318	27	125	125	53	100
		2012	10000	10000	0	39	-	141322	26	82	35	95	95
		2013	93726	93726	0	36	-	32824	6	518	518	100	100
	Democratic People's Republic of Korea	2011	79960	79960	0	6	-	2013084	17	18104	0	100	100
		2012	332000	332000	0	11	-	1646580	14	23537	0	100	100
		2013	0	0	0	6	-	2651611	22	80353	0	100	100
	India	2011	6580000	6580000	0	2	-	53348697	5	330000000	2920000	100	100
		2012	0	0	0	1	-	49942758	5	30523925	3147400	100	100
		2013	0	0	0	1	-	45854424	4	147000	147000	17	32
	Indonesia	2011	2829748	2829748	0	8	-	527535	0	479850	479850	16	29
		2012	845712	845712	0	7	-	110000	0	341697	341697	13	24
		2013	911443	911443	0	5	-					-	-
	Myanmar	2011	1613830	551107	1062723	12	-	1036	0	594756	569607	96	100
		2012	2964812	1042244	1922568	22	-	56414	0	546060	546060	74	0
		2013	2812517	1508557	1303960	25	-			371663	371663	63	0
	Nepal	2011	934476	934476	0	24	-	256070	2	71140	612	91	6
		2012	499166	499166	0	26	-	443229	3	669152	53252	100	0
		2013	1395865	1395865	0	38	-	345000	3	38113	325	93	0
	Sri Lanka	2011		0	0	35	-	80499	2	175	17	98	100
		2012	637250	637250	0	30	-	75354	2	70	48	61	100
		2013	0	0	0	23	-	50666	1	95	43	80	100
	Thailand	2011	232150	100343	131807	5	-	423638	1	5642	5642	15	38
		2012	264806	139000	125806	4	-	451730	1	3298	3298	10	28
		2013	783896	670000	113896	6	-	106374	0	16503	16503	50	100
	Timor-Leste	2011	24613	24613	0	31	-	102858	9	19739	15981	54	54
		2012	25148	25148	0	35	-	159743	14	5211	2923	85	85
		2013	253037	253037	0	48	-	0	0	23667	3131	100	100

WHO region	Country/area	Year	No. of ITN + LLIN sold or delivered	No. of LLIN sold or delivered	No. of ITN sold or delivered	% of population potentially protected by ITNs delivered	Modelled % of population with access to an ITN	No. of people protected by IRS	% IRS coverage	Any 1st-line treatment courses delivered (including ACT)	ACT treatment courses delivered	% Antimalarials distributed vs reported cases	% ACTs distributed vs reported *P. f.* cases[2]
Western Pacific	Cambodia	2011	1212490	1203321	9169	57	-	0	0	206529	120529	75	70
		2012	2177808	2177808	0	84	-	0	0	422024	422024	100	0
		2013	5418	5418	0	77	-	0	0	117547	117547	100	0
	China	2011	656674	149394	507280	0	-	1043963	0			-	-
		2012	257935	0	257935	0	-	1096877	0			-	-
		2013	58874	0	58874	0	-	447639	0	4127	3919	87	100
	Lao People's Democratic Republic	2011	241935	241935	0	26	-	0	0	56340	56340	100	100
		2012	54056	54056	0	52	-	1856	0	104400	104400	100	0
		2013	439677	439677	0	33	-	13113	0	58470	58470	100	0
	Malaysia	2011	260487	260487	0	100	-	307769	27	5306	2218	100	100
		2012	220703	220703	0	100	-	489988	42	4725	2088	100	100
		2013	317943	317943	0	100	-	682288	57	3850	2873	100	100
	Papua New Guinea	2011	1140571	1140571	0	61	-			1259038	1259038	100	100
		2012	1062508	1062508	0	77	-			886560	886560	87	96
		2013	1625831	1625831	0	94	-	0	0	915330	915330	90	99
	Philippines	2011	3037404	3037404	0	14	-	1052050	1	34080	34080	100	100
		2012	783463	783463	0	12	-	1541860	2	13469	13469	100	100
		2013	715125	715125	0	10	-	1108220	1	24771	24771	100	0
	Republic of Korea	2011	10000	10000	0	1	-			838		65	-
		2012	0	0	0	1	-			555		65	-
		2013	0	0	0	1	-			600		88	100
	Solomon Islands	2011	46574	46574	0	100	-	175265	33	236665	236665	100	100
		2012	31781	31781	0	100	-	131752	24	190255	190255	100	0
		2013	371124	371124	0	100	-	98971	18	146439	146439	100	0
	Vanuatu	2011	92385	92385	0	100	-	18490	8			-	-
		2012	35863	35863	0	100	-	9705	4	52010	52010	100	1
		2013	94232	94232	0	100	-	3033	1	24000	24000	100	1
	Viet Nam	2011	766606	100000	666606	7	-	1555892	5	274852	110576	100	100
		2012	968413	0	968413	8	-	1364815	4	266351		100	-
		2013	0	0	0	18	-	1310820	4	218389	141570	100	100

1 Based on Probable and confirmed cases adjusting for reporting completeness and any first-line treatment courses distributed as proxy indicator for treated cases
2 Based on Probable and confirmed cases adjusting for reporting completeness and % of P. falciparum using ACT distributed as proxy indicator for treated cases
3 South Sudan became a separate State on 9 July 2011 and a Member State of WHO on 27 September 2011. South Sudan and Sudan have distinct epidemiological profiles comprising high-transmission and low-transmission areas respectively. For this reason data up to June 2011 from the high-transmission areas of Sudan (10 southern states which correspond to South Sudan) and low-transmission areas (15 northern states which correspond to contemporary Sudan) are reported separately.

Annex 5 – Household surveys, 2011–2013

WHO region	Country/area	Source	% of HH that have at least ITN	% of HH with enough ITNs for individuals who slept in the house the previous night	% of population with access to an ITN in their household	% of existing ITNs in HH used the previous night	% of the population who slept under an ITN the previous night	% of the children <5 years who slept under an ITN the previous night	% of pregnant women who slept under an ITN the previous night	% of HH sprayed by IRS within last 12 months	% of HH with = 1 ITN for 2 pers. and/ or sprayed by IRS within last 12 months	% of children age 6-59 months with a hemoglobin measure-ment <8g/dL	% of children age 6-59 months with a positive microscopy blood smear	% children <5 years with fever in last 2 weeks for whom advice or treatment was sought	% of children <5 years with fever in last 2 weeks who received an ACT among those who received any antimalarial	% of children <5 years with fever in the last 2 weeks who had a finger or heel stick	% of women who received at least 3 doses of IPT during ANC visits during their last pregnancy
African	Angola	MIS 2011	35	6	19	84	19	26	26	-	-	3	10	59	76	-	9
	Benin	DHS 2012	-	43	64	89	62	-	74	7	-	7	-	59	31	17	-
	Burundi	MIS 2012	63	23	46	83	47	53	55	6	27	-	17	59	71	48	0
	Cameroon	DHS 2011	18	4	11	62	7	11	10	3	11	6	-	59	26	-	13
	Comoros	DHS 2012	-	23	41	93	37	-	44	6	-	-	-	55	14	29	-
	Congo	DHS 2012	33	9	23	90	25	31	26	-	-	4	-	67	39	29	18
	Côte d'Ivoire	DHS 2012	67	30	49	62	32	37	40	2	31	12	17	67	18	11	8
	Democratic Republic of the Congo	DHS 2013	-	24	47	85	49	-	59	-	-	8	-	59	19	19	-
	Ethiopia	DHS 2011	-	-	-	-	-	-	-	-	-	5	-	27	35	-	-
	Gabon	DHS 2012	36	14	27	87	26	39	28	6	20	5	-	71	36	15	2
	Guinea	DHS 2012	-	9	25	68	19	-	28	2	-	17	-	54	5	9	-
	Liberia	MIS 2011	50	16	31	83	31	36	39	12	26	8	28	77	69	33	26
		DHS 2013	-	20	37	71	31	-	36	13	-	-	-	80	42	42	-
	Madagascar	MIS 2011	81	31	57	88	66	75	70	41	62	1	7	44	19	6	4
		DHS 2013	-	28	48	85	54	-	61	30	-	4	-	55	41	13	-
	Malawi	MIS 2012	55	18	37	91	40	56	51	9	25	9	28	59	89	36	13
	Mali	DHS 2013	-	38	65	90	58	-	73	6	-	21	-	49	17	12	-
	Mozambique	DHS 2011	51	22	37	70	29	35	34	19	37	10	35	63	60	30	11
	Niger	DHS 2012	-	-	-	-	-	-	-	-	-	9	-	64	78	14	-
	Nigeria	DHS 2013	-	22	36	35	13	-	16	2	-	-	-	78	18	11	-
	Rwanda	DHS 2013	-	41	66	75	60	-	74	12	-	-	-	72	93	30	-
	Senegal	DHS 2011	63	15	38	69	28	34	36	11	24	14	3	54	41	10	14
		DHS 2013	-	27	57	66	39	-	43	13	-	10	-	54	18	-	-
	Sierra Leone	DHS 2013	-	14	38	93	41	-	52	5	-	17	-	75	77	40	-
	Uganda	DHS 2011	60	26	45	75	34	42	46	8	32	5	-	85	68	26	11
	United Republic of Tanzania	DHS 2012	91	52	74	77	65	70	74	15	61	6	4	79	61	25	5
	United Republic of Tanzania (Mainland)	DHS 2012	91	52	74	77	65	70	74	15	61	6	4	79	61	25	5
	Zimbabwe	DHS 2011	29	12	20	39	8	10	10	19	26	4	-	44	29	7	6
Region of the Americas	Haiti	DHS 2012	19	5	11	-	7	12	-	-	7	-	-	49	-	12	-
	Honduras	DHS 2012	-	-	-	-	-	-	-	-	-	-	-	64	-	-	-
Eastern Mediterranean	Sudan	DHS 2012	51	-	31	-	14	16	-	-	-	-	-	-	-	-	-

DHS = Demographic and Health Survey
MICS = Multiple Indicator Cluster Survey
MIS = Malaria Indicator Survey
HH = Households
IPTp = intermittent preventive treatment in pregnancy
IRS = indoor residual spraying
ITN = insecticide-treated mosquito net

Annex 6A – Reported malaria cases and deaths, 2013

WHO region	Country/area	Population				Reported malaria cases									Inpatient malaria cases and deaths	
		UN Population	At risk (low + high)	At risk (high)	Number of people living in active foci	Suspected malaria cases	Presumed and confirmed malaria cases	Malaria case definition	Mic. slides/ RDTs performed	Mic. slides/ RDTs positive	Mic. slides/ RDTs *P. falciparum*	Mic. slides/ RDTs *P. vivax*	Imported cases / (Introduced cases)	Cases at community level	Inpatient malaria cases	Malaria attributed deaths
African	Algeria	39208194		0	N/A	12762	603	P+C	12762	603	14	2	587 /(6)	-	3	3
	Angola	21471618	21471618	21471618	N/A	5273305	3144100	P+C	4129073	1999868	-	-	-	-	225223	7300
	Benin	10323474	10323474	10323474	N/A	2041444	1670273	P+C	1450005	1078834	-	-	-	46842	99368	2288
	Botswana	2021144	1313744	363806	N/A	506	506	P+C	-	456	456	-	-	-	60	7
	Burkina Faso	16934839	16934839	16934839	N/A	7857296	7146026	P+C	4480321	3769051	-	-	-	469683	414234	6294
	Burundi	10162532	7926775	2439008	N/A	7384501	4469007	P+C	7056881	4141387	-	-	-	98421	142522	3411
	Cabo Verde3	498897		N/A	298745	10621	46	P+C	10621	46	22	-	24	-	46	0
	Cameroon	22253959	22253959	15800311	N/A	3625958	1824633	P+C	1827976	26651	-	-	-	460779	468269	4349
	Central African Republic	4616417	4616417	4616417	N/A	491074	407131	P+C	200243	116300	-	-	-	47401	12124	1026
	Chad	12825314	12697061	10260251	N/A	1272841	1272841	P+C	621469	754565	-	-	-	-	44810	1881
	Comoros	734917	734917	690822	N/A	185779	62565	P+C	176370	53156	45669	72	-	0	17485	15
	Congo	4447632	4447632	4447632	N/A	209169	183026	P+C	69375	43232	43232	-	-	0	17118	2870
	Côte d'Ivoire	20316086	20316086	20316086	N/A	5982151	4708425	P+C	3780679	2506953	-	-	-	17373	142763	3261
	Democratic Republic of the Congo	67513677	67513677	65488267	N/A	14871716	11363817	P+C	10223122	6715223	4103745	-	-	4664	955311	30918
	Equatorial Guinea	757014	757014	757014	N/A	44561	25162	P+C	32528	13129	13129	-	-	-	6914	66
	Eritrea	6333135	6333135	4496526	N/A	134183	34678	P+C	120822	21317	12482	7361	-	15409	3719	6
	Ethiopia	94100756	63047507	941008	N/A	9243894	3316013	P+C	8573335	2645454	1687163	958291	-	-	27114	358
	Gabon	1671711	1671711	1671711	N/A	256531	185196	P+C	100317	28982	26432	-	-	-	23053	273
	Gambia	1849285	1849285	1849285	N/A	889494	279829	P+C	850457	240792	175126	-	-	1721	10281	262
	Ghana	25904598	25904598	25904598	N/A	8444417	7200797	P+C	2883071	1639451	1629198	-	-	54904	462557	2506
	Guinea	11745189	11745189	11745189	N/A	775341	775341	P+C	-	211257	63353	-	-	0	12585	108
	Guinea-Bissau	1704255	1704255	1704255	N/A	238580	132176	P+C	160988	54584	-	-	-	-	15280	418
	Kenya	44353691	33708805	15967329	N/A	14677837	9750953	P+C	7262170	2335286	2335286	-	-	60648	12904	360
	Liberia	4294077	4294077	4294077	N/A	2202213	1483676	P+C	1962757	1244220	1244220	-	-	305199	-	1191
	Madagascar	22924851	22924851	6877455	N/A	2142620	387045	P+C	1071310	387045	-	-	-	87046	10752	641
	Malawi	16362567	16362567	16362567	N/A	5787441	3906838	P+C	3161495	1280892	-	-	-	15408	-	3723
	Mali	15301650	15301650	13771485	N/A	2849453	2327385	P+C	1889286	1367218	-	-	-	183149	50333	1680
	Mauritania	3889880	3500892	2295029	N/A	135985	128486	P+C	9086	1587	-	-	-	-	7324	25
	Mayotte, France	222152		N/A	0	82	82	C	-	82	9	-	71	-	20	0
	Mozambique	25833752	25833752	25833752	N/A	8200849	3924832	P+C	7274891	2998874	2998874	-	-	336697	83812	2941
	Namibia	2303315	1658387	1543221	N/A	188004	4911	P+C	94002	4911	136	-	-	0	628	21
	Niger	17831270	17831270	12303576	N/A	5151131	4391189	P+C	2191740	1431798	1426696	-	-	45480	322497	2209
	Nigeria	173615345	173615345	173615345	N/A	21659831	12830911	P+C	8828920	-	-	-	-	-	693029	7878
	Rwanda	11776522	11776522	11776522	N/A	6129170	962618	P+C	3064585	962618	962618	-	-	78178	9508	409
	Sao Tome and Principe	192993	192993	192993	N/A	108652	9261	P+C	108634	9243	9242	1	-	0	1843	11
	Senegal	14133280	14133280	13567949	N/A	1119100	772222	P+C	692767	345889	345889	-	-	94932	20801	815
	Sierra Leone	6092075	6092075	6092075	N/A	2576550	1715851	P+C	2562657	1701958	1701958	-	-	486936	38568	4326
	South Africa	52776130	5277613	2111045	N/A	603932	8851	P+C	603726	8645	8645	-	-	-	5366	105
	South Sudan2	11296173	11296173	11296173	N/A	1855501	1855501	P+C	-	262520	-	-	-	-	-	1311
	Swaziland	1249514	349864	0	N/A	669	669	P+C	-	635	-	-	233	-	159	4
	Togo	6816982	6816982	6816982	N/A	2885142	882430	P+C	1442571	882430	272847	-	-	82904	33875	1361
	Uganda	37578876	37578876	33820988	N/A	24068702	14464650	P+C	11106414	1502362	1502362	-	-	-	-	7277
	United Republic of Tanzania	49253126	49253126	36331049	N/A	14650226	8585482	P+C	7617188	1552444	2194	-	-	-	371553	8528
	Mainland	47859545	47859545	34937468	N/A	14122269	8582934	P+C	7089585	1550250	-	-	-	-	371380	8526
	Zanzibar	1393581	1393581	1393581	N/A	527957	2548	P+C	527603	2194	2194	-	-	-	173	2
	Zambia	14314515	14314515	14314515	N/A	5465122	5465122	P+C	-	-	-	-	-	-	163144	3548
	Zimbabwe	13327925	6663963	6663963	N/A	1115005	422633	P+C	1115005	422633	422633	-	-	-	21969	352
Region of the Americas	Argentina	41446246	N/A	N/A	0	4913	4	C	4913	4	-	4	4	0	0	0
	Belize	331900	N/A	N/A	4539	25351	26	C	25351	26	-	26	4	0	0	0
	Bolivia (Plurinational State of)	10671200	3766934	512218	N/A	144139	7342	C	144139	7342	959	6346	-	0	0	0
	Brazil	200361925	40673471	4608324	N/A	1893018	178546	C	1893018	177767	29201	143050	-	0	2355	41
	Colombia	48321405	10872316	7151568	N/A	327064	51722	C	284332	51696	17650	33345	-	0	313	10

WHO region	Country/area	Population				Reported malaria cases									Inpatient malaria cases and deaths	
		UN Population	At risk (low + high)	At risk (high)	Number of people living in active foci	Suspected malaria cases	Presumed and confirmed malaria cases	Malaria case definition	Mic. slides/ RDTs performed	Mic. slides/ RDTs positive	Mic. slides/ RDTs *P. falciparum*	Mic. slides/ RDTs *P. vivax*	Imported cases / (Introduced cases)	Cases at community level	Inpatient malaria cases	Malaria attributed deaths
Region of the Americas	Costa Rica	4872166	N/A	N/A	2500	16774	6	C	16774	6	-	1	4	0	0	0
	Dominican Republic	10403761	8905619	447362	N/A	502683	579	C	502683	579	576	3	-	0	15	5
	Ecuador	15737878	N/A	N/A	265371	397628	378	C	397628	378	161	217	10	0	1	0
	El Salvador	6340454	N/A	N/A	54877	103748	7	C	103748	7	-	7	1	0	0	0
	French Guiana, France	249227	249227	213089	N/A	22327	875	C	22327	875	304	220	-	0	103	3
	Guatemala	15468203	7038032	2320230	N/A	171405	6214	C	171405	6214	101	6062	-	0	-	0
	Guyana	799613	743640	279865	N/A	205903	31479	C	205903	31479	13655	13953	-	0	-	3
	Haiti	10317461	10317461	5468254	N/A	172624	109625	C	172624	20957	20957	-	-	0	364	10
	Honduras	8097688	5895117	1133676	N/A	145294	5428	C	145294	5428	1113	4269	-	0	-	1
	Mexico	122332399	N/A	N/A	4064020	1017508	499	C	1017508	499	4	495	4	0	0	0
	Nicaragua	6080478	3052400	79046	N/A	536170	1194	C	536170	1194	220	974	-	0	220	0
	Panama	3864170	2921313	170023	N/A	93624	705	C	93624	705	6	699	-	0	33	0
	Paraguay	6802295	N/A	N/A	1064590	24806	11	C	24806	11	7	3	11	0	1	0
	Peru	30375603	4860096	1366902	N/A	864648	43139	C	864648	43468	6630	36285	-	0	25	4
	Suriname	539276	84666	84666	N/A	19736	729	C	19736	729	322	322	-	-	5	1
	Venezuela (Bolivarian Republic of)	30405207	5716179	790535	N/A	476764	78643	C	476764	78643	22777	50938	-	0	-	6
Eastern Mediterranean	Afghanistan	30551674	23089547	8222177	N/A	787624	319742	P+C	507145	39263	1877	37386	-	118971	3688	24
	Djibouti	872932	436466	0	N/A	7934	1684	P+C	7189	1684	939	-	-	0	197	17
	Iran (Islamic Republic of)	77447168	N/A	N/A	746100	-	1373	C	385172	1373	72	426	854 /(26)	-	91	2
	Iraq	33765232	N/A	N/A	-	-	8	C	1796587	8	-	-	8	-	0	0
	Pakistan	182142594	179065987	52670037	N/A	7752797	3472727	P+C	4561825	281755	46067	223660	-	0	46013	244
	Saudi Arabia	28828870	N/A	N/A	40434	-	2513	C	1309783	2513	34	-	2479	-	8	-
	Somalia	10495583	10495583	7310851	N/A	62788	36298	P+C	36960	10470	-	-	-	-	2230	-
	Sudan	37964306	37964306	32990981	N/A	2197563	989946	P+C	1800000	592383	-	-	-	-	-	685
	Yemen	24407381	16733857	10447499	N/A	927821	149451	P+C	881148	102778	102369	408	-	0	1201	55
European	Azerbaijan	9413420	N/A	N/A	12613	432810	4	C	432810	4	-	-	4	-	4	0
	Georgia	4340895	N/A	N/A	0	192	7	C	192	7	-	-	7	-	7	0
	Kyrgyzstan	5547548	N/A	N/A	0	54249	4	C	54249	4	-	-	4	-	4	0
	Tajikistan3	8207834	N/A	N/A	1954522	213916	14	C	213916	14	-	7	7 /(11)	-	13	0
	Turkey	74932641	N/A	N/A	0	255125	285	C	255125	285	-	34	251	-	0	3
	Uzbekistan	28934102	N/A	N/A	0	908301	3	C	908301	3	-	-	3	-	3	0
South-East Asia	Bangladesh	156594962	16223238	4165426	N/A	93926	3864	P+C	93926	3864	3597	262	-	23027	1155	15
	Bhutan	753947	N/A	N/A	234669	31632	45	P+C	31632	45	14	9	23 /(30)	-	45	0
	Democratic People's Republic of Korea	24895480	N/A	N/A	13111053	71453	14407	P+C	71453	14407	-	14407	-	-	0	0
	India	1252139596	1114404240	275470711	N/A	127891198	881730	C	127891198	881730	462079	417884	-	-	-	440
	Indonesia	249865631	152418035	42477157	N/A	3197890	1833256	P+C	1708161	343527	170848	150985	-	0	-	45
	Myanmar	53259018	31955411	19705837	N/A	2601112	333871	P+C	1300556	333871	222770	98860	-	55051	18362	236
	Nepal	27797457	13328881	1009048	N/A	169464	38113	P+C	133325	1974	273	1659	-	-	58	0
	Sri Lanka	21273228	N/A	N/A	0	1236580	95	C	1236580	95	-	-	95	-	78	0
	Thailand	67010502	33505251	5360840	N/A	1830090	33302	C	1830090	33302	14449	15573	-	-	3014	37
	Timor-Leste	1132879	1132879	872317	N/A	178200	1042	P+C	178183	1025	373	512	-	198	18	3
Western Pacific	Cambodia	15135169	8021640	6659474	N/A	152137	24130	P+C	149316	21309	7092	11267	-	20613	3708	12
	China	1385566537	579466850	197320	N/A	5555001	4127	P+C	5554960	4086	2907	930	-	-	-	23
	Lao People's Democratic Republic	6769727	3994139	2437102	N/A	339013	41385	P+C	335759	38131	24538	12537	-	7563	584	28
	Malaysia	29716965	N/A	N/A	1050143	1576012	3850	C	1576012	3850	422	385	865 /(26)	-	3468	14
	Papua New Guinea	7321262	7321262	6881986	N/A	1454166	1125808	S	608352	279994	119469	7579	-	51066	12911	307
	Philippines	98393574	78501709	7058669	N/A	318883	6514	C	318883	6514	4968	1357	-	1206	729	12
	Republic of Korea	49262698	N/A	N/A	5625106	443	443	C	-	443	-	383	50	-	260	2
	Solomon Islands	561231	555619	555619	N/A	245014	53270	P+C	217353	25609	13194	11628	-	0	1245	18
	Vanuatu	252763	250235	250235	N/A	28943	2381	P+C	28943	2381	1039	1342	-	502	37	0
	Viet Nam	91679733	34373702	16095160	N/A	3115804	35406	P+C	3097526	17128	9532	6901	-	24058	8384	6

Annex 6A – Reported malaria cases and deaths, 2013 (continued)

WHO region	Country/area	Population				Reported malaria cases									Inpatient malaria cases and deaths	
		UN Population	At risk (low + high)	At risk (high)	Number of people living in active foci	Suspected malaria cases	Presumed and confirmed malaria cases	Malaria case definition	Mic. slides/ RDTs performed	Mic. slides/ RDTs positive	Mic. slides/ RDTs *P. falciparum*	Mic. slides/ RDTs *P. vivax*	Imported cases / (Introduced cases)	Cases at community level	Inpatient malaria cases	Malaria attributed deaths
	Regional Summary	**Population**				**Reported malaria cases**										
		UN Population	At risk (low + high)	At risk (high)	Number of people living in active foci	Suspected malaria cases	Presumed and confirmed malaria cases		Mic. slides/ RDTs performed	Mic. slides/ RDTs positive	Mic. slides/ RDTs *P. falciparum*	Mic. slides/ RDTs *P. vivax*	Imported cases	Cases at community level	Inpatient malaria cases	Malaria attributed deaths
	African	923 135 304	782 340 469	638 070 206	298 745	192 819 341	122 454 712		108 819 619	44 764 581	21 033 630	965 727	915	2 993 774	5 298 508	116 336
	Region of the Americas	573 818 555	105 096 471	24 625 760	5 455 897	7 166 127	517 151		7 166 127	428 007	113 719	297 198	38	0	25 404	85
	Eastern Mediterranean	426 475 740	267 785 746	111 641 545	786 534	11 736 527	4 973 742		11 285 809	1 032 227	151 358	261 880	3 340	118 971	53 428	1 027
	European	131 376 440	N/A	N/A	N/A	N/A	N/A		N/A	N/A	N/A	N/A	276	0	31	N/A
	South-East Asia	1 854 722 700	1 362 967 935	349 061 336	13 345 722	137 301 545	3 121 363		134 475 104	1 613 840	874 403	700 151	118	78 276	22 730	776
	Western Pacific	1 684 659 659	712 485 156	40 135 566	6 675 249	12 785 416	1 297 314		11 887 104	399 445	183 161	54 309	915	105 008	31 326	422
	Total	5 594 188 398	3 230 675 778	1 163 534 413	26 562 147	361 808 956	132 364 282		273 633 763	48 238 100	22 356 271	2 279 265	5 602	3 296 029	5 431 427	118 646

Notes: C=Confirmed P=Probable S=Suspected
RDT, rapid diagnostic test
1 Method 1 for cases: Adjusted data reported by countries
Method 2 for cases: Modelled relationship between malaria transmission, case incidence and intervention coverage
Method 1 for deaths: Fixed case fatality rate applied to case estimates
Method 2 for deaths: Modelled relationship between malaria transmission, malaria mortality and intervention coverage
See World Malaria Report 2011 for more details of methods used
2 South Sudan became a separate State on 9 July 2011 and a Member State of WHO on 27 September 2011. South Sudan and Sudan have distinct epidemiological profi les comprising high-transmission and low-transmission areas respectively. For this reason data up to June 2011 from the high-transmission areas of Sudan (10 southern states which correspond to South Sudan) and low-transmission areas (15 northern states which correspond to contemporary Sudan) are reported separately.

Annex 6B – Reported malaria cases by method of confirmation, 2000–2013

WHO region	Country/area		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
African	Algeria	Presumed and confirmed	541	435	307	427	163	299	117	288	196	94	408	191	887	603
		Microscopy examined	27 733	26 411	18 803	17 059	16 686	18 392	13 869	14 745	11 964	15 635	12 224	11 974	15 790	12 762
		Confirmed with microscopy	541	435	307	427	163	299	117	288	196	94	408	191	887	603
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Imported cases	-	-	-	-	-	-	-	-	192	90	396	187	828	587
	Angola	Presumed and confirmed	2 080 348	1 249 767	1 862 662	3 246 258	2 489 170	2 329 316	2 283 097	2 726 530	3 432 424	3 726 606	3 687 574	3 501 953	3 031 546	3 144 100
		Microscopy examined	-	-	-	-	-	-	-	1 458 123	2 118 053	2 172 036	1 947 349	1 765 933	2 245 223	3 025 258
		Confirmed with microscopy	-	-	-	-	-	889 572	1 029 198	1 295 535	1 106 534	1 120 410	1 324 264	1 147 473	1 056 563	1 462 941
		RDT Examined	-	-	-	-	-	-	106 801	506 756	541 291	906 916	639 476	833 753	1 069 483	1 103 815
		Confirmed with RDT	-	-	-	-	-	-	53 200	237 950	271 458	453 012	358 606	484 809	440 271	536 927
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benin	Presumed and confirmed	-	717 290	782 818	819 256	853 034	803 462	861 847	1 171 522	1 147 005	1 256 708	1 432 095	1 424 335	1 513 212	1 670 273
		Microscopy examined	-	-	-	-	-	-	-	-	-	-	-	88 134	243 008	291 479
		Confirmed with microscopy	-	-	-	-	-	-	-	-	-	534 590	-	68 745	-	99 368
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	475 986	825 005	1 158 526
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	355 007	-	354 223	705 839	979 466
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Botswana	Presumed and confirmed	71 555	48 281	28 907	23 657	22 404	11 242	23 514	16 983	17 886	14 878	12 196	1 141	308	506
		Microscopy examined	-	-	-	-	-	-	-	14 200	23 253	17 553	-	-	-	-
		Confirmed with microscopy	-	-	-	-	-	-	-	381	914	951	1 046	432	193	456
		RDT Examined	-	-	-	-	-	-	-	113	941	1 053	-	-	-	-
		Confirmed with RDT	-	-	-	-	-	-	-	9	13	73	-	-	-	-
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Burkina Faso	Presumed and confirmed	-	352 587	1 188 870	1 443 184	1 546 644	1 615 695	2 060 867	2 487 633	3 790 238	4 537 600	5 723 481	5 024 697	6 970 700	7 146 026
		Microscopy examined	-	30 006	32 796	31 256	52 874	73 262	122 047	127 120	138 414	137 632	177 879	400 005	223 372	183 971
		Confirmed with microscopy	-	-	-	-	18 256	21 335	44 265	44 246	36 514	59 420	88 540	83 857	90 089	82 875
		RDT Examined	-	-	-	-	-	-	-	-	-	182 658	940 985	450 281	4 516 273	4 296 350
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	123 107	715 999	344 256	3 767 957	3 686 176
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Burundi	Presumed and confirmed	3 252 692	3 345 881	2 626 149	2 243 185	1 749 892	2 334 067	2 265 970	2 079 861	1 950 266	2 588 830	4 255 301	3 298 979	2 570 754	4 469 007
		Microscopy examined	484 249	508 558	530 019	600 369	608 017	903 942	1 034 519	1 411 407	1 161 153	1 537 768	2 825 558	2 859 720	2 659 372	4 123 012
		Confirmed with microscopy	308 095	312 015	327 138	353 459	363 395	327 464	649 756	860 606	690 748	893 314	1 599 908	1 485 332	1 484 676	2 366 134
		RDT Examined	-	-	-	-	-	-	251 925	406 738	330 915	472 341	273 324	181 489	1 148 965	2 933 869
		Confirmed with RDT	-	-	-	-	-	-	141 975	241 038	185 993	292 308	163 539	86 542	666 400	1 775 253
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cabo Verde	Presumed and confirmed	144	107	76	68	45	68	80	18	35	65	47	36	36	46
		Microscopy examined	6 843	7 141	8 022	6 001	9 833	7 902	6 979	7 402	7 033	-	-	-	8 715	10 621
		Confirmed with microscopy	144	107	76	68	45	68	80	18	35	65	47	-	36	46
		RDT Examined	-	-	-	-	-	-	1 750	1 500	2 000	21 913	-	26 508	-	-
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	36	-	-
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	29	35	24
	Cameroon	Presumed and confirmed	3 256 939	3 012 710	2 524 788	2 280 070	2 041 733	277 413	634 507	604 153	1 650 749	1 883 199	1 845 691	1 829 266	1 589 317	1 824 633
		Microscopy examined	-	-	-	-	-	-	-	-	-	-	-	1 110 308	1 182 610	1 236 306
		Confirmed with microscopy	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	120 466	93 392	591 670
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Central African Republic	Presumed and confirmed	89 614	140 742	140 874	78 094	129 367	131 856	114 403	119 477	152 260	175 210	66 484	221 980	459 999	407 131
		Microscopy examined	-	-	-	-	-	-	-	-	-	-	-	-	-	63 695
		Confirmed with microscopy	-	-	-	-	-	-	-	-	-	-	-	-	-	36 943
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	55 746	136 548
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	-	46 759	79 357
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chad	Presumed and confirmed	437 041	451 182	517 004	505 732	481 122	501 846	251 354	518 832	478 987	549 048	544 243	528 454	660 575	1 272 841
		Microscopy examined	45 283	43 180	44 689	54 381	1 525	37 439	62 895	64 884	64 171	74 791	89 749	-	69 789	-
		Confirmed with microscopy	40 078	38 287	43 933	45 195	1 360	31 668	45 155	48 288	47 757	-	75 342	86 348	-	206 082
		RDT Examined	-	-	-	-	-	-	-	-	-	-	309 927	114 122	-	621 469
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	125 106	94 778	-	548 483
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-

WHO region	Country/area		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
African		Presumed and confirmed	-	-	-	-	43 918	29 554	54 830	53 511	46 426	57 084	103 670	76 661	65 139	62 565
		Microscopy examined	-	-	-	-	-	-	-	-	-	13 387	87 595	63 217	125 030	154 824
	Comoros	Confirmed with microscopy	-	-	-	-	12 874	6 086	20 559	-	-	5 982	35 199	22 278	45 507	46 130
		RDT Examined	-	-	-	-	-	-	-	-	-	-	5 249	20 226	27 714	21 546
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	1 339	2 578	4 333	7 026
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Presumed and confirmed	-	-	-	-	-	-	157 757	149 552	157 125	150 583	446 656	277 263	117 640	183 026
		Microscopy examined	-	-	-	-	-	-	-	163 924	203 869	203 160	-	-	-	69 375
	Congo	Confirmed with microscopy	-	-	-	-	-	-	-	103 213	117 291	92 855	-	37 744	120 319	43 232
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	-	0
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	-	-	0
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Presumed and confirmed	-	1 193 288	1 109 751	1 136 810	1 275 138	1 280 914	1 253 408	1 277 670	1 343 654	1 847 366	1 721 461	2 588 004	2 795 919	4 708 425
		Microscopy examined	-	-	-	-	-	-	-	-	19 661	34 755	-	49 828	195 546	395 914
	Côte d'Ivoire	Confirmed with microscopy	-	-	-	-	-	-	-	-	3 527	7 388	62 726	29 976	107 563	215 104
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	1 572 785	3 384 765
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	-	1 033 064	2 291 849
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Presumed and confirmed	964 623	2 199 247	2 640 168	4 386 638	4 133 514	6 334 608	5 008 959	3 720 570	4 933 845	7 839 435	9 252 959	9 442 144	9 128 398	11 363 817
		Microscopy examined	3 758	3 244	3 704	4 820	5 320	5 531	4 779	1 181 323	2 613 038	2 956 592	3 678 849	4 226 533	4 329 318	4 126 129
	Democratic Republic of the Congo	Confirmed with microscopy	897	1 531	1 735	2 438	2 684	2 971	2 050	740 615	1 618 091	1 873 816	2 374 930	2 700 818	2 656 864	2 611 478
		RDT Examined	-	-	-	-	-	-	-	2 275	428	12 436	54 728	2 912 088	3 327 071	6 096 993
		Confirmed with RDT	-	-	-	-	-	-	-	243	127	4 889	42 850	1 861 163	2 134 734	4 103 745
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Presumed and confirmed	-	-	-	-	-	-	-	20 948	67 196	84 532	78 095	37 267	20 890	25 162
		Microscopy examined	-	-	-	-	-	-	-	10 752	11 815	15 960	42 585	23 004	33 245	27 039
	Equatorial Guinea	Confirmed with microscopy	-	-	-	-	-	-	-	5 842	7 883	11 603	39 636	20 601	13 196	11 235
		RDT Examined	-	-	-	-	-	-	-	655	2 572	3 773	16 772	2 899	6 826	5 489
		Confirmed with RDT	-	-	-	-	-	-	-	445	1 620	2 581	14 177	1 865	1 973	1 894
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Presumed and confirmed	-	125 746	74 861	65 517	27 783	24 192	10 148	19 568	10 572	21 298	53 750	39 567	42 178	34 678
		Microscopy examined	-	22 637	52 228	52 428	41 361	48 937	46 096	68 905	54 075	68 407	79 024	67 190	84 861	81 541
	Eritrea	Confirmed with microscopy	-	9 716	6 078	10 346	4 119	9 073	6 541	9 528	4 364	6 633	13 894	15 308	11 557	10 890
		RDT Examined	-	-	-	-	-	-	-	7 520	6 566	-	-	25 570	33 758	39 281
		Confirmed with RDT	-	-	-	-	-	-	-	6 037	4 400	5 126	22 088	19 540	10 258	10 427
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Presumed and confirmed	-	2 555 314	2 929 684	3 582 097	5 170 614	3 901 957	3 038 565	2 557 152	2 532 645	3 043 203	4 068 764	3 549 559	3 876 745	3 316 013
		Microscopy examined	-	851 942	1 115 167	1 010 925	1 312 422	1 364 194	785 209	739 627	986 323	2 065 237	2 509 543	3 418 719	3 778 479	8 573 335
	Ethiopia	Confirmed with microscopy	-	392 377	427 795	463 797	578 904	538 942	447 780	451 816	458 561	927 992	1 158 197	1 480 306	1 692 578	2 645 454
		RDT Examined	-	-	-	-	-	-	-	-	-	262 877	-	-	-	-
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	108 324	-	-	-	-
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Presumed and confirmed	127 024	132 918	157 440	166 321	200 214	235 479	111 527	190 749	187 714	113 803	185 105	178 822	188 089	185 196
		Microscopy examined	-	-	-	-	100 107	129 513	136 916	142 406	151 137	1 623	54 714	-	66 018	90 185
	Gabon	Confirmed with microscopy	50 810	53 167	62 976	58 212	70 075	70 644	33 458	45 186	40 701	660	12 816	-	18 694	26 432
		RDT Examined	-	-	-	-	-	-	-	-	-	-	7 887	-	4 129	10 132
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	1 120	-	1 059	2 550
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Presumed and confirmed	-	481 590	620 767	540 165	395 043	329 426	427 598	439 798	508 846	479 409	194 009	261 967	271 038	279 829
		Microscopy examined	-	-	-	-	-	-	-	-	-	-	290 842	172 241	156 580	236 329
	Gambia	Confirmed with microscopy	-	-	-	-	-	-	-	-	39 164	50 378	52 245	71 588	29 325	65 666
		RDT Examined	-	-	-	-	-	-	-	-	-	-	123 564	-	705 862	614 128
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	64 108	190 379	271 038	175 126
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Presumed and confirmed	3 349 528	3 044 844	3 140 893	3 552 896	3 416 033	3 452 969	3 511 452	3 123 147	3 200 147	3 694 671	3 849 536	4 154 261	10 676 731	7 200 797
		Microscopy examined	-	-	-	-	-	-	-	-	1 100 238	2 431 048	2 031 674	1 172 838	4 219 097	1 394 249
	Ghana	Confirmed with microscopy	-	-	-	-	475 441	655 093	472 255	476 484	956 359	962 599	1 029 384	624 756	2 971 699	721 898
		RDT Examined	-	-	-	-	-	-	-	-	143 879	468 449	247 278	781 892	1 438 284	1 488 822
		Confirmed with RDT	-	-	-	-	-	0	0	-	138 124	141 771	42 253	416 504	783 467	917 553
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Annex 6B – Reported malaria cases by method of confirmation, 2000–2013 (continued)

WHO region	Country/area		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
African	Guinea	Presumed and confirmed	816 539	851 877	850 147	731 911	876 837	850 309	834 835	888 643	657 003	812 471	1 092 554	1 189 016	1 220 574	775 341
		Microscopy examined	-	-	-	-	-	-	-	-	-	-	-	43 549	-	-
		Confirmed with microscopy	4 800	6 238	16 561	107 925	103 069	50 452	41 228	28 646	33 405	20 932	20 936	5 450	191 421	63 353
		RDT Examined	-	-	-	-	-	-	16 554	21 150	-	20 866	-	139 066	-	-
		Confirmed with RDT	-	-	-	-	-	-	12 999	15 872	-	14 909	-	90 124	125 779	147 904
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Guinea-Bissau	Presumed and confirmed	246 316	202 379	194 976	162 344	187 910	185 493	148 720	140 205	148 542	156 633	140 143	174 986	129 684	132 176
		Microscopy examined	-	-	-	-	-	33 721	34 862	34 384	31 083	25 379	48 799	57 698	61 048	58 909
		Confirmed with microscopy	-	-	-	-	-	14 659	15 120	14 284	11 299	11 757	30 239	21 320	23 547	17 733
		RDT Examined	-	-	-	-	-	-	-	-	-	-	56 455	139 531	97 047	102 079
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	20 152	50 662	26 834	36 851
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Kenya	Presumed and confirmed	4 216 531	3 262 931	3 319 399	5 338 008	7 545 541	9 181 224	8 926 058	9 610 691	839 903	8 123 689	6 071 583	11 120 812	9 335 951	9 750 953
		Microscopy examined	-	-	43 643	96 893	59 995	-	-	-	-	-	2 384 402	3 009 051	4 836 617	6 606 885
		Confirmed with microscopy	-	-	20 049	39 383	28 328	-	-	-	839 903	-	898 531	1 002 805	1 426 719	2 060 608
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	164 424	655 285
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	-	26 752	274 678
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Liberia	Presumed and confirmed	-	-	-	-	-	44 875	1 171 175	694 428	726 905	1 035 940	2 675 816	2 480 748	1 800 372	1 483 676
		Microscopy examined	-	-	-	-	-	8 718	165 095	123 939	238 752	327 392	335 973	728 443	772 362	818 352
		Confirmed with microscopy	-	-	-	-	-	5 025	115 677	80 373	157 920	212 657	212 927	577 641	507 967	496 269
		RDT Examined	-	-	-	-	-	57 325	880 952	508 987	635 855	676 569	998 043	1 593 676	1 276 521	1 144 405
		Confirmed with RDT	-	-	-	-	-	39 850	645 738	411 899	449 032	626 924	709 246	1 338 121	899 488	747 951
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Madagascar	Presumed and confirmed	1 392 483	1 386 291	1 598 919	2 198 297	1 458 408	1 229 385	1 087 563	736 194	352 870	299 094	293 910	255 814	395 149	382 495
		Microscopy examined	31 575	33 354	27 752	37 333	39 174	37 943	29 318	30 921	30 566	23 963	24 393	34 813	38 453	41 316
		Confirmed with microscopy	6 946	8 538	5 272	6 909	7 638	6 753	5 689	4 823	4 096	2 720	2 173	3 447	3 667	4 550
		RDT Examined	-	-	-	-	-	-	-	175 595	299 000	610 035	604 114	739 572	906 080	1 029 994
		Confirmed with RDT	-	-	-	-	-	-	-	43 674	89 138	212 390	200 277	221 051	355 753	382 495
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Malawi	Presumed and confirmed	3 646 212	3 823 796	2 784 001	3 358 960	2 871 098	3 688 389	4 498 949	4 786 045	5 185 082	6 183 816	6 851 108	5 338 701	4 922 596	3 906 838
		Microscopy examined	-	-	-	-	-	-	-	-	-	-	-	119 996	406 907	132 475
		Confirmed with microscopy	-	-	-	-	-	-	-	-	-	-	-	50 526	283 138	44 501
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	580 708	2 763 986	3 029 020
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	253 973	1 281 846	1 236 391
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Mali	Presumed and confirmed	546 634	612 896	723 077	809 428	1 969 214	962 706	1 022 592	1 291 853	1 045 424	1 633 423	2 171 542	1 961 070	2 171 739	2 327 385
		Microscopy examined	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Confirmed with microscopy	-	-	-	-	-	-	-	-	-	-	-	-	97 995	190 337
		RDT Examined	-	-	-	-	-	-	-	-	-	-	1 380 178	974 558	-	1 889 286
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	227 482	307 035	788 487	1 176 881
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Mauritania	Presumed and confirmed	-	243 942	224 614	318 120	224 840	223 472	188 025	222 476	201 044	174 820	244 319	154 003	169 104	128 486
		Microscopy examined	-	-	-	-	-	-	31 013	-	835	3 717	5 449	3 752	1 865	5 510
		Confirmed with microscopy	-	-	-	-	-	-	1 061	-	268	603	909	1 130	255	957
		RDT Examined	-	-	-	-	-	-	-	-	720	4 338	2 299	7 991	3 293	3 576
		Confirmed with RDT	-	-	-	-	-	-	-	-	34	337	1 085	1 796	1 633	630
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Mayotte, France	Presumed and confirmed	-	-	-	792	743	500	392	421	346	352	396	92	72	82
		Microscopy examined	-	-	-	-	-	-	-	-	-	-	2 023	1 214	1 463	-
		Confirmed with microscopy	-	-	-	792	743	500	392	421	346	352	396	92	72	82
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Imported cases	-	-	-	-	-	-	74	129	148	250	236	51	47	71
	Mozambique	Presumed and confirmed	-	-	-	-	-	-	-	6 155 082	4 831 491	4 310 086	3 381 371	3 344 413	3 203 338	3 924 832
		Microscopy examined	-	-	-	-	-	-	-	-	-	-	1 950 933	2 504 720	2 546 213	2 058 998
		Confirmed with microscopy	-	-	-	-	-	-	-	141 663	120 259	93 874	644 568	1 093 742	886 143	774 891
		RDT Examined	-	-	-	-	-	-	-	-	-	-	2 287 536	2 966 853	2 234 994	5 215 893
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	878 009	663 132	927 841	2 223 983
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-

WHO region	Country/area		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
African		Presumed and confirmed	-	538 512	445 803	468 259	610 799	339 204	265 595	172 024	132 130	87 402	25 889	14 406	3 163	4 745
		Microscopy examined	-	-	-	-	-	-	-	-	24 361	16 059	14 522	13 262	7 875	1 507
	Namibia	Confirmed with microscopy	-	41 636	23 984	20 295	36 043	23 339	27 690	4 242	1 092	505	556	335	194	136
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	48 599	-	92 495
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	1 525	-	4 775
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Presumed and confirmed	-	1 340 142	888 345	681 783	760 718	817 707	886 531	1 308 896	2 229 812	2 358 156	3 643 803	3 157 482	3 888 044	4 391 189
		Microscopy examined	-	-	-	-	81 814	107 092	87 103	1 308 896	2 229 812	2 358 156	165 514	130 658	120 527	392 441
	Niger	Confirmed with microscopy	-	-	-	56 460	76 030	46 170	-	55 628	62 243	79 066	49 285	68 529	84 234	255 087
		RDT Examined	-	-	-	-	-	21 230	12 567	1 308 896	530 910	312 802	7 426 774	1 130 514	1 084 747	1 799 299
		Confirmed with RDT	-	-	-	-	-	9 873	3 956	193 399	434 615	230 609	570 773	712 347	758 108	1 176 711
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Presumed and confirmed	2 476 608	2 253 519	2 605 381	2 608 479	3 310 229	3 532 108	3 982 372	2 969 950	2 834 174	4 295 686	3 873 463	4 306 945	6 938 519	12 830 911
		Microscopy examined	-	-	-	-	-	-	-	-	-	-	-	672 185	1 953 399	1 633 960
	Nigeria	Confirmed with microscopy	-	-	-	-	-	-	-	-	-	335 201	523 513	-	-	-
		RDT Examined	-	-	-	-	-	-	-	-	-	-	45 924	242 526	2 898 052	7 194 960
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	144 644	27 674	-	-	-
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Presumed and confirmed	-	1 003 793	1 073 546	1 217 405	1 303 494	1 654 246	1 429 072	946 569	772 197	1 247 583	638 669	208 498	483 470	939 076
		Microscopy examined	-	748 806	951 797	1 071 519	1 201 811	1 438 603	1 523 892	1 754 196	1 640 106	2 637 468	2 708 973	1 602 271	2 904 793	2 862 877
	Rwanda	Confirmed with microscopy	-	423 493	506 028	553 150	589 315	683 769	573 686	382 686	316 242	698 745	638 669	208 858	422 224	879 316
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	190 593	201 708
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	-	61 246	83 302
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Presumed and confirmed	32 149	44 034	50 953	47 830	53 991	22 370	7 293	2 421	1 647	6 182	3 346	8 442	12 550	9 261
		Microscopy examined	66 076	83 045	93 882	81 372	97 836	68 819	58 672	49 298	38 583	59 228	48 366	83 355	103 773	73 866
	Sao Tome and Principe	Confirmed with microscopy	31 975	42 086	50 586	42 656	46 486	18 139	5 146	2 421	1 647	3 798	2 233	6 373	10 706	6 352
		RDT Examined	-	-	-	-	-	-	-	-	140 478	60 649	9 989	33 924	23 124	34 768
		Confirmed with RDT	-	-	-	-	-	-	-	-	4 611	2 384	507	2 069	1 844	2 891
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Presumed and confirmed	1 123 377	931 682	960 478	1 414 383	1 195 402	1 346 158	1 555 310	1 170 234	737 414	584 873	707 772	604 290	634 106	772 222
		Microscopy examined	56 169	55 494	54 257	85 246	67 750	105 093	138 254	195 487	48 324	43 026	27 793	18 325	19 946	24 205
	Senegal	Confirmed with microscopy	44 959	12 920	14 425	26 865	22 234	33 160	48 070	78 278	24 830	19 614	17 750	14 142	15 612	20 801
		RDT Examined	-	-	-	-	-	-	-	90 161	487 188	485 548	651 737	555 614	524 971	668 562
		Confirmed with RDT	-	-	-	-	-	-	-	40 054	217 096	146 319	325 920	263 184	265 468	325 088
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Presumed and confirmed	460 881	447 826	507 130	524 987	355 638	233 833	160 666	653 987	932 819	747 339	934 028	856 332	1 945 859	1 715 851
		Microscopy examined	-	4 985	10 605	12 298	4 985	10 605	12 298	-	-	770 463	718 473	46 280	194 787	185 403
	Sierra Leone	Confirmed with microscopy	-	2 206	3 702	3 945	2 206	3 702	3 945	-	-	273 149	218 473	25 511	104 533	76 077
		RDT Examined	-	-	-	-	-	3 452	4 675	-	235 800	544 336	1 609 455	886 994	1 975 972	2 377 254
		Confirmed with RDT	-	-	-	-	-	1 106	987	-	154 459	373 659	715 555	613 348	1 432 789	1 625 881
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Presumed and confirmed	64 624	26 506	15 649	13 459	13 399	7 755	14 456	6 327	7 796	6 117	8 060	9 866	6 846	8 851
		Microscopy examined	-	-	-	-	-	-	-	-	-	-	-	178 387	121 291	364 021
	South Africa[3]	Confirmed with microscopy	-	26 506	15 649	13 459	13 399	7 755	12 098	6 327	7 796	6 072	3 787	5 986	1 632	2 572
		RDT Examined	-	-	-	-	-	-	-	-	-	-	276 669	204 047	30 053	239 705
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	4 273	3 880	3 997	6 073
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Presumed and confirmed	-	237 712	462 056	646 673	515 958	337 582	116 473	101 008	136 492	325 634	900 283	795 784	1 125 039	1 855 501
		Microscopy examined	-	-	-	-	-	-	-	-	116 555	-	-	-	-	-
	South Sudan	Confirmed with microscopy	-	-	-	-	-	-	-	-	52 011	-	900 283	112 024	225 371	262 520
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Presumed and confirmed	29 374	12 854	10 129	7 203	5 140	6 066	7 807	6 338	5 881	6 624	1 722	797	626	669
		Microscopy examined	-	24 123	13 997	12 564	6 754	4 587	3 985	-	-	-	-	-	-	-
	Swaziland	Confirmed with microscopy	-	1 395	670	342	574	279	155	84	58	106	87	130	78	161
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	181	419	217	474
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	170	153	233

Annex 6B – Reported malaria cases by method of confirmation, 2000–2013 (continued)

WHO region	Country/area		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
African		Presumed and confirmed	45 643	5 993 506	7 950 109	21 076 063	22 647 469	21 333 887	20 750 997	20 550 475	19 255 361	24 926 648	26 101 704	22 338 325	768 287	881 611
		Microscopy examined	53 533	53 804	1 223 726	5 916 961	7 439 690	10 144 630	6 405 218	7 010 355	6 240 987	60 691	7 342 943	6 042 835	579 507	560 096
	Togo	Confirmed with microscopy	17 734	#VALUE	599 627	2 778 398	3 381 414	3 868 359	2 795 694	2 891 295	67	211	2 858 184	1 947 905	260 535	272 855
		RDT Examined	-	-	-	-	-	-	-	188 225	-	121 248	136 123	1 822 911	660 627	882 475
		Confirmed with RDT	-	-	-	-	-	-	-	103 390	-	3 031	1 974	434 729	436 839	609 575
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Presumed and confirmed	3 552 859	5 624 032	7 536 748	9 657 332	10 717 076	9 867 174	10 168 389	11 978 636	11 602 700	12 086 399	13 208 169	12 173 358	13 591 932	14 464 650
		Microscopy examined	-	-	1 100 374	1 566 474	1 859 780	2 107 011	2 238 155	2 348 373	2 397 037	3 612 418	3 705 284	385 928	3 466 571	3 718 588
	Uganda	Confirmed with microscopy	-	-	557 159	801 784	879 032	1 104 310	867 398	1 045 378	979 298	1 301 337	1 581 160	134 726	1 413 149	1 502 362
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	194 819	2 449 526	7 387 826
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	97 147	1 249 109	-
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Presumed and confirmed	45 643	369 474	413 361	11 418 731	11 930 393	11 466 713	10 582 608	8 571 839	7 652 661	12 840 249	12 893 535	10 164 967	8 477 435	-
		Microscopy examined	53 533	53 804	123 352	4 350 487	5 579 910	8 037 619	4 167 063	4 661 982	3 843 950	60 691	3 637 659	5 656 907	6 931 025	-
	United Republic of Tanzania	Confirmed with microscopy	17 734	38 537	42 468	1 976 614	2 502 382	2 764 049	1 928 296	1 845 917	67	211	1 277 024	1 813 179	1 772 062	-
		RDT Examined	-	-	-	-	-	-	-	-	-	121 248	136 123	1 628 092	1 091 615	-
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	3 031	1 974	337 582	214 893	-
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Presumed and confirmed	-	324 584	369 394	11 379 411	11 898 627	11 441 681	10 566 201	8 562 200	7 643 050	12 752 090	12 819 192	10 160 478	8 474 278	8 582 934
		Microscopy examined	-	-	71 384	4 296 588	5 528 934	7 993 977	4 136 387	4 638 471	3 830 767	-	3 573 710	5 513 619	6 784 639	6 720 141
	Mainland	Confirmed with microscopy	-	20 152	25 485	1 960 909	2 490 446	2 756 421	1 926 711	1 845 624	-	-	1 276 660	1 812 704	1 771 388	1 480 791
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	1 315 662	701 477	369 444
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	333 568	212 636	69 459
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Presumed and confirmed	45 643	44 890	43 967	39 320	31 766	25 032	16 407	9 639	96 101	88 159	74 343	4 489	3 157	2 548
		Microscopy examined	53 533	53 804	51 968	53 899	50 976	43 642	30 676	23 511	56 579	60 691	63 949	143 288	146 386	83 944
	Zanzibar	Confirmed with microscopy	17 734	18 385	16 983	15 705	11 936	7 628	1 585	293	77	211	364	475	674	484
		RDT Examined	-	-	-	-	-	-	-	-	173 311	121 248	136 123	312 430	390 138	443 659
		Confirmed with RDT	-	-	-	-	-	-	-	-	4 508	3 031	1 974	4 014	2 257	1 710
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Presumed and confirmed	3 337 796	3 838 402	3 760 335	4 346 172	4 078 234	4 121 356	4 731 338	4 248 295	3 080 301	2 976 395	4 229 839	4 607 908	4 695 400	5 465 122
		Microscopy examined	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Zambia	Confirmed with microscopy	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Presumed and confirmed	-	-	-	-	1 815 470	1 494 518	1 313 458	1 154 519	1 003 846	736 897	648 965	319 935	276 963	422 633
		Microscopy examined	-	-	-	-	-	-	-	234 730	59 132	122 133	-	10 004	-	-
	Zimbabwe	Confirmed with microscopy	-	-	-	-	-	-	-	116 518	16 394	57 014	-	-	-	-
		RDT Examined	-	-	-	-	-	-	-	-	59 132	122 133	513 032	470 007	727 174	1 115 005
		Confirmed with RDT	-	-	-	-	-	-	-	-	16 394	57 014	249 379	319 935	276 963	422 633
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Region of the Americas		Presumed and confirmed	440	215	125	122	115	252	212	387	130	86	72	18	4	4
		Microscopy examined	7 949	6 685	5 043	3 977	3 018	3 018	6 353	6 353	5 157	-	2 547	7 872	12 694	4 913
	Argentina	Confirmed with microscopy	440	215	125	122	115	252	212	387	130	86	72	18	4	4
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Imported cases	-	-	-	-	-	-	-	-	-	-	46	18	4	4
		Presumed and confirmed	2	4	1	3	2	1	49	6	14	0	1	6	0	-
		Microscopy examined	22	-	-	34	17	9	546	-	35	-	27 272	31 013	-	-
	Bahamas[2]	Confirmed with microscopy	2	4	1	3	2	1	49	6	14	-	1	6	-	-
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-

WHO region	Country/area		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Region of the Americas	Belize	Presumed and confirmed	1486	1162	1134	1084	1066	1549	844	845	540	256	150	79	37	26
		Microscopy examined	18559	18173	15480	15480	17358	25119	25755	22134	25550	26051	27366	22996	20789	25351
		Confirmed with microscopy	1486	1162	1134	1084	1066	1549	844	845	540	256	150	79	37	26
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	4
	Bolivia (Plurinational State of)	Presumed and confirmed	31469	15765	14276	20343	14910	20142	18995	14610	9748	9743	13769	7143	7415	7342
		Microscopy examined	143990	122933	137509	158299	163307	202021	208616	180316	159826	132633	133463	143272	121944	133260
		Confirmed with microscopy	31469	15765	14276	20343	14910	20142	18995	14610	9748	9234	12252	6108	6293	6272
		RDT Examined	-	-	-	-	5000	6000	6000	1500	5000	981	7394	7390	10960	10879
		Confirmed with RDT	-	-	-	-	-	1300	730	-	-	509	1517	1035	1122	1070
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Brazil	Presumed and confirmed	613241	388303	348259	408886	465004	606067	549469	458652	315746	309316	334667	267146	242758	178546
		Microscopy examined	2562576	2274610	2118491	2009414	2194780	2660539	2959489	2986381	2726433	2620787	2711432	2476335	2325775	1873518
		Confirmed with microscopy	613241	388303	348259	408886	465004	606067	549469	458652	315746	309316	334667	266713	237978	174048
		RDT Examined	-	-	-	-	-	-	-	-	-	90275	-	1486	23566	19500
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	433	4780	3719
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Colombia	Presumed and confirmed	144432	231233	204916	180956	142241	121629	120096	125262	79230	79347	117650	64309	60179	51722
		Microscopy examined	478820	747079	686635	640453	562681	493562	451240	564755	470381	428004	521342	396861	346599	284332
		Confirmed with microscopy	144432	231233	204916	180956	142241	121629	120096	125262	79230	79252	117637	60121	50938	44293
		RDT Examined	-	-	-	-	-	-	-	25000	22754	8362	-	21171	70168	42732
		Confirmed with RDT	-	-	-	-	-	-	-	3200	1329	95	13	4188	9241	7403
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Costa Rica	Presumed and confirmed	1879	1363	1021	718	1289	3541	2903	1223	966	262	114	17	8	6
		Microscopy examined	61261	43053	17738	9622	9204	12767	24498	22641	17304	4829	15599	10690	7485	16774
		Confirmed with microscopy	1879	1363	1021	718	1289	3541	2903	1223	966	262	114	17	8	6
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Imported cases	-	-	-	-	-	-	-	-	-	-	4	6	1	4
	Dominican Republic	Presumed and confirmed	1233	1038	1296	1529	2355	3837	3525	2711	1840	1643	2482	1616	952	579
		Microscopy examined	427297	411431	391216	349717	322948	397108	446839	435649	381010	353336	469052	421405	415808	431683
		Confirmed with microscopy	1233	1038	1296	1529	2355	3837	3525	2711	1840	1643	2482	1616	952	579
		RDT Examined	-	-	-	-	-	-	-	-	-	-	26585	56150	90775	71000
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	932	-	-	-
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ecuador	Presumed and confirmed	104528	108903	86757	52065	28730	17050	9863	8464	4891	4120	1888	1233	558	378
		Microscopy examined	544646	538757	403225	433244	357633	358361	318132	352426	384800	446740	481030	460785	459157	397628
		Confirmed with microscopy	104528	108903	86757	52065	28730	17050	9863	8464	4891	4120	1888	1233	558	378
		RDT Examined	-	-	-	-	-	-	-	-	2758	4992	7800	-	-	-
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	14	14	10
	El Salvador	Presumed and confirmed	753	362	117	85	112	67	49	40	33	20	24	15	19	7
		Microscopy examined	279072	111830	115378	102053	94819	102479	113754	95857	97872	83031	115256	100883	124885	103748
		Confirmed with microscopy	753	362	117	85	112	67	49	40	33	20	24	15	19	7
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	1	-	-
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	1	-	-
		Imported cases	-	-	-	-	-	-	-	-	-	-	7	6	6	1
	French Guiana, France	Presumed and confirmed	3708	3823	3661	3839	3038	3414	4074	4828	3265	3462	1608	1209	900	875
		Microscopy examined	48162	44718	44718	32402	32402	32402	32402	32402	11994	20065	14373	14429	13638	22327
		Confirmed with microscopy	3708	3823	3661	3839	3038	3414	4074	2797	1341	1433	688	505	401	324
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Confirmed with RDT	-	-	-	-	-	-	-	2031	1979	2029	944	704	499	551
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Guatemala	Presumed and confirmed	53311	35824	35540	31127	28955	39571	31093	15382	7198	7080	7198	6817	5346	6214
		Microscopy examined	246642	198114	197113	156227	148729	178726	168958	129410	173678	154651	235075	195080	186645	171405
		Confirmed with microscopy	53311	35824	35540	31127	28955	39571	31093	15382	7198	7080	7384	6817	5346	6214
		RDT Examined	-	-	-	-	-	-	-	3000	2000	2000	2000	-	0	0
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	0	-	0	0
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Annex 6B – Reported malaria cases by method of confirmation, 2000–2013 (continued)

WHO region	Country/area		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Region of the Americas	Guyana	Presumed and confirmed	24018	27122	21895	27627	28866	38984	21064	11656	11815	13673	22935	29471	31601	31479
		Microscopy examined	209197	211221	175966	185877	151938	210429	202688	178005	137247	169309	212863	201693	196622	205903
		Confirmed with microscopy	24018	27122	21895	27627	28866	38984	21064	11656	11815	13673	22935	29471	31601	31479
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	35	-	0
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	35	55	-
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Haiti	Presumed and confirmed	16897	9837	-	-	10802	21778	32739	29825	36774	49535	84153	32969	25423	109625
		Microscopy examined	21190	51067	-	-	30440	3541506	87951	142518	168950	270438	270427	180227	161236	165823
		Confirmed with microscopy	16897	9837	-	-	10802	21778	32739	29825	36774	49535	84153	32969	25423	20586
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	-	5586
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Honduras	Presumed and confirmed	35125	24149	17223	14063	17134	15943	11947	10512	8368	9313	9685	7618	6439	5428
		Microscopy examined	175577	174430	178616	137522	144516	152557	125266	130255	119484	108522	148243	151785	137165	144436
		Confirmed with microscopy	35125	24149	17223	14063	17134	15943	11947	10512	8368	9313	9685	7618	6439	5364
		RDT Examined	-	-	-	-	-	2500	2500	-	-	4000	4000	4000	4000	858
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	0	-	45	10	64
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Jamaica[2]	Presumed and confirmed	7	6	7	9	141	88	194	199	22	22	12	9	5	-
		Microscopy examined	874	596	725	394	3879	2470	6821	-	30732	34149	10763	5042	3687	123
		Confirmed with microscopy	7	6	7	9	141	88	194	199	22	22	12	9	5	-
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Mexico	Presumed and confirmed	7390	4996	4624	3819	3406	2967	2514	2361	2357	2703	1226	1124	833	499
		Microscopy examined	2003569	1857233	1852553	1565155	1454575	1559076	1345915	1430717	1246780	1240087	1192081	1035424	1025659	1017508
		Confirmed with microscopy	7390	4996	4624	3819	3406	2967	2514	2361	2357	2703	1226	1130	842	499
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Imported cases	-	-	-	-	-	-	-	-	-	-	7	6	9	4
	Nicaragua	Presumed and confirmed	23878	10482	7695	6717	6897	6642	3114	1356	762	610	692	925	1235	1194
		Microscopy examined	509443	482919	491689	448913	492319	516313	464581	521464	533173	544717	535914	521904	536278	517141
		Confirmed with microscopy	23878	10482	7695	6717	6897	6642	3114	1356	762	610	692	925	1235	1194
		RDT Examined	-	-	-	-	-	-	11563	16173	10000	9000	18500	14021	16444	19029
		Confirmed with RDT	-	-	-	-	-	-	-	0	0	0	0	-	0	-
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Panama	Presumed and confirmed	1036	928	2244	4500	5095	3667	1663	1281	744	778	418	354	844	705
		Microscopy examined	149702	156589	165796	166807	171179	208582	212254	204193	200574	158481	141038	116588	107711	93624
		Confirmed with microscopy	1036	928	2244	4500	5095	3667	1663	1281	744	778	418	354	844	705
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	0	0	0
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	0	0	0
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Paraguay	Presumed and confirmed	6853	2710	2778	1392	694	376	823	1341	341	91	27	10	15	11
		Microscopy examined	97026	71708	99338	126582	97246	85942	111361	92339	94316	64660	62178	48611	24806	24806
		Confirmed with microscopy	6853	2710	2778	1392	694	376	823	1341	341	91	27	10	15	11
		RDT Examined	-	-	-	-	-	-	-	-	1997	-	-	-	-	-
		Confirmed with RDT	-	-	-	-	-	-	-	-	7	-	-	-	-	-
		Imported cases	-	-	-	-	-	-	-	-	-	-	9	9	15	11
	Peru	Presumed and confirmed	68321	78544	99237	88408	93581	87699	64925	50797	44522	42645	31545	25005	31436	43139
		Microscopy examined	1483816	1417423	1582385	1485012	1438925	1438925	1438925	1438925	796337	-	744627	702894	758723	863790
		Confirmed with microscopy	68321	78544	99237	88408	93581	87699	64925	50797	44522	42645	31545	25005	31436	43139
		RDT Examined	-	-	-	-	-	-	-	-	64953	-	23	58	562	858
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	1	34	134	329
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Suriname	Presumed and confirmed	11361	16003	12837	10982	8378	9131	3289	1104	2086	2499	1712	750	345	729
		Microscopy examined	63377	67369	68070	43241	56975	59855	45722	31768	28137	33279	16533	15135	17464	13693
		Confirmed with microscopy	11361	16003	12837	10982	8378	9131	3289	1104	2086	1842	1574	751	306	530
		RDT Examined	-	-	-	-	-	-	-	2224	1774	1438	541	135	3346	6043
		Confirmed with RDT	-	-	-	-	-	-	-	637	623	538	138	20	50	199
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-

WHO region	Country/area		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Region of the Americas	Venezuela (Bolivarian Republic of)	Presumed and confirmed	29736	20006	29491	31719	46655	45049	37062	41749	32037	35828	45155	45824	52803	78643
		Microscopy examined	261866	198000	278205	344236	420165	420165	479708	392197	414137	370258	400495	382303	410663	476764
		Confirmed with microscopy	29736	20006	29491	31719	46655	45049	37062	41749	32037	35828	45155	45824	52803	78643
		RDT Examined	-	-	-	-	-	-	-	4141	-	-	-	-	-	-
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Eastern Mediterranean	Afghanistan	Presumed and confirmed	203911	364243	626839	585602	273377	326694	414407	456490	467123	390729	392463	482748	391365	319742
		Microscopy examined	257429	-	-	-	248946	338253	460908	504856	549494	521817	524523	531053	511408	507145
		Confirmed with microscopy	94475	-	415356	360940	242022	116444	86129	92202	81574	64880	69397	77549	54840	39263
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	0	0	0
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	0	0	0
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Djibouti	Presumed and confirmed	4667	4312	5021	5036	2142	2469	6457	4694	3528	2686	1010	232	25	1684
		Microscopy examined	-	-	-	-	-	1913	-	3461	2896	-	-	124	1410	7189
		Confirmed with microscopy	-	-	-	5036	122	413	1796	210	119	2686	1010	-	22	939
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	-	7	745
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Egypt[2]	Presumed and confirmed	17	11	10	45	43	23	29	30	80	94	85	116	206	262
		Microscopy examined	1155904	1357223	1041767	-	-	-	-	23402	34880	41344	664294	-	818600	-
		Confirmed with microscopy	17	11	10	45	43	23	29	30	80	94	85	116	206	262
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Imported cases	17	11	10	45	43	23	29	30	80	94	85	116	206	262
	Iran (Islamic Republic of)	Presumed and confirmed	19716	19303	15558	23562	13821	18966	15909	15712	11460	6122	3031	3239	1629	1373
		Microscopy examined	1732778	1867500	1416693	1358262	1326108	1674895	1131261	1074196	966150	744586	614817	530470	479655	385172
		Confirmed with microscopy	19716	19303	15558	23562	13821	18966	15909	15712	11460	6122	3031	3239	1629	1373
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	0	-
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	-	0	-
		Imported cases	7422	10379	6436	6502	6219	4570	2782	2434	3111	1645	1184	1529	842	854
	Iraq	Presumed and confirmed	1860	1265	952	347	155	47	24	3	6	1	7	11	8	8
		Microscopy examined	-	997812	1072587	681070	913400	944163	970000	844859	1105054	1493143	1849930	2097732	1963638	1796587
		Confirmed with microscopy	1860	1265	952	347	155	47	24	3	6	1	7	11	8	8
		RDT Examined	-	-	-	-	-	10824	-	-	-	-	-	-	0	-
		Confirmed with RDT	-	-	-	-	-	0	-	-	-	-	-	0	0	-
		Imported cases	-	-	-	3	5	3	1	1	4	1	7	11	8	8
	Morocco[1]	Presumed and confirmed	59	59	107	73	56	100	83	75	142	145	218	312	364	314
		Microscopy examined	277671	335723	345173	405800	405601	-	-	367705	292826	290566	232598	171400	285039	108432
		Confirmed with microscopy	59	59	107	73	56	100	83	75	142	145	218	312	364	314
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	0	0
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	-	0	0
		Imported cases	56	59	88	69	55	100	83	75	142	145	215	312	364	314
	Oman[2]	Presumed and confirmed	694	635	590	740	615	544	443	705	965	898	1193	1531	2051	1451
		Microscopy examined	494884	521552	495826	409532	326127	258981	242635	244346	245113	234803	226009	267353	269990	230041
		Confirmed with microscopy	694	635	590	740	615	544	443	705	965	898	1193	1531	2051	1451
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	0	0
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	-	0	0
		Imported cases	688	633	584	734	615	544	443	701	957	898	1169	1518	2029	1440
	Pakistan	Presumed and confirmed	3337054	3577845	4238778	4210611	1958350	4022823	4314637	4553732	4658701	4242032	4281356	4065802	4285449	3472727
		Microscopy examined	-	3572425	3399524	4577037	4243108	4776274	4490577	4905561	3775793	3655272	4281346	4168648	4497330	3933321
		Confirmed with microscopy	82526	125292	107666	125152	126719	127826	124910	128570	104454	132688	220870	287592	250526	196078
		RDT Examined	-	-	-	-	-	-	-	-	-	243521	279724	518709	410949	628504
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	34891	19721	46997	40255	85677
		Imported cases	-	-	-	2592	1101	290	1149	190	120	-	-	-	-	-
	Saudi Arabia	Presumed and confirmed	6608	3074	2612	1724	1232	1059	1278	2864	1491	2333	1941	2788	3406	2513
		Microscopy examined	-	821860	825443	819869	780392	715878	804087	1015781	1114841	1078745	944723	1062827	1186179	1309783
		Confirmed with microscopy	6608	3074	2612	1724	1232	1059	1278	2864	1491	2333	1941	2788	3406	2513
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	0	-
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	-	0	-
		Imported cases	1872	1471	1402	1024	924	855	1008	2397	1430	2275	1912	2719	3324	2479

Annex 6B – Reported malaria cases by method of confirmation, 2000–2013 (continued)

WHO region	Country/area		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Eastern Mediterranean	Somalia	Presumed and confirmed	10364	10364	96922	23349	36732	28404	49092	50444	82980	72362	24553	41167	59709	36298
		Microscopy examined	-	-	21350	12578	30127	47882	-	-	73985	59181	20593	26351	-	17519
		Confirmed with microscopy	-	-	15732	7571	11436	12516	16430	16675	36905	25202	5629	1627	18842	1537
		RDT Examined	-	-	-	-	-	-	-	-	-	-	200105	35236	-	19441
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	18924	1724	-	8933
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sudan	Presumed and confirmed	-	-	-	-	-	-	-	-	-	-	-	-	-	#N/A!
		Microscopy examined	-	-	-	-	-	-	-	-	-	-	-	-	-	#N/A!
		Confirmed with microscopy	-	-	-	-	-	-	-	-	-	-	-	-	-	#N/A!
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	-	#N/A!
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	-	-	#N/A!
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	#N/A!
	Syrian Arab Republic[2]	Presumed and confirmed	42	79	27	24	13	28	34	37	51	39	23	48	42	22
		Microscopy examined	-	-	-	-	-	-	-	68000	-	25751	19151	25109	19136	18814
		Confirmed with microscopy	42	79	27	24	13	28	34	37	51	39	23	48	42	22
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	0	-
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	0	0	-
		Imported cases	36	16	12	22	12	28	34	37	51	39	23	48	42	22
	Yemen	Presumed and confirmed	1394495	-	187159	265032	158561	200560	217270	223299	158608	138579	198963	142147	165678	149451
		Microscopy examined	-	-	556143	398472	501747	472970	799747	585015	781318	797621	645463	645093	685406	723691
		Confirmed with microscopy	1394495	-	75508	50811	48756	44150	55000	67607	43545	53445	78269	60207	68849	63484
		RDT Examined	-	-	-	-	-	-	-	303	5015	18566	97289	108110	150218	157457
		Confirmed with RDT	-	-	-	-	-	-	-	70	661	2001	28428	30203	41059	39294
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
European	Armenia[1]	Presumed and confirmed	141	79	52	29	47	7	230	1	1	0	1	-	-	-
		Microscopy examined	356	174	165	126	220	209	230	658	30761	31467	31026	-	-	-
		Confirmed with microscopy	141	79	52	29	47	7	0	1	1	0	1	-	-	-
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Confirmed with RDT	0	0	0	0	0	0	0	0	0	0	-	-	-	-
		Imported cases	-	-	-	-	-	-	0	1	1	0	1	0	-	-
	Azerbaijan	Presumed and confirmed	1526	1058	506	482	386	242	143	110	73	80	52	8	4	4
		Microscopy examined	527688	536260	507252	536822	545145	515144	498697	465033	408780	451436	456652	449168	497040	432810
		Confirmed with microscopy	1526	1058	506	482	386	242	143	110	73	80	52	8	4	4
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	0	-	-	-	-
		Imported cases	-	-	-	-	-	-	0	1	1	2	2	4	1	4
	Georgia[2]	Presumed and confirmed	173	438	472	315	256	155	60	25	8	7	0	6	5	7
		Microscopy examined	-	3574	6145	5457	3365	5169	4400	3400	4398	4120	2368	2032	1046	192
		Confirmed with microscopy	245	438	474	316	257	155	60	25	8	7	0	6	5	7
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Confirmed with RDT	0	0	0	0	0	0	0	0	0	0	-	-	-	-
		Imported cases	-	-	-	-	-	-	1	0	2	6	0	5	4	7
	Kyrgyzstan[2]	Presumed and confirmed	12	28	2743	468	93	226	318	96	18	4	6	5	3	4
		Microscopy examined	70500	72020	69807	144070	79895	114316	74729	62444	40833	33983	30190	27850	18268	54249
		Confirmed with microscopy	12	28	2743	468	93	226	318	96	18	4	6	5	3	4
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Confirmed with RDT	0	0	0	0	0	0	0	0	0	0	-	-	-	-
		Imported cases	-	-	-	-	-	-	1	0	0	0	3	5	3	4
	Russian Federation[2]	Presumed and confirmed	795	898	642	533	382	205	143	122	96	107	102	85	-	-
		Microscopy examined	-	-	-	-	-	-	-	35784	28340	27382	33024	28311	-	-
		Confirmed with microscopy	795	898	642	533	382	205	143	122	96	107	102	85	-	-
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Confirmed with RDT	0	0	0	0	0	0	0	0	0	0	-	-	-	-
		Imported cases	-	-	-	-	-	-	41	42	47	107	101	83	-	-
	Tajikistan	Presumed and confirmed	19064	11387	6160	5428	3588	2309	1344	635	318	165	112	78	33	14
		Microscopy examined	233785	248565	244632	296123	272743	216197	175894	159232	158068	165266	173523	173367	209239	213916
		Confirmed with microscopy	19064	11387	6160	5428	3588	2309	1344	635	318	165	112	78	33	14
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Imported cases	-	-	-	-	-	-	28	7	0	1	1	13	15	7

WHO region	Country/area		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
European	Turkey	Presumed and confirmed	11 432	10 812	10 224	9 222	5 302	2 084	796	358	215	84	78	128	376	285
		Microscopy examined	1 597 290	1 550 521	1 320 010	1 187 814	1 158 673	1 042 509	934 839	775 502	616 570	606 875	507 841	421 295	337 830	255 125
		Confirmed with microscopy	11 432	10 812	10 224	9 222	5 302	2 084	796	358	215	84	78	128	376	285
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Confirmed with RDT	0	0	0	0	0	0	0	0	0	0	-	-	-	-
		Imported cases	-	-	-	-	-	-	29	29	49	46	69	127	157	251
	Turkmenistan[1]	Presumed and confirmed	24	8	18	7	3	1	1	0	1	0	0	-	-	-
		Microscopy examined	50 105	50 075	59 834	72 643	71 377	56 982	58 673	65 666	75 524	94 237	81 784	-	-	-
		Confirmed with microscopy	24	8	18	7	3	1	1	0	1	0	0	-	-	-
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Imported cases	-	-	-	-	-	-	0	0	1	0	0	0	-	-
	Uzbekistan	Presumed and confirmed	126	77	74	74	66	102	76	89	27	4	5	1	1	3
		Microscopy examined	735 164	691 500	735 164	812 543	893 187	917 843	924 534	858 968	883 807	916 839	921 364	886 243	805 761	908 301
		Confirmed with microscopy	126	77	74	74	66	102	76	89	27	4	5	1	1	3
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	0	-	-	-	-
		Imported cases	-	-	-	-	-	-	3	2	20	4	2	1	1	3
South-East Asia	Bangladesh	Presumed and confirmed	437 838	320 010	313 859	489 377	386 555	290 418	164 159	59 866	168 885	79 853	91 227	51 773	29 518	3 864
		Microscopy examined	360 300	250 258	275 987	245 258	185 215	220 025	209 991	266 938	336 505	397 148	308 326	270 253	253 887	74 755
		Confirmed with microscopy	55 599	54 216	62 269	54 654	58 894	48 121	32 857	58 659	50 004	25 203	20 519	20 232	4 016	1 866
		RDT Examined	-	-	-	-	-	-	-	3 199	106 001	156 639	152 936	119 849	35 675	19 171
		Confirmed with RDT	-	-	-	-	-	-	-	1 207	34 686	38 670	35 354	31 541	5 885	1 998
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bhutan	Presumed and confirmed	5 935	5 982	6 511	3 806	2 670	1 825	1 868	793	450	1 421	487	207	82	45
		Microscopy examined	76 445	65 974	74 696	61 246	54 892	60 152	66 079	51 446	47 268	62 341	54 709	44 481	42 512	31 632
		Confirmed with microscopy	5 935	5 982	6 511	3 806	2 670	1 825	1 868	793	329	972	436	194	82	45
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	0	23
	Democratic People's Republic of Korea	Presumed and confirmed	204 428	300 000	241 192	60 559	33 803	11 507	9 353	4 795	16 989	14 845	13 520	16 760	21 850	14 407
		Microscopy examined	-	143 674	129 889	32 083	-	-	-	7 985	24 299	34 818	25 147	26 513	39 238	71 453
		Confirmed with microscopy	90 582	143 674	16 578	16 538	27 090	11 315	12 983	4 795	16 989	14 845	13 520	16 760	21 850	14 407
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Imported cases	-	-	-	-	-	-	-	-	378	213	-	-	-	-
	India	Presumed and confirmed	2 031 790	2 085 484	1 841 227	1 869 403	1 915 363	1 816 569	1 785 109	1 508 927	1 532 497	1 563 574	1 599 986	1 310 656	1 067 824	881 730
		Microscopy examined	86 790 375	90 389 019	91 617 725	99 136 143	97 111 526	104 120 792	106 606 703	86 355 000	86 734 579	103 396 076	108 679 429	108 969 660	109 033 790	113 109 094
		Confirmed with microscopy	2 031 790	2 085 484	1 841 227	1 869 403	1 915 363	1 816 569	1 785 109	1 508 927	1 532 497	1 563 574	1 599 986	1 310 656	1 067 824	881 730
		RDT Examined	-	-	-	-	-	-	-	8 500 000	9 000 000	9 100 000	10 600 000	10 500 384	13 125 480	14 782 104
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Indonesia	Presumed and confirmed	1 432 178	2 776 477	2 416 039	2 554 223	3 016 262	1 445 831	1 320 581	1 140 423	746 119	544 470	1 963 807	2 384 260	2 051 425	1 833 256
		Microscopy examined	1 752 763	1 604 573	1 440 320	1 224 232	1 109 801	1 178 457	1 233 334	1 750 000	1 243 744	1 420 795	1 335 445	962 090	1 429 139	1 447 980
		Confirmed with microscopy	245 612	267 592	273 793	223 074	268 852	437 323	347 597	333 792	266 277	199 577	465 764	422 447	417 819	343 527
		RDT Examined	-	-	-	-	-	19 164	12 990	-	462 249	1 040 633	255 733	250 709	471 586	260 181
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	72 914	-	-	-	-
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Myanmar	Presumed and confirmed	581 560	661 463	721 739	716 806	602 888	516 041	538 110	520 887	634 280	591 492	693 124	567 452	480 586	315 509
		Microscopy examined	381 610	463 194	467 871	481 201	432 581	437 387	485 251	512 862	499 296	381 424	275 374	312 689	265 135	138 473
		Confirmed with microscopy	120 083	170 502	173 096	177 530	152 070	165 737	203 071	216 510	223 174	164 965	103 285	91 752	75 220	26 509
		RDT Examined	-	-	-	-	-	-	-	499 725	543 941	599 216	729 878	795 618	1 158 831	1 162 083
		Confirmed with RDT	-	-	-	-	-	-	-	157 448	223 899	271 103	317 523	373 542	405 366	307 362
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Nepal	Presumed and confirmed	48 686	146 351	133 431	196 605	140 687	178 056	166 474	135 809	153 331	123 903	96 383	71 752	70 272	38 113
		Microscopy examined	100 063	126 962	183 519	196 223	158 044	188 930	166 476	135 809	153 331	150 230	102 977	95 011	152 780	100 336
		Confirmed with microscopy	7 981	6 396	12 750	9 506	4 895	5 050	4 969	5 621	3 888	3 335	3 115	1 910	1 659	1 197
		RDT Examined	-	-	-	-	-	-	-	-	-	-	17 887	25 353	22 472	32 989
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	779	1 504	433	777
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Annex 6B – Reported malaria cases by method of confirmation, 2000–2013 (continued)

WHO region	Country/area		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
	Sri Lanka	Presumed and confirmed	210039	66522	41411	10510	3720	1640	591	198	670	558	684	175	93	95
		Microscopy examined	1781372	1353386	1390850	1192259	1198181	974672	1076121	1047104	1047104	909632	1001107	985060	948250	1236580
		Confirmed with microscopy	210039	66522	41411	10510	3720	1640	591	198	670	558	736	175	93	95
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Imported cases	-	-	-	-	-	-	-	-	-	-	52	51	70	95
	Thailand	Presumed and confirmed	78561	63528	44555	37355	26690	29782	30294	33178	28569	29462	32480	24897	32569	33302
		Microscopy examined	4403739	4100778	3819773	3256939	3012710	2524788	2280070	2041733	1910982	1816383	1695980	1354215	1130757	1830090
		Confirmed with microscopy	78561	63528	44555	37355	26690	29782	30294	33178	26150	23327	22969	14478	32569	33302
		RDT Examined	-	-	-	-	-	-	-	-	20786	68437	81997	96670	-	-
		Confirmed with RDT	-	-	-	-	-	-	-	-	2419	6135	9511	10419	-	-
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Timor-Leste	Presumed and confirmed	15212	83049	86684	33411	202662	130679	164413	121905	143594	108434	119072	36064	6148	1042
		Microscopy examined	-	-	60311	83785	79459	97781	96485	114283	92870	96828	109806	82175	64318	56192
		Confirmed with microscopy	15212	-	26651	33411	39164	43093	37896	46869	45973	41824	40250	19739	5211	1025
		RDT Examined	-	-	-	-	-	-	-	32027	30134	41132	85643	127272	117599	121991
		Confirmed with RDT	-	-	-	-	-	-	-	5944	5287	5703	7887	-	-	-
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Western Pacific	Cambodia	Presumed and confirmed	203164	110161	100194	119712	91855	67036	89109	59848	58887	83777	47910	51611	45553	24130
		Microscopy examined	122555	121691	108967	106330	99593	88991	94460	135731	130995	96886	90175	86526	80212	54716
		Confirmed with microscopy	51320	42150	38048	42234	37389	26914	33010	22081	20347	24999	14277	13792	10124	4598
		RDT Examined	18167	23928	24954	54024	51359	58791	102590	46989	51036	94788	103035	130186	108974	94600
		Confirmed with RDT	11122	11451	8854	29031	22356	22522	45686	20437	21777	39596	35079	43631	30352	16711
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	China	Presumed and confirmed	-	26945	172200	169828	145676	100106	116260	133699	135467	14598	7855	4498	2716	4127
		Microscopy examined	-	5391809	5641752	4635132	4212559	3814715	3995227	3958190	4316976	4637168	7115784	9189270	6918657	5554960
		Confirmed with microscopy	-	21237	25520	28491	27197	21936	35383	29304	16650	9287	4990	3367	2603	4086
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lao People's Democratic Republic	Presumed and confirmed	279903	103983	85192	88657	53808	30359	20468	20364	19347	22800	23047	17904	46819	41385
		Microscopy examined	256273	226399	245916	256534	181259	156954	113165	159002	168027	173459	150512	213578	223934	202422
		Confirmed with microscopy	40106	27076	21420	18894	16183	13615	8093	6371	4965	5508	4524	6226	13232	10036
		RDT Examined	-	-	-	-	-	-	95676	113694	143368	84511	127790	7743	145425	133337
		Confirmed with RDT	-	-	-	-	-	-	10289	11087	14382	9166	16276	11609	32970	28095
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Malaysia	Presumed and confirmed	12705	12780	11019	6338	6154	5569	5294	5456	7390	7010	6650	5306	4725	3850
		Microscopy examined	1832802	1808759	1761721	1632024	1577387	1425997	1388267	1565033	1562148	1565982	1619074	1600439	1566872	1576012
		Confirmed with microscopy	12705	12780	11019	6338	6154	5569	5294	5456	7390	7010	6650	5306	4725	3850
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Imported cases	-	-	-	-	-	-	-	-	873	584	831	1142	924	865
	Papua New Guinea	Presumed and confirmed	1751883	1643075	1587580	1650662	1868413	1788318	1676681	1618699	1606843	1431395	1379787	1151343	878371	1125808
		Microscopy examined	225535	254266	227387	205103	222903	267132	223464	239956	240686	128335	198742	184466	156495	139972
		Confirmed with microscopy	79839	94484	75748	72620	91055	92957	88817	82979	81657	62845	75985	70603	67202	70658
		RDT Examined	-	-	-	-	-	-	10756	7643	5955	25150	20820	27391	228857	468380
		Confirmed with RDT	-	-	-	-	-	-	5121	3976	2795	14913	17971	13457	82993	209336
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Philippines	Presumed and confirmed	36596	34968	37005	48441	50850	46342	35405	36235	23655	19316	18560	9552	7133	6514
		Microscopy examined	-	-	-	-	-	581871	378535	403415	278652	352006	301031	327060	332063	317360
		Confirmed with microscopy	-	-	-	-	-	-	-	36235	23655	19316	18560	9552	7133	5826
		RDT Examined	-	-	-	-	-	12125	18171	4839	-	-	-	-	-	1523
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	-	-	688
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Republic of Korea	Presumed and confirmed	4183	2556	1799	1171	864	1369	2051	2227	1052	1345	1772	838	555	443
		Microscopy examined	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Confirmed with microscopy	-	-	-	-	-	-	-	2227	1052	1345	1772	838	555	443
		RDT Examined	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Imported cases	-	-	-	-	-	-	-	-	-	36	56	64	47	50

WHO region	Country/area		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Western Pacific		Presumed and confirmed	368 913	373 838	353 114	208 364	412 251	393 288	403 892	150 126	102 140	84 078	95 006	80 859	57 296	53 270
		Microscopy examined	300 806	297 345	278 178	300 591	321 954	316 898	328 555	311 447	276 639	231 221	212 329	182 847	202 620	191 137
	Solomon Islands	Confirmed with microscopy	68 107	76 493	74 936	92 227	90 297	76 390	75 337	65 404	40 535	33 002	35 373	23 202	21 904	21 540
		RDT Examined	-	-	-	-	-	-	-	-	-	-	17 300	17 457	13 987	26 216
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	4 331	3 455	2 479	4 069
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Presumed and confirmed	33 779	19 493	35 151	43 386	42 008	34 912	30 067	20 215	24 279	22 271	16 831	5 764	3 435	2 381
		Microscopy examined	31 668	36 576	54 234	54 524	53 524	61 092	40 625	38 214	30 267	24 813	29 180	19 183	16 981	15 219
	Vanuatu	Confirmed with microscopy	6 768	7 647	14 339	15 240	14 653	9 834	8 055	5 471	3 473	3 615	4 013	2 077	733	767
		RDT Examined	-	-	-	-	-	-	-	-	1 639	2 065	10 246	12 529	16 292	13 724
		Confirmed with RDT	-	-	-	-	-	-	-	-	292	574	4 156	2 743	2 702	1 614
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Presumed and confirmed	274 910	188 122	151 961	135 989	108 350	84 473	74 766	59 601	51 668	49 186	54 297	45 588	43 717	35 406
		Microscopy examined	2 682 862	2 821 440	2 856 539	2 738 600	2 694 854	2 728 481	2 842 429	3 634 060	1 297 365	2 829 516	2 760 119	2 791 917	2 897 730	2 684 996
		Confirmed with microscopy	74 316	68 699	47 807	38 790	24 909	19 496	22 637	16 389	11 355	16 130	17 515	16 612	19 638	17 128
	Viet Nam	RDT Examined	-	10 000	94 000	-	-	-	130 000	78 294	72 087	44 647	7 017	491 373	514 725	412 530
		Confirmed with RDT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Imported cases	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Regional Summary (Presumed and confimed malaria cases)			**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
		African	35 663 718	46 972 829	49 768 299	81 949 918	88 223 698	87 111 881	86 318 735	88 382 497	79 363 959	106 901 538	116 038 775	110 369 629	118 654 354	122 454 712
		Region of the Americas	1 181 104	982 778	895 134	889 993	909 466	1 049 444	920 506	784 591	563 429	573 032	677 183	493 667	469 155	517 151
		Eastern Mediterranean	9 312 314	7 966 892	8 228 975	8 200 465	4 528 808	7 117 410	7 137 177	8 348 266	8 459 131	7 217 208	6 370 339	5 954 145	5 874 630	4 975 791
		European	33 293	24 785	20 891	16 558	10 123	5 331	3 111	1 436	757	451	356	311	422	317
		South-East Asia	5 046 227	6 508 866	5 846 648	5 972 055	6 331 300	4 422 348	4 180 952	3 526 781	3 425 384	3 058 012	4 610 770	4 463 996	3 760 367	3 121 363
		Western Pacific	2 966 036	2 515 921	2 535 215	2 472 548	2 780 229	2 551 772	2 453 993	2 106 470	2 030 728	1 735 776	1 651 715	1 373 263	1 090 320	1 297 314
		Total	54 202 692	64 972 071	67 295 162	99 501 537	102 783 624	102 258 186	101 014 474	103 150 041	93 843 388	119 486 017	129 349 138	122 655 011	129 849 248	132 366 648

Cases reported before 2000 can be presumed and confi rmed or only confi rmed cases depending on the country

1 Armenia, Morocco and Turkmenistan are certified malaria free countries, but are included in this listing for historical purposes

2 There is no local transmission

3 In May 2013 South Sudan was reassigned to the Who African Region (WHA resolution 66.21 http://apps.who.int/gb/ebwha/pdf_fi les/WHA66/A66_R21-en.pdf). Nonetheless, since most data in this report precede 2013, South Sudan is placed in Eastern Mediterranean Region

Annex 6C – Reported malaria cases by species, 2000–2013

WHO region	Country/area		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
African	Algeria	Suspected	27 733	26 411	18 803	17 059	16 686	18 392	13 869	14 745	11 964	15 635	12 224	11 974	15 790	12 762
		No Pf	261	247	188	313	71	242	91	261	2	3	7	4	48	14
		No Pv	277	181	116	111	92	57	24	24	1	1	4	-	11	2
		No Other	-	-	-	-	-	-	-	-	0	0	1	0	0	0
	Angola	Suspected	2 080 348	1 249 767	1 862 662	3 246 258	2 489 170	2 329 316	2 283 097	3 157 924	4 713 776	5 232 136	4 591 529	4 469 357	4 849 418	5 273 305
		No Pf	-	-	-	-	-	-	53 200	237 950	271 458	-	-	-	-	-
		No Pv	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benin	Suspected	-	747 417	830 700	819 256	853 034	877 447	861 847	1 171 522	1 147 005	1 256 708	1 432 095	1 565 487	1 875 386	2 041 444
		No Pf	-	-	-	-	-	-	-	-	-	534 590	-	68 745	0	-
		No Pv	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Other	-	-	-	-	-	-	-	-	-	0	-	0	0	-
	Botswana	Suspected	71 555	48 281	28 907	23 657	22 404	11 242	23 514	30 906	41 153	32 460	12 196	1 141	308	506
		No Pf	-	-	-	-	-	-	-	381	914	951	1 046	432	193	456
		No Pv	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Burkina Faso	Suspected	-	382 593	1 221 666	1 474 440	1 581 262	1 667 622	2 138 649	2 570 507	3 892 138	4 675 363	6 037 806	5 446 870	7 852 299	7 857 296
		No Pf	-	0	0	0	0	0	0	0	0	-	-	-	-	-
		No Pv	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Other	-	-	0	0	0	0	0	0	0	-	-	-	-	-
	Burundi	Suspected	3 428 846	3 542 424	2 829 030	2 490 095	1 994 514	2 910 545	2 760 683	2 796 362	2 565 593	3 413 317	5 590 736	4 768 314	4 228 015	7 384 501
		No Pf	-	-	-	-	-	-	141 975	241 030	185 993	-	-	-	-	-
		No Pv	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cabo Verde	Suspected	6 843	7 141	8 022	6 001	9 833	7 902	8 729	8 902	9 033	21 913	-	26 508	8 715	10 621
		No Pf	144	107	76	68	45	68	160	36	70	65	47	7	1	22
		No Pv	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cameroon	Suspected	6 513 878	6 025 420	5 049 576	4 560 140	4 083 466	2 188 395	634 507	604 153	1 650 749	1 883 199	1 845 691	3 044 828	2 865 319	3 625 958
		No Pf	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Pv	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Central African Republic	Suspected	139 988	181 037	195 562	136 683	196 781	178 753	114 403	119 477	152 260	175 210	66 484	221 980	468 986	491 074
		No Pf	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Pv	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chad	Suspected	442 246	456 075	517 760	514 918	481 287	507 617	269 094	535 428	495 401	623 839	743 471	528 454	722 654	1 272 841
		No Pf	20 977	19 520	21 959	21 532	665	14 770	21 354	24 282	24 015	-	-	-	-	-
		No Pv	19 101	18 767	21 974	23 663	695	16 898	23 801	24 006	23 742	-	-	-	-	-
		No Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Comoros	Suspected	-	-	-	-	43 918	29 554	54 830	53 511	46 426	64 489	159 976	135 248	168 043	185 779
		No Pf	-	-	-	-	-	-	-	-	-	5 771	33 791	21 387	43 681	45 669
		No Pv	-	-	-	-	-	-	-	-	-	79	528	334	637	72
		No Other	-	-	-	-	-	-	-	-	-	132	880	557	1 189	363
	Congo	Suspected	-	-	-	-	-	-	157 757	210 263	243 703	260 888	446 656	277 263	117 640	209 169
		No Pf	-	-	-	-	-	-	-	103 213	117 291	92 855	-	37 744	120 319	43 232
		No Pv	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Other	-	-	-	-	-	-	-	0	0	0	-	0	0	0
	Côte d'Ivoire	Suspected	-	1 232 328	1 145 765	1 165 901	1 298 356	1 294 030	1 253 408	1 277 670	1 359 788	1 874 733	1 721 461	2 607 856	3 423 623	5 982 151
		No Pf	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Pv	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Democratic Republic of the Congo	Suspected	967 484	2 200 960	2 642 137	4 389 020	4 136 150	6 337 168	5 011 688	4 163 310	5 929 093	8 929 758	10 568 756	12 018 784	11 993 189	14 871 716
		No Pf	889	1 517	1 727	2 418	2 659	2 844	2 043	1 885	1 251	-	-	-	-	4 103 745
		No Pv	-	-	-	6	7	110	3	7	27	-	-	-	-	-
		No Other	-	-	-	-	-	-	-	-	3	-	0	0	0	0
	Equatorial Guinea	Suspected	-	-	-	-	-	-	-	26 068	72 080	90 081	83 639	40 704	45 792	44 561
		No Pf	-	-	-	-	-	-	-	5 842	7 883	11 603	53 813	22 466	15 169	13 129
		No Pv	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-

WHO region	Country/area		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
African	Eritrea	Suspected	-	138 667	121 011	107 599	65 025	64 056	49 703	80 428	62 449	77 946	96 792	97 479	138 982	134 183
		No Pf	-	8 994	5 335	8 998	3 480	7 506	5 750	8 791	5 638	3 358	9 785	10 263	12 121	12 482
		No Pv	-	722	743	1 348	639	1 567	791	6 508	2 832	3 244	3 989	4 932	9 204	7 361
		No Other	-	-	-	-	9	5	10	252	281	0	57	19	381	1 433
	Ethiopia	Suspected	-	3 014 879	3 617 056	4 129 225	5 904 132	4 727 209	3 375 994	2 844 963	3 060 407	4 335 001	5 420 110	5 487 972	5 962 646	9 243 894
		No Pf	-	233 218	262 623	291 402	396 621	374 335	293 326	269 514	274 657	594 751	732 776	814 547	946 595	1 687 163
		No Pv	-	157 625	164 772	171 387	178 676	158 658	149 020	171 710	173 300	287 114	390 252	665 813	745 983	958 291
		No Other	-	1 534	400	1 006	3 607	5 949	5 434	10 592	10 604	0	0	-	-	-
	Gabon	Suspected	127 024	132 918	157 440	166 321	230 246	294 348	214 985	287 969	298 150	114 766	233 770	178 822	238 483	256 531
		No Pf	50 810	53 167	62 976	58 212	70 075	70 644	33 458	45 186	40 701	187	2 157	-	-	26 432
		No Pv	-	-	-	-	-	-	-	-	-	23	720	-	-	-
		No Other	-	-	-	-	-	-	-	-	-	0	2 015	-	-	0
	Gambia	Suspected	-	481 590	620 767	540 165	395 043	329 426	427 598	439 798	508 846	479 409	492 062	-	1 724 884	889 494
		No Pf	-	-	-	-	-	-	-	-	-	-	64 108	190 379	271 038	175 126
		No Pv	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ghana	Suspected	3 349 528	3 044 844	3 140 893	3 552 896	3 416 033	3 452 969	3 511 452	3 123 147	3 349 781	5 489 798	5 056 851	5 067 731	12 578 946	8 444 417
		No Pf	-	-	-	-	-	-	-	457 424	918 105	924 095	926 447	593 518	3 755 166	1 629 198
		No Pv	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Other	-	-	-	-	-	-	-	19 060	38 254	38 504	102 937	31 238	0	0
	Guinea	Suspected	816 539	851 877	850 147	731 911	876 837	850 309	834 835	888 643	657 003	812 471	1 092 554	1 276 057	1 220 574	775 341
		No Pf	4 800	6 238	16 561	4 378	103 069	50 452	41 228	28 646	33 405	20 932	20 936	5 450	191 421	63 353
		No Pv	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Other	-	-	-	-	-	-	-	-	-	-	-	-	-	0
	Guinea-Bissau	Suspected	246 316	202 379	194 976	162 344	187 910	204 555	168 462	160 305	168 326	170 255	195 006	300 233	237 398	238 580
		No Pf	-	-	-	-	-	-	-	12 855	-	-	-	-	-	-
		No Pv	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Kenya	Suspected	4 216 531	3 262 931	3 342 993	5 395 518	7 577 208	9 181 224	8 926 058	9 610 691	-	8 123 689	7 557 454	13 127 058	12 883 521	14 677 837
		No Pf	-	-	-	39 383	28 328	-	-	-	839 903	-	898 531	1 002 805	1 453 471	2 335 286
		No Pv	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Liberia	Suspected	-	-	-	-	-	66 043	1 455 807	835 082	994 560	1 200 320	3 087 659	2 887 105	2 441 800	2 202 213
		No Pf	-	-	-	-	-	44 875	761 095	80 373	157 920	212 657	212 927	577 641	1 407 455	1 244 220
		No Pv	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Other	-	-	-	-	-	-	-	0	0	0	0	-	-	0
	Madagascar	Suspected	1 417 112	1 411 107	1 621 399	2 228 721	1 489 944	1 260 575	1 111 192	894 213	589 202	717 982	719 967	805 701	980 262	2 142 620
		No Pf	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Pv	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Malawi	Suspected	-	324 584	415 293	13 715 090	14 937 115	16 679 237	12 775 877	11 355 047	11 473 817	12 752 090	15 116 242	14 843 487	13 976 370	14 122 269
		No Pf	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Pv	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Mali	Suspected	3 646 212	3 823 796	2 784 001	3 358 960	2 871 098	3 688 389	4 498 949	4 786 045	5 185 082	6 183 816	6 851 108	5 734 906	6 528 505	5 787 441
		No Pf	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Pv	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Mauritania	Suspected	546 634	612 896	723 077	809 428	1 969 214	962 706	1 022 592	1 291 853	1 045 424	1 633 423	3 324 238	2 628 593	2 171 739	2 849 453
		No Pf	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Pv	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Mayotte, France	Suspected	-	243 942	224 614	318 120	224 840	223 472	217 977	222 476	202 297	181 935	250 073	162 820	172 374	135 985
		No Pf	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Pv	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Mozambique	Suspected	-	-	-	792	743	500	392	421	346	352	2 023	1 214	1 463	82
		No Pf	-	-	-	-	-	-	301	284	186	63	138	38	21	9
		No Pv	-	-	-	-	-	-	2	-	1	3	3	2	2	-
		No Other	-	-	-	-	-	-	1	1	4	18	19	0	2	-

Annex 6C – Reported malaria cases by species, 2000–2013 (continued)

WHO region	Country/area		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
African	Namibia	Suspected	-	-	-	-	-	-	-	6 155 082	4 831 491	4 310 086	6 097 263	7 059 112	6 170 561	8 200 849
		No Pf	-	-	-	-	-	-	-	-	-	-	878 009	663 132	927 841	2 998 874
		No Pv	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Niger	Suspected	-	538 512	445 803	468 259	610 799	339 204	265 595	172 024	155 399	102 956	39 855	74 407	10 844	188 004
		No Pf	-	-	-	-	-	-	-	-	1 092	505	556	335	194	136
		No Pv	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Other	-	-	-	-	-	-	-	-	0	0	0	0	0	0
	Nigeria	Suspected	-	1 340 142	888 345	681 783	766 502	889 986	982 245	3 677 661	4 493 676	4 719 439	10 616 033	3 637 778	4 250 976	5 151 131
		No Pf	-	-	-	-	53 637	74 129	44 612	54 515	60 998	77 484	601 455	757 449	817 072	1 426 696
		No Pv	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Other	-	-	-	-	2 206	1 878	1 056	1 112	1 244	1 581	18 601	23 425	25 270	5 102
	Rwanda	Suspected	2 476 608	2 253 519	2 605 381	2 608 479	3 310 229	3 532 108	3 982 372	2 969 950	2 834 174	4 295 686	3 873 463	5 221 656	11 789 970	21 659 831
		No Pf	-	-	-	-	-	-	-	-	-	-	523 513	-	-	-
		No Pv	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sao Tome and Principe	Suspected	-	1 329 106	1 519 315	1 735 774	1 915 990	2 409 080	2 379 278	2 318 079	2 096 061	3 186 306	2 708 973	3 204 542	3 095 386	6 129 170
		No Pf	-	-	-	-	-	-	-	-	316 242	698 745	638 669	208 858	483 470	962 618
		No Pv	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Senegal	Suspected	66 250	84 993	94 249	86 546	105 341	73 050	60 819	49 298	358 122	119 877	58 961	117 279	126 897	108 652
		No Pf	-	-	-	-	-	-	-	-	-	-	2 219	6 363	10 700	9 242
		No Pv	-	-	-	-	-	-	-	-	-	-	14	4	1	1
		No Other	-	-	-	-	-	-	-	-	-	-	0	6	4	0
	Sierra Leone	Suspected	1 134 587	974 256	1 000 310	1 472 764	1 240 918	1 418 091	1 645 494	1 337 550	1 031 000	947 514	1 043 632	900 903	897 943	1 119 100
		No Pf	44 959	14 261	15 261	28 272	23 171	38 746	49 366	118 332	194 234	19 614	343 670	277 326	281 080	345 889
		No Pv	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Other	-	-	-	-	-	-	-	-	-	-	-	-	1	0
	South Africa	Suspected	460 881	450 605	514 033	533 340	358 417	243 082	172 707	653 987	1 014 160	1 415 330	2 327 928	1 150 747	2 579 296	2 576 550
		No Pf	-	2 206	3 702	3 945	2 206	3 702	3 945	-	-	273 149	218 473	25 511	1 537 322	1 701 958
		No Pv	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Other	-	0	0	0	0	0	0	-	-	-	-	-	-	-
	South Sudan	Suspected	64 624	26 506	15 649	13 459	13 399	7 755	14 456	6 327	7 796	6 117	276 669	382 434	152 561	603 932
		No Pf	-	-	-	-	-	-	-	-	-	-	2 181	6 906	3 109	8 645
		No Pv	-	-	-	-	-	-	-	-	-	-	-	14	5	-
		No Other	-	-	-	-	-	-	-	-	-	-	5	15	7	0
	Swaziland	Suspected	-	237 712	462 056	646 673	515 958	337 582	116 473	101 008	201 036	325 634	900 283	795 784	1 125 039	1 855 501
		No Pf	-	-	-	-	-	-	-	-	-	-	-	112 024	-	-
		No Pv	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Togo	Suspected	29 374	35 582	23 456	19 425	11 320	10 374	11 637	6 338	5 881	6 624	1 722	797	626	669
		No Pf	0	1 395	670	342	574	279	155	84	58	106	87	-	-	-
		No Pv	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Other	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	Uganda	Suspected	-	498 826	583 872	490 256	516 942	437 662	566 450	914 590	1 193 316	1 304 772	1 419 928	893 588	1 311 047	2 885 142
		No Pf	-	-	-	-	-	-	-	220 521	344 098	191 357	224 080	237 282	260 526	272 847
		No Pv	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Other	-	-	-	-	-	-	-	0	0	195	7	23	9	8
	United Republic of Tanzania[3]	Suspected	3 552 859	5 624 032	8 079 963	10 422 022	11 697 824	10 869 875	11 539 146	13 281 631	13 020 439	14 397 480	15 332 293	12 522 232	16 845 771	24 068 702
		No Pf	-	-	546 015	785 748	861 451	1 082 223	850 050	1 024 470	959 712	1 275 310	1 565 348	231 873	2 662 258	1 502 362
		No Pv	-	-	-	-	-	-	-	-	-	-	15 812	-	-	-
		No Other	-	-	11 143	16 035	17 580	22 086	17 347	20 908	19 586	26 027	0	0	0	-
	Mainland	Suspected	81 442	384 741	494 245	13 792 604	15 007 921	16 740 283	12 821 375	11 387 904	11 496 544	13 018 946	15 388 319	15 299 205	14 513 120	0
		No Pf	17 734	18 385	16 983	15 705	11 936	7 628	1 585	293	67	211	2 338	4 489	2 730	-
		No Pv	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Other	-	-	-	-	-	-	-	-	-	0	0	0	201	-

WHO region	Country/area		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
African	Zanzibar	Suspected	3 337 796	3 838 402	3 760 335	4 346 172	4 078 234	4 121 356	4 731 338	4 248 295	3 080 301	2 976 395	4 229 839	4 607 908	4 695 400	5 465 122
		No Pf	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Pv	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Zambia	Suspected	81 442	80 309	78 952	77 514	70 806	61 046	45 498	32 857	321 406	266 856	272 077	455 718	536 750	527 957
		No Pf	17 734	18 385	16 983	15 705	11 936	7 628	1 585	293	77	211	2 338	4 489	2 730	2 194
		No Pv	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Other	-	-	-	-	-	-	-	-	0	0	0	0	201	52
	Zimbabwe	Suspected	-	-	-	-	1 815 470	1 494 518	1 313 458	1 272 731	1 089 322	867 135	912 618	480 011	727 174	1 115 005
		No Pf	-	-	-	-	-	-	-	-	-	-	249 379	319 935	276 963	422 633
		No Pv	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Other	-	-	-	-	-	-	-	-	-	-	-	0	-	-
Region of the Americas	Argentina	Suspected	7 949	6 685	5 043	3 977	3 018	3 018	6 353	6 353	5 157	86	2 547	7 872	12 694	4 913
		No Pf	1	0	0	0	0	1	1	2	0	0	-	0	0	0
		No Pv	439	215	125	122	115	251	211	385	130	86	72	18	4	4
		No Other	0	0	0	0	0	0	0	0	0	-	-	-	0	0
	Bahamas[2]	Suspected	22	4	1	34	17	9	546	6	35	0	27 272	31 013	0	-
		No Pf	-	-	-	-	2	1	-	-	13	-	-	-	-	-
		No Pv	-	-	-	-	0	0	-	-	0	-	-	-	-	-
		No Other	-	-	-	-	0	0	-	-	1	-	-	-	-	-
	Belize	Suspected	18 559	18 173	15 480	15 480	17 358	25 119	25 755	22 134	25 550	26 051	27 366	22 996	20 789	25 351
		No Pf	20	6	0	0	6	32	10	0	0	1	0	1	1	0
		No Pv	1 466	1 156	1 134	1 084	1 060	1 517	834	845	540	255	149	78	36	26
		No Other	-	0	0	0	2	0	0	0	0	0	0	0	0	0
	Bolivia (Plurinational State of)	Suspected	143 990	122 933	137 509	158 299	168 307	208 021	214 616	181 816	164 826	133 614	140 857	150 662	132 904	144 139
		No Pf	2 536	808	727	793	695	1 080	1 785	1 622	836	574	808	370	337	959
		No Pv	28 932	14 957	13 549	17 319	14 215	19 062	17 210	12 988	8 912	8 660	11 444	6 756	7 067	6 346
		No Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Brazil	Suspected	2 562 576	2 274 610	2 118 491	2 009 414	2 194 780	2 660 539	2 959 489	2 986 381	2 726 433	2 711 062	2 711 432	2 477 821	2 349 341	1 893 018
		No Pf	131 616	81 333	80 188	88 174	110 422	155 169	145 858	93 591	49 358	50 933	51 048	32 029	31 913	29 201
		No Pv	478 212	306 396	267 245	320 378	354 366	450 687	403 383	364 912	266 300	258 271	283 435	231 368	203 018	143 050
		No Other	932	574	826	298	216	211	228	149	88	112	183	143	105	32
	Colombia	Suspected	478 820	747 079	686 635	640 453	562 681	493 562	451 240	589 755	493 135	436 366	521 342	418 032	416 767	327 064
		No Pf	51 730	100 242	88 972	75 730	55 158	43 472	46 147	54 509	22 392	21 441	34 334	14 650	15 215	17 650
		No Pv	92 702	130 991	115 944	105 226	87 083	78 157	73 949	70 753	56 838	57 111	83 255	44 701	44 283	33 345
		No Other	0	0	0	0	0	0	0	0	0	0	48	16	9	11
	Costa Rica	Suspected	61 261	43 053	17 738	9 622	9 204	12 767	24 498	22 641	17 304	4 829	15 599	10 690	7 485	16 774
		No Pf	12	1	2	14	5	3	32	11	0	1	2	4	0	1
		No Pv	1 867	1 362	1 008	704	1 284	3 538	2 667	1 212	966	261	112	13	5	4
		No Other	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	Dominican Republic	Suspected	427 297	411 431	391 216	349 717	322 948	397 108	446 839	435 649	381 010	353 336	495 637	477 555	506 533	502 683
		No Pf	1 226	1 034	1 292	1 528	2 353	3 829	3 519	2 708	1 839	1 643	2 480	1 614	950	576
		No Pv	7	4	4	1	2	8	6	3	1	0	2	2	2	3
		No Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Ecuador	Suspected	544 646	538 757	403 225	433 244	357 633	358 361	318 132	352 426	387 558	451 732	488 830	460 785	459 157	397 628
		No Pf	48 974	37 491	20 015	10 724	5 891	2 212	1 596	1 158	396	551	258	296	80	161
		No Pv	55 624	71 412	66 742	41 341	22 839	14 836	8 267	7 306	4 495	3 569	1 630	937	478	217
		No Other	0	0	0	0	0	0	0	0	0	0	0	0	2	0
	El Salvador	Suspected	279 072	111 830	115 378	102 053	94 819	102 479	113 754	95 857	97 872	83 031	115 256	100 884	124 885	103 748
		No Pf	9	2	0	2	1	2	1	2	1	1	2	3	3	0
		No Pv	744	360	117	83	111	65	48	38	32	19	22	12	16	7
		No Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	French Guiana, France	Suspected	48 162	44 718	44 718	32 402	32 402	32 402	32 402	32 402	11 994	20 065	14 373	14 429	13 638	22 327
		No Pf	3 051	3 166	2 547	3 080	2 437	1 777	1 847	845	406	424	604	369	260	304
		No Pv	657	657	954	759	600	1 637	2 227	1 804	925	1 003	476	339	257	220
		No Other	214	0	160	0	0	71	27	23	10	6	5	5	2	3
	Guatemala	Suspected	246 642	198 114	197 113	156 227	148 729	178 726	168 958	132 410	175 678	156 651	237 075	195 080	186 645	171 405
		No Pf	1 474	1 044	1 841	1 310	852	1 062	804	196	50	56	35	107	54	101
		No Pv	50 171	34 772	33 695	29 817	28 103	38 641	30 289	15 182	7 148	7 024	7 163	6 707	5 278	6 062
		No Other	36	0	0	0	0	48	0	0	0	0	0	0	0	0

Annex 6C – Reported malaria cases by species, 2000–2013 (continued)

WHO region	Country/area		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Region of the Americas	Guyana	Suspected	209 197	211 221	175 966	185 877	151 938	210 429	202 688	178 005	137 247	169 309	212 863	201 728	196 622	205 903
		No Pf	12 324	12 831	10 599	12 970	12 226	16 438	9 818	4 677	5 741	7 542	14 401	15 945	16 695	13 655
		No Pv	11 694	14 291	11 296	14 654	16 141	21 255	10 560	6 712	5 927	6 029	8 402	9 066	11 225	13 953
		No Other	0	0	0	3	446	1 291	686	267	147	102	132	96	83	101
	Haiti	Suspected	21 190	51 067	-	-	30 440	3 541 506	87 951	142 518	168 950	270 438	270 427	180 227	161 236	172 624
		No Pf	16 897	9 837	-	-	10 802	21 778	32 739	29 824	36 768	49 535	84 153	32 969	25 423	20 957
		No Pv	0	0	-	-	0	0	0	1	6	0	0	0	0	0
		No Other	0	0	-	-	0	0	0	0	0	0	0	0	0	0
	Honduras	Suspected	175 577	174 430	178 616	137 522	144 516	155 057	127 766	130 255	119 484	112 522	152 243	154 761	159 165	145 294
		No Pf	1 446	938	606	540	834	998	767	813	610	1 382	985	579	560	1 113
		No Pv	33 679	23 211	16 617	13 523	16 300	14 942	11 180	9 700	7 758	7 931	8 700	6 896	5 865	4 269
		No Other	0	0	0	0	0	0	0	0	0	0	0	10	0	0
	Jamaica[2]	Suspected	874	596	725	394	3 879	2 470	6 821	199	30 732	34 149	10 763	5 042	3 687	1 441
		No Pf	-	3	-	-	-	-	-	-	21	17	-	-	-	-
		No Pv	-	2	-	-	-	-	-	-	1	4	-	-	-	-
		No Other	-	1	-	-	-	-	-	-	-	1	-	-	-	-
	Mexico	Suspected	2 003 569	1 857 233	1 852 553	1 565 155	1 454 575	1 559 076	1 345 915	1 430 717	1 246 780	1 240 087	1 192 081	1 035 424	1 025 659	1 017 508
		No Pf	131	69	19	44	49	22	16	4	0	1	0	6	9	4
		No Pv	7 259	4 927	4 605	3 775	3 357	2 945	2 498	2 357	2 357	2 702	1 226	1 124	833	495
		No Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Nicaragua	Suspected	509 443	482 919	491 689	448 913	492 319	516 313	476 144	537 637	543 173	553 717	554 414	535 925	552 722	536 170
		No Pf	1 369	1 194	995	1 213	1 200	1 114	336	106	61	93	154	150	236	219
		No Pv	22 645	9 304	6 700	5 525	5 699	5 498	2 784	1 250	701	517	538	775	999	974
		No Other	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	Panama	Suspected	149 702	156 589	165 796	166 807	171 179	208 582	212 254	204 193	200 574	158 481	141 038	116 588	107 711	93 624
		No Pf	45	39	337	627	882	766	62	48	4	3	20	1	1	6
		No Pv	991	889	1 907	3 873	4 213	2 901	1 601	1 233	740	775	398	353	843	699
		No Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Paraguay	Suspected	97 026	71 708	99 338	126 582	97 246	85 942	111 361	92 339	96 313	64 660	62 178	48 611	31 499	24 806
		No Pf	0	4	1	4	1	0	2	2	7	10	5	7	11	7
		No Pv	6 853	2 706	2 777	1 388	693	376	821	1 337	333	81	22	3	4	3
		No Other	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	Peru	Suspected	1 483 816	1 417 423	1 582 385	1 485 012	1 438 925	1 438 925	1 438 925	1 438 925	861 290	42 645	744 650	702 952	759 285	864 648
		No Pf	20 618	17 687	21 174	19 154	20 905	15 058	8 437	7 766	4 768	4 044	2 374	2 929	3 399	6 630
		No Pv	47 690	61 680	78 000	66 588	72 676	72 611	56 488	43 031	33 895	32 976	29 168	21 984	28 030	36 285
		No Other	13	11	10	13	0	-	-	-	-	0	3	3	7	11
	Suriname	Suspected	63 377	67 369	68 070	43 241	56 975	59 855	45 722	33 992	29 911	34 717	-	15 270	20 810	19 736
		No Pf	10 648	13 217	9 752	8 782	6 738	6 931	2 331	547	838	929	721	331	126	322
		No Pv	1 673	1 229	1 648	1 047	915	1 611	733	509	639	895	817	382	167	322
		No Other	811	1 549	1 388	0	726	589	225	14	17	18	36	17	2	0
	Venezuela (Bolivarian Republic of)	Suspected	261 866	198 000	278 205	344 236	420 165	420 165	479 708	396 338	414 137	370 258	400 495	382 303	410 663	476 764
		No Pf	5 491	2 774	2 572	5 562	4 620	6 026	6 928	8 077	5 540	8 776	12 385	11 167	13 302	22 777
		No Pv	24 829	17 224	26 907	26 111	41 972	38 985	30 111	33 621	26 437	27 002	32 710	34 651	39 478	50 938
		No Other	1	8	12	46	63	38	23	51	60	50	60	6	23	46
Eastern Mediterranean	Afghanistan	Suspected	366 865	-	-	-	280 301	548 503	789 186	869 144	935 043	847 666	847 589	936 252	847 933	787 624
		No Pf	5 115	-	84 528	44 243	12 789	5 917	6 216	6 283	4 355	4 026	6 142	5 581	1 231	1 877
		No Pv	89 240	-	330 083	316 697	229 233	110 527	79 913	85 919	77 219	60 854	63 255	71 968	53 609	37 386
		No Other	-	-	0	0	0	0	0	0	0	0	0	0	0	0
	Djibouti	Suspected	-	-	-	-	-	3 969	-	7 945	6 305	-	-	356	1 410	7 934
		No Pf	-	-	-	-	-	413	1 796	210	119	-	1 010	-	22	939
		No Pv	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Other	-	-	-	-	-	0	0	0	0	-	0	-	0	0
	Egypt[2]	Suspected	1 155 904	1 357 223	1 041 767	-	-	-	-	-	-	-	-	-	-	-
		No Pf	17	9	8	44	39	23	27	28	76	81	82	107	179	0
		No Pv	-	-	2	1	4	-	2	2	4	13	3	9	26	-
		No Other	0	-	0	0	0	0	0	0	0	0	0	0	0	0
	Iran (Islamic Republic of)	Suspected	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Pf	2 546	2 158	2 382	4 475	1 380	2 219	1 199	1 266	938	264	166	152	44	72
		No Pv	-	17 145	13 176	19 087	12 441	16 747	14 710	14 322	10 337	4 130	1 656	1 502	711	426
		No Other	-	0	0	0	0	0	0	0	0	0	0	0	0	0

WHO region	Country/area		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Eastern Mediterranean	Iraq[2]	Suspected	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Pf	-	-	-	1	1	0	0	0	1	0	0	0	0	0
		No Pv	-	-	-	346	154	47	24	3	5	-	-	-	-	-
		No Other	-	-	-	0	0	0	0	0	0	0	0	0	0	0
	Oman	Suspected	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Pf	316	283	266	299	158	153	100	93	94	160	140	6	0	0
		No Pv	366	336	315	428	449	385	341	602	870	718	1 039	7	22	11
		No Other	12	16	9	13	8	6	2	2	1	2	3	0	0	0
	Pakistan	Suspected	-	7 024 978	7 530 636	8 662 496	6 074 739	8 671 271	8 680 304	9 330 723	8 330 040	7 973 246	8 601 835	8 418 570	8 902 947	7 752 797
		No Pf	-	41 771	32 591	39 944	32 761	42 056	37 837	39 856	24 550	37 079	73 857	73 925	95 095	46 067
		No Pv	-	83 504	75 046	85 176	93 385	85 748	86 999	88 699	79 868	95 604	143 136	205 879	228 215	223 660
		No Other	-	0	0	32	538	0	74	15	36	0	0	0	2 901	10 506
	Saudi Arabia	Suspected	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Pf	-	2 360	1 999	1 234	-	-	984	2 349	833	58	29	69	82	34
		No Pv	-	678	567	462	-	-	280	515	658	-	-	-	-	-
		No Other	-	28	42	28	0	1	12	0	0	12	0	0	0	0
	Somalia	Suspected	-	-	102 540	28 356	55 423	63 770	-	-	120 060	106 341	220 698	99 403	-	62 788
		No Pf	-	-	15 732	7 571	11 436	12 516	16 430	16 058	36 167	24 698	5 629	-	-	-
		No Pv	-	-	-	-	-	-	-	617	738	504	-	-	-	-
		No Other	-	-	0	0	0	0	0	0	0	0	0	-	-	-
	Sudan	Suspected	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Pf	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Pv	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		No Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Syrian Arab Republic[2]	Suspected	-	-	-	-	-	-	-	68 000	-	25 751	19 151	25 109	19 136	18 814
		No Pf	-	-	-	-	-	17	27	35	46	38	19	37	40	0
		No Pv	-	-	-	-	-	-	-	-	-	1	-	9	1	-
		No Other	-	-	-	-	-	-	-	-	-	0	3	0	1	0
	Yemen	Suspected	-	-	667 794	612 693	611 552	629 380	962 017	740 940	900 735	899 320	835 018	804 940	891 394	927 821
		No Pf	-	-	73 667	47 782	47 306	42 627	53 887	64 991	42 702	52 836	77 271	59 689	109 504	102 369
		No Pv	-	-	1 659	1 474	1 297	1 442	1 019	2 339	745	589	966	478	398	408
		No Other	-	-	122	112	7	27	10	0	4	3	2	33	4	0
European	Armenia[1]	Suspected	356	174	165	126	220	209	230	658	30 761	31 467	31 026	0	0	0
		No Pf	1	0	0	4	2	0	0	0	0	0	0	0	-	-
		No Pv	140	79	52	25	45	7	-	-	-	-	-	-	-	-
		No Other	0	0	0	0	0	0	0	0	0	0	0	-	-	-
	Azerbaijan	Suspected	527 688	536 260	507 252	536 822	545 145	515 144	498 697	465 033	408 780	451 436	456 652	449 168	497 040	432 810
		No Pf	0	1	0	0	0	0	0	1	0	0	0	0	0	0
		No Pv	1 526	1 056	506	482	386	242	143	109	72	78	50	4	3	-
		No Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Georgia[2]	Suspected	173	3 574	6 145	5 457	3 365	5 169	4 400	3 400	4 398	4 120	2 368	2 032	1 046	192
		No Pf	0	0	1	2	1	0	0	0	0	0	0	0	0	0
		No Pv	245	438	473	314	255	155	59	24	6	1	-	1	1	-
		No Other	0	0	0	0	0	0	0	1	0	0	0	0	0	0
	Kyrgyzstan[2]	Suspected	70 500	72 020	69 807	144 070	79 895	114 316	74 729	62 444	40 833	33 983	30 190	27 850	18 268	54 249
		No Pf	0	0	1	0	0	0	0	0	0	0	0	0	0	0
		No Pv	12	28	2 742	468	93	226	318	96	18	4	3	-	-	-
		No Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Russian Federation[2]	Suspected	795	898	642	533	382	205	143	35 784	28 340	27 382	33 024	28 311	0	-
		No Pf	60	-	48	51	43	31	0	0	0	0	0	0	-	-
		No Pv	-	-	-	-	-	-	-	76	46	-	1	2	-	-
		No Other	-	-	-	-	-	-	-	4	3	0	0	0	-	-
	Tajikistan	Suspected	233 785	248 565	244 632	296 123	272 743	216 197	175 894	159 232	158 068	165 266	173 523	173 367	209 239	213 916
		No Pf	831	826	509	252	151	81	0	0	2	0	0	0	0	0
		No Pv	18 233	10 561	5 651	5 176	3 437	2 228	1 316	628	316	164	111	65	18	7
		No Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Turkey	Suspected	1 597 290	1 550 521	1 320 010	1 187 814	1 158 673	1 042 509	934 839	775 502	616 570	606 875	507 841	421 295	337 830	255 125
		No Pf	7	11	12	12	13	32	0	0	0	0	0	1	0	0
		No Pv	11 424	10 799	10 209	9 209	5 289	2 052	767	329	166	38	9	-	219	34
		No Other	1	2	3	1	0	0	0	0	0	0	0	0	0	0

Annex 6C – Reported malaria cases by species, 2000–2013 (continued)

WHO region	Country/area		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
European	Turkmenistan[1]	Suspected	50 105	50 075	59 834	72 643	71 377	56 982	58 673	65 666	75 524	94 237	81 784	0	0	-
		No Pf	-	-	0	0	0	0	0	0	0	0	0	0	-	-
		No Pv	24	8	18	7	3	1	1	-	-	-	-	-	-	-
		No Other	0	0	0	0	0	0	0	0	0	0	0	-	-	-
	Uzbekistan[2]	Suspected	735 164	691 500	735 164	812 543	893 187	917 843	924 534	858 968	883 807	916 839	921 364	886 243	805 761	908 301
		No Pf	1	0	1	0	0	0	0	0	0	0	0	0	0	0
		No Pv	125	77	72	74	66	102	73	87	7	-	3	-	-	-
		No Other	0	0	1	0	0	0	0	0	0	0	0	0	0	0
South-East Asia	Bangladesh	Suspected	742 539	516 052	527 577	679 981	512 876	462 322	341 293	270 137	526 701	569 767	496 616	390 102	309 179	93 926
		No Pf	39 475	39 274	46 418	41 356	46 402	37 679	24 828	46 117	69 606	18 242	52 012	49 084	9 428	3 597
		No Pv	16 124	14 942	15 851	13 298	12 492	10 442	8 029	13 063	14 409	6 853	3 824	2 579	396	262
		No Other	-	-	-	-	-	-	-	686	675	108	0	0	36	2
	Bhutan	Suspected	76 445	65 974	74 696	61 246	54 892	60 152	66 079	51 446	47 389	62 790	54 760	44 494	42 512	31 632
		No Pf	2 738	2 915	3 207	1 518	966	853	772	288	136	559	140	87	33	14
		No Pv	3 197	2 805	3 015	2 126	1 580	871	963	414	148	413	261	92	47	9
		No Other	241	262	289	162	124	101	133	0	0	0	0	0	0	-
	Democratic People's Republic of Korea	Suspected	204 428	300 000	354 503	76 104	33 803	11 507	25 966	7 985	24 299	34 818	25 147	26 513	39 238	71 453
		No Pf	-	0	0	0	0	0	0	0	0	0	0	0	0	0
		No Pv	-	115 615	98 852	16 538	15 827	6 728	6 913	4 795	16 611	14 632	13 520	16 760	21 850	14 407
		No Other	-	-	-	-	-	-	-	0	0	0	0	0	0	0
	India	Suspected	86 790 375	90 389 019	91 617 725	99 136 143	97 111 526	104 120 792	106 606 703	94 855 000	95 734 579	112 496 076	119 279 429	119 470 044	122 159 270	127 891 198
		No Pf	1 047 218	1 005 236	897 446	857 101	890 152	805 077	840 360	741 076	775 523	839 877	830 779	662 748	524 370	462 079
		No Pv	984 572	1 080 248	943 781	1 012 302	1 025 211	1 011 492	944 769	767 851	750 687	723 697	765 622	645 652	534 129	417 884
		No Other	2 048	-	-	-	-	4 680	3 475	2 973	3 640	2 828	3 585	2 256	9 325	1 767
	Indonesia	Suspected	2 939 329	4 113 458	3 582 566	3 555 381	3 857 211	2 206 129	2 219 308	2 556 631	2 185 835	2 733 407	3 089 221	3 174 612	3 534 331	3 197 890
		No Pf	89 289	85 596	98 430	81 591	98 729	127 594	160 147	-	127 813	95 557	220 077	200 662	199 977	170 848
		No Pv	156 323	190 608	190 048	161 180	145 868	147 543	177 006	159 179	125 150	93 801	221 176	187 989	187 583	150 985
		No Other	-	-	-	-	-	-	-	-	0	240	2 547	2 261	981	1 342
	Myanmar	Suspected	843 087	954 155	1 016 514	1 020 477	883 399	787 691	820 290	1 159 516	1 230 444	1 136 064	1 277 568	1 210 465	1 423 966	2 601 112
		No Pf	95 499	130 029	133 187	138 178	114 523	124 644	149 399	148 010	167 562	121 636	70 941	59 604	314 676	222 770
		No Pv	21 802	35 783	35 030	35 151	34 045	37 014	50 667	53 351	52 256	40 167	29 944	28 966	135 388	98 860
		No Other	252	941	864	867	501	638	453	433	288	319	346	162	28 020	11 573
	Nepal	Suspected	140 768	266 917	304 200	383 322	293 836	361 936	327 981	265 997	302 774	270 798	213 353	188 702	243 432	169 464
		No Pf	560	428	2 165	1 195	743	1 181	1 358	1 295	792	575	550	219	612	273
		No Pv	7 056	6 216	10 621	8 200	3 892	5 691	3 932	3 870	3 096	2 760	2 349	1 631	1 480	1 659
		No Other	-	-	-	-	-	-	-	96	-	187	0	0	0	22
	Sri Lanka	Suspected	1 781 372	1 353 386	1 390 850	1 192 259	1 198 181	974 672	1 076 121	1 047 104	1 047 104	909 632	1 001 107	985 060	948 250	1 236 580
		No Pf	59 650	10 600	4 848	1 273	549	134	27	7	46	21	6	3	4	0
		No Pv	150 389	55 922	36 563	9 237	3 171	1 506	564	191	623	529	668	119	19	-
		No Other	1 735	360	187	82	49	40	9	1	1	8	0	2	0	0
	Thailand	Suspected	4 403 739	4 100 778	3 819 773	3 256 939	3 012 710	2 524 788	2 280 070	2 041 733	1 931 768	1 884 820	1 777 977	1 450 885	1 130 757	1 830 090
		No Pf	43 717	29 061	20 389	19 024	13 371	14 670	14 124	16 557	12 108	9 486	9 401	5 710	11 553	14 449
		No Pv	37 975	34 467	24 166	18 331	13 319	14 921	15 991	16 495	13 886	13 616	13 401	8 608	17 506	15 573
		No Other	47	40	40	32	29	59	35	16	10	23	20	13	3 172	3 084
	Timor-Leste	Suspected	15 212	83 049	120 344	83 785	242 957	185 367	223 002	215 402	215 338	198 867	266 384	225 772	182 854	178 200
		No Pf	-	-	26 651	33 411	39 164	43 093	37 896	34 174	34 406	29 252	28 350	14 261	1 962	373
		No Pv	-	-	11 148	15 392	16 158	15 523	13 477	12 544	11 295	12 160	11 432	3 758	2 288	512
		No Other	-	-	105	333	72	266	200	0	0	0	0	0	0	0
Western Pacific	Cambodia	Suspected	281 444	202 179	187 213	208 801	183 062	165 382	207 463	200 050	198 794	210 856	386 420	433 424	194 263	152 137
		No Pf	46 150	37 105	33 010	36 338	31 129	17 482	24 779	16 518	36 387	17 442	8 213	7 054	14 896	7 092
		No Pv	4 505	4 408	4 386	5 179	5 709	9 004	7 551	4 987	4 625	6 362	4 794	5 155	19 575	11 267
		No Other	665	637	652	717	551	428	680	576	627	0	0	0	4 971	2 418
	China	Suspected	0	5 397 517	5 788 432	4 776 469	4 331 038	3 892 885	4 076 104	4 062 585	4 435 793	4 642 479	7 118 649	9 190 401	6 918 770	5 555 001
		No Pf	-	3 732	5 753	3 497	3 879	3 588	2 808	1 613	1 222	948	1 269	1 370	1 419	2 907
		No Pv	-	17 295	19 581	24 852	23 138	18 187	32 345	27 550	15 323	8 214	3 675	1 907	1 080	930
		No Other	-	210	186	142	180	161	230	141	105	125	20	50	60	184

WHO region	Country/area		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Western Pacific	Lao People's Democratic Republic	Suspected	496 070	303 306	309 688	326 297	218 884	173 698	210 927	275 602	311 395	266 096	280 549	221 390	369 976	339 013
		No Pf	38 271	25 851	20 696	18 307	15 648	13 106	28 347	17 178	18 938	5 328	4 393	5 770	37 692	24 538
		No Pv	1 689	1 204	712	574	491	473	316	193	247	176	122	442	7 634	12 537
		No Other	146	19	12	15	30	36	8	7	21	0	1	14	770	956
	Malaysia	Suspected	1 832 802	1 808 759	1 761 721	1 632 024	1 577 387	1 425 997	1 388 267	1 565 033	1 562 148	1 565 982	1 619 074	1 600 439	1 566 872	1 576 012
		No Pf	6 000	5 643	5 486	2 756	2 496	2 222	1 790	1 778	1 903	1 648	1 344	634	651	422
		No Pv	5 953	6 315	4 921	3 127	3 167	2 729	2 774	2 862	3 357	3 059	3 387	1 750	915	385
		No Other	287	337	292	128	162	212	190	615	977	1 480	943	1 660	2 187	2 136
	Papua New Guinea	Suspected	1 897 579	1 802 857	1 739 219	1 783 145	2 000 261	1 962 493	1 816 963	1 779 343	1 769 032	1 507 122	1 505 393	1 279 140	1 113 528	1 454 166
		No Pf	63 591	74 117	58 403	54 653	63 053	62 926	59 040	61 803	61 071	48 681	56 735	59 153	58 747	119 469
		No Pv	14 721	18 113	14 187	14 055	18 730	22 833	22 744	16 239	16 806	11 472	13 171	9 654	7 108	7 579
		No Other	729	879	2 053	2 977	4 119	2 632	2 998	5 128	3 168	1 024	1 990	632	609	1 279
	Philippines	Suspected	36 596	34 968	37 005	48 441	446 104	593 996	396 706	408 254	278 652	352 006	301 031	327 060	332 063	318 883
		No Pf	25 912	18 006	22 831	32 948	29 018	20 033	24 515	8 789	11 807	13 933	11 824	6 877	4 774	4 968
		No Pv	-	-	-	-	-	6 482	8 839	3 622	4 806	4 951	2 885	2 380	2 189	1 357
		No Other	-	-	-	-	-	213	338	17	197	262	175	127	57	83
	Republic of Korea	Suspected	4 183	2 556	1 799	1 171	864	1 369	2 051	2 227	1 052	1 345	1 772	838	555	443
		No Pf	-	-	-	-	-	-	-	-	11	13	27	20	36	0
		No Pv	-	-	-	-	-	-	-	2 227	1 052	1 297	1 691	754	473	383
		No Other	-	-	-	-	-	-	-	-	-	0	0	0	0	0
	Solomon Islands	Suspected	601 612	594 690	556 356	416 728	643 908	633 796	657 110	396 169	338 244	282 297	284 931	254 506	249 520	245 014
		No Pf	46 703	50 806	50 090	64 910	64 449	54 001	54 441	48 612	29 492	19 580	22 892	14 454	14 748	13 194
		No Pv	21 322	25 649	24 822	27 399	25 927	22 515	20 971	16 653	11 173	8 544	12 281	8 665	9 339	11 628
		No Other	82	38	24	82	79	126	75	139	84	233	200	0	232	446
	Vanuatu	Suspected	58 679	48 422	75 046	82 670	80 879	86 170	62 637	52 958	52 420	44 960	48 088	32 656	33 273	28 943
		No Pf	3 226	3 402	7 016	8 406	6 999	3 817	3 522	2 424	1 579	1 802	1 545	770	1 257	1 039
		No Pv	2 972	4 236	7 210	6 582	6 350	4 453	4 405	2 987	1 850	1 632	2 265	1 224	1 680	1 342
		No Other	10	8	112	251	163	64	121	0	0	4	10	2	470	0
	Viet Nam	Suspected	2 883 456	2 950 863	3 054 693	2 835 799	2 778 295	2 793 458	3 024 558	3 755 566	1 409 765	2 907 219	2 803 918	3 312 266	3 436 534	3 115 804
		No Pf	57 605	52 173	36 583	29 435	19 023	14 231	17 911	11 470	8 901	12 719	12 763	10 101	11 448	9 532
		No Pv	15 935	15 898	10 846	9 004	5 681	5 102	4 497	4 737	2 348	3 206	4 466	5 602	7 220	6 901
		No Other	772	628	378	351	205	163	229	0	0	0	0	0	0	0

Notes
Suspected cases: are calculated by adding Examined cases" to "Probable cases".
Probable cases : are calculated by subtracting "Confirmed cases" from "Probable and Confirmed cases ".
1 Armenia, Morocco and Turkmenistan are certified malaria free countries, but are included in this listing for historical purposes
2 There is no local transmission
3 Where national totals for the United Republic of Tanzania are unavailable, refer to the sum of Mainland and Zanzibar

Annex 6D – Reported malaria deaths, 2000–2013

WHO region	Country/area	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
African	Algeria	1	1	-	-	-	-	-	-	0	1	5	1	0	3
	Angola	9 510	9 473	14 434	38 598	12 459	56	10 220	60	9 465	355	8 114	6 909	69	7 300
	Benin	-	468	707	560	944	322	1 226	1 005	918	1 157	801	1 753	2 261	1 671
	Botswana	-	4	23	1	19	11	7	6	1	6	8	8	1	7
	Burkina Faso	-	4 233	4 032	4 860	4 205	5 224	333	3 828	61	4 707	51	5 519	88	6 294
	Burundi	691	167	483	185	689	354	434	90	595	566	2 677	1 116	2 263	44
	Cabo Verde	-	0	0	4	0	2	0	2	0	2	0	1	1	0
	Cameroon	-	-	-	-	-	836	2 887	1 811	1 112	4 943	241	2 528	3 209	39
	Central African Republic	422	535	-	326	859	523	865	467	456	515	526	711	1 442	810
	Chad	712	957	98	1 021	13	558	837	617	1 018	221	676	1	1 359	1 881
	Comoros	-	-	-	-	0	92	0	10	47	-	53	14	9	15
	Congo	-	-	-	-	-	-	-	113	70	116	-	12	623	2 870
	Côte d'Ivoire	-	-	-	-	-	-	-	5	1 249	391	1 023	261	1 534	3 261
	Democratic Republic of the Congo	3 856	416	2 152	989	13 613	1 439	12 970	1 616	17 940	217	23 476	310	15 725	215
	Equatorial Guinea	-	-	-	-	-	-	-	-	3	0	20	52	77	0
	Eritrea	-	37	86	29	24	6	47	0	19	0	4	0	30	6
	Ethiopia	-	67	1 607	68	401	71	432	17	189	11	242	150	195	358
	Gabon	2 016	438	1 141	175	466	87	238	48	156	0	95	46	134	273
	Gambia	-	160	3	122	2	270	9	229	14	94	151	246	289	262
	Ghana	54	1 717	60	2 103	74	2 037	54	4 622	29	3 378	3 859	1 539	2 855	13
	Guinea	6	517	15	586	528	490	-	274	441	11	735	4	11	9
	Guinea-Bissau	-	416	780	535	565	373	507	242	487	168	296	472	4	418
	Kenya	48 767	48 286	47 697	51 842	25 403	44 328	40 079	285	1 102	-	26 017	230	284	135
	Liberia	-	-	-	-	-	41	36	310	345	1 706	1 422	-	11	31
	Madagascar	238	742	211	817	302	699	186	428	127	348	177	398	552	641
	Malawi	-	2 027	5 775	2 872	3 457	3 042	6 464	54	8 048	25	23	3 931	3 398	3 723
	Mali	444	562	826	1 309	1 012	1 285	1 914	1 782	951	2 331	3 006	1 558	1 894	1 680
	Mauritania	-	-	-	-	-	-	67	5	-	66	211	17	106	25
	Mayotte, France	-	-	-	-	-	-	-	-	-	-	0	0	0	0
	Mozambique	-	-	-	-	-	-	-	1 733	4 424	954	3 354	923	2 818	2 941
	Namibia	-	1 728	1 504	1 106	1 185	1 325	571	181	152	10	63	2	4	8
	Niger	1 244	2 366	2 769	2 248	1 382	2 060	2 570	1 358	2 036	2 159	2 987	2 083	2 825	2 209
	Nigeria	-	4 317	4 092	5 343	6 032	156	6 586	10 289	8 677	4 126	4 238	1 860	4 209	7 878
	Rwanda	-	1 653	3 167	1 208	2 362	1 288	2 486	449	566	280	175	380	459	409
	Sao Tome and Principe	198	2	251	1	139	1	17	0	11	0	9	0	2	11
	Senegal	127	1 515	61	1 602	79	1 587	50	1 935	24	574	553	160	649	313
	Sierra Leone	-	328	30	157	56	50	23	254	871	564	8 188	2 723	3 611	2 962
	South Africa	424	81	96	142	88	63	87	37	43	45	83	54	1	105
	South Sudan	-	-	-	-	-	-	-	-	263	187	1 053	297	1 321	1 311
	Swaziland	-	62	46	30	28	17	27	0	10	2	8	1	3	4
	Togo	-	1 394	1 661	1 130	1 183	1 024	819	13	2 663	9	14	944	1 197	373
	Uganda	-	-	-	-	-	-	2 795	113	1 279	69	4 463	5 958	6 585	4 136
	United Republic of Tanzania[3]	379	1 087	815	15 121	19 859	18 238	141	12 565	5 065	16 776	10 896	11 806	3 925	73
	United Republic of Tanzania (Mainland)	-	838	441	14 943	19 547	18 075	4	12 529	5 007	16 696	10 893	11 799	3 925	73
	United Republic of Tanzania (Zanzibar)	379	249	374	178	312	163	137	36	58	80	3	7	0	0
	Zambia	-	5 513	9 021	4 935	8 289	3 388	6 484	3 801	3 781	38	2 790	4 540	36	2 011
	Zimbabwe	-	-	1 844	1 044	1 809	1 916	174	18	37	108	40	451	351	352
Region of the Americas	Argentina	0	0	0	1	0	0	0	0	0	0	0	0	0	0
	Bahamas	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Belize	0	0	0	-	1	0	1	0	0	0	0	0	0	0
	Bolivia (Plurinational State of)	11	0	4	1	3	0	0	0	0	0	0	0	0	0
	Brazil	243	142	93	103	100	122	105	93	67	85	76	69	64	41
	Colombia	41	58	40	24	25	28	53	19	22	12	23	18	20	10
	Costa Rica	0	0	0	0	0	0	0	0	0	1	0	0	0	0
	Dominican Republic	6	17	11	12	16	16	10	17	11	14	15	10	8	5
	Ecuador	0	0	0	0	0	0	0	0	1	0	0	1	0	0
	El Salvador	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	French Guiana, France	0	3	2	5	1	2	5	5	2	1	1	2	2	3
	Guatemala	0	0	0	0	2	4	2	3	0	0	0	0	0	0

WHO region	Country/area	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Region of the Americas	Guyana	-	30	27	41	38	32	20	20	11	11	18	3	3	3
	Haiti	16	62	76	102	23	29	32	28	17	7	8	5	6	10
	Honduras	0	0	0	0	0	1	0	2	2	1	3	2	1	1
	Jamaica	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Mexico	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Nicaragua	4	2	8	7	1	6	1	0	0	0	1	0	2	0
	Panama	1	1	2	4	2	1	1	1	1	0	1	0	1	0
	Paraguay	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Peru	20	25	12	9	6	4	6	2	2	2	0	0	2	4
	Suriname	24	23	15	18	7	1	1	1	0	0	1	1	0	1
	Venezuela (Bolivarian Republic of)	24	28	23	40	35	17	11	16	9	11	18	16	6	6
Eastern Mediterranean	Afghanistan	-	-	-	-	-	0	-	25	46	32	22	40	36	24
	Djibouti	-	-	-	-	-	-	29	1	-	0	0	0	0	17
	Egypt[2]	-	-	-	-	-	-	0	0	2	2	2	4	-	-
	Iran (Islamic Republic of)	4	2	2	5	1	1	1	3	3	-	2	0	0	2
	Iraq	-	0	0	0	0	0	0	0	0	0	0	0	0	0
	Oman	-	-	-	-	-	0	0	0	2	2	0	0	0	0
	Pakistan	-	-	-	29	-	52	9	24	20	-	-	4	260	244
	Saudi Arabia	-	0	0	0	0	0	0	2	0	0	0	2	0	0
	Somalia	-	-	8	54	79	15	58	45	49	45	6	5	-	-
	Sudan	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Syrian Arab Republic[2]	-	-	-	-	-	2	2	1	1	1	0	0	1	1
	Yemen	-	-	-	-	-	-	73	-	-	38	92	26	72	55
European	Armenia[1]	0	0	0	0	0	0	0	0	0	0	0	-	-	-
	Azerbaijan	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Georgia[2]	-	0	0	0	0	0	0	0	0	0	0	0	0	0
	Kyrgyzstan[2]	0	0	0	0	0	0	0	0	0	0	0	1	0	0
	Russian Federation[2]	2	3	2	4	5	3	4	3	2	1	1	1	-	-
	Tajikistan	-	0	0	0	0	0	0	0	0	0	0	0	0	0
	Turkey	0	0	0	0	0	0	0	0	3	1	0	4	0	3
	Turkmenistan[1]	0	0	0	0	0	0	0	0	0	0	0	-	-	-
	Uzbekistan[2]	0	0	0	0	0	0	0	1	0	0	0	0	0	0
South-East Asia	Bangladesh	484	470	598	574	505	501	508	86	154	8	7	13	0	15
	Bhutan	15	14	11	14	7	5	7	0	2	1	0	0	1	0
	Democratic People's Republic of Korea	-	-	-	-	-	-	-	0	0	0	0	0	0	0
	India	892	1 015	973	1 006	949	963	1 708	1 311	1 055	1 144	1 018	754	519	440
	Indonesia	833	-	-	-	508	88	494	-	669	900	432	388	252	45
	Myanmar	14	2 814	14	2 476	27	1 707	14	1 261	9	972	788	65	403	236
	Nepal	-	1	3	5	7	10	42	3	-	8	0	2	0	0
	Sri Lanka	77	52	30	4	1	0	1	1	0	1	0	0	0	0
	Thailand	625	424	361	204	230	161	113	97	101	5	80	2	37	37
	Timor-Leste	-	-	-	-	65	71	68	23	33	8	58	5	3	3
Western Pacific	Cambodia	91	476	67	492	50	296	59	241	20	279	151	11	45	12
	China	31	27	42	52	31	48	37	18	23	10	19	33	14	23
	Lao People's Democratic Republic	0	242	4	187	0	77	0	14	0	5	7	3	0	28
	Malaysia	2	46	38	21	4	33	1	18	3	26	33	18	16	14
	Papua New Guinea	617	144	647	145	619	725	668	559	628	604	616	523	381	307
	Philippines	536	439	71	162	167	145	124	73	1	24	0	2	1	12
	Republic of Korea	0	0	0	0	0	0	0	1	0	1	2	2	0	2
	Solomon Islands	38	55	61	71	51	38	3	15	13	53	34	7	18	18
	Vanuatu	1	4	1	14	1	5	0	5	1	2	1	1	0	0
	Viet Nam	5	91	3	8	34	2	41	1	25	3	0	14	0	6
Regional summary	African	69 468	92 356	106 302	156 190	127 385	111 497	102 783	63 237	79 810	64 012	123 719	71 775	70 345	57 153
	Region of the Americas	390	391	313	367	260	263	248	207	145	145	165	127	115	84
	Eastern Mediterranean	4	2	10	88	80	70	172	101	123	120	124	81	369	343
	European	2	3	2	4	5	3	4	4	5	2	1	6	0	3
	South-East Asia	2 940	4 790	1 990	4 283	2 299	3 506	2 955	2 782	2 023	3 047	2 383	1 229	1 215	776
	Western Pacific	1 321	1 524	934	1 152	957	1 369	933	945	714	1 007	863	614	475	422
	Total	74 125	99 066	109 551	162 084	130 986	116 708	107 095	67 276	82 820	68 333	127 255	73 832	72 519	58 781

Notes:
Cases reported before 2000 can be presumed and confirmed or only confirmed cases depending on the country.
1 Armenia, Morocco and Turkmenistan are certified malaria free countries, but are included in this listing for historical purposes
2 There is no local transmission
3 Where national totals for the United Republic of Tanzania are unavailable, refer to the sum of Mainland and Zanzibar