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**THE E-2020  
INITIATIVE OF  
21 MALARIA-  
ELIMINATING  
COUNTRIES**

2019 progress  
report



# Foreword

## Countdown to 2020 for 21 countries

Creating a malaria-free world is a bold and important public health and sustainable development goal. It is also the vision of the *Global technical strategy for malaria 2016–2030*, which calls for the elimination of malaria in at least 10 countries by the year 2020.

In 2016, WHO identified 21 countries, spanning five regions, that could defeat malaria by 2020, considering the likelihood of elimination across key criteria. All are united by one target: to achieve zero indigenous cases of malaria within the 2020 timeline. This report charts their progress.

In 2019, significant milestones were reached. Algeria was granted an official WHO certification of malaria elimination after reporting zero indigenous cases for the fifth consecutive year. Argentina, though not an E-2020 country, was also certified malaria-free.

For the first time in 2018, the Islamic Republic of Iran, Malaysia and Timor-Leste achieved zero indigenous

cases of human malaria.<sup>1</sup> In China and El Salvador, zero indigenous cases were declared for two consecutive years (2017–2018) and, in Cabo Verde, the last confirmed indigenous case of malaria was in January 2018.

This report documents the good progress overall towards achieving the 2020 elimination milestone of the global strategy (see Table 1). However, a substantial commitment is still needed to get at least 10 countries across the finish line by the end of next year. We must focus on shared solutions. Our mandate is clear and our deadline is urgent.

Many of the challenges faced by countries are not new and they can be overcome by working together – with added resources, resolve and political commitment. WHO stands by the 21 malaria-eliminating countries as they inspire others to get to zero and create a world in which no one dies of malaria.

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**Dr Pedro Alonso**

Director, Global Malaria Programme  
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<sup>1</sup>Malaysia achieved zero indigenous cases of human malaria but continues to report cases of zoonotic malaria due to *P. knowlesi*.

# E-2020 initiative

## A brief overview

To meet the elimination milestone of the global strategy, at least 10 countries must report zero indigenous malaria cases by 2020. According to a WHO analysis published in 2016, 21 countries have the potential to reach this target, based on three criteria:

- ① Trends in malaria case incidence between 2000 and 2014
- ② Declared malaria elimination objectives of affected countries
- ③ Informed opinions of WHO experts in the field

Through the E-2020 initiative, WHO is working with these countries to scale up efforts to achieve elimination within the 2020 timeline. This includes a *Framework for malaria elimination*, launched by WHO in March 2017, that provides countries with an updated set of tools, activities and strategies for interrupting transmission and preventing

re-establishment of the disease. The framework also offers a clear and streamlined process for countries to obtain malaria-free certification from WHO.

To keep elimination high on both the programmatic and political agendas in E-2020 countries, WHO convened an inaugural global forum in Geneva in March 2017, bringing together malaria programme managers from the 21 countries to map progress and strategies.

This forum resulted in two new independent bodies to support countries: the Malaria Elimination Oversight Committee, which guides countries in their efforts to eliminate malaria, and the Malaria Elimination Certification Panel, tasked with verifying a country's malaria-free status.

During the second forum, hosted by Costa Rica in June 2018, Paraguay was officially certified malaria-free. Building on the success of the first two global forums, China hosted a third forum in June 2019 focused on populations at high risk of malaria.

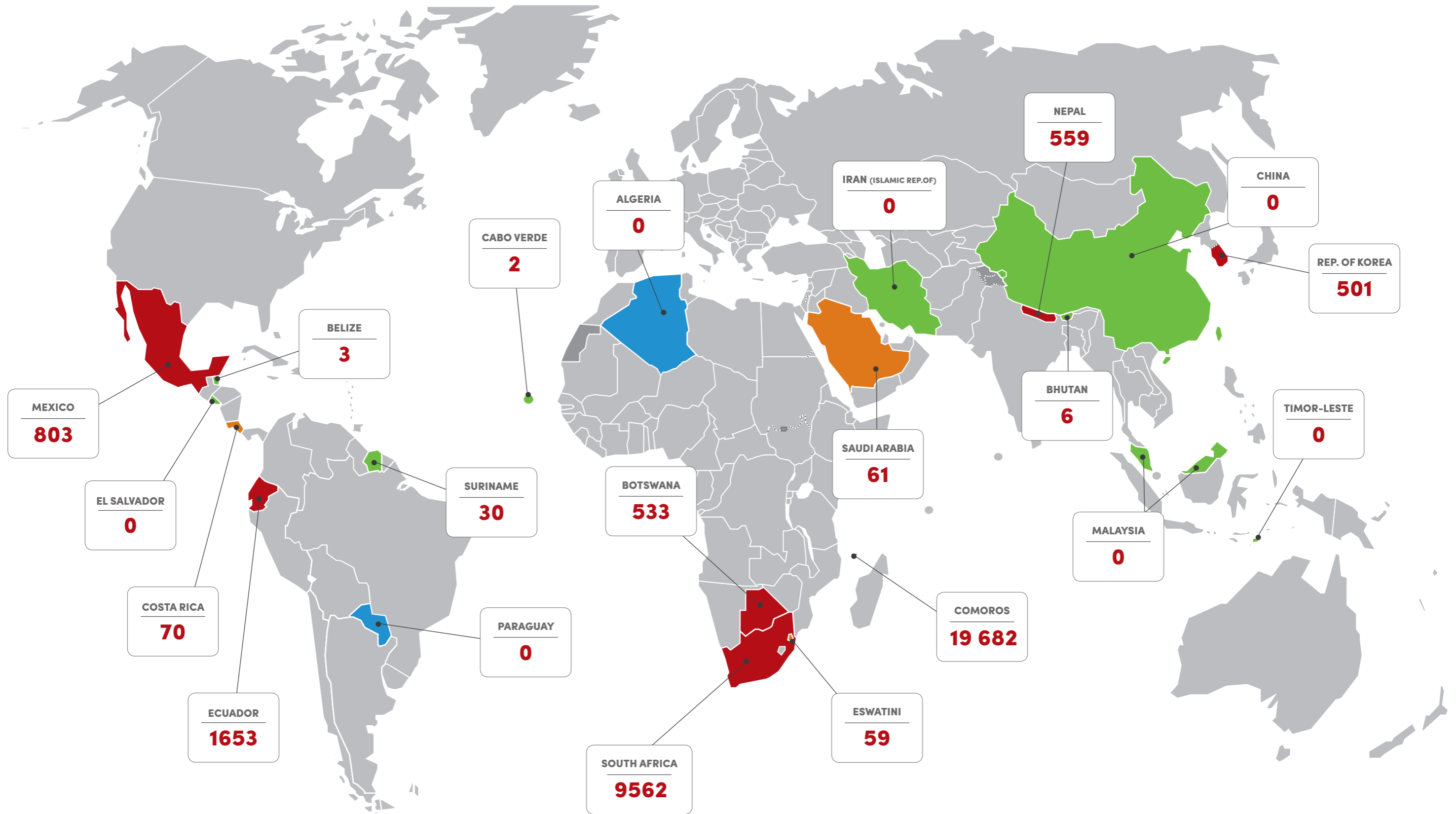
**Table 1. Goals of the *Global technical strategy for malaria 2016–2030***

Vision – A world free of malaria

GOALS	MILESTONES		TARGETS
	2020	2025	2030
1. Reduce malaria mortality rates globally compared with 2015	At least 40%	At least 75%	At least 90%
2. Reduce malaria case incidence globally compared with 2015	At least 40%	At least 75%	At least 90%
3. Eliminate malaria from countries in which malaria was transmitted in 2015	At least 10 countries	At least 20 countries	At least 35 countries
4. Prevent re-establishment of malaria in all countries that are malaria-free	Re-establishment prevented	Re-establishment prevented	Re-establishment prevented

# E-2020 countries

Snapshot of indigenous malaria cases in 2018\*



\* Preliminary figures for 2018 (Source: national malaria control programme reports); final figures will be published in the *World malaria report 2019*.

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of WHO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

# Elimination progress

Country	2010	2011	2012	2013	2014	2015	2016	2017	2018 <sup>b</sup>	↕ ↔ ↕ <sup>c</sup>	2020 <sup>d</sup>
<b>Africa</b>											
Algeria	1	1	55	8	0	0	0	0	0	↔	●
Botswana <sup>a</sup>	1 046	432	193	456	1 346	326	716	1 900	533	↓	●
Cabo Verde	47	7	1	22	26	7	48	423	2	↓	●
Comoros	36 538	24 856	49 840	53 156	2 203	1 300	1 066	2 274	19 682	↑	●
Eswatini	268	549	562	962	711	157	350	724	59	↓	●
South Africa	8 060	9 866	5 629	8 645	11 705	555	4 323	22 061	9 562	↓	●
<b>Americas</b>											
Belize	150	72	33	20	19	9	4	7	3	↓	●
Costa Rica	110	10	6	0	0	0	4	12	70	↑	●
Ecuador	1 888	1 219	544	368	242	618	1 191	1 275	1 653	↑	●
El Salvador	19	9	13	6	6	2	12	0	0	↔	●
Mexico	1 226	1 124	833	495	656	517	551	736	803	↑	●
Paraguay	18	1	0	0	0	0	0	0	0	↔	●
Suriname	1 712	771	356	729	401	81	76	40	30	↓	●
<b>Eastern Mediterranean</b>											
Iran <sup>(Islamic Republic of)</sup>	1 847	1 632	756	479	358	167	81	57	0	↓	●
Saudi Arabia	29	69	82	34	30	83	272	177	61	↓	●
<b>South-East Asia</b>											
Bhutan	436	194	82	15	19	34	15	11	6	↓	●
Nepal <sup>a</sup>	3 894	3 414	2 092	1 974	832	591	507	623	559	↓	●
Timor-Leste <sup>a</sup>	48 137	19 739	5 211	1 025	342	80	94	16	0	↓	●
<b>Western Pacific</b>											
China	4 990	3 367	244	86	56	39	3	0	0	↔	●
Malaysia	5 194	3 954	3 662	2 921	3 147	242	266	85	0	↓	●
Republic of Korea	1 267	505	394	383	557	627	602	436	501	↑	●

Annual totals may differ from the *World malaria report 2018*, as countries are allowed to update figures published in the report on an ongoing basis.

a Data provided for all years are the unadjusted case counts reported by the national malaria control programmes.

b Preliminary data for 2018 (Source: national malaria control programme reports); final figures will be published in the *World malaria report 2019*.

c Change in indigenous malaria cases between 2017 and 2018.

d ● on track, less than 51 indigenous cases   ● somewhat off track, between 51 and 166 indigenous cases   ● off track, more than 166 indigenous cases   ● certified malaria-free by WHO

These thresholds are based on an analysis in the *World malaria report 2018* that indicated that out of 17 countries that successfully eliminated malaria 75% had fewer than 51 indigenous cases and 95% had fewer than 166 indigenous cases two years before reaching zero.

# Country highlights

## Africa



### Algeria awarded malaria-free WHO certification

In May 2019, Algeria became the third country in Africa to be officially recognized as malaria-free, after Morocco in 2010 and Mauritius in 1973.

Algeria's path to becoming malaria-free has a long history, starting with French physician Dr Charles Louis Alphonse Laveran's 1880 discovery of the malaria parasite, for which he won a Nobel Prize in 1907. By the 1960s, malaria had become Algeria's primary health challenge, with an estimated 80 000 cases reported each year.

In 1977, after the completion of the Algerian segment of the Trans-Saharan Highway that linked Algeria to sub-Saharan Africa, population movement in neighbouring malaria-endemic countries spurred higher transmission in Algeria's southern provinces.

This resulted in several malaria outbreaks in border areas. Between 1977 and 2008, the annual number of malaria cases rose from zero to an average of 250.

Algeria's subsequent success in beating the disease is primarily due to a well-trained health workforce, coupled with free healthcare, allowing for effective prevention measures, early diagnosis and treatment of all malaria cases, and a rapid response to disease outbreaks. Algeria has always fully funded its budget for malaria elimination through domestic financing.

In 2013, the country reported its last indigenous case. Thanks to its malaria-free status, Algeria is expected to benefit from a growth in tourism and development in the southern provinces.



### Cabo Verde: Targeted spraying to stop transmission

Until the late 1950s, Cabo Verde reported between 5000 and 15 000 malaria cases per year. Since then, the island nation has twice achieved malaria elimination, primarily through the use of indoor residual spraying (IRS) of homes with insecticides, although lapses in vector control led to resurgences of the disease.

Cabo Verde was back on track to achieve elimination by 2020 when, in 2017, the country reported 423 indigenous infections in the capital city of Praia, located on the southern coast of Santiago island. Twenty-three malaria cases were imported from several African countries and one case of *P. vivax* was imported from Brazil.

The archipelago's malaria control programme combines rapid diagnostics and quick treatment of all confirmed cases, as well as preventive measures, including vector control with IRS and larval source management. All confirmed malaria cases are treated, with at least three days of hospitalization.

After the 2017 epidemic was detected, Cabo Verde targeted its vector control efforts to affected neighbourhoods by interviewing people with confirmed malaria and geolocating the site where they were most likely infected. These targeted actions stopped the epidemic in its tracks and interrupted transmission. As a result, Cabo Verde has been malaria-free since January 2018.

# Americas



## El Salvador: A small country with mighty malaria ambitions

El Salvador's malaria elimination programme is supported by three pillars: strong political engagement backed by sustained domestic financing; a multisectoral national strategic plan that is data-driven; and ongoing education about malaria for everyone – from clinicians to community members.

With zero reported indigenous malaria cases since 2017, El Salvador is on the path to achieving an official malaria-free certification by WHO. This small country has made great strides by ensuring that all malaria cases are treated and reported.

As early as 1990, El Salvador introduced an electronic malaria information system to allow for the targeting of malaria interventions to specific geographies and populations. The country is also working to ensure all of its cases are 100% verified and confirmed through quality diagnostic testing.

As a neighbour of malaria-endemic Guatemala and Honduras, El Salvador is strengthening malaria surveillance along international borders. This includes developing a strategy for detecting suspected malaria cases among immigrants who may already be working in the country.

# Eastern Mediterranean



## Islamic Republic of Iran: Leaving no one behind

Thanks to the Islamic Republic of Iran's malaria programme, the reported number of indigenous malaria cases dropped to zero in 2018 compared to more than 1800 in 2010. Underpinning this success is strong political will, socio-economic development in endemic areas, and the resolve to leave no one behind; everyone has access to free primary healthcare, which includes the control and treatment of communicable diseases like malaria.

Significant cross-border movement, including migrant workers coming from high-burden malaria neighbouring countries Afghanistan and Pakistan, contributes to imported cases in the Islamic Republic

of Iran. In response, the country has set up malaria diagnosis posts at border areas to offer services to people who show symptoms of the disease.

Volunteers are critical to controlling malaria in Iran. They help reduce the number of malaria cases in the region as they have been trained in using rapid diagnostic tests and can follow patients to ensure they take all prescribed malaria treatments.

With strong community and national commitment, the Islamic Republic of Iran is poised to seek the WHO certification of malaria-free status by 2021.

# South-East Asia



## Timor-Leste: Matching tactics to transmission type

The malaria landscape in the Democratic Republic of Timor-Leste has dramatically improved over the past 10 years, from a high of 223 002 cases in 2006, to 95 cases in 2016, to zero cases in 2018. This is a remarkable achievement for a country that only came into existence in 2000.

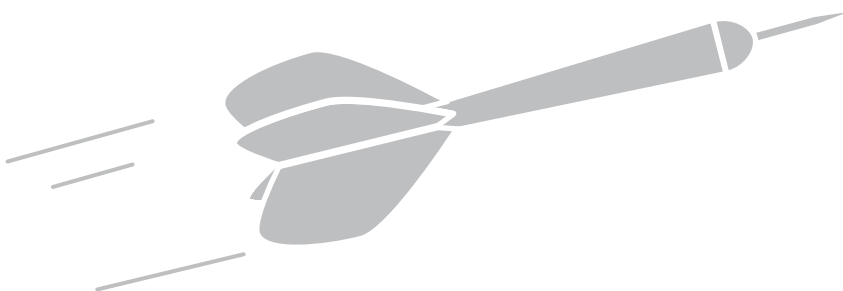
Altogether, 30 cases were reported in 2017 throughout the country and all were investigated. Most of the indigenous cases in 2017 were reported in Oecusse region, an exclave surrounded by Indonesia's West Timor. To interrupt transmission, health workers focused on border regions, attacking malaria through intensive vector control and surveillance.

Timor-Leste owes its success, in part, to the rapid scale-up of quality diagnosis as well as malaria treatment in remote areas, aided by community volunteers and other health staff. Insecticide-treated nets (ITNs) and indoor spraying of insecticides are

the main vector control methods employed. The Ministry of Health provides universal access to ITNs.

Community mobilization is an integral part of Timor-Leste's national malaria strategy. The use of "edutainment" – education through entertainment such as songs, drama and games – helps health staff, households and schools fight malaria. Efforts are especially targeted at high risk populations engaged in slash-and-burn agriculture as well as fishing. Regular training for health workers on malaria diagnosis and treatment protocol is intended to inform and empower malaria staff at every level of the health system.

In line with its *National Strategic Plan for Malaria Elimination 2017-2021*, Timor-Leste aims to achieve malaria-free certification from WHO by 2023. With zero indigenous malaria cases since July 2017, the country is well placed to reach this target ahead of schedule.





# Western Pacific



## China: Auspicious 1-3-7 numbers

As the world's most populous country, China's achievement of two years of zero indigenous malaria cases is astounding, given its estimated 30 million cases and 300 000 deaths a year due to malaria in the 1940s. However, through decades of large-scale control and elimination efforts, malaria transmission has been reduced significantly.

In particular, the implementation of the "1-3-7" surveillance and response strategy, introduced after China launched its malaria elimination programme in 2010, has successfully brought the number of indigenous cases of malaria to zero since August 2016.

The numeral "1" of 1-3-7 signifies the one-day deadline health facilities are given to report a malaria diagnosis. They must act quickly to prevent local malaria transmission.

The "3" signifies a three-day deadline for the local Centers for Disease Control and Prevention (known as the CDC) to confirm and investigate the case and determine if there is a risk of spread.

And by day "7," the CDC office manages the area where the malaria case originated to reduce the risk of further transmission by actively searching for cases that might have occurred and treating anyone with malaria, raising community awareness and spraying the inside walls of homes with insecticides.

Using the 1-3-7 strategy, China has achieved success even in Yunnan Province, despite its shared borders with the malaria-endemic countries of Lao People's Democratic Republic, Myanmar and Viet Nam.



## Malaysia: Elimination success in remote areas

In reaching zero indigenous human malaria cases in 2018, Malaysia accomplished its goal two years ahead of schedule. This is especially impressive given that more than 5000 cases were reported in 2010. Ensuring prompt malaria diagnosis, treatment and surveillance in remote, hard-to-reach regions played a key role in Malaysia's elimination success.

However, the risk of imported malaria remains a key concern. Temporary foreign workers in Malaysia, many of whom are undocumented, may expose the local population to the disease. Malaysians who work outside the country in sectors such as agriculture and logging are also at high risk of contracting malaria abroad and carrying the infection with them when they return home.

To stop the cyclical nature of malaria infection, Malaysian officials are engaging with employers to distribute mosquito bed nets, increase indoor insecticide spraying in homes and share information on malaria prevention and treatment.

Although Malaysia has successfully eliminated indigenous transmission of all human malaria species (*P. falciparum*, *P. vivax*, *P. ovale* and *P. malariae*), the *P. knowlesi* parasite, normally found in monkeys, continues to infect a large number of people. While there is no evidence of sustained human-to-human transmission of *P. knowlesi* – and, thus, it is not considered a human malaria parasite – the health outcomes for people infected with *P. knowlesi* malaria can be serious.

# Getting to 2020

With just less than two years to go to meet the 2020 milestone, the road ahead is clear for eliminating countries: reaching zero indigenous cases of malaria will require an added sense of urgency resulting in decisive actions. For countries experiencing setbacks, extra focus will be needed to overcome the hurdles they encounter.

But the journey does not end with elimination: preventing re-establishment of the disease will require maintaining robust technical capabilities and skilled know-how in place. Integrating malaria activities into public health programmes can ensure that central functions are sustained. A high level of vigilance of the healthcare system to identify suspected malaria cases and diagnose them quickly is essential.

The 21 eliminating countries are engaged in a potentially historic effort that demonstrates what is possible when a joint end goal is identified and pursued. The combined actions of the E-2020 countries are helping to bring the international community closer to the common vision of a malaria-free world.



## Best practices at work in malaria-free Sri Lanka

Certification doesn't always mean malaria-free forever. Vigilance is a must, especially in a world where millions of people are on the move every day.

Sri Lanka, certified by WHO as malaria-free in 2016, was put to the test in December 2018 when a labourer from India working at a rural construction site came down with a *P. vivax* malaria infection.

Since he had arrived in Sri Lanka 23 days earlier, his illness was classified as an "imported case." He was quickly diagnosed and effectively treated. Surveillance at the site revealed high densities of *Anopheles culicifacies*, the principal vector of malaria in Sri Lanka; all residents of the construction site were immediately given insecticide-treated nets.

Before the labourer's case was reported, a Sri Lankan national – a salesman who had

not recently travelled abroad – visited the construction site. Ten days after returning to his residence in the capital city of Colombo, he, too, developed fever and was diagnosed with *P. vivax* malaria.

The salesman's case was classified as "introduced" since it came after, and was linked, to the imported case. Analysis revealed that parasite strains of both infections were identical. The salesman was rapidly treated and, as of mid-May, no further transmission of malaria has occurred.

Best practices for success included a high general country-wide alert on malaria to hospitals and doctors as well as media coverage. Given that these cases occurred during the slow year-end, pre-holiday period, Sri Lanka's rapid response is even more impressive.

# Widening the **elimination net**

Looking beyond the 21 countries, the *Global technical strategy for malaria 2016–2030* provides a basis for all malaria-endemic countries to work towards elimination. This progress is vital if WHO Member States are to achieve the 2030 elimination target of the strategy: eliminating malaria from at least 35 countries in which the disease was transmitted in 2015.

For countries with a high malaria burden, elimination – undoubtedly – is a longer-term goal, requiring a longer-term view. Yet, it is still the ultimate end goal. The global strategy outlines the critical requirements needed to achieve and maintain elimination at every level of malaria transmission intensity in every endemic country. It is founded on five core principles that highlight the need for:

## **Country ownership**

For elimination efforts to succeed, government stewardship in malaria-endemic countries is essential, together with the engagement and participation of affected communities. Malaria responses within national borders can be optimized through cross-border and regional collaboration.

## **Tailored responses**

All countries can accelerate progress towards elimination through an effective mix of interventions and strategies tailored to local contexts.

## **Strengthened surveillance**

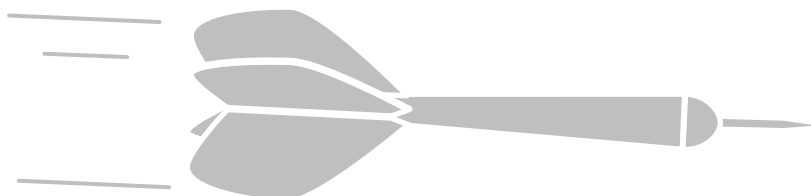
Malaria surveillance helps countries identify gaps in coverage of malaria control tools and take action based on the data received. As countries approach elimination, detecting every infection, or clusters of infections, becomes increasingly important to halt any remaining areas of transmission.

## **Equity in access to health services**

As some countries approach elimination, a high proportion of cases are found among vulnerable populations living in rural and remote areas. Progress can be accelerated by ensuring access to malaria prevention, diagnosis and treatment for all at-risk groups. This is particularly key for hard-to-reach populations like undocumented migrants.

## **Innovation in malaria control tools**

Eliminating malaria in all countries, especially those with a high disease burden, will likely require new tools that are not available today. Investing in the research and development of improved diagnostics, more effective medicines, new insecticides and innovative vector control tools must be a priority.



# Shared solutions

Good progress has been realized across many malaria-eliminating countries. In 2019, Algeria became the second E-2020 country to achieve certification, after Paraguay was certified malaria-free by WHO last year. Uzbekistan and Argentina, though not E-2020 countries, were also awarded the malaria-free certification in 2018 and 2019, respectively.

The Islamic Republic of Iran, Malaysia and Timor-Leste achieved zero indigenous human malaria cases for the first time in 2018. Several other countries recorded important declines in malaria transmission, bringing them ever closer to elimination. To capture and treat remaining pockets of indigenous cases, and to prevent onward transmission from imported malaria, the 21 E-2020 countries have focused on improving systems and tools.

## Better targeting of solutions



Capturing accurate data and then using it to match appropriate interventions – like insecticide-treated mosquito nets and household spraying – to the right geographic areas helps reduce malaria transmission and save lives.

## Focus on border regions



By focusing attention on areas along international borders, communities on both sides are protected.

## Strengthened community surveillance



Where infections do occur, the use of individual case data greatly helps focus community and country responses.

## Malaria elimination beyond the health sector



Malaria's devastating impact on the economy, worker productivity and tourism is being increasingly recognized in other sectors, leading to multi-sectoral involvement in malaria elimination efforts in many countries.

## National malaria elimination committees



Ministries of Health benefit from the advice, guidance and objective perspective provided by members of national elimination committees.

## Integration of malaria programmes into health systems



In order for countries to prevent malaria re-establishment, prevention, diagnosis and treatment services must be provided throughout areas at risk, and this can only be achieved through integrating malaria services into countries' health systems.

## Quality-assured diagnostics



Countries are ensuring that no cases are missed by establishing national reference laboratories to oversee the quality of their diagnostics on malaria.

## Significant domestic financing



Many eliminating countries are financing programmes entirely on their own, without outside assistance. Other countries contribute significant financing even when they receive some outside funding.

## Changing mindsets



Countries are changing their paradigm from 'business as usual' to 'whatever it takes' to get to zero malaria.

# The WHO elimination certification process **at a glance**

Certification of malaria elimination is the official recognition by WHO of a country's malaria-free status.

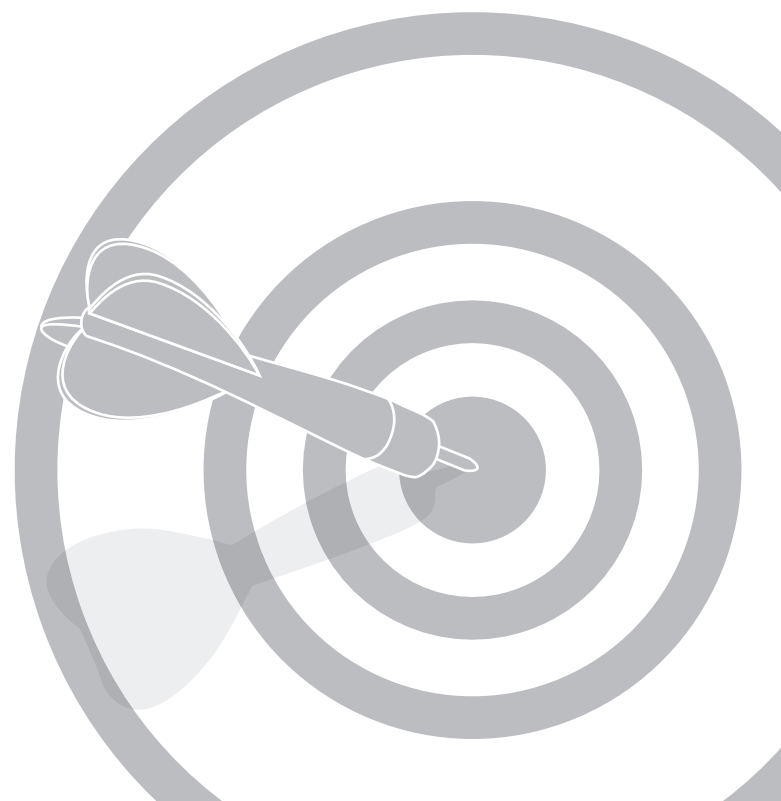
WHO grants this certification when a country has proven, beyond reasonable doubt, that the chain of indigenous malaria transmission by *Anopheles* mosquitoes has been interrupted nationwide for at least the past three consecutive years. Additionally, the country must demonstrate the capacity to prevent the re-establishment of transmission.

The burden of proof falls on the country requesting certification. A national surveillance system capable of rapidly detecting and responding to malaria cases (if they were occurring) must be operational, together with an appropriate programme to prevent re-establishment of transmission.

The final decision on granting certification of malaria elimination rests with the WHO Director-General, based on a recommendation by the Malaria Elimination Certification Panel.

Certification of malaria elimination is managed by the WHO Global Malaria Programme and involves rounds of expert reviews, field assessments and the compilation of a final evaluation report that determines, based on evidence gathered, if a country is ready to be certified as free of malaria.

This process is voluntary and can be initiated only after a country has submitted an official request to WHO.



# Malaria Elimination Oversight Committee

## Helping countries get to zero

The Malaria Elimination Oversight Committee (MEOC) works with countries to achieve malaria-free status. Established in April 2018, the committee aims to maintain a 360-degree overview of how countries and regions are advancing towards malaria elimination. Progress is assessed in line with the milestones and timelines set by countries, through programme reviews and occasional field visits carried out by the committee. An important function of the MEOC is identifying issues that could threaten elimination. By sharing such findings, potential risks can be addressed by WHO, regional initiatives or the country's national malaria programme. Further, as an independent body, the committee can raise difficult issues while remaining impartial.

# Malaria Elimination Certification Panel

## Verifying malaria-free status

Countries that have interrupted indigenous malaria transmission for at least the past three consecutive years may request WHO certification of elimination. Tasked with reviewing such requests – and making a recommendation to the WHO Director-General – is the Malaria Elimination Certification Panel (MECP). Formed in December 2017, the panel assesses evidence submitted by countries (e.g. national malaria reports), analyses independent sources (e.g. articles, research, country visit reports) and conducts evaluation missions, all to arrive at a recommendation either to certify the country as malaria-free or postpone certification based on its assessment.

For more information on the members and functions of the MEOC and the MECP, please visit: <http://www.who.int/malaria/areas/elimination/advisory-committees/>

## ACKNOWLEDGEMENTS

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