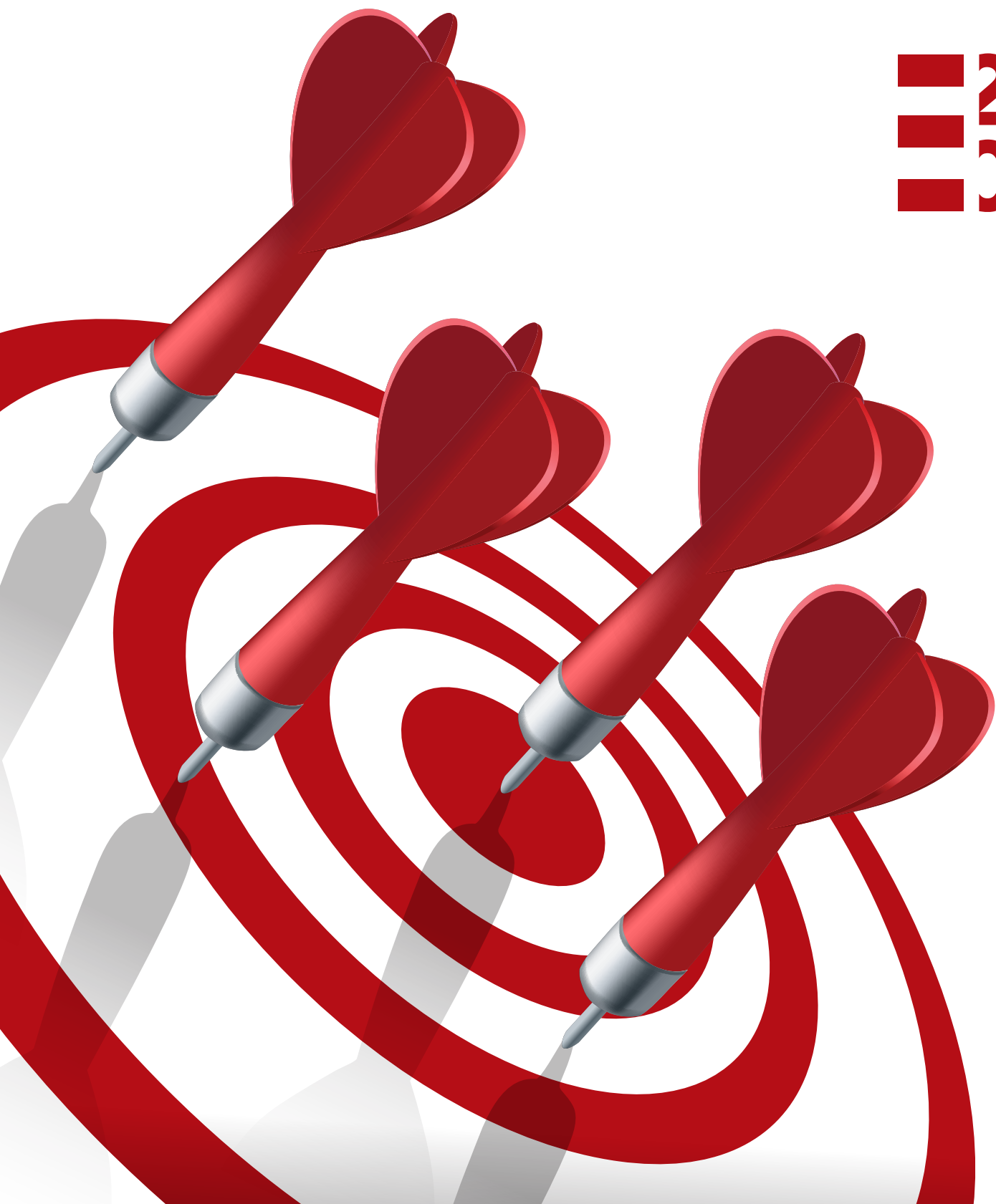


ZEROING IN ON MALARIA ELIMINATION:

Final report of the
E-2020 initiative

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Foreword

In recent years, WHO has sounded the alarm over worrying trends in the global response to malaria: progress has levelled off, and many countries hardest hit by the disease have been losing ground.

At the same time, a growing number of countries with a low burden of malaria have been moving with steady determination towards the target of zero malaria, providing a source of inspiration for all malaria-endemic nations that are working to stamp out the disease.

Since 2017, WHO has supported a group of 21 malaria-eliminating countries through a special initiative called the “E-2020”. This report charts their progress towards a common goal: eliminating malaria within the 2020 timeline.

As described in these pages, many countries that reached zero malaria cases carried, at one time, a very high burden of malaria. Their elimination successes have shown the world that getting to zero is a viable goal for all countries, no matter how near or far they may be from that target today.

In 1965, El Salvador reported the highest number of malaria cases in Central America. Following a more than 50-year commitment, the country became the first in the region to eliminate the disease. El Salvador was certified malaria-free by WHO earlier this year – an impressive feat for a country that shares open borders with two malaria-endemic nations.

In 2019, Algeria became the third country in Africa to be certified malaria-free. Underpinning this achievement was a well-trained health workforce, a rapid response to disease outbreaks and a resolve to

leave no one behind: everyone in Algeria receives free diagnosis and treatment, regardless of nationality or legal status.

Although each country’s elimination journey is unique, common drivers of success have been seen across all regions. Political commitment to ending the disease often transcends any one government and is maintained over many decades. This commitment is translated into domestic funding and actions that prevent malaria transmission and save lives.

Most countries that succeed in eliminating malaria offer free primary health care, ensuring that all people in need of malaria services can access them without financial hardship. Robust data systems and the engagement of communities are also key drivers of success.

According to this report, eight E-2020 member countries reported zero indigenous cases of malaria in 2020, a remarkable achievement in view of the ongoing global COVID-19 pandemic. Maintaining zero cases is a testament to their commitment to protect hard-won gains and keep the disease at bay.

WHO and partners continue to stand by all countries that are working to end this deadly scourge, at every step of the journey. The road to malaria elimination is not quick, nor is it easy. But with sustained commitment and collaboration, we can achieve our common vision of a malaria-free world.

Dr Pedro Alonso
Director, Global Malaria Programme
World Health Organization

“ Malaria control should not be a campaign; it should be a policy, a long-term programme. It cannot be accomplished or maintained by spasmodic effort. It requires the adoption of a practicable programme, the reasonable continuity of which will be sustained for a long term of years. ”

Mark F. Boyd (1939)

E-2020 initiative: a brief overview

The WHO *Global technical strategy for malaria 2016–2030*,¹ endorsed by the World Health Assembly in May 2015, is designed to guide and support all malaria-affected countries as they work to reduce and eliminate the human suffering caused by the world’s deadliest mosquito-borne disease.

The strategy sets ambitious targets aimed at dramatically lowering the global malaria burden over a 15-year period, with milestones at each five-year mark to track progress (see table below). A key milestone for 2020 is the elimination of malaria in at least 10 countries that had the disease in 2015.

In 2016, WHO identified a group of 21 countries across five regions with the potential to reach this milestone. Countries were selected based on an

analysis that considered the likelihood of elimination across three key criteria:

- ① trends in malaria case incidence between 2000 and 2014;
- ① declared malaria elimination objectives of affected countries;
- ① informed opinions of WHO experts in the field.

Through the E-2020 initiative, launched in 2017, WHO supported these 21 countries in their efforts to achieve zero indigenous cases of malaria within the 2020 timeline. While some countries did not meet the 2020 elimination goal, they remain committed to ridding their populations of the last vestiges of this disease.

Goals, milestones and targets 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 |



¹ Global technical strategy for malaria 2016–2030. Geneva: World Health Organization; 2015 (<https://apps.who.int/iris/handle/10665/176712>, accessed 20 April 2021).

WHO guidance

To guide countries in their elimination journeys, WHO developed the 2017 *Framework for malaria elimination* with an updated set of tools, activities and strategies.² It outlines the critical requirements needed to achieve and maintain elimination, such as national case-based surveillance systems, quality data management, and robust human and financial resources.

The framework includes a clearly defined process for countries to obtain a malaria-free certification from WHO. It introduces, for the first time, the concept of subnational malaria elimination, which is particularly relevant for large countries like Brazil, China and


Mexico as well as countries with significant variation in transmission levels, such as Ethiopia, Kenya and Madagascar. The framework also offers guidance on setting targets and systems to verify malaria-free areas within a country's borders, which can be an important building block for obtaining national certification.

In January 2021, WHO published a new manual, *Preparing for certification of malaria elimination*,³ with extended guidance for countries that are approaching elimination and preparing for malaria-free certification.

Global forums and advisory bodies

To keep elimination high on the agenda in E-2020 countries, WHO convened three global forums that brought together malaria programme managers from the 21 countries. The forums provided an important platform for technical experts from all regions to share progress, challenges and lessons learned. The inaugural forum, held in March 2017, led to the creation of two new independent WHO advisory bodies:

 The **Malaria Elimination Oversight Committee** guides countries in their efforts to reach the target of zero malaria. The committee aims to maintain a 360-degree overview of how countries and regions are advancing towards this goal. Progress is assessed through programme reviews and occasional field visits.

 The **Malaria Elimination Certification Panel** is tasked with verifying a country's malaria-free status. After reviewing evidence submitted by countries, analyzing independent sources and conducting on-site evaluation missions, members of the panel make a recommendation to WHO to either certify a country as malaria-free or to postpone certification.

The second E-2020 global forum in Costa Rica, held in June 2018, saw Paraguay officially certified as malaria-free. China hosted a third forum in June 2019 focused on populations at high risk of malaria infection.

STOP-Malaria

In 2019, WHO launched a new programme, in collaboration with partners, to address the shortage of skilled technical staff at the district and provincial levels in countries working to eliminate malaria. Through the STOP-Malaria programme, consultants were deployed to five countries in 2020 – Botswana,

Cabo Verde, Eswatini, Namibia and Sao Tome and Principe – to support their elimination efforts at the subnational level. The consultants provided a range of support to malaria elimination programmes in these countries, from case management and case-based surveillance to vector control.

² A framework for malaria elimination. Geneva: World Health Organization; 2017 (<https://apps.who.int/iris/handle/10665/254761>, accessed 20 April 2021).

³ Preparing for certification of malaria elimination. Geneva: World Health Organization; 2020 (<https://apps.who.int/iris/handle/10665/337837>, accessed 20 April 2021).

Malaria elimination certification **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.

A country must also demonstrate the capacity to prevent the re-establishment of transmission. A national surveillance system able to rapidly detect and respond to malaria cases (if they are occurring) must be operational, together with appropriate

measures to prevent onward transmission from any imported cases of the disease.

The final decision on awarding a malaria-free certification rests with the WHO Director-General, based on a recommendation by the Malaria Elimination Certification Panel. This process is voluntary and can be initiated only after a country has submitted an official request to WHO. Globally, a total of 39 countries and territories have been certified malaria-free.



Reaching the **elimination milestone**

This report assesses country progress at the finishing line of the E-2020 initiative. To reach the elimination milestone of the WHO global strategy, a country that was malaria-endemic in 2015 had to achieve at least one year of zero indigenous cases, and then maintain that status through the end of 2020. Seven E-2020 member countries⁴ succeeded in reaching this milestone: Algeria, Belize, Cabo Verde, China, El Salvador, the Islamic Republic of Iran and Malaysia.⁵

Additionally, three countries that were not part of the E-2020 initiative – Azerbaijan, Sri Lanka and Tajikistan –

reached the milestone. All three countries had already achieved the target of zero indigenous cases by 2017, when the E-2020 initiative was first formed.

Now begins a new initiative: the E-2025. WHO has identified a new cohort of 25 countries that could eliminate malaria within the next five years. At the time of this publication, E-2025 countries continue to respond to the dual threat of malaria and COVID-19. But as the stories in this report show, elimination is possible, even in the face of extreme challenges.

⁴ When WHO first conducted its analysis of malaria-eliminating countries in 2016, preliminary estimates at the time showed that Paraguay was still malaria-endemic. These estimates were later corrected as more data became available and showed that Paraguay achieved zero indigenous cases for the period 2012-2014. As such, the country was no longer considered malaria-endemic in 2015 and its success does not count towards the attainment of the 2020 elimination milestone of the WHO global malaria strategy.

⁵ Although Malaysia has eliminated the malaria species transmitted between people (*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.

Eliminating malaria in the context of COVID-19

Since early 2020, the pandemic has disrupted nearly all health services – whether they were routine or emergency response. Malaria was no different.

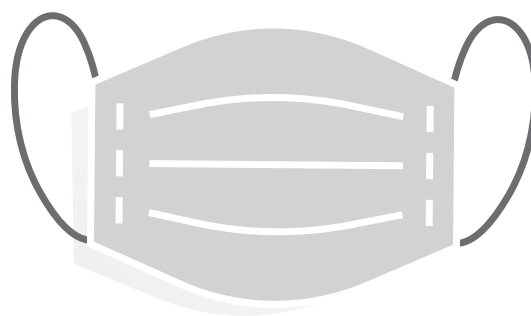
Firefighting a virus that was spreading at top speed across the globe required an extraordinary surge capacity. To meet this need, governments diverted human and financial resources away from national malaria programmes to tackle COVID-19; in some cases, nearly all national malaria programme staff were detailed to the pandemic.

To reduce the spread of COVID-19, countries implemented lockdowns and restrictions on the movement of people and goods. This led, in many cases, to delays in the delivery of malaria preventive measures, such as the spraying of insecticides in homes and the provision of insecticide-treated nets.

In Bhutan, the delayed distribution of nets and other disease control tools led to a spike in malaria cases in 2020. Following lockdowns that prevented health workers from travelling quickly to rural areas, Timor Leste – a country that had reported zero indigenous cases of malaria in 2018 and 2019 – saw an outbreak of the disease along its shared border with Indonesia in mid-2020.

Malaria diagnosis and treatment services were also interrupted during the pandemic as many people were unable – or unwilling – to seek care in health facilities. According to the results of a recent WHO survey, one third of countries reported experiencing disruptions in the delivery of malaria services in the first three months of 2021. Many people are not seeking care due to the fear of contracting COVID-19.

COVID-19 has affected malaria case numbers in other ways, too. In Botswana, for example, a sharp rise in malaria cases in mid-2020 is thought to have resulted from an increase in the number of people travelling from urban to rural areas in anticipation of lockdowns.



In all E-2020 countries but one (Saudi Arabia), restrictions on movement due to COVID-19 have led to lower rates of imported malaria cases, reducing the risk of local transmission of the disease. Countries that have seen the greatest drop in importation rates are: Cabo Verde, Belize and El Salvador (100%); Timor-Leste (89%); Eswatini (75%); Malaysia (74%); Bhutan (70%); Republic of Korea (61%); China, Mexico and South Africa (59%).⁶

Some countries managed to maintain and even strengthen their malaria elimination efforts during the pandemic. Of the 21 E-2020 countries, eight have successfully kept malaria at bay during the pandemic, reporting – as of April 2021 – zero indigenous cases of the disease. These countries include Algeria, Belize, Cabo Verde, China, El Salvador, the Islamic Republic of Iran, Malaysia and Paraguay.


In the face of the pandemic, Algeria bolstered its surveillance system, ensuring active screening, detection, and management of malaria cases. Eswatini switched to conducting malaria case investigations by telephone after mobility restrictions prevented teams from going to the field.

⁶ Data provided by national malaria programmes.


Elimination progress

Number of reported indigenous malaria cases in E-2020 countries, by WHO region, 2012–2020

| Country | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020* | ↑** 0 ↓ |
|--|--------|--------|--------|-------|-------|--------|--------|--------|-------|---------------|
| Algeria  | 55 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Botswana | 193 | 456 | 1 346 | 284 | 659 | 1 847 | 534 | 169 | 864 | ↑ |
| Cabo Verde | 1 | 22 | 26 | 7 | 48 | 423 | 2 | 0 | 0 | 0 |
| Comoros*** | 49 840 | 53 156 | 2 203 | 1 884 | 1 467 | 3 896 | 15 613 | 17 599 | 4 546 | ↓ |
| Eswatini | 409 | 728 | 389 | 318 | 250 | 440 | 686 | 239 | 234 | ↓ |
| South Africa | 6 621 | 8 645 | 11 705 | 4 959 | 4 323 | 23 381 | 9 540 | 3 096 | 4 463 | ↑ |
| Belize | 33 | 20 | 19 | 9 | 4 | 7 | 3 | 0 | 0 | 0 |
| Costa Rica | 6 | 0 | 0 | 0 | 4 | 12 | 70 | 95 | 91 | ↓ |
| Ecuador | 544 | 368 | 242 | 618 | 1 191 | 1 275 | 1 653 | 1 803 | 1 921 | ↑ |
| El Salvador  | 13 | 6 | 6 | 5 | 12 | 0 | 0 | 0 | 0 | 0 |
| Mexico | 833 | 495 | 656 | 517 | 551 | 736 | 803 | 618 | 345 | ↓ |
| Paraguay  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Suriname | 569 | 729 | 401 | 81 | 76 | 19 | 29 | 95 | 148 | ↑ |
| Iran (Islamic Republic of) | 756 | 479 | 358 | 167 | 81 | 57 | 0 | 0 | 0 | 0 |
| Saudi Arabia | 82 | 34 | 30 | 83 | 272 | 177 | 61 | 38 | 107 | ↑ |
| Bhutan | 82 | 15 | 19 | 34 | 15 | 11 | 6 | 2 | 22 | ↑ |
| Nepal | 3 230 | 1 974 | 832 | 591 | 507 | 623 | 493 | 127 | 71 | ↓ |
| Timor-Leste | 5 518 | 1 223 | 411 | 80 | 81 | 16 | 0 | 0 | 1 | ↑ |
| China | 244 | 83 | 53 | 39 | 1 | 0 | 0 | 0 | 0 | 0 |
| Malaysia | 2 050 | 1 092 | 604 | 242 | 266 | 85 | 0 | 0 | 0 | 0 |
| Republic of Korea | 394 | 383 | 557 | 627 | 602 | 436 | 501 | 485 | 362 | ↓ |

 Countries that reported zero indigenous cases of human malaria in 2020



 Countries that have been certified malaria-free by WHO

Source: national malaria programmes

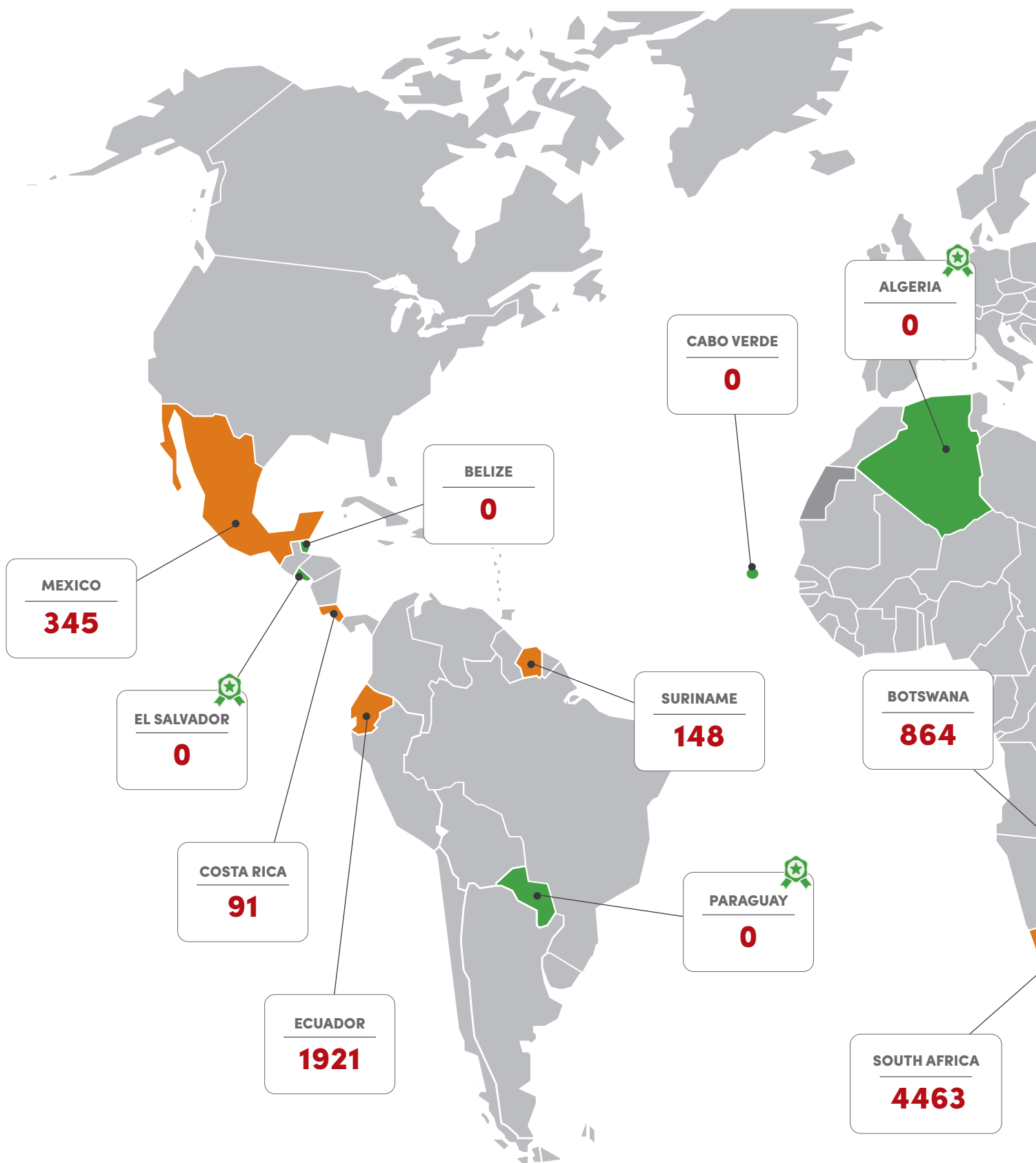
* Preliminary numbers of indigenous or local (indigenous and introduced) human malaria cases as of 1 April 2021, as reported by national malaria programmes, except where noted. Final figures will be reported in the *World malaria report 2021*.

** Change in indigenous malaria cases between 2019 and 2020

*** Comoros is reporting total malaria cases as classifications have not yet been completed.

E-2020 countries

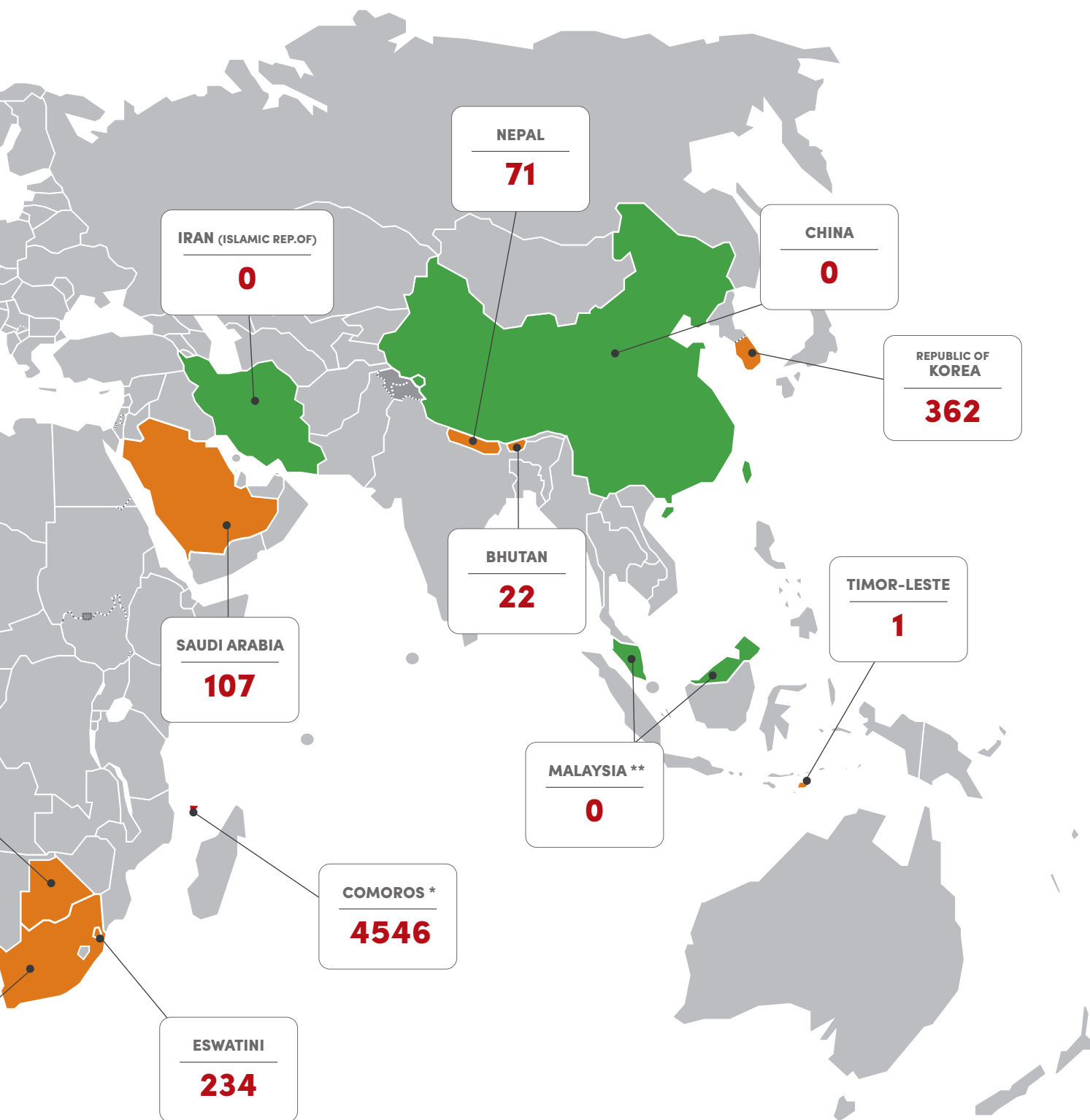
Snapshot of indigenous malaria cases in 2020



Source: national malaria programmes. Preliminary numbers of indigenous or local (indigenous and introduced) human malaria cases as of 1 April 2021, as reported by national malaria programmes, except where noted. Final figures will be reported in the *World malaria report 2021*.

* Comoros is reporting total malaria cases as classifications have not yet been completed.

** Although Malaysia has eliminated the malaria species transmitted between people (*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.



Countries that have been certified malaria-free by WHO



Countries that reported zero indigenous cases of human malaria in 2020



Countries that reported 1 or more indigenous cases of human malaria in 2020

The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization 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.

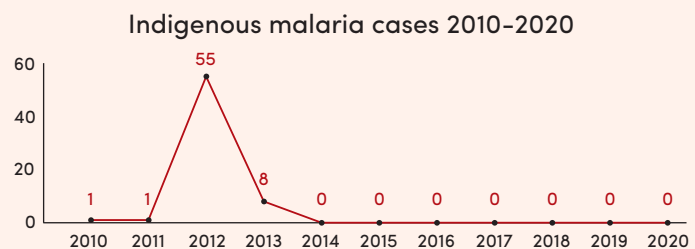
Country highlights

To reach the elimination milestone of the WHO global malaria strategy, a country that was malaria endemic in 2015 had to achieve at least one year of zero indigenous cases of the disease, and then maintain that status through the end of 2020.

Seven E-2020 member countries succeeded in meeting this milestone: Algeria, Belize, Cabo Verde, China, El Salvador, the Islamic Republic of Iran and Malaysia. We trace their elimination journeys here.⁷

African Region

Algeria



In 1880, French physician Alphonse Laveran discovered the malaria parasite while working at a military hospital in northern Algeria – a key milestone in the global fight against the disease. The country’s early malaria control efforts, conducted under French rule, focused on vector control techniques such as the draining of stagnant water to eliminate mosquito breeding sites and the mass distribution of preventive antimalarial drugs.

As a result of these and other control measures, Algeria’s malaria burden declined substantially in the period before 1945. However, during the Algerian War of 1954–1962, efforts to control the disease faltered and malaria became the country’s main health challenge, with an estimated 70 000 cases per year.

After gaining independence from France in 1962, Algeria launched a malaria elimination strategy that succeeded in dramatically reducing the disease burden through insecticide spraying and the use of antimalarial drugs on a mass scale. Between 1968 and 1978 cases fell by 98%, from more than 12 000 to just 30.

In the late 1970s, the development of the Algerian segment of the Trans-Saharan highway spurred an increase in malaria transmission in the country’s

southern provinces. The highway linked Algeria to neighbouring malaria-affected countries in sub-Saharan Africa, facilitating population movement. Between 1977 and 2008, the annual number of malaria cases in Algeria rose to an average of 250.

Beginning in 2009, Algeria stepped up its efforts to reduce imported cases of malaria through cross-border cooperation with Libya, Mali, Mauritania, Niger and Tunisia. By 2014, indigenous cases of the disease were reduced to zero, an achievement that Algeria has maintained to this day.

Key to success was the country’s excellent health care system that extends even to remote areas. All health services, including malaria prevention, diagnosis and treatment, are provided free of charge to anyone within Algeria’s borders, regardless of nationality or legal status.

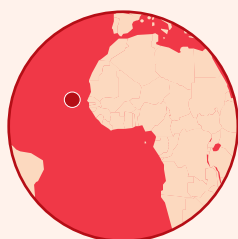
This achievement was also underpinned by a robust surveillance system, a well-trained health workforce, effective vector control and a rapid response to outbreaks of the disease. Algeria’s malaria elimination programme was fully funded through domestic sources – a testament to the country’s strong political commitment to ending the disease.

⁷ For all graphs, source: national malaria programmes. For 2020, preliminary numbers of indigenous or local (indigenous and introduced) human malaria cases as of 1 April 2021 are provided. Final figures will be reported in the *World malaria report 2021*.

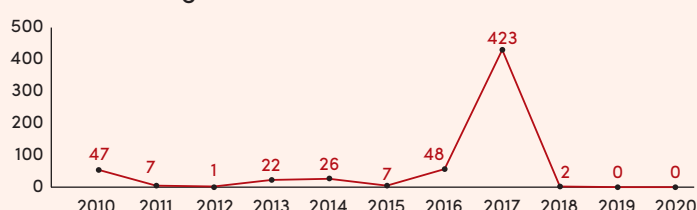
In 2019, Algeria became the third country in Africa to be officially certified malaria-free by WHO, after Mauritius (1973) and Morocco (2010). While the risk of re-establishment of malaria remains a concern, Algeria has proven capable of detecting, treating and responding to all imported malaria cases rapidly enough to prevent indigenous transmission from occurring.

During the COVID-19 pandemic, Algeria further strengthened its surveillance system, ensuring that the active screening, detection, and management of malaria cases were undertaken according to national protocol. In the country's southern provinces, where most imported cases of the disease continue to be recorded, Algeria has made an extra effort to ensure the availability of antimalarials for all in need.

Cabo Verde



Indigenous malaria cases 2010–2020



Before the 1950s, all of Cabo Verde's nine inhabited islands located off the coast of West Africa were affected by malaria, with severe epidemics occurring regularly in the most densely populated areas. Through the targeted use of insecticide spraying and larval source management, the country eliminated malaria twice: in 1968 and 1983. However, subsequent lapses in vector control led to a return of the disease.

By 2015, Cabo Verde had reduced indigenous malaria transmission to only seven cases. However, imported cases led to an outbreak in 2017, when the country recorded 423 indigenous infections in the capital city of Praia on the island of Santiago. Supported by WHO, Cabo Verde responded quickly and vigorously through a combination of robust vector control, rapid case detection and treatment.

Since the last peak of cases in the late 1980s, malaria in Cabo Verde has been confined to two islands (Santiago and Boa Vista). In 2007, the country's Ministry of Health set its sights again on stamping out any remaining pockets of indigenous transmission; malaria elimination by 2020 was included as an objective in the country's national health policy.

In January 2021, after achieving three consecutive years of zero indigenous cases, Cabo Verde became eligible to apply for the WHO certification of malaria elimination. During the ongoing COVID-19 pandemic, the country's leaders have expressed a commitment to safeguard progress; current efforts are focused on sustaining vector control, on strengthening malaria surveillance – especially at ports, airports and in the capital city – and in preparing for certification.

A five-year national strategic malaria plan (2009–2013) laid additional groundwork for Cabo Verde's success today. It called, among other measures, for the expansion of quality-assured diagnosis in all health facilities, early and effective treatment for all infected patients, and the reporting and investigation of all detected cases. Notably, diagnosis and treatment were provided free of charge to international travellers and migrants, an effort to stem the tide of imported cases from mainland Africa.

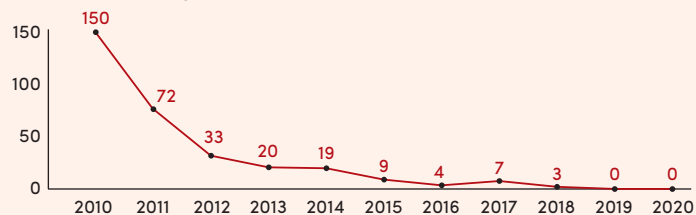
All people with a confirmed malaria diagnosis continue to be hospitalized for three days of treatment, a strategy that has resulted in high rates of adherence to antimalarial medication, low rates of mortality and, ultimately, zero indigenous cases of the disease.

Region of the Americas

Belize



Indigenous malaria cases 2010-2020



In 1930, records from health facilities in Belize – known at the time as British Honduras – showed that more than 10% of deaths in the country were due to malaria. By 1939, an estimated 50% of the population living outside of urban areas had the disease, and severe malaria was particularly common in the country’s southern districts.

Belize launched a targeted vector control programme in 1950 that succeeded, by 1963, in nearly wiping out malaria nationwide. However, after the regular use of insecticide spraying ceased, cases reappeared. By 1982, over half of all localities in Belize’s six districts reported malaria transmission. Cases continued to rise in the 1980s – a trend attributed to a shrinking malaria control budget and an influx of refugees from neighbouring malaria-endemic countries during a period of political upheaval.

Over the last 25 years, Belize achieved a dramatic reduction in its malaria burden, from a peak of about 10 000 cases in 1994 to zero indigenous cases from December 2018. The country will be eligible to apply for the WHO certification of malaria elimination in December 2021, assuming no new indigenous cases are reported before that date.

This remarkable achievement was underpinned, in large part, by a combination of early case detection through a dedicated network of community-based health workers and, for those with a confirmed malaria diagnosis, the provision of effective antimalarial treatment. Belize’s success also stemmed from the regular and widespread use of effective vector control methods, including insecticide-treated mosquito nets and indoor spraying of insecticides.

By 2011, Belize was reporting fewer than 100 cases annually. Beginning in 2015, the country reoriented its malaria programme, placing a greater focus on enhanced surveillance in the remaining malaria-endemic areas. This, in turn, allowed for a more strategic targeting of interventions and available resources. To sustain malaria surveillance efforts during the pandemic, the country has made an effort to integrate malaria and COVID-19 surveillance systems and to introduce the use of malaria rapid diagnostic tests.

Belize is now on the last mile of the road to elimination. With the support of WHO and the Pan American Health Organization (PAHO), the country is working towards the goal of malaria-free certification in 2022 through an integrated programme that includes, among other measures, annual training for health workers to ensure that any imported cases are detected and treated rapidly.

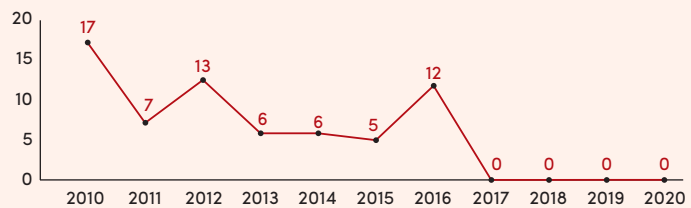
The frequent travelling of Belizean nationals to neighbouring Guatemala and Mexico, where malaria transmission still occurs, as well as an increase in the number of immigrant workers in Belize’s agriculture and tourism industries, pose ongoing threats to the country’s malaria elimination effort. Cross-border cooperation will be critical to prevent the reintroduction of the disease in malaria-free areas.



El Salvador



Indigenous malaria cases 2010–2020



In February 2021, El Salvador became the first Central American country to be certified malaria-free by WHO. This achievement follows more than 50 years of commitment and concerted action by the Salvadoran Government and its people to end the disease.

Beginning in the 1940s, El Salvador worked to stamp out malaria through the use of the pesticide DDT and by draining large reservoirs of water that served as mosquito breeding grounds. In the mid-1950s, the country recruited a network of volunteers to detect and treat malaria at the community level; known as “Col Vol”, these volunteer health workers registered cases, allowing for strategic and targeted responses to the disease.

By the late 1960s, progress had slowed as mosquitoes developed resistance to DDT. An expansion in the country’s cotton industry is thought to have fuelled a further rise in cases; the 1970s saw a surge in the number migrant laborers on cotton estates in coastal areas near mosquito breeding sites. El Salvador experienced a resurgence of malaria, reaching a peak of nearly 96 000 cases in 1980.

With the support of WHO and partners, El Salvador successfully reoriented its malaria programme by targeting resources and interventions to high-transmission areas. The Government decentralized its network of diagnostic laboratories, allowing for cases to be detected and treated more rapidly. These factors, together with the collapse of the cotton industry, led to a rapid decline of cases in the 1980s.

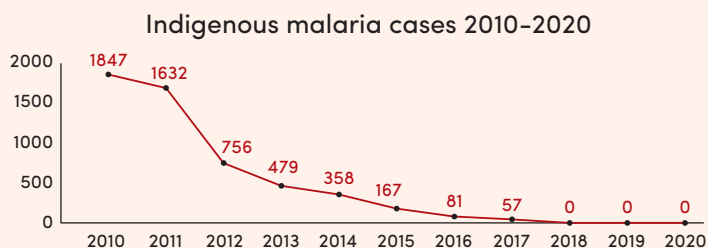
With the exception of one outbreak in 1996, El Salvador continued to steadily reduce its malaria burden: between 1990 and 2010, the number of malaria cases fell from more than 9000 to less than 30. The country has reported zero indigenous cases of the disease since 2017.

Despite reporting its last malaria-related death in 1984, El Salvador has maintained its domestic investments for malaria. In 2020, the country continued to rely on a large network of vector control personnel, laboratories, nurses and doctors, and more than 3000 community health workers involved in case detection. As part of El Salvador’s commitment to maintain zero cases, national budgeting for malaria will be preserved, despite the COVID-19 pandemic.

The threat of imported cases of malaria from neighbouring Guatemala and Honduras remains a challenge, but one that lessens each day as both countries make progress towards elimination. Salvadoran nationals working in the sugar cane industry in Guatemala may carry the disease with them when they return home. Tourists from neighbouring countries may also expose the local population to the disease. El Salvador has important economic and trade links with Guatemala which have resulted in a steady flow of people across the border in both directions.

Eastern Mediterranean Region

Islamic Republic of Iran



Historical records suggest that malaria has been prevalent in the Islamic Republic of Iran for thousands of years, threatening lives and national development efforts. Now, after more than six decades of concerted action, the country has achieved what once seemed impossible: zero indigenous cases of malaria.

In the early 20th century, malaria was the most important public health problem in the Islamic Republic of Iran; while the disease was particularly severe in the humid Caspian plains, it could be found in all regions, even in major cities. By the 1940s, malaria was the main cause of death in the country and there were approximately 5 million new cases annually.

Following the Second World War, the Ministry of Health launched an ambitious malaria control programme that achieved major reductions of malaria in high burden areas, mainly through the widespread use of the insecticide DDT. A national malaria elimination programme, launched in 1956, succeeded in further lowering the country's malaria burden, including in the southern regions.

By 1990, malaria was concentrated in three south-eastern provinces where the disease was highly endemic. Cases peaked at approximately 98 000 in 1991 and then steadily declined. Ten years later, the country had succeeded in lowering its malaria caseload to just over 12 000, mainly through intense surveillance and improved vector control.

In 2010, the Islamic Republic of Iran set its sights on eliminating malaria by 2025. Following the launch of a new national malaria elimination programme, the country set up more than 100 rapid response teams to manage case investigations and vector control. The teams established emergency sites stocked with all

major malaria commodities, such as insecticide-treated nets, rapid diagnostic tests, and antimalarial medicines.

As part of its malaria elimination strategy, the country also recruited and trained more than 3700 community health volunteers to provide prompt diagnosis and treatment services in all malaria-endemic areas, even in remote villages. By 2016, a network of 500 case detection posts staffed by volunteers had been erected along border areas in the south-eastern provinces.

These efforts paid off: by 2017, there were fewer than 100 indigenous cases reported nationwide and, in 2018, the Islamic Republic of Iran reported its last indigenous case of malaria. The country became eligible to apply for the WHO malaria-free certification in February 2021.

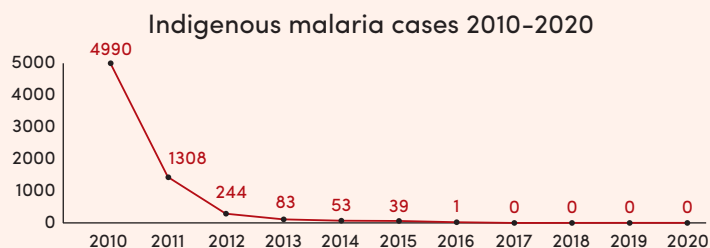
Underpinning this success was robust political commitment to stamping out malaria, sustained domestic funding, socio-economic development in endemic areas and a resolve to leave no one behind: everyone in the country has access to free primary health care, including for the control and treatment of malaria.

The frequent cross-border movement of migrant workers poses an ongoing threat to this achievement. In recent years, more than 80% of cases detected in the Islamic Republic of Iran have been imported.

In response, the country continues to offer services to all people who show symptoms of the disease – regardless of their legal status – through malaria case detection posts in border areas. The Ministry of Health has also trained volunteer migrant workers in the use of insecticide-treated nets and rapid diagnostic testing; these workers serve as important links to their communities, helping prevent and detect malaria among populations at high risk of infection.

Western Pacific Region

China



Over the course of seven decades, China, the world's most populous country, succeeded in driving down its malaria burden from 30 million cases per year in the 1940s to zero indigenous cases in 2017 – a stunning achievement that has been maintained to this day.

Beginning in the 1950s, health authorities worked to locate and stop the spread of malaria by providing free preventive treatment for people at risk of the disease as well as antimalarial medicines for those who had fallen ill. The country also reduced mosquito breeding grounds and stepped up the use of insecticide spraying in homes. By the end of 1990, the number of cases had plummeted to 117 000, and deaths were reduced by 95%.

In 2003, with support from the Global Fund, China stepped up training, staffing, laboratory equipment, medicines and mosquito control, an effort that led to a further reduction in cases. Within 10 years, the number of cases had fallen to about 5000 annually.

In recent years, a strict adherence to the timelines of the “1-3-7” strategy has been key to success. The “1” signifies the one-day deadline for health facilities to report a malaria diagnosis; by the end of day 3, health authorities are required to confirm a case and determine the risk of spread; and, within seven days, appropriate measures must be taken to prevent the further spread of the disease.

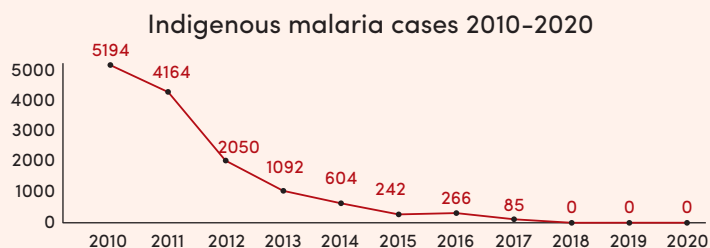
China's achievement was also underpinned by effective multi-sector collaboration. In 2010, 13 ministries – including those representing health, education, finance, research and science, development, public security, the army, police, commerce, industry, information technology, media and tourism – joined forces to end the risk of malaria nationwide.

In 2020, after reporting four consecutive years of zero indigenous cases, China applied for the WHO certification of malaria elimination. An independent group of experts aims to travel to China in 2021 to assess whether the country can be granted an official malaria-free status.

The risk of imported cases of malaria remains a key concern, particularly in the border regions of southern Yunnan Province where communities regularly cross the border and may bring the disease back with them. The country also faces a risk of imported cases among Chinese nationals returning from sub-Saharan Africa and other malaria-endemic regions.

To prevent a reintroduction of the disease, China has stepped up its malaria surveillance in at-risk zones and has engaged actively in regional malaria control initiatives. During the COVID-19 pandemic, the country maintained training for health providers through an online platform and held virtual meetings for the exchange of information on malaria case investigations and the treatment of patients, among other topics.

Malaysia



Malaysia has one of the oldest malaria control programmes in the world. Under British colonial rule in the early 1900s, the country experimented with new vector control methods, such as the draining of swamps and other mosquito habitats in areas with high malaria transmission. This pioneering work would later form the foundation of the Government's malaria control programme.

The country has battled malaria for most of its recent history. Reports following World War II show upwards of 300 000 cases treated each year in Peninsular Malaysia alone. Rates remained high through the 1950s and 1960s, with more than 200 000 reported cases in 1961.

In 1967, Malaysia developed a national malaria elimination plan and, over the next 13 years, succeeded in bringing its caseload down significantly: from about 300 000 cases in 1966 to just over 44 000 in 1980. The country continued, in subsequent decades, to achieve a steady decline in cases through a combination of effective vector control, early diagnosis and treatment, and robust surveillance.

Malaysia achieved the goal of zero indigenous cases of human malaria in 2018, well ahead of the 2020 target. 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.

Although Malaysia has eliminated the malaria species transmitted between people (*P. falciparum*, *P. vivax*, *P. ovale* and *P. malariae*), the country faces challenges with the *P. knowlesi* parasite, normally found in monkeys. In 2020, *P. knowlesi* infected approximately 2600 people. The Government has responded to this threat by, among other measures, developing national guidelines for the treatment of *P. knowlesi* malaria as well as a zoonotic malaria control strategy.

As restrictions on movement were imposed in Malaysia to contain COVID-19, the Ministry of Health ensured the continuity of routine case detection, case management and other key malaria elimination interventions. An adequate supply of malaria commodities, such as diagnostic equipment and antimalarial medicines, was maintained.

The national malaria programme also modified critical activities in the field to prevent the reintroduction of malaria and protect communities against COVID-19. For example, to avoid community gatherings and maintain social distancing, the country changed its strategy for the delivery of insecticide-treated nets, switching from the mass distribution of nets at fixed points in communities to door-to-door distribution at individual homes.

Lessons learned from the E-2020 initiative



1. Country ownership

The E-2020 initiative has shown that for malaria elimination responses to succeed, sustained government stewardship is vital. Political commitment to ending the disease must be translated into resources and actions that save lives.



2. Domestic financing

Some E-2020 countries have financed malaria elimination programmes entirely on their own, while others have contributed significant levels of funding to stamp out the disease.



3. Robust surveillance

As countries approach elimination, detecting and investigating every infection, or clusters of infections, becomes increasingly important to halt any remaining areas of transmission.



4. Leaving no one behind

In many E-2020 countries, a high proportion of malaria cases have been found among vulnerable populations living in remote or hard-to-reach areas. Progress has been accelerated by ensuring access to prevention and treatment for all at-risk groups, regardless of citizenship or legal status.



5. Cross-border collaboration

Countries nearing elimination will often detect the last few cases of the disease along international borders. Through cross-border collaboration, communities on both sides can be protected.



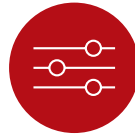
6. Quality-assured diagnostics

E-2020 countries have ensured the rapid detection of new cases by establishing national reference laboratories to oversee the quality of their diagnostics for malaria.



7. Multisectoral collaboration

Malaria's devastating impact is being increasingly recognized beyond the health sector; the disease can take a significant toll, for example, on a country's economy, worker productivity and tourism industry. Multi-sectoral collaboration has underpinned the success of a number of elimination efforts in E-2020 countries.



8. Tailored malaria responses

Many E-2020 countries have accelerated progress towards elimination through an effective mix of malaria control tools and strategies tailored to local settings. Capturing local data and using it to inform the optimal mix of interventions for a specific geographic context can reduce malaria transmission and save lives.



9. Integrated responses

All countries that have eliminated malaria should develop strategies to prevent its return. Providing ongoing services for the prevention, detection and treatment of the disease is critical, especially in at-risk areas. This can only be achieved through the integration of malaria services within a country's broader health system.



10. Innovative approaches and best practices

Many E-2020 countries have developed novel ways of working that are tailored to their specific circumstances, such as innovative approaches to deliver insecticide-treated nets or to improve case detection and treatment rates.

The next milestone: looking ahead to 2025

Ahead of World Malaria Day 2021, WHO announced the launch of the E-2025, a new elimination initiative that builds on the foundation of the E-2020. A set of 25 countries has been identified with the potential to eliminate malaria within the next five years.

All E-2020 member countries that have not yet requested malaria-free certification by WHO have been automatically nominated to participate in the E-2025. Additionally, eight new countries have been added based on four criteria.

1. Each of these countries has set a goal for malaria elimination by 2025 backed by a government-endorsed elimination plan. This is considered the minimum requirement to demonstrate that a country is committed to ending the disease within the next five-year timeframe.

2. Each of the countries has met a defined threshold of malaria case reductions in recent years, suggesting that they have the ability to be malaria-free by 2025. Specifically, this means that countries reported either:

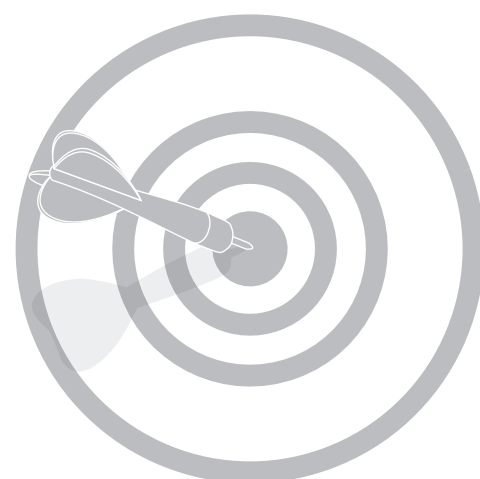
- o fewer than 3000 cases in 2019, or;
- o fewer than 5000 cases in 2019 accompanied by decreases in the number of indigenous cases in at least four out of the five years between 2015 and 2019.

3. Countries were also selected based on a number of programme requirements. Each country, for example, must have a governmental agency or focal point responsible for malaria elimination as well as the capacity to confirm 100% of suspected malaria cases in a laboratory.

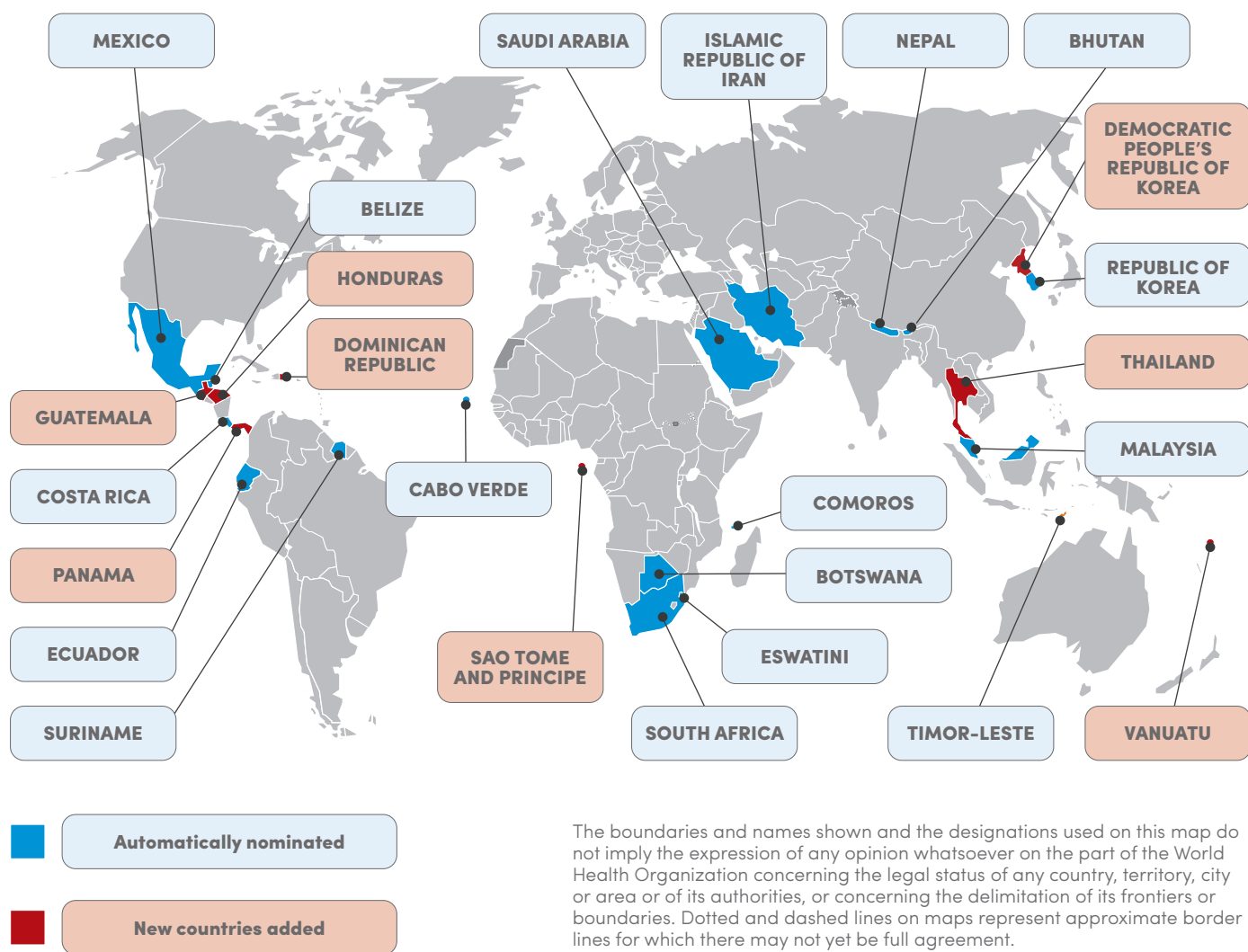
4. Finally, country selection was based on the expert opinions of WHO staff and members of the Malaria Elimination Oversight Committee. The Committee supports WHO and countries to eliminate malaria through strategic oversight and advice.

A country's willing participation and ownership of its elimination response is fundamental to success. In exchange for substantial technical and on-the-ground support provided by WHO and partners, countries are expected to audit their elimination programmes annually, participate in regular elimination forums, conduct periodic surveillance

assessments, and publicly share malaria case data quarterly. Countries are also encouraged to establish an independent national elimination committee to support the malaria programme in conducting audits and assessments, monitoring progress and other activities.



Countries selected for the E-2025 initiative



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ACKNOWLEDGEMENTS

The progress described in this report would not have been possible without the leadership and commitment of the 21 malaria-eliminating countries and the efforts of a broad coalition of partners. Their support was critical in making the E-2020 initiative a reality. Funding for the production of this report and overall support to the E-2020 initiative was gratefully received from The Global Fund, the Bill & Melinda Gates Foundation and other donors.

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Zeroing in on malaria elimination: Final report of the E-2020 initiative

ISBN 978-92-4-002435-9 (electronic version)

ISBN 978-92-4-002436-6 (print version)

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