World Health Organization
REGIONAL OFFICE FOR THE Eastern Mediterranean

Malaria action plan for the Eastern Mediterranean Region 2022–2030

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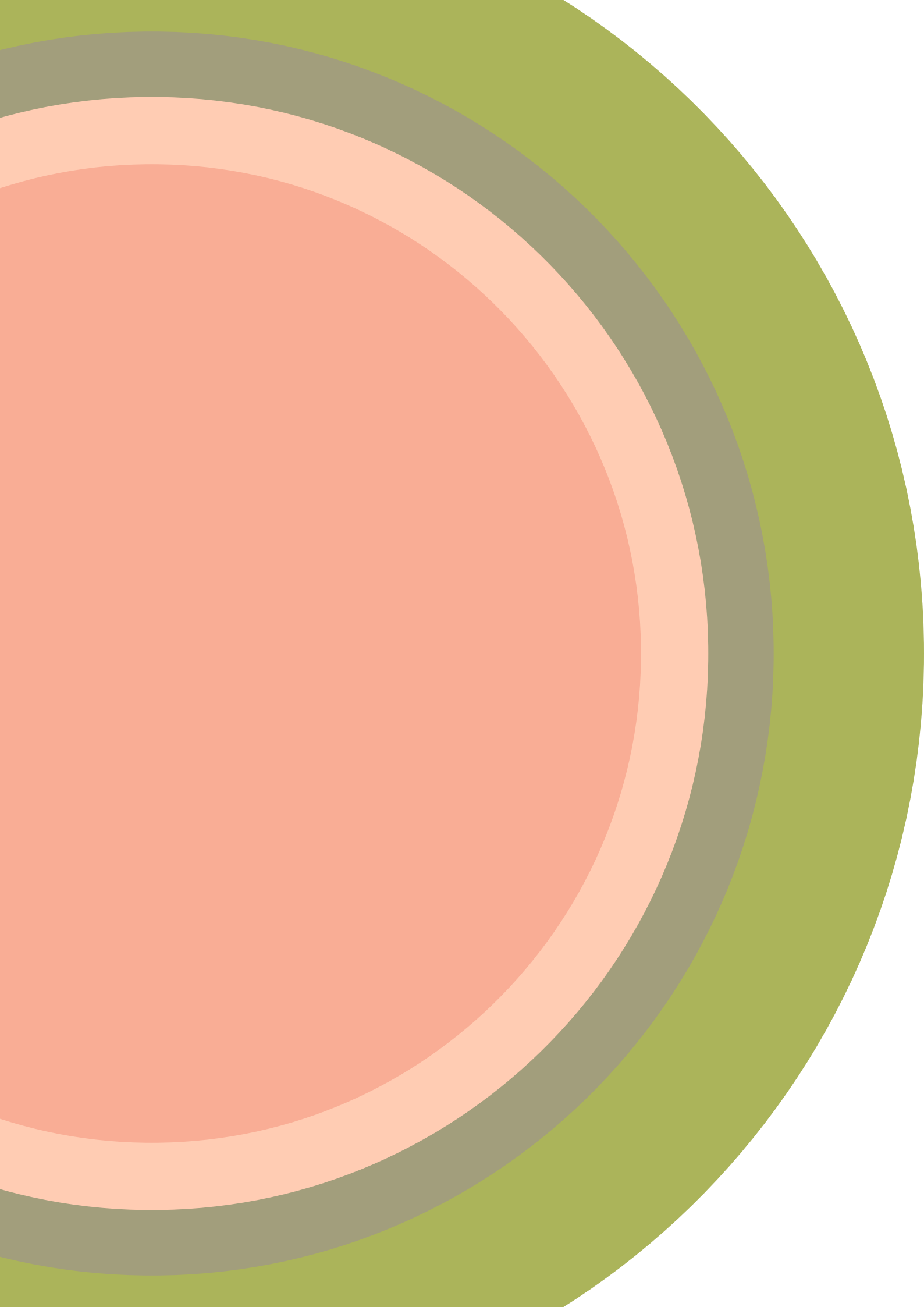

1. INTRODUCTION

1.1 Background

For millennia malaria has been endemic in almost all countries of the Eastern Mediterranean Region. After the Second World War, malaria eradication campaigns and social and economic development greatly reduced the malaria burden in the Region. By 2020, malaria transmission had been interrupted in Bahrain, Egypt, Jordan, Kuwait, Lebanon, Libya, Morocco, occupied Palestinian territory, Qatar, Tunisia and United Arab Emirates. It had also been interrupted in the majority of areas in other countries such as Iraq, Islamic Republic of Iran, Oman, Saudi Arabia and Syrian Arab Republic. Malaria remains endemic in six countries in the Region: Afghanistan, Djibouti, Pakistan, Somalia, Sudan and Yemen.

In 1999, the Roll Back Malaria initiative was launched in the Eastern Mediterranean Region. Countries in the Region committed themselves to its objectives and updated their national strategies for malaria control and elimination. In 2002, the World Health Organization (WHO) Regional Office for the Eastern Mediterranean developed the first regional strategic plan for Roll Back Malaria, for the period 2003–2006. The objectives of this plan were to halve the malaria burden in countries with a severe problem; decrease malaria morbidity and mortality so that it was no longer a public health problem in countries with low to moderate endemicity; eliminate malaria in countries with few residual foci; and prevent reintroduction in malaria-free countries. The strategy was updated following the WHO Regional Committee for the Eastern Mediterranean resolution EM/RC55/R.9 (2008), putting more emphasis on malaria elimination. Following this resolution, the Islamic Republic of Iran and Saudi Arabia started to implement malaria elimination strategies.

In 2016, the WHO Regional Office for the Eastern Mediterranean developed the *Regional malaria action plan 2016–2020: towards a malaria-free Region*, in consultation with all countries in the Region. This iteration of the regional action plan was in line with resolution EM/RC55/R.9, global resolutions pertaining to malaria control and elimination, and other related regional strategies, including integrated vector management and public health pesticides management frameworks. The goal, objectives, targets and approaches of the regional action plan were in line with the WHO Global technical strategy for malaria 2016–2030 (GTS), adopted by the Sixty-eighth World Health Assembly in May 2015 (WHA68.2). The GTS was updated in 2021.

By 2021, two milestones of the original GTS and regional action plan had been achieved. First, none of the 14 countries that were malaria-free in 2015 reported re-establishment of local malaria transmission. Second, the Islamic Republic of Iran reported zero indigenous cases for three consecutive years and became eligible for certification of malaria-free status in 2020, and Saudi Arabia reported zero indigenous cases for the first time in 2021.

Unfortunately, the Region did not reach the 2020 targets for reduction of malaria morbidity and mortality by 40% in the six endemic countries. In fact, most of them faced increasing biological threats. In Djibouti, Somalia, Sudan and Yemen, these threats included *Anopheles stephensi*, which can lead to greater risk of urban malaria, insecticide resistance, PfHRP2/3 gene deletion that in turn leads to diagnostic evasion for rapid tests, and antimalarial resistance. Malaria programmes are usually the only available resource for vector surveillance and control in the affected countries. In the absence of sufficient investment for this surveillance and control, the increasing burden and expansion of other vector-borne diseases, particularly *Aedes*-borne

diseases, increased the cost and burden on these countries' already under-resourced malaria control and elimination programmes.

In 2021, during the development of a new regional action plan, analysis of global and regional data indicated that the Eastern Mediterranean Region was not on track to reach GTS and Sustainable Development Goal (SDG) targets. The regional action plan will guide countries and WHO to address the current crisis and challenges for malaria that have delayed reaching global and regional targets. The goal, objectives, targets and approaches of the new plan will keep the aspirational aims of the GTS. However, the new plan will also consider the specific situation in the Region when setting regional targets. In view of the diversity of malaria burdens across the Region, this action plan sets out specific strategic approaches and malaria interventions for endemic countries, countries approaching malaria elimination and malaria-free countries.

1.2 Target audience

This action plan is intended for senior-level decision-makers in ministries of health, malaria programme managers, entomologists, and epidemiologists working on malaria and other vector-borne diseases programmes. It is also intended for decision-makers and technical and advocacy staff at other organizations and stakeholders involved in public health, malaria control and elimination, and urban and rural development.

1.3 Plan development

In this iteration of the regional action plan, the strategies and approaches designed for countries are the result of epidemiological analyses and risk mapping as well as country-specific discussions regarding the contextual factors and challenges that could affect strategy implementation. The Regional Office has also adapted and modified the methodology used for the *World malaria report 2021* projections and applied it to the six high-burden countries. The structure of the Regional malaria action plan 2022–2030 is based on countries' feedback on the 2016–2020 plan, consultation with malaria experts and guidance from leadership of the Department of Communicable Diseases in the Regional Office. The regional action plan reflects three possible scenarios of investment: continuation of the current level of coverage, increasing coverage of current interventions, and the introduction of new approaches and interventions.

In 2021, the Regional Office shared the first draft of the new plan with countries and WHO country offices for their input. The malaria and vector control programme of the Regional Office then convened a series of country-specific discussions with the respective countries. These discussions reviewed the national malaria situation, needs and feedback on the GTS and the draft regional action plan. After several internal reviews, the regional malaria programme shared the updated document with countries' malaria programmes, the WHO country offices, WHO headquarters for their review and input.

2. Malaria in the Eastern Mediterranean Region, 2015–2021

2.1 Malaria eco-epidemiology

The geographical diversity of the Eastern Mediterranean Region explains the variability in the endemicity, intensity of transmission and types of malaria found across the Region. The malaria-endemic countries of the Region are in the three eco-epidemiological zones of malaria: Afrotropical, Oriental and Palearctic. Currently, countries in the Region are also at different stages in their progress towards being malaria free (Table 1).

Table 1. Eastern Mediterranean Region countries and their progress towards malaria-free status

Phase	Number of countries	Countries
Transmission interrupted and preventing re-establishment	14	Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, the occupied Palestinian territory, Oman, Qatar, the Syrian Arab Republic, Tunisia and the United Arab Emirates. Two of these countries have been certified as malaria free by WHO: the United Arab Emirates in 2007 and Morocco in 2010 (Table 2).
Recently stopped reporting indigenous cases	2	The Islamic Republic of Iran (zero indigenous cases for first time in 2018) and Saudi Arabia (zero indigenous cases for first time in 2021) (Table 2).
Burden reduction phase	6	Afghanistan, Djibouti, Pakistan, Somalia, Sudan and Yemen (Table 3 and Table 4).

In the three African endemic countries – Djibouti, Somalia and Sudan – as well as Yemen, the main vectors are *An. arabiensis* and *An. funestus*, which are highly efficient and challenging to control. Since 2013, an Asian vector, *An. stephensi*, has invaded the Horn of Africa, Sudan and Yemen, leading to increased transmission, especially in Djibouti and possibly in urban areas of Somalia, Sudan and Yemen. The predominant malaria parasite species is *Plasmodium falciparum*, but *P. vivax* is increasing in many areas. In the other endemic countries, Afghanistan and Pakistan, both *P. falciparum* and *P. vivax* are transmitted, the latter being predominant. The main vector species are the oriental *An. culicifacies*, *An. stephensi* and *An. fluviatilis*. Evidence indicates that with sustained efforts, transmission can be controlled for these species. In some areas of these countries and in North Africa, palearctic vectors such as *An. superpictus*, *An. sacharovi* and *An. maculipennis* have historically been important.

2.2 Trend of malaria burden

The WHO Eastern Mediterranean Region did not meet the targets for malaria morbidity and mortality adopted by the GTS and the Regional malaria action plan 2016–2020 (Fig. 1). Progress has been slow or has stalled or the burden has increased in some high-burden countries. Regional indicators for case incidence and mortality rate were off target by 50% and 55%, respectively.

Table 2. Reported malaria cases in malaria-free countries and countries approaching malaria-free status in the WHO Eastern Mediterranean Region, 2015 and 2021

Country	2015		2021	
	Total reported cases	Indigenous cases	Total reported cases	Indigenous cases
Bahrain	87	0	49	0
Egypt	291	0	232	0
Iraq	2	0	25	0
Islamic Republic of Iran	799	187	999	0
Jordan	59	0	38	0
Kuwait	309	0	37	0
Lebanon	125	0	77a	0
Libya	324	2	52	0
Morocco	510	0	715	0
Occupied Palestinian territory	2	0	0 [a]	0
Oman	822	4	172	0
Qatar	445	0	262	0
Saudi Arabia	2620	83	2616	83
Syrian Arab Republic	12	0	12	0
Tunisia	88	0	79	0
United Arab Emirates	3685	0	1014	0

Note: [a] 2020 data

Table 3. Regional core indicators for malaria for the six countries in the burden-reduction stage in the WHO Eastern Mediterranean Region, 2015 and 2020/2021

Country	Estimated incidence rate per 1000		Estimated mortality rate per 100 000		Estimated proportion of at-risk population protected by long-lasting insecticidal nets (%)		Reported proportion of suspected cases tested (%)	
	2015	2021	2015	2021	2015	2020	2015	2021
Afghanistan	13.9	6.3	0.6	0.3	35.8	27.5	72.0	100
Djibouti	13.9	70.5	2.9	14.1	7.5	–	99.2	100
Pakistan	5.1	2.2	0.4	0.2	5.7	24.0	59.8	100
Somalia	55.8	66.3	14.3	14.7	17.8	29.1	84.7	89.8
Sudan	42.2	72.8	10.3	17.0	66.7	76.3	87.4	71.5
Yemen	30.1	46.1	7.7	11.5	25.5	30.5	96.0	96.0

Table 4. Malaria indicators for the six countries in the burden-reduction stage in the WHO Eastern Mediterranean Region, 2015 and 2021

Country	Estimated number of cases		Estimated number of deaths		Reported presumed and confirmed malaria cases		Reported confirmed malaria cases		Reported number of tested for malaria	
	2015	2021	2015	2021	2015	2021	2015	2021	2015	2021
Afghanistan	368 200	193 000	170	91	383 008	86 370	119 859	86 263	676 815	917 001
Djibouti	9500	58 000	20	117	9557	58 916	9473	58 916	10 502	218 591
Pakistan	992 600	506 000	780	460	3 776 244	400 316	202 013	399 097	5 311 225	7 788 224
Somalia	769 200	1 132 000	1970	2506	39 169	50 648	20 953	12 967	100 792	331 104
Sudan	1 642 200	3 326 000	4020	7784	1 102 186	3 960 655	3 586 482	1 647 745	586 827	5 798 807
Yemen	513 800	980 100	1310	2455	104 831	244 857	76 259	180 339	683 108	1 509 468

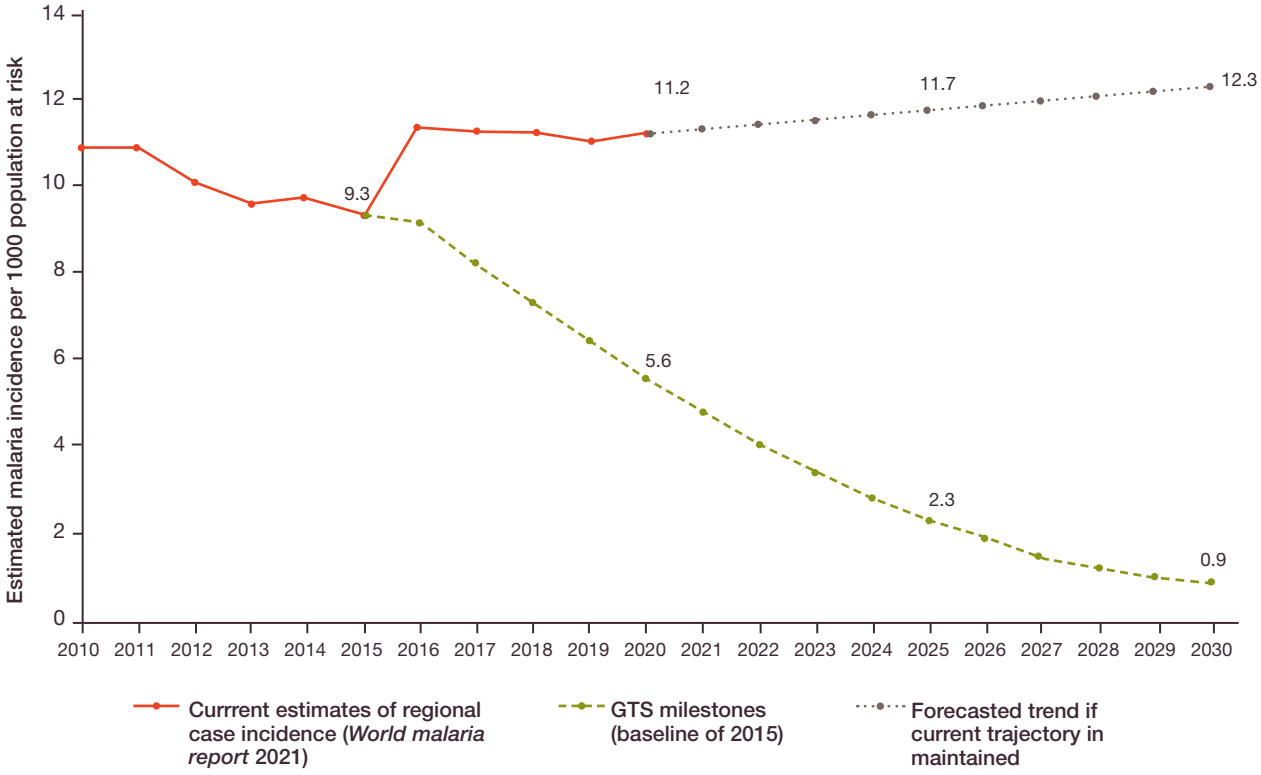

Fig. 1. Progress in estimated malaria case incidence in the WHO Eastern Mediterranean Region, for current trajectory maintained versus GTS projected targets achieved, 2010–2030

As per the World malaria report 2022, in 2021, the total population at risk of malaria in the Region was 346 million. The estimated number of malaria cases in the Region reduced by 38% between 2000 and 2015, from 7 million to 4.3 million, before steadily increasing from 2016 to reach 6.2 million cases in 2021. About 26% of the cases in 2021 were due to *P. vivax*, mainly in Afghanistan and Pakistan. However, the situation varies among the six high-burden countries. Pakistan reported good progress and is on track towards its targets. Its estimated case incidence reduced by 40% between 2015 and 2021. Djibouti, Sudan and Yemen were off track, with estimated malaria case incidences that increased by 40% or more. The estimated case incidence also increased in Somalia but by less than 25%. The estimated malaria mortality rates decreased by at least 40% in Pakistan and Afghanistan. In 2021, Sudan accounted for 54% of the estimated malaria cases in the Region, followed by Somalia (18%), Yemen (16%), Pakistan (8%), Afghanistan (3%) and Djibouti (1%) (Fig. 2). Overall, in 2015–2021, the estimated malaria case incidence in the Region increased from 9.3 to 11.6 cases per 1000 population at risk, and the mortality rate increased from 1.8 to 2.5 deaths per 100 000 population at risk.

2.3 Funding situation

In 2021, globally, the governments of malaria-endemic countries and their partners invested an estimated US$ 3.5 billion in malaria control and elimination. The amount invested in 2021 falls short of the US$ 7.3 billion estimated to be required globally to stay on track towards the GTS milestones. Of the amount invested, only 5% was spent in the WHO Eastern Mediterranean Region. The total annual funding available for malaria in the Region was US$ 137.1 million in 2010, US$ 168.8 million in 2015 and US$ 166.5 million in 2021. The proportion of domestic financing was 25% in 2021. Over the same period, the Global Fund to Fight AIDS, Tuberculosis

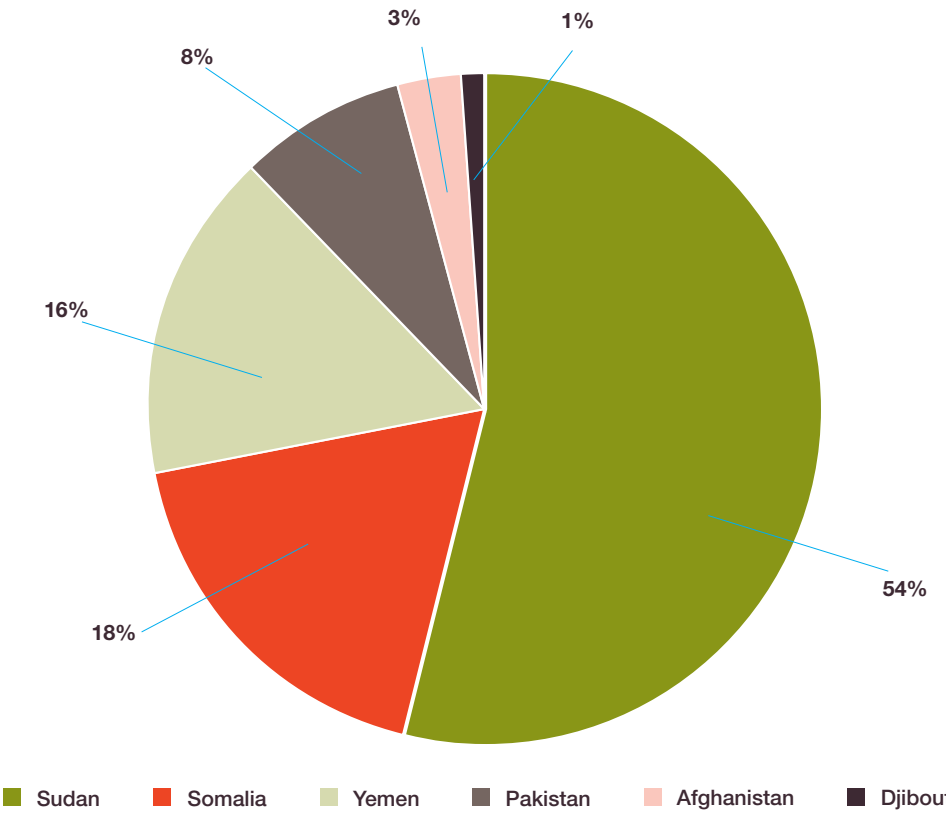

Fig. 2. Share of estimated malaria cases in the six countries in the burden-reduction stage in the WHO Eastern Mediterranean Region, 2021

and Malaria contributed an average of US$ 67 million per year to malaria control and elimination in the Region, 96–97% of all external support. Combined, the six malaria-endemic countries have received allocations from the Global Fund of more than US$ 225 million, which will be disbursed for the period 2021–2023. This amount is only one third of the estimated amount needed to sustain achievements and 15% of the amount needed to accelerate the interventions to reach GTS and SDG targets.

2.4 Challenges to malaria control and elimination

Several factors have contributed to the stalling of progress at the regional level and to setbacks in some high-burden countries:

- Continuous humanitarian emergency situation and instability. Many people still lack access to malaria interventions. There are many challenges to reach poor and marginalized people – particularly refugees, internally displaced people, migrants and those living in conflict zones in endemic areas.
- Environmental factors. Increasing unbalanced economic development and inequalities, urbanization, deforestation and climate change contribute to changes in transmission dynamics, increase the size of risk areas and potentially increase disease burden.
- Governance. Declared political commitments do not necessarily lead to sustainable time-bound support. Frequent changes to decision-makers and programme managers in ministries of health and malaria programmes have contributed to this situation, particularly in the countries that have the highest burden.

- Insufficient sustainable international and domestic financing. For some countries in the Region external funding is the only source of financing, and in other countries the share of national resources has decreased in recent years.
- Weak health systems. Weak health systems compromise the equitable coverage and quality of services. Weak supply chains are unable to provide quality products at the point of delivery. These weaknesses became more prominent during the COVID-19 pandemic. The unregulated and poorly informed private sector is challenged in terms of quality of programme management. Surveillance, monitoring and evaluation systems have been failing to identify gaps in programme coverage and to track changes in the disease burden, meaning that programmes have been unable to use timely data for decision-making.
- Insufficient resources for WHO. WHO is the main organization providing technical support for the high-burden malaria-endemic countries, which all have critical gaps in national capacities. WHO resources at the regional and country office levels are insufficient to respond to the increasing demand and need for support.

High-burden countries are also facing the following biological challenges and threats:

- parasite resistance to antimalarial medicines;
- mosquito resistance to insecticides;
- PfHRP2/3 gene deletions, which are leading to false-negative rapid diagnostic test results;
- the spread of invasive *An. stephensi* in the Horn of Africa countries, which has increased the risk of urban malaria due to the increasing diversity of malaria vectors and the differences in their behaviours, as this limits the effectiveness of existing vector control interventions; and
- the increasing risk of other vector-borne diseases, particularly *Aedes*-borne disease, which creates an extra burden for malaria programmes in the six endemic countries.

Given the projected population growth through to 2030, if these challenges continue unchecked then more people will be living in at-risk areas, putting further strain on societies, health systems and national malaria programmes.

3. Malaria action plan for the Eastern Mediterranean Region, 2022–2030

3.1 Vision

An Eastern Mediterranean Region free from malaria.

3.2 Goal

Interrupt malaria transmission in areas where it is feasible and reduce the burden so that malaria is no longer a public health problem or a barrier to social and economic development.

3.3 Targets

- By the end of 2030, reduce the incidence of malaria by 60% compared with 2020.
- By the end of 2030, reduce malaria mortality rates by more than 60% compared with 2020.
- By the end of 2026, certify malaria-free status in the Islamic Republic of Iran and Saudi Arabia.
- Prevent re-establishment of transmission in the countries and areas that have eliminated malaria.

3.4 Principles

Six principles guide the GTS and, in turn, the regional action plan:

1. Resilient health system. A resilient, gender-responsive, equity-oriented health system reinforces the overall success of the malaria response to deliver quality malaria services and effectively adapt to disruptive events, including epidemics, pandemics and other natural disasters. Malaria programmes work with all relevant programmes and departments in ministries of health – including those for immunization, mother and child, health emergencies, integrated surveillance and health information, environmental health and public health laboratories – to integrate malaria interventions.
2. Country ownership and leadership. Countries, with the involvement and participation of communities, will lead the process to ensure that malaria is included in essential primary health care service packages. A multisectoral approach is essential to accelerate progress.
3. Elimination acceleration. All countries can accelerate efforts towards malaria elimination through combinations of interventions that are tailored to the local context.
4. Use of data. Improve impact using data to stratify and tailor malaria interventions to the local context.
5. Equity. Equity must be ensured in access to quality health services, especially for the populations who are experiencing disadvantage and are the most challenging to reach, in line with the universal health coverage agenda.
6. Innovation. Investment in new interventions and their modality of implementation will enable countries to maximize their progress for burden reduction and elimination.

4. Strategic framework

The GTS is built on three pillars and two supporting elements, and the regional action plan employs these, as outlined below.

Pillar 1. Ensure access to malaria prevention, diagnosis and treatment as part of universal health coverage

National malaria programmes should provide all populations at risk with equitable access to an appropriate mix of interventions to prevent, diagnose and treat malaria, without the population incurring financial hardship. Prevention strategies are based on vector control and – in certain settings and in some population groups – administration of chemoprevention and the newly approved vaccine (see Box 1). Diagnosis and prompt and effective treatment of malaria should be included as part of essential health services in public health facilities and at the community level free of charge. Countries should regulate private health facilities to ensure they diagnose and treat malaria patients according to national policies. Strategic responses will be based on analysis of past and current malaria transmission intensity and incidence data; the contextual vulnerability related to the human host, parasites, vectors and the environment; and access to services. This information will be used to tailor interventions to the local context and ensure efficient and equitable use of resources.

Box 1. Malaria vaccine: one more tool

In October 2021, WHO issued a recommendation for the first malaria vaccine, called RTS,S/AS01, to be used for the prevention of *P. falciparum* malaria in children living in sub-Saharan Africa and in other regions with moderate to high transmission. To optimize impact, the vaccine should be implemented as part of a comprehensive malaria control plan. Following the "high burden to high impact" approach, countries should use the best available local data and contextual information to target the RTS,S/AS01 vaccine and other malaria vaccines as and when they become available subnationally, as part of a mix of interventions that collectively have an impact on malaria. Malaria vaccines will be implemented by the immunization programme in each country, in close coordination with the country's malaria programmes and in line with national immunization and malaria strategies. Sudan is the first country in the Region that started the process for malaria vaccine introduction.

Pillar 2. Accelerate efforts towards elimination and attainment of malaria-free status

All countries, including high-burden countries, should intensify their efforts to interrupt local malaria transmission in a continuum from burden reduction to elimination and prevention of re-establishment of local transmission. These efforts should be phased in both time and space. Countries should provide quality prevention, diagnosis and treatment, targeting both parasites and vectors in transmission foci through active case detection and case investigations. Countries should consider using medicines to rapidly reduce the parasite reservoir, when indicated according to WHO recommendations. A country that is planning to request certification of its malaria-free status should start to prepare the necessary documentation while it is approaching zero indigenous cases. The country should establish a national malaria elimination committee, which will have an overall mandate and responsibility to support malaria elimination programmes and to monitor and evaluate the country's progress towards elimination and its preparation for certification.

Pillar 3. Transform malaria surveillance into a key intervention

Countries should invest in an effective health management information system to provide timely and quality information for strategic and programmatic decisions. Such a system will help to identify gaps, detect outbreaks and assess the impact of interventions, information that can be used to guide national strategic planning and the effective use of resources. Malaria programmes should use resources to plan a mix of interventions, at the minimum at the district level. Endemic countries should scale up malaria surveillance as part of their integrated disease surveillance and keep specialized critical components of malaria surveillance functional. Countries should improve their data quality and data use for risk mapping and tailoring interventions based on local data.

Supporting element 1. Conduct implementation research to optimize the impact and cost–effectiveness of existing interventions and facilitate the rapid uptake of new interventions

Programmes should identify relevant implementation research questions to refine approaches and apply existing interventions as effectively and efficiently as possible in their local contexts. Implementation research will need to focus on equitable population coverage and intervention uptake. Countries should continue to strengthen the national regulatory environment and facilitate the appropriate uptake of recommended interventions. Implementation research can identify – and determine how best to overcome – many of the bottlenecks restricting the early and equitable introduction of new interventions.

Supporting element 2. Strengthening the enabling environment for more sustainable and equitable results

Supporting element 2 responds to four key issues.

Supporting element 2.1. Ensure strong political and financial commitments

Countries need to translate high-level political commitment into predictable and long-term financing for health, including for malaria programmes. Countries will need to decrease their dependency on external funding. They will need to explore all possible options for increasing additional domestic funding and identify innovative financing solutions, including through private sector resources. To reach the targets of the regional action plan and their own national strategies, countries should scale up resource mobilization and must engage with international and regional donors to encourage them to increase their commitments to health in general, including malaria burden reduction and elimination.

Effectively addressing the funding gap for malaria control in the Eastern Mediterranean Region will require a comprehensive approach that incorporates several key elements:

- Support for endemic countries. Endemic countries should be supported to develop a comprehensive plan for resource mobilization and an investment case for an integrated approach for malaria and other vector-borne diseases as part of a resilient health system.
- Mobilization of internal resources. Within their own economies, endemic countries in the Region, whenever possible, should reduce their dependence on external funding sources and provide a more stable source of funding for malaria control efforts.
- Use of evidence-based integrated approaches. By employing and acting upon evidence-based approaches, countries can direct resources towards interventions that have the

greatest impact on reducing the burden of malaria and other vector-borne diseases, ensuring that funding is used effectively.

- Promotion of partnerships between government, the private sector and international organizations. Through such partnerships, more resources can be mobilized to support interventions for malaria and other vector-borne diseases to achieve common goals.
- Engagement with regional donors. The Region is home to a number of regional development organizations, such as the Arab Fund for Economic and Social Development, the Islamic Development Bank, the African Development Bank and several foundations. Engaging these regional donors can help to mobilize additional resources to support malaria intervention in line with regional targets.

Supporting element 2.2. Develop multisectoral approaches and build cross-border and regional collaborations

Coordination within each country and across borders is needed given the large number of interested stakeholders and partners, including development partners, private industry, research and academia, private sector health facilities, nongovernmental organizations, community health workers and national public health systems. Strengthened, effective cross-border collaboration between national programmes will ensure optimal coverage of interventions in these areas, avoid the duplication of efforts and leave no one behind.

Supporting element 2.3. Strengthen the health workforce and build skills for malaria

The scaling up of malaria interventions requires trained, quality human resource capacity to analyse data; respond to a dynamic changing environment and eco-epidemiology; and plan, implement and monitor targeted interventions at the most granular settings and community levels possible. Based on the current status of health administration and planning in endemic countries in the Region, the recommended minimum level of stratification and decision-making regarding interventions is districts/localities with populations in the range of 100 000 to 150 000 people. Investment in human resource capacities across a broad range of expertise, including community health workers, will ensure that the limited available resources are used properly and that quality services are accessible to those in need.

Supporting element 2.4. Empower communities to engage in all stages of response and in finding solutions to the problems of malaria and other vector-borne diseases

Educating people on their right to health services and involving them in planning, designing and implementing their health services are key determinants for ensuring equitable access, improving the quality and coverage of outcomes, and having an effective impact on health conditions. The meaningful participation of community leaders, target populations and nongovernmental implementing partners is an essential factor for success. Malaria interventions cannot succeed unless communities are fully engaged and able to fully realize the benefits of using the interventions. Programmes should use public health communication and behaviour change programmes for educating, engaging and mobilizing affected communities to increase community ownership. Countries and all partners need to work together to reach all affected communities. Nobody should be left out, including marginalized minorities and people with disabilities.

5. Pathway towards 2030 for reducing the malaria burden in the Region

5.1 Medium- and long-term perspectives for reaching global targets

Through to 2030, the GTS will remain the overarching reference document for setting targets aimed at reducing the malaria burden, expanding the areas that are free from malaria transmission and preventing re-establishment of local transmission in already malaria-free areas. In 2021, the Seventy-fourth World Health Assembly kept the original GTS targets for 2025 and 2030. However, the Eastern Mediterranean Region is not on track to reach these targets, and the countries shouldering the highest burden of malaria in the Region are in an unstable condition. Thus, the Regional malaria action plan 2022–2030 tailors the GTS targets for morbidity and mortality to the Region's situation (see section 2.3) and aims to reach the projected targets through an accelerated approach with new interventions. This regional action plan will focus on country-specific approaches under the framework of the current GTS.

The GTS and the regional action plan are in line with SDG 3, aimed at ensuring healthy lives and promoting well-being for all at all ages. They are also in line with the SDG's target 3.3 for ending the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combating hepatitis, waterborne diseases and other communicable diseases by end of 2030. The progress towards this target for the GTS and the regional action plan are measured by estimated malaria incidence per 1000 population at risk (as per SDG indicator 3.3.3).

The regional action plan envisages three possible scenarios for which we can project possible impact. These scenarios focus mainly on the six high-burden countries, but support must also be maintained for the malaria-free countries and countries on the pathway to certification. Implementation of malaria vector control will be in line with the Global vector control response 2017–2030 and the Regional plan of action 2019–2023 for implementation of the global vector control response 2017–2030. Malaria programmes will apply strategies for integrated vector surveillance and control through increased capacity, improved surveillance, and better coordination and integrated action across sectors and diseases. Three principles are fundamental to controlling malaria and other vector-borne diseases:

1. Intrasectoral collaboration across vector-borne disease programmes
2. Intersectoral collaboration
3. Community engagement and mobilization.

Support for malaria and vector control in the Region will be coordinated by the Regional Office's malaria and vector control programme, within the Department of Universal Health Coverage/ Communicable Diseases, in coordination with other departments. WHO support will address capacity-building, integrated disease surveillance, operational research, emergency response and quality assurance of malaria diagnosis.

In the current critical situation of malaria and other vector-borne diseases, as well as over the next few years, health services and malaria programmes need to maintain alertness and agility. Efforts to ensure supplies and timely vector control operations need to be maintained.

Synergies must be sought with other disease control programmes, but at the same time malaria programme managers must keep in mind that malaria epidemics can lead to massive mortality and morbidity and that they have a specific responsibility to prevent such epidemics. Therefore, three actions are key:

- Maintain functional services. While all efforts should continue to scale up evidence-based and properly focused interventions, the priorities are to maintain existing services, minimize delays, prevent stock-outs, maintain staff morale and motivation, and communicate the need for maintenance of efforts to political leaders and at-risk populations.
- Stay on high data alert. Surveillance and monitoring need to be on high alert, with local services playing their role and collecting information not only on malaria but also on rainfall and temperature, population movements and other well-known social determinants.
- Be prepared. Preparedness needs to include alertness, stockpiling and operational contingency plans for rapidly moving people, products and other resources to where they are needed.

5.2 High burden to high impact approach

In May 2018, the Seventy-first World Health Assembly and the WHO Director-General called for an aggressive new approach to accelerate progress against malaria. Ministries of health in affected nations worked with WHO and the Roll Back Malaria partnership to map out a way forward, resulting in the "high burden to high impact" (HBHI) approach. HBHI is a country-led response – catalysed by WHO and other partners to accelerate progress in the global fight against malaria (Box 2).

Box 2. Key elements of the HBHI approach

1. Political will to reduce malaria burden. High-burden countries and global partners must translate their stated political commitment into resources and tangible actions that will save more lives. Ownership of the challenge lies in the hands of those governments most affected by malaria. Initiatives that empower people to take action to protect themselves from malaria can help foster an environment of accountability and action.
2. Strategic information to drive impact. Through better analysis and the strategic use of quality data, countries should pinpoint where to deploy the most effective malaria control tools for maximum impact. They can also use data to optimize the way tools are delivered to those in need, including through improved primary health care.
3. Better guidance, policies and strategies. WHO will support high-burden countries to adapt global guidance to their range of local settings, based on the best available evidence. This guidance will be continually updated and refined based on country experience and the development of new tools.
4. A coordinated national malaria response. A more coordinated health sector response complemented by other sectors, such as environment, education and agriculture, will ensure that scarce resources are used as efficiently as possible.

In April 2022, Sudan formally adopted the HBHI approach. Sudan has highest malaria burden and the most complex situation for the reduction of that burden in the Region. The impact of and lessons learned from the implementation of the HBHI approach in Sudan will therefore inform the core approach for control and reduction of malaria to shift the direction of the malaria trend in the Region.

5.3 Proposed scenarios for high-burden countries

By 2030, the aim is that there will be only six malaria-endemic countries in the Region. The Islamic Republic of Iran and Saudi Arabia will be certified as malaria free, and the other 14 countries will remain malaria free. To explore possible pathways to accelerate towards reaching the GTS and SDG targets, the regional action plan puts forward three scenarios based on possible combinations of interventions for the six high-burden countries in the Region (Table 5). These scenarios will have different impacts on the malaria burden and require different levels of commitment and attributable costs.

Continuity scenario: sustaining current coverage. Coverage of interventions will be sustained at the 2020 level, at least, and/or will increase at the same rate as in the last 5 years. Trends of increasing pyrethroid resistance in mosquitoes will continue in the future, reducing the effectiveness of insecticide-treated nets. With the current levels of investment and coverage in the countries, the incidence of disease will have a mild increasing trend (Fig. 3). With the population projected to increase, the projected number of cases will reach more than 7 million per year, placing a substantial burden on societies and health systems (Fig. 4). To sustain current achievements, the Region needs total investments exceeding US$ 2.8 billion through until 2030, with an increase in annual investments from US$ 240 million in 2022 to US$ 400 million in 2030.

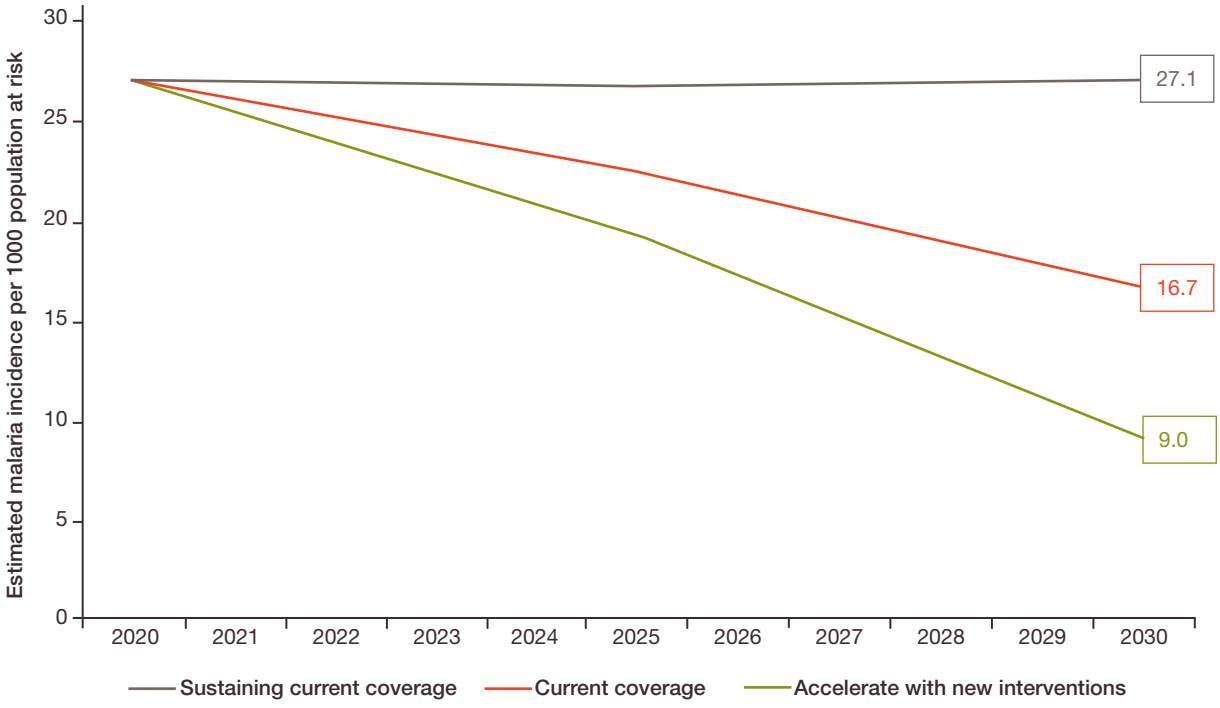

Fig 3. Projected incidence of malaria cases in the six countries in the burden-reduction stage in the WHO Eastern Mediterranean Region for three intervention scenarios, 2020–2030

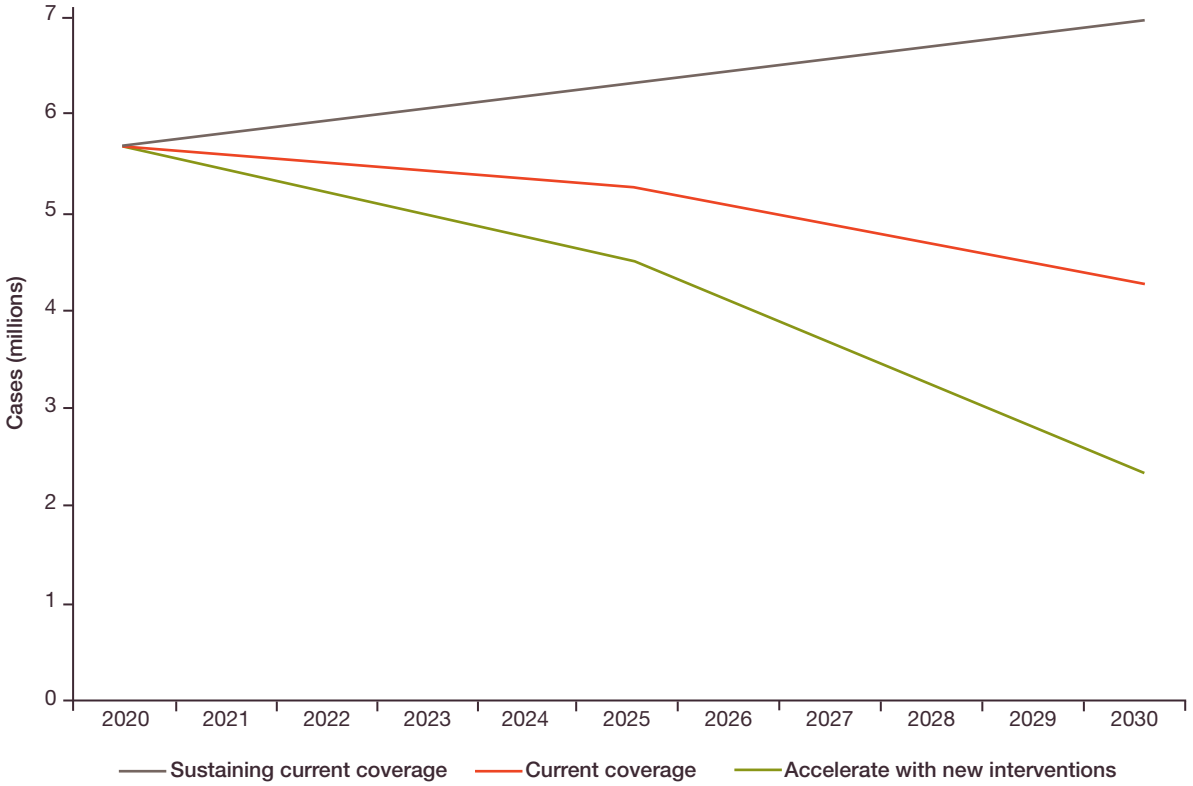

Fig 4. Projected number of malaria cases in the six countries in the burden-reduction stage in the WHO Eastern Mediterranean Region for three intervention scenarios, 2020–2030

Progress scenario: coverage increase. The HBHI approach and a stable malaria programme will be operational in Sudan by at least 2025, and coverage of the current main interventions will increase to at least 80% for the population at risk, with better tailoring at the subnational level. The regional malaria and vector control programme estimates that under these circumstances malaria incidence will decrease to 40% and the estimated number of cases will decrease to more than 4.3 million per year.

Ambitious scenario: accelerate with new interventions. The HBHI approach and a stable malaria programme will be operational in Sudan by 2025, and coverage of the current main interventions will increase to at least 80% of the population at risk, with better tailoring at the subnational level. Eligible countries/areas will implement a new mix of possible interventions such as seasonal malaria chemoprevention, intermittent preventive treatment of malaria in pregnancy, intermittent preventive treatment of malaria in school-aged children, perennial malaria chemoprevention and the malaria vaccine. Also, new insecticide-treated nets will replace the current nets from 2025 onwards. This ambitious scenario needs a substantial increase in investment in current and new interventions, as well as dynamic tailoring of interventions by strong programme and integrated service delivery systems. The regional malaria and vector control programme estimates that with this approach the incidence of malaria could fall by more than 60% and the number of cases could decrease to 2.2 million per year. This achievement would prepare the ground for more ambitious targets than those of the current SDGs and GTS after 2030. To reach close to the target of a 60% reduction in burden in the Region, countries and partners must double their investments compared to the continuity scenario, to US$ 5.6 billion.

Many other factors cannot be easily assessed in the projections, including political and socioeconomic stability, population movements and climate change. The projections assume that the Region will not have more extreme disruptions in terms of security conditions and natural and human-made disasters.

5.4 Monitoring and evaluation

Countries should develop a monitoring and evaluation (M&E) plan as part of their national malaria strategy. The M&E plan should have standard indicators in line with the global indicators (see Annex 3) and be adapted to the local context to monitor and evaluate progress. It should also have a defined timeline and methodology for conducting review exercises during the implementation period and before updating the strategy. The *World malaria report* will be a platform for reporting on and monitoring global, regional and country efforts and results in the progress towards targets.

Investment in an integrated health information system, particularly the District Health Information System 2 (DHIS2), will facilitate the process of reporting and using data for decisions on tailoring the best mix of interventions. Countries should resist attempts to create a non-sustainable parallel systems of reporting for donors and other partners as this can increase the administrative burden and counter efforts to streamline and standardize reporting.

5.5 WHO areas of work and support

The Regional Office for the Eastern Mediterranean will continue to provide technical support to countries on updating their strategies, based on local data and WHO recommendations. It will also raise resources from internal and external sources. WHO will support countries, both technically and, if needed, logistically, to ensure access to quality malaria prevention diagnosis and treatment. The Regional Office, in coordination with the Global Malaria Programme and WHO country offices, will support countries to improve their malaria surveillance, data quality and data use. The Regional Office will support countries to update the malaria and vector control module of DHIS2 for risk mapping and adoption and implementation of the best mix of interventions (see annexes 1 and 2).

The Regional Office will continue to support and expand the functions of the bi-regional HANMAT and PIAM-Net networks for information sharing, cross-border surveillance, operational research, capacity-building and the collective monitoring of the regional action plan. WHO will work with malaria programmes and other partners to scale up coordinated capacity-building using new modalities, including the WHO Academy and open WHO platforms.

WHO will support endemic countries in the regular (annual and quarterly) reporting of their progress towards their strategic objectives and the targets of the regional action plan through global and regional reporting platforms. The Regional Office will use the standard minimum set of indictors to monitor and evaluate this progress (see Annex 3). The Regional Office will support the Global Malaria Programme, when needed, on the scaling up of new tools and interventions, although its primary focus will be on supporting operational and implementation research.

Table 5. Estimated and projected malaria incidence and number of cases for the six countries in the burden-reduction stage in the WHO Eastern Mediterranean Region in three possible scenarios of interventions, 2020, 2025 and 2030

Scenario	Country	Estimated no. of cases in 2020	Population at risk 2020	Estimated incidence (per 1000)	Projected no. of cases in 2025	Projected population at risk 2025	Projected incidence (per 1000)	Projected no. of cases in 2030	Projected population at risk 2030	Projected incidence (per 1000)
Sustaining current coverage	Afghanistan	253 000	29 976 000	8.44	278 300	33 520 000	8.30	284 625	37 033 000	7.69
	Djibouti	72 000	742 000	97.04	57 600	793 000	72.64	36 000	838 000	42.96
	Pakistan	543 000	101 611 000	5.34	581 010	111 429 000	5.21	651 600	120 962 000	5.39
	Sudan	3 218 000	43 850 000	73.39	3 620 250	49 354 000	73.35	4 183 400	55 254 000	75.71
	Somalia	829 000	15 894 000	52.16	887 030	18 377 000	48.27	953 350	21 192 000	44.99
	Yemen	780 000	19 387 000	40.23	858 000	21 542 000	39.83	897 000	23 665 000	37.90
	Total	5 695 000	211 460 000	26.93	6 282 190	235 015 000	26.73	7 005 975	258 944 000	27.06
Coverage increases	Afghanistan	253 000	29 976 000	8.44	215 050	33 520 000	6.42	177 100	37 033 000	4.78
	Djibouti	72 000	742 000	97.04	54 000	793 000	68.10	18 000	838 000	21.48
	Pakistan	543 000	101 611 000	5.34	434 400	111 429 000	3.90	380 100	120 962 000	3.14
	Sudan	3 218 000	43 850 000	73.39	3 153 640	49 354 000	63.90	2 574 400	55 254 000	46.59
	Somalia	829 000	15 894 000	52.16	663 200	18 377 000	36.09	580 300	21 192 000	27.38
	Yemen	780 000	19 387 000	40.23	741 000	21 542 000	34.40	585 000	23 665 000	24.72
	Total	5 695 000	211 460 000	26.93	5 261 290	235 015 000	22.39	4 314 900	258 944 000	16.66
Accelerate with new interventions	Afghanistan	253 000	29 976 000	8.44	189 750	33 520 000	5.66	101 200	37 033 000	2.73
	Djibouti	72 000	742 000	97.04	43 200	793 000	54.48	7200	838 000	8.59
	Pakistan	543 000	101 611 000	5.34	407 250	111 429 000	3.65	217 200	120 962 000	1.80
	Sudan	3 218 000	43 850 000	73.39	2 574 400	49 354 000	52.16	1 287 200	55 254 000	23.30
	Somalia	829 000	15 894 000	52.16	663 200	18 377 000	36.09	331 600	21 192 000	15.65
	Yemen	780 000	19 387 000	40.23	624 000	21 542 000	28.97	390 000	23 665 000	16.48
	Total	5 695 000	211 460 000	26.93	4 501 800	235 015 000	19.16	2 334 400	258 944 000	9.02

Summary

Malaria is a complex disease with dynamic eco-epidemiologic factors and interactions of human, parasite and vector biologies. Malaria has always been a local disease. Control and elimination programmes have been successful whenever this was understood and preferred over a “one size fit all” approach to interventions. Global, regional and country experiences in the last decade have clearly demonstrated that ignoring this critical characteristic of malaria and advocating for continental or even country-level sets of interventions has resulted in a slow-down in progress and, in many situations, even a resurgence of malaria. Recognizing this and following detailed country-specific discussions based on evolving knowledge of the epidemiology of the disease in the Region, the WHO Regional Office for the Eastern Mediterranean has developed the current regional action plan for malaria-free countries, countries in the elimination stage and high-burden endemic countries.

Detailed groups of interventions for each of the pillars and supporting elements of the regional action plan, considering three different scenarios, are presented in annexes 1 and 2, below. In all countries, and particularly the six high-burden countries, the number one priority is to provide free-of-charge malaria diagnosis and treatment for all affected communities in public health facilities. These interventions should never be deprioritized in favour of other interventions. Similarly, countries should plan and implement vector surveillance, control and interventions, noting the local vector profile, the status of insecticide resistance and the prospects for available funding.

All endemic countries should move towards an integrated surveillance system and improve the coverage and quality of DHIS2, which is in different stages of implementation in each country. Countries should use the available integrated modules for DHIS2 so that they have a standard set of indicators and should resist attempts to create a parallel system of reporting for donors and other partners.

Although countrywide elimination of malaria is not possible in the six high-burden countries under current circumstances, there are areas in which subnational elimination could be feasible, such as in the Punjab province of Pakistan. These six countries can start to plan and prepare for elimination once their malaria burden has reached a very low level and enough resources are or will be available. It is unlikely that some high-burden countries in protracted emergency conditions will be able to increase their public sector domestic financing of malaria interventions; however, with support from partners, they should explore new modalities of focusing on the private sector, in addition to international resources. The six high-burden countries should develop or update their national strategies in line with the guidance in the GTS and regional action plan and based on their local context, incorporating detailed stratification to at least the level of districts or localities with a population of 100 000–150 000, as an indicative guide.

For the Islamic Republic of Iran and Saudi Arabia, which have begun to implement malaria elimination strategies, the most crucial task will be to maintain vigilance and strong surveillance, particularly in border areas. The “last mile” to elimination will be the most difficult and demand the most resources. Maintaining the malaria awareness of staff members across all levels of health services is critical for the prompt detection and treatment of malaria cases. The countries that have reached malaria-free status should move towards integrated malaria and other vector-borne diseases programmes as soon as possible. This will ensure that long-term resources are available to prevent local transmission of malaria from re-establishing, given the countries’ proximity to endemic areas.

Annexes

Annex 1. Regional malaria action plan strategies for the six countries in the burden-reduction stage in the WHO Eastern Mediterranean Region, for the period 2022–2030

Regional malaria action plan strategies for Afghanistan, 2022–2030

	Access to malaria interventions as part of universal health coverage				Acceleration towards elimination	Surveillance as intervention	Innovation and research	Enabling environment
	Vector control and surveillance	Chemo-prevention	Vaccine	Diagnosis and treatment				
Baseline: sustaining current coverage	Universal coverage of long-lasting insecticidal nets in six provinces Integrated vector surveillance in priority areas	–	–	Free-of-charge diagnosis and treatment of all cases in public facilities and community	–	Continued health management information systems surveillance for biological threats	–	Increase financing Strengthen workforce Build skills for malaria
Additional interventions for coverage increase	Universal coverage of long-lasting insecticidal nets and integrated vector surveillance in all priority areas	–	–	Free-of-charge rapid diagnostic tests (RDTs) and malaria medicines for cases in some private health facilities Primaquine and glucose-6-phosphate dehydrogenase deficiency (G6PDD) test in health facilities scaling up integrated community case management (iCCM)	Elimination strategy in in four provinces	Full implementation of DHIS2 Surveillance of biological threats Updated risk mapping with mix of interventions	Operational research on vector-borne diseases	Increase private sector participation Empower communities for malaria and other vector-borne diseases problems Cross-border collaboration
Additional intervention to accelerate with new interventions	Universal coverage of new long-lasting insecticidal nets and/or indoor residual spraying for all at-risk population	–	–	Tafenoquine and G6PDD test in health facilities	Elimination strategy in northern and western provinces	Updated risk mapping with mix of interventions at district level	–	Establish and strengthen regional malaria and other vector-borne diseases programmes

Annex 1. Regional malaria action plan strategies for the six countries in the burden-reduction stage in the WHO Eastern Mediterranean Region, for the period 2022–2030

Regional malaria action plan strategies for Djibouti, 2022–2030

	Access to malaria interventions as part of universal health coverage				Acceleration towards elimination	Surveillance as intervention	Innovation and research	Enabling environment
	Vector control and surveillance	Chemo-prevention	Vaccine	Diagnosis and treatment				
Baseline: sustaining current coverage	Increase coverage of targeted long-lasting insecticidal nets and/or indoor residual spraying and larval source management Integrated vector surveillance	–	–	Free-of-charge diagnosis and treatment of all cases in public facilities and community		Implementation of integrated DHIS2 Updated risk mapping Surveillance of biological threats	Operational research on vector-borne diseases in urban setting	Increase financing Strengthen workforce and build skills for malaria Cross-border collaboration
Additional interventions for coverage increase	Universal coverage of long-lasting insecticidal nets and/or indoor residual spraying for specific groups Increase larval source management Scale up integrated vector surveillance	–	–	Free-of-charge RDTs and malaria medicines for cases in private health facilities Primaquine and G6PDD test in health facilities	Preparation for implementation of elimination strategy and active case finding	Full implementation of integrated DHIS2 Scaling up surveillance of biological threats	–	Increase private sector participation Empower communities for malaria and other vector-borne disease problems

Annex 1. Regional malaria action plan strategies for the six countries in the burden-reduction stage in the WHO Eastern Mediterranean Region, for the period 2022–2030

Regional malaria action plan strategies for Djibouti, 2022–2030

	Access to malaria interventions as part of universal health coverage				Acceleration towards elimination	Surveillance as intervention	Innovation and research	Enabling environment
	Vector control and surveillance	**Chemo-prevention**	**Vaccine**	**Diagnosis and treatment**				
Additional intervention to accelerate with new interventions	Targeted coverage of new long-lasting insecticidal nets for specific groups/situations from 2025 New tools targeting An. stephensi	Intermittent preventive treatment of malaria in pregnancy, plus intermittent preventive treatment of malaria in school-aged children when needed	Vaccine deployment when country is eligible	Tafenoquine and G6PDD test in health facilities	Elimination strategy implementation	Case-based surveillance in integrated DHIS2	Research on new tools in collaboration with partners	Domestic financing in addition to international financing

Annex 1. Regional malaria action plan strategies for the six countries in the burden-reduction stage in the WHO Eastern Mediterranean Region, for the period 2022–2030

Regional malaria action plan strategies for Pakistan, 2022–2030

	Access to malaria interventions as part of universal health coverage				Acceleration towards elimination	Surveillance as intervention	Innovation and research	Enabling environment
	Vector control and surveillance	Chemo-prevention	Vaccine	Diagnosis and treatment				
Baseline: sustaining current coverage	Sustain current coverage of long-lasting insecticidal nets and indoor residual spraying in selected areas Integrated vector surveillance	–	–	Free-of-charge diagnosis and treatment of all cases in public facilities and community in all of Pakistan		Continue current DHIS2 / health management information systems surveillance of biological threats	Supporting operational research on vector-borne diseases	Increase financing Strengthen workforce and build skills for malaria Cross-border collaboration
Additional interventions for coverage increase	Universal coverage of long-lasting insecticidal nets and indoor residual spraying for all at-risk population Scaling up vector surveillance in all areas	–	–	Free-of-charge RDTs and malaria medicines for cases in some private health facilities Primaquine and G6PDD test in health facilities Scaling up iCCM	Elimination strategy in Punjab	Full implementation of integrated DHIS2 and data-quality modules in targeted districts	–	Increase private sector participation Empower communities for malaria and other vector-borne diseases problem
Additional intervention to accelerate with new interventions	New long-lasting insecticidal nets for specific groups/ situations from 2025, and/or indoor residual spraying and larval source management	–	–	Tafenoquine and G6PDD test in health facilities	Elimination strategy in Punjab and other provinces except Baluchistan	Full implementation of integrated DHIS2 in all districts Case-based surveillance in Punjab	–	Domestic financing in addition to international financing by national and provincial level

Annex 1. Regional malaria action plan strategies for the six countries in the burden-reduction stage in the WHO Eastern Mediterranean Region, for the period 2022–2030

Regional malaria action plan strategies for Somalia, 2022–2030

	Access to malaria interventions as part of universal health coverage				Acceleration towards elimination	Surveillance as intervention	Innovation and research	Enabling environment
	Vector control and surveillance	Chemo-prevention	Vaccine	Diagnosis and treatment				
Baseline: sustaining current coverage	Universal coverage of long-lasting insecticidal nets in priority areas Integrated vector surveillance	Improve quality and coverage of intermittent preventive treatment of malaria in pregnancy in current targeted areas	–	Free-of-charge diagnosis and treatment of all cases in public facilities and community		Implementation of integrated DHIS2 Surveillance of biological threats	Supporting operational research on vector-borne diseases	Increase financing Strengthen workforce and build skills for malaria Cross-border collaboration
Additional interventions for coverage increase	Universal coverage of long-lasting insecticidal nets including continuous distribution strategies and/or indoor residual spraying for all at-risk population	Increase coverage of intermittent preventive treatment of malaria in pregnancy to areas that are identified in risk mapping	–	Free-of-charge RDTs and malaria medicines for cases in some private health facilities Primaquine and G6PDD test in health facilities Scaling up iCCM	Implementation elimination strategy in Somaliland	Full implementation of integrated DHIS2 at least at zonal level Improve quality and use of data	Operational research on vector-borne diseases	Increase private sector participation Empower communities for malaria and other vector-borne diseases problems
Additional intervention to accelerate with new interventions	Universal coverage of new long-lasting insecticidal nets and/or indoor residual spraying using new insecticides for indoor residual spraying and or larval source management for all at-risk population	Intermittent preventive treatment of malaria in pregnancy plus intermittent preventive treatment of malaria in school-aged children in selected districts with high endemicity	Vaccine deployment in targeted areas	Tafenoquine and G6PDD test in health facilities	Implementation of elimination strategy in Somaliland and other very low-transmission districts	Case-based surveillance in integrated DHIS2 in elimination areas	Research on new tools in collaboration with partners	Domestic financing in addition to international financing by national and provincial level

Annex 1. Regional malaria action plan strategies for the six countries in the burden-reduction stage in the WHO Eastern Mediterranean Region, for the period 2022–2030

Regional malaria action plan strategies for Sudan, 2022–2030

	Access to malaria interventions as part of universal health coverage				Acceleration towards elimination	Surveillance as intervention	Innovation and research	Enabling environment
	Vector control and surveillance	Chemo-prevention	Vaccine	Diagnosis and treatment				
Baseline: sustaining current coverage	Universal coverage of long-lasting insecticidal nets or indoor residual spraying for priority at-risk population Integrated vector surveillance	–	–	Free-of-charge confirmation and treatment of all cases in public facilities and community	–	Sustain current DHIS2 system and improve quality and data use for all states Surveillance of biological threats (invasive vectors, drug resistance, insecticide resistance and PfHRP2/3 gene deletion)	Operational research on new tools	Increase financing Strengthen workforce and build skills for malaria Cross-border collaboration
Additional interventions for coverage increase	Continuous distribution strategies and/or indoor residual spraying Using new insecticides for indoor residual spraying and/or larval source management Scaling up integrated vector surveillance	Intermittent preventive treatment of malaria in pregnancy in all targeted areas	–	Free-of-charge RDTs and malaria medicines for cases in some private health facilities Primaquine and G6PDD test in health facilities for vivax single low-dose primaquine for *P. falciparum* cases Scaling up iCCM	–	Improve quality of DHIS2 and data use at locality level Surveillance of biological threats	Supporting operational research on vector-borne diseases	Launch and implementation of HBHI approach Increase private sector participation Empower communities for malaria and other vector-borne diseases problem

Annex 1. Regional malaria action plan strategies for the six countries in the burden-reduction stage in the WHO Eastern Mediterranean Region, for the period 2022–2030

Regional malaria action plan strategies for Sudan, 2022–2030

	Access to malaria interventions as part of universal health coverage				Acceleration towards elimination	Surveillance as intervention	Innovation and research	Enabling environment
	Vector control and surveillance	Chemo-prevention	Vaccine	Diagnosis and treatment				
Additional intervention to accelerate with new interventions	Universal coverage of new long-lasting insecticidal nets, including continuous distribution strategies	Intermittent preventive treatment of malaria in pregnancy plus intermittent preventive treatment of malaria in school-aged children in some areas of southern states and seasonal malaria chemoprevention in targeted areas	Vaccine deployment in targeted areas	Tafenoquine and G6PDD test in health facilities	Preparation for implementation elimination strategies in low-transmission localities	Full implementation of integrated DHS2 and data use at locality level	Research on new tools in collaboration with partners	Full implementation of HBHI Domestic financing in addition to international financing by national and provincial level

Annex 1. Regional malaria action plan strategies for the six countries in the burden-reduction stage in the WHO Eastern Mediterranean Region, for the period 2022–2030

Regional malaria action plan strategies for Yemen, 2022–2030

	Access to malaria interventions as part of universal health coverage				Acceleration towards elimination	Surveillance as intervention	Innovation and research	Enabling environment
	Vector control and surveillance	Chemo-prevention	Vaccine	Diagnosis and treatment				
Baseline: sustaining current coverage	Universal coverage of long-lasting insecticidal nets or indoor residual spraying for priority at-risk population Integrated vector surveillance	–	–	Free-of-charge confirmation of all malaria cases in public health facilities and community	–	Sustain current surveillance system and improve quality Surveillance of biological threats	Supporting operational research on vector-borne diseases	Increase financing Strengthen workforce and build skills for malaria Cross-border collaboration
Additional interventions for coverage increase	Universal coverage of long-lasting insecticidal nets including continuous distribution strategies and/or indoor residual spraying with new insecticides and/or larval source management	–	–	Free-of-charge confirmation of all malaria cases in public health facilities and community plus some private health facilities Scaling up iCCM	–	Expand current integrated system Surveillance of biological threats (invasive vectors, drug resistance, insecticide resistance and PfHRP2/3 gene deletion)	Supporting operational research on vector-borne diseases	Increase private sector participation Empower communities for malaria and other vector-borne diseases problems
Additional intervention to accelerate with new interventions	Universal coverage of new long-lasting insecticidal nets from 2025 onwards, including continuous distribution strategies and/or indoor residual spraying and/or larval source management	Intermittent preventive treatment of malaria in school-aged children in target areas	–	Free-of-charge confirmation of all malaria cases in all sectors Scaling up iCCM	Implementation of elimination strategies in Hadramout areas	Full implementation of integrated DHIS2 at district level Case-based surveillance in Hadramout areas in DHIS2	Supporting operational research on vector-borne diseases	Launch and implementation of HBHI approach

Annex 2. Regional malaria action plan strategies for malaria-free countries and countries at the elimination/certification stage in the WHO Eastern Mediterranean Region, for the period 2022–2030

	Access to malaria interventions as part of universal health coverage		Elimination and prevention of establishment of local transmission	Surveillance as intervention	Innovation and research	Enabling environment
	Vector control and surveillance	Diagnosis and treatment				
Countries at the stage of elimination/ certification: **Islamic Republic of Iran and Saudi Arabia**	Integrated vector control and surveillance for all vector-borne diseases	Free-of-charge malaria diagnosis and treatment for all suspected cases	Certification of malaria-free status by 2026 and implementation of a strategy to prevent the re-establishment of local transmission	Malaria surveillance as part of integrated disease surveillance, including investigation of all malaria cases and response to possible local transmission using defined standard operating procedures	Research on vector-borne diseases, new tools and approaches	Strengthen health workforce and keep skills for malaria diagnosis, treatment, and surveillance and vector control Increase private health sector participation Cross-border collaboration and support for malaria-endemic countries
Malaria-free countries	Integrated vector control and surveillance for all vector-borne diseases	Free-of-charge malaria diagnosis for all suspected cases	Implementation of a strategy to prevent the re-establishment of local transmission	Malaria surveillance as part of integrated disease surveillance, including investigation of all malaria cases and response to possible local transmission using defined standard operating procedures	Research on vector-borne diseases, new tools and approaches	Strengthen health workforce and keep skills for malaria diagnosis, treatment, and surveillance and vector control Increase private health sector participation Cross-border collaboration and support for malaria-endemic countries

Annex 3. Indicators for the WHO Global technical strategy for malaria 2016–2030 and the Malaria action plan for the Eastern Mediterranean Region, 2022–2030

Outcome

- Proportion of population at risk who slept under an insecticide-treated net the previous night
- Proportion of population at risk protected by indoor residual spraying within the past 12 months
- Proportion of pregnant women who received three or more doses of intermittent preventive treatment of malaria while attending antenatal care during their previous pregnancy (sub-Saharan Africa only)
- Proportion of patients with suspected malaria who receive a parasitological test
- Proportion of patients with confirmed malaria who receive first-line antimalarial treatment according to national policy
- Proportion of expected health facility reports received at national level
- Proportion of malaria cases notified within 24 hours (programme engaged in elimination)
- Proportion of cases investigated (programmes engaged in elimination)
- Proportion of foci investigated (programmes engaged in elimination)

Impact

- Malaria case incidence: number of confirmed malaria cases per 1000 persons per year
- Malaria mortality rate: number of malaria deaths per 100 000 persons per year
- Number of countries that have newly eliminated malaria since 2022
- Number of countries that were malaria-free in 2022 in which malaria was re-established