SUMMARY

WHO convened 21 countries with the potential to eliminate malaria by 2020 (E-2020) at a second Global Forum of malaria-eliminating countries in San José, Costa Rica, 11–13 June 2018. Representatives of the national malaria programmes of the ministries of health from 20 of the 21 E-2020 countries attended the two-and-a-half-day meeting along with representatives from four Central American countries (Guatemala, Nicaragua, Honduras and Panama) and Argentina. Accompanying the national programme representatives were WHO country, regional and headquarters staff, and the meeting was joined by observers from major donors. Countries shared their progress towards elimination and the challenges they face in achieving this goal. Several technical presentations were made by WHO staff, including conclusions from an evidence review group on border malaria, highlights from the new WHO surveillance, monitoring and evaluation manual, focus microstratification and microplanning, and updates on certification procedures. For the first time, the Malaria Elimination Oversight Committee attended the Global Forum and produced a series of recommendations to help countries achieve elimination. Several countries reported significant progress towards elimination: For the first time, China and El Salvador reported zero indigenous cases since the beginning of 2017, while Algeria maintained its malaria-free status and Iran (the Islamic Republic of), Malaysia, the Republic of Korea, Saudi Arabia, Suriname and Timor-Leste reported important reductions in the number of cases in 2017 compared with 2016. The certification of Paraguay as malaria-free was celebrated at an evening ceremony on the first night, with the certificate presented by the Regional Director of the WHO Regional Office for the Americas and the Pan American Health Organization.

BACKGROUND

In 2015, the World Health Organization (WHO) launched the Global Technical Strategy for Malaria 2016–2030 with "accelerate efforts towards elimination and
The attainment of malaria-free status as one of its three pillars. In line with this objective, the milestones for 2020 include elimination of malaria in at least 10 countries that had malaria transmission in 2015, while preventing re-establishment of malaria in any country. In 2016, WHO identified 21 countries as having the potential to eliminate malaria by 2020 based on three criteria: the trends in incident case reductions between 2000 and 2014; the declared malaria elimination objectives of the country; and the informed opinions of malaria experts in the region. These 21 countries, referred to as the E-2020, are found across the globe: seven from the Region of the Americas (Belize, Costa Rica, Ecuador, El Salvador, Mexico, Paraguay, Suriname); six from the African Region (Algeria, Botswana, Cabo Verde, Comoros, South Africa, Swaziland); three from the South-East Asia Region (Bhutan, Nepal, Timor-Leste); three from the Western Pacific Region (China, Malaysia, Republic of Korea); and two from the Eastern Mediterranean Region (Iran [Islamic Republic of] and Saudi Arabia). WHO convened the E-2020 countries at an inaugural Global Forum in Geneva, Switzerland, 16–17 March 2017. The second Global Forum was held in San José, Costa Rica, 11–13 June 2018 and was attended by representatives from 20 of the 21 E-2020 countries and the remaining Central American countries (Panama, Nicaragua, Honduras and Guatemala) plus Argentina, along with WHO staff from the national, regional and headquarters levels. Observers included representatives from the major donors (see list of participants in the annex).

For the first time, the newly convened Malaria Elimination Oversight Committee (MEOC), established by WHO in April 2018, attended the Global Forum to support countries in their attempts to achieve malaria elimination. The MEOC supports countries and regions actively pursuing that goal by reviewing country progress towards elimination, reviewing the challenges and bottlenecks identified, and providing recommendations on how to accelerate elimination. The MEOC meeting report can be found here (http://www.who.int/malaria/areas/elimination/advisory-committees/en/).

METHOD OF WORK

The theme of the second Global Forum E-2020 was “Focusing on the Foci”. During the meeting, countries presented their progress towards elimination using a standard template that requested information on the trend in the number of indigenous and imported cases over time, malaria programme staffing levels, their most recent stratification map indicating the distribution of malaria foci throughout the country, the implementation status of surveillance and response activities, and the challenges and bottlenecks facing the country. Each country presentation was followed by a question-and-answer period where other country representatives, the MEOC, WHO staff and observers could ask questions about the country’s elimination strategy or programme implementation. Participants received a briefing on a recent evidence review group (ERG) on border malaria, an important issue that had been raised at the inaugural Global Forum; the new Malaria surveillance, monitoring and evaluation manual; updates on hot topics such as tafenoquine, a new anti-relapse medication being reviewed; and an introduction to microstratification and microplanning approaches utilized in the Americas. The procedures for countries to request and receive certification of malaria-free status were clarified.

OPENING SESSIONS

The meeting was opened by Dr Giselle Amador Muñoz, Minister of Health, Costa Rica, who welcomed the participants from around the world. Dr Pedro Alonso, Director, WHO Global Malaria Programme (GMP), provided an overview of the world malaria situation and the goals for malaria elimination under the Global Technical Strategy for malaria 2016–2030. Dr Carissa Etienne, Director, Pan American Health Organization (PAHO).
WHO Regional Office for the Americas, extended a warm welcome to all participants and especially the representatives of national programmes who were visiting the region for the first time. She thanked the Minister of Health of Costa Rica for her hospitality and noted that holding the Global Forum in Costa Rica was important because the country was demonstrating that it is possible to eliminate malaria when correct political decisions are made. Dr Etienne also welcomed representatives of donor institutions and other global partners committed to the elimination of malaria, and said that the work to be completed over the next few days would contribute in an important way to achieving the goals that WHO member states have set in eliminating malaria in as many as 21 countries by 2020, and hopefully the rest of the world thereafter.

During the second half of the opening sessions, a video on malaria elimination in the Americas was presented, after which a panel discussion of malaria elimination in the Americas was facilitated by Dr Luis Gerardo Castellanos, Unit Chief, Neglected, Tropical and Vector-Borne Diseases, PAHO/WHO. The panel participants included Dr Marcos Espinal, Director, Communicable Diseases and Environmental Determinants, PAHO/WHO; Dr Emma Iriarte, Health Lead Specialist, Inter-American Development Bank; and Dr Daniel Salas Peraza, Director, Health Surveillance, Ministry of Health, Costa Rica.

**INTRODUCTION TO THE MEOC**

Dr Frank Richards, Chair, MEOC, presented the purpose and terms of reference for the MEOC. The MEOC was created by WHO with the endorsement of the Malaria Policy Advisory Committee (MPAC) to assist countries close to elimination achieve the elimination targets that are part of the Global Technical Strategy for malaria 2016–2030. Its terms of reference include provision of independent advising, monitoring and reporting on progress in eliminating countries, identifying risks to elimination and confronting difficult issues. The MEOC was attending the Global Forum for the first time and its immediate goal was to introduce the committee as an ally to eliminating countries. Dr Richards distinguished the goals of the MEOC from a sister committee, the Malaria Elimination Certification Panel (MECP), whose terms of reference are related to evaluating whether countries have met the criteria to be certified malaria-free by WHO. Dr Richards noted that the MEOC is an advocate for countries to reach elimination, while the MECP is external to the elimination effort, to preserve impartiality with respect to certification.

**REPORT ON THE CONCLUSIONS AND RECOMMENDATIONS OF AN ERG ON BORDER MALARIA**

During the first Global Forum of malaria-eliminating countries in 2017, multiple counties identified border malaria as a significant challenge. As a result, WHO convened an ERG to examine the issue, define border malaria more clearly and review evidence for effective interventions. Dr Li Xiao Hong, Elimination Unit, WHO/GMP, shared preliminary conclusions and recommendations from the border malaria ERG. “Cross-border” malaria problems may be comprised of two related but distinct issues: movement of people infected with malaria parasites across international borders, including airports and sea ports, and malaria transmission that crosses international boundaries. “Border malaria” was defined in the ERG as malaria transmission or potential for transmission that takes place across adjacent administrative areas that share an international border (or lie at a specified distance from an international border). Border malaria can be considered a transmission focus that crosses the international border. “Transnational malaria”
was defined as the importation of malaria parasites across international borders, which may include airports and sea ports. Transnational malaria does not involve the border area per se but may contribute to transmission within the country if it leads to local transmission. The overall conclusions of the ERG were that border areas need to be considered by elimination programs early on, because the border region is likely to be one of the last places to eliminate transmission; that information-sharing and coordination at the local level is essential, and is often more efficient than attempts to coordinate information-sharing at the national level; and that malaria-endemic countries sharing international borders should conduct joint mapping and joint risk assessments, leading to a harmonized and holistic approach to malaria elimination in the border area.

MICROPLANNING FOR ELIMINATION IN MALARIA FOCI

The PAHO region has been using a microplanning approach for elimination of malaria in foci based on the detección-tratamiento-investigación–respuesta (DTIR – detection, treatment, investigation and response) paradigm for elimination. Dr Roberto Montoya, Regional Malaria Advisor, AMRO/PAHO, presented results from the region’s experiences with microstratification and microplanning. He noted that malaria elimination at the national level is the result of elimination of malaria in each of the transmission foci and requires elimination of the human reservoir of infection. The microstratification and microplanning approach identifies the bottlenecks and weaknesses of the malaria-elimination programme at the local level, generates hypotheses as to the drivers of transmission in the focus and then develops a microplan to address the programme gaps and reduce transmission. Examples of this approach in Gracias a Dios, Honduras, were presented.

SURVEILLANCE AS AN INTERVENTION FOR MALARIA

In 2018, WHO issued Malaria surveillance monitoring & evaluation: a reference manual and Dr Kim Lindblade, Team Lead, Elimination Unit, WHO/GMP, presented the key elements from both the surveillance manual and the 2017 WHO Framework for malaria elimination. As countries move from higher to lower levels of malaria transmission, the surveillance system changes from use of aggregate data collected only by passive surveillance systems and reported monthly, to case-based data collected by both passive and active surveillance systems and reported immediately. Surveillance as an intervention seeks to limit onward transmission from a malaria case and requires immediate attention to treat all cases promptly, identify additional cases in the vicinity and ensure appropriate vector control is in place. Investigations in transmission foci or of outbreaks are conducted to determine the drivers of malaria transmission in the focus, whether the drivers include programmatic weaknesses or environmental factors, in order to design an appropriate response plan.

HOT TOPICS AND UPCOMING INTERVENTIONS FOR ELIMINATION

Dr Alonso updated participants on four new or upcoming malaria tools. Tafenoquine is a single-dose anti-relapse medication that has been submitted for registration with the United States Food and Drug Administration (US FDA) and the Australian Therapeutic
Goods Association. (Note: Since the Global Forum, the US FDA has approved tafenoquine for the radical cure of *Plasmodium vivax*). Testing to determine a patient’s status of glucose-6-phosphate dehydrogenase (G6PD) deficiency will be required before administration of tafenoquine because the drug has a long half-life. In response, new quantitative G6PD point of care tests are in advanced phases of development to support the safe use of primaquine and tafenoquine. WHO may recommend pilot implementation studies of tafenoquine with point-of-care G6PD tests to inform policy recommendations.

In areas where the main malaria vectors have confirmed pyrethroid resistance of at least an intermediate level due to mono oxygenase-based metabolic mechanisms, WHO recently recommended countries consider deploying long-lasting insecticidal nets (LLINs) that contain piperonyl butoxide, a chemical that knocks out mono oxygenase mechanisms so they can’t detoxify the insecticide. The recommendation can be found at http://www.who.int/malaria/publications/atoz/use-of-pbo-treated-llins/en/.

Ivermectin is a drug that has been used extensively for the control of parasites of onchocerciasis and lymphatic filariasis. Ivermectin also has effects on biting insects, such as lice, and is considered an endectocide, i.e., a drug to kill biting insects that can be ingested by humans. Ivermectin is being investigated as a potential complementary tool for elimination to address residual transmission due to vectors with a tendency for outdoor biting and resting, biting at early evening and at dawn, and vectors that feed on livestock. A number of trials measuring public health impact are underway.

In elimination programmes, WHO recommends the use of microscopy or rapid diagnostic tests (RDTs) for diagnosis. The limits of detection of these methods are considered to be 50 parasites(p)/µl and 100–200 p/µl, respectively. Many cross-sectional studies have shown that a proportion of malaria infections have densities below the detection of microscopy or RDTs. In response, a new *P. falciparum* RDT was released in 2017 claiming to have a limit of detection of 2 p/µl. The new highly sensitive RDT made by Alere Inc. (Waltham, Massachusetts) is not prequalified by WHO. The importance of low-density malaria infections, undetectable by conventional microscopy and RDTs, in elimination settings is not known. WHO convened a technical consultation 4–6 June 2018 to recommend the research requirements to support policy recommendations for highly sensitive malaria diagnostic tests; these recommendations will be reviewed by the MPAC in October 2018.

**CERTIFICATION OF MALARIA ELIMINATION**

Dr Li discussed the criteria for WHO certification of elimination that can be found in the Framework for malaria elimination, and the key steps along the path to WHO certification of countries as malaria-free. She noted that after countries meet the minimum criteria of three years with zero indigenous cases, the official request is sent to the WHO Director-General, after which the country prepares a national elimination report. The MECP reviews the report and sends an evaluation mission to the country to verify the findings in the report, after which the Committee makes a recommendation on whether to certify. The MECP recommendation is subsequently endorsed by the MPAC, which forwards the final recommendation to the WHO Director-General. Dr Li reported on the development of a guide for countries on the certification process that is expected to be released in 2019, and presented a minimum required timeline for the submission of the national elimination report to the awarding of the certificate of elimination by the Director-General (14 weeks).
AWARD CEREMONY

The evening award ceremony featured remarks by Dr Alonso and Ms Annelise Hirschmann, Regional Manager for Latin America and the Caribbean, the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM); a video on elimination of malaria in Paraguay; and a videotaped, congratulatory message from Dr Tedros Adhanom Ghebreyesus, Director-General, WHO. Dr Etienne presented Dr Carlos Ignacio Moringo Aguiera, Minister of Health, Paraguay, with the framed certificate of elimination signed by the WHO Director-General. Dr Etienne saluted the hundreds of health workers who helped eliminated malaria in Paraguay through their dedication to controlling and then eliminating transmission. Dr Etienne mentioned four specific factors that contributed to elimination in Paraguay:

- Growth in the country’s economy at an average of 5% per year over the past decade, higher than its neighbours.
- Social reforms, including universal access to free health care and basic education.
- The quality and coverage of health services.
- Public investment in health, with 10.8% of public expenditures invested in health.

Dr Etienne encouraged Paraguay to maintain its success by preventing the re-establishment of malaria. Dr Moringo thanked WHO for the certification and emphasized that Paraguay achieved elimination and would prevent re-establishment because it had focused its efforts on the long-term sustainability of its health strategies. The ceremony concluded with congratulations to Paraguay from Dr Alejandra Acuña, the Vice-Minister of Health of Costa Rica.

E-2020 COUNTRY PROGRESS

Member countries at the Global Forum reaffirmed their commitment to meeting their national elimination goals and accepted the invitation from WHO to present their progress annually at subsequent Global Forums. Individual country progress towards elimination, along with surveillance and vector control strategies, is summarized below.

African Region

Algeria

Algeria reported zero indigenous malaria cases in 2017 for the fourth consecutive year, along with 448 imported and seven introduced cases. Since the last Global Forum, Algeria has requested WHO certification of malaria-free status. The area of greatest risk for Algeria is in the southern province of Tamanrasset, which borders malaria-endemic Niger and Mali and accounted for 81% of the imported cases. Algeria recently updated its standard operating procedures for surveillance with technical assistance from WHO, requiring case notification within 24 hours, and response activities, including reactive case detection within 100 metres of the identified case, within 48 hours. The country conducts proactive case detection in areas with migrants and in border areas that are receptive to malaria transmission. A national malaria-elimination committee was established in 2017 consisting of eight members from the Ministry of Health, universities and research institutions. The committee meets quarterly. The national programme is planning to submit its national malaria-elimination report, the next milestone on the way to WHO certification, in September 2018.
Botswana

In 2016, Botswana reported 716 indigenous cases and 64 imported malaria cases; after adjusting for completeness of reports and use of the private sector for malaria treatment, WHO estimates the country had 1911 indigenous cases of malaria. These figures indicate an increasing trend in malaria transmission in Botswana compared with the 2015 reported and adjusted total indigenous cases of 326 and 877 cases, respectively. The latest stratification map shows a large number of cases along Botswana’s south-eastern border with Limpopo Province, South Africa, and along its northern and north-eastern borders with Namibia and Zimbabwe, respectively. The national malaria programme in Botswana is staffed by six professionals and was fully funded by the government until 2015, when a US$ 5.2 million GFATM grant was received to support the elimination strategy until September 2018. The independent National Malaria Elimination Advisory Committee was formed in 2015 but has not yet become functional. The national programme faces challenges related to the quality of case investigations due to low adherence to surveillance guidelines, poor uptake of vector control interventions by communities and inadequate human resource capacity at all levels. Priority actions for 2018 include advocating for adequate resources for elimination, strengthening community-driven malaria-elimination initiatives, increasing coverage of vector control in all transmission foci and continuing to implement cross-border activities with neighbouring countries.

Cabo Verde

Cabo Verde experienced a significant epidemic of malaria in the city of Praia during 2017, with 423 indigenous, 23 imported and 11 recrudescent cases of *P. falciparum*, compared with 47 indigenous and 28 imported cases in 2016. The epidemic ended in January 2018 after the national programme retrained its indoor residual spray (IRS) agents and resprayed the areas most affected by the epidemic. Cabo Verde has five professionals in the national malaria control programme and provides US$ 4.6 million of domestic financing for malaria elimination, in addition to a US$ 466 000 GFATM grant. The national programme reports a lack of qualified staff, equipment and material. The frequent importation of malaria cases from mainland Africa poses a significant challenge to the programme. In addition, there is difficulty implementing vector control in many areas, particularly in the Praia, due to refusals of homeowners to allow IRS and a general lack of acceptance to use LLINs. The programme is working to strengthen epidemiologic and entomologic surveillance systems and to increase community sensitization about the need for IRS. [Note: The representative from Cabo Verde was unable to attend the meeting but shared the country’s presentation in advance.]

Comoros

Comoros reported a significant increase in malaria cases (4852) and malaria deaths (3) in 2017, compared with 2016 (1658 cases and zero deaths). However, no cases were reported from Mwali or Ndzuwani, the smaller of the three islands that make up Comoros. Although the increasing number of cases on the big island of Ngazidja is of significant concern, the total number of reported cases remains significantly lower than the caseload in 2013 (54 130), immediately before there was a mass drug administration campaign on Ngazidja. The management unit of the national malaria programme consists of seven professionals, in addition to three professionals dedicated to malaria in the monitoring and evaluation unit and 17 others in the laboratory department. Domestic financing accounts for 10% of the required budget for malaria elimination in Comoros, the GFATM provides 42%, and 8% comes from other sources, leaving a financing gap of 40%. The national programme has identified limited financial resources as an important impediment to maintaining universal coverage of interventions, responding adequately to introduced cases on the two smaller islands and reinforcing community-based surveillance. Priority actions include achieving and maintaining universal coverage of case management and LLINs, organizing routine IRS and MDA campaigns, and strengthening surveillance.
**Eswatini**

Eswatini (formerly Swaziland) reported an increase in malaria in 2017 similar to those of other southern African countries. After reporting 67 indigenous and 230 imported cases and three malaria-related deaths in 2016, the country reported 683 indigenous and 403 imported cases and 21 malaria-related deaths in 2017. The US$ 2 million budget in 2018 was funded almost equally by domestic sources and the GFATM. The national programme counts on five professionals at the national level. The Malaria Elimination Advisory Group meets twice per year to provide guidance and endorse decisions of the national programme. In 2017, the identification of indigenous cases in parts of Eswatini not considered to be receptive to transmission suggests the need to update the stratification map. The national programme believes that changes in weather patterns require adjustment to the timing and location of its interventions. The large population movement into Eswatini to support the agricultural industry is a challenge because of associated importation of malaria parasites. At the same time, residents of many communities where malaria is no longer a significant public health concern often do not seek prompt diagnosis and treatment when they experience clinical signs and symptoms suggestive of malaria. The national programme identifies the need to increase domestic funding for insecticides to ensure an adequate supply and to implement a well-designed IRS campaign to achieve high coverage in transmission foci. The programme is working towards systematically identifying transmission foci, developing appropriate response plans and clearing the foci of infections.

**South Africa**

South Africa reported a serious resurgence of malaria in 2017. The national programme reported 21,883 indigenous cases, 8,028 imported cases and 534 cases of unknown classification, in addition to 331 malaria deaths. In 2016, the country reported 1,114 indigenous, 4,501 imported and 227 unclassified cases and 54 deaths. The national malaria programme is funded by domestic resources with additional support from regional grants as part of the E8 initiative. There are four professionals at the national level in the malaria control programme. The South Africa Malaria Elimination Committee was formed in 2014 and has two meetings per year. The committee includes experts on case management, vector control, surveillance, monitoring and evaluation, and health promotion, drawing heavily on experts from the private sector, national public health institutes, WHO and academic institutions. The national programme has been successful in mobilizing extra funding from the national treasury and increased IRS coverage to 98% in the 2017–2018 season. Outbreaks reported in 2017 from malaria-endemic areas without recent transmission were not included in the IRS program. The number of structures in these areas to be sprayed will be increased. The country faces continuous importation of malaria parasites through population movements from neighbouring malaria-endemic countries. There have been challenges in acquiring dichlorodiphenyltrichloroethane (DDT) for the IRS programme; South Africa is looking at the potential for pool procurement through a supplier to the Southern African Development Community.

**Region of the Americas**

**Belize**

Belize has reported fewer than 10 indigenous cases per year since 2015 but has yet to eliminate transmission. In 2017, Belize reported seven indigenous and two imported cases, compared with four indigenous cases and one imported case in 2016. Most financing for the malaria-elimination programme comes from domestic resources, but Belize received a start-up grant and a cash award from the GFATM’s Elimination of Malaria in Mesoamerica and Hispaniola Island (EMMIE) grant for achieving key health outcomes. While the budget has remained static for several years, reductions in transmission have
permitted strategic investments in the most vulnerable areas. The malaria programme is integrated with other vector-borne diseases, such as dengue, Zika virus and Chagas disease, although there is just one chief of operations at the national level. The national programme faces a challenge in maintaining adequate surveillance in areas that have been malaria-free for long periods. In the next year, the national programme will focus on improving passive surveillance at public health facilities and on strengthening cross-border collaboration with Guatemala and Mexico, including developing a mechanism to share data with health authorities in neighbouring departments.

Costa Rica

Costa Rica reported 12 indigenous and 13 imported cases in 2017, compared with four indigenous and nine imported cases in 2016, but has reported no indigenous cases since the beginning of 2018. With an annual national budget of US$ 5 million, Costa Rica uses only domestic resources to fund its malaria-elimination programme. While clinical care of patients is the responsibility of the Caja Costarricense de Seguro Social (Costa Rica Social Security System), the Ministry of Health oversees surveillance of all vector-borne diseases with the support of seven professionals at the national level. The Centro Nacional de Referencia en Parasitología (National Reference Center for Parasitology) within the Instituto Costarricense de Investigación y Enseñanza en Nutrición y Salud (Costa Rica Institute of Research and Teaching in Nutrition and Health) is responsible for the quality control and quality assurance programme for malaria diagnostics. The national programme faces challenges in preventing re-establishment of transmission in malaria-free areas through the rapid detection and treatment of imported cases. The number of trained medical entomologists is a significant limitation. Priorities for 2018 include incorporating RDTs as an initial screening test in certain defined areas, establishing entomologic surveillance teams at the national level and working on cross-border collaboration with Nicaragua.

Ecuador

Ecuador reported 1230 indigenous and 75 imported cases in 2017, an increase from 1007 indigenous and 44 imported cases in 2016. Ecuador has 20 professionals at the national level, including entomologic and parasitologic laboratory personnel. The national budget in 2017 was US$ 6.2 million; 93% came from domestic funding and the remainder from WHO/PAHO. The malaria-endemic zones of the country are difficult to access, with 80% of malaria foci located in areas accessible only by water. These areas are also at risk of violence due to drug trafficking and illegal mining. The health system has limited coverage in malaria zones, which results in persistent delays in access to diagnosis and treatment. The high degree of human movement across borders with Colombia and Peru result in frequent parasite importations. Priority actions include implementing early diagnosis and treatment and strengthening surveillance in the malaria foci, while achieving and maintaining optimal coverage with LLINs.

El Salvador

El Salvador reached zero malaria cases for the first time in 2017, reporting only three imported cases. In 2016, the country reported 13 indigenous cases, one imported case and one relapsing case. Despite recent success in achieving zero malaria cases, the national programme recognizes the need to shorten the time between onset of symptoms and case detection, and is focusing on changing the behaviour of persons at risk – to consulting medical services or a volunteer collaborator rather than using self-treatment for febrile illnesses. The country is working to incorporate private medical services into the notification system. Priority actions to maintain El Salvador’s malaria-free status include increasing the sensitivity and specificity of epidemiologic surveillance in areas that are both receptive and vulnerable to include case investigation and focus response.
**Mexico**

The number of indigenous cases in Mexico increased to 736 in 2017, compared with 551 in 2016. The number of imported cases declined from 45 in 2016 to 29 in 2017. Mexico has 10 professionals at the national level and spent US$ 40.6 million in 2017. The successful reduction in malaria transmission has changed the paradigm of the national programme from one of vector control to surveillance as an intervention; there remains some resistance to this change. The national programme is working to ensure the detection, diagnosis and rapid treatment of cases, to preserve the subnational areas that are malaria-free and to identify new operational approaches to social problems and insecurity in areas with remaining malaria transmission. Priority actions include completing the stratification exercise, designing more efficient work plans to fit the new stratification map, implementing the use of rapid diagnostic tests in the field and continuing to guarantee the availability of antimalarial medication.

**Paraguay**

Paraguay was certified malaria-free at the Global Forum, after reporting zero indigenous cases of malaria since 2012 and receiving a positive recommendation from the WHO MECP. Imported cases continue to be identified, but there were only five in 2017 compared with 10 in 2016. Now that the country has achieved elimination, focus has shifted to preventing re-establishment of the infection. Paraguay has integrated its detection, treatment, investigation and response activities within the health system as part of the Health Services, Central Public Health Laboratory and General Office of Health Surveillance. This integration and reorientation of the malaria programme has increased the coverage of diagnostics and strengthened the surveillance system to rapidly identify and respond to imported cases of malaria to prevent transmission. These systems must be maintained, and additional strategies are needed to mitigate importation of malaria by students coming from malaria-endemic countries and Paraguayans working and travelling abroad.

**Suriname**

Suriname reported 40 indigenous and 511 imported cases in 2017, compared with 77 indigenous and 250 imported cases in 2016. There are 20 malaria programme staff at the national level, and 27 at the district level. The malaria programme receives funding from the Global Fund, PAHO, the United States Agency for International Development (USAID) and from the private sector. Challenges for malaria elimination include: a highly mobile, migrant population, largely undocumented and living in non-regulated (unsafe) environments; insufficient national policy and strategy to provide sustainable low-threshold integrated health services for these populations; lack of accessibility to health services among at-risk populations as a result of logistical, economic, cultural and language barriers; and and continuous importation of malaria cases from French Guiana. Priority actions for 2018 include strengthening the country’s surveillance system, enhancing the delivery of malaria services in mining areas, establishing border posts, distributing LLINs in high-risk communities and cross-border collaboration with neighbouring countries to tackle the issue of malaria among migrants.

**Eastern Mediterranean Region**

**Iran (Islamic Republic of)**

Iran reported 57 indigenous and 871 imported cases in 2017, compared with 81 indigenous and 597 imported cases in 2016. There are seven malaria programme staff at the national level. Malaria control programme activities are fully integrated at the district level.
Funding for malaria elimination is fully reliant on the national budget. The Independent National Malaria Elimination Advisory Committee has been established. Cross-border population movements, particularly with the neighbouring Pakistani province of Balochistan; competing public health priorities, especially with non-communicable diseases; and maintaining political commitment pose challenges for malaria elimination. Priority actions for 2018 include strengthening vigilance within the surveillance system in line with prevention of re-establishment of local transmission, reviewing and revising criteria for case and foci classification, strengthening human capacity at the national level in entomologic surveillance and vector control, and exploring potential modalities for scaling up cross-border coordination and collaboration with neighbouring countries.

Saudi Arabia

Saudi Arabia reported 177 indigenous and 2974 imported cases in 2017, compared with 272 indigenous and 5110 imported cases in 2016. There are 14 malaria programme staff at the national level. All funding for malaria elimination comes from the national budget. The Independent National Malaria Elimination Advisory Committee has been established. Saudi Arabia faces several challenges to elimination, including a large influx of pilgrims from all over the world for the Hajj, a shortage of highly-qualified and experienced staff in entomology and case management, and civil unrest in Yemen. Priority actions for 2018 include strengthening reporting, case investigation and the unified information system; expanding the network of mobile teams and village collaborators at border areas in the Jazan and Aseer regions to quickly diagnose and treat imported cases; initiating meetings between Saudi Arabian and Yemeni malaria control committees; supporting the National Malaria Control Programme in Yemen; and continuing training programs on different aspects of malaria elimination.

South-East Asian Region

Bhutan

Bhutan reported 11 indigenous and 38 imported cases in 2017, compared with 15 indigenous and 53 imported cases in 2016. The national malaria programme is a semi-integrated programme with 25 staff at the national level. Malaria elimination is funded by the GFATM, the Asia-Pacific Malaria Elimination Network, WHO, the Indian government, and the Royal Government of Bhutan. Population movements across international borders (particularly with India) pose a major threat for malaria elimination in Bhutan. A decrease in donor support for malaria and a shift in national priorities to other diseases also are a challenge to sustaining gains made by the country. Priorities for 2018 include forming a functional independent national malaria elimination advisory committee, establishing functional cross-border collaboration for case notification and other information-sharing, and strengthening surveillance and use of real-time online reporting.

Nepal

Nepal reported 628 indigenous and 665 imported cases in 2017, compared with 492 indigenous and 636 imported cases in 2016. The Epidemiology and Disease Control Division under the Department of Health Services manages control of all vector-borne diseases, including malaria. The division has 20 technical staff at the national level. The major donor for malaria elimination is the GFATM; funding also comes from the government. Approximately 56% of all cases reported are imported from India. Importation of cases from India and a lack of elimination focal points at the national and district levels pose a major challenge for malaria elimination. In addition, elimination of P. vivax (which causes more than 80% of malaria burden) and poor compliance by the private sector regarding case notification and the national malaria treatment protocol
are significant challenges to reaching Nepal’s elimination target. Priorities for 2018 include strengthening the surveillance system while maintaining quality of its “1-3-7” response, engaging the community and private sector, and training and building capacity for diagnosis and treatment.

Timor-Leste

Timor-Leste reported 16 indigenous and 13 imported cases in 2017, compared with 94 indigenous and zero imported cases in 2016. The national malaria programme has 15 staff dedicated to malaria elimination at the national level. Most funding for malaria elimination comes from the GFATM, and the government provides a substantial portion of the budget. More than 95% of reported cases come from the border with Indonesia, and movement of people across the border poses a challenge to detection and timely response. The private sector does not use WHO prequalified rapid diagnostic tests (RDTs) nor does it report its cases to the national programme. Priorities for 2018 include strengthening cross-border collaboration with Indonesia and increasing involvement of the private health sector to improve the quality of malaria diagnosis, data recording and reporting to the national malaria programme.

Western Pacific Region

China

China reported zero indigenous and 2672 imported cases in 2017, compared with three indigenous and 3139 imported cases in 2016. The national malaria programme oversees malaria elimination with 15 staff at the national level. Until 2012, China received GFATM funds for malaria control, but since 2013 it uses only domestic resources to fund its programme. In 2017, the National Experts Group on Malaria Elimination and the National Experts Group on Severe Malaria Treatment were established. Most imported cases were from African countries (86%). The national malaria programme implements the 1-3-7 strategy of surveillance and response throughout the country. Malaria along the border with Myanmar and imported malaria pose challenges to preventing re-establishment of malaria. Priorities for 2018 include continuing to implement the 1-3-7 surveillance and response approach, strengthening regional, intersectoral collaboration to reduce the risk of imported malaria and continuing to conduct subnational malaria verification.

Malaysia

Malaysia reported 85 human indigenous and 415 imported cases in 2017, compared with 266 indigenous and 420 imported cases in 2016, but has reported zero indigenous cases since the beginning of 2018. However, Malaysia reported 1600 and 3614 *P. knowlesi* malaria cases in 2016 and 2017, respectively. The national malaria elimination programme has seven staff at the national level and is fully funded through the Malaysian Ministry of Health. The diagnosis and treatment aspects of the national programme are integrated within health services; case and focus investigations and focus response are carried out by special malaria units. The country faces challenges from infections imported by undocumented migrant workers and Malaysians working in other endemic countries in the agriculture or forestry sectors, and from hard-to-reach populations (including aboriginal populations). To improve access to malaria preventive and diagnostic services, the national programme has trained select plantation workers to be malaria focal points. Priorities for 2018 include continuing vigilance for imported malaria, conducting subnational verification of malaria elimination at the provincial level, developing guidelines for control of simian malaria and implementation of micro-stratification using receptivity and vulnerability indices, a core requirement of Malaysia’s programme to prevent re-establishment.
**Republic of Korea**

The Republic of Korea reported 436 indigenous and 79 imported cases in 2017, compared with 602 indigenous and 71 imported cases in 2016. The Republic of Korea has 11 national-level staff who oversee malaria elimination activities. The national programme is fully funded by the government. Malaria cases along border districts with the Democratic People’s Republic of Korea and among military personnel are major challenges to reaching the national elimination target. Priorities for 2018 include setting up cross-border collaboration on malaria elimination on both sides of the Demilitarized Zone, increasing cooperation between the Ministry of National Defense and the Korea Centers for Disease Control and Prevention, and enhancing surveillance among military personnel and civilians in high-risk areas.

**PRELIMINARY RECOMMENDATIONS FROM THE MEOC**

The MEOC presented preliminary conclusions and recommendations during the meeting, and finalized its report in the afternoon in a closed session. The complete report of the MEOC recommendations can be found at: http://www.who.int/malaria/areas/elimination/advisory-committees/en/

**CLOSING**

At the closing ceremony, Dr Lilian Reneau-Vernon, PAHO/WHO representative, Costa Rica, thanked participants for travelling to attend the Global Forum and wished them the best as they continue their efforts to end malaria. Dr Castellanos, on behalf of PAHO, thanked participants for their attention and dedication at the meeting. The representative of the E-2020 countries, Nomcebo Dlamini, Chief Surveillance Officer, National Malaria Control Programme, Eswatini, reaffirmed the countries’ commitment to eliminating malaria. Dr Alonso closed the meeting by reminding the E-2020 countries that their leadership and optimism is critical to showing all malaria-endemic countries that a malaria-free world is possible.

**Endnotes**


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