
**Progress report on emerging and re-emerging diseases including dengue
and dengue haemorrhagic fever**

Introduction

1. Countries in the Eastern Mediterranean Region continue to be hotspots for emerging and re-emerging infectious diseases. Outbreaks of such diseases have a significant impact on health and economic development in the Region. At least 11 of the 22 countries in the Region have reported epidemics of emerging infectious diseases over the past 10 years with the potential for global spread. These epidemic threats remain potentially devastating to development in the Region, through decreased productivity, avoidable medical costs, loss of revenues from tourism and travel, negative incentive for investment, and loss of economic opportunities for people. International travel to and from the Region and the varying levels of capacity to early detect and diagnose an unknown pathogen remain significant risk factors for rapid international spread once such infections or diseases emerge in the Region. The need to prevent, detect and respond to any infectious disease that poses a persistent threat to global health security remains a national, regional and international priority.
2. The principal risk factors contributing to the emergence and rapid spread of epidemic diseases in the Region include acute and protracted humanitarian emergencies resulting in fragile health systems, increased population mobility (travel and displacement), rapid urbanization, climate change, weak surveillance and limited laboratory diagnostic capacity, and increased human–animal interaction. The complex humanitarian emergencies and protracted conflicts have had a profound impact on the already fragile health systems in many countries in the Region, making the disease control and elimination efforts extremely difficult and challenging.
3. Political instability and civil conflict pose threats to the progress being made in the prevention and control of infectious diseases and provide opportunities for emerging health threats to evolve, without heed to political boundaries.
4. In 2011 the Regional Committee for the Eastern Mediterranean discussed dengue and dengue haemorrhagic fever and issued resolution EM/RC58/R.4 in which it requested the Regional Director to report to the Regional Committee periodically on the progress made in control of dengue and dengue haemorrhagic fever in the Region.

Situation update

5. Over the past decade, countries of the Region have faced repeated outbreaks from emerging infectious diseases with the potential to cause a global health emergency. Major infectious disease outbreaks that were detected, investigated and rapidly contained over the past five years include yellow fever in Sudan (2012), Middle East respiratory syndrome in Bahrain, Oman, Qatar, Saudi Arabia, United Arab Emirates and Yemen (2013–2015), cholera in Iraq (2015), avian influenza A (H5N1) infection in Egypt, and dengue fever in Yemen, Sudan and Pakistan (2012–2015). Timely and effective public health response efforts helped avert major international health emergencies from these outbreaks.
6. Dengue and severe dengue fever cases, the most widespread mosquito-borne infection in humans, remain an emerging public health problem in the countries of the Eastern Mediterranean Region. Countries, especially those on the Red Sea rim, frequently report sporadic cases to explosive

outbreaks of dengue fever during high transmission season. At least 8 of the 22 countries in the Region are endemic for dengue with a high abundance of competent vectors such as *Aedes* mosquitoes. While outbreaks of dengue and severe dengue fever were reported in the past from Egypt (2015), Pakistan (2011 and 2014), Sudan and Yemen (2012–2015), Oman (2014 and 2015) has reported imported cases only while both Djibouti, Somalia have reported sporadic cases signifying presence of competent vectors in these countries with the risk of local transmission. The principal risk factors for dengue and severe dengue cases transmission in the Region include increased urbanization, uncontrolled population growth in urban and peri-urban areas, unprecedented increase in travel by air as well as poor vector control intervention.

7. As of June 2016, none of the countries in the Eastern Mediterranean Region has reported Zika virus infection but the risk remains considerable. The potential for the current outbreak to spread beyond the Region of the Americas is a concern, as it was shown recently that the Zika strain responsible for the outbreak in Cabo Verde was most likely imported from Brazil. The risk of local transmission following introduction of the virus poses further concern. This risk is highest in eight countries, Djibouti, Egypt, Oman, Pakistan, Saudi Arabia, Somalia, Sudan and Yemen, where *Aedes aegypti* mosquitoes exist. Furthermore, the invasive mosquito *Aedes albopictus*, another vector of mosquito-borne disease, is spreading in the Region and has been recently reported in the Islamic Republic of Iran, Lebanon, Palestine and Syrian Arab Republic. The density of *Aedes* mosquitoes usually peaks during the summer months and also during the rainy season, when water is temporarily stored in household containers, especially in water-insecure urban areas. Temperature plays a role in adult vector survival, viral replication and infective period. Global climate change may favour the geographic expansion of the *Aedes* mosquito distribution in the Region and thus the risk of spread of Zika virus and other arboviral infections.

8. Chikungunya, another mosquito-borne disease, is prevalent in Yemen, Sudan and Somalia. Yemen faced two major outbreaks in 2011 and 2012, and sporadic cases have been reported from Sudan and recently from Somalia. Owing to reactivity with other arboviral diseases and similarity in presenting symptoms at the initial stage of disease manifestation, diagnosis of chikungunya remains a challenge in the countries where dengue virus is endemic or concurrently circulating.

9. Sudan remains the only country in the Region with reports of major outbreaks of yellow fever, another mosquito-borne disease with haemorrhagic manifestations. In both 2012 and 2013, the country reported an outbreak of yellow fever with high morbidity and mortality. In Somalia and Djibouti, Serological studies show evidence of circulation of yellow fever in Djibouti and Somalia.

10. The emergence of Middle East respiratory syndrome coronavirus (MERS-CoV) in the Region and its continuing transmission since 2012 currently poses one of the biggest threats to global health security. Following its identification, cases have continued to increase over the past three years and hundreds of human infections have been reported globally, of which approximately 36% were fatal. The majority of cases (over 85%) reported to date have been from the countries of the Region, notably from Saudi Arabia (more than 95% of cases), Jordan, Kuwait, Oman, Qatar and the United Arab Emirates. Laboratory-confirmed human infections with history of travel to one of these countries have also been reported from other countries including Egypt, Islamic Republic of Iran, Lebanon, Tunisia and Yemen, bringing the total number of countries reporting laboratory-confirmed cases of MERS-CoV to 11 out of 22 in the Region.

11. Cholera re-emerged in the Region in 2015. Afghanistan, Pakistan and Somalia, the three most cholera endemic countries in the Region, continue to report sporadic cases. Imported cases of cholera were reported in 2015 from Bahrain, Islamic of Iran Kuwait Lebanon, Oman and Qatar. An outbreak was reported from Iraq after a gap of nearly 3 years. The outbreak threatened to spill over to other countries owing to frequent cross-border movement between Iraq and other neighbouring countries affected by conflict. Available surveillance data show that nine of the 22 countries in the Region are

endemic for cholera, which is linked to insufficient water supply, sanitation, poor hygiene and food safety. Given the worsening humanitarian and security situation in the Region, the potential risk of cholera is heightened especially countries hosting a high number of refugees and displaced populations.

12. Crimean–Congo haemorrhagic fever (CCHF), a tick-borne viral infection, continues to cause human infections in the endemic belt of the Region that includes Pakistan, Afghanistan and the Islamic Republic of Iran. In recent years the CCHF virus has been found in Oman, which is a sign that this emerging virus may spread to other non-endemic countries where the animal reservoir of the virus remains unknown. Trade in animals and animal skins within Pakistan, and between Afghanistan, Islamic Republic of Iran and Pakistan, is thought to play a major role in the spread of CCHF among people who handle animals or their skins, slaughter infected animals and come into close contact with ticks or CCHF patients.

13. Influenza causes significant public health problem together with social and economic impact in the region. Acute respiratory infections are the most common causes for clinic visits and the leading causes of morbidity among children and adults in the region, and this has the potential to overwhelm primary and secondary health care services. Over the past 5 years, a seasonal surge of influenza caused by influenza A (H1N1) pdm09 was reported from Egypt, Islamic Republic of Iran, Iraq, Jordan, Kuwait, Libya and Tunisia. Egypt is the only country in the Region that is continuing to report human infections caused by avian influenza A (H5N1). The country, currently, has the highest number of human infections caused by avian influenza A (H5N1) globally and second-highest mortality among all countries affected by H5N1 globally. Despite the unprecedented surge in human cases in Egypt, it does not appear that the risk of an H5N1 pandemic has changed appreciably. The transmission pattern of influenza H5N1 in Egypt appears to remain predominantly the same despite the upsurge. Egypt, last year, also reported two human infections caused by influenza A (H9N2) which are enzootic in poultry populations in parts of the Region.

Progress to date

14. WHO continues to provide strategic, operational and technical support to the countries in the Region for detection, risk assessment and rapid response to emerging infectious diseases and to prevent international spread of these infections.

15. In the areas with dengue and severe dengue cases, a strategy for surveillance, outbreak response, social mobilization and vector control has been rolled out following a subregional meeting held in 2012 on the control of dengue fever in the Red Sea rim. Additionally, the Regional Office deployed staff and international experts to contain outbreaks of dengue/severe dengue in Pakistan during 2012 and 2014, Sudan during 2013 and 2015 and in Yemen during 2012, 2013 and in 2015. WHO also supported training for participants from Djibouti, Saudi Arabia, Somalia, Sudan and Yemen in the areas of epidemiological surveillance, entomological surveillance and laboratory diagnosis at the Environmental Health Institute of Singapore, which is a WHO collaborating centre for reference and research of arbovirus and its associated vectors.

16. On 1 February 2016 WHO declared a public health emergency of international concern with regard to clusters of microcephaly and neurological disorders potentially associated with Zika virus. The Regional Office conducted three rounds of emergency meetings convening all Member States and key partner agencies with a view to enhancing preparedness and readiness measures across the Region. The meeting resulted in a regional Zika preparedness plan with a set of recommended actions to strengthen surveillance and response to early detect any imported case of Zika virus infection and rapidly contain local transmission. A range of integrated activities covering prevention, surveillance and control interventions for *Aedes* mosquitoes have been initiated in the endemic belt of the Region with high abundance of competent vectors.

17. Sudan launched its first ever yellow fever mass preventive vaccination campaigns in December 2014 vaccinating close to 7.5 million people aged between 9 months and 60 years in seven high risk states in the country. The vaccination campaign was preceded by a risk assessment combining a serological prevalence survey and entomological studies conducted in 2012–2013 covering four ecological zones. Based on the findings of this risk assessment the areas with active circulation of yellow fever virus were targeted for preventive vaccination campaigns with a view to eliminating the risk of yellow fever in Sudan.

18. Since the emergence of MERS-CoV, WHO has worked closely with the affected Member States in three main areas: improving public health preparedness; outbreak response; and addressing critical knowledge gaps to better understand the epidemiology and transmission patterns of the disease caused by the virus. In order to improve detection and response capacity for this novel virus, surveillance efforts were intensified across all countries in the Region through training front-line health care workers on surveillance, field investigation, infection prevention and control and laboratory diagnostics, as well as through sharing best practice guidance. WHO led technical missions to several countries reporting cases (Islamic Republic of Iran, Jordan, Qatar, Saudi Arabia, Tunisia, United Arab Emirates), to conduct field investigation and also to advise on appropriate public health measures. In the area of addressing critical knowledge gaps, WHO has convened four international scientific meetings on MERS-CoV so far. These meetings have shaped the public health research agenda for MERS-CoV by identifying critical knowledge gaps. WHO is working closely with the Food and Agriculture Organization of the United Nations (FAO) and the World Organisation for Animal Health (OIE) as well as other international health agencies to come up with an appropriate research agenda for both animal and human health to bridge these critical gaps.

19. A strategic framework for cholera preparedness and response has been developed to guide Member States in developing country-specific preparedness and response plans. Efforts to strengthen the epidemic response capacity included enhancing disease surveillance, improving case management through training of health workers and provision of medical supplies, and deployment of experts to support health authorities and partners. Regional efforts to control and prevent cholera outbreaks entered a new era following the implementation of the first mass vaccination campaign with oral cholera vaccine from the global stockpile in response to the outbreak in Iraq.

20. In view of the threat of importation of Ebola virus disease, the Regional Committee in resolution EM/RC61/R.2 (2014) urged Member States to undertake a comprehensive assessment of their capacity to deal with a potential importation, in order to identify and address the main gaps. At the request of Member States, WHO conducted assessments in 20 countries. Based on results of the assessments, a 90-day action plan was drawn up and implemented between March and May 2015 to address the critical gaps identified in the areas of prevention, detection and response to the threat of Ebola virus disease importation.

21. Surveillance systems for influenza-like illness and severe acute respiratory infections were established in 16 countries in the Region to build local capacity for early detection, recognition and response to any novel influenza virus with pandemic potential. A total of 16 national influenza centres have been established in the Region for influenza virus isolation, sequencing and antiviral resistance testing. In addition, the Pandemic Influenza Preparedness Framework, a unique public–private partnership initiative, was rolled out in 7 middle-income and low-income countries with a view to strengthening capacities for detection and response to influenza with pandemic potential and increasing access to vaccines and other pandemic-related supplies.

22. In view of the geographic expansion of Crimean–Congo haemorrhagic fever, the Regional Office is scaling up efforts aimed at the prevention and control of human infections, particularly in the areas of surveillance for early detection of human cases, therapeutic options and tick control.

23. A regional network for experts and technical institutions has been established to facilitate support for international outbreak response in response to the growing frequency, duration and scale of disease outbreaks in the Region. In October 2014 the 61st Session of the Regional Committee adopted a resolution (EM/RC61/R.1) calling for the development of national cadre of emergency management experts and the creation of a regional surge roster of experts for rapid deployment in emergencies.

Challenges

24. More countries in the Region are currently experiencing protracted and persistent humanitarian emergencies, with over 56 million people currently affected. These internally displaced persons, refugees and surrounding host communities are at high risk of the potential outbreaks from infectious diseases. Epidemic threats are often exacerbated in such situations, owing to fragile public health systems and weakened or fragmented surveillance and threat detection capacities.

25. Regional preparedness and control efforts for dengue/severe dengue fever and other arboviral infections such as chikungunya and yellow fever face major challenges. First, the vector surveillance capacity of countries in the endemic belt of these mosquito-borne arboviral infections remains critically poor. Second, arboviral diseases, because of their complex nature, require multidisciplinary and intersectoral collaboration and an integrated vector management approach involving different sectors and communities. Third, risk perception of these infections is low, which may be the result of knowledge gaps on a range of issues including the spectrum of complications and long-term burden. Finally, significant funding gaps exist for the prevention and control of arboviral infections. Globally and particularly in the Region, donors do not see arboviral infections such as dengue, chikungunya and Zika virus infection and their complications as a public health emergency, which has severely limited the mobilization of resources. Without all of these critical elements in place, most prevention and control efforts will remain unsuccessful.

26. Other major challenges in prevention and control efforts for emerging diseases include knowledge gaps on the risk factors for transmission of emerging infections, weak and variable surveillance systems for early detection and response, limited laboratory diagnostic capacity, insufficient investment in disease surveillance and response activities, disruption of public health services in areas affected by conflict and other emergencies and absence of a comprehensive and inclusive preparedness and response plan to prevent, detect and timely respond to any event of potential public health concern.

27. Health security in the Region is a critical concern. Fulfillment of the core public health capacities required under the International Health Regulations (2005) remains severely compromised owing to critical gaps in public health systems. Despite the political commitment among countries in the Region, some countries still lack the public health capacity and resources required to strengthen their surveillance and response efforts for control of emerging infections.

Recommended actions

28. Accelerated efforts are needed by countries to build and maintain a resilient public health system for detection and response to all acute public health threats. In addition to scaling up such efforts, actions must be focused on health security, namely, full compliance by all countries with the core capacities required under the IHR (2005). Although country self-assessments indicated fairly high levels of implementation of the Regulations, subsequent assessment missions in response to potential importation of Ebola found many critical gaps in countries that reported having met their obligations. These gaps, such as the absence of operational coordination structures, emergency operating centres and real-time monitoring of acute health threats, need to be bridged through a concerted effort. The Regional Office has defined specific steps countries must take and is providing technical assistance and capacity building to support full IHR (2005) compliance.

29. In view of the imminent public health threat and challenges caused by dengue/severe dengue and the recent Zika outbreak spreading in the Americas and beyond, there is an urgent need to step up preparedness and response efforts in the Region including reporting of human cases on an annual basis by affected countries. This requires intensified and concerted actions by all stakeholders, including governments, development partners, civil society and communities. WHO will continue leading and coordinating these efforts and actions, providing technical support and guidance to countries, identifying priorities and revising strategies for the next phase of response, convening and engaging a broader range of partners, and intensifying resource mobilization at all levels to address dengue/severe dengue fever, Zika virus infection and other arboviral diseases.

30. Another priority is to continue to assess the global risk and mitigate the health threats associated with transmission and spread of both MERS-CoV and H5N1 infections in the Region. Public health vigilance must be maintained through better preparedness, surveillance and readiness measures to detect early any signal that either of these two viruses has become more efficient in spreading from person to person. Both national and international efforts should be intensified urgently in order to fill the current gaps in knowledge, so as to improve the public health response and contain the threats associated with these viruses.

31. As part of the collective responsibility to protect global health, all countries need to accelerate their ongoing efforts to build, maintain and sustain a public health system that is able to effectively prevent, detect and rapidly respond to any health threat before it becomes an international emergency. Protecting public health security through preparedness, readiness, response and recovery is a critical undertaking and must be maintained at all times and all levels. The IHR (2005) remains the key driver in national and international efforts to strengthen national and global health security.

32. WHO will continue to support the high-risk countries in the areas of surveillance, early detection and response to emerging infectious disease outbreaks. In recognition of the complexity of prevention and control efforts for emerging diseases, especially in complex emergency situations, the Regional Office will develop comprehensive and integrated preparedness and response plans for epidemic diseases based on a comprehensive risk assessment and mapping of hotspot areas.