

# YELLOW FEVER

## STRATEGIC RESPONSE PLAN

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# TABLE OF CONTENTS

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## **PART I: STRATEGIC RESPONSE FRAMEWORK**

The strategic response framework at a glance

Situation overview

Strategic objectives

Response strategy

Response coordination

Response monitoring

Summary of requirements

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## **PART II: JOINT OPERATIONS PLAN**

Strategic Objective 1

Strategic Objective 2

Strategic Objective 3

Strategic Objective 4

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## **PART III: ANNEX**

List of organizations involved

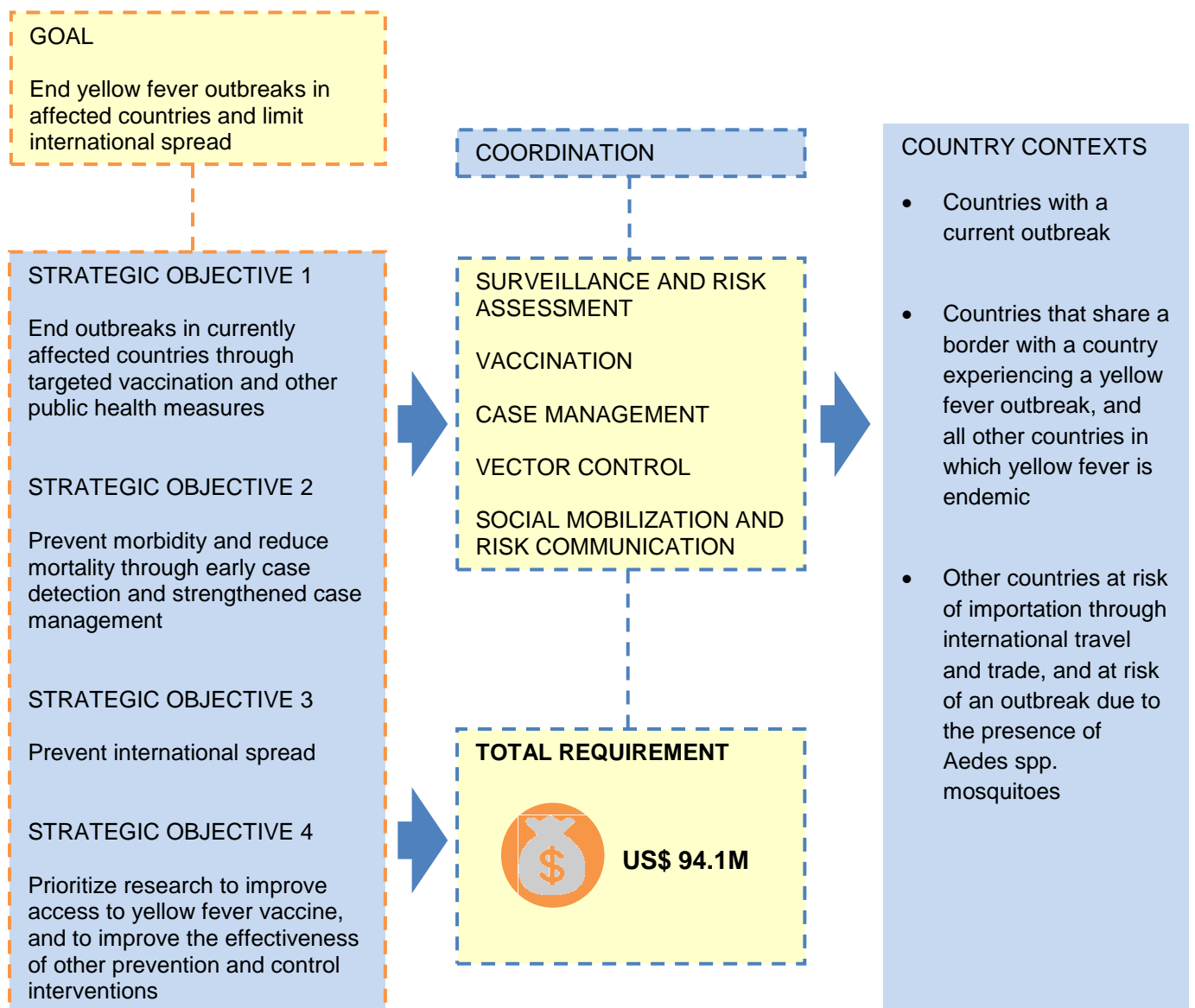
Participating organizations funding requirements

## THE STRATEGIC RESPONSE FRAMEWORK

# AT A GLANCE

Page | 4 This document is intended to guide a coordinated international response to interrupt transmission of the 2016 yellow fever outbreak in Angola, the Democratic Republic of the Congo, and a concurrent yellow fever outbreak in Uganda, including preparedness for the importation of cases in non-affected countries. The document is informed by lessons learned over the past six months, and provides an overview of the current situation, outlining the response strategy for the rapid containment of current outbreaks and the prevention of international spread. It includes a Joint Operations Plan that provides further detail of how WHO and its partners are and will continue to implement the framework’s strategic objectives.

The overview and strategy were developed with input from WHO’s regional office for Africa, the WHO Country Offices of Angola, the Democratic Republic of the Congo, and Uganda, and from partners including Médecins Sans Frontières, the Prevention and Control Program of the Communicable Disease Control Directorate of the Department of Health, Western Australia, UNDP, UNHCR, UNICEF regional offices for West and Central Africa (WCARO) and East and Southern Africa (ESARO), UNICEF headquarters, and from The University of Texas Medical Branch (UTMB Health).



# OVERVIEW OF THE SITUATION

## Page | 5 Background

Yellow Fever is endemic in tropical areas of Africa and Central and South America. Thirty four (34) countries in Africa and thirteen (13) in Central and South America are either endemic for, or have regions that are endemic for, yellow fever.<sup>1</sup>

On 21 January 2016 WHO received official notification through the International Health Regulations (2005) of a yellow fever outbreak in Angola.<sup>2</sup> The first suspected cases were reported in late December from Luanda – the country's capital city and main trade and travel hub, with a population of over 6 million people. The disease, which is transmitted in urban settings by the *Aedes aegypti* mosquito, spread rapidly in Luanda. From there, cases were exported to the rest of the country (figure 1). By early May, all 18 of Angola's provinces had reported suspected cases of yellow fever. As of 11 July, 12 provinces had confirmed local mosquito-borne transmission (figure 2). Cases of yellow fever have also been exported from Angola to the Democratic Republic of Congo (DRC), China<sup>3</sup> and Kenya<sup>4</sup> (figure 1; table 1).

On 22 March, the DRC, which borders Angola to the south, confirmed the detection of imported cases of yellow fever in areas bordering Angola by analysis at the Kinshasa National Institute of Bio-medical Research (INRB) and Pasteur Institute Dakar (IPD).<sup>5</sup> By 15 June, over 63 confirmed cases had been reported in districts bordering Angola (figure 1), including evidence of local mosquito-borne transmission in the capital, Kinshasa, and the country's main seaport Matadi. Together these two large urban settlements have a population of over 11 million people and are well connected to international travel and trade routes. On 21 May 2016, The Republic of Congo reported a probable case of yellow fever in the town of Madingou, located close to the border with DRC and Angola. WHO provided immediate technical assistance to the Congolese Ministry of Health, and is currently undertaking full field investigations to determine the nature and possible source of infection. As of 11 July, two probable cases were reported in The Republic of Congo. Resources have been mobilised to strengthen local surveillance and diagnostic capacity.

**Table 1 | Total yellow fever cases and deaths as of 11 July 2016**

	Total confirmed, probable, and suspected cases of yellow fever	Total deaths from confirmed, probable, and suspected yellow fever
<b>Local transmission plus imported cases</b>		
Angola	3552	355
DRC	1582	75
The Republic of Congo	2	0
Uganda*	68	3
Brazil*	1	1
Peru*	79	9
<b>Imported cases only</b>		
China	11	0
Kenya	2	1

\*Not epidemiologically linked to the outbreak that originated in Angola. Investigations are ongoing into suspect cases (not epidemiologically linked to the Angola outbreak) reported in Ghana (4 cases), Guinea (8 cases). To date, the situation remains stable and there are no updates for Chad (1 case) and Colombia (1 case)

<sup>1</sup> WHO. Yellow fever Fact sheet: <http://www.who.int/mediacentre/factsheets/fs100/en/> (last accessed 24 May 2016).

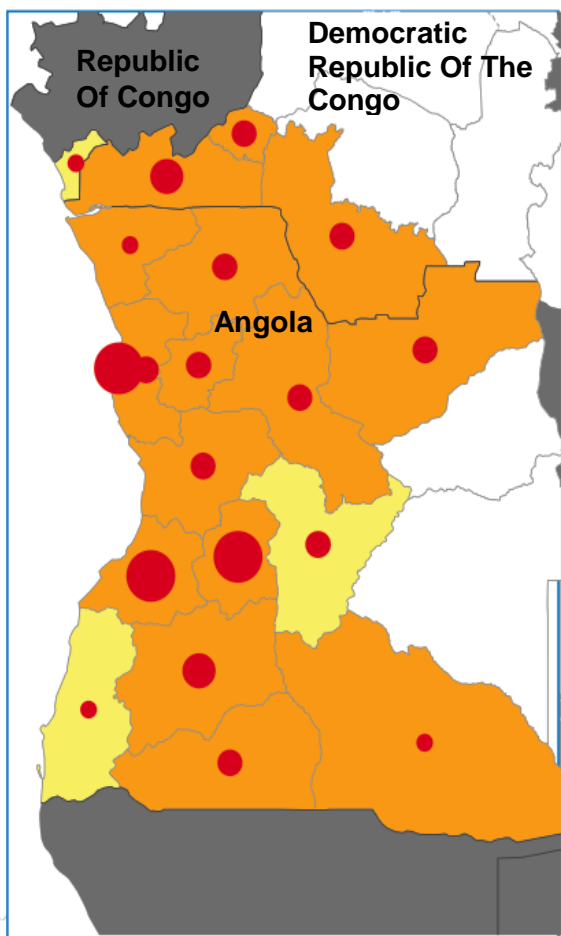
<sup>2</sup> WHO disease outbreak news: <http://www.who.int/csr/don/12-february-2016-yellow-fever-angola/en/> (last accessed 24 May 2016)

<sup>3</sup> WHO disease outbreak news: <http://www.who.int/csr/don/22-april-2016-yellow-fever-china/en/> (last accessed 24 May 2016).

<sup>4</sup> WHO disease outbreak news: <http://www.who.int/csr/don/6-april-2016-yellow-fever-kenya/en/> (last accessed 24 May 2016).

<sup>5</sup> WHO disease outbreak news: <http://www.who.int/csr/don/11-april-2016-yellow-fever-drc/en/> (last accessed 24 May 2016).

Figure 1 | National and international spread of yellow fever



Areas reporting confirmed cases with autochthonous transmission  
 Areas reporting confirmed cases imported from other areas

**Number of confirmed cases**

- 1-5
- 6-25
- 26-50
- 51-100
- 101-1000

As of 11 July, over 3500 suspected cases and over 860 confirmed cases have been reported from Angola, with 355 deaths. Over 1500 suspected cases have been reported from the Democratic Republic of The Congo (DRC), where there have been 68 confirmed cases and 75 deaths.

Three countries have reported confirmed cases of yellow fever imported from Angola:

- 11 cases in China
- 59 cases in the DRC
- 2 cases in Kenya



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In addition to the yellow fever outbreak taking place in and around Angola, on 26 March WHO received official notification of a yellow fever outbreak in Uganda. By 11 July, 68 suspected and seven confirmed cases had been reported from three districts. Analysis of the genetic sequence of the circulating virus indicates that the Ugandan outbreak is not linked to the outbreak in Angola. Further unrelated outbreaks in South America in 2016 have been reported from Peru in April and Brazil in May (table one). One case was also reported in Colombia. WHO also continues to support countries in Africa with the verification and investigation of other suspected cases of Yellow fever - Ghana (four cases), Guinea (eight cases) Chad (one case) -- all of which were reported in June.

### Response

Since the beginning of the outbreak, WHO and partners have supported the governments of Angola, DRC, and Uganda in their ongoing efforts to rapidly interrupt yellow fever transmission and strengthen measures to prevent spread across borders. WHO and its partners in the [International Coordinating Group](#) (ICG) for Vaccine Provision are managing an emergency stockpile supported by the [Global Alliance for Vaccine and Immunization](#) (GAVI). As of 20 May 2016, WHO has facilitated the procurement and delivery of over 14 million doses of yellow fever vaccine allocated through the ICG mechanism, for mass vaccination campaigns in Angola, DRC and Uganda. Funds amounting to approximately \$US 2.24 million have been disbursed from the WHO Contingency Fund for Emergencies to further support national response efforts in affected countries. The response in Angola has also been supported by the Central Emergency Fund of the United Nations (CERF).<sup>6</sup> Further CERF proposals are in process for DRC and Uganda. However, despite reactive mass vaccination campaigns in the Angolan capital Luanda and the provinces of Benguela and Huambo, new cases continue to be reported throughout Angola and around the border area with DRC and the Republic of Congo. By 15 June continued spread of yellow fever in Angola, including on the border with DRC, and the confirmation of autochthonous transmission in Kinshasa, DRC, prompted WHO to initiate a rapid, large-scale vaccination campaign to prevent further spread.

### Rationale for a global response strategy

The continued spread of yellow fever in Angola, evidence of local transmission in DRC, and the threat of further international spread triggered WHO to activate its organization-wide incident management system on 22 April 2016. A reallocation of vaccine stocks through ICG mechanisms has provided a temporary boost to vaccine availability; however, current vaccine stocks are insufficient to respond to multiple simultaneous urban outbreaks. In the context of a constrained global supply of yellow fever vaccine there is an urgent need for a coordinated global response in order to end current yellow fever outbreaks. Failure to intervene decisively now may result in further large-scale urban outbreaks in at-risk areas, and a consequent inability to meet the demand for vaccine. The strategic framework set out in this document provides the basis for WHO's continued response to the yellow fever outbreak, and for strengthened coordination and collaboration with partners to ensure that national and international response activities are supported.

The [Yellow Fever Emergency Committee](#) gathered under the International Health Regulations (2005) convened by WHO on 19 May 2016 emphasized the seriousness of the national and international risks posed by urban yellow fever outbreaks and made the following recommendations:

- In Angola and DRC, accelerate surveillance, mass vaccination, risk communication, community mobilization, vector control and case management measures
- For travelers to and from Angola and DRC ensure travellers, especially migrant workers, are vaccinated against yellow fever
- In at-risk countries and countries that share land borders with affected countries, intensify surveillance and preparedness activities, including verification of vaccination of travelers and risk communication
- Identify and manage imported cases rapidly
- Evaluate the effectiveness of the response
- Rapidly expand yellow fever diagnostic and confirmatory capacity
- Apply the policy of one lifetime dose of yellow fever vaccine<sup>7</sup>
- Undertake a rapid evaluation and implement the of dose-sparing strategies in consultation with the WHO Strategic Advisory Group of Experts (SAGE) on Immunization

<sup>6</sup> CERF Funding by Country (2016) - Project Detail Angola (01/01/2016 to 24/05/2016; last accessed 24 May 2016).

<sup>7</sup> World Health Assembly Resolution WHA 67.13.

## STRATEGIC

## OBJECTIVES

To achieve the over-arching goal of ending yellow fever outbreaks in affected countries and limiting international spread, WHO will coordinate with partners to support countries to attain the following strategic objectives:



## Country context

The implementation of interventions should be tailored to three country contexts (Table 2 and below).

- Countries with a current outbreak: Angola, Democratic Republic of the Congo (DRC), and Uganda.
- Countries that share a border with a country experiencing a yellow fever outbreak, and all other countries in which yellow fever is endemic
- other countries at risk of importation through international travel and trade, and at risk of an outbreak due to infestation by *Aedes* spp. Mosquitoes

Table 2   Recommended yellow fever response interventions by country context	Current yellow fever outbreak	Endemic or adjacent to outbreak	At risk of importation and <i>Aedes</i> spp present
<i>Surveillance and risk assessment</i>			
Assess the risk of the spread or start of an outbreak*			
Prepare for the importation of (more) cases from another area or country			
Ensure prompt and open information sharing in country and with the WHO and members states at risk through the IHR focal person.			
Strengthen case detection and reporting, including laboratory diagnostic capabilities			
Monitor the course of the epidemic and the outcome of interventions			
<i>Vaccination</i>			
Undertake reactive mass vaccination in areas where it is still likely to have an impact on the course of the outbreak, primarily in urban settings†			
Consider halting yellow fever vaccination provided through the expanded program of immunization, in order to prioritize the use of available vaccine for mass vaccination			
<i>Case management</i>			
Prevent excess mortality among suspected and confirmed cases			
<i>Social mobilization and risk communication</i>			
Community engagement and social mobilization			
Risk communication			
<i>Vector control</i>			
Intensify vector surveillance and control			



## RESPONSE

## STRATEGY

Achieving the strategic objectives will require coordinated implementation of a broad range of interventions, grouped here into: surveillance and risk assessment; vaccination; case management; social mobilization and risk communication; and vector control. Coordination with member states and partners remains essential to enable the implementation of all response activities. WHO will continue to monitor trends in affected and unaffected countries, and will adapt the strategic response framework on the basis of changing epidemiology and needs. WHO will support the implementation of preparedness activities in priority and at-risk countries at national and sub-national levels, and will support the assessment of surveillance and response capacity.

### Surveillance and risk assessment

Effective yellow fever surveillance<sup>8</sup> is critical to ensure that new cases and newly affected areas are identified quickly and that all data are transmitted to decision makers in a timely manner, which in turn enables the rapid implementation of response measures to contain outbreaks. Access to yellow fever vaccine from the ICG stockpile depends on laboratory confirmation of a case according to the standard case definition. Integrated arboviruses surveillance (epidemiological and laboratory) is a must where several mosquito-borne diseases are being transmitted especially when clinical presentation at the start is none-specific. Robust systems for transmission and management of data, including links between case investigation information and laboratory results are required.

Approximately 25 laboratories are able to test for Yellow Fever in Africa. In addition, there are two (2) international reference laboratories for Yellow Fever: the Pasteur Institute Dakar, Senegal, and the Arbovirus Branch at the Centers for Disease Control in Fort Collins, USA.

WHO will coordinate technical support to countries through the Global Outbreak Alert and Response Network (GOARN) and WHO collaborating laboratories to strengthen national surveillance capacity, and harness support from the Inter Agency

Standing Committee Cluster System as required. Areas of support will include technical support for surveillance, case investigation and risk assessment; provision of reagents, personnel, and equipment; sample transport logistics; and the deployment of mobile laboratories where needed to expedite laboratory testing. Additionally, coordination structures will be established and strengthened to support national government efforts at national and subnational levels in areas with ongoing outbreaks.

#### Panel 1 | Yellow fever case definition

A suspected case is confirmed when, in the absence of recent yellow fever vaccination, yellow-fever-specific IgM is found in the serum, or when a fourfold or greater rise in IgG levels is found in PAIRED acute AND convalescent sera, or when yellow fever virus is isolated in cell culture or laboratory animals, or in case of positive postmortem liver histopathology, or when yellow fever antigens are detected in tissues by immunohistochemistry, or when yellow fever virus genomic sequences are detected in blood or organs by molecular diagnostic techniques such as Reverse Transcription Polymerase Chain Reaction (RT-PCR).

Preparedness strengthening activities, including risk assessments for spread, will target priority countries at risk of yellow fever importation from countries with on-going outbreaks. As of end of May 2016, the countries at risk of cross-border importation from epidemic countries, either through mosquito infestation or human travel and trade are:

- Neighbouring Angola : western Zambia, northern Botswana, and northern Namibia
- Neighbouring Congo: Gabon

<sup>8</sup> WHO-recommended surveillance standard of yellow fever: [http://www.who.int/immunization/monitoring\\_surveillance/burden/vpd/surveillance\\_type/passive/YF\\_standards/en/](http://www.who.int/immunization/monitoring_surveillance/burden/vpd/surveillance_type/passive/YF_standards/en/) (last accessed 24 May 2016).

- Neighbouring affected areas in DRC: the south of the Republic of Congo
- Neighbouring affected areas in Uganda: eastern DRC, northern Rwanda, and northern Tanzania (through boat travel across lake Victoria)

Risk assessments for yellow fever outbreaks must be carried out regularly and be based on the findings of case and outbreak investigation and of entomological investigations. Recommendations should account for local surveillance and response capacity, and set prioritise interventions and resource allocation on the basis of national and local context.

### **In countries experiencing an outbreak**

- Yellow fever case-based surveillance should be implemented and/or strengthened. Synergy with the existing polio surveillance network should be sought where appropriate. Case-based investigation aims to establish vaccination status, differentiate between local transmission (autochthonous transmission) and imported cases, and document travel history and information regarding location of exposure.
- As per the requirements of the IHR (2005), affected countries should monitor yellow fever vaccination status of travelers through entry points.
- Reporting of yellow fever cases and the geographical extent of the outbreak should be done in accordance with the requirements of the IHR 2005.
- WHO and partners will support:
  - ◊ Dissemination and use of the standard case definition.
  - ◊ Case-based surveillance.
  - ◊ Strengthening of national or regional reference laboratories to improve capacity for diagnostic testing and reporting, and the shipment of specimens for validation and quality control.
  - ◊ Strengthen laboratory capacity in countries where they are limited
  - ◊ Support implementation of inter-country cooperation mechanisms for cross-border surveillance and outbreak investigation.

### **In countries that share a border with a country experiencing a yellow fever outbreak, and all other countries where yellow fever is endemic**

- WHO and partners will support countries to heighten their surveillance for yellow fever,

especially in areas that border countries experiencing an outbreak.

- Case investigations should seek to distinguish between imported cases and cases of local transmission, and should facilitate rapid risk assessment to determine the risk and possible extent of further spread.
- WHO and partners will support countries to establish and strengthen surveillance and reporting procedures at major entry points where requested including airports and ports.
- As per the requirements of the IHR (2005), countries should monitor yellow fever vaccination status of travelers through entry points.

### **In other countries at risk of importation through international travel and trade, and at risk of an outbreak due to infestation by *Aedes* spp. mosquitoes**

Ad-hoc surveillance measures should be strengthened, especially in countries that have regular flight, road and boat connections with countries and cities affected by outbreaks. Entry screening of yellow fever vaccination status may be implemented at entry points for travelers coming from affected countries.

## **Vaccination**

Vaccination is the most important measure for preventing yellow fever. The vaccine is safe, affordable, and provides effective immunity within 10 days for more than 90% of people vaccinated and within 30 days for 99% of people vaccinated. A single dose confers sustained immunity and life-long protection. Side-effects are rare and serious adverse events are rarely reported.<sup>9</sup> The International Certificate of Vaccination is valid 10 days after vaccination. In a non-epidemic situation all individuals above 9 months are eligible to be vaccinated with the exception of women who are pregnant and/or breastfeeding, individuals who are severely allergic to egg or another vaccine component, and immunocompromised individuals. In an epidemic situation eligibility for vaccination is extended to infants aged 6 months and above and to women who are pregnant and/or breastfeeding.

<sup>9</sup> WHO Yellow fever vaccine safety: <http://www.who.int/ith/vaccines/yf/en/> (last access 24 May 2016).

WHO and its partners in the ICG for Vaccine Provision have activated the ICG mechanism for release of yellow fever vaccine from the emergency stockpile. Despite the reallocation of vaccine from the Expanded Programme on Immunization (EPI) to the global stockpile, stocks are insufficient to respond to several simultaneous urban outbreaks. Vaccine producers have been requested to accelerate vaccine production, and WHO will continue to work with partners to:

- prioritize the release of vaccine according to risk
- validate and adopt dose-sparing strategies to increase vaccine availability
- carry out other research and development related to vaccines

WHO is developing a strategy on how best to prioritise the use of vaccines in the event of simultaneous urban outbreaks and a depletion of global stocks. Meanwhile, national strategies for vaccination may include either reactive mass vaccination campaigns, preventive mass campaign based on risk assessment (e.g. in high-risk areas located near the affected countries), or targeted vaccination of travelers, depending on the country's risk of an outbreak. In the event that vaccine stocks approach exhaustion, routine vaccination activities against yellow fever as part of the expanded program of immunization (EPI) may have to be deferred.

#### **In countries experiencing an outbreak**

- WHO is collaborating with partners to support affected countries to rapidly implement reactive mass vaccination campaigns in combination with other response and prevention measures.
- In addition to reactive vaccination, WHO will prioritise unaffected, high-risk areas for the implementation of pre-emptive vaccination campaigns to mitigate spread within the affected countries and across borders. Priority will be given to high-risk border areas and other non-border areas that are at high risk due to high levels of economic migration and trade activity. WHO will engage in discussions with ICG and other partners to rationalise the use of limited vaccine stocks and mobilise additional logistical capacity.
- WHO and UNICEF may recommend a temporary suspension of national routine childhood yellow fever immunization programs in order to prioritize vaccines for reactive mass vaccination campaigns

- In case of multiple large outbreaks priority will be given to the control of urban and peri-urban outbreaks.
- Vaccination cards must be distributed to vaccinated individuals to facilitate surveys of vaccination coverage, and to enable the individuals concerned to travel internationally.
- Yellow Fever vaccination activity should include surveillance for adverse effect and adverse events following immunization (AEFI) against yellow fever should be implemented according to WHO guidance.<sup>10</sup>
- Strict border control measures must include checking of yellow fever vaccination cards for all outgoing and in-coming travelers.
- Dose-sparing strategies may be considered in the context of limited vaccine availability.

#### **In countries that share a border with a country experiencing a yellow fever outbreak, and in all other countries where yellow fever is endemic**

- Countries should enforce the vaccination of travelers.
- WHO will work with countries to map areas at highest risk of importation, and prioritise areas for pre-emptive vaccination to mitigate this risk.
- In the context of limited availability of vaccines where the yellow fever immunization coverage is below 80%, preventive vaccination<sup>11</sup> may have to be postponed until the global vaccine stock is adequately replenished, unless the assessed outbreak risk is estimated to be high.
- Micro plans for emergency mass vaccination should address the logistical organization of the campaign, crowd control, safe waste disposal, resources mobilization, social mobilization/risk communication, daily monitoring of outcome of the campaign and monitoring of Adverse Events Following Immunization (AEFI).
- WHO will support the implementation of preparedness activities at national and sub-national levels, and the assessment of surveillance and response capacity.
- National/regional checks must monitor vaccine availability, injection/safety material availability, the availability of vaccination cards, the capacity

<sup>10</sup> WHO. Surveillance of adverse events following immunization against yellow fever. Field Guide for staff at the central, intermediate and peripheral level. January 2010: [http://www.who.int/csr/resources/publications/HSE\\_GAR\\_ERI\\_2010\\_1ENw.pdf](http://www.who.int/csr/resources/publications/HSE_GAR_ERI_2010_1ENw.pdf).

<sup>11</sup> WHO. Yellow fever Fact sheet: <http://www.who.int/mediacentre/factsheets/fs100/en/> (last accessed 24 May 2016).

of active and passive cold chain, and report findings to the yellow fever partnership.

- Strict border control measures must be implemented to verify the yellow fever vaccination status of all passengers who have travelled to countries with a yellow fever outbreak in the past **two** weeks.<sup>12</sup>

### **In other countries at risk of importation through international travel and trade, and at risk of an outbreak due to infestation by *Aedes* spp. Mosquitoes**

- Countries that implement yellow fever vaccination as part of the routine EPI program and receive vaccine through UNICEF, will receive staggered shipments to prevent the exhaustion of national vaccine stocks. Countries will receive shipments one month prior to depletion of vaccine stocks. Such shipments will include enough supply to cover two months of use.
- All countries are at risk of importation through international travel and trade. Therefore, travelers planning to visit yellow fever endemic and epidemic countries or returning from affected countries, should be vaccinated at least ten (10) days before to travel to the affected country or at least ten (10) days prior to return to a non-affected country.<sup>13</sup>

### **Dose-sparing strategy**

Dose-sparing, also known as fractional dosing, is under consideration as a short-term measure, in the context of a potential vaccine shortage for use in emergencies. WHO Strategic Advisory Group of Experts (SAGE) on Immunization reviewed existing evidence that demonstrates that using a fifth of a standard vaccine dose would still provide protection against the disease for at least 12 months and possibly much longer. More research is needed to find out whether fractional doses would be effective in young children, who may have a weaker immune response to yellow fever vaccine.

## **Clinical management**

<sup>12</sup> . US Centers for Disease Control and Prevention: <http://www.cdc.gov/travel/yellowbook/2016/infectious-diseases-related-to-travel/yellow-fever> (last accessed 24 May 2016).

<sup>13</sup> WHO. Yellow fever risk mapping and recommended vaccination for travellers : [http://www.who.int/ith/yellow-fever-risk-mapping/risk\\_mapping/en/](http://www.who.int/ith/yellow-fever-risk-mapping/risk_mapping/en/) (last access 24 May 2016).

Symptoms of yellow fever are non-specific and resemble other tropical febrile diseases, making diagnosis in the absence of laboratory testing challenging at all phases of the disease. Around 15% of cases suffer relapse after an initial phase. The case-fatality rate in severe cases can reach 50%.

There is no specific cure for yellow fever. Case management is based on supportive care and provision of insecticide-impregnated mosquito nets, including for daytime use, to prevent transmission to other patients via infected mosquitoes at the site of treatment. Symptom relief can include therapies to control fever and pain (paracetamol), but non-steroidal anti-inflammatory agents such as salicylates (aspirin) should not be used to limit the risk of bleeding in severely affected patients. Treatment of patients with severe yellow fever disease is resource intensive, requiring additional medical supplies and trained medical staff. Further recommendations for the management of patients suffering bleeding signs can be found in WHO guidance for the clinical management of patients with haemorrhagic fever<sup>14</sup> and more general guidance for clinical management of yellow fever patients are included in reference communicable disease manuals.<sup>15</sup> The WHO-coordinated Emerging Diseases Clinical Assessment and Response Network (EDCARN) has been mobilised, and will provide technical support, training and mentoring of the health workers involved in the yellow fever response.

### **In countries experiencing an outbreak**

- Patients with suspected yellow fever with progressive or severe symptoms should be hospitalized and receive good supportive care. Presumptive treatment should be guided by local disease epidemiology (e.g. malaria) to eliminate other common causes of similar symptoms, and laboratory diagnosis should be prioritized.
- Care/supportive treatments for patients with suspected and confirmed yellow fever should be made available free of charge.<sup>16</sup>

<sup>14</sup> WHO. Clinical management of patients with viral haemorrhagic fever. A pocket guide for the front-line health worker. <http://www.who.int/csr/resources/publications/clinical-management-patients/en/> (last accessed 24 May 2016.)

<sup>15</sup> Heymann. D.L. Control of Communicable diseases Manual. 20th Edition.

<sup>16</sup> IASC. Removing user fees for primary health care services during humanitarian crises. [http://www.who.int/hac/global\\_health\\_cluster/about/policy\\_strategy/EN\\_final\\_position\\_paper\\_on\\_user\\_fees.pdf](http://www.who.int/hac/global_health_cluster/about/policy_strategy/EN_final_position_paper_on_user_fees.pdf) (last accessed 24 March 2010).

- Trained health workers at all levels should be provided with the case definition to detect cases early, provide initial supportive care, and to refer to appropriate follow up.
- The disease-management strategy should assess the presence of co-infections with other similar debilitating conditions that may include malaria or other arboviruses such as dengue. Where needed malaria and dengue rapid-detection tests should be made available to support differential diagnosis.
- Although isolation of patients infected with yellow fever is not part of usual recommendations (no human-to-human transmission has been described), case management can be optimized through the creation of designated specialized health units.
- Insecticide-impregnated mosquito nets should be provided in clinical settings and for people who rest during the day (pregnant women, infants, sick or bedridden individuals), especially in countries neighboring those currently experiencing yellow fever outbreaks. Malaria and dengue rapid detection tests should be made available to support differential diagnosis.
- WHO and partners will support the dissemination of emergency guidance for clinical management, supply needs, train staff and support case management activities in reference health facilities, as well as the organization of referral and contra-referral strategies.
- Where requested, WHO will assist in securing additional international clinical management capacity.
- All countries may be at risk of importation through international travel and trade. Those with infestation by *Aedes* spp. mosquitoes are further at risk of local transmission. Therefore all countries should be ready to detect cases of yellow fever and to transfer patients with suspected yellow fever (either from country entry point or from health facility of first admission) to pre-identified infectious disease health units competent to manage yellow fever cases. The WHO yellow fever vaccination recommendations for travelers should be enforced, and travelers returning from countries affected by yellow fever informed to report to the health authorities in case of a febrile event with suspected signs within a week from return, especially if the patient had not been vaccinated against yellow fever prior to travel to or through an affected country or area.

## Social mobilization and risk communication

Populations need and have a right to information about yellow fever (including symptoms, mode of transmission, need for vaccination, possible adverse effect following immunization, the need to seek medical care early, and other personal and environmental protective strategies) adapted to local contexts, providing realistic recommendations, and translated into local languages. Access to essential care, supplies, and advice should be ensured. It is essential to engage community influencers, and to implement mechanisms to identify and address misinformation and rumors. Community mobilisation approaches for engagement in surveillance and vector control should be adopted, and efforts made to sustain the effects beyond the period of the vaccination campaign especially in the border areas.

Risk-communication strategies should be based on an analysis of socio-cultural barriers to adopting interventions (e.g. vaccine hesitancy or refusal, vector control, seeking medical care) and on consultations with the communities. They should segment audiences, clearly define results and activities for each of them, and set the monitoring and evaluation framework, process and tools. Preferably, operational research utilizing rapid qualitative and Knowledge, Attitude and Practice (KAP) surveys should be implemented to support work to understand barriers to applying interventions,

### **In countries that share a border with a country experiencing a yellow fever outbreak, and in all other countries where yellow fever is endemic**

- Clinical management standards should be reiterated to all health practitioners.
- Care/supportive treatments for patients with suspected and confirmed yellow fever should be made available free of charge.
- Insecticide-impregnated mosquito nets should be provided in clinical settings and for people who rest during the day (pregnant women, infants, sick or bedridden individuals), especially in countries neighboring those currently experiencing epidemics. Malaria and dengue rapid detection tests should be made available to support differential diagnosis.

### **All other countries**

especially prior to mass vaccination campaigns, but should not delay intervention.

WHO, UNICEF and key operational partners should coordinate their messages and, wherever possible, activities for greater effect and consistency. Evidence-based risk communication can build confidence and trust in yellow fever vaccination and the health system in case any accident or adverse event occurs during mass vaccination. Depending on the country context, messages may address various issues, from disease presentation to the vaccination to travelers.

#### **In countries experiencing an outbreak**

- If they do not exist, health authorities should set up mechanisms to communicate risk and mobilise society, and continuously assess the effectiveness of community engagement strategies, focusing on analysing public concerns and knowledge gaps with regards to the on-going outbreak, and on sound monitoring of both implementation and results.
- Micro-plans should integrate risk communication and social mobilisation activities at local level. Activities should target groups most affected and most at risk.
- The approaches for different contexts (urban, peri-urban, and rural) will differ due to population density, infrastructure, work and daily routines, and access to services, communications and media. This should be documented and incorporated into micro-planning and wider coordination
- Communication materials should be adapted to local cultural perceptions and languages, and community health workers, mobilisers, volunteers and health workers should be trained on key messages and, if needed, on interpersonal communication skills.
- Supervision of and reporting by actors engaged in risk communication activities should be ensured.
- Partners should facilitate the development and implementation of community-led action plans and community monitoring mechanisms, in priority areas at a minimum, and not limited to the period of the vaccination campaign.
- Vector-control communication should engage communities, families and individuals through health education and social mobilization informed by KAP assessment to tailor strategies and messages.

- Vaccine and vaccination campaigns messages should be based whenever possible on the results of KAP surveys, focus group discussions, and rumor monitoring to identify and address vaccine hesitancy. Key stakeholders include communities, families and individuals, influential individuals, community leaders, community based organizations (CBOs), religious groups, civil society organizations (CSOs) and professional groups, services providers and local authorities.

#### **In countries that share a border with a country experiencing a yellow fever outbreak, and in all other countries where yellow fever is endemic**

- Preparedness plans and materials used for social mobilization should be reviewed urgently, especially in countries neighbouring those experiencing an outbreak.
- Information should be made available to communities at each entry point in the country in local language(s), and should address clinical presentation, health seeking behavior, and the need for travellers to be vaccinated.

#### **All other countries**

- Authorities should assess the pertinence of developing contingency plans and ensure that information is made available at main entry points at a minimum.
- Travelers to affected countries should be made aware of the compulsory requirement for vaccination at least 10 days prior to departure.
- Travelers returning from affected countries should be informed of how to recognize signs and symptoms, the importance of case notification and how to seek treatment in case of suspected infection.

## **Vector control**

The yellow fever virus is transmitted to humans by *Aedes* species mosquitoes that also spread dengue, Chikungunya and Zika viruses. The implementation of vector control measures and the prioritization of interventions in the case of a yellow fever outbreak should follow the guidance set out in the WHO guidance document Vector control operations framework for Zika, which will be published shortly.

Well-implemented vector control can effectively reduce the transmission of vector-borne diseases if significant resources are available and communities fully engaged. Vector control is a cross sectoral approach requiring the investment and coordination of several ministries (e.g. health, sanitation and environment, education). WHO and partners will support efforts to intensify existing national *Aedes* mosquito vector surveillance and control programs, especially for *Aedes* spp., and improve access to larvicides and monitor insecticide resistance in countries with an ongoing outbreak.

Countries can be categorized on the basis of their entomological situation as follows:

**A:** Ongoing yellow fever outbreak AND *Aedes* present AND intense yellow fever transmission in humans

**B:** Neighbouring a country with an ongoing outbreak AND *Aedes* present AND limited yellow fever transmission in humans (a small number of imported or autochthonous cases reported)

**C:** Other country AND *Aedes* present NO YF human transmission

Different targeted interventions are recommended depending on which category a country falls in (table three), but in all countries, community mobilization should start to eliminate/cover urban and peri-urban standing water mosquito breeding sites around homesteads.

### Countries in categories A and B

- Vector-control measures should come as a package, addressing the control of adult mosquitoes and larvae, the removal of eggs, and the prevention of mosquito bites through personal protection. Personal protection methods are advised for patients who are being treated for yellow fever and for members of affected communities.
- Targeted residual spraying is the primary vector-control intervention for immediate response. During outbreaks of vector borne diseases authorities should implement space spraying to kill adult vectors so as to reduce virus transmission. An appropriate WHOPES-recommended insecticide should be selected,

17 18

<sup>17</sup> WHO. Recommended insecticides for space spraying against mosquitoes:

- Control measures to target breeding sites should be immediately intensified, especially when an outbreak occurs in urban areas. These control measures must be complemented with long-term monitoring of mosquito population density.

### Countries in category C

- WHO and partners will support governments to play a direct and pre-emptive role in implementing vector surveillance and vector control at the scale needed to prevent transmission. To be most effective, action must be taken before human cases of yellow fever occur.

Vector-control activities should be guided by an assessment of population immunity, vaccination coverage, mosquito density, and access to care and to control measures.

[http://www.who.int/whopes/Space\\_Spray\\_products\\_February\\_2016.pdf](http://www.who.int/whopes/Space_Spray_products_February_2016.pdf) (last accessed 23 May 2016.)

<sup>18</sup> WHOPES-recommended compounds and formulation for control of mosquito larvae: [http://www.who.int/whopes/Mosquito\\_larvicides\\_Feb\\_2016.pdf](http://www.who.int/whopes/Mosquito_larvicides_Feb_2016.pdf) (Last accessed 23 May 2016.)

<b>Table 3   Recommended yellow fever response interventions by country classification</b>	Epidemic AND Aedes present AND intense yellow fever transmission in humans	Neighbouring epidemic AND Aedes present AND limited human transmission of yellow fever*	Other country AND Aedes present AND no human transmission of yellow fever
<b>Vector surveillance and risk assessment</b>			
Intensification of entomological surveillance, assessing the density of Aedes mosquitoes around residences of detected cases (400 m radius), yellow fever patient treatment sites, and in areas where there is known to be a high risk of mosquito proliferation Intensification of entomological surveillance, assessing the density of Aedes mosquitoes around residences of detected cases, yellow fever patient treatment sites, and in areas where there is known to be a high risk of mosquito proliferation			
Monitoring of ports of entry			
Monitoring of insecticide resistance of Aedes mosquitoes where insecticide-based interventions are being used or planned			
Monitoring and evaluation of the quality and impact of control measures			
<b>Vector control</b>			
Adaptation of vector control strategies to the intensity of virus transmission and to the timing of the mosquito breeding season, including source reduction			
Provision of insecticide-impregnated mosquito nets as part of the management of suspected yellow fever cases, and where needed, to affected communities			
Distribution and appropriate use of mosquito repellents			
Implementation of vector control measures integrated with surveillance			
Conduct adult vector control, including indoor space spraying in identified hot spots			
Application of larvicides in targeted areas not amenable to source reduction			
<b>Specific social mobilization interventions</b>			
Community mobilization with source reduction			
Risk communication and promotion of personal protection			

\*Few imported or autochthonous cases reported.



## RESPONSE

# COORDINATION

Page |  
17

An effective response depends on effective national and international coordination. WHO will continue to keep member states informed through IHR focal points and in its public communications, and to mobilize technical experts through the Global Outbreak Alert and Response Network. WHO will also support the mobilization of other resources (financial, logistical or other), in addition to the resources being provided bi-laterally by other partners or through a health sector/cluster coordination mechanism.

### In countries experiencing an outbreak

- WHO and partners will support national and local health authorities to continue leading the coordination of all stakeholders. The national coordination mechanism should include an appropriate structure and management, and a framework for the collection of information, decision making, and for action implementation. Leadership should also design and implement a framework for response monitoring so as to adapt interventions to the evolving situation
- Intersectoral collaboration at governmental level is recommended to help mobilize national and local ministries involved in health, environmental health, and in education, social development and tourism sectors, communication sectors, and entry points (ports, airports, ground entry points). Public practitioners and community health workers, private practitioners and traditional healers must all be engaged in response and prevention activities. In parallel, local, national, and international partners, non-governmental organizations (NGOs), the donor community, community leaders and private entities should be encouraged to engage in response and prevention interventions.
- Domain-specific working groups within the wider national and subnational coordination mechanisms (e.g. a risk communication and social mobilization sub-group) should be established.
- Cross-border coordination with surrounding countries at risk should be established
- WHO and partners should be ready to mobilize self-sufficient multidisciplinary and ready-to-operate teams (epidemiologists; public and media communication officers; social mobilization and community engagement officers; logistician,

laboratories, case management vector control, administration staffs) for large-scale assistance.

### In countries that share a border with a country experiencing a yellow fever outbreak, and in all other countries where yellow fever is endemic

- National and sub-national coordination capacity should be reviewed as soon as possible.
- Health authorities should be familiar with the ICG procedures and criteria for the deployment of vaccines from the global emergency stockpile and the related ICG vaccine request forms.
- A coordination structure or disease taskforce should be created to coordinate and/or conduct risk assessments, prepare and plan on the basis of those assessments, and convene partners to assess needs and mobilise resources. Health authorities should be familiar with the response capacity of the main external health actors present in country (e.g. NGOs, donors, presence or not of the Cluster system of the Inter-Agency Standing committee, and UN agencies), and have defined how the response to an outbreak would be coordinated (who is doing what, lines of reporting, roles and responsibilities).

### All other countries

- National and local health authorities should review coordination mechanisms, and assess the risk of an outbreak in case of a yellow fever importation.

## RESPONSE

## MONITORING

Table 4| Global yellow fever response monitoring indicators (priority indicators in bold)

Domain	Activity	Indicator	Target	Information source	
Vaccination	Availability of vaccines for urban outbreaks	<b>% of request of vaccine supply complying with ICG criteria responded to within 1 week</b>	100%	ICG activity report	
	Monitoring of adverse event following immunization (AEFI) with yellow fever vaccine	% of mass vaccination campaigns where active and passive daily AEFI monitoring is being carried out	100%	National reports to the ICG, reports from responsible entity/agency	
Human-disease surveillance	Global level surveillance	<b>Weekly number of new countries reporting yellow fever cases</b>	-	Surveillance reports	
		<b>Weekly number of new epidemic countries</b>	-	Surveillance reports	
		Weekly number of new provinces reporting yellow fever cases in affected* countries	-	Surveillance reports	
		Weekly number of suspected and confirmed cases reported by country, and in total	-	Surveillance reports	
		Weekly number of suspected and confirmed deaths reported by country, and in total	-	Surveillance reports	
		<b>Weekly number of confirmed cases by status, imported versus autochthonous, by country and in total</b>	-	Surveillance reports	
	Specimen shipment and processing	% of international requests for laboratory support (equipment, reagent, mobile laboratory) from epidemic countries that were effectively supported within 2 weeks from request	100%	Situation reports	
	Health Security and International Health Regulation		% of affected countries complying with the IHR obligations for notification <sup>†</sup>	100%	IHR reports
			% of countries carrying out entry screening for yellow fever vaccination proof, on main entry points, on travelers coming from epidemic countries	100%	Situation reports
			Weekly number travelers reported not carrying a valid yellow fever vaccination card while entering country, per epidemic country, and in total	0%	Situation reports
		Weekly number of travelers vaccinated upon entry to country, per epidemic country, and in total	0%	Situation reports	
Vector control	Vector surveillance	Weekly number of new priority areas identified for vector control per country <sup>†</sup>	-	Surveillance, situation and other reports	
Case management	Case identification	% of affected* countries having disseminated an appropriate case definition	100%	Assessment	
	Case management	Weekly number of newly admitted YF cases in epidemic countries	Country specific	Specific monitoring	
		Weekly number of specialized bed in YF ad-hoc facilities per province in epidemic countries	Country specific	Specific monitoring	
Risk communication and social mobilization	Risk communication and social mobilization	<b>% of countries with updated risk communication/social mobilization strategies/plans</b>	100%	Situation and other reports	
		% of epidemic countries and neighboring countries where risk communication and community engagement plans and material in local languages are available	100%	Situation and other reports	
		% of epidemic countries and neighboring countries where risk communication and community engagement material is available in appropriate international and local languages at main official points of entry/exit	100%	Assessment	
International coordination	International coordination	% of epidemic and neighboring countries with sub-national coordination frameworks and response plans for yellow fever outbreaks	100%	WHO situation up dates	
		% of epidemic countries with national coordination frameworks and response plans in affected provinces	100%	WHO situation up dates	
		Number and list of partners supporting YF national response per domain (surveillance, vaccination, cases management, vector control, social mobilization, coordination) per country and globally	Country specific	4Ws, countries reports, WHO situation reports, Health sector/cluster reports	
		Total number of international technical experts deployed by week from GOARN partners	Country specific	GOARN reports	
		Total number of WHO staff by week supporting the response at sub-national, national and international levels	Country specific	WHO situation up dates	

\*Any country reporting yellow fever cases, including sporadic sylvatic cases. <sup>†</sup>See International Health Regulation (2015) Third edition; Part II-information and public health response; Article 6 Notification.

## Rationale for response monitoring

Effective response operations depend on continuous, regular and detailed surveillance and response monitoring, analysis and reporting. Surveillance and response monitoring data and analysis provide an overview of trends, and are used to adjust needs, targets and funding requirements. Response monitoring data and analysis also enable leadership to review the progress of the overall response and make adjustments where necessary.

Page |  
19

WHO is working to provide Member States with recommendations on strengthening surveillance and reporting systems in the context of current yellow fever outbreaks. WHO also encourages and requests partners to regularly report on their response activities at the global, regional and national levels through an online portal currently in development.

The overall yellow fever response strategy is being continually reassessed to respond to changing circumstances. WHO publishes a global situation report on a weekly basis through the WHO website.

## SUMMARY OF

# REQUIREMENTS

## REQUIREMENTS (US\$)

# 94.14 M

WHO is currently working with all partners to consolidate needs and requirements across the response based on the strategic response framework. The budget requirements identified to date by WHO are summarized below (table five).

WHO headquarters, the WHO regional office for Africa, and the relevant country offices have a consolidated requirement of **US\$ 94,143,426** (annex B). For all activities conducted by WHO there is a total need of approximately **US\$ 80.31 million**. There is a total request of approximately **US\$ 13.82 million** for human resources. There is a total partner requirement of **US\$ 11.72 million** (annex B) on behalf of those partners who have informed WHO of their needs so far. Most activities are taking place either in, or in support of, the African regional office and affected countries.

Response activities and related human resource requirements across all levels have been aligned to the four strategic objectives of this response framework.

To support the ongoing response, existing funds have been matched against some requirements for Yellow Fever activities:

- US\$ 3 200 000 from ICG revolving fund for procurement of YF vaccine
- US\$ 500 000 from USAID for Angola outbreak and response activities
- US\$ 2 200 000 from Contingency Fund for Emergencies, which will need to be reimbursed to the CFE

Additionally other funding to support vaccination activities in Angola, DRC and Uganda

WHO is also working on a model to examine budget estimates for epidemic preparedness in at-risk countries/locations neighbouring currently affected countries. Based on ongoing preparedness work, usual costs are between US\$ 2.5 and four million per country for a hazard-specific preparedness and response contingency plan, and around US\$ 10 million for an annual all-hazard preparedness plan (which ranges from US\$ six to 15 million in the African region). Of the yellow fever affected and surrounding countries, only Uganda, DRC, and Tanzania currently have ongoing preparedness programmes in place.

# PART II: JOINT OPERATIONS PLAN

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## JOINT OPERATIONS PLAN

**STRATEGIC OBJECTIVE 1 - End outbreaks in currently affected countries through targeted vaccination and other public health measures**

**STRATEGIC OBJECTIVE 2 - Prevent morbidity and reduce mortality through early case detection and strengthened case management**

**STRATEGIC OBJECTIVE 3 - Prevent international spread**

**STRATEGIC OBJECTIVE 4 - Prioritize research to improve access to yellow fever vaccine, and to improve the effectiveness of other prevention and control interventions**

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REQUIREMENTS (US\$)



79.8M

## STRATEGIC OBJECTIVE 1

End outbreaks in currently affected countries through targeted vaccination and other public health measures

### Vaccination (reactive and pre-emptive)

Mass vaccination campaigns are critical in the control of a yellow fever epidemic. The earlier a mass vaccination campaign begins, the more will cases of disease be prevented. Vaccination has been initiated in the affected countries with varying coverage ranging from 30% to 96% in Angola and Uganda respectively. However, many at risk districts and provinces require urgent vaccination to create a sufficient cordon sanitaire around areas reporting locally transmitted cases. When all high risk areas have been covered by the vaccination campaign and subject to availability of vaccines, vaccination will be expanded outward into adjacent areas, to include all areas at risk. If vaccines and resources are limited, vaccination will be targeted to the age groups with the highest attack rates i.e. ages 6 months to 45 years.

Due to emerging concerns about the spread northwards through Angola to DRC, and the potential impact this may have on large urban centres, a large scale vaccination campaign will be carried out in late July and August 2016 in areas that are pose the greatest risk. The identification of risks, target populations and areas is being informed by current disease epidemiology, and modelling to determine risk levels:

1. A 75-100km belt spanning the border between Angola and DRC
2. Other high risk in-land areas associated with local mining areas, and big markets attracting large migrant populations and population movements to and from Angola
3. Vaccination of at risk populations around confirmed cases of local transmission and a phased pre-emptive vaccination of the entire population of Kinshasa to mitigate further spread within and internationally.

According to vaccine supply and emerging priorities it will also be assessed further whether there are communities outside the proposed 100km belt that should be factored into the pre-emptive campaign in order to prevent further spread of the disease. As areas are vaccinated the coordinated recording of coverage will be documented accurately and shared appropriately to inform ongoing planning.

The unit cost of implementing such a campaign is approximately two US dollars per vaccine administered, which is inclusive of all costs, broken down into approximately one dollar for the vaccine itself and one dollar for the operational costs of vaccine delivery.

As DRC is GAVI eligible, and pre-emptive vaccination campaigns are funded through this mechanism during an emergency, these costs will be covered through the existing GAVI mechanism. However, the cost per vaccine provided by GAVI is 25 cents per vaccine for operational cost, and allowing for the increased cost of delivering vaccinations in a complex urban environment such as Kinshasa, one dollar per vaccine administered will need to be raised for DRC.

Angola is not covered by GAVI, but the Angolan Government has committed to funding half the vaccination costs during the current outbreak. Therefore one dollar for each vaccine administered will need to be raised for Angola.

In view of this strategic re-orientation there is a need to scale up the human resources for each country and for the WHO Africa Regional Office to facilitate robust micro-planning and logistical preparation required to deliver such a vaccination programme. The human resource cost for implementing this can be found within the section relating to strategic objective three below.

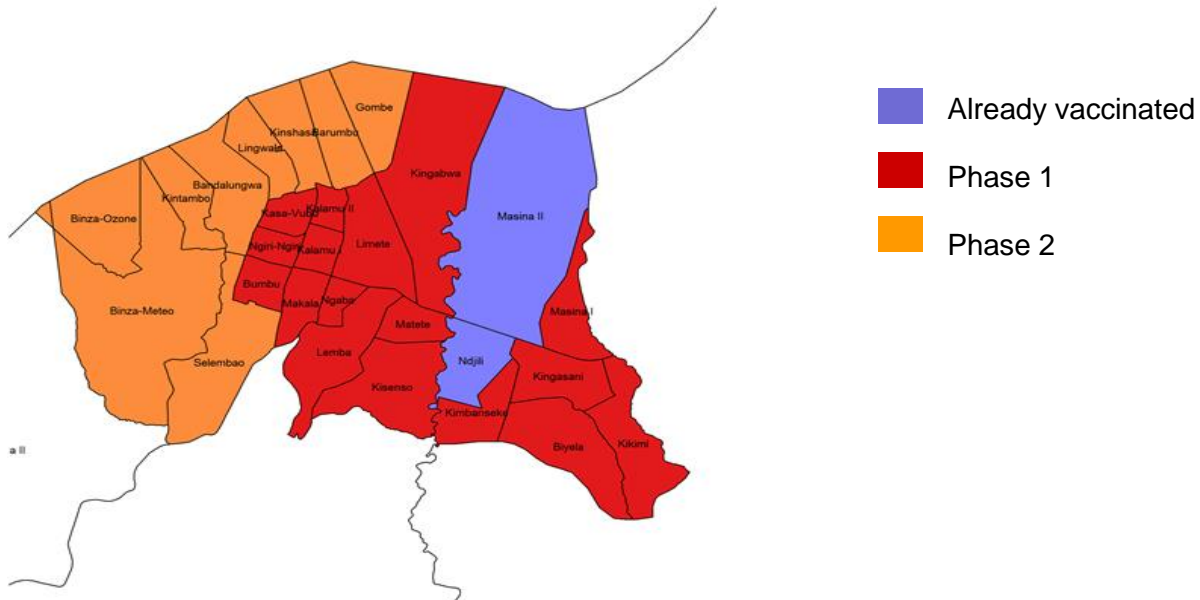
There are limited vaccine stocks immediately available for the pre-emptive campaign, and therefore prioritization will be required in the micro-planning, along with synchronising the approach between DRC and Angola, and trying to achieve the vaccinations in as short a time as is realistic and as vaccine supplies with associated logistics allow.



## Targeting Kinshasa City

Population estimates vary significantly, but the total population requiring vaccination for the purposes of this plan is approximately eight million. However, the planned number for vaccination is approximately 10 million, in order to take account of the difficulties in estimating population and projected wastage of vaccines. WHO recommends considering dose fractioning as a way to extend the limited stock of vaccine to cover the entire city in a phased approach. This method would be more feasible in an urban setting than in a remote rural area.

**Figure 3 | Map of Kinshasa City (DR Congo) targeted for fractionated dose**



**Table 4 | Target population for the pre-emptive vaccination campaign**

Country	Border Area	Other Area	Overall Population
Angola	1,307,977	3,083,654	4,391,631
DRC	2,998,015	8,053,536 (Kinshasa)	11,041,551
<b>Total</b>			<b>15,433,182</b>

**Table 5 | Total requirements for the vaccination campaign**

Component	Requirement	Quantity	Unit Cost (USD)	Shipping Cost	Total Cost (USD)
Fractionated	Vaccine	2,500,000	1	50,000	2,550,000
Fractionated	Syringes	10,000,000	0.06	700,000	1,300,000
Fractionated	Operational Cost	10,000,000	1.25		12,500,000
Fractionated	Technical Support	50,000	4		200,000
Full Dose	Vaccine	7,883,051	1	50,000	7,933,051
Full Dose	Syringes	7,883,051	0.1	700,000	1,488,305
Full Dose	Operational Cost	7,883,051	1		7,883,051
<b>Total</b>					<b>33,854,407</b>

**Table 6 | Total requirements for the vaccination campaign by country**

Requirement	DRC Kinshasa	DRC Border & <2s Kinshasa	Angola
Doses	10,000,000	3,315,755	4,567,296
Vaccine	2,500,000 (fractionated)	3,315,755	4,567,296
Syringes	10,000,000 0.1 ml syringes	3,315,755	4,567,296
Operational Cost	12,500,000 USD	3,315,755 USD	4,567,296 USD
Technical Support	200,000 USD		

**Key Assumptions**

- Fractionated dosing is possible in urban centres not rural
- Fractionated dosing not possible in under two year olds in Kinshasa (n=200,211)
- Vaccine from Brazil only option for fractionated dosing currently
- Wastage of four percent needs to be factored in for all areas other than Kinshasa, where MoH DRC have already built in wastage
- Fractionated dose – five doses from each vial, including wastage reduces to four
- Technical support includes Risk Communications, Research, Monitoring & Evaluation and Programmatic Work, for the fractionated dosing in Kinshasa
- Operational cost 1.25 US \$ for Kinshasa, one US \$ USD all other areas

At the time of writing the total number of vaccines instock is approximately four million, with an expected 13 million by the end of July due to an increase in production. If a decision is made to use dose fractioning, both the cross-border belt approach and the Kinshasa approach could be done simultaneously, phasing each by priority geographies, with the suggested timing for the campaign being late July to mid-August.

Implementation of a dose-fractioning strategy would require more resources and logistics in terms of appropriate syringes and cold chain, including training and close monitoring of the campaigns. Organizations will work in collaboratively with the Ministries of Health of the affected countries to link with and support existing vaccination campaigns.

The human resource costs for implementing this vaccination plan are stipulated under strategic objective three below.



Table 7 | Partner Activities- Vaccination

Key Activity	Location	Partners
Vaccination campaign and post campaign evaluation	DRC	Save the Children, MoH, WHO, UNICEF, MSF
Preparedness and deployment readiness of Emergency Health Team for all at risk areas but priority for support	DRC	Medair
Vaccination of cross-border travellers, migrant workers and host communities	Angola and DRC border	IOM
Financing the global yellow fever vaccine emergency stockpile and contributing to operational cost for vaccination campaigns	Global	GAVI
Ensuring all newly arriving refugees are included in respective national screening and vaccination programs/ strategies	Kenya, Rwanda, Tanzania, Uganda, DRC and others	UNHCR
Design and support of post-campaign independent monitoring	Angola	US-CDC
Provide technical support to the National Directorate of Public Health in the preparation and implementation of the current response to extend the vaccination campaign to all districts in Luanda and to other provinces in the country, focusing on the coordination of the response, and strategic and operations planning.	Angola	UNDP, MoH
Provide logistical support to the vaccination efforts	Lunabda, Angola	UNFPA Angola
Support vaccination micro-planning for efficient use of vaccine and monitor campaign coverage. Providing additional in-country capacity support for vaccine management and coordination	Angola	UNICEF EASRO
National Immunization campaign for all population	Sao Tome	UNICEF WCARO
Advocacy, training and community sensitization for reactive vaccination campaign.	Gabon	UNICEF Gabon
Reinforcement of the routine immunization system through the purchase of VAA vaccine and consumables, the social mobilization, the coordination and the surveillance and risk assessment in collaboration WHO	Gabon	UNICEF Gabon
Support YF pre-emptive campaigns operations and monitoring	Angola	UNICEF EASRO, Angola, MoH, WHO

## Risk Communication and Community Engagement

When a yellow fever epidemic has been declared, there is likely to be widespread public concern and media attention. Therefore, efforts to reach communities with key messages about the outbreak have to be instituted and sustained throughout the epidemic.

The strategy will support the deployment of social scientists including anthropologists to explore local beliefs about disease transmission and conduct operational research to understand barriers. Knowledge, Attitude and Practice (KAP) surveys will be conducted to measure the understanding and application of this key information.

This will allow the messages to be culturally relevant, to be communicated through channels which maximize their impact and will assist in dispelling misconceptions. It will be critical for media campaigns to be conducted in multiple local languages to maximize the reach they have. Multiple channels will also be key in ensuring the reach and impact of the messaging; including national and international media, television, leaflets, social media, and the development of an Android/iOS phone application. Activities mobilizing community organizations and networks will include training community workers in inter-personal communication for yellow fever prevention, as well as dynamic and interactive community-based approaches in high risk villages. Outreach to the public will prioritize evidence based channels such as: meetings with the community, religious and political leaders, presentations at markets, health centres, schools, religious centres and house-to-house visits.

Together these risk communication and community engagement methods will aim to both raise general awareness, whilst also providing specific, clear information on:

1. Why they should be vaccinated
2. When and where to go for vaccination
3. Why it is important for travellers to present a valid yellow fever vaccination card at borders and points of entry
4. When and where to seek medical attention;
5. How yellow fever is spread; and
6. How to reduce mosquitoes and their breeding sites.

In any setting where dose fractioning is considered, community engagement and risk communication will be very important in order to gain health worker and community acceptance. People will need to be informed that fractional dosing does not mean partial efficacy or an inferior vaccine.

Table 8 | Partner Activities - Risk Communication and Community Engagement

Key Activity	Location	Partners
Social mobilization in support of vaccination campaign and vector control activities	Angola, DRC and Uganda	IFRC
Community engagement through information, education and communication (IEC) channels for raising awareness on vaccination campaign	Angola	World Vision International, MOH, WHO, UNICEF, CDC and MSF (Spain)
Providing information to asylum seekers at entry points and refugee hosting sites in local language(s), on clinical presentation, health seeking behaviour, and the need for vaccination. Training community workers in inter-personal communication on yellow fever	Kenya, Rwanda, Tanzania, Uganda, DRC, others	UNHCR
Development and implementation of communication strategy targeting cross-border travellers, migrant workers and host communities including border community engagement and peer support for migrant worker	Angola and DRC - border areas	IOM
Community sensitization	DRC	Malteser International
Provide technical support to CO on YF social mobilization and risk communication and support the development of an integrated communication response including the effective use of available and existing community communication platforms	Uganda, Namibia, Zambia	UNICEF ESARO, MOH, WHO
UNICEF ESARO C4D team to provide technical support to Angola CO. Mapping of and re-activating the polio communication structure and mobilization of Red Cross volunteer in areas of vaccination campaign	Angola	UNICEF ESARO , Angola Red, WHO, CDC
Development of risk communication strategies , mobilization of community networks, media campaign and production of culturally relevant communication materials	Western and Southern African region, DR Congo, Sao Tome	UNICEF WSARO
Technical assistance to countries for embedding risk communication, community engagement and crisis communication in country preparedness and response plans according to the global SRF. Technical assistance to develop/update operational tools and to reinforce YF messaging in regular RI communication activities	Cape Vert, Congo, Gabon, Sao Tome	UNICEF WSARO
Providing technical support to develop regional risk communication and community engagement approach for prevention of yellow fever	Global	UNICEF HQ

## Vector Control

Eliminating adult and larval mosquito populations and potential mosquito breeding sites reduces the vector that transmits yellow fever. Mosquito control efforts are most effective when the major vector is a peri-domestic mosquito such as *Aedes Aegypti*. In such cases, both the management of individual homes (using insecticide sprays and protecting water containers) and community-based programs can have substantial impact on the size of infected mosquito populations.

Significant resource will be allocated to integrated vector control as part of this strategy, and in addition countries will be provided technical support in vector control activities, including WASH expertise. A number of entomologists will be deployed and vector control field assessments will be supported in high risk areas. Communities will also be supported to use mosquito nets, especially on the beds of ill patients. Consequently, the scale up plan below has costed the HR needs to deploy vector control experts in the provinces and the districts.

**Table 9 | Partner Activities - Vector Control**

Key Activity	Location	Partners
Contribution from the WASH section specialists regarding vector control	Western and Southern African region	UNICEF WCARO
Develop guidance on vector control activities for UNICEF and provide technical support to UNICEF country offices on vector control activities for prevention of yellow fever	Global	UNICEF HQ
Community based vector control	Angola, DRC	IFRC

REQUIREMENTS (US\$)

**8.2 M**

## STRATEGIC OBJECTIVE 2

### Prevent morbidity and reduce mortality through early case detection and strengthened case management

#### Surveillance & Risk Assessment

Coordinating the collection, analysis and dissemination or communication of vital information is critical in early case detection and in strengthening case management. Assessing the health risks, the needs, the response of the sector and the identified gaps will also be key in allocating resources appropriately to prevent morbidity and reduce mortality. Diagnosis and reporting of new cases will be based on standard case definitions and laboratory confirmation, and risk assessment requires comprehensive investigation of all confirmed cases informing the basis of timely vaccine allocation and the implementation of vaccination campaigns. The standard case definitions will be widely disseminated. All health facilities will be required to send daily and weekly reports on the number of cases and deaths. All districts will prepare summary reports of health facility data and submit them to the provincial level.

These reports will include: the period of time covered by the report, the number of health facilities that reported (including the health facilities that reported no cases of suspected yellow fever), the total number of health facilities in the district, the total number of suspected yellow fever cases and deaths during the reporting period and the number of vaccinations planned and the number given.

Such reports will be consolidated by developing and maintaining a global laboratory and enhanced epidemiological database to allow the appropriate monitoring, tracking, verification and mapping of yellow fever.

Risk mapping and specific field risk assessments will also be conducted in high risk areas to guide further response planning.

It will be important to strengthen surveillance at the provincial level to ensure completeness and quality of reporting. Support in case investigations, case classification and in assessment of surveillance quality at the provincial level will be prioritized to improve the early detection, reporting and referral of suspected cases through active surveillance and investigation.

The strengthening of disease surveillance in the city of Kinshasa and Kongo Central Province in the Democratic Republic of Congo is seen as a priority and will be supported through: investigation of mission alerts; strengthening the capacity of laboratories; conducting active research; and through logistics training.

Laboratory capacity and capacity for specimen collection, packaging and shipment for confirmation are important components of surveillance and risk assessment. The laboratory capacity should also include the ability to rule out or determine co-infections, including differential diagnosis for negative cases meeting suspect case definition for Yellow Fever. For maximizing testing capacity, the option of deploying mobile laboratories is also being explored.

WHO will coordinate updates on epidemiology and on laboratory results and will conduct modelling on yellow fever risk and a global risk assessment.

Table 10 | Partner Activities - Surveillance &amp; Risk Assessment

Key Activity	Location	Partners
Community based surveillance	Angola, DRC ( potentially surrounding countries, Namibia, Zambia)	IFRC
Epidemiological surveillance	DRC	IMC
Surveillance through community health workers and clinics in Medair supported areas	Eastern DRC	Medair
Providing guidance on the preparedness plan	DRC	Malteser International
Health screening of cross border travelers and host communities at priority ground crossings and mobility hotspots at the border spaces of Angola and DRC	Angola and DRC - border areas	IOM
Mission to assess the situation of the outbreak	Angola	ECDC
Preparing risk assessments and epi updates, RT report and weekly CDTR, Daily screening for the round table – International health regulations	ECDC-Stockholm Sweden	ECDC
Strengthening of surveillance at province level, completeness of and quality of reporting, case investigations, case classification; assessment of surveillance quality and AEFI Surveillance	Angola	US-CDC
in-country Lab services: PCR, IgM, Test evaluation; Confirmatory test and genotyping	Angola, US	US-CDC
Continued surveillance and risk assessment activities at entry points and in refugee hosting sites in coordination with national authorities and partners	Kenya, Rwanda, Tanzania, Uganda, DRC, others	UNHCR
Providing laboratory manpower and supplies for serology and molecular detection of yellow fever virus diagnostics		IPD
Monitoring, evaluation and documentation of communication activities (supervisions, SMS, documentation)	DR Congo	UNICEF WCARO, MoH and Ministry of Communication and Media
Support to IELE (national Agency in charge of epidemiological surveillance) through the training of district level Focal Points on case investigation and case management	Gabon	UNICEF WCARO, MoH
Nationwide campaign on supervision	Gabon	UNICEF WCARO, MoH
Technical assistance to country offices to support YF preparedness and response activities	Angola, Namibia, Zambia	UNICEF – EASRO, MoH; WHO

## Case Management

Although there is no specific curative therapy for yellow fever, such as antiviral drugs, adequate supportive care is imperative. This strategy and scale up plan will ensure the wide dissemination of simplified case management emergency guidance for yellow fever, as well as retraining of health workers in clinical case management to cover early recognition, management, and referral of severe cases.

Page  
31

Support will be provided for case management, including required logistical support and in the clinical management of suspected, probable and confirmed cases. Laboratory facilities will be strengthened to support clinical management including PCR, IgM and test evaluation services.

**Table 11 | Partner Activities- Case Management**

Key Activity	Location	Partners
Importation of essential medicines and medical supplies to support the pediatric and other hospitals in Luanda and Huambo. GIK supply of basic medicines and supplies in support of the priority needs of the paediatric hospitals over a 12 month period.	Luanda and Huambo, Angola	WVI, MOH, WHO, UNICEF, CDC and MSF (Spain)
Ensuring access to essential health care for asylum seekers and refugees in coordination with national authorities and partners	Kenya, Rwanda, Tanzania, Uganda, DRC, others	UNHCR
Preparedness and deployment readiness of Emergency Health Team	DRC - Walikalie, Ituri, North Kivu	Medair
Comprehensive primary health care support with EPI being supported in 34 clinics in Eastern DRC	DRC - Walikalie, Ituri, North Kivu	Medair
Selection and mobilization of experts to support outbreak response that fulfil all need in terms of language and field skills	Angola	TEPHINET/REDSUR
Support resource mobilization and surge capacity for outbreak response	Eastern and Southern African Region	UNICEF - EASRO
Support to IELE (national Agency in charge of epidemiological surveillance) through the training of district level focal points on case investigation and case management	Gabon	UNICEF - Gabon
Capacity building of community workers in inter personal communication for yellow fever prevention	DRC	UNICEF – WCARO
Training of health staff	DRC	Malteser International

REQUIREMENTS (US\$)



13.4M

## STRATEGIC OBJECTIVE 3

### Prevent international spread

#### Coordination and Leadership

The WHO at all three levels (HQ, Regional Office and Country Offices) shall support the objectives through:

- providing technical guidance to countries to conduct rapid assessments, prepare plans, mobilize financial and other resources, and provide advice on implementation
- establishing regional mechanisms for international/cross national actions
- establishing a regional dashboard system with member states to monitor the implementation and progress with these strategies; and
- facilitating partner coordination to ensure synergy of the response actions through strategic planning.

In order to ensure that the epidemic is rapidly controlled, the WHO will specifically:

- strengthen leadership and coordination frameworks using the Incident management system (IMS) at all levels of the organization and in synchrony with national coordination structures at country level
- coordinate, mobilize and deploy staff with appropriate expertise from member states, in collaboration with regional and international partners; The GOARN network, and other partners will be mobilized as necessary
- deploy specialized staff and resources in the affected districts; and
- establish standard operating procedures (SOPs) for response actions

Advocacy is needed for the response at all levels from the global to the local, requiring strong political engagement. Advocacy for adequate domestic financial resources needs to be pursued to contribute for the operational costs. Response teams will be placed in all the provinces and districts for better support to the local authorities. In Kinshasa and at the field level in DRC, WHO will organize coordination meetings and will ensure the coverage of needs and identification of gaps are filled by partners in the health sector.

For the purposes of coordination and leadership to the response, the Incident Management System in Angola, DRC, Uganda and AFRO will be strengthened to fulfil the required functions and expectations. The support to these structures will continue to be drawn from a variety of sources, with tight coordination needed between all three levels of the Incident Management System (led by AFRO) to identify gaps in the recruitment to each IMS, especially in light of the pre-emptive vaccination campaign and required micro-planning.



**Table 12 | Partner Activities- Coordination and Leadership**

Key Activity	Location	Partners
Support to establishing a national EOC/IM system, program planning and implementation	Angola	US- CDC
Support countries by providing technical assistance in preparation of outbreak preparedness and response plans, campaign preparation & implementation and continuous advocacy with government authorities for strong coordination and resource inputs.	Eastern and Western African region	UNICEF- WCARO, EASRO
Support monitoring activities at central and province level, engage with mobile population for personal protection and environment hygiene promotion	DR Congo	UNICEF- WCARO
Coordination and oversight of countries' preparedness and response	Cape Vert, Congo, DRC, Gabon, Sao Tome	UNICEF- WCARO
In consultation with the UNICEF ESARO, UNICEF Angola to develop key advocacy messages for use by UNICEF in senior level policy dialogue, and for sharing with the RC and OCHA (the latter, through UNICEF ESARO).	Angola	UNICEF – EASRO, OCHA
Provide technical assistance to local consultants for supervision, data management at provincial and municipal levels; monitoring and coordination of yellow fever campaigns	Angola, Zambia, Namibia	UNICEF – EASRO
Liasion with IASC, GOARN , ICG and regional offices' to monitor, review and update the YF response activities	Global	UNICEF HQ
Ensuring refugees are included in global coordination framework and preparedness and response strategies	Kenya, Rwanda, Tanzania, Uganda, DRC, others	UNHCR
Data gathering and coordination with GHC response (logistics cluster coordination)	all at risk, but priority for support to DRC	Medair
Coordination for current gaps and additional partner needs through in country health advisor to DRC Health Cluster in Kinshasa	DRC	Medair
Cross border population mobility assessment for 1) identification of high priority mobility affected locations for surveillance and monitoring, and 2) forecasting the potential spread of the disease	Angola and DRC	IOM
Lobbying with the National Directorate for Public Health to ensure that the official data regularly released is disaggregated by age and sex	Angola	UNFPA Angola

**Table 13 | Incident management structure augmentation requirements in AFRO, Angola and DRC**

IMS	Position	Requirement
<b>AFRO</b>	Planning and resource forecasting	1
	Case management	0
	Logisticians	2
	Epidemiologists	2
	SHOC	1
	Vector control	1
	IVD immunisation expert	1
	GIS	1
	Planning Officer	1
	Admin-finance officer	1
	<b>TOTAL</b>	<b>11</b>
<b>Angola</b>	Laboratory support	3
	Data management	4
	Planning and resource forecasting	1
	Epidemiology	4
	Vaccination	1
	Social mobilization	1
	Case management	2
	Incident Manager	1
	Team Leads	2
	Information manager	1
	Media and press	1
	Admin - HR support	1
	Admin - senior	2
	IT support	1
	Admin general - support	1
	Driver	10
	General logistician	2
	<b>TOTAL</b>	<b>38</b>
<b>DRC</b>	Data management	5
	Epidemiology	2
	Field coordination	5
	Planning and resource forecasting	2
	Case management	5
	Logistician	5
	Epidemiology	6
	Vector control	5
<b>TOTAL</b>	<b>35</b>	

WHO will work with neighbouring countries (Congo, Namibia and Zambia) to conduct preparedness assessments and to develop preparedness plans and establish minimum preparedness capabilities in readiness for a yellow fever introduction and/or outbreak. A checklist package will be prepared to support countries with preparedness activities. Through preparedness missions to 10 countries including all neighbouring countries over a three to six month period key preparedness actions shall include the following:

- assessing risks, mapping in-country capacities and development of preparedness plans
- establishing emergency operation centres and strengthening coordination capacity in each country;
- establishing, training and operationalizing Rapid Response Teams (RRTs);
- embedding the community engagement and public awareness components of Yellow fever strategies in country preparedness and response plans

- reinforce each country's national epidemiological surveillance capacity; and
- help to build core capacities for the International Health Regulations (IHR) and Integrated Disease Surveillance and Response (IDSR).

### Scale up of human resources

Page

35 The WHO and partners will mobilize US \$ four million for the planned scale up of HR deployments for Yellow Fever surge capacity to Angola and DRC for a period of 60 days. The cost includes per diem, transport for the experts and catalytic operational costs. This requirement will need to be constantly updated and refined in view of the evolving epidemiological data, and how that affects the proposed plan for pre-emptive vaccination.

**Table 14 | Scale up Plan**

Position	Angola		DRC*		Republic of Congo			Total WHO Deployments	Total Requirements	
	Total Requirements	Source of Deployment	WHO Deployments	Total Requirements	WHO Deployments	Total Requirements	Source of Deployment			WHO Deployments
Field Coordinator	5	WHO/AFRO, MOH, GOARN	3	6	6	1	WHO/AFROW/CO	1	10	12
Epidemiologist	39	MOH, GOARN, UNICEF, WHO/AFRO, CDC	11	6	6	1	WHO/AFROW/CO	1	18	46
Entomologist	6	Cuban Cooperation	0	5	5	1			5	12
Social Mobilization expert	12	UNICEF, WHO/AFROW/CO, WHO/AFRO, CDC	6	5	5	0			11	17
Logistician	12	WHO/AFRO, WHO/AFROW/CO	12	6	6	0			18	18
Risk Communication				3	3	0			3	3
Vaccination coordinator	3	UNICEF	0	6	6	0			6	9
Vaccination experts	0		0	18	18	1	WHO/AFROW/CO	1	19	19
Data Managers	0		0	5	5	1	WHO/AFROW/CO	1	6	6
Vaccination logistician	10	WHO/HQ, UNICEF	6	0	0	0			6	10
Admin support	6	WHO/AFRO			0				0	
<b>Total</b>	<b>93</b>		<b>38</b>	<b>60</b>	<b>60</b>	<b>5</b>		<b>4</b>	<b>102</b>	<b>158</b>

\*source of deployment not available for DRC

REQUIREMENTS (US\$)



2.7 M

## STRATEGIC OBJECTIVE 4

**Prioritize research to improve access to yellow fever vaccine, and to improve the effectiveness of other prevention and control interventions**

Page |  
36

### Operational Review

A joint technical and operational process review of the yellow fever response in Angola and the DR Congo will commence shortly. This rapid review is in accordance with the recommendations of the IHR yellow fever Emergency Committee. It will include an analysis of the current epidemiology, risk assessment, and will generate recommendations for amending the yellow fever outbreak response to prevent further international spread.

In each country, review teams will work with the partners and national counterparts to:

1. Review current status of the disease epidemiology and provide risk assessment for further spread within the country and internationally, including a mapping of priority areas requiring urgent attention;
2. Review the current status of the operational response, to identify gaps and provide recommendations for a scaled up response as well improved operational excellence focusing on early recognition of cases, effective case investigation and risk assessment, case based reporting, vector surveillance and control, planning for and implementation of vaccination campaigns, improved case management, social mobilization and risk communication, cross border interventions to mitigate international spread, and logistic capabilities in support of the response;
3. Review and assess the status of implementation of the YF EC recommendations and recommend solutions;
4. Review the operational organization of the WHO response framework, organizational structure and operations in view of the planned scaled up operations and work with the Country level IMS and WR to recommend feasible solutions to strengthen the WCO IMS in support of the planned scaled up operations;
5. Review the national coordination framework at national and provincial level, including framework for partnerships and provide recommendations to the national government for a scaled up operations to contain the outbreak; and
6. Advocate for and provide evidence based technical and operational guidance for improved and scaled up operations to the MOH, the WHO and partners in respective countries.

It is expected that the output of this review will be a report detailing findings and recommendations for:

1. A scaled up operational response and operational excellence at national and sub-national level with a primary focus on the following areas:
  - Current epidemiology, risks status and priority areas requiring special attention
  - Gaps and needs in the Incident command / management function, including the HR needs for response operations
  - Gaps and needs in operational implementation of technical functions
  - Capacity for planning and forecasting needs
  - Logistics and logistic support
  - Information management and sharing
  - Administration and finance function
  - Existing partnerships and areas for strengthening

2. Outline of proposed priority interventions for the immediate (first one month), medium (second month), and for the long term (three months and beyond), agreed upon by national government and all stakeholders
3. Increased political support for the scaled up operational response to the yellow fever outbreak response measured by endorsement of the proposed recommendations for a scaled up operations.

## Yellow Fever Dose Fractioning

WHO recognizes that further yellow fever outbreaks will strain available vaccine supplies and cannot be met by increasing the production capacity alone. Therefore, innovative solutions to stretch available supplies are being actively investigated by experts recruited for this response. The dose-sparing option, especially in the context of limited vaccine supply as well as the need to rationalize and quickly immunize a large population in an urban setting to mitigate risks of potential explosion of an outbreak with further risks of exportation elsewhere, is currently the most promising option if implemented strategically and with proper planning and roll out.

The available scientific data from one manufacturer (Bio-Manguinhos) with reduced doses given intramuscularly, and the intradermal administration of a fifth of a dose by another manufacturer (Sanofi Pasteur), provide evidence that the fractional-dose approach is an option to stretch vaccine supplies and ensure that as much of the target population as possible can receive a dose of yellow fever vaccine in case of a further expanding outbreak (i.e., for emergency use).

The data have been reviewed by an ad-hoc expert group formed for the response, and will be reviewed in an upcoming SAGE meeting. In parallel, a research agenda is being prepared to ensure that the remaining questions can be addressed expeditiously, including generalizing the dose-sparing to other manufacturers, generating data on children and infants, and addressing regulatory issues (including a potential label change).

## Further research

A specific research agenda is being developed for yellow fever diagnosis and vaccine. In addition to this, studies on co-infection of malaria and yellow fever, vaccine adverse effects, and differential diagnosis of negatives cases are being conducted. The development of performance indicators for the Incident Management System is also taking place to assess this aspect of the response.

# PART III: ANNEXES

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Annex A- List of organizations involved

Annex B- Participating organizations' funding  
requirements

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## ANNEX A- TABLE OF ORGANIZATIONS INVOLVED

Actionaid
Agence de Médecine Préventive
Animators without borders
Anthrologica
BBC Media Action
CDAC Network
CERF
Cuban Brigades
ECDC
EDCARN
Emerging and Dangerous Pathogens Laboratory Network (EDPLN)
Epicentre
Federal Ministry of Health, Sudan
GAVI Alliance
GOAL
Grupo Core
IFRC
Institut de Veille Sanitaire (InVS)
Institut National de Recherches Biomédicales (IRNB)
Institute Pasteur of Dakar-mobile unit
Instituto Nacional de Saude Publica
International Organization of Migration
International Medical Corp
Lifeline energy
Malteser International
Medair
MDM
MH USAID
MSF
OCHA
Pasteur Institute Dakar (IPD)
Pôle santé publique, parquet du tribunal de grande instance de Paris
Public Health England
REDSUR
REDR AUSTRALIA
Robert Koch Institute (RKI)
Rockefeller foundation
Save the Children
SIMLab
TEPHINET
Translator without borders
UNAIDS
UNDP
UNESCO
UNFPA
UNHCR
UNICEF
UNEP
UNV
USAID
US-CDC
Wellcome Trust
World Bank
WVI

## ANNEX B- PARTICIPATING ORGANIZATIONS' FUNDING REQUIREMENTS

Organization	Sum of Total Activity Requirement (USD)	Sum of Total HR Requirement (USD)	Sum of Total Requirement (USD)
<b>Total Requirements</b>	<b>80,316,373</b>	<b>13,827,053</b>	<b>94,143,426</b>
<b>WHO 3 levels</b>	<b>68,589,274</b>	<b>13,827,053</b>	<b>82,416,327</b>
<b>AFRO</b>	<b>67,462,399</b>	<b>11,896,208</b>	<b>79,358,607</b>
AFRO HQ	39,774,212	-	39,774,212
1. End outbreaks in currently affected countries through targeted vaccination and other public health measures	34,354,407		34,354,407
3. Prevent international spread	5,419,805		5,419,805
Angola	14,742,712	5,624,708	20,367,420
1. End outbreaks in currently affected countries through targeted vaccination and other public health measures	14,403,483	865,750	15,269,233
2. Prevent morbidity and reduce mortality through early case detection and strengthened case management	339,229	717,625	1,056,854
3. Prevent international spread		165,000	165,000
Other		3,876,333	3,876,333
DR Congo	1,054,492	2,857,750	3,912,242
1. End outbreaks in currently affected countries through targeted vaccination and other public health measures	310,041	974,750	1,284,791
2. Prevent morbidity and reduce mortality through early case detection and strengthened case management	672,841	877,750	1,550,591
3. Prevent international spread	29,325	220,125	249,450
4. Prioritize research to improve access to yellow fever vaccine, and to improve the effectiveness of other prevention and control interventions	42,285		42,285
Other		785,125	785,125
Uganda	11,890,983	1,499,500	13,390,483
1. End outbreaks in currently affected countries through targeted vaccination and other public health measures	11,602,293	677,500	12,279,793
2. Prevent morbidity and reduce mortality through early case detection and strengthened case management	266,106	659,875	925,981
3. Prevent international spread	22,584	162,125	184,709
Republic of Congo	-	1,914,250	1,914,250
1. End outbreaks in currently affected countries through targeted vaccination and other public health measures		843,875	843,875
2. Prevent morbidity and reduce mortality through early case detection and strengthened case management		672,750	672,750
3. Prevent international spread		201,375	201,375
Other		196,250	196,250
WHO HQ	1,126,875	1,930,844	3,057,719
1. End outbreaks in currently affected countries through targeted vaccination and other public health measures	241,875	924,038	1,165,913
2. Prevent morbidity and reduce mortality through early case detection and strengthened case management	65,000	640,113	705,113
3. Prevent international spread	355,000	209,356	564,356
4. Prioritize research to improve access to yellow fever vaccine, and to improve the effectiveness of other prevention and control interventions	465,000		465,000
Other		157,338	157,338



<b>PARTNERS</b>	<b>11,727,099</b>	<b>-</b>	<b>11,727,099</b>
ECDC			*
2. Prevent morbidity and reduce mortality through early case detection and strengthened case management			
IFRC			*
1. End outbreaks in currently affected countries through targeted vaccination and other public health measures			
2. Prevent morbidity and reduce mortality through early case detection and strengthened case management			
IMC			*
2. Prevent morbidity and reduce mortality through early case detection and strengthened case management			
3. Prevent international spread			
IOM	3,100,000		3,100,000
1. End outbreaks in currently affected countries through targeted vaccination and other public health measures	1,500,000		1,500,000
2. Prevent morbidity and reduce mortality through early case detection and strengthened case management	1,500,000		1,500,000
3. Prevent international spread	100,000		100,000
Malteser International			*
1. End outbreaks in currently affected countries through targeted vaccination and other public health measures			
2. Prevent morbidity and reduce mortality through early case detection and strengthened case management			
Medair			*
1. End outbreaks in currently affected countries through targeted vaccination and other public health measures			
2. Prevent morbidity and reduce mortality through early case detection and strengthened case management			
3. Prevent international spread			
REDSUR			*
2. Prevent morbidity and reduce mortality through early case detection and strengthened case management			-
Save the Children	1155000		1155000
1. End outbreaks in currently affected countries through targeted vaccination and other public health measures	1,155,000		1,155,000
TEPHINET			*
2. Prevent morbidity and reduce mortality through early case detection and strengthened case management			
3. Prevent international spread			
UNHCR			*
1. End outbreaks in currently affected countries through targeted vaccination and other public health measures			
2. Prevent morbidity and reduce mortality through early case detection and strengthened case management			
3. Prevent international spread			
UNICEF	6,972,099		6,972,099
UNICEF HQ	25,000		25,000
1. End outbreaks in currently affected countries through targeted vaccination and other public health measures	20,000		20,000

3. Prevent international spread			-
4. Prioritize research to improve access to yellow fever vaccine, and to improve the effectiveness of other prevention and control interventions	5,000		5,000
ESARO	3,887,500		3,887,500
1. End outbreaks in currently affected countries through targeted vaccination and other public health measures	3,019,500		3,019,500
2. Prevent morbidity and reduce mortality through early case detection and strengthened case management	60,000		60,000
3. Prevent international spread	618,000		618,000
4. Prioritize research to improve access to yellow fever vaccine, and to improve the effectiveness of other prevention and control interventions	190,000		190,000
GABON	205,000		205,000
1. End outbreaks in currently affected countries through targeted vaccination and other public health measures	170,000		170,000
2. Prevent morbidity and reduce mortality through early case detection and strengthened case management	30,000		30,000
3. Prevent international spread	5,000		5,000
WCARO	190,000		190,000
1. End outbreaks in currently affected countries through targeted vaccination and other public health measures	180,000		180,000
3. Prevent international spread	10,000		10,000
International	200,000		200,000
1. End outbreaks in currently affected countries through targeted vaccination and other public health measures	125,000		125,000
3. Prevent international spread	75,000		75,000
Regional	19,000		19,000
1. End outbreaks in currently affected countries through targeted vaccination and other public health measures	19,000		19,000
Other	2,445,599		2,445,599
1. End outbreaks in currently affected countries through targeted vaccination and other public health measures	2,176,599		2,176,599
2. Prevent morbidity and reduce mortality through early case detection and strengthened case management	54,000		54,000
3. Prevent international spread	210,000		210,000
4. Prioritize research to improve access to yellow fever vaccine, and to improve the effectiveness of other prevention and control interventions	5,000		5,000
US CDC			*
1. End outbreaks in currently affected countries through targeted vaccination and other public health measures			
2. Prevent morbidity and reduce mortality through early case detection and strengthened case management			
3. Prevent international spread			
4. Prioritize research to improve access to yellow fever vaccine, and to improve the effectiveness of other prevention and control interventions			
WVI	500,000		500,000
2. Prevent morbidity and reduce mortality through early case detection and strengthened case management	500,000		500,000
* Partner requirements undisclosed			

This report is produced on behalf of the WHO Outbreaks and Health Emergencies Programme and partners.

This document provides the WHO Outbreaks and Health Emergencies's shared understanding of the crisis, including the most pressing health needs, and reflects its joint health response planning.

The designation employed and the presentation of material in this report do not imply the expression of any opinion whatsoever on the part of the WHO Outbreaks and Health Emergencies Programme and partners concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.



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<http://www.who.int/emergencies/yellow-fever/response/en/>



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