YELLOW FEVER

Risk Communication and Social and Community Mobilization

GUIDELINES FOR THE COMMUNICATION DESIGN OF PREPAREDNESS AND RESPONSE IN CASE OF YELLOW FEVER OUTBREAKS IN THE AMERICAS

Pan American Health Organization

World Health Organization
REGIONAL OFFICE FOR THE Americas

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WASHINGTON, DC • 2018

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DESIGN

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ACRONYMS

ESAVI	Surveillance of events supposedly attributable to vaccination or immunization
IEC	Information, education and communication
IHR	International Health Regulations
NGO	Non-governmental organization
PAHO	Pan American Health Organization
PHEIC	Public Health Emergency of International Concern
WHO	World Health Organization

INTRODUCTION

Jungle (sylvatic) yellow fever is endemic in regions of 13 countries and territories of the Americas: Argentina, Bolivia, Brazil, Colombia, Ecuador, French Guiana, Guyana, Panama, Paraguay, Peru, Suriname, Trinidad Island and Venezuela.

According to the Pan American Health Organization/World Health Organization (PAHO/WHO) epidemiological report of May 2, 2017 (1), six countries of the Americas have reported suspected and confirmed cases of yellow fever (Bolivia, Brazil, Colombia, Ecuador, Peru and Suriname). Since the beginning of the outbreak in December 2016 until April 27, 2017, Brazil is the country with the highest number of cases of yellow fever reported (715 confirmed and 827 suspected cases to be confirmed, including 240 confirmed deaths and 39 under investigation). The mortality rate among confirmed cases is 34 % (1).

In the Americas, a relatively recent event from which important lessons were learned regarding communication was the 2008 yellow fever outbreak in Paraguay.

During this outbreak, information of the media reporting indigenous cases and deaths due to yellow fever in the border areas of Brazil and Paraguay, plus the high *Aedes aegypti* infestation rates in urban areas of at least 17 out of the 18 departments of the country, caused great alarm in the population.

The experience with the media and the public during the yellow fever outbreak in Paraguay revealed the challenges and setbacks health authorities – particularly those in charge of crisis communication – have to face during epidemic outbreaks and other public health emergencies.

The current situation of yellow fever in several countries of the Region, including case notification in areas where cases had not been detected before, represents an alarm to strengthen the risk communication and social mobilization component.

PAHO/WHO. *Epidemiological update yellow fever*, 2 May 2017. Available at: https://www.paho.org/hq/index.php?option=com_docman&task=doc_download&Itemid=270&gid=39764&lang=en

For this purpose, it is important to start planning how to manage timely communication, particularly regarding the risk of potential disease transmission in urban areas, disease causes, symptoms and mortality, as well as the vaccine and its possible adverse effects. These are sensitive issues which, if not properly managed through different instances and channels, may cause scenarios of informative crisis and confusion in the population.

This document provides:

- **Recommendations** for the elaboration of communication plans and actions for risk communication regarding the infection caused by the yellow fever virus, both in sylvatic and urban areas.

- **Technical contents** on yellow fever, its signs and symptoms, complications, transmission routes and prevention measures to be taken in order to address most frequently asked questions and messages in information and communication pieces and materials, community talks, spokesmanship, among others.

This guide is intended for the Ministries of Health and other members of the health sector so that they, jointly with their national (multidisciplinary) communication and social mobilization teams, adapt the information according to national needs and the intended population.

II

FRAMING YOUR **COMMUNICATIONS**

ORIENTATION OF COMMUNICATION GOALS

Provide timely information about yellow fever, bringing together public health concerns and public information needs regarding the risks and complications of this disease.

Enhance the coverage of the yellow fever vaccine in populations living in or travelling to at-risk areas, particularly to sylvatic areas or areas of disease transmission, by means of understandable information that encourage vulnerable populations to get vaccinated.

Segment the audience to emphasize the risks of yellow fever in most vulnerable populations, for instance, those residing, working or travelling to areas of virus circulation (i.e., where cases of disease transmission have occurred).

Foster, on an ongoing basis, behavioral changes at individual level, social mobilization and community participation so that the inhabitants carry on prevention actions and vector control by eliminating breeding sites in their households and surrounding areas and getting vaccinated if cases occur in their communities.

Keep the public well informed about the risk of yellow fever infection and its consequences, and explain the processes carried out by health institutions in their country or region.

Sustain public credibility and trust in health authorities by disseminating timely and evidence-based information.

Establish a monitoring system to be aware of speculations and assumptions of the population, end rumors, refute wrong information and eradicate erroneous concepts as soon as possible, particularly regarding vaccination and potential events supposedly attributable to vaccination or immunization (ESAVI).

Respond rapidly to specific concerns and information needs from the public, partners, allies, healthcare providers and public health community in general.

Adopt a unified and coherent governmental (national) approach for strategic and operative communication. Include partners and allies from non-governmental sectors NGOs (private companies and the community).

Establish a system to facilitate the dissemination of consistent messages from national governmental officers, hospitals and other local health authorities. A content guide for unified messages is an alternative to manage the consistency of messages, as well as the establishment of a protocol or policy to regulate the release of public information in response to this event.

IDENTIFYING COMMUNICATION CHANNELS

The Ministry of Health of each country can use a variety of channels to disseminate information and messages to the media and the public regarding the response to yellow fever, either the actions performed by public health institutions for detection and control, or the prevention measures (vector control, vaccination, non-pharmaceutical interventions) and recommendations for more vulnerable audiences.

Key information channels include, but are not limited to:

- **Informative sessions for the media**, including televised press conferences and guidelines for journalists over the telephone.
- **Social media channels** (e.g., Twitter, Facebook, YouTube, Instagram, podcasts, text messages, etc.).
- **Web sites** with detailed information on yellow fever (most frequently asked questions, etc.).
- **Public service** announcements on the radio.
- **Distribution of printed** (informational, educational, etc.) material.
- **Other social and community mobilization actions**.
- **Channels used by other partners and associates** (churches and parishes, community assemblies, sports activities, celebrities, etc.).

GUIDING PRINCIPLES FOR ELABORATING A PLAN FOR RISK COMMUNICATION IN RESPONSE TO YELLOW FEVER

- Timely and clear dissemination of precise and accessible evidence-based information on yellow fever and the importance of vaccination against this disease will build trust with the population.

- It is important to define consistent key messages (social networks, institutional websites, community leaders, mass media, target audience of partners and allies, etc.).

- Coordination in the elaboration of messages and release of information between all the organizations and health officers is essential for the clarity of messages to be disseminated, thus maintaining the public's trust, avoiding fear and anxiety and facilitating response measures.

- Prioritization of messages is necessary to maintain a hierarchy. It is necessary to consider messages having the greatest impact (for outbreak containment) and the highest potential to change the population's behavior.

- Information intended for the public should be accessible and exact from a technical point of view, but tailored to different audiences and complete enough to promote the support to official policies and measures such as vaccination and control and elimination of mosquitoes and their breeding sites.

- It is necessary to have the possibility of translating messages into different languages or dialects, as necessary, always respecting cultural diversity.

- Acknowledging that the community should be at the heart of the response, thus requiring actions for social mobilization and effective community participation to promote vaccination in places where vaccination campaigns, mosquito control and elimination of breeding sites are started.

- Elaborating and implementing contingency plans, i.e., preparing mechanisms and actions to face potential social awareness and mobilization actions.

- The need to maintain mass media professionals constantly informed about the progress of the situation, thus requiring the constant presence of trained spokespersons to provide consistent information.

CONSIDER THE POPULATION'S PERCEPTION OF RISK

The population's perception of risk is based on what people consider or perceive about their likelihood of contracting yellow fever, or about the vaccine, and the possibility of not having access to the vaccine because it is not available, or because they are not among priority populations; their severity or magnitude, the perception of benefits derived from making behavioral changes versus personal costs, and their willingness to make these changes.

It is important to analyze the perception of risk to be able to design and implement successful communication efforts.

Below is a practical table to categorize according to their perceived risk.

	VERY HIGH RISK	HIGH RISK	MODERATE RISK	LOW RISK
Having yellow fever				
Why?				
Vaccination against yellow fever				
Why?				

The following table provides examples of some questions to include in public surveys:

DIMENSION	YELLOW FEVER	VACCINATION AGAINST YELLOW FEVER
Awareness	→ *Is it a well-known risk for you?*	→ *Have you heard of this vaccine?*
Understanding	→ *Do you understand how complications of yellow fever occur?*	→ *Do you understand the benefits for you?*
Uncertainty	→ *Do you think you have a possibility to contract yellow fever?*	→ *Do you think you may vaccinate against yellow fever?*
Control	→ *Can you implement personal control measures to reduce the risk of contracting yellow fever?*	→ *What other control measures can you implement at personal level to reduce the risk of contracting yellow fever?*
Equity	→ *Are there people who, due to their living conditions, are more at risk of contracting yellow fever than others?*	→ *Are there people who, due to their living conditions, should have priority to get the vaccine?*
Benefits	→ *Is there any benefit from contracting yellow fever*	→ *Is there any benefit from vaccinating against yellow fever?*
Fear	→ *Are you afraid of contracting yellow fever?*	→ *Are you afraid of vaccinating against yellow fever?*
Distrust	→ *Do you know if authorities or other responsible institutions are acting to prevent the risk of yellow fever?*	→ *Do you know if the authorities or other responsible institutions are ready to vaccinate?*
Reversibility	→ *Is it possible to recover from yellow fever?*	→ *Is it possible that the vaccine helps control this disease?*
Personal interest	→ *Have you felt that you or your close family are at risk?*	→ *Do you think that you and your family should be vaccinated?*
Catastrophe/ magnitude	→ *Do you think your country is at risk of yellow fever epidemics?*	→ *What happens if there are not enough vaccines available to immunize the whole population?*
Other	*Fear that fractional doses of the vaccine have no effect.*	

This survey can include other questions on attitudes and practices, since the abovementioned table explores mainly knowledge.

SAMPLE INFORMATION COLLECTION MODELS FOR RISK COMMUNICATION

GROUPS AND POPULATIONS AT RISK

- → *What specific groups are at risk?*
- → *What groups, partners and allies are directly related?*
- → *What groups should be regarded as a communication priority considering their likelihood of being required as partners and/or advisors?*
- → *Are there any particularly vulnerable or at-risk groups that is necessary to contact?*

KNOWLEDGE, AWARENESS, PERCEPTIONS

- → *What do individuals and communities know about disease cause and transmission?*
- → *What are the local descriptions or terms for the disease?*
- → *What is the perception of people and the community regarding the risk posed by the outbreak?*
- → *Have these groups experienced previous outbreaks? How did they address them?*
- → *What are the messages circulating in the community?*

INFORMATION SOURCES AND CHANNELS, AND ENABLING ENVIRONMENTS

- → *What are the channels through which people get information? What are the reliable and credible sources of information? Why are they considered so? For example, information conveyed by health workers, local leaders, religious leaders or influential people.*
- → *What are the available media or communication channels to promote messages? What are the most popular or influential channels among the affected groups? Which are the traditional communication media used?*
- → *Which are the current models of social communication? Which are the active community networks and structures available and how does the local population perceive them?*
- → *What other organizations are currently addressing the issue in the community? (Some examples are fact sheets, face-to-face communication, information bulletins, posters and brochures, public service announcements, information media, websites, social networks (Facebook, Twitter, etc.), text messages and other new technologies, email messages.)*

INFORMATION SOURCES AND CHANNELS, AND ENABLING ENVIRONMENTS

→ *What are the appropriate environments to distribute communication material and disseminate the messages? (For instance, health facilities, schools, work centers, households, communities and neighborhoods, etc.).*

CURRENT DOMESTIC AND COMMUNITY PRACTICES

→ *Which are the practices to look for health services and health care in ordinary situations?*

→ *Which are the immunization practices and coverage in the area?*

→ *What current practices increase the risk and what are the beliefs and values supporting them? For example, from groups against the use of vaccines.*

→ *What current practices reduce the risk and what are the beliefs and values supporting them?*

→ *What are the decision-making processes within communities and families in relation to the search for health services?*

SOCIOCULTURAL, ECONOMIC AND ENVIRONMENTAL CONTEXT

→ *Are there social and political tensions that may affect practices for risk reduction?*

→ *Do people have access to enough resources to observe practices for risk reduction (e.g., access to drinking water)? Are there health services available and accessible? Are there any problems in relation to the transport of ill people to health facilities or hospitals?*

→ *What current religious beliefs and traditional social rules may hinder the adoption of practices for risk reduction?*

SEGMENTING TARGET AUDIENCES

Health authorities will widely disseminate yellow fever information to the general public, health workers and the public health community in order to address concerns, for instance, on disease lethality and prevention measures such as vaccination.

Some specific audiences are presented below. Each has their own concerns and information needs, thus requiring special communication efforts tailored for each. This will enable to build and maintain trust and a better management of their expectations.

GENERAL PUBLIC

- People who live, work in, or travel to areas at risk of infection
- Patients and people with symptoms

HEALTH WORKERS

- Physicians and other health workers, including laboratory staff
- Workers in medical professional associations

RURAL WORKERS

- Agricultural workers
- People living or working in agricultural areas

TRAVELERS AND TOURISM INDUSTRY

- Travelers to areas at risk of infection
- Workers from aviation and other transportation companies

COMMUNITY ORGANIZATIONS

- Schools
- Religious organizations
- Stores
- Civic organizations

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SÃO PAULO

III

IMPLEMENTING THE STRATEGY AND DEVELOPING MATERIALS AND PRODUCTS

TASKS FOR THE INTERNAL ORGANIZATION OF THE RISK COMMUNICATION TEAM

Develop a clear policy including the criteria (protocol) to disseminate the information to the public, including a process for the rapid approval of announcements and warnings for public dissemination in case of an actual or potential public health risk and protocols for issuing announcements and warnings outside normal working hours.

Define the members of the communication team who will be contact points for the Ministry of Health to coordinate the communication with other institutions responding to the yellow fever outbreak.

Activate the team responsible of monitoring the media, social networks and other channels of information to monitor the perception of risk in target audiences.

Determine the measures to be taken regarding the population at risk and make the necessary arrangements to adapt and disseminate predetermined messages to target audiences through previously identified channels.

Deliver official announcements about the event, and subsequent announcements, according to the evolution of the situation. Provide frank and quick answers to the first questions of the media, partners and allies, as well as to the public.

- The information should be disseminated before rumors, including wrong information, are spread, for instance, against vaccination or against recommended actions from health authorities within the framework of vaccination campaigns (this helps to foresee situations such as "children first," fractional doses of the vaccine, etc.).
- The first announcement of the spokesperson should include information on disease prevention measures, the situation of the first case (or first cases) and the actions health authorities are carrying out to protect the public and health workers, vaccination areas and reasons why these areas are a priority.

Provide information to the media regarding where and when data will be updated and where updates can be found on the internet and other channels.

Use different channels to be in constant communication with the public.

TASK FOR ELABORATING MESSAGES AND IDENTIFYING DISTRIBUTION CHANNELS

Prepare and test key messages, including basic information about the threat that yellow fever represents to the health as well as about vaccination, measures to eliminate breeding sites, and self-care against mosquito bites.

Elaborate preliminary versions of press releases, public service announcements and documents with frequently asked question including information on health protection and potential complications of yellow fever.

Select the communication channels that will be used to distribute messages according to the intended audiences.

Update information continuously in different channels (such as websites, social networks, printed material and radio announcements).

Collaborate with health workers and EPI mainly for the elaboration and communication of messages for disease prevention and regarding the importance of vaccination in primary care through the integral health care models.

Involve the community in the response by working with community leaders and providing support to carry out actions for community participation and social mobilization.

TASKS TO ADDRESS THE NEEDS OF THE MOST VULNERABLE POPULATIONS

Define mechanisms to communicate with difficult-to-access and vulnerable groups in order to ensure access to information regarding disease prevention and where to go to be vaccinated or if they have symptoms similar to those of yellow fever.

Define the communication channels that will be used to reach vulnerable groups.

Prepare messages and communication material in all the languages and dialects spoken by the target audiences.

TASKS TO CONNECT DIRECT STAKEHOLDERS AND PARTNERS

Create an inter-institutional team to facilitate communication between organisms and coordinate the communication intended for the public.

Define groups to support communication actions, such as groups of young people, schools, mayors, unions, churches, associations and others. Create databases for these groups and include them in the preparedness.

Obtain the support of physicians, nurses, personnel of the EPI and health promoters within the setting of primary care so that they can receive information and transmit it to users.

Work with celebrities and influencers for the dissemination of disease prevention measures.

COMMUNITY PARTICIPATION

Rapidly determine what the community's attitude is towards vaccination and vector control as well as behavioral goals to be achieved.

→ *What information needs to be adjusted to change the population's attitude in favor of vaccination?*

→ *What behaviors should be encouraged in order to control mosquitoes and breeding sites? Why is the population not currently doing so? How can those behaviors be influenced and better supported? What are the current barriers? Why do some people behave like that while others do not? How is change achieved?*

→ *What do healthcare workers and residents think and expect regarding the efficacy of control measures applied so far?*

→ *Who is a reliable source of information for the community?*

→ *Which are the best media to disseminate that information?*

→ *What terms and concepts should be used regarding vaccination, the disease and mosquitoes?*

→ *What are the available resources for the community that would enable the promotion of vaccination and effective vector control?*

SOME ACTIONS TO BE CONSIDERED FOR SOCIAL MOBILIZATION AND COMMUNITY PARTICIPATION

Implementing mechanisms to track the effectiveness of communication and methods to understand public attitudes and motivations.

Establishing a team to monitor communication media and a telephone line for assistance.

Identifying and maintaining frequent communications with community leaders of at-risk populations and other intended public in order to be aware of their information needs and worries.

Committing the community and its leaders to a constant dialogue regarding their concerns and response activities.

Activating call centers and monitoring public calls.

Holding meetings with the community and influencers.

Monitoring news and social media.

Sharing, on a regular basis, the results of the monitoring of information channels with authorities, spokespersons, specialists, risk managers, partners and the communication team, so they can be analyzed and used as a base to produce new communication actions and materials to address wrong concepts or information as well as public concerns, and tailoring response interventions to yellow fever.

Establishing lines of action, elaborating materials and testing them with the intended audience.

Reorienting actions according to community research such as knowledge, attitudes and practice (KAP) surveys, opinion surveys, etc.

EXAMPLES OF IMMEDIATE ACTIVITIES IN YOUR COMMUNICATION PLAN

The following are some suggested actions in case of a yellow fever outbreak in your country, regions or specific cities.

These activities are not listed by importance nor correspond to the sequence in which they should be performed. According to the situation, some activities may be carried out simultaneously, before, or after their order in this list.

IMMEDIATE ACTIONS IN THE COMMUNTICATION PLAN

- [ ] Adjust and distribute key messages to the public.
- [ ] Elaborate and issue messages for a press release.
- [ ] Provide information to partners and allies.
- [ ] Hold an informative session with journalists (educational talk on the event).
- [ ] Post information on the website of the Ministry of Health. Keep this information updated.
- [ ] Post messages on social media.
- [ ] Respond to requests from the media.
- [ ] Track and monitor the information published in the media, social networks and questions from the public.
- [ ] Provide information and orientation to health workers, public and private health community, and laboratories.
- [ ] Update the list of frequently asked questions and answers for call centers.
- [ ] Activate call centers.
- [ ] Hold press conferences to make public announcements with updated information regarding the evolution of the event.
- [ ] Elaborate and provide supplementary material including information, education and communication for different target audiences.
- [ ] Track and evaluate information media, social networks and questions from the public.
- [ ] Activate community communication channels with partners and allies and other previously identified parties.

LISTENING: MONITORING COMMUNICATIONS AND PERCEPTION OF RISK

The following competencies are required to ensure the best results of this component:

Gather and process opinions and perception of people, associates and communities affected by a severe public health event, and tailor communication strategies as required, based on this information.

Monitor the information offered by traditional and non-traditional media, including follow-up of noteworthy questions, information requirements, confusing issues and circulating rumors.

Have access to existing assessments of the needs and vulnerability of different communities, and groups within communities, in case of a serious public health event.

Have access to socioeconomic, cultural, and language profiles of the community, in case of a serious public health event.

Use simplified and specific emergency information gathered in spreadsheets already in use to facilitate effective dialogue during an event.

Reflect the results of the listening and assessment processes in the decision making for emergency management.

Gather information directly from associates; for instance, educators through their students and families.

IV

WORKING WITH **THE MEDIA**

INITIAL ANNOUNCEMENTS AND REPORTS ABOUT DATA

It is important to distinguish between data relevant from the epidemiological point of view and data of general interest that should be disseminated through established public channels.

It should be ensured that the data provided is aligned with the epidemiological reports from the Ministry of Health and that reporters understand what the cutoff dates are to avoid speculation.

During an epidemic outbreak, it is possible that mass media requirements of news exceed the information available. It will be important to take advantage of media interest to give emphasis to concrete, reliable and useful information for target audiences.

Exactness of data should be strictly observed to prevent conflicting information, particularly regarding possible side effects attributed to vaccination.

If information regarding the identification of patients is disseminated, the main objective will be to guarantee their privacy; therefore, names should not be released without authorization of family members.

RELATIONS WITH THE MEDIA

Establish or update media databases.
Define the logistics to collaborate with the media and provide sustained updates.
Organize spaces for educational talks with journalists about yellow fever and the importance of vaccination.

OFFICIAL SPOKESPERSONS IN CASE OF A YELLOW FEVER OUTBREAK

It is important to identify and designate qualified spokespersons to manage the information about yellow fever in the media.

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QUEM DEVE SE VACINAR

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MOST FREQUENTLY ASKED QUESTIONS

ABOUT YELLOW FEVER AND POTENTIAL CONSEQUENCES FOR HEALTH

Following are the most frequently asked questions about yellow fever, which are aimed at facilitating technical contents for the elaboration of key messages to be used in communication materials or pieces, call centers, institutional web pages, social networks, community talks and public appearances, among others.

The following list also includes the potential most frequently asked questions regarding yellow fever, its signs and symptoms, complications, prevention measures and vaccination.

1. WHAT IS YELLOW FEVER?

Yellow fever is a disease caused by a virus transmitted by the bite of infected mosquitoes. The term "yellow" refers to the jaundice (yellowish skin) that affects some patients.

The virus is common/native in tropical zones of Africa, Central America and South America.

Large epidemics of yellow fever occur when the virus is introduced by infected people or non-human primates (e.g., monkeys) in heavily populated areas, with high mosquito density and where most people have little or no immunity due to lack of vaccination.

2. WHERE DOES YELLOW FEVER OCCUR?

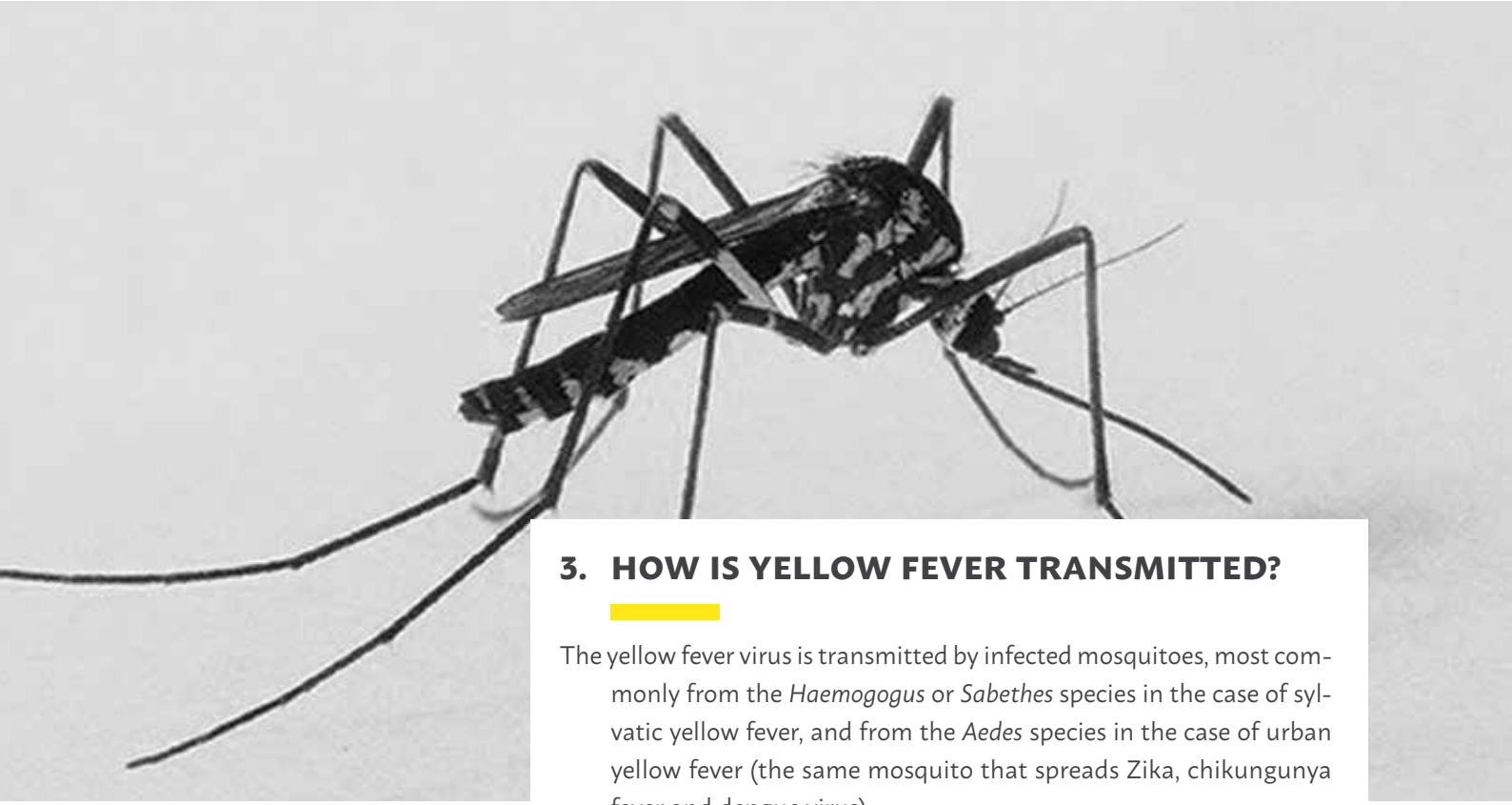
Yellow fever occurs in 47 endemic countries in Africa, Central America and South America. Around 90% of cases reported every year occur in Sub-Saharan Africa. In the Americas, yellow fever is sylvatic in risk areas of 13 countries and territories: Argentina, Bolivia, Brazil, Colombia, Ecuador, French Guiana, Guyana, Panama, Paraguay, Peru, Suriname, Trinidad Island and Venezuela.

Brazil
is the country with **the highest number** of reported cases of yellow fever

Since the beginning of the outbreak in December 2016 up to April 27, 2017

34% fatality rate

According to the PAHO/WHO epidemiological report of May 2, 2017(1), six countries in the Americas have reported suspected and confirmed cases of yellow fever in humans (Bolivia, Brazil, Colombia, Ecuador, Peru and Suriname). Since the beginning of the outbreak in December 2016 up to April 27 2017, Brazil is the country with the highest number of reported cases of yellow fever (715 confirmed, 827 suspected to be confirmed, including 240 confirmed deaths and 39 deaths under investigation). The fatality rate among confirmed cases is 34% (1).



Haemagogus leucocelaenus
(photo: Genilton Vieira/IOC/Fiocruz)

3. HOW IS YELLOW FEVER TRANSMITTED?

The yellow fever virus is transmitted by infected mosquitoes, most commonly from the *Haemogogus* or *Sabethes* species in the case of sylvatic yellow fever, and from the *Aedes* species in the case of urban yellow fever (the same mosquito that spreads Zika, chikungunya fever and dengue virus).

Person-to-person transmission has not been documented.

Mosquitoes get infected when they bite persons or monkeys infected with the virus.

Increased contact between people and mosquitoes infected with the virus may lead to outbreaks, especially in urban areas with yellow fever unvaccinated populations.

People infected with yellow fever may reach urban centers with (*Aedes aegypti*) mosquitoes capable of spreading the virus to other people. If this occurred, an urban cycle of transmission of yellow fever could be triggered. It is necessary to highlight that due to the high density of *Aedes aegypti* mosquitoes in urban centers jointly with the significant movement of people, the risk of urbanization of yellow fever is under constant evaluation.

Disease outbreaks in urban settings are particularly upsetting in overcrowded areas with deficient services of water supply and waste management, which promote mosquito breeding.

4. WHAT ARE THE TRANSMISSION CYCLES OF YELLOW FEVER?

- **Jungle yellow fever:** transmission occurs in tropical rainforests when monkeys, which are the primary reservoir of the virus, are bitten by mosquitoes that pass the virus on to other monkeys. People travelling to or living in the forest are bitten by infected mosquitoes and develop the disease.

- **Urban yellow fever:** large epidemics occur when infected people or monkeys introduce the virus into heavily populated areas with high mosquito density and where most people have little or no immunity due to lack of vaccination. In these conditions, infected mosquitoes transmit the virus from one person to another.

These forms of transmission (sylvatic and urban) are key to guide actions to control the outbreak. In the case of sylvatic outbreaks, the most important issue is vaccination of at-risk people in areas of transmission. In the case of an urban outbreak, besides vaccination, it is necessary to enhance measures for vector control in domestic settings.

5. WHAT ARE THE SIGNS AND SYMPTOMS OF YELLOW FEVER?

The incubation period (time from infection to onset of symptoms) is three to six days after the bite of an infected mosquito.

Many cases can be asymptomatic, but when symptoms occur, the most common are fever, muscle pain (particularly back pain), headache, loss of appetite, and nausea or vomiting. In most cases, symptoms disappear within three or four days.

Disease progression may include three clinically evident periods: infection, remission and intoxication period. After 24 hours of initial remission, about 15% of patients enter a second, more toxic phase. This phase is characterized by high fever, jaundice (yellowish skin and eyes), abdominal pain including vomiting, and renal impairment. In addition, bleeding can occur from the mouth, nose, eyes, or stomach, including blood in vomit or stools. Half of the patients who enter this toxic phase die within 10 to 14 days, while the other half recovers without significant organ damage.

Appropriate supportive treatment in a hospital increases survival rate. There is no specific antiviral treatment for yellow fever.

Yellow fever can be prevented with a highly efficient, safe and affordable vaccine. A single dose is sufficient to confer immunity and life-long protection within a minimum term of 10 days, and a booster dose is not required. The vaccine provides effective immunity for 99% of vaccinated individuals within 30 days.

6. HOW IS YELLOW FEVER DIAGNOSED?

Yellow fever can be difficult to diagnose, especially during the early stages because symptoms can be confused with other common diseases such as malaria, dengue, leptospirosis or the disease caused by Zika virus, as well as those of some poisonings.

Laboratory tests are required to confirm suspected yellow fever. Blood tests can detect antibodies against the virus, which show that a person has been infected or whether he/she has been vaccinated.

Other techniques are also used to identify the virus in blood specimens or liver tissue collected after death. These tests require highly trained laboratory staff and specialized equipment and materials.

7. IS THERE ANY TREATMENT AGAINST YELLOW FEVER?

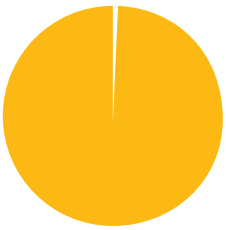
There is no specific treatment for yellow fever, but symptoms such as dehydration, fever and opportunistic infections can be treated to improve the survival rate. Therefore, the best tool is prevention using a highly effective vaccine that confers long-life protection.

Associated bacterial infections can be treated with antibiotics, only under medical prescription. It is very important to avoid self-medication.

8. HOW CAN YELLOW FEVER BE PREVENTED?

VACCINATION

Vaccination is the most important measure to fight yellow fever; it is safe and affordable. It consists of live but attenuated viruses, meaning that they are less potent than the virus strain.



99%
of the individuals get protection
in the following 30 days

- One single dose provides life long protection against the disease.
- It provides protection to more than 90% of individuals within 10 days after vaccination, and to 99% in the following 30 days.
- In order to prevent outbreaks in the affected areas, vaccination coverage should reach at least 95% of at-risk population.
- According to the International Health Regulations (IHR), yellow fever is the only disease for which countries can request travelers to have a certificate of yellow fever vaccination.

MOSQUITO ELIMINATION OR CONTROL

Prevention implies identifying mosquitoes' behavior and their breeding sites, as well as the environmental responsibility of each individual in the fight for sustained elimination of breeding sites. This should be a regular practice in households and communities.

Mosquito elimination and control is crucial in areas where vaccination coverage is low or where the vaccine is not immediately available.

ACTIONS FOR ELIMINATING BREEDING SITES:

Involve elimination of breeding sites (larvae and eggs) and adult mosquitoes through fumigation with pesticides (in the case of urban yellow fever) in areas with virus circulation. One should bear in mind that pesticides should be used by trained health professionals.

Aedes mosquitoes prefer to lay eggs in containers filled with water (sinks, basins, tires, in particular) in households, schools, work centers, and their surroundings.

- In order to reduce mosquito breeding sites, it is advisable to eliminate the water in containers such as flowerpots, bottles, pots, and other containers that can hold water. Useful containers should be turned upside down when not in use.
- Adequate brushing of sink and basin walls to eliminate eggs adhering to them, which will develop when in contact with water.
- Water tanks or deposits should be covered tightly or treated with chemicals (such as bleach or larvicides) or biological products (such as larvae-eating fish). Keep in mind that pesticides should be used by trained health professionals.

- Taking care of the surroundings of houses, as well as containers that can hold water, is essential to eliminate breeding of new mosquitoes.
- Avoid accumulating garbage. The best is to place the garbage in closed plastic bags or keep it in closed containers.
- Unclog drains that may hold standing water.
- Using screens on windows and doors also contributes to reduce the contact of mosquitoes with people.
- Keep grass short and weed-free.

ACTIONS FOR ELIMINATING ADULT MOSQUITOES:

Spraying pesticides to eliminate adult mosquitoes is important to support outbreak containment, but it is not enough. It is also necessary to eliminate breeding sites.

- Since mosquitoes are more active at dawn and dusk, it is advisable to carry out peri-domicile control actions within these hours. Therefore, people and families should be informed in advance about the time of spraying in their neighborhoods so they can leave their doors and windows open in order to facilitate penetration of the pesticide into houses.
- For pesticide application within the houses, carried out by health professionals or others, kitchen utensils, food and water for human consumption, and animals should be properly covered or kept in closed spaces.
- When pesticides are applied inside the houses, by health professionals or others, people are required to leave the house during application and keep the house closed for at least 20 minutes after spraying to ensure the elimination of mosquitoes.

PERSONAL PROTECTION MEASURES

It should be kept in mind that mosquitoes can bite even when people are exposed for a short period of time to areas with vector circulation.

- Use repellents recommended by health authorities, containing N-methyl-meta-toluamide (DEET), IR3535, or icaridin and apply according to label instructions. In addition, eucalyptus oil can be applied on exposed skin.
- Wear clothing, such as long-sleeved shirts, pants, socks and hats, to cover exposed skin, particularly when outdoors or in areas with mosquito circulation.
- Place protective mesh on doorways and windows to prevent mosquitoes from entering the house.
- Sleep under bed nets.
- Exposure to mosquito bites is higher at dawn and dusk. Nevertheless, *Aedes aegypti* mosquitoes, one of the species that transmit yellow fever, also feed during the day; therefore, use repellents and adequate clothing during the whole day.
- People suspected to have a mosquito-transmitted disease (dengue, Zika, chikungunya, yellow fever) should always sleep or rest under bed nets.

9. HOW IS URBAN TRANSMISSION PREVENTED?

Mosquito control helps to prevent urban yellow fever and it is essential in areas where vector infestation rates are high. Mosquito control includes eliminating larvae breeding sites and, when required, application of pesticides by properly trained professionals. Adult mosquitoes can also be controlled by pesticide application (fumigation), particularly when there is an outbreak .

Community involvement in activities such as cleaning household drainage and adequate coverage of water-filled containers where mosquitoes can develop is extremely important and efficient for mosquito control.

Using repellents approved by health authorities is a prevention option, as well as the use of long-sleeved shirts and trousers for people going into the jungle or forest (e.g. people who take ecotourism trips).

In urban areas, it is important to use mosquito nets in windows and doorways to prevent mosquitoes entering the houses.

10. IS THE YELLOW FEVER VACCINE SAFE AND EFFECTIVE?

- The vaccine is safe; it has been used for several decades.
- The vaccine provides protection to more than 90% of vaccinated individuals within 10 days after application and 99% in the following 30 days.
- A single dose provides life-long protection. It is given as a subcutaneous injection. Nevertheless, a second dose should be given when a person receives a fractional dose due to an outbreak.

11. WHAT ARE THE SECONDARY EFFECTS OF THE YELLOW FEVER VACCINE?

The yellow fever vaccine contains a live attenuated virus. It is effective, safe, and it has been used for more than 60 years for active immunization of children and adults against yellow fever virus infection.

In general, yellow fever vaccine is considered one of the safest vaccines. Over 600 million people have been vaccinated with good results regarding safety and tolerability.

Side effects of the vaccine are generally mild and may include headache, muscle pain and low temperature.

Severe adverse reactions caused by yellow fever vaccine are very rare.

12. WHAT SHOULD BE DONE IF AN ADVERSE EFFECT IS SUSPECTED?

Seek immediate medical attention if an adverse effect associated to the vaccine occurs.

13. WHO SHOULD BE VACCINATED?

WHO recommends systematic vaccination of the population older than nine months of age in countries where yellow fever occurs except for pregnant women, people over 60 years of age, and immunodeficient patients such as those with HIV.

In case of outbreaks, vaccination campaigns are targeted towards all susceptible individuals older than six months of age (when the risks derived from the disease outweigh adverse effects caused by the vaccine).

Pregnant women should be vaccinated in epidemiological emergencies, according to specific recommendations of health authorities.

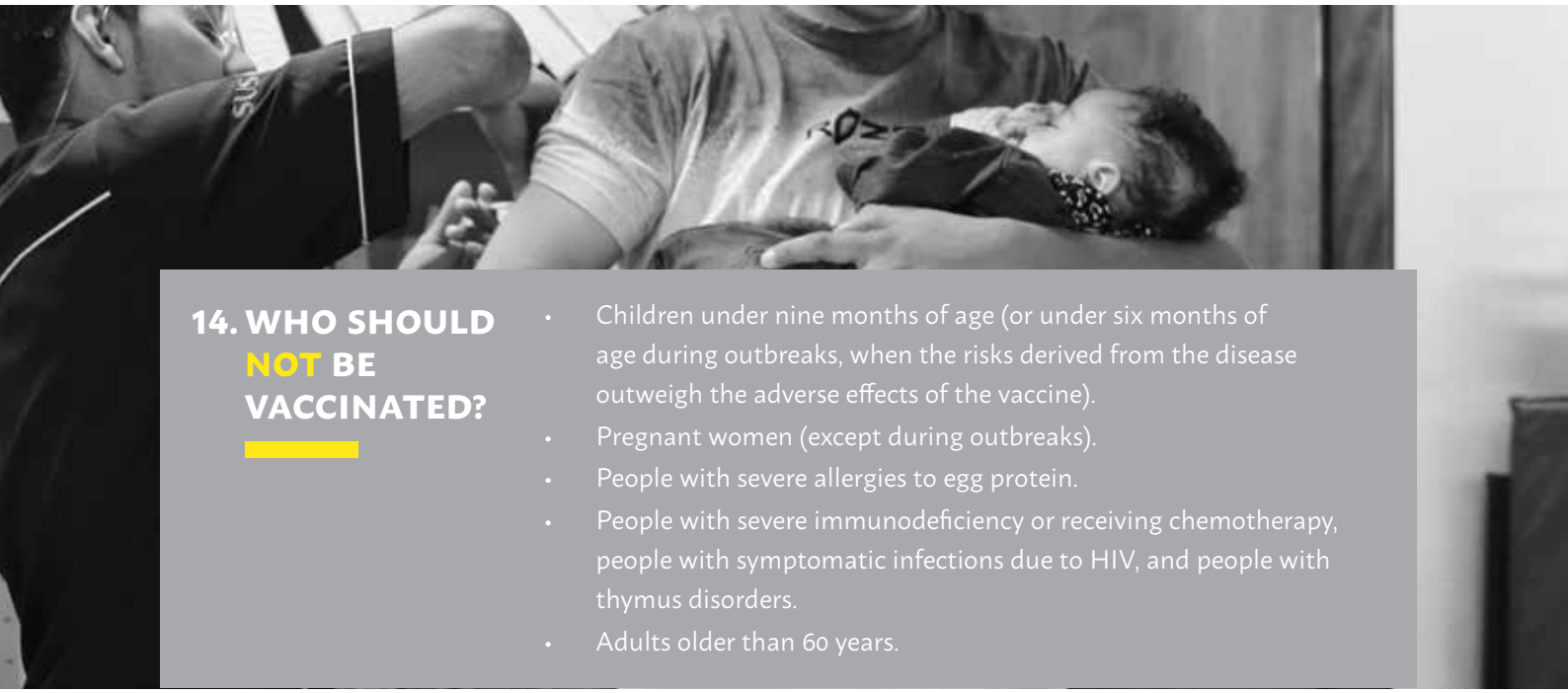
Pregnant and breastfeeding women travelling to areas with yellow fever transmission are advised to get vaccinated when the trip cannot be postponed or avoided.

Vaccination is recommended in breastfeeding women living in endemic areas, since the risk of transmitting the vaccine virus to the child is lower than the benefits of breastfeeding. Breastfeeding women should be given advice on the benefits and potential risks of vaccination to make an informed decision. The benefits of breastfeeding are higher than other nutritional alternatives.

WHO recommends vaccination of all travelers (with a few exceptions) visiting areas at risk of yellow fever. Travelers who have medical reasons for not being vaccinated must have a certificate issued by appropriate authorities explaining those reasons.

To issue a visa, many countries require proof that the traveler is vaccinated against yellow fever, particularly if the traveler has visited or comes from a country where yellow fever occurs.

It is important to keep the yellow fever vaccine certificate safe and bring it with you when you travel to a foreign country.



14. WHO SHOULD NOT BE VACCINATED?

- Children under nine months of age (or under six months of age during outbreaks, when the risks derived from the disease outweigh the adverse effects of the vaccine).
- Pregnant women (except during outbreaks).
- People with severe allergies to egg protein.
- People with severe immunodeficiency or receiving chemotherapy, people with symptomatic infections due to HIV, and people with thymus disorders.
- Adults older than 60 years.

15. HOW LONG SHOULD A WOMAN WAIT AFTER CONCEPTION TO RECEIVE THE YELLOW FEVER VACCINE?

There is no evidence that the yellow fever vaccine causes harm to children born from women who have received the vaccine during pregnancy.

The vaccine has been given to many pregnant women without adverse effects to the fetus. Nevertheless, since this is a live virus vaccine, it could pose some risk.

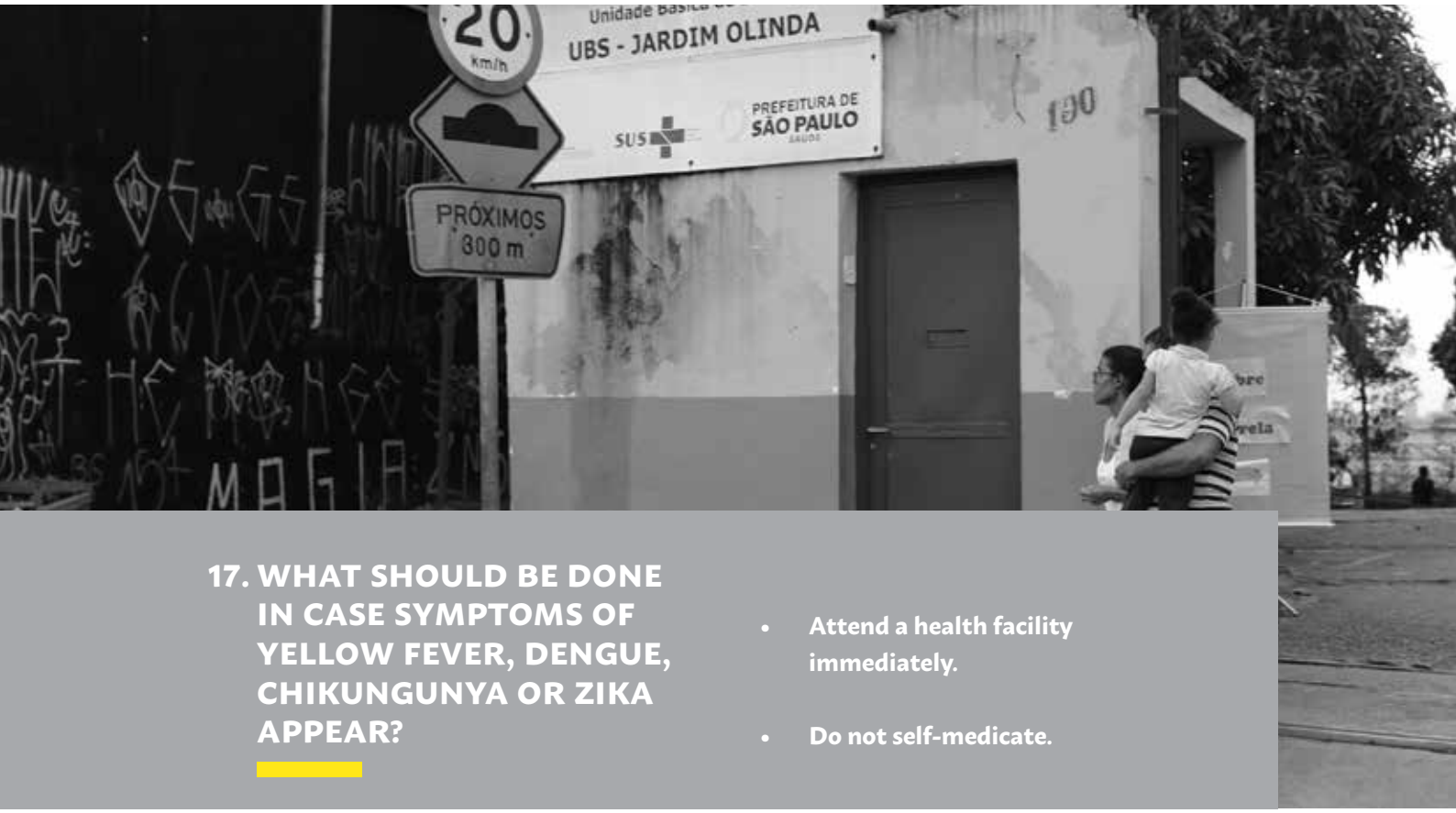
It is advisable to apply the vaccine one month after delivery.

If a pregnant woman needs to be vaccinated, she will most likely will experience no adverse effects and her baby will be healthy.

16. HOW DOES THE VACCINE PROVIDE PROTECTION?

In general, immunity against the yellow fever virus is acquired at least 10 to 14 days after date of vaccination.

In endemic areas, it is essential to adopt other personal protection measures during these 10 to 14 days: wearing protective clothing, using insecticide-treated bed nets, even during the day, and using the recommended repellents.



17. WHAT SHOULD BE DONE IN CASE SYMPTOMS OF YELLOW FEVER, DENGUE, CHIKUNGUNYA OR ZIKA APPEAR?

- **Attend a health facility immediately.**
- **Do not self-medicate.**

18. HOW LONG DOES YELLOW FEVER VACCINE PROTECTION LAST?

A single dose of the vaccine provides life-long protection. Some people may receive a second dose of the vaccine, because either they have problems with their immune system or they are in high-risk areas.

19. WHAT IS A FRACTIONAL DOSE OF THE YELLOW FEVER VACCINE?

According to experts, a reduced dose of the vaccine can protect people against yellow fever. Studies show that 1/5 of the regular dose can provide full immunity against the disease for at least 12 months, and sometimes longer.

Fractional doses are used for the control of outbreaks in cases where the vaccine supply is limited.

After reviewing existing evidence, WHO Strategic Advisory Group of Experts (SAGE) on Immunization determined that 1/5 of the regular dose of the vaccine can provide full protection against the disease for at least 12 months, and can be used for the control of epidemic outbreaks.

Fractional doses are not indicated for routine immunization schedules since there is not enough data available to show that lower doses confer life-long protection. Further studies are needed to show evidence that factional doses provide immunity for more than 12 months.

Fractional doses of yellow fever vaccine can be used during emergency situations.

20. WHY DOES WHO PROPOSE TO USE FRACTIONAL DOSES OF THE VACCINE AS AN EMERGENCY MEASURE IN CASE OF OUTBREAKS?

Since recent epidemic outbreaks have occurred in African countries in 2016, vaccine supplies did not cover the increasing demand of vaccines. Just in the first six months of 2016, WHO and other partners sent more than 19 million doses of the vaccine to Angola, the Democratic Republic of the Congo and Uganda in response to outbreaks. This was three times the volume of vaccine stock for yellow fever, generally six million doses for an outbreak.

The process of vaccine production takes at least six months.

When vaccines are urgently needed, WHO experts and the affected countries may use fractional doses for massive vaccination campaigns to protect the population from the outbreak.

21. WHO WILL RECEIVE A YELLOW FEVER VACCINATION CERTIFICATE?

Fractional doses do not entitle people to a valid yellow fever certificate for international travel. As long as further evidence on the duration of fractional dose protection is not obtained, people travelling internationally require a regular (full) dose of the vaccine, which entitle them to the certificate.

So far, there is no evidence that a fractional dose in children under two years of age provides the same protection than the regular dose. It is likely that young infants have a weak immune response to the vaccine compared to older people. In this sense, children aged less than two years should receive a complete dose of the vaccine.

22. HOW ARE PEOPLE WHO RECEIVED FRACTIONAL DOSES CONTROLLED?

WHO recommends Member States to elaborate records of people who received fractional doses of the vaccine, for the relevant follow-up and to be able to gather evidence on the extent of vaccine protection, as well as to repeat vaccination if necessary.

People who received fractional doses should be informed on the type of vaccination they are receiving and on the need of full vaccination if they wish to travel.

23. IS THERE A GREATER RISK OF ADVERSE EFFECTS WITH LOWER DOSES OF THE VACCINE?

Fractional doses are taken from regular doses. In the past, they have been applied to millions of people to prevent yellow fever. The fractional dose is as safe and effective as the full dose of the vaccine.

Serious adverse effects after a regular (full) dose are very rare, less than 1% per million people. There is no current evidence of increased adverse effects when fractional doses of the vaccine are used.

24. HAS THIS METHOD BEEN USED FOR OTHER VACCINES?

Fractional doses are being used for the polio (IPV) vaccine, rabies vaccine, and Bacillus Calmette–Guérin (BCG) vaccine, which is mainly used against tuberculosis.

For further information on how to answer these and other questions on yellow fever, refer to PAHO's page on yellow fever.

VI

RELATED LINKS

- World Health Organization. Outbreak communication guidelines. 2005. Available at: http://www.who.int/csr/resources/publications/WHO_CDS_2005_28/en/
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OUTBREAK COMMUNICATION GUIDELINES AND HANDBOOKS

- World Health Organization, 7 steps to effective media communication during public health emergencies, 2005. Available at: http://www.who.int/csr/resources/publications/WHO%20MEDIA%20HANDBOOK%20WALL%20CHART.pdf
- Pan American Health Organization, Fundamentals of communication during crises and emergencies, 2009. Available at: http://www.paho.org/disasters/index.php?option=com_docman&view=download&category_slug=tools&alias=539-pandinflu-leadershipduring-tool-12&Itemid=1179&lang=en
- World Health Organization, Effective communications, 2015. Available at: http://apps.who.int/iris/bitstream/handle/10665/249241/9789241509466-eng.pdf

PAHO/WHO Health Emergencies Department (PHE) focuses on strengthening the health sector's capacities in prevention, risk reduction, preparedness, surveillance, response and early recovery for emergencies and disasters related to any threat (natural, man-made, biological), chemical, radiological and others). In addition, when national capacities are overwhelmed, direct and coordinate the international health response to contain disasters, including epidemic outbreaks, and provide effective relief and recovery to affected populations.

Within that context this practical guide of risk communication strategies for yellow fever, built on the experiences obtained during the response to outbreaks of the disease in Brazil during 2016 and 2017, was designed to support national authorities in the development and implementation of interventions in risk communication that support the affected communities. These interventions will help increase awareness of the yellow fever virus, as well as its consequences, prevent its spread, and mitigate the impact on people.

The guide presents risk communication strategies focusing on the messages of personal protection, vector control and vaccination. It presents in a didactic way how to plan messages during the response preparation phase, in order to help public health authorities carry out a strategy of activities to be developed for response and control. Therefore, it reduces the need to create communication plans in times of crisis, taking advantage of peace times.

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