

Summary report on the

WHO-EM/CSR/124/E

Consultative workshop to define an appropriate surveillance strategy for detection of clusters of Zika virus infection and other arboviral diseases using both syndromic- and event-based surveillance systems

Islamabad, Pakistan
14–16 November 2016



**World Health
Organization**

Regional Office for the Eastern Mediterranean

Summary report on the

Consultative workshop to define an appropriate surveillance strategy for detection of clusters of Zika virus infection and other arboviral diseases using both syndromic- and event-based surveillance systems

Islamabad, Pakistan
14–16 November, 2016



**World Health
Organization**

Regional Office for the Eastern Mediterranean

© World Health Organization 2017

Some rights reserved. This work is available under the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 IGO licence (CC BY-NC-SA 3.0 IGO; <https://creativecommons.org/licenses/by-nc-sa/3.0/igo>).

Under the terms of this licence, you may copy, redistribute and adapt the work for non-commercial purposes, provided the work is appropriately cited. In any use of this work, there should be no suggestion that WHO endorses any specific organization, products or services. The use of the WHO logo is not permitted. If you adapt the work, then you must license your work under the same or equivalent Creative Commons licence. If you create a translation of this work, you should add the following disclaimer along with the suggested citation: “This translation was not created by the World Health Organization (WHO). WHO is not responsible for the content or accuracy of this translation. The original English edition shall be the binding and authentic edition”.

Any mediation relating to disputes arising under the licence shall be conducted in accordance with the mediation rules of the World Intellectual Property Organization.

Suggested citation. [Title]. Cairo: WHO Regional Office for the Eastern Mediterranean; 2017. Licence: CC BY-NC-SA 3.0 IGO.

Sales, rights and licensing. To purchase WHO publications, see <http://apps.who.int/bookorders>. To submit requests for commercial use and queries on rights and licensing, see <http://www.who.int/about/licensing>.

Third-party materials. If you wish to reuse material from this work that is attributed to a third party, such as tables, figures or images, it is your responsibility to determine whether permission is needed for that reuse and to obtain permission from the copyright holder. The risk of claims resulting from infringement of any third-party-owned component in the work rests solely with the user.

General disclaimers. The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by the World Health Organization in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.

All reasonable precautions have been taken by the World Health Organization to verify the information contained in this publication. However, the published material is being distributed without warranty of any kind, either expressed or implied. The responsibility for the interpretation and use of the material lies with the reader. In no event shall the World Health Organization be liable for damages arising from its use.

Contents

1.	Introduction.....	1
2.	Summary of discussions	2
3.	Conclusions.....	8
4.	Recommendations.....	9

1. Introduction

On 1 February 2016 the World Health Organization (WHO) declared microcephaly and other neurological disorders associated with Zika virus (ZIKV) a Public Health Emergency of International Concern (PHEIC) owing to the cluster of neurological disorders and neonatal malformations reported in the Region of the Americas.

Following this declaration, the WHO Regional Office for the Eastern Mediterranean conducted three rounds of emergency meetings with a view to enhancing preparedness and response capacities for ZIKV infection and its complications. The first two rounds of meetings, one in Cairo from 22 to 23 February 2016 and the other in Casablanca from 28 to 29 February 2016, had good representation from the health ministries of the 22 Member States in the Region. These two meetings provided up-to-date information on ZIKV infection and its complications, and recommended a set of priority actions to be implemented by the Member States and WHO to enhance preparedness, readiness and response measures for ZIKV. A regional plan for enhancing preparedness and readiness for ZIKV infection was developed to improve prevention, detection and response to the spread of the virus in the Region. One of the key priority activities in the plan was the establishment of an effective surveillance system for early detection of the introduction, or any autochthonous transmission, of Zika and other epidemic arboviruses.

In view of the need to enhance the surveillance system for detecting and monitoring the threats from the introduction of ZIKV in the Region, WHO developed a strategic framework for establishing a syndromic-based surveillance system and an event-based surveillance system for detection and verification of the presence of infection as well as other associated disorders (microcephaly and other neurological disorders such as Guillain-Barré syndrome) in the high risk countries.

Following this, the Regional Office organized a three-day consultative workshop for selected Member States in Islamabad, Pakistan, from 14 to 16 November 2016. The meeting was attended by 18 representatives (senior epidemiologists and senior disease surveillance officers from communicable disease departments) from seven countries (Egypt, Islamic Republic of Iran, Oman, Pakistan, Saudi Arabia, Sudan and Syrian Arab Republic) and WHO staff members from headquarters and regional offices. The objectives of the meeting were to:

- define an appropriate surveillance strategy for the detection of clusters of Zika virus infection and other epidemic arboviruses transmitted by *Aedes* mosquitoes;
- review and refine the strategic framework for establishing syndromic- and event-based surveillance for diseases transmitted by *Aedes* mosquitoes.

The workshop was inaugurated by Dr Tran Minh, Technical Officer, Infectious Hazards Management Unit in the WHO Regional Office for the Eastern Mediterranean. Dr Minh highlighted the importance of defining surveillance strategies for the detection of clusters of Zika infection and other arboviral diseases based on the currently available knowledge on ZIKV transmission. He also emphasized that the strategic framework which has been developed by the Regional Office and discussed in the consultative meeting needs to be rolled out in the high risk countries in the Region in order to reduce the threat of the introduction of ZIKV and mitigate the impact.

2. Summary of discussions

Syndromic surveillance system

Electronic surveillance systems are being developed across the world to improve early detection of disease outbreaks from new or emerging

pathogens. The participants reviewed the rationale, goals, definitions, and realistic expectations of syndromic surveillance systems for early detection of cases of ZIKV.

The fundamental objective of any syndromic surveillance is to identify any illness clusters early, before diagnoses are confirmed and reported to public health agencies, with a view to mobilizing a rapid response to the cluster, thereby limiting the transmission of the pathogens causing these illness clusters and preventing further spread within the community.

The syndromic surveillance systems seek to use existing health data in real time to provide immediate analysis and feedback to those charged with investigation and follow-up of potential outbreaks. There are advantages and limitations to these systems. Syndromic surveillance systems might enhance collaboration among public health agencies, health care providers, information system professionals, academic investigators and industry. However, syndromic surveillance does not replace traditional public health surveillance, nor does it substitute for direct physician reporting of unusual or suspect cases of public health importance.

The ability of syndromic surveillance to detect outbreaks earlier than conventional surveillance methods depends on such factors as the size of the outbreak, the population dispersion of those affected, the data sources and syndrome definitions used, the criteria for investigating threshold alerts, and the health care provider's ability to detect and report unusual cases/clusters of cases using a syndromic case definition of health conditions.

Any routine or conventional indicator-based disease surveillance systems primarily rely on reports provided by health care providers on diseases that are mostly known and meet specific case definitions, or they rely on reports involving laboratory confirmation of cases. On the

other hand, ZIKV infection is an emerging health threat, not known to exist and not reported in the Region previously. The infection caused by ZIKV is often mild; the signs and symptoms often overlap with those of other arboviral infections, making clinical diagnosis uncertain. Diagnosis can be confirmed by laboratory testing for the presence of ZIKV RNA or specific anti-Zika antibodies in the blood, which remains particularly challenging in the countries of the Region. Therefore, it is highly unlikely that cases of ZIKV would be picked up timely by any conventional surveillance system. As syndromic surveillance focuses on the early symptom (prodrome) period, before clinical or laboratory confirmation of a disease, and uses both clinical and alternative data sources, it is highly probable that even if the first few cases of ZIKV infection are missed by the routine disease surveillance system, the systematical use of a broader and more sensitive syndromic case definition will allow any system to detect any cluster of febrile syndromes early. Once picked up by the syndromic surveillance system, a series of field investigations leading to verification and laboratory testing would confirm (or dismiss) the existence of ZIKV infection.

Considering the need for detecting ZIKV infection early and the possibility of using a syndromic case definition to detect clusters of infection promptly, even if the first few cases are missed, the syndromic surveillance system can generate early warnings by detecting clusters of ZIKV infection and other vector-borne diseases using a uniform case definition for clusters of acute febrile syndromes. Such a system would be much more efficient if it was integrated with the sentinel-based entomological surveillance system for *Aedes* mosquitoes and data from the two systems were periodically shared.

Event-based surveillance

Increasingly, the event-based surveillance system is being used to detect and monitor public health events of both national and international

importance using data from nonconventional sources. While the two types of public health surveillance – event-based surveillance and indicator-based surveillance – complement one another, the types of data used, the data sources and the situations in which event-based surveillance are used can be different.

The goal of event-based surveillance is to detect unusual events that might signal an outbreak. The system looks at reports, stories, rumours and other information about health events that could be a serious risk to public health. Such information may be described as unstructured information because the information obtained is nonstandardized or subjective. Event-based surveillance can also be community-based, meaning that information about a possible public health event is reported to health facilities or to any health care worker by people in the community through any means.

The application of event-based surveillance in detecting ZIKV transmission would be supplementary to the syndromic surveillance system, and should use information from community sources, news media, rumour, etc., and also from clinicians in the private sector, who are often not part of the routine disease surveillance system.

As part of actions to enhance the routine disease surveillance system for epidemic detection and monitoring, the countries have already been using event-based surveillance. Thus, the same structure and verification process can be used or modified to detect and monitor the threat of the introduction or circulation of ZIKV. For example, an entomological survey/surveillance finding of high densities of *Aedes* mosquitoes can be considered to be a trigger for an event-based surveillance system for verification, investigation and confirmation (or ruling out) of the presence of ZIKV infection.

Strategic framework for establishing syndromic-based and event-based surveillance for Zika virus and other arboviral diseases

Using the principles and approach of syndromic- and event-based surveillance systems, the Regional Office has developed a strategic framework for enhancing surveillance aimed at detecting unusual clusters of ZIKV infection in the community. Syndromic surveillance focuses on the prodromal period of a disease and uses both clinical and alternative data sources, therefore the framework proposes a case definition suggestive of a clinical syndrome. This syndrome is consistent with the clinical and epidemiological characteristics of the disease caused by ZIKV. The strategic framework also proposes a ZIKV-specific data collection instrument, data elements to be collected for identifying suspected clusters of ZIKV infection and primary and secondary sources of data for ZIKV infection for interpreting and analysing information.

The draft version of the strategic framework for establishing the syndromic- and event-based surveillance systems for ZIKV and other arboviruses was presented in the consultative meeting. Discussion centred on the sources of information for early detection of ZIKV transmission using the two systems, a process of verification, and the algorithm/decision tree to be used for applying the two systems for ZIKV infection. Following an extensive discussion, the revisions to the draft framework listed below were suggested.

- The framework should refer to syndromic surveillance for detecting ZIKV as an “approach” rather than a “system” as many countries in the Region have already established such a system for syndromic surveillance for the detection and monitoring of other emerging or unknown disease threats. In order to detect ZIKV promptly, the framework developed by the Regional Office would endorse using the same structure as the system but with a different

case definition, data elements and algorithm for verification. The framework should support the integration of syndromic surveillance for ZIKV infection into existing systems.

- Setting thresholds for syndromic surveillance is a challenge. However, the framework should provide guidance on how countries determine the alert/action thresholds for the clinical syndromes that would be suggestive of ZIKV infection.
- The data collection instrument for syndromic- and event-based surveillance systems as presented in the framework should be broadened bearing in mind that mild infections caused by ZIKV would often be missed. Consequently, the system needs to collect data that are more sensitive than specific, and both primary and secondary sources of data need to be explored for triangulation and verification.
- The algorithm presented in the framework for verification purposes should be simplified, starting with case definitions, be easy to read, flow in a stepwise manner and include steps for verification and response.
- The framework should indicate sources of both primary and secondary data for both the syndromic- and event-based surveillance systems for ZIKV infection.
- Linkages with vector surveillance maps should be indicated in the framework.

The participants also identified a number of challenges for the implementation of the framework.

- Integrating the proposed surveillance strategy for ZIKV infection with the existing systems may be challenging as it may require a shift in responsibilities and commitment from the health workforce or surveillance officials.
- Accessibility of various secondary and/or other data sources for events under surveillance for ZIKV may be challenging,

especially the data that are outside the authority and scope of influence of the ministries of health.

- Establishing/integrating the proposed strategies for surveillance of ZIKV infection within the existing system may have financial implications and may not be very attractive as ZIKV infection is a mild infection and may not gain political support from the government.
- Monitoring and supervision of the system would be critical if benefits need to be accrued from such systems for surveillance of ZIKV infection.
- Financial requirements for establishing such systems at intermediate and lower levels may outweigh the benefits if not properly planned and implemented.
- Intersectoral and private sector collaboration to support the enhancing of surveillance for ZIKV would also be a challenge.
- The limited capacity of the health workforce in resource-limited settings may inhibit full operationalization of such surveillance strategies for ZIKV infection.

3. Conclusions

The workshop concluded with a plan to roll out the framework after revising it in line with the consensus reached in the meeting and the revisions/suggestions proposed.

The participants of the meeting considered that the concept, design and implementation of an early warning system for ZIKV infection in the Region would very much depend on how effectively the countries used the syndromic-based surveillance approach in combination with the routine disease surveillance system and the event-based surveillance system. The event-based system would be an adjunct to the countries' existing systems for monitoring and detection of the threat from ZIKV infection in situations where both the syndromic

and the routine disease surveillance systems of a country fail to pick up any cluster or cases of ZIKV.

Finally, the participants discussed the priorities for rolling out the strategic framework, which included:

- conducting rapid situation analysis and operational feasibility for establishing syndromic- and event-based surveillance systems for ZIKV within the existing disease surveillance systems;
- setting up steering committees at the ministries of health to support roll-out;
- establishing sentinel-based syndromic surveillance sites after conducting entomological risk mapping.

4. Recommendations

To WHO

1. The draft “*Strategic framework for establishing syndromic- and event-based surveillance for ZIKV infection*” should be finalized by mid-December 2016 in line with the revisions suggested to the draft, and after collating other comments from the participants after the meeting.
2. Convene an expert consultative meeting, tentatively in January 2017, to peer review the framework once it is finalized.
3. Follow up with the high risk countries such as Sudan, Pakistan and Yemen for transmission of ZIKV on their plans to enhance early detection of ZIKV infection and other epidemic arboviruses through rolling out the strategic framework.

The image features a minimalist, abstract design composed of several rectangular blocks of color. A large teal block occupies the top right and bottom right portions. A grey block is positioned in the top left. A horizontal grey band runs across the middle. A dark grey block is located in the bottom left. The bottom of the image is a solid grey bar containing white text.

World Health Organization
Regional Office for the Eastern Mediterranean
P.O. Box 7608, Nasr City 11371
Cairo, Egypt
www.emro.who.int