

Report

Pakistan Expert Consultation on ZIKA Virus



**World Health
Organization**

WHO Country Office, Islamabad, Pakistan

Zika virus infection caused by the bite of an infected Aedes mosquito has recently been declared a Public Health Emergency of International Concern (PHEIC) by WHO due to the suspected correlation with the recent cluster of microcephaly and other neurologic disorders reported in Brazil [1].

The infection itself is either asymptomatic or presents with mild fever, rash, conjunctivitis, and muscle pain [2].

The emerging situation has enhanced potential concern for Pakistan, due to the abundant presence and favorable environment for vector (*Aedes Egypti*) breeding; gaps in surveillance and reporting systems including dearth of baseline data on microcephaly and GBS.

Country Office, Pakistan has been vigilant and supporting the Ministry of NHR&C in closely monitoring the escalating global situation on ZIKV. A joint statement had previously been issued on 29th January 2016 in this regard (Press Statement: Annex 1) to impart general awareness on the disease through scientifically correct information.

An expert consultation was another step to systematically assess the potential implications of ZIKV for Pakistan. The purpose was to discuss and deliberate on the technical and operational aspects of preparedness and response, standardization of SOPs, surveillance protocols towards eventual development of a national contingency plan.



¹ Zika Situation Report: Neurological syndrome and congenital anomalies. Geneva, World Health Organization, 2016 (<http://www.who.int/emergencies/zika-virus/situation-report/5-february-2016/en/>, accessed 11 February 2016)

² Zika facts sheet. Geneva, World Health Organization, 2016 (<http://www.who.int/mediacentre/factsheets/zika/en/>, accessed on 11 February 2016).

The expert consultation on ZIKV technically and financially supported by the WHO, was presided by the Minister of State, Ministry of National Health Services Regulations & Coordination on 12th of February, 2016 (Agenda: Annex 2). A select group of experts (Participants: Annex 3) representing the clinical, MNCH, labs and diagnostics, entomology, risk communication and implementation aspects discussed and deliberated on the technical and operational aspects of preparedness and response to Zika virus in Pakistan (Proceedings Annex 4).



The discussion established that currently there is no case of ZIKV infection in Pakistan; however, the potential risk to the spread of ZIKV is high owing to the presence of the vector and favorable climatic and social conditions. The considerable capacities and experience developed and established in Pakistan for vector and disease surveillance for Dengue should be used for responding to ZIKV. The considerable knowledge on ZIKV in Pakistan can be consolidated to create a resource repository in the country.

There is need for clear case definition for diagnosis and clinical management and building requisite lab and diagnostic capacities. A committee of experts may review the WHO guidelines to develop a working case definition for ZIKV particularly in the context of Pakistan. Support of WHO will be required for strengthening of laboratory capacity for testing of Zika Virus in the country including recommendations for finalization of a testing algorithm for ZIKV infection.

However, the focus and concern remains on strategizing the response to the serious neurological complications of microcephaly and GBS. The districts/hospitals (OBGYN & Pediatrics) should register and share monthly data on microcephalic births; in the absence of historical data this could serve in providing basis for monitoring of trends.

Risk communication is particularly important for the travelers coming from the ZIKV affected areas and aspect of pregnancy. Rio Olympics in 2016 pose special consideration in terms of imparting knowledge and awareness on personal protection amongst the athletes and officials. There is additional

likelihood that informed decision making may be subsequently required for participation of the Pakistan contingent in the Rio Olympics.

The deliberations during the expert consultation concluded in the following recommendations:

- There should be no vertical approach and ZIKV response should be built on the available resource especially those established and mobilized for Dengue;
- The main concern is the neurological complications for which collection of baseline data on GBS and microcephaly is critically required; use of AFP Polio data will be considered for screening for GBS;
- Government has to take lead for risk communication and run the story line, instead of the media to avoid creating panic. In this regard, a technical inter-institutional committee will be constituted for addressing risk communication by the Ministry;
- A subcommittee to be notified comprising of representation of the Ministry, Sports Department and WHO to finalize advice for Olympic squad and ensure knowledge sharing and orientation sessions for awareness on ZIKV for the players and Olympic delegation;
- There is no methodology to quantify risk assessment as yet, and we need to work on this aspect. The Regional Office, WHO is fielding a review mission in this regard, which will visit Pakistan from 16th-19th Feb 2016. The mission in addition to learning from the experience of responding to the dengue outbreaks in Punjab will also;
 - Review the entomological surveillance of the Aedes vector in the country; and
 - Identify the main challenges and priority actions to enhance preparedness and response to potential Arboviral outbreaks.
- Specific travel advisory should be issued on ZIKV;
- A follow up second consultative meeting along with the EMR review mission report should support and lead to national decision making as an outcome; and,
- A response mechanism for incident management system needs to be established with notification of a team/ authority with specific responsibilities for requisite coordination at the Federal and Provincial levels; and,
- The challenge may be taken as an opportunity to address the gaps and needs towards developing optimal preparedness and response capacities throughout Pakistan.



Annex 1



PRESS RELEASE ON ZIKA FEVER AND ZIKV



The Ministry of National Health Services Regulation and Coordination jointly with the World Health Organization in Pakistan is alive and monitoring the situation following reports of Zika Virus cases in Latin America. It is critical that scientifically sound information is available to the people so as to avoid any misconceptions.

The health authorities of Pakistan are very much aware of the current global health security debate around the Zika virus, and are carefully monitoring any implication for Pakistan. At this stage, there is no case of Zika fever in Pakistan to date, and the risk for such outbreak is not significant.

Given the closeness between Zika and Dengue virus, the collective and individual prevention measures for both viruses are strictly identical. Any effective action against dengue is an equally effective action against Zika.

Pregnant women have the same risk as the rest of the population of being infected with Zika virus. The transmission from the mother to her child during pregnancy or at the time of delivery remains unproved.

Zika fever is a mosquito-borne viral disease caused by Zika virus (ZIKV), which manifests itself with moderate fever, skin rash, headaches, joints and muscle pain or soreness, fatigue, red eyes. ZIKV is a close parent of Dengue virus and is transmitted by the same mosquito, the *Aedes Aegypti*.

Zika virus holds its name from the area where it has been first discovered in 1947, the Zika forestry area in Uganda. It has then been occasionally observed in Africa, Asia, and the Pacific. The virus has been first notified in the Americas by the Chilean health authorities in March 2014 and on a higher scale in Brazil since October 2015. The reason why the Zika fever has received global attention is for its alleged, yet unproved, association with severe birth defect from infected pregnant women and with an impairing neurological disorder called Guillain-Barre Syndrome.

WHO and MNHSR&C are neither recommending any restriction on travel or international trade, nor imposing any sort of screening measures of entering symptomatic travellers at ports of entry in Pakistan.

The MNHSR&C is ensuring optimal level of preparedness in accordance with Pakistani obligation towards the International Health Regulation (IHR).

MNHSR&C and WHO, PAKISTAN reaffirm the importance of adequately interpreting the globally reported information on ZIKV in the national context to avoid creating anxiety and concern among the people of Pakistan. It is important to settle on evidence based information and not generalize concepts which have yet to be scientifically validated.

Annex 2

Agenda: Expert Consultation on Zika Virus

12th February, 2016

Committee Room Ministry of National Health Services Regulations & Coordination (NHSR&C)

Time	Agenda Item	Presenter/ Facilitator
09:30-10:00 am	Registration of Participants	
10:00-10:05 am	Recitation of Holy Quran	
10:05-10:10 am	Introduction of Participants	
10:10-10:20 am	Welcome Remarks	Minister of State, M/o NHSR&C
10:20-10:30 am	Objective of the Meeting	DG Health M/o NHSR&C
10:30-10:45 am	Overview on Zika Virus: <ul style="list-style-type: none"> • General Virology • General Transmission & Pathology • Global Context 	WHO
10:45-11:00 am	Implications of Zika Virus in Pakistan: <ul style="list-style-type: none"> • Risk Assessment • Comorbidity with Dengue • Forecast based on Dengue transmission 	ED NIH/ IHR Focal Point
11:00 am-12:00 noon	Discussion on Thematic Areas with Recommendations: <ul style="list-style-type: none"> • Standard Operating Procedures for case notification and case definition/ guidelines; • Surveillance protocols • Laboratory diagnostics & logistics requirement • Interprovincial Coordination • Risk Communication 	Facilitated Discussion
12:00-12:15 pm	Way Forward/ Comments	M/o NHSR&C/ WHO
12:30 pm	Vote of Thanks	M/o NHSR&C

Annex 3

List of Participants

1. Ms. Saira Afzal Tarar, Minister of State, Ministry of NHR&C
2. Mr. Muhammad Ayub Sheikh, Secretary, M/o NHR&C
3. Dr. Assad Hafeez, Director General Health, M/o NHR&C
4. Dr. Michel Thieren, WR, WHO Country Office, Pakistan
5. Dr. Farnaz Malik, ED, NIH, M/o NHR&C
6. Dr. Minhaj us Siraj, DDG health, CADD
7. Dr. Muneer Mangerio, DG NHEPRN, M/o NHR&C
8. Dr. Sohail Zaidi, Chief Virologist, NIH, Islamabad
9. Dr. Shahzad, Molecular Biologist, NIH, Islamabad
10. Mr. Mazhar Nisar, Director Implementation, M/o NHR&C
11. Dr. Sabeen Afzal, Deputy Director Program, M/o NHR&C
12. Dr. Irfan Tahir, Health Officer, Islamabad Airport
13. Mr. Mukhtar, Entomologist, DOMC, Islamabad
14. Dr. Mohammad Hayat, Director Public Health/ IHR, FP
15. Dr. Asim Altaf, IHR Focal Person/ ADHS(CDC), Punjab
16. Dr. Muhammad Tahir, DHO, Islamabad
17. Dr. Muhammad Najeeb Durrani, Epidemiologist and ADHO, ICT
18. Prof. M Ashraf Sultan, Pediatrician and Infectious Disease Expert, Lahore
19. Dr. Muhammad Saleem Rana, Professor of Medical Entomology and Parasitology CSPH, Lahore
20. Dr. Tamkeen Ghafoor, FELTP, Islamabad
21. Dr. Najma Javed, FELTP
22. Dr. Fauzia Bashir, FELTP
23. Dr. Farhat Parveen, Associate Professor, Gyne/Obs, PIMS
24. Dr. Ejaz A. Khan, Consultant Pediatrician and Infectious Disease Expert, Shifa, Hospital, Islamabad
25. Dr. M. Usman, Consultant Microbiologist, Shifa Hospital, Islamabad
26. Ms. Shazia Ejaz, AD (Women Cell), Pakistan Sport board, Islamabad
27. Dr. Shaheen, Medical Office, Olympic Association of Pakistan
28. Dr Rahim Agha, FSO, WHO
29. Dr Saeed Gul, DD(RH), DGHS KP
30. Mr. Mohammad Ali, Surveillance Coordinator, NEOC, PEI, M/o NHR&C
31. Dr. Ayesha Rasheed, Sr. Health Advisor, DFID, Islamabad
32. Dr. Tania Glodner, Chief of Health Section, UNIOCEF country office, Islamabad
33. Dr. Outbudddin Kakar, NPO MCE/ NTDs, WHO country office, WHO
34. Dr. Lamia Mahmoud, MNCH Officer, WHO
35. Dr. Farah Sabih, NPO GHI, WHO
36. Dr. Jamshaid Ahmed, WHO, Lahore
37. Ms. Maryam Younus, Communications Officer, WHO

Annex 4

Proceedings and Discussion

Meeting started with recitation of the Holy Quran followed by introduction of the participants.

The Minister of State in her welcome remarks thanked all the participants, and emphasized that the M/o NHR&C is closely following the global situation. A joint statement with WHO has been issued to impart general awareness on Zika through scientifically correct information. Zika has been designated as public health emergency in view of its link with severe birth defects. There is clear need of extreme vigilance and close monitoring owing to the fact that dengue and Zika caused by the same mosquito which is abundant in Pakistan. The Ministry in partnership with provincial health departments and technical partners is taking necessary measures for prevention and control of the potential spread of Zika in Pakistan. The expert consultation is the first step in this regard to systematically assess the potential implications, establishing Standard Operating procedures (SOPS) and develop national contingency plan.

Dr. Assad Hafeez, Director General Health, M/o NHR&C shared the objectives and expected outcome of the meeting. The identified group of relevant experts will deliberate on the technical and operational aspects of preparedness and response to Zika virus in Pakistan. The expected outcomes of the consultation include endorsement of Standard Operating Procedures for case notification and case definition/ guidelines; development of contingency plan for case management; plan for surveillance and development of risk communication strategy.



Dr Jamshaid on behalf of WHO presented a detailed overview on Zika virus (WHO Presentation: Annex 5) in terms of the virology, transmission and pathology and the global context leading to the categorization of public health emergency of international concern. The apprehension in Pakistan is due to abundant presence and favorable environment for vector breeding; lack of immunity in the population against ZIKV; no surveillance/reporting system for microcephaly; presence of Zika Virus in South & South East Asia; and the upcoming Rio Olympics in 2016.

Dr Farnaz Malik, ED National Institute of Health (NIH) presented implications of Zika virus in Pakistan, particularly in the context of favorable climatic conditions conducive to the growth of *Aedes aegypti* which is the common vector for both Dengue and Zika virus. The clinical symptoms are nonspecific and same as for any viral infection. Diagnosis can be made on PCR (Polymerase Chain Reaction). NIH is currently in the process of developing the assay for which support has been requested from WHO. Once control is available NIH will have the capability to diagnose Zika virus.

The Director General Health, M/o NHR&C opened the forum for discussion. The expert consultation was undertaken according to the six defined areas in relevance to the need for prevention and control of ZIKV in Pakistan. He commended the participation of relevant technical experts representing clinical/MNCH areas, lab and diagnostics, entomology, risk communication and implementation. DG also stated that the expected outcomes of the consultation will include a) case definition and mechanism to define case definition; b) adaptation of SOPs; c) contingency plan; d) surveillance; and e) risk communication.

Dr. Ejaz of Shifa Hospital commentate that Zika has very nonspecific symptoms which make it difficult to diagnose, however, travel history can be considered for suspecting the infection. Lab diagnostics will also be an issue. WHO case definition is fine, however, common causes and travel history will be more supportive. In this regard, awareness in the clinicians will be very important so that they are alert to the possibility of ZIKV infection in the patients.

Prof. Ashraf Sultan, infectious disease expert, stressed that the primary focus should remain on the disease and case definition as compared to the complications of ZIKV. The probable diagnosis can be made on the basis of suggestive symptoms, travel history and link to serology. In this regard, surveillance of travelers from affected areas is crucial. Even though fortunately there are no direct flights to Pakistan from Latin America; however, the convergence of travelers and carriers in Thailand can pose a risk due to direct flight. Like dengue, the disease tends to spread first to cosmopolitan cities and then urban to rural. The cycle takes 15 years to become endemic. The role of the Airport health authorities is very critical in this regard, and completion of yellow fever card should be ensured. He further proposed that a mechanism of surveillance dashboard at all ports of entry should be imposed.

Dr. Farhat Parveen, Associate Professor Gynae/obs, PIMS emphasized the need for different controls during pre- pregnancy and pregnancy period. Microcephaly is rare in Pakistan for which folic acid deficiency is the major causative factor. The TORCH syndrome can be manifested as neurological and birth defects including microcephaly. The ultra-sonographic diagnosis is only possible after the first or second trimester of pregnancy. The rather late diagnostic confirmation and the feasibility of advising pregnancy termination is a sensitive issue. There is also need to look at existence of coinfections which can result in augmentation of disease effects. Enhanced vigilance in terms of awareness of clinicians and health care providers and diagnosis is required. In Pakistan inter-cousin marriages are very common so detailed family history should be taken in

case of microcephaly. Awareness of clinicians is required to ensure enhanced vigilance for diagnosis of ZIKV.

Dr. Najeeb Durrani, Epidemiologist/ADHO, ICT informed that epidemic can quickly become pandemic therefore focus should be on vector control and surveillance, risk communication, capacity building and clinical case management. Strict vigilance is needed to identify index case at port of entry and there should also be quarantine facilities.

Dr. Michel Thieren, WHO Representative, commented that although much information about the disease was not available, however, an increase in number of cases has recently been reported in Brazil. Since any country with similar climatic condition is prone to Zika virus transmission, therefore, focus should be on travelers. It is an evolving condition on which queries and discussion will continue until more clarity is scientifically established on the association with neurological complications. The Regional Office is organizing an expert consultation in Morocco in the next two week where Pakistan can further discuss this issue and share recommendations of this meeting. Furthermore, a review mission is also coming to Pakistan to assess the capacity for prevention and control of Zika in Pakistan. Mission will visit Punjab and findings will be shared with the government and other stakeholders.

Dr. Jamshaid Ahmed, WHO Sub Office, Punjab emphasized the need for surveillance on four areas a) diagnosis through case definition; b) examining trends of neurological complications (GBS & microcephaly) through analysis of relevant data collected and compiled in the last five years; c) vector surveillance for which Punjab has developed an online dash board; and d) surveillance of travelers coming from ZIKV affected areas/regions.

Dr. Ashraf Sultan emphasized that for preventive measures on ZIKV, the government should only focus on three areas of: a) issuance of travel advisory in line with IHR 2005; b) one entity to deal with all vectors borne diseases; and, c) Risk communication to only focus on the travelers instead of a mass campaign. He also emphasized that perhaps more consideration should be given to the scientifically established association of birth defects following mumps & rubella infections for which a vaccine is available for the last 15 years.

Dr. Saleem Rana stressed on careful data review as there seems to be a gap between case identification and case notification. There is also need to create post of medical entomologist which is expected to become considerable requirement in the near future.

Dr. Qutbuddin Kakar, NPO WHO, Islamabad underlined the importance of surveillance, implementation of integrated vector management guidelines with maintenance and review of traveler record. He also proposed revival of Medical Entomology course which was initiated by the Health Services Academy, Islamabad.

Mr. Mukhtar, Entomologist, DOMC, informed that the Malaria Directorate has already developed guidelines for control of vector borne disease of public health importance in Pakistan. Risk mapping for vector has also been completed. In addition, a meeting to discuss in details all the aspects of vector borne disease will be held with all provincial counter parts and stakeholders next week. Another important aspect of consideration is the resistance level of the vector as several insecticides are in use. In this regard, allocation of resource from Global Fund grant for short term diploma courses to develop required capacity can be considered.

Dr. Shaheen, representing JS Sports, IPC enquired on the precautions and advice for the large contingent of Pakistani athletes and officials expected to attend the August 2016 Rio Olympics in Brazil. WR responded that the contingent should be given awareness and knowledge on ZIKV and stress on taking measures for personal precaution. He expected subsequent question on participation. The decision whether to participate or not is beyond this group, however informed decision needs to be made. WR proposed establishment of a small technical group by the Olympic Association Pakistan for liaison with M/o NHSR&C in this regard.

Dr. Sohail Zaidi, Principal Investigator/ Virologist, NIH stated that previously only one case was reported in 1983 in the country. The currently available data indicates no case has been detected in the EMRO region including Pakistan, which is an evidence of absence of virus circulation in the country. Moreover, Pakistan has very good surveillance system for dengue and same resources can be used for Zika.

Dr. Zaidi also stressed on avoiding media hype on ZIKV for which awareness & risk communication workshop may be arranged for media personnel. Health education material can be developed and circulated among health care providers specially taking the advantages of low transmission season. There are many viruses with similar clinical symptoms making it difficult to diagnose. Therefore, the available WHO case definition should be widely circulated for the clinicians and HCP. In addition, the seven sentinel sites of NIH across Pakistan can be utilized for surveillance and data collection. In this regard, WHO can support the requisite technical training of medics and laboratory personnel. There is strong possibility of cross reactivity on serological testing which is why commercial test kits are not available. The diagnostic detection can be made on PCR which can either be conventional or real time. In this regard, NIH is prepared and in the process of developing assay with the support of WHO.

Dr. Usman, Microbiologist, Shifa Hospital stated that serological examination despite its limitations has value and can exclude dengue. Also Zika can be tested on the dengue negative cases; the pooled sera can be used for conducting PCR diagnosis.

Dr. Tamkeen Ghafoor, FELTP informed that FELTP is currently in process of collecting data on genetic anomalies and GBS and will have some baseline data within a month.

Dr. Agha Coordinator AFP Polio Surveillance informed that Polio program has complete data of all AFP cases which can be analyzed for detection of GBS cases. There are polio eradication officer in the EDO/DHO office which report each case and send stool sample for examination. Orientation of health care provider is needed so that each case should be reported to EDO/DHO office.

Dr. Irfan Tahir, Airport Health Officer Islamabad Airport outlined the steps taken at the airport for surveillance, which includes public declaration forms for travelers, information from airlines, immigration desk awareness of functionaries and passengers. However, Civil Aviation Authority (CAA) has received a court order for not collecting the declaration form. In this regard, the Ministry is in close contact with CAA for details and will take action accordingly.

Mr. Mazhar Nisar, Director Implementation said that although we don't have a case but threat is imminent. As it is an evolving situation, spread of rumor has to be avoided and dissemination of correct information ensured to gain public trust through unified approach and single narrative. In this regard, an inter-institutional committee may be formed for risk communication.

Dr. Tania Goldner, Chief of Health, UNICEF expressed that the many lessons learnt for Ebola risk communication can be applied now. Rumors have to avoid so no public panic is created. Risk communication should have three components public awareness and provision of basic correct information, community mobilization especially for travelers and pregnant women whose spouse are frequent travelers and awareness of health care providers at all levels.

Dr. Muneer Mangerio, DG NHEPRN informed that National Epidemic plan has been developed to address any situation to address ZIKV.

Dr. Ayesha Rasheed, Health Specialist, DFID said that if requested and needed Public health UK can be taken on board for advice.

Recommendations

The following recommendations were agreed by the participating experts after the detailed deliberations undertaken during the meeting:

1. There should be no vertical approach and ZIKV response should be built on the available resource especially those established and mobilized for Dengue;
2. The main concern is the neurological complications for which collection of baseline data on GBS and microcephaly is critically required; use of AFP Polio data will be considered for screening for GBS;
3. Government has to take lead for risk communication and run the story line, instead of the media to avoid creating panic. In this regard, a technical inter-institutional committee will be constituted for addressing risk communication by the Ministry;
4. A subcommittee to be notified comprising of representation of the Ministry, Sports Department and WHO to finalize advice for Olympic squad and

- ensure knowledge sharing and orientation sessions for awareness on ZIKV for the players and Olympic delegation;
5. There is no methodology to quantify risk assessment as yet, and we need to work on this aspect. The Regional Office, WHO is fielding a review mission in this regard, which will visit Pakistan from 16th-19th Feb 2016. The mission in addition to learning from the experience of responding to the dengue outbreaks in Punjab will also;
 - a. Review the entomological surveillance of the Aedes vector in the country; and
 - b. Identify the main challenges and priority actions to enhance preparedness and response to potential Arboviral outbreaks.
 6. Specific travel advisory should be issued on ZIKV;
 7. A follow up second consultative meeting along with the EMR review mission report should support and lead to national decision making as an outcome; and,
 8. A response mechanism for incident management system needs to be established with notification of a team/ authority with specific responsibilities for requisite coordination at the Federal and Provincial levels; and,
 9. The challenge may be taken as an opportunity to address the gaps and needs towards developing optimal preparedness and response capacities throughout Pakistan.

Director General Health M/o NHR&C in his concluding remarks thanked all the participants for their valuable inputs. He further reinstated that the Ministry is fully committed to meet the potential challenge with timely and coordinated efforts and invaluable support of the provincial DOH and technical partners. The report of this expert consultation will be circulated for follow up and further action.

Meeting ended at 1:30 pm with vote of thanks.

Annex 5

Presentation by World Health Organization: An Overview on Zika Virus

Expert Consultation on Zika Virus World Health Organization

12th February 2016



Outline

- Introduction
- General Virology
- Transmission & Pathology
- Global Context
- Why the Concern in Pakistan?
- Global Response Strategy
- Recommendations



Zika Virus Infection

- **Emerging mosquito-borne infection**
- **Virus** first identified in Uganda in 1947 in rhesus monkeys;
- **Humans in 1952** in Uganda and the United Republic of Tanzania;
- **Tropical Area Occurrence** with large mosquito populations (Africa, the Americas, Southern Asia and Western Pacific);
- **Previous Outbreaks** recorded in Africa, the Americas, Asia and the Pacific;
- **33 countries** have reported circulation of Zika virus between January 2014 and 5 February 2016.

Countries with Active Transmission of ZIKV



Why ZIKV is a Public Health Concern

- Reported increase in cases of **Microcephaly** and **Guillain-Barré Syndrome** concomitantly with a Zika virus outbreak in 7 Latin American countries;
- Declared **Public Health Emergency of International Concern on 1st Feb 2016** due to the recent cluster of microcephaly and other neurologic disorders reported in Brazil.

Virology

- Zika virus (ZIKV) is an RNA virus- a member of the Flaviviridae virus family and the Flavivirus genus
- There are two lineages of Zika virus:
 - African lineage
 - Asian lineage
- Sudden spread attributed to the ability of viruses to mutate very fast

Transmission

- Bite of an infected mosquito mainly *Aedes aegypti*
- Same mosquito that transmits dengue, chikungunya and yellow fever
- Other modes of transmission still under investigation (vertical transmission from mother to fetus, through blood or sexual contact).
- Also isolated from a number of other species of *Aedes* genus

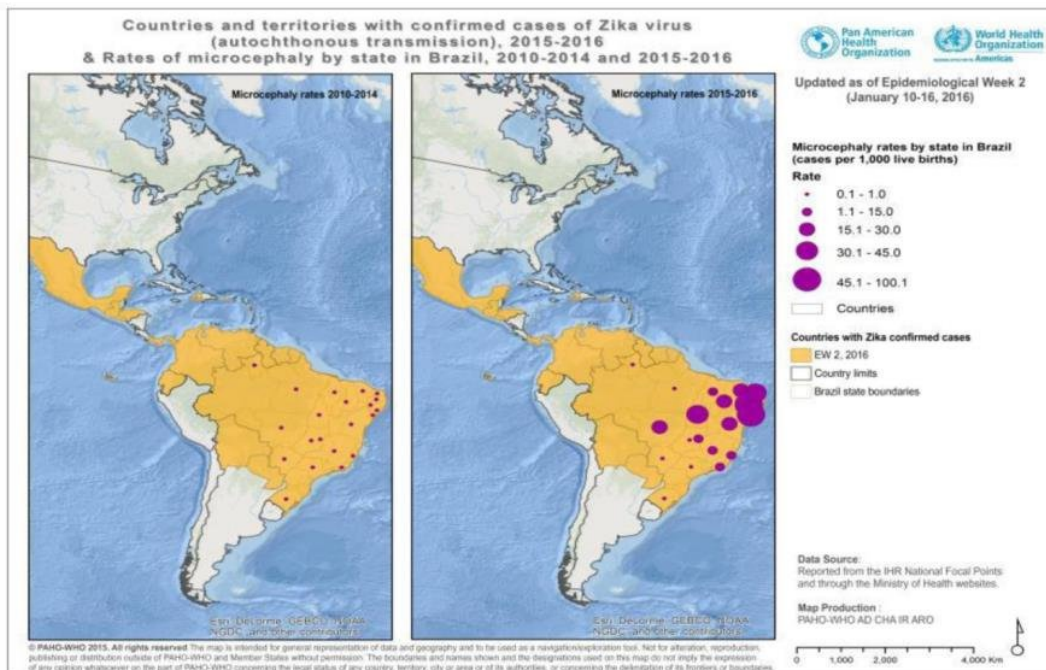


Signs & Symptoms

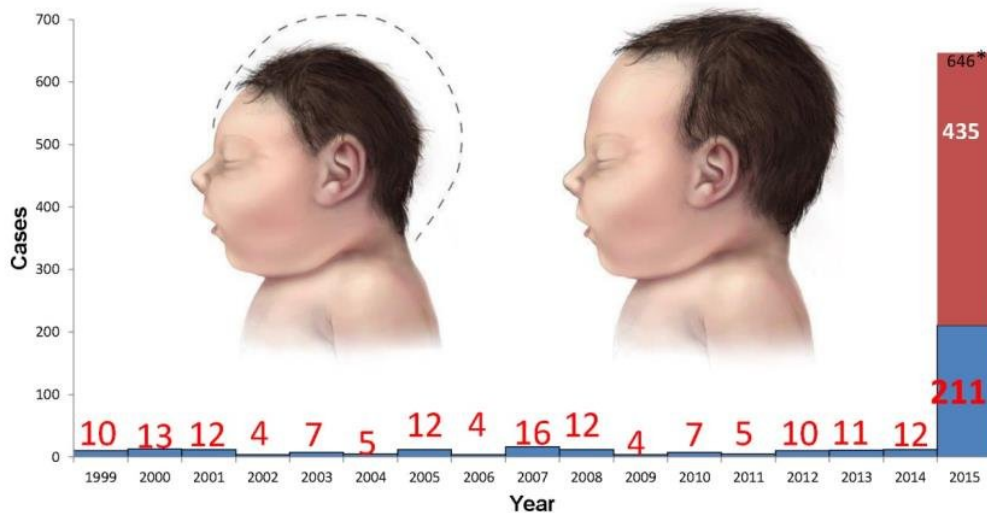
- **Incubation period** is usually 3-12 days
- **Only one in five persons** infected with Zika will develop symptoms
- ZIKA Virus fever is **usually mild** and lasts 2-7 days, with symptoms similar to other arbovirus infections such as dengue:
 - fever, skin rashes, conjunctivitis, muscle and joint pain, malaise, and headache
- Severe disease requiring hospitalization is uncommon

Complications of ZIKV

- Neurological & Autoimmune
- Only observed during large outbreaks in French Polynesia and Brazil in 2013 and 2015 respectively
- Recently in Brazil, local health authorities have observed an increase in Zika virus infections in the general public as well as an increase in babies born with **microcephaly**
- **Guillain-Barré Syndrome**
- **Other rare neurological syndromes** (meningitis, meningoencephalitis and myelitis)?
- Deaths are rare.



Microcephaly cases, Pernambuco, 1999-2015



Fuente: Sinasc and Notification to SES-PE

(*) Microcephaly notifications, up to Nov 28, 2015 Note: blue < 32 cm, red 32-33 cm

Diagnosis

- Clinically suggestive infection where dengue has been ruled out is recommended for ZIKA diagnostic testing
- Diagnosis by **PCR** (polymerase chain reaction); virus isolation from blood samples (during the **first 5 days** after the establishment of the clinical picture)
- The **serological tests** (ELISA or immunofluorescence) to detect specific IgM or IgG against Zika virus can be positive after 5 to 6 days following the onset of symptoms
- Diagnosis by serology can be difficult as the virus can **cross-react** with other flaviviruses such as dengue, West Nile and yellow fever

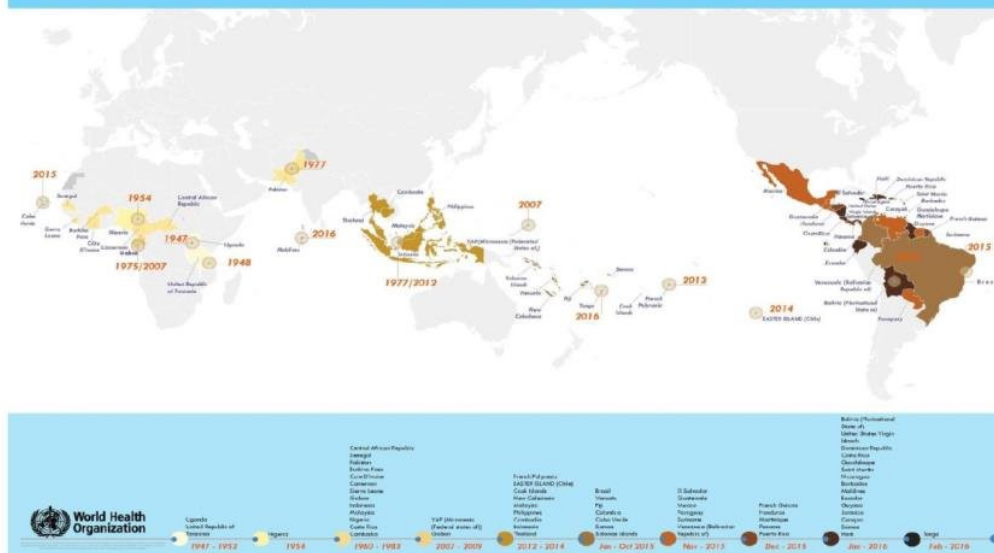
Treatment

- **No specific treatment required** as the disease usually mild
- Plenty of rest, enough fluids and treatment of pain and fever with common medicines (such as paracetamol).
- Aspirin and other non-steroidal anti-inflammatory drugs should be avoided
- **No vaccine** is currently available.



Global Context of Zika Virus Infection

Countries and territories showing historical time-line of Zika virus spread (1947 - 2016)



Global Context of Zika Virus Infection

- Expanding global distribution of *A. aegypti* due to trade and travel
- Most extensive ever recorded across all continents
- From 1951 through 1981 human ZIKV was reported from some African countries and in parts of Asia
- In 2015 and 2016, the geographical range of Zika virus has been increasing significantly.
- Currently, the total estimated no of cases of current outbreak are 1.6 m+ of which 1.5 m are reported from Brazil
- Projection: as many as four million people could be infected by the end of the year.

Global Context of Zika Virus Infection

Countries and territories with autochthonous transmission of Zika virus, 2007 – 2016

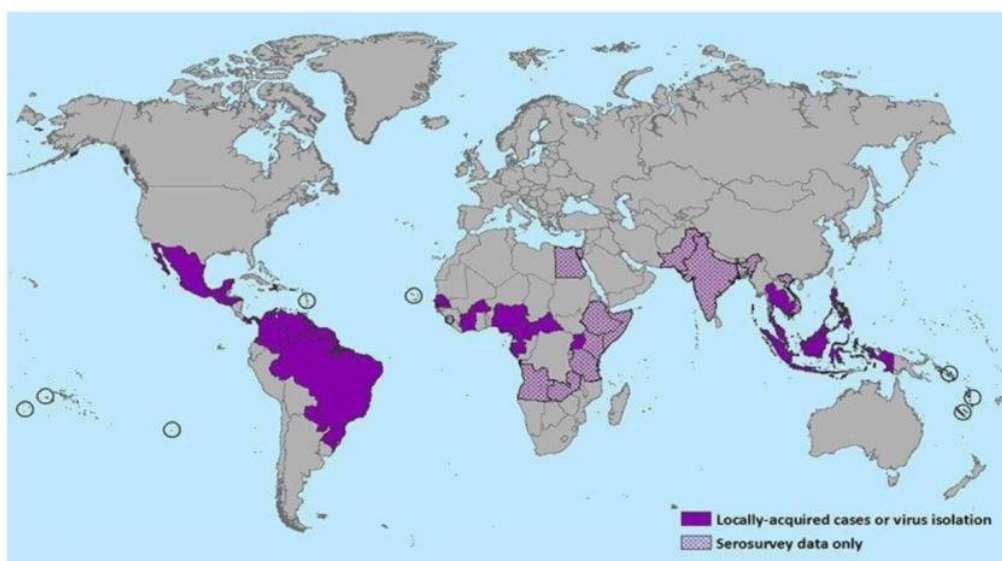
	WHO Regional Office	Country or territory
Reported autochthonous transmission	AFRO	Cape Verde
	AMRO/PAHO	Barbados, Bolivia, Brazil, Colombia, Curaçao, Costa Rica, Dominican Republic, Ecuador, El Salvador, French Guiana, Guadeloupe, Guatemala, Guyana, Haiti, Honduras, Jamaica, Martinique, Mexico, Nicaragua, Panama, Paraguay, Puerto Rico, Saint Martin, Suriname, United States Virgin Islands, Venezuela (Bolivarian Republic of)
	SEARO	Maldives
	WPRO	Fiji, Tonga, Samoa, Solomon Islands, Vanuatu
Indication of viral circulation	AFRO	Gabon
	SEARO	Indonesia, Thailand
	WPRO	Cambodia, Philippines, Malaysia

Previously affected countries include Cook Islands, French Polynesia, New Caledonia, Yap & Easter Island.

Concerns on ZIKV for Pakistan

- Frequent outbreaks of Dengue in recent past
- Abundant presence and favorable environment for Vector (Aedes) breeding
- Population has no immunity against ZIKV
- Lack of surveillance and data for microcephaly
- Presence of Zika Virus in the neighborhood (South & South East Asia)
- Rio Olympics in August 2016

Concerns on ZIKV for Pakistan



Recommendations for WHO Member States

- Multisectoral coordinated approach for Integrated Vector Management
- Partnering and engaging relevant stakeholders and the community
- Detection and monitoring dissemination of virus
 - Laboratory platform implementation and event-based surveillance
- Health services **preparedness** for the management of potential complications including neurological syndromes and birth defects
- Risk communication and public awareness
- Capacity building – clinical, laboratory, vector control and risk communication
- Research & Development

Points for Discussion

- Not every case of microcephaly is Zika
- Zika is not Ebola
- Risk Assessment
- Working case definition?
- Baseline data on microcephaly & GB syndrome
- Main concern of association and implications on with MNCH & Reproductive Health
- Using AFP surveillance for data on GBS

Annex 6

Presentation by Executive Director (NIH) on Zika Virus



ZIKA Virus

Dr Farnaz Malik
Executive Director, NIH

Contents

- Laboratory Diagnostic Testing
- Risk Assessment (Threat) in Pakistan
- Mitigation Measures
- Comorbidity with Dengue Fever
- Forecast Based on Dengue Transmission

Diagnostic Testing for Zika Virus

- **Reverse transcriptase-polymerase chain reaction (RT-PCR) for viral RNA** in serum (collected ≤ 7 days after illness onset)
- **Serology for IgM** and neutralizing antibodies in serum collected ≥ 4 days after illness onset
- **Plaque reduction neutralization test (PRNT)** for ≥ 4 -fold rise in virus-specific neutralizing antibodies in paired sera

Serology Cross-Reactions with Other Flaviviruses

- Zika virus serology (IgM) can be positive due to antibodies against related flaviviruses (e.g., dengue and yellow fever viruses)
- Difficult to distinguish infecting virus in people previously infected with or vaccinated against a related flavivirus

Diagnostic Testing Capacity

No commercial diagnostic test available

Working closely with WHO on Zika virus molecular diagnostic assay

Recommendations for Testing

- **Travelers:**

- Having History of travelling from affected country
 - Having symptoms like Fever, Rash, Joint Pain, Red eye.

- **Pregnant women:**

- History of travel to an area with Zika virus transmission during pregnancy AND :

- Presence of two or more of the following symptoms (acute onset of fever, maculopapular rash, arthralgia, or conjunctivitis) during travel or within 2 weeks of travel

OR

- Presence of fetal microcephaly or intracranial calcification by ultrasound

- **Infants:**

- Having Microcephaly or intracranial calcifications born to women who traveled to or resided in an area with Zika virus transmission while pregnant

- Born to mothers with positive or inconclusive test results for Zika virus infection

Risk (Threat) Assessment in Pakistan

- Zika Virus Disease has not been reported from any country of the Eastern Mediterranean Region (EMRO)

- Risk of Zika virus importation through travelers and then favorable factors in the country that help in local circulation like

- Aedes aegypti* and *Aedes albopictus* mosquitoes are widely distributed

- Rainy season/monsoon –Poor sanitary and hygiene-Increased breeding of the vector

- Poor health infrastructure in rural areas

- The proportion of asymptomatic infections may be as high as 80%. Only a small fraction of Zika virus infections are likely to be laboratory confirmed.

- Risk of Zika virus infection associated substances of human origin –Blood transfusion (reported in French Polynesia, 42 of 1505 (3%) blood donors)

- Lack of people awareness program against different diseases in the community

Mitigation Measure

- **Surveillance of imported cases** (Information to travellers and PAK residents in affected areas)
- **Clinicians** may **include** Zika infection in **differential diagnosis of travelers** coming from infected areas
- ZIKA infection is transmitted by *Aedes* mosquitoes, prevention is based on protection against **mosquito bite and vector control**
- Neither treatment nor vaccines are available, only **personal protection measures** similar to the measures that are applied against dengue and chikungunya infections
- Advise that **pregnant women** consider postponing travel to the currently affected areas
- If travel is unavoidable, they are advised to **practice strict preventive measures** to avoid mosquito bites
- Due to the potential link between Zika infection and neurological and autoimmune complications such as GBS, need of **strengthening surveillance of neurological syndromes for all age groups**
- **Safety of substances of human origin** (Blood Transfusion, Tissue replacement)
- **Information to healthcare** providers
- To establish the Diagnostic capacity in all provinces to confirm suspected ZIKA infections

Comorbidity with Dengue Fever-A Rare Phenomenon

- Zika Virus infection may present along with Dengue and Chickungunya
- No synergistic phenomenon is reported
- Very few reports* of co-infection.

* Co-infection with Zika and Dengue Viruses in 2 Patients, New Caledonia, 2014 Emerg Infect Dis. 2015 Feb; 21(2): 381–382

Forecast Based on Dengue Transmission

What we have to assume is

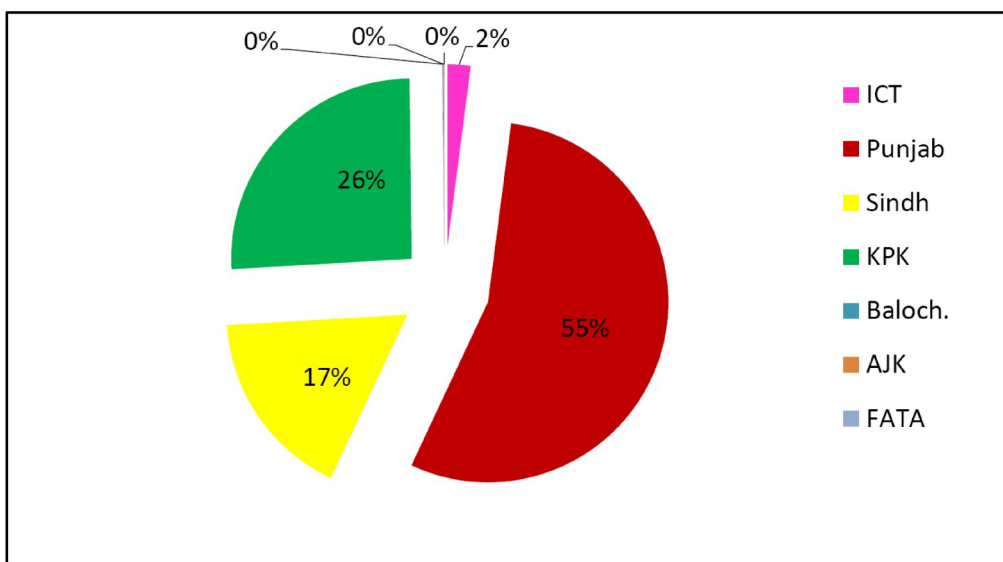
anywhere where we have the Aedes (mosquitoes),
they could have the Zika virus and
we should have the tools to be able to look for it

A **biggest threat** of the spread of this virus is in monsoon season in country

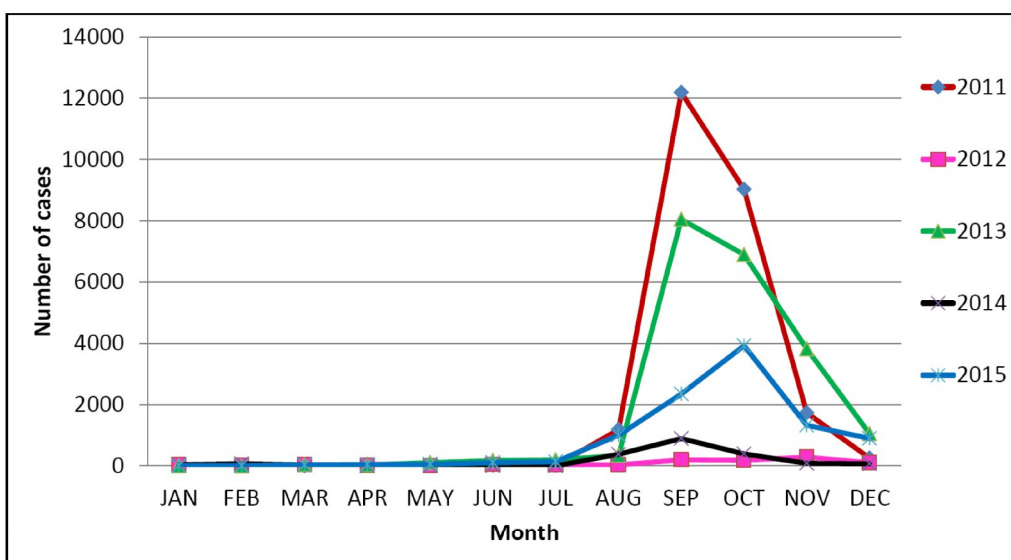
Number of cases and deaths due to Dengue Fever in Pakistan, 2011-2015

Year	Number of Cases	Number of Deaths
2011	24,497	378
2012	809	01
2013	20,710	104
2014	1,991	18
2015	9,899	7
Total	57,906	508

Geographical distribution of Dengue Fever Cases, 2011-2015



Seasonality; Month wise Dengue Fever Cases, 2011-2015



Way Forward

- **Surveillance:** Surveillance of Zika infection should be strengthened along-with other vector-borne diseases
- **Vector control:** WHO recommends controlling mosquito populations to reduce the spread of Zika virus, dengue and chikungunya which are transmitted by the same mosquito
- **Diagnostic facilities:** Strengthening /establishment of diagnostic facilities at Provincial Level
- **Notification/reporting:** In accordance with Article 6 of the IHR, any case of Zika virus infection have to be notified to WHO (IHR/EMRO) including suspected cases with comprehensive reporting of these cases

Way Forward (Contd..)

Travel & Trade:

- WHO does **not** recommend any travel or trade restriction to the Zika affected countries
- As a precautionary measure, some national governments may make public health and travel recommendations to their own populations, based on their assessments of the available evidence and local risk factors