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37th Issue

October 2016 - February 2017

SEASONAL AWARENESS AND ALERT LETTER (SAAL)

For Epidemic-prone infectious diseases in Pakistan
Winter Season

OBJECTIVES OF SAAL

1. To alert concerned health authorities and professionals at all levels about the epidemic-prone infectious diseases in the Winter Season
2. To facilitate the preparations for timely and efficient response to the encountered alerts / outbreaks / epidemics and thus reduce the associated morbidity and mortality.

DATA SOURCES

The last five years (2012-2016) available national data collected by the Disease Early Warning System (DEWS), District Health Information System (DHIS), Provincial Health Departments, Provincial Disease Surveillance & Response Units (PDSRUs), Lab based Influenza surveillance program in collaboration with Field Epidemiology & Disease Surveillance Division (FE&DSD), NIH has been analyzed to see the exhibited patterns of high priority communicable diseases.

The description of all priority diseases has been arranged in alphabetical order. Additionally, under the section of diseases of national concern, technical details on Naegleria fowleri infection are included because of fatal cases encountered in Karachi during 2013-16. Reporting of Zika Virus Infection, Chikungunya virus disease, Middle East Respiratory syndrome Coronavirus (MERS-CoV) infection and Yellow Fever has been shared as Diseases of International Concern.

October 2016 - February 2017		
Outbreak-prone Diseases	**High Alert**	**Medium Alert**
Crimean Congo Hemorrhagic Fever (CCHF)		
Dengue Fever (DF)		
Diphtheria		
Gastroenteritis (Acute)		
Leishmaniasis		
Malaria		
Measles		
Meningoccoccal Meningitis		
Poliomyelitis		
Pertussis		
Seasonal Influenza-A (H1N1, H5N1)		
Typhoid Fever		
Viral Hepatitis (Acute)		

High alert - peak occurrence in the Winter Season

Medium alert - cases will be encountered and may show up as outbreak

CRIMEAN-CONGO HEMORRHAGIC FEVER (CCHF)

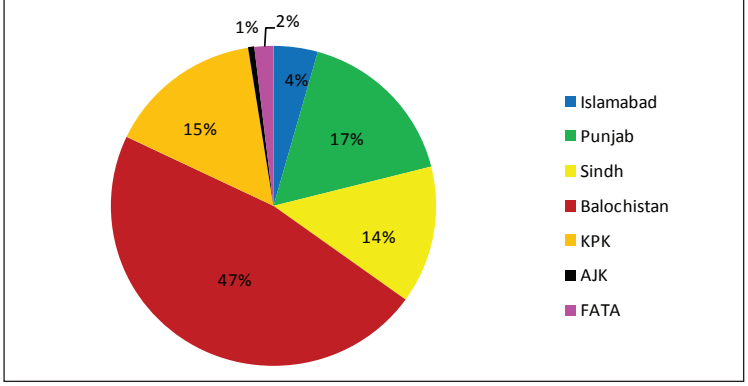
Crimean-Congo Hemorrhagic Fever (CCHF), caused by infection with a tick-borne virus (Nairovirus) in the family Bunyaviridae, is a zoonotic viral disease that is asymptomatic in infected animals, but a serious threat to humans. Human infections begin with nonspecific febrile symptoms, but progress to a serious hemorrhagic syndrome with a high case fatality rate (10 – 40%). It is one of the most widely distributed viral hemorrhagic fevers occurring in parts of Africa, Middle East, Asia and Europe. The occurrence of this virus is correlated with the distribution of Hyalomma spp., the principal tick vectors. CCHF is endemic in Pakistan with sporadic outbreaks. Since the diagnosis of first human case of CCHF in 1976, the sporadic cases have continued to occur across Pakistan.

Nosocomial transmission have been reported frequently in Pakistan and is usually associated with the lack of, or improper use of, personal protective equipment when caring for a patient. It may occur during early contact with healthcare services, before CCHF is recognized in the source patient and appropriate protective measures implemented.

From 2012-2016 a total of 294 cases were confirmed from NIH. Baluchistan remains the most affected province Imported cases from Afghanistan are continuously being reported to the major hospitals of Peshawar, Quetta and Islamabad throughout the year.

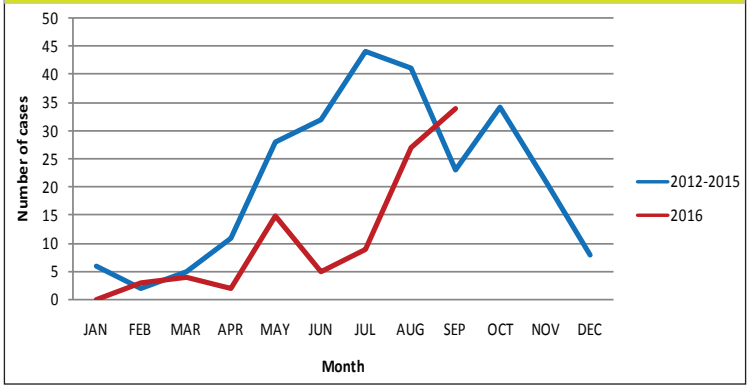
Identified Transmitting Sources: Domestic animals cattle, goats, sheep etc are the usual hosts for the adult ticks. It is transmitted to humans by the bite of a Hyalomma tick; crushing an infected tick with bare skin, exposure to blood or tissue of the infected animal during slaughtering, drinking unpasteurized milk, direct contact with blood or secretions of an infected person and in hospitals due to poor infection control practices. Aerosol transmission was suspected in a few cases in Russia specially while aerosol generating procedures.

Reported CCHF cases by Province/Area in Pakistan, 2012-2016 (n=318)



Seasonal Variation: Monthly reported CCHF cases from January 2011 to December 2015 showed varied trends.

Reported CCHF cases by month in Pakistan, 2012-2016 (n=318)



Natural Process of CCHF

The onset is sudden, with initial signs and symptoms including headache, high fever, back pain, joint pain, stomach pain, and vomiting. Red eyes, flushed face, red throat, and petechiae (red spots) on the palate are common. As the illness progresses, large areas of severe bruising, severe nosebleeds, and uncontrolled bleeding from injection site occur.

Incubation Period

The incubation period ranges from one to 13 days and varies according to the type of transmission and viral load. The incubation period can be shorter with exposure to blood or bodily fluids from a patient with high viral loads at later stages of disease.

After Tick Bite 1 to 3 days, with a maximum of 9 days

Contact with infected blood/tissues 5 to 6 days, with maximum of 13 days

Alert threshold: One probable case is an alert requiring immediate investigation

Outbreak threshold: One lab confirmed case is an outbreak.

Case Definition

Suspected Case:

Patient with sudden onset of illness with high grade fever over 38.5°C for >72 hrs and <10 days, especially in CCHF endemic area and among those in contact with a confirmed patient, suspected sheep or other livestock (shepherds, butchers and animal handlers). Fever is usually associated with headache, muscle pains and bleeding manifestations not responding to antibiotic or anti-malarial treatment.

Probable case:

Suspected case with acute febrile illness lasting 10 days or less AND any two of these: Thrombocytopenia <50,000/mm3, petechial or purpuric rash, epistaxis, haematemesis, gum bleeding, haemoptysis, blood in stool, ecchymosis, other haemorrhagic symptom AND no known predisposing host factors for haemorrhagic manifestations.

Confirmed case:

Probable case diagnosed positive in an especially equipped high biosafety level laboratory and through either of these techniques; Viral RNA detection (RT-PCR) in blood or tissues and virus isolation during 1st week of illness. Confirmation of presence of IgM / IgG antibodies in serum by ELISA from day 7 of illness.

Specimen Collection and Transportation

Collect 5 ml of blood observing strict biosafety precautions and transport serum specimens to the lab in triple packing maintaining cold chain, along with a prominent Biohazard label. A complete history form containing brief clinical, contact and travel history of the patient must invariably accompany the sample, with test request.

Management

Treatment is primarily supportive. Care should include attention to fluid balance and correction of electrolyte abnormalities, oxygenation, hemodynamic support and appropriate treatment of secondary infections. Oral Ribavirin has been used with reported success and maybe taken orally as 2 gm loading dose, 4gm/day in 4 divided doses for 6 days and 2 gm/day in 4 divided doses for 6 days. 1 to 3 days, with a maximum of 9 days

Pregnancy should be absolutely prevented (whether female or male partner is the patient) within six months of completing a course of Ribavirin.

Observed Pitfalls in Health Care Facilities of Pakistan

- In Pakistan, a number of hospital acquired infections have been reported in the past indicative of poor infection control practices
- At times, monitoring of exposed contacts for 2 weeks, is not practiced in health facilities
- Asymptomatic contacts are started Ribavirin & also advised unnecessary lab. tests
- Some healthcare providers do not rule out common bleeding causes before suspecting CCHF

Prophylaxis: Prophylactic treatment with ribavirin has occasionally been used after high-risk exposures. The efficacy for post-exposure ribavirin in the management of CCHF remains anecdotal. However, if ribavirin is used, it should be given in a high loading dose (35 mg/kg orally followed by 15 mg/kg three times daily for 10 days) and only for high-risk settings (eg, needle stick injury, mucous membrane contamination, emergency resuscitative contact, or prolonged intimate exposure during transport).

Prevention and Control Measures of CCHF

At Healthcare Facility-Patients with probable CCHF should be isolated under strict barrier nursing and health workers use PPEs. All contaminated articles should be handled and de-contaminated or disposed off safely.

At community level- Family of CCHF case should be advised to practice standard and contact precautions while caring the patient. In case of death, safe burial practices must be exercised.

Exposed HWs, family and contacts- Those with high risk exposures needle stick, sharps, blood or body fluids contact should be monitored for fever (morning and evening) for 14 days. Once fever develops, patient should be immediately shifted and managed in isolation room.

Treatment of animals- Reduce tick infestation on cows, sheep and goats. Acaricides may be useful on domestic animals if used 10 - 14 days prior to slaughter or to export.

Insect repellents -Acaricides to be used on animals to control ticks, keeping the animals free of ticks for 14 days before slaughter or export. DEET are effective. Wearing protective clothing when working with livestock and correct removal of ticks are also recommended.

DENGUE FEVER

Dengue Fever, caused by any of the four distinct but closely related *dengue virus* (DENV) serotypes (called DENV-1, 2, 3, and 4), is a mosquito-borne viral disease that has rapidly spread in various regions of the world during recent years. Dengue virus is transmitted by female mosquitoes mainly of the species Aedes aegypti and, to a lesser extent, A. albopictus. It is a febrile illness and symptoms appearing 3-14 days after the infective bite. Clinical presentation can range from a mild nonspecific febrile syndrome, to classic dengue fever or "break-bone fever" or in the most severe forms like dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS). More than 20% of cases may be asymptomatic.

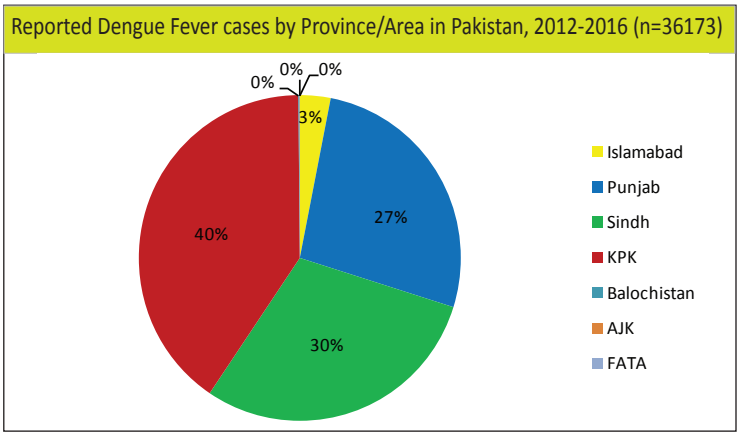
Sources of Transmission

Dengue fever is transmitted by the bites of Aedes aegypti and sometimes A. albopictus. It can't be spread directly from one person to another person. The vector mainly breeds on the surface of clean stagnant water, generally kept open in the buckets, water tanks or leftover in the plant saucers. It stays mainly in door, in cooler and darker places i.e. under the bed, behind curtains etc, and bites around dusk and dawn. Higher temperatures reduce the time required for the virus to replicate and disseminate in the mosquito as well.

Dengue Fever Surveillance

Dengue has emerged as a worldwide problem since 1950 and approximately 400 million people are infected yearly. Globally, the reported incidence of dengue has been increasing. More than one third of the world's population is living in dengue endemic areas and is the leading cause of illness and death in the tropics and subtropics. During 2012-2016, a total of 36,173 cases were reported in Pakistan.

Geographical distribution



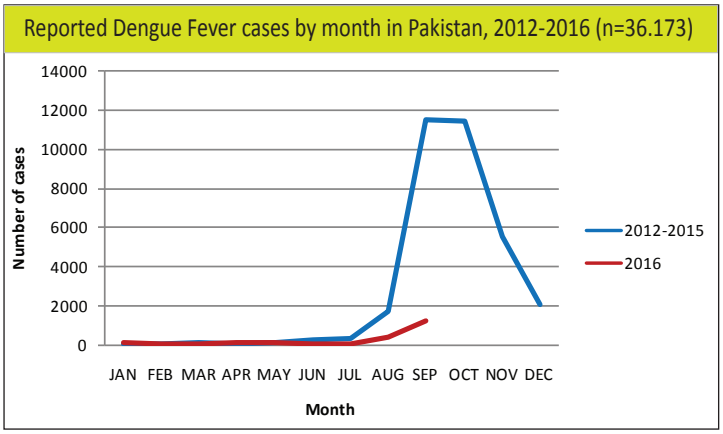
Natural Process of Dengue Fever

In symptomatic cases, the incubation period ranges from 3 to 14 days, symptoms typically develop between 4-7 days after the bite of an infected mosquito. Dengue symptoms ranges from mild to incapacitating high grade fever, with severe headache, retro-orbital pain, muscle and joint pain, and rashes. Severe dengue fever/dengue hemorrhagic fever is characterized by fever, abdominal pain, persistent vomiting, bleeding and breathing difficulty this is a potentially lethal complication, affecting mainly children. The infection causes vascular leakage as well as platelet destruction, which in severe cases, results in thrombocytopenia, bleeding and death.

Epidemiology of Dengue Fever

Seasonal Variation

Cases are increased during and after rainy seasons as compared to winter and summer seasons. Relative humidity and rainy days remained significant predictors of dengue incidence in Pakistan



Case Definitions

- **Suspected case**

Any person with acute febrile illness of 2 - 7 days duration AND two or more of the symptoms like, headache, retro-orbital pain, myalgia, arthralgia, rash, haemorrhagic manifestations and leucopoenia.

- **Confirmed Case**

Any suspected case confirmed by laboratory isolation of virus by PCR or positive Non-structural Protein-1 (NS-1) on days 1 - 6 of illness. IgM sero-conversion in specimens collected >5 days after the onset of symptoms.

- **Suspected Dengue Haemorrhagic Fever**

A suspected or confirmed case of dengue AND any two of these; thrombocytopenia <100,000/mm3, petechial or purpuric rash, epistaxis, haematemesis, haemoptysis, blood in stools, ecchymosis, gum bleeding, other haemorrhagic symptom - AND no known predisposing host factors for haemorrhagic manifestations.

Lab. Diagnosis

Laboratory diagnosis is best made during acute phase of the illness when virus circulates in blood through assays that detect viral RNA genome or soluble antigens i.e. NS-1 antigen. Anti-DENV IgM antibody becomes detectable by ELISA at days 3 - 5 after the onset of fever. The RT-PCR detects DENV serotypes 1, 2, 3 or 4.

Management

- There is no specific treatment of a dengue infection. As such supportive management must be undertaken as required.
- Fever and myalgias should be managed with acetaminophen. Aspirin or nonsteroidal anti-inflammatory agents should generally be avoided because of the risk of bleeding complications and the potential risk of Reye's syndrome in children.
- Maintain intake of oral fluid to avoid dehydration
- Platelet transfusions may be warranted in severe 3 thrombocytopenia <20,000/mm) and active bleeding. Prophylactic platelet transfusions without active bleeding are generally not recommended.

Prevention and Control Measures

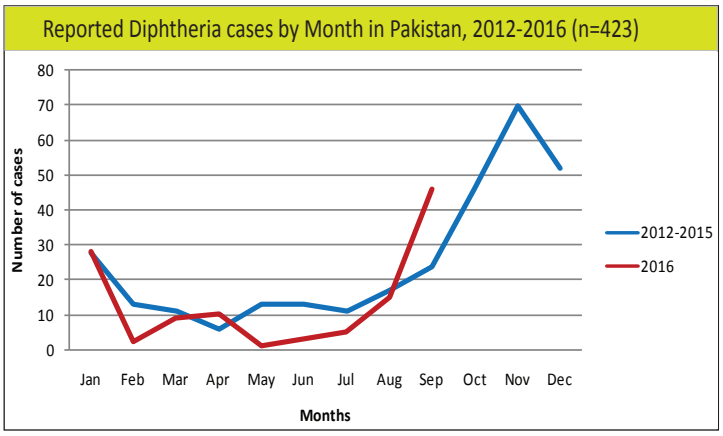
Indoor residual spray in urban and peri-urban high-risk areas at least one month before transmission period. Health education campaign for improved water storage practices, removal of mosquito breeding sites and protecting families and individuals from mosquito bites awareness sessions in schools focusing household control of breeding sites and avoidance of mosquito bites help in disease prevention and control. To reduce the mosquito population, get rid of breeding sites including old tyres, cans, or flower pots that collect rain. Regularly change the water in outdoor bird baths and pets' water dishes.

DIPHTHERIA

Diphtheria is caused by infection with *Corynebacterium diphtheria*, transmitted usually through direct contract with the respiratory droplets. In Pakistan, sporadic cases of Diphtheria continue to be reported. From 1st January 2012 to 30th September 2016 a total of 423 suspected samples received at NIH.

Seasonal Veriation

In Pakistan the maximum suspected cases were reported during August to January



Incubation period: varies from 2-5 days.

Case Definition

Probable Case: An illness characterized by a thick adherent gray coating called "pseudomembrane" usually developed within 2 to 3 days over the nasal tissues, tonsils, voice box or throat.

Confirmed Case: A probable case which has been laboratory confirmed or linked epidemiologically to a confirmed case and meets the following criteria:

- The isolation of *Corynebacterium diphtheria* from a throat swab or nasopharyngeal swab; OR
- A fourfold or greater rise in serum antibody (but only if both serum samples were obtained before the administration of diphtheria toxoid or antitoxin)

Note: Asymptomatic person with positive *C. diphtheria* cultures i.e. asymptomatic carriers should not be reported as a probable or confirmed case.

Specimen collection and transportation:

- Collection nasopharyngeal samples by using alginate or throat cotton swab in Amies transport medium
- For serological diagnosis collect 5ml of clotted blood or serum during acute and convalescent phase, in plain venoject tube.

Management

Patients:

- Upon diagnosis of probable diphtheria, the treatment should be started immediately without waiting for the lab results which may turn out negative if sampling is not done carefully and before antibiotic is administered.
- Specific treatment of diphtheria is by using anti-toxin (Anti Diphtheria Serum) 20,000 to 100,000 units 1/M in a single dose, immediately after throat swabs have been taken; plus Procaine penicillin G IM 25,000 – 50,000 units/kg/day (child); 1,200,000 units/day (adults) in 2 divided doses or parenteral erythromycin 40-50 mg/kg/day with a max 2g/d until patient can swallow; then Oral penicillin V 125-250 mg in 4 doses/day, or erythromycin 40- 50m/kg/day in divided doses for 14 days. ·
- Clinical diphtheria does not necessarily confer natural immunity and patients should thus be vaccinated before discharge with either primary or booster doses.

Contacts

All close contacts, regardless of vaccination status, should have nose and throat cultures and must receive a single dose of Benzathine Penicillin I/M 600,000 units for children <6 years; 1.2 million units for 6 years or older or a 7-10 days course of erythromycin orally and remain under surveillance for 7 days.

Prevention and Control Measures

Routine immunization consists of 3 doses of 0.5 ml DPT-HepB-Hib administered IM to children under one year of age (1st dose at the age of 6 weeks; 2nd at 10 weeks and 3rd at 14 weeks. Booster dose is recommended at 4-6 years of age.

Epidemic Control

If children in outbreak area are unimmunized, the most affected and highest risk age group should be immunized.

MALARIA

Malaria is caused by Plasmodium, transmitted by female mosquitoes "Anopheles" species. Plasmodium parasite have 5 known species, (falciparum, ovale, vivax, malariae and knowlesi) P. falciparum can cause life threatening illness. Patients may have a wide variety of symptoms, ranging from absent or very mild symptoms to severe disease and even

death and can be classified as uncomplicated or severe (complicated). Young children (6 to 36 months) can develop severe illness and pregnant women are at risk for delivering low birth weight newborns. Malaria occurs in most of the tropical regions of the world and approximately three billion people living in 106 countries are exposed.

Mode of Transmission

Transmitted through the bite of a female Anopheles mosquito, mainly in between late evening hours and mid night. Rare routes of transmission include: blood transfusion, sharing of contaminated needles and organ transplantation.

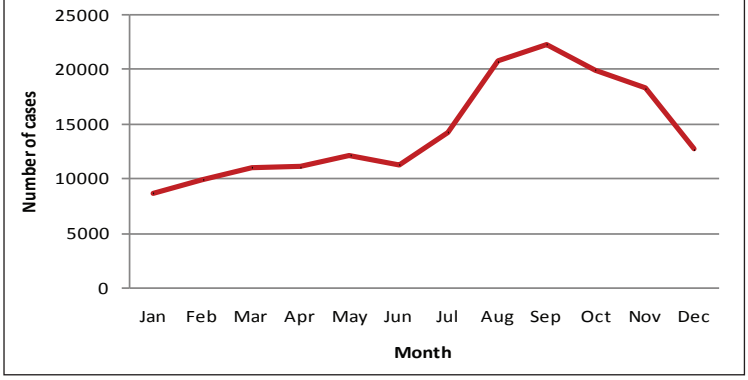
Malaria Relapses

In P. vivax and P. ovale infections, patients having recovered from the first episode of illness may suffer several additional attacks ("relapses") after months or even years without symptoms. Relapses occur because P. vivax and P. ovale have dormant liver stage parasites ("hypnozoites") that may reactivate.

Seasonality

Transmission is seasonal, post monsoon rains with the peak during mid of August to end of November.

Reported Malaria cases by Month in Pakistan, 2012-2016 (n=1,72,181)



Incubation Period Varies from 7 to 30 days.
P. falciparum: 9-14 days P. vivax: 12-17 days

Alert Threshold Number of cases reaches two times the mean number of suspected cases in the previous three weeks from a given location.

Outbreak threshold

In endemic area: Slide positivity rate above 50% or falciparum rate above 40%; while in non-endemic area, evidence of indigenous transmission of falciparum.

Case definition

Probable case

A suspected case with history of same type of manifestation in other members of the household; or in the same patient in the past.

Confirmed case

Clinical case, which is confirmed by:

- Laboratory diagnosis of malarial parasites in peripheral blood film (thick and thin smear).
- Parasite antigens by immunodiagnostic test kit and Rapid Diagnostic test (RDT).

Specimen Collection Capillary or venous blood may be used for preparation of at least 2 thick and 2 thin smears as soon as possible after collection.

Diagnosis:

Malaria diagnostic tools are clinical criteria, microscopy, Serologic methods (detection of antibodies), Rapid Diagnostic Tests (antigen detection) and molecular diagnostic techniques (PCR- extremely high sensitivity).Additional laboratory findings may include mild anemia, mild decrease in blood platelets (thrombocytopenia), elevation of bilirubin, and elevation of aminotransferases. Smear microscopy remains the gold standard for malaria diagnosis. Due to cyclic nature of malaria parasitemia, smears should be evaluated every 6 to 12 hours for 48 hours.

Preventive and control Measures

Include effective use of anti-malarial drugs and effective and sustainable vector control measures. Mosquito vector control - include Indoor Residual Spraying, Community-based environmental management and other improved personal protection measures including the use of Long Lasting Insecticidal nets (LLINs) and repellents.

Treatment

For uncomplicated P. falciparum malaria

Artemisinin-based combination therapies (ACTs)

- Second-line anti-malarial treatment comprises Artesunate plus Tetracycline or Doxycycline or Clindamycin for 7 days or Quinine plus tetracycline or Doxycycline or Clindamycin 7days.

For uncomplicated P. falciparum malaria in special risk groups

- Pregnancy: Quinine plus Clindamycin for 7 days
- Lactating women: Standard antimalarial treatment (including ACTs) except for dapsone, primaquine and tetracyclines
- Infants and young children: ACTs as first-line treatment

For severe Malaria

Severe malaria is a medical emergency and full dose of parenteral antimalarial treatment (Artesunate IV or IM, Artemether or quinine) is recommended.

For uncomplicated P. vivax malaria

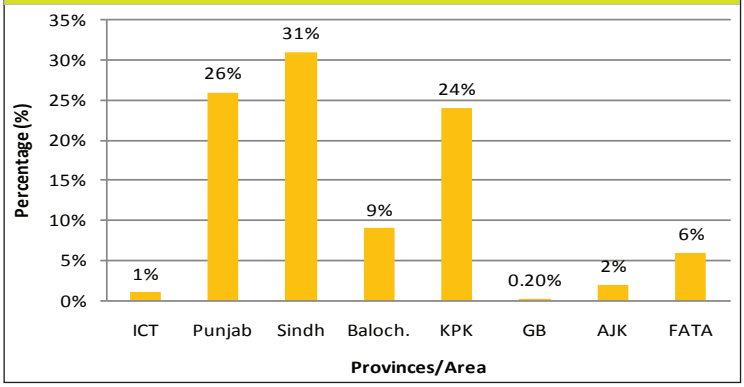
Chloroquine combined with primaquine is the treatment of choice. ACT can also be used for P. vivax malaria in combination with primaquine for radical cure. Artesunate plus Sulfadoxine-Pyrimethamine is not effective against P. vivax. 14-day course of primaquine is required for the radical treatment.

MEASLES (RUBEOLA)

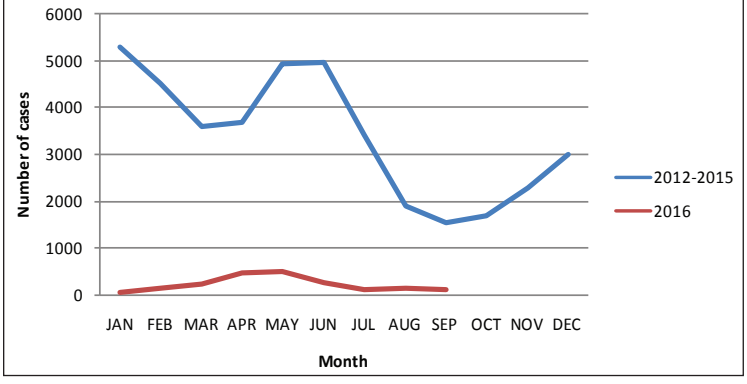
Measles is a highly contagious viral disease mostly affecting children caused by Paramyxoviridae, genus Morbillivirus. Despite high community vaccination coverage, measles outbreaks can occur among under-vaccinated children. Its virus spreads via droplets from the nose, mouth or throat of the infected persons. Immunity after measles infection is life long, although there are rare reports of measles reinfection. Symptoms may include: bloodshot eyes, cough, fever, rash photophobia, muscle pain, conjunctivitis, runny nose, sore throat, tiny white spots inside the mouth (Koplik's spots) etc. The occurrence of fever beyond the 3rd - 4th day of rash suggests a measles-associated complication. Measles can cause variety of clinical syndrome such as post measles infection(s) like pneumonia, lifelong brain damage/neurologic syndromes i.e. acute disseminated encephalomyelitis (ADEM) and Sub-acute Sclerosing Panencephalitis (SSPE), deafness and death. Severe measles is more likely among poorly nourished young children, especially those with insufficient vitamin A, or whose immune systems have been weakened by other diseases.

Surveillance

Reported Measles cases by Province/Area in Pakistan, 2012-2016 (n=42,779)



Reported Measles cases by Month in Pakistan, 2012-2016 (n=42,779)



Incubation period 10-12 days with a maximum range of 7-18 days.

Alert threshold One suspected case is an alert.

Outbreak threshold Five or more clinical cases in a single location over a 30 day time with at least one lab confirmed case constitute an outbreak requiring investigations and response.

Case Definition

Suspected Case

A patient presenting with fever, generalized maculopapular rash with one of these: cough, coryza and conjunctivitis (3Cs).

Confirmed Case

A suspected case, which is laboratory-confirmed or linked epidemiologically to a laboratory- confirmed case (positive IgM antibodies).

Specimen Collection

Collect throat swab for virus isolation and genotyping, very early in the rash phase and preserve in VTM. Collect 5ml blood for serology. Store serum at 4-8° C for not more than 48 hours. Do not freeze the whole blood. Transport the specimens, triple packaged with complete request form maintaining proper cold chain.

Laboratory diagnosis

WHO recommends serum IgM as the standard confirmatory test. Anti-measles IgM is detectable within 3 - 30 days after the appearance of the exanthema. Anti-measles IgG is undetectable up to 7 days after rash onset and subsequently peaks about 14 days after the exanthema appears.

Management

Uncomplicated cases

The treatment is mainly supportive includes antipyretics, fluids and antibiotics for bacterial super infection(s). The WHO and UNICEF recommend Vit. A supplementation for 2 days with the dose of 50,000IU in <6 months, 100,000 IU in 6-11 months, 200,000IU in >12 months and for children with ophthalmologic evidence of Vit. A deficiency, doses should be repeated on day 2 and 28.

Complicated cases Refer complicated cases to th health facility after Vit. A supplementation.

Prevention and Control Measures

Immunize population at risk as soon as possible. Priority is to immunize children of 6 months to 5 years old, regardless of vaccination status or history of disease.Children who are vaccinated against measles before 9 months of age must receive a 2nd measles vaccination.All children aged 6 months – 5 years should also be administered prophylactic Vit. A supplementation.

POLIOMYELITIS

Introduction

Poliomyelitis is a crippling and potentially fatal viral infectious disease that can affect nerves and can lead to partial or full paralysis. It is an infection with an enterovirus subgroup, family Picornaviridae, having three serotypes P1, P2 and P3, each capable of causing paralysis. Infection with one cerotype does not confer protection against the other two strains. Humans are the only known reservoir and disease is transmitted person-to-person mostly through faecal-oral route. Cases are most infectious from 7-10 days before and after paralysis onset. There are three basic patterns of polio infection: sub clinical infections, non-paralytic, and paralytic. Clinical poliomyelitis affects the CNS and is divided into non paralytic and paralytic forms.

There is no cure, but there are safe and effective vaccines. The strategy to eradicate polio is therefore based on preventing infection by immunizing every child until transmission stops and the world is polio-free. Global public health efforts are ongoing to eradicate polio by immunizing every child and focusing on pockets of missed children until transmission stops and the world is polio-free. Polio was declared a Public Health Emergency of International Concern (PHEIC) on 5th May 2014.

States currently exporting wild poliovirus or cVDPV

Afghanistan (WPV) Pakistan (WPV)

States infected with wild poliovirus or cVDPV but not currently exporting

Guinea (cVDPV) Lao People's Democratic Republic (cVDPV)

Madagascar (cVDPV) Myanmar* (cVDPV)

Nigeria (cVDPV) Ukraine (cVDPV)

States no longer infected by wild poliovirus or cVDPV, but which remain vulnerable to international spread, and states that are vulnerable to the emergence and circulation of VDPV

Cameroon Equatorial Guinea

Ethiopia Iraq

Israel Somalia

South Sudan Syrian Arab Republic

Area wise distribution of Polio cases in Pakistan has been provided in the following table:

Reported Polio cases by Province/Area in Pakistan, 2012- Sept 2016

Area/Provinces	Year wise Number of Polio cases				
	2012	2013	2014	2015	2016
Punjab	2	7	5	2	0
Sindh	4	10	30	12	4
KPK	27	11	68	17	7
FATA	20	65	179	16	2
Balochistan	4	0	25	7	1
GB	1	0	0	0	0
AJK	0	0	0	0	0
Total	**58**	**93**	**306**	**54**	**14**

Government of Pakistan has also declared Polio as an Emergency Program. On the acquisition of poliovirus exportation, International Health Regulatory Committee had imposed temporary recommendations for travel regulations on 6th May 2015, in relation to PHEIC. On 20th May 2016, the temporary recommendations in relation to PHEIC were extended for another three months.

Incubation Period 7 -14 days for paralytic cases (range 3 - 35 days).

Seasonality Hot and rainy season

Alert Threshold One suspected case is an alert requires an immediate notification and sample for confirmation.

Outbreak threshold One lab confirmed case is an outbreak.

Case Definition

Suspected

Acute flaccid paralysis (AFP) in a child aged <15 years, including Guillain-Barré Syndrome; OR Any paralytic illness in a person of any age when polio is suspected.

Confirmed AFP with laboratory-confirmed wild poliovirus in stool sample.

Polio-compatible AFP clinically compatible with poliomyelitis, but without adequate virological investigation.

Discarded case A discarded case is an AFP case, which is neither diagnosed as confirmed nor compatible with a polio case definition.

Specimen Collection

Collect 2 stool samples about 8 gms each (about the size of the tip of thumb) at an interval of 24 to 48 hours for virus isolation as soon as possible or within 14 days of onset of illness in a clean, leak proof, screw-capped container, preferably in a transport medium like Minimal Essential Medium or Eagle's Medium.

Seal the container with tape and place samples immediately after collection in refrigerator at 2-8°C or in a cold box with frozen ice packs. Transport specimens to the lab maintaining cold chain with duly filled request form within 72 hours after collection. The set of specimens from a single patient should be placed in a single plastic bag just large enough to hold both the containers.

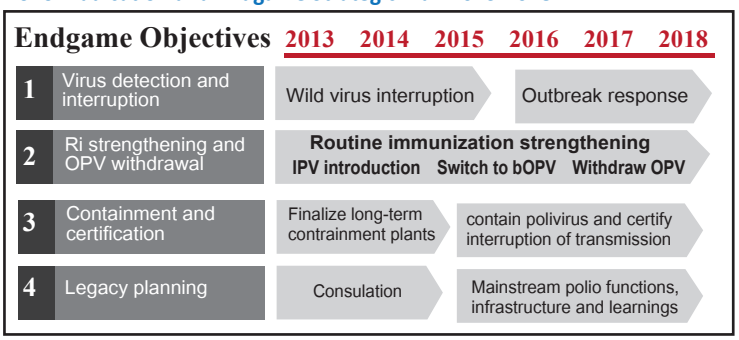
Prevention and Control

Four pillars of polio eradication

- Achieving a high level of coverage with at least 3 doses of the oral poliovirus vaccine (OPV)

- Providing supplementary doses of OPV to all children <5years old during NIDs
- Surveillance for all cases of acute flaccid paralysis
- House-to-house OPV campaigns, targeting areas in which transmission of wild poliovirus persists, based on surveillance studies.

Polio Eradication and Endgame Strategic Plan 2013-2018

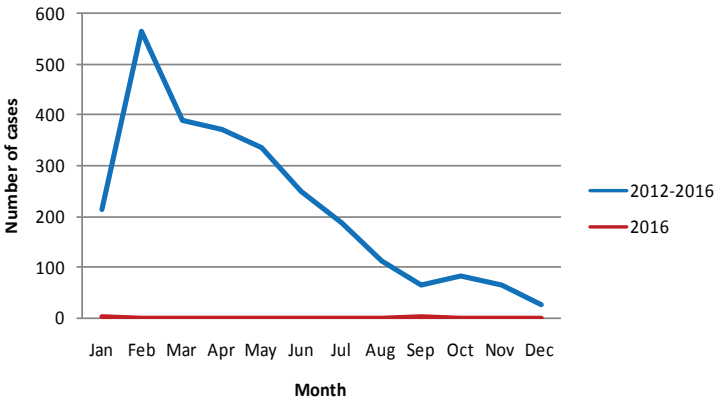


PERTUSSIS

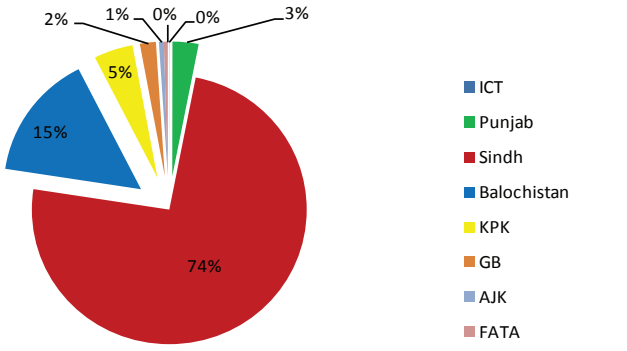
Pertussis, also known as whooping cough, is a highly contagious, a toxin-ediated respiratory disease. Pertussis is known for uncontrollable, violent coughing which often makes it hard to breathe. It is caused by the bacterium Bordetella Pertussis, primarily transmitted by direct contact with discharges from respiratory mucous membrane of infected person or via airborne route. Human is the only host. It has three phases i.e. Catarrhal, Paroxysmal and Convalescent Phase.

Seasonality:
Monthly reported Pertussis suspected cases showed varied trends.

Reported Pertussis cases by Month in Pakistan, 2012-2016 (n=2680)



Reported Pertussis cases by Province/Area in Pakistan, 2012-2016 (n=2680)



Incubation Period: 7-10 days (range 6-20 days)

Alert threshold: One suspected case is an alert and requires prompt action.

Outbreak Threshold: Five (5) cases in one locality

Period of Communicability:
Pertussis is highly communicable with early catarrhal stage. Communicability gradually decreases after the onset of paroxysmal cough. Untreated patient may be contagious for up to 3 weeks after the onset of paroxysmal cough in the absence of treatment or up to 5 days after onset of treatment.

Case Definition:

Suspected Case:
Any person with cough lasting at least 2 weeks with one of these paroxysms of cough OR inspiratory "whooping cough"; OR post-tussive vomiting (immediately after coughing) AND without other apparent cause.

Confirmed Case:
A clinical case that is laboratory confirmed

Specimen Collection:
Culture: culture is the standard for diagnosis and growth typically takes 7 to 10 days. Collect duplicate nasopharyngeal specimens using calcium alginate swabs on fine flexible wire. Wherever possible, bronchial or nasopharyngeal secretions/aspirates provide superior specimens for analysis. Direct plating at bedside of the patients on a freshly prepared Bordet Gangue (BG) medium is the most reliable method for culturing. In the absence of direct plating, appropriate bacterial transport medium may be used for sample transportation.

Serology: IgM and IgG are most specific for the diagnosis of B.pertussis infection.

Blood Picture: Marked leukocytosis (>60,000/µL) with absolute lymphocyte count > 10,000/ µL.

Management:
- Antibiotic treatment should be initiated in all suspected cases. Treatment options include:
- Erythromycin 500 mg, 6 hourly for 7 days
- Azithromycin 500 mg orally for 3 days OR Clarithromycin 500 mg orally twice daily for 7 days
- Trimethoprim Sulfamethoxozole, 160-800 mg orally twice a day for 7 days

Symptomatic Treatment and Supportive Case Management:
- Young infants particularly those <6 months of age should be hospitalized and mild cases require only supportive treatment
- Methadone (cough suppressant) may be helpful in controlling the severity of paroxysms.
- When the illness is of long duration and vomiting is frequent, skilled nursing will be required to maintain nutrition, especially in infants and young children.
- Seriously ill infants should be kept in a darkened, quiet room and disturbed as little as possible, since any disturbance can precipitate serous paroxysmal spells with anoxia.
- Specific attention must be devoted to the maintenance of proper water and electrolyte balance, adequate nutrition and sufficient oxygenation.

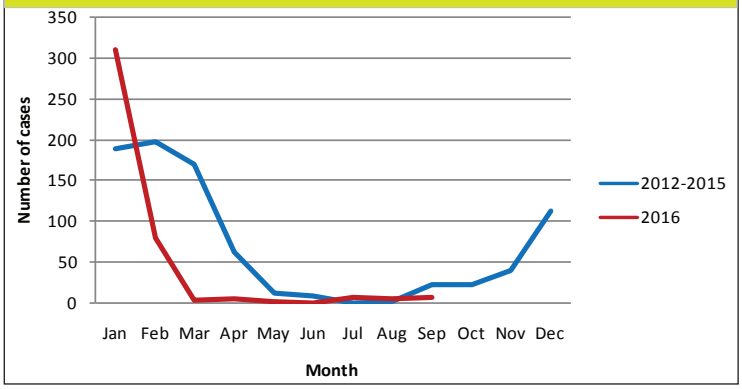
Prevention: All household and close contacts, irrespective of age or immunization status, should receive chemoprophylaxis with erythromycin 40-50 mg/kg per day in four divided doses for 14 days.

Immunization: Active primary immunization against B. Pertussis infection with the whole cell vaccine (WP) is recommended in association with the administration of diphtheria and tetanus toxoids (DTP).

SEASONAL INFLUENZE –A (H1N1, H5N1)

Influenza is a contagious respiratory illness caused by influenza A and B viruses and may cause mild to severe illness; at times leading to death. Older people, young children and people with certain health conditions are at high risk for serious complications. A novel influenza-A H1N1 virus emerging in 2009 caused global influenza pandemic with low mortality rate (0.45%). The virus caused serious disease in children and certain risk groups such as diabetes, obesity and pregnant women. During 2010, WHO announced the end of the pandemic period, but recommended clinicians to remain vigilant and treat all suspected cases of H1N1 appropriately. In Pakistan, the influenza activity typically starts increasing from September and reaches peak during the winter months.
clinicians to remain vigilant and treat all suspected cases of H1N1 appropriately. In Pakistan, the influenza activity typically starts increasing from September and reaches peak during the winter months.

Reported Seasonal Influenza cases by Month in Pakistan, 2012-2016 (n=1282)



Case Definitions: A case of seasonal influenza may present with

Influenza Like illness (ILI)

A patient with acute respiratory infection with fever >38° C with cough and onset of symptoms within 7 days

Severe Acute Respiratory Illness (SARI)

A patient with acute respiratory infection with fever >38°C with cough, onset within 7 days and requiring hospitalization

Sample Collection & Transportation

- Respiratory specimens including throat or nasal/nasopharyngeal swabs and nasopharyngeal aspirates may be collected from patients in Viral Transport Medium (VTM).
- The samples may be stored at 4° C for 4 days, or frozen at -70° C in case of prolonged storage.
- Specimens for influenza virus isolation should not be stored or transported in dry ice unless they are sealed, taped and double plastic bagged.

Management

- The symptoms in mild illness are relieved with warm liquid and rest along with analgesics and antipyretics.
- Analgesics such as Paracetamol 500mg – 1G every 4-6 hours usually relieves headache and generalized pains and cough suppressants such as pholcodine 5-10 mg, 3-4 times daily are generally sufficient.
- Antibiotics are not effective against viruses, specific treatment with antibiotics for complications such as bronchitis and pneumonia may be necessary.
- High risk patients, including pregnant women and children under age 5 years, may be treated with anti-virals, oseltamivir or zanamivir as indicated but preferably not later than 48 hours after onset of the symptoms to ensure a positive clinical outcome.

Prevention and Control Measures: Annual winter vaccination (seasonal anti-influenza vaccine) is recommended for health care workers, pregnant women, young children and immuno-compromised patients with pulmonary, cardiac or renal disease. General precautions include improved ventilation in living places; avoiding close contact with ill people and crowded settings, avoiding touching mouth and nose and regular hand washing with soap. Patients should be encouraged to cover their faces with a mask or handkerchief when coughing and sneezing.

AVIAN/HUMAN INFLUENZE –A (H5N1)

Avian (bird) flu, caused by influenza-A viruses that occur naturally amongst birds. Human infections carry high mortality rates. Since 2003 to September 2016, a total of 854 confirmed cases of human infection from subtype influenza-A H5N1 infection have been confirmed globally, including 450 deaths (CFR 53.1%). Since reporting of 3 cases and one death in 2007, there has been no reported human H5N1 infection in Pakistan.

Case Definition

Possible Case: Any person presenting with severe pneumonia, characterized by fever >38°C AND one or more of these cough, sore throat, shortness of breath AND who can answer "Yes" to any of the following questions in the 7 days before first symptoms started:

- Have you been in contact with a person who was suspected or confirmed case of Influenza-A H5N1 during the infectious period?
- Have you been in contact with live or dead birds, pigeons including chickens, ducks, fancy/backyard birds or crows?
- Have you lived in or have you visited a place where poultry deaths have occurred in the last 2 weeks?
- Have you worked in a laboratory where there is processing of samples from persons or animals that are suspected of having Highly Pathogenic Avian Influenza (HPAI) infection?

Probable Case: Any possible case AND limited laboratory evidence for influenza-A H5N1 such as IFA + using HF5 monoclonal antibodies OR no other disease

Confirmed Case: Confirmed case of influenza-A H5N1 infection is any probable case with detection of viral nucleic acid by PCR.

Prevention and Control Measures

- The primary risk factor for human infection appears to be direct or indirect exposure to infected live or dead poultry or contaminated environments.
- Humans become infected with avian influenza through close contact with live, sick or dead infected birds, e.g. breathing in particles from their droppings, plucking or handling poultry, playing in an area where carcasses were buried.
- The public may accordingly be educated on the following preventive measures:

a) Report sick or dying poultry to local authorities
b) Wash hands after contact with poultry or other birds
c) Cook poultry and eggs thoroughly before eating. If you must go to a bazaar where live poultry is sold, protect your eyes, nose and mouth from dust.

Treatment: Suspected H5N1 case should be hospitalized and treated in intensive care strictly observing the universal plus recommended additional precautions. Treatment with antiviral medication such as oseltamivir or zanimivir should be started as soon as possible, ideally within 48 hours following symptoms onset, to maximize its therapeutic benefits. However, given the significant mortality associated with H5N1 infection and evidence of prolonged viral replication in this disease, administration of the drug should also be considered in patients presenting later in the course of illness.

Diseases of National Concern

Primary Amebic Meningoencephalitis (PAM)

Background: Since detection of first case in Australia during 1965; about 300 cases have so far been reported from 16 countries. In Pakistan since 2012, a total of 39 fatal cases were reported from different tertiary care hospitals of Karachi.

Causing Agent: Primary Amebic Meningoencephalitis (PAM) is caused by parasite Naegleria fowleri;a rare, with about 99% CFR. Naegleria fowleri "brain-eating amoeba", is a unicellular, free-living microscopic & grows best at higher temp. up to 46°C & is naturally found in warm freshwater environments feeding on bacteria and other microbes.Transmission occurs primarily through inhalation of infested water during swimming or putting contaminated water in to the nose during ablution. Symptoms start 1-9 days (median 5 days) after nasal exposure to Naegleria-containing water.People may die 1-18 days (median 5 days) after symptoms begin.

Clinical manifestations are similar to bacterial meningitis (severe frontal headache, fever, vomiting, meningeal signs, stiff neck, seizures and focal neurologic deficits) that increases chances of misdiagnosing.

Prevention & Control Both trophozoites and cysts forms are sensitive to adequate levels of chlorination. The municipality public health authorities therefore, must ensure that adequate levels of chlorine are maintained in the supplied tap water along with strict monitoring arrangements.

Diseases of International Concer

Zika virus

Background: Zika virus disease (Zika) is a disease caused by the Zika virus, which is spread to people primarily through the bite of an infected Aedes species mosquito. The most common symptoms of Zika are fever, rash, joint pain, and conjunctivitis (red eyes). The illness is usually mild with symptoms lasting for several days to a week after being bitten by an infected mosquito. Based on research to date, there is scientific consensus that Zika virus is a cause of microcephaly and GBS. During 2016, 60 countries and territories reported continuing mosquito-borne transmission.

Diagnosis: Preliminary diagnosis is based on the patient's clinical features, places and dates of travel, and activities. Laboratory diagnosis by testing serum or plasma to detect virus, viral nucleic acid, or virus-specific immunoglobulin-M and neutralizing antibodies.

Reporting: Healthcare providers are encouraged to report suspected cases to their district health departments to facilitate diagnosis and mitigate the risk of local transmission.ifferential Diagnosis: Patients with suspected Zika virus infections also should be evaluated for possible dengue, Yellow fever or chikungunya virus infection.

Treatment: No specific antiviral treatment is available. Treatment is generally supportive. Aspirin and other non-steroidal anti-inflammatory drugs (NSAIDs) should be avoided until dengue can be ruled out.

Prevention:No vaccine available. The only preventive strategy is the control of mosquito vectors and limiting person-mosquito contact. Mosquito surveillance is a key component. Beside other preventive measures like insecticidal sprays, Public mosquito education campaigns focusing on reducing or eliminating larval habitats is also recommended.

Chikungunya Virus Disease

Background: Chikungunya virus (ChikV) is a single-stranded RNA virus of the genus alphavirus, first identified in Tanzania in 1953. The transmission of this virus occurs by the bite of infected mosquitoes of the genus Aedes. Blood-borne transmission is also possible. The incubation period ranges from 3 to 12 days. The onset is usually abrupt and the acute stage is characterized by sudden high fever, incapacitating arthralgia, myalgias, and skin rash. Chronic arthritis may develop in about 15% of the patients and is associated with fever, asthenia, exacerbation of arthralgias, inflammatory polyarthritis, and stiffness. Neurological, ocular, and mucocutaneous manifestations have also been described. In recent years, countries in the South- East Asia Region have been severely affected by the outbreaks of chikungunya fever. India was hit in 2006 after quiescence of 32 years. Indonesia, Maldives, Sri Lanka and Thailand have also been swept by this emerging infection. Various factors that have been incriminated to resurgence of chikungunya include mutation of the virus, absence of herd immunity, lack of efficient vector control activities, globalization and emergence of Aedes albopictus, in addition to Aedes aegyptii as an efficient vector for chikungunya virus.

Suspected Case: A person with acute onset of fever and severe arthralgia or arthritis not explained by other medical conditions, and who resides or has visited epidemic or endemic areas within 2 weeks before the onset of symptoms

Probable case: A person with fever or chills as reported by the patient or health-care provider, absence of a more likely explanation, and virus-specific IgM antibodies in serum but with no other testing

Confirmed case: A person with fever or chills as reported by the patient or a health-care provider, absence of a more likely explanation, and one or more of the following laboratory criteria:

- Isolation of virus from, or demonstration of specific viral antigen or nucleic acid in, tissue, blood, or other body fluid, OR
- Four-fold or greater change in virus-specific quantitative antibody titers in paired serum samples, OR
- Virus-specific IgM antibodies in serum with confirmatory neutralizing antibodies (PRNT) in the same or a later specimen

Prevention and Control Measures

- Surveillance to identify and destroy mosquito larval habitats
- Mosquito-clean water contact should be blocked at the breeding sites i.e. water containers, buckets, pitchers, saucers and flower pots should be properly covered
- Protect against day biting mosquitoes by screening, protective clothing, covering maximum body parts using repellents and bed-nets.
- Isolation of patient in insecticides treated nets (ITN).

Human Infections with Middle East Respiratory Syndrome Coronavirus Reported in Arabian Peninsula

Background: First reported the disease in Saudi Arabia in September 2012. MERS is viral respiratory illness caused by corona virus from the same family as 2003 outbreak of Severe Acute Respiratory Syndrome (SARS). The source of the virus remains unknown but Virological studies point towards dromedary camels. MERS-CoV has spread from ill people to others through close contact, such as caring for or living with an infected person. Incubation period is 1-2 weeks. The clinical presentation of MERS ranges from asymptomatic to very severe pneumonia with acute respiratory distress syndrome, septic shock and multi-organ failure resulting in death. The clinical course is more severe in immune-compromised patients and persons with underlying chronic co-morbidities. So far, the observed human-to-human transmission has occurred mainly in health care settings.

Since September 2012, WHO has been notified of 1,806 laboratory-confirmed cases of infection with 643 deaths related to MERS-CoV. Mass gathering events provide a basis for communicable diseases to spread easily. WHO recommends that probable and confirmed cases should be admitted to adequately ventilate single rooms or rooms with airborne transmission precautions. Healthcare workers caring for probable or confirmed cases of MERS should use personal protective equipments (PPEs) appropriate for the exposure.

Sample Collection and Transportation

- Collection of lower respiratory specimens (sputum or bronchoalveolar lavage) is strongly recommended however, nasopharyngeal swab, oropharyngeal swab, sputum, serum, and stool/rectal swab may be collected.
- Wear personal protective equipment and adhere to infection control precautions.
- Notify to district health departments if suspect MERS-CoV infection in a person.

Treatment and prevention: No specific treatment/drugs and vaccines are currently available. Treatment is mainly supportive and based on the clinical condition of the patient. Preventive measures include standard plus aerosol, droplet precautions and practicing good hand hygiene.

Travel Recommendations: There are currently no travel restriction in place however travelers are advised to avoid unnecessary contact with camels, consumption of raw milk and should practice good general hygiene especially regular hand washing. Returning travelers must report to health department in case of severe respiratory symptoms. Based on the current situation and available information, WHO encourages all Member States to continue their surveillance for acute respiratory infections and to carefully review any unusual patterns.

Yellow Fever

Background: Yellow fever is caused by a virus (Flavivirus) which is transmitted to humans by the bites of infected Aedes and haemogogus mosquitoes. Occasionally, infected travelers from areas where yellow fever occurs have exported cases to other countries.

Clinical Presentation: The first symptoms of the disease usually appear 3–6 days after infection. The first, or "acute", phase is characterized by fever, muscle pain, headache, shivers, loss of appetite, nausea and vomiting. After 3–4 days, most patients improve and symptoms disappear. However, in a few cases, the disease enters a "toxic" phase: fever reappears, and the patient develops jaundice and sometimes bleeding, with blood appearing in the vomit. About 50% of patients who enter the toxic phase die within 10–14 days.

Surveillance: According to the recent analysis, there are an estimated 84,000– 170,000 cases and up to 60,000 deaths due to yellow fever per year. The virus is endemic in tropical areas of Africa and Latin America. Yellow fever has never been reported from Pakistan but there are vulnerabilities for importation and its transmission through presence of vector mosquito (Aedes Aegypti), warm humid environment, susceptible hosts and movements of ships, containers, aircrafts and international travelers. Unvaccinated travelers heading to areas with active yellow fever outbreaks pose a risk of introducing the virus into areas where yellow fever risk factors (human susceptibility, prevalence of competent vector, and animal reservoirs) are present.

An outbreak of yellow fever in Angola started in December 2015 in the municipality of Viana, Luanda province and spread to all the 18 provinces of Angola.

An Emergency Committee (EC) meeting on19 May 2016 decided that it does not yet constitute a Public Health Emergency of International Concern (PHEIC). However recommends ensuring the acceleration of surveillance, vaccination for travelers, risk communications, community mobilization, vector control, quickly developing diagnostic capacity and case management measures be in place. Nearly 17 million people have been vaccinated in Democratic Republic of the Congo and Angola.

Diagnosis: Blood tests to detect yellow fever-specific IgM antibodies or virus genome by PCR must conducted by a highly trained laboratory staff with specialized equipment and materials. There is no specific treatment for yellow fever except supportive care. Yellow fever can be prevented through vaccination and mosquito control. WHO recommends vaccination for all travelers older than 9 months of age in areas where there is evidence of persistent or periodic yellow fever virus transmission.

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