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36th Issue **June-September 2016**

SEASONAL AWARENESS AND ALERT LETTER (SAAL)

For Epidemic-prone infectious diseases in Pakistan
Summer Season

OBJECTIVES OF SAAL

1. To alert concerned health authorities and professionals at all levels about the epidemic-prone infectious diseases in the Summer 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.

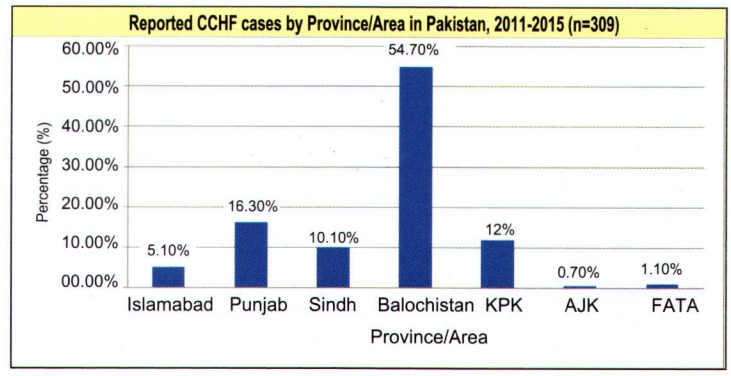
DATA SOURCES

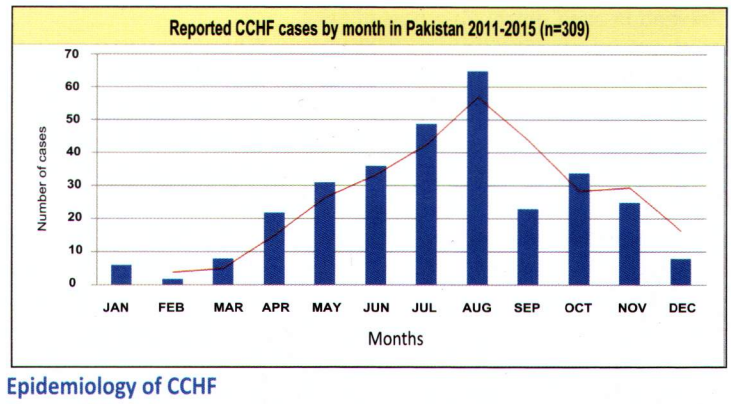
The last five years (2011-2015) available national data collected by the Disease Early Warning System (DEWS), District Health Information System (DHIS), Provincial Health Departments, Expanded Programme on Immunization, Influenza Control programme in collaboration with Field Epidemiology & Disease Surveillance Division, 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 public health events of national concern, technical details on Naegleria fowleri infection are included because of fatal cases encountered in Karachi during 2013-15. Reporting of Zika Virus Infection, Ebola Virus disease, Middle East Respiratory Coronavirus (MERS-CoV) infection and Yellow Fever has been shared as events of international concern.

June - September 2016		
Outbreak-prone Diseases	**High Alert**	**Medium**
Crimean Congo Hemorrhagic Fever (CCHF)		
Dengue Fever (DF)		
Gastroenteritis		
Leishmaniasis		
Malaria		
Measles		
Meningoccoccal		
Poliomyelitis		
Typhoid Fever		
Viral Hepatitis (Acute)		
	High alert - peak occurrence in the Summer 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 out breaks. Since the diagnosis of first human case of CCHF in 1976, the sporadic cases have continued to occur across Pakistan.
From 2011-2015 a total of 309 cases were confirmed from NIH. Balochistan 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 Hyaloma 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.

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.

Epidemiology of CCHF

Seasonal Variation

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

Incubation Period

The length of the incubation period depends on the mode of acquisition of the virus.
After Tick Bite 1 to 3 days, with a maximum of 9 days
Following contact with infected blood or 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 stools, 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; ViralRNA sequence (RT-PCR) in blood or tissues and virus isolation during 1st week of illness. Confirmation of presence of IgM / IgG antibodies inserum by antigen-capture enzyme-linked immunosorbent assays(ELISA) from day 7 of illness.

Specimen Collection and Transportation

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

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 stared Ribavirin & also advised unnecessary lab. tests
- Some healthcare providers do not rule out common bleeding causes before suspecting CCHF

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 stick 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.

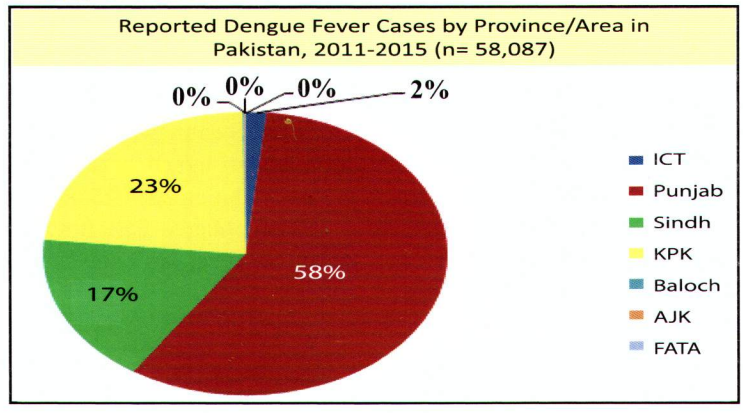
Sources of Transmission

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 2011-2015 ,58,087 cases were reported in Pakistan.

Geographical distribution



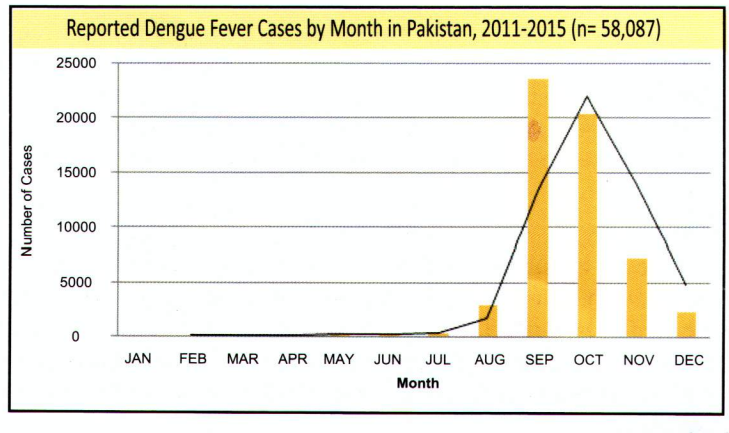
Natural Process of Dengue Fever

The majority (~75%) of DENV infections are asymptomatic. 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 range from mild to incapacitating high grade fever, with severe headache, retro-orbital pain, muscle and joint pain, and rashes. Severe dengue/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 probable 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.

GASTROENTERITIS (ACUTE)

Gastroenteritis is an infection of the gut (intestines),caused by a number of infectious agents like bacteria, viruses and parasites. The severity can range from a mild tummy upset with mild diarrhoea, to severe diarrhoea and vomiting.Diarrhoea means loose or watery stools (faeces), usually at least three times in 24 hours. Blood or mucus can appear in the stools with some infections.Globally, an estimated two billion cases of diarrheal disease with about 1.5 to 2 million annual deaths have been reported. Diarrhoeal disease can be prevented through safe drinking-water and adequate sanitation and hygiene.

Acute watery diarrhea (AWD) Diarrhea is acute intestinal infection causing copious, painless, watery diarrhoea that can quickly lead to severe dehydration and death if not treated promptly the passage of loose or watery stools at least 3 times or more in 24 hours. Vibrio cholerae (O1 or O139 Ogawa, or Inaba El Tor) is an important bacterial cause in endemic areas, 80-90% of episodes are of mild or moderate severity and are difficult to distinguish clinically from other types of acute diarrhoea. Less than 20% of ill persons develop typical cholera with signs of moderate or severe dehydration.

Invasive (bloody) diarrhea/dysentery is characterized by frank blood and mucus in the stool accompanied by fever mostly caused by Shigella, Salmonella enterica, Campylobacter, enterohemorrhagic Escherichia coli,enteroinvasive E. coli, and the protozoan parasite Entamoeba histolytica.

Mode of transmission

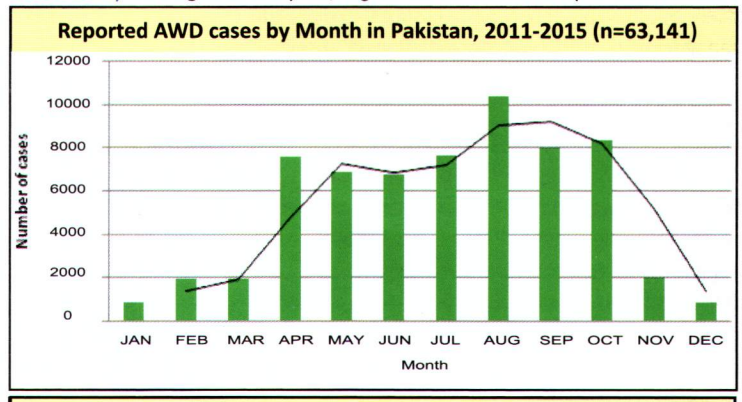
Infection results from ingestion of organisms in food and water or directly from person to person by the faecal-oral route.

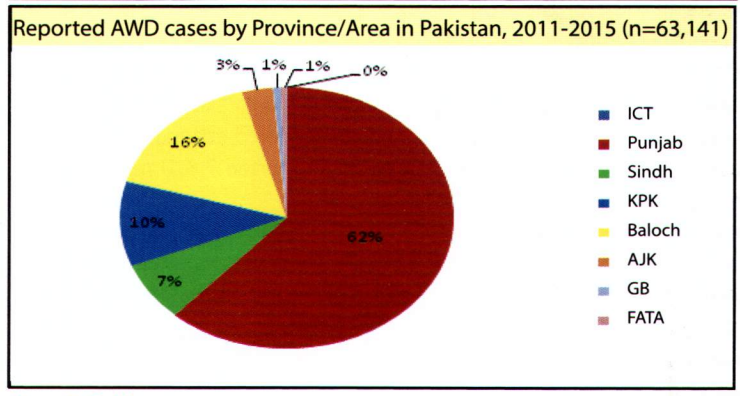
Incubation Period Few hours to 5 days

Alert One case of AWD is an alert and must be investigated.

Outbreak One lab confirmed case or cluster of 6 or more cases in a single location.

Seasonality Throughout the year; higher incidence from April to November





Case Definitions

Suspected Case

A case of cholera should be suspected when

In a non-endemic areas a patient age 5 years or more develops severe dehydration or dies from acute watery diarrhoea.

In an endemic areas a patient age 5 years or more develops AWD, with or without vomiting.

Confirmed Case

A case of cholera is confirmed when Vibrio cholerae O1 or O139 is isolated from the stool sample.

Note: Once Vibrio cholerae has been confirmed, the WHO clinical case definition is sufficient to diagnose further cases in the area.

Specimen Collection and Transportation

Collect rectal swab or fresh stool sample during active diarrhoea period (preferably as soon as possible after onset of illness before the initiation of antibiotic therapy), and send to lab.

Note: Stool specimens should be transported at 4-8°C in Cary-Blair transport medium or alkaline peptone water. Bacterial yields may fall significantly if specimens are not processed within 1-2 days of collection. A complete lab request form with brief history of the patient should accompany each specimen.

Management

Treatment

- The mainstays of treatment are:correction of fluid and electrolyte losses, appropriate nutritional care, and treatment of co-morbid conditions.
- Fluid and electrolytes:Fluid management consists of two phases: replacement and maintenance. Oral Rehydration Solution (ORS),in both the replacement and maintenance phase should be administered. In severe dehydration appropriate intravenous fluids (IVF) must be given.
- Micro Nutrients:The WHO recommends Zinc for children <5 years of age with diarrhea (10 mg/day for <6 months and 20 mg/day for 10 days for 6 months to 5 years) and Vitamin A for Children in developing countries.
- Antibiotics:Not indicated in AWD except in suspected cholera and dysentery. The sensitivity patern against Vibrio Cholerae observed at Microbiology Lab NIH revealed good for Chloromphenicol, Ampicilline, Doxycycline, Ciprofloxine and Tetracycline.

Prevention and Control

Effective prevention requires a three pronged approach; improved drinking water supplies, adequate sanitation and health education. Handwashing after defecating, disposing of a child's stool and before preparing meals must be strongly advocated. District health authorities must regularly monitor restaurant, street vendors and other food outlets to ensure proper hygine. Public health engineering departments must strengthen water quality monitoring and ensure proper chlorination.

strengthen water quality monitoring and ensure proper chlorination. Surveillance must be strengthened for early detection of first case and timely application of control measures. In outbreak situations, proper case management, sufficient pre-positioned medical supplies and effective health education usually help in early control.

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. In 2015 an estimated 214 million cases of malaria occurred worldwide and 438,000 people died, mostly children in the African Region. Pakistan is categorized by WHO in the Group 3 countries and has reported estimated 1.5 million cases annually. During 2012-13 DEWS has reported 7,810 malaria cases from all areas of Pakistan.

Mode of Transmission

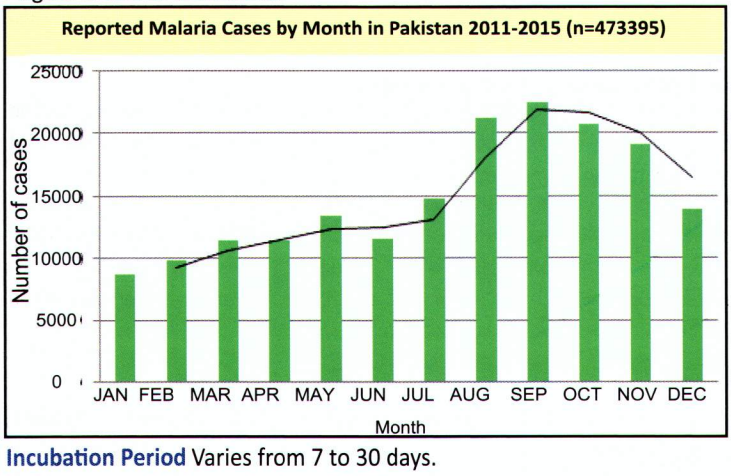
Transmitted through the bite of a female Anopheles mosquito, mainly in between late evening hours and mid night. Rare routes of transmission include: blood transfusion, sharing of contaminated needles and organ transplantation.

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.



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.

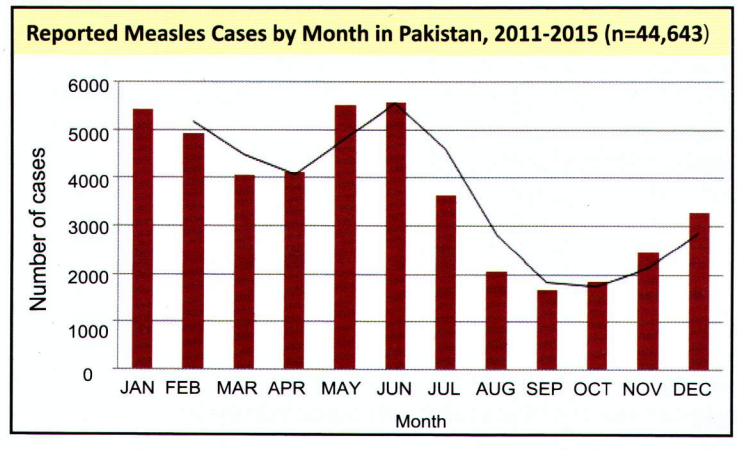
For uncomplicated P. vivax malaria

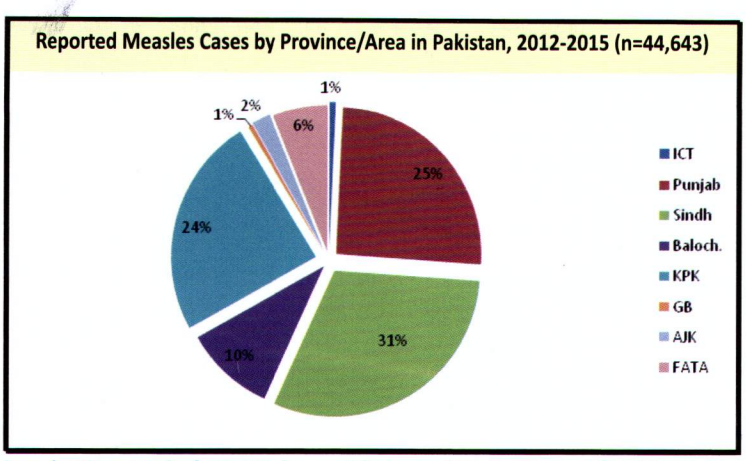
Chloroquine combined with primaquine is the treatment of choice. ACT can also be used for P. vivax malaria in combination with primaquine for radical cure. Artesunate plus Sulfadoxine-Pyrimethamine is not effective against P. vivax. 14-day course of primaquine is required for the radical treatment.

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





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.

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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. Five samples should be taken from fresh cases, less than five days from rash onset, in documented outbreaks.Collect 5ml blood for serology. Store serum at 4-8oC for not more than 48 hours. Do not freeze the whole blood.Transport the specimens in zip lock plastic bags with complete request form along with the cold chain.

Laboratory diagnosis

WHO recommends serum IgM as the standard confirmatory test. Anti-measles IgM is detectable in 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 the complicated cases to the 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 and infection with one does not confer protection against the other two strains. Humans are the only known reservoir and the disease is transmitted person-to-person mostly through the 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. Area wise distribution of Polio cases in Pakistan has been provided in the following table:

Reported Polio cases by Province/Area in Pakistan, 2011- JUNE 2016

Area/Provinces	Year wise Number of Polio cases					
	2011	2012	2013	2014	2015	2016
Punjab	9	2	7	5	2	0
Sindh	33	4	10	30	12	4
KPK	23	27	11	68	17	7
FATA	59	20	65	179	16	0
Balochistan	73	4	0	25	7	1
GB	1	1	0	0	0	0
AJK	0	0	0	0	0	0
Total	198	58	93	306	54	12

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

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. The transmission zones in Pakistan included Peshawar and surrounding districts, FATA, southern KPK, Quetta and adjoining districts, northernSindh province, Karachi and southern districts of Punjab.

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

Seasonality Hot and rainy season

Alert Threshold One 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

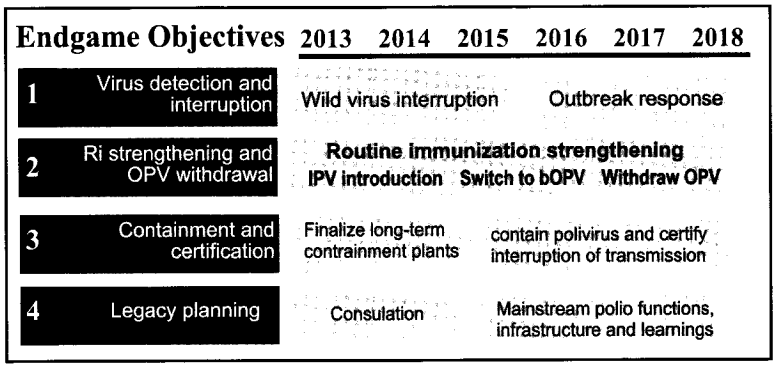
Prevention and Control

Four pillars of polio eradication

1. Achieving a high level of coverage with at least 3 doses of the oral poliovirus vaccine (OPV)
2. Providing supplementary doses of OPV to all children<5years old during NIDs
3. Surveillance for all cases of acute flaccid paralysis
4. 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

The Polio Eradication and Endgame Strategic Plan 2013–2018 is a comprehensive, long-term strategy that addresses what is needed to deliver a polio-free world by 2018. This addresses the eradication of all polio disease, whether caused by wild poliovirus or circulating vaccine-derived poliovirus.



IPV introduction and OPV withdrawal

The Government of Pakistan has approved the introduction of inactivated polio vaccines (IPVs) to be used in routine immunization drives to strengthen children's immunity. From July 2015 onward both the oral polio vaccine and injectable polio vaccine (OPV-IPV) are now part of the routine immunization. IPV is administered by intramuscular (IM) injection, preferably or subcutaneously (S/C), in a dose of 0.5 ml into the outer part of the thigh. Following the polio endgame strategy the OPV will be excluded from routine immunization in 2020 and after that only IPV will be use to immunize the children against the polio.

TYPHOID FEVER (Enteric Fever)

Typhoid fever is a serious disease spread by contaminated food and water. Symptoms of typhoid include lasting high fevers, weakness, stomach pains, headache, and loss of appetite. Some patients have constipation, and some have a rash. Internal bleeding and death can occur but are rare.

Salmonella typhi is the causative agent, human is the only reservoir and thedisease is more common in impoverished and overcrowded population withpoor access to sanitation. Typhoid fever is contracted by takingcontaminated food or water. People with acute illness can contaminate thesurrounding water supply through stool, which contains a high concentration of the bacteria. The bacteria can survive for weeks in water ordried sewage. Typhoid fever is common in the developing world, affectsabout 22 million persons each year and 200,000 deaths occur worldwide.Southeast Asia and Southern Africa are regions with high incidence of S.typhi infection (more than 100 cases per 100,000 person years). Without therapy, the illness may last for 3 to 4 weeks and death rates range between12% and 30%.

Seasonality maximum cases are reported during post Monsoon season.

Chronic Salmonella Carriage is excretion of the organism in stool or urine>12 months after acute infection (@ of 1 to 6%).

Alert: Two or more linked cases are an alert and require an immediate investigation.

Outbreak threshold Six or more cases in one location.

Incubation period

Usually between 8 – 14 days, may vary from 3 days to 2 months.

Mode of transmission

Transmitted through faecal-oral route, particularly contaminated water and food or direct contact with an infected individual.

Case Definition

Suspected case: Any person with acute illness and demonstrates:abdominal pain, fever rising "stepwise", chills and may be associated withheadache, malaise, anorexia, relative brady-cardia, constipation ordiarrhoea or abdominal tenderness progressing to prostration.

Confirmed case A suspected case that is laboratory confirmed by: Isolationof Salmonella typhi from blood, stool or urine specimens or a suspected casethat has positive Widal or Typhidot Test. In the 1 week of fever, bloodculture is the most important diagnostic method in suspected cases. Duringthe 2nd and 3rd weeks, the faeces may contain the organism more frequently.

Specimen Collection

Blood Collect 5-10 ml of blood before the start of antibiotic for bloodculture and 1-3 ml of blood for serology. The samples can be stored at 4°Cfor a week without affecting antibody titre. For longer storage the serummay be frozen at -20°C.

Stool Collect stool sample for the diagnosis of typhoid carriers andpreferably be processed within two hours after collection. In case of delay,store at 4°C or in a cool box with freezer packs and should be transported tothe lab in a cool box. If stool sample cannot be obtained, rectal swabs inoculated into Carry Blair transport medium can be used but it is less successful.

Lab. Diagnosis The etiologic agent may be recovered from the blood stream or bone marrow, and occasionally from the stool or urine. Bone marrow culture is the most sensitive diagnostic tool. Serologic tests are of limited clinical utility given insufficient sensitivity and specificity. Typhidot, Enzyme-Linked Immunosorbent Assay(ELISA) and dipstick techniques are available now.

Management

Increasing resistance to available antimicrobial agents, including fluoroquinolones, may foretell dramatic increases in case-fatality rates. Uncomplicated patients may be treated on outpatient basis and advised touse strict hand washing techniques and to avoid preparing food for othersduring the illness course. Special attention must be paid towards themaintenance of nutrition and fluid intake. The commonly isolated strains inPakistan are sensitive to the following broad spectrum antibiotics:

- Ciprofloxacin (500 mg twice daily) or Ofloxacin (400 mg twice daily),either orally or parenterally for 7 to 10 days
- A beta-lactam such as Ceftriaxone (2 to 3 g once daily) parenterally or Cefixime (20 - 30 mg/kg / day orally in two divided doses) for 7 to 14 days.

Alternative agents include

- Azithromycin (1 g orally once followed by 500 mg once daily for five toseven days, or 1 G orally once daily for five days)
- Chloramphenicol 2 to 3 g per day orally in four divided doses for 14 daysbut it shows resistant currently.

Prevention and Control Measures

Two basic actions can protect from typhoid fever; avoid risky foods and drinks and get vaccinated against typhoid fever. Be careful of food and water in areas where sanitation and personal hygiene may be poor. Eat only thoroughly cooked and still hot foods. Avoid raw vegetables and fruits that cannot be peeled. Avoid salads, food and beverages from street vendors.Flies must not be allowed to access food.

Immunization

The role of new and effective vaccines as control measures for epidemics and as tools for elimination remains to be explored. There are two vaccines available for protection against S. typhi: live oral S.Typhi vaccine strain TY21a and parenteral Vi polysaccharide vaccine.Neither is completely effective against S. typhi and neither provides protection against paratyphoid fever. Natural infection does not provide complete protection against recurrent illness.

ACUTE VIRAL HEPATITIS (A&E)/ACUTE JAUNDICE SYNDROME

Infectious Hepatitis, the most common type, is transmitted by thefaecal–oral route through the use of contaminated water and food.Outbreaks occur following monsoon rains, heavy flooding, contamination of well water, or massive uptake of untreated sewage into city water treatment plants.

HEPATITIS -A

Usually a mild, self-limiting disease but may manifest severely in around10% cases, mostly affecting children. In children aged <6 years, 70% ofinfections are asymptomatic; if illness does occur, it is typically notaccompanied by jaundice. Among older children and adults, infection istypically symptomatic, with jaundice occurring in >70% of patients.Common-source outbreaks and sporadic cases can occur from exposure tofecally contaminated food or water.

Incubation period 15 to 50 days (average 28-30 days)

Case Definition Suspected case viral hepatitis syndrome:
An acute illness with discrete onset of symptoms of jaundice, dark urine, anorexia, malaise, extreme fatigue, and right upper quadrant tenderness OR elevated serum alanine aminotransferase level >2.5 times the upperlimit.

Confirmed case
A suspected case that meets the clinical case definition AND is laboratory-confirmed for Anti-HAV IgM antibodies (anti-Hepatitis A virus immunoglobulin M) positive.

HEPATITIS -E

HEV causes generally a mild self-limiting illness with no long-term sequelae-however; the disease is especially severe during pregnancy causingfulminant hepatic failure. The case fatality in third trimester may reach20%. It may cause abortion, premature delivery or neonatal death. The disease appears to be relatively severe compared with hepatitis A.Acute disease manifests with symptoms including jaundice; darker urine;extreme fatigue; nausea; vomiting and abdominal pain. It may take several months to a year for a patient to feel fit again. The fulminant hepatic failureoccurs more frequently during pregnancy, resulting in an inordinately high mortality rate of 15 to 25 percent, primarily in women in the third trimester.

Incubation period 15-64 days (May vary from 26 - 42 days)

Case Definition Suspected case viral hepatitis syndrome: As for hepatitis A.

Confirmed case A suspected case that meets the clinical case definition AND is laboratoryconfirmed for Anti-HEV immunoglobulin M (IgM)

Alert Threshold A cluster of 3 - 5 cases in one location is an alert and requires investigation.

Outbreak threshold A cluster of 8-10 cases in one location is an outbreak

Specimen Collection and Transportation Collect 5 ml blood during acute phase of illness observing all safetyprecautions. Transport serum specimen for serology or for antigendetection by PCR with complete lab request form.

Laboratory findings
HAV: Marked elevations of serum aminotransferases (usually >1000 IU/dL),-bilirubin and alkaline phosphatase. Serum IgM anti-HAV is the gold standard-for the detection of acute illness and remains positive for approximately 4 - 6months. IgG anti-HAV appears early in the convalescent phase of thedisease and remains detectable for decades.

HEV Resolution of the abnormal LFT's generally occurs within 1 - 6 weeksafter the onset of the HEV illness. IgM anti-HEV appears during early phaseof clinical illness and disappears rapidly over 4 - 5 months. The IgG responseappears shortly after the IgM response and its titer increases throughoutthe acute phase into the convalescent phase, remaining high from 1 to 14years.

Prevention and Control Measures

- As the HAV and HEV infections mostly spread by the faecal-oral route, the prevention can be aided by adherence to safe drinking water and sanitary practices such as hand washing, heating foods appropriately etc.
- Hand washing is highly effective in preventing the transmission of the virus as HAV may survive for up to four hours on the fingertips. Chlorination and certain disinfecting solutions (household bleach 1:100dilution) are sufficient to inactivate the virus.
- An effective inactivated hepatitis A vaccine is available both for adults and children aged 2 years or older but is seldom recommended for routine vaccination in Pakistan. Full, two-dose series of Hepatitis A vaccine is the best way to prevent HAV infection. No vaccine is however, available against Hepatitis E as yet.
- For HAV post-exposure prophylaxis of non-vaccinated people, the passive administration of Immunoglobulin can modify the symptoms of infection, provided it is given within 2 weeks of exposure. For children aged <12 months, immuno compromised persons, persons with chronic liver disease, and persons for whom vaccine is contraindicated, IG should be used.

Public Health Events of National Concern (PHENC)

Primary Amebic Meningoencephalitis (PAM)

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 (12 fatal cases during 2015). One case reported in June 2016.

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.

Transmission does not occur by drinking contaminated water or by swimming in sea. Initial symptoms of PAM usually start from 1-7 days after infection which may include headache, fever, nausea or vomiting.

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. After the start of symptoms, the disease progresses rapidly and while death may occur in 1-12 days of illness. Because of rapid progression, the diagnosis is usually made after death.

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. Any of the suspected cases should immediately be reported to health authorities. Awareness and education in the affected areas must also be undertaken to educatepeople on requisite preventive measures.

Public Health Events of International Concern (PHEINC)

Zika virus

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. Subsequent to an alert issued by Pan American Health Organization (PAHO) regarding the confirmed Zika virus cases in Brazil, WHO declared ZVD as Public Health Emergency of International Concern (PHEIC)on 1 February 2016.

Based on research to date, there is scientific consensus that Zika virus is a cause of microcephaly and GBS. As of 28 May 2016, Brazil has reported 7 723 suspected cases of microcephaly and other nervous system disorders.Of these cases, 1 489 are confirmed cases, 223 of which are laboratory-confirmed. As of 8 June 2016, 60 countries and territories report continuing mosquito-borne transmission. In the week to 8 June 2016, no new country reported mosquito-borne or person-to-person Zika virus transmission.On 7 June 2016, WHO updated its Interim guidance regarding the possible sexual transmission and more common than previously assumed and advised to couples to adopt safer sex practices or consider abstinence for at least 8 weeks upon return from endemic areas and in case of disease, men should use condoms or consider abstinence for at least 6 months.

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.

Human Infections with Ebola Virus Disease(EVD)

Ebola virus disease (EVD) or Ebola hemorrhagic fever (EHF) is the most virulent human viral hemorrhagic disease caused by the Ebola virus; with the average case fatality rate is around 50%. Symptoms may appear from 2 to 21 days after exposure which typically include fever, headache, joint and muscle aches, weakness, diarrhea, vomiting, stomach pain and lack of appetite and may be followed by rash, red eyes, difficulty breathing, difficulty swallowing, bleeding from different sites of the body.A person infected with Ebola virus is not contagious until symptoms appear. Ebola is not spread through the air or by food or water. The virus can spread through direct contact with the bodily fluids of an infected person, or with contaminated objects. No specific drug available however early supportive clinical treatment and management are essential and can improve the chances of recovery.

The outbreak of Ebola virus disease was begun in West Africa mainly affecting Guinea, Liberia and Sierra Leone in December 2013and declared as Public Health Emergency of International Concern (PHEIC) by WHO on 8th August 2014. The outbreakhas now ended but small additional outbreaks or sporadic cases remain a risk.The WHO declared the end of the most recent outbreak of Ebola virus disease in Liberia on 9th June 2016 and on 1st June 2016 in the Republic of Guinea. A total of 28,616 Ebola cases have been reported in Guinea, Liberia and Sierra Leone, with 11,310 deaths and there are over 10,000 survivors of Ebola virus disease.

Public Health Measures Ensure preparedness, contact tracing, raising awareness and sensitizing healthcare workers, supporting them with resources, information and communication to travelers and surveillance.Ensure implementation of infection control measures, Isolation rooms with dedicated bathroom, availability of personal protective equipment and trained Personnel.

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

First reported the disease in Saudi Arabia in September 2012. So far, all cases of MERS have been linked through travel to or residence in countries in and near the Arabian Peninsula. 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 multiorgan 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 April 2012 and as of 18 May 2016, 2016, 1 751 cases of MERS, including 680 deaths, have been reported by health authorities worldwide. Mass gathering events such as the Hajj provide a basis for communicable diseases to spread easily. Several cases detected outside of Saudi Arabia were in pilgrims returning from the minor Umrah pilgrimage, but not from the Hajj. 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 restrection in place however travelers are advised to avoid unnecessary contact with camels, consumption of raw milk and should practice good general hygiene specially regular hand washing. Returning travlers must report to health department in case of severe respiratory symptoms.

Yellow Fever

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.

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.

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. As of 15 May 2016, the Angolan has reported 2420 suspected and 736 confirmed cases including 298 deaths while 49 cases from CDR and 60 cases of which 7 are laboratory confirmed from Uganda.

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.

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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