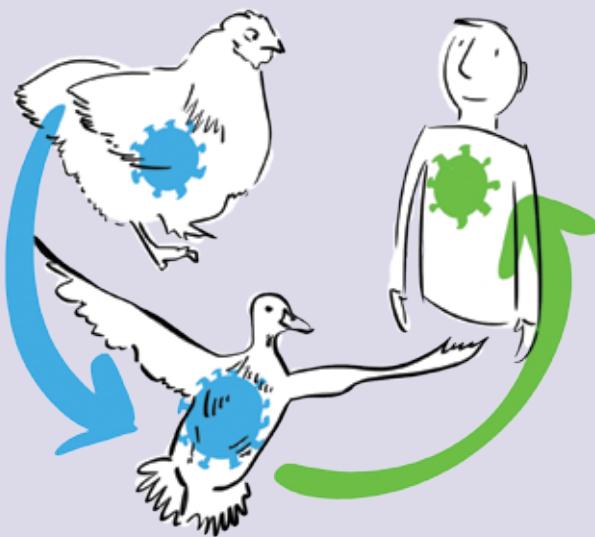


Avian and other zoonotic influenza

10 THINGS YOU SHOULD KNOW



1. Animal influenza viruses have occasionally infected humans (Avian, swine and other zoonotic influenza viruses)
2. Multisectoral coordination and communication are essential parts of any outbreak response
3. Protect all individuals with occupational or other risks of exposure
4. Eggs, poultry and poultry products can be safely consumed, provided these items are properly cooked and properly handled during food preparation
5. To minimize exposure of the public, encourage proper personal hygiene and instruct the public to seek medical help if illness develops
6. Increase surveillance for human cases of Avian influenza
7. Collecting appropriate samples, and rapid and precise characterization of virus isolates are essential for early detection and management of patients
8. Health care facilities need to be ready to manage patients with Avian influenza virus infections
9. The animal health sector is in charge of preventing and controlling outbreaks of disease in animals, including Avian influenza
10. Influenza A(H5N1) vaccines are not widely available and the decision to use them depends on the risk of infection

Avian and other zoonotic influenza response tips

Coordinating responders

- Multisectoral response: collaboration between animal health sector and public health sector is key in surveillance, response and prevention activities

Communicating risk

- Encourage health authorities to:
 - Have a way to compensate owners/farmers for the loss of sick animals to encourage early reporting
 - Have a multisector communications strategy in place
- Key messages:
 - Avian influenza is transmitted primarily from infected animals to human through direct contact
 - There is usually no sustained human-to-human transmission
 - Promote good personal hygiene (i.e. handwashing)
 - Promote proper food safety guidance
 - Report sick animals to the authorities

Health Information

- Sharing information from the animal health sector with human health sector supports preventive action in the affected areas
- Sharing information on human cases with the animal health sector is equally important so that they can target their response activities
- Ensure sharing of viruses from human cases with WHO Collaborating Centres
- Report cases to WHO, under the IHR (2005)

Health Interventions

- Investigate cases and enhance surveillance
- Collect appropriate specimens
- Antiviral and supportive treatment for cases
- Monitoring of contacts
- Vaccination of high-risk groups
- Infection prevention and control measures:
 - Prevent nosocomial infections
 - Personal Protective Equipment

1

Animal influenza viruses have occasionally infected humans (Avian, swine and other zoonotic influenza viruses)

- Wild aquatic birds are the reservoir for influenza A viruses. The emergence of a new and very different influenza A virus with the ability infect people and have sustained human-to-human transmission, can cause an influenza pandemic.
- Humans can be infected with Avian, swine and other zoonotic influenza viruses.
- Avian influenza is a disease of domestic and wild birds with severe consequences for the poultry sector when outbreaks of disease occur. Domesticated populations (poultry: chickens, ducks, turkeys) can become infected by contact with wild birds. Avian influenza viruses are categorized as either low pathogenic (LP) or highly pathogenic (HP) viruses, depending on the severity of the disease they cause in birds and poultry. These two terms do not refer to the disease in humans infected with these viruses.
- Avian influenza A viruses are distinct from human influenza viruses and do not easily transmit between humans. Human infections are primarily acquired through direct contact with infected animals or contaminated environments, but do not result in efficient transmission of these viruses between people.
- Avian and other zoonotic influenza infections in humans may cause disease ranging from mild conjunctivitis to severe pneumonia and even death.

2

Multisectoral coordination and communication are essential parts of any outbreak response

- The first occurrence of a poultry outbreak of highly pathogenic Avian influenza in a country often creates widespread concern and can disrupt social and economic life. Therefore, effective communication with all stakeholders is an essential part of any outbreak response.
- Strong coordination between sectors (animals and human health) is needed for surveillance, risk communications and interventions monitoring.



3

Protect all individuals with occupational or other risks of exposure

- Protect people involved in specific, high-risk tasks such as sampling sick birds, culling and disposing of infected birds and cleaning of contaminated premises.
- Provide appropriate personal protective equipment and training on how to use it properly.
- All persons involved in these tasks should be registered and monitored closely by local health authorities for seven days following the last day of contact with poultry or their environments.
- Symptomatic persons should be treated according to WHO guidelines with influenza-specific antivirals.
- If sufficient antivirals are available, antiviral chemoprophylaxis can be considered (recommendations for regimen of antiviral prophylaxis can be found in the WHO guidelines).
- Consideration should be given to the immunization of persons with high potential to be exposed to Avian influenza using the seasonal influenza vaccine.

4

Eggs, poultry and poultry products can be safely consumed, provided these items are properly cooked and properly handled during food preparation

- Inform the public about ways to promote safe food consumption. Promote thorough cooking of poultry and poultry products. Separate raw meat from cooked or ready-to-eat foods. Keep clean and wash your hands. Handle and store meat properly.
- Live animal market hygiene and biosecurity should be assessed and improved where possible.
- National food safety authorities and poultry producers should develop and implement quality assurance schemes in line with HACCP (Hazard Analysis Critical Control Point) principles and steps.
- Carefully treat drinking water supplied from open surface water to minimize any potential risks. Be aware that properly treated waste water seems to pose only a small risk for humans. Be aware that in some cases, recreational water might be contaminated. And consider that faeces from infected animals can be infectious.



5

To minimize exposure of the public, encourage proper personal hygiene and instruct the public to seek medical help if illness develops

- Minimize exposure of the public to potentially infected birds and other sources of contamination and encourage proper personal hygiene, especially frequent hand washing, and instruct people to seek medical help if illness develops.
- When Avian influenza viruses circulate in an area, all the people who are exposed to infected birds are at risk, especially those who: keep live poultry in their backyards or homes, or purchase live poultry or birds at markets; slaughter, de-feather, or butcher poultry handle and prepare raw poultry for further cooking and consumption; transport or sell live poultry or carcasses; are involved in culling / depopulating / disposing of



6

Increase surveillance for human cases of Avian influenza

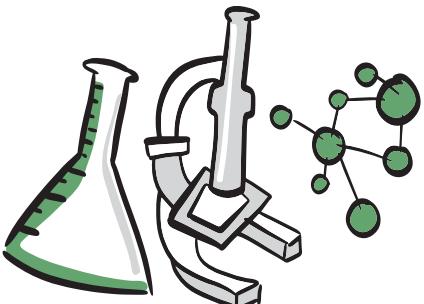
- Avian influenza is not easily transmitted from infected animals to humans and there has not been sustained human-to-human transmission.
- However, it is important to ensure suspected human cases are investigated in order to give them the best possible treatment; to identify other potential human contacts in those cases and monitor them for occurrence of illness; and to identify if there is human-to-human transmission of the virus.
- The most important goal for investigations of human cases of infections with Avian influenza viruses is to assess the extent of potential human-to-human transmission, especially in clusters of human cases and contacts of confirmed cases.
- Enhanced surveillance should consider the health care seeking behaviour of the population and can include a range of options such as active and passive approaches that are health care and/or community-based.
- Persons with exposure to Avian influenza should monitor their health for the duration of the known exposure period plus an additional seven days. This will facilitate early detection of illness and timely commencement of antiviral treatment and isolation precautions. They should report any relevant health problems to a health care facility.



7

Collecting appropriate samples and rapid and precise characterization of virus isolates are essential for early detection and management of patients

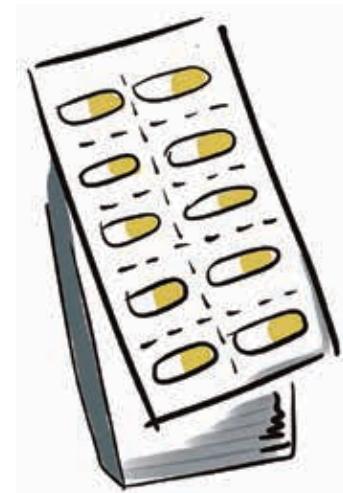
- Collection of appropriate specimens from suspected human cases for identification by a qualified laboratory, together with rapid and precise characterization of virus isolates at specialized reference laboratories, are essential for early detection of cases, proper management of patients, and understanding the epidemiology of the disease.
- In addition, appropriate specimen collection is important for monitoring the development of resistance to antivirals, producing effective vaccines, and evaluating laboratory methods.
- Ensure that specimen collection materials are available and collection of specimens is done safely, correctly and in a timely manner.
- Promote virus/sample sharing with WHO-recognized laboratories.



8

Health care facilities need to be ready to manage patients with Avian influenza virus infections

- Implement early infection control precautions to prevent nosocomial (originating in a hospital) spread of the disease.
- Manage cases properly to prevent severe illness and death. Administer neuraminidase inhibitors (oseltamivir, zanamivir) treatment as the primary choice of antiviral treatment, using the standard regimen for seasonal influenza virus infection, as soon as possible (ideally, within 48 hours following symptom onset) to maximize therapeutic benefits. Monitor patients and viruses for indications of antiviral resistance.
- If there is an insufficient in-country supply of neuraminidase inhibitors, WHO can provide it from its strategic global stockpile.
- Report laboratory-confirmed cases to WHO, under the International Health Regulations (2005).



9

The animal health sector is in charge of preventing and controlling outbreaks of disease in animals, including Avian influenza

- Controlling the disease in the animal source is critical to decrease risk to humans.
- Reporting new and ongoing outbreaks in animals is important for focusing human health prevention action in the affected areas and raising awareness among professionals working with potentially infected animals, as well as with the public. The sharing of information on human cases with the animal health sector is equally important so that they can target their response activities.
- The Food and Agriculture Organization (FAO) of the United Nations (UN) promotes food security and good nutrition by providing access to knowledge, policy advice and technical

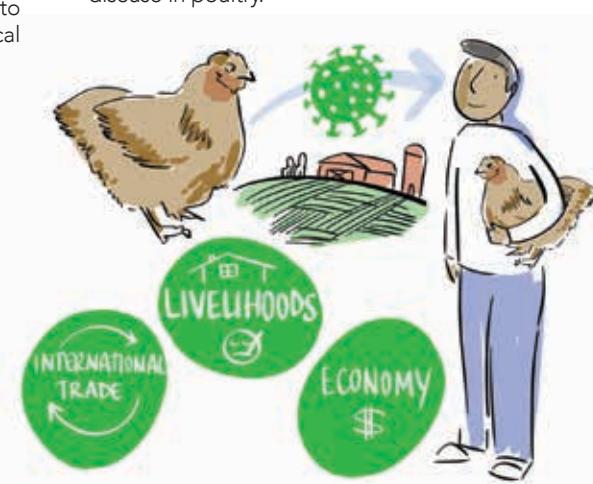
assistance to Member Countries. FAO publishes information and guidance on Avian influenza, provides direct technical assistance to countries and works closely with many stakeholders.

- The World Organization for Animal Health (OIE) sets international standards for animal health and zoonoses, through the 'OIE Code' and 'OIE Manual' and is responsible for collecting and disseminating official animal disease information from Member Countries. It collaborates with National Veterinary Services as well as with FAO at national, regional and global levels to provide technical assistance to countries (e.g. laboratory support).
- National veterinary services, often located within the Ministry of Agriculture, are responsible for implementation of national Avian influenza measures to control and prevent the spread of the disease in poultry.

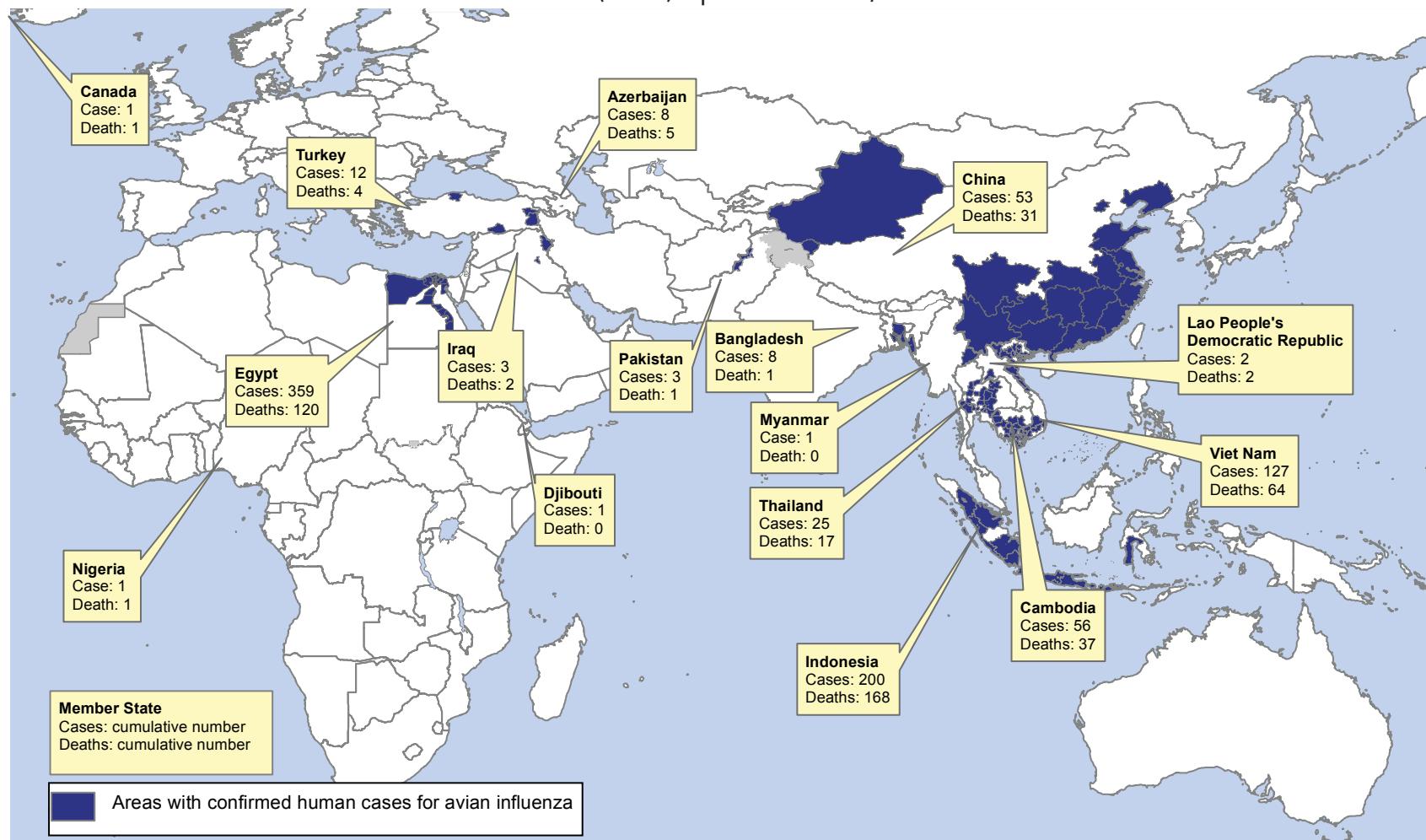
10

Influenza A(H5N1) vaccines are not widely available and the decision to use them depends on the risk of infection

- WHO recommends the targeted administration of seasonal influenza vaccine to health care workers in all countries in order to protect their patients from seasonal influenza infections. In addition, WHO recommends vaccination against seasonal influenza infection to selected groups at increased risk of exposure to Avian influenza viruses, as one of several measures for reducing opportunities for the simultaneous infection of humans with Avian and human influenza viruses.
- Vaccines for A(H5N1) virus for human use have been developed based on WHO-recommended candidate vaccine viruses and licensed in several countries. They are not widely available. Vaccination with A(H5N1) vaccines for human use are recommended for first responders to human or animal A(H5N1) outbreaks, and for health care workers who evaluate or manage patients with suspected or confirmed A(H5N1) virus infection in designated referral facilities. Be aware that WHO has no stockpile of A(H5N1) vaccines.



Areas with confirmed human cases for avian influenza A(H5N1) reported to WHO, 2003–2018*



* All dates refer to onset of illness

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

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Source: WHO/IHM, as of 16 February 2018

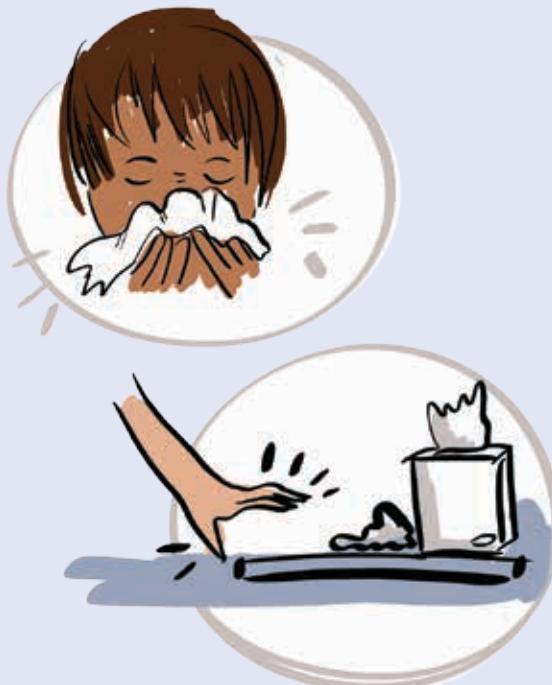


More information about Avian and other zoonotic influenza:

- Avian and other zoonotic influenza WHO webpage:
http://www.who.int/influenza/human_animal_interface/en/
- Avian and other zoonotic influenza WHO fact sheet:
http://www.who.int/mediacentre/factsheets/avian_influenza/en/
- Avian and other zoonotic influenza WHO MOOC:
<https://openwho.org/courses/avian-and-other-zoonotic-influenza-introduction>
- WHO Summary Of Key Information Practical To Countries Experiencing Outbreaks Of A(H5N1) And Other Subtypes Of Avian Influenza, First Edition July 2016
<http://apps.who.int/iris/bitstream/10665/246251/1/WHO-OHE-PED-GIP-EPI-2016.1-eng.pdf?ua=1>
- Case definitions for the four diseases requiring notification to WHO in all circumstances under the IHR (2005)
http://www.who.int/ihr/surveillance_response/case_definitions/en/
- Pandemic Influenza Preparedness Framework for sharing of influenza virus and access to vaccines and other benefits
http://www.who.int/influenza/resources/pip_framework/en/

Seasonal influenza

10 THINGS YOU SHOULD KNOW



1. Seasonal influenza is a respiratory disease transmitted through droplets
2. Influenza disease appears in seasonal epidemics and may be very disruptive
3. Influenza A and B viruses can cause epidemics
4. Influenza can be severe and fatal
5. Annual vaccination is the best way to prevent infection
6. Early treatment with antiviral drugs may reduce complications and deaths
7. Seasonal influenza is hard to differentiate clinically from other respiratory diseases
8. Non-pharmaceutical measures prevent and reduce transmission
9. Monitoring, regular surveillance and sharing of data and viruses are important
10. Border controls do not reduce international spread

Seasonal influenza response tips

Coordinating responders

- WHO Global Influenza Surveillance and Response System (GISRS) monitors influenza activity globally and provides recommendations in areas including laboratory diagnostics, vaccines, antiviral susceptibility and risk assessment

Health Information

- Regular sharing of epidemiological information and viruses helps to develop policy to reduce the influenza burden

Communicating risk

- Encourage health authorities to:
 - Educate on prevention measures
 - Communicate about vaccine effectiveness and safety, especially for high-risk groups
- Promote hand and respiratory hygiene, and cough etiquette
- Key messages:
 - Seasonal influenza is highly contagious
 - It spreads through droplets
 - Annual vaccination is the best prevention
 - High-risk groups such as the elderly, pregnant women, infants and people with underlying conditions are most at risk and should seek medical care

Health Interventions

- Annual vaccination
- Antiviral drugs
- Non-pharmaceutical interventions:
 - Social distancing (e.g. school closure)
 - Hygiene: cough etiquette, hand hygiene

1

Seasonal influenza is a respiratory disease transmitted through droplets

- Seasonal influenza (or "flu") is an acute respiratory disease.
- It is highly contagious: it spreads easily from person to person through droplets when an infected individual coughs or sneezes. Sometimes, the transmission can be airborne, especially when aerosol-generating procedures are performed.
- It can also be transmitted by touching contaminated surfaces or hands.
- Therefore, rapid transmission can occur in crowded areas (e.g. schools or nursing homes).
- Precautionary measures to limit transmission include: hand hygiene, respiratory hygiene and cough etiquette, and droplet precautions in hospital settings.

2

Influenza disease appears in Seasonal epidemics and may be very disruptive

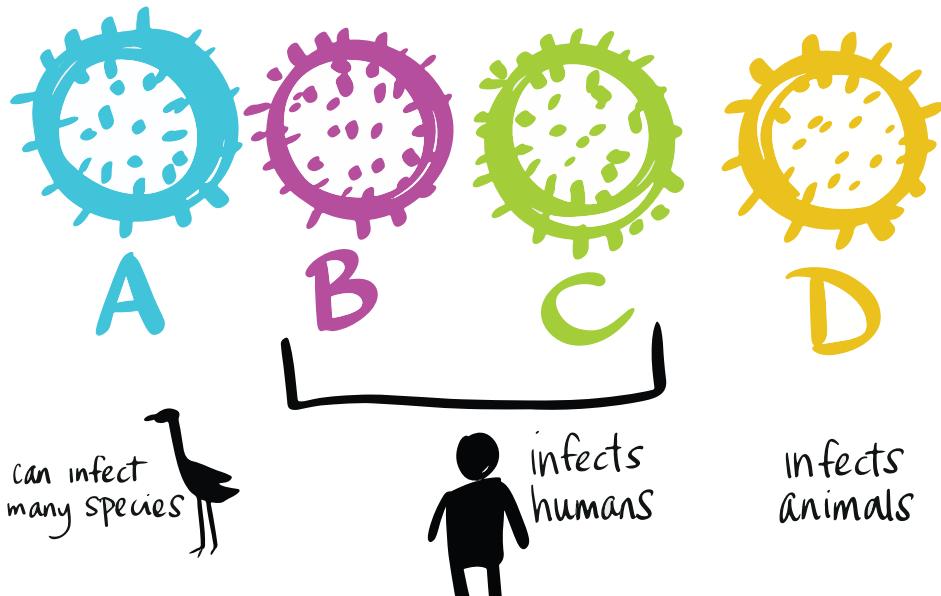
- In temperate climates, seasonal epidemics occur mainly during winter. The epidemics generally last from eight to 10 weeks in temperate areas.
- In tropical regions, the pattern of influenza epidemics is not always as regular. Some countries have two peaks and some do not have very regular epidemics.
- Epidemics can be very disruptive. While the yearly burden is variable and the average burden is currently being evaluated, influenza does cause considerable disease in all countries. In addition to illness, epidemics can have a high economic impact because of work and school absenteeism, productivity losses and overwhelmed hospital capacity.



3

Influenza A and B viruses can cause epidemics

- There are four types of influenza viruses - types A, B, C and D - but only influenza A and B cause epidemics. Influenza A can infect many species (birds, humans, pigs, horses, etc.). Influenza B and C infect mainly humans. Influenza type C virus is less frequent and usually causes mild infections, thus presents less significant public health implications.
- The A type of influenza viruses are further classified in subtypes based on their surface proteins. There are 18 different haemagglutinin (H) types and 11 different neuraminidase (N) types. Different combinations are possible. Currently, H3N2, H1N1pdm09 are circulating in humans as Seasonal influenza A viruses.



- Influenza viruses are in constant mutation. This is called antigenic drift and results in changes to the viruses which make people susceptible to catch flu every year, as they do not have immunity against the drifted viruses.



4

Influenza can be severe and fatal

- Influenza can cause severe illness or death in any person.
- A wide range of complications can be caused by influenza virus infection of the upper respiratory tract (nasal passages, throat) and lower respiratory tract (lungs). Sinus and ear infections are examples of moderate complications from flu, while pneumonia is a serious flu complication, that people with chronic lung disease are at higher risk of developing.
- Other possible serious complications triggered by flu can include inflammation of the heart (myocarditis), brain (encephalitis) or muscle (myositis, rhabdomyolysis) tissues, and multi-organ failure (for example, respiratory and kidney failure). Flu virus infection of the respiratory tract can trigger an extreme inflammatory response in the body and can lead to sepsis.
- People at higher risk of developing complications and severe Seasonal influenza are:
 - a. Children younger than five years;
 - b. People older than 65 years;
 - c. People with chronic medical conditions such as HIV/AIDS, asthma, heart and lung diseases and diabetes.
- Flu also can make chronic medical problems worse. For example, people with asthma may experience asthma attacks while they have the flu, and people with chronic heart disease may experience a worsening of this condition triggered by flu.

5

Annual vaccination is the best way to prevent infection

- The most effective way to prevent the disease is getting vaccinated every year.
- Vaccination is especially important for pregnant women, people at high risk of exposure, people at higher risk of serious influenza complications, and for people who live with, or care for, high-risk individuals (health care workers).
- Ideally, people should get vaccinated just before the influenza season begins for the most effective coverage, although getting vaccinated at any time during the influenza season can still help prevent infections.
- Influenza viruses evolve constantly, and twice a year, WHO makes recommendations to update the vaccine compositions, based on the monitoring done through the Global Influenza



Surveillance and Response System (GISRS). This maximises the effectiveness of the vaccines, as circulating viruses need to be well-matched with the viruses contained in the vaccines.

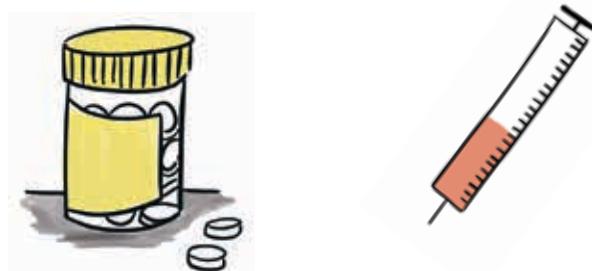
- A number of inactivated influenza vaccines and recombinant influenza vaccines are available in injectable form. Live attenuated influenza vaccine is available as a nasal spray.



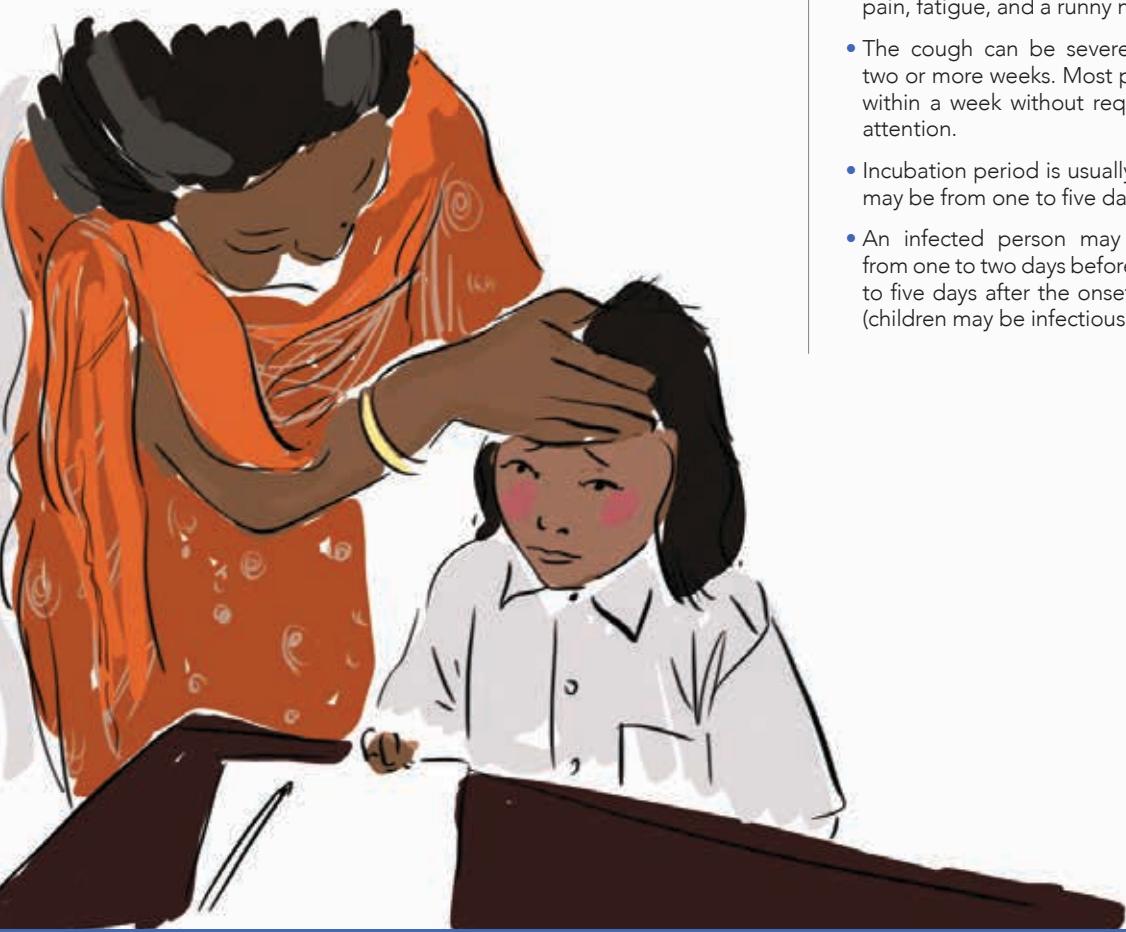
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Early treatment with antiviral drugs may reduce complications and deaths

- Antiviral drugs may reduce severe complications and deaths. Ideally, they need to be administered early in the disease (within 48 hours of onset of symptoms). They are especially important for high-risk groups.
- They are two types of drugs: neuraminidase inhibitors and adamantanes. Currently, the majority of circulating influenza viruses are resistant to the adamantanes, limiting their effectiveness. Therefore, neuraminidase inhibitors (oseltamivir and zanamivir, peramivir and laninamivir) are the recommended first-line treatment.
- People with Seasonal influenza should always drink plenty of water, rest and not go to work, in order to reduce transmission.

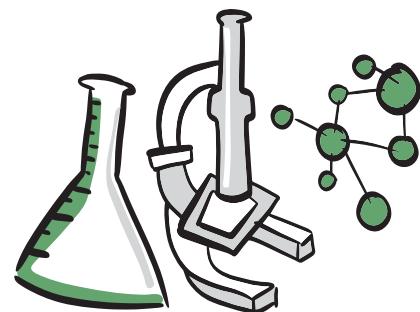


7



Seasonal influenza is hard to differentiate clinically from other respiratory diseases

- People with Seasonal influenza usually show non-specific symptoms. They include: sudden onset of fever, cough (usually dry), headache, muscle and joint pain, fatigue, and a runny nose.
 - The cough can be severe and can last two or more weeks. Most people recover within a week without requiring medical attention.
 - Incubation period is usually two days but may be from one to five days.
 - An infected person may be infectious from one to two days before and until four to five days after the onset of symptoms (children may be infectious for longer).
- Laboratory diagnosis is critical to differentiate Seasonal influenza from other respiratory diseases:
 - The most appropriate specimens for the diagnosis of influenza are upper respiratory tract specimens. Samples should be taken from the deep nostrils (nasal swab), throat (oropharyngeal swab) and nasopharynx (nasopharyngeal swab). Nasopharyngeal aspirate and bronchial aspirate are also useful;
 - The Reverse Transcription Polymerase Chain Reaction (RT-PCR) is the preferred technique for diagnosis;
 - In addition to RT-PCR, other laboratory techniques are available for the detection, identification and characterization of influenza virus including virus isolation in cell culture and the identification of viral antigens (fluorescent antibodies, FA, test or Enzyme-Linked Immunosorbent Assay, ELISA). Single serum is not ideal for diagnosis of an acute infection.



8

Non-pharmaceutical measures prevent and reduce transmission

- The implementation of non-pharmaceutical measures helps to prevent and slow transmission and control epidemics.
- Before an epidemic, to reduce the potential disruptive effects of Seasonal influenza, it is critical that:
 - There is effective health planning in place so health education and immunization for at-risk patients, their close contacts and health care workers are implemented;
 - Increased demand for medical care and possible absenteeism of health care workers during the epidemic period are anticipated.
- During an epidemic, to reduce transmission:
 - Health education should continue;
 - Hand hygiene, respiratory hygiene and cough hygiene (e.g. covering mouth and nose with a tissue when coughing and then throwing it out and washing hands) should be strictly observed by all;
 - Personal protective equipment in health care settings (masks) should be used when in contact with people with Seasonal influenza (the sick are wearing the mask);
 - Social distancing may help. It includes isolation of patients, staying at home when sick, and school closure. School closures have the greatest benefit when applied early in the course of the outbreak. The benefit has to be weighed against the cost of disruption;

- Risk communication and community engagement should be implemented so populations comply with recommended public health measures (especially needed to implement vaccination recommendations).



9

Monitoring, regular surveillance and sharing of data and viruses are important

- Regular monitoring and surveillance are important to anticipate severe epidemics and plan health care services as well as to be prepared for a pandemic.
- Since 1952, WHO has been coordinating a network which now has more than 150 laboratories and experts to analyse the spread of influenza and recommend the vaccine composition.
- Sharing of viruses and data is also important to be able to update the vaccine and antiviral treatments.

10

Border controls do not reduce international spread

- Border control measures such as entry and exit screening and quarantining of travellers crossing international borders are generally not recommended, as they have not been shown to reduce the spread of influenza.
- Screening for detecting people with fever might be inefficient as:
 - Infected people may travel during the incubation period, during which they will not show symptoms but will be able to transmit the disease;
 - People may be using anti-pyretics and not show fever.
- Implementing borders control measures may also be very expensive and disruptive.



More information about Seasonal influenza:

- Influenza WHO webpage:
<http://www.who.int/influenza/en/>
- Seasonal influenza WHO fact sheet:
<http://www.who.int/mediacentre/factsheets/fs211/en/>
- Seasonal influenza WHO MOOC:
<https://openwho.org/courses/seasonal-influenza-introduction>
- Patient care:
http://www.who.int/influenza/patient_care/en/
- Global Influenza Surveillance and Response System (GISRS):
http://www.who.int/influenza/gisrs_laboratory/en/



Pandemic influenza

10 THINGS YOU SHOULD KNOW



1. Another influenza pandemic is inevitable but unpredictable
2. Pandemics require global concerted actions
3. A pandemic happens when an influenza virus emerges to which most people have no immunity
4. Influenza pandemics may be mild or severe and can have a global impact
5. Vaccines will probably not be available in the first months
6. Risk groups and symptoms will be unknown until the pandemic occurs
7. Early treatment with antivirals and other medical support can reduce complications and deaths
8. Non-pharmaceutical interventions may be the only effective initial measures in most countries
9. Communicating risk is critical
10. Pandemic response capacity can be built through Seasonal influenza

Pandemic influenza response tips

Coordinating responders

- Multisectoral coordination
- Whole-of-society approach

Communicating risk

- Encourage health authorities to:
 - Have a plan on the use of antivirals and vaccines
 - Have a multisectoral risk communication plan in place
 - Communicate early and frequently about how to protect from the disease
- Engage communities and individuals to practice good hygiene
- Key messages:
 - Pandemic influenza is caused by a new virus to which no one has immunity and protection
 - You can protect yourself by using proper cough hygiene, effective hand washing and by distancing yourself away from others if you fall sick
 - Stay at home, drink plenty of fluids
 - Seek medical advice if you have severe symptoms or you already have other medical conditions that may put you at further risk of severe disease
 - Take the new vaccine when it became available if you are asked to do so

Health Information

- Notify a case of novel influenza to WHO, under the IHR (2005)
- Share viruses and information with the WHO GISRS (Global Influenza Surveillance and Response System)
- Consult WHO surveillance and severity assessment guidance

Health Interventions

- Vaccines
- Antiviral treatment
- Non-pharmaceutical interventions (at personal and community level): hygiene, social distancing etc.

1

Another influenza pandemic is inevitable but unpredictable

- It is not possible to predict when or where the next Pandemic influenza will occur, what subtype it will be, and what morbidity and mortality impact it will have, but it is certain that there will be one.
- History has shown pandemics occur at 10- to 50-year intervals, with varying severity and impact. During the 20th century, there have been three influenza pandemics (in 1918, 1957 and 1968). Since 2000, there has been one influenza pandemic, in 2009.
- Influenza viruses are very unstable and constantly mutating. They undergo small mutations (antigenic drift) and cause Seasonal influenza epidemics and out-of-season outbreaks. But a substantial change (antigenic shift) can occur at any time. It will result in a new virus (different subtype) which may lead to a pandemic. This antigenic shift can be the re-assortment of human influenza viruses with Avian or swine viruses, or significant point mutations of Avian or swine viruses.

When?

2

Pandemics require global concerted actions

- Influenza pandemics are very disruptive events that can cause severe social, economic, and political stress. Preparedness requires a whole-of-society approach to ensure that when the next pandemic strikes, the world will be able to respond rapidly and effectively to reduce morbidity and mortality. Not only the health sector but also all other sectors, individuals, families and communities, have a role to play in mitigating the effects of a pandemic.



3

A pandemic happens when an influenza virus emerges to which most people have no immunity

- There are three necessary factors for the emergence of Pandemic influenza:
 - A new influenza virus emerges and causes illness in humans;
 - This virus has the ability to cause sustained human-to-human transmission;
 - Human population has little or no immunity to the virus.
- Because it is a new virus to which people have not yet been exposed, the population has no or little immunity and the virus is able to spread quickly and cause illness in people.
- A Pandemic influenza virus may arise when:
 - Genes from animal and human influenza viruses mix together to create a human-animal influenza re-assortant virus (genetic re-assortment);
 - Genes in an animal influenza virus change allowing the virus to infect humans and transmit easily among them (genetic mutation).
- It is mandatory to notify a human influenza case caused by a new subtype to WHO, under the IHR (2005).



4

Influenza pandemics may be mild or severe and can have a global impact

- Influenza pandemics have various levels of severity and impact.
- It is hard to predict the characteristics, including level of severity, of the next pandemic.
- During an influenza pandemic, severity assessments should be conducted regularly at local, national and global levels, to inform public health decisions (vaccine production and use, antivirals use, school closures, social distancing strategies, etc.). Key elements to take into consideration are: the transmissibility of the disease, its seriousness (complications, for which group of people, etc.), the impact on the health sector (whether it is overwhelmed or not).

5

Vaccines will probably not be available in the first months

- Vaccines are one of the most effective ways to protect people during influenza epidemics and pandemics.
- However, the availability of a pandemic vaccine will be delayed by several months because of the requirements for vaccine formulation and production lead-time. It is expected that it takes about 24 weeks (almost six months) for a vaccine to be available after the identification of the pandemic virus.
- It is probable that the worldwide production capacity will still be insufficient and restrict global access to the vaccine, at least during the first phase of the pandemic. In the best case scenario, it has been estimated (2015) that annual production could reach about 6.2 billion



doses of vaccines, which is still insufficient to cover the world population because two doses of vaccines will probably be needed to fully protect against the virus. Furthermore, it is challenging to maintain this production capacity.

- Vaccination should target the most at risk of exposure (health care workers, people living in crowded areas) and those most at risk of complications.
- Antigen-sparing strategies can be used to increase vaccine availability.
- Some countries are stockpiling pre-pandemic vaccines against some Avian influenza viruses.

Characteristics of the past four influenza pandemics

Pandemic year of emergence and common name	Area of origin	Influenza A virus sub-type (type of animal genetic introduction/recombination event)	Estimated reproductive number	Estimated case fatality	Estimated attributable excess mortality worldwide	Age group most affected
1918 "Spanish flu"	Unclear	H1N1 (unknown)	1.2–3.0	2–3%	20–50 million	Young adults
1957–1958 "Asian flu"	Southern China	H2N2 (avian)	1.5	<0.2%	1–4 million	All age groups
1968–1969 "Hong Kong flu"	Southern China	H3N2 (avian)	1.3–1.6	<0.2%	1–4 million	All age groups
2009–2010 "influenza A(H1N1) 2009"	North America	H1N1 (swine)	1.1–1.8	0.02%	100 000–400 000	Children and young adults

Source: Pandemics of the 20th–21st centuries. Stockholm, European Centre for Disease Prevention and Control.

6

Risk groups and symptoms will be unknown until the pandemic occurs

- Although we start with the assumption that the risk groups for infection and severe outcome are the same as in Seasonal influenza, there might be differences.
- Historical knowledge from the 1918 and 2009 pandemics indicates that healthy, young adults can be disproportionately and more severely affected.
- Pandemic influenza might present differently from Seasonal influenza and symptoms may be more severe and complications more frequent.
- People with influenza will usually develop the following symptoms: sudden onset of fever, cough (usually dry), headache, muscle and joint pain, fatigue, sore throat and a runny nose;
- Complication can include pneumonia, sepsis, and inflammation of the heart (myocarditis), brain (encephalitis) or muscle (myositis);
- The incubation period is usually two days but may be from one to five days.



7

Early treatment with antivirals and other medical support can reduce complications and deaths

- Antiviral drugs may reduce severe complications and deaths. Ideally, they need to be administered early in the disease (within 48 hours of onset of symptoms). They are especially important for high-risk groups.
- During an influenza pandemic, antiviral drugs are an important tool to prevent the spread of the disease and severe outcome and complications, as vaccines will most likely not be available at an early stage.
- Effectiveness of the drugs on the novel pandemic virus must be monitored, as some influenza viruses may be (or become) resistant to them.
- Pharmaceutical interventions typically encompass the application of antivirals treatments and other drug treatment (e.g. antibiotics to target complications of influenza).



8

Non-pharmaceutical interventions may be the only effective initial measures in most countries

- Vaccination is the primary intervention to prevent infection and severe outcomes caused by influenza virus. However, at the beginning of a pandemic, Pandemic influenza vaccines, matching the new virus, will most likely not be available.
- In addition to antiviral drugs administration (which might also be short in supply), non-pharmaceutical interventions (NPI) should be put in place, at the early stage of a pandemic, to slow transmission and reduce its impact. NPI include (but are not limited to):
 - Social distancing: staying at home when sick;
 - Hygiene such as cough etiquette (covering coughs and sneezes with a tissue), hand washing and cleaning of touched surfaces and objects;
 - During severe pandemics, more extreme measures can be implemented: using facemasks when sick, schools closures, decreasing the amount of contacts among people.
 - NPI will help to reduce the number of people who are exposed and then infected.



9

Communicating risk is critical

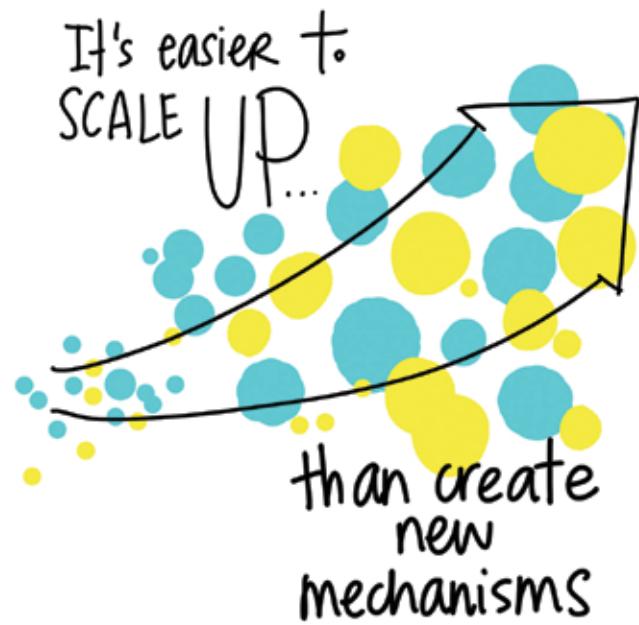
- Risk communication is particularly important in a rapidly evolving situation and when there is little known about an epidemic, which will be the case at the beginning of an influenza pandemic (novel virus). Without effective communication, the many unknowns give enough space for rumors to develop.
- As the pandemic requires a whole-of-society approach, individuals and communities must be engaged, listened to and see that their concerns are addressed. People need to be informed on how to protect themselves and stop the spread of the disease.
- Strong risk communication must be built before the emergency occurs.



10

Pandemic response capacity can be built through Seasonal influenza

- Pandemic influenza would require the implementation of the same control measures, on a larger scale: Infection Prevention and Control and Hygiene; Health Education; Vaccination; Early treatment; Social distancing; Risk communication and Community engagement.



Highlight: the PIP Framework

- The Pandemic influenza Preparedness Framework or “PIP Framework” is an innovative public health instrument that seeks to better prepare the world to respond to Pandemic influenza.
- It brings together Member States, industry, other stakeholders and WHO to implement a global approach to Pandemic influenza preparedness and response.
- The PIP Framework has two objectives which are to be pursued on equal footing:
 - To improve the sharing of influenza viruses with the potential to cause a human pandemic;
 - To establish more predictable, efficient, and equitable access to the benefits that result from the sharing of such viruses, notably vaccines and antiviral medicines.
- The Framework, developed by Member States, came into effect on 24 May 2011, unanimously adopted by the World Health Assembly.



More information about Pandemic influenza:

- Influenza WHO webpage:
<http://www.who.int/influenza/en/>
- Pandemic Influenza WHO MOOC:
<https://openwho.org/courses/pandemic-influenza-introduction>
- WHO Global Epidemiological Surveillance Standards for Influenza
http://www.who.int/influenza/resources/documents/influenza_surveillance_manual/en/
- WHO surveillance case definitions for influenza-like illness (ILI) and severe acute respiratory infections (SARI)
http://www.who.int/influenza/surveillance_monitoring/ili_sari_surveillance_case_definition/en/
- Pandemic Influenza Risk Management, WHO interim guidance, 2013
http://www.who.int/influenza/preparedness/pandemic/influenza_risk_management/en/
- WHO Checklist for Pandemic Influenza Risk and Impact Management
<http://www.who.int/influenza/preparedness/pandemic/en/>
- WHO Pandemic Influenza Severity Assessment (PISA)
http://www.who.int/influenza/surveillance_monitoring/pisa/guidance/en/
- Pandemic Influenza Preparedness Framework:
<http://www.who.int/influenza/pip/en/>



Middle East respiratory syndrome (MERS)

10 THINGS YOU SHOULD KNOW



1. MERS (Middle East respiratory syndrome) is a respiratory disease caused by a coronavirus whose reservoir is dromedary camels
2. Humans can be infected through direct or indirect contact with infected dromedary camels and potentially from camel products
3. The impact ranges from asymptomatic infection to severe pneumonia and death
4. People with weakened immune systems and chronic diseases are at high risk of severe disease
5. Early supportive clinical management reduces mortality
6. Infection prevention and control measures are critical to prevent the spread of human-to-human transmission
7. Laboratory diagnostics are available for MERS
8. Thorough case and outbreak investigation and other measures will help to prevent spread
9. Research is ongoing for treatment in humans and vaccines for camels and humans
10. MERS coronavirus (MERS-CoV) infection is a notifiable disease under the International Health Regulations (2005)

MERS response tips

Coordinating responders

- Coordination between animal and human health sectors is essential for:
 - Surveillance
 - Risk assessment
 - Investigation
 - Mitigation

Health Information

- Report cases to WHO, under the IHR (2005)
- WHO regularly conducts global risk assessments for MERS-CoV, these can be found here: http://www.who.int/csr/disease/coronavirus_infections/archive_updates/en/
- WHO has developed standard case reporting forms for data analysis and to guide actions

Communicating risk

- Encourage health authorities to:
 - Identify and target at-risk populations with information on how to protect themselves and prevent further transmission
 - Have a multi-sectoral risk communication plan and to activate it
- Key messages:
 - Precautions for people at high risk of developing severe disease include: practicing good personal hygiene, avoiding contact with camels; not drinking raw camel milk or camel urine; and not eating camel meat that has not been thoroughly cooked
 - Enhance infection prevention and control in health care facilities
 - Seek health care early on and follow medical advice

Health Interventions

- Active case finding and contact tracing
- Supportive case management
- Infection prevention and control measures to prevent health care workers infections

1

MERS (Middle East respiratory syndrome) is a respiratory disease caused by a coronavirus whose reservoir is dromedary camels

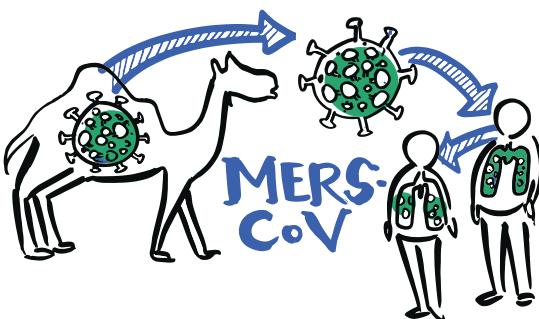
- Middle East respiratory syndrome (MERS) is a viral respiratory illness caused by a coronavirus (Middle East respiratory syndrome coronavirus, or MERS-CoV) that was first identified in humans in the Kingdom of Saudi Arabia in 2012.
- Coronaviruses are a large family of viruses that can cause diseases in humans, ranging from the common cold to Severe Acute Respiratory Syndrome (SARS).
- Dromedary camels (one-humped camels) are the reservoir host for MERS-CoV.
- Since 2012, MERS has been reported in 27 countries. Approximately 80% of human cases have been reported by the Kingdom of Saudi Arabia. Cases identified outside the Middle East are people who were infected in the Middle East and then travelled elsewhere. On rare occasions, small outbreaks have occurred in areas outside the Middle East.



2

Humans can be infected through direct or indirect contact with infected dromedary camels and potentially from camel products

- MERS-CoV is a zoonotic virus: it is transmitted between animal and people.
- Dromedary camels are the main source of infection in humans: humans are infected through direct or indirect contact with infected dromedary camels.
- At-risk groups of infection, because they are in contact with dromedary camels, include: camel farm workers; slaughterhouse workers; market workers; veterinarians; anyone handling dromedary camels or dromedary camels'



products (e.g. cooking). Health care workers caring for MERS patients without adequate personal protective equipment are also at high risk of infection.

- It is recommended that these high-risk groups practice good personal hygiene, including frequent hand hygiene. Hands should be washed with soap and water

and/or alcohol gel after every contact with an animal. Workers should wear facial protection where feasible; and protective clothing, which should be removed after work (followed by hand hygiene) and washed daily.

- The consumption of raw or undercooked animal products, including milk and meat, carries a potential risk. Animal products that are processed appropriately through cooking or pasteurization are safe for consumption. Properly cooked products should also be handled with care to avoid cross contamination with uncooked foods.
- As a general precaution, anyone visiting farms, markets, barns, or other places where dromedary camels and other animals are present should practice general hygiene measures, including regular hand washing before and after touching animals, and should avoid contact with sick animals. People should avoid unprotected direct contact with any animal that has been confirmed positive for MERS-CoV infection.
- There is no evidence of sustained human-to-human transmission: the virus does not pass easily from person to person unless there is close and unprotected contact. There has been limited human-to-human transmission among family members. However, human-to-human transmission has been repeatedly shown to be amplified in health care settings, especially when infection prevention and control measures are inadequate.

3

The impact ranges from asymptomatic infection to severe pneumonia and death

- The clinical spectrum of MERS-CoV infection ranges from no symptoms (asymptomatic) or mild respiratory symptoms to severe acute respiratory disease and death.
- MERS symptoms are non-specific and can include headache, tiredness, feverishness, mild cough, sore throat, and runny nose. Some patients may present



4

People with weakened immune systems and chronic diseases are at high risk of severe disease

- The virus causes a more severe disease in older people, people with weakened immune systems, and those with chronic diseases such as renal disease, cancer, chronic lung disease, blood disease and diabetes. These people are also at increased risk of infection.
- People at high risk of developing severe disease (people with underlying conditions) should avoid contact with camels.

5

Early supportive clinical management reduces mortality

- Supportive therapies prevent complications and increase chances of survival. They include: oxygen, antimicrobials, specific treatment for underlying conditions such as diabetes, kidney failure, etc.
- Treatment is based on a person's clinical condition.
- There is no specific treatment or vaccine available for MERS currently.



6

Infection prevention and control measures are critical to prevent the spread of human-to-human transmission

- Standard precautions should be routinely applied to all patients. They include hand hygiene, respiratory hygiene, use of Personal Protective Equipment (PPE), safe waste management, cleaning and disinfection of equipment and cleaning of the environment.
- Triage policies should be implemented to rapidly detect potential MERS-CoV cases and all cases with acute respiratory symptoms.
- Triage, waiting areas and patient rooms should be adequately ventilated.
- Health care workers involved in aerosol-generating procedures are at greater risk of infection.
- Droplet precautions should be added to the standard precautions when providing care to any patient with symptoms of acute respiratory infection.
- Hospital cleaning staff should also be informed of and trained to take proper precautions when cleaning rooms of MERS patients.



respiratory infection (ARI). They include the use of a mask and eye-protection when working within 1-2 metres of the patient and patient isolation (organization of the space and processes to allow separation of at least 1-2 metres between patient with ARI and other individuals not wearing PPE).

Infection prevention and control when caring for patients with MERS or suspected MERS

All patients	Standard precautions, triage procedures
Patients with ARI	Droplet precautions
When performing aerosol-generating procedures in patients with ARI	Airborne precautions

Laboratory diagnostics are available for MERS

- Laboratory confirmation of MERS-CoV infection requires good samples, high levels of biosafety and good laboratory capacities.

Testing:

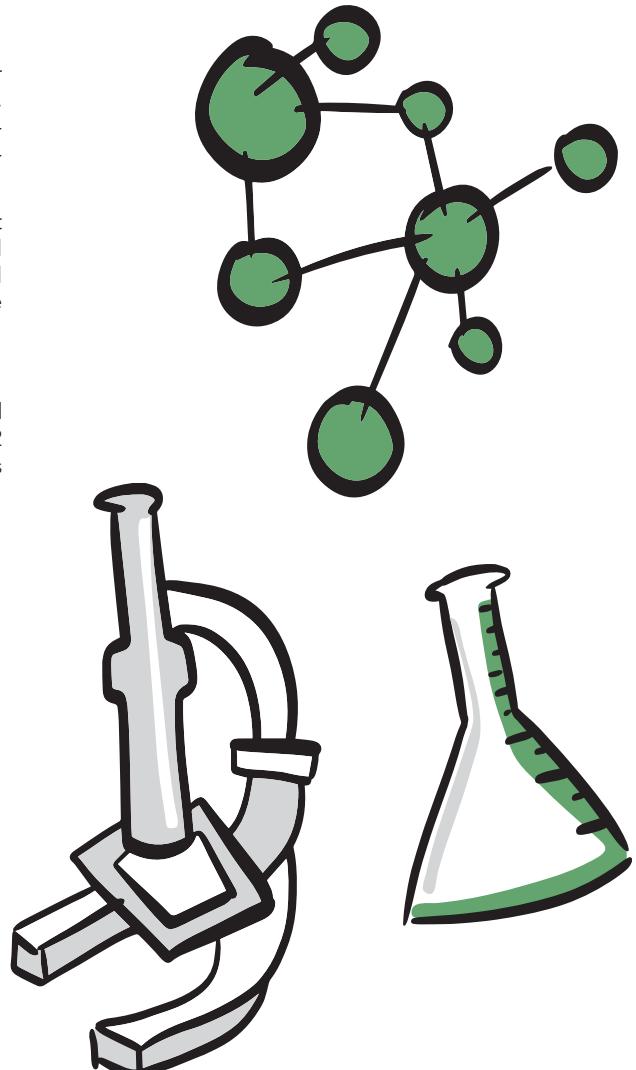
- A case of MERS-CoV infection may be laboratory confirmed by detection of viral nucleic acid or by using serology to demonstrate antibodies.
- The presence of viral nucleic acid can be confirmed by either:
 - A positive real-time Reverse Transcription Polymerase Chain Reaction (RT-PCR) on at least two specific genomic targets;
 - o A case with a positive RT-PCR result for a single specific target without further testing but with a history of potential exposure and consistent clinical signs is considered a probable case.
 - Or a single positive target with sequencing.
- If initial testing is negative in patient who is strongly suspected to have MERS-CoV infection, the patient should be resampled and include lower respiratory specimens. To confirm clearance of the virus, respiratory samples should continue to be collected until there are two consecutive negative results at least 24 hours apart in clinically recovered persons.

Samples:

- It is strongly recommended that lower respiratory specimens such as sputum, endotracheal aspirate or broncho-alveolar lavage are collected for MERS-CoV when possible.
- If not possible, upper respiratory tract specimens such as nasopharyngeal aspirate or combined nasopharyngeal and oropharyngeal swab should be collected.

Biosafety:

- Molecular testing for MERS-CoV should be conducted under Biosafety level 2 (BSL-2) conditions. Virus culture requires BSL-3 biosafety conditions.



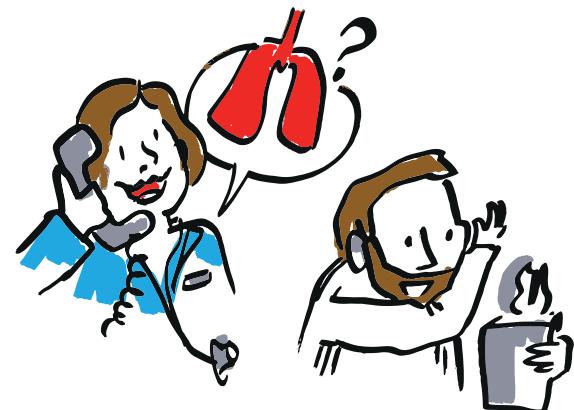
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Thorough case and outbreak investigation and other measures will help to prevent spread

- Each human case of MERS requires thorough investigation to understand the source of infection and the potential human-to-human spread amongst contacts.
- Thorough case investigation includes the investigation of potential human, animal, and/or environmental sources of exposure(s) and risk factors for infection. Patients (confirmed and suspected cases) and family members should be interviewed to collect: Essential basic information; Exposure information and travel history; and Clinical information. WHO has generated case report forms identifying the minimum amount of information that should be collected for each case of MERS.



- Once a case has been confirmed, to prevent further spread of the disease, active case finding should be implemented in the community and in health care settings:
 - All close contacts should be identified and monitored for the presence of symptoms for 14 days. A contact is any person who has cared for or lived with a confirmed case, or had unprotected contact with that person's respiratory secretions, body fluids and/or excretions when that person was symptomatic;
 - Contacts should be placed under active surveillance for 14 days after last exposure to the confirmed or probable case with monitoring for respiratory symptoms (a health care worker should visit or call them on a daily basis);
 - Any contacts who develop symptoms should be isolated in a health care facility and tested for MERS-CoV infection;
 - Health care workers with direct contact with a MERS patient should be closely monitored.
- Health Education, including basic information about MERS, how to prevent against MERS-CoV infection for different groups (e.g. contacts of confirmed patients, health care workers caring for MERS patients, occupational groups who work with dromedary camels, and populations at higher risk of severe disease) and what to do should an individual suspect they have MERS-CoV infection, should be provided by trained individuals.

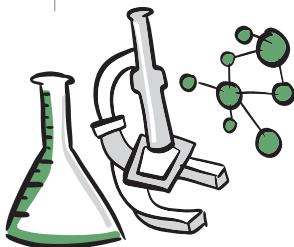


management of close contacts

9

Research is ongoing for treatment in humans and vaccines for camels and humans

- WHO has developed a MERS-CoV research agenda to address key unknowns for this virus focusing on five major areas of research: i) virus origin and characteristics, ii) epidemiology and transmission, iii) clinical management and infection prevention and control measures, iv) product development and implementation, and v) impact of interventions and operational research.
- WHO's Research and Development Blueprint is working to accelerate the development of medical interventions for MERS.
 - Currently, there are no licensed treatments for MERS;
 - Currently, a dozen vaccine candidates for both humans and dromedary camels are in preclinical development.



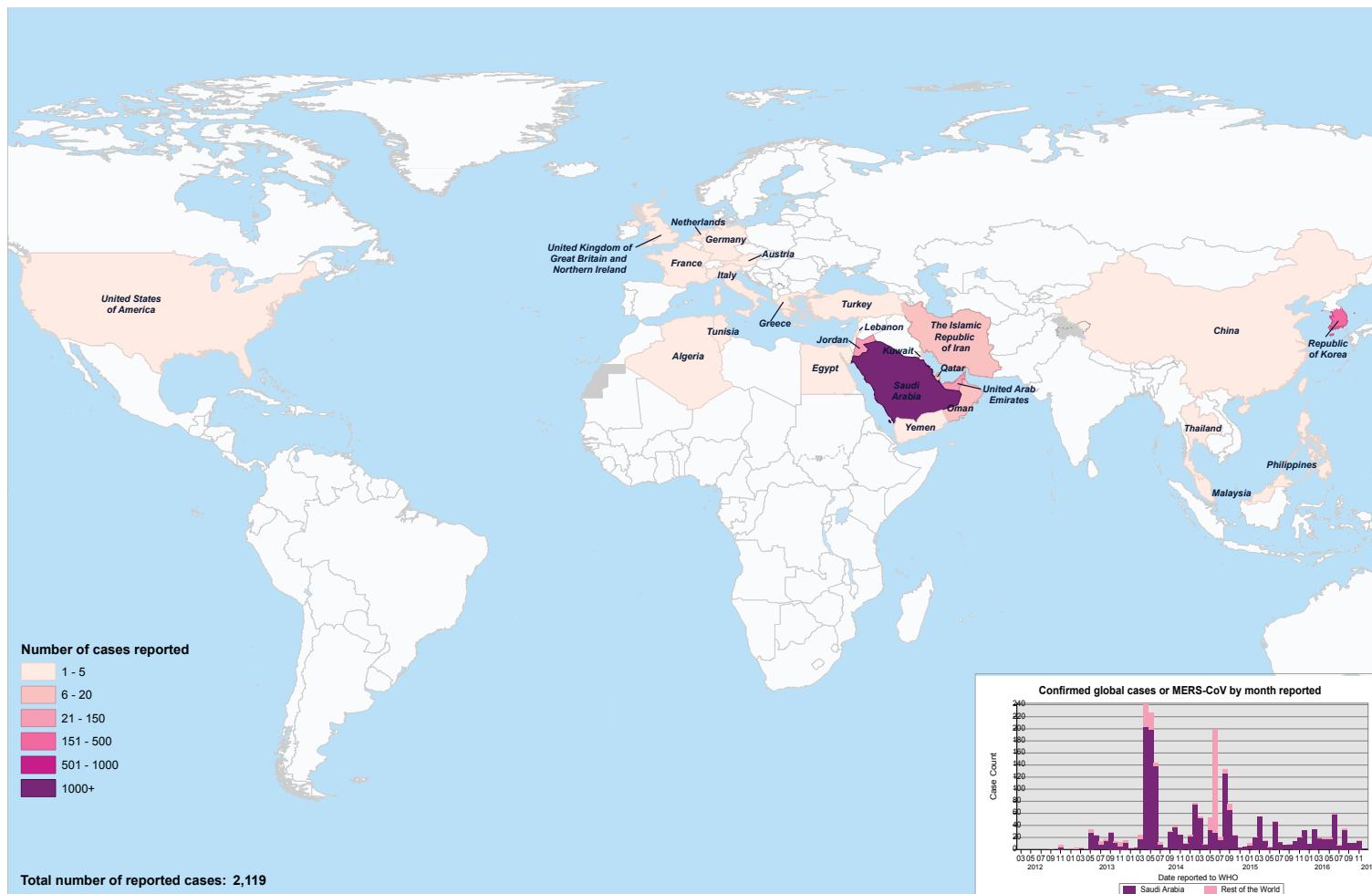
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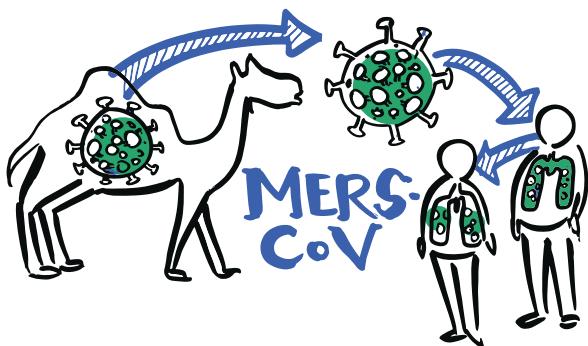
MERS-CoV infection is a notifiable disease under the International Health Regulations (2005)

- Probable and confirmed cases must be reported within 24 hours of classification, with information about their exposure, testing and clinical course. MERS case definitions for reporting to WHO can be found here: http://www.who.int/csr/disease/coronavirus_infections/case_definition/en/



Confirmed global cases of MERS-CoV 2012 – 2017



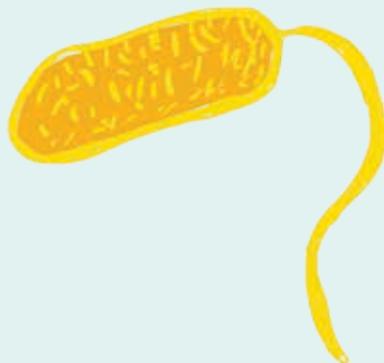


More information about MERS:

- MERS-CoV WHO website:
<http://www.who.int/emergencies/mers-cov/en/>
- MERS WHO MOOC:
<https://openwho.org/courses/pandemic-epidemic-diseases>
- Latest global risk assessment for MERS-CoV:
http://www.who.int/csr/disease/coronavirus_infections/archive_updates/en/
- Guidance on laboratory testing:
http://www.who.int/csr/disease/coronavirus_infections/mers-laboratory-testing/en/
- Surveillance guidance including recommendations on criteria for case investigation and testing:
http://www.who.int/csr/disease/coronavirus_infections/surveillance-human-infection-mers/en/
- Guidance on the investigation of cases of MERS-CoV infection:
http://www.who.int/csr/disease/coronavirus_infections/mers-investigation-cases/en/
- WHO case investigation form for MERS-CoV:
http://www.who.int/csr/disease/coronavirus_infections/MERS_case_investigation_questionnaire.pdf?ua=1
- MERS case definitions for reporting to WHO:
http://www.who.int/csr/disease/coronavirus_infections/case_definition/en/
- Guidance on case management and Infection Prevention and Control:
http://www.who.int/csr/disease/coronavirus_infections/technical-guidance-infection/en/
- Information about MERS-CoV Research and Development:
<http://www.who.int/blueprint/priority-diseases/key-action/mers-cov/en/>

Cholera

10 THINGS YOU SHOULD KNOW



1. Cholera is closely linked to inadequate access to clean water and sanitation
2. Cholera is transmitted by faecally-contaminated water and food
3. Cholera outbreaks can be explosive
4. Rapid detection of suspected cases and laboratory confirmation are essential
5. People with Cholera experience acute watery diarrhoea with no fever
6. Severe forms of Cholera can kill within hours: early rehydration is the cornerstone of treatment
7. Oral Cholera Vaccines are safe and should be used with other prevention and control strategies
8. Populations at risk should be provided with safe water and basic sanitation
9. Mapping the origin of cases is critical to orient control activities
10. WHO can provide countries with Cholera kits

Cholera response tips

Coordinating responders

- Intersectoral coordination at national and local level is critical to outbreak response
- Epidemiological data on the origin of cases should drive the multisectoral response
- Cholera kits are available for preparedness and immediate outbreak response
- Contact WHO/ICG for emergency Oral Cholera Vaccines
- Technical support is available through the Global Task Force on Cholera Control (GTFCC)

Communicating risk

- Encourage health authorities to:
 - Engage communities to enhance hygiene and food safety practices
 - Set up treatment facilities and let the public know how to access them
 - Make sure Oral Rehydration Salts are available
- Key messages:
 - Cholera is transmitted through contaminated water or food
 - Cholera can rapidly lead to severe dehydration and death if left untreated: seek treatment quickly
 - Wash hands at critical moments
 - Mild cases can be treated at home with oral rehydration
 - Take the Cholera vaccine if advised, when there is a Cholera outbreak or its threat, in your area

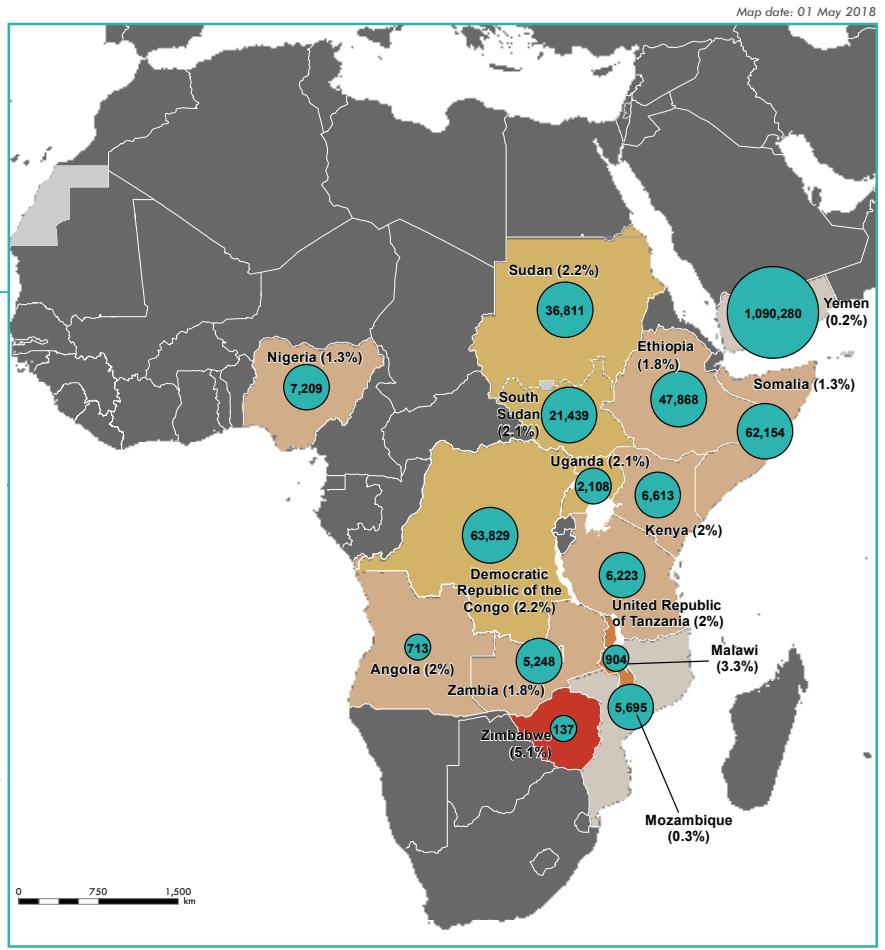
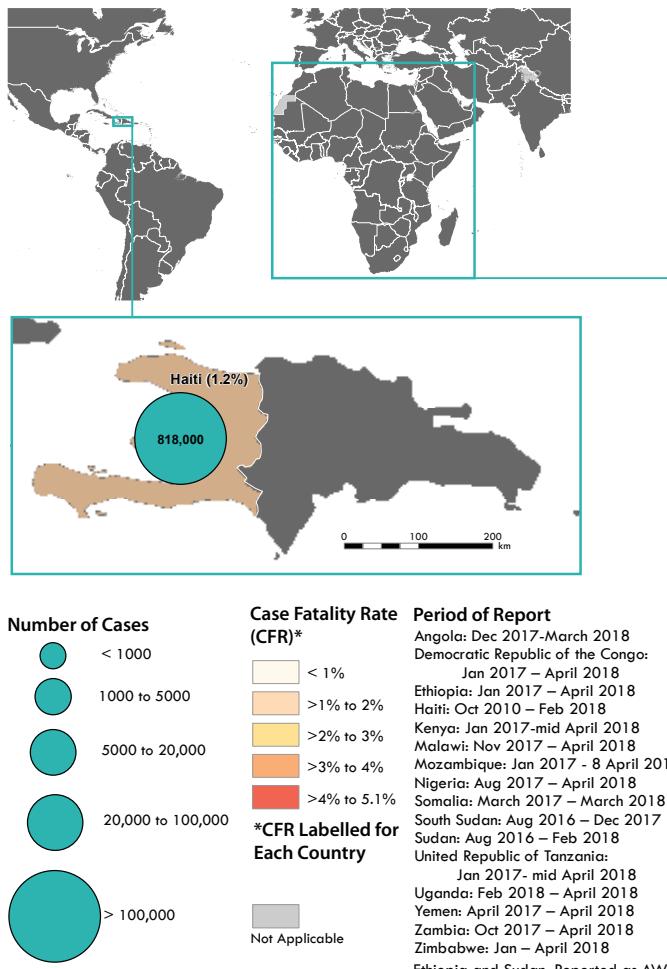
Health Information

- Investigate the source of the outbreak
- Once *Vibrio Cholerae* has been confirmed by culture or PCR, the WHO clinical case definition is sufficient to identify cases. Periodic sampling and testing on suspected cases should be carried out throughout the epidemic to monitor antimicrobial sensitivity

Health Interventions

- Provide populations with safe water and sanitation
- Treat early (rehydration):
 - Oral rehydration points (ORPs) in the community facilitate early access to treatment
 - Cholera treatment centres (CTCs) provide 24-hour care for patients with more severe forms of Cholera
- Infection prevention and control practices must be implemented in all health facilities receiving Cholera patients
- Vaccination with Oral Cholera Vaccines in humanitarian emergencies and to prevent further spread of epidemics

Major Cholera Outbreaks in 2017 - 2018



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

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1

Cholera is closely linked to inadequate access to clean water and sanitation

- The long-term solution for Cholera control lies in economic development and universal access to safe drinking water and adequate sanitation. These measures prevent both epidemic and endemic Cholera as well as other faecally transmitted and water-borne diseases. They may require substantial long-term investments.
- Cholera is closely linked to poor environmental conditions. The absence or shortage of safe water and of proper sanitation are the main contributors to the spread of the disease. Typical at-risk areas are peri-urban slums, with precarious basic infrastructure, as well as internally displaced or refugee camps.



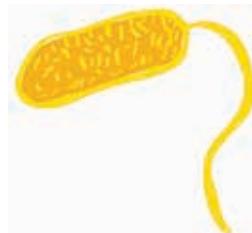
- Actions to reduce the transmission of Cholera include:

- The implementation of adapted long-term sustainable WASH (Water Sanitation and Hygiene) solutions to ensure use of safe water, basic sanitation and good hygiene practices to populations most at risk of Cholera;
- o Interventions at the household level (water filtration, chemical or solar disinfection of water, safe water storage, the construction of systems for safe sewage disposal, including latrines);
- o Adoption of basic hygiene practices;
- o Access to safe water and sanitation in public areas such as health facilities and schools.
- Rapid access to treatment;
- Implementation of adapted infection control practices in treatment structures;
- Vaccination.

2

Cholera is transmitted by faecally-contaminated water and food

- A person can become infected by drinking water or eating food contaminated by the bacterium *Vibrio Cholerae*.
- Bacteria present in the faeces of an infected person are the main source of contamination.
- Food may be contaminated by soiled hands during preparation, or while eating or by some irrigation practices.
- During funeral ceremonies, transmission may occur through consumption of food and beverages contaminated by someone who touched the corpse of the deceased and also prepared the food without adequately washing their hands, or by funeral attendees touching the corpse.
- Beverages prepared with contaminated water and sold by street vendors are vehicles of Cholera transmission, as well as vegetables and fruits "freshened" with contaminated water and raw or undercooked seafood.
- The bacterium can persist in water for long periods and multiply in moist left-over food.



3

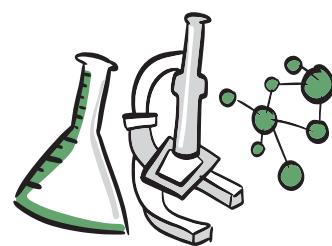
Cholera outbreaks can be explosive

- The incubation period is very short. It ranges from two hours to five days, usually two to three days.
- This leads to explosive epidemics as the numbers of cases can rise extremely quickly.
- Early detection and treatment of cases and rapid initiation of control activities are critical.
- Asymptomatic carriers can transmit the infection. As long as stools are positive, infected people can transmit the disease. Even among asymptomatic carriers, the pathogens stay in their faeces for up to 14 days and are shed back into the environment, possibly infecting other individuals.

4

Rapid detection of suspected cases and laboratory confirmation are essential

- When an outbreak is suspected, a multidisciplinary team should be sent to the field in order to confirm the outbreak and to take the first measures to control the spread of the disease. These teams should carry sampling materials, rapid diagnostic tests, the means to make clean water and ORS (Oral Rehydration Salts) at a minimum. More medical materials should be carried if a treatment facility is visited.
- Rapid diagnostic tests (RDTs) should be used to reinforce suspicion of Cholera. This allows quick testing without the need for a laboratory and is frequently used to increase suspicion during outbreak investigations. The sensitivity and specificity of Cholera RDTs are not sufficient for them to be used as individual diagnostic tests. Send the RDT positive stool samples to the laboratory for confirmation.
- Cholera is confirmed by identifying *V. Cholerae* in stool samples from affected patients using:
 - Culture for confirmation and antibiotic sensitivity testing;
 - PCR (Polymerase Chain Reaction) for confirmation.
- Laboratory confirmation is essential to confirm that this is a Cholera outbreak. Once an outbreak is confirmed, a clinical diagnosis using WHO standard case definition is sufficient.



5

People with Cholera experience acute watery diarrhoea with no fever

- Most people infected with Cholera (approximately 80%) do not develop any symptoms although the bacteria are present in their faeces for up to 14 days after infection.
- Among people developing symptoms, approximately 80% present with mild to moderate watery diarrhoea resulting in no or only minor signs of dehydration. The remaining 20% rapidly develop profuse watery diarrhoea that can lead to severe dehydration and to death if not treated.
- Other signs and symptoms may include:
 - Profuse vomiting;
 - Abdominal or muscle cramps;
 - Hypoglycemia;
 - Hypokalaemia.
- There is a high risk of fetal loss in pregnant woman with Cholera.
- Fever is not a symptom of Cholera, but may be a result of co-morbidity in patients with Cholera.

6

Severe forms of Cholera can kill within hours: early rehydration is the cornerstone of treatment

- The most important treatment is rehydration, which consists of prompt replacement of the fluid and salts loss through severe diarrhoea and vomiting. Early rehydration can save the lives of nearly all Cholera patients. With early and proper treatment, the case fatality rate should remain below 1%.
- Good assessment of the state of dehydration is key to appropriate treatment (see the assessment tool in the manual "First steps for managing an outbreak of acute diarrhoea").
- Patients with no signs or some signs of dehydration (approximately 80% of patients), both adults and children, can be rehydrated quickly and easily by following standard protocols for treatment with Oral Rehydration Solution (ORS). ORS should be given early at home, by volunteers and family members, to avert delays in rehydration and death.
- Patients who become severely dehydrated need to receive fluids intravenously (Ringer's Lactate solution).
- Continued breastfeeding of infants and young children is encouraged.
- Zinc is also an important adjunctive therapy for children under five years, which also reduces the duration of diarrhoea and may prevent future episodes of other causes on acute watery diarrhoea.



7

Oral Cholera Vaccines are safe and should be used with other prevention and control strategies

- There are three Oral Cholera Vaccines (OCV):
 - Shanchol™ and Euvichol® are essentially the same vaccine. One dose can be used to contain epidemics (protection for at least six months). Two doses are required for longer protection (both vaccines provide sustained protection of >65% for at least three years after two doses). The two doses can be administered to all individuals over the age of one year with a minimum two-week interval between doses;
 - There is a third vaccine, Dukoral®, that is primarily used for travellers. It also confers significant short-term protection against Enterotoxigenic Escherichia coli (ETEC). The vaccine is administered with a buffer solution. It can be given to all individuals over the age of two years with a minimum

ORAL CHOLERA VACCINE



of a week between doses.

- Oral Cholera Vaccines are considered safe for pregnant women.
- OCV can be used for emergencies:
 - In humanitarian crises, OCV can be used to prevent Cholera, even before any suspected cases are reported;
 - For outbreak response, OCV is used to prevent further spread of Cholera. It should be used as early as possible to prevent the greatest number of cases;
 - All OCVs currently require cold chain (2-8°C), but use out of cold chain is currently under review;
 - For emergency use of OCV, there is a global emergency stockpile of Oral Cholera Vaccine doses (Shanchol™ or Euvichol®) managed by the International Coordinating Group (ICG).
- In endemic settings, Oral Cholera Vaccines are used as part of a longer-term Cholera control plan, including reinforcement of surveillance and laboratory diagnostic capacity and improving water, sanitation and hygiene conditions. OCV is used to provide mid-term protection to the population while longer term water, sanitation and hygiene solutions are being implemented.
- OCV for endemic use is available via the Global Task Force on Cholera Control.



8

Populations at risk should be provided with safe water and basic sanitation

- During outbreaks:
 - People should be provided with safe water or means to prepare and store safe water at home;
 - Awareness campaigns should be organized, and information should be provided to the community about the potential risks and symptoms of Cholera, precautions to take to avoid Cholera, when and where to report cases, and to seek immediate treatment when symptoms appear. The location of appropriate treatment sites should also be shared.
- Community engagement is critical, at any time, so that communities adopt preventive behaviors to avert contamination:

- Health education campaigns should promote the adoption of appropriate hygiene practices such as hand-washing with soap, safe preparation and storage of food and safe disposal of the faeces of children;
- Handwashing should be promoted at key times;
- Funeral practices for individuals who die from Cholera must be adapted to prevent infection among attendees;
- Breastfeeding should be promoted;
- Health campaigns should be adapted to local culture and beliefs.



9

Mapping the origin of cases is critical to orient control activities

- Mapping the origin of cases can help identify priority areas for water and sanitation activities and hygiene promotion. The more precise the mapping, the more effectively interventions can be targeted.
- Access to treatment for people living in priority areas should also be ensured.
- Oral rehydration points in key areas and transport services to Cholera treatment centres can save lives.
- Active case finding should also be carried out in these areas.
- In areas with community health programmes, the community health workers or volunteers can be trained to identify and report suspected Cholera, to safely make and give ORS, and to refer patients for treatment.

10

WHO can provide countries with Cholera kits

- WHO can provide necessary materials for the investigation and confirmation of Cholera outbreaks, as well as for the treatment of Cholera patients. Cholera kits are designed to help prepare for a potential Cholera outbreak and to support the first month of the initial response.
- There are six kits:
 - One kit provides the necessary materials for the investigation of Cholera outbreaks;
 - One provides the supplies for laboratory confirmation of suspected Cholera cases.

Note: triple packaging for sample transport is NOT included;

- Three kits are designed for the treatment of Cholera patients within existing structures at the central, peripheral and community levels;
- One kit provides the necessary material to set up a provisional structure for patient care when no existing structure is in place.
- There is a tool that quickly estimates needs of Cholera kits (see link on next page).





More information about Cholera:

- Cholera WHO webpage
<http://who.int/cholera/en/>
- Cholera WHO factsheet
<http://who.int/mediacentre/factsheets/fs107/en/>
- Ending Cholera: a global roadmap to 2030
<http://www.who.int/cholera/publications/global-roadmap/en/>
- Cholera kits
<http://who.int/cholera/kit/en/>
- Cholera outbreak: assessing the outbreak response and improving preparedness
<http://who.int/cholera/publications/OutbreakAssessment/en/>
- First steps for managing an outbreak of acute diarrhoea
<http://who.int/cholera/publications/firststeps/en/>
- Interim guidance document for Cholera surveillance, Global Task Force on Cholera Control, Surveillance Working Group
http://www.who.int/cholera/task_force/GTFCC-Guidance-cholera-surveillance.pdf?ua=1
- Interim technical notes on the Use of Cholera Rapid Diagnostic Tests, Global Task Force on Cholera Control, Surveillance and Laboratory Working Group
http://www.who.int/cholera/task_force/Interim-guidance-cholera-RDT.pdf?ua=1
- Oral Cholera Vaccine and technical notes on the use of OCV in pregnant women and travellers
<http://www.who.int/cholera/vaccines/en/>
- WHO Oral Cholera Vaccines position paper – 2017
<http://apps.who.int/iris/bitstream/10665/258763/1/WER9234.pdf?ua=1>