



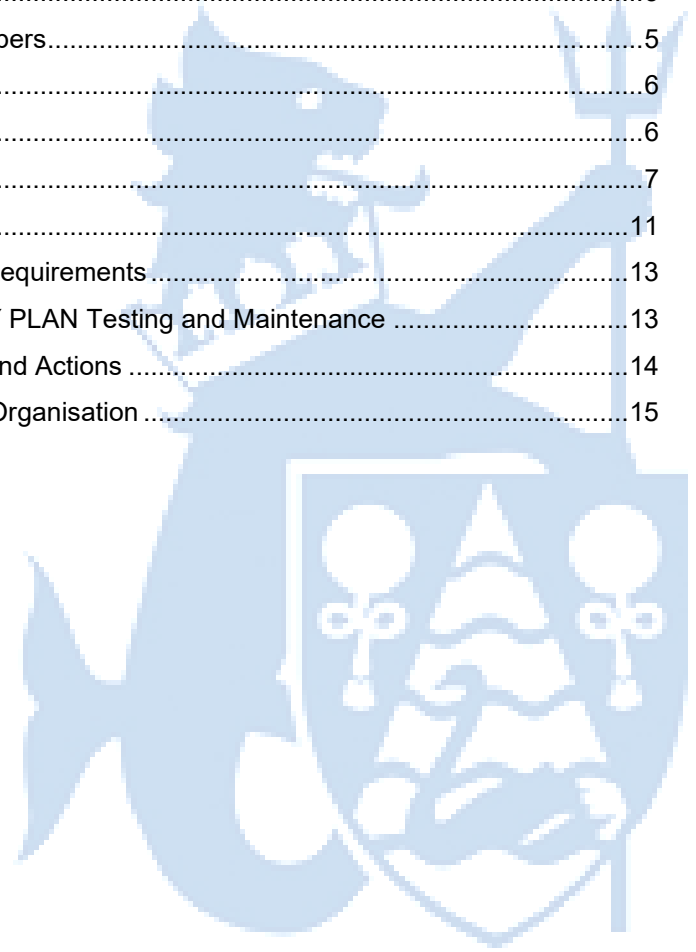
CITY OF FREMANTLE

Pandemic Business Continuity Plan

Prevention, Preparedness, Response and Recovery
It's Everyone's Responsibility

Business Continuity Plan Contents

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Business Continuity Plan Summary Information

This Business Continuity Plan provides the management response by City of Fremantle in the event of a pandemic in Western Australia, Australia. Its primary objective is to set out a structured response plan to respond to a Pandemic affecting the City of Fremantle staff and operations.

This Plan should be read in conjunction with the overall City of Fremantle – Business Continuity Plan, CITY OF FREMANTLE & TOWN OF EAST FREMANTLE Local Emergency Management Arrangements and CITY OF FREMANTLE Local Recovery Arrangements.

The following table summarises key roles and information from the City of Fremantle Pandemic Business Continuity Plan.

Name	Position	Telephone Numbers
[REDACTED]	Mayor	[REDACTED]
[REDACTED]	Acting Chief Executive Officer	[REDACTED] [REDACTED]
[REDACTED]	Acting Director City Business	[REDACTED] [REDACTED]
[REDACTED]	Director Infrastructure	[REDACTED] [REDACTED]
[REDACTED]	Manager Community Development	[REDACTED] [REDACTED]
[REDACTED]	Manager Field Services	[REDACTED] [REDACTED]
[REDACTED]	Manager Facilities and Environmental Management	[REDACTED] [REDACTED]
[REDACTED]	Senior Environmental Health Officer	[REDACTED] [REDACTED]
[REDACTED]	Team Leader Community Safety	[REDACTED] [REDACTED]
[REDACTED]	Senior Project Officer People and Culture	[REDACTED] [REDACTED]
Duty Community Safety Officer	Community Safety Officer	[REDACTED] (2) If the City's switchboard is down phone Team Leader Community Safety

1. Plan Assumptions

The Pandemic Business Continuity Plan for the City of Fremantle is based upon the following assumptions:

- The absence of 30% of staff during a pandemic period.
- A pandemic period of between 12 and 26 weeks.
- Possible reduction in services consistent with staffing capability and the increase demand for the City of Fremantle services.
- Possible increase/decrease in demand for services.
- The City of Fremantle buildings, IT systems, hardware and other operating equipment will function as normal as possible during a pandemic.
- Maintenance of and adherence to current safety and other regulatory requirements.

2. Pandemic Management Strategy Overview

There are four main objectives to the City of Fremantle's strategy to manage the impact of influenza pandemic on its employees, and operations. They are:

- Ensuring all employees are properly informed and well prepared for a pandemic.
- Containment of the disease by reducing the spread amongst staff and within business premises and locations;
- Maintenance of critical business functions, processes and systems; and
- Recovery of the business following pandemic stand down.

The City of Fremantle Pandemic Management Strategy is based around four time periods or phases, as illustrated in the diagram and described below.

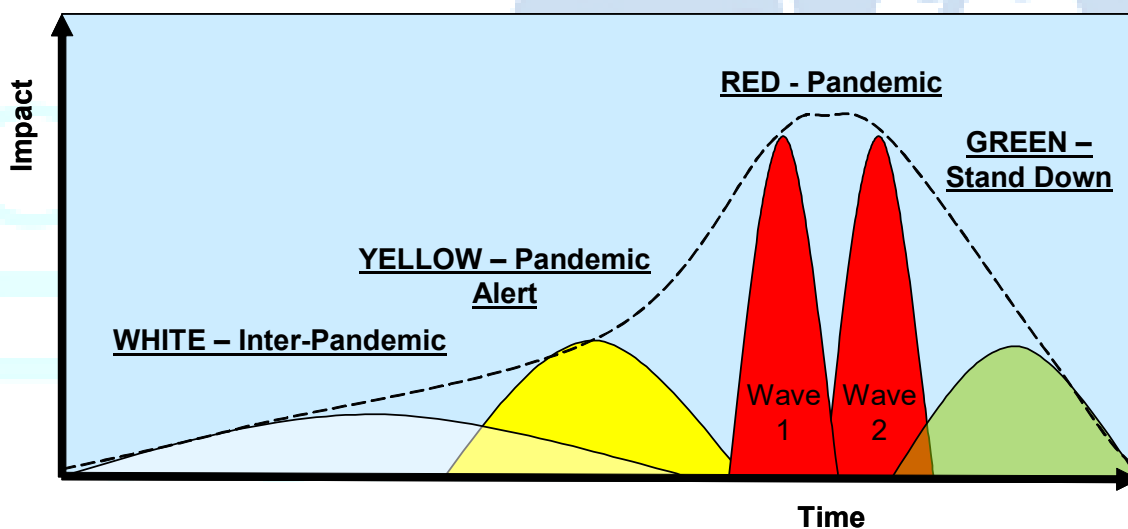


Figure 1 City of Fremantle Pandemic Management Phases

3. Pandemic Phases

The following Phased approach relates to the City of Fremantle and World Health Organisations (WHO) Pandemic stages – see Section 2 and Appendix 1.

Phase	Strategies
WHITE Inter-Pandemic	Preparation Phase. Activities to be taken before a pandemic to plan, raise awareness, communicate responsibilities to key staff and develop preparedness across the City of Fremantle.
YELLOW Pandemic Alert	Maintenance Phase. The activities undertaken to ensure maintenance of the City of Fremantle's preparedness and monitoring of information sources to provide with an ongoing awareness of the influenza threat to ensure early warning. Actions to minimise the impact of an outbreak and protect the health of the City of Fremantle employees. The White and Yellow Phase activities may overlap.
RED Pandemic	Response Phase. Actions to maintain the continuity of critical City of Fremantle operations, making use of existing City of Fremantle incident management, business continuity and IT Disaster Recovery arrangements as required.
GREEN Stand Down	Return to Business as Usual. Actions to ensure a planned and progressive return to 'Business as usual' operations as the impact of the Pandemic subsides and business returns to normal.

This four phase strategy forms the basis of the Pandemic Business Continuity Plan for the City of Fremantle, as set out in the remainder of this document.

4. Pandemic Management Team Members

The following personnel are responsible for managing the response by the City of Fremantle during all stages of a pandemic. If the primary member is unavailable for any reason one of the alternates must take over the role.

Role Description	Primary	Alternates
Pandemic Management Team Leader		
Team Member		
Team Member		
Team Member		
Team Member		
Communications Facilitator		

See Appendix 2 for an overview of the City of Fremantle Pandemic Management Organisation and Crisis Management structure.

5. Critical Operations / Functions

In the case of a full-scale pandemic, the City of Fremantle will remain focused on its key functions. The following Operations / Functions have been identified as critical by the City of Fremantle.

Priority	Critical Operation / Function Title & Description
1	Call Centre / Help Desk S&I
2	IT System Support
3	Key Staff Support
4	Telecommunications Support
5	Data Network Support
7	Community Safety
8	Environmental Health
9	Accounts receivable and payable
10	H/R
11	Waste Management

6. Key Skills and Personnel

The following skills and personnel have been identified as essential to support the implementation of the City of Fremantle's Pandemic Plan. Staff should be identified by name (primary and alternates) if there is a limited number of staff with the required skills.

Key Skills (To support Pandemic Management Plan)	Min Staff Required (for each skill)
1. Primary Services	One
2. Accounting Systems	Two
3. Environmental Health	Three
4. Sales and New Business	One
5. IT Systems	Two
6. Telecommunications	One
7. Data Network	One
8. Community Safety	One
9. H/R	One

Key Skills (To support Pandemic Management Plan continued ...)	Min Staff Required (for each skill)
10. Risk Management	One
11. S&I	One
12. Waste Management	Four

Key Staff - Primary (to provide Key Skills)		
Core Skill	Primary	Alternates
1. Community Services		
2. Accounting Systems		
3. Environmental Health		
4. Waste Management		
5. IT Systems		
6. Telecommunications		
7. Data Network		
8. Community Safety		
9. S&I		

7. Pandemic Management Action Plan

The table below outlines the actions to be taken by the City of Fremantle in the event of a Pandemic. The Team Leader (or Alternate) should use the information as a reminder of the actions and issues to address as the Pandemic response continues. The Phase relates to the City of Fremantle and WHO Pandemic stages – see Section 2 and Appendix 1.

#	Phase	Response Action	✓
WHITE PHASE			
1.	White	Complete testing of the City of Fremantle Pandemic BUSINESS CONTINUITY PLAN	
2.	White	Prepare communication strategies for stakeholders identified in Section 6.	
3.	White	Prepare content for Pandemic awareness and training workshops for staff.	
4.	White	Determine the requirements to support a home office environment for key staff.	
5.	White	Identify vendors supporting critical / key functions.	

#	Phase	Response Action	✓
6.	White	Confirm a Pandemic Management Plan is in place with each vendor to maximise support to the City of Fremantle. Initiate the following: - Review plan to ensure consistency with the City of Fremantle's objectives and plans. - Establish / agree the approach to resolve issues (i.e. remotely from own site). - Establish / agree on the communication and escalation protocol between the City of Fremantle and clients (this will include revised (reduced) service levels). - Liaise with the clients to ensure sufficient support staff will be available (from each vendor) to assist during a Pandemic.	
7.	White	Ensure the technical Disaster Recovery Plan contains detailed repair and recovery procedures. Identify critical components and develop recovery and fallback strategies.	
8.	White	Develop suitable Admin Telephony strategies that could be implemented to provide alternate voice capabilities. Initiate the following: - Identify suitable PABX fallback sites and the redirection of services to the site, including redirection to a home office. - Document all redirection procedures and configuration changes (i.e. emergency IVR / PABX setup).	
YELLOW PHASE - Standby			
9.	Yellow	Create a roster of support and vendor staff relevant to each critical function / system. Consider the following strategies: - Identify staff to work from home. - Establish communication strategy between all staff, if operating from multiple the City of Fremantle office locations.	
10.	Yellow	Establish and maintain a priority list of IT applications and the hardware on which each application resides. Agree on criticality and priority. Coordinate with and communicate this to the IT team and clients.	
11.	Yellow	Prepare emergency IVR scripting to be activated on alert phase Red, to reduce the volume of calls requiring response from a City of Fremantle staff member.	
12.	Yellow	Establish procedures to ensure all major faults or problems are escalated and addressed promptly with minimal staff. Include procedures for the City of Fremantle Support and Client Support.	
13.	Yellow	Coordinate a suitable air-conditioning protocol with Building Management to minimise the chance of infection.	
YELLOW PHASE - Containment			
14.	Yellow	Implement Containment Plans as per instructions from government health officials	
15.	Yellow	Remind the City of Fremantle staff of their responsibilities for personal hygiene and pandemic preparedness. Provide Pandemic awareness and training workshops for staff and address any staff questions / concerns.	

#	Phase	Response Action	✓
16.	Yellow	Activate the City of Fremantle's Pandemic Management Team and ensure all staff with Key Skills are briefed on their role in supporting the pandemic management strategy.	
17.	Yellow	Ensure alternate data network paths are in place and tested for all critical sites (i.e. those sites dependent on critical IT systems/applications and/or support critical processes).	
18.	Yellow	Identify all critical functions and ensure they are operated at an appropriate location relative to the threat.	
19.	Yellow	Link strategies with government health requirements.	
20.	Yellow	Issue advice to all staff and customers to inform them of the following emergency operational procedures: • Response times may be affected due to minimal resources. • Priority given to issues and orders based on potential impact. • Non-critical issues will be logged and attended to as time / resources permit. • May need to use an alternate PC or work from home for low priority issues.	
RED PHASE			
21.	Red	Reinforce Containment Plans as per instructions from government health officials.	
22.	Red	Record all incidents and to keep track of problem escalation and resolution.	
23.	Red	Initiate the Pandemic Roster and separate support staff across multiple sites.	
24.	Red	Maintain the roster of support and vendor staff, relevant to each critical function / application / system. Instruct all the City of Fremantle and client support to immediately advise if / when unavailable.	
25.	Red	Initiate agreed strategies. • Suspend all non-critical work until the Pandemic period is over. • Consider all external faults or problems as critical. • Establish appropriate fault resolution with service providers, where appropriate. • Establish a web site advising remote access details. • Attend to all responses based on the predefined priority schedule (key staff). • Confirm minimum client support staff numbers available to the City of Fremantle. • Maintain documentation and escalation procedures for each key function. • Redeploy staff from other areas to assist with issues as required (technical / non-technical).	
26.	Red	Implement daily monitoring of staff welfare and availability for all Teams. Report daily results to Crisis Management Team.	
27.	Red	Decide whether to instruct non-critical staff to remain at home until further notice	

#	Phase	Response Action	✓
28.	Red	For all Phone failures or when required to use other Phones or mobile phone, ensure infection control process is in place.	
29.	Red	Maintain current daily operations schedules – regular processing, reports, etc	
30.	Red	Ensure all Operations staff are provided with parking facilities and other amenities whilst at the primary location, to minimise contact with the public.	
31.	Red	Determine and maintain operations based on the agreed function/system/application priorities.	
GREEN PHASE			
32.	Green	Manage an organised return of the City of Fremantle's operations to business as normal.	
33.	Green	Reassign staff working under pandemic rosters to normal duties	
34.	Green	Continue to provide welfare support and assistance to all staff during return to Business as usual.	
35.	Green	Update staff, customers and stakeholders to confirm stand down for Pandemic status	

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Communication Strategy

Key Stakeholders

Key stakeholders for communication during a Pandemic are:

A. Key Management Team Members		
	Name	Title
Team Leader	██████████	CEO
Team Member	██████████	Director City Business
Team Member	██████████	Manager Field Services
Team Member	██████████	Manager Community Development
Team Member	██████████	Manager Facilities and Environmental Management
Communications Facilitator	██████████	Manager Information Technology
Alternate Key Management Team Members		
Alt Team Member		
Alt Team Member		
Alt Team Member		
Alt Team Member		
Communications		
Primary		
Alternate		

Stakeholders	System/Function Supported	Contact Person	Contact Details
B. Key Clients			
Department of Health	State-wide Pandemic Response	██████████ Director Environmental Health Directorate	██████████
South Metropolitan Public Health Unit	Local Disease Notification & Outbreak Control	██████████ Senior Project Officer - Disaster Preparedness and Emergency Management	██████████

Stakeholders	System/Function Supported	Contact Person	Contact Details
Public Health Emergency Operations Centre (PHEOC)	State Pandemic Operational Control	None	[REDACTED]
State Health Incident Coordination Centre (SHICC)	State Health Incident Control		[REDACTED]

Key Messages

Pandemic Management Messages	Timing of Messages
1. All staff: Notify of Alert Phase and advise on personal preparedness. Outline methods of communication. Seek feedback on any personal requirements to ensure preparations are in place should Alert Phase escalate to Red and BUSINESS CONTINUITY PLAN enacted.	Alert Phase : Yellow
2. All City of Fremantle clients: Services will be operating on limited basis. Urgent orders/issues will be dealt with as soon as possible, with non-urgent issues logged for future resolution.	Alert Phase : Red
3. All City of Fremantle staff: Services will be operating on limited basis. Urgent issues will be dealt with as soon as possible, with non-urgent issues logged for future resolution.	Alert Phase : Red
4. All staff: Advise non-critical staff they are not required to attend the office.	Alert Phase : Red

9. Pandemic Management Resource Requirements

The following resources will be required by the Division during a Pandemic.

Resource	Source	Quantity
1 Laptops		
2 Mobile Phones		
3 Remote Access		
4 Personal Protection Equipment		
5 Headsets with microphone		

10. Pandemic Business Continuity Plan Maintenance

The Pandemic Business Continuity Plan will be reviewed and updated every 12 months, or more frequently, as appropriate.



Appendix 1 Pandemic Alert Phases and Actions

The phases and status of a pandemic and the subsequent actions to be undertaken by the City of Fremantle are summarised in the table below.

Alert Code, Pandemic Phase and Actions Required

Alert Code		City of Fremantle Actions
The City of Fremantle Phase	Link to WHO Alert Phase	
WHITE Inter-Pandemic	Local 0	PLAN – No outbreak anywhere in the world. Preparations underway - Complete planning and preparation. - Identify essential functions, processes. - Assess core staff and skill requirement needs. - Prepare business continuity plans to manage continuity of service at the height of the pandemic. - Identify and develop delegations, policies and procedures required to facilitate continued business operations. - Prepare communication strategies for customers, staff and stakeholders. - Monitor national and international pandemic situation. - Business as usual.
	Overseas 1	
	Local 1	
	Overseas 2	
	Local 2	
YELLOW Pandemic Alert	Overseas 3	STANDBY - No outbreak anywhere in the world. Preparation complete - Maintain preparedness focus. - Quarterly review and testing of business continuity plan plans. - Monitor national and international pandemic situation.
	Local 3	
	Overseas 4	CONTAIN – Avian flu human-to-human contagious; isolated incidents overseas or pandemic declared overseas. - Action Containment Plans. - Communicate with staff about personal preparedness. - Review all business continuity plans and ensure relevant areas can quickly move to next stage. - Monitor national and international pandemic situation.
	Local 4	
	Overseas 5	
RED Pandemic	Local 5	MANAGE – Flu pandemic declared - Activate business continuity plans. - Communicate with staff, customers and stakeholders. - Delegate authority as required. - Monitor national and international pandemic situation.
	Overseas 6	
	Local 6a	
	Local 6b	
GREEN Stand Down	Local 6c	RECOVER – Crisis over - Manage return to business as normal. - Communicate with staff, customers and stakeholders. - Conducts full debrief processes.
	Local 6d	

Appendix 2 Pandemic Management Organisation

The diagram below illustrates the City of Fremantle Pandemic Management Organisation, which is led by the Crisis Management Team (CMT)

The Crisis Management Team (CMT) includes 3 sub-teams responsible for the successful execution of the Pandemic Business Continuity Plan. These teams are:

- **The Management Team** — responsible for managing the City of Fremantle overall responses, and communicating with key clients, stakeholders and City of Fremantle senior management. This team is also responsible for the on-going business continuity program and for keeping this plan current during a Pandemic.
- **The Recovery Team** — responsible for ensuring computing services is available as per business requirements.
- **The Facility Team** — responsible for property related assessments, and protection of the office environment.

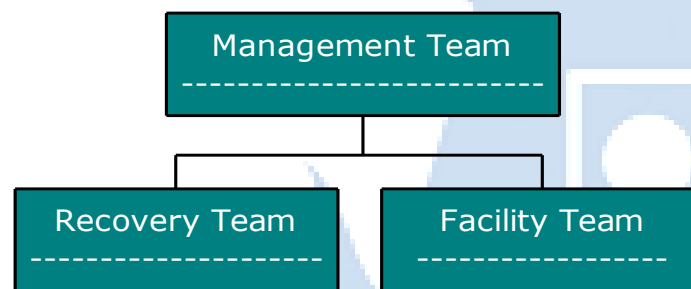


Figure 1: Crisis Management Team

Appendix 3 World Health Organisation – Avian Influenza ‘Bird Flu’ Fact Sheet

THE DISEASE IN BIRDS

Avian influenza is an infectious disease of birds caused by type A strain of the influenza virus. The disease occurs worldwide. While all birds are thought to be susceptible to infection with avian influenza viruses, many wild bird species carry these viruses with no apparent signs of harm.

Other bird species, including domestic poultry, develop disease when infected with avian influenza viruses. In poultry, the viruses cause two distinctly different forms of disease – one common and mild, the other rare and highly lethal. In the mild form, signs of illness may be expressed only as ruffled feathers, reduced egg production, or mild effects on the respiratory system. Outbreaks can be so mild they escape detection unless regular testing for viruses is in place.

In contrast, the second and far less common highly pathogenic form is difficult to miss. First identified in Italy in 1878, highly pathogenic avian influenza is characterized by sudden onset of severe disease, rapid contagion, and a mortality rate that can approach 100% within 48 hours. In this form of the disease, the virus not only affects the respiratory tract, as in the mild form, but also invades multiple organs and tissues. The resulting massive internal haemorrhaging has earned it the lay name of “chicken Ebola”.

All 16 HA (haemagglutinins) and 9 NA (neuraminidase) subtypes of influenza viruses are known to infect wild waterfowl, thus providing an extensive reservoir of influenza viruses perpetually circulating in bird populations. In wild birds, routine testing will nearly always find some influenza viruses. The vast majority of these viruses cause no harm.

To date, all outbreaks of the highly pathogenic form of avian influenza have been caused by viruses of the H5 and H7 subtypes. Highly pathogenic viruses possess a tell-tale genetic “trade mark” or signature – a distinctive set of basic amino acids in the cleavage site of the HA – that distinguishes them from all other avian influenza viruses and is associated with their exceptional virulence.

Not all virus strains of the H5 and H7 subtypes are highly pathogenic, but most are thought to have the potential to become so. Recent research has shown that H5 and H7 viruses of low pathogenicity can, after circulation for sometimes short periods in a poultry population, mutate into highly pathogenic viruses. Considerable circumstantial evidence has long suggested that wild waterfowl introduce avian influenza viruses, in their low pathogenic form, to poultry flocks, but do not carry or directly spread highly pathogenic viruses. This role may, however, have changed very recently: at least some

species of migratory waterfowl are now thought to be carrying the H5N1 virus in its highly pathogenic form and introducing it to new geographical areas located along their flight routes.

Apart from being highly contagious among poultry, avian influenza viruses are readily transmitted from farm to farm by the movement of live birds, people (especially when shoes and other clothing are contaminated), and contaminated vehicles, equipment, feed, and cages. Highly pathogenic viruses can survive for long periods in the environment, especially when temperatures are low. For example, the highly pathogenic H5N1 virus can survive in bird faeces for at least 35 days at low temperature (4oC). At a much higher temperature (37oC), H5N1 viruses have been shown to survive, in faecal samples, for six days.

For highly pathogenic disease, the most important control measures are rapid culling of all infected or exposed birds, proper disposal of carcasses, the quarantining and rigorous disinfection of farms, and the implementation of strict sanitary, or “biosecurity”, measures. Restrictions on the movement of live poultry, both within and between countries, are another important control measure. The logistics of recommended control measures are most straightforward when applied to large commercial farms, where birds are housed indoors, usually under strictly controlled sanitary conditions, in large numbers. Control is far more difficult under poultry production systems in which most birds are raised in small backyard flocks scattered throughout rural or periurban areas.

When culling – the first line of defence for containing outbreaks – fails or proves impracticable, vaccination of poultry in a high-risk area can be used as a supplementary emergency measure, provided quality-assured vaccines are used and [recommendations from the World Organisation for Animal Health \(OIE\)](#) are strictly followed. The use of poor quality vaccines or vaccines that poorly match the circulating virus strain may accelerate mutation of the virus. Poor quality animal vaccines may also pose a risk for human health, as they may allow infected birds to shed virus while still appearing to be disease-free.

Apart from being difficult to control, outbreaks in backyard flocks are associated with a heightened risk of human exposure and infection. These birds usually roam freely as they scavenge for food and often mingle with wild birds or share water sources with them. Such situations create abundant opportunities for human exposure to the virus, especially when birds enter households or are brought into households during adverse weather, or when they share areas where children play or sleep. Poverty exacerbates the problem: in situations where a prime source of food and income cannot be wasted, households frequently consume poultry when deaths or signs of illness appear in flocks. This practice carries a high risk of exposure to the virus during slaughtering, defeathering, butchering, and preparation of poultry meat for cooking, but has proved difficult to change. Moreover, as

deaths of birds in backyard flocks are common, especially under adverse weather conditions, owners may not interpret deaths or signs of illness in a flock as a signal of avian influenza and a reason to alert the authorities. This tendency may help explain why outbreaks in some rural areas have smouldered undetected for months. The frequent absence of compensation to farmers for destroyed birds further works against the spontaneous reporting of outbreaks and may encourage owners to hide their birds during culling operations.

THE ROLE OF MIGRATORY BIRDS

During 2005, an additional and significant source of international spread of the virus in birds became apparent for the first time, but remains poorly understood. Scientists are increasingly convinced that at least some migratory waterfowl are now carrying the H5N1 virus in its highly pathogenic form, sometimes over long distances, and introducing the virus to poultry flocks in areas that lie along their migratory routes. Should this new role of migratory birds be scientifically confirmed, it will mark a change in a long-standing stable relationship between the H5N1 virus and its natural wild-bird reservoir.

Evidence supporting this altered role began to emerge in mid-2005 and has since been strengthened. The die-off of more than 6000 migratory birds, infected with the highly pathogenic H5N1 virus that began at the Qinghai Lake nature reserve in central China in late April 2005 was highly unusual and probably unprecedented. Prior to that event, wild bird deaths from highly pathogenic avian influenza viruses were rare, usually occurring as isolated cases found within the flight distance of a poultry outbreak. Scientific studies comparing viruses from different outbreaks in birds have found that viruses from the most recently affected countries, all of which lie along migratory routes, are almost identical to viruses recovered from dead migratory birds at Qinghai Lake. Viruses from Turkey's first two human cases, which were fatal, were also virtually identical to viruses from Qinghai Lake.

COUNTRIES AFFECTED BY OUTBREAKS IN BIRDS

The outbreaks of highly pathogenic H5N1 avian influenza that began in south-east Asia in mid-2003 and have now spread to a few parts of Europe are the largest and most severe on record. To date, nine Asian countries have reported outbreaks (listed in order of reporting): the Republic of Korea, Viet Nam, Japan, Thailand, Cambodia, the Lao People's Democratic Republic, Indonesia, China, and Malaysia. Of these, Japan, the Republic of Korea, and Malaysia have controlled their outbreaks and are now considered free of the disease. Elsewhere in Asia, the virus has become endemic in several of the initially affected countries.

In late July 2005, the virus spread geographically beyond its original focus in Asia to affect poultry and wild birds in the Russian Federation and adjacent

parts of Kazakhstan. Almost simultaneously, Mongolia reported detection of the highly pathogenic virus in wild birds. In October 2005, the virus was reported in Turkey, Romania, and Croatia. In early December 2005, Ukraine reported its first outbreak in domestic birds. Most of these newer outbreaks were detected and reported quickly. Further spread of the virus along the migratory routes of wild waterfowl is, however, anticipated. Moreover, bird migration is a recurring event. Countries that lie along the flight pathways of birds migrating from central Asia may face a persistent risk of introduction or re-introduction of the virus to domestic poultry flocks.

Prior to the present situation, outbreaks of highly pathogenic avian influenza in poultry were considered rare. Excluding the current outbreaks caused by the H5N1 virus, only 24 outbreaks of highly pathogenic avian influenza have been recorded worldwide since 1959. Of these, 14 occurred in the past decade. The majority have shown limited geographical spread, a few remained confined to a single farm or flock, and only one spread internationally. All of the larger outbreaks were costly for the agricultural sector and difficult to control.

THE DISEASE IN HUMANS

History and epidemiology; Influenza viruses are normally highly species-specific, meaning that viruses that infect an individual species (humans, certain species of birds, pigs, horses, and seals) stay “true” to that species, and only rarely spill over to cause infection in other species. Since 1959, instances of human infection with an avian influenza virus have been documented on only 10 occasions. Of the hundreds of strains of avian influenza a virus, only four are known to have caused human infections: H5N1, H7N3, H7N7, and H9N2. In general, human infection with these viruses has resulted in mild symptoms and very little severe illness, with one notable exception: the highly pathogenic H5N1 virus.

Of all influenza viruses that circulate in birds, the H5N1 virus is of greatest present concern for human health for two main reasons. First, the H5N1 virus has caused by far the greatest number of human cases of very severe disease and the greatest number of deaths. It has crossed the species barrier to infect humans on at least three occasions in recent years: in Hong Kong in 1997 (18 cases with six deaths), in Hong Kong in 2003 (two cases with one death) and in the current outbreaks that began in December 2003 and were first recognized in January 2004.

A second implication for human health, of far greater concern, is the risk that the H5N1 virus – if given enough opportunities – will develop the characteristics it needs to start influenza pandemic. The virus has met all prerequisites for the start of a pandemic save one: an ability to spread efficiently and sustainably among humans. While H5N1 is presently the virus of greatest concern, the possibility that other avian influenza viruses, known to infect humans, might cause a pandemic cannot be ruled out.

The virus can improve its transmissibility among humans via two principal mechanisms. The first is a "reassortment" event, in which genetic material is exchanged between human and avian viruses during co-infection of a human or pig. Reassortment could result in a fully transmissible pandemic virus, announced by a sudden surge of cases with explosive spread.

The second mechanism is a more gradual process of adaptive mutation, whereby the capability of the virus to bind to human cells increases during subsequent infections of humans. Adaptive mutation, expressed initially as small clusters of human cases with some evidence of human-to-human transmission, would probably give the world some time to take defensive action, if detected sufficiently early.

During the first documented outbreak of human infections with H5N1, which occurred in Hong Kong in 1997, the 18 human cases coincided with an outbreak of highly pathogenic avian influenza, caused by a virtually identical virus, in poultry farms and live markets. Extensive studies of the human cases determined that direct contact with diseased poultry was the source of infection. Studies carried out in family members and social contacts of patients, health workers engaged in their care, and poultry cullers found very limited, if any, evidence of spread of the virus from one person to another. Human infections ceased following the rapid destruction – within three days – of Hong Kong's entire poultry population, estimated at around 1.5 million birds. Some experts believe that that drastic action may have averted an influenza pandemic.

All evidence to date indicates that close contact with dead or sick birds is the principal source of human infection with the H5N1 virus. Especially risky behaviours identified include the slaughtering, defeathering, butchering and preparation for consumption of infected birds. In a few cases, exposure to chicken faeces when children played in an area frequented by free-ranging poultry is thought to have been the source of infection. Swimming in water bodies where the carcasses of dead infected birds have been discarded or which may have been contaminated by faeces from infected ducks or other birds might be another source of exposure. In some cases, investigations have been unable to identify a plausible exposure source, suggesting that some as yet unknown environmental factor, involving contamination with the virus, may be implicated in a small number of cases. Some explanations that have been put forward include a possible role of peri-domestic birds, such as pigeons, or the use of untreated bird faeces as fertilizer. At present, H5N1 avian influenza remains largely a disease of birds. The species barrier is significant: the virus does not easily cross from birds to infect humans. Despite the infection of tens of millions of poultry over large geographical areas since mid-2003, fewer than 200 human cases have been laboratory confirmed. For unknown reasons, most cases have occurred in rural and periurban households where small flocks of poultry are kept. Again for unknown reasons, very few cases have been detected in presumed high-risk groups, such as commercial poultry workers, workers at live poultry markets,

cullers, veterinarians, and health staff caring for patients without adequate protective equipment. Also lacking is an explanation for the puzzling concentration of cases in previously healthy children and young adults. Research is urgently needed to better define the exposure circumstances, behaviours, and possible genetic or immunological factors that might enhance the likelihood of human infection.

Assessment of possible cases: Investigations of all the most recently confirmed human cases, in China, Indonesia, and Turkey, have identified direct contact with infected birds as the most likely source of exposure. When assessing possible cases, the level of clinical suspicion should be heightened for persons showing influenza-like illness, especially with fever and symptoms in the lower respiratory tract, who have a history of close contact with birds in an area where confirmed outbreaks of highly pathogenic H5N1 avian influenza are occurring. Exposure to an environment that may have been contaminated by faeces from infected birds is a second, though less common, source of human infection. To date, not all human cases have arisen from exposure to dead or visibly ill domestic birds. Research published in 2005 has shown that domestic ducks can excrete large quantities of highly pathogenic virus without showing signs of illness. A history of poultry consumption in an affected country is not a risk factor, provided the food was thoroughly cooked and the person was not involved in food preparation. As no efficient human-to-human transmission of the virus is known to be occurring anywhere, simply travelling to a country with ongoing outbreaks in poultry or sporadic human cases does not place a traveller at enhanced risk of infection, provided the person did not visit live or "wet" poultry markets, farms, or other environments where exposure to diseased birds may have occurred.

Clinical features ¹. In many patients, the disease caused by the H5N1 virus follows an unusually aggressive clinical course, with rapid deterioration and high fatality. Like most emerging disease, H5N1 influenza in humans is poorly understood. Clinical data from cases in 1997 and the current outbreak are beginning to provide a picture of the clinical features of disease, but much remains to be learned. Moreover, the current picture could change given the propensity of this virus to mutate rapidly and unpredictably.

The incubation period for H5N1 avian influenza may be longer than that for normal seasonal influenza, which is around two to three days. Current data for H5N1 infection indicate an incubation period ranging from two to eight days and possibly as long as 17 days. However, the possibility of multiple exposures to the virus makes it difficult to define the incubation period precisely. WHO currently recommends that an incubation period of seven days be used for field investigations and the monitoring of patient contact.

Initial symptoms include a high fever, usually with a temperature higher than 38°C, and influenza-like symptoms. Diarrhoea, vomiting, abdominal pain, chest pain, and bleeding from the nose and gums have also been reported as

early symptoms in some patients. Watery diarrhoea without blood appears to be more common in H5N1 avian influenza than in normal seasonal influenza. The spectrum of clinical symptoms may, however, be broader, and not all confirmed patients have presented with respiratory symptoms. In two patients from southern Viet Nam, the clinical diagnosis was acute encephalitis; neither patient had respiratory symptoms at presentation. In another case, from Thailand, the patient presented with fever and diarrhoea, but no respiratory symptoms. All three patients had a recent history of direct exposure to infected poultry.

One feature seen in many patients is the development of manifestations in the lower respiratory tract early in the illness. Many patients have symptoms in the lower respiratory tract when they first seek treatment. On present evidence, difficulty in breathing develops around five days following the first symptoms. Respiratory distress, a hoarse voice, and a crackling sound when inhaling are commonly seen. Sputum production is variable and sometimes bloody. Most recently, blood-tinted respiratory secretions have been observed in Turkey. Almost all patients develop pneumonia. During the Hong Kong outbreak, all severely ill patients had primary viral pneumonia, which did not respond to antibiotics. Limited data on patients in the current outbreak indicate the presence of a primary viral pneumonia in H5N1, usually without microbiological evidence of bacterial supra-infection at presentation. Turkish clinicians have also reported pneumonia as a consistent feature in severe cases; as elsewhere, these patients did not respond to treatment with antibiotics.

In patients infected with the H5N1 virus, clinical deterioration is rapid. In Thailand, the time between onsets of illness to the development of acute respiratory distress was around six days, with a range of four to 13 days. In severe cases in Turkey, clinicians have observed respiratory failure three to five days after symptom onset. Another common feature is multiorgan dysfunction. Common laboratory abnormalities, include leukopenia (mainly lymphopenia), mild-to-moderate thrombocytopenia, elevated aminotransferases, and with some instances of disseminated intravascular coagulation.

Limited evidence suggests that some antiviral drugs, notably oseltamivir (commercially known as Tamiflu), can reduce the duration of viral replication and improve prospects of survival, provided they are administered within 48 hours following symptom onset. However, prior to the outbreak in Turkey, most patients have been detected and treated late in the course of illness. For this reason, clinical data on the effectiveness of oseltamivir are limited. Moreover, oseltamivir and other antiviral drugs were developed for the treatment and prophylaxis of seasonal influenza, which is a less severe disease associated with less prolonged viral replication. Recommendations on the optimum dose and duration of treatment for H5N1 avian influenza, also in children, need to undergo urgent review, and this is being undertaken by WHOM.

In suspected cases, oseltamivir should be prescribed as soon as possible (ideally, within 48 hours following symptom onset) to maximize its therapeutic benefits. However, given the significant mortality currently associated with H5N1 infection and evidence of prolonged viral replication in this disease, administration of the drug should also be considered in patients presenting later in the course of illness.

Currently recommended doses of oseltamivir for the treatment of influenza are contained in the [product information](#) at the manufacturer's web site. The recommended dose of oseltamivir for the treatment of influenza, in adults and adolescents 13 years of age and older, is 150 mg per day, given as 75 mg twice a day for five days. Oseltamivir is not indicated for the treatment of children younger than one year of age.

As the duration of viral replication may be prolonged in cases of H5N1 infection, clinicians should consider increasing the duration of treatment to seven to ten days in patients who are not showing a clinical response. In cases of severe infection with the H5N1 virus, clinicians may need to consider increasing the recommended daily dose or the duration of treatment, keeping in mind that doses above 300 mg per day are associated with increased side effects. For all treated patients, consideration should be given to taking serial clinical samples for later assay to monitor changes in viral load, to assess drug susceptibility, and to assess drug levels. These samples should be taken only in the presence of appropriate measures for infection control.

In severely ill H5N1 patients or in H5N1 patients with severe gastrointestinal symptoms, drug absorption may be impaired. This possibility should be considered when managing these patients.

COUNTRIES WITH HUMAN CASES IN THE CURRENT OUTBREAK

To date, human cases have been reported in six countries, most of which are in Asia: Cambodia, China, Indonesia, Thailand, Turkey, and Viet Nam. The first patients in the current outbreak, which were reported from Viet Nam, developed symptoms in December 2003 but were not confirmed as H5N1 infection until 11 January 2004. Thailand reported its first cases on 23 January 2004. The first case in Cambodia was reported on 2 February 2005. The next country to report cases was Indonesia, which confirmed its first infection on 21 July. China's first two cases were reported on 16 November 2005. Confirmation of the first cases in Turkey came on 5 January 2006, followed by the first reported case in Iraq on 30 January 2006. All human cases have coincided with outbreaks of highly pathogenic H5N1 avian influenza in poultry. To date, Viet Nam has been the most severely affected country, with more than 90 cases.

Altogether, more than half of the laboratory-confirmed cases have been fatal. H5N1 avian influenza in humans is still a rare disease, but a severe one that

must be closely watched and studied, particularly because of the potential of this virus to evolve in ways that could start a pandemic.

Source: World Health Organisation www.who.org

Swine Influenza

What is swine flu?

Swine Influenza (swine flu) is a respiratory disease of pigs caused by type an influenza virus that causes regular outbreaks in pigs. People do not normally get swine flu, but human infections can and do happen.

Is this swine flu virus contagious?

CDC has determined that this swine influenza A (H1N1) virus is contagious and is spreading from human to human. However, at this time, it is not known how easily the virus spreads between people.

What are the signs and symptoms of swine flu in people?

The symptoms of swine flu in people are similar to the symptoms of regular human flu and include;

- fever,
- cough,
- sore throat,
- body aches,
- headache,
- chills and fatigue

Some people have reported diarrhoea and vomiting associated with swine flu. Like seasonal flu, swine flu may cause a worsening of underlying chronic medical conditions.

How does swine flu spread?

Spread of this swine influenza A (H1N1) virus is thought to be happening in the same way that seasonal flu spreads. Flu viruses are spread mainly from person to person through coughing or sneezing of people with influenza. Sometimes people may become infected by touching something with flu viruses on it and then touching their mouth or nose.

How can someone with the flu infect someone else?

Infected people may be able to infect others beginning 1 day before symptoms develop and up to 7 or more days after becoming sick. That means that you may be able to pass on the flu to someone else before you know you are sick, as well as while you are sick.

Are there medicines to treat swine flu?

Yes. CDC recommends the use of oseltamivir or zanamivir for the treatment and/or prevention of infection with these swine influenza viruses. Antiviral drugs are prescription medicines that fight against the flu by keeping flu viruses from reproducing in your body. If you get sick, antiviral drugs can make your illness milder and make you feel better faster. They may also prevent serious flu complications. For treatment, antiviral drugs work best if started soon after getting sick (within 2 days of symptoms).

What can I do to protect myself from getting sick?

There is no vaccine available right now to protect against swine flu. There are everyday actions that can help prevent the spread of germs that cause respiratory illnesses like influenza. Take these everyday steps to protect your health:

- Cover your nose and mouth with a tissue when you cough or sneeze. Throw the tissue in the trash after you use it.
- Wash your hands often with soap and water, especially after you cough or sneeze. Alcohol based hand cleaners are also effective.
- Avoid touching your eyes, nose or mouth. Germs spread this way.
- Try to avoid close contact with sick people.
- If you get sick with influenza, CDC recommends that you stay home from work or school and limit contact with others to keep from infecting them.

What should I do if I get sick?

If you live in areas where swine influenza cases have been identified and become ill with influenza-like symptoms, including fever, body aches, runny nose, sore throat, nausea, or vomiting or diarrhea, you may want to contact your health care provider, particularly if you are worried about your symptoms. Your health care provider will determine whether influenza testing or treatment is needed.

If you are sick, you should stay home and avoid contact with other people as much as possible to keep from spreading your illness to others.

If you become ill and experience any of the following warning signs, seek emergency medical care.

In children emergency warning signs that need urgent medical attention include:

- Fast breathing or trouble breathing
- Bluish skin color
- Not drinking enough fluids
- Not waking up or not interacting
- Being so irritable that the child does not want to be held
- Flu-like symptoms improve but then return with fever and worse cough
- Fever with a rash

In adults, emergency warning signs that need urgent medical attention include:

- Difficulty breathing or shortness of breath
- Pain or pressure in the chest or abdomen
- Sudden dizziness
- Confusion
- Severe or persistent vomiting

Can I get swine influenza from eating or preparing pork?

No. Swine influenza viruses are not spread by food. You cannot get swine influenza from eating pork or pork products. Eating properly handled and cooked pork products is safe.

For further information:

- www.cdc.gov/swineflu/swineflu_you.htm
- www.cdc.gov/swineflu/key_facts.htm
- www.who.int/en/
- www.public.health.wa.gov.au

Swine Flu**What is Swine Influenza?**

Swine Influenza (swine flu) is a respiratory disease of pigs caused by type A influenza virus that regularly causes outbreaks of influenza in pigs. Swine flu viruses cause high levels of illness and low death rates in pigs. Swine influenza viruses may circulate among swine throughout the year, but most outbreaks occur during the late autumn and winter months similar to outbreaks in humans. The classical swine flu virus (an influenza type A H1N1 virus) was first isolated from a pig in 1930.

How many swine flu viruses are there?

Like all influenza viruses, swine flu viruses change constantly. Pigs can be infected by avian influenza and human influenza viruses as well as swine influenza viruses. When influenza viruses from different species infect pigs, the viruses can reassort (i.e. swap genes) and new viruses that are a mix of swine, human and/or avian influenza viruses can emerge. Over the years, different variations of swine flu viruses have emerged. At this time, there are four main influenza virus subtypes that have been isolated in pigs:

H1N1, H1N2, H3N2, and H3N1. However, most of the recently isolated influenza viruses from pigs have been H1N1 viruses.

Swine Flu in Humans**Can humans catch swine flu?**

Swine flu viruses do not normally infect humans. However, sporadic human infections with swine flu have occurred. Most commonly, these cases occur in persons with direct exposure to pigs (e.g. children near pigs at a fair or workers in the swine industry). In addition, there have been documented cases of one person spreading swine flu to others. For example, an outbreak of apparent swine flu infection in pigs in Wisconsin in 1988 resulted in multiple human infections, and, although no community outbreak resulted, there was antibody evidence of virus transmission from the patient to health care workers who had close contact with the patient.

How common is swine flu infection in humans?

In the past, CDC received reports of approximately one human swine influenza virus infection every one to two years in the U.S., but from December 2005 through February 2009, 12 cases of human infection with swine influenza have been reported.

What are the symptoms of swine flu in humans?

The symptoms of swine flu in people are expected to be similar to the symptoms of regular human seasonal influenza and include fever, lethargy, lack of appetite and coughing. Some people with swine flu also have reported runny nose, sore throat, nausea, vomiting and diarrhea.

Can people catch swine flu from eating pork?

No. Swine influenza viruses are not transmitted by food. You cannot get swine influenza from eating pork or pork products. Eating properly handled and cooked pork and pork products are safe.

How does swine flu spread?

Influenza viruses can be directly transmitted from pigs to people and from people to pigs. Human infection with flu viruses from pigs are most likely to occur when people are in close proximity to infected pigs, such as in pig barns and livestock exhibits housing pigs at fairs. Human-to-human transmission of swine flu can also occur. This is thought to occur in the same way as seasonal flu occurs in people, which is mainly person-to-person transmission through coughing or sneezing of people infected with the influenza virus.

People may become infected by touching something with flu viruses on it and then touching their mouth or nose.

How can human infections with swine influenza be diagnosed?

To diagnose swine influenza an infection, a respiratory specimen would generally need to be collected within the first 4 to 5 days of illness (when an infected person is most likely to be shedding virus). However, some persons, especially children, may shed virus for 10 days or longer. Identification as a swine flu influenza a virus requires sending the specimen for laboratory testing.

What medications are available to treat swine flu infections in humans?

There are four different antiviral drugs that are licensed for use in the US for the treatment of influenza: amantadine, rimantadine, oseltamivir and zanamivir. While most swine influenza viruses have been susceptible to all four drugs, the most recent swine influenza viruses isolated from humans are resistant to amantadine and rimantadine. At this time, CDC recommends the use of oseltamivir or zanamivir for the treatment and/or prevention of infection with swine influenza viruses.

Is the H1N1 swine flu virus the same as human H1N1 viruses?

No. The H1N1 swine flu viruses are antigenically very different from human H1N1 viruses and, therefore, vaccines for human seasonal flu would not provide protection from H1N1 swine flu viruses.

Which countries have been affected by outbreaks in pigs?

Swine influenza is not notifiable to international animal health authorities (OIE, www.oie.int); therefore, its international distribution in animals is not well known. The disease is considered endemic in the United States. Outbreaks in pigs are also known to have occurred in North America, South America, Europe (including the UK, Sweden, and Italy), Africa (Kenya), and in parts of eastern Asia including China and Japan.

What about the pandemic risk?

It is likely that most people, especially those who do not have regular contact with pigs, do not have immunity to swine influenza viruses that can prevent the virus infection. If a swine virus establishes efficient human-to human transmission, it can cause an influenza pandemic. The impact of a pandemic caused by such a virus is difficult to predict: it depends on virulence of the virus, existing immunity among people, cross protection by antibodies acquired from seasonal influenza infection and host Factors.

Is there a human vaccine to protect from swine influenza?

There are no vaccines that contain the current swine influenza virus causing illness in humans. It is not known whether current human seasonal influenza vaccines can provide any protection. Influenza viruses change very quickly. It is important to develop a vaccine against the currently circulating virus strain for it to provide maximum protection to the vaccinated people. This is why WHO needs access to as many viruses as possible in order to select the most appropriate candidate vaccine virus.

How can I protect myself from getting swine influenza from infected people?

In the past, human infection with swine influenza was generally mild but is known to have caused severe illness such as pneumonia. For the current outbreaks in the United States and Mexico however, the clinical pictures have been different. None of the confirmed cases in the United States have had the severe form of the disease and the patients recovered from illness without requiring medical care. In Mexico, some patients reportedly had the severe form of the disease. To protect yourself, practice general preventive measures for influenza:

- Avoid close contact with people who appear unwell and who have fever and cough.
- Wash your hands with soap and water frequently and thoroughly.
- Practice good health habits including adequate sleep, eating nutritious food, and keeping physically active.

If there is an ill person at home:

- Try to provide the ill person a separate section in the house. If this is not possible, keep the patient at least 1 meter in distance from others.
 - Cover mouth and nose when caring for the ill person. Masks can be bought commercially or made using the readily available materials as long as they are disposed of or cleaned properly.
 - Wash your hands with soap and water thoroughly after each contact with the ill person.
 - Try to improve the air flow in the area where the ill person stays. Use doors and windows to take advantage of breezes.
 - Keep the environment clean with readily available household cleaning agents.
- If you are living in a country where swine influenza has caused disease in humans, follow additional advice from national and local health authorities.

What should I do if I think I have swine influenza?

If you feel unwell, have high fever, cough and/or sore throat:

- Stay at home and keep away from work, school or crowds as much as possible.
- Rest and take plenty of fluids.
- Cover your mouth and nose with disposable tissues when coughing and sneezing and dispose of the used tissues properly.
- Wash your hands with soap and water frequently and thoroughly, especially after coughing or sneezing.
- Inform family and friends about your illness and seek help for household chores that require contact with other people such as shopping.

If you need medical attention:

- Contact your doctor or healthcare provider before travelling to see them and report your symptoms.

Explain why you think you have swine influenza (for example, if you have recently travelled to a country where there is a swine influenza outbreak in humans). Follow the advice given to you for care.

- If it is not possible to contact your healthcare provider in advance, communicate your suspicion of having swine influenza immediately upon arrival at the healthcare facility.
- Take care to cover your nose and mouth during travel

For further information:

- www.cdc.gov/swineflu/swineflu_you.htm
- www.cdc.gov/swineflu/key_facts.htm
- www.who.int/en/
- www.public.health.wa.gov.au

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