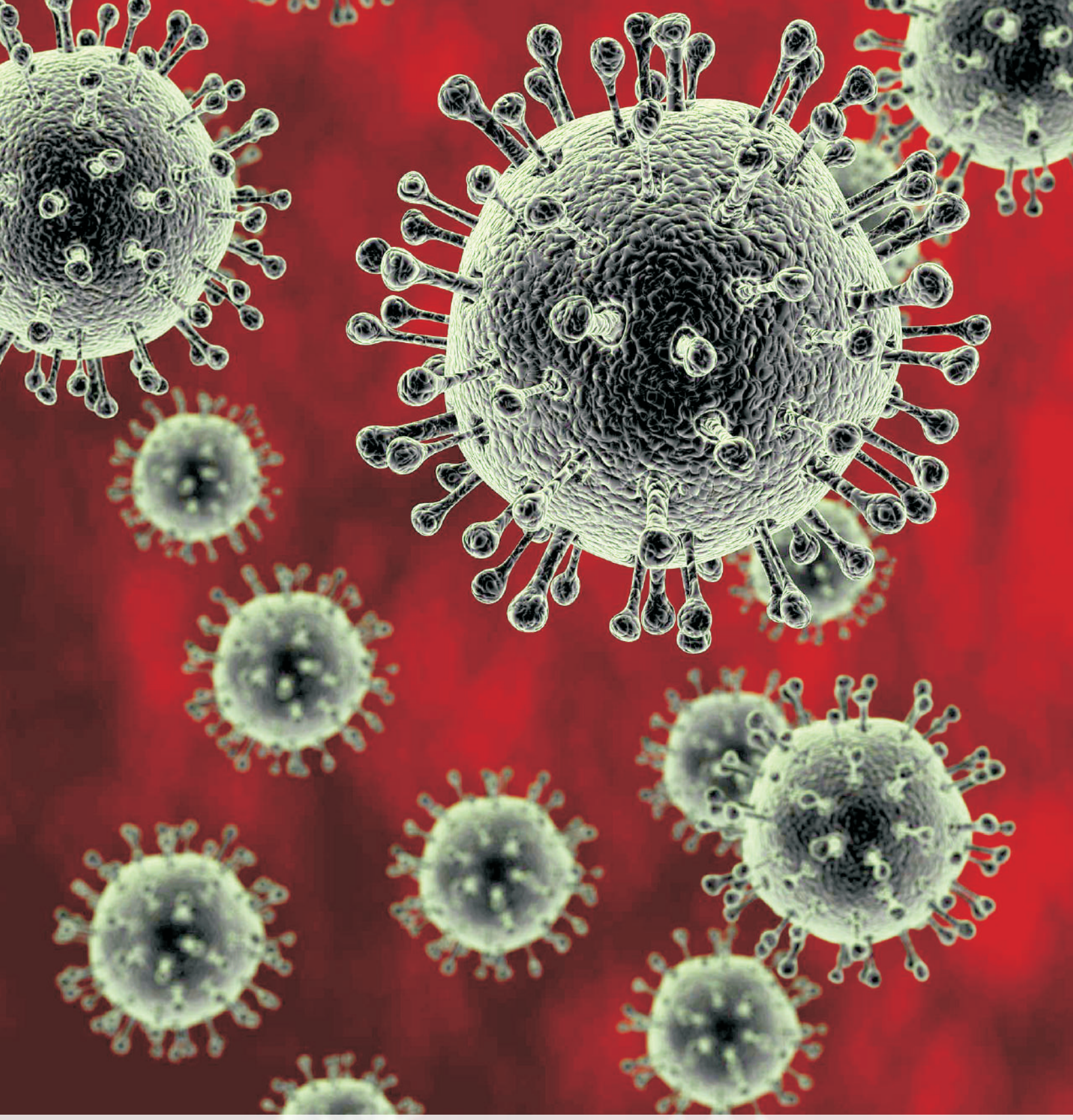
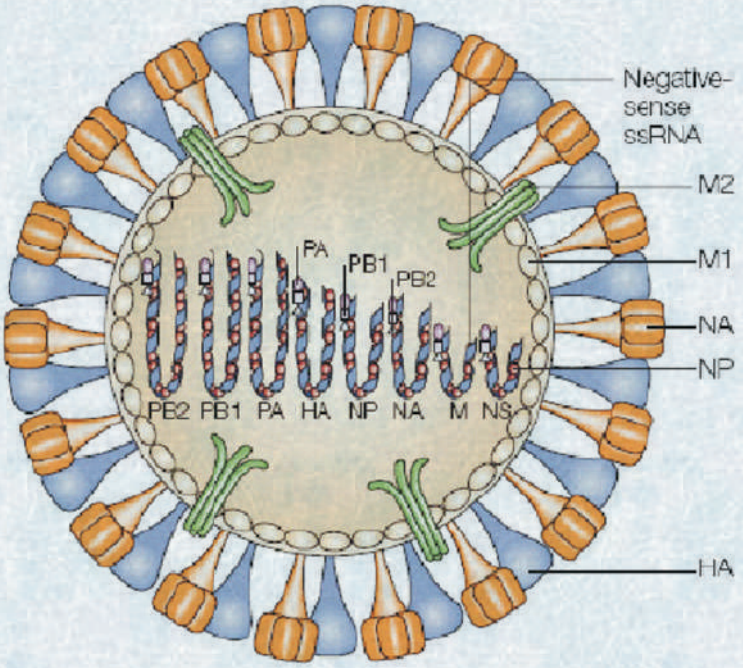


INFLUENZA A-H1N1

INFORMATION MANUAL

Epidemic Branch
Commissionerate of Health, Family Welfare and Medical Services
Gandhinagar, Gujarat.

HEALTH AND FAMILY WELFARE DEPARTMENT
GOVERNMENT OF GUJARAT



INFLUENZA A - H1N1
INFORMATION MANUAL

EPIDEMIC BRANCH

April 2012

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INFLUENZA A -H1N1

INTRODUCTION

INTRODUCTION

The declaration of a Phase 6 pandemic alert by the World Health Organization in June 2009 signaled that sustained H1N1 Influenza epidemics were occurring worldwide and that countries were to act purposefully to control the disease.

In Gujarat the first case of H1N1 Influenza was confirmed in July, 2009 and within a short time frame several suspected cases of the disease were reported.

In response, the Health Department further strengthened surveillance at various facilities, developed protocols and instituted systems for more effective and efficient patient management and activated the Communications Strategy of the State and National Influenza Action Plan

The objective of this manual is to provide information on H1N1 Influenza to individuals, community–based groups, non government organizations, and public and private sector organizations, with a view to empowering them to take measures to protect themselves and others from contracting the disease.

The manual is designed to facilitate simple instruction on the topic of H1N1 Influenza, its characteristics as well as prevention and control measures. It is intended to serve as a useful tool to empower staffers and members of organizations to combat the transmission of the disease at the organizational and household level.

The general information section provides concise and accurate information on the disease, its course and prevention measures. The appendices comprise useful information regarding the prevention and control of the disease. The inclusion of a PowerPoint presentation should assist Human Resource Personnel and senior members of organizations to conduct further training and sensitization of staff and members.

The Health Department is available to assist with any additional information required regarding H1N1 Influenza and can be contacted at the numbers provided in appendix XII.

GENERAL H1N1 INFORMATION

GENERAL INFORMATION ON H1N1 INFLUENZA

H1N1 (swine flu):

H1N1 (referred to as "swine flu" early on) is a new influenza virus causing illness in people. This virus is spreading from person-to-person worldwide, probably in much the same way that regular seasonal influenza viruses spread.

H1N1 Flu in Humans

H1N1 virus spread:

H1N1 virus is spread from person-to-person. It is spread in the same way that seasonal flu. The Flu viruses are spread mainly through:

- The inhalation of infected droplets expelled when an infected individual coughs or sneezes in open air;
- Using the hands to rub or touch face and nose after touching contaminated surfaces.

Signs and symptoms of this virus:

The symptoms of H1N1 flu virus in people include fever, cough, sore throat, runny or stuffy nose, body aches, headache, chills and fatigue. A significant number of people who have been infected with this virus also have reported diarrhea and vomiting. Severe illnesses and death has occurred as a result of illness associated with this virus.

Illness associated with H1N1 flu virus:

Illness with the new H1N1 virus has ranged from mild to severe. While most people who have been sick have recovered without needing medical treatment, hospitalizations and deaths from infection with this virus have occurred.

In seasonal flu, certain people are at "high risk" of serious complications. This includes people 65 years and older, children younger than five years old, pregnant women, and people of any age with certain chronic medical conditions. About 70 percent of people who have been hospitalized with this H1N1 virus have had one or more medical conditions previously recognized as placing people at "high risk" of serious seasonal flu-related complications. This includes pregnancy, diabetes, heart disease, asthma and kidney disease.

One thing that appears to be different from seasonal influenza is that adults older than 64 years do not yet appear to be at increased risk of H1N1-related complications thus far. Studies have shown that no children and very few adults younger than 60 years old have

existing antibody to 2009 H1N1 flu virus; however, about one-third of adults older than 60 may have antibodies against this virus. It is unknown how much, if any, protection may be afforded against 2009 H1N1 flu by any existing antibody.

How long can an infected person spread this virus to others?

People infected with seasonal and H1N1 flu shed virus and may be able to infect others from 1 day before getting sick to 5 to 7 days after. This can be longer in some people, especially children and people with weakened immune systems and in people infected with the new H1N1 virus.

APPENDICES

Appendix I

Clinical management Protocol and Infection Control Guidelines

Clinical Management Protocol

1. Introduction

Influenza like Illness caused by Influenza A [H1N1], a re-assorted influenza virus, was reported from Mexico on 18th March, 2009 and rapidly spread to neighboring United States and Canada. Subsequently the disease spread to all the continents. World Health Organization [WHO] has raised the level of Influenza pandemic alert from phase 5 to 6 on 11.06.09. As per WHO, we are now at the start of 2009 Influenza pandemic. As per WHO assessment the overall severity of Influenza pandemic is moderate implying that most people recover from infection without the need for hospitalization or the medical care. As on October 2010 World Health Organization has declared as pandemic over.

2. Epidemiology

2.1 The agent

Genetic sequencing shows a new sub type of influenza A (H1N1) virus with segments from four influenza viruses: North American Swine, North American Avian, Human Influenza and Eurasian Swine.

2.2 Host factors

The majority of these cases have occurred in otherwise healthy young adults.

2.3 Transmission

The transmission is by droplet infection and fomites.

2.4 Incubation period

1-7 days.

2.5 Communicability

From 1 day before to 7 days after the onset of symptoms. If illness persist for more than 7 days, chances of communicability may persist till resolution of illness. Children may spread the virus for a longer period.

There is substantial gap in the epidemiology of the novel virus which got re-assorted from swine influenza.

3. Clinical features

Important clinical features of swine influenza include fever, and upper respiratory symptoms such as cough, running nose and sore throat. Head ache, body ache, fatigue diarrhea and vomiting have also been observed.

There is insufficient information to date about clinical complications of the current pandemic influenza A (H1N1) virus infection. Clinicians should expect complications to be similar to seasonal influenza: sinusitis, otitis media, croup, pneumonia, bronchiolitis, status asthamaticus, myocarditis, pericarditis, myositis, rhabdomyolysis, encephalitis, seizures, toxic shock syndrome and secondary bacterial pneumonia with or without sepsis. Individuals at extremes of age and with preexisting medical conditions are at higher risk of complications and exacerbation of the underlying conditions.

The standard case definitions are as follows:

A *suspected case* of Pandemic influenza A (H1N1) virus infection is defined as a person with acute febrile respiratory illness (fever ≥ 38 0 C) with onset.:

- ✓ *within 7 days of close contact with a person who is a confirmed case of pandemic influenza A (H1N1) virus infection, or*
- ✓ *within 7 days of travel to community where there are one or more confirmed pandemic influenza A(H1N1) cases, or*
- ✓ *resides in a community where there are one or more confirmed pandemic influenza cases.*

A *probable case* of Pandemic influenza A (H1N1) virus infection is defined as a person with an acute febrile respiratory illness who:

- ✓ *is positive for influenza A, but unsubtypable for H1 and H3 by influenza RT-PCR or reagents used to detect seasonal influenza virus infection, or*
- ✓ *is positive for influenza A by an influenza rapid test or an influenza immunofluorescence assay (IFA) plus meets criteria for a suspected case*
- ✓ *individual with a clinically compatible illness who died of an unexplained acute respiratory –illness who is considered to be epidemiologically linked to a probable or confirmed case.*

A *confirmed case* of pandemic influenza A (H1N1) virus infection is defined as a person with an acute febrile respiratory illness with laboratory confirmed pandemic influenza A (H1N1) virus infection at WHO approved laboratories by one or more of the following tests:

- ✓ *Real Time PCR*
- ✓ *viral culture*
- ✓ *Four-fold rise in pandemic influenza A (H1N1) virus specific neutralizing antibodies.*

4. Investigations

Routine investigations required for evaluation and management of a patient with symptoms as described above will be required. These may include haematological, biochemical, radiological and microbiological tests as necessary.

Confirmation of Pandemic influenza A(H1N1) infection is through:

- ✓ Real time RT PCR or
- ✓ Isolation of the virus in culture or
- ✓ Four-fold rise in virus specific neutralizing antibodies.

For confirmation of diagnosis, clinical specimens such as nasopharyngeal swab, throat swab, nasal swab, wash or aspirate, and tracheal aspirate (for intubated patients) are to be obtained. The sample should be collected by a trained physician / microbiologist preferably before administration of the anti-viral drug. Keep specimens at 4°C in viral transport media until transported for testing. The samples should be transported to designated laboratories with in 24 hours. If they cannot be transported then it needs to b stored at -70°C. Paired blood samples at an interval of 14 days for serological testing should also be collected.

5. Treatment

The guiding principles are:

- ✓ Early implementation of infection control precautions to minimize nosocomical / household spread of disease
- ✓ Prompt treatment to prevent severe illness & death.
- ✓ Early identification and follow up of persons at risk.

5.1 Infrastructure / manpower / material support

- ✓ Isolation facilities: if dedicated isolation room is not available then patients can be cohorted in a well ventilated isolation ward with beds kept one metre apart.
- ✓ Manpower: Dedicated doctors, nurses and paramedical workers.
- ✓ Equipment: Portable X Ray machine, ventilators, large oxygen cylinders, pulse oxymeter
- ✓ Supplies: Adequate quantities of PPE, disinfectants and medications (Oseltamivir, antibiotics and other medicines)

5.2 Standard Operating Procedures

- ✓ Reinforce standard infection control precautions i.e. all those entering the room must use high efficiency masks, gowns, goggles, gloves, cap and shoe cover.
- ✓ Restrict number of visitors and provide them with PPE.
- ✓ Provide antiviral prophylaxis to health care personnel managing the case and ask them to monitor their own health twice a day.
- ✓ Dispose waste properly by placing it in sealed impermeable bags labeled as Bio-Hazard.

5.3 Oseltamivir Medication

Oseltamivir is the recommended drug both for prophylaxis and treatment.

Dose for treatment is as follows:

By Weight:

- For weight <15kg	30 mg BD for 5 days
- 15-23kg	45 mg BD for 5 days
- 24-<40kg	60 mg BD for 5 days
- >40kg	75 mg BD for 5 days

For infants:

< 3 months	12 mg BD for 5 days
3-5 months	20 mg BD for 5 days
6-11 months	25 mg BD for 5 days

It is also available as syrup (12mg per ml) - If needed dose & duration can be modified as per clinical condition.

Adverse reactions:

Oseltamivir is generally well tolerated, gastrointestinal side effects (transient nausea, vomiting) may increase with increasing doses, particularly above 300 mg/day. Occasionally it may cause bronchitis, insomnia and vertigo. Less commonly angina, pseudo membranous colitis and peritonsillar abscess have also been reported. There have been rare reports of anaphylaxis and skin rashes. In children, most frequently reported side effect is vomiting. Infrequently, abdominal pain, epistaxis, bronchitis, otitis media, dermatitis and conjunctivitis have also been observed. There is no recommendation for dose reduction in patients with hepatic disease. Though rare reporting of fatal neuro-psychiatiric illness in children and adolescents have been linked to oseltamivir, there is no scientific evidence for a causal relationship.

5.4 Supportive therapy

- ✓ IV Fluids.
- ✓ Parentral nutrition.
- ✓ Oxygen therapy/ ventilatory support.
- ✓ Antibiotics for secondary infection.
- ✓ Vasopressors for shock.
- ✓ Paracetamol or ibuprofen is prescribed for fever, myalgia and headache. Patient is advised to drink plenty of fluids. Smokers should avoid smoking. For sore throat, short course of topical decongestants, saline nasal drops, throat lozenges and steam inhalation may be beneficial.
- ✓ Salicylate / aspirin is strictly contra-indicated in any influenza patient due to its potential to cause Reye's syndrome.
- ✓ The suspected cases would be constantly monitored for clinical / radiological evidence of lower respiratory tract infection and for hypoxia (respiratory rate, oxygen saturation, level of consciousness).
- ✓ Patients with signs of tachypnea, dyspnea, respiratory distress and oxygen saturation less than 90 per cent should be supplemented with oxygen therapy. Types of oxygen devices depend on the severity of hypoxic conditions which can be started from oxygen cannula, simple mask, partial re-breathing mask (mask with reservoir bag) and non re-breathing mask. In children, oxygen hood or head boxes can be used.
- ✓ Patients with severe pneumonia and acute respiratory failure (SpO_2 < 90% and PaO_2 <60 mmHg with oxygen therapy) must be supported with mechanical ventilation. Invasive mechanical ventilation is preferred choice. Non invasive ventilation is an option when mechanical ventilation is not available. To reduce spread of infectious aerosols, use of HEPA filters on expiratory ports of the ventilator circuit / high flow oxygen masks is recommended.
- ✓ Maintain airway, breathing and circulation (ABC);
- ✓ Maintain hydration, electrolyte balance and nutrition.
- ✓ If the laboratory reports are negative, the patient would be discharged after giving full course of oseltamivir. Even if the test results are negative, all cases with strong epidemiological criteria need to be followed up.
- ✓ Immunomodulating drugs has not been found to be beneficial in treatment of ARDS or sepsis associated multi organ failure. High dose corticosteroids in particular have no evidence of benefit and there is potential for harm. Low dose corticosteroids (Hydrocortisone 200-400 mg/ day) may be useful in persisting septic shock (SBP < 90).
- ✓ Suspected case not having pneumonia do not require antibiotic therapy. Antibacterial agents should be administered, if required, as per locally accepted clinical practice guidelines. Patient on mechanical ventilation should be administered antibiotics prophylactically to prevent hospital associated infections.

5.5 Discharge Policy

It has been observed that some of the patients even though asymptomatic, continue to test positive for influenza A H1N1. A treated and recovered patient, even though testing positive, has very little possibility of infecting others. In view of the above, the following recommendations are made:

Patients who responded to treatment after two to three days and become totally asymptomatic should be discharged after 5 days of treatment. There is no need for a repeat test.

Patients who continue to have symptoms of fever, sore throat etc. even on the 5th day should continue treatment for 5 more days. If the patient become asymptomatic during the course of treatment there is no need to test further.

For patients who continue to be symptomatic even after 10 days of treatment or those cases with respiratory distress and in whom secondary infection is taken care of, and if patient continue to shed virus, then resistance of the patients to anti viral would be tested. The dose of anti viral may be adjusted on case to case basis.

The family of patients discharged earlier should be educated on personal hygiene and infection control measures at home; children should not attend school during this period.

5.6 Chemoprophylaxis

Chemoprophylaxis with oseltamivir either for short duration (10 days) or of long duration (42 days) protect the individual till such time he is on Chemoprophylaxis. In a community where there is rampant spread of pandemic Influenza A H1N1, the risk of getting the infection exists the moment a person is taken off Chemoprophylaxis. As prophylaxis cannot be continued in perpetuity, the following is recommended:

If the States qualify the criteria for community spread, then chemoprophylaxis would only be provided to family contacts that are at high risk and especially those with co-morbid condition.

The prophylaxis to the high risk family contact would be provided irrespective of laboratory testing i.e. any high risk contact of patients in category A, B or C would be provided Chemoprophylaxis.

The doctors screening the patients and categorizing them as A, B, C would invariably take the history of high risk contacts among the family members of these suspect cases and persuade them to attend screening centres.

States which does not qualify the criteria of community spread would continue the

preventive approach of contact tracing and providing chemoprophylaxis to family contacts, school contacts and social contacts.

Irrespective of whether there is a community spread or not medical personnel attending to influenza A H1N1 cases in dedicated treatment facilities would be put on Chemoprophylaxis to a maximum of 42 days.
Prophylaxis should be provided till 10 days after last exposure (maximum period of 6 weeks)

By Weight:

- For weight <15kg 30 mg OD
- 15-23kg 45 mg OD
- 24-<40kg 60 mg OD
- >40kg 75 mg OD

For infants:

< 3 months not recommended unless situation judged critical due to limited data on use in this age group

3-5 months 20 mg OD
6-11 months 25 mg OD

5.7 Non-Pharmaceutical Interventions

- ✓ Close Contacts of suspected, probable and confirmed cases should be advised to remain at home (voluntary home quarantine) for at least 7 days after the last contact with the case. Monitoring of fever should be done for at least 7 days. Prompt testing and hospitalization must be done when symptoms are reported.
- ✓ All suspected cases, clusters of ILI/SARI cases need to be notified to the State Health Authorities and the Ministry of Health & Family Welfare, Govt. of India (Director, EMR and NICD)

6. Laboratory Tests

- ✓ The samples are to be tested in BSL-3 or BSL 2+ laboratory with BSL-3 precautions. The apex laboratories are:
  - National Institute of Communicable Diseases, 22, Sham Nath Marg, Delhi [Tel. Nos. Influenza Monitoring Cell: 011-23921401; Director: 011-23913148]
  - National Institute of Virology, 20-A, Dr. Ambedkar Road, Pune-411001 [Tel.No. 020-26124386]
- ✓ There is a network of 16 other laboratories that can test for Influenza A H1N1. This network is being expanded to include private laboratories. The updated list is available on the web site of Ministry of Health and Family Welfare (www.mohfw.nic.in).

Infection control Measures

Infection control measures would be targeted according to the risk profile as follows:

✓ **Health facility managing the human cases of Influenza A H1N1**

- During Pre Hospital Care

  - Standard precautions are to be followed while transporting patient to a health-care facility. The patient should also wear a three layer surgical mask.
  - Aerosol generating procedures should be avoided during transportation as far as possible.
  - The personnel in the patient's cabin of the ambulance should wear full complement of PPE including N95 masks, the driver should wear three layered surgical mask.
  - Once the patient is admitted to the hospital, the interior and exterior of the ambulance and reusable patient care equipment needs to be sanitized using sodium hypochlorite / quaternary ammonium compounds.
  - Recommended procedures for disposal of waste (including PPE used by personnel) generated in the ambulance while transporting the patient should be followed.

- During Hospital Care

  - The patient should be admitted directly to the isolation facility and continue to wear a three layer surgical mask.
  - The identified medical, nursing and paramedical personnel attending the suspect/ probable / confirmed case should wear full complement of PPE . If splashing with blood or other body fluids is anticipated, a water proof apron should be worn over the PPE.
  - Aerosol-generating procedures such as endotracheal intubation, nebulized medication administration, induction and aspiration of sputum or other respiratory secretions, airway suction, chest physiotherapy and positive pressure ventilation should be performed by the treating physician/ nurse wearing full complement of PPE with N95 respirator on.
  - Sample collection and packing should be done under full cover of PPE with N-95 respirator .
  - Perform hand hygiene before and after patient contact and following contact with contaminated items, whether or not gloves are worn.
  - Until further evidence is available, infection control precautions should continue in an adult patient for 7 days after resolution of symptoms and 14 days after resolution of symptoms for children younger than 12 years because of longer period of viral shedding expected in children. If the patient insists on

returning home, after resolution of fever, it may be considered, provided the patient and household members follow recommended infection control measures and the cases could be monitored by the health workers in the community.

- The virus can survive in the environment for variable periods of time (hours to days). Cleaning followed by disinfection should be done for contaminated surfaces and equipments.
- The virus is inactivated by a number of disinfectants such as 70% ethanol, 5% benzalkonium chloride (Lysol) and 10% sodium hypochlorite. Patient rooms/areas should be cleaned at least daily and finally after discharge of patient. In addition to daily cleaning of floors and other horizontal surfaces, special attention should be given to cleaning and disinfecting frequently touched surfaces. To avoid possible aerosolization of the virus, damp sweeping should be performed. Horizontal surfaces should be dusted by moistening a cloth with a small amount of disinfectant.
- Clean heavily soiled equipment and then apply a disinfectant effective against influenza virus (mentioned above) before removing it from the isolation room/area. If possible, place contaminated patient-care equipment in suitable bags before removing it from the isolation room/area.
- When transporting contaminated patient-care equipment outside the isolation room/area, use gloves followed by hand hygiene. Use standard precautions and follow current recommendations for cleaning and disinfection or sterilization of reusable patient-care equipment.
- All waste generated from influenza patients in isolation room/area should be considered as clinical infectious waste and should be treated and disposed in accordance with national regulations pertaining to such waste. When transporting waste outside the isolation room/area, gloves should be used followed by hand hygiene.

Appendix II

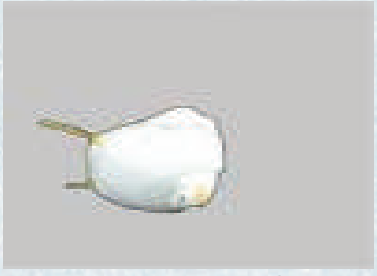
Standard Operating Procedures on Use of PPE

Personal Protection Equipments

PPE reduces the risk of infection if used correctly. It includes:

- Gloves (nonsterile),
- Mask (high-efficiency mask) / Three layered surgical mask,
- Long-sleeved cuffed gown,
- Protective eyewear (goggles/visors/face shields),
- Cap (may be used in high risk situations where there may be increased aerosols),
- Plastic apron if splashing of blood, body fluids, excretions and secretions is anticipated.

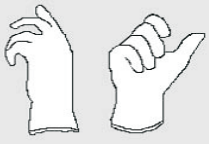
Goggles



N-95 Mask

Gown(must for lab work)

Triple layer Mask



Gloves

Shoe Cover

The PPE should be used in situations were regular work practice requires unavoidable,

relatively closed contact with the suspected human case / poultry.

Correct procedure for applying PPE in the following order:

1. Follow thorough hand wash
2. Wear the coverall.
3. Wear the goggles/ shoe cover/and head cover in that order.
4. Wear face mask
5. Wear gloves

The masks should be changed after every six to eight hours.

Remove PPE in the following order:

- Remove gown (place in rubbish bin).
- Remove gloves (peel from hand and discard into rubbish bin).
- Use alcohol-based hand-rub or wash hands with soap and water.
- Remove cap and face shield (place cap in bin and if reusable place face shield in container for decontamination).
- Remove mask - **by grasping elastic behind ears – do not touch front of mask**
- Use alcohol-based hand-rub or wash hands with soap and water.
- Leave the room.
- Once outside room use alcohol hand-rub again or wash hands with soap and water.

Used PPE should be handled as waste as per waste management protocol

Appendix III

Guidelines/ operating procedures for infection control practices

1. Infection control measures at Individual level

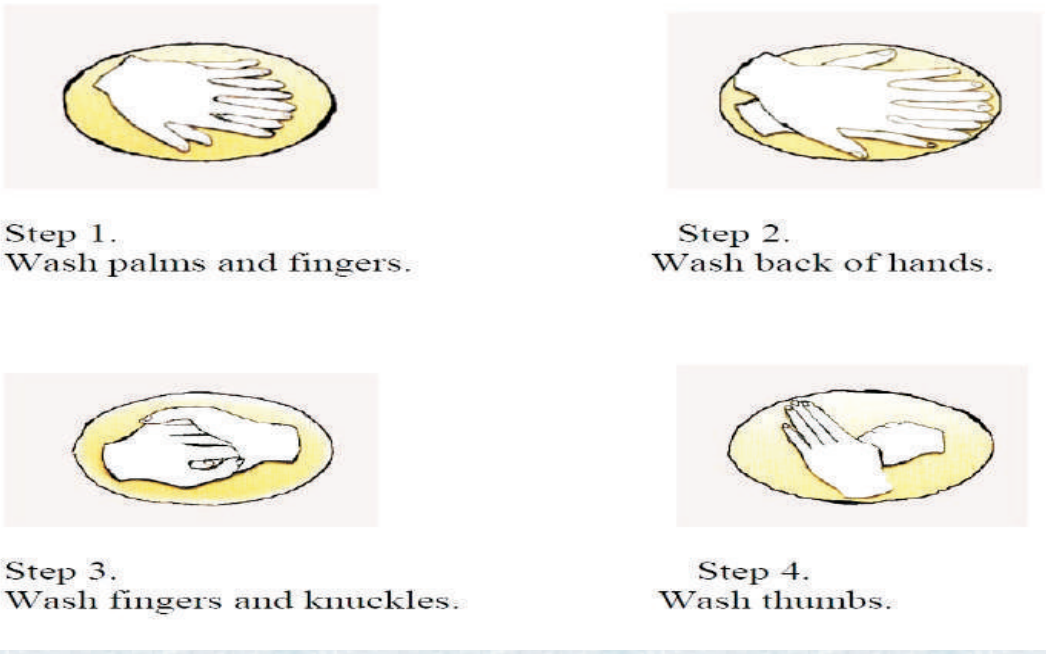
1.1 Hand Hygiene

- ✓ Hand hygiene is the single most important measure to reduce the risk of transmitting infectious organism from one person to other.

- ✓ Hands should be washed frequently with soap and water / alcohol based hand rubs/ antiseptic hand wash and thoroughly dried preferably using disposable tissue/ paper/ towel.

- ✓ After contact with respiratory secretions or such contaminated surfaces.
- ✓ Any activity that involves hand to face contact such as eating/ normal grooming / smoking etc.

Step of hand washing



Step 5.
Wash fingertips.

Step 6.
Wash wrists.

1.2 Respiratory Hygiene/Cough Etiquette

The following measures to contain respiratory secretions are recommended for all individuals with signs and symptoms influenza like illness.

- ✓ Cover the nose/mouth with a handkerchief/ tissue paper when coughing or sneezing;
- ✓ Use tissues to contain respiratory secretions and dispose of them in the nearest waste receptacle after use;
- ✓ Perform hand hygiene (e.g., hand washing with non-antimicrobial soap and water, alcohol-based hand rub, or antiseptic hand wash) after having contact with respiratory secretions and contaminated objects/materials

1.3 Staying away

- ✓ Stay arms length away from those showing symptoms of influenza like illness.

1.4 Use of mask

Three layered surgical mask is recommended for medical personnel working in screening areas and in isolation facilities. Medical personnel working in isolation ward or critical care facility performing aerosol generating procedures such as suction, endotracheal intubation etc.

2. Infection control measures at health facility

2.1 Droplet Precautions:

Advise healthcare personnel to observe Droplet Precautions (i.e., wearing a surgical or procedure masks for close contact), in addition to Standard Precautions, when examining a patient with symptoms of a respiratory infection, particularly if fever is present. These precautions should be maintained until it is determined that the cause of symptoms is not an infectious agent that requires Droplet Precautions.

2.2 Visual Alerts

Post visual alerts (in appropriate languages) at the entrance to outpatient facilities (e.g., emergency departments, physician offices, outpatient, clinics) instructing patients and persons who accompany them (e.g., family, friends) to inform healthcare personnel of symptoms of a respiratory infection when they first register or care and to **practice Respiratory Hygiene/Cough Etiquette.**

2.3 Use of PPE

- ✓ The medical, nurses and paramedics attending the suspect/ probable / confirmed case should wear full complement of PPE
- ✓ Use N-95 masks during aerosol-generating procedures.
- ✓ Perform hand hygiene before and after patient contact and following contact with contaminated items, whether or not gloves are worn.
- ✓ Sample collection and packing should be done under full cover of PPE.

2.4 Decontaminating contaminated surfaces, fomites and equipments

Cleaning followed by disinfection should be done for contaminated surfaces and equipments.

- ✓ Use phenolic disinfectants, quaternary ammonia compounds , alcohol or sodium hypochlorite. Patient rooms/areas should be cleaned at least daily and terminally after discharge. In addition to daily cleaning of floors and other horizontal surfaces, special attention should be given to cleaning and disinfecting frequently touched surfaces.
- ✓ To avoid possible aerosolization of AI virus, damp sweeping should be performed.
- ✓ Clean heavily soiled equipment and then apply a disinfectant effective against influenza virus before removing it from the isolation room/area.
- ✓ When transporting contaminated patient-care equipment outside the isolation room/area, use gloves followed by hand hygiene. Use standard precautions and follow current recommendations for cleaning and disinfection or sterilization of reusable patient-care equipment.

2.5 Guidelines for waste disposal

- ✓ All the waste has to be treated as infectious waste and decontaminated as per standard procedures
- ✓ Articles like swabs/gauges etc are to be discarded in the Yellow coloured autoclavable biosafety bags after use, the bags are to be autoclaved followed by incineration of the contents of the bag.
- ✓ Waste like used gloves, face masks and disposable syringes etc are to be discarded in Blue/White autoclavable biosafety bags which should be autocalaved/microwaved before disposal
- ✓ All hospitals and laboratory personnel should follow the standard guidelines (Biomedical waste management and handling rules, 1998) for waste management.

Appendix IV

Criteria to determine Community Spread of Pandemic Influenza A H1N1

"If there is 25 or more epidemiologically linked suspect cases of Pandemic Influenza A H1N1 of which at least one or more are laboratory confirmed for Pandemic Influenza A H1N1, in two or more cities, over a period of two weeks, then the State would be considered to be having community spread".

Application

States that report community spread, the curative approach would be followed (i) To screen Influenza like illness in designated health facilities (ii) Categorization into A, B and C categories, (iii) home isolation for category A and B and (iv) hospitalization for Category C. Treatment with Oseltamivir would continue to be for Category B and Category C (refer to patient categorization guidelines).

States not reporting community spread, would continue to do (i) testing of suspect cases (ii) contact tracing and (iii) chemoprophylaxis to family, school and social contacts. This would continue till such time they report community spread.

Appendix V

Guidelines for screening centre and isolation facilities in hospitals

Fundamental principles of isolation are (i) Standard precautions (ii) droplet precautions (iii) airborne precautions and (iv) contact precautions. An isolation facility needs to follow these precautions to ensure that the hospital is not a source of infection to the hospital patients with in and the community. A brief note on each of these precautions is at Annexure-I.

All hospitals indented to screen and admit patients with influenza H1N1 should conform to these guidelines. Identified hospitals would have a separate screening area to screen outdoor patients and an isolation facility to admit those requiring indoor treatment. For clarity, these guidelines are in six parts: (i) Generic Guidelines (ii) Guidelines for pre hospital care (iii) Guidelines for the screening centre (iv) Guidelines for isolation facility and (v) Guidelines for critical care (vi) Mortuary care.

(i) Generic guidance

Standard Precautions to be followed at all patient care areas : hand hygiene, Gloves and use of personal protective equipment (PPE) to avoid direct contact with patient's blood, body fluids, secretions and non-intact skin, prevention of needle stick/sharp injury and cleaning and disinfection of the environment and equipment.

Droplet precautions to be followed when caring for patients with influenza AH1N1 (masks, respirators and eye shield) in isolation facilities.

Airborne and Contact Precautions should complement Standard Precautions while managing case of Pandemic influenza AH1N1 in critical care facilities.

Hospitals should been following the hospital waste management protocols as per the hospital waste management rules.

Dead body should be handled using full cover of PPE.

(ii) Guidelines for Pre Hospital Care

- ✓ All identified hospitals to have advanced life support ambulance.
- ✓ Designated paramedic and driver for the ambulance
- ✓ The ambulance staff should follow standard precautions while handling the patient and airborne precautions if aerosol generating procedures are done.
- ✓ Triple layer surgical masks should be available and worn during transport

- ✓ As far as possible the movements should be restricted.
- ✓ During transport, optimize the vehicle's ventilation to increase the volume of air exchange (e.g. opening the windows). When possible, use vehicles that have separate driver and patient compartments.
- ✓ Aerosol generating procedures to be avoided to the extent possible.
- ✓ Disinfect the ambulance after shifting patient.
- ✓ Notify the receiving facility as soon as possible before arrival that a patient.

(iii) Guidelines for setting up Screening Centre

Purpose of the Screening Centre is to:

- ✓ Attend to patients of influenza like illness in a separate area as to avoid these patients further infecting other patients in Out Patient Department.
- ✓ To facilitate implementing standard and droplet precautions
- ✓ To triage the patients
- ✓ Collect samples.

The screening area would have:

- ✓ A waiting area of about 2000 sq feet to accommodate 50-100 patients
- ✓ Preferably stand alone building with separate entry.
- ✓ Well ventilated to ensure frequent air changes. If air-conditioned, then independent from central air conditioning. Exhaust air to be filtered through HEPA filter (desirable).
- ✓ Patient's seating to have at least one meter clearance on all sides. Avoid overcrowding of patients.
- ✓ Will have cabins for registration, clinical examination chambers, sample collection rooms and drug distribution centre.
- ✓ The waiting area should be adequately cleaned and disinfected.
- ✓ Source control (e.g. use of tissues, handkerchiefs, piece of cloth or triple layer surgical masks to cover nose and mouth) of the patient in the waiting room when coughing or sneezing, and hand hygiene after contact with respiratory secretions.
- ✓ Facility for hand wash. / Wash rooms etc

(iv) Guidelines for setting up isolation facility / ward

- ✓ Patients should be housed in single rooms, whenever possible.
- ✓ However, if sufficient single rooms are not available, beds could be put with a spatial separation of at least 1 m (3 feet) from one another.

- ✓ To create a 10 bed facility, a minimum space of 2000 sq feet area is required clearly segregated from other patient-care areas.
- ✓ There should be double door entry with changing room and nursing station. Enough PPE should be available in the changing room with waste disposal bins to collect used PPEs.
- ✓ Place a puncture-proof container for sharps disposal inside the isolation room/area.
- ✓ Keep the patient's personal belongings to a minimum. Keep water pitchers and cups, tissue wipes, and all items necessary for attending to personal hygiene within the patient's reach.
- ✓ Non-critical patient-care equipment (e.g. stethoscope, thermometer, blood pressure cuff, and sphygmomanometer) should be dedicated to the patient, if possible. Any patient-care equipment that is required for use by other patients should be thoroughly cleaned and disinfected before use.
- ✓ Dedicated hand washes and wash room facilities.
- ✓ If room is air-conditioned, ensure 12 air changes/ hour and filtering of exhaust air. A negative pressure in isolation rooms is desirable for patients requiring aerosolization procedures (intubation, suction nebulisation) . These rooms may have stand alone air-conditioning. These areas should not be a part of the central air-conditioning.
- ✓ If air-conditioning is not available negative pressure could also be created through putting up 3-4 exhaust fans driving air out of the room.
- ✓ In District hospital, where there is sufficient space, natural ventilation may be followed. Such isolation facility should have large windows on opposite walls of the room allowing a natural unidirectional flow and air changes. The principle of natural ventilation is to allow and enhance the flow of outdoor air by natural forces such as wind and thermal buoyancy forces from one opening to another to achieve the desirable air change per hour.
- ✓ Avoid sharing of equipment, but if unavoidable, ensure that reusable equipment is appropriately disinfected between patients.
- ✓ Ensure regular cleaning and proper disinfection of common areas, and adequate hand hygiene by patients, visitors and care givers.
- ✓ Visitors to the isolation facility should be restricted. For unavoidable entries, they should use PPE according to the hospital guidance, and should be instructed on its proper use and in hand hygiene practices prior to entry into the isolation room/area.
- ✓ Doctors, nurses and paramedics posted to isolation facility need to be dedicated and not to be allowed to work in other patient-care areas.
- ✓ Consider having designated portable X-ray equipment
- ✓ Corridors with frequent patient transport should be well-ventilated.
- ✓ All health staff involved in patient care should be well trained in the use of PPE.
- ✓ A telephone or other method of communication should be set up in the isolation room/area to enable patients or family members/visitors to communicate with nurses.

(V) Guidelines for Critical Care facility

- ✓ At least one identified hospital may have a 10 bed dedicated intensive care facility at State Capital.
- ✓ The critical care facility requires to follow all the guidelines as mentioned above for infection control.
- ✓ Also have than or equal to 12 air changes and maintain negative pressure of 40 psi.
- ✓ Should have dedicated equipments. It should also have additional equipments to ventilate at least 10 patients manually.
- ✓ A telephone or other method of communication should be set up in the isolation room/area to enable patients or family members/visitors to communicate with nurses inside the facility.
- ✓ Would have an information board outside to update relatives on the clinical status.

(vi) Mortuary care

- ✓ Mortuary staff should apply Standard Precautions i.e. perform proper hand hygiene and use appropriate PPE (use of gown, gloves, facial protection if there is a risk of splashes from patient's body fluids/secretions onto staff's body and face).
- ✓ Embalming, if required should be conducted according to usual procedures, subject to local regulations/legislation.
- ✓ Hygienic preparation of the deceased (e.g. cleaning of body, tidying of hair, etc) also may be done using standard precautions.

Fundamentals of Isolation Precautions

1. Standard Precautions

Use Standard Precautions, or the equivalent, for the care of all patients. The standard precautions are:

1.1 Hand washing

Wash hands after touching blood, body fluids, secretions, excretions, and contaminated items, whether or not gloves are worn. Wash hands immediately after gloves are removed, between patient contacts, and when otherwise indicated to avoid transfer of microorganisms to other patients or environments. It may be necessary to wash hands between tasks and procedures on the same patient to prevent cross-contamination of different body sites.

1.2 Gloves

Wear gloves (clean, non-sterile gloves are adequate) when touching blood, body fluids, secretions, excretions, and contaminated items. Put on clean gloves just before touching mucous membranes and non- intact skin. Change gloves between tasks and procedures on

the same patient after contact with material that may contain a high concentration of microorganisms. Remove gloves promptly after use, before touching non contaminated items and environmental surfaces, and before going to another patient, and wash hands immediately to avoid transfer of microorganisms to other patients or environments.

1.3 Mask, Eye Protection, Face Shield

Wear a mask and eye protection or a face shield to protect mucous membranes of the eyes, nose, and mouth during procedures and patient-care activities that are likely to generate splashes or sprays of blood, body fluids, secretions, and excretions.

1.4 Gown

Wear a gown (a clean, non sterile gown is adequate) to protect skin and to prevent soiling of clothing during procedures and patient-care activities that are likely to generate splashes or sprays of blood, body fluids, secretions, or excretions. Select a gown that is appropriate for the activity and amount of fluid likely to be encountered. Remove a soiled gown as promptly as possible, and wash hands to avoid transfer of microorganisms to other patients or environments.

1.5 Patient- Care Equipment

Handle used patient-care equipment soiled with blood, body fluids, secretions, and excretions in a manner that prevents skin and mucous membrane exposures, contamination of clothing, and transfer of microorganisms to other patients and environments. Ensure that reusable equipment is not used for the care of another patient until it has been cleaned and reprocessed appropriately. Ensure that single-use items are discarded properly.

1.6 Environmental Control

Ensure that the hospital has adequate procedures for the routine care, cleaning, and disinfection of environmental surfaces, beds, bed rails, bedside equipment, and other frequently touched surfaces and ensure that these procedures are being followed.

1.7 Linen

Handle, transport, and process used linen soiled with blood, body fluids, secretions, and excretions in a manner that prevents skin and mucous membrane exposures and contamination of clothing, and that avoids transfer of microorganisms to other patients and environments.

1.8 Occupational Health and Blood borne Pathogens

Take care to prevent injuries when using needles, scalpels, and other sharp instruments or devices; when handling sharp instruments after procedures; when cleaning used instruments; and when disposing of used needles. Never recap used needles, or otherwise manipulate them using both hands, or use any other technique that involves directing the point of a needle toward any part of the body; rather, use either a one-handed "scoop" technique or a mechanical device designed for holding the needle sheath. Do not remove used needles from disposable syringes by hand, and do not bend, break, or otherwise manipulate used needles by hand. Place used disposable syringes and needles, scalpel blades, and other sharp items in appropriate puncture-resistant containers, which are

located as close as practical to the area in which the items were used, and place reusable syringes and needles in a puncture-resistant container for transport to the reprocessing area. Use mouthpieces, resuscitation bags, or other ventilation devices as an alternative to mouth-to-mouth resuscitation methods in areas where the need for resuscitation is predictable.

1.9 Patient Placement

Place a patient who contaminates the environment or who does not (or cannot be expected to) assist in maintaining appropriate hygiene or environmental control in a private room. If a private room is not available, consult with infection control professionals regarding patient placement or other alternatives.

2. Airborne Precautions

In addition to Standard Precautions, use Airborne Precautions, or the equivalent, for patients known or suspected to be infected with microorganisms transmitted by airborne droplet nuclei (small-particle residue {5 um or smaller in size} of evaporated droplets containing microorganisms that remain suspended in the air and that can be dispersed widely by air currents within a room or over a long distance).

2.1 Patient Placement.

Place the patient in a private room that has (1) monitored negative air pressure in relation to the surrounding area, (2) 12 air changes per hour, and (3) appropriate discharge of air outdoors or monitored high-efficiency filtration of room air before the air is circulated to other areas in the hospital. (23) Keep the room door closed and the patient in the room. When a private room is not available, place the patient in a room with a patient who has active infection with the same microorganism, unless otherwise recommended, (23) but with no other infection. When a private room is not available and cohorting is not desirable, consultation with infection control professionals is advised before patient placement.

2.2 Respiratory Protection

Wear respiratory protection (three layered surgical mask / N 95 respirator) when entering the room of a patient.

2.3 Patient Transport

Limit the movement and transport of the patient from the room to essential purposes only. If transport or movement is necessary, minimize patient dispersal of droplet nuclei by placing a surgical mask on the patient, if possible.

3. Droplet Precautions

In addition to Standard Precautions, use droplet precautions, or the equivalent for a patient known or suspected to be infected with microorganisms transmitted by droplets (large-particle droplets {larger than 5 um in size} that can be generated by the patient during coughing, sneezing, talking, or the performance of procedures).

3.1 Patient Placement

Place the patient in a private room. When a private room is not available, place the patient in a room with a patient(s) who has active infection with the same microorganism but with no other infection (cohorting). When a private room is not available and cohorting is not achievable, maintain spatial separation of at least 3 ft between the infected patient and other patients and visitors. Special air handling and ventilation are not necessary, and the door may remain open.

3.2 Mask

In addition to standard precautions, wear a mask when working within 3 ft of the patient. (Logistically, some hospitals may want to implement the wearing of a mask to enter the room.)

3.3 Patient Transport

Limit the movement and transport of the patient from the room to essential purposes only. If transport or movement is necessary, minimize patient dispersal of droplets by masking the patient, if possible.

4. Contact Precautions

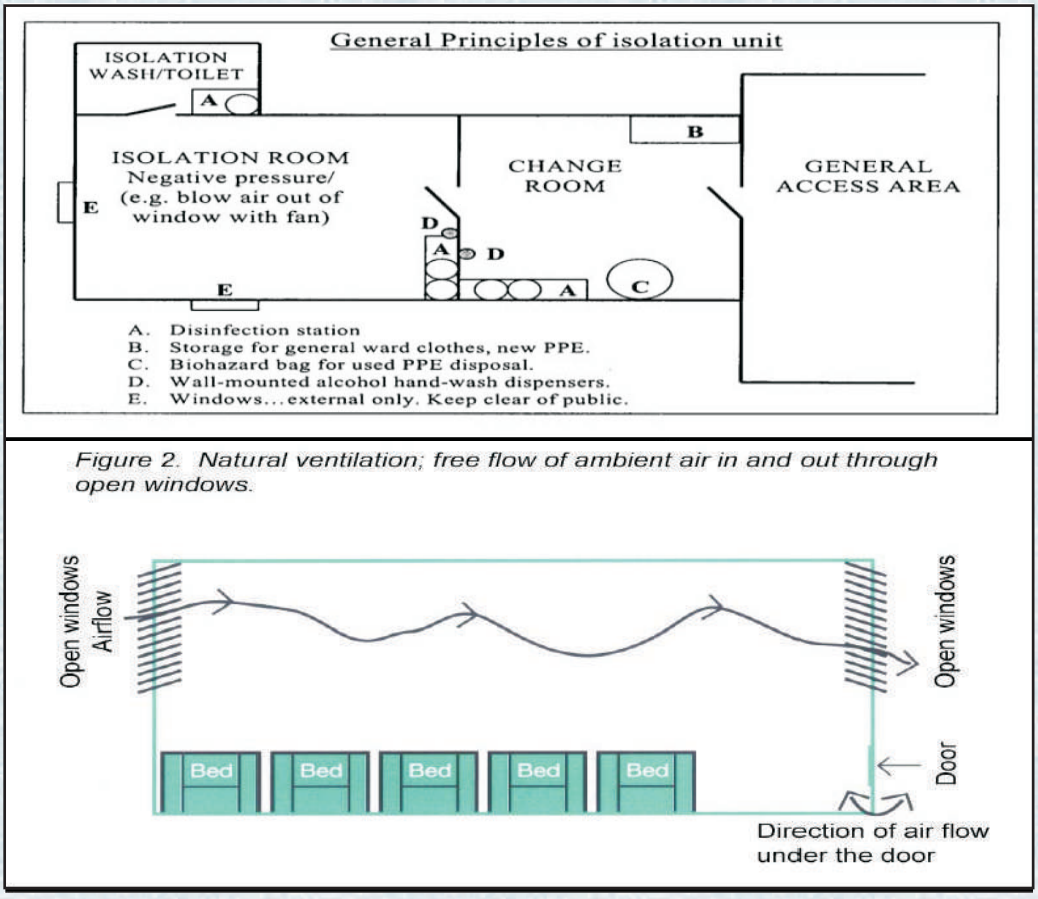
In addition to Standard Precautions, use Contact Precautions, or the equivalent, for specified patients known or suspected to be infected or colonized with epidemiologically important microorganisms that can be transmitted by direct contact with the patient (hand or skin-to-skin contact that occurs when performing patient-care activities that require touching the patient's dry skin) or indirect contact (touching) with environmental surfaces or patient-care items in the patient's environment.

4.1 Patient Placement

Place the patient in a private room. When a private room is not available, place the patient in a room with a patient(s), who has active infection with the same microorganism but with no other infection (cohorting).

4.2 Gloves and Hand Washing

In addition to wearing gloves as outlined under Standard Precautions, wear gloves (clean, non-sterile gloves are adequate) when entering the room. During the course of providing care for a patient, change gloves after having contact with infective material that may contain high concentrations of microorganisms (fecal material and wound drainage). Remove gloves before leaving the patient's environment and wash hands immediately with an antimicrobial agent or a waterless antiseptic agent. After glove removal and hand-washing, ensure that hands do not touch potentially contaminated environmental surfaces or items in the patient's room to avoid transfer of microorganisms to other patients or environments.



4.3 Gown

In addition to wearing a gown as outlined under Standard Precautions, wear a gown (a clean, non-sterile gown is adequate) when entering the room if you anticipate that your clothing will have substantial contact with the patient, environmental surfaces, or items in the patient's room.

4.4 Patient Transport

Limit the movement and transport of the patient from the room to essential purposes only. If the patient is transported out of the room, ensure that precautions are maintained to minimize the risk of transmission of microorganisms to other patients and contamination of environmental surfaces or equipment.

4.5 Patient-Care Equipment

When possible, dedicate the use of non critical patient-care equipment to a single patient (or cohort of patients infected or colonized with the pathogen requiring precautions) to avoid sharing between patients. If use of common equipment or items is unavoidable, then adequately clean and disinfect them before use for another patient.

Appendix VI

Guidelines on categorization of Influenza A H1N1 cases during screening for home isolation, testing treatment, and hospitalization

In order to prevent and contain outbreak of Influenza-A H1N1 virus for screening, testing and isolation following guidelines are to be followed:

At first all individuals seeking consultations for flu like symptoms should be screened at healthcare facilities both Government and private or examined by a doctor and these will be categorized as under:

Category-A

- ✓ Patients **with mild fever plus cough / sore throat** with or without body ache, headache, diarrhoea and vomiting will be categorized as Category-A. They **do not require** Oseltamivir and should be treated for the symptoms mentioned above. The patients should be monitored for their progress and reassessed at 24 to 48 hours by the doctor.
- ✓ **No testing of the patient for H1N1 is required.**
- ✓ Patients should confine themselves at home and avoid mixing up with public and high risk members in the family**.**

Category-B

(i) In addition to all the signs and symptoms mentioned under Category-A, if the patient has high grade fever and severe sore throat, may require home isolation and Oseltamivir;

(ii) In addition to all the signs and symptoms mentioned under Category-A, individuals having one or more of the following high risk conditions shall be treated with Oseltamivir:

- ✓ Children with mild illness but with predisposing risk factors. 1.Pregnant women; 2.Persons aged 65 years or older; 3.Patients with lung diseases, heart disease, liver disease, kidney disease, blood disorders, diabetes, neurological disorders, cancer and HIV/AIDS; 4.Patients on long term cortisone therapy.
- ✓ **No tests for H1N1 is required for Category-B (i) and (ii).**
- ✓ All patients of Category-B (i) and (ii) should confine themselves at home and avoid mixing with public and high risk members in the family.

Category-C

- ✓ In addition to the above signs and symptoms of Category-A and B, if the patient has one or more of the following:
- ✓ Breathlessness, chest pain, drowsiness, fall in blood pressure, sputum mixed with blood, bluish discoloration of nails;
- ✓ Children with influenza like illness who had a severe disease as manifested by the red flag signs (Somnolence, high and persistent fever, inability to feed well, convulsions, shortness of breath, difficulty in breathing, etc).
- ✓ Worsening of underlying chronic conditions.
- ✓ All these patients mentioned above in Category-C require testing, immediate hospitalization and treatment.

Guidelines on use of masks for health care workers, patients and members of public

Masks are personal protective devices which if used correctly would protect the user from contracting Influenza A H1N1 or for that matter, any other aerosol/droplet borne/air-borne infection. Masks should be used mandatory for all health personnel working in an infective environment. The particular type of mask to be used is related to particular risk profile of the category of personnel and his/her work. The risk categorization may change according to the expected degree of environmental contamination and lethality of the virus.

There are two types of masks which are recommended for various categories of personnel depending upon the work environment;

1. Triple layer surgical mask
2. N 95 Respirator

The use of these masks in context of their work setting is enumerated below:

1. Hospital Setting

1.1 Screening Area :
All medical personnel including nursing and paramedical staff would use Disposable Triple layer surgical mask.

1.2 Isolation Ward:

Medical and nursing staff involved in Clinical Care in isolation facilities would require Triple layer surgical mask, along with other Personal Protective Equipment (PPE). However, if the staff is involved in any aerosol generating procedures like suction, intubation, nebullization, etc. they should use N95 Respirator. If the medical personnel need to collect clinical samples from patients then they would also use N95 Respirators.

1.3 Critical Care Facility :

Medical and nursing staff involved in critical care in Intensive Care Unit should use N 95 Respirators.

1.4 Laboratory:

All personnel working in laboratories and handling clinical samples related to Influenza A H1N1 should use N 95 Respirators.

1.5 Mortuary:
Personnel involved in handling dead bodies of suspect/confirmed cases of Influenza A H1N1 should use Triple layer surgical mask.

1.6 Ambulance Staff:

Driver of the ambulance earmarked for transporting patients of Influenza A H1N1 should use Triple layer surgical mask. The paramedic in the patient cabin should use Triple layer surgical mask and if performance of any aerosol generating procedures is contemplated (suction, oxygen administrati on by nasal catheter, intubation, nebulization etc) N 95 respirator should be used.

2. Health Workers in Community Setting

2.1 Doctors in screening centres/Private practitioners attending Influenza Like Illness (ILI) in gener al practice and other health workers working with them should use Triple layer surgical mask.

2.2 Health workers involved in community surveillance, contact tracing and health monitoring of c ases at home or under home quarantine should use Triple layer surgical mask.

3. Security personnel

Security personnel working in an infected/ potentially infected area involved in quarantine, social d istancing measures or in maintaining law and order in the affected locality should use Triple layer s urgical mask.

4. Members of public

Suspect/ probable/confirmed cases of influenza A H1N1 should also use Triple layer surgical mask. T he care provider in home care settings should use triple layer mask. Close family contacts of such c ases undergoing home care should also use Triple layer surgical mask.

There is no scientific evidence to show health benefit of using triple layer masks for members of p ublic. In fact erroneous use of masks or continuous use of a disposable mask for longer than 6 hou rs or repeated use of same mask may actually increase risk of infection further.

Guidelines for use of mask

1. Mask for use of health personnel should be of standard and certified make.

2. The correct procedure of wearing triple layer surgical mask :

- ✓ Unfold the pleats; make sure that they are facing down.
- ✓ Place over nose, mouth and chin.
- ✓ Fit flexible nose piece over Nose Bridge.
- ✓ Secure with tie strings (upper string to be tied on top of head above the ears – lower string at the back of the neck.)
- ✓ Ensure there are no gaps on either side of the mask, adjust to fit.
- ✓ Do not let the mask hanging from the neck.
- ✓ Change the mask after six hours or as soon as they become wet.
- ✓ Disposable masks are never to be reused and should be disposed off.

- ✓ While removing the mask great care must be taken not to touch the potentially infected outer surface of the mask
- ✓ To remove mask first untie the tie-string below and then the tie string above and handle the mask using the upper strings.

3. Disposal of used masks

Used mask should be considered as potentially infected medical waste. In the hospital setting it should be disposed off in the identified infectious waste disposal bag/container. In community settings where medical waste management protocol cannot be practiced, it may be disposed off either by burning or deep burial.

4.During home care patients and contacts using Triple layer mask should first disinfect used mask with ordinary bleach solution or sodium hypochlorite solution or Quaternary Ammonium house hold Disinfectant and then dispose off either by burning or deep burial.

Specification for Triple Layer Surgical Mask and N-95 Respirator Mask

Item	Specification
Triple Layer Surgical Mask	Tie on Mask of Non-woven, Hypoallergenic 3 ply construction with filter in between offering >99 percent standard with 4 tie strings
N-95 Respirator Mask	N-95 Face Respirator Mask: Filter efficiency of 95 % or more against particulate aerosols. The mask should be provided with expiration valve. It should be disposable & to be able to fit for wide range of face sizes. It should accompany with certification from NIOSH or any other internationally accepted certification.

Appendix VIII

Guidelines for diagnostic laboratories pertaining to requirements of infrastructure for testing of specimens for Pandemic Influenza A (H1N1) virus infection (based on CDC/WHO guidelines)

General Bio-safety measures: Gloves (latex), shoe cover, head cover, goggles, triple layered mask, mask with N-95 specification, front closed full length apron, puncture resistant autoclavable yellow coloured bio-safety bag with bio-safety symbols, hypochlorite solution. (As per bio-safety manual attached as Document 2).

Civil Infrastructure: Separate dedicated areas for sample handling and PCR testing as per recommended guidelines (Document 3).

Sample collection kit: Throat/Nasal swab with synthetic up (polyester or Dacron) and aluminium or plastic shaft sample collection vials or tubes (leak proof and autoclavable) containing 1-3 ml. virus transport media (with protein stabilizer and antibiotics) as primary container.

Sample storage: Refrigerator (4-8$_0$ C) for storage up to 48 hrs. Deep freeze (-70$_0$C) for longer storage.

Back up sample for future testing etc. should be kept at -70$_0$ C.

Sample Transport: Absorbent cotton, tissue paper or waste newspaper for wrapping primary container. Secondary container to hold the primary container i.e. bigger tube or sealed plastic bag. Insulated ice box with ice pack, sample proforma fastened on to the secondary container.

Sample handling and testing:

Handling: In BSL-3 Bio-safety or BSL-2+ facility with BSL-3 precautions.

Testing: Real time RT-PCR test, by Real Time PCR machine using validated reagents accessories and protocol as per CDC/WHO guidelines/testing protocols$_3$ and subsequent amendments published from time to time.

Reporting of Results: Standardized uniform reporting proforma. PC with internet facilities, fax machine.

Guidelines for Sample Collection and Handling of Human Clinical samples for Laboratory Diagnosis of H1N1 Influenza

If any case fits in the case definition then samples should be collected according to the sample collection guidelines.

What sample to be collected?

Respiratory specimens including: bronchoalveolar lavage, tracheal aspirates, nasopharyngeal or oropharyngeal aspirates as washes, and nasopharyngeal or oropharyngeal swabs. Swab specimens should be collected only on swabs with a synthetic tip (such as polyester or Dacron) and aluminium or plastic shaft. Swabs with cotton and wooden shafts are not recommended. Specimens collected with swabs made of calcium alginate are acceptable.

When to Collect Respiratory Specimens?

As soon as possible after symptoms begin

Before antiviral medications are administered

Even if symptoms began more than one week ago

Multiple specimens on multiple days could be collected if you have access to patient

Specimen: before initiating collection of sample a full complement of PPE should be worn.

Personal Protective Equipment

- Masks (N-95)
- Gloves
- Protective eye wear (goggles)
- Hair covers
- Boot or shoe covers
- Protective clothing (gown or apron)

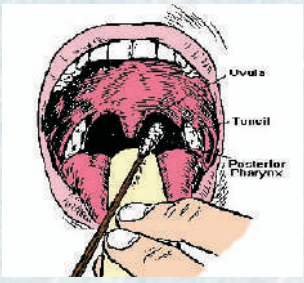
Methods of Collection

- Throat swab
- Nasal / Nasopharyngeal swab

Throat Swab

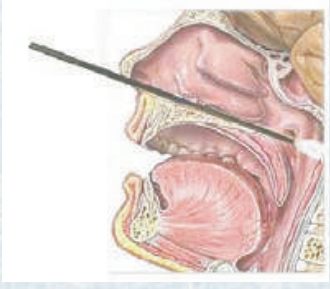
- Easy to do
- Highest yield in detecting H1N1 influenza in suspected cases

• Have the patient open his/her mouth wide open.
• The patient should try to resist gagging and closing the mouth while the swab touches the back of the throat near the tonsils.



Nasal / Nasopharyngeal Swab: Insert dry swab into nostril and back to nasopharynx. Leave in place for a few seconds. Slowly remove swab while slightly rotating it. Use a different swab for the other nostril. Put tip of swab into vial containing VTM, breaking applicator's stick.

Nasal Swab is collected from the anterior turbinate.



Both Nasal and Throat swabs can be collected into the same VTM to increase the viral yield.

How to Label Samples

Use pre-printed barcode* labels:

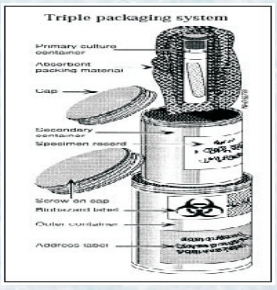
– On the specimen container
– On the field data collection form
– On the log book
– Subject's name
– Subject's unique identification number

Label
Specimen No. :
Patient's Name :
Hospital Name :
Unique ID No. :

How to Store Specimens

- ✓ Store specimens at 4 °C before and during transportation within 48 hours
- ✓ Store specimens at -70 °C beyond 48 hours
- ✓ Do not store in standard freezer – keep on ice or in refrigerator
- ✓ Avoid freeze-thaw cycles
- ✓ Better to keep on ice for a week than to have repeat freeze and thaw

Transportation of specimens



Refer to WHO guidelines for the safe transport of infectious substances and diagnostic specimens

- Follow local regulations on the transportation of infectious material
- Coordinate with the laboratory

All samples should be transported after proper packaging using the standard triple packaging system (WHO) and it should accompany with the clinical details as per Performa
While transportation cold chain should be maintained

Waste Disposal: should be done as per guidelines of your hospital

Maintain adequately stocked specimen collection kits and store them properly when they are not in use.
Throat swabs are the easiest and best specimens to collect for suspected cases of avian influenza. Nasal swabs are easy to collect as well and should be done to increase yield.
Collect multiple specimens (respiratory and blood) on multiple days.

General Biosafety Measures

- ✓ Clinical samples should be collected by hospital staff and not by the laboratory staff.
- ✓ All clinical samples have to be collected wearing complete complement of PPE.
- ✓ While taking samples always use N95 mask.
- ✓ Use Latex disposable gloves.
- ✓ Wear laboratory coat/disposable apron.
- ✓ Always cover your hairs with head cover.
- ✓ Use protective eye wear (goggles)/face shields
- ✓ The clinical samples should be processed only in designated laboratory having the appropriate containment facilities.
- ✓ All technical procedures should be performed in a way that minimizes the formation of aerosols and droplets.
- ✓ Adequate and conveniently located biohazard containers should be available for disposal of contaminated materials.
- ✓ Work surfaces must be decontaminated after any spill of potentially dangerous material and at the end of the working day. Generally, 5% bleach solutions are appropriate for dealing with biohazard us spillage. More information on disinfections and sterilization is provided in the WHO laboratory biosafety manual.
- ✓ Personnel must wash their hands often – especially after handling infectious materials and , before leaving the laboratory working areas, and before eating.
- ✓ Personal protective equipment must be removed before leaving the laboratory.

NOTE: Whenever sample is send to laboratory(NICD, Delhi; NIV, Pune) a certificate should be attached with it stating that the sample is for research purpose and is packed properly and not hazardous to the community .

CLINICAL & EPIDEMIOLOGICAL DATA FOR H1N1 INFLUENZA

Name of Doctor/Health personal ……

District …….. State ……..

Tel. : ……

Influenza regional Laboratory ……..

Name of hospital ……..

Patient's Name ……CR/OPD No.……..

Age ……Sex …….. Tel. No. ……..

Address ……

…… Occupation ……..

Total OPD attendees ……. Date of onset of illness ……..

Clinical Signs & symptoms:

- Fever axilla > 38^{0}C Yes ☐ No ☐
- Oral > 38.5^{0}C Yes ☐ No ☐
- Cough Yes ☐ No ☐
- Sore throat Yes ☐ No ☐
- Nasal catarrh Yes ☐ No ☐
- Shortness of breath/difficulty in breathing Yes ☐ No ☐

Exposure History:

- Country Visit Date of visit ☐ Name ☐
- Close contact with a person (within 7 days) who is confirmed case of influenza A (H1N1). Yes ☐ No ☐
- Travell to community (Within 7 days) where one or more confirmed cases of Influenza A (H1N1) have been reported. Yes ☐ No ☐
- Resides in a community where there are one or more confirmed influenza cases. Yes ☐ No ☐

Sample Collection:

Data of sample collection ……

Sample collected: throat swab/nasopharyngeal swab/other ……

No. of samples collected ……

Treatment History:

Treatment taken Yes ☐ No ☐

If yes what & when ……

Investigations Done Yes ☐ No ☐

Chest X-Ray findings ……

Appendix X

WHO recommendations for the post-pandemic period

10 AUGUST 2010 | GENEVA - The world is now in the post-pandemic period. Based on knowledge about past pandemics, the H1N1 (2009) virus is expected to continue to circulate as a seasonal virus for some years to come. While the level of concern is now greatly diminished, vigilance on the part of national health authorities remains important. Such vigilance is especially critical in the immediate post-pandemic period, when the behaviour of the H1N1 (2009) virus as a seasonal virus cannot be reliably predicted.

For example, it is likely that the virus will continue to disproportionately affect a younger age group, at least in the immediate post-pandemic period. Groups identified during the pandemic as at higher risk of severe or fatal illness will probably remain at heightened risk, though the number of such cases could diminish. In addition, a small proportion of people infected during the pandemic developed a severe form of primary viral pneumonia that is not commonly seen during seasonal epidemics and is especially difficult to treat. It is not known whether this pattern will continue during the post-pandemic period, further emphasizing the need for vigilance.

WHO is today issuing guidance on recommended activities during the post-pandemic period, including advice on epidemiological and virological monitoring, vaccination, and the clinical management of cases.

National health authorities are reminded that cases and local outbreaks of H1N1 (2009) infection will continue to occur, and in some locations, such outbreaks could have a substantial impact on communities.

WHO recommendations to health authorities during the post-pandemic period

Monitoring of respiratory disease activity

WHO recommends that surveillance during the post-pandemic period include:

- monitoring for unusual events, such as clusters of severe respiratory illness or death;
- investigating severe or unusual cases, clusters or outbreaks to facilitate rapid identification of important changes in the epidemiology or severity of influenza;
- maintaining routine surveillance, including for influenza-like illness and cases of severe acute respiratory infections;
- continuing to use routine channels of data transmission, such as FluID, FluNet, and EUROFlu, to transmit data from the routine surveillance of respiratory disease;

- notifying WHO (including, where appropriate, notifications under the International Health Regulations) immediately if any of the following changes are detected:
    - sustained transmission of antiviral-resistant H1N1 2009 influenza
    - human cases of infection with any influenza virus not currently circulating in human populations
    - any notable changes in the severity or other epidemiological or clinical characteristics of the H1N1 2009 virus, including changes in the age distribution, the clinical appearance, proportion of cases requiring intensive management, or unexpected increases in numbers of cases.
- monitoring the H1N1 2009 virus for important genetic, antigenic or functional changes, such as antiviral drug sensitivity.

Vaccination

Vaccination remains important as a means of reducing the morbidity and mortality caused by influenza viruses. WHO strongly recommends vaccination of high-risk individuals in countries where influenza vaccines are available.

The H1N1 influenza virus, which caused the 2009 pandemic, continues to circulate in some parts of the world, causing variable levels of disease and outbreaks. In some countries, seasonal[1] trivalent vaccines are available that cover the H1N1 (2009) virus. In other countries, however, seasonal influenza vaccines are not available. WHO advises that there is still public health value in using monovalent H1N1 vaccine (where available) to immunize persons at risk of severe disease from H1N1 influenza infection, especially where trivalent seasonal influenza vaccine is not available.

Such monovalent H1N1 influenza vaccines should be used according to guidelines of National Regulatory Authorities. WHO will continue to seek advice from the Strategic Advisory Group of Experts (SAGE) as the situation evolves.

Clinical management

Persons suspected of illness from influenza should receive appropriate clinical care. WHO's guidelines for clinical management, which refer to both seasonal and pandemic influenza, offer guidance. The H1N1 (2009) virus is expected to continue to circulate as a seasonal virus for some years to come. Cases of severe illness in higher-risk individuals, as well as in otherwise healthy individuals, are likely to occur. Early recognition and appropriate treatment of such cases remains important. WHO's guidelines for use of antiviral medicines, which refer to both seasonal and pandemic influenza, should continue to be followed.

Groups at increased risk of severe illness from the pandemic H1N1 virus included young children, pregnant women, and people with underlying respiratory or other chronic conditions, including asthma and diabetes. Patients who have severe or deteriorating influenza should be treated as soon as possible with oseltamivir. Patients who are at higher risk of severe or complicated influenza should be treated with oseltamivir or zanamivir as soon as possible.

FAQs

What can I do to protect myself from getting sick?

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. If soap and water are not available, use an alcohol-based hand rub.
- Avoid touching your eyes, nose or mouth. Germs spread this way.
- Try to avoid close contact with sick people.
- If you are sick with flu-like illness, the Ministry of Health recommends that you stay home for at least 24 hours after your fever is gone except to get medical care or for other necessities. (Your fever should be gone without the use of a fever-reducing medicine.) Keep away from others as much as possible to keep from making others sick.

Other important actions that you can take are:

- Follow public health advice regarding school closures, avoiding crowds and other social distancing measures.
- Be prepared in case you get sick and need to stay home for a week or so; a supply of over-the-counter medicines, alcohol-based hand rubs, tissues and other related items might could be useful and help avoid the need to make trips out in public while you are sick and contagious

Also vaccine is available to protect against H1N1 virus.

What is the best way to keep from spreading the virus through coughing or sneezing?

If you are sick with flu-like illness, keep away from others as much as possible. Cover your mouth and nose with a tissue when coughing or sneezing. Put your used tissue in the waste basket. Then, clean your hands, and do so every time you cough or sneeze.

If I have a family member at home who is sick with H1N1 flu, should I go to work?

Employees who are well but who have an ill family member at home with 2009 H1N1 flu can go to work as usual. These employees should monitor their health every day, and take everyday precautions including washing their hands often with soap and water, especially after they cough or sneeze. Alcohol-based hand cleaners are also effective. If they become ill, they should notify their supervisor and stay home. Employees who have an underlying medical condition or who are pregnant should call their health care provider for advice, because they might need to receive influenza antiviral drugs to prevent illness. For more information please see

What is the best technique for washing my hands to avoid getting the flu?

Washing your hands often will help protect you from germs. Wash with soap and water or clean with alcohol-based hand cleaner, when you wash your hands -- with soap and warm water -- that you wash for 15 to 20 seconds. When soap and water are not available, alcohol-based disposable hand wipes or gel sanitizers may be used. You can find them in most supermarkets and drugstores. If using gel, rub your hands until the gel is dry. The gel doesn't need water to work; the alcohol in it kills the germs on your hands.

What should I do if I get sick?

If you live in areas where people have been identified with H1N1 flu and become ill with influenza-like symptoms, including fever, body aches, runny or stuffy nose, sore throat, nausea, or vomiting or diarrhea, you should stay home and avoid contact with other people. Stay away from others as much as possible to keep from making others sick. Staying at home means that you should not leave your home except to seek medical care. This means avoiding normal activities, including work, school, travel, shopping, social events, and public gatherings.

If you have severe illness or you are at high risk for flu complications, contact your health care provider or seek medical care at the nearest flu clinic to you.

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 or gray skin color
- Not drinking enough fluids
- Severe or persistent vomiting
- 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

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
- Flu-like symptoms improve but then return with fever and worse cough

Are there medicines to treat H1N1 infection?

Yes, the use of Tamiflu (oseltamivir) or Relenza (zanamivir) for the treatment and/or prevention of infection with H1N1 flu virus. Antiviral drugs are prescription medicines (pills, liquid or an inhaled powder) 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. During the current pandemic, the priority use for influenza antiviral drugs is to treat severe influenza illness (for example hospitalized patients) and people who are sick with a condition that places them at high risk for serious flu-related complications. Note that not everyone will need antiviral medication.

How long can influenza virus remain viable on objects (such as books and doorknobs)?

Studies have shown that influenza virus can survive on environmental surfaces and can infect a person for 2 to 8 hours after being deposited on the surface.

What kills influenza virus?

Influenza virus is destroyed by heat (167-212°F or 75-100°C). In addition, several chemical germicides, including chlorine, hydrogen peroxide, detergents (soap), iodophors (iodine-based antiseptics), and alcohols are effective against human influenza viruses if used in proper concentration for a sufficient length of time. For example, wipes or gels with alcohol in them can be used to clean hands. The gels should be rubbed into hands until they are dry.

***What if soap and water are not available and alcohol-based products are not allowed in my facility?**

If soap and water are not available and alcohol-based products are not allowed, other hand sanitizers that do not contain alcohol may be useful.

What surfaces are most likely to be sources of contamination?

Germs can be spread when a person touches something that is contaminated with germs and then touches his or her eyes, nose, or mouth. Droplets from a cough or sneeze of an infected person move through the air. Germs can be spread when a person touches respiratory droplets from another person on a surface like a desk, for example, and then touches their own eyes, mouth or nose before washing their hands.

How should waste disposal be handled to prevent the spread of influenza virus?

Germs can be spread when a person touches something that is contaminated with germs and then touches his or her eyes, nose, or mouth. Droplets from a cough or sneeze of an infected person move through the air. Germs can be spread when a person touches respiratory droplets from another person on a surface like a desk, for example, and then touches their own eyes, mouth or nose before washing their hands.
To prevent the spread of influenza virus, it is recommended that tissues and other disposable items used by an infected person be thrown in a properly covered garbage bin. Additionally, persons should wash their hands with soap and water after touching used tissues and similar waste.

What household cleaning should be done to prevent the spread of influenza virus?

To prevent the spread of influenza virus it is important to keep surfaces (especially bedside tables, surfaces in the bathroom, kitchen counters and toys for children) clean by wiping them down with a household disinfectant according to directions on the product label.

How should linens, eating utensils and dishes of persons infected with influenza virus be handled?

Linens, eating utensils, and dishes belonging to those who are sick do not need to be cleaned separately, but importantly these items should not be shared before a thorough wash with water and soap and sanitized with bleach or hot water.

Linens (such as bed sheets and towels) should be washed by using household laundry soap and tumbled dry on a hot setting. Individuals should avoid "hugging" laundry prior to washing it to prevent contaminating themselves. Individuals should wash their hands with soap and water or alcohol-based hand rub immediately after handling dirty laundry.

Appendix XII

Contact Information

For more information on H1N1 Influenza, please call:
Dr Dinkar Raval MBBS,DPH,MPH
Deputy Director (Epidemic) & State Nodal Officer (Influenza)
Epidemic Branch
Commissionerate Of Health, Medical Services & Medical Education
3rd Floor, Block No. 5, Dr. Jivraj Mehta Bhavan
Gandhinagar-Gujarat
Phone: +9179-23253336, +9179-23253326,+919909966905
Email: hrgujarat@yahoo.com

You can also visit this websites for more information on managing H1N1 Influenza:

http://www.cdc.gov/h1n1flu/guidance_homecare.htm
http://www.gujhealth.gov.in

Rapid Response Team Details District Wise

Sr. No.	Distr-ict Name	Designation	RRT Members Name	Address	Phone Numbers			E-mail id
					Office	Fax No.	Mobile No.	
1	State Coordinator	Additional Director (Health)	Dr. P. V. Dave	Commissinerate of Health, 2nd Floor, Block No. 5, Gandhinagar	079-3257948	079-23254544	9376166580	pvdave1@gmail.com
		Deputy Director (Epeidemic)	Dr. Dinkar raval	Epidemic Branch, Commissinerate of Health, Gandhinagar	079-23253336	079-23253334 079-23253335	9909966905	dr.dinkar@hotmail.com
		State Nodal Officer (IDSP)	Dr. V. S. Dhruwey	IDSP, Govt. Dispensary Sector No. 3/A New, Gandhinagar	079-23237376	079-23236365	9099024729	ssoidsp@rediffmail.com, ssoidsp@gmail.com, drdhruwey@gmail.com
2	**State Head Quarter**	Clinician (Medicine)	Dr. K. J. Upaddhyay	Add. Prof. Medicine, Civil Hospital, Asharwa, Ahmedabad	079-27664359	-	9825362253	drkjupadhyay@hotmail.com
		Laboratory Officer (Microbiology)	Dr. M. M. Veghad	HOD, Microbilogy Dpt. B.J.M.College, Civil Hospital Ahmedabad	079-22680074 22681024	079-22683067	9825067308 8866631814	mahendravegad@rediffmail.com
		State Epidemiologist	Dr. G.C.Patel	Epidemic Branch, Commissinerate of Health, Gandhinagar	079-23253326	079-23253334-35	9727723301	drgcpatel@hotmail.com

		Entomologist	Mr. P.T. Joshi	Commissionerate, I.D.S.P. Govt. Dispensary, Sector No. 3/A New, Gandhinagar.	079-23236365	079-23237376	9998035956 9428814457	ptjoshi1952@gmail.com
3	Ahmedabad	Clinician (Pediatrics)	Dr. Bhanu R. Desai	Civil Hospital, Sola, Ahmedabad	079 - 27664359	-	9979842156	cs-ahd@gujarat.gov.in
		Physician	Dr. H. K. Bhavsar	CDMO, General Hospital, Sola, Ahmedabad	079 - 27664359	-	9426367557	hkbhasar_57@ yahoo.com
		Laboratory Officer (Microbiology)	Dr. Navin Shah	B.J.M.College, Civil Hospital Campus, Asharwa, Ahmedabad	079-22680074 22681024	079-22683067	9426006955	mcahd@gujhealth.gov.in
		Epidemiologist (CDHO)	Dr. N. J. Patel	District Panchayat, Ahmedabad	079-25507076	25501204	9099064001	drnilamj.patel@gmail.com
		District Surveillance Officer (EMO)	Dr. P.L. Dave	District Panchayat, Ahmedabad	079-25500107, 079-25502015	079-25511248	9879560297 9099064030	emodsuahmedabad@gmail.com
		Entomologist/DMO	Shri Alok Kulshrestha	District Panchayat, Ahmedabad	079-25507569	-	9825852088 9099064008	dmoapk@rediffmail.com

		Public Health Expert	Dr. Geeta Kedia	HOD, PSM-B.J.M.College, Civil Hospital Campus, Asharwa, Ahmedabad,	079-22683721 079-22680943 (R) 22860543	-	9427113914 9825063403 9974462606	drgeetakedia@gmail.com
4	Amreli	Clinician (Paedi.)	-			-	–	
		Laboratory Officer (Pathologist/ Micro)	Dr.Vipul K Patel	General Hospital Amreli	02792-222587	02792-222115	9099940764	Cs-amr@gujarat.gov.in
		Epidemiologist (CDHO)	Dr. K. P. Patel	District Panchayat, Amreli	02792-232344	02792-222115	9978976602	cdhoamreli@gmail.com
		District Surveillance Officer (EMO)	Dr. A.K. Singh	District Panchayat, Amreli	02792-220960	-	9727723302	dsoamreli@rediffmail.com
		Entomologist/DMO	Mr.Gaurav Upadhyay	District Panchayat, Amreli	02792-222008	-	9727723304	dmoamreli@yahoo.com

5	Anand	Clinician (Pediatrics)	-	-	-	-	-	-
		Laboratory Officer (Micro)	Dr.Bhavesh Mengar	Civil Hospt. Petlad, Anand	02697-224645	-	-	mengitoxic@yahoo.com
		Epidemiologist (CDHO)	Dr. S.B.shah	Health Branch District Panchayat Anand	02692-268775	02692-254277	7567870001	dr.sb_shah@yahoo.co.in
		District Surveillance Officer(EMO)	Dr.H.J.sharma	Health Branch District Panchayat	02692-268820	02692-268820	7567870004	emoharshad@yahoo.com
		Entomologist/DMO	Mr N. L. Rathod	Health Branch District Panchayat Anand	02692-259675	-	75678 70006	anand_dmo@yahoo.co.in
6	Banaskantha	Clinician (Pediatrician)	Dr. Pinalben Bhojak	Civil hospital palanpur	(02742)253 083	(02742)2517 09	99791 62127	aha.palanpur@gmail.com
		Laboratory Officer (Pathologist)	Dr. Hemaben Patel	Civil hospital palanpur	(02742)253 083	(02742)2517 09	98241 89332	aha.palanpur@gmail.com

		Epidemiologist (CDHO) (ADHO)	Dr.A.H.Acharya **(I/C) ADHO**	3rd floor, health branch, district panchayat banaskantha palanpur	(02742)252243	(02742)258908	9727730002	cdhobk@yahoo.com, idsp_palanpur@yahoo.co.in
		District Surveillance Officer(EMO)	Dr. N. K. Garg	3rd floor, idsp, health branch, district panchayat banaskantha palanpur	(02742)253017	(02742)258909	9727730012	idsp_palanpur@yahoo.co.in
		Entomologist/DMO	N. G. Bhalakiya	4th floor,malaria branch, district panchayat banaskantha palanpur	(02742)257260	(02742)257260	9727730011	dmobk@yahoo.com
7	**Bharuch**	Clinician (Medicine)	Dr. S. R. Patel	General Hospital Bharuch	02642 243515	02642 241759	9426891971	cs-bha@gujarat.gov.in
		Laboratory Officer (Pathologist)	Dr J. N. Vasava	General Hospital Bharuch	02642 243515	02642 241759	9426891971	cs-bha@gujarat.gov.in
		Epidemiologist (CDHO)	Dr V. S. Tripathi	District Panchayat, Bharuch	02642 243660	02642 243660	9727702155	dpmu_bharuch@yahoo.com

		District Surveillance Officer (EMO)	Dr. N. G. Patel	District Panchayat, Bharuch	02642 243660	02642 243660	9727702225	dsobhar-guj@nic.in
		Entomologist/DMO	Mr B.C. Rathod	District Panchayat, Bharuch	02642 574036	02642 243660	9879039711	dmo-ddo-bha@gujarat.gov.in
8	**Bhavnagar**	Clinician (Medicine)	Dr. Alpesh R. Vohra	Govt. Medical College Nr. Bus Stand, Jail Rd, Bhavnagar	0278-2430808	0278-2422011, 2422011	-	mcbvn@gujhealth.gov.in
		Laboratory Officer (Microbiologist)	Dr. Kairavi Desai	Govt. Medical College Nr. Bus Stand, Jail Rd, Bhavnagar	0278-2430808	-	9825469106	-
		Public Health Specialist (PSM)	Dr. K.D.Bhalani	Govt. Medical College Nr. Bus Stand, Jail Rd, Bhavnagar	0278-2431866	0278-2422011, 2422011	9427287722	idsp.mcbhavnagar@yahoo.com
		Epidemiologist (CDHO)	Dr. V R Gupta	Dist. Panchayat, Bhavnagar	0278-2423665	0278-2423665	9727779661	dho-ddo-bav@gujarat.gov.in
		District Surveillance Officer (EMO)	Dr. H.C.Gordiya	Dist. Panchayat, Bhavnagar	0278-2515172	0278-2423665	9426261501 / 9727779717	idsp.bhavnagar@yahoo.co.in

		Entomologist/DMO	Shri. M.M.Chauhan	Dist. Panchayat, Bhavnagar	0278-2439823	-	9727779690	dmo-ddo-bav@gujarat.gov.in
9	Dang	Clinician (Medicine)	--	Civil Hospital,Dangs	02631-220205	--	--	--
		Laboratory Officer (Pathologist)	Dr.Atit Desai	Civil Hospital,Dangs	02631-220205	--	--	--
		Epidemiologist (CDHO)	Dr. M.R .Chuadhari	Civil Hospital,Dangs	2631220325	2.63E+09	9426770602	dho-ddo-dan@guj.gov.in
		District Surveillance Officer(EMO)	Dr. D.C.Gamit	Civil Hospital,Dangs	2631220344	2.63E+09	9428823492	emo.dang.guj@gmail.com
		Entomologist/DMO	Mr.R.K.Patel	Civil Hospital,Dangs	2631220344	2.63E+09	9426896343	dmo.ddo.dang@gmail.com
10	Dahod	Clinician (Pediatrics)	Dr.Kalpesh Baria	General Hospital, Station Road Dahod	02673-220029	02673-246548	9228893051	---
		Clinician (Physician)	Dr.Vinod Vahoniya				--	---

		Laboratory Officer (Pathologist)	Dr.Priyanka Sheth	General Hospital, Station Road Dahod	02673-220029	02673-246548	9426321000	---
		Epidemiologist (CDHO)	Dr.(Mrs) Dhanlaxmi B.Rathod	Health Branch, District Panchayat Chhapri, Dahod	02673-239130	02673-239138 02673-239257	9427319530	dpc_dahod@yahoo.co.in
		District Surveillance Officer (EMO)	Dr.Dilip N. Patel	Health Branch (IDSP), District Panchayat Chhapri, Dahod	02673-239125	02673-239138 02673-239257	9426431704 9427319583	idsp_dahod@rediffmail.com
		Entomologist/DMO	Shri Atit S. Damor	Health Branch (Malaria), District Panchayat Chhapri, Dahod	02673-239192	02673-239138	9427106076	send2atit@yahoo.com
11	Gandhinagar	Clinician (Pediatrics)	Dr.Simaben Shah	General Hospital Gandhinagar	079-23221931		9429063590	cs-gnr@gujarat.gov.in
		Laboratory Officer (Pathologist)	Dr.Manoj Patel	General Hospital Gandhinagar	079-23221931		9825273163	cs-gnr@gujarat.gov.in
		Epidemiologist (CDHO) (CDHO)	Dr.R.R.Vaidh	District Panchayat	079-23256942		9925472855	

		District Surveillance Officer (EMO)	Dr.Kalpesh Shah	District Panchayat	079-23246276		9909942242	dr.kalpesh123@gmail.com
		Entomologist/DMO	Dr.Mamta Dattaani	District Panchayat	079-23256948		9909942204	Dmo-ddo-gnr@gujarat.gov.in
12	Jamnagar	Clinician (Medicine)	Dr. Chintan kansara	M.P.Shah Medical College, Jamnagar	0288-2666216	0288-2666216	8980133166	
		Laboratory Officer (Microbiologist)	Dr. Prakash Gelotar	M.P.Shah Medical College, Jamnagar	0288-2553515 2556636	0288-2540036	9825193498	mcjmr@gujhealth.gov.in
		Public Health Specialist (PSM)	Dr.Mithun Sanghvi	M.P.Shah Medical College, Jamnagar	0288-2553515 2556636	0288-2540036	9428125190	-
		Epidemiologist (CDHO)	Dr. J. J. Pandya	District Panchayat, Jamnagar	0288-2671097	0288-2671097	8128653770	dho-ddo-jam@gujarat.gov.in
		District Surveillance Officer (EMO)	Dr. Dr. B.M.Panchara	District Panchayat,Jamnagar	0288-2671097	0288-2661153	9727769807	dsojam-guj@nic.in

		Entomologist/DMO	Shri Jitendr Parkar	District Panchayat,Jamnagar	0288-2678907	-	9909908194	dmo-ddo-jam@gujarat.gov.in
13	Junagadh	Physician	Dr. Gaurang Bagda	Civil Hospital-Junagadh	-	-	9909187737	-
		Clinician (Pediatrics)	Dr.Nilesh Baraiya	Civil Hospital-Junagadh	-	-	9825014065	-
		Laboratory Officer (Pathologist)	Dr. Jignaben Kanjariya	Civil Hospital-Junagadh	0285 2651436	-	-	-
		Epidemiologist (CDHO)	Dr.D. K. Dabhi	District Panchcyat-JunagadhHealth Branch	0285-2653131	0285-2653131	75678 85111	dho-ddo-jun@gujarat.gov.in
		District Surveillance Officer (EMO)	Dr. C.L. Vyas	District Panchcyat-Junagadh Health Branch	0285-2653131	0285-2653131	75678 84999	dsojun-guj@nic.in
		Entomologist/DMO	Shri H. F. Radadiya	District Panchcyat-Junagadh Health Branch	0285 - 2627097	-	75678 85444	dmo_jun@yahoo.co.in

14	Kheda	Clinician (Medicine)	NA	NA	NA	NA	NA	NA
		Pediatrician	Dr.Tarisha Kapadia	Civil Hos. Nadiad	0268-2529074	0268-2529074	9099932005	tarishakapadia@yahoo.com
		Laboratory Officer (Pathologist)	Dr.Manish Jadawala	Civil Hos. Nadiad	0268-2529074	0268-2529074	9099932002	kmjadawala@yahoo.co.in
		Epidemiologist (CDHO)	DR. B.R. Panchal	Dist.Panchayat, Nadiad	0268-2556273	0268-2555732	7567863211	idsp.kheda@gmail.com
		District Surveillance Officer (EMO)	Dr.Ajit Thaker	Dist.Panchayat, Nadiad	0268-2556273	0268-2555732	7567863216	idsp.kheda@gmail.com
		Entomologist/DMO	Mr. Gayus Christian	Dist.Panchayat, Nadiad				idsp.kheda@gmail.com
15	Kutchh	Clinician (Medicine)	Dr. K. N. Buch	G.K. General Hospital, Bhuj Kachchh	02832-250150, 220852	02832-250150, 220852	-	drkbuch@yahoo.co.in

		Laboratory Officer (Pathologist)	Dr. Jigna J. Dave	G.K. General Hospital, Bhuj Kachchh			-	cs-kut@gujarat.gov.in
		Epidemiologist (CDHO)	Dr. S. K. Mod	District Panchayat-Kachchh, Bhuj	02832-252207, 221666	02832-252207, 221666	9909949303	mod_surendra@yahoo.com
		District Surveillance Officer(EMO)	Vacant i/c. Dr. S. K. Mod	District Panchayat-Kachchh, Bhuj	02832-221666	02832-221666	9909949305	emo.bhuj@gmail.com
		Entomologist/DMO	Shri A. M. Bhatt	District Panchayat-Kachchh, Bhuj	02832-222307	02832-222307	9909949306	dmo.bhuj@yahoo.com
16	**Mehsana**	Clinician (Medicine)	-	-	-	-	-	-
		Pediatrician	Dr.Dinesh Amin	Gen. Hospital,Mehsana	02762-221108	-	9727737970	-
		Laboratory Officer (Pathologist)	Dr. D.P. Vyas	Gen. Hospital,Mehsana	02762-221109	-	9727737938	-

		Epidemiologist (CDHO)	Dr. D.C.Jagani	Health Branch,D.P. Mehsana	02762-235220	02762-220282	9909966909	dcjagani@yahoo.com
		District Surveillance Officer (EMO)	Dr.R.N.Patel	Health Branch,D.P. Mehsana	02762-222030	02762-222002	9909966911	dr_rameshpatel@yahoo.in
		Entomologist/DMO	Shri. Dipak Patel	Malaria Branch,D.P. Mehsana	02762-251500	-	9909966910	dmomehsana@yahoo.com
17	Narmada	Clinician (Medicine)	-	-	-	-	-	-
		Laboratory Officer (Pathologist)	-	-	-	-	-	-
		Epidemiologist (CDHO)	Dr. M.K. Gajera	2nd Floor, Health Department, District Panchayat Narmada	02640-222141	02640-221248	9099943388	dpc_narmada@yahoo.co.in
		District Surveillance Officer (EMO)	Dr. R.S. Kashyap	Room No. 03, Ground Floor, IDSP District Panchayat Narmada	02640-221806	02640-221248	9099943335	rajendrakashyap72@yahoo.com

		Entomologist/DMO	Shri R.S. Parikh	2nd Floor, Health Department, District Panchayat Narmada	02640-221248	02640-221248	9099943314	dmo_narmada_08@yahoo.com
18	Navsari	Clinician (Medicine)	Dr. Ashwin Parmar	M.G.G. Hospital Navsari	02637 250389	02637 257265	098240 27500	drashvinparmar@yahoo.co.in
		Laboratory Officer (Pathologist)	Dr. Nitin Chaudhry	M.G.G. Hospital Navsari	02637 250389	02637 257265	096876 03969	nchaudhari51283@yahoo.com
		Epidemiologist (CDHO)	Dr. Rajesh Hajirawal	District Panchayat Navsari	02637 280143	02637 232533	090990 86001	dho-ddo-nav@gujarat.gov.in
		District Surveillance Officer (EMO)	Dr. M.R.Deliwala	District Panchayat Navsari	02637 232533	02637 232533	097277 04007	idsp_dsu_nav@yahoo.com
		Entomologist/DMO	I/C Dr. M.R.Deliwala	District Panchayat Navsari	02637 235468	02637 235468	097277 04006	dmo-ddo-nav@gujarat.gov.in dmo_navsari@rocketmail.com
19	Panchmahal	Clinician (Medicine)	Dr.D.N.Raval	Gerneral Hospital,Godhra	02672-243192	02672-242559	9428512237	cspan@gujarat.gov.in

		Laboratory Officer (Pathologist)	Dr.Purvi Desai	Gerneral Hospital,Godhra	02672-243192	02672-242559	9428512243	cspan@gujarat.gov.in
		Epidemiologist (CDHO)	Dr.P.K.Shrivastav	District Panchyat, Panchmahal,Godhra	02672-253610	02672-250668	7567893400	dpc_panchmahal@yahoo.com
		District Surveillance Officer (EMO)	Dr.B.K.patel	District Panchyat, Panchmahal,Godhra	02672-250668	02672-250668	7567893800	dsu_godhra@yahoo.co.in
		Entomologist/DMO	Smt. Rupalben Patel	District Panchyat, Panchmahal,Godhra	02672-253395	02672-253395	7567894100	malariadistrict@yahoo.co.in
20	**Patan**	Clinician (Pediatrics)	Dr. R.C.Thakkar	General Hospital Patan	02766-233311	02766-232667	9727778757	cs-pat@gujarat.gov.in
		Laboratory Officer (Micro)	Dr. Dipak G Patel	General Hospital Patan	02766-233311	02766-232667	9727778767	cs-pat@gujarat.gov.in
		Epidemiologist (CDHO)	Dr. T. V. Bhalodiya	District Panchayat, Patan	02766-221554	02766-232495 220592	9979843698	dho-ddo-pat@gujarat.gov.in

		District Surveillance Officer (EMO)	Dr. R.T. Patel	District Panchayat, Patan	02766-234295	02766-234295	9909981888	idsp.patan2009@yahoo.co.in
		Entomologist/DMO	Sanatbhai Joshi	District Panchayat, Patan	02766-233287	-	9909981889	dmo-ddo-pat@gujarat.gov.in
21	**Porbandar**	Clinician (Medicine)	Dr. Modhvadiya	General Hospital Porbandar	0286-2240923	0286-2242910	9099079682	cs-por@gujarat.gov.in
		Laboratory Officer (Pathologist)	Dr. Liza A. Dhameliya	General Hospital Porbandar	0286-2240923	0286-2242910	9099079107	cs-por@gujarat.gov.in
		Epidemiologist (CDHO)	Dr.Ashok G.Lakhani	District Panchayat, Porbandar	0286-2211083	0286-2241134	9909989700	cdhopor@yahoo.co.in
		District Surveillance Officer (EMO)	Dr. N.A. Khudkhudia	District Panchayat, Porbandar	0286-2247480	0286-2211083	9979437863	emoporbandar@yahoo.com
		Entomologist/DMO	Shri H.F.Raddiya	District Panchayat, Porbandar	0286-2242831	0286-2211083	9909989642	malaria-por-@gujarat.gov.in

22	Rajkot	Clinician (Pediatrics)	Dr.S.K.Doshi	Pandit Dindayal Upadhyay Medical College Rajkot, Jamnagar Road, Rajkot	0281-2458337	0281-2458323	9824165456	mcraj@gujhealth.gov.in
		Laboratory Officer (Microbiologist)	Dr.Yogesh S.Goswami	Pandit Dindayal Upadhyay Medical College Rajkot, Jamnagar Road, Rajkot	0281-2458337	0281-2458323	9427776100	y.swami65@gmail.com
		Public Health Specialist (PSM)	Dr. Umed Patel	Pandit Dindayal Upadhyay Medical College Rajkot, Jamnagar Road, Rajkot	0281-2458337	0281-2458323	9426996010	mcraj@gujhealth.gov.in
		Epidemiologist (CDHO)	Dr.A.S.Shanghvi	District Panchayat ,Rajkot	0281-2476361	0281-2476361	9727700031	rchrajkot@yahoo.co.in
		District Surveillance Officer (EMO)	Dr.N.M.Rathod	District Panchayat ,Rajkot	0281-2443235	0281-2476361	9825211895	idsprajkot@yahoo.co.in
		Entomologist/DMO	Dr.Bhanderi	District Panchayat ,Rajkot	0281-2443132	0281-2443132	9727700033	dmo-ddo-raj@gujarat.gov.in

23	Sabarkantha	Clinician (Pediatrics)	Dr.Rajesh Tekchandani	General Hospital Himatnagar	02772-246618	02772-246618	9687633107	
		Laboratory Officer (Pathologist)	Dr.B.H.Patel	General Hospital Himatnagar	02772-246619	02772-246619	9687633109	-
		Epidemiologist (CDHO)	Dr.P.M.Patel	District T.B Center Himatnagar	02772-246422	02772-246422	9687679004	idspsabarkantha@gmail.com
		District Surveillance Officer(EMO)	Dr.A.K.Bhati	District Panchayat,Himatnagar	02772-246423	02772-246423	9687679009	drakbhati@yahoo.com
		Entomologist/DMO	Shri.B.A.Rathod	District Panchayat,Himatnagar	02772-242552	02772-242552	9687679008	dmo_sab@gujarat.gov.in
24	Surat	Clinician (Medicine)	Dr.Vijay B. Shah	Govt.Med.College-Surat	PBX 2244456-59 Ex.Medicin	0261-2244456	9374716006	Vijaysurat@hotmail.com
		Laboratory Officer (MicroBiologist)	Dr. Sumaiya Mulla	Govt.Med.College-Surat	PBX 2244456-59 Ex.Micro		9825319755	microbiologydepartment@yahoo.in

		Public Health Specialist (PSM)	Dr. S.L. Kanthariya	Govt.Med.College-Surat	PBX 2244456-59 Ex.Micro		9824156947	slkantharia@gmail.com
		Epidemiologist (CDHO)	Dr.R.K.Kachhal	Dist.Panchayat-Surat	0261-2430589	0261-2430589	9727709501	dpc_surat@yahoo.co.in
		District Surveillance Officer(EMO)	Dr.Piyush Shah	Dist.Panchayat-Surat	0261-2430589	0261-2430589	9727709506	dso_surat@yahoo.com
		Entomologist/DMO	Shri. Chetnaben Desai(DMO)	Nanpura-Surat	0261-2472250		9727709619	malaria-sur@gujarat.gov.in
25	Surendranagar	Clinician (Medicine)	Dr.D.K.PARMAR	General Hospital Surendranagar	02752-222553	02752-222052	9825318584	cs-srn@gujarat.gov.in
		Laboratory Officer (MicroBiologist)	Dr. Harshad Prajapati	General Hospital Surendranagar	02752-222553	02752-222052	9924126232	cs-srn@gujarat.gov.in
		Epidemiologist (CDHO)	Dr. V.S. Shobhavat	District Panchayat, Surendranagar	02752-283706	02752-285383	99099 87301	dho-ddo-srn@gujarat.gov.in

		District Surveillance Officer(EMO)	Dr. Arbind Singh	District Panchayat, Surendranagar	02752-283706	02752-285383	9426944188	dho-ddo-srn@gujarat.gov.in
		Entomologist/DMO	Smt. Rituben Panchal	District Panchayat, Surendranagar	02752-284851	-	9426534059	dmosgar@yahoo.com
26	Vadodara	Clinician (Medicine)	Dr.N.C Meheta	Medical College Vadodara	0265-2433592	0265-2421056	9879020735	dr.n.c.mehta@gmail.com
		Laboratory Officer (Microbiologist)	Dr.T.B.Javdekar	Medical College Vadodara	0265-2424265	065--2415746	9824919676	bjavadekar@rediffmail.com
		Public Health Specialist(PSM)	Dr.V.Mazumdar	Medical College Vadodara	0265-2422808	0265-2421056	9825676499	vihang.mazumdar@gmail.com
		Epidemiologist (CDHO)	Dr.B.R.Solanki	District Panchayat Vadodara	0265-2432383	0265-2413301	8980039101	dho-ddo-vad@gujarat.gov.in
		District Surveillance Officer (EMO)	Dr.V.K.Birla	District Panchayat Vadodara	0265-2432383	0265-2413301	8980039118	vijaybirla@yahoo.co.in

		Entomologist/DMO	Shri N.R.Raj	RDD Office, Vadodara	0265-2413829	0265-2413829	9825324248	entordd@yahoo.com
27	Valsad	Clinician (Physician)	Dr. Pururesh Ramawat	General Hospital Valsad	02632-251911	02632-251744	9978905356	civilhospital.valsad@gmail.com aha_valsad@rediffmail.com
		Laboratory Officer (Pathologist)	Dr. Amit Shah	General Hospital Valsad	02632-251911	02632-251744	9978905358	civilhospital.valsad@gmail.com, amitshah251@gmail.com
		Epidemiologist (CDHO)	Dr. Ajay S. Sanghvi	District Panchayat, Valsad	02632-53080	02632-53080	9727782001	drajaysanghvi@gmail.com
		District Surveillance Officer (EMO)	Dr. B.M.Patel	District Panchayat, Valsad	02632-243213	02632-243213	9727782012	dsoval-guj@nic.in
		Entomologist/DMO	i/c Dr. K.B. Dhodhia	District Panchayat, Valsad	02632-244346	–	9727782009	idspvalsad@yahoo.co.in
28	Tapi	Tapi Clinician (Physician)	A.P.form G.M.C. Surat	G.M.C. Surat	02626-220053	–	–	–

		Laboratory Officer (Pathologist)	Dr.Chirag Shah	G.H.Vyara	02626-220053	–	–	–
		Epidemiologist (CDHO)	Dr. S.k.Ishnava	D.P.-TAPI	02626-220376	02626-220376	9824268951	emo.tapi@gmail.com
		District Surveillance Officer (EMO)	Dr.vipul B. Gamit	D.P.-TAPI	02626-220376	02626-220376	9727774632	emo.tapi@gmail.com
		Entomologist/DMO	Mr.D.B. chhasatiya	D.P.-TAPI	02626-220453	02626-220453	9727709637	dmo.tapi@gmail.com

Epidemic Branch
Commissionerate of Health, Family Welfare and Medical Services
Gandhinagar, Gujarat.
www.gujhealth.gov.in • e-mail : hrgujarat@yahoo.co.in