



How does Wuhan respond to 2019-nCoV outbreak when the Spring Festival comes?

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Correspondence to: JPHE Editorial Office, AME Publishing Company. Email: jphe@amegroups.com.

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According to the information released by People's Daily & DXY (www.dxy.cn, the largest physician community in China), by 17:30 January 22, a total of 456 2019-nCoV cases had been reported in China, among which 25 were cured, and 9 died. The remaining patients had stable conditions and are isolated and treated in local designated hospitals.

On January 19, the relevant experts and the local government officials briefed the control and prevention of the 2019-nCoV outbreak. Here are the main points collected by DXY according to the press conference.

New 2019-nCoV cases were detected thanks to the use of new kit, and the case number is expected to rise in the coming days

On January 16, after receiving the kits released by the central government, Hubei Provincial Centers for Disease Control and Prevention began to perform pathogen identification on the specimens obtained from Wuhan patients with viral pneumonia of unknown causes. On January 16–17, the national and provincial expert groups confirmed 4 and 17 2019-nCoV patients, respectively, based on the clinical manifestations, epidemiological histories and pathogen testing results.

It is expected that the number of new cases will continue to rise with the implementation of the testing.

Enhanced screening of fever patients with pneumonia

After the outbreak of the unexplained viral pneumonia, Wuhan has strengthened the screening of fever patients

with pneumonia in the fever clinics of medical institutions. Patients with viral pneumonia that was not caused by a known virus (including influenza virus, adenovirus, SARS-CoV, and MERS-CoV) were immediately isolated for treatment. Meanwhile, specimens were collected for testing for new coronavirus.

The national, provincial, and municipal expert groups carefully reviewed the clinical manifestations, epidemiological histories and etiological testing results of these patients and finally confirmed the diagnosis of 2019-nCoV infection.

The outbreak is still preventable and controllable. The possibility of human-to-human transmission can not be ruled out

The preliminary judgment is that the pathogen, 2019-nCoV, is not highly contagious; the possibility of limited human-to-human transmission can not be ruled out, but the risk of sustained human-to-human transmission is low.

With the implementation of a variety of prevention and control measures, the outbreak can be prevented and controlled. Most of the 2019-nCoV cases were mild. Up to January 19, 681 of the 763 close contacts have been removed from medical observation, and none of them have been found to be infected with 2019-nCoV.

The pneumonia due to 2019-nCoV infection is generally treatable

All the patients with confirmed 2019-nCoV infection were treated in a designated hospital, and each patient is treated by one medical team with one tailored treatment protocol.

Five experts in respiratory medicine and infectious diseases sent by the central government, together with 26 medical experts from Hubei Province and Wuhan City, have formed joint medical rescue expert groups for treating the patients in the designated hospital on shifts that cover 24 hours a day, seven days a week. Meanwhile, a group of medical staff from major hospitals in Wuhan reinforced the designated hospital.

As of January 22, 2020, 25 patients were cured and discharged. Generally, the pneumonia caused by 2019-nCoV can be cured.

Measures have been taken to prevent the spread of 2019-nCoV during the Spring Festival

Management of close contacts

Medical observation of the close contacts is implemented citywide. In each district, medical record has been established for each close contact, and the close contacts, based on their categories, have been monitored and managed by community cadres, community grid members, and community medical personnel. The family members of the patients and other close contacts of the general populations have been followed up by home visit on a daily basis by medical staff from district CDCs and community health service centers, and the number has reached 12,100 visits. The close contacts of the patients diagnosed in Thailand and Japan are also being tracked and observed.

Coordinated prevention and control

Fever screening for passengers departing from Wuhan and disinfection and ventilation in public transportation tools. Passengers leaving Wuhan are screened for body temperature in the airports and railway stations. For passengers with fever, the following steps will be taken: register; deliver them with brochures and masks; arrange ticket refund or change free of charge; guide the referrals to medical institutions in their jurisdictions; and submit the registration reports.

As of January 18, screening for body temperature has been performed in about 300,000 passengers. Fever was detected in 16 persons, and none of them were positive for 2019-nCoV.

Monitoring of the Hua'nán Seafood Wholesale Market. Monitoring of the Hua'nán Seafood Wholesale Market continues after it was closed. Environmental sanitation measures have been applied in the market and its surrounding areas. The market and its surrounding entrances and exits are monitored 24 hours a day. The wastes have been disposed environment-friendly.

Furthermore, the agricultural trading markets, bazaars, and various business establishments have been inspected and rectified, where the sale of live poultry, the illegal breeding, processing, sale, transshipment, and trafficking of wild animals are strictly prohibited and punished. The cleaning, disinfection, and ventilation of the agricultural trading markets, bazaars, and various business establishments have been enhanced.

All the unnecessary or non-essential large-scale public gatherings will not be approved during the Spring Festival. Other efforts include enhanced management of fever clinics and promotion of Patriotic Health Campaigns.

In the coming days and months, we will continue our efforts in the following areas: (I) strengthen the screening of fever personnel; (II) increase the monitoring and control of agricultural trading markets and bazaars and resolutely prohibit the sale of live poultry and strictly crack down the illegal trading of wild animals; (III) promote the Patriotic Health Campaign; (IV) strengthen the treatment of patients and do our best to rescue the critically ill patients, so as to minimize the mortality; (V) strengthen the management of close contacts to effectively protect the health of residents and medical staff; and (VI) actively carry out health education and popularize knowledge about disease prevention and control.

Knowledge for medical staff

On January 12, the World Health Organization issued an interim guidance on the clinical management of severe acute respiratory infection when novel coronavirus (nCoV) infection is suspected.

- (I) Triage: early recognition of patients with SARI associated with nCoV infection (*Tables 1,2*).
- (II) Immediate implementation of appropriate IPC measures (*Table 3*).
- (III) Prevention of complications (*Table 4*).

Table 1 Definitions of patients with SARI, suspected of nCoV**SARI**

An ARI with history of fever or measured temperature $\geq 38^\circ\text{C}$ and cough; onset within the last ~10 days; and requiring hospitalization. However, the absence of fever does NOT exclude viral infection

Surveillance case definitions for nCoV

- (I) Severe acute respiratory infection (SARI) in a person, with history of fever and cough requiring admission to hospital, with no other etiology that fully explains the clinical presentation¹ (clinicians should also be alert to the possibility of atypical presentations in patients who are immunocompromised); and any of the following
 - (i) A history of travel to Wuhan, Hubei Province China in the 14 days prior to symptom onset; or
 - (ii) The disease occurs in a health care worker who has been working in an environment where patients with severe acute respiratory infections are being cared for, without regard to place of residence or history of travel; or
 - (iii) The person develops an unusual or unexpected clinical course, especially sudden deterioration despite appropriate treatment, without regard to place of residence or history of travel, even if another etiology has been identified that fully explains the clinical presentation
- (II) A person with acute respiratory illness of any degree of severity who, within 14 days before onset of illness, had any of the following exposures
 - (i) Close physical contact with a confirmed case of nCoV infection, while that patient was symptomatic; or
 - (ii) A healthcare facility in a country where hospital-associated nCoV infections have been reported

Table 2 Clinical syndromes associated with nCoV infection**Uncomplicated illness**

Patients with uncomplicated upper respiratory tract viral infection, may have non-specific symptoms such as fever, cough, sore throat, nasal congestion, malaise, headache, muscle pain or malaise. The elderly and immunosuppressed may present with atypical symptoms. These patients do not have any signs of dehydration, sepsis or shortness of breath

Mild pneumonia

Patient with pneumonia and no signs of severe pneumonia. Child with non-severe pneumonia has cough or difficulty breathing + fast breathing: fast breathing (in breaths/min): <2 months old, ≥ 60 ; 2–11 months old, ≥ 50 ; 1–5 years old, ≥ 40 and no signs of severe pneumonia

Severe pneumonia

Adolescent or adult: fever or suspected respiratory infection, plus one of respiratory rate >30 breaths/min, severe respiratory distress, or $\text{SpO}_2 < 90\%$ on room air. Child with cough or difficulty in breathing, plus at least one of the following: central cyanosis or $\text{SpO}_2 < 90\%$; severe respiratory distress (e.g., grunting, very severe chest indrawing); signs of pneumonia with a general danger sign: inability to breastfeed or drink, lethargy or unconsciousness, or convulsions. Other signs of pneumonia may be present: chest indrawing, fast breathing (in breaths/min): <2 months old, ≥ 60 ; 2–11 months old, ≥ 50 ; 1–5 years old, ≥ 40 . The diagnosis is clinical; chest imaging can exclude complications

Acute respiratory distress syndrome

Onset: new or worsening respiratory symptoms within one week of known clinical insult. Chest imaging (radiograph, CT scan, or lung ultrasound): bilateral opacities, not fully explained by effusions, lobar or lung collapse, or nodules. Origin of oedema: respiratory failure not fully explained by cardiac failure or fluid overload. Need objective assessment (e.g., echocardiography) to exclude hydrostatic cause of oedema if no risk factor present. Oxygenation (adults): (I) mild ARDS: $200 \text{ mmHg} < \text{PaO}_2/\text{FiO}_2 \leq 300 \text{ mmHg}$ (with PEEP or CPAP $\geq 5 \text{ cmH}_2\text{O}$, 7 or non-ventilated); (II) moderate ARDS: $100 \text{ mmHg} < \text{PaO}_2/\text{FiO}_2 \leq 200 \text{ mmHg}$ with PEEP $\geq 5 \text{ cmH}_2\text{O}$, 7 or non-ventilated); (III) severe ARDS: $\text{PaO}_2/\text{FiO}_2 \leq 100 \text{ mmHg}$ with PEEP $\geq 5 \text{ cmH}_2\text{O}$, or non-ventilated); (IV) when PaO_2 is not available, $\text{SpO}_2/\text{FiO}_2 \leq 315$ suggests ARDS (including in non-ventilated patients). Oxygenation (children; note OI = oxygenation index and OSI = oxygenation index using SpO_2): (I) bilevel NIV or CPAP $\geq 5 \text{ cmH}_2\text{O}$ via full face mask: $\text{PaO}_2/\text{FiO}_2 \leq 300 \text{ mmHg}$ or $\text{SpO}_2/\text{FiO}_2 \leq 264$; (II) mild ARDS (invasively ventilated): $4 \leq \text{OI} < 8$ or $5 \leq \text{OSI} < 7.5$; (III) moderate ARDS (invasively ventilated): $8 \leq \text{OI} < 16$ or $7.5 \leq \text{OSI} < 12.3$; (IV) severe ARDS (invasively ventilated): $\text{OI} \geq 16$ or $\text{OSI} \geq 12.3$

Table 2 (continued)

Table 2 (continued)

Sepsis

Adults: life-threatening organ dysfunction caused by a dysregulated host response to suspected or proven infection, with organ dysfunction. Signs of organ dysfunction include: altered mental status, difficult or fast breathing, low oxygen saturation, reduced urine output, fast heart rate, weak pulse, cold extremities or low blood pressure, skin mottling, or laboratory evidence of coagulopathy, thrombocytopenia, acidosis, high lactate or hyperbilirubinemia. Children: suspected or proven infection and ≥ 2 SIRS criteria, of which one must be abnormal temperature or white blood cell count

Septic shock

Adults: persisting hypotension despite volume resuscitation, requiring vasopressors to maintain MAP ≥ 65 mmHg and serum lactate level >2 mmol/L. Children: any hypotension (SBP 2 SD below normal for age) or 2–3 of the following: altered mental state; tachycardia or bradycardia (HR 160 bpm in infants and HR 150 bpm in children); prolonged capillary refill (>2 sec) or warm vasodilation with bounding pulses; tachypnea; mottled skin or petechial or purpuric rash; increased lactate; oliguria; hyperthermia or hypothermia

Table 3 How to implement infection prevention and control measures for patients with suspected or confirmed nCoV infection

At triage

Give suspect patient a medical mask and direct patient to separate area, an isolation room if available. Keep at least 1 meter distance between suspected patients and other patients. Instruct all patients to cover nose and mouth during coughing or sneezing with tissue or flexed elbow for others. Perform hand hygiene after contact with respiratory secretions

Apply droplet precautions

Droplet precautions prevent large droplet transmission of respiratory viruses. Use a medical mask if working within 1–2 meters of the patient. Place patients in single rooms, or group together those with the same etiological diagnosis. If an etiological diagnosis is not possible, group patients with similar clinical diagnosis and based on epidemiological risk factors, with a spatial separation. When providing care in close contact with a patient with respiratory symptoms (e.g., coughing or sneezing), use eye protection (face-mask or goggles), because sprays of secretions may occur. Limit patient movement within the institution and ensure that patients wear medical masks when outside their rooms

Apply contact precautions

Droplet and contact precautions prevent direct or indirect transmission from contact with contaminated surfaces or equipment (i.e., contact with contaminated oxygen tubing/interfaces). Use PPE (medical mask, eye protection, gloves and gown) when entering room and remove PPE when leaving. If possible, use either disposable or dedicated equipment (e.g., stethoscopes, blood pressure cuffs and thermometers). If equipment needs to be shared among patients, clean and disinfect between each patient use. Ensure that health care workers refrain from touching their eyes, nose, and mouth with potentially contaminated gloved or ungloved hands. Avoid contaminating environmental surfaces that are not directly related to patient care (e.g., door handles and light switches). Ensure adequate room ventilation. Avoid movement of patients or transport. Perform hand hygiene

Apply airborne precautions when performing an aerosol generating procedure

Ensure that healthcare workers performing aerosol-generating procedures (i.e., open suctioning of respiratory tract, intubation, bronchoscopy, cardiopulmonary resuscitation) use PPE, including gloves, long-sleeved gowns, eye protection, and fit-tested particulate respirators (N95 or equivalent, or higher level of protection). (The scheduled fit test should not be confused with user seal check before each use.) Whenever possible, use adequately ventilated single rooms when performing aerosol-generating procedures, meaning negative pressure rooms with minimum of 12 air changes per hour or at least 160 litres/second/patient in facilities with natural ventilation. Avoid the presence of unnecessary individuals in the room. Care for the patient in the same type of room after mechanical ventilation commences

Table 4 Prevention of complications

Anticipated outcome	Interventions
Reduce days of invasive mechanical ventilation	Use weaning protocols that include daily assessment for readiness to breathe spontaneously; minimize continuous or intermittent sedation, targeting specific titration endpoints (light sedation unless contraindicated) or with daily interruption of continuous sedative infusions
Reduce incidence of ventilator-associated pneumonia	Oral intubation is preferable to nasal intubation in adolescents and adults; keep patient in semi-recumbent position (head of bed elevation 30–45°); use a closed suctioning system; periodically drain and discard condensate in tubing; use a new ventilator circuit for each patient; once patient is ventilated, change circuit if it is soiled or damaged but not routinely; change heat moisture exchanger when it malfunctions, when soiled, or every 5–7 days
Reduce incidence of venous thromboembolism	Use pharmacological prophylaxis [low molecular-weight heparin (preferred if available) or heparin 5,000 units subcutaneously twice daily] in adolescents and adults without contraindications. For those with contraindications, use mechanical prophylaxis (intermittent pneumatic compression devices)
Reduce incidence of catheter-related bloodstream infection	Use a checklist with completion verified by a real-time observer as reminder of each step needed for sterile insertion and as a daily reminder to remove catheter if no longer needed
Reduce incidence of pressure ulcers	Turn patient every two hours
Reduce incidence of stress ulcers and gastrointestinal bleeding	Give early enteral nutrition (within 24–48 hours of admission); Administer histamine-2 receptor blockers or proton-pump inhibitors in patients with risk factors for GI bleeding. Risk factors for gastrointestinal bleeding include mechanical ventilation for ≥48 hours, coagulopathy, renal replacement therapy, liver disease, multiple comorbidities, and higher organ failure score
Reduce incidence of ICU-related weakness	Actively mobilize the patient early in the course of illness when safe to do so

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