The 2019-2020 Novel Coronavirus Outbreak

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Coronaviruses

- Hosts: humans, other mammals, birds
- Frequent cause of the common cold
  - Accounts for 5-10% of adult URIs
- Typical symptoms: fever, cough, sore throat
- Can cause viral pneumonia or bronchitis
- Primarily occur in winter and early spring
- Spread by aerosol droplets and contact with secretions
Coronaviruses

- No vaccines exist
- No anti-virals exist
- Treatment is supportive
- Patients should be placed in droplet isolation
Coronaviruses can go rogue:

SARS
MERS

SARS (Severe Acute Respiratory Syndrome)

• Onset November 2002
• Last known case 2004
• Total 8,098 cases with 774 deaths (9.6% mortality)
• Caused by a Coronavirus
• Original viral host: Horseshoe Bats in Yunnan Province, China
   • Civet cats were the intermediary
SARS (Severe Acute Respiratory Syndrome)

• In February 2003, a U.S. businessman became ill on a flight to Hanoi
  • Several healthcare workers then became ill
• In Hong Kong, a doctor from Guangdong infected 16 people at the Metropole Hotel
  • These visitors then traveled to Canada, Singapore, Taiwan, and Vietnam
• February 23, 2003 – First case in Toronto
  • 257 people then infected
SARS (Severe Acute Respiratory Syndrome)

- Symptoms: fever, myalgia, pharyngitis, shortness of breath, cough
- Incubation period = 4-6 days (range 1-14 days)
- Transmission: droplet
- United States: 27 cases, no deaths
- Last reported case: January 2004
Lessons learned from SARS:

- Air travel permits rapid world-wide spread
- Don’t cover it up
- Rapid epidemiologic investigation is essential
- Countries must work together
- Have a high clinical suspicion
- Infection control works
- Health personnel are at greatest risk

MERS (Middle East Respiratory Syndrome)

- Onset 2012 in Saudi Arabia
- Caused by a Coronavirus
- Overall: 1,227 cases, 37% mortality
- Saudi Arabia outbreak 2014: 402 cases, 27% mortality
- South Korea outbreak 2015: 150 cases, 17% mortality
- United States: 2 cases in 2014, both healthcare workers traveling from Saudi Arabia
MERS (Middle East Respiratory Syndrome)

Symptoms:
- Cough
- Dyspnea
- Fever

Chest x-ray:
- Patchy pneumonia
- ARDS
Lessons learned from MERS

- A single missed infected person can cause a nationwide outbreak
- Hospitals and ERs can accelerate spread
- Doctors in community hospitals and clinics are the first line of defense
- New coronavirus strains can have a very high mortality rate
- Outbreaks are expensive
  - 2015 outbreak in South Korea estimated cost was $8.5 billion

Ebola

- NOT a coronavirus
- Hemorrhagic fever
- Spread by contact with body fluids
- Animal origin: fruit bats and monkeys
- 24 outbreaks in sub-Saharan Africa since 1976
- Mortality rate: 50%
- 2014 spread to United States by 2 travelers
  - Two healthcare workers became infected
Lessons learned from Ebola

• All countries need to strengthen infection control capacities
• Research in novel microorganisms is necessary
• Public trust in public health organizations must be cultivated

Novel Coronavirus (2019-nCoV)

• Spread by droplets
• Mortality rate = 3%
• Thousands of cases, most in China
• World-wide spread to other countries by air travelers from Wuhan
• NOT detected by the standard respiratory viral PCR panel used by hospital labs
The 2020 Novel Coronavirus (2019-nCoV) Outbreak

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Countries With Coronavirus 2019-nCoV
As of February 3, 2020
### 2019 nCoV in the United States

- 241 total Patients Under Investigation (PUI) in 36 states
- 114 returned negative
- 121 pending
- 6 confirmed positive
  - Washington, California, Arizona, Illinois, Massachusetts
  - All had recent travel to Wuhan

Information updated on 2/3/20
Risk Assessment

• This is a serious public health threat, however the risk to individuals is dependent on exposure.
• More cases are likely in the coming days with increased travel to and from China due to the Lunar New Year.
• General American public are unlikely to be exposed to this virus and immediate health risk of 2019 nCoV is low.

Illness Severity

• 2019-nCoV infections range from people being mildly sick to severely ill and dying.
When should you suspect 2019-nCoV?

1. Fever AND symptoms of lower respiratory infection AND either:
   • Travel from Wuhan City, China in the past 14 days
   • Close contact in the past 14 days with a person under investigation for 2019-nCoV

   OR

2. Fever OR symptoms of lower respiratory infection AND:
   • Close contact in the past 14 days with a person with laboratory-confirmed 2019-nCoV
The CDC recommends **ALL** of the following:

<table>
<thead>
<tr>
<th>Contact Isolation:</th>
<th>Droplet Isolation:</th>
<th>Airborne Isolation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Gown</td>
<td>• Mask</td>
<td>• Negative airflow room</td>
</tr>
<tr>
<td>• Gloves</td>
<td>• Face shield or goggles</td>
<td>• N-95 mask or PAPR</td>
</tr>
<tr>
<td>• Hand hygiene with soap and water*</td>
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</tbody>
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*alcohol based hand sanitizer if not available

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**What to do with a suspected case**

- Isolate the patient IMMEDIATELY
  - Airborne, droplet and contact precautions
- Obtain a full travel history
- Prompt communication with local infection control and local health department to determine need for testing
- Testing is currently only being performed at the CDC, thus requires approval first
Testing for 2019-nCoV:

All of the following:

1. Sputum or bronchoalveolar lavage or tracheal aspirate
2. Serum
3. Nasopharyngeal **AND** oropharyngeal swab/wash/aspirate

Maintain proper infection control when collecting specimens.

Treatment

- No antiviral therapy available
- Only supportive care measures
CDC Recommendations

- CDC issued updated travel guidance, recommending travelers avoid all nonessential travel to China. (Level 3 travel health notice)

- Patients who have been in Wuhan within past 14 days and develop fever, cough or have difficulty breathing seek medical care right away.
  
  - Call ahead before going to see a doctor or emergency room. Tell them you were in Wuhan and your symptoms.

- Persons returning from travel in China who are well are NOT currently recommended to undergo self-isolation, and have no activity restrictions. They should monitor for symptoms and present for evaluation if symptoms develop.

Any patient with a suspected viral respiratory infection should always be placed in droplet isolation
The mainstays of response to any epidemiologic threat are:

- Preparedness
- Surveillance
- Containment
- Education

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**Standard Infection Prevention**

- Maintain proper hand hygiene practices
- Cover your cough
- Stay home if you are sick
- Get your Influenza vaccination
For updates:


https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports/