Understanding COVID19

Webinar Hosted By ReACT Africa

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(No disclosures)
3rd March 2020
Learning Objectives

1. Understand the epidemiology of COVID-19
2. Understand the clinical manifestation of COVID-19
3. Know what to do if you encounter a suspected case of COVID-19
4. Recognize the preparedness & response structures to combat COVID-19

The speaker has no significant financial conflicts of interest to disclose.
Acknowledgement

WHO
US-CDC
Africa-CDC
University Teaching Hospital, Lusaka
Ministry Of Health, Zambia (MoH)
Zambia National Public Health Institute (ZNPHI)
Dr Francis Mupeta – Head Infectious Diseases Unit/COVID19 Case Management Lead

The speaker has no significant financial conflicts of interest to disclose.
Content

• Overview of COVID 19
  – Definition
  – Epidemiology
  – Clinical presentation

• Detection
  – Screening
  – Testing

• Management

• Containment
  – Personal Protective Equipment
  – Infection Prevention & Control

• Preparedness and Response to COVID-19
  – Incident Management System

• Frequently Asked Questions

The speaker has no significant financial conflicts of interest to disclose.
COVID-19 POLLS

The speaker has no significant financial conflicts of interest to disclose.
Poll 1

• Which of the following most accurately reflects the estimated incubation period of COVID-2019

• A. Within 24 hours
• B. 2 days to 2 weeks
• C. 3 to 4 weeks
• D. Longer than 1 month

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Poll 2

Which of the following is most accurate regarding the presentation COVID-19

• A. Women have demonstrated a higher incidence of severe COVID-19 infection than men
• B. Early estimates suggest mortality rate of COVID-2019 is around 2%
• C. Early reports suggest that COVID-19 is substantially more clinically severe than MERS or SARS
• D. Unlike similar viruses, COVID-19 has a higher incidence among younger populations (40 years)
Poll 3

Which of the following is the most *commonly* reported clinical finding in patients with COVID-2019

- A. Headache
- B. Excess sputum production
- C. Diarrhoea
- D. Fever

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Poll 4

Which of the following **tests** is currently used to diagnose COVID-19

A. Enzyme-linked immunosorbent assay (ELISA)
B. Virus isolation in cell culture
C. Real-time reverse transcription polymerase chain reaction (rRT-PCR)
D. Viral antigen detection test

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Poll 5-Treatment and Prevention of COVID-19

Which of the following is CORRECT

A. All individuals should use standard, contact, airborne and droplet precautions before entering a room with a patient who has confirmed or suspected

B. Chloroquine is recommended for all patients with COVID-19

C. Alcohol-based sanitizers have been found to be wholly ineffective in the prevention of COVID-19

D. Taking a lot of vitamin C is the best way to avoid getting infected

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OVERVIEW OF NOVEL COVID 19
Definition, EPIDEMIOLOGY & CLINICAL PRESENTATION

The speaker has no significant financial conflicts of interest to disclose.
Coronaviruses Background

• Coronaviruses are a large family of RNA viruses that cause respiratory illness in animals
  – Ubiquitous in the environment
  – Circulate among animals and humans (zoonotic)
  – 7 coronaviruses are known to infect humans

• Cause a spectrum of illness
  – Common cold: cause ~5-10% of all acute URIs in adults, more in children
  – Severe illness
    • SARS-CoV (2002): case fatality rate ~11%
    • MERS-CoV (2012): case fatality proportion ~30%
    • SARS-CoV 2: ?, 1.38% China. Shigui Ruan. Lancet 30Mar2020

The speaker has no significant financial conflicts of interest to disclose.
COVID-19 Pandemic (1)

• Coronavirus disease of 2019 (“COVID-19) is a severe acute respiratory syndrome caused by SARS-CoV-2*

• First reported in Wuhan City, China in December 2019
  – Initially, linked to animal and seafood market
  – Likely animal-to-human spread from unknown species (likely bats via an intermediate host)

• Initially concentrated in China it has now spread world-wide
  – Today’s (03Apr20) figures: 900,306 confirmed, 45,693 deaths, 206 countries

• **Very dynamic situation**

The speaker has no significant financial conflicts of interest to disclose.
COVID-19 Pandemic (2)

- >900,000 confirmed cases worldwide
  - ~15-20% are severe infections
  - >45,000 deaths (~3% mortality)
- >206 countries affected
  - Initially, many cases with link to China
  - Now worldwide spread

The speaker has no significant financial conflicts of interest to disclose.
COVID-19 Epidemiology (1)

• Transmission occurs through close contact with infected persons via respiratory droplets (coughing)
  – Droplets can travel up to 2 meters from an infected person
  – Transmission also likely from contact with surfaces contaminated by droplets (i.e., fomite transmission)
  – Virus isolate from stool but no epidemiologic evidence of fecal-oral transmission
• In China, most transmission occurred within families
• Adults primarily affected. Median age = 51 years
  – ~80% in persons aged 30-69yo
  – Very small proportion reported in children (~2%)

The speaker has no significant financial conflicts of interest to disclose.
Definition of “Close Contact”

• “Close contact” with COVID-19 is a risk factor, but what is close contact?

  • WHO
    – Caring for or visiting patient in a health care setting without PPE
    – Working, attending school, etc. together in close proximity
    – Living in the same household
    – Traveling together (within 1m)

  • US CDC
    – Being within approximately 2 meters for a prolonged period of time while not wearing PPE
    – Having direct contact with infectious secretions (e.g., being coughed on) while not wearing PPE

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COVID-19 Epidemiology (2)

- Incubation period: 3-6 days (range: 2-14 days)
  - Delayed onset of SOB: 5-8 days after Sx
- Most infections are mild/moderate (~80%)
- Recovery period:
  - Mild: ~2 weeks
  - Severe: 3-6 weeks
- Mortality: 1-3%

The speaker has no significant financial conflicts of interest to disclose.
COVID-19 Epidemiology (3)

- COVID-19 symptoms are non-specific. Mainly **fever and cough**
  - Many other illness present similarly
- Truly asymptomatic infection appears to be rare (<1%)
  - ~75% of ‘asymptomatic’ infections at diagnosis progress to symptomatic illness
  - Difficult to know true extent of asymptomatic disease without serologic assays
- Viral shedding greatest early in disease
  - Can occur 1-2 days prior to symptom onset
  - Shedding occurs for 7-12 day in mild/moderate disease, and longer in severe disease (>2wks)
  - PCR can remain positive after symptom resolution. Significance not known
Clinical Presentation (1)

- Varies in severity from asymptomatic infection or mild illness to severe or fatal illness
  - Severe illness: ~15-20%
  - Mortality: ~1-3%
  - (Note, both are likely overestimates because of unaccounted for mild [and asymptomatic] illness)

- Severe illness & death is more common among elderly patients and those with chronic medical conditions
  - e.g., heart disease, lung disease, kidney disease, diabetes, hypertension, immunocompromised states, cancer, etc.

The speaker has no significant financial conflicts of interest to disclose.
Clinical Presentation (2)

- Symptoms are non-specific. **A thorough history and high index of suspicion are important**
- At illness onset, most common symptoms are:
  - Fever (43–98%)
  - Cough (46%–82%)
  - Shortness of breath (SOB)/dyspnea (18-55%)
  - Myalgia or fatigue (11–44%)
  - Others: Sore throat (5-13%); Diarrhea (2-10%); Nausea (5%)
- SOB/dyspnea is often not a prominent feature at first presentation
- **Above estimates are primarily from studies among hospitalized.** Milder presentations are likely

The speaker has no significant financial conflicts of interest to disclose.
Lab and Radiography

• Common lab findings
  – Lymphopenia (low lymphocytes)
  – Elevated liver enzymes (AST/ALT)
  – Leukocytosis or leukopenia
  – Normal procalcitonin

• Radiographic findings
  – Bilateral lung involvement on chest imaging

The speaker has no significant financial conflicts of interest to disclose.
COVID-19 Mortality

• Mortality estimates vary
  – By geography, patient characteristics, disease severity
• Overall, ~1-3%
  – Suspect this will drop as extent of mild (or asymptomatic disease) is better understood
• Hospitalized patients with high mortality

<table>
<thead>
<tr>
<th>Group</th>
<th>Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>1-3%</td>
</tr>
<tr>
<td>Region</td>
<td></td>
</tr>
<tr>
<td>Hubei Province</td>
<td>5%</td>
</tr>
<tr>
<td>China, outside Hubei</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Rest of world</td>
<td>3%</td>
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<tr>
<td>Sex</td>
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<tr>
<td>Males</td>
<td>2-5%</td>
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<tr>
<td>Females</td>
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</tr>
<tr>
<td>Age</td>
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<tr>
<td>0-39</td>
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<td>40-49</td>
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<td>50-59</td>
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<td>60-69</td>
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<td>70-79</td>
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<td>≥80</td>
<td>14.8%</td>
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</table>

<table>
<thead>
<tr>
<th>Group</th>
<th>Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comorbidities</td>
<td></td>
</tr>
<tr>
<td>Heart disease</td>
<td>10-13%</td>
</tr>
<tr>
<td>Diabetes</td>
<td>7-9%</td>
</tr>
<tr>
<td>COPD</td>
<td>6-8%</td>
</tr>
<tr>
<td>Cancer</td>
<td>5-7%</td>
</tr>
<tr>
<td>Hospitalized</td>
<td>4-15%</td>
</tr>
<tr>
<td>Critically ill</td>
<td>49%</td>
</tr>
</tbody>
</table>

Many Unknowns about COVID-19

- What is the animal source of COVID-19?
- What is the full spectrum of illness?
- Why are children being spared?
- Is there prolonged viral shedding after recovery?
- Is fecal virus infectious?
- Is there a seasonality to Covid-19 (as with flu)?
- Does infection confer immunity?
- And others

The speaker has no significant financial conflicts of interest to disclose.
WHO Surveillance Case Definitions (1)

• Suspect case
  a. Any acute respiratory infection AND contact with a confirmed or probable case of COVID-19 infection OR
  b. Acute respiratory infection (fever and one other respiratory symptom) AND with no other etiology AND a history of travel in a country/area or territory reporting local transmission* OR
  c. Severe acute respiratory infection (“SARI,” fever and one other respiratory symptom requiring hospitalization) with no other etiology that fully explains presentation

* Available on WHO website

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WHO Surveillance Case Definitions (2)

- **Probable case**
  - A suspect case for whom testing for COVID-19 is inconclusive

- **Confirmed case**
  - A laboratory-confirmed COVID-19 infection, irrespective of clinical signs and symptoms

The speaker has no significant financial conflicts of interest to disclose.

DETECTION OF NOVEL COVID 19
SCREENING AND TESTING

The speaker has no significant financial conflicts of interest to disclose.
COVID-19 Screening

• Obtain a detailed travel history for patients with fever or respiratory illness

• Suspect COVID-19 infection in patients with:
  1. Travel to or resided in any country with local transmission in the past 14 days
  2. Close contact with a person with COVID-19 infection in the past 14 days

The speaker has no significant financial conflicts of interest to disclose.
COVID-19 Testing

• COVID-19-specific rRT-PCR testing available in most countries
• Clinical testing criteria, for persons with:
  – Any person with signs or symptoms of a fever or respiratory infection and an epidemiologic risk factor for COVID-19. Epidemiologic risk factors include:
    • Travel in the past 14 days from a country or territory experiencing local transmission of COVID-19
    • Close contact in the past 14 days with a person with confirmed COVID-19 infection
  – Severe acute respiratory infection (SARI) with no alternative aetiology (no epidemiological risk factor needed)

Up-to-date information about countries experiencing local transmission are available through the WHO at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports/
MANAGEMENT OF PATIENTS WITH NOVEL COVID 19

The speaker has no significant financial conflicts of interest to disclose.
Treatment of COVID-19

• **Think AHEAD. Plan**
• COVID19 treatment centre (WHO,CDC)
• It’s a multi-disciplinary approach
• Infection Prevention and Control is cardinal
• Personal Protective Equipment (PPE)
Treatment of COVID-19

• Currently, no specific treatment exists for COVID-19

• Provide empiric treatment as needed
  – O₂ for oxygen level <90%, patients may progress to extent of requiring mechanical ventilation
  – Paracetamol for T>38.0°, antihistamine for congestion, etc.
  – Antibiotics if secondary infection suspected or critically ill
  – IVF if hypotensive (spARINGLY, as ARDS is risk)
  – Do not use steroids in critically ill (unless otherwise clinically indicated)

• Protect IV by correct use of PPE
COVID-19 in PLWHA

• The clinical course of COVID-19 in people leaving with HIV/AIDS PLHIV is not known. This very important in sub-Saharan Africa home of two-thirds of World HIV/AIDS population

• Some measures can help ensure high quality care for recipients of care (RoC) as more information becomes available

The speaker has no significant financial conflicts of interest to disclose.
CONTAINMENT OF NOVEL COVID 19
PPE & IPC

The speaker has no significant financial conflicts of interest to disclose.
Infection Prevention and Control

- PPE by healthcare workers
  - Control transmission at the source (the patient)
  - Protect caregivers – people in close contact with patients
- Environmental cleaning and disinfection
- Engineering controls
- Administrative controls

The speaker has no significant financial conflicts of interest to disclose.
Hand Hygiene

• **Single most effective way to reduce the risk of spreading or acquiring infections**

• Hand hygiene should be performed at the “5 moments”
  – Before putting on personal protective equipment (PPE) and after removing it
  – Whenever changing gloves
  – After any contact with a suspected or confirmed COVID-19 patient or their waste
  – After contact with any respiratory secretions
  – Before eating and after using the toilet

The speaker has no significant financial conflicts of interest to disclose.
PPE for Covid-19

- Covid-19 transmission: droplet and fomite
  1. Standard precautions: hand hygiene, gloves if contact with body fluids
  2. Droplet precautions: medical mask, eye protection
  3. Contact precautions: gloves, gown

Note, the use of boots, coverall and apron is not required during routine care of COVID-19
## PPE by Location

<table>
<thead>
<tr>
<th>Location</th>
<th>PPE Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient rooms, laboratory</td>
<td>Face mask*, gloves, gown, eye protection</td>
</tr>
<tr>
<td>Triage, waiting room, corridors, wards</td>
<td>Face masks for patients, facemask + gloves</td>
</tr>
<tr>
<td>administrative areas</td>
<td>for staff</td>
</tr>
<tr>
<td>Home</td>
<td>Face mask and gloves for caregiver</td>
</tr>
<tr>
<td></td>
<td>Mask for patient</td>
</tr>
<tr>
<td>Public areas</td>
<td>None</td>
</tr>
</tbody>
</table>

*Any patient with respiratory symptoms should be provided a mask, regardless of locations*

Maintain spatial distance of ≥1 meter

*Add N95 respiratory if aerosol-generating procedure*

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The speaker has no significant financial conflicts of interest to disclose.

PREPAREDNESS AND RESPONSE TO NOVEL COVID 19

IMS

The speaker has no significant financial conflicts of interest to disclose.
Public Health Measures for COVID-19

• Prevention
• Detection
  – Enhanced surveillance
  – Active case finding
• Response
  – Case and contact identification
  – Outbreak investigation
  – Containment (isolation and quarantine)
  – Care for the infected
Prevention

• No vaccine available yet
• Frequent hand hygiene is key to prevention
• Cough etiquette
• Avoidance of touching face with unclean hands
• Social distancing
• Early isolation of persons with suspected cases
• Appropriate use of PPE by Health Care Workers
Health Promotion Messaging for Patients

1. Wash hands often with soap and water for at least 20 seconds. Use an alcohol-based hand sanitizer if soap and water are not readily available
2. Avoid touching eyes, nose, and mouth with unwashed hands
3. Cover cough or sneeze with a tissue, then throw it away
4. Clean and disinfect frequently touched objects and surfaces
5. Avoid close contact with people who are sick (>1 meter distance)
6. Stay home when feeling sick
Enhanced Surveillance

- Improving ability to detect COVID-19 cases
  - Sensitizing clinicians to COVID-19 (e.g., signs and symptoms, case definition, etc.)
  - Liberalizing testing criteria (i.e., testing persons with mild symptoms)
  - Expanding testing capacity (i.e., number of labs, testing for other respiratory pathogens)
  - Event-based surveillance, including raising public awareness
  - ILI and SARI sentinel surveillance
  - Syndromic surveillance
Active Case Finding

• Screening at PoE and monitoring at-risk individuals for 14 days
• Seeking out patients at health facilities
• Contact tracing *(if cases are confirmed)*
  – Searching for new illness among:
    1. Patients and their visitors in health care facilities where the infected patient sought treatment
    2. Health care providers who cared for or cleaned the room of an infected patient
    3. Social, family, work, and travel contacts of infected patients
  – Implementation of contact tracing and monitoring earlier in an outbreak is more likely to interrupt transmission
Case and Contact Identification

- Collect information about:
  - Patient identifiers
  - Demographics
  - Clinical
  - Exposure history
  - Travel history
  - Laboratory data
- If confirmed, initiate contact tracing
Outbreak Investigation

• When ≥2 infections are clustered in space and time
• Led by rapid response teams
• Confirm the diagnosis of COVID-19 and develop case definitions (person/place/time) for the outbreak
• Identify suspect cases via contact tracing and test them for COVID-19
• Identify risk factors through descriptive and analytic epidemiology
• Make recommendations to stop the outbreak (e.g., isolation and quarantine)
• Share findings with stakeholders
Containment

• Travel restrictions
• Social distancing measures
  – School/work closures
  – Cancelling large events
  – Remain ≥1 meter from other people in public
• Quarantine (for exposed persons)
• Isolation (for infected persons)
• PPE and IPC in health facilities (and elsewhere)
The speaker has no significant financial conflicts of interest to disclose.
FAQs

• Who is at risk for COVID-19?
A: Currently, those at greatest risk of infection are persons who have had prolonged, unprotected close contact with a patient with symptomatic, confirmed COVID-19 and those who live in or have recently been to areas with sustained transmission.

• Who is at risk for severe disease from COVID-19?
A: It is possible that older adults, and persons who have underlying chronic medical conditions, such as HTN, Diabetes, Lung problems & other immunocompromising conditions, may be at risk for more severe outcomes.

• When is someone infectious?
A: Existing literature suggest that the incubation period may range from 2–14 days.

FAQs

• **Aside from respiratory fluids, which body fluids can spread infection?**
  A: SARS-CoV-2 RNA has been detected in blood and stool specimens, but whether infectious virus is present in extrapulmonary specimens is currently unknown.

• **Can people who recover from COVID-19 be infected again?**
  A: The immune response to COVID-19 is not yet understood. Patients with MERS-CoV infection are unlikely to be re-infected shortly after they recover, but it is not yet known whether similar immune protection will be observed for patients with COVID-19.

• **Can I use corticosteroids in the management of a patient with COVID-19?**
  A: Corticosteroids are not routinely recommended for viral pneumonia or ARDS and should be avoided unless they are indicated for another reason.

• **Should post-exposure prophylaxis be used for people who may have been exposed to COVID-19?**
  A: There is currently no FDA-approved post-exposure prophylaxis for people who may have been exposed to COVID-19.

The speaker has no significant financial conflicts of interest to disclose.

Summary of Key Points

• COVID-19 is a global health threat
• Early detection and isolation of cases, rapid identification/monitoring of contacts, and rapid access to clinical care are effective to strategies to contain Covid-19

The speaker has no significant financial conflicts of interest to disclose.
Thank you

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COVID-19 RE-POLLS

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- B. Excess sputum production
- C. Diarrhoea
- D. Fever
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Which of the following tests is currently used to diagnose COVID-19

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Which of the following is CORRECT

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B. Chloroquine is recommended for all patients with COVID-19

C. Alcohol-based sanitizers have been found to be **wholly ineffective** in the prevention of COVID-19

D. Taking a lot of vitamin C is the best way to avoid getting infected

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Annex Slides
How to Collect Nasopharyngeal and Oropharyngeal Specimens

**Nasopharyngeal (NP) swabs**

1) Have patient blow nose prior to collection
2) Insert NP swab in level/flat position into back of nasopharynx until resistance if felt
3) Rotate for 10-15 seconds

**Oropharyngeal swab**

1) Swab both tonsils and back of throat
2) Avoid touching tongue and teeth

Use sterile dacron or rayon swabs. Do not use cotton swabs or wood shafts as can interfere with RT-PCR assays.
Holding the Swab..

Correctly held swab can slide out of the way

Swab held correctly

Incorrectly held swab can injure the client

Swab held incorrectly
Specimen Handling

- Label specimen with client name / ID number and date
- Place completed forms with specimen
- Ensure the Patient ID is same on specimen and case investigation form
- Place specimen in designated triple package / cool box with ice packs (+4°C) for transport
- Transport the samples to Lusaka UTH virology within 24 hours
  - Contact ZNPHI

The speaker has no significant financial conflicts of interest to disclose.
Case Investigation Form

Form C: Case Investigation Form for COVID-2019

Date of reporting to national level: ____________
Reporting facility/institution: __________________________
Reporting date: __________________________

Case classification: ☐ Suspect ☐ Probable ☐ Confirmed

Detected at point of entry: ☐ No ☐ Yes ☐ Unknown
If yes, date, place: ____________

Section A: Patient Information

Unique Case Identifier (if available): __________________________
Date of birth: ____________
Date of admission to hospital: ____________
If no, indicate the estimated age: ____________

Place where the case was diagnosed: __________________________
Province: ____________________ District: ____________________
Patient usual place of residence: __________________________
Province: ____________________ District: ____________________

Section B: Clinical Information

Patient clinical course

Date of onset of symptoms: ____________ = Asymptomatic = Unknown

Admission to hospital: ☐ No ☐ Yes = Unknown
First date of admission to hospital: ____________
Name of hospital: __________________________

Date of isolation: ____________ = Unknown

Was the patient ventilated: ☐ No ☐ Yes = Unknown
Health status at time of reporting: ☐ Recovered ☐ Not recovered ☐ Death = Unknown

Date of death or discharge, if applicable: ____________

Patient symptoms (check all reported symptoms):
☐ History of fever / chills ☐ Shortness of breath ☐ Pain (check all that apply)
☐ General weakness ☐ Diarrhoea ☐ Abdominal discomfort
☐ Cough ☐ Nausea/vomiting ☐ Joint
☐ Sore throat ☐ Headache ☐ Gastrointestine
☐ Runny nose ☐ Irritability/confusion ☐ Other:
☐ Other:

Patient signs:

Temperature: ____________ °F
Check all observed signs:
☐ Pharyngeal exudate ☐ Coma ☐ Abnormal lung X-ray findings
☐ Conjunctival injection ☐ Dysinesias / tachycardia ☐ Seizure
☐ Abnormal lung auscultation ☐ Other:

Section C: Exposure and travel information in the 14 days prior to symptom onset (prior to reporting if asymptomatic)

Occupation: (tick any that apply)
☐ Student ☐ Health care worker ☐ Other:
☐ Working with animals ✗ ☐ Health laboratory worker
Has the patient travelled in the 14 days prior to symptom onset: ☐ No ☐ Yes = Unknown
If yes, please specify the places the patient travelled to and date of departure from the place:

Section D: Laboratory Information

Name of confirming laboratory: __________________________
Date of laboratory confirmation: ____________

Please specify which assay was used: ____________
Sequencing done?: ☐ Yes ☐ No = Unknown

Note: Close contact is defined as being within approximately 6 feet (2 meters) of a COVID-19 case for a prolonged period of time while not wearing recommended personal protective equipment (e.g., gowns, gloves, surgical face masks, eye protection). If close contact occurs while caring for someone with COVID-19, or if having direct contact with infectious secretions of COVID-19, is, for being coughed or while not wearing recommended personal protective equipment.
Video- how to wear appropriate PPE for COVID-19

• https://www.dropbox.com/s/ym9g5c0hhr16gul/DonningDoffing_COVID19_PPE_480p_04Mar2020.mov?dl=0