E-learning Course for Healthcare Workers on COVID-19

(Novel Coronavirus) Outbreak

Course Outline

Module 1: Introduction to COVID-19

1. Types of Coronavirus
2. About COVID-19
3. How it spreads
4. Symptoms
5. Basic Screening and provision of testing
6. Home Quarantine and Isolation
7. Basic Administrative Measures

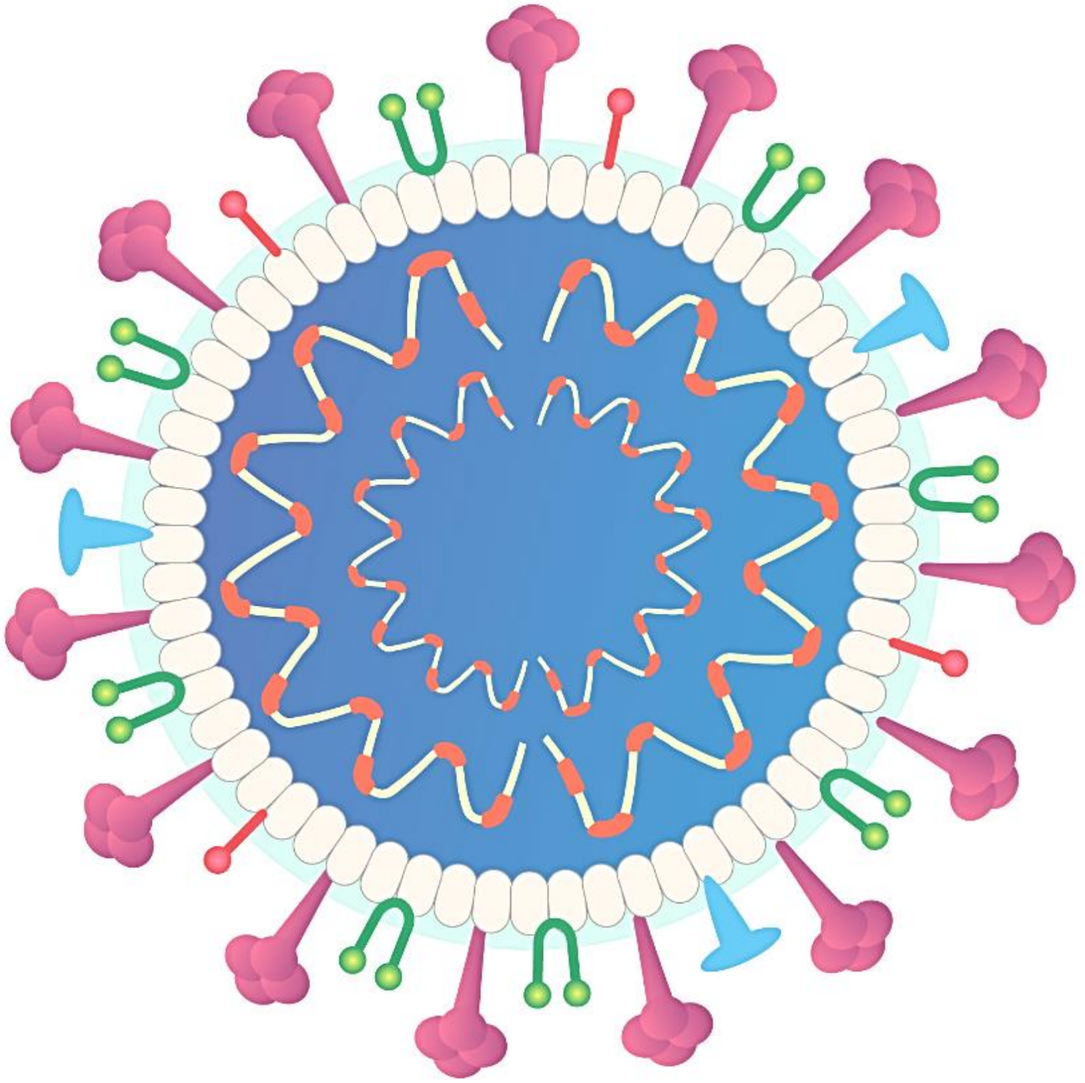
Module 2: Infection Prevention and Control

1. What are standard precautions
2. When and How to do hand hygiene
3. When and how to wear masks
4. When and how to wear gloves
5. When and how to wear goggles or face shields
6. Donning and Doffing standard PPE
7. Rational use of PPE
8. Bio-Waste Management

Module 3: Clinical Management

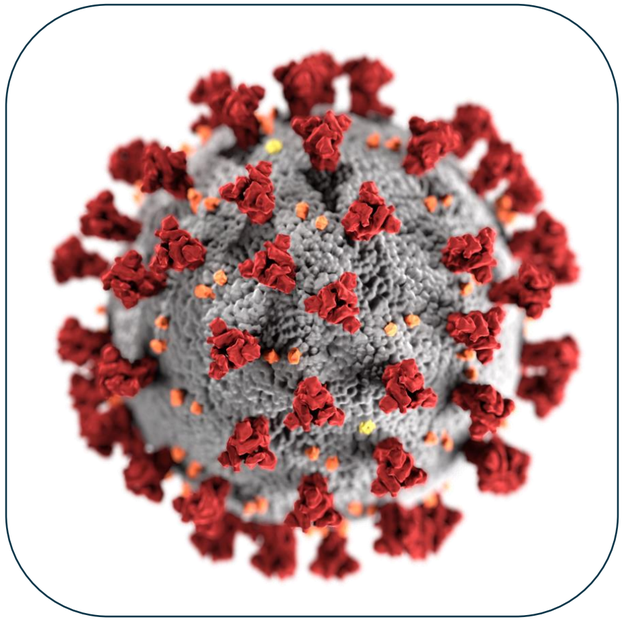
Module 1: Introduction

Coronavirus and COVID-19



About Coronaviruses (CoV)

- Enveloped positive sense (+) single stranded (ss) RNA viruses, named for the crown-like spikes on their surface
- Belong to a large family, cause illness ranging from common cold to more severe diseases
- Human coronaviruses were first identified in the mid-1960s. Seven coronaviruses can infect people
- Sometimes coronaviruses that infect animals can evolve and make people sick and become a new human coronavirus, for e.g.
  - SARS-CoV: emerged in 2003 in southern China
  - MERS-CoV: emerged in 2012 in Saudi Arabia
  - **SARS-CoV-2: emerged in December 2019 in China**

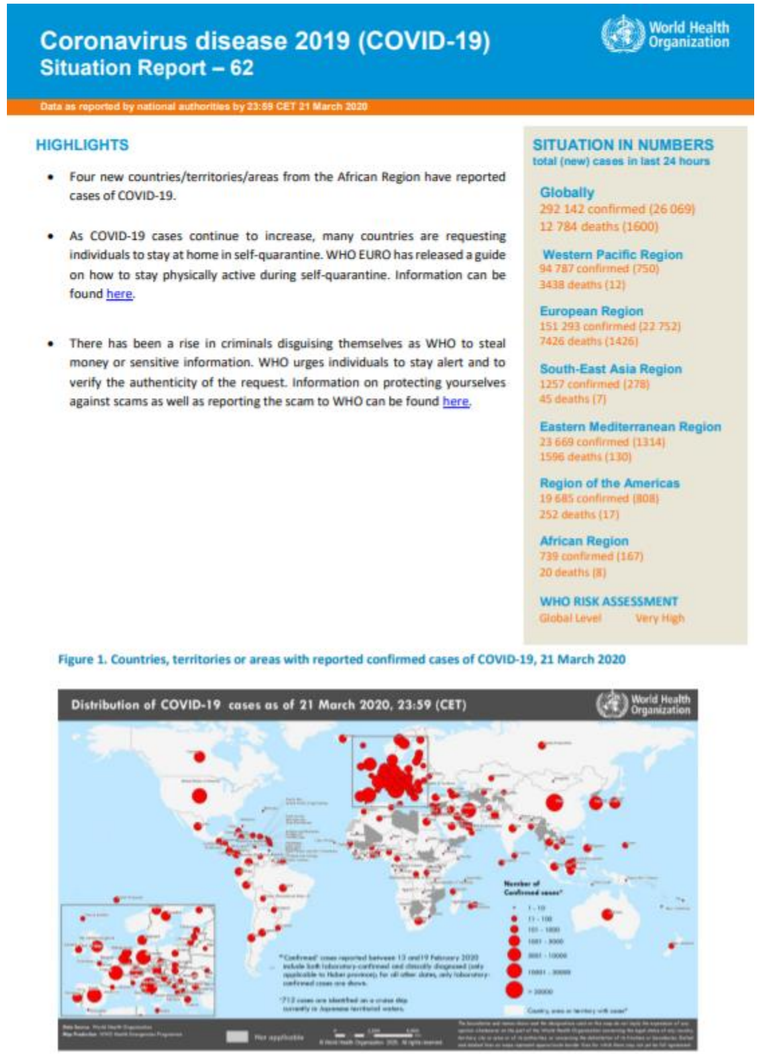


Picture Credit: Content Provider(s): CDC/ Alissa Eckert, MS; Dan Higgins, MAM - This media comes from the Centers for Disease Control and Prevention's Public Health Image Library(PHIL), with identification number #23312.

Source: WHO and CDC

About COVID-19

- An infectious disease caused by a newly discovered coronavirus- SARS-CoV-2
- Declared as a **Pandemic** by WHO on 11th March 2020
- At this time, there are **no specific vaccines or treatments for COVID-19**. However, there are many ongoing clinical trials evaluating potential treatments
- **Incubation period ranges from 1 to 14 days** with a median of about 5 - 6 days, based on the available data
- Most people experience **mild to moderate respiratory illness** and recover without requiring special treatment
- **Older people**, and those with underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease, cancer and immunocompromised conditions are **more likely to develop serious illness**



Coronavirus disease 2019 (COVID-19)
Situation Report – 62

World Health Organization

Data as reported by national authorities by 23:59 CET 21 March 2020

HIGHLIGHTS

- Four new countries/territories/areas from the African Region have reported cases of COVID-19.
- As COVID-19 cases continue to increase, many countries are requesting individuals to stay at home in self-quarantine. WHO EURO has released a guide on how to stay physically active during self-quarantine. Information can be found here.
- There has been a rise in criminals disguising themselves as WHO to steal money or sensitive information. WHO urges individuals to stay alert and to verify the authenticity of the request. Information on protecting yourselves against scams as well as reporting the scam to WHO can be found here.

SITUATION IN NUMBERS
total (new) cases in last 24 hours

Globally
292 142 confirmed (26 069)
12 784 deaths (1600)

Western Pacific Region
94 787 confirmed (750)
3438 deaths (12)

European Region
151 293 confirmed (22 752)
7426 deaths (1426)

South-East Asia Region
1257 confirmed (278)
45 deaths (7)

Eastern Mediterranean Region
23 669 confirmed (1314)
1596 deaths (130)

Region of the Americas
19 685 confirmed (808)
252 deaths (17)

African Region
739 confirmed (167)
20 deaths (8)

WHO RISK ASSESSMENT
Global Level Very High

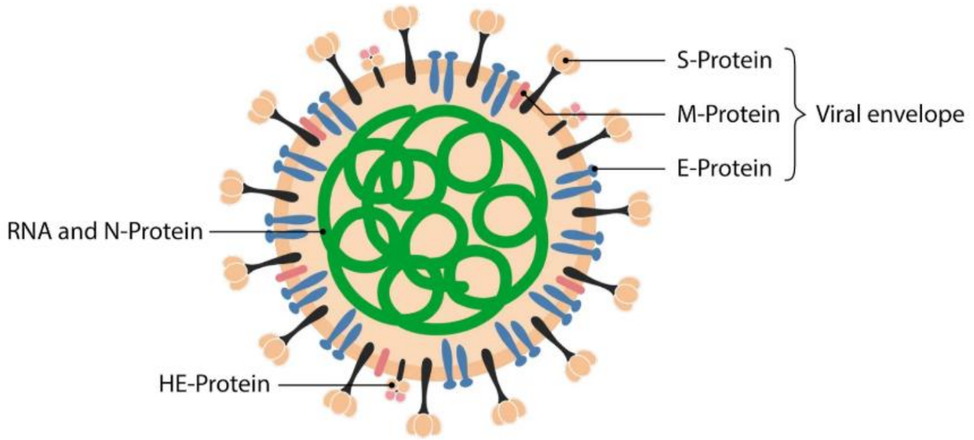
Figure 1. Countries, territories or areas with reported confirmed cases of COVID-19, 21 March 2020

Coronavirus disease (COVID-2019) situation reports by WHO:
https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports

Source: WHO, MOHFW

Transmission of COVID-19- How it Spreads?

- **Zoonotic transmission** (from animals to humans)
- **Human-to-human transmission**
  - SARS-CoV-2 binds, via its Spike (S) protein, to host cell through angiotensin-converting enzyme 2 (ACE2) and basigin (BSG)
  - ACE 2 is expressed by epithelial cells of the intestine, kidney, blood vessels, and most abundantly in type II alveolar cells of the lungs
  - Once in human, the virus is transmitted mainly via **direct hand-to-face contact** and **inhalation of aerosol** (suspension of fine solid particles or liquid droplets in air)/ **droplets from the coughing or sneezing of infected individuals**
  - As per WHO, transmission is also possible **through surface or object containing the virus** and then touching mouth, nose, or face

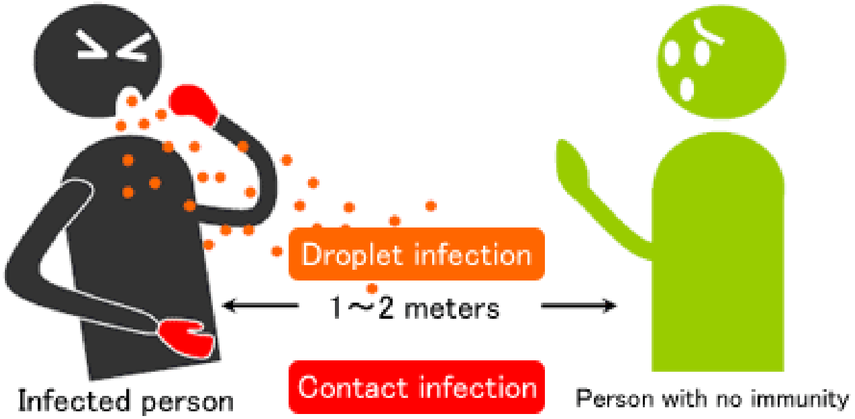


Structural proteins of the SARS-CoV 2 virion.
Image: by Lecturio

Source: WHO

Transmission of COVID-19- How it Spreads?

- **Human-to-human transmission (Contd.)**
  - SARS-CoV-2 is **highly contagious** due to the production of high viral loads and efficient shedding of virions from the upper respiratory tract
  - Droplets typically **do not travel more than 6 feet (about 2 metres)** from the infected individual, but can remain **viable in the air for up to 3 hours** under optimum conditions
  - **Infectious period** ranges from 2 days before the onset of symptoms up to 2-3 days after their resolution
  - **Asymptomatic individuals are also contagious**, but to a lesser degree
  - Number of secondary infections generated **from 1 infected individual, is between 2 and 2.5,** higher than for Influenza. This is called the R0



Symptoms

- The illness seems to start with a **fever, followed by a cough, and then followed by a shortness of breath** and some other respiratory symptoms like stuffy nose, weakness or malaise, nausea, vomiting, diarrhoea, or headaches

- **Emergency warning signs** for COVID-19 demanding immediate medical attention, include:
  - Trouble breathing
  - Persistent pain or pressure in the chest
  - New confusion or inability to arouse
  - Bluish lips or face
  - Other symptoms that are severe or concerning

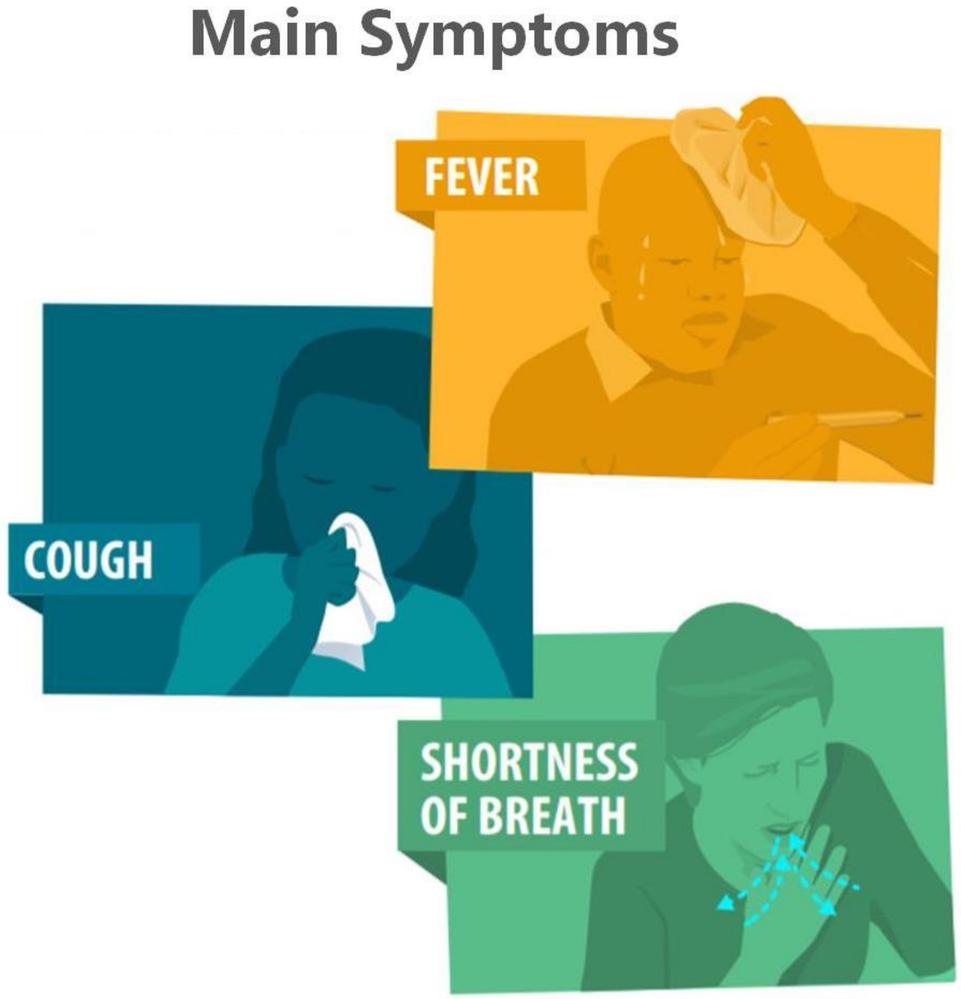


Image Credit: CDC

Source: MOHFW, CDC

Who is a Suspected Case of COVID-19?

A patient with

- acute respiratory illness {fever and at least one sign/symptom of respiratory disease (e.g., cough, shortness of breath)},

AND

- a history of travel to or residence in a country/area or territory reporting local transmission of COVID-19 disease during the 14 days prior to symptom onset

OR

A patient/Health care worker with

- any acute respiratory illness

AND

- having been in contact with a confirmed COVID-19 case in the last 14 days prior to onset of symptoms

OR

A patient with

- severe acute respiratory infection {fever and at least one sign/symptom of respiratory disease (e.g., cough, shortness breath)}

AND

- requiring hospitalization

AND

- with no other etiology that fully explains the clinical presentation

Source: MOHFW

Setting Up of Triage Area

- A well-equipped triage **station at the entrance to the facility**, **separate from the other areas** supported by trained staff
- The HCWs must be instructed to maintain a **very High Index of Suspicion**
- HCW to use screening questionnaires according to the updated case definition (from NCDC)
- The health workforce should be provided all **Personal Protective Equipment (PPE)**
- Post signs in public areas reminding symptomatic patients to alert HCWs
- Offer a medical mask to patients with suspected COVID-19 while they are in waiting/public areas or in cohorting rooms
- Evaluate family members of suspected patients for possibility of infection
- The patients should have access to material for respiratory hygiene like masks, tissue papers with adequate proper disposal facility thereof.

Source: WHO

Sample Algorithm for Management of Suspected COVID-19 cases

SCREEN – ISOLATE - TRANSFER

At Hospital Entrance

- Screening desk to be placed at the main entrance of the hospital lobby
- It will be manned by nurse who will screen (wearing PPE)
- H/O fever and cough/difficulty in breathing AND history of travel or Close Contact with suspected/ probable/ confirmed case of COVID 2019
- Temp with Infra-Red Thermometer

Not a Suspected Case

If patient has flu like symptom with no H/O travel or contact- will be given surgical mask & will be guided to **Respiratory/ Flu Clinic**

Suspected Case

- Nurse to fill screening form
- Referral to identified hospital along with screening form

All Patients with Fever and Cough arriving at **OPD**

Respiratory/Flu Clinic (with separate entrance and Registration desk)

Screening by dedicated nurse in Respiratory/Flu Clinic

- H/O fever and cough/difficulty in breathing AND history of travel or Close Contact with suspected/ probable/ confirmed case of COVID 2019
- Temp with Infra-Red Thermometer, vitals
- Spo2 with finger monitor
- Give mask to patient

Not a Suspected Case

- Send to Doctor in Respiratory / Flu Clinic
- Treatment as per patients clinical requirement

Suspected Case

- Nurse to fill screening form
- Send to Doctor in Respiratory/Flu Clinic
- Referral to identified hospital

For shifting to COVID-19 Authorized Hospital

- Call CATS ambulance (preferable)
- Can take in own car
- Avoid public transport
- While patient is awaiting transfer, isolate near screening desk
- Safe Transfer PPE

Source: Protocols from various hospitals

Screening for COVID-19

In Health Care Facilities

- Conduct timely and effective TRIAGE (assignment of degree of urgency) for early identification of patients with acute respiratory infection (ARI) to prevent the transmission of pathogens to health care workers and other patients
- Prioritize isolation and care of symptomatic patients
- Prevent Overcrowding. Maintain a separate **Flu-clinic** for all patients coming with flu-like symptoms
- 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

Key requirements in triage or screening area

- ✓ **Screening questionnaire**
- ✓ Algorithm for triage
- ✓ **PPE (Personal Protective Equipment)**
- ✓ **Hand hygiene supplies**
- ✓ **Infrared thermometer**
- ✓ Cleaning/disinfection supplies

Source: WHO

Screening of Visitors and Close Contacts

- **Screening of visitors and close contacts of a confirmed case should also be done**

- **All high risk contacts of a confirmed case**
  - if asymptomatic: should be put under home quarantine for at least 28 days.
  - if symptomatic: should be lab tested for COVID-19

Source: MOHFW

Sample Collection and Testing

- Lab test can be offered when prescribed by physician **as per ICMR Guidelines for COVID-19 testing**
- Currently, **only hospitals and collection centres authroised by ICMR can collect samples** for suspected cases of COVID-19
- Samples are to be **tested only in ICMR designated labs**
- On 21st March, ICMR announced that approved private labs can conduct the tests for COVID-19
- ICMR guidance evolves periodically and can be accessed at https://icmr.nic.in/content/covid-19

Current Testing Strategy:

i. **All asymptomatic individuals who have undertaken international travel in the last 14 days, if they become symptomatic for COVID-19**

ii. **All symptomatic contacts of laboratory confirmed cases**

iii. **All symptomatic health care workers**

iv. **All hospitalized patients with Severe Acute Respiratory Illness** (fever AND cough and/or shortness of breath)

v. **Asymptomatic direct and high-risk contacts of a confirmed case** should be tested once between day 5 and day 14 of coming in his/her contact

Source: ICMR

Home Quarantine

- Appropriate for patients with **mild infection** who can be adequately isolated in the outpatient setting
- Patients should be advised to
  - **stay at home** and try to separate themselves from other people in the household
  - **wear a facemask** when in the same room (or vehicle) as other people and when presenting to healthcare settings
- Caregivers should ensure **regular disinfection** of frequently touched surfaces by the patient

MoHFW Guidelines for home quarantine

https://www.mohfw.gov.in/DraftGuidelinesforhomequarantine.pdf

Source: MoHFW

Setting up Isolation Facility

- Set-up one single large COVID-19 dedicated facility at each location and preferably at a newer construction
  - **Newly constructed hospitals/newly constructed wings** of hospitals should be considered for conversion to COVID-19 isolation facility
  - **Logistically simpler** to manage manpower, supplies, disinfection and waste management
  - Select facilities positioned **away from densely populated** areas of the city
  - **Triage area** must be right next to the admission facility so possibility of cross infection is minimized
  - **Disinfection** of these facilities must be done rigorously and repeatedly as per protocol
  - **Commonly available room air-purifiers with HEPA filters** (used for air-pollution) may be placed alongside beds to remove viral load from the air and thereby reduce chances of cross infection

Source: WHO

Basic Administrative Measures

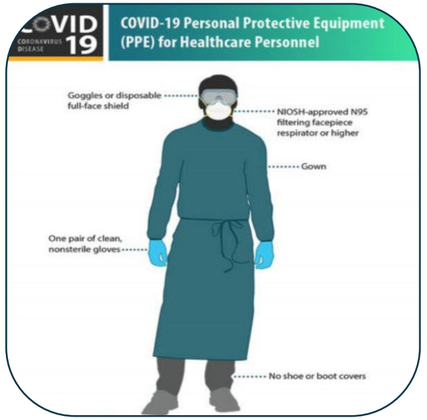
Prevent overcrowding, especially in OPDs/ Pharmacies/Emergency Departments

- **Separate/alternative provision for OPD patients** should be considered
- A **separation of at least 1 meter** should be maintained between all patients
- Plan a safe flow of patients, to help prevent transmission of ARI-causing pathogens
- Provide health services targeting uninfected populations in a separate facility
- Provide **dedicated waiting areas** for symptomatic patients
- Ensure adequate supplies of **quality PPE with N-95 or better respirators**
- Ensure strict adherence to IPC policies and procedures for all aspects of health care

Source: WHO

Basic Administrative Measures: Surge Management

- Plan for surge capacity according to the estimated impact of a potential pandemic on health care
- Identify the supplies and infrastructures needed to implement IPC measures.
- Outline the limits of the health-care facility's surge capacity and suggest thresholds at which alternative sites for provision of health care
- Outline surge capacity in relation to
  - Supplies (e.g. pharmaceuticals and PPE);
  - Ventilators and supplemental oxygen
  - Staff – develop plans to maintain sufficient personnel to carry out activities (e.g. by planning alternative shifts or staffing assignments, and having a supplemental staffing plan)
  - Infrastructure and Space
  - Laboratory and diagnostic capacity
  - Security policies to handle an unexpected increase in demand for services



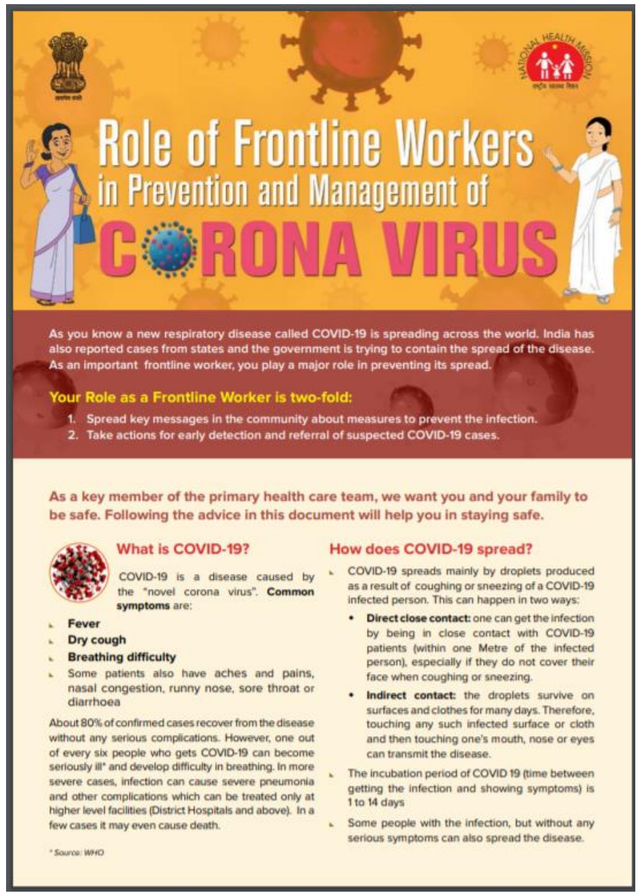
Source: WHO

Basic Administrative Measures: Limiting HCW Exposure

- **Develop strong assessment, reporting and management channels to assess HCWs for potential infection upon exposure and rapid treatment facilities for the same**
- Organize health-care workers into groups designated for caring for patients
- Check temperature of each HCW regularly (e.g. before and after each work shift)
- Monitor HCW for symptoms of infection (cough, sore throat and difficulty in breathing) for 7–10days after last possible exposure to a patient with a patient of potential concern
- Advise workers to take the following actions if they develop a fever >38°C or symptoms of infection
    - Stop work immediately or do not report to work
    - Limit interactions with others
    - Exclude themselves from public areas
    - Notify management or the team dealing with IPC

Source: WHO

Ministry of Health and Family Welfare
Role of Frontline Health Workers in COVID-19



Role of Frontline Workers in Prevention and Management of CORONA VIRUS

As you know a new respiratory disease called COVID-19 is spreading across the world. India has also reported cases from states and the government is trying to contain the spread of the disease. As an important frontline worker, you play a major role in preventing its spread.

Your Role as a Frontline Worker is two-fold:

1. Spread key messages in the community about measures to prevent the infection.
2. Take actions for early detection and referral of suspected COVID-19 cases.

As a key member of the primary health care team, we want you and your family to be safe. Following the advice in this document will help you in staying safe.

What is COVID-19?

COVID-19 is a disease caused by the "novel corona virus". **Common symptoms** are:

- **Fever**
- **Dry cough**
- **Breathing difficulty**
- Some patients also have aches and pains, nasal congestion, runny nose, sore throat or diarrhoea

About 80% of confirmed cases recover from the disease without any serious complications. However, one out of every six people who gets COVID-19 can become seriously ill* and develop difficulty in breathing. In more severe cases, infection can cause severe pneumonia and other complications which can be treated only at higher level facilities (District Hospitals and above). In a few cases it may even cause death.

** Source: WHO*

How does COVID-19 spread?

- COVID-19 spreads mainly by droplets produced as a result of coughing or sneezing of a COVID-19 infected person. This can happen in two ways:
  - **Direct close contact:** one can get the infection by being in close contact with COVID-19 patients (within one Metre of the infected person), especially if they do not cover their face when coughing or sneezing.
  - **Indirect contact:** the droplets survive on surfaces and clothes for many days. Therefore, touching any such infected surface or cloth and then touching one's mouth, nose or eyes can transmit the disease.
- The incubation period of COVID 19 (time between getting the infection and showing symptoms) is 1 to 14 days
- Some people with the infection, but without any serious symptoms can also spread the disease.

https://www.mohfw.gov.in/pdf/PreventionandManagementofCOVID19FLWEnglish.pdf

कोरोना वायरस
रोकथाम और प्रबंधन में फ्रंटलाइन कार्यकर्ताओं की भूमिका

जैसा कि आप जानते हैं कि COVID-19 (कोरोना–वायरस) नामक एक नया सीस/स्वसन संक्रमण रोग दुनिया भर में फैल रहा है। भारत के विभिन्न राज्यों में भी इस संक्रमण के मामले दर्ज किए जा रहे हैं और सरकार इस बीमारी को फैलने से रोकने का भरपूर प्रयास कर रही है। एक फ्रंटलाइन कार्यकर्ता के रूप में, इसे फैलने से रोकने में आपकी महत्वपूर्ण भूमिका है।

फ्रंटलाइन कार्यकर्ता के रूप में आपकी दोहरी भूमिका है

1. **संक्रमण को फैलने से रोकने के लिए समुदाय में महत्वपूर्ण संदेशों का प्रसार करना।**
2. **संदिग्ध COVID-19 मामलों की शीघ्र पहचान करना और उनके उचित रेफेरल की कार्यवाही करना।**

प्राथमिक स्वास्थ्य देखभाल टीम के एक प्रमुख सदस्य के रूप में, हम चाहते हैं कि आप और आपका परिवार सुरक्षित रहें। नीचे आपके सुरक्षित रहने के लिए महत्वपूर्ण जानकारी का सारांश दिया गया है।

COVID-19 क्या है?

COVID-19 "नोवल कोरोना–वायरस" के संक्रमण से होने वाली बीमारी है। इसके सामान्य **लक्षण** हैं :

- **बुखार**
- **सूखी खाँसी**
- **सांस लेने में कठिनाई**
- कुछ रोगियों में **मांसपेशियों और जोड़ों का दर्द, नाक बंद, नाक बहना, गले में खराश होना या दस्त** जैसे सामान्य लक्षण भी हो सकते हैं।

संक्रमण ग्रस्त होने की पुष्टि के बाद भी लगभग 80% मामले बिना किसी गंभीर जटिलता के ठीक हो जाते हैं। परन्तु COVID-19 से संक्रमित होने वाले हर 6 में से एक व्यक्ति गंभीर रूप से बीमार हो सकता है और उसे सांस लेने में कठिनाई हो सकती है।* अधिक जोखिम वाले मामलों में यह गंभीर निमोनिया और अन्य जटिलताओं का कारण भी बन सकता है जिनका इलाज केवल उच्च–स्तरीय स्वास्थ्य सुविधाओं (कम से कम जिला–अस्पताल) में ही किया जा सकता है। कुछ मामलों में यह संक्रमण मृत्यु का कारण भी हो सकता है।

** स्रोत : विश्व स्वास्थ्य संगठन*

COVID-19 कैसे फैलता है?

- जब COVID-19 से संक्रमित कोई व्यक्ति खांसता या छींकता है तो उसके मुंह या नाक से निकली बूंदों द्वारा यह रोग फैलता है। ऐसा मुख्यतः दो तरह से हो सकता है :
  - **प्रत्यक्ष निकट संपर्क** (Direct close contact): COVID-19 ग्रस्त रोगी या संक्रमित व्यक्ति के निकट संपर्क (1 मीटर या उससे कम दूरी) में आने से कोई भी व्यक्ति इससे संक्रमित हो सकता है।
  - **अप्रत्यक्ष संपर्क** (Indirect contact): थूक की बूंदें सतहों और कपड़ों पर कई दिनों तक जीवित रहती हैं। इसलिए, ऐसी किसी भी संक्रमित सतह या कपड़े को छूने और उसके बाद मुंह, नाक या आंखों को छूने से यह बीमारी फैल सकती है।
- COVID-19 के पनपने की अवधि (संक्रमण होने और लक्षण दिखने के बीच का समय) 1 से 14 दिन है।
- यह बीमारी उन संक्रमित व्यक्तियों से भी फैल सकती है जिनमें कोई गंभीर लक्षण नहीं है।

https://www.mohfw.gov.in/pdf/PreventionandManagementofCOVID19FLWHindi.pdf

Source: MOHFW

Completed:

Introduction

Next Topic

Infection Prevention and Control

Next Topic

Infection Prevention and Control