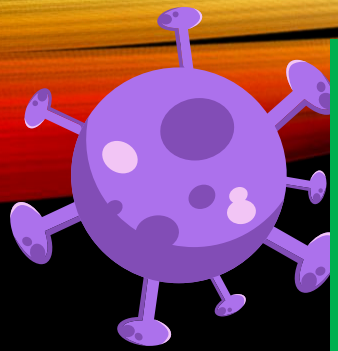
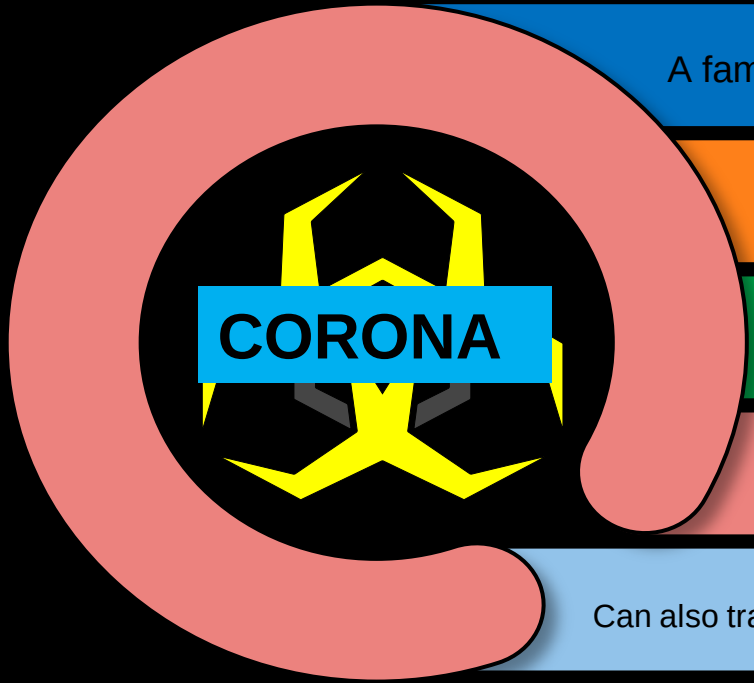


COVID-19
(CORONAVIRUS DISEASE 2019)

By:- Mr Cyril Savio

What's a Corona virus ?



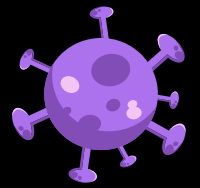
A family of viruses affecting Respiratory Tract

Causing Disease from common cold to Pneumonia.

Usually lives in bats & other wiled animals.

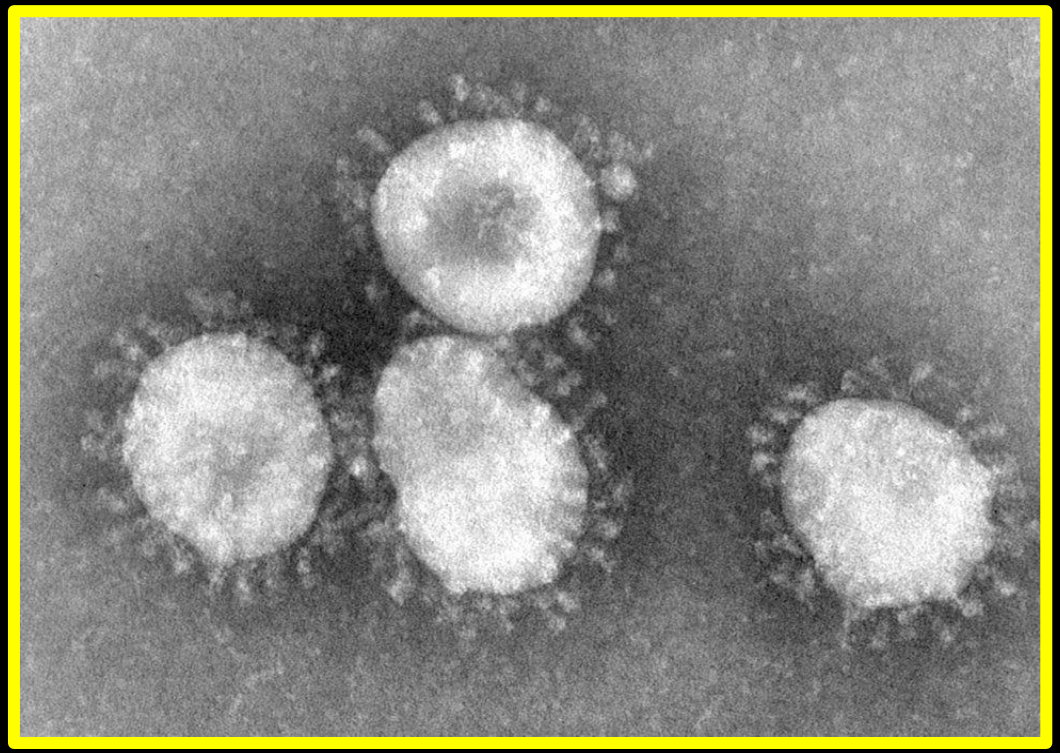
Transmitted to humans directly, or via other animals.

Can also transmit between humans via respiratory droplets,

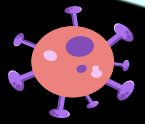


“Coronaviruses viewed under an electron microscope. Note the characteristic crown-like (corona) appearance”

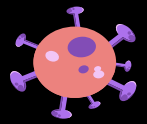
By CDC/Dr. Fred Murphy



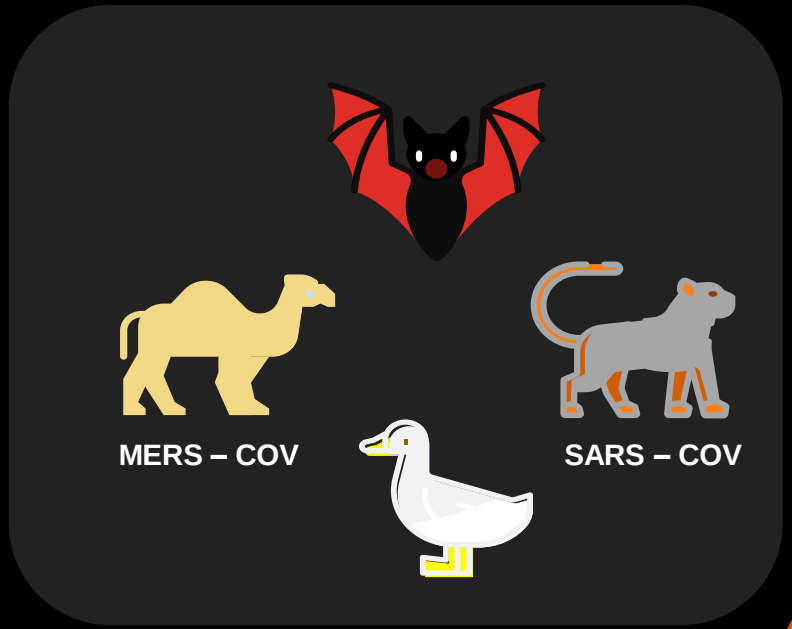
ETIOLOGY



- Coronaviruses (CoV) are a family of enveloped, positive-sense, single-stranded RNA (+ssRNA) viruses. species of CoV, only 3 are known to cause severe infections in humans:
- **Severe acute respiratory disease coronavirus (SARS-CoV):** emerged in 2003 in southern China from civet cats
- **Middle East respiratory syndrome coronavirus (MERS-CoV):** emerged in 2012 in Saudi Arabia from dromedary camels
- **SARS-CoV 2:** emerged in December 2019 in China possibly from **bats or pangolins** (still under investigation)



Origin of the Virus Circulate in a Range of animals



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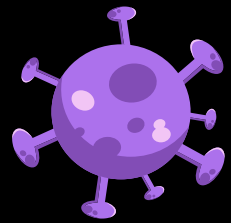
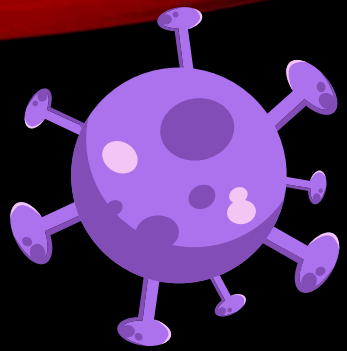
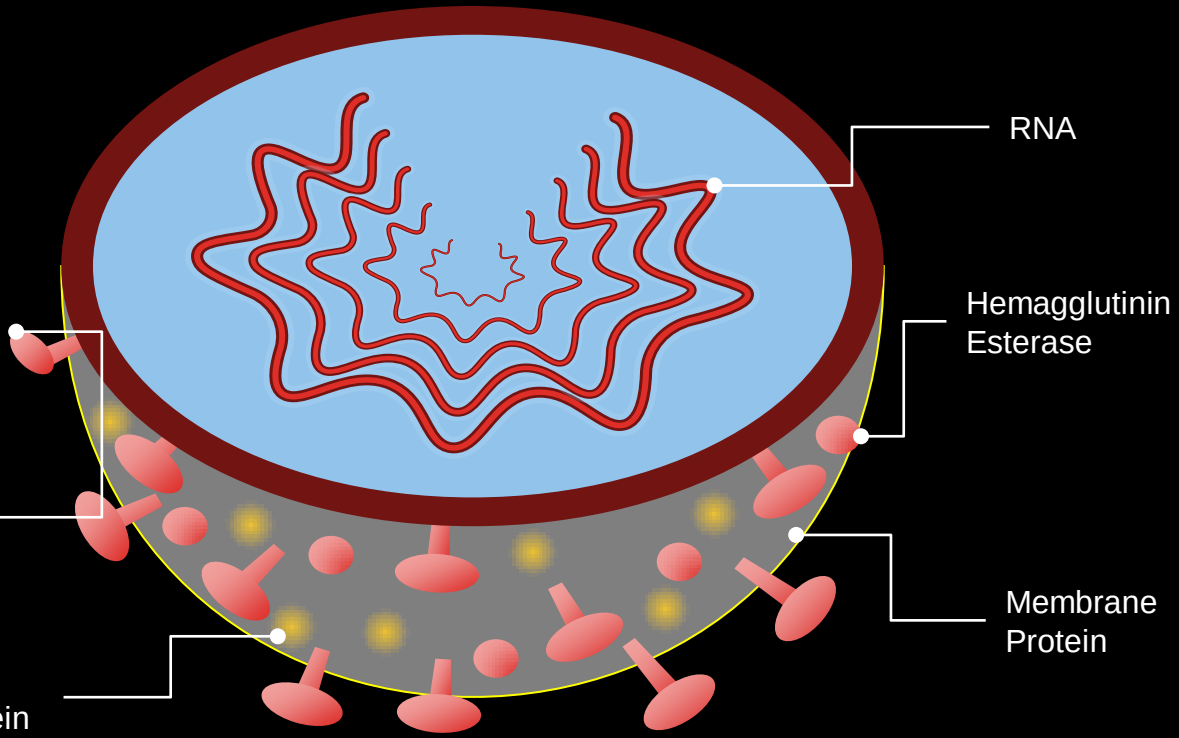
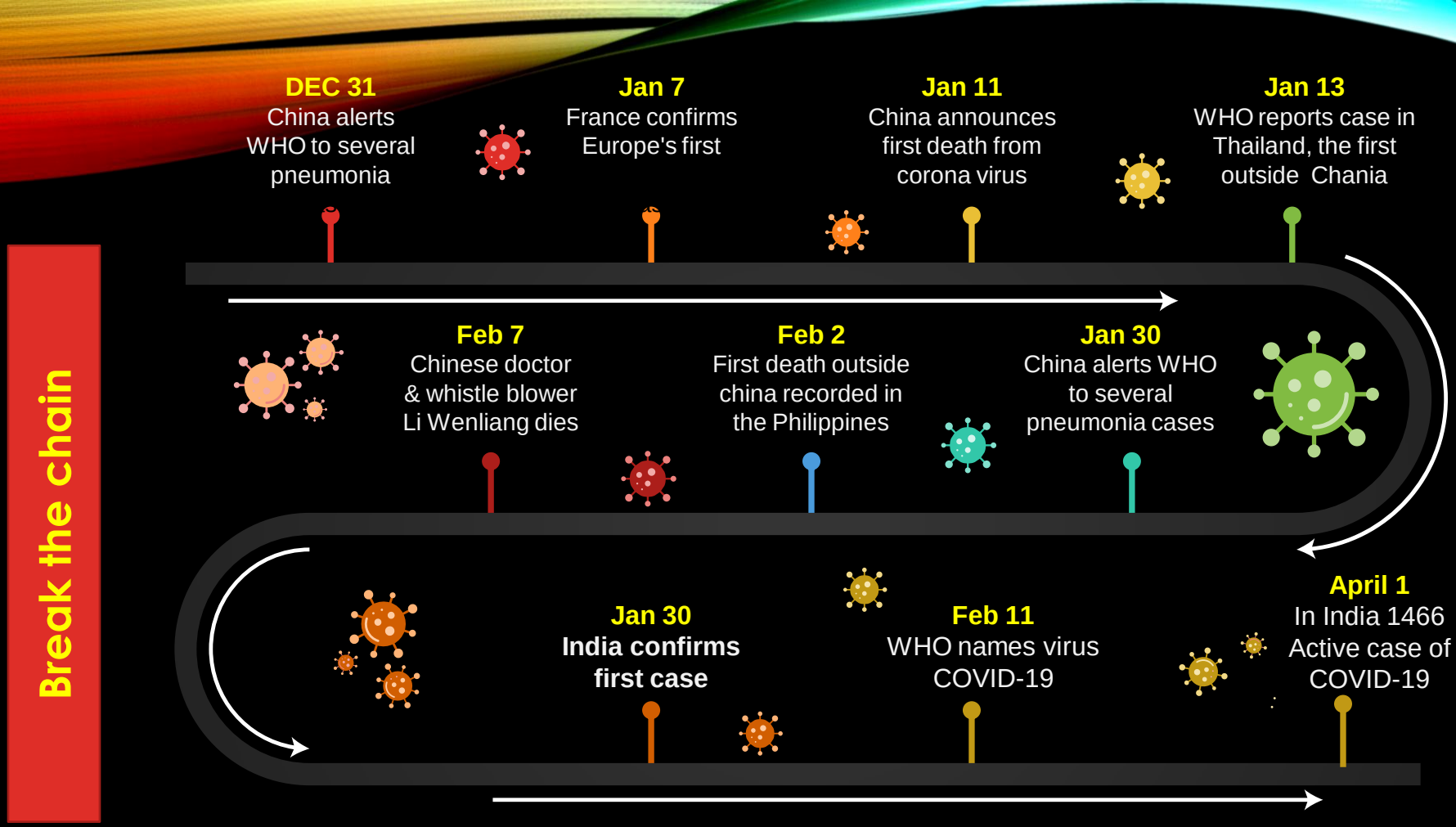
2019 - NCOV

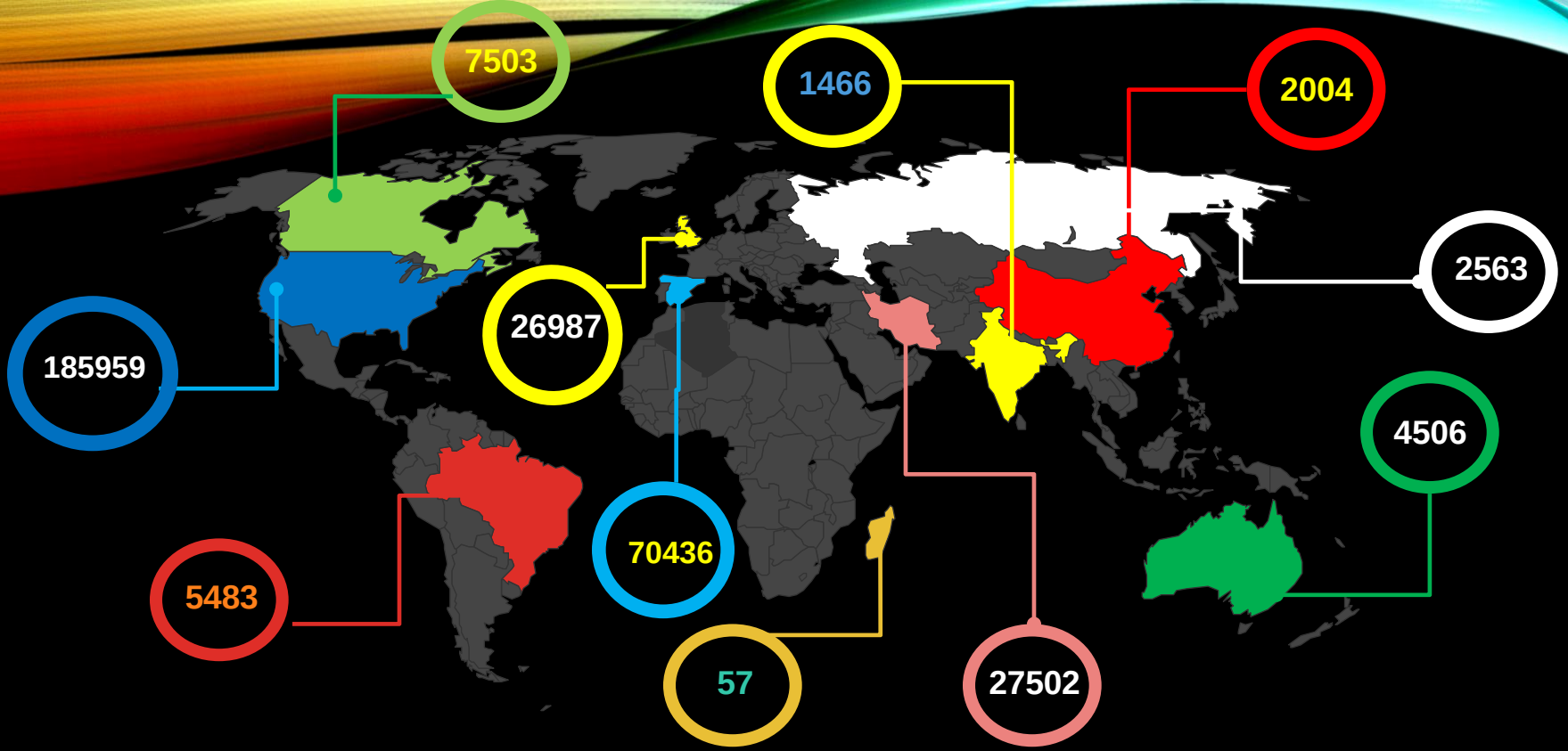


Virus Structure





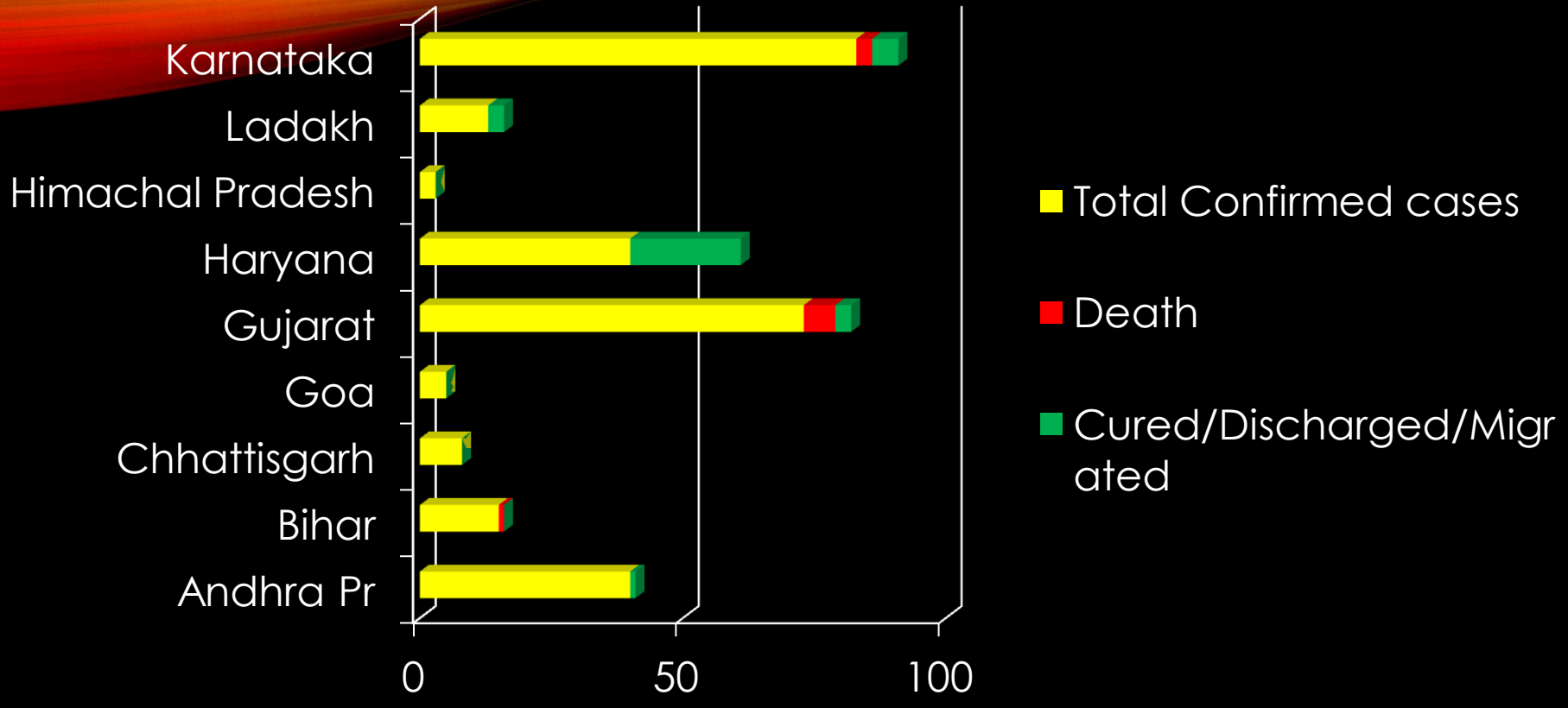

Break the chain
DEC 31
China alerts WHO to several pneumonia
Jan 7
France confirms Europe's first
Jan 11
China announces first death from corona virus
Jan 13
WHO reports case in Thailand, the first outside Chania
Jan 30
China alerts WHO to several pneumonia cases
Feb 2
First death outside china recorded in the Philippines
Feb 7
Chinese doctor & whistle blower Li Wenliang dies
Jan 30
India confirms first case
Feb 11
WHO names virus COVID-19
April 1
In India 1466 Active case of COVID-19



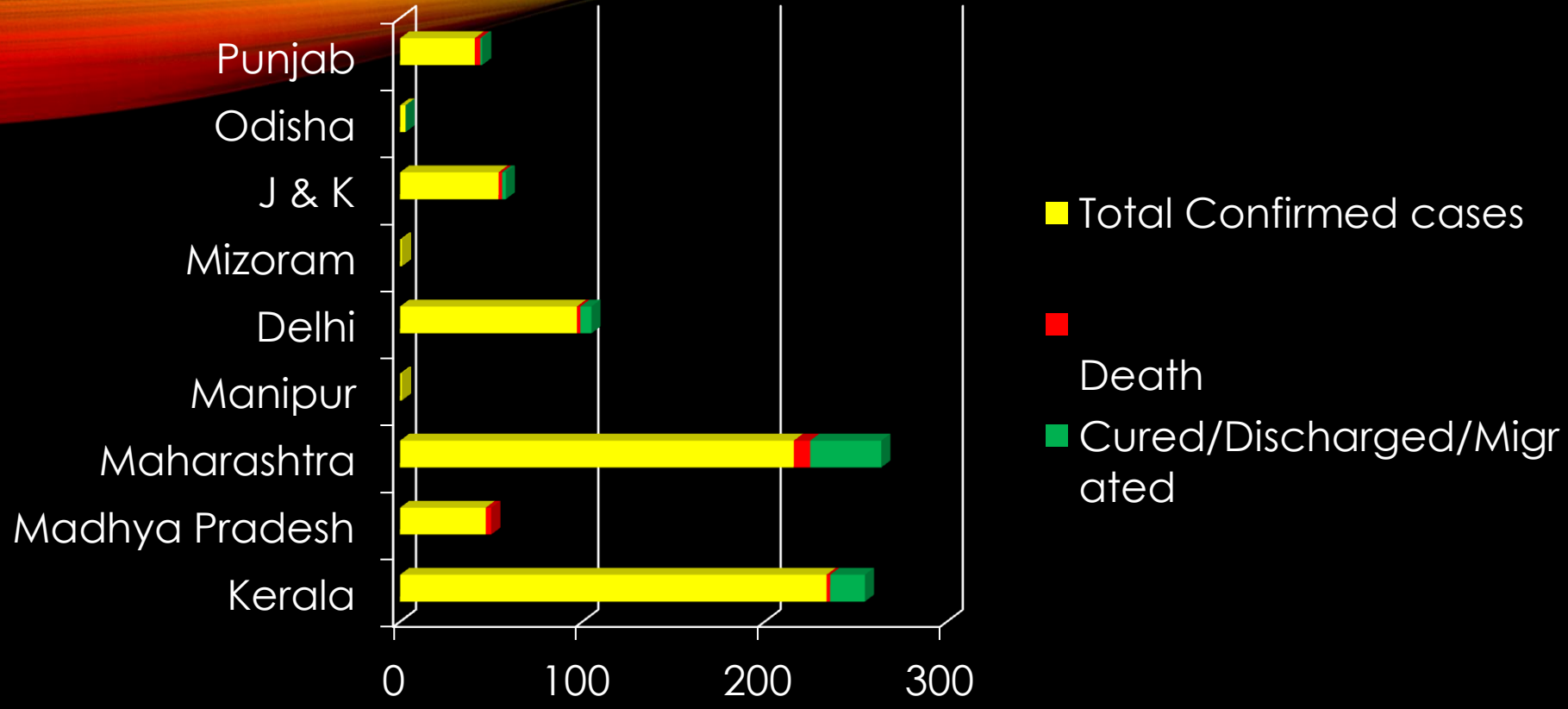
Total Fatal Cases – 45,050

Total Active Cases – 659,507

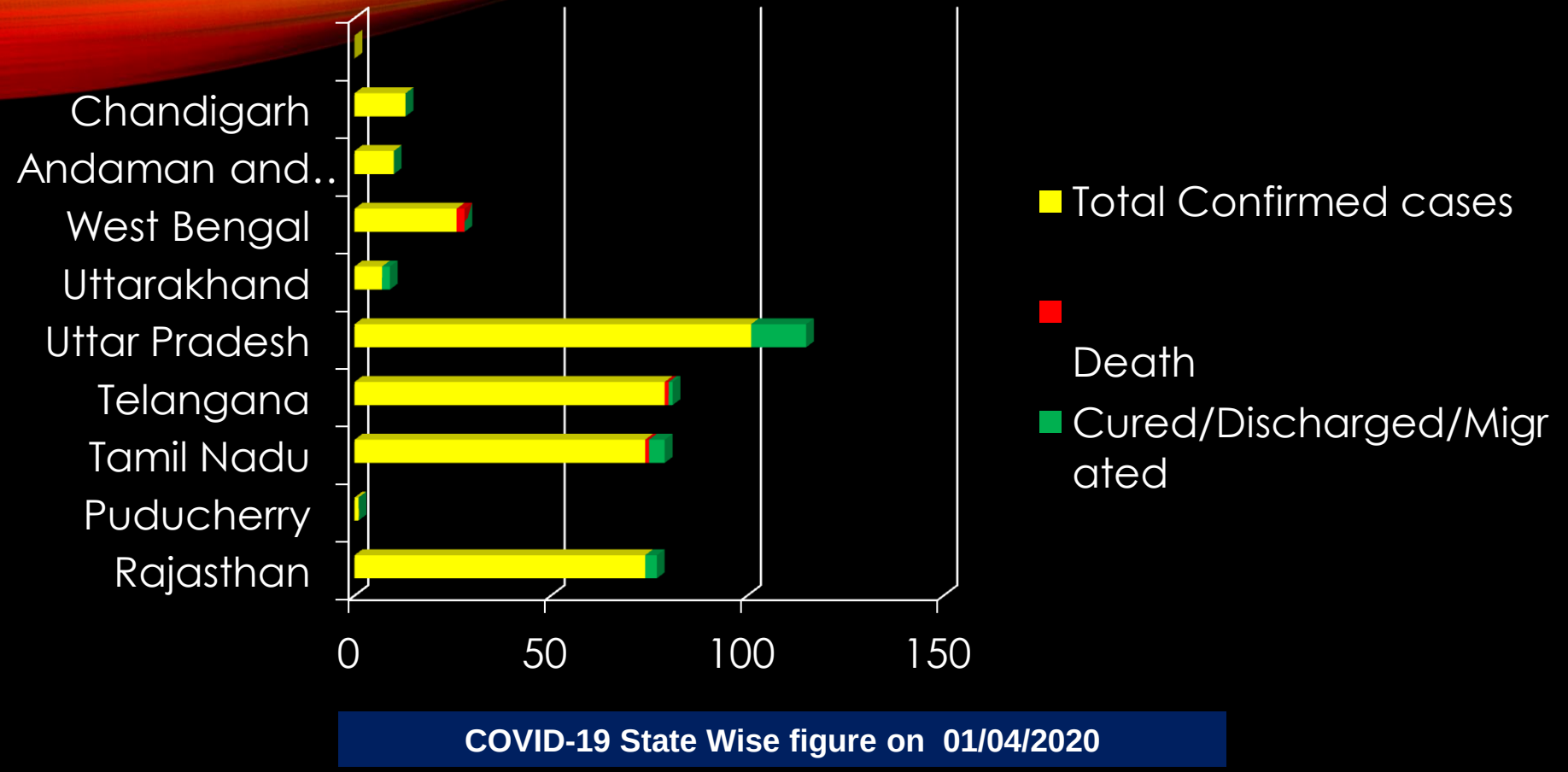
Note: Above mentioned numbers are active COVID-19 Cases in different countries of the world up to 01/04/2020



COVID-19 State Wise figure on 01/04/2020

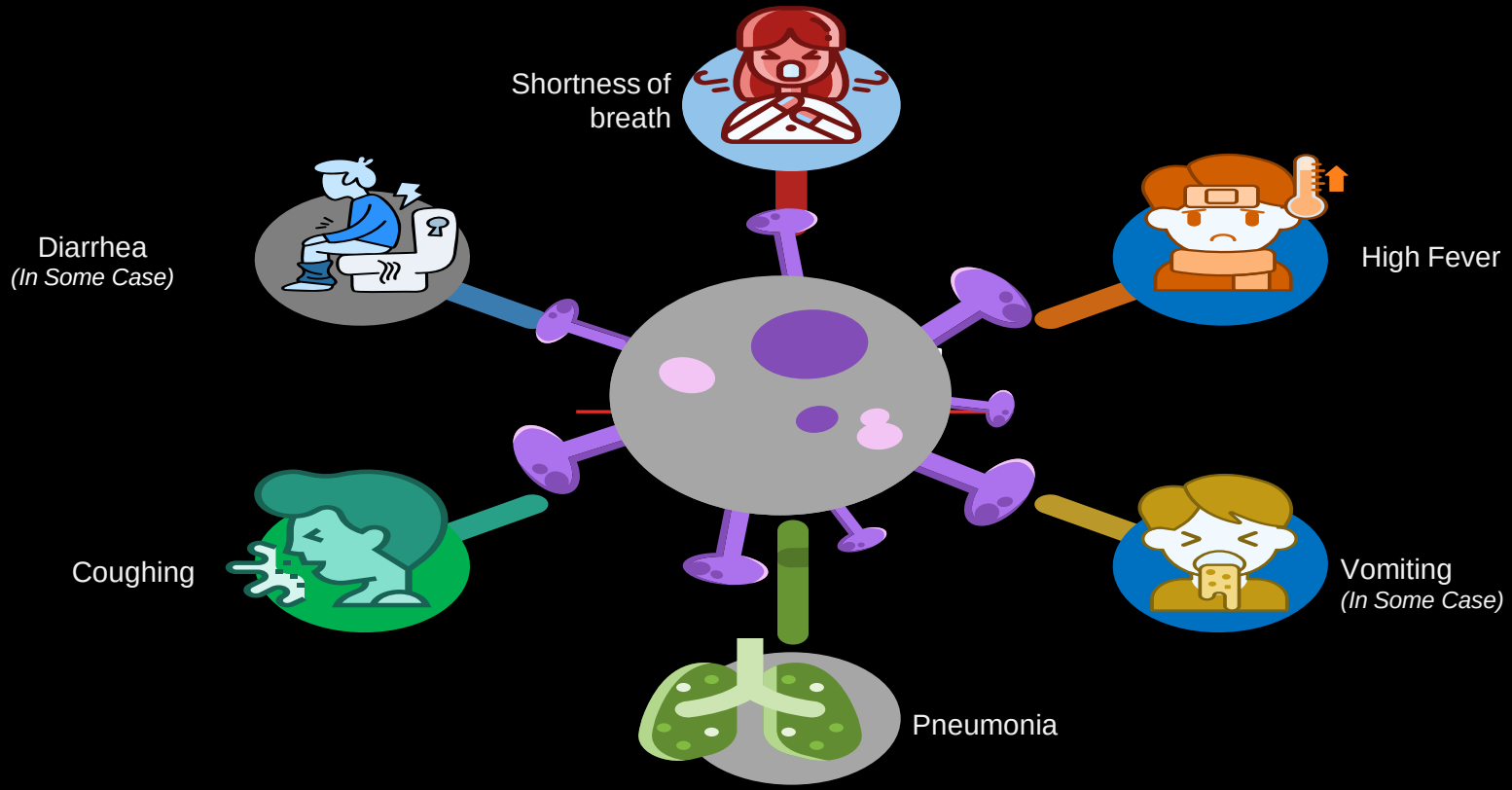


COVID-19 State Wise figure on 01/04/2020



COVID-19 State Wise figure on 01/04/2020

Corona Virus Symptoms



CLINICAL PRESENTATION

The incubation period for COVID-19 ranges from 2–14 days, with an average of 5 days.

- 80% of infections are mild or asymptomatic.
- 15% are severe infections (requiring oxygen therapy).
- 5% are critical infections (requiring ventilation).

This proportion of severe and critical to mild cases is higher than in influenza infections.

Asymptomatic cases:

- Can transmit the virus
- Represent >50% of all infections (still under investigation)

TRANSMISSION

- CoV are zoonotic or transmitted to humans through animals. It is hypothesized that horseshoe bats are the natural reservoir of SARS-CoV 2 since its genome is 97% identical to that of a bat coronavirus. The intermediate host is still unknown.
- The virus is transmitted mainly via inhalation of aerosol droplets from coughing, sneezing, or talking of symptomatic individuals. In the air, larger droplets tend to drop towards the ground within 1 m (3 ft), while smaller droplets can travel as an aerosol cloud over 2 m (6 ft) and remain viable in the air for up to 3 hours under certain conditions. Other forms of transmission include:
- Direct transmission through hand-to-face contact from infected surfaces.
- Fecal-oral transmission is hypothesized (observed in SARS infection, but is still under investigation).
- Vertical transmission (mother-to-child) hasn't been reported.

May not develop any noticeable symptoms

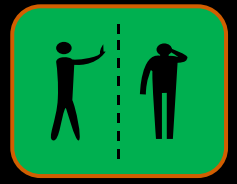
- Anosmia, hyposmia, and dysgeusia have been reported in many laboratory-confirmed cases of patients that were otherwise asymptomatic.
- It has not been clearly determined how long asymptomatic individuals remain contagious after initial infection.

Mild cases:

- Dry cough and moderate fever
- Common flu-like symptoms, including fatigue, malaise, runny nose, nasal congestion, and sore throat
- Less frequently: diarrhea, nausea, vomiting, diffuse abdominal pain, productive cough, headache, and muscle or joint pain
- Recovery time: ~2 weeks

PREVENTION

Wash Hands with water and soap/Sanitizer, at least 20 Seconds



Avoid contact with sick people

Don’t touch eyes, nose or mouth with unwashed hands

Don’t eat raw food, thoroughly cook meat and eggs

Avoid contact with animals and animal products

IF YOU ARE INFECTED

Stay at home

Avoid Contact with others

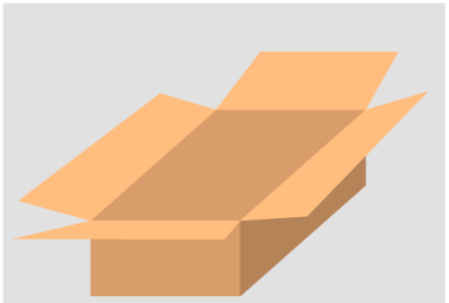
Cover your nose and mouth when sneezing

Keep objects and surface clean

Wear a surgical mask

Persistence of coronavirus on surfaces

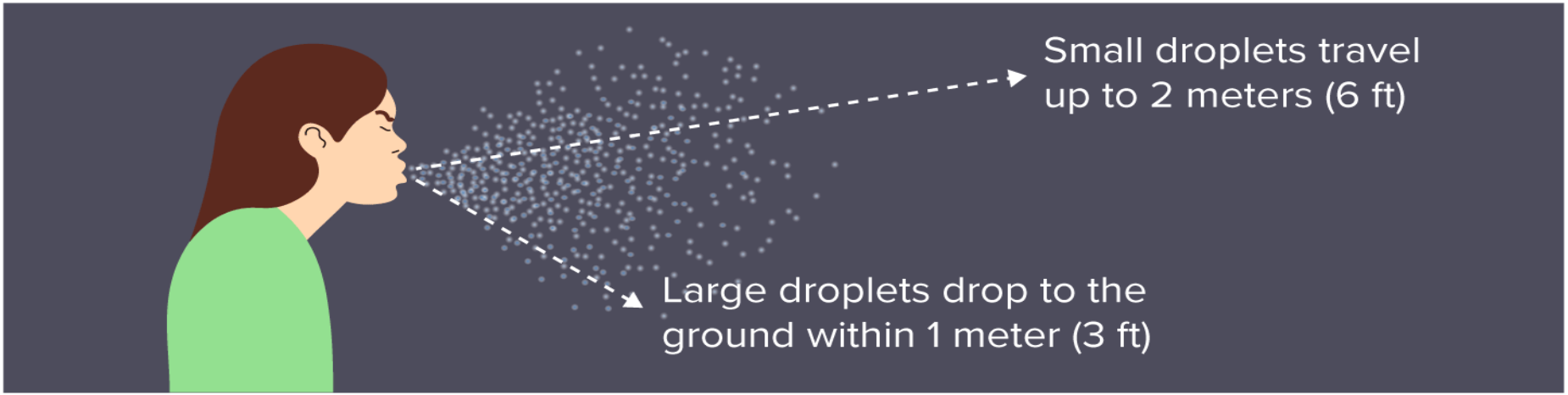
Copper: 4 hours



Cardboard: 24 hours

Plastic & stainless steel: 2-3 days

Air: 3 hours



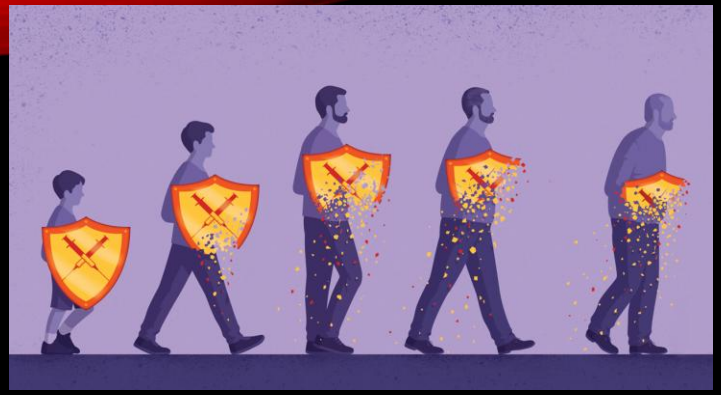
COMMON COMPLICATIONS OF COVID-19:

- Viral/interstitial pneumonia
- Acute respiratory distress syndrome (ARDS)
- Sepsis, and septic shock

Severe cases and complications:

- ~1 in 6 people with COVID-19 experience clinical deterioration and/or develop a complication in the 2nd week of illness
- Median time from onset of symptoms to the onset of critical care/ICU transfer: 8-9 days
- Patients develop dyspnea, high fever, chest pain, hemoptysis, respiratory crackles, and progressive respiratory failure
- Recovery time: ~3-6 weeks

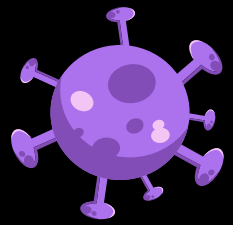
RISK FACTORS



Immunosuppression

60+ y/o

Pregnancy

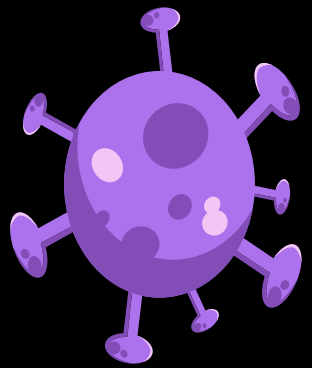


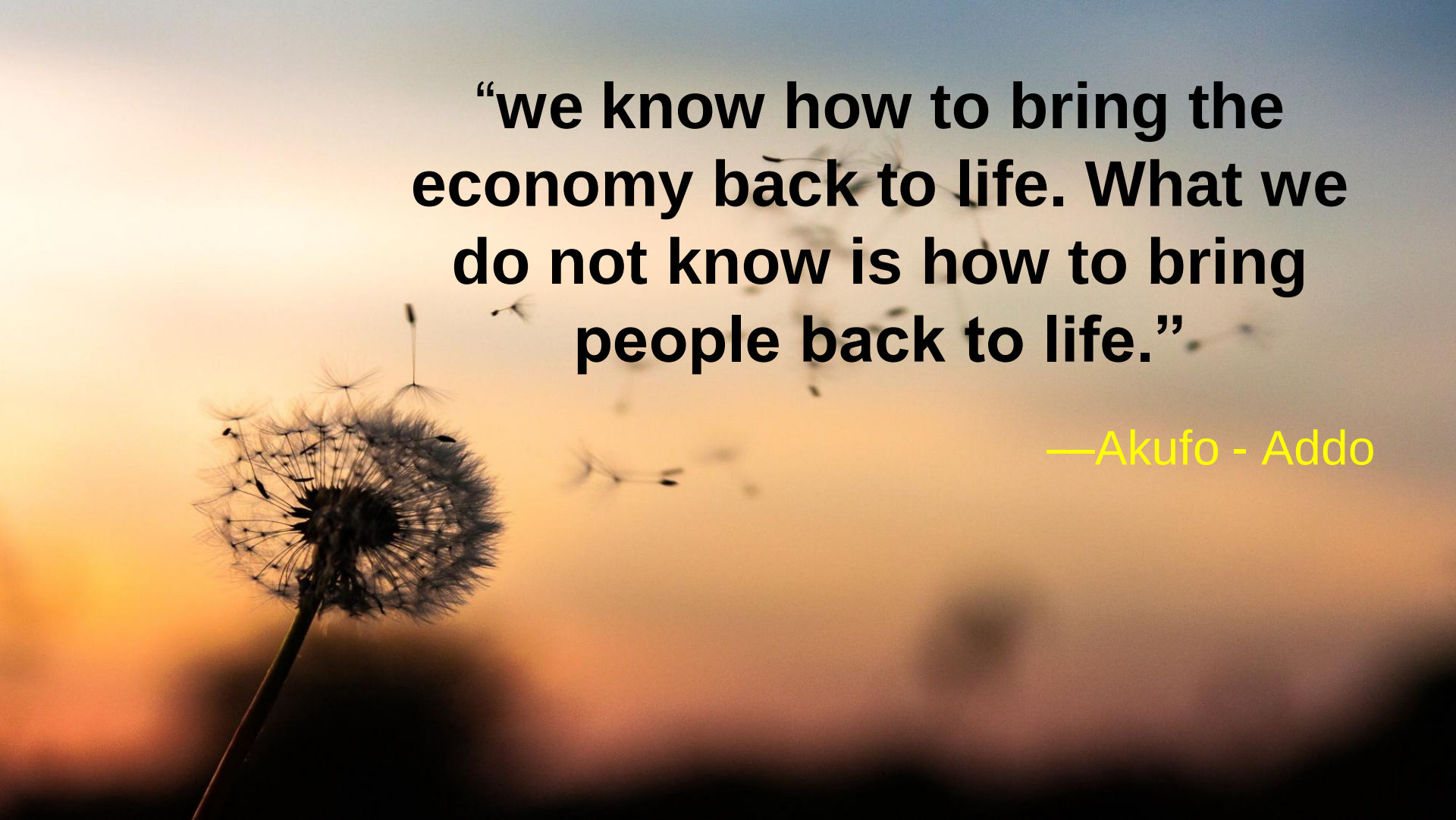
894,027

Cases detected

140+

Countries affected



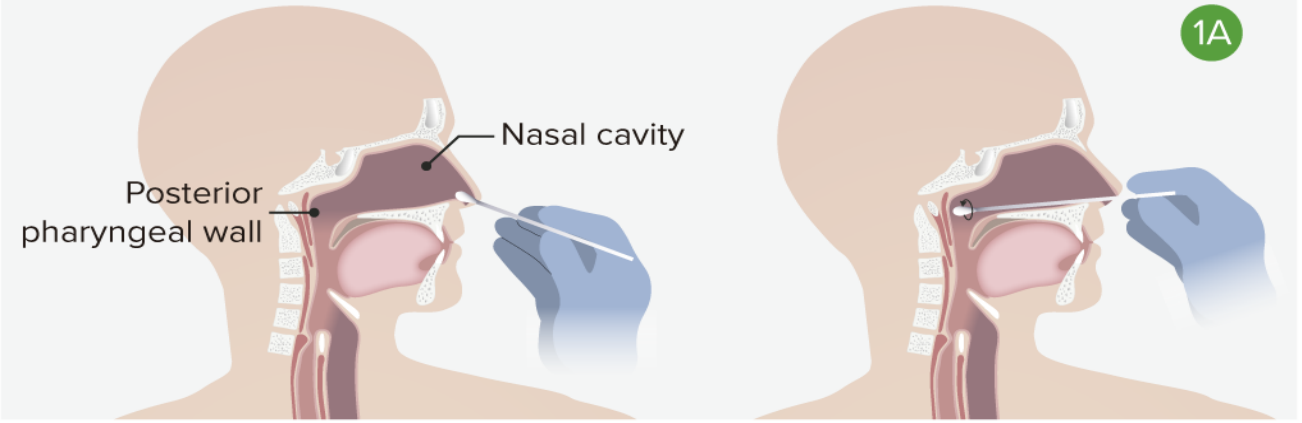

“we know how to bring the economy back to life. What we do not know is how to bring people back to life.”
—Akufo - Addo

Diagnostics

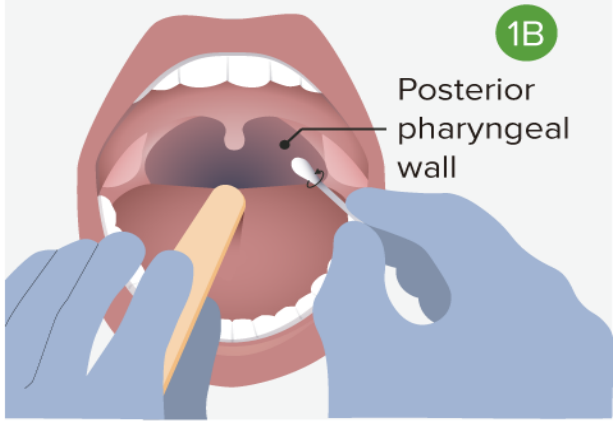
Polymerase chain reaction (PCR) is currently the only test being used to confirm cases of COVID-19 infection and should be performed as soon as possible once a person under investigation (PUI) is identified. The specimens used for testing include:

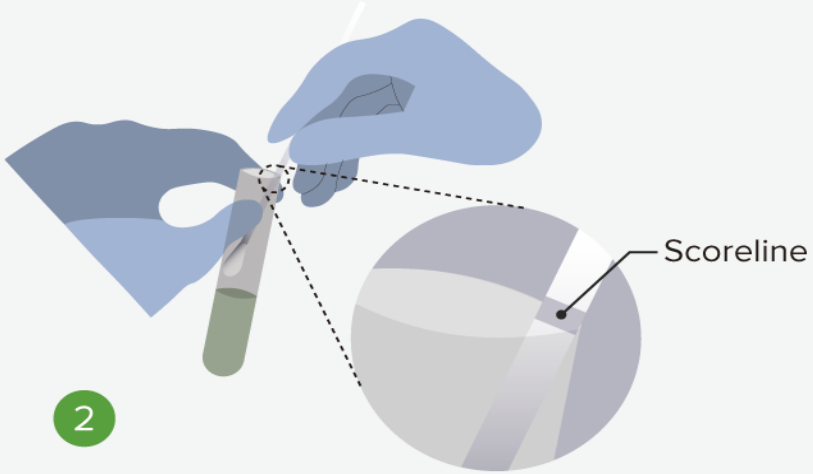
- **Nasopharyngeal (NP) and/or oropharyngeal (OP) swab (for mild or asymptomatic suspected cases)**
  - **NP is the first choice. OP swabs are acceptable only if other swabs are not available.**
  - **Can be negative initially. If suspicion of COVID-19 remains, retest every 2-3 days.**
  - **In severe cases, NP and OP swabs may be negative, while specimens from the lower respiratory tract are positive.**
- **Sputum (for patients with productive cough, inducing is not recommended)**
- **Bronchial and tracheal secretions or bronchoalveolar lavage (for patients receiving invasive mechanical ventilation)**

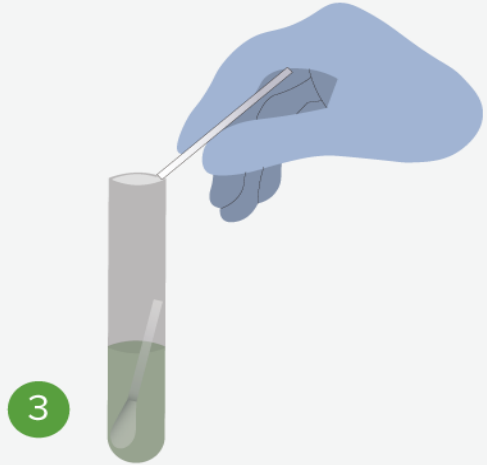
Nasopharyngeal swab

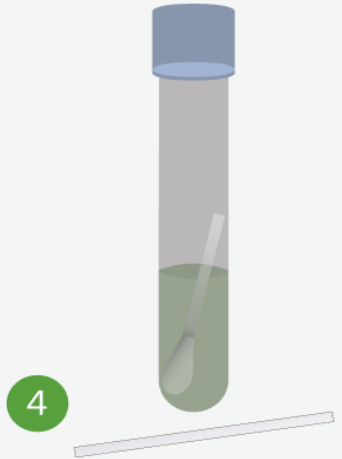


Oropharyngeal swab









In hospitalized patients with severe infections, regular laboratory testing and imaging are necessary in order to monitor disease progression and early diagnosis of complications.

- **CBC:** severe cases present with advanced lymphocytopenia and thrombocytopenia
- **ABG:** to assess levels of hypoxia and acid-base balance
  - ARDS presents initially as hypoxemic respiratory failure with low PaO_2 and respiratory alkalosis, later progressing into hypercapnic respiratory failure.
- **Inflammatory markers:**
  - ↑ IL-6 and C-reactive protein in severe cases
  - ↑ procalcitonin in bacterial coinfection with pneumonia and/or sepsis
  - ↑ lactate in sepsis and septic shock

- **Hemostasis tests:**
  - Prolonged PT and PTT times
  - ↑ D-dimer in cardiac injury and septic shock
- **Assessment of organ function:** abnormal findings may indicate multi-organ failure
  - Creatinine, urea, and BUN used to assess renal function
  - AST, ALT, GGT, and bilirubin used to assess hepatic function
  - Troponin and ECG used to assess cardiac function
- **Chest X-ray and CT:** severe infections may also present
  - Pleural thickening and effusion
  - Lymphadenopathy
  - Air bronchograms and atelectasis
  - Solid white consolidation

TREATMENT

01

No specific treatment for COVID-19 is currently available. Always implement practices for infection prevention and control (IPC)

02

Patients with mild symptoms are recommended to begin supportive at-home care. In the case of antipyretics, the use of ibuprofen

03

- Oxygen therapy for patients who develop respiratory distress, hypoxemia, or shock
- Empiric antimicrobials in the case of sepsis or secondary pneumonia

04

Advanced oxygen therapy, ventilatory support, and conservative fluid management in the case of acute respiratory distress syndrome

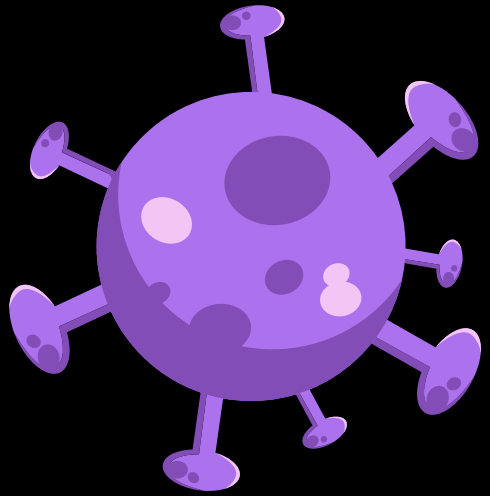
INVESTIGATIONAL THERAPIES

Several clinical trials are currently being performed to further the development and research of antiviral drugs against SARS-CoV 2. However, it's important to note that there is no available data as of April 1, 2020, to support the recommendation of any of the following investigational therapeutics for patients with confirmed/suspected COVID-19:

- **Remdesivir** is reported to have in-vitro activity against SARS-CoV and MERS-CoV by incorporating into nascent viral RNA chains and producing pre-mature termination.
- **Chloroquine and hydroxychloroquine,** widely-used antimalarial drugs, are reported to block viral entry by inhibiting virus/cell fusion.

- The combined use of **hydroxychloroquine and azithromycin**, a macrolide antibiotic, was reported to **reduce the detection of SARS-CoV-2 RNA** in upper respiratory tract specimens. Caution is advised when administering these drugs in patients with chronic medical conditions as both are associated QT prolongation and may lead to life-threatening arrhythmia or sudden death.
- **Lopinavir-ritonavir**, a combined protease inhibitor usually used for HIV infection, was reported as having in vitro inhibitory activity against SARS-CoV. However, no benefit was observed in hospitalized adult patients with severe Covid-19 in trials conducted in China.
- **Tocilizumab** is an **anti-IL-6 receptor agent** used for rheumatoid arthritis. It is currently being investigated in patients with severe COVID-19 presenting with high IL-6 levels.
- **Camostat mesilate (CM):** a TMPRSS2 inhibitor, is reported to block viral entry by inhibiting S protein priming.

VACCINE



There is no FDA-approved vaccine yet available to prevent COVID-19. A Phase 1 clinical trial evaluating an investigational vaccine began on March 16, 2020, in the Kaiser Permanente Washington Health Research Institute (KPWHRI) in Seattle, WA, USA.

The vaccine is called mRNA-1273, and is designed to encode for a prefusion-stabilized form of the S protein.

The trial will enroll 45 healthy adult volunteers aged 18 to 55 years over approximately 6 weeks.

TRAVEL ADVICE

- Avoid travelling to affected areas unless necessary.
- Make sure you have all necessary vaccination and travel medication.
- Seek advice from your healthcare provider
- Don’t travel if you have fever and cough
- If you become sick while travelling seek medical care immediately


MOVEON
STAY HOME*
SAVE LIVES
This is you.
* If you're able to.

REFERENCES

- https://www.mygov.in/covid-19/
- https://www.who.int/emergencies/diseases/novel-coronavirus-2019
- https://www.bing.com/covid