SARI CLINICAL CARE TRAINING

COVID-19
CLINICAL UPDATE

World Health Organization

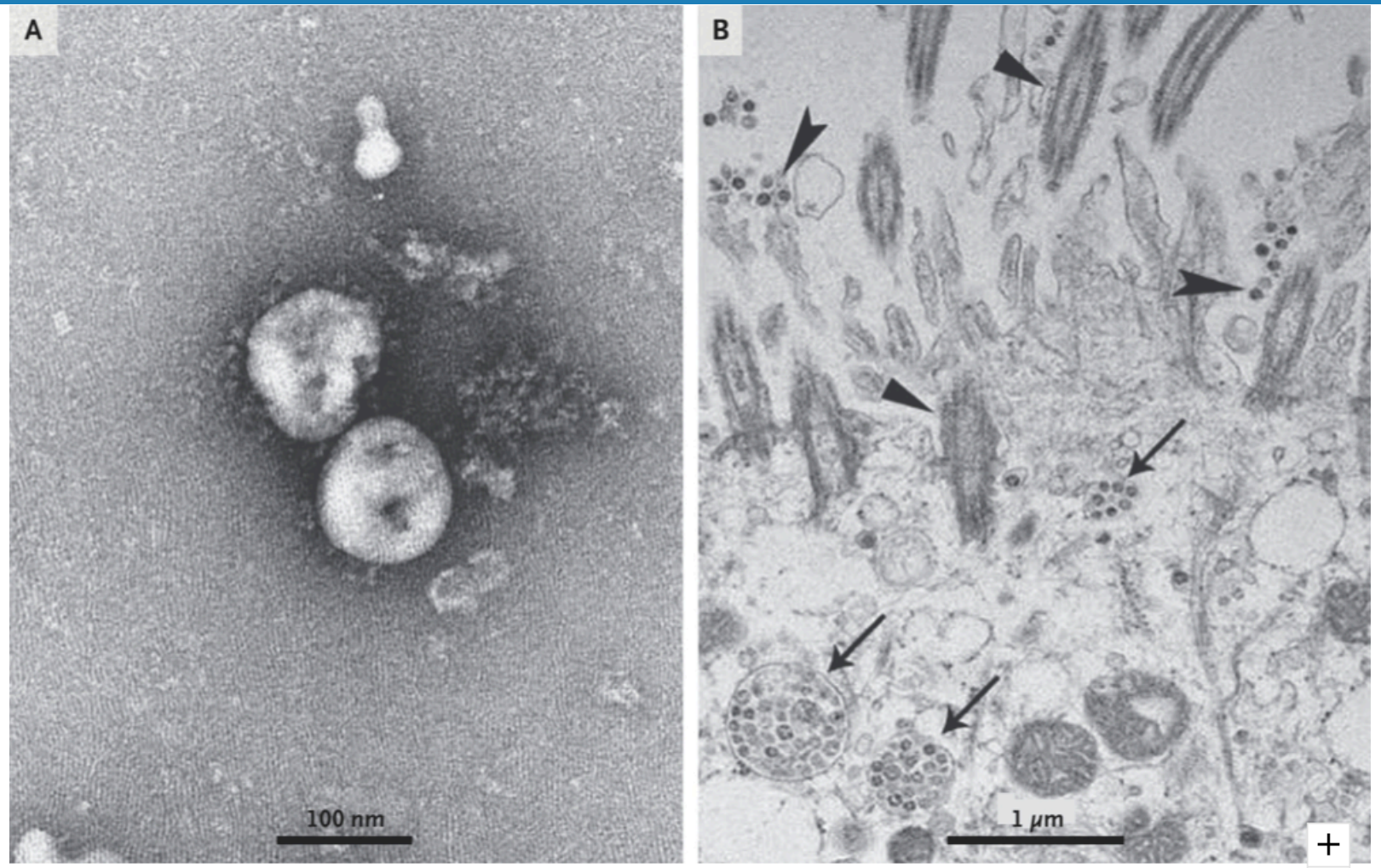
HEALTH EMERGENCIES programme

Learning objectives

At the end of this lecture, you will be able to:

- Describe clinical presentation of COVID-19 infection.
- Compare COVID-19 infection to MERS and SARS, other coronavirus.
- Provide links to WHO case definition and other guidance

2019-novel Coronavirus



Electron microscopy:

A nCoV virus particles

B nCoV particles within human airway epithelial cells

World Health Organization

Na Zhu et al. A Novel Coronavirus from Patients with Pneumonia in China, 2019. DOI: 10.1056/NEJMoa2001017

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Coronaviruses (1/3)

- Large, enveloped, positive-strand RNA viruses
- 4 human (H)CoVs cause 10-30% of URTIs in adults
- **SARS-CoV, MERS-CoV & COVID-19** cause severe human infections
- Other SARS-like CoVs have been found in animal reservoirs but have not yet been detected in humans

Coronaviruses (2/3)

Key feature of coronaviruses which cause SARI:

- Limited human-human transmission, predominantly nosocomial (MERS > SARS)
- Viral replication in the lower respiratory tract
- Aberrant host immune response (upregulation of pro-inflammatory cytokines)

Coronaviruses (3/3)

NAME	ANIMAL RESERVOIR	BINDING RECEPTOR (predominant)	RECEPTOR LOCATION (predominant)	NUMBER OF CASES TO DATE*	CASE FATALITY RATE
SARS-CoV	Bats	ACE2	Lower resp tract	8098	10%
MERS-CoV	Dromedaries	DPP4	Lower resp tract GI tract, kidneys	2494	34%
COVID-19	?	ACE2	Lower resp tract	7783	?
SARS-CoV-like#	Bats	ACE2	(in vitro only)		

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* As of 30 Jan 2020
# No human infections yet

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CASE DEFINITION

A. Patients with severe acute respiratory infection (fever, cough, and requiring admission to hospital), **AND** with no other aetiology that fully explains the clinical presentation **AND** at least one of the following:

- a history of travel to or residence in the city of Wuhan, Hubei Province, China in the 14 days prior to symptom onset,

or

- patient is a health care worker who has been working in an environment where severe acute respiratory infections of unknown aetiology are being cared for.

B. Patients with any acute respiratory illness **AND** at least one of the following:

- close contact with a confirmed or probable case of COVID-19 in the 14 days prior to illness onset, or
- visiting or working in a live animal market in Wuhan, Hubei Province, China in the 14 days prior to symptom onset,

or

- worked or attended a health care facility in the 14 days prior to onset of symptoms where patients with hospital associated COVID-19 infections have been reported.

COVID-19 - TRANSMISSION

- Cluster of cases of pneumonia reported in Wuhan on 31 Dec 2019, with 1st case symptomatic on 8 Dec
- Initial cases associated with a market in Wuhan
- Rapid spread within Wuhan and to many other Chinese provinces and other countries
- Human-human transmission, but full extent not yet known
- Nosocomial transmission to HCWs has occurred
- Spread is through droplets and contact

COVID-19 - EPIDEMIOLOGY*

- Age: 59 years (15-89)
- Males 56%, females 44%
- Market exposure:
  - before January 1 - 64%
  - January 1-11 - 16%
  - January 12-22 - 6%
- Incubation period 5.2 days (4.1-7.0 95% CI)
- R_O value 2.2 (1.4-3.9 95% CI)

World Health Organization

*Qun Li, M.Med., Xuhua Guan, Ph.D., Peng Wu, Ph.D., Xiaoye Wang, M.P.H., Lei Zhou, M.Med., et al. Early Transmission Dynamics in Wuhan, China, of Novel Coronavirus–Infected Pneumonia. DOI: 10.1056/NEJMoa2001316

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COVID-19 - COMORBIDITIES*

- Any co-morbidity: 32%
- Diabetes 20%
- Hypertension 15%
- Cardiovascular disease 15%
- COPD 2%, malignancy 2%
- Chronic liver disease (2%)

*from initial group in Wuhan: https://doi.org/10.1016/S0140-6736(20)30183-5

COVID-19 - CLINICAL FEATURES

- Incubation period may be 5.2 days; patients may be infectious during this time
- Symptoms at onset*: fever (98%), dry cough (76%), fatigue & myalgia (44%), sputum production (28%), headache (8%), haemoptysis (5%), diarrhoea (3%)
- Subsequent symptoms: dyspnoea (25%)

*from initial group in Wuhan: https://doi.org/10.1016/S0140-6736(20)30183-5

COVID-19 - INVESTIGATIONS*

INVESTIGATIONS*:

- Blood: leucopenia (25%), lymphopenia (63%), elevated AST (37%)
- Radiology - CT chest abnormalities in all patients (bilateral in 98%); typically bilateral lobular & sub segmental consolidation

*from initial group in Wuhan: https://doi.org/10.1016/S0140-6736(20)30183-5

COVID-19 - COMPLICATIONS

- Pneumonia (100%)
- ARDS (29%)
- Viral RNA detected in blood (15%)
- Acute cardiac injury (12%)
- Secondary infection (10%)
- 39% admitted to ICU, 10% required mechanical ventilation
- 68% discharged, 15% dead, 17% remain in hospital.

*from initial group in Wuhan: https://doi.org/10.1016/S0140-6736(20)30183-5

COVID-19 - OUTCOMES

- As of 30 January, there are 7783 reported cases globally.
- In China, there are 7736 cases: 1370 are severe, 170 deaths and 133 discharged.
- *Note many patients remain in hospital and thus cannot accurately describe case fatality.
- **See website for most up to date information**
- **https://www.who.int/emergencies/diseases/novel-coronavirus-2019**

COVID-19 – CLINICAL MANAGEMENT

- Triage and early recognition (module 3).
- Maintain strict IPC protocols (module 1b).
- Early diagnosis (module 2a and 5).
- Supportive measures for SARI and sepsis (modules 8-10).
- Prevention of complications (module 11).
- There are no proven effective antivirals for COVID-19, but severe cases may be treated with antibiotics for possible co-infections (module 7).
- Investigational antivirals should be administered as part of a protocolized, ethically approved, clinical trial (module 15).

See website: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance

Summary

- In December 2019, a novel coronavirus (COVID-19) started an outbreak of pneumonia in Wuhan, China
- COVID-19 is related to SARS-CoV and MERS-CoV.
- Initial origin was probably zoonotic but human-human transmission is highly likely.
- Number of cases is increasing rapidly, most patients have mild illness, presenting with fever, cough, fatigue & myalgia.
- Management involves early recognition, strict IPC and supportive care..