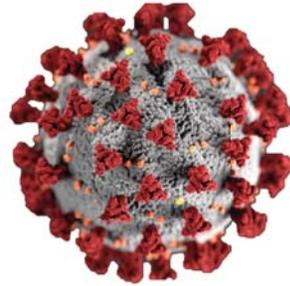




การประชุมใหญ่วิชาการประจำปีสมาคมโรคติดเชื้อแห่งประเทศไทย ครั้งที่ 46
Emerging and Re-emerging Infectious Diseases: A Continuous Challenge

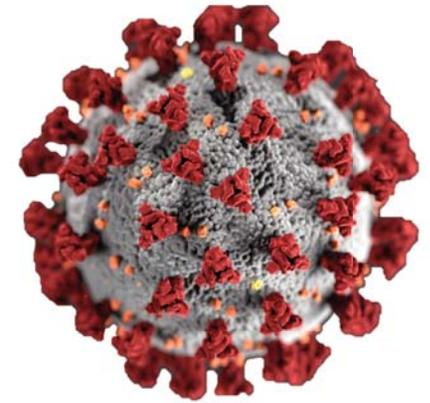
COVID-19

Up to date



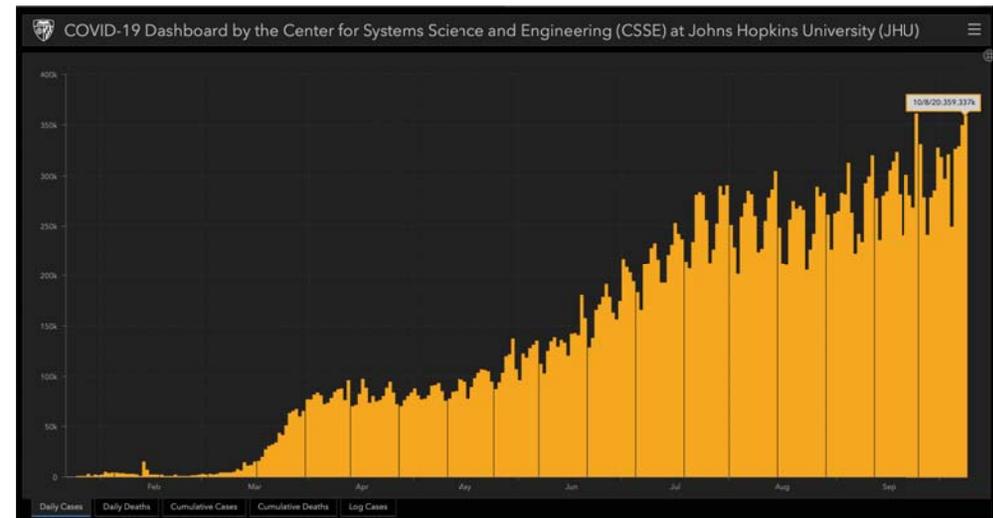
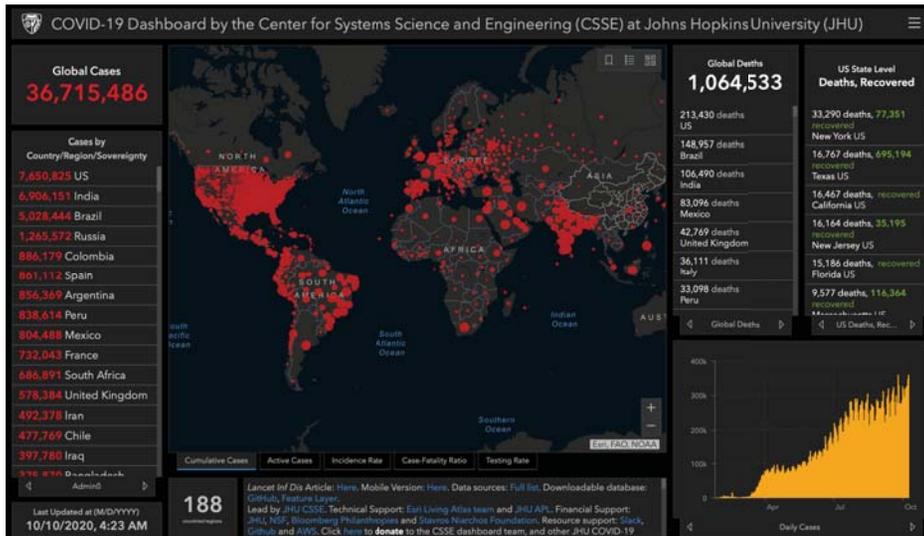
Outline

Epidemiology
Diagnosis
Infection control

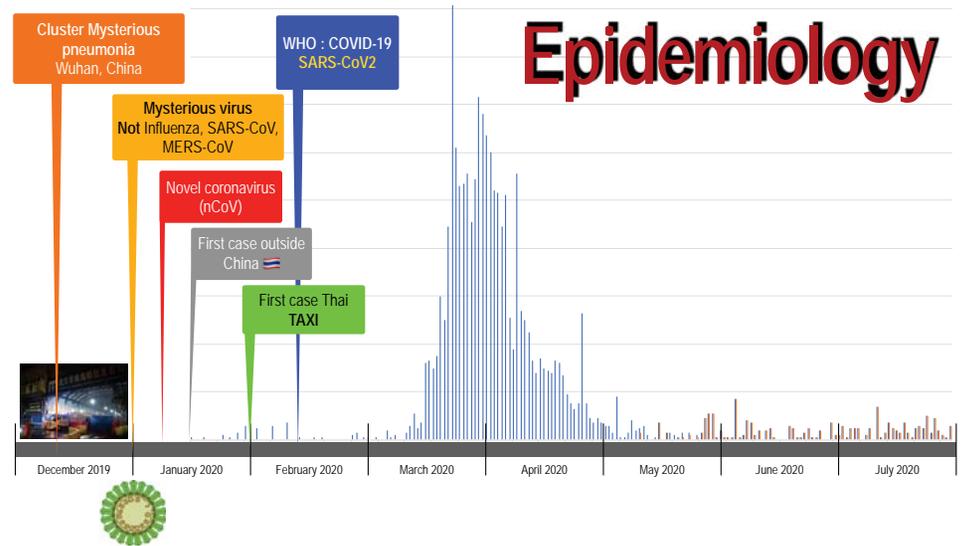


Col. *Dhitiwat Changpradub* M.D.

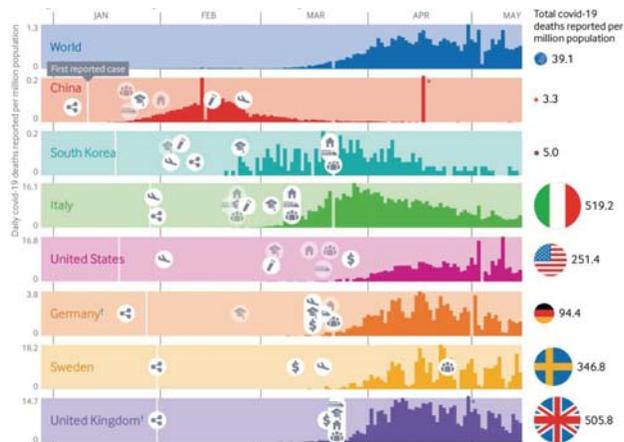
Chief of division of Infectious Disease, Department of Internal Medicine, Phramongkutkiao Hospital



All	Europe	North America	Asia	South America	Africa	Oceania									
#	Country, Other	Total Cases	New Cases	Total Deaths	New Deaths	Total Recovered	Active Cases	Serious, Critical	Tot Cases/ 1M pop	Deaths/ 1M pop	Total Tests	Tests/ 1M pop	Population		
	World	37,058,696	+319,036	1,071,341	+4,931	27,857,277	8,130,078	68,237	4,754	137.4					
1	USA	7,884,144	+50,381	218,464	+726	5,054,605	2,611,075	14,663	23,781	659	116,390,148	351,068	331,531,610		
2	India	6,977,008	+73,196	107,450	+929	5,985,505	884,053	8,944	5,042	78	84,634,680	61,166	1,383,678,536		
3	Brazil	5,055,888	+26,349	149,639	+605	4,433,595	472,654	8,318	23,740	703	17,900,000	84,049	212,970,378		
4	Russia	1,272,238	+12,126	22,257	+201	1,009,421	240,560	2,300	8,717	152	49,656,873	340,228	145,951,658		
5	Colombia	894,300	+8,121	27,495	+164	780,547	85,258	2,220	17,525	539	4,097,223	80,291	51,029,561		
6	Spain	890,367	+5,986	32,929	+241	N/A	N/A	1,590	19,041	704	13,689,776	292,768	46,759,755		
7	Argentina	856,369		22,710		684,844	148,815	4,043	18,901	501	2,166,276	47,812	45,308,202		
8	Peru	838,614		33,098		728,216	77,300	1,233	25,339	1,000	4,003,363	120,964	33,095,400		
9	Mexico	804,488	+5,300	83,096	+370	583,603	137,789	2,553	6,222	643	2,053,282	15,880	129,299,186		
10	France	691,977	+20,339	32,583	+62	100,828	558,566	1,448	10,595	499	12,061,094	184,666	65,313,096		
11	South Africa	688,352	+1,461	17,547	+139	620,081	50,724	546	11,567	295	4,360,105	73,266	59,510,270		
12	UK	575,679	+13,864	42,679	+87	N/A	N/A	436	8,468	628	26,987,470	396,972	67,983,287		
13	Iran	492,378	+4,142	28,098	+210	401,379	62,901	4,392	5,842	333	4,257,766	50,518	84,282,671		
14	Chile	477,769	+1,753	13,220	+53	450,297	14,252	821	24,935	690	3,618,019	188,825	19,160,727		
15	Iraq	397,780	+3,214	9,735	+52	328,097	59,948	523	9,831	241	2,456,782	60,719	40,461,765		
	Bangladesh	375,870	+1,278	5,477	+17	289,912	80,481		2,276	33	2,050,669	12,418	165,133,610		

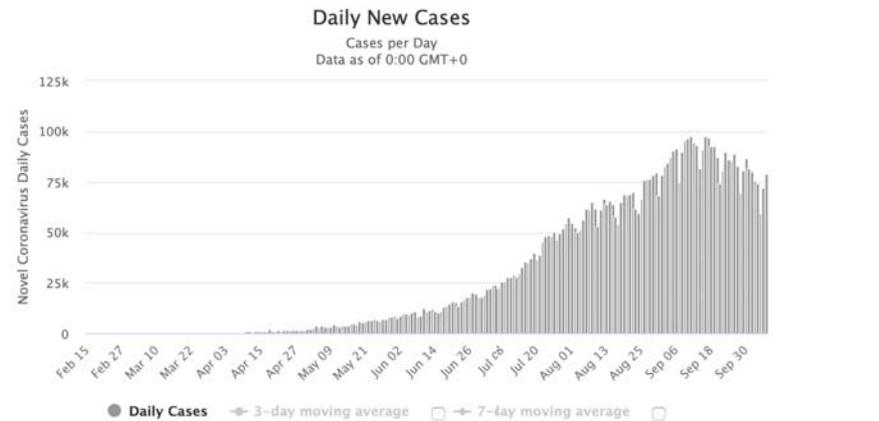


Global Situation

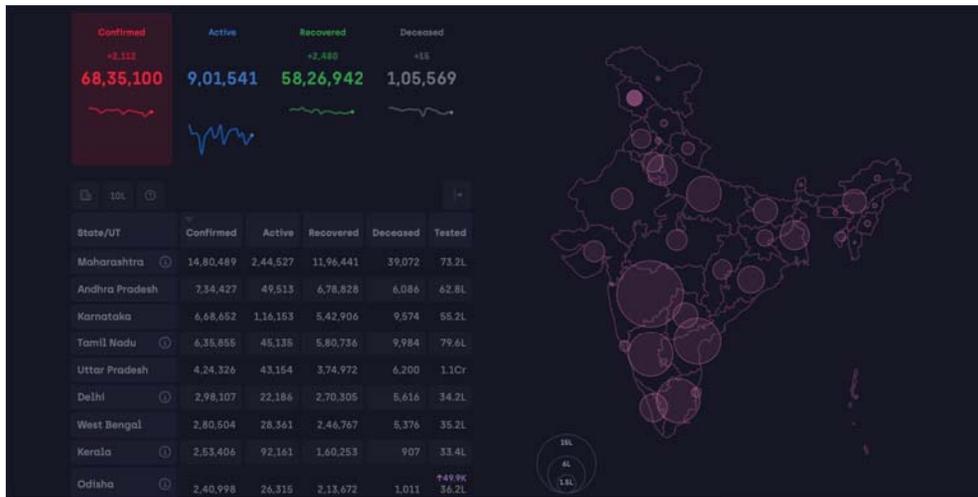


BMJ 2020; 369 doi: <https://doi.org/10.1136/bmj.m1932> (Published 15 May 2020)

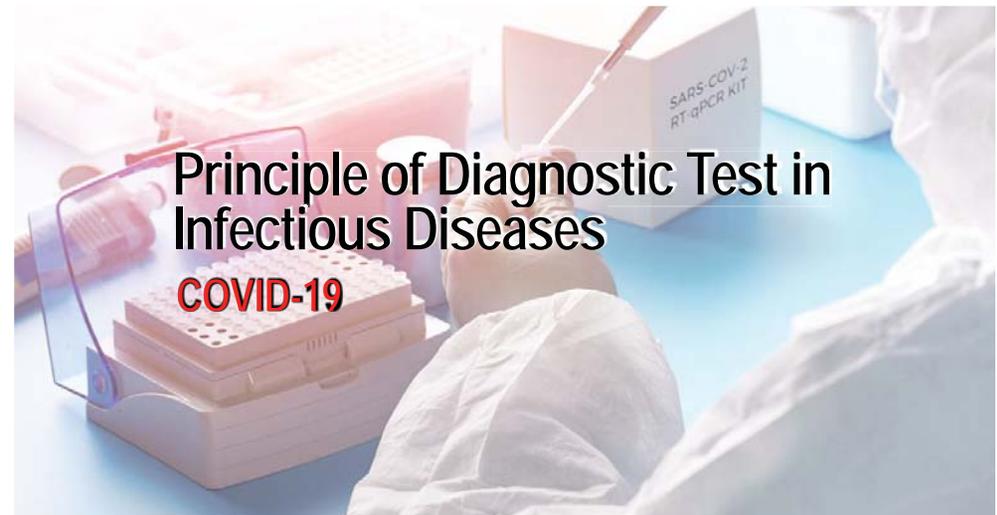
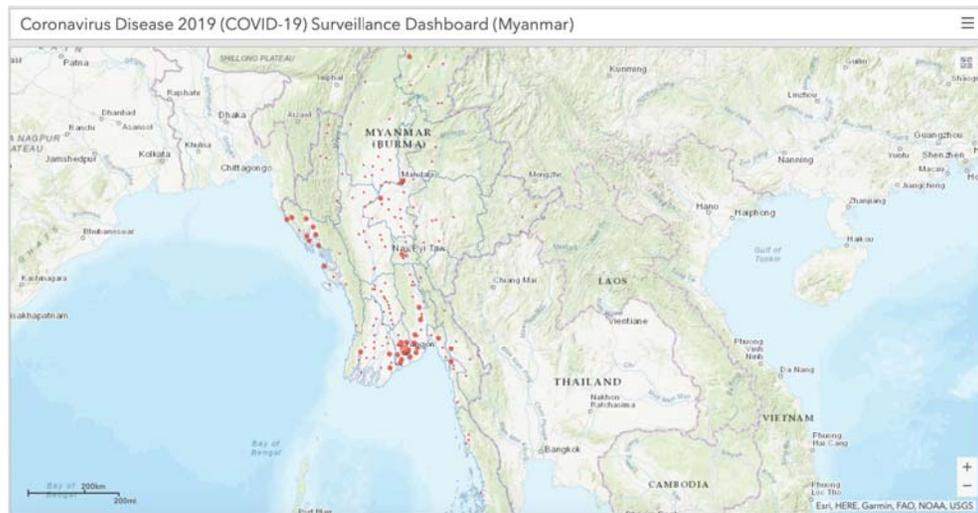
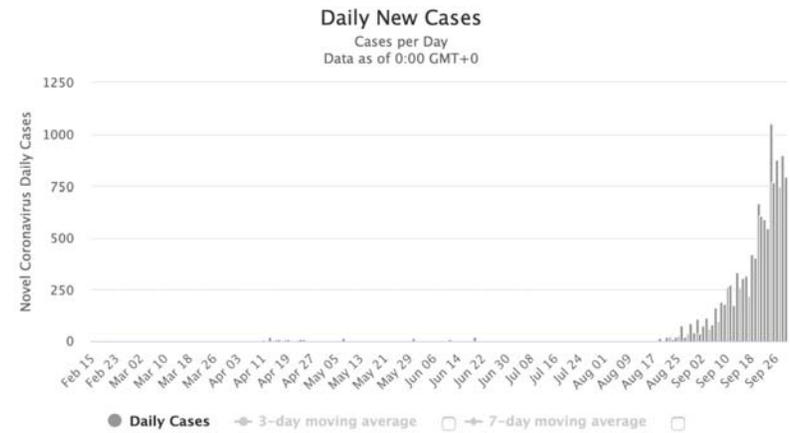
Daily New Cases in India

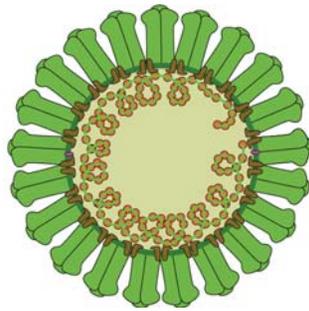


<https://www.worldometers.info/coronavirus/country/india/>

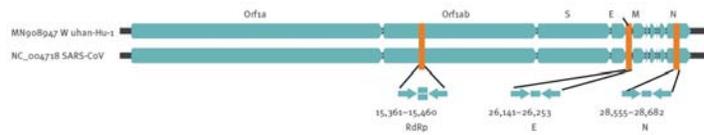


Daily New Cases in Myanmar





-  **Spike (S) glycoprotein**
Receptor binding and fusion to cell
Most antigenic
Trimeric
-  **Nucleocapsid (N) phosphoprotein**
RNA-binding, synthesis, translation
IFN I antagonist
-  **Membrane (M) glycoprotein**
Triple membrane spanning
-  **Small Envelope (E) glycoprotein**
Ion channel
Pentameric
-  **RNA**
(+) ssRNA
-  **Envelope**
Bilipid, host derived membrane



Antigen detection :

RT-PCR, WGS, rapid antigen detection



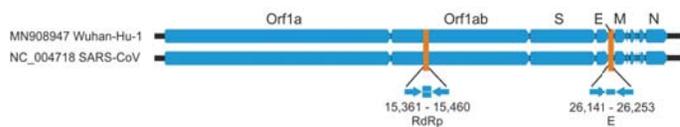
Antibodies detection ?

- IgM, IgA, IgG
- Rapid test (lateral flow assay), ELISA

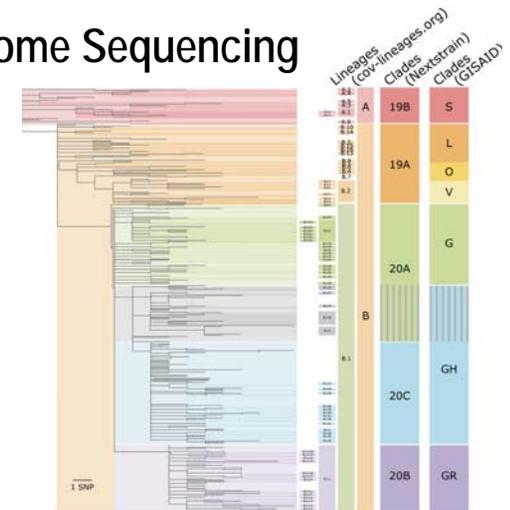
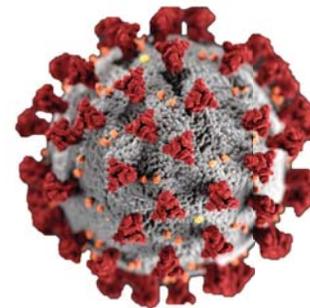


Novel Coronavirus (2019-nCoV) technical guidance:
Laboratory testing for 2019-nCoV in humans

Summary table of available protocols		
Country	Institute	Gene targets
China	China CDC	ORF1ab and N
Germany	Charité	RdRP, E, N
Hong Kong	HKU	ORF1b-nsp14, N
Japan	National Institute of Infectious Diseases, Department of Virology III	Pancorona and multiple targets, Spike protein
Thailand	National Institute of Health	N
US	US CDC	Three N primers, RdRP

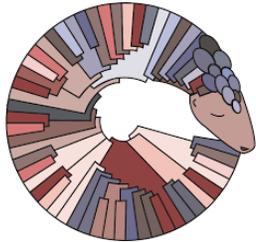


SARS-CoV2 Whole Genome Sequencing

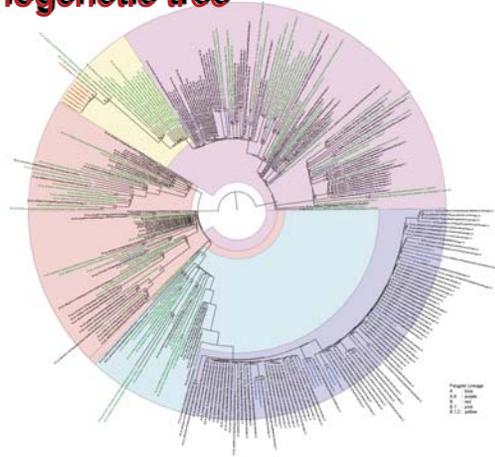




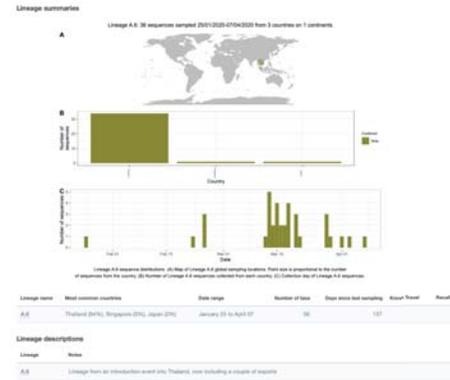
SARS-CoV2 coding sequencing phylogenetic tree



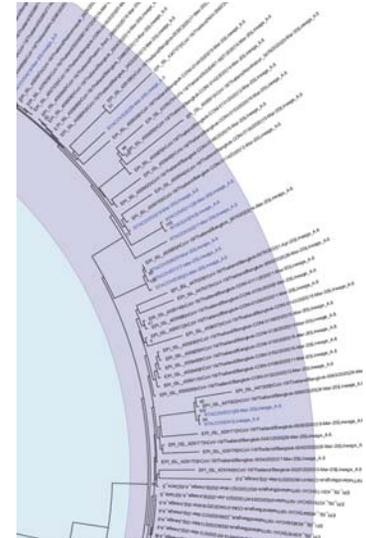
Pagolin chart



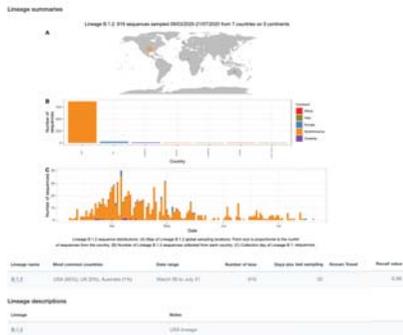
Domestic Cases



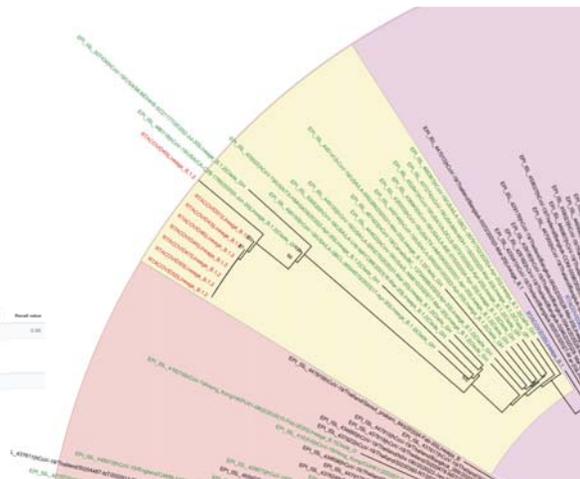
https://cov-lineages.org/lineages/lineage_A.6.html



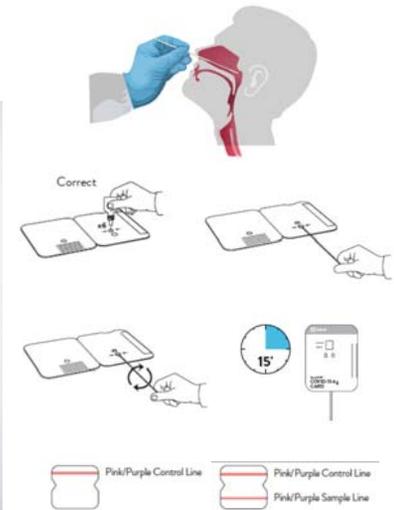
Imported Cases

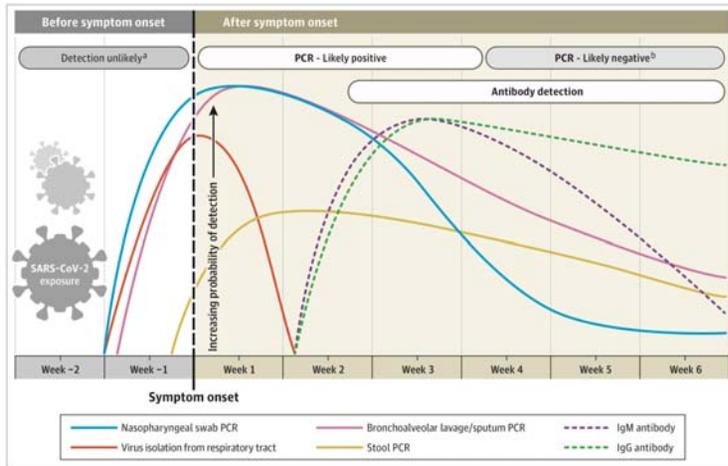


https://cov-lineages.org/lineages/lineage_B.1.1.2.html



Rapid antigen detection





Estimated Variation Over Time in Diagnostic Tests for Detection of SARS-CoV-2 Infection Relative to Symptom Onset

JAMA. Published online May 6, 2020. doi:10.1001/jama.2020.8259



Transmission of SARS-CoV-2: implications for infection prevention precautions

Scientific brief
9 July 2020

Centers for Disease Control and Prevention
CDC 24/7: Saving Lives. Protecting People™

Coronavirus Disease 2019 (COVID-19)

Modes of transmission



- Contact and droplet transmission
 - Transmission of SARS-CoV-2 can occur through **direct, indirect, or close contact** with infected people through infected secretions
 - **Respiratory droplet transmission** can occur when a person is in close contact (**within 1 metre**) with an infected person who has respiratory symptoms
 - Indirect contact transmission involving contact of a susceptible host with a contaminated object or surface (fomite transmission) may also be possible

Modes of transmission



- Airborne transmission
 - defined as the spread of an infectious agent caused by the dissemination of droplet nuclei (aerosols) that remain infectious when suspended in air over long distances and time.
 - Airborne transmission of SARS-CoV-2 can occur during **medical procedures that generate aerosols** (“aerosol generating procedures”).
 - SARS-CoV-2 **may also spread** through aerosols in the absence of aerosol generating procedures, particularly in **indoor settings with poor ventilation**.
 - Outside of medical facilities, some outbreak reports related to indoor crowded spaces have suggested the possibility of aerosol transmission, combined with droplet transmission, for example, during choir practice, in restaurants or in fitness classes.
 - short-range aerosol transmission



Modes of transmission



- Fomite transmission
 - Respiratory secretions or droplets expelled by infected individuals can contaminate surfaces and objects, creating fomites (contaminated surfaces).
 - **Viable SARS-CoV-2 virus and/or RNA** detected by RT-PCR can be found on those surfaces for periods ranging **from hours to days**.
 - Transmission may also occur indirectly through touching surfaces in the immediate environment or objects contaminated with virus from an infected person followed by touching the mouth, nose, or eyes.

Modes of transmission



- Other modes of transmission
 - SARS-CoV-2 RNA has also been detected in other biological samples, including the urine and feces of some patients.
 - One study found viable SARS-CoV-2 in the urine of one patient.
 - Three studies have cultured SARS-CoV-2 from stool specimens.
 - To date, however, there have been **no published reports of transmission of SARS-CoV-2 through feces or urine**.

COVID-19: Transmission

- The primary transmission of COVID-19 is from person to person through respiratory droplets
 - Droplets are released when someone talks, sneezes, or coughs
 - Infectious droplets can land in the mouths or noses of people who are nearby or possibly be inhaled into the lungs
- COVID-19 may also be spread if you touch contaminated objects and surfaces
- Recent data suggest transmission by people who are not showing symptoms



COVID-19: Transmission

- Current data do not support long range aerosol transmission of SARS-CoV-2 such as with measles and tuberculosis
- As with many respiratory pathogens, short-range inhalation aerosols is a possibility for COVID-19 transmission
 - Particularly in crowded medical wards and inadequately ventilated spaces
- Certain procedures in health facilities can generate fine aerosols and should be avoided whenever possible.



See WHO Guidance: [Modes of transmission of virus causing COVID-19: implications for IPC precaution recommendations](#)

To prevent transmission, WHO recommends a comprehensive set of measures including:



- Identify suspect cases as quickly as possible, test, and isolate all cases (infected people) in appropriate facilities;
- Identify and quarantine all close contacts of infected people and test those who develop symptoms so that they can be isolated if they are infected and require care;
- Use fabric [masks](#) in specific situations, for example, in public places where there is community transmission and where other prevention measures, such as physical distancing, are not possible;
- Use of contact and droplet precautions by health workers caring for suspected and confirmed COVID-19 patients, and use of airborne precautions when aerosol generating procedures are performed;
- Continuous use of a medical mask by health workers and caregivers working in all clinical areas, during all routine activities throughout the entire shift;
- At all times, practice frequent hand hygiene, physical distancing from others when possible, and respiratory etiquette; avoid crowded places, close-contact settings and confined and enclosed spaces with poor ventilation; wear fabric masks when in closed, overcrowded spaces to protect others; and ensure good environmental ventilation in all closed settings and appropriate environmental cleaning and disinfection.

Considerations for quarantine of contacts of COVID-19 cases

Interim guidance
19 August 2020



- face-to-face contact with a probable or confirmed case of COVID-19 within 1 meter and for more than 15 minutes;
- direct physical contact with a probable or confirmed case of COVID-19
- direct care for an individual with probable or confirmed COVID-19 without using proper personal protective equipment;¹⁰ or
- other situations, as indicated by local risk assessments.⁵

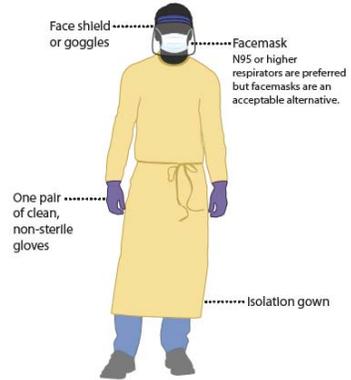


COVID-19 Personal Protective Equipment (PPE) for Healthcare Personnel

Preferred PPE – Use N95 or Higher Respirator



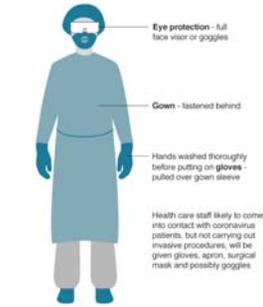
Acceptable Alternative PPE – Use Facemask



ข้อแนะนำการใช้อุปกรณ์ป้องกันร่างกายส่วนบุคคล (PPE)

หมวก Goggles หรือ Face shield Respiratory protection

ถุงมือ Protective gown/ cover all รองเท้าบูท/ Leg cover/ shoe cover



COVID-19

Infection Control

