

COVID-19對醫療的衝擊與因應



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最大的全球健康衝擊

2020年1月30日世界衛生組織宣告COVID-19成為國際關注公共衛生緊急事件，2020年3月11日宣布全球大流行(pandemic)

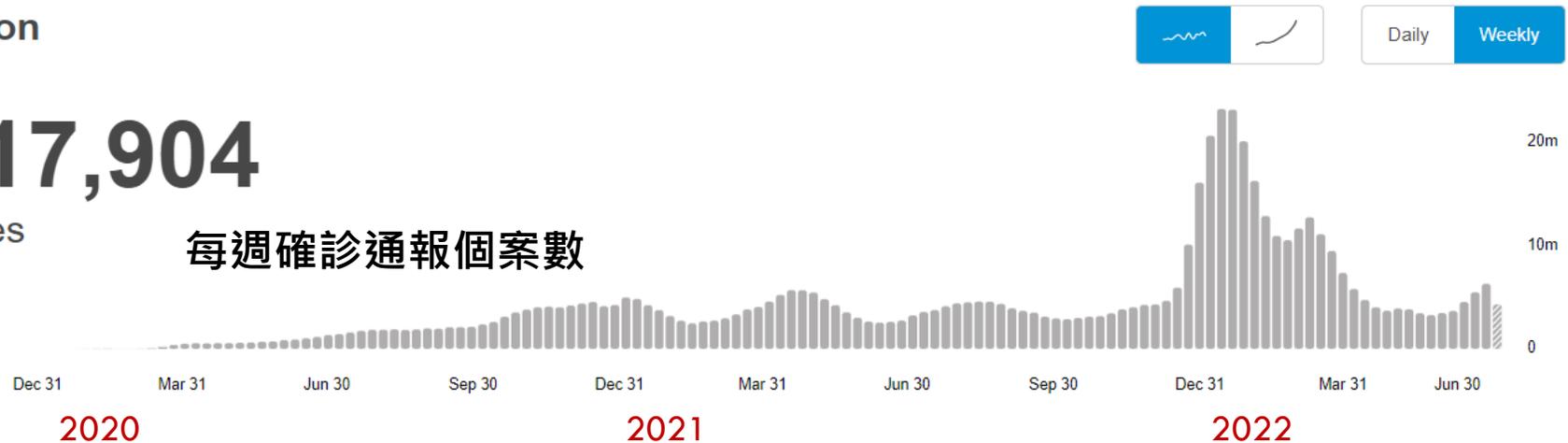
詭譎多變的疫情走勢

Global Situation

557,917,904

confirmed cases

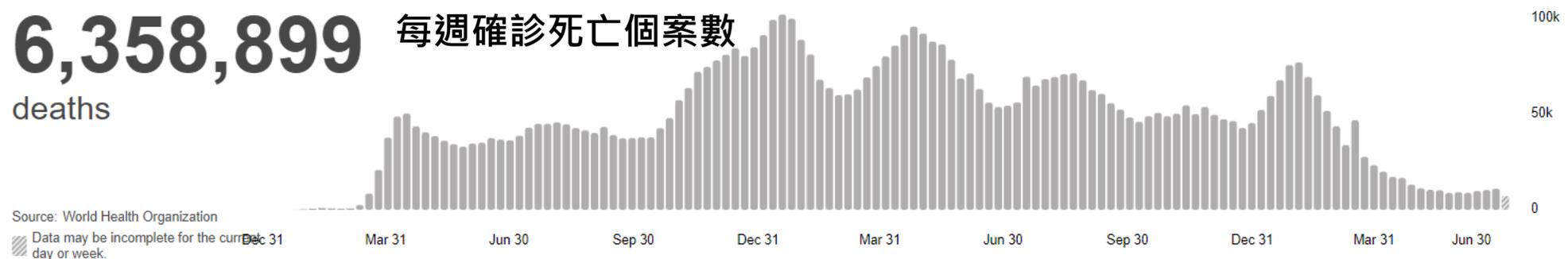
每週確診通報個案數



6,358,899

deaths

每週確診死亡個案數



Source: World Health Organization

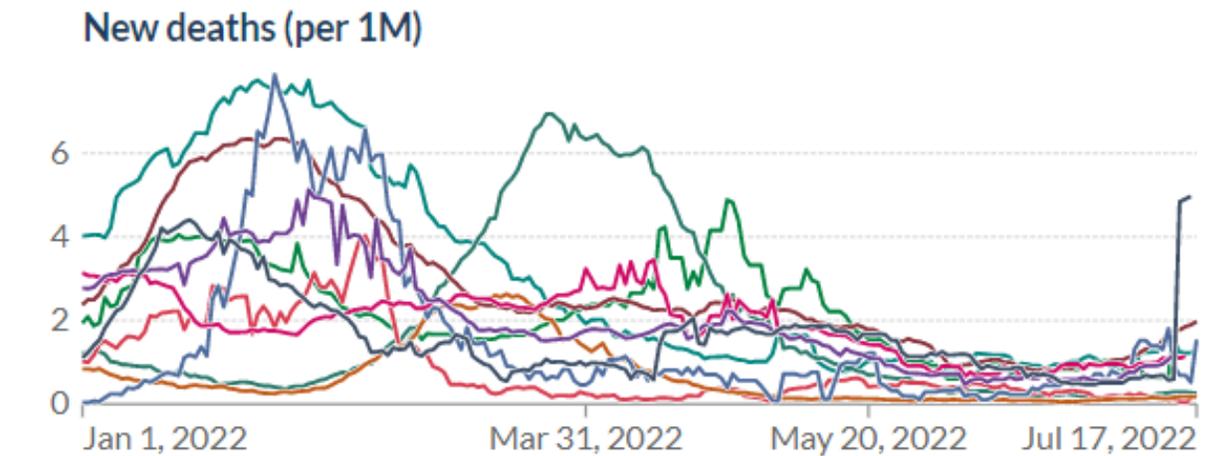
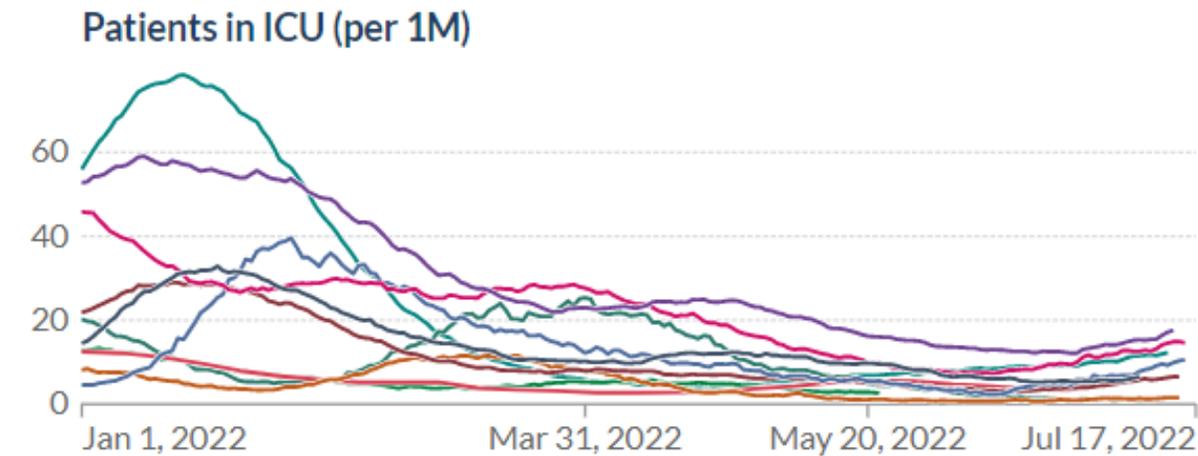
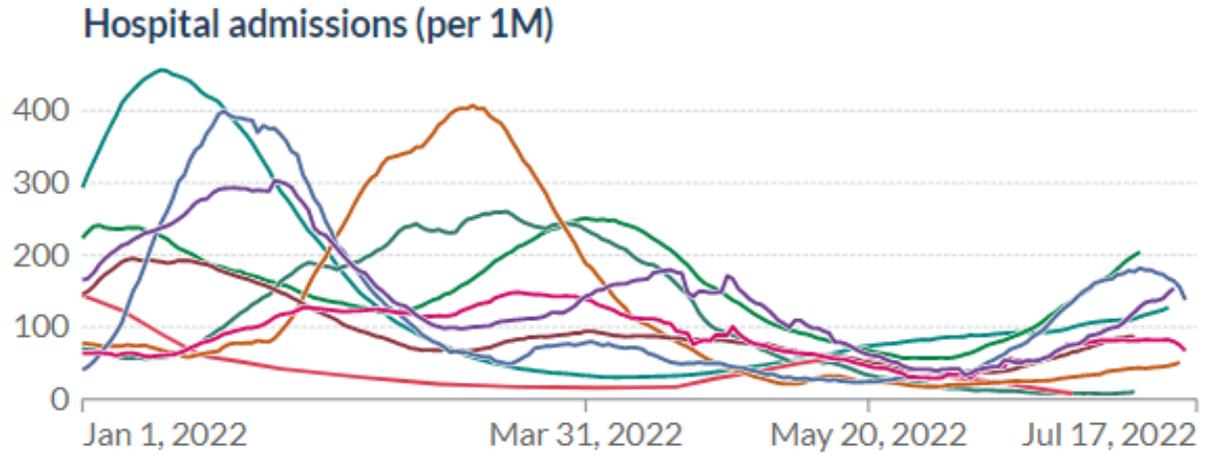
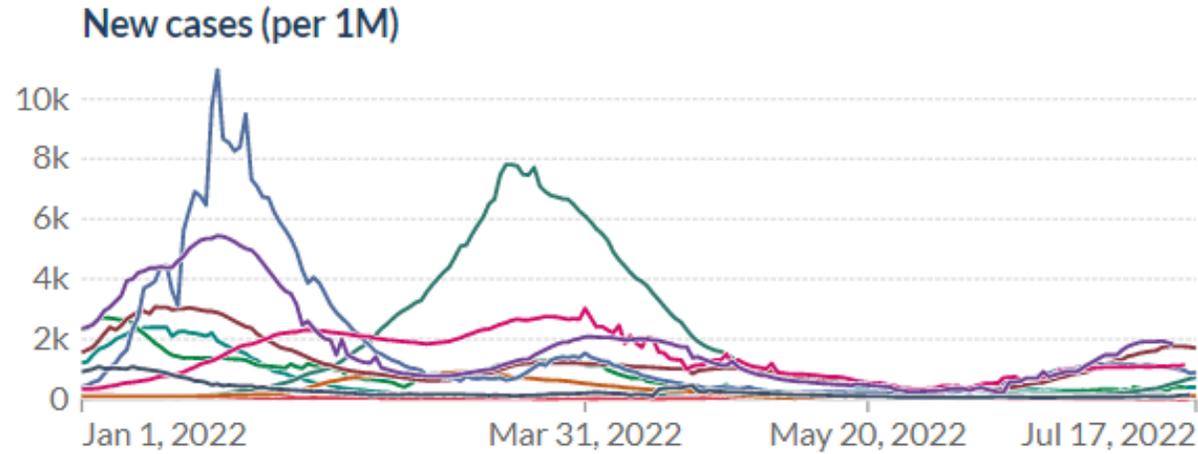
Data may be incomplete for the current day or week.

Confirmed COVID-19 cases, deaths, hospital admissions, and patients in ICU per million people

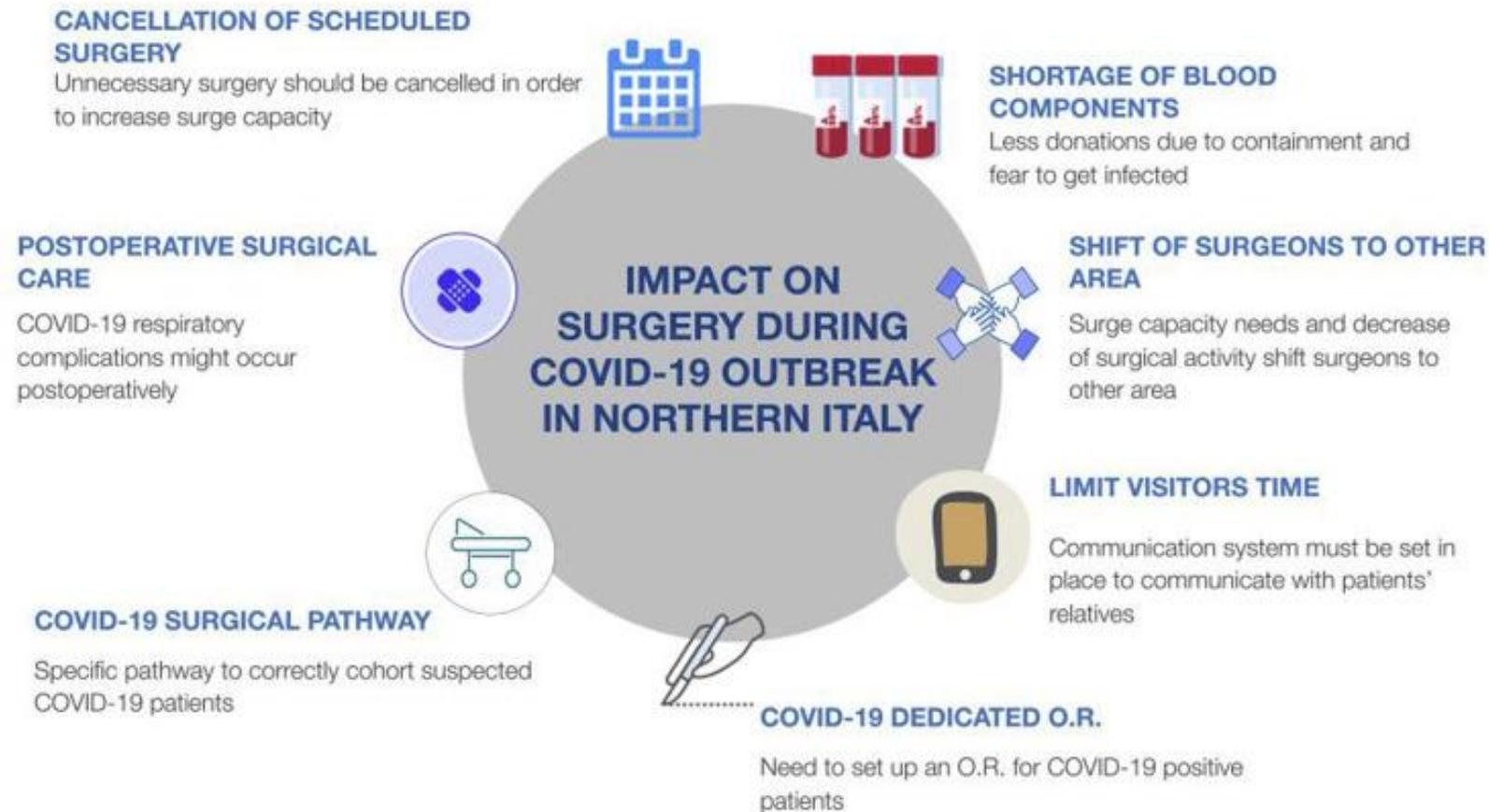
Limited testing and challenges in the attribution of cause of death means the cases and deaths counts may not be accurate.

LINEAR LOG Align axis scales

Canada France Germany Israel Italy Malaysia South Africa South Korea United Kingdom United States



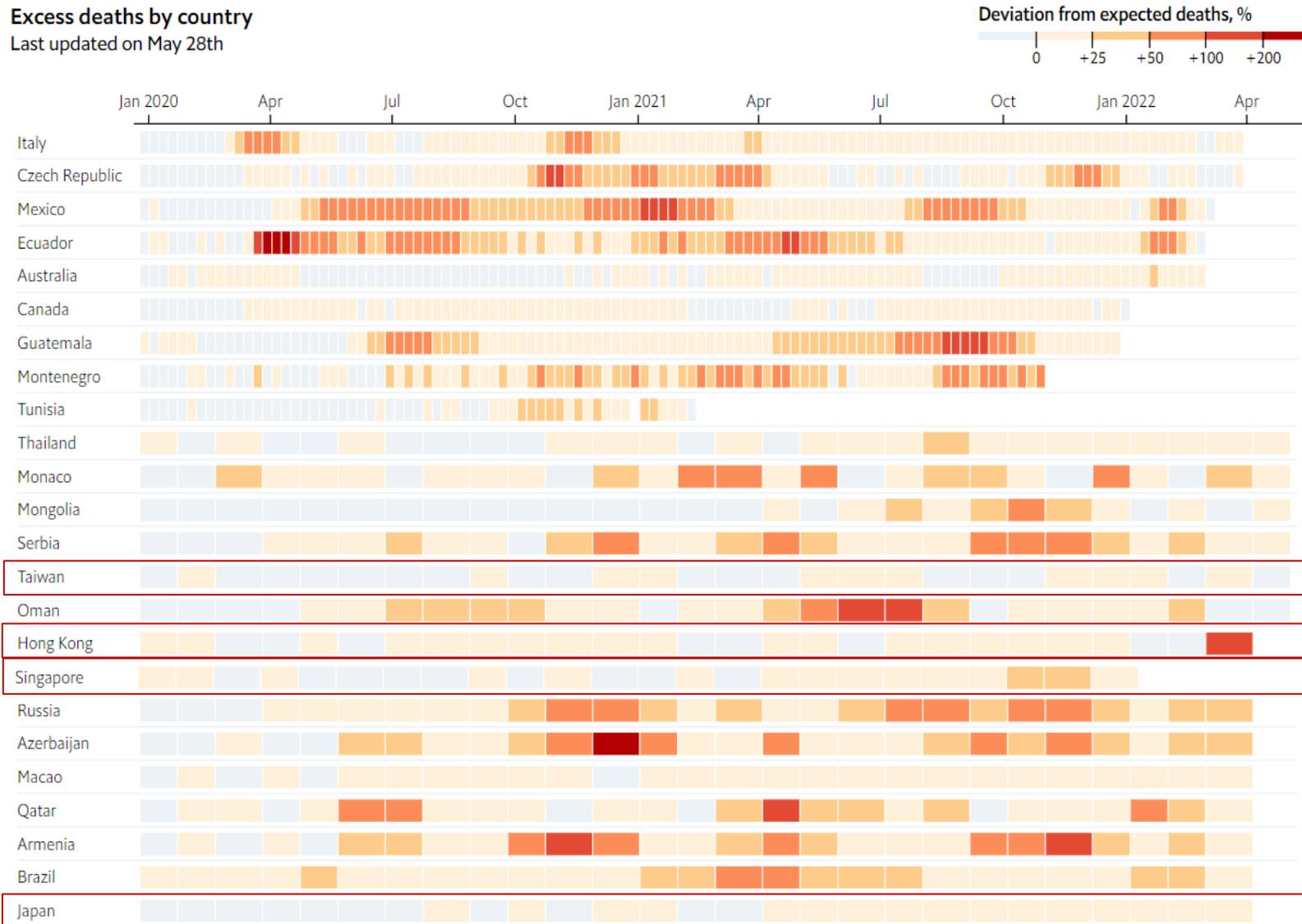
The impact of COVID-19 on surgical practice is widespread ranging from workforce and staffing issues, procedural prioritisation, viral transmission risk intraoperatively as well as impact on surgical education



Shift of staff
(physicians/nurses)
to other area
Or become ill

Covid-19 excess deaths across countries

Excess deaths by country
Last updated on May 28th





HEALTHCARE PERSONNEL

CASES **926,057**

DEATHS **2,277**

Of 81,176,398 case reports received by CDC, 11,399,978 (14.04%) have known HCP status. For the 926,057 cases of COVID-19 among HCP, death status is available for 524,019 (56.59%). Update on July 15, 2022.

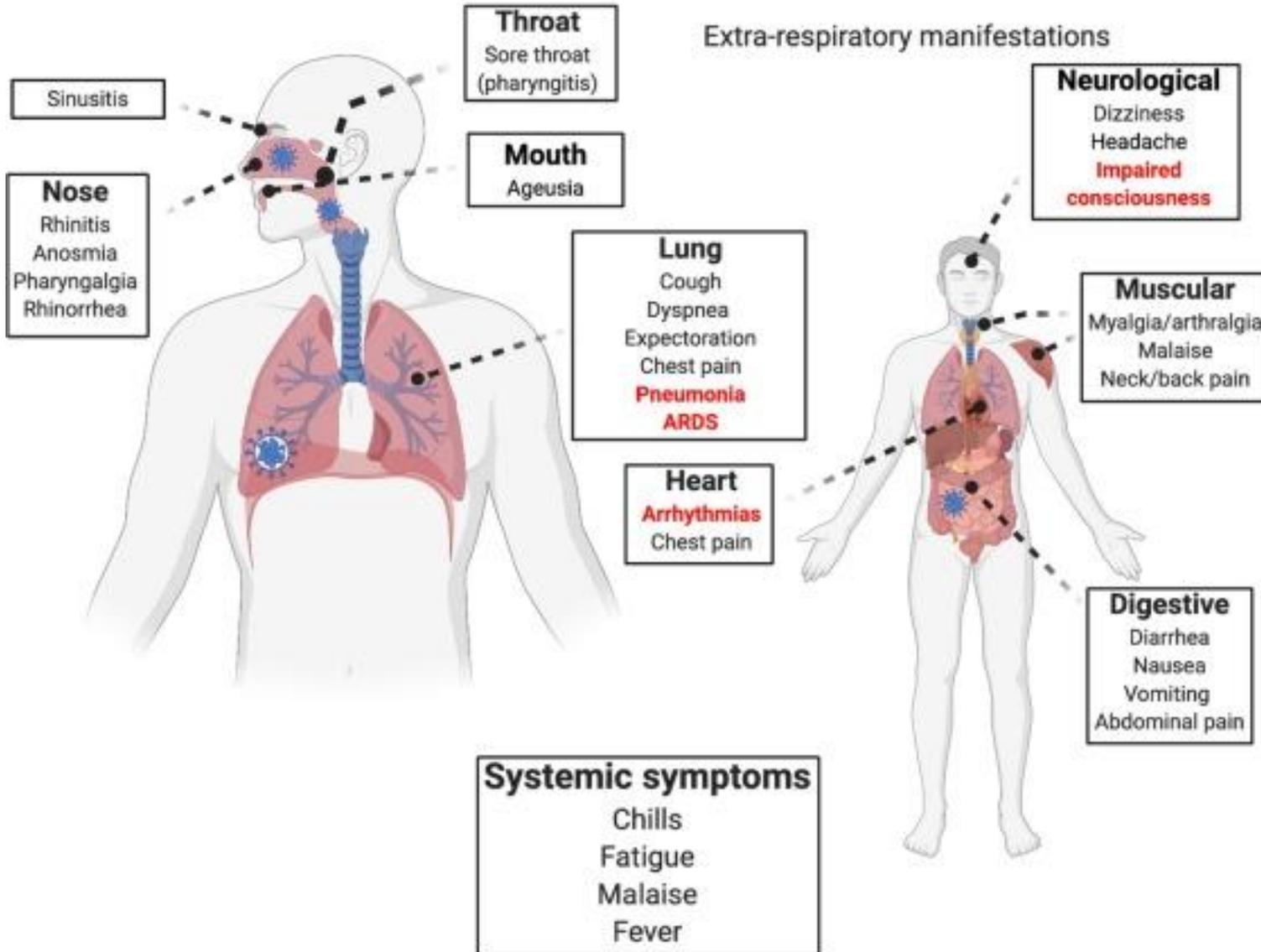
<https://covid.cdc.gov/covid-data-tracker/?#health-care-personnel>

Registered nurses and other health care workers at UCLA Medical Center in Santa Monica, Calif., protest in April what they say was a lack of personal protective equipment for the pandemic's front-line workers. *Mario Tama/Getty Images*

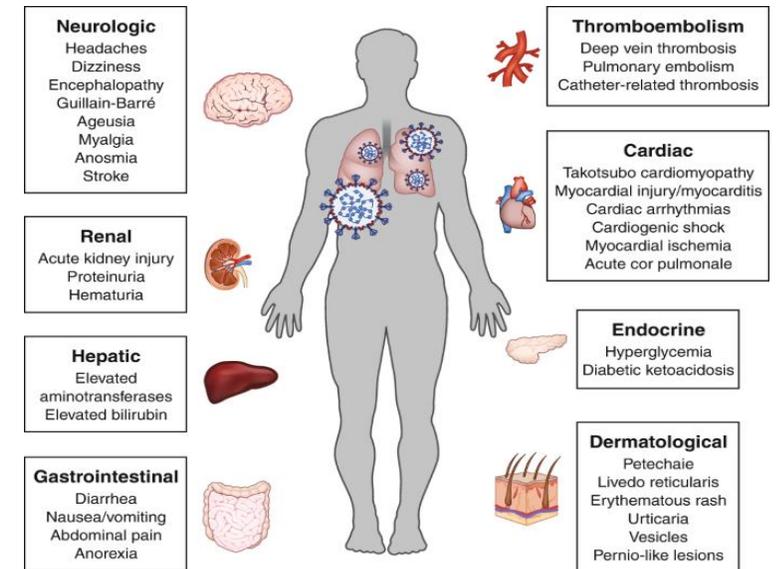
Respiratory tract manifestations



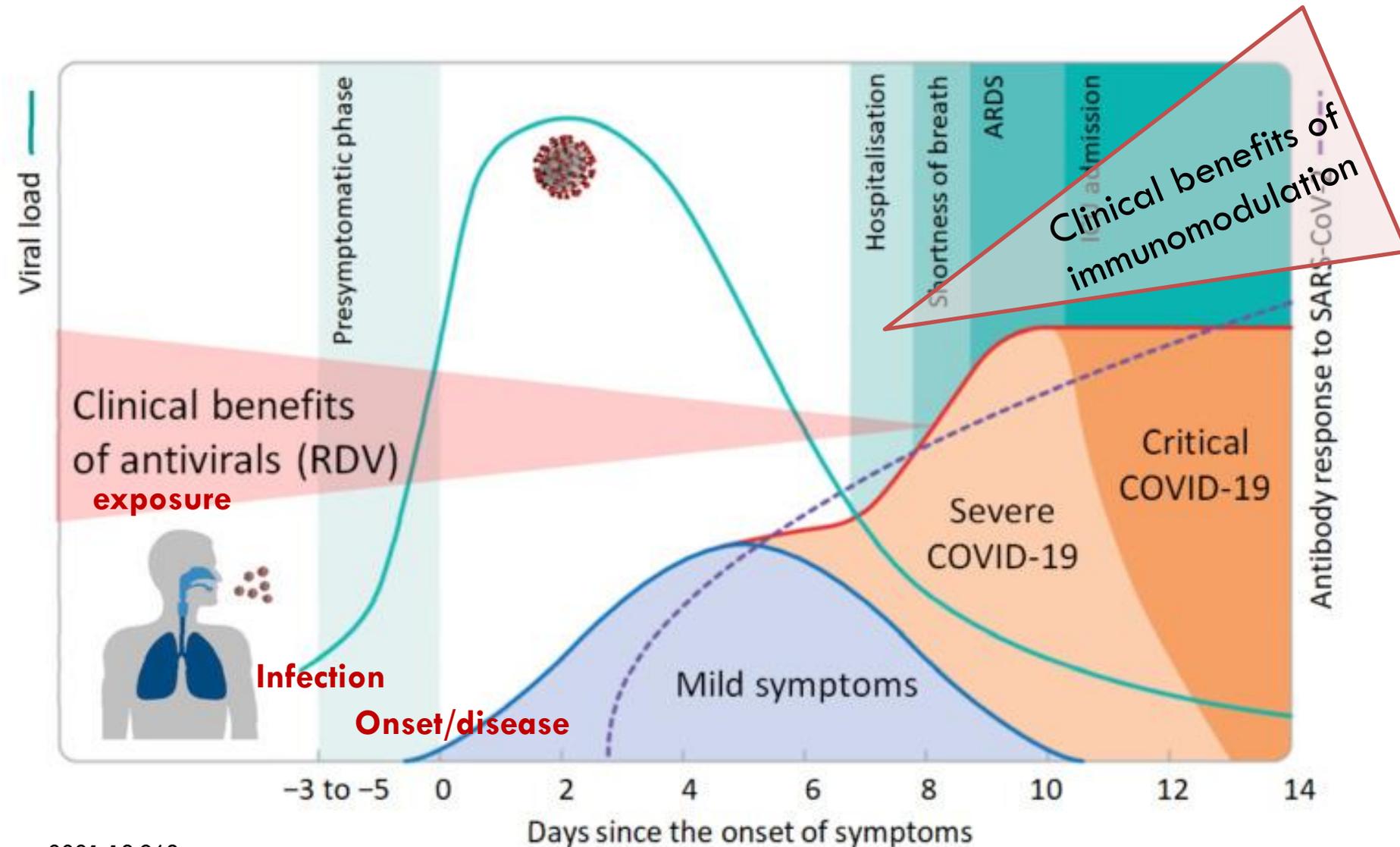
Extra-respiratory manifestations

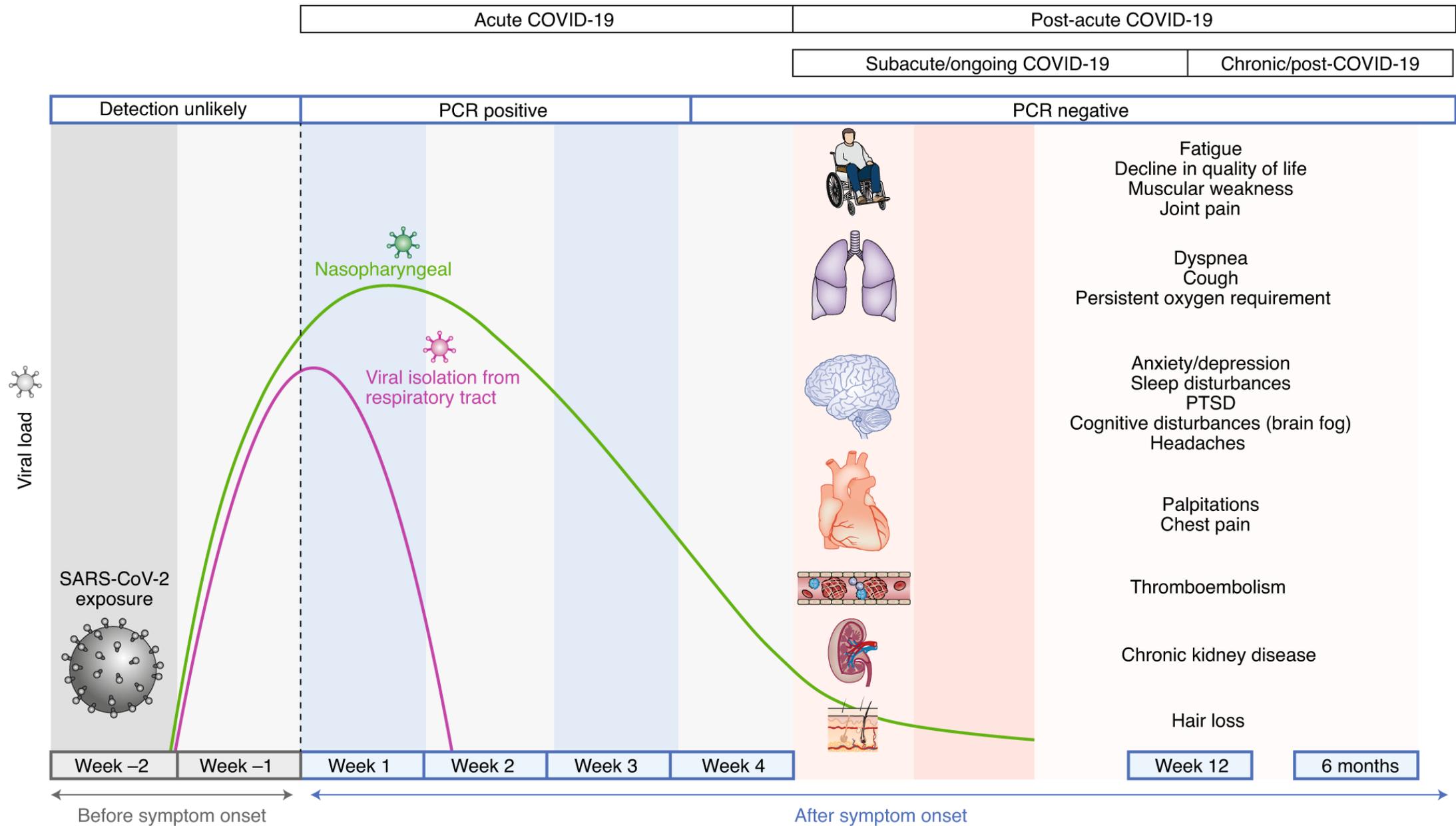


Clinical Symptoms



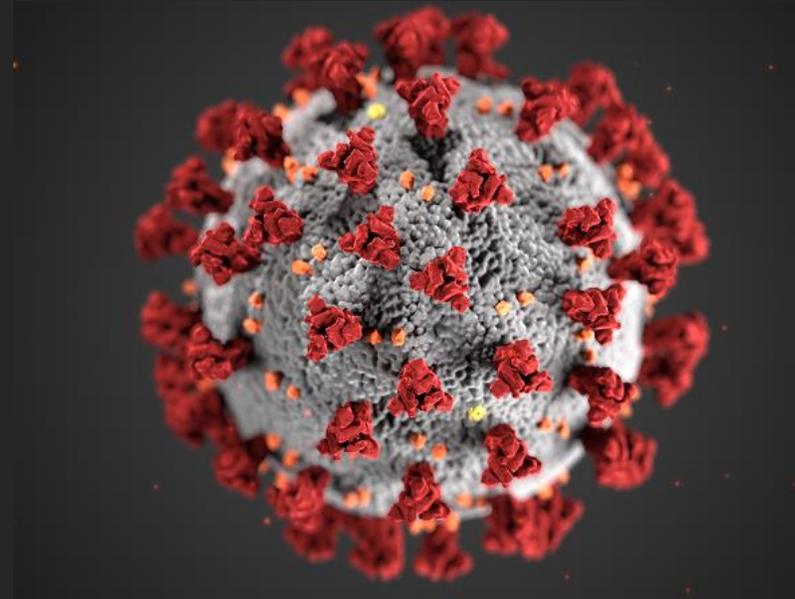
Course of COVID-19





SARS-CoV-2病毒特性

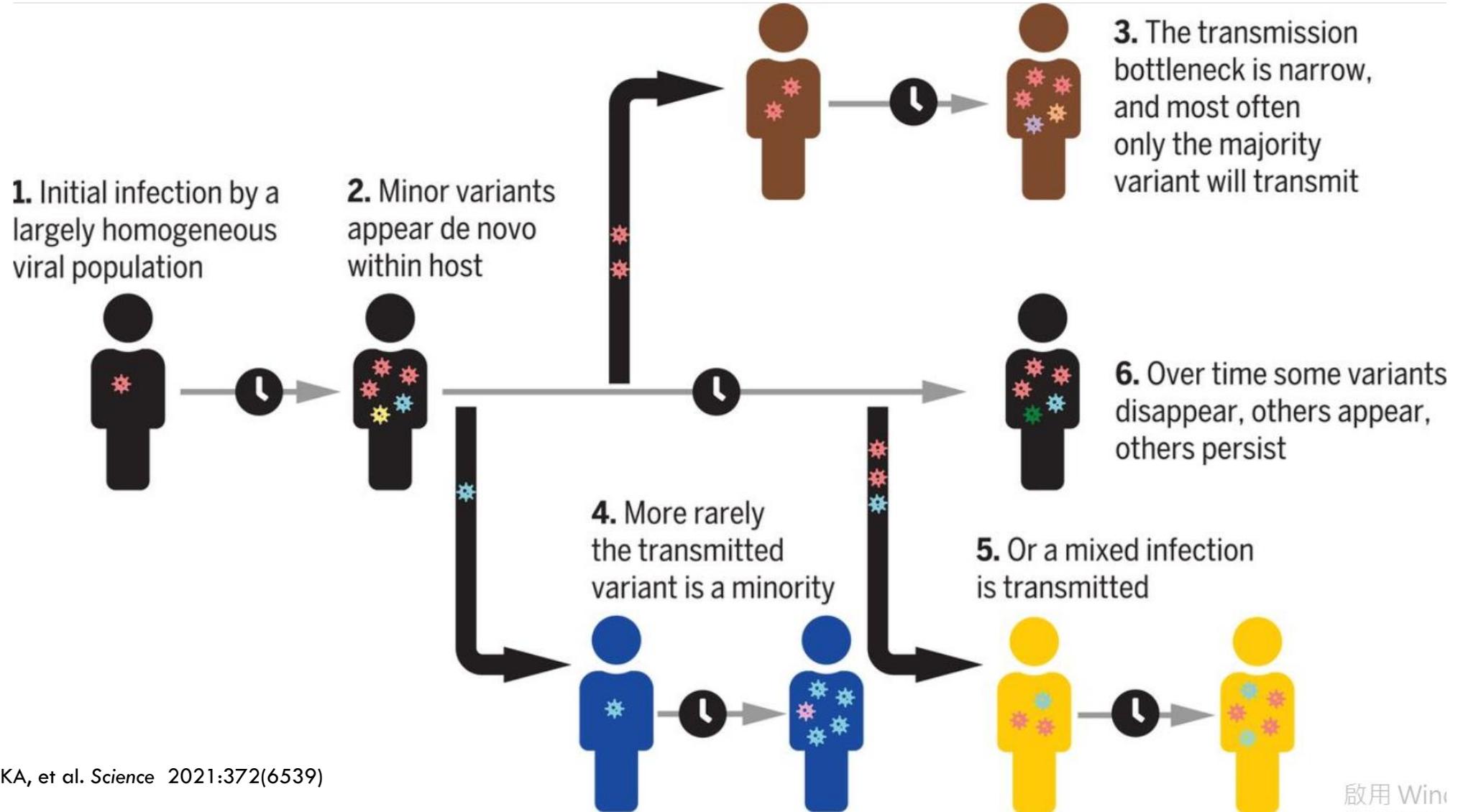
- A newly identified member of the Coronaviridae family
- Enveloped
- Single-stranded
- Positive sense
- **RNA** genome
- Non-segmented
- Helical nucleocapsid



CDC/ Alissa Eckert, MSMI; Dan Higgins, MAMS

病毒演變 改變是常態

SARS-CoV-2 變異及傳播



Emergence of Immunity-evading Variants of Concern

The larger the number of infected persons, the greater the chance that new variants of concern will arise. Partially effective interventions encourage viral evolution.

- Circumstances in which rapid transmission of high titers of virus occurs (e.g., crowded living conditions)
- Prolonged viral replication in the presence of partial immunity in immunocompromised persons
- Use of antibody-based treatments (e.g., monoclonal antibodies or convalescent plasma) in circumstances in which they are of limited or undemonstrated

高關注變異株 Variants of concern (VOC)

- Increase in transmissibility or detrimental change in COVID-19 epidemiology; OR
- Increase in virulence or change in clinical disease presentation; OR
- Decrease in effectiveness of public health and social measures or available diagnostics, vaccines, therapeutics.

SARS-CoV-2 Variants of Concern 高關注變異株

之前

現在

WHO label	Pango lineage	GISAID clade/lineage	Nextstrain clade	Earliest documented samples	Date of designation
Alpha	B.1.1.7	GRY (formerly GR/501Y.V1)	20I (V1)	United Kingdom, Sep-2020	18-Dec-2020
Gamma	P.1	GR/501Y.V3	20J (V3)	Brazil, Nov-2020	11-Jan-2021
Delta	B.1.617.2	G/478K.V1	21A	India, Oct-2020	VOI: 4-Apr-2021 VOC: 11-May-2021
Omicron*	B.1.1.529	GR/484A	21K, 21L, 21M, , 22A, 22B, 22C	Multiple countries, Nov-2021	VUM: 24-Nov-2021 VOC: 26-Nov-2021

* Includes BA.1, BA.2, BA.3, BA.4, BA.5 and descendent lineages. It also includes BA.1/BA.2 circulating recombinant forms such as XE. WHO emphasizes that these descendant lineages should be monitored as distinct lineages by public health authorities and comparative assessments of their virus characteristics should be undertaken.

Omicron subvariants under monitoring

Pango lineage	GISAID clade	Nextstrain clade	Relationship to circulating VOC lineages	Genetic features	Earliest documented samples
BA.4 [#]	GRA	22A	BA.1 and BA.2 sister lineage	BA.2-like constellation in the spike protein + S:del69/70, S:L452R, S:F486V, S:Q493 reversion	South Africa, Jan-2022
BA.5	GRA	22B	BA.1 and BA.2 sister lineage	BA.2-like constellation in the spike protein + S:del69/70, S:L452R, S:F486V, S:Q493 reversion	South Africa, Jan-2022
BA.2.12.1	GRA	22C	BA.2 sublineage	BA.2 + S:L452Q, S:S704F	USA, Dec-2021
BA.2.9.1 [§]	GRA	-	BA.2 sublineage	BA.2 + S:L452M	Multiple countries, Feb-2022
BA.2.11 ^{**}	GRA	-	BA.2 sublineage	BA.2 + S:L452R	Multiple countries, Mar-2022
BA.2.13 [§]	GRA	-	BA.2 sublineage	BA.2 + S:L452M	Multiple countries, Feb-2022
BA.2.75 ^{***}	GRA	-	BA.2 sublineage	BA.2 + S:W152R, S:F157L, S:I210V, S:G257S, S:D339H, S:G446S, S:N460K, S:Q493 reversion	India, May-2022

SARS CoV-2高關注變異株特性

Public health domain of impact	Alpha變異株	Delta變異株
Transmissibility	Increased transmissibility	Increased transmissibility
Disease severity	Increased risk of hospitalization, possible increased risk of severity and mortality	Possible increased risk of hospitalization
Risk of reinfection	Neutralizing activity retained, risk of reinfection remains similar	Reduction in neutralizing activity reported
Vaccine efficacy/ effectiveness	Protection retained against all outcomes	Protection retained against severe disease; possible reduced protection against symptomatic disease and infection; limited evidence

SARS CoV-2高關注變異株特性

	Wild type	Alpha / Delta variant	Omicron variant
常見症狀	Fever/chills Headache Myalgia/fatigue Cough sore throat Running/stuffy nose Diarrhea Dysosmia/dysgeusia Tachypnea/dyspnea	Fever Headache Fatigue/myalgia Sore throat Running/stuffy nose Tachypnea/dyspnea Dysosmia/dysgeusia (not delta variant)	Mild headache Fatigue/myalgia Fever Running/stuffy nose Sore throat Diarrhea
R_0	3 ~ 4	3 ~ 7	7 ~ 14
Hospital	2.5 ~ 6% (fully vaccinated)	6.4 ~ 12% (no vaccinated)	5% (no vaccinated)

Omicron變異株特性

Public health domain of impact	Omicron (B.1.1.529)	BA.1	BA.2	BA.4	BA.5
Transmissibility	Growth advantage and increased transmissibility compared to Delta		Increased transmissibility compared to BA.1		Growth advantage compared to BA.2
Disease severity	Lower severity compared to Delta (earlier studies); similar or increased severity (recent studies)				Currently available evidence does not suggest a difference in disease severity compared to BA.1
Risk of reinfection	Reduced risk of Omicron reinfection if previously infected with a different SARS-CoV-2 variant		Reduced risk of reinfection with BA.2 following infection with BA.1, and vice versa	NA	NA
Impact on antibody responses	Reduction in neutralizing activity reported as compared to other VOCs		Lower neutralising antibody titers compared to the index virus		Lower neutralising antibody titres (7.5-fold) compared to BA.1

Large increase seen in re-infection rates since Omicron variants became most common

- The risk of re-infection was around seven times higher in the period when the Omicron variants were most common (20 December 2021 onwards), compared with the period when the Delta variant was most common (17 May to 19 December 2021).
- Between 2 July 2020 and 4 June 2022, people were more likely to be re-infected if they:
 - were unvaccinated
 - had a "milder" primary infection with a lower viral load
 - did not report symptoms with their first infection
 - were younger

Consider COVID-19 in the following clinical scenarios

- Compared with patients with nonsevere infection, patients with severe infection were older, had more underlying disorders, especially hypertension, and showed fewer typical symptoms of COVID-19, such as fever and cough. Patients with more severe infection had neurologic manifestations, such as acute cerebrovascular diseases (5 [5.7%] vs 1 [0.8%]), impaired consciousness (13 [14.8%] vs 3 [2.4%]), and skeletal muscle injury (17 [19.3%] vs 6 [4.8%]).
- Patients with COVID-19 commonly have neurologic manifestations. During the epidemic period of COVID-19, when seeing patients with neurologic manifestations, clinicians should suspect severe acute respiratory syndrome coronavirus 2 infection as a differential diagnosis to avoid delayed diagnosis or misdiagnosis and lose the chance to treat and prevent further transmission.

The Talents of SARS-CoV 2 Against Eradication

- Transmissibility is higher than influenza though remains much lower than measles
- Shorter latent than incubation period
- The most is asymptomatic or mild illness
- The immunity is not life-long
 - Both nature infection and vaccination
 - Resulting in re-infection
- Presence of reservoir other than human beings
- Easy for mutation

傳染病大分類

類型疾病	描述
既定感染病 Endemic Established	地方流行疾病已盛行一段時間，有相對穩定和可預測的發病率和死亡率。例如，病毒和細菌的呼吸道和腹瀉疾病，藥物敏感的肺結核和瘧疾，寄生蟲病等熱帶疾病，醫療照護相關感染
新興感染病 Newly emerging	第一次確認在人類宿主產生疾病，例如HIV，新流感 (pH1N1, H7N9); SARS, MERS, COVID-19
再浮現感染病 Reemerging Resurged	在歷史上已確認在人類宿主產生疾病，但 <ul style="list-style-type: none">• 出現在新的地理分布，例如西尼羅河病毒在美國• 具有抗藥性，例如流感，金黃葡萄球菌，瘧疾• 具有新的致病力，例如新型流感• 明顯控制後或絕跡後再次出現，例如脊髓灰質炎 (polio)在非洲部分地區，霍亂在海地，登革熱在美國佛羅里達州• 在特殊情況下，例如2001年故意釋放的炭疽

Important Ways to Slow the Spread of COVID-19

1. Get vaccinated and stay up to date on your COVID-19 vaccines. Find a vaccine.
2. Wear a well-fitted mask to help protect yourself and others.
3. Avoid crowds and poorly ventilated indoor spaces.
4. Stay 6 feet apart from others who don't live with you.
5. Wash your hands often with soap and water. Use hand sanitizer if soap and water aren't available.
6. Test to prevent spread to others.

- 口罩戴好防傳染
- 打追加劑防重症
- 老人確診速服藥



Chief Medical Advisor to the president Dr. Anthony Fauci

Dr. Anthony Fauci, chief medical adviser to the White House, 2022/7/16

<https://www.cdc.gov/coronavirus/2019-ncov/variants/understanding-variants.html> access 2022/7/18

2022/7/16



三防

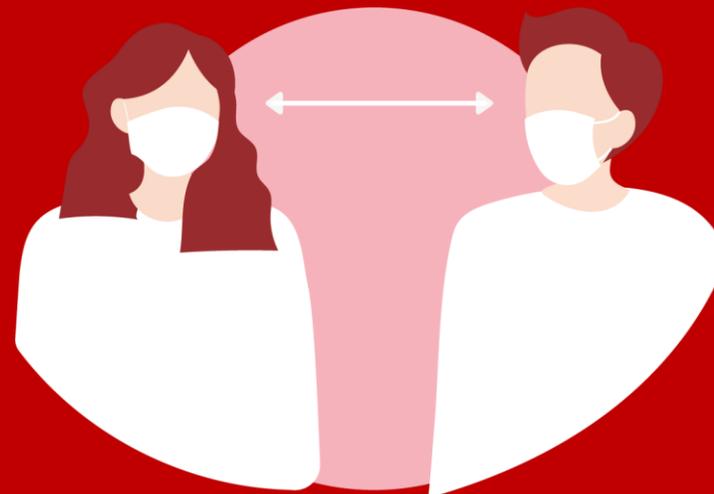
1. 戴口罩



2. 勤洗手



3. 保持社交距離

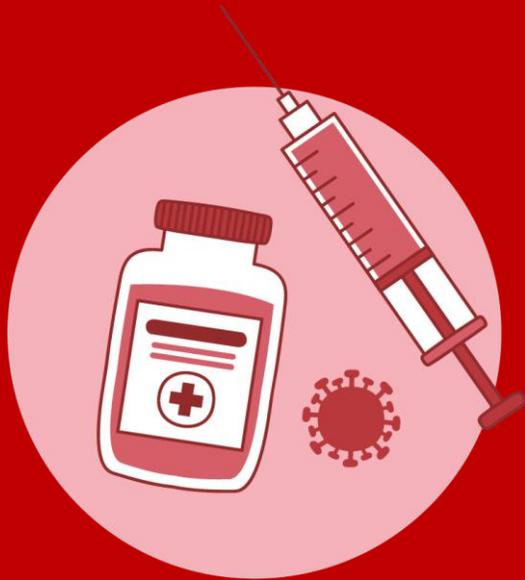


積極保護自己 用心照顧家人

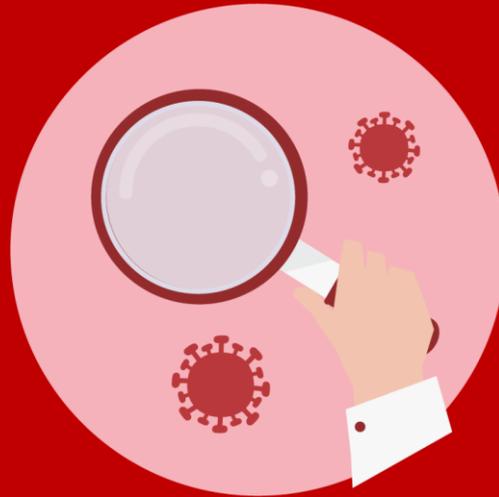


三擊

1. 疫苗



2. 篩檢



3. 治療

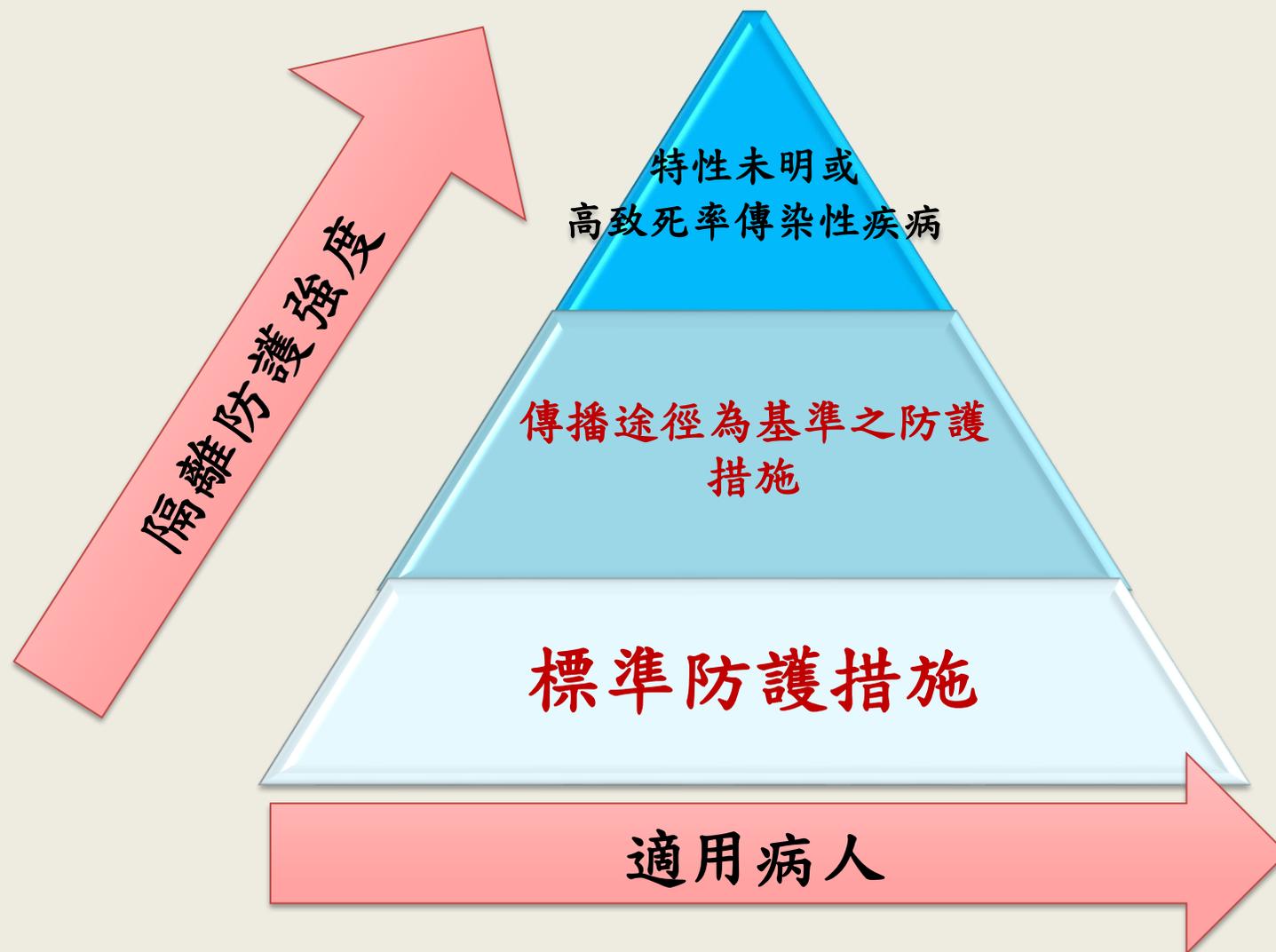


舒緩醫療量能衝擊 有效照顧所有病患

醫院

面對各種傳染性疾病，如何在每日醫療照護中確保自己及病人的安全？

請依據**風險評估** 三層次感染管制措施



Respiratory bundles

- Common respiratory viruses are common causes of HAI, HAP
- COVID-19 in addition to influenza and RSV cause considerable morbidity/mortality.
- Comprehensive preventive strategy important in compromised host wards
- National/systemic level preventive strategy: vaccination, more single room (or national ventilation rooms)
- Hospital preventive measures: raising hand hygiene compliance, masking of HCP; early diagnosis, post-exposure prophylaxis (EVUSHELD 600 mg IM, 300 mg tigagevimab, cilgavimab, q6 months, AZ) NT 50k/dose, 300 mg

標準防護措施 Standard Precautions

任何時間對所有病人而言，標準防護措施是最基本的防護措施

COVID-19

風險評估，適當配戴

內 容	建 議	SARS
手部衛生	手部衛生五時機、穿脫PPE前後、準備用物	
個人防護裝備 (PPE)		
手套	接觸血液、體液...等潛在/現存感染源時	
隔離衣	手臂及衣服會暴露於潛在/現存感染源時	
臉部保護 (口罩、護目鏡、護面板)	會吸入潛在/現存感染源時或被噴濺臉部時 執行侵入性治療(如：腰椎穿刺術)時	
呼吸道衛生/咳嗽禮節	口罩、打噴嚏或咳嗽時遮住口鼻 / 手部衛生	SARS
病人安置	必要時使用單人病室或隔離室	
醫療儀器/器材	醫療儀器/器材之消毒及滅菌、運送及處理	
醫療環境控制	常規及持續維持環境清潔	
被服管理	被服及布單的清洗、消毒、存放與運送	
安全注射行為、職場安全	使用安全針具 使用抗針刺容器	AIDS

- 已確知罹患空氣傳播疾病或新興呼吸道傳染病的病人，建議**避免使用蒸氣吸入治療**，改採取其他比較不會產生飛沫微粒(aerosol)的給藥治療方式。
- 若因疾病所需，一定要使用，最好在負壓且每小時換氣率達 12 次的病室或診療室中進行，治療執行期間應避免不必要的人員進出，人員如需在場應配戴 N95 等級(含)以上口罩。

國家 全球

Combined Challenges while COVID 'nowhere near over'

- SARS-CoV-2 virus continues to circulate and evolve which drives waves of cases, hospitalizations and deaths globally. Covid-19 **reinfections** may increase the likelihood of new health problems.
- Reduced **surveillance**, the relaxation and/or inappropriate use of **public health** and social measures, suboptimal **infection prevention and control**, and inadequate **vaccination** coverage/healthcare inequity, contribute to surges in incidence, hospitalizations and deaths in many countries.
- More challenges due to pandemic fatigue and a **disconnect in COVID-19 risk perception** between scientific communities, political leaders and the general public in many countries
- We should not take for granted measures/tools that have prevented infections, hospitalizations and deaths and must continue to allocate resource for implementation of these measures in addition to **test-and-treat** protocols.

總結

Without a strategic plan for the “new normal” with endemic COVID-19, more people... will unnecessarily experience morbidity and mortality, health inequities will widen, and trillions will be lost from the US economy. Emanuel EJ, et al. JAMA 2022 Jan 18



How the world learns to live with covid-19
From pandemic to epidemic

From pandemic to endemic

Past	Current/future
Zero COVID-19	Living with COVID-19
Containment	Mitigation

Challenges

Rapid emergence of variants of concerns, from Alpha, Delta to Omicron

Back to basic practices

Community: Vaccination **AND** New Normalcy (hand hygiene, mask, or social distance)

Healthcare settings: standard precautions **AND** droplet & contact precautions

Testing and Treatment