

The background features a dark blue gradient with faint, glowing blue lines. On the left, there is a stylized outline of a human head in profile, facing right, with a detailed brain structure inside. On the right, there is a stylized medical monitor displaying a heart rate line and various icons representing different organs (heart, lungs, stomach, intestines).

Long COVID in ICU patients managing persistent symptoms and organ dysfunction

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What did GPT say?

“Long COVID in ICU patients: managing persistent symptoms and organ dysfunction”

- **Long COVID** → A condition where patients experience symptoms lasting weeks to months after acute SARS-CoV-2 infection.
- **ICU patients** → Focus is on critically ill COVID-19 patients who required intensive care (often due to severe pneumonia, ARDS, sepsis, or multiorgan failure).
- **Persistent symptoms** → Lingering issues such as fatigue, breathlessness, cognitive impairment ("brain fog"), sleep disturbances, anxiety/depression, or muscle weakness.
- **Organ dysfunction** → Long-term complications affecting lungs (fibrosis), heart (myocarditis, arrhythmia), kidneys (AKI to CKD), brain (neurocognitive decline), and others.
- **Managing** → How to recognize, evaluate, and treat these ongoing problems through rehabilitation, follow-up care, multidisciplinary teams, and evidence-based strategies.



Outline

1

Burden of COVID-19

2

Long COVID

3

Long COVID in ICU

4

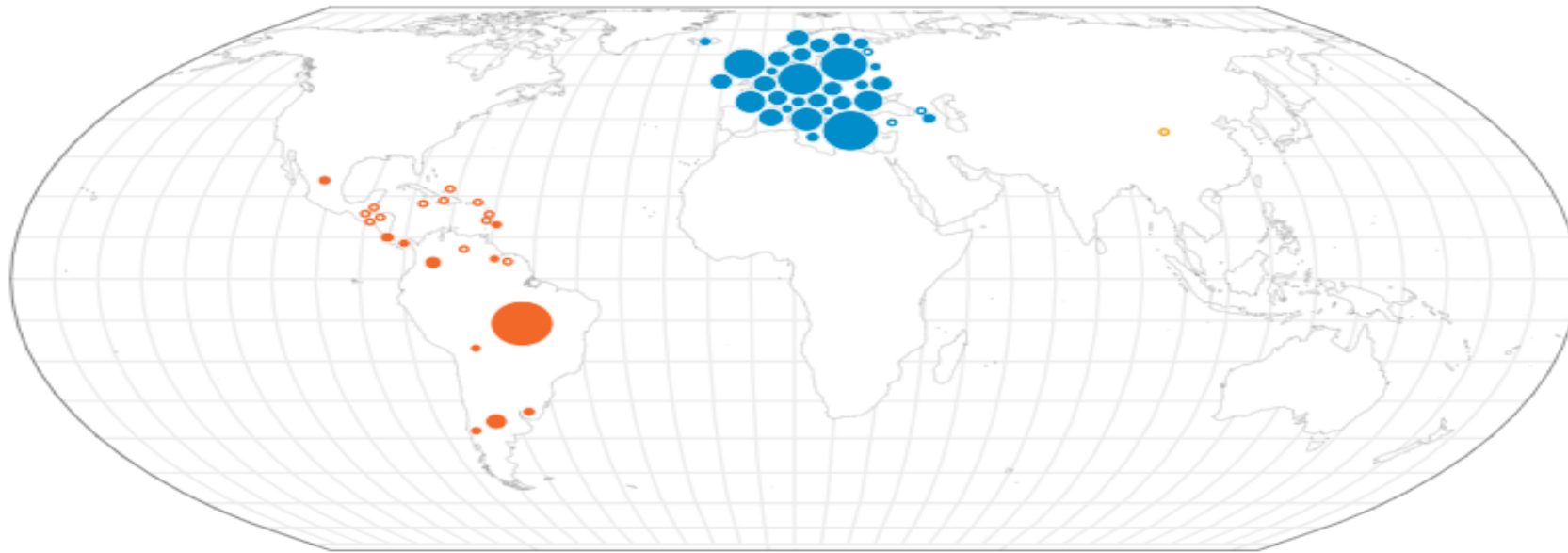
**Management of long
COVID**

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Global Epidemiology

Number of COVID-19 cases reported to WHO

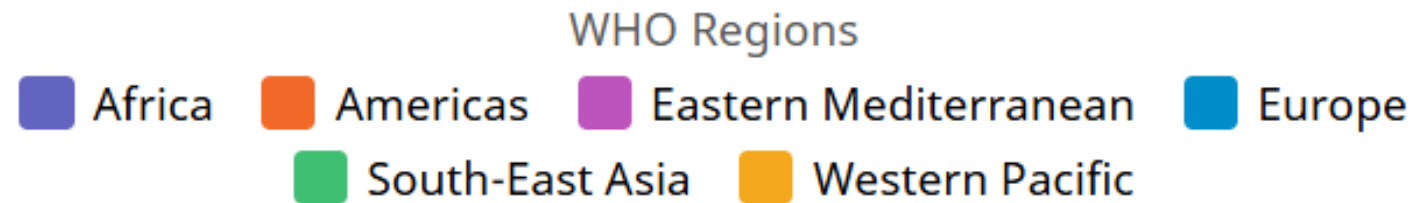
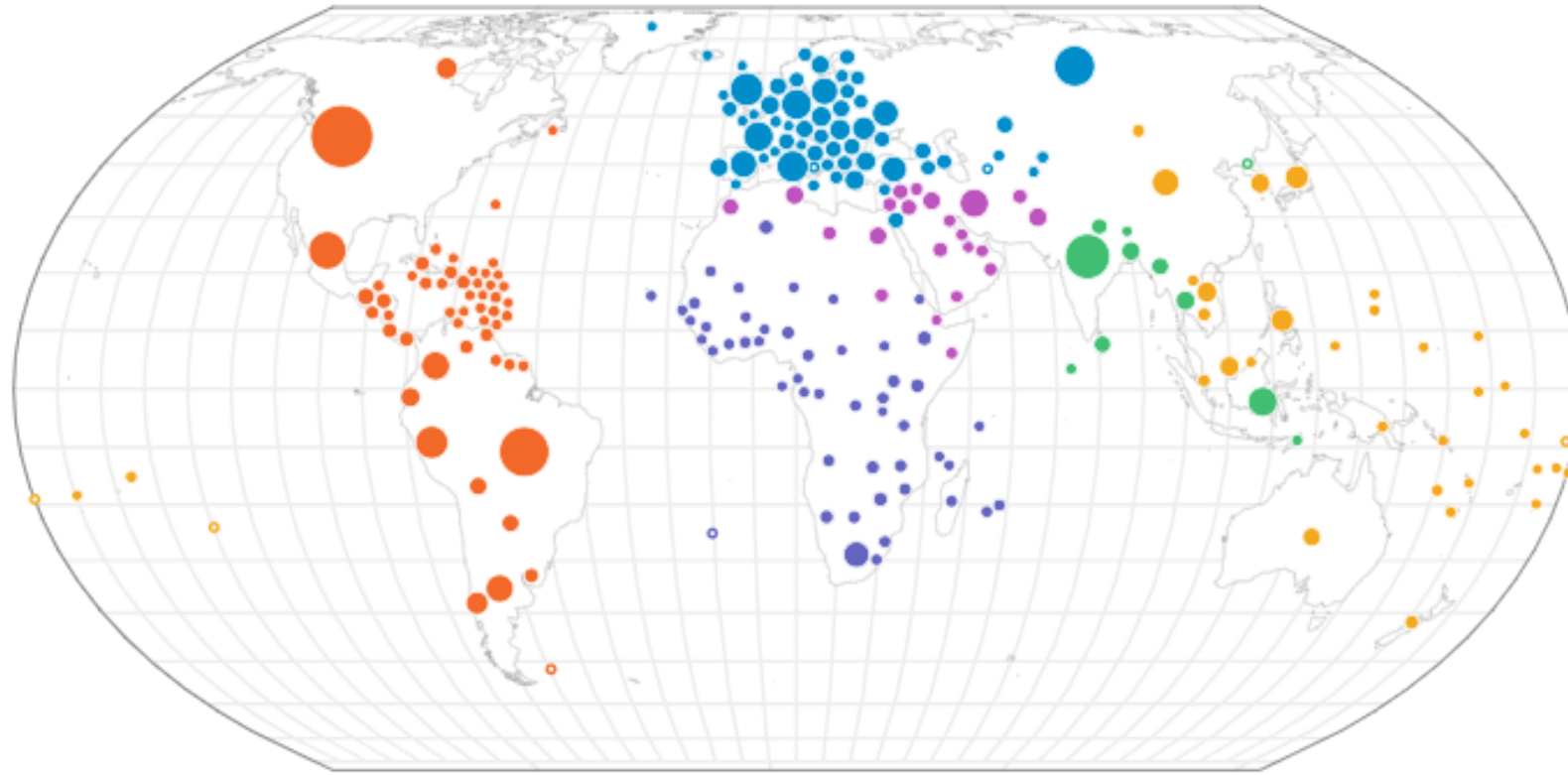
World, 7 days to 19 October 2025



WHO Regions

 Africa	 Americas	 Eastern Mediterranean	 Europe
	 South-East Asia	 Western Pacific	

As of 19 October 2025, there have been 778,856,342 confirmed cases of COVID-19



As of 19 October 2025, there have been 7,103,185 deaths of COVID-19

1-2

COVID-19 in Taiwan

Total case
10,241,502

Death
19,005

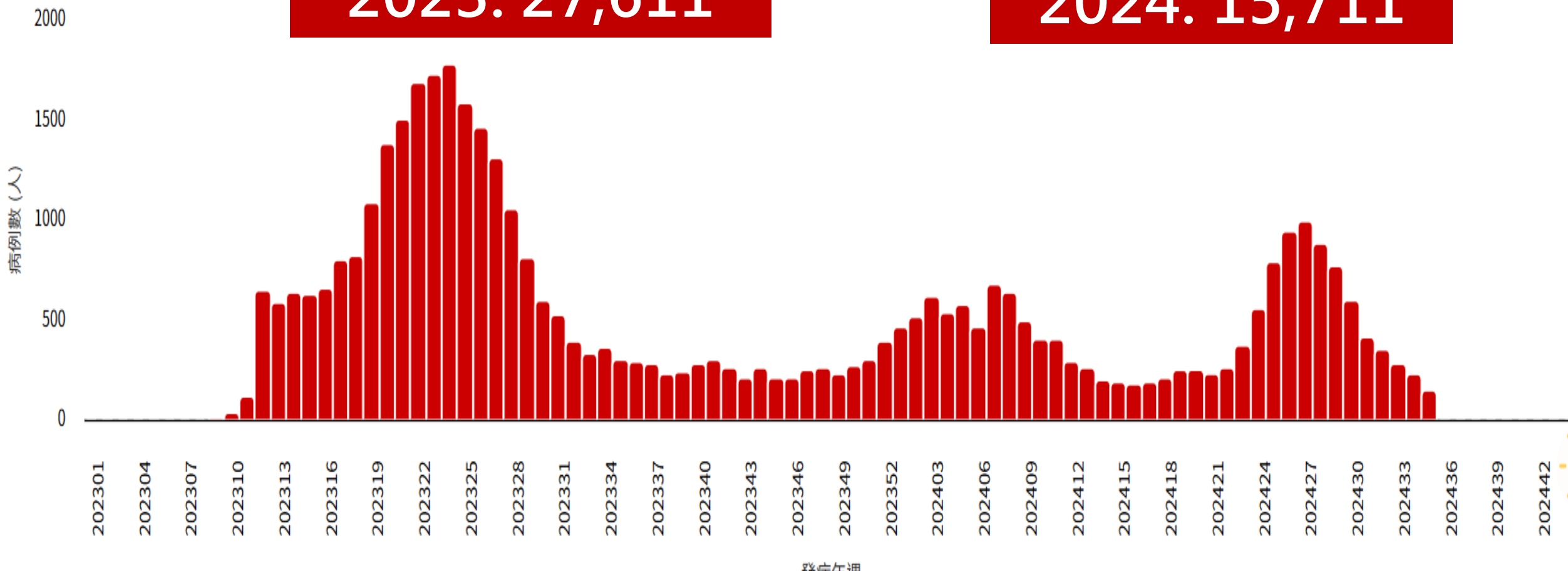
Updated on March 2023

<https://nidss.cdc.gov.tw/nndss/disease?id=19CVS>

First period
2020-1 ~ 2023-3

2023: 27,611

2024: 15,711



Second period
2023-4 ~ 2024-8



COVID-19疫情週報

2025年第43週
疾病管制署

Present
2024/9 ~2025/10/25

9/1更改新冠疾病名稱及病例定義

嚴重特殊
傳染性肺炎

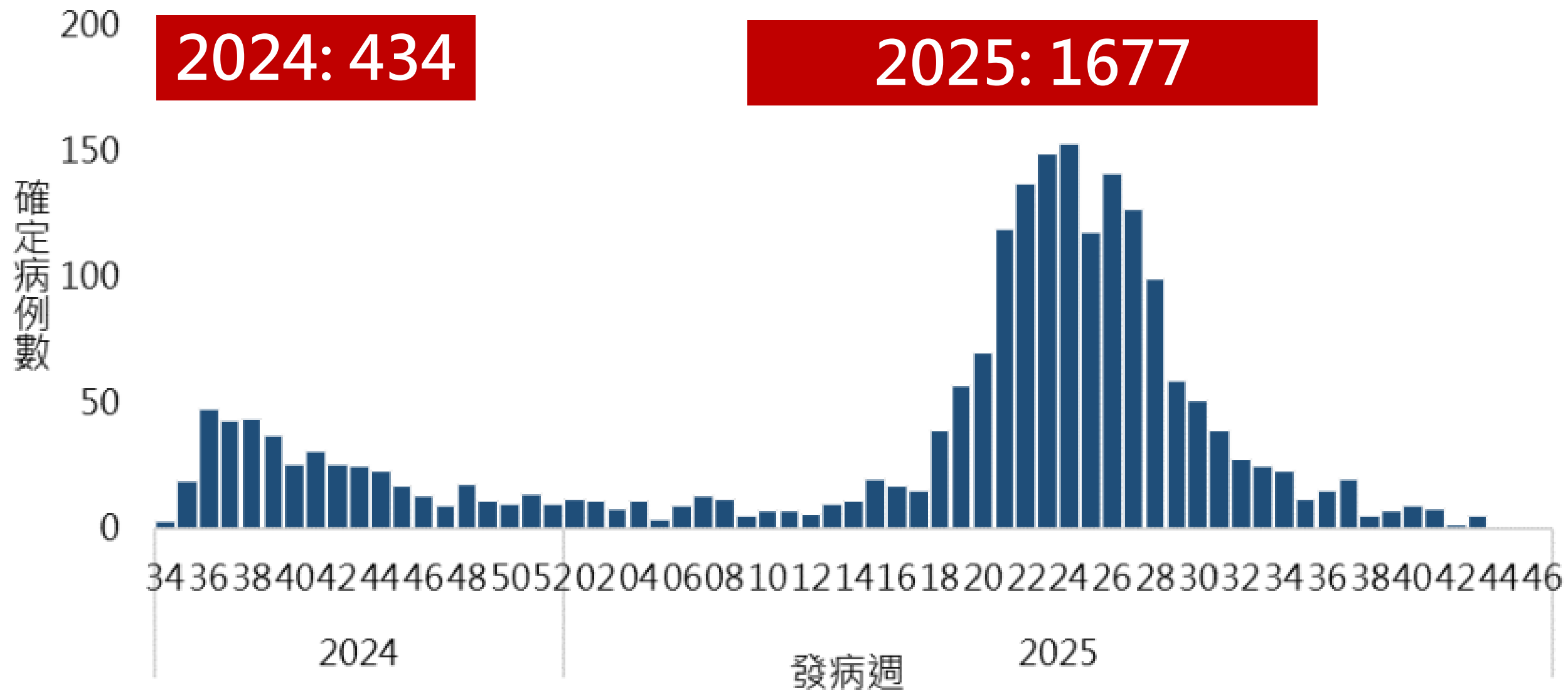


新冠併發重症

現行多元監測方式已能有效掌握疫情，為降低醫院通報負荷，修訂為「需加護病房治療者」醫院才須通報，**公費藥物條件不變**，**不影響民眾權益**。

	現行	修訂後
疾病名稱	嚴重特殊傳染性肺炎	新冠併發重症
病例定義之臨床條件	發燒($\geq 38^{\circ}\text{C}$)或有呼吸道症狀後 14日(含)內，出現肺炎需氧氣治療或其他併發症，因而住院(含急診待床)或死亡者。	發燒($\geq 38^{\circ}\text{C}$)或有呼吸道症狀後14日(含)內出現肺炎或其他併發症，因而 需加護病房治療 或死亡者。
通報時限	72小時	1週內

2024年9/1起新冠併發重症確定病例發病趨勢



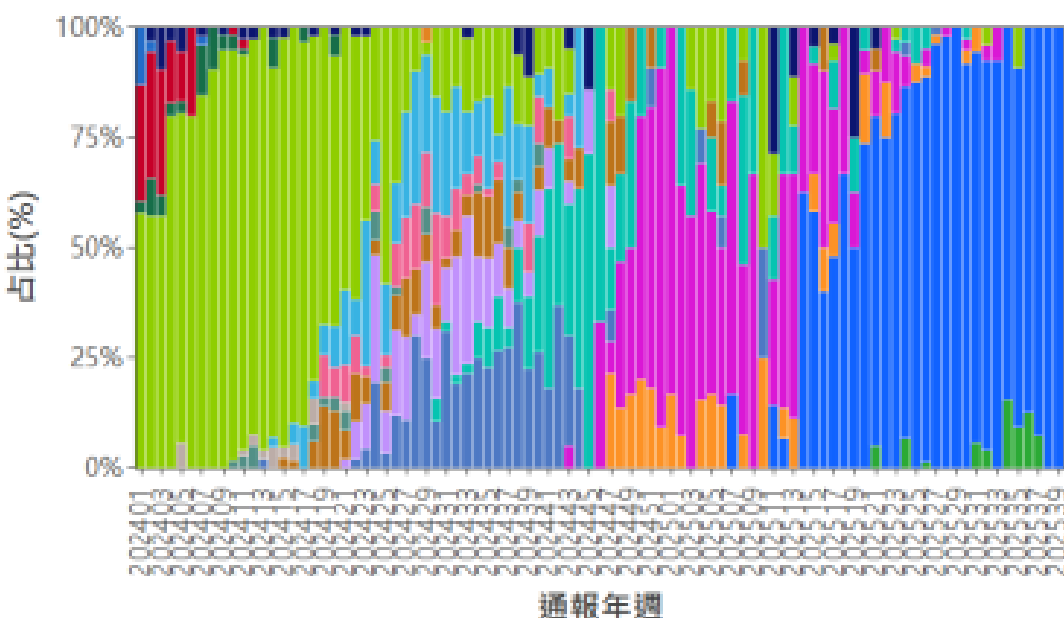
SARS-CoV-2 Variants : Omicron 變異株檢出趨勢

10/28更新資料

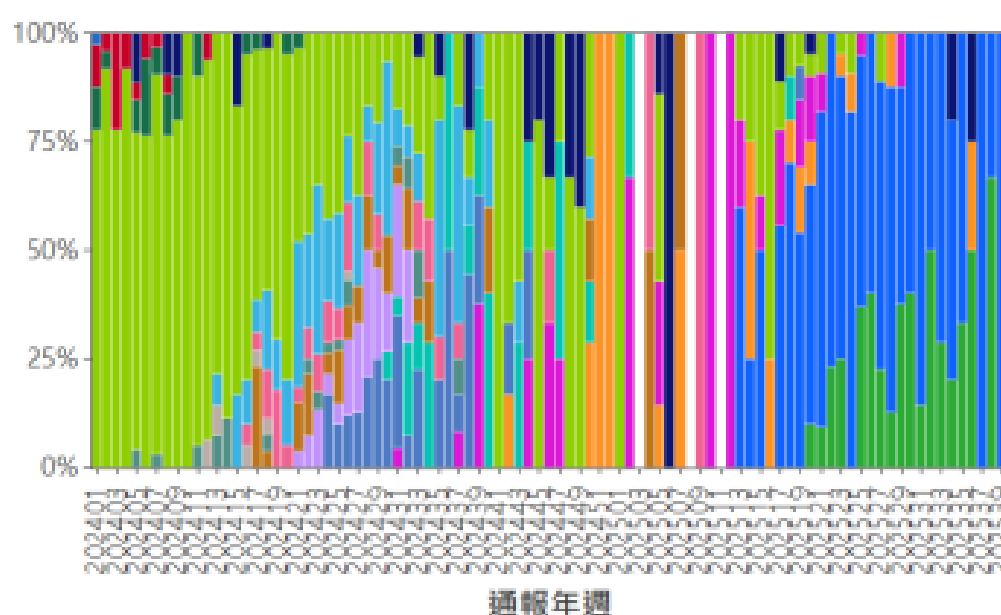
近四週監測變異株占比：

- ◆ 本土病例：NB.1.8.1占93%為多，XFG占7%
- ◆ 境外移入：XFG占44%為多，NB.1.8.1占33%、LP8.1占11%、其他占11%

本土病例



境外移入



WHO 現行 VOI

JN.1

WHO 現行 VUM

KP.3.1.1

LP.8.1

XFG

國內重點監測

XDV.1

KP.3.3

WHO 曾列為 VOI/VUM

BF.7

XBB.1.5

BA.2.86

JN.1.18

KP.3

EG.5

JN.1.7

KP.2

LB.1

其他

其他重組變異株

1-3

Critical COVID-19

2025年1/1起新冠併發重症本土病例流行病学特征描述 (n=1,677)

變項	個案數(%)	變項	個案數(%)
性別		慢病史	
男	1028 (61.3%)	有	1449 (86.4%)
女	649 (38.7%)	無	228 (13.6%)
年齡		通報時LP.8.1疫苗接種情形	
未滿1歲	17 (1.0%)	無	19 (95.0%)
1-6歲	23 (1.4%)	1劑	1 (5.0%)
7-12歲	5 (0.3%)		
13-18歲	6 (0.4%)		
19-49歲	96 (5.7%)		
50-64歲	226 (13.5%)		
65歲以上	1304 (77.8%)		

截至2025/10/27資料



Contents lists available at [ScienceDirect](#)

Journal of the Formosan Medical Association

journal homepage: www.jfma-online.com



Original Article

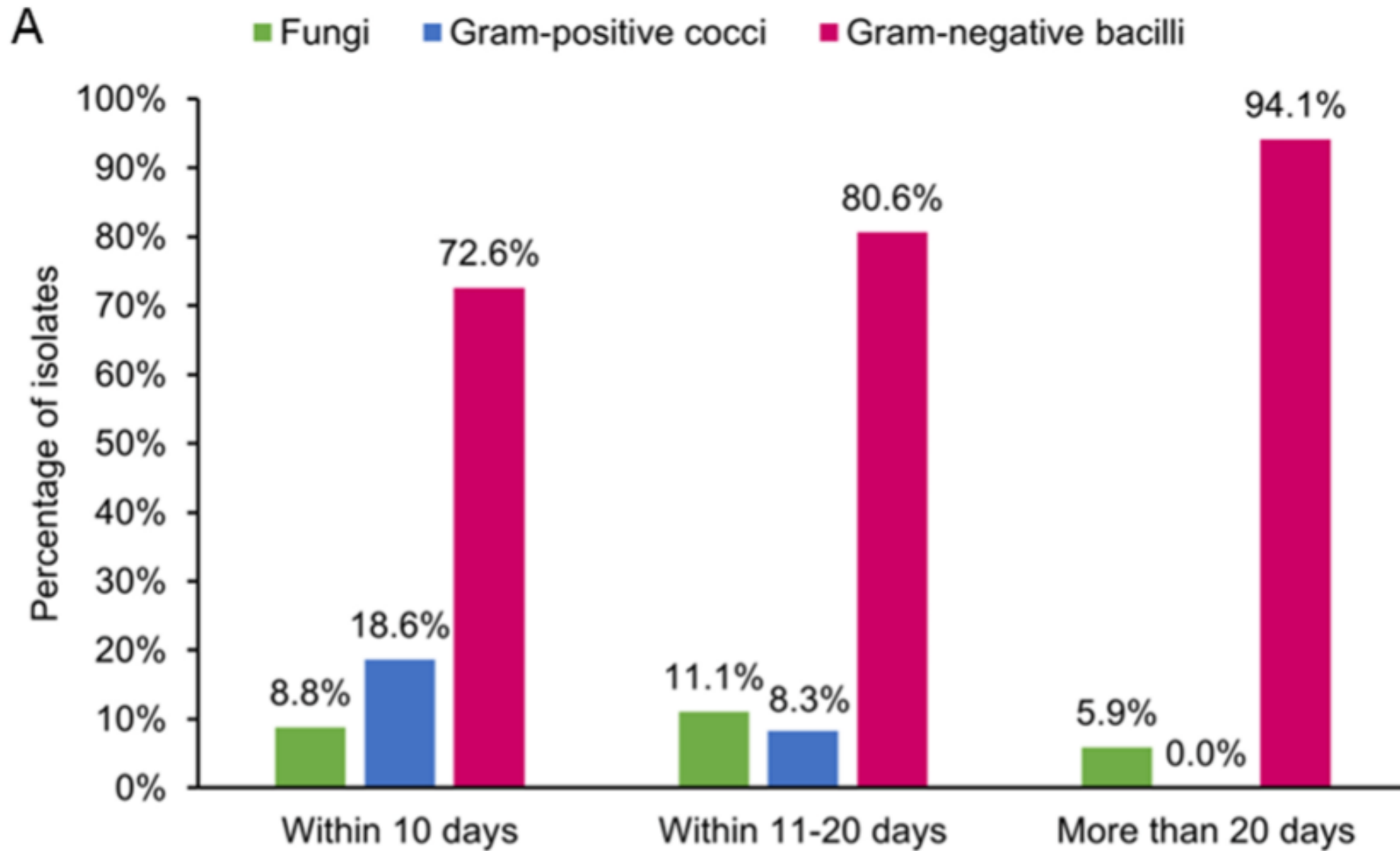
Microbial dynamics, risk factors and outcomes of secondary pneumonia in critically ill patients with COVID-19: A multicenter retrospective cohort study

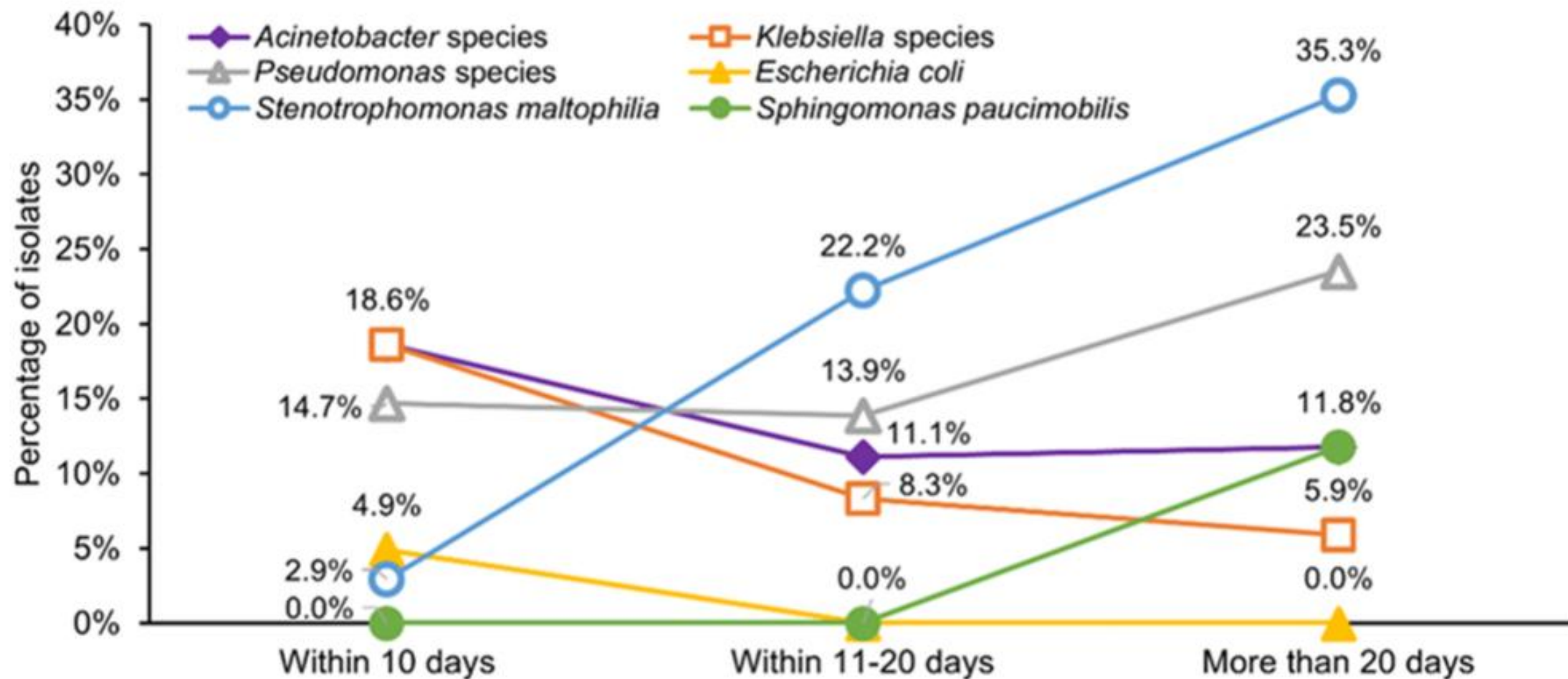


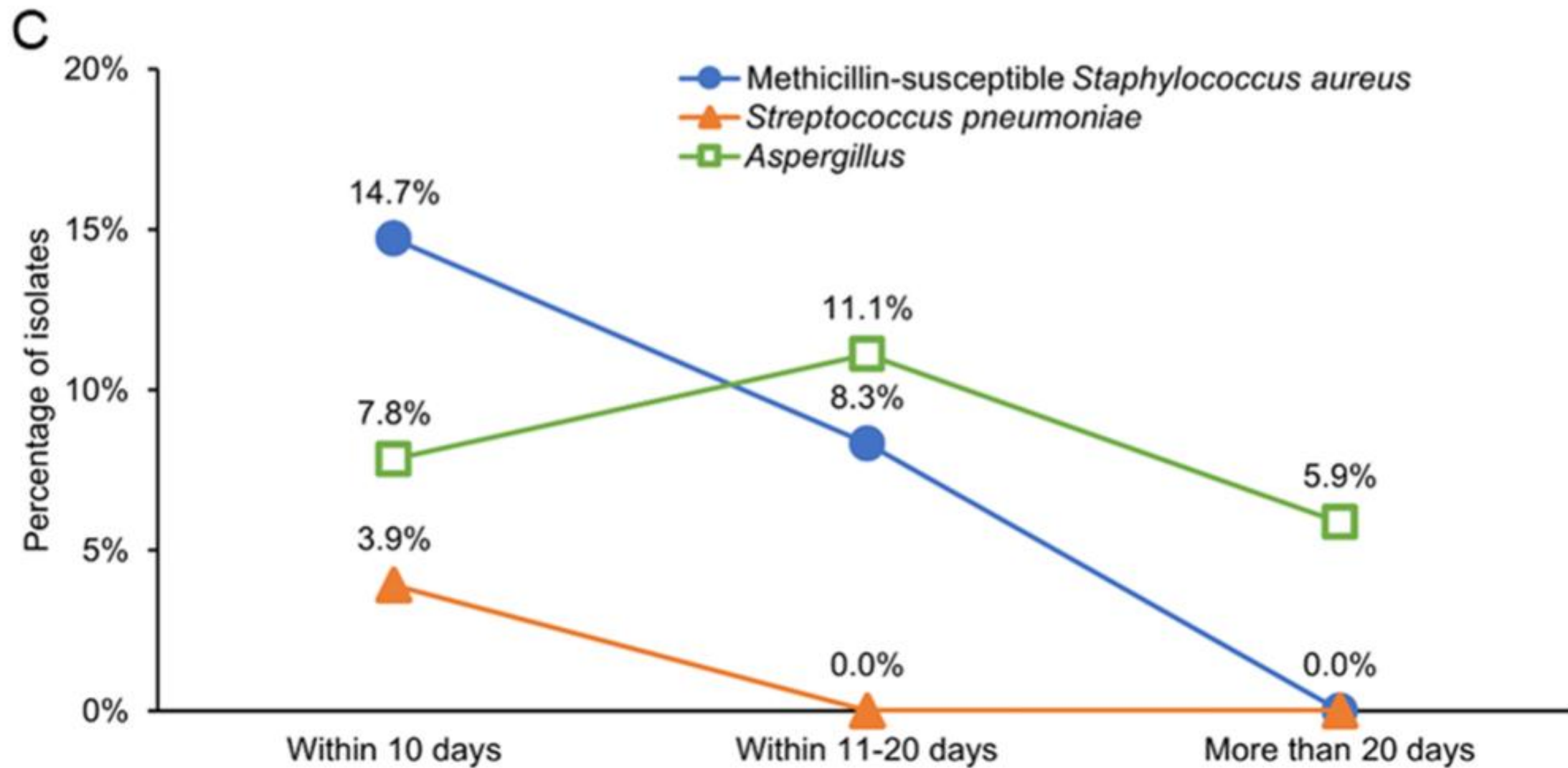
Geng-Ning Hu^{a,b}, Wei-Lun Liu^{c,d,e}, Chia-Hao Chang^{a,b}, Sheng-Yuan Ruan^b, Kuei-Pin Chung^{f,g}, Jung-Yien Chien^{b,*}, Chong-Jen Yu^{a,b}, for the TACTICS Study Group

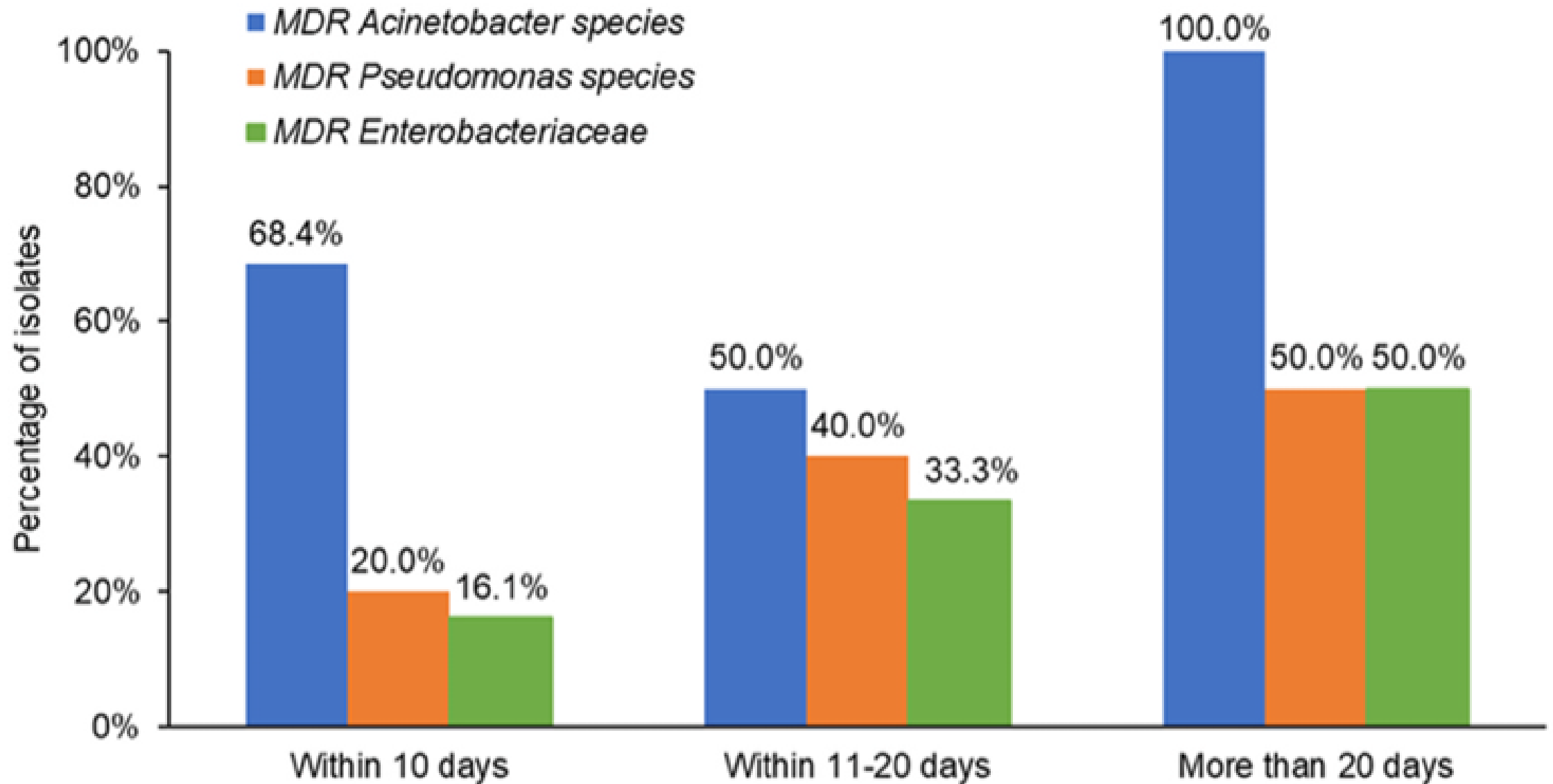
- This multicenter, retrospective cohort study enrolled critical COVID-19 patients requiring ICU admission in Taiwan from December 31, 2020, to June 1, 2022.
- Among the 187 critical COVID-19 patients, 80 (42.8%) developed secondary pneumonia.

J Formos Med Assoc 2024 Nov;123(11):1186-1193.





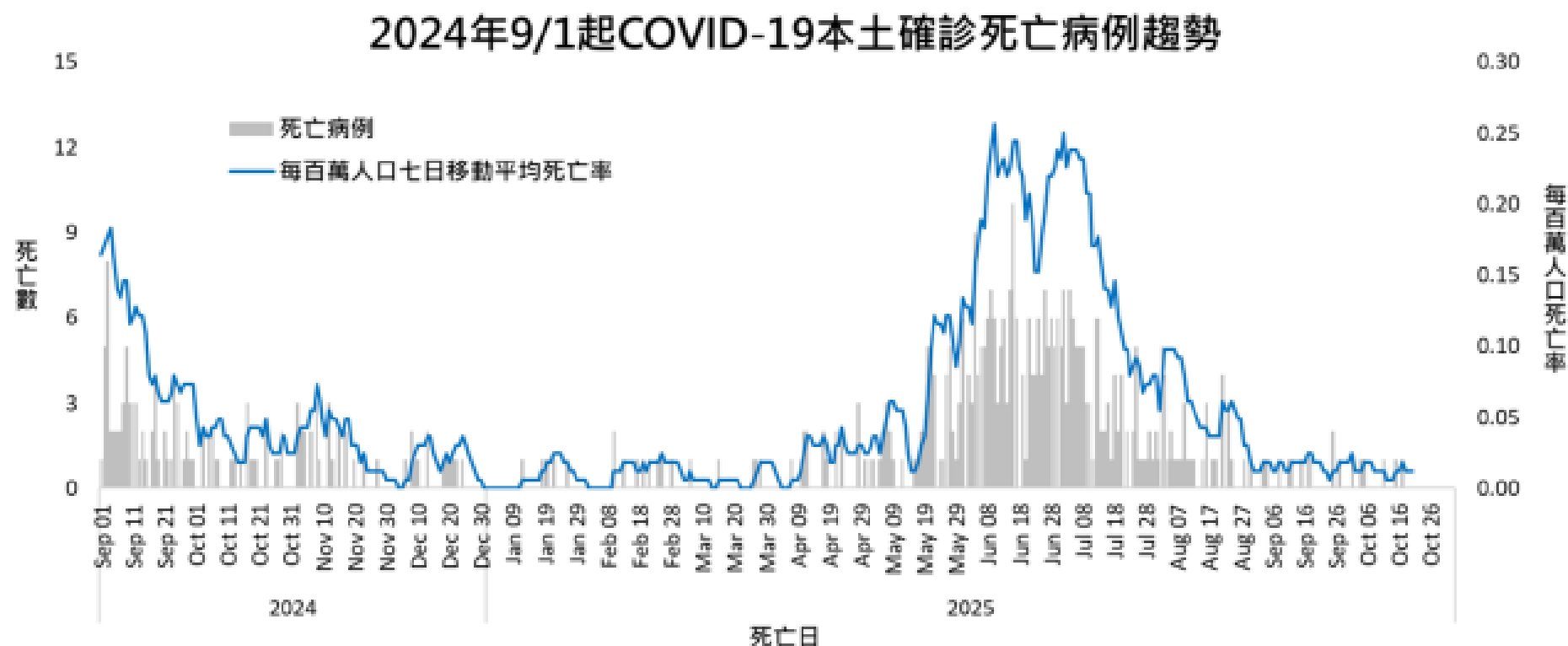




新冠併發重症本土死亡病例分析 (n=391)

10/28更新資料

- 近7日(10/21-10/27)無新增死亡，前7日新增3例
- 2025年起累計391例，年齡介於0-105歲(中位數80歲)，65歲(含)以上334例(85.4%)；具潛在病史342例(87.5%)，10/1起通報之病例均未接種LP.8.1疫苗



The effect of age on mortality

		Age (years)								
		0–4	5–17	18–29 (Ref)	30–39	40–49	50–64	65–74	75–84	85+
Hospitalization	Case No	0.5x	0.7x	-	1x	0.9x	0.8x	0.6x	0.6x	0.8x
		0.6x	0.2x	-	1.5x	1.9x	3.1x	4.9x	8.9x	15x
	Mortality	0.3x	0.1x	-	3.5x	10x	25x	60x	140x	350x

Adapted from CDC. Risk for COVID-19 Infection, Hospitalization, and Death By Age Group, USA

*This group was selected as the reference group because it has accounted for the largest cumulative number of COVID-19 cases compared to other age groups.
CDC. Risk for COVID-19 Infection, Hospitalisation, and Death By Age Group: www.cdc.gov/coronavirus/2019-ncov/covid-data/investigations-discovery/hospitalization-death-by-age.html#print (Accessed April 2023).

Comorbidity

- US CDC systemic review

Higher Risk (conclusive)		Suggestive Higher Risk	Mixed Evidence [#]
- 氣喘 - 癌症 - 腦血管疾病 - 慢性腎臟病* - 慢性肝臟疾病 (肝硬化、非酒精性脂肪肝、酒精性肝臟疾病、自體免疫肝炎) - 慢性肺臟疾病 (氣管炎、慢性阻塞性肺病、間質性肺病、肺栓塞、肺高壓) - 囊腫性纖維化 - 糖尿病 (第一型及第二型*) - 身心障礙[†]，包含唐氏症 - 心臟疾病 (如心衰竭、冠狀動脈疾病或心肌病變)	- HIV 病毒感染 - 精神健康及病 (僅限於情緒障礙，包含憂鬱症、思覺失調症等) - 神經相關疾病 (失智症)[†] - 肥胖 (BMI ≥ 30 kg/m² 或 兒童體重 $\geq 95^{\text{th}}$ 百分位) - 體能障礙 - 懷孕或近期結束妊娠 - 原發性免疫不全 - 正在或曾經吸菸 - 固體器官或血液幹細胞移植 - 結核病 - 使用皮質性類固醇或其他免疫抑制劑	- 有特定潛在疾病的兒童 - 過重 (BMI ≥ 25 kg/m² 但 < 30 kg/m²) - 鎌狀細胞疾病 - 藥物濫用	- Alpha-1 抗胰蛋白酶缺乏症 - 支氣管肺部發育不全 - B 型肝炎 - C 型肝炎 - 高血壓* - 地中海型貧血 [#] Inconclusive: no conclusions can be drawn from the evidence

Higher risk: An underlying condition / risk factor with a published meta-analysis or systematic review or underwent the CDC systematic review process (Source demonstrates a conclusive increase in risk for ≥ 1 severe COVID-19 outcome)
Suggestive higher risk: An underlying condition / risk factor with no published meta-analysis or systematic review or did not undergo the CDC systematic review process (Evidence is mostly cohort, case-control, or cross-sectional studies)
Mixed evidence: An underlying condition / risk factor with a published meta-analysis or systematic review or underwent the CDC systematic review process (Source demonstrates inconclusive evidence)

This list of underlying medical conditions is not exhaustive and will be updated as the science evolves.

*Indicates underlying conditions for which there is evidence for pregnant and non-pregnant people; [†]Underlying conditions for which there is evidence in pediatric patients.

BMI, body mass index; CDC, Centers for Disease Control and Prevention; COPD, chronic obstructive pulmonary disease; HIV, human immunodeficiency virus; ILD, interstitial lung disease; NAFLD, non-alcoholic fatty liver disease.

US CDC. Underlying Medical Conditions Associated with Higher Risk for Severe COVID-19, Information for Healthcare Professionals: www.cdc.gov/coronavirus/2019-ncov/hcp/clinical-care/underlyingconditions.html (Accessed April 2023).

COVID-19疫情總結

- 國內疫情：處低點波動，惟仍新增新冠併發重症及死亡病例，須留意連假後疫情變化及高風險族群重症/死亡發生風險
 - 近期就診人次、新增併發重症數及死亡數於低點波動；今年累計併發重症及其死亡病例以65歲以上長者、具潛在病史及未接種疫苗者占比為高，未接種疫苗者均8成以上
 - 本土變異株以NB.1.8.1為多，其次為XFG
- 國際疫情：
 - 全球陽性率近期呈上升趨勢，歐洲及非洲區署陽性率增加，全球流行變異株由XFG占比最高，其次為NB.1.8.1

2

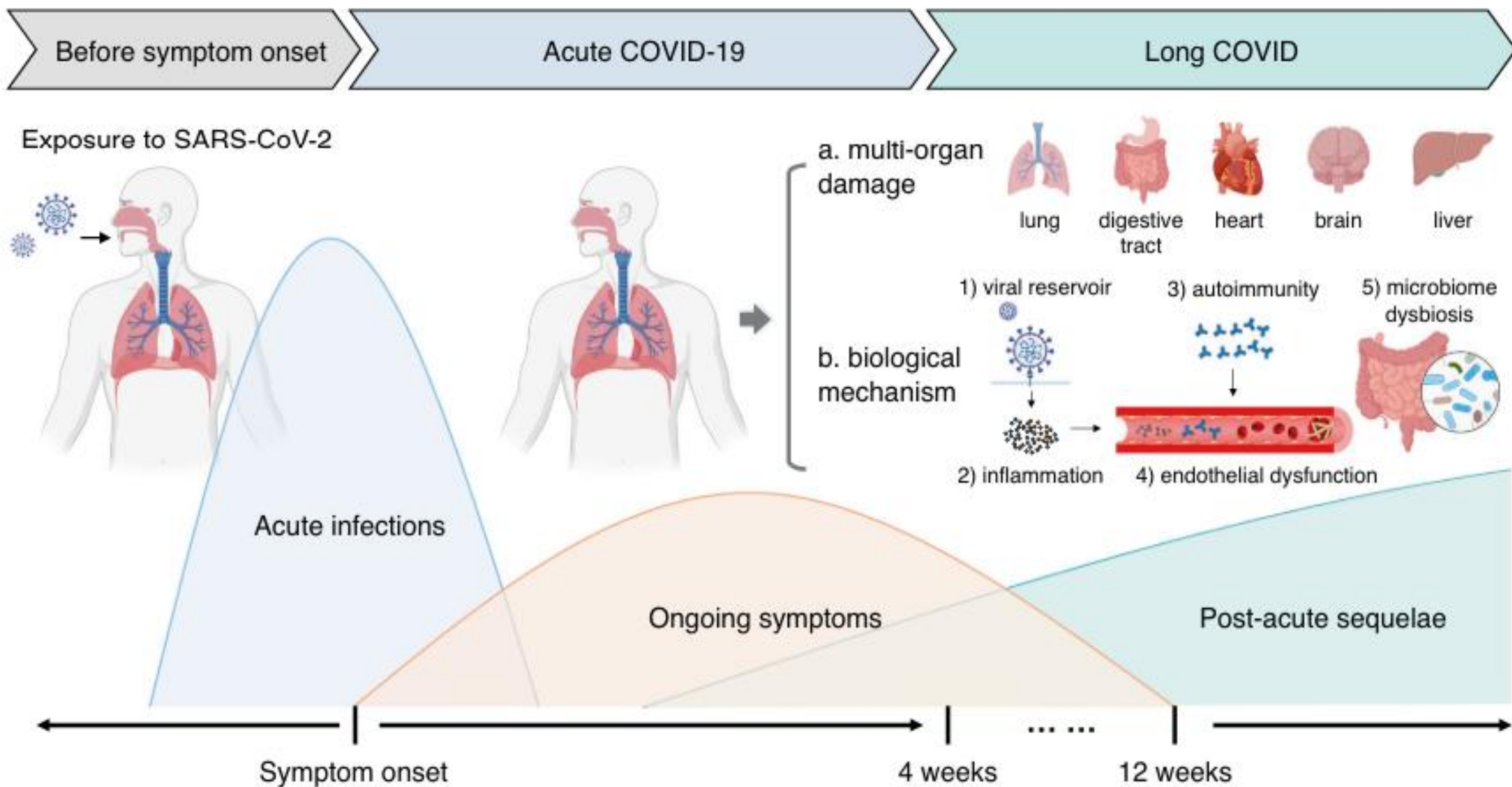
Long COVID

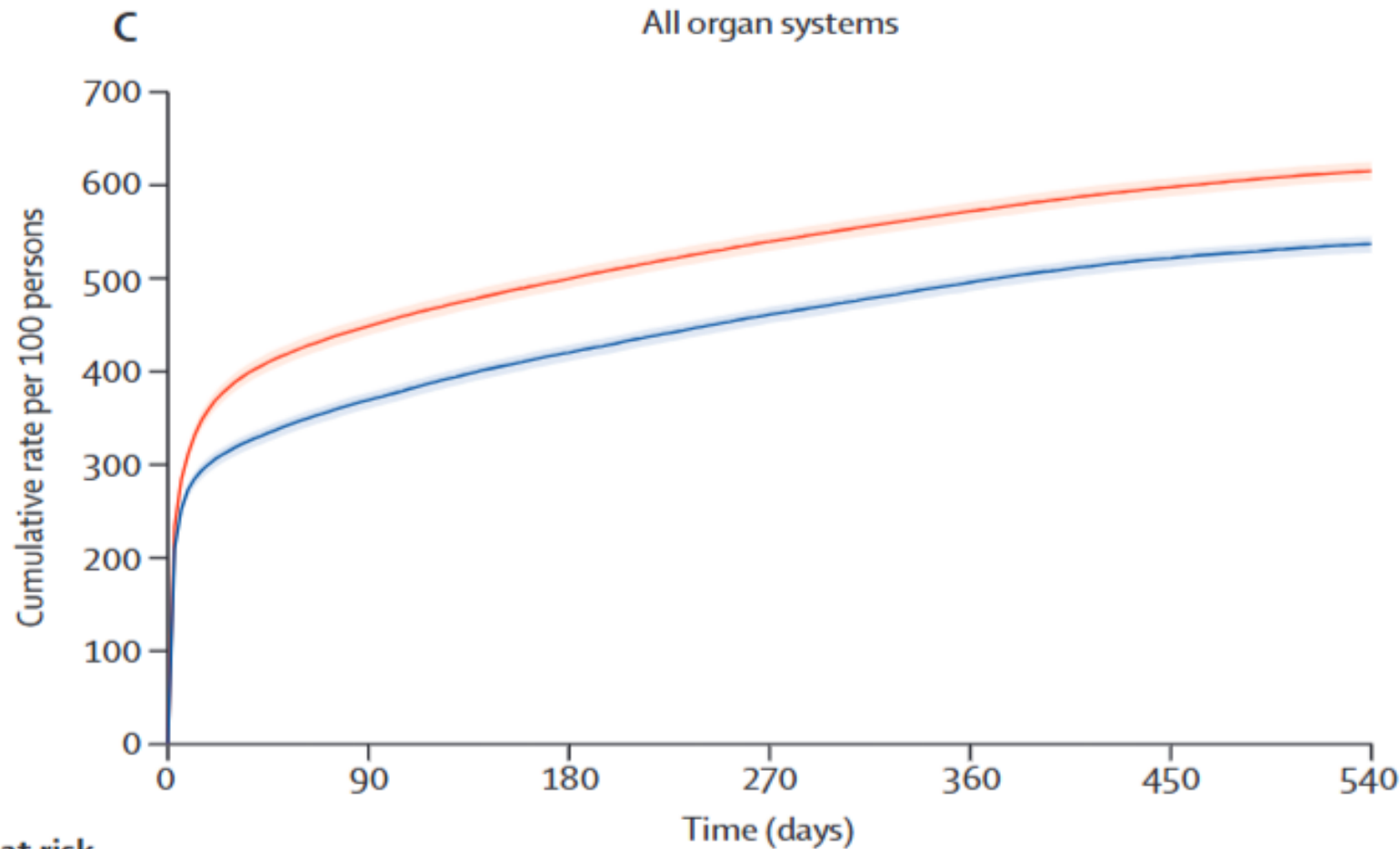
New symptoms that affect everyday function, emerge within 4 weeks to 3 months after first being infected, and last for ≥ 2 months

- Symptoms may fluctuate over time**
- Overlap with prolonged symptoms post hospitalization**

WHO. Delphi consensus 2021

Definition





COVID-19

Seasonal flu

Number at risk

COVID-19 81280

Seasonal influenza 10985

67077
9858

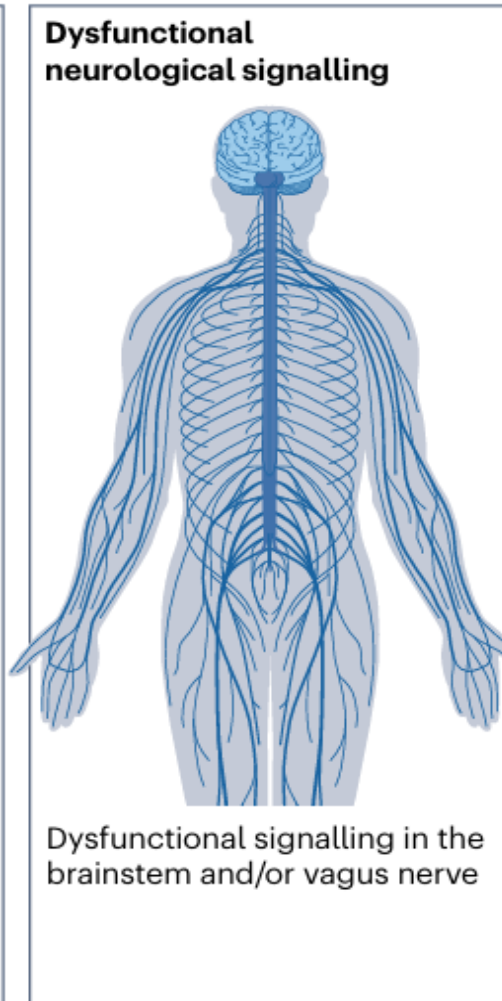
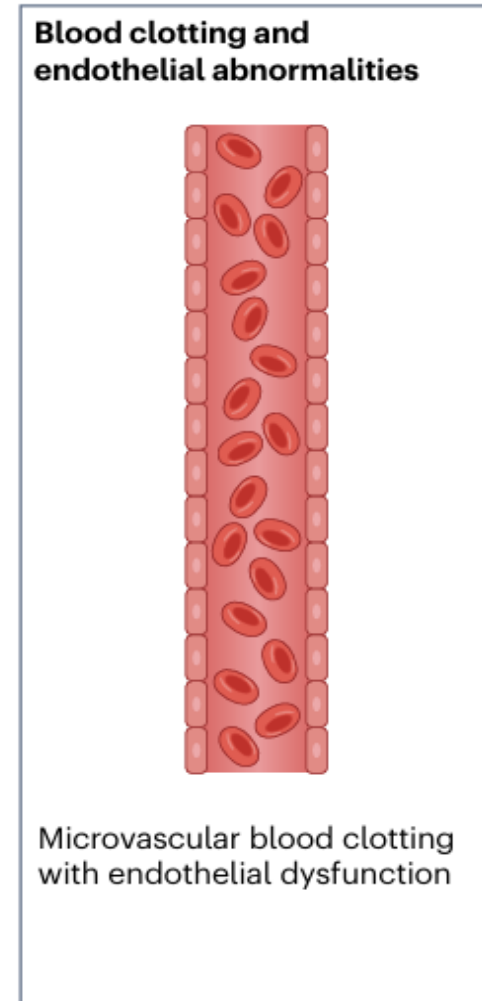
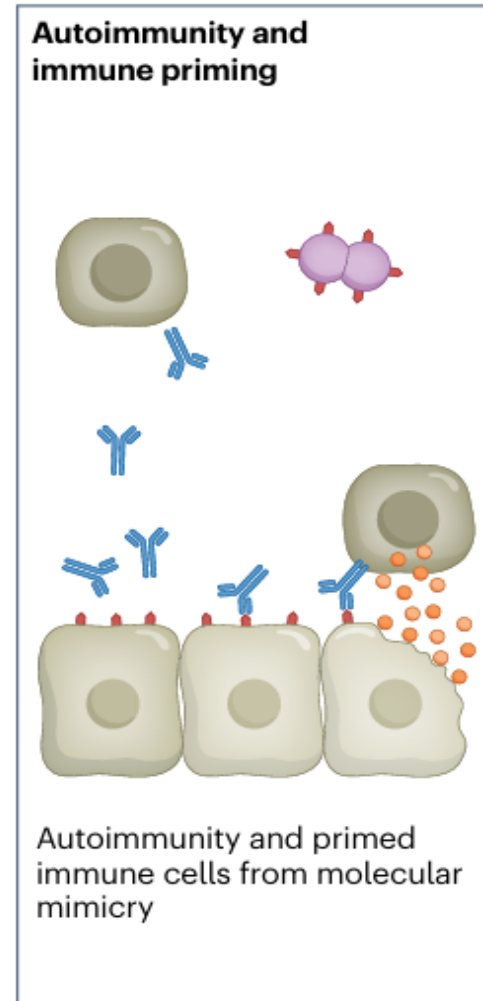
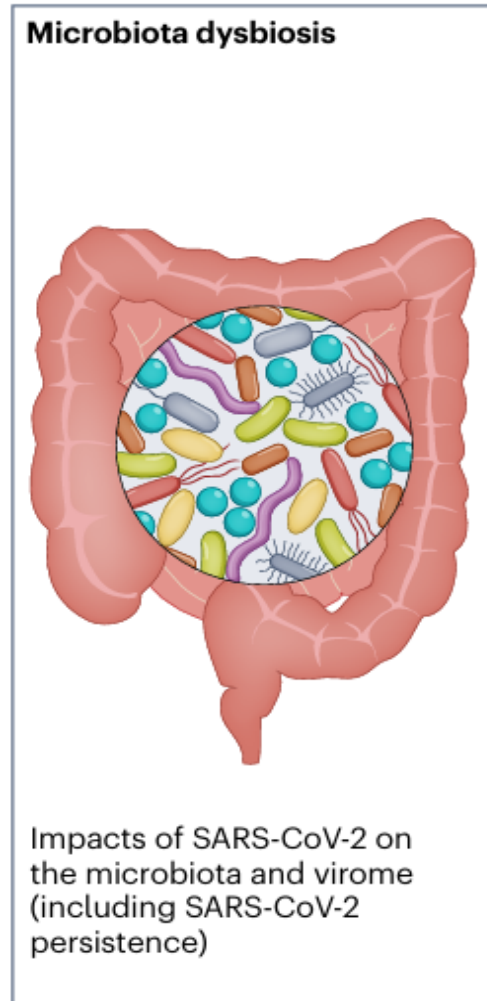
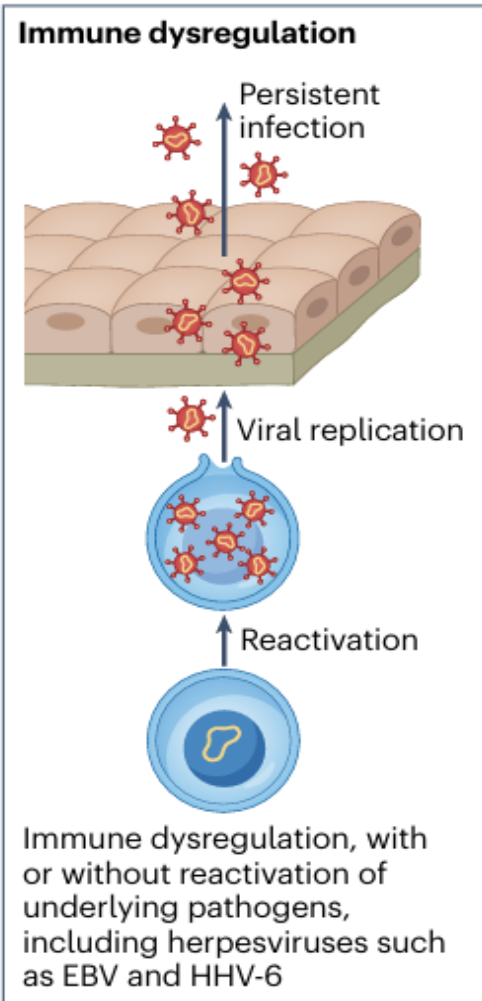
63647
9260

25528
3125

Lancet Infect Dis 2024 Mar;24(3):239-255.

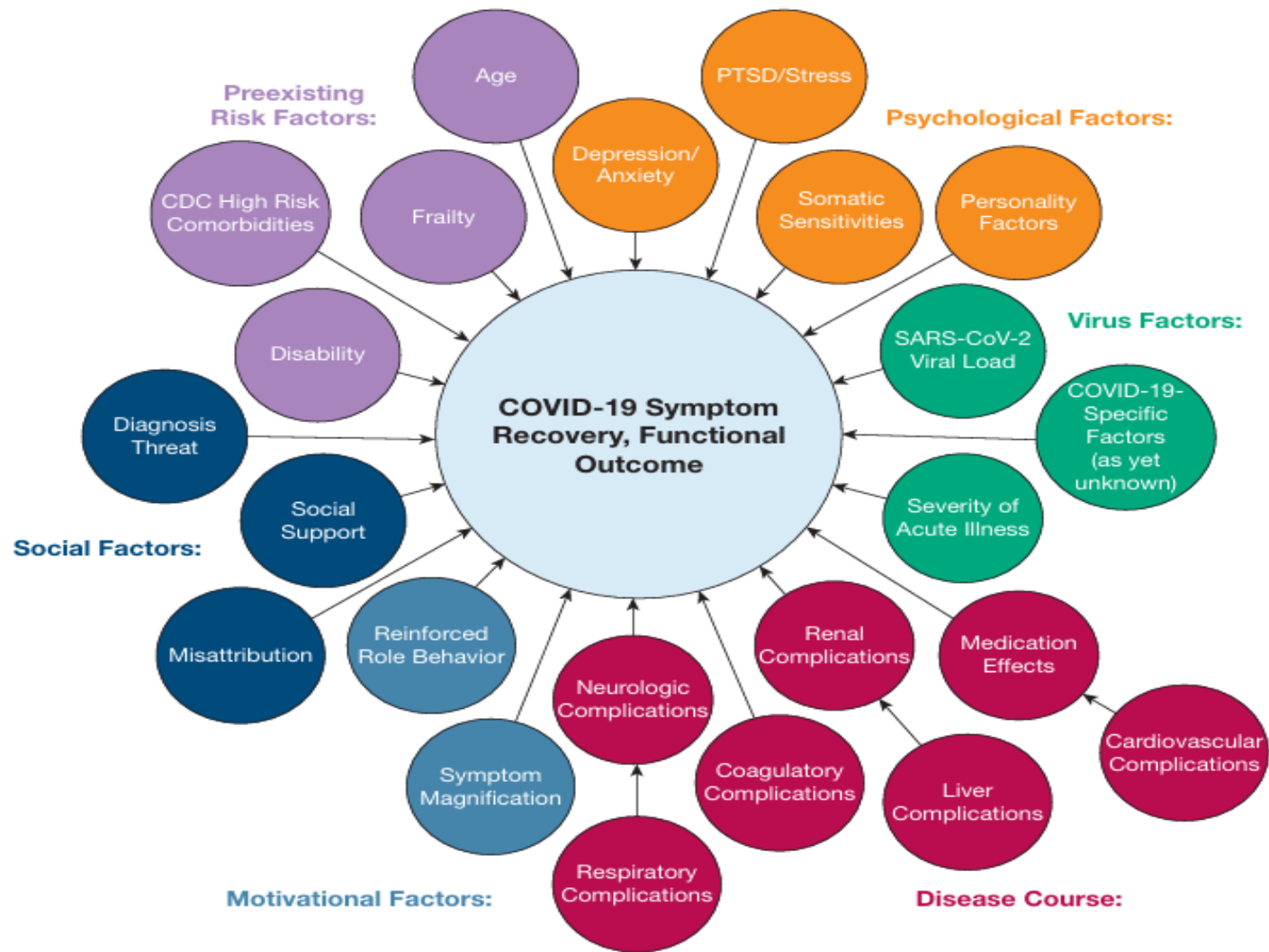
Adverse health outcome

following hospital admission for COVID-19 versus seasonal influenza



Nat Med 2024 Aug;30(8):2148-2164.

Potential causes



Chest 2024;165(5):1149-1162

Risk of prolonged illness after critical COVID-19

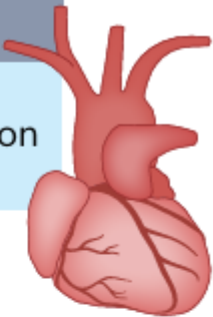
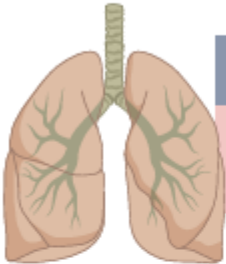
Symptoms

Pathology

Heart

- Chest pain
- Palpitations

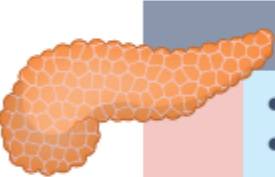
- Cardiac impairment
- Myocardial inflammation
- POTS

Lungs

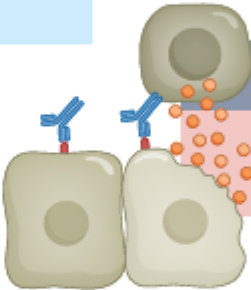
- Cough
- Dyspnoea

- Abnormal gas exchange



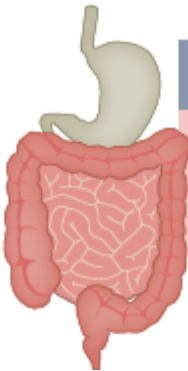
Pancreas

- Diabetes
- Pancreas injury



Immue system

- Autoimmunity
- MCAS

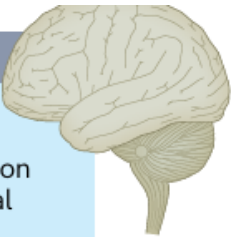


Gastrointestinal tract

- Abdominal pain
- Nausea

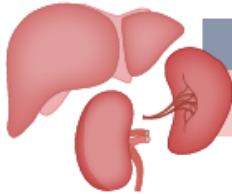
- Gut dysbiosis
- Viral persistence and viral reservoir

Neurological system



- Cognitive impairment
- Fatigue
- Disordered sleep
- Memory loss
- Tinnitus

- Dysautonomia
- ME/CFS
- Neuroinflammation
- Reduced cerebral blood flow
- Small fibre neuropathy



Kidneys, spleen and liver

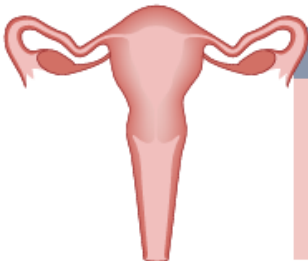
- Organ injury

Blood vessels



- Fatigue

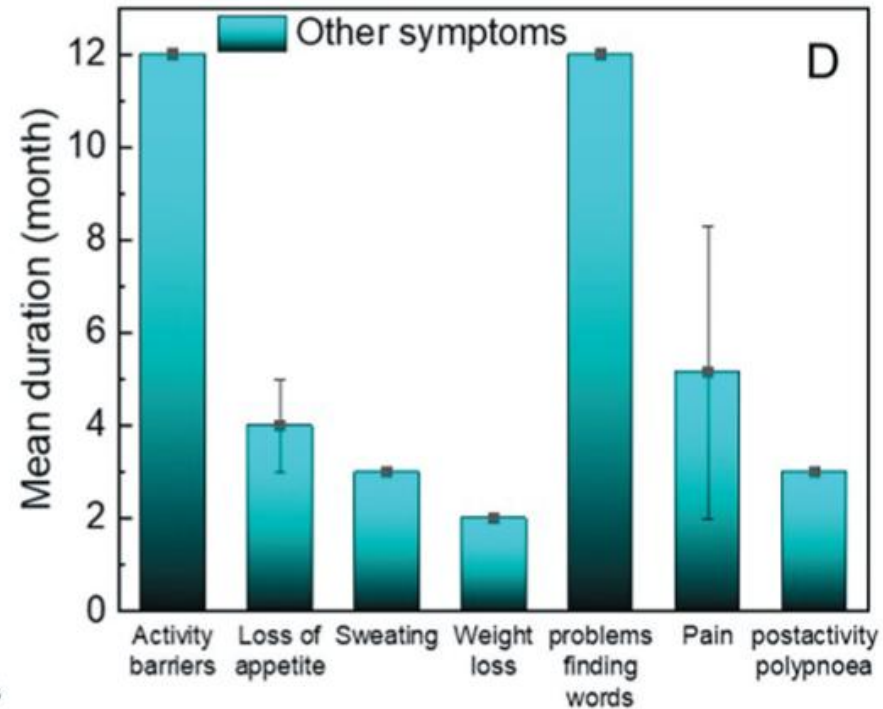
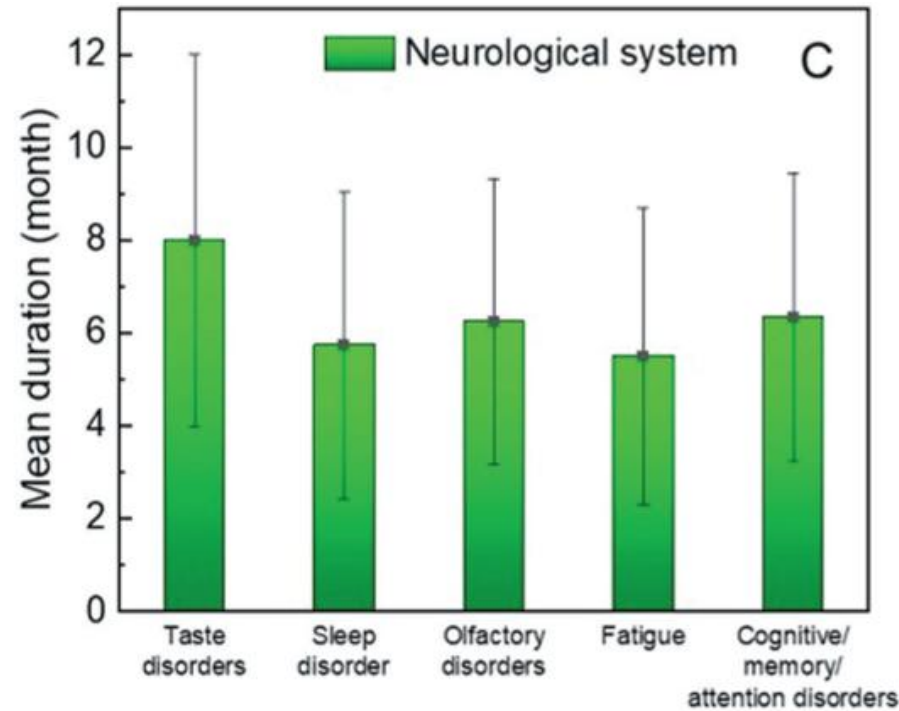
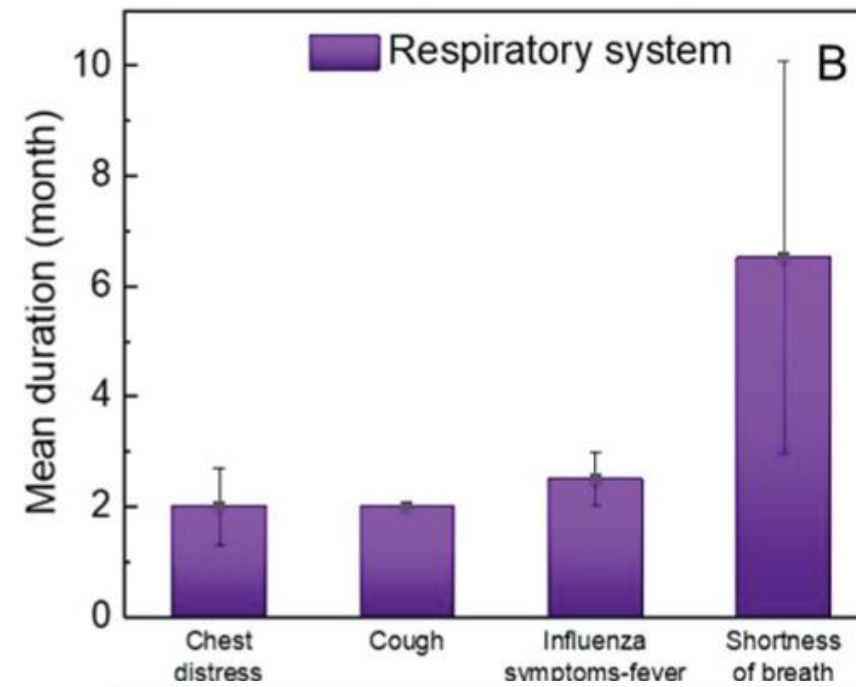
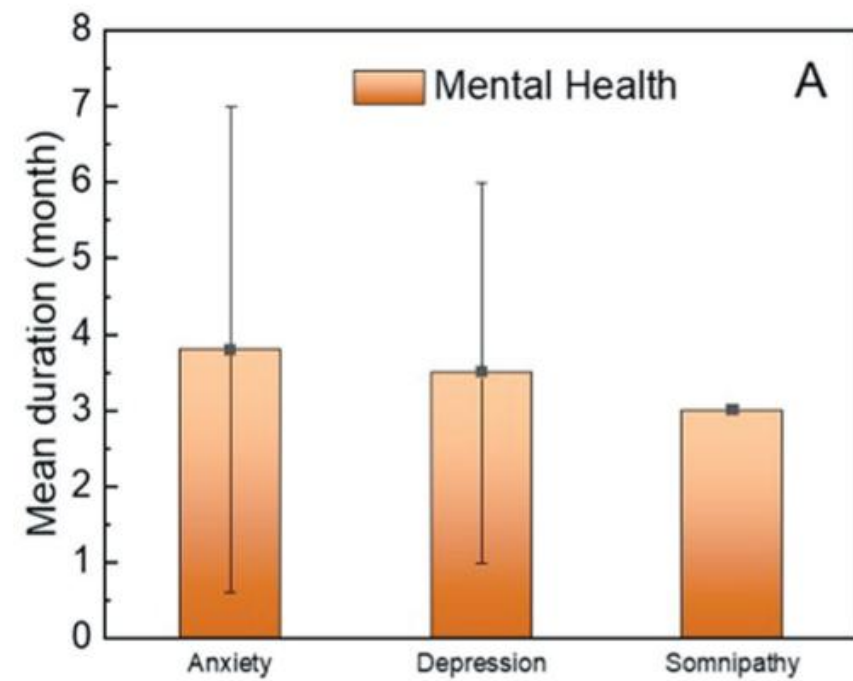
- Coagulopathy
- Deep vein thrombosis
- Endothelial dysfunction
- Microangiopathy
- Microclots
- Pulmonary embolism
- Stroke



Reproductive system

- Erectile dysfunction
- Increased severity and number of premenstrual symptoms
- Irregular menstruation

- Reduced sperm count



2-1

Assessment

Domain	Assessment	Description	Considerations
Physical or general functional status	6-min walk test ⁵⁰	- Measures aerobic exercise capacity - Instructs patients to walk as far as possible for 6 min	Can help provide information pertaining to pulmonary and cardiovascular systems, blood circulation, and peripheral circulation
	EQ-5D-5L ⁵¹	Assesses health-related quality of life across five dimensions: mobility, self-care, usual activities, pain or discomfort, and anxiety or depression	- Available in > 150 languages - Various methods of administration (eg, self-report, interviewer administered) - Learn more at https://euroqol.org/eq-5d-instruments/eq-5d-5l-about/
	World Health Organization Disability Assessment Schedule 2.0 ⁵²	- Assesses functioning across six domains: cognition, mobility, self-care, getting along with others, life activities, participation - Higher scores represent higher levels of disability (both total score and domain-specific scores reported)	- Multiple versions exist (eg, 36-item vs 12-item) - Various methods of administration (eg, self-report, interviewer administered) - Available in > 30 languages
	Post-COVID-19 Functional Status Scale ⁵³	A structured interview that assesses degree of functional impairments in daily life after infection (ADLs and IADLs, participation in social roles, persisting symptoms, and care needs)	- Assessment of functional status before COVID-19 is recommended - Intended to be assessed at time of discharge, in the first few weeks after discharge, and up to 6 mo after COVID-19 to track functional status over time

Chest 2024;165(5):1149-1162

Assessment

Domain	Assessment	Description	Considerations
Psychological functioning	Impact of Events Scale-Revised ^{a,54}	Twenty-two items measuring symptoms of PTSD across the three categories of PTSD symptoms (avoidance, intrusion, hyperarousal symptoms)	- Available in several languages - Avoid diagnosis of PTSD based on screening alone
	Patient Health Questionnaire-9 ⁵⁵	Nine items that assess the presence and intensity of depressive symptoms	- Widely used in health care settings, covers all symptoms for MDD based on DSM-5 criteria - Safety risk: includes suicidal ideation item that should be checked on completion - The first two items can be used for an ultrabrief screening (Patient Health Questionnaire-2) - Available in > 30 languages translations (see https://www.phqscreeners.com/)
	General Anxiety Disorder-7 ⁵⁶	Seven items designed to assess the presence and severity of symptoms of generalized anxiety disorder	- Also adequately screens for panic disorder, social anxiety, and PTSD - The first two items can be used for an ultrabrief screening (General Anxiety Disorder-2) - Available in > 20 languages translations (see https://www.phqscreeners.com/)
	Health Anxiety and Depression Scale ^{57,a}	Fourteen items (seven anxiety and seven depression) assessing the presence of these symptoms in medical patients	- Designed to reduce the impact of physical symptoms on scoring (eg, depression items focus on anhedonia instead of sleep difficulties and fatigue) - Translated into > 70 languages
	Posttraumatic Stress Symptoms-14 ⁵⁸	Fourteen items assessing symptoms of PTSD according to DSM-4 criteria	Commonly used in patient populations in the ICU
	PTSD Checklist for DSM-5 ⁵⁹	Twenty-item measure that assesses presence and severity of PTSD symptoms based on DSM-5	Commonly used within service members and veterans

Chest 2024;165(5):1149-1162

Assessment

Domain	Assessment	Description	Considerations
Cognitive functioning	Montreal Cognitive Assessment ^{a,60}	• Sixteen items • Requires 10 min to administer	• Broad assessment of multiple cognitive domains, including executive functions • Designed to be sensitive to subtle forms of cognitive impairment • Requires certification (visit https://www.mocatest.org/training-certification/)
	Montreal Cognitive Assessment-Blind ⁶¹	• Removes visuospatial executive and naming tasks of MoCA • Requires < 10 min to administer	• Can be used when in-person assessment is not feasible or with patients with vision or motor impairments
	5-min Montreal Cognitive Assessment ⁶²	• Includes four tasks based on MoCA (word list, verbal fluency, orientation, delayed recall) • Requires 5 min to administer	• Briefest version of the MoCA available • Does not require in-person assessment
	Repeatable Battery for Neuropsychological Status ⁶³	• Requires 30 min to administer • Stimulus book required	• Allows for continuously examining performance within the domains of immediate memory, attention, language, visuospatial, and delayed memory • Higher sensitivity to change than global cognitive screens • Alternative forms available for repeat assessment

Chest 2024;165(5):1149-1162

Assessment

2-2

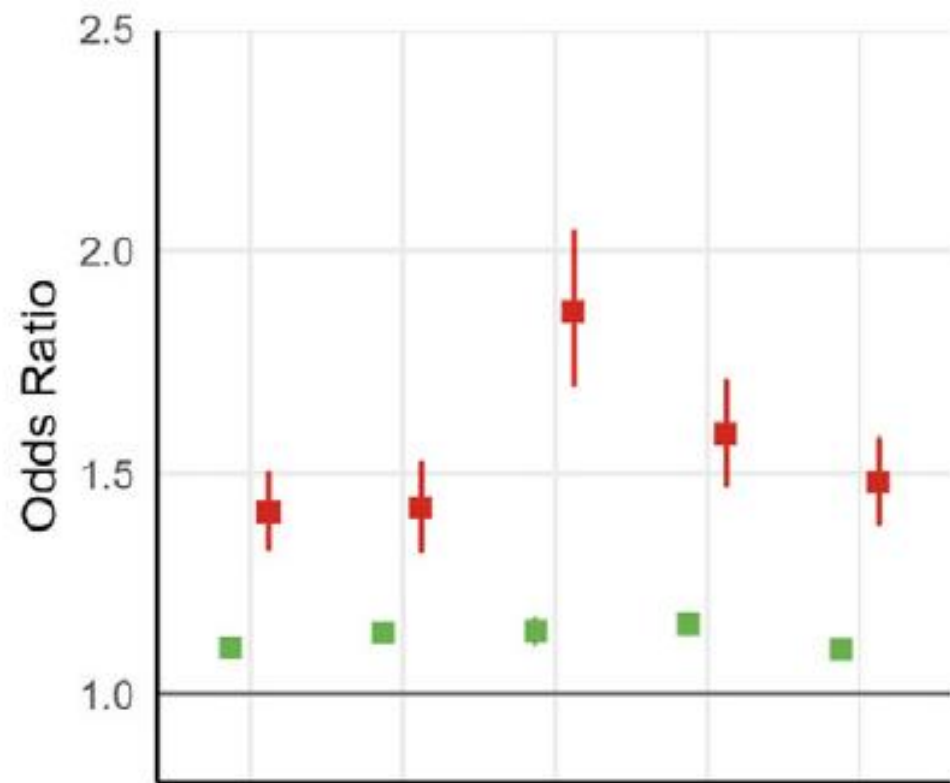
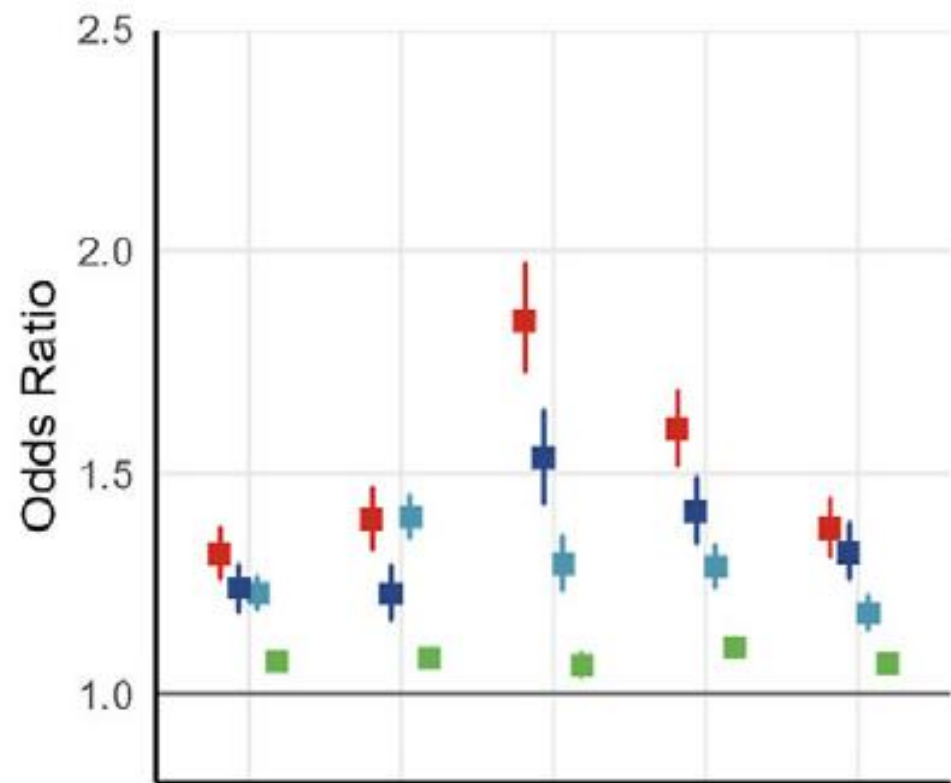
Prevalence

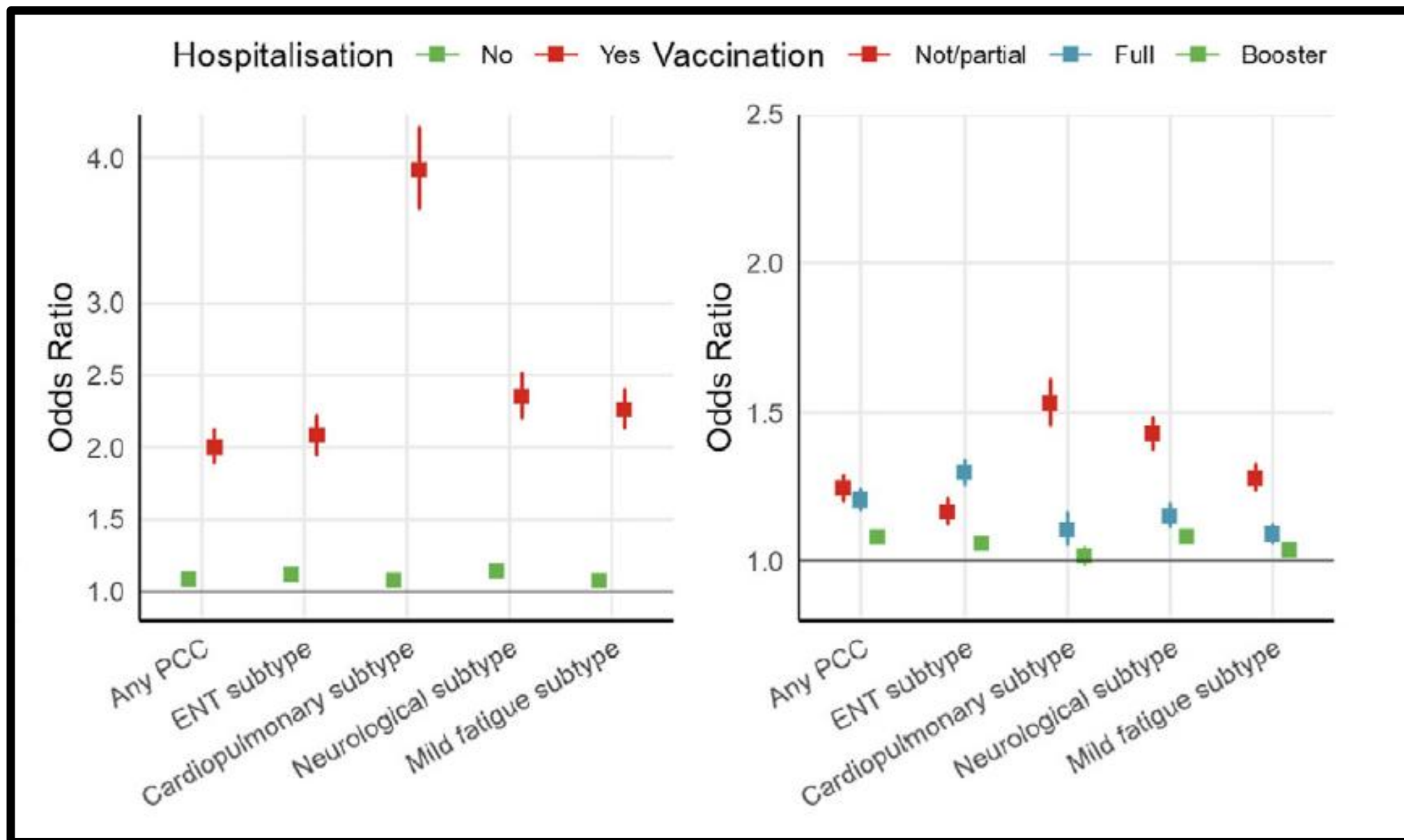
Refinement of post-COVID condition core symptoms, subtypes, determinants, and health impacts: a cohort study integrating real-world data and patient-reported outcomes

participants from UK Biobank who completed a health and wellbeing survey between June and September 2022

EBioMedicine 2025 Jan;111:105493.

Variants Wild Alpha Delta Omicron Infection One Multiple



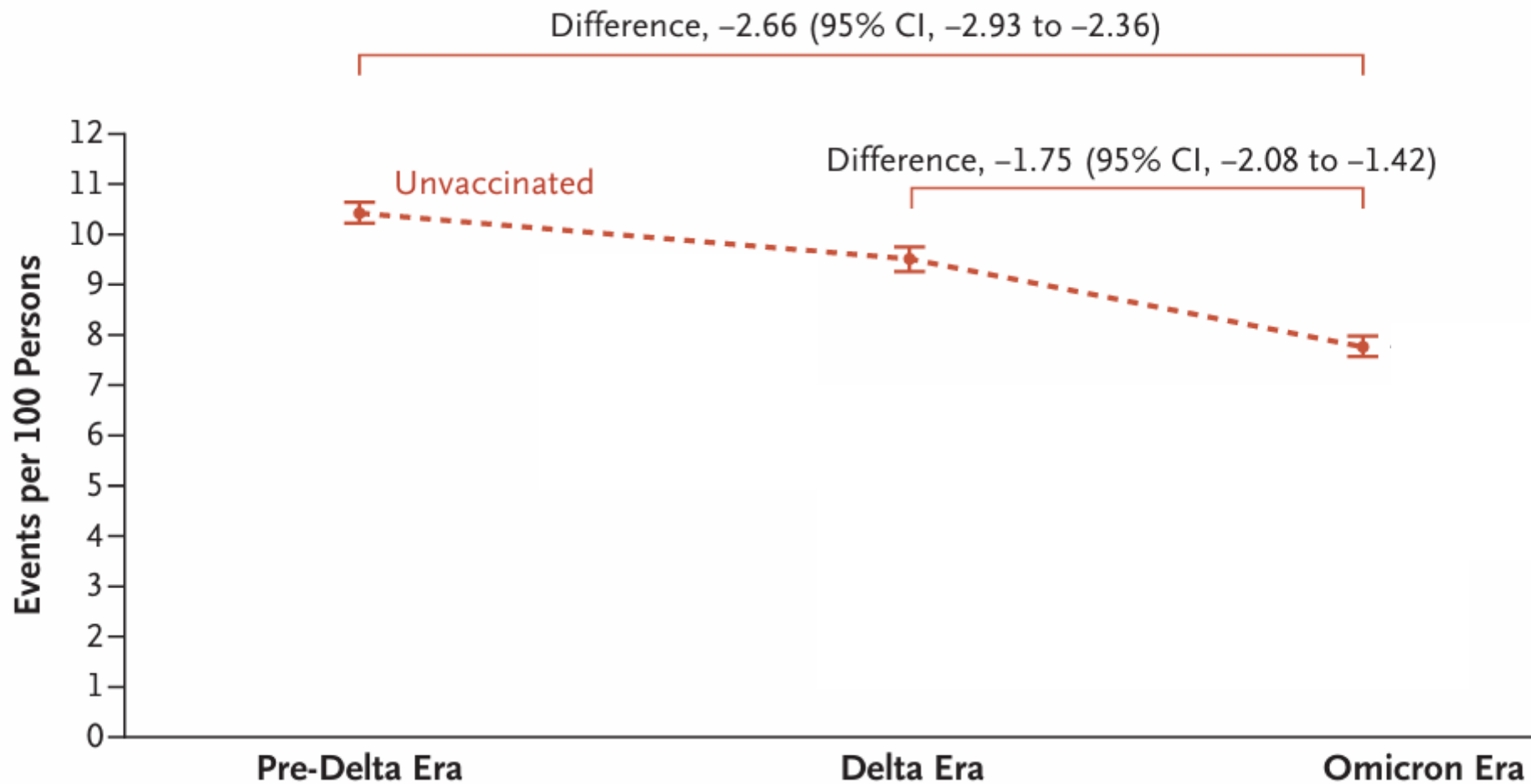


The NEW ENGLAND JOURNAL *of* MEDICINE

ORIGINAL ARTICLE

Postacute Sequelae of SARS-CoV-2 Infection in the Pre-Delta, Delta, and Omicron Eras

Yan Xie, Ph.D., Taeyoung Choi, M.S., and Ziyad Al-Aly, M.D.



Events per 100 Persons

Unvaccinated 10.42 (95% CI, 10.22–10.64)

Vaccinated 5.34 (95% CI, 5.10–5.58)

9.51 (95% CI, 9.26–9.75)

7.76 (95% CI, 7.57–7.98)

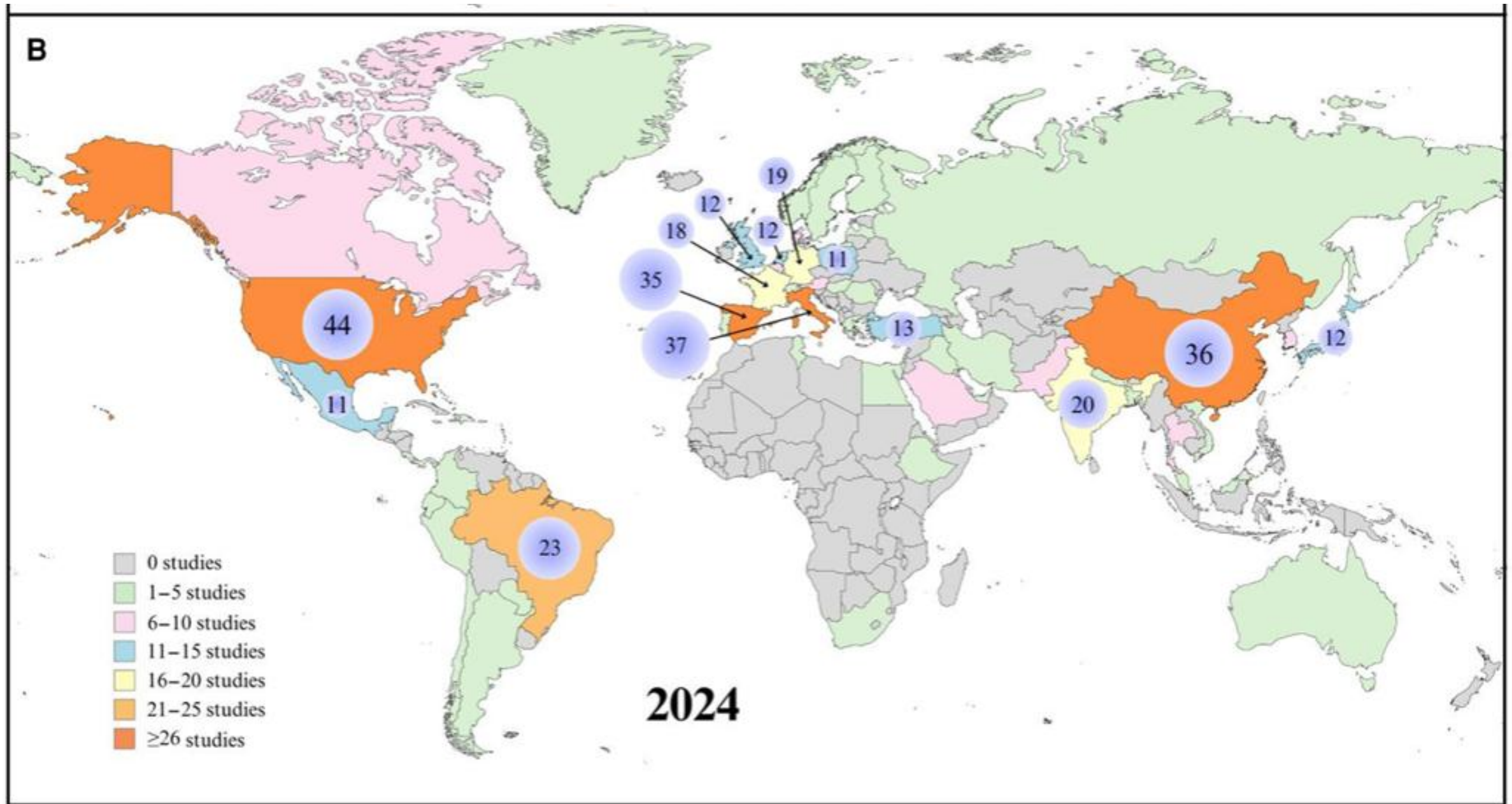
3.50 (95% CI, 3.31–3.71)

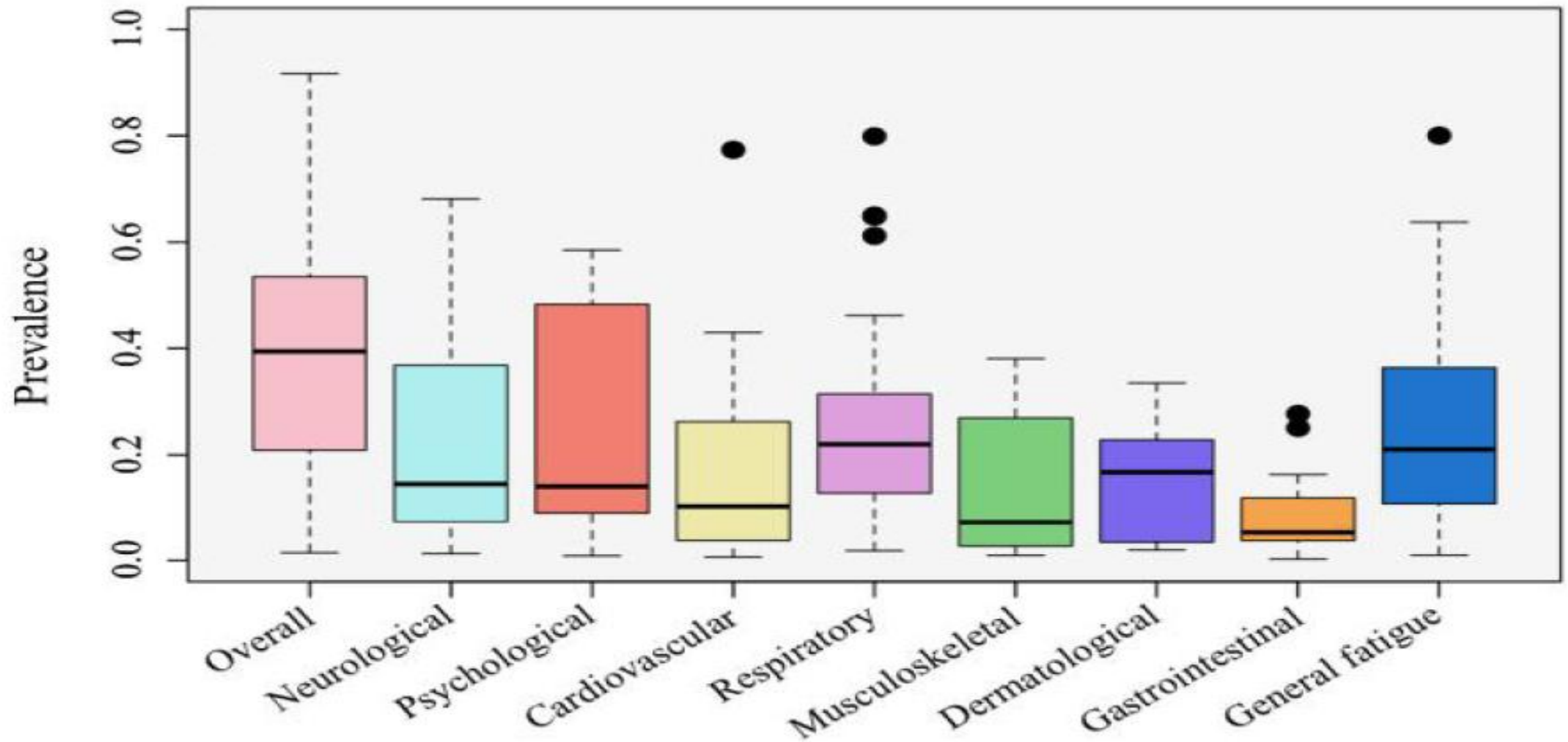
Global Prevalence of Long COVID, Its Subtypes, and Risk Factors: An Updated Systematic Review and Meta-analysis

Studies published from 5 July 2021 to 29 May 2024 were searched in PubMed, Embase, and Web of Science, with supplemental updates on 23 July 2024

A total of 429 studies were meta-analyzed

The global pooled long COVID prevalence was 36% (95% confidence interval [CI], 33%–40%) with 144 contributing studies.





Two-year follow-up of patients with post-COVID-19 condition in Sweden: a prospective cohort study



Carl Wahlgren,^{a,d,*} Gustaf Forsberg,^{b,d} Anestis Divanoglou,^a Åse Östholm Balkhed,^c Katarina Niward,^c Sören Berg,^b and Richard Levi^a



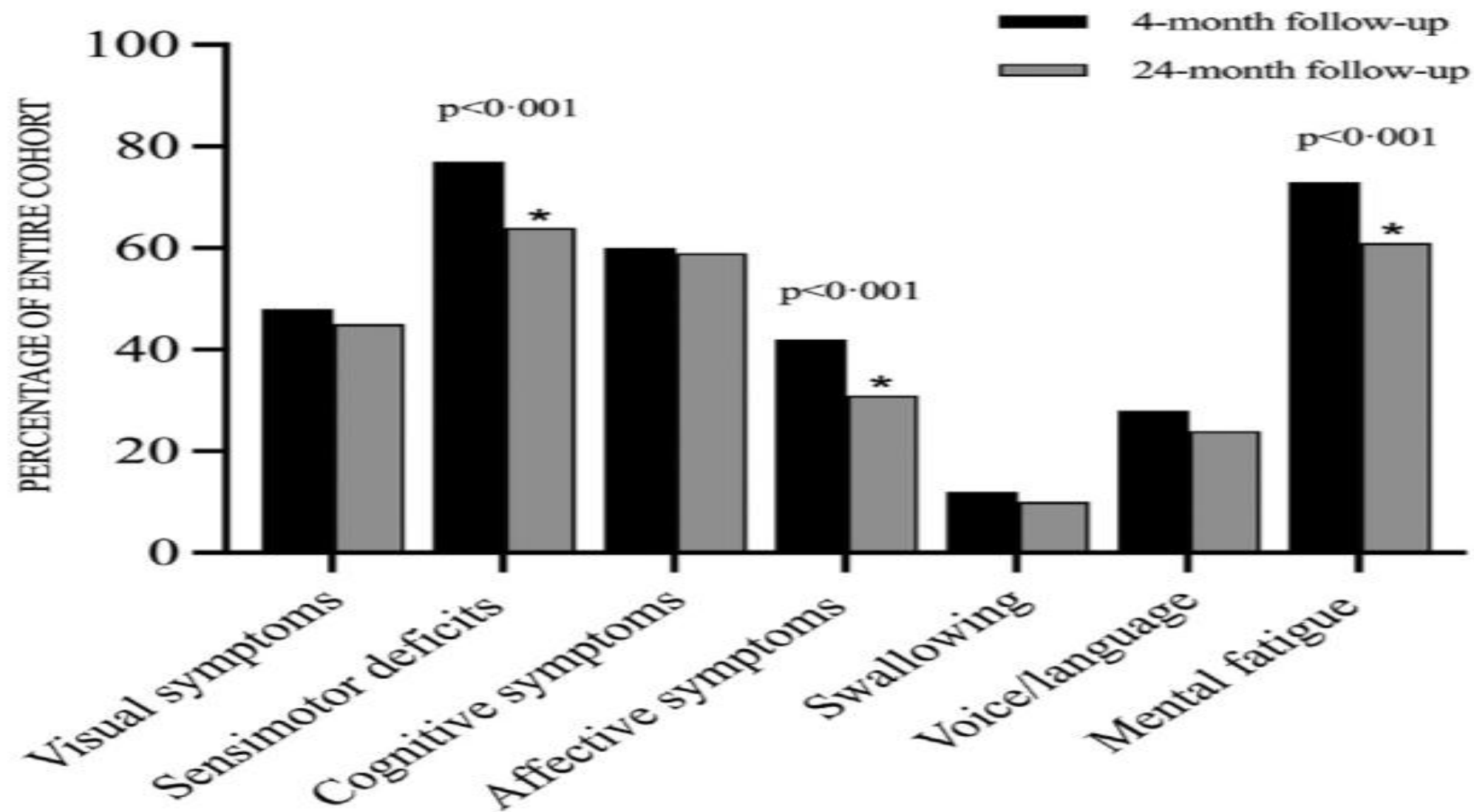
^aDepartment of Rehabilitation Medicine and Department of Health, Medicine and Caring Sciences, Linköping University, Linköping, Sweden

^bDepartment of Cardiothoracic and Vascular Surgery and Department of Health, Medicine and Caring Sciences, Linköping University, Linköping, Sweden

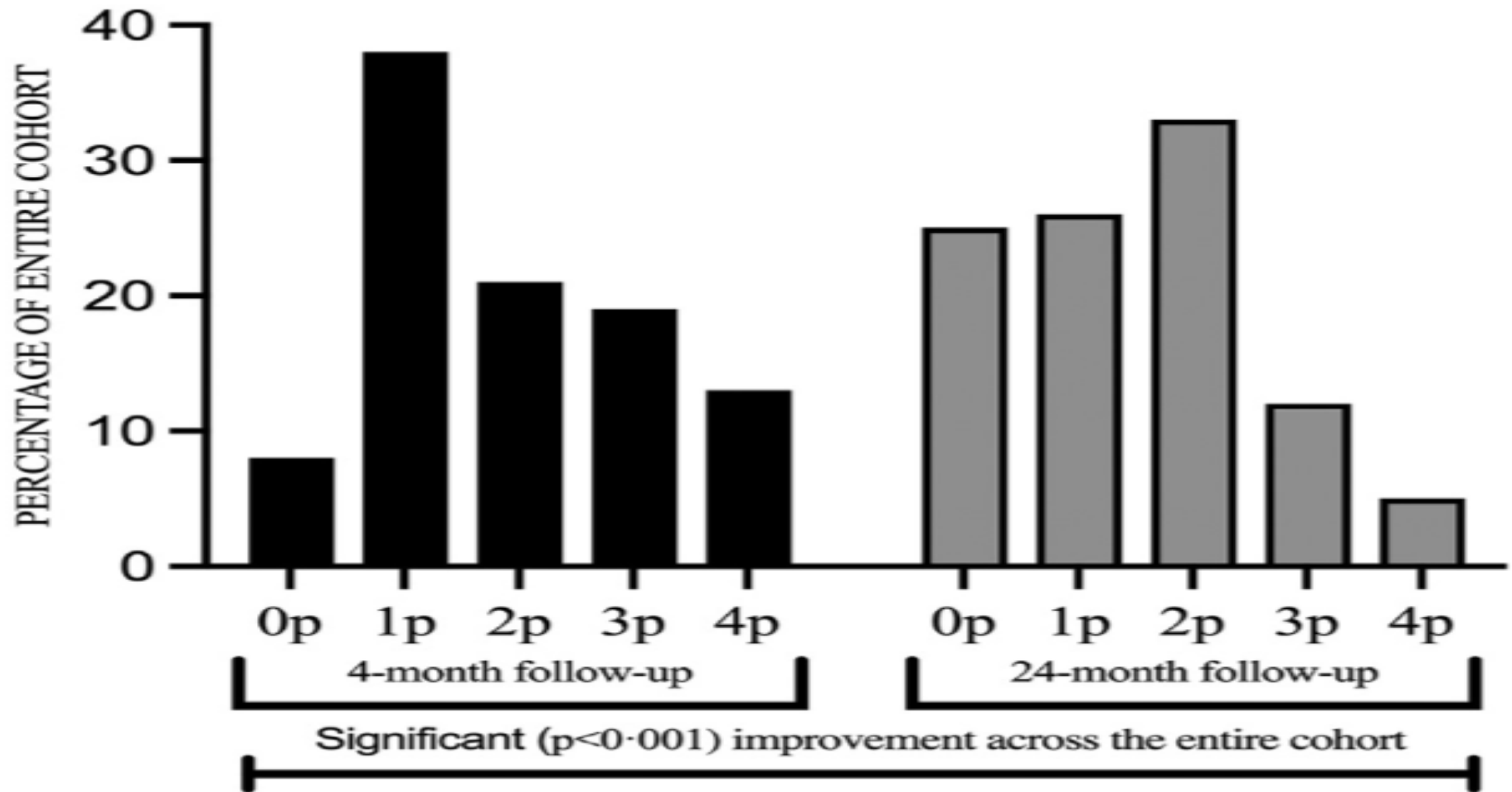
^cDepartment of Infectious Diseases and Department of Biomedical and Clinical Sciences, Linköping University, Linköping, Sweden

Of 185 patients with PCC at 4 months post-discharge, 181 were alive at the 24-month assessment and 165 agreed to participate

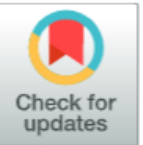
Lancet Reg Health Eur 2023;28:100595.



Breathlessness—mMRC dyspnea scale



Health outcomes up to 3 years and post-exertional malaise in patients after hospitalization for COVID-19: a multicentre prospective cohort study (CO-FLOW)



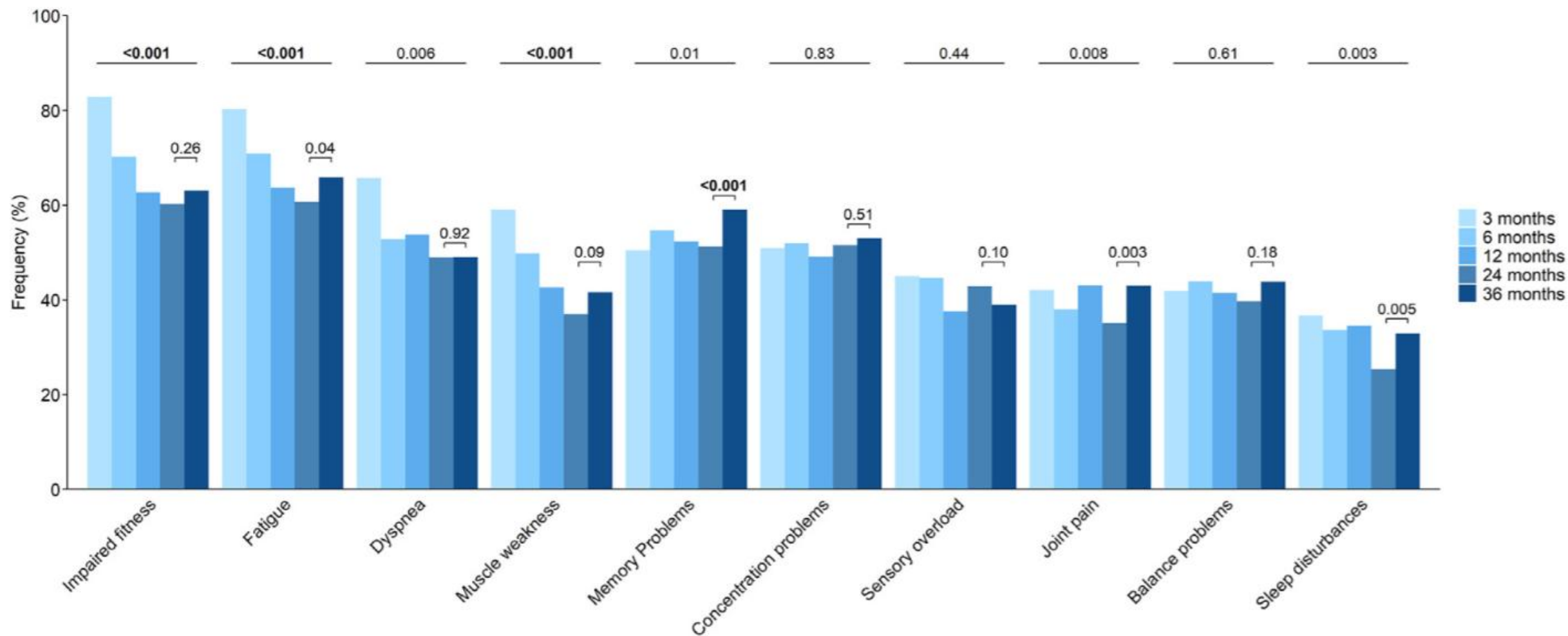
Julia C. Berentschot,^{a,e,*} L. Martine Bek,^{b,e} Manon Drost,^a Rita J. G. van den Berg-Emons,^b Gert-Jan Braunstahl,^{a,c} Gerard M. Ribbers,^{b,d} Joachim G. J. V. Aerts,^a Merel E. Hellemons,^{a,f} and Majanka H. Heijenbrok-Kal,^{b,d,f} on behalf of the CO-FLOW collaboration Group^g



The prospective cohort study followed up adults hospitalized for COVID-19 in 7 hospitals, located in the Netherlands.

Study assessments were performed at 3, 6, 12, 24, and 36 months post-discharge, conducted between July 1, 2020, and May 22, 2024

Lancet Reg Health Eur 2025;53:101290



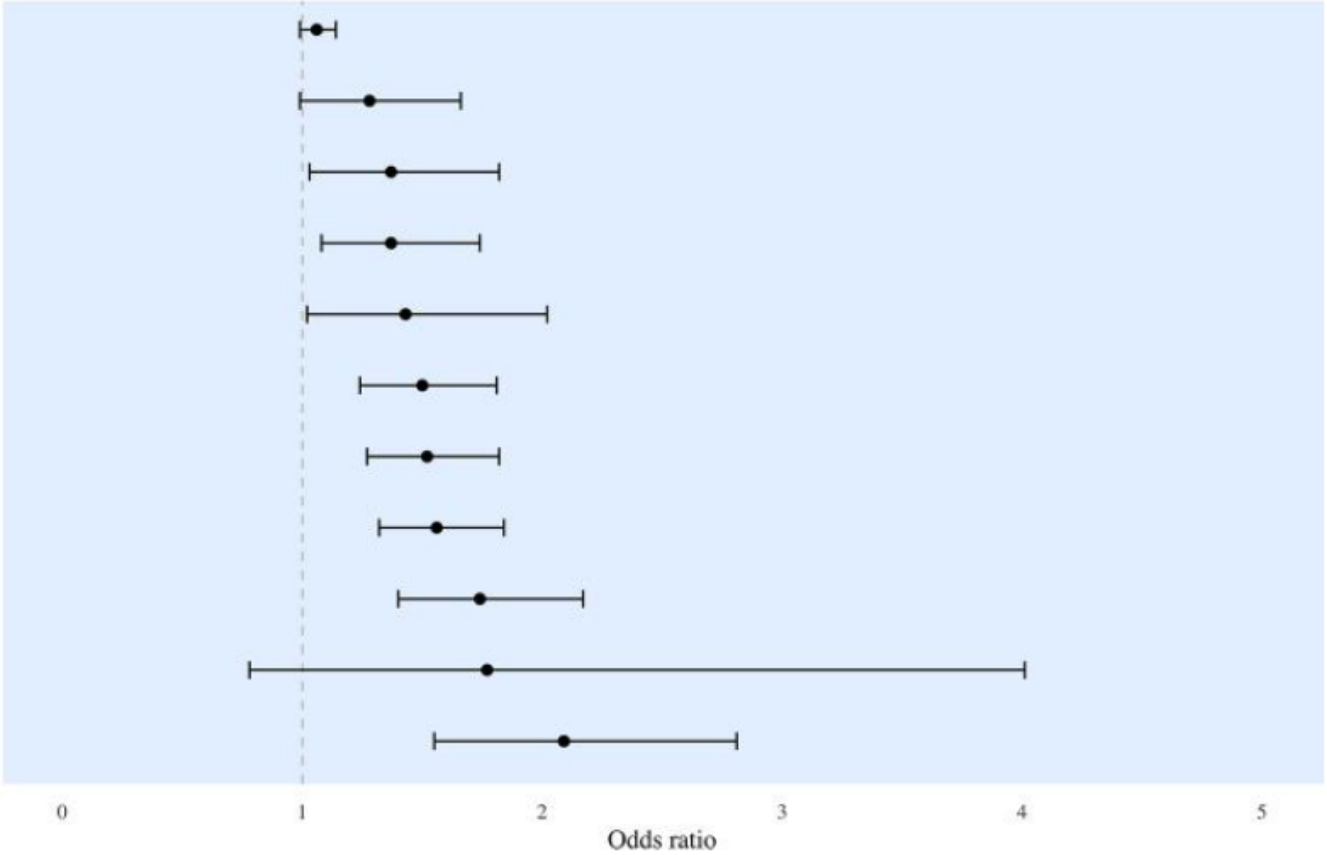
In total, 299/344 (87%) patients completed the 3-year follow-up and were included in the analysis.

Completer recovery rates increased ($p < 0.001$), from 12% at 3 months to 24% at 3 years

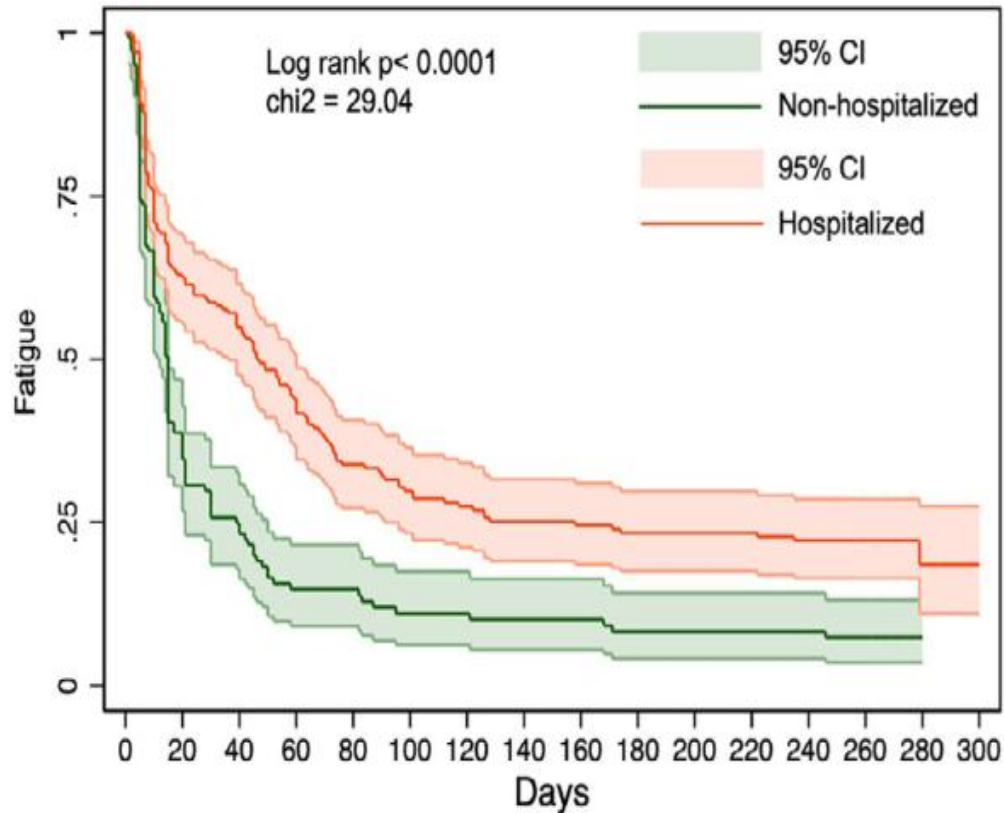
2-3

Risk factor

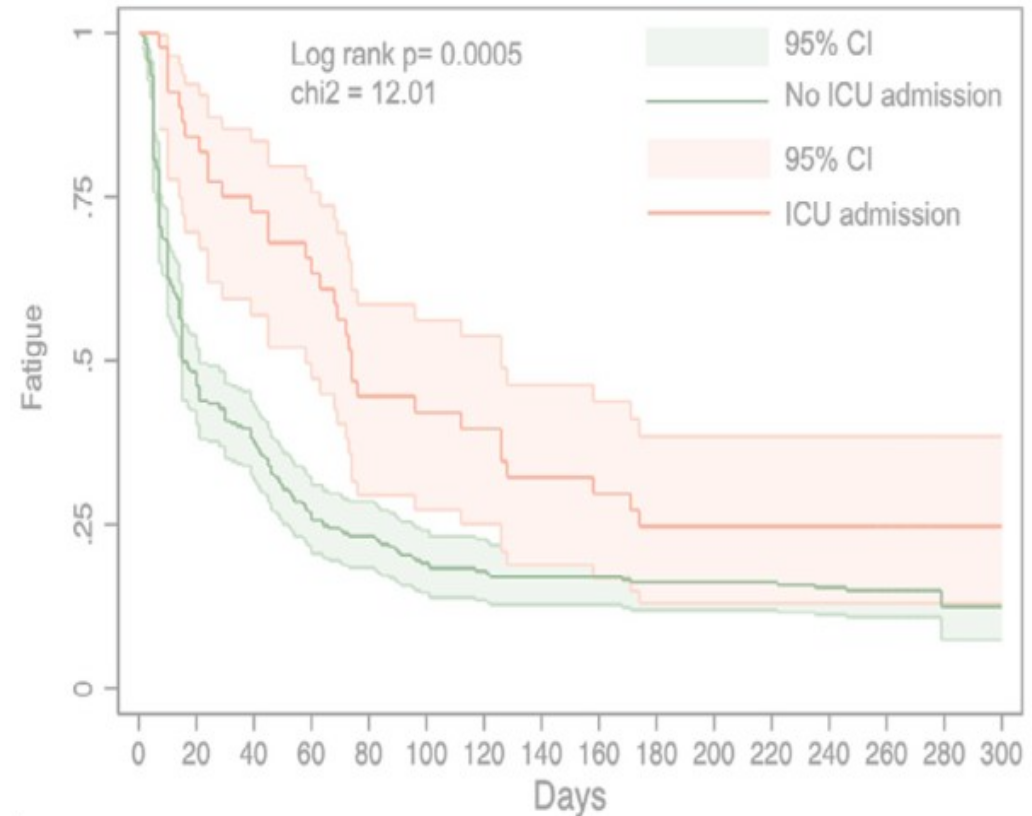
Risk Factors	Pooled Odds Ratio [95% CI]; (# of studies)
Age, per 5-year increase	1.06 [.99–1.14]; (14)
Obesity	1.28 [.99–1.66]; (6)
History of COPD	1.37 [1.03–1.82]; (6)
Hypertension	1.37 [1.08–1.74]; (9)
Intensive care unit admission	1.43 [1.02–2.02]; (8)
Cardiovascular disease	1.50 [1.24–1.81]; (5)
At least 1 comorbidity	1.52 [1.27–1.82]; (17)
Female sex	1.56 [1.32–1.84]; (33)
Infected with any pre-Omicron variants of SARS-CoV-2	1.74 [1.40–2.17]; (6)
Diabetes	1.77 [.78–4.01]; (12)
Unvaccinated for COVID-19	2.09 [1.55–2.81]; (7)



Fatigue persistence



															Number at risk	
146	48	30	16	16	12	12	11	11	9	9	9	9	7	1	0	Non-hospitalized
206	119	100	79	59	51	47	43	42	40	40	40	38	33	5	4	Hospitalized



															Number at risk	
307	130	99	67	56	46	43	41	41	39	39	39	37	31	5	3	No ICU admission
45	37	31	28	19	17	16	13	12	10	10	10	10	9	1	1	ICU admission

Multivariable logistic regression model for persistence of symptoms at 9-month follow-up.

Variable	Bivariable			Multivariable		
	OR	95% CI	P value	OR	95% CI	P value
Male gender	0.80	0.49–1.29	0.35	–	–	–
Hospitalization	2.65	1.58–4.43	<0.001	1.57	0.85–2.87	0.147
ICU stay	3.15	1.64–6.05	0.001	2.35	1.15–4.79	0.019
Age > 50 years	3.05	1.64–5.67	<0.001	2.50	1.28–4.88	0.007
≥ 4 symptoms	1.86	1.14–3.02	0.012	2.04	1.22–3.42	0.007
Comorbidity	1.81	1.11–2.94	0.017	1.00	0.50–2.01	0.996

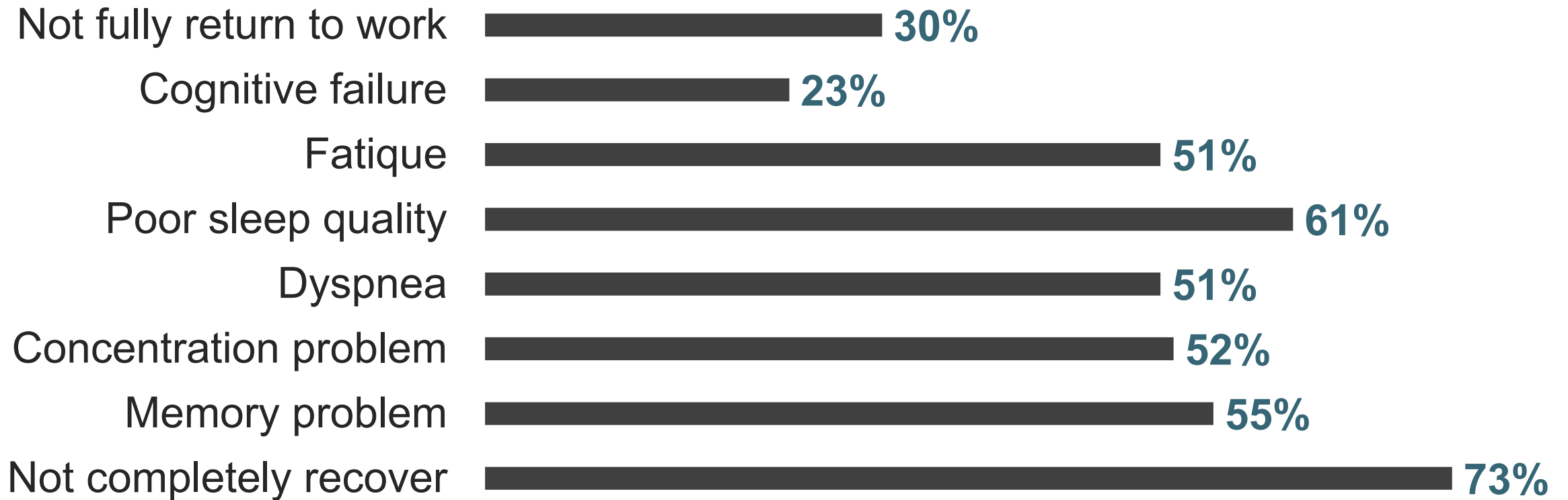
3

Long COVID and ICU



Long-term health outcomes of COVID-19 in ICU- and non-ICU-treated patients up to 2 years after hospitalization: a longitudinal cohort study (CO-FLOW)

The CO-FLOW multicenter prospective cohort study followed adults hospitalized for COVID-19 at 3, 6, 12, and 24 months post-discharge
650 patients (median age 60.0 [IQR 53.0–67.0] years; 449/650 [69%] male) surviving hospitalization for COVID-19 were included, of whom 273/650 (42%) received ICU treatment



ICU-treated patients tended to show slower recovery in neurocognitive symptoms, mental health outcomes, and resuming work than non-ICU-treated patients



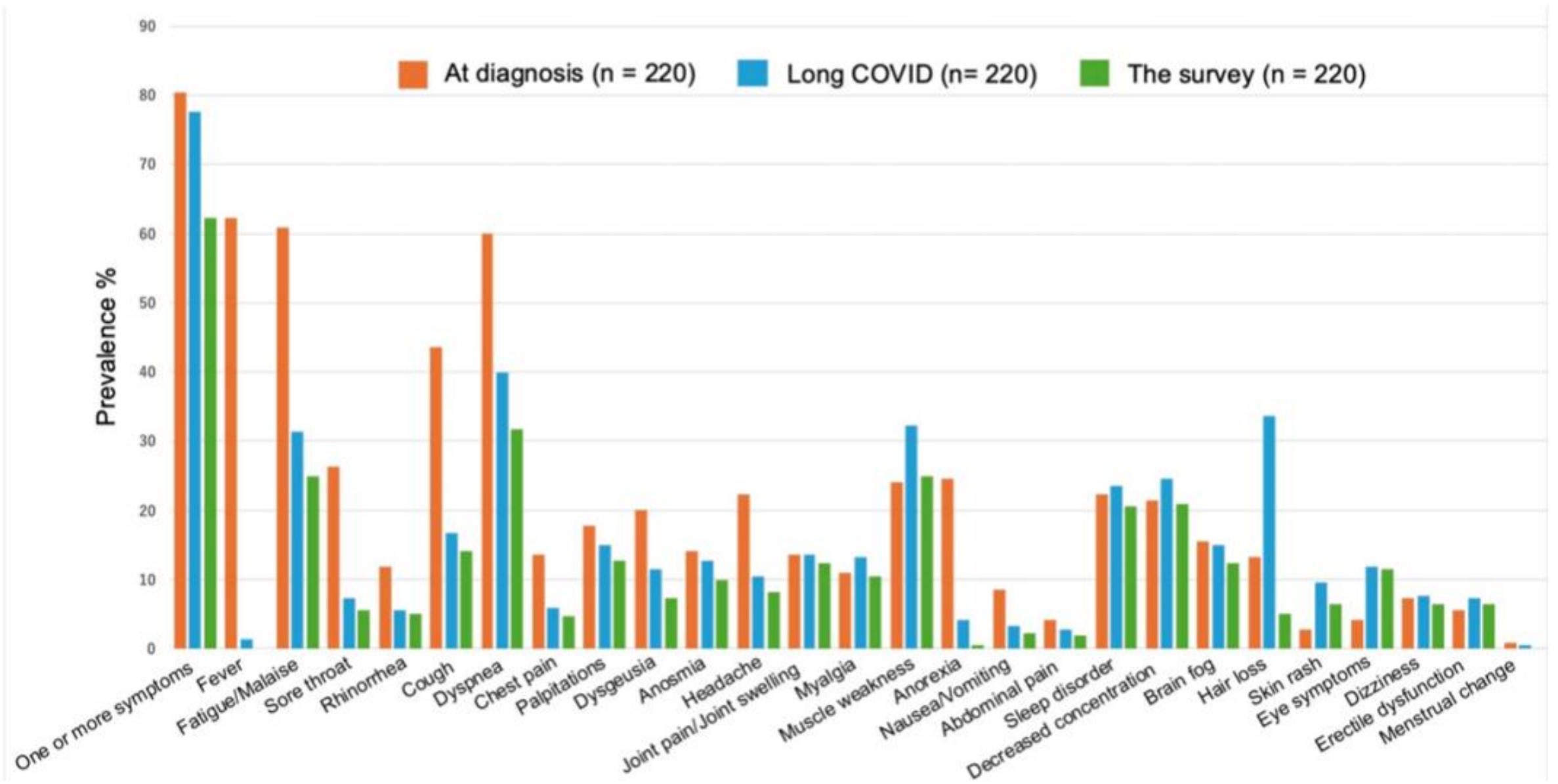
Article

Effects of Long COVID in Patients with Severe Coronavirus Disease 2019 on Long-Term Functional Impairments: A Post Hoc Analysis Focusing on Patients Admitted to the ICU in the COVID-19 Recovery Study II

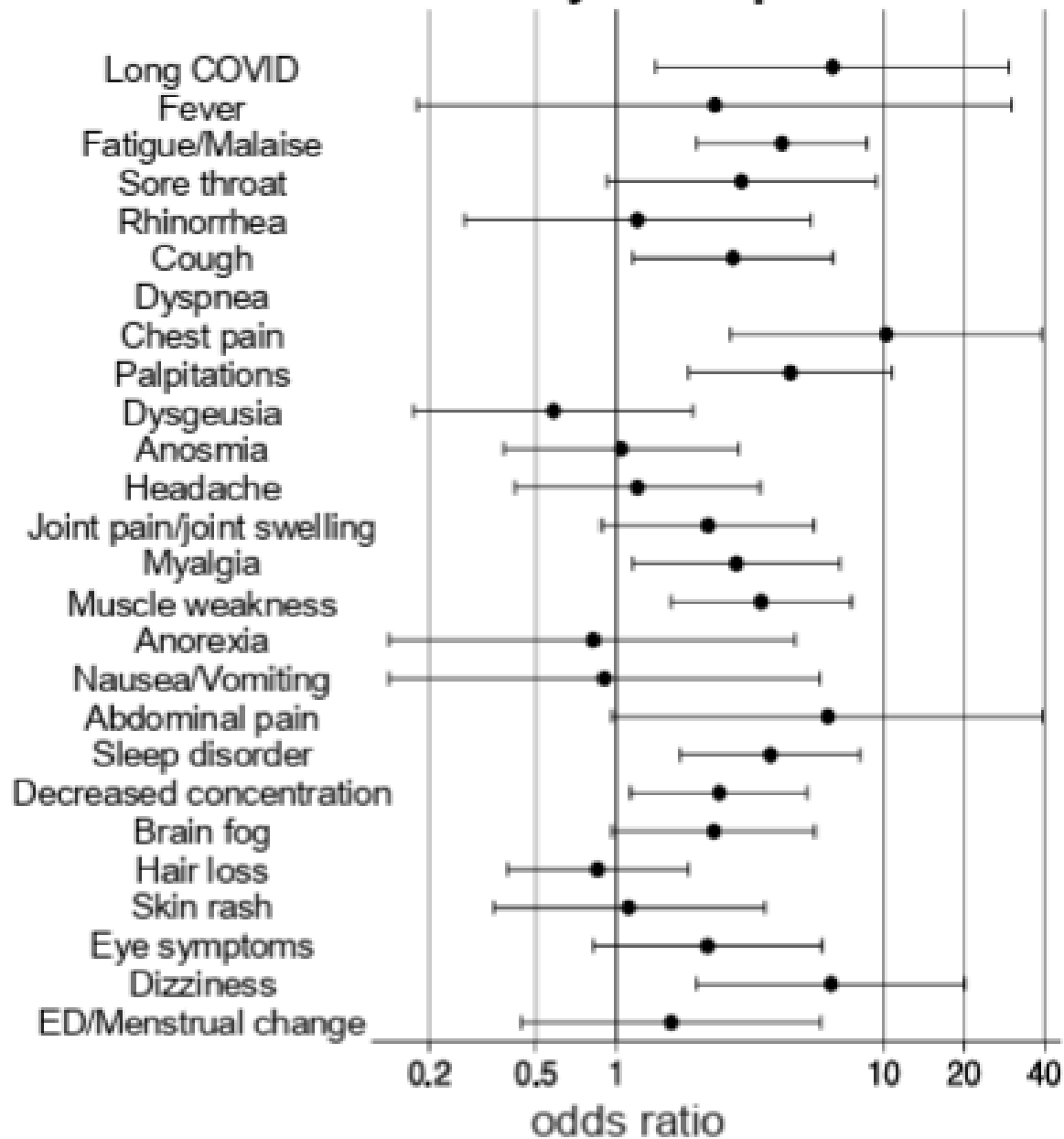
Junji Hatakeyama ¹, Kensuke Nakamura ^{2,3,*}, Shotaro Aso ⁴, Akira Kawauchi ⁵, Shigeki Fujitani ⁶, Taku Oshima ⁷, Hideaki Kato ⁸, Kohei Ota ⁹, Hiroshi Kamijo ¹⁰, Tomohiro Asahi ¹¹, Yoko Muto ¹², Miyuki Hori ¹², Arisa Iba ¹², Mariko Hosozawa ¹² and Hiroyasu Iso ¹²

a nationwide cohort study in collaboration with nine hospitals, collecting data using self-administered questionnaires from participants aged 20 years or older who were diagnosed with COVID-19, admitted to the ICU between April 2021 and September 2021, and discharged alive

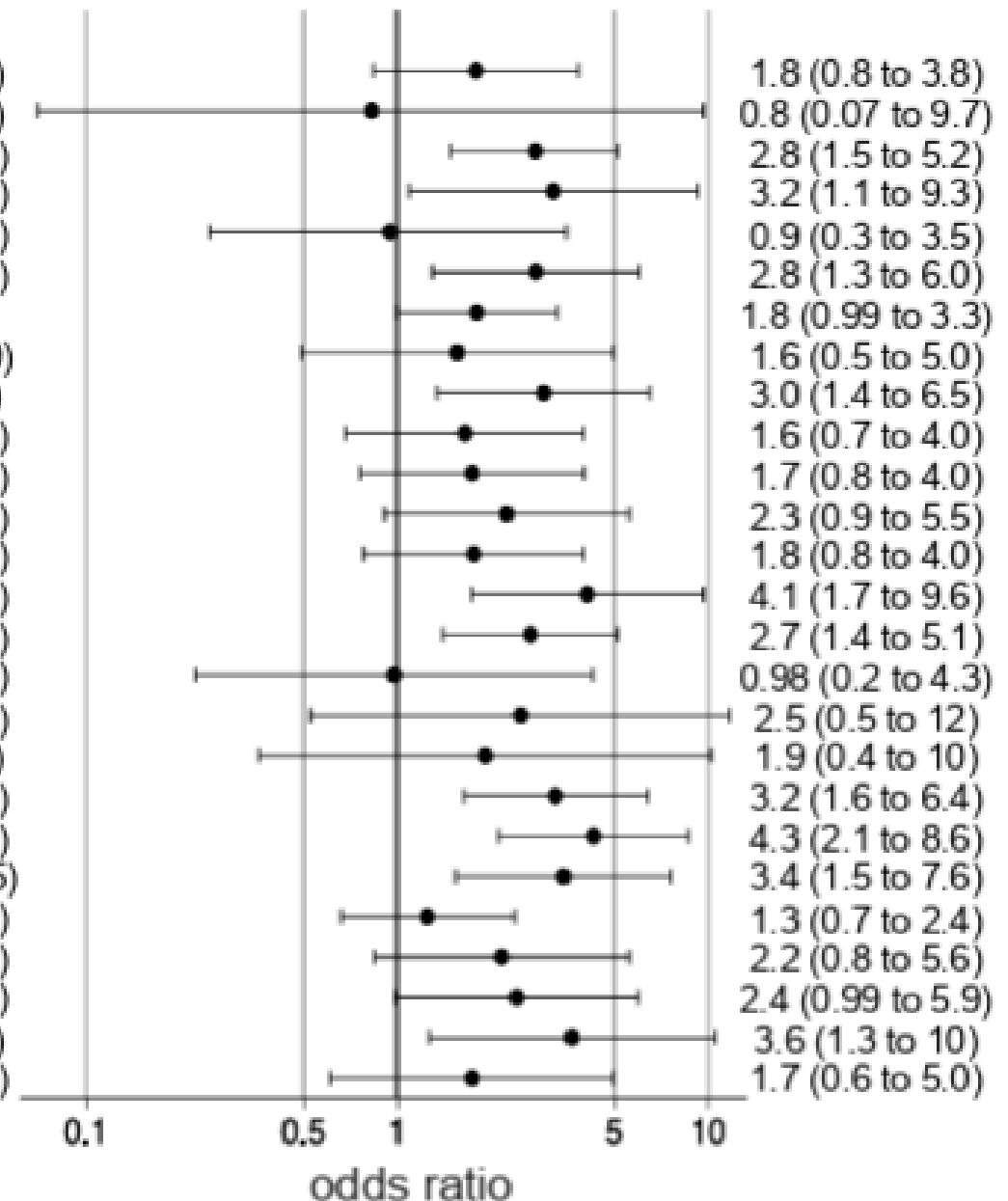
The survey was completed by 220 patients, with a mean of 416 days after discharge



Physical impairments



Mental disorders



ORIGINAL

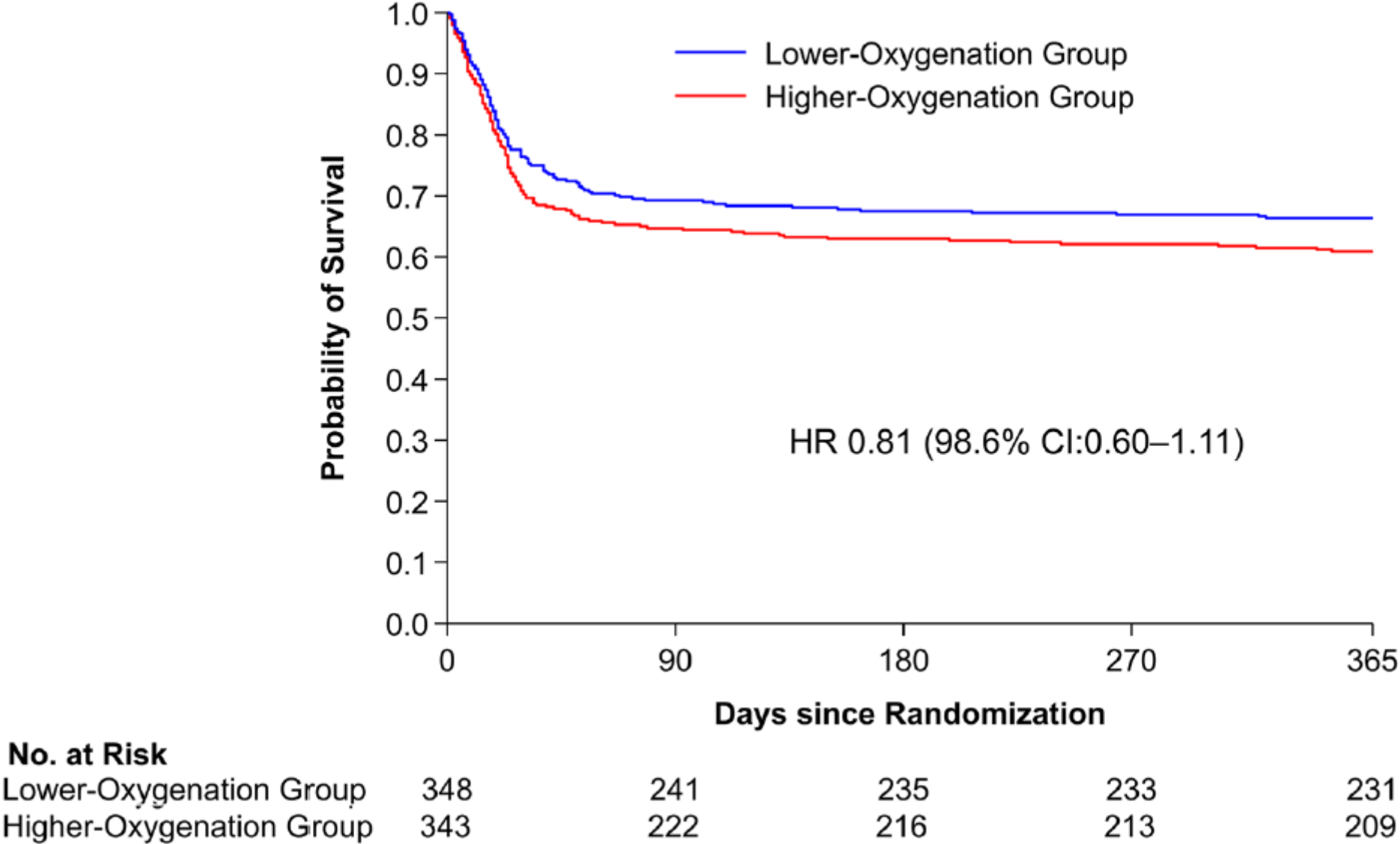


Long-term mortality and health-related quality of life with lower versus higher oxygenation targets in intensive care unit patients with COVID-19 and severe hypoxaemia

The trial randomised 726 ICU patients with COVID-19 and hypoxaemia to partial pressure of arterial oxygen targets of 8 kPa (60 mmHg) versus 12 kPa (90 mmHg) during ICU stay up to 90 days,

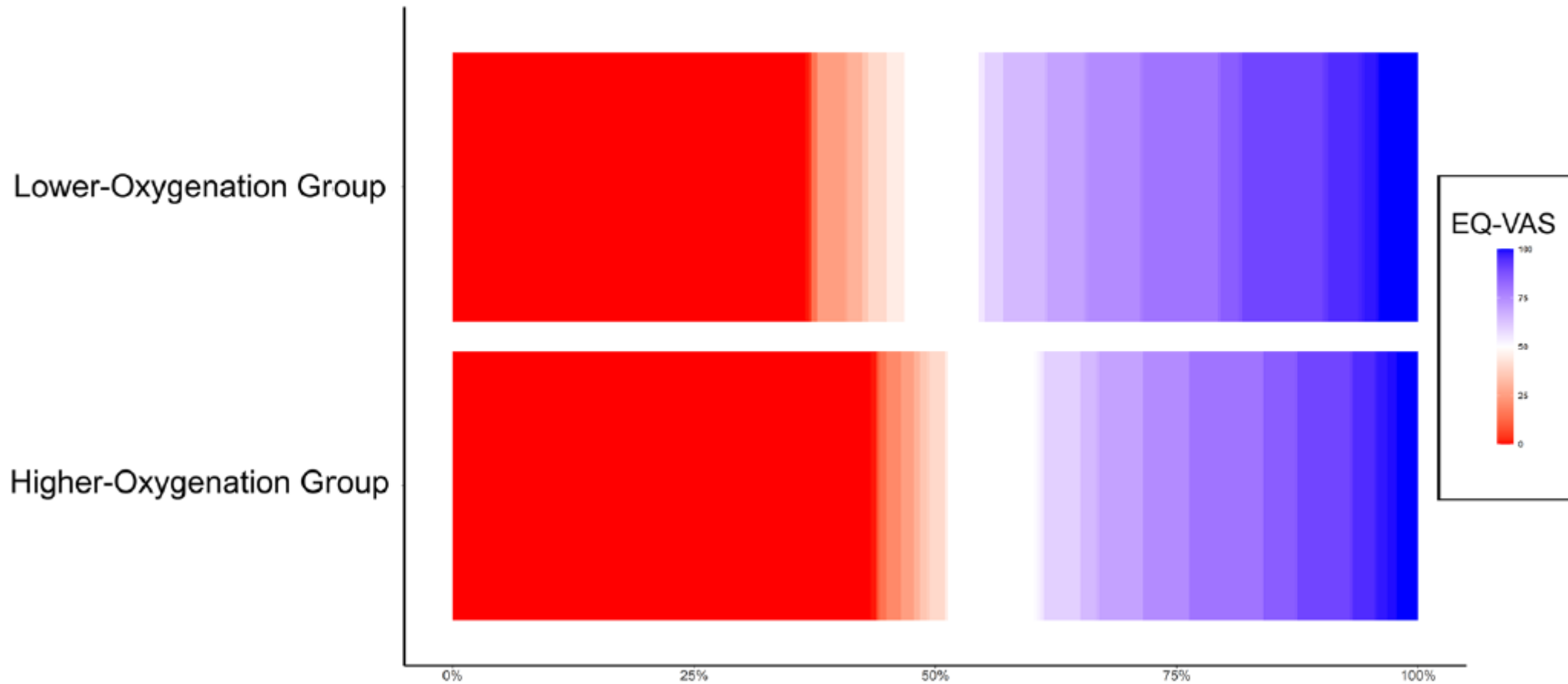
Intensive Care Med 2024;50(10):1603-1613.

a



EuroQol Visual Analogue Scale

b



	Lower-oxygen- ation group (N = 350)	Higher-oxy- genation group (N = 344)	Adjusted RR (98.6% CI) ^a	Adjusted RD ^b or MD ^c (98.6% CI)	Adjusted OR (98.6% CI) ^d	p value
Mortality^e						
One-year mortality, n./ total n.(%)	117/348 (33.6)	134/343 (39.1)	0.85 (0.66–1.09)	–4.9% (– 14 to 3.8%)		0.11 ^f
One-year mortality analysis adjusted for trial site and baseline variables					0.81 (0.52–1.27)	0.25
Health-related quality of life^g						
Median EQ-VAS (IQR) ^h	50 (0–80)	40 (0–75)		4.8 (– 2.2 to 11.9)		0.09
Median EQ-VAS (IQR) in survivors only ⁱ	75 (50–90)	73 (50–85)				0.36 ^l
Median EQ-5D-5L index value (IQR)	0.61 (0–0.91)	0.43 (0–0.89)				0.20 ^l
Median EQ-5D-5L index value (IQR) in survivors only ⁱ	0.86 (0.64–0.95)	0.87 (0.64–0.95)				0.99 ^l



Clustering patients with COVID-19 according to respiratory support requirements, and its impact on short- and long-term outcome (RECOVID study)

In total, 2148 of 2454 hospitalized patients (87.5%) received care in the conventional ward, whilst 126 in IRCU and 180 in ICU

Table 2. Oxygen and respiratory support treatments according to initial care setting: conventional ward, IRCU and ICU.

Respiratory support	Ward	IRCU	ICU	Total
Nasal cannula	848 (79)	16 (14)	3 (2)	867 (59)
Reservoir oxygen therapy	167 (10)	17 (14)	3 (2)	187 (13)
HFNO/CPAP	118 (7)	36 (30)	7 (5)	161 (11)
NIMV	46 (3)	31 (25)	16 (9)	93 (6)
IMV	13 (1)	22 (17)	128 (82)	163 (11)

Data are presented as n (%). Abbreviations: IRCU, intermediate respiratory care unit; ICU, intensive care unit; HFNO, high-flow nasal oxygen; CPAP, continuous positive airway pressure; NIMV, non-invasive mechanical ventilation; IMV, invasive mechanical ventilation.

	↓ Comorbidities ↑ Inflammation ↑ Resp. support C1	↑ Comorbidities ↑ Inflammation ↑ Resp. support C2	↑ Comorbidities ↓ Inflammation ↓ Resp. support C3	↓ Comorbidities ↔ Inflammation ↓ Resp. support C4
CVE (in-hospital)	33.3%	26.3%	9.1%	6%
In-hospital mortality	11.1%	18.6%	0%	3.3%
1 year mortality	26.8%	31%	0%	6.2%
Radiological alterations (1 year)	36.8%	40%	50%	25.6%
Altered DLCO (1 year)	70%	75%	54.5%	27.1%
No clinical resolution (1 year)	57.1%	47.3%	60%	54.4%

ORIGINAL ARTICLE

One-Year Mental and Physical Health Assessment in Survivors after Extracorporeal Membrane Oxygenation for COVID-19–related Acute Respiratory Distress Syndrome

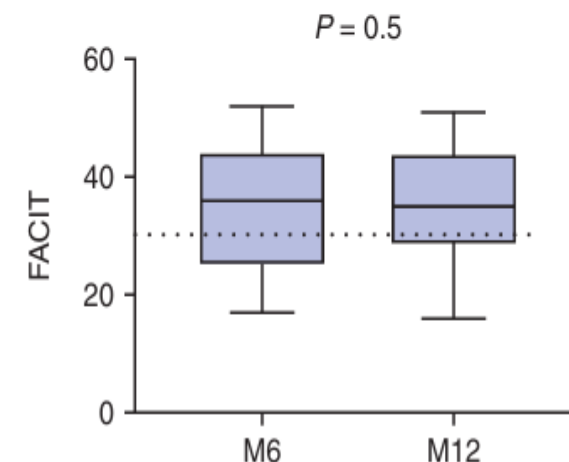
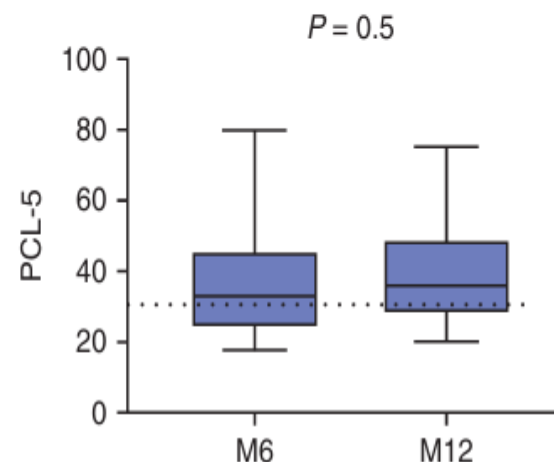
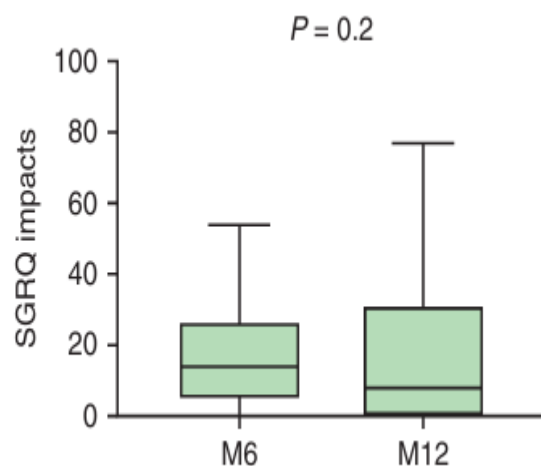
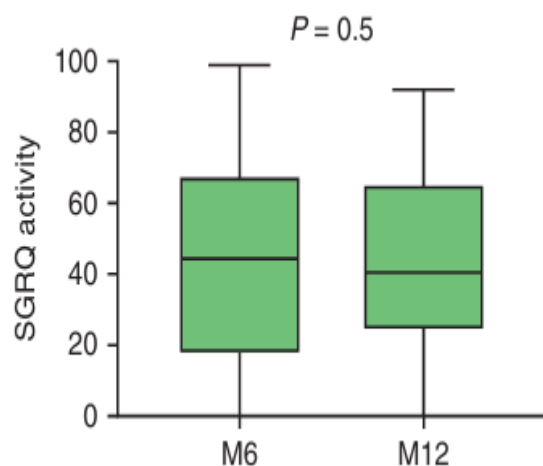
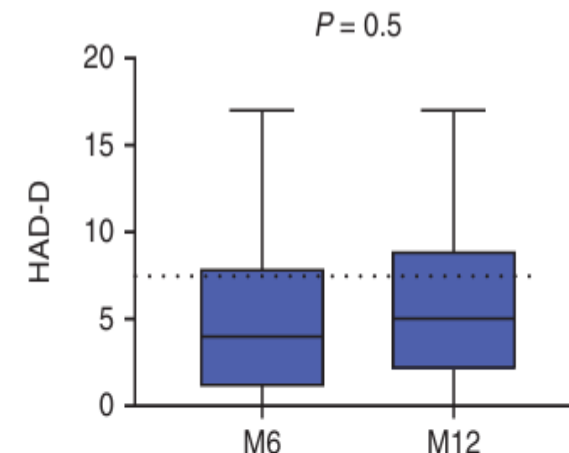
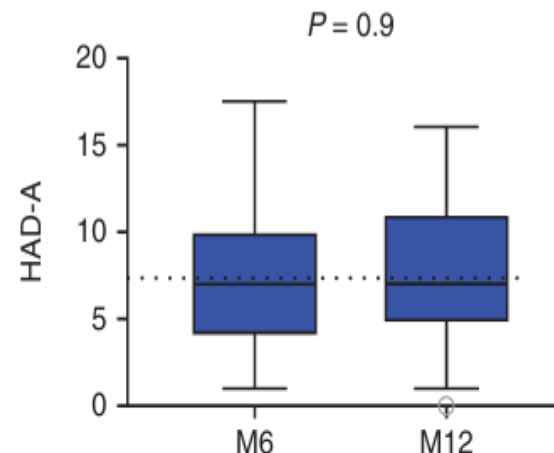
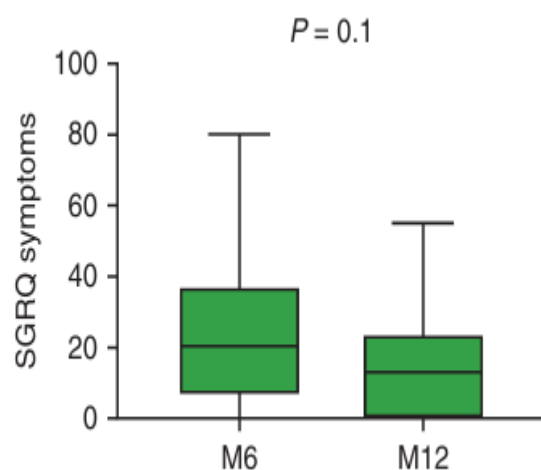
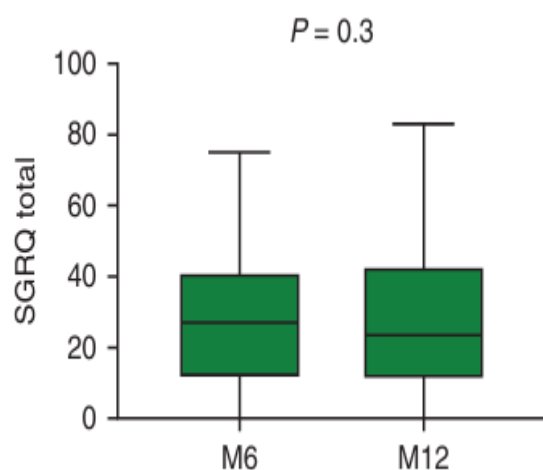
To assess physical examination, pulmonary function tests, anxiety, depression, post-traumatic stress disorder and quality of life at 6 and 12 months after ECMO onset. Multicenter, prospective study in patients who received ECMO for COVID-19 acute respiratory distress syndrome from March to June 2020 and survived hospital discharge.

Of 80 eligible patients, 62 were enrolled in seven French ICUs.

ECMO and invasive mechanical ventilation duration were 18 (11-25) and 36 (27-62) days, respectively

Table 2. General, Physical, and Pulmonary Assessments at 6 and 12 Months in ECMO-rescued Patients with Severe ARDS due to COVID-19

	At 6 mo (n = 62)	At 12 mo (n = 62)
Still in an acute rehabilitation center	2 (3)	1 (2)
Back to their initial work	13 (20)*	19 (38) [†]
Sport practice	9 (14)*	11 (23) [‡]
Oxygen requirement	4 (6)*	3 (5)*
Evaluation of muscle strength (MRC scale)	60 (57–60) [§]	60 (57–60) [§]
Similar sex drive as before COVID-19	16 (38)	13 (31)
Lung function tests		
TLC, % predicted	84 (68–98) [¶]	87 (79–103)**
TLC < 80% predicted	18 (37) [¶]	8 (21)**
FVC, % predicted	84 (70–96) [¶]	88 (78–102)**
FVC < 80% predicted	15 (31) [¶]	8 (21)**
DL _{CO} , % predicted	65 (48–80) [¶]	68 (50–84)**
DL _{CO} < 80% predicted	22 (46) [¶]	22 (58)**
FEV, % predicted	85 (77–98) [¶]	87 (78–99)**
FEV/FVC, % predicted	85 (82–89) [¶]	83 (78–86)**
FEV/FVC < 70% predicted	2 (4) [¶]	2 (5)**
Six-minute walking test, % predicted	81 (67–90) [‡]	88 (73–91) ^{††}

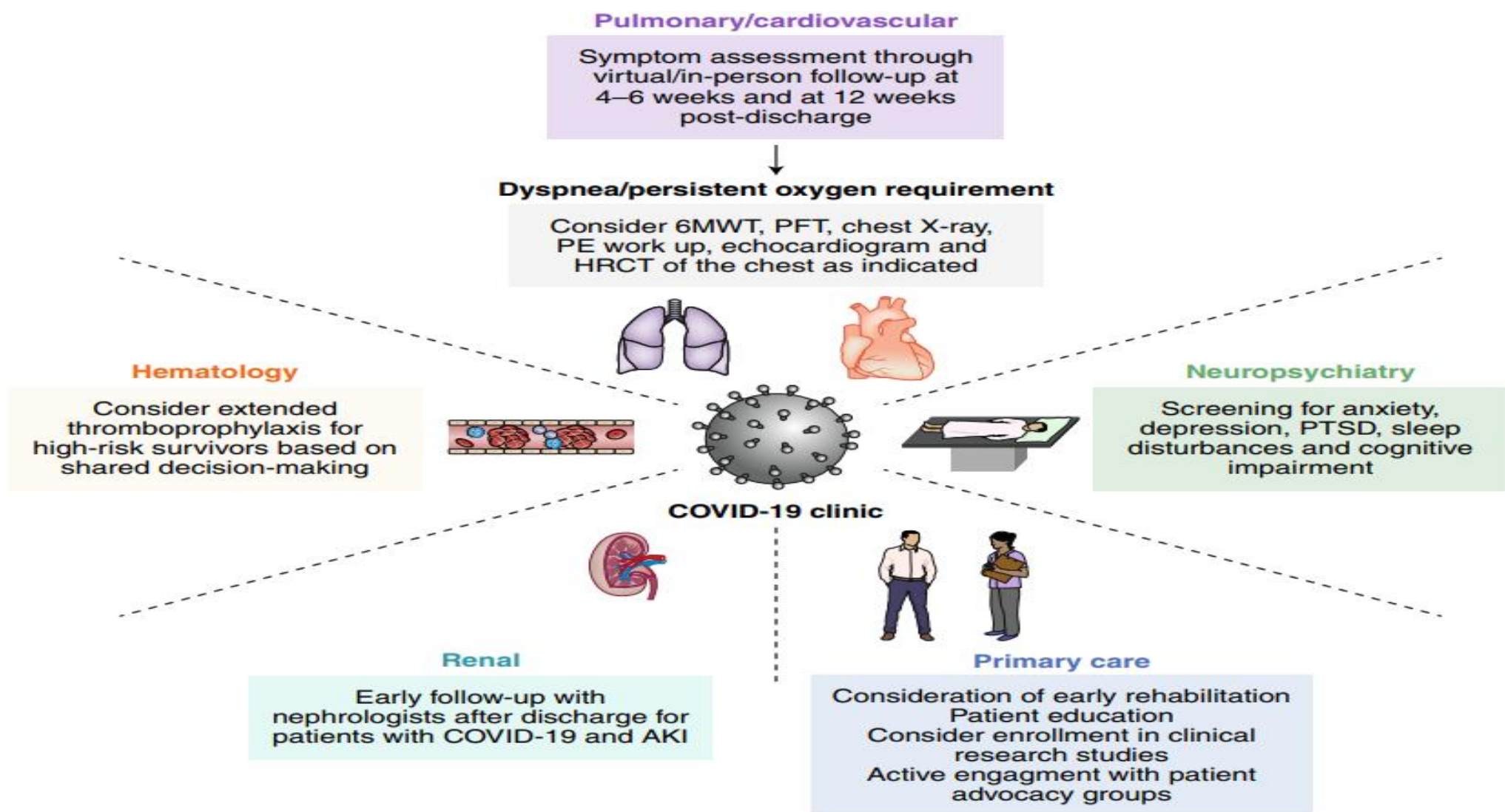


Saint George's Respiratory Questionnaire (SGRQ), Hospital Anxiety and Depression Scale–Anxiety (HAD-A), HAD–Depression (HAD-D), Post-traumatic Stress Disorder Checklist for the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition Post-Traumatic Stress Disorder Checklist for DSM-5 (PCL-5), and Functional Assessment Chronic Illness Therapy–Fatigue (FACIT) assessments at 6 and 12 months

Am J Respir Crit Care Med 2023;207(2):150-159.

4

Management



Nat Med 2021 Apr;27(4):601-615.

Management

Effects of therapeutic interventions on long COVID: a meta-analysis of randomized controlled trials



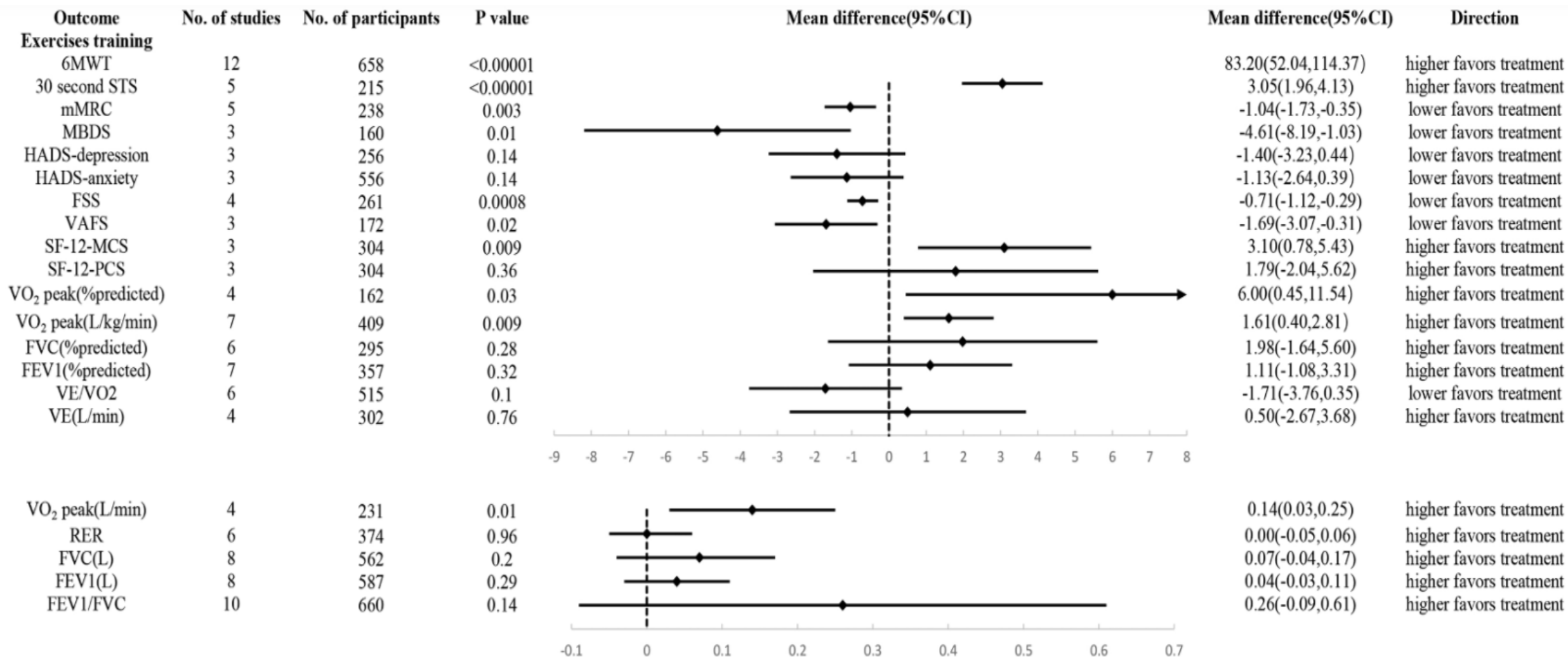
Chang Tan,^{a,b,g} Jiahao Meng,^{a,e,g} Xingui Dai,^c Baimei He,^{d,f} Pan Liu,^{a,e} Yumei Wu,^a Yilin Xiong,^{a,e,f} Heng Yin,^a Shuhao Wang,^a and Shuguang Gao^{a,e,f,*}



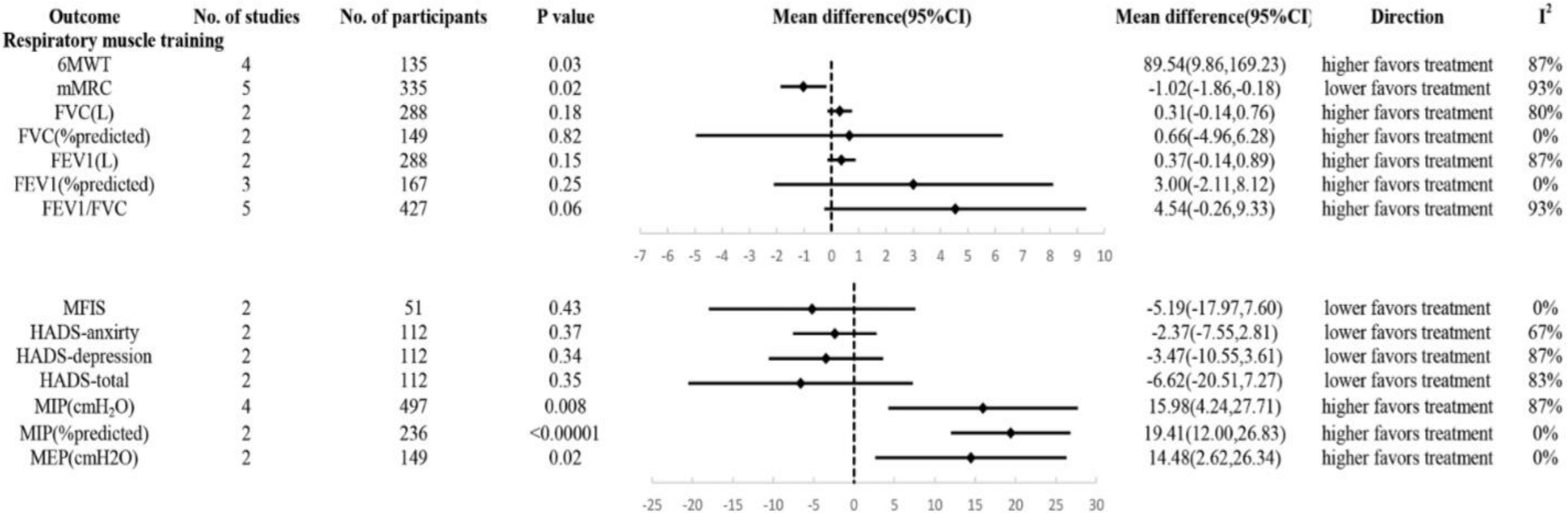
- PubMed, Cochrane Library, Embase, Web of Science, SPORTDiscus(EBSCO), CINAHL (EBSCO), and Rehabilitation & Sports medicine source (EBSCO) from inception to July 20.2025

棕櫚油乙醇胺 (PEA) 是一種天然脂肪酸醯胺，具有抗發炎、鎮痛與神經保護作用。木犀草素 (Luteolin) 是一種植物類黃酮，能減少氧化壓力與神經發炎。兩者結合後可增強彼此的抗發炎與神經保護效果，並提升 PEA 的穩定性與吸收率。此組合常用於改善慢性疼痛神經發炎與長新冠相關的腦霧或疲勞症狀。

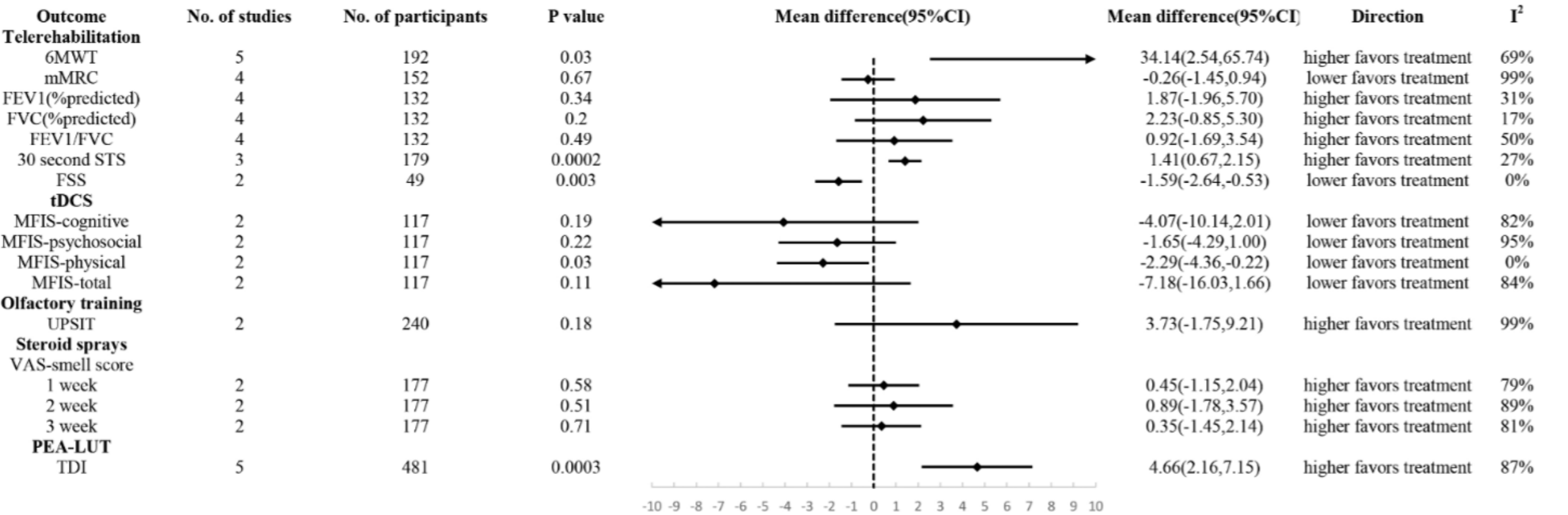
Efficiency of exercise training in long COVID



Efficiency of Respiratory muscle training in long COVID



Efficiency of Telerehabilitation, Transcranial direct current stimulation (tDCS), Olfactory training, Steroid sprays, Percutaneous electrical acupuncture-lumbar traction (PEA-LUT)



- Exercise training should be prioritized for improving cardiopulmonary function and exercise capacity in Long COVID, supported by high-certainty evidence.
- Respiratory muscle training and PEA-LUT offer targeted benefits for respiratory strength and anosmia, while tDCS may address fatigue.
- Telerehabilitation, as a form of supervision, also improved the effectiveness of the intervention.
- In contrast, steroid sprays and olfactory training lack efficacy

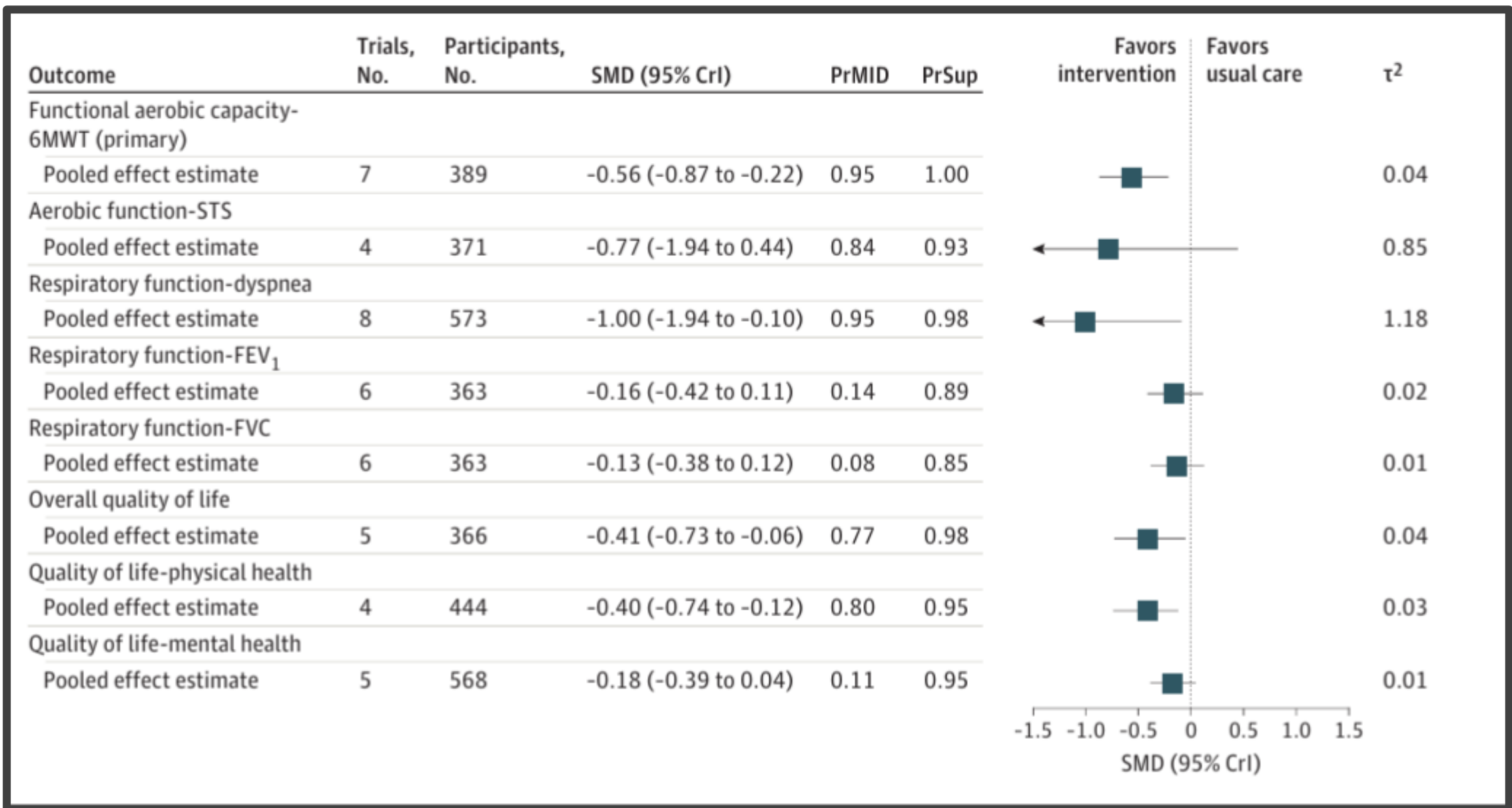


Original Investigation | Physical Medicine and Rehabilitation

Rehabilitation Interventions for Physical Capacity and Quality of Life in Adults With Post-COVID-19 Condition

A Systematic Review and Meta-Analysis

- A systematic electronic search was performed from January 2020 until February 2023, in MEDLINE, Scopus, CINAHL, and the Clinical Trials Registry
- 14 eligible trials, comprising 1244 participants



JAMA Netw Open 2023 Sep 5;6(9):e2333838.

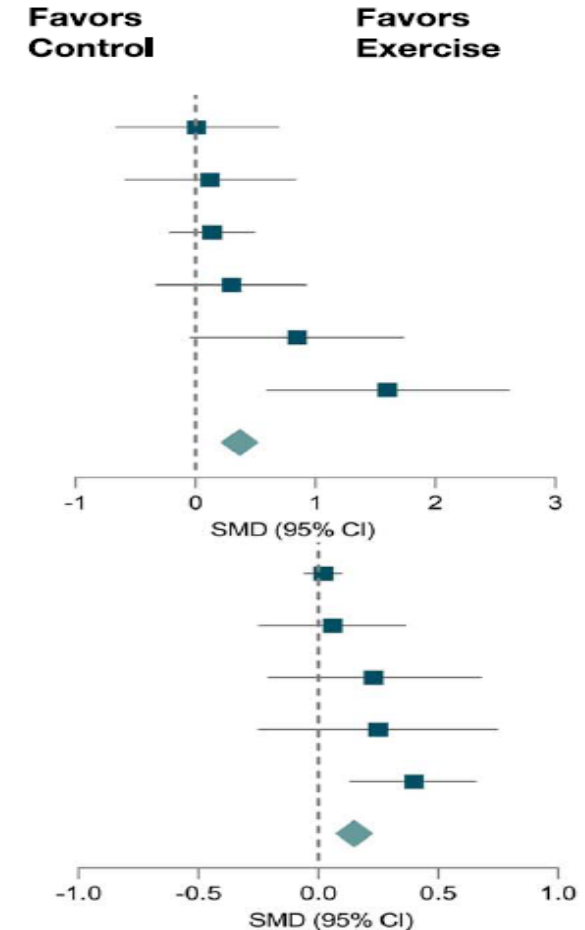
Effect of Physical Exercise–Based Rehabilitation on Long COVID: A Systematic Review and Meta-analysis

- The electronic databases Medline, Embase, Global Health (Ovid), CINAHL (EBSCO), Web of Science, WHO Global Research Database on COVID-19, LitCovid, and Google Scholar were searched from their inception to November 2022
- Twenty-three studies involving 1579 individuals

Pulmonary function

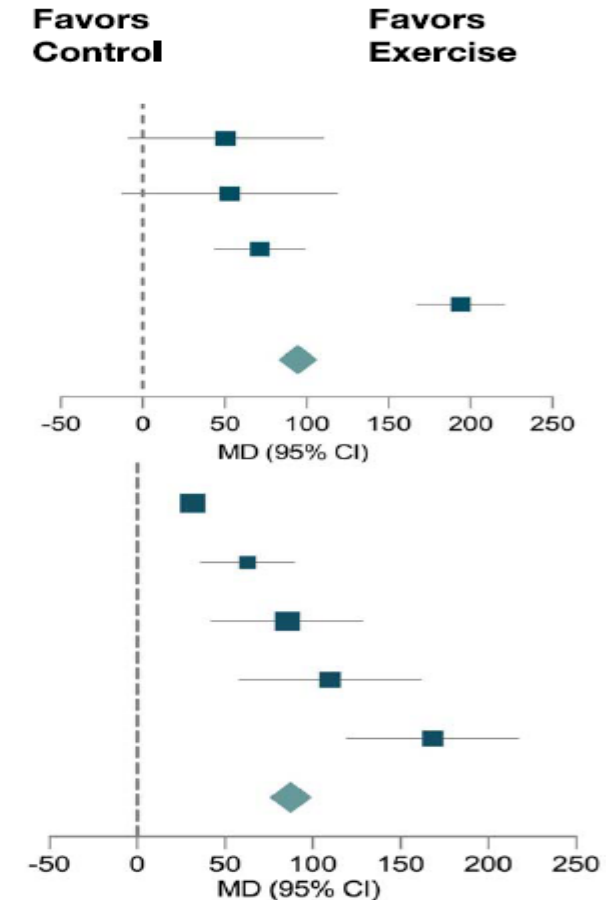
A

FEV1			
Study	Standardized Mean Difference	(95%CI)	Weight (%)
RCT or CCT			
Campos et al., 2022	0.01	(-0.67, 0.70)	16.54
Amaral et al., 2022	0.12	(-0.59, 0.84)	15.74
Li et al., 2022	0.14	(-0.22, 0.50)	27.78
Jimeno-Almazan et al., 2022	0.30	(-0.33, 0.93)	18.07
Bagherzadeh et al., 2022_pilates	0.85	(-0.05, 1.74)	11.93
Bagherzadeh et al., 2022_aqua	1.60	(0.59, 2.62)	9.94
Overall ($P = 0.015$; $I^2 = 47\%$)	0.37	(0.00, 0.75)	100
Pretest-posttest			
Loboda et al., 2022	0.02	(-0.06, 0.10)	39.65
Albu et al., 2021	0.06	(-0.25, 0.37)	18.19
Stavrou et al., 2021	0.23	(-0.21, 0.68)	11.28
Everaerts et al., 2021	0.25	(-0.25, 0.75)	9.48
Nopp et al., 2022	0.40	(0.13, 0.66)	21.40
Overall ($P = 0.081$; $I^2 = 58\%$)	0.15	(-0.02, 0.33)	100



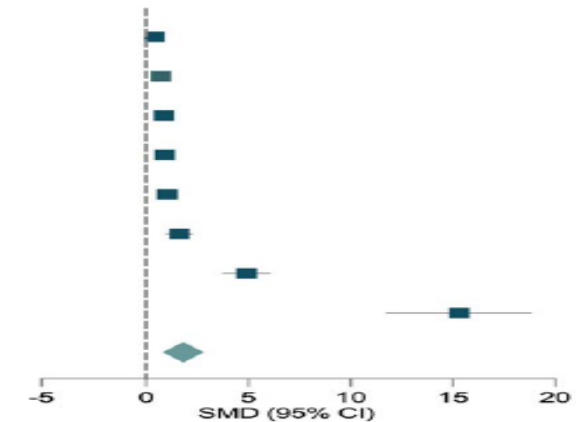
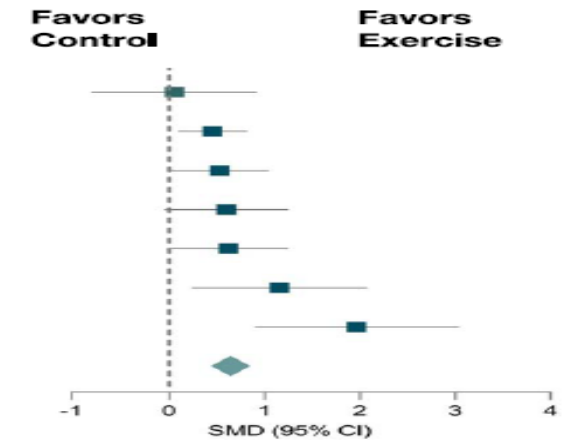
6-WMT

Study	Mean Difference	(95% CI)	Weight (%)
6-MWT (m)			
RCT or CCT			
King et al., 2022	50.50	(-9.38, 110.38)	23.76
Amaral et al., 2022	53.00	(-13.01, 119.01)	23.10
Li et al., 2022	71.30	(43.52, 99.08)	26.54
Dun et al., 2021	194.00	(167.16, 220.84)	26.60
Overall ($P = 0.02$; $I^2 = 94\%$)	94.76	(14.83, 174.70)	100
Pretest-posttest			
Loboda et al., 2022	31.50	(26.30, 36.70)	23.33
Nopp et al., 2022	62.90	(36.19, 89.61)	21.57
Stavrou et al., 2021	85.40	(42.02, 128.78)	19.13
Mayer et al., 2021	110.00	(58.14, 161.86)	17.74
Everaerts et al., 2021	168.40	(119.56, 217.24)	18.24
Overall ($P < 0.001$; $I^2 = 91\%$)	87.47	(43.08, 131.87)	100



Quality of life

Study	Standardized Mean Difference	(95%CI)	Weight (%)
RCT or CCT			
King et al., 2022	0.06	(-0.79, 0.92)	9.99
Li et al., 2022	0.46	(0.09, 0.82)	25.38
Romanet et al., 2022	0.53	(0.02, 1.05)	18.85
Jimeno-Almazan et al., 2022	0.60	(-0.04, 1.25)	14.78
Bhandari et al., 2022	0.62	(-0.02, 1.25)	14.98
Bagherzadeh et al., 2022_pilates	1.16	(0.24, 2.08)	8.95
Bagherzadeh et al., 2022_aqua	1.97	(0.90, 3.04)	7.06
Overall ($P < 0.001$; $I^2 = 39\%$)	0.65	(0.33, 0.96)	100
Pretest-posttest			
Daynes et al. 2021	0.41	(0.03, 0.78)	14.49
Mayer et al., 2021	0.70	(0.29, 1.10)	14.39
Dalbosco-Salas et al. 2021	0.87	(0.56, 1.17)	14.68
Nopp et al. 2022	0.92	(0.52, 1.32)	14.40
Albu et al., 2021	1.04	(0.66, 1.43)	14.45
Kortianou et al., 2022	1.63	(0.99, 2.27)	13.49
Nambi et al. 2022_hight	4.91	(3.75, 6.07)	10.84
Nambi et al. 2022_light	15.30	(11.75, 18.85)	3.26
Overall ($P < 0.001$; $I^2 = 94\%$)	1.82	(1.10, 2.54)	100



Dyspnea

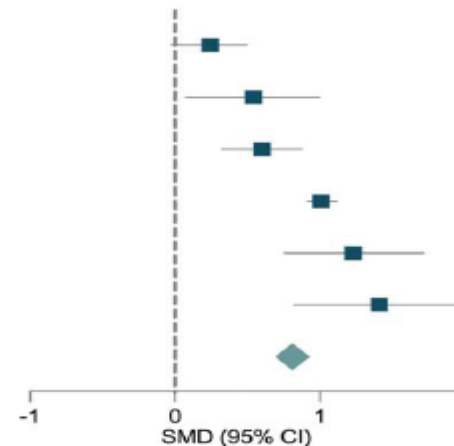
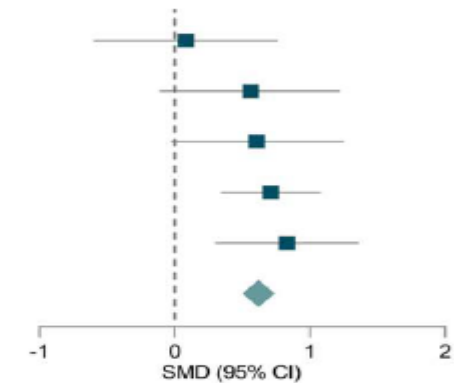
A

Dyspnea

Study	Standardized Mean Difference	(95%CI)	Weight (%)
RCT or CCT			
Capin et al., 2022	0.08	(-0.60, 0.76)	12.35
Campos et al., 2022	0.56	(-0.11, 1.22)	12.65
Jimeno-Almazan et al., 2022	0.61	(-0.03, 1.25)	13.70
Li et al., 2022	0.71	(0.34, 1.08)	41.16
Romanet et al., 2022	0.83	(0.30, 1.36)	20.14
Overall ($P < 0.001$; $I^2 = 0\%$)	0.62	(0.39, 0.86)	100
Pretest-posttest			
Nopp et al. 2022	0.24	(-0.03, 0.50)	18.56
Stavrou et al. 2021	0.54	(0.07, 1.00)	15.00
Dalbosco-Salas et al. 2021	0.60	(0.32, 0.88)	18.31
Loboda et al., 2022	1.01	(0.91, 1.12)	20.53
Mayer et al., 2021	1.23	(0.75, 1.72)	14.74
Kortianou et al., 2022	1.41	(0.82, 2.00)	12.86
Overall ($P < 0.001$; $I^2 = 87\%$)	0.81	(0.46, 1.15)	100

Favors Control

Favors Exercise



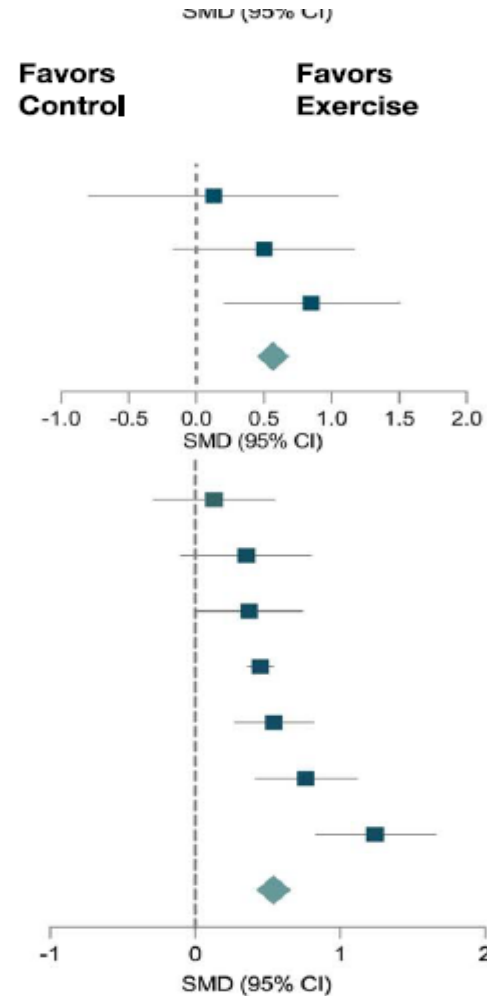
B

Fatigue

Standardized

Fatigue

Fatigue			
Study	Standardized Mean Difference	(95%CI)	Weight (%)
RCT or CCT			
King et al., 2022	0.13	(-0.80, 1.05)	20.34
Campos et al., 2022	0.50	(-0.17, 1.17)	39.22
Jimeno-Almazan et al., 2022	0.85	(0.20, 1.51)	40.44
Overall ($P = 0.008$; $I^2 = 0\%$)	0.57	(0.15, 0.98)	100
Pretest-posttest			
Kortianou et al., 2022	0.13	(-0.29, 0.55)	11.74
Stavrou et al. 2021	0.35	(-0.10, 0.80)	10.90
Daynes et al. 2021	0.37	(-0.00, 0.74)	13.21
Loboda et al., 2022	0.45	(0.36, 0.54)	22.33
Dalbosco-Salas et al. 2021	0.54	(0.27, 0.82)	16.26
Nopp et al. 2022	0.76	(0.41, 1.12)	13.61
Albu et al., 2021	1.24	(0.83, 1.66)	11.94
Overall ($P < 0.001$; $I^2 = 69\%$)	0.54	(0.34, 0.75)	100

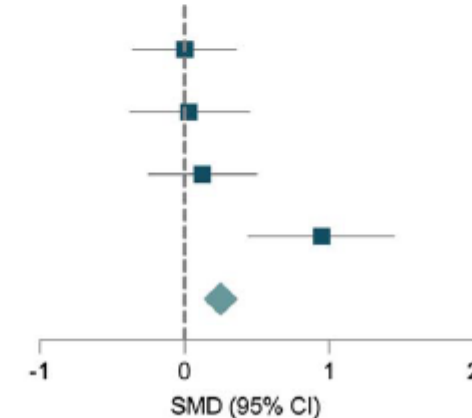
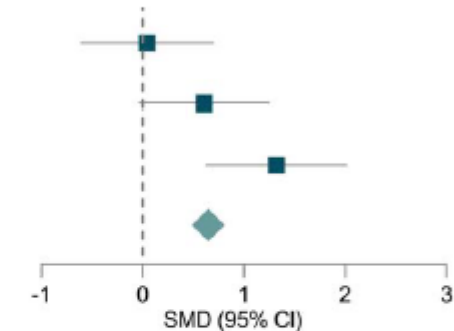


Anxiety

A

Anxiety		Standardized Mean Difference	(95%CI)	Weight (%)
Study				
RCT or CCT				
Campos et al., 2022	0.04	(-0.61, 0.70)	33.64	
Jimeno-Almazan et al., 2022	0.61	(-0.04, 1.25)	34.06	
Bhandari et al., 2022	1.32	(0.62, 2.02)	32.30	
Overall ($P = 0.073$; $I^2 = 70\%$)	0.65	(-0.06, 1.36)	100	
Pretest-posttest				
Daynes et al. 2021	0.00	(-0.36, 0.36)	26.93	
Everaerts et al. 2021	0.03	(-0.38, 0.45)	24.78	
Mayer et al., 2021	0.12	(-0.25, 0.50)	26.43	
Kortianou et al., 2022	0.95	(0.44, 1.45)	21.85	
Overall ($P = 0.200$; $I^2 = 71\%$)	0.25	(-0.13, 0.63)	100	

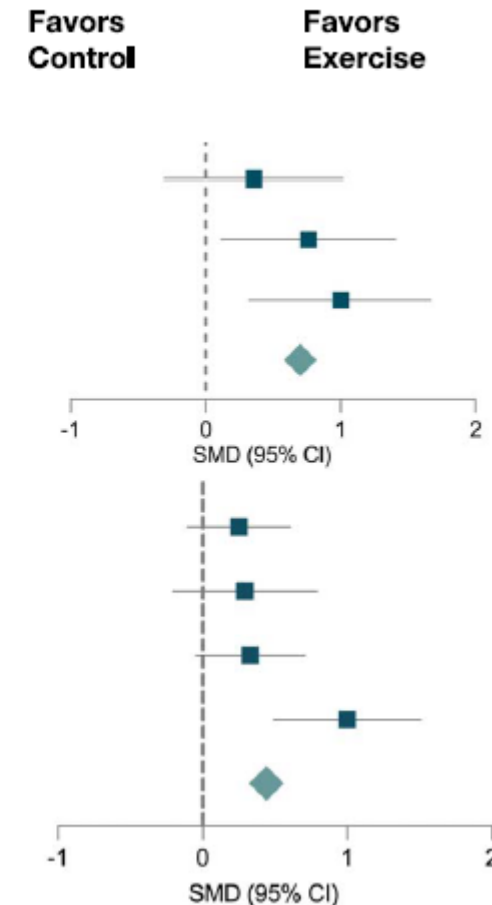
Favors Control Favors Exercise



Depression

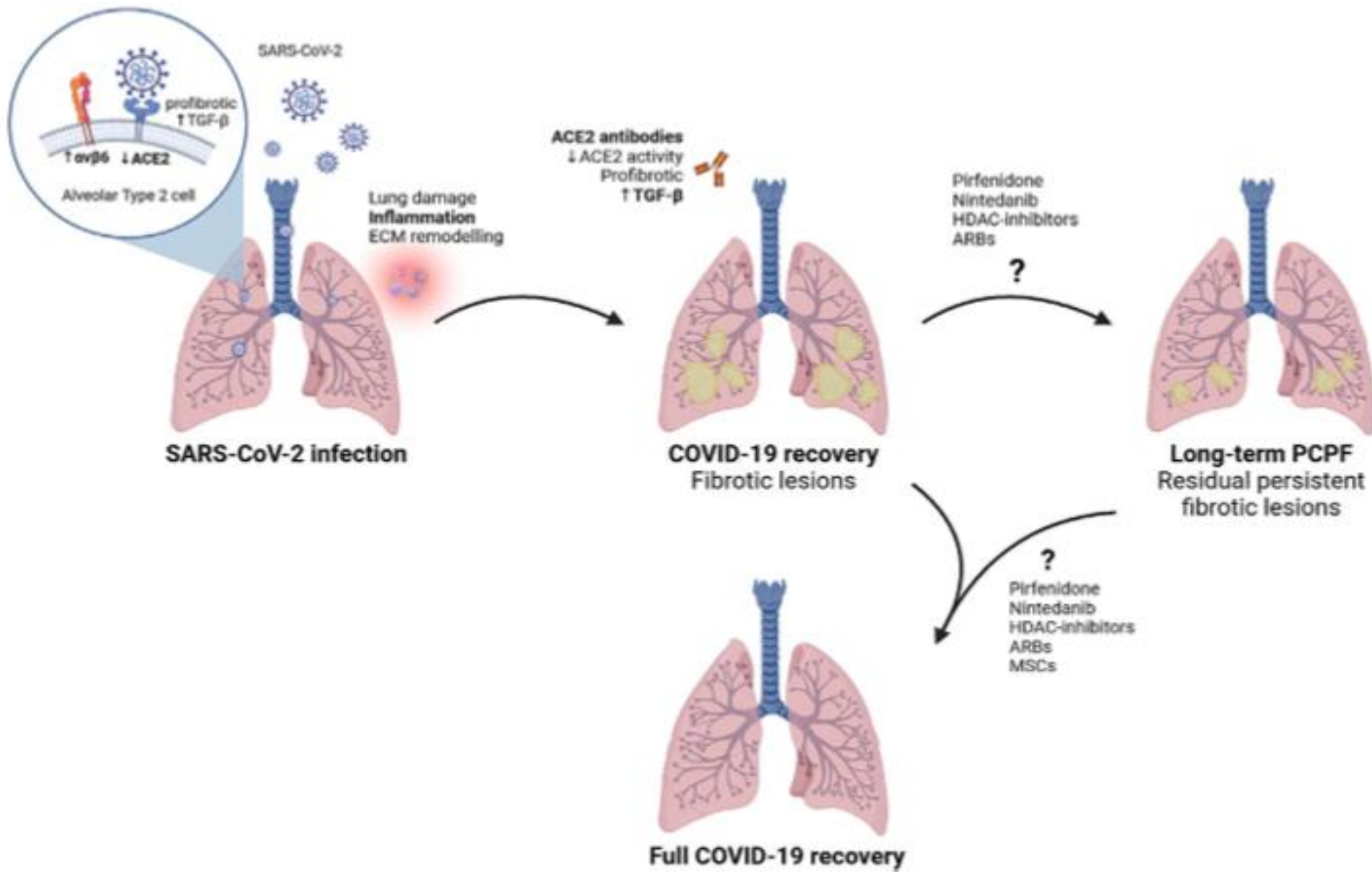
B

Study	Standardized Mean Difference	(95% CI)	Weight (%)
RCT or CCT			
Campos et al., 2022	0.36	(-0.31, 1.02)	33.37
Jimeno-Almazan et al., 2022	0.76	(0.11, 1.41)	34.54
Bhandari et al., 2022	1.00	(0.32, 1.67)	32.09
Overall ($P < 0.001$; $I^2 = 0\%$)	0.70	(0.32, 1.08)	100
Pretest-posttest			
Daynes et al. 2021	0.25	(-0.11, 0.61)	29.26
Everaerts et al. 2021	0.29	(-0.21, 0.79)	21.55
Mayer et al., 2021	0.33	(-0.05, 0.71)	28.18
Kortianou et al., 2022	1.00	(0.49, 1.51)	21.02
Overall ($P = 0.006$; $I^2 = 52\%$)	0.44	(0.13, 0.75)	100



4-1

Prevention



The efficacy and safety of pirfenidone in patients with fibrotic interstitial lung changes after recovery from severe COVID-19 pneumonia were evaluated



Post-COVID-19
fibrotic lung
changes



Pirfenidone



2:1

24 weeks

Placebo



No significant difference in lung improvement (pirfenidone versus placebo).
Clinically meaningful improvement in health-related quality of life was not statistically different between groups.
Exercise capacity, adverse events and hospitalisations were similar between groups. No deaths were reported.

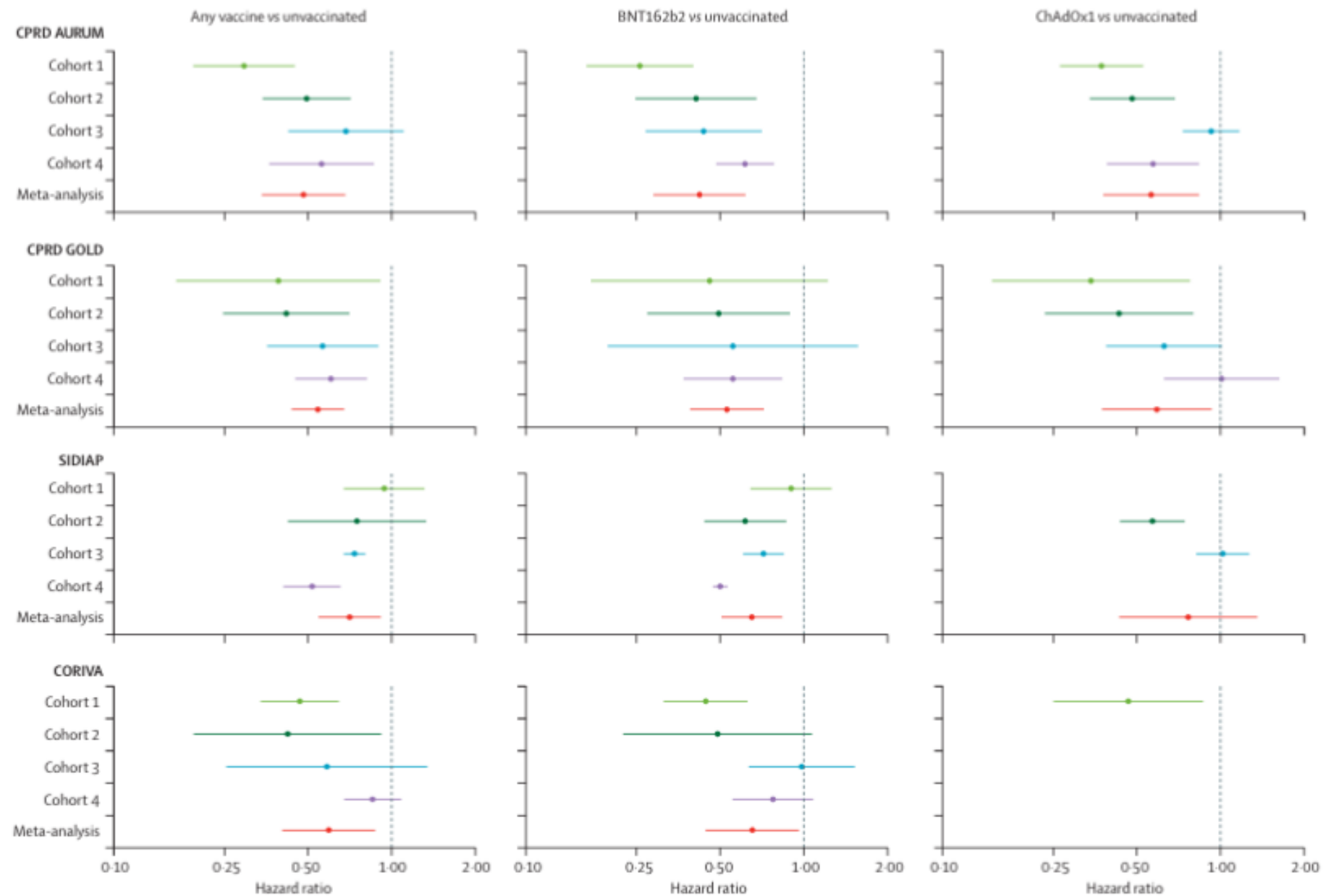
The effectiveness of COVID-19 vaccines to prevent long COVID symptoms: staggered cohort study of data from the UK, Spain, and Estonia



Martí Català, Núria Mercadé-Besora, Raivo Kolde, Nhung T H Trinh, Elena Roel, Edward Burn, Trishna Rathod-Mistry, Kristin Kostka, Wai Yi Man, Antonella Delmestri, Hedvig M E Nordeng, Anneli Uusküla, Talita Duarte-Salles, Daniel Prieto-Alhambra*, Annika M Jödicke*



Lancet Respir Med 2024 Mar;12(3):225-236





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Clinical Microbiology and Infection

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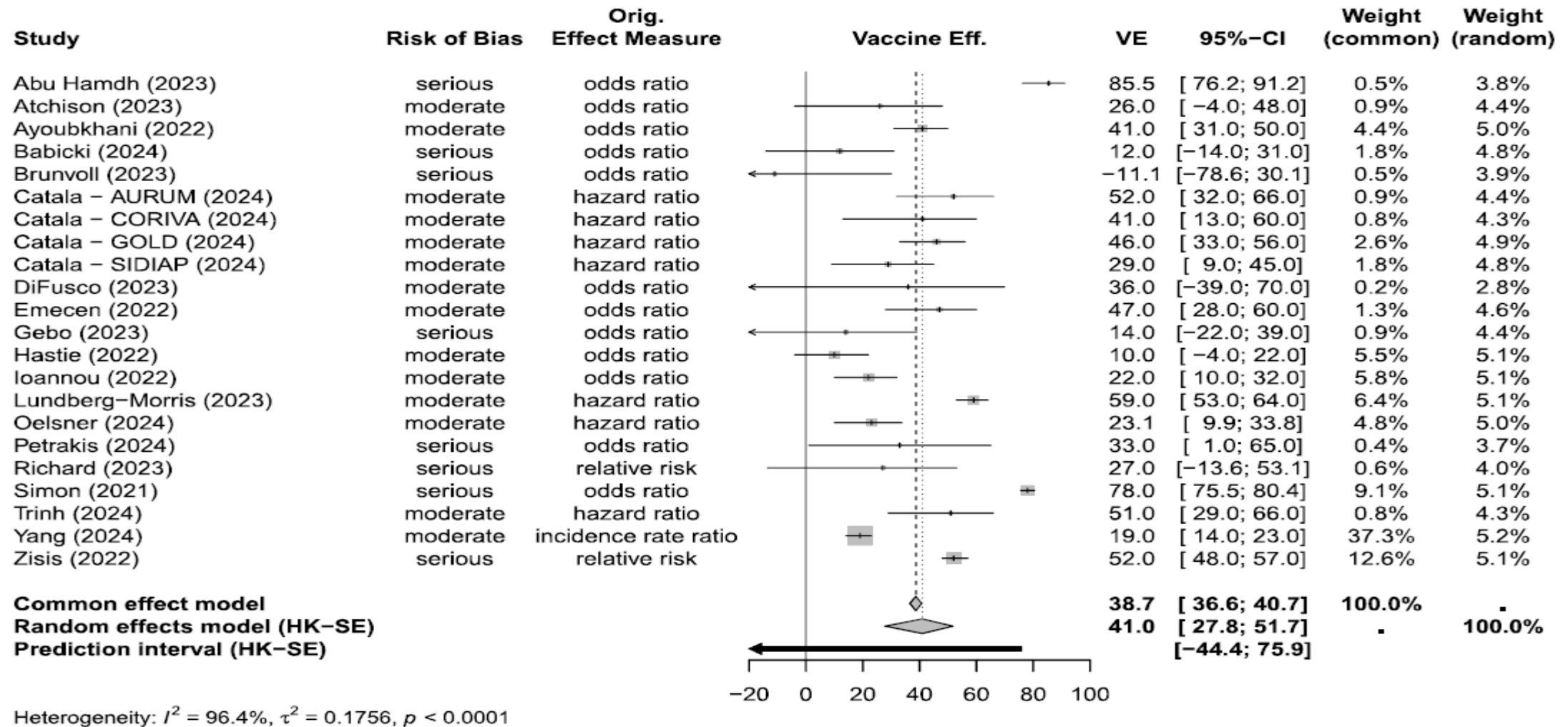
Systematic review

Effectiveness of COVID-19 vaccines against post-COVID-19 condition/ long COVID: systematic review and meta-analysis

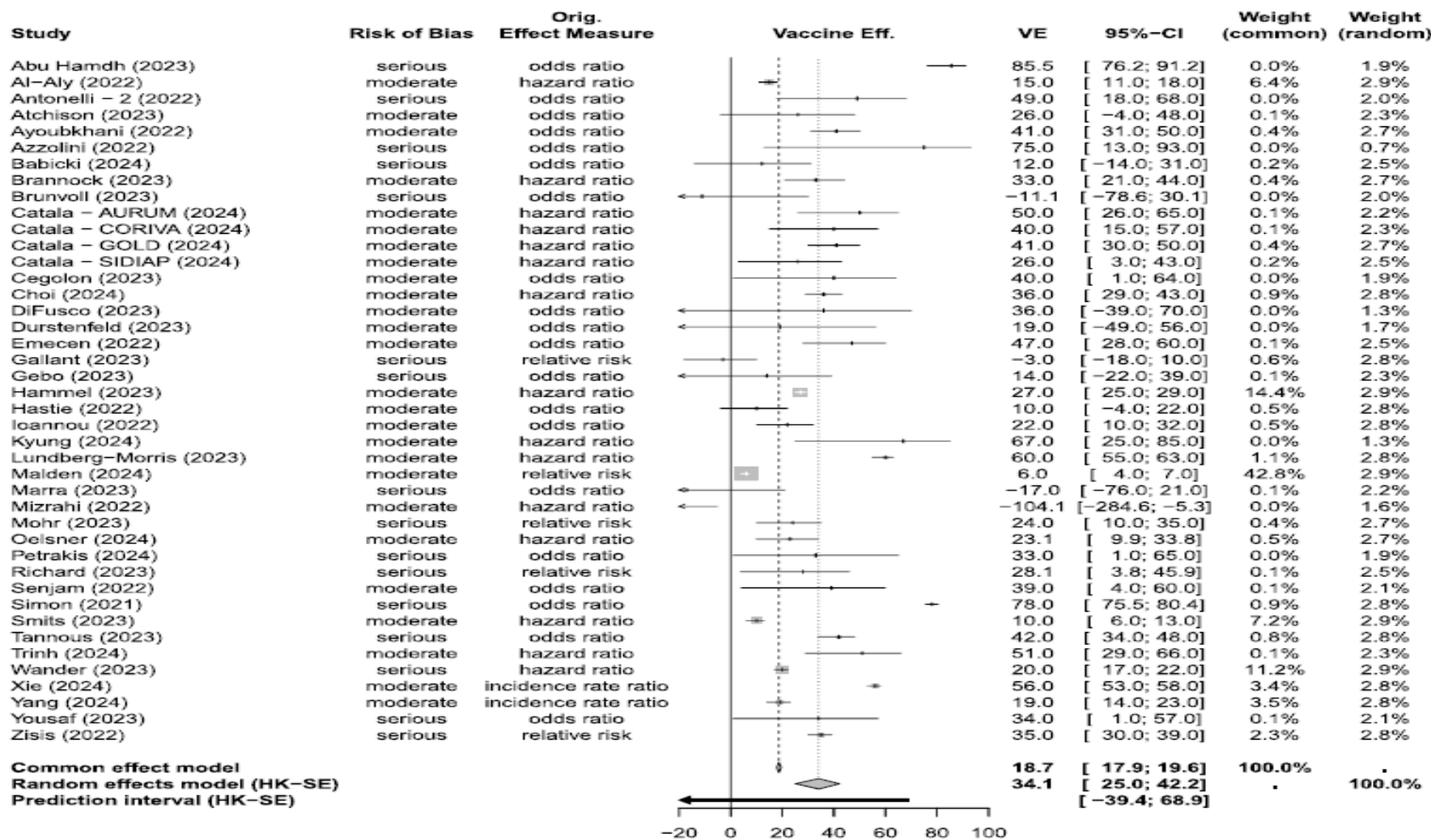
- Post COVID-19 condition (PCC; symptoms ≥ 3 months after infection) or long COVID (LC; symptoms ≥ 1 month after infection)
- Studies were identified in Embase, MEDLINE, PreView, COVID-19 L.OVE repository, and Cochrane Library up to August 1, 2024
- A total of 6423 records were screened, and 65 nonrandomized studies of interventions reporting adjusted estimates were included, comprising >5.7 mio.

Clin Microbiol Infect 2025 Aug 7:S1198-743X(25)00367-2.

Vaccine effectiveness against PCC



Vaccine effectiveness against long COVID



- **VE for ≥ 1 vaccine dose against PCC was 41.0% (95% CI 27.8%; 51.7%; 22 NRSI, certainty of evidence: low).**
- **VE after 1, 2, or 3 doses versus unvaccinated was 19.1% (-119.4%; 70.2%, 3 NRSI), 43.2% (4.5%; 66.2%; 4 NRSI), and 70.0% (30.0%; 87.0%; 1 NRSI), respectively.**
- **In <18 years old, VE against PCC was 26% for ≥ 1 dose (-4%; 48%, 1 NRSI) and in >60 years old 41% (17%; 59%, 1 NRSI).**
- **VE after pre-Omicron-SARS-CoV-2 infection was 32.1% (-54.3%; 70.1%, 3 NRSI) and 20.9% (-10.1%; 43.3%, 2 NRSI) after Omicron infection**

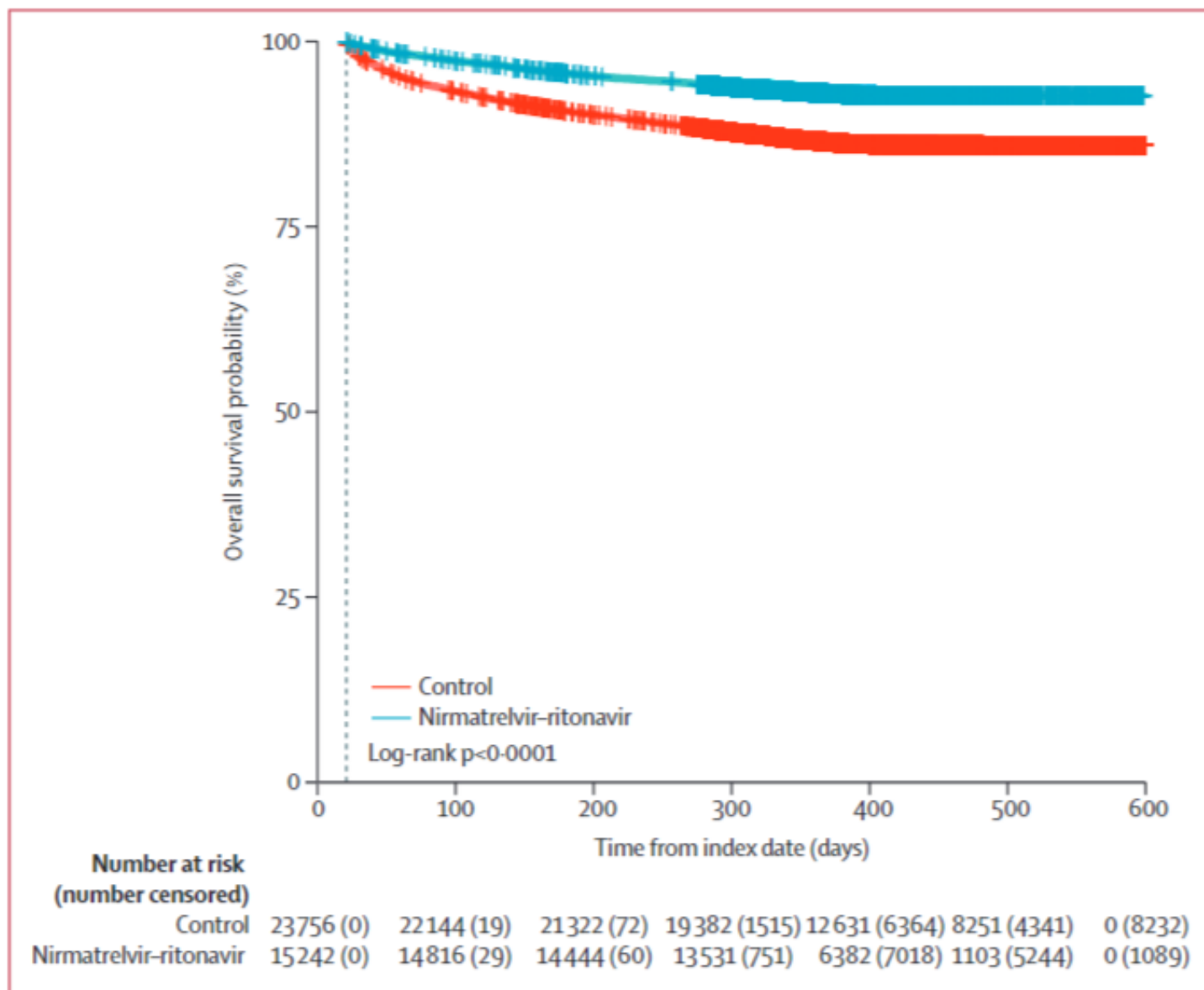
Nirmatrelvir plus Ritonavir

Post-acute sequelae

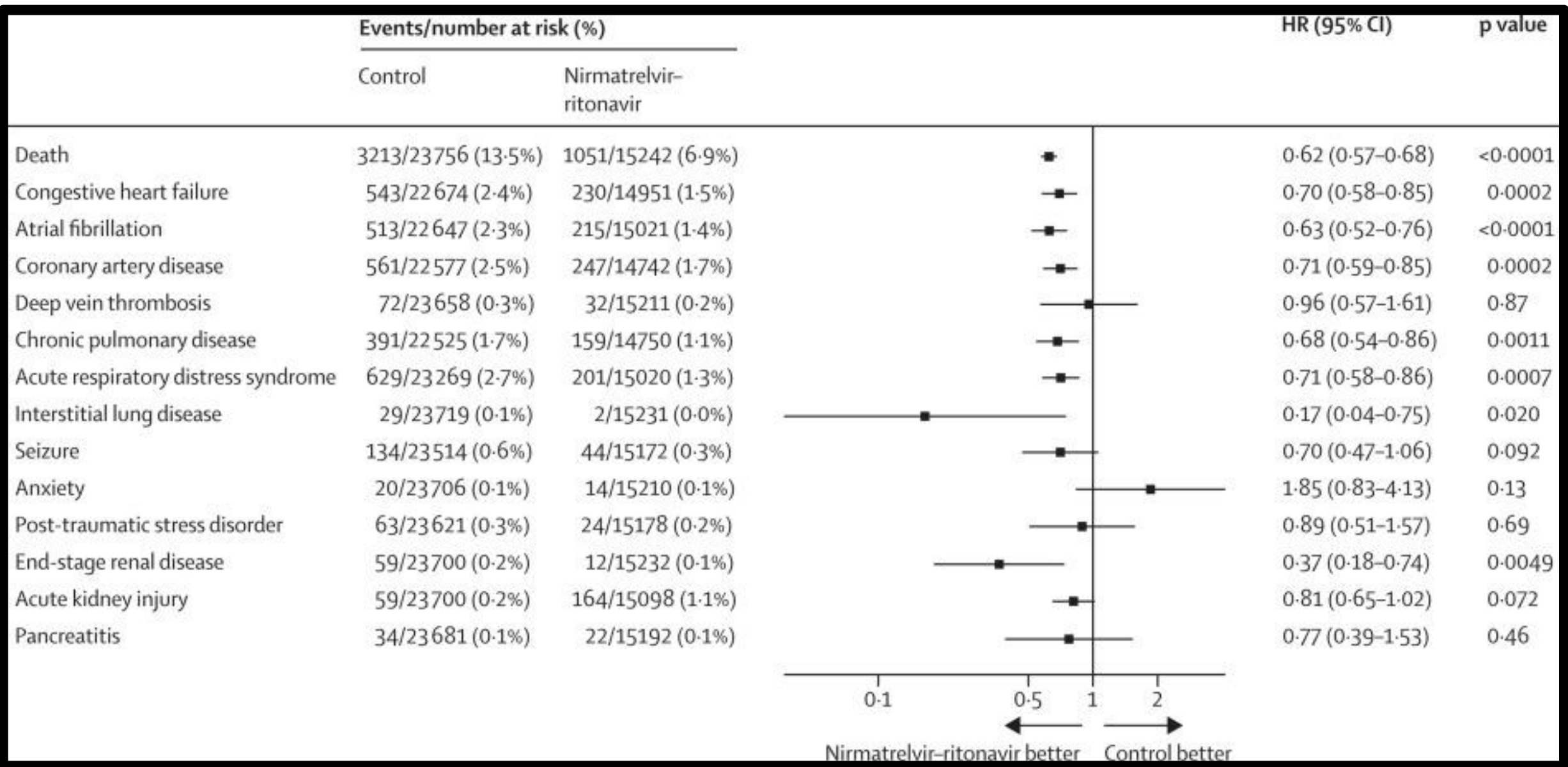
Association of nirmatrelvir–ritonavir with post-acute sequelae and mortality in patients admitted to hospital with COVID-19: a retrospective cohort study



Huwen Wang, Yuchen Wei, Chi Tim Hung, Guozhang Lin, Xiaoting Jiang, Conglu Li, Katherine Min Jia, Carrie Ho Kwan Yam, Tsz Yu Chow, Janice Ying-en Ho, Yawen Wang, Shi Zhao, Zihao Guo, Kehang Li, Aimin Yang, Chris Ka Pun Mok, David S C Hui, Eng Kiong Yeoh, Ka Chun Chong



A significantly lower hazard of post-acute death in the nirmatrelvir–ritonavir group than in the control group



Emerging Microbes & Infections
2025, VOL. 14, 2469648 (9 pages)
<https://doi.org/10.1080/22221751.2025.2469648>



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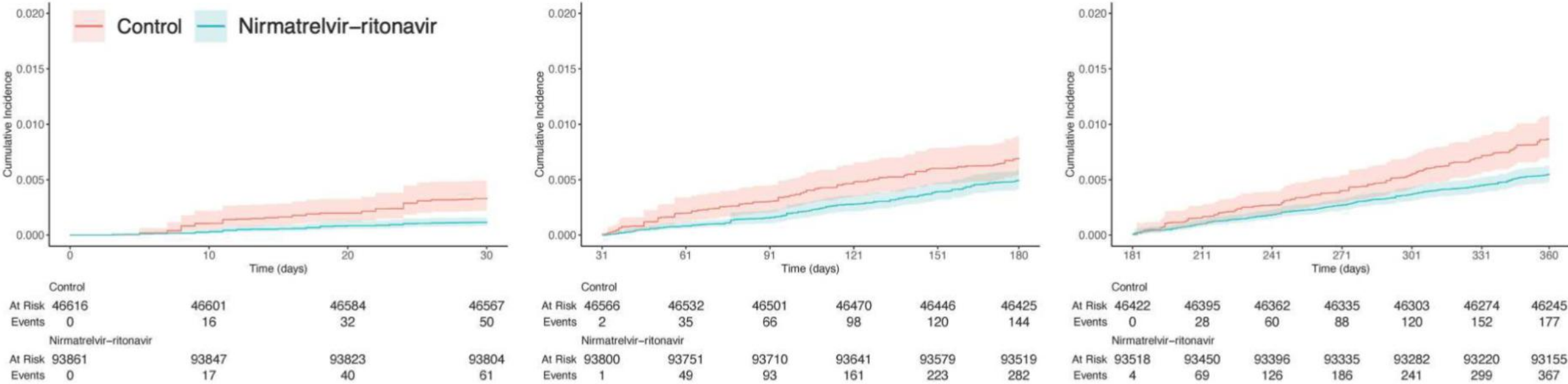


Effectiveness of nirmatrelvir/ritonavir and molnupiravir on post-COVID-19 outcomes among outpatients: a target trial emulation investigation

Yuchen Wei^a, Christopher Boyer^b, Katherine Min Jia^b, Guozhang Lin^a, Huwen Wang^a, Conglu Li^a, Chi Tim Hung^a, Xiaoting Jiang^a, Carrie Ho Kwan Yam^a, Tsz Yu Chow^a, Yawen Wang^c, Shi Zhao^{a,d}, Zihao Guo^a, Kehang Li^a, Aimin Yang^e, Chris Ka Pun Mok^f, David S. C. Hui^g, Ka Chun Chong^a and Eng Kiong Yeoh^a

Death

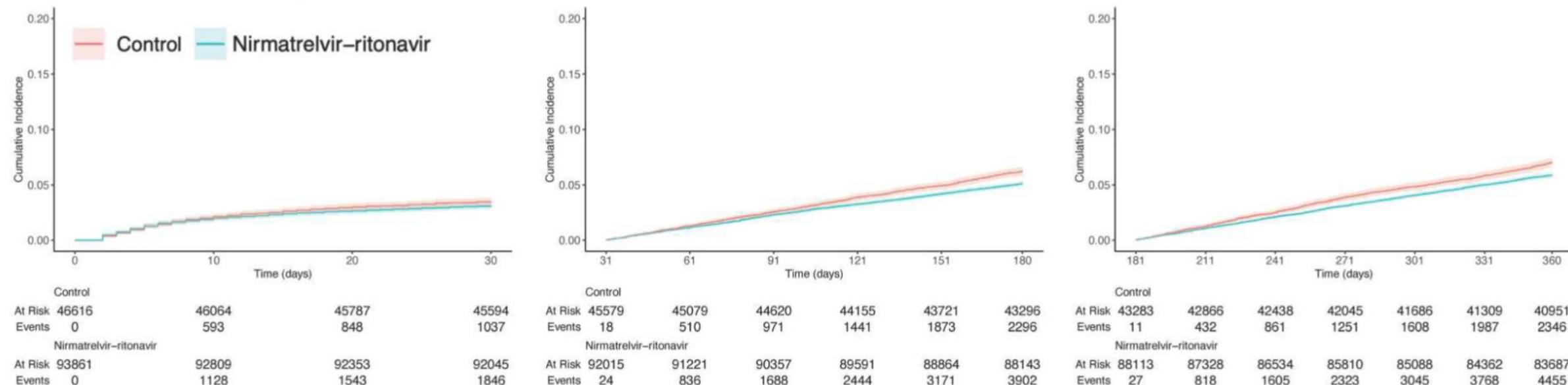
A. Cumulative incidence of mortality in Nirmatrelvir/ritonavir trial



Outcome	Subgroup	Risk difference % (95% CI)			RR (95% CI)	P-value
Death	day 0-30	0.22	(0.09 to 0.34)		0.39 (0.22 to 0.59)	<0.01
	day 31-180	0.20	(0.02 to 0.38)		0.71 (0.54 to 0.96)	0.03
	day 181-360	0.32	(0.13 to 0.51)		0.64 (0.50 to 0.82)	<0.01

Hospitalization

B. Cumulative incidence of hospitalization in Nirmatrelvir/ritonavir trial



Outcome	Subgroup	Risk difference % (95% CI)		RR (95% CI)	P-value
Hospitalization	day 0-30	0.40	(0.07 to 0.74)	0.89 (0.80 to 0.98)	0.02
	day 31-180	1.11	(0.70 to 1.55)	0.82 (0.76 to 0.88)	<0.01
	day 181-360	1.18	(0.70 to 1.66)	0.83 (0.78 to 0.89)	<0.01



Research

JAMA Internal Medicine | [Original Investigation](#)

Association of Treatment With Nirmatrelvir and the Risk of Post-COVID-19 Condition

Yan Xie, PhD; Taeyoung Choi, MPH; Ziyad Al-Aly, MD

JAMA Intern Med 2023 Mar 23;e230743.

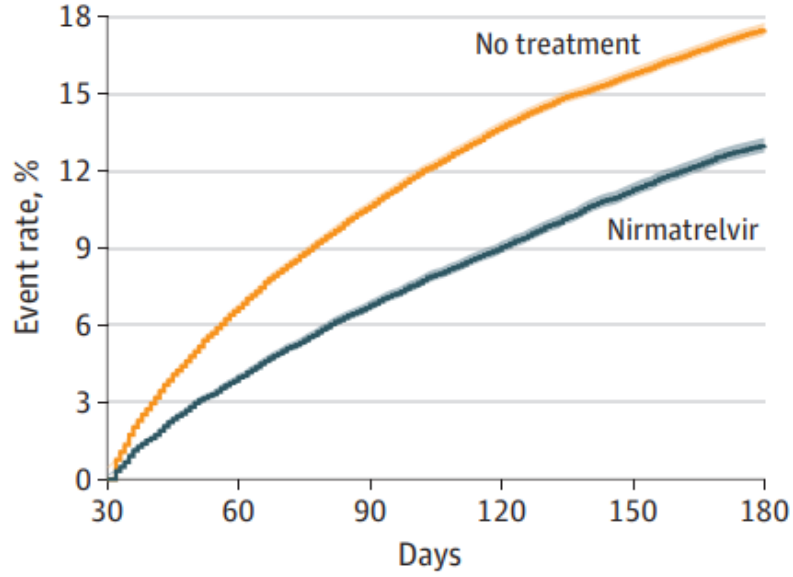
Post-COVID-19 Condition

Organ system	Outcome	Hazard ratio (95% CI)	Event rate, % at 180 d (95% CI)	
			Nirmatrelvir group ^a	Control group ^b
Cardiovascular	Dysrhythmia	0.73 (0.68 to 0.78)	2.86 (2.67 to 3.06)	3.91 (3.82 to 4.00)
	Ischemic heart disease	0.71 (0.63 to 0.79)	1.23 (1.10 to 1.36)	1.74 (1.68 to 1.80)
Coagulation and hematologic	Pulmonary embolism	0.61 (0.51 to 0.74)	0.43 (0.35 to 0.51)	0.70 (0.66 to 0.74)
	Deep vein thrombosis	0.72 (0.56 to 0.93)	0.26 (0.20 to 0.32)	0.36 (0.33 to 0.39)
Fatigue and malaise	Fatigue and malaise	0.79 (0.73 to 0.84)	3.53 (3.29 to 3.77)	4.47 (4.37 to 4.58)
Gastrointestinal	Liver disease	0.91 (0.81 to 1.02)	1.31 (1.17 to 1.45)	1.45 (1.39 to 1.51)
Kidney	Acute kidney injury	0.67 (0.58 to 0.77)	0.79 (0.68 to 0.89)	1.17 (1.12 to 1.22)
Musculoskeletal	Muscle pain	0.65 (0.58 to 0.72)	1.35 (1.22 to 1.49)	2.08 (2.01 to 2.14)
Metabolic	Diabetes	0.98 (0.86 to 1.11)	1.49 (1.31 to 1.67)	1.52 (1.45 to 1.59)
Neurological	Neurocognitive impairment	0.74 (0.67 to 0.83)	1.29 (1.16 to 1.42)	1.74 (1.68 to 1.80)
	Dysautonomia	0.86 (0.75 to 0.97)	0.97 (0.86 to 1.09)	1.14 (1.09 to 1.19)
Pulmonary	Shortness of breath	0.89 (0.83 to 0.95)	4.18 (3.91 to 4.44)	4.69 (4.58 to 4.79)
	Cough	0.96 (0.88 to 1.04)	3.47 (3.21 to 3.73)	3.62 (3.52 to 3.72)

JAMA Intern Med 2023 Mar 23;e230743.

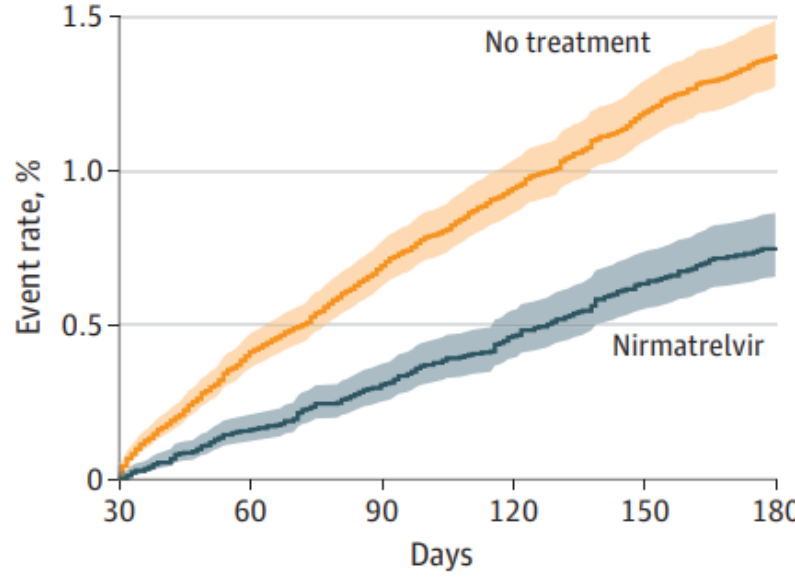
Post-COVID-19 Condition

A PCC



No. at risk						
No treatment	246076	235468	225891	216902	205222	189205
Nirmatrelvir	35717	31549	28461	25920	22898	18134
Cumulative No. of events						
No treatment	0	13313	21638	27610	32354	36572
Nirmatrelvir	0	1075	1837	2452	3060	3526

B Death



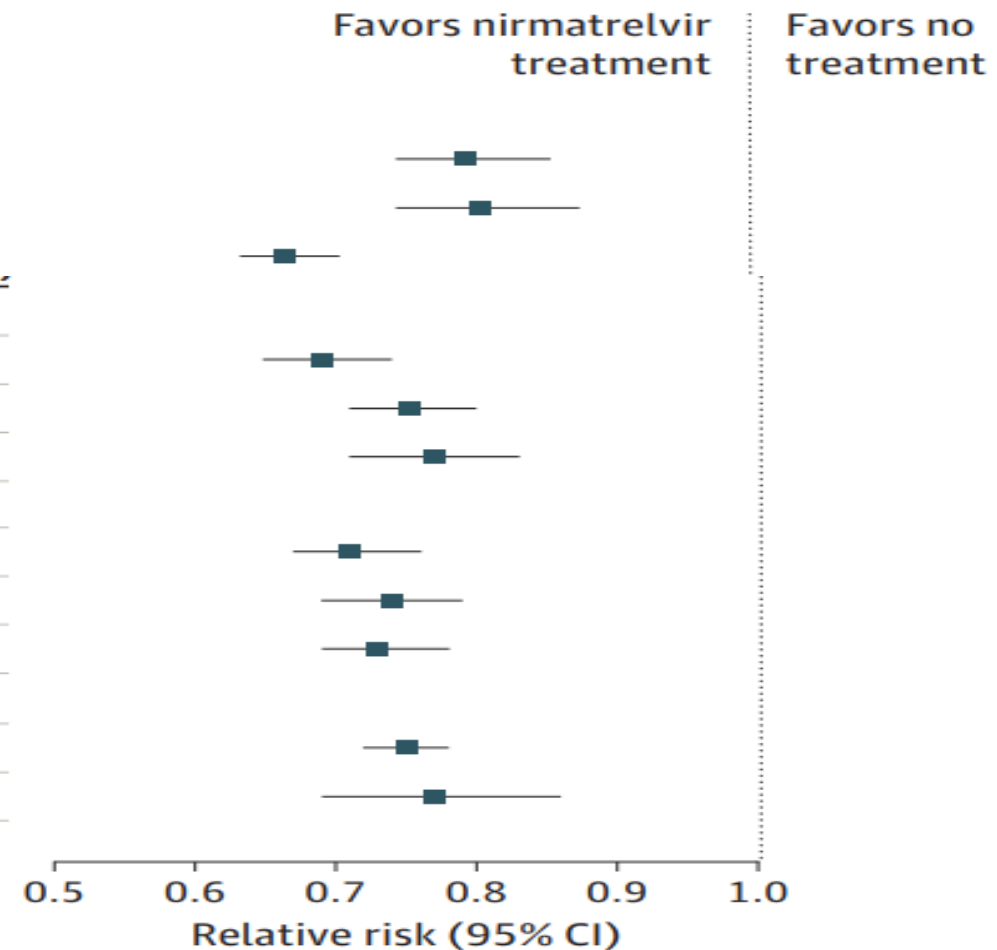
No. at risk						
No treatment	246076	235468	225891	216902	205222	189205
Nirmatrelvir	35717	31549	28461	25920	22898	18134
Cumulative No. of events						
No treatment	0	1421	2263	3004	3,608	4101
Nirmatrelvir	0	54	98	141	184	207

JAMA Intern Med 2023 Mar 23;e230743.

Post-COVID-19 Condition

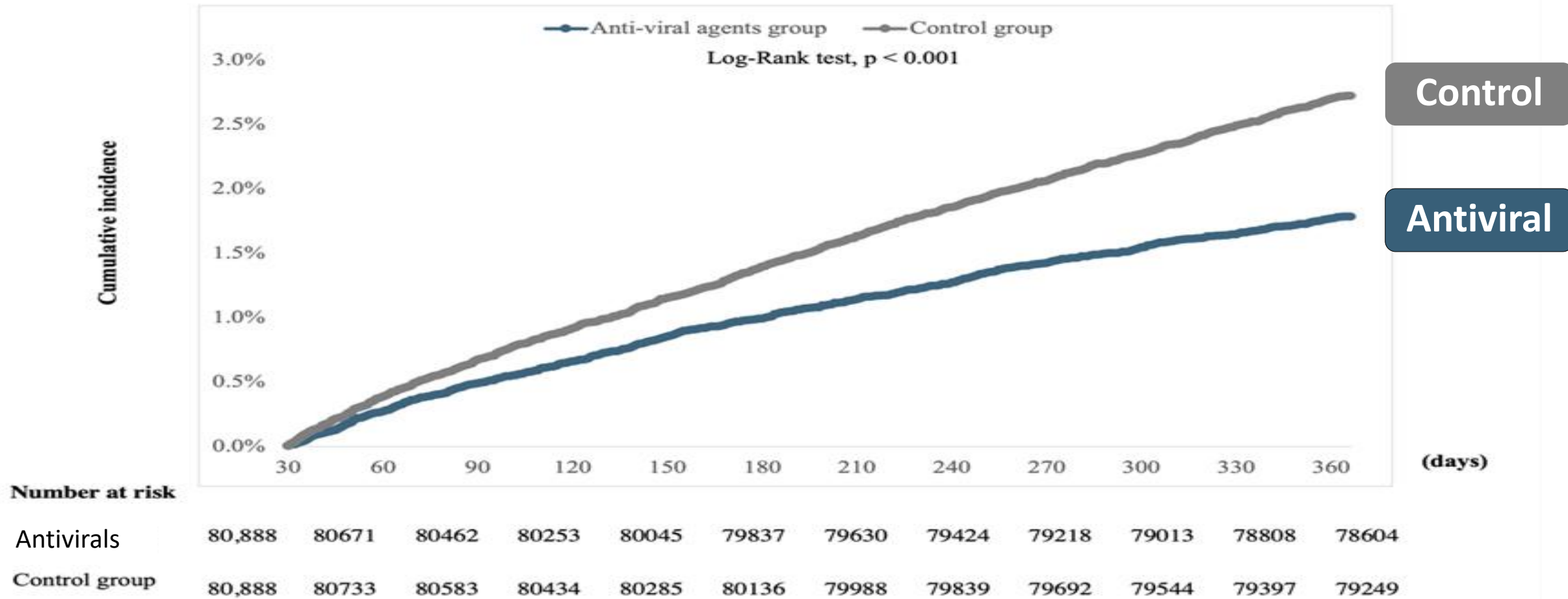
A By demographic characteristics and disease

	Relative risk (95% CI)
Age, y	
≤60	0.79 (0.74-0.85)
61 to ≤70	0.80 (0.74-0.87)
>70	0.66 (0.63-0.70)
Baseline risk factors, No.	
1 to 2	0.69 (0.65-0.74)
3 or 4	0.75 (0.71-0.80)
≥5	0.77 (0.71-0.83)
Vaccine status	
Unvaccinated	0.71 (0.67-0.76)
1 or 2 doses of vaccine	0.74 (0.69-0.79)
Booster dose	0.73 (0.69-0.78)
SARS-CoV-2 infection	
Primary SARS-CoV-2 infection	0.75 (0.72-0.78)
SARS-CoV-2 reinfection	0.77 (0.69-0.86)



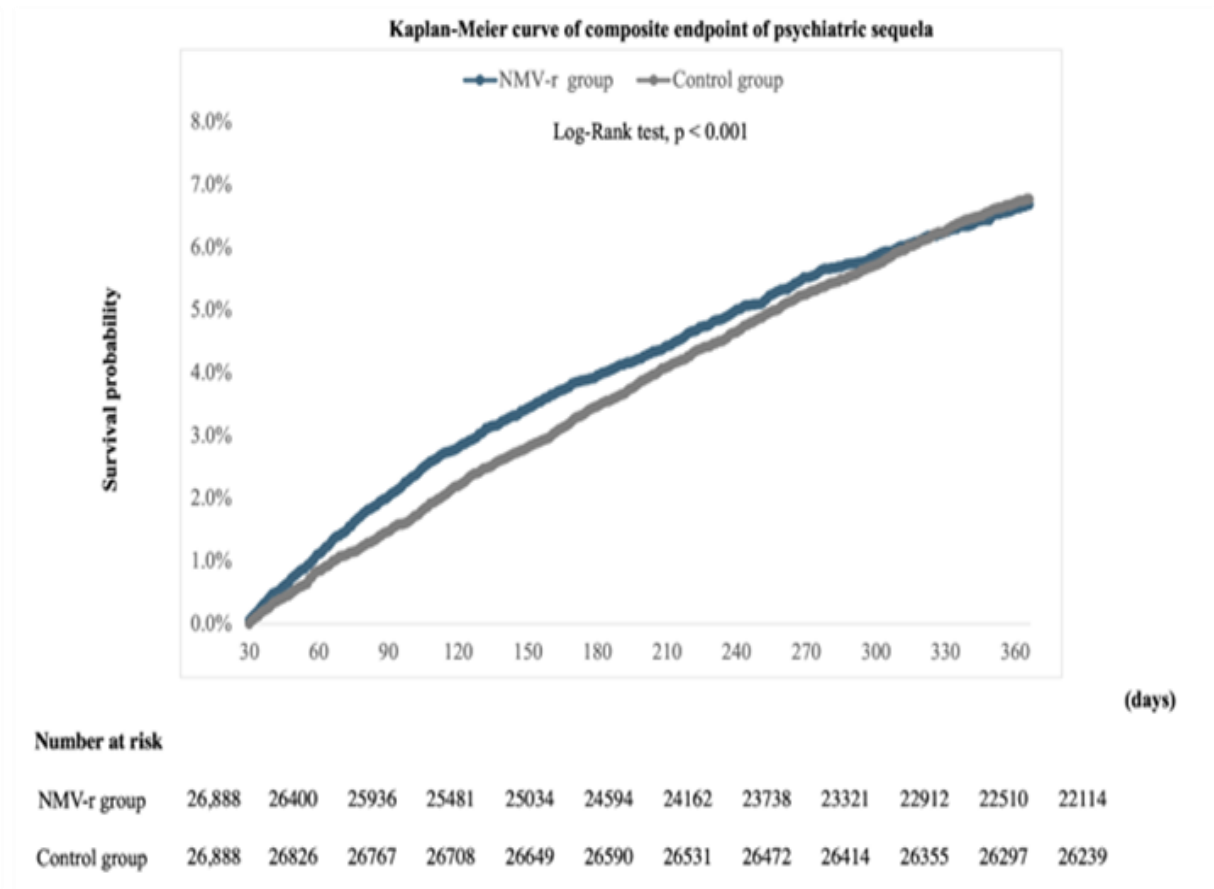
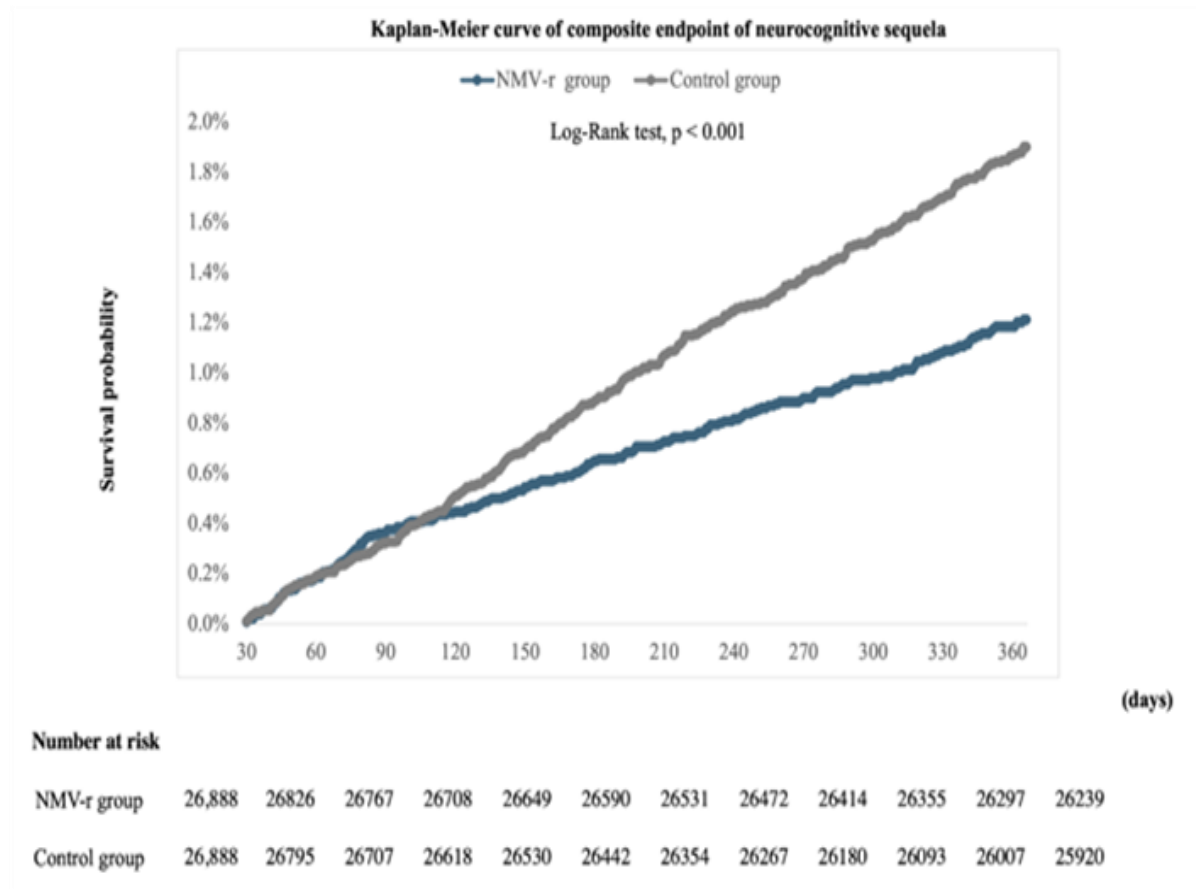
JAMA Intern Med 2023 Mar 23;e230743.

Post-COVID-19 Condition



J Med Virol. 2023 Aug;95(8):e28992..

Cardiovascular outcomes



J Med Virol. 2023 Jul;95(7):e28951

Neuropsychiatric outcomes

Conclusion

1

Burden of COVID-19

2

Long COVID

3

Long COVID in ICU

4

Management of long COVID



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Determinants of persistence of symptoms and impact on physical and mental wellbeing in Long COVID: A prospective cohort study



J Infect 2022;84(4):566-572

