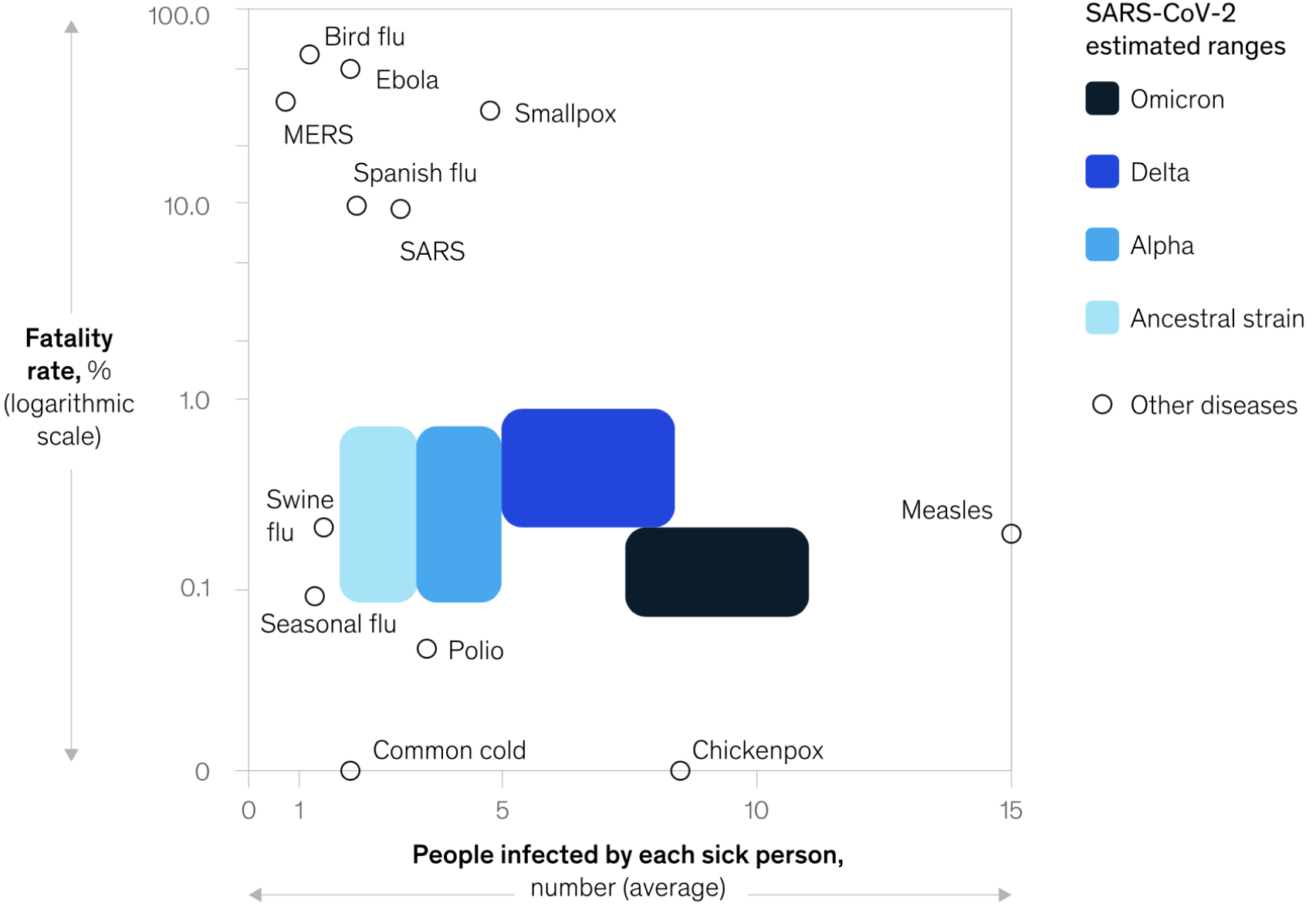
(Ne)dlouhodobost protekce po očkování COVID vakcínami

Roman Prymula

Omicron is more infectious than other common viruses, and less fatal than Delta.

Disease fatality and infection rates[1]



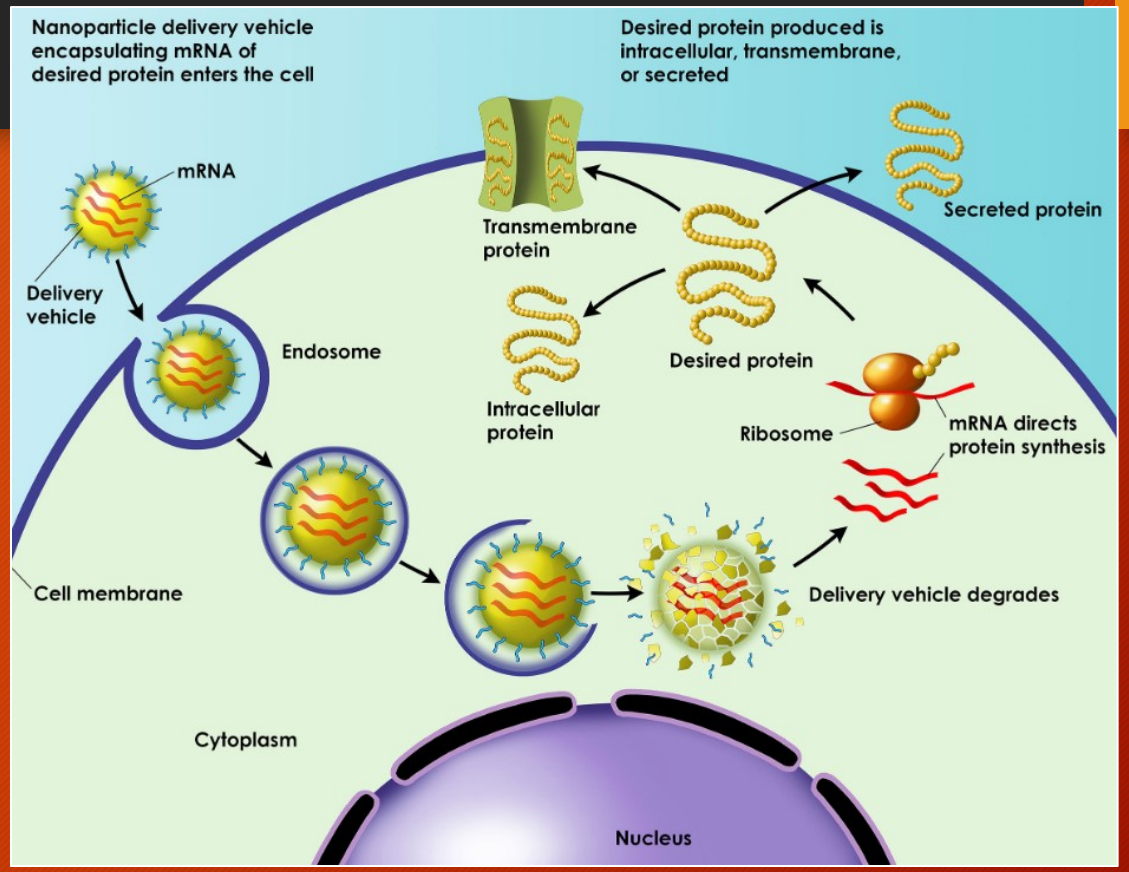
mRNA vakcíny

Moderna (mRNA)

-20°C

Pfizer/BioNTech (mRNA)

-70°C

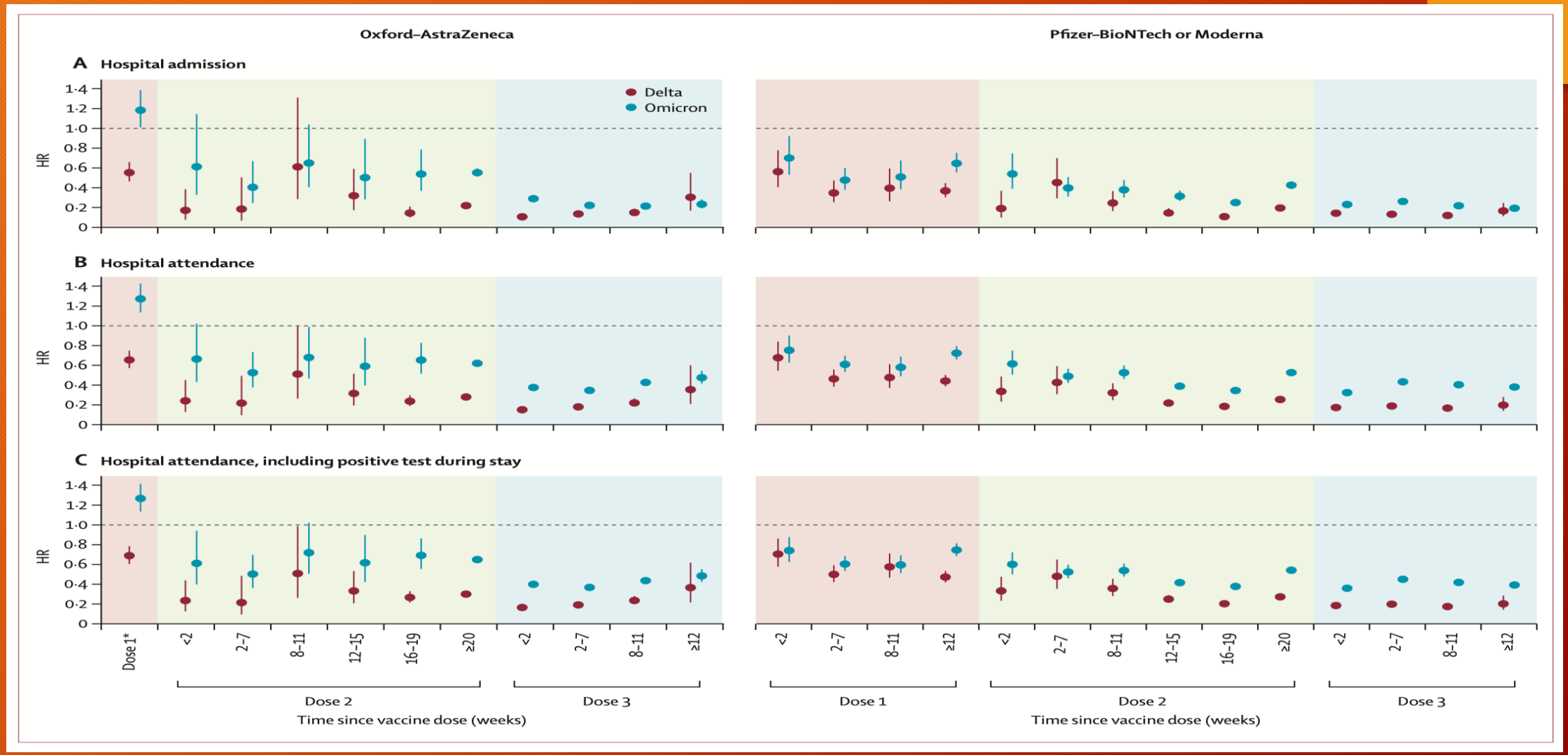


https://www.genengnews.com/wp-content/uploads/2018/10/RNAAnalysis_TranslateBio_MOA2099772151.jpg

Comparative analysis of the risks of hospitalisation and death associated with SARS-CoV-2 omicron (B.1.1.529) and delta (B.1.617.2) variants in England: a cohort study

Tommy Nyberg, Neil M Ferguson*, Sophie G Nash, Harriet H Webster, Seth Flaxman, Nick Andrews, Wes Hinsley, Jamie Lopez Bernal, Meaghan Kall, Samir Bhatt, Paula Blomquist, Asad Zaidi, Erik Volz, Nurin Abdul Aziz, Katie Harman, Sebastian Funk, Sam Abbott, COVID-19 Genomics UK (COG-UK) consortium, Russell Hope, Andre Charlett, Meera Chand, Azra C Ghani, Shaun R Seaman, Gavin Dabrera, Daniela De Angelis†, Anne M Presanis†, Simon Thelwall†*

Odhadované riziko pro kategorie očkování, sekundární analýza. Variantně specifické riziko přijetí do nemocnice (A), jakákoli návštěva nemocnice, včetně příjmu (B), nebo jakákoli návštěva nemocnice, včetně přijetí nebo pozitivního testu během pobytu v nemocnici (C), podle typu vakcíny použité pro dávky 1 a 2, počtu dávek vakcíny a doby od poslední dávky ve vztahu k neočkovaným případům.



Jak dlouho po očkování jste chráněni proti COVID-19?

Vakcíny COVID-19 Pfizer, Moderna a AstraZeneca chrání proti COVID-19 dva týdny po druhém očkování.

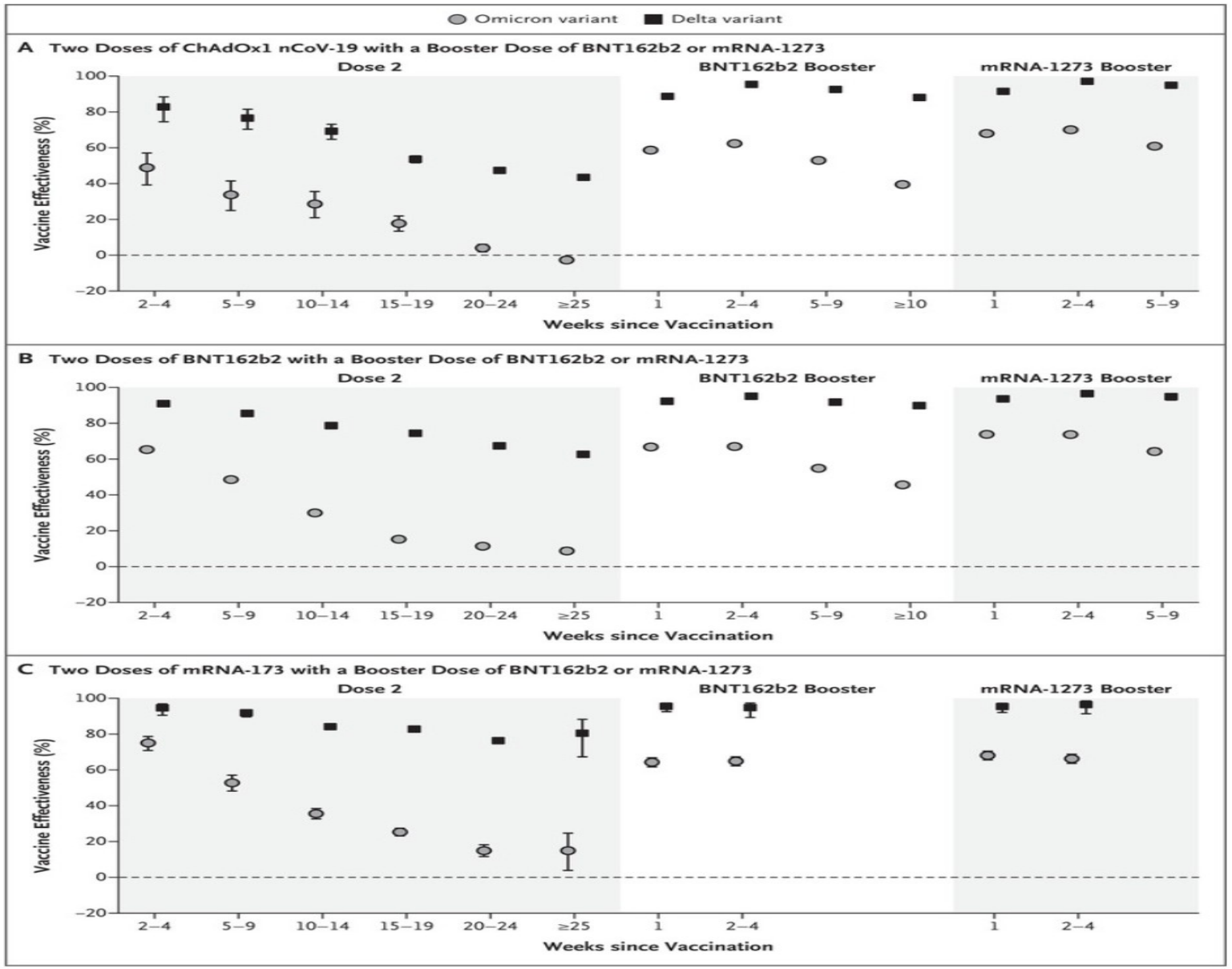
Vakcína Janssen - čtyři týdny po jednom očkování.

Po prodělání COVID-19 a poté očkování - ochrana dva týdny po očkování.

Posilovací dávka vakcíny je účinná týden po očkování.

NIPH, Netherland, accessed 23.09.20212

Účinnost vakcíny proti symptomatickému onemocnění způsobenému variantami delta a omikron, podle období po druhé a posilovací dávce.



The NEW ENGLAND JOURNAL of MEDICINE

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ORIGINAL ARTICLE

Covid-19 Vaccine Effectiveness against the Omicron (B.1.1.529) Variant

N. Andrews, J. Stowe, F. Kirsebom, S. Toffa, T. Rickeard, E. Gallagher, C. Gower, M. Kall, N. Groves, A.-M. O'Connell, D. Simons, P.B. Blomquist, A. Zaidi, S. Nash, N. Iwani Binti Abdul Aziz, S. Thelwall, G. Dabrera, R. Myers, G. Amirthalingam, S. Gharbia, J.C. Barrett, R. Elson, S.N. Ladhani, N. Ferguson, M. Zambon, C.N.J. Campbell, K. Brown, S. Hopkins, M. Chand, M. Ramsay, and J. Lopez Bernal

Účinnost vakcíny proti symptomatickému onemocnění způsobenému variantami delta a omikron, podle období po druhé a posilovací dávce.

Vaccination Status, Dose, and Interval after Vaccination	Test-Negative Status	Delta Variant		Omicron Variant	
	Controls	Case Participants	Vaccine Effectiveness (95% CI)†	Case Participants	Vaccine Effectiveness (95% CI)†
	no.	*no.*	%	*no.*	%
BNT162b2					
Dose 1					
0–3 wk	7,038	5381	45.2 (43.3 to 47.1)	4,548	42.8 (40.3 to 45.1)
≥4 wk	29,759	466	72.3 (69.4 to 74.9)	19,043	31.5 (29.9 to 33.1)
Dose 2					
2–4 wk	9,516	240	90.9 (89.6 to 92.0)	3,369	65.5 (63.9 to 67.0)
5–9 wk	20,163	981	85.5 (84.5 to 86.5)	8,768	48.7 (47.1 to 50.2)
10–14 wk	61,014	5,562	78.7 (78.0 to 79.4)	25,178	30.1 (28.7 to 31.5)
15–19 wk	144,172	17,077	74.4 (73.8 to 74.9)	82,221	15.4 (14.2 to 16.6)
20–24 wk	72,018	10,348	67.4 (66.5 to 68.2)	55,719	11.5 (10.1 to 12.9)
≥25 wk	51,625	8,531	62.7 (61.6 to 63.7)	33,983	8.8 (7.0 to 10.5)
Booster dose					
BNT162b2					
1 wk	29,459	631	92.3 (91.6 to 92.9)	14,615	66.9 (66.1 to 67.6)
2–4 wk	64,874	1,220	95.1 (94.8 to 95.4)	21,886	67.2 (66.5 to 67.8)
5–9 wk	110,306	3,769	91.8 (91.4 to 92.1)	42,854	55.0 (54.2 to 55.8)
≥10 wk	61,534	1,222	89.9 (89.2 to 90.5)	41,569	45.7 (44.7 to 46.7)
mRNA-1273					
1 wk	12,718	195	93.7 (92.7 to 94.6)	5,308	74.0 (73.1 to 74.9)
2–4 wk	20,045	147	96.6 (96.0 to 97.1)	7,288	73.9 (73.1 to 74.6)
5–9 wk	5,311	40	94.9 (93.0 to 96.2)	2,807	64.4 (62.6 to 66.1)
≥10 wk	53	1		33	

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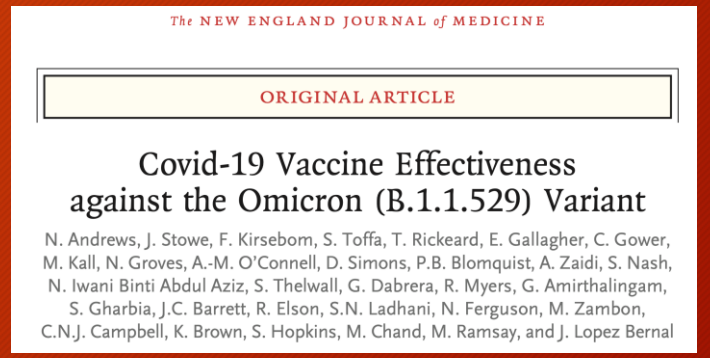


COVID-19 vaccine waning and effectiveness and side-effects of boosters: a prospective community study from the ZOE COVID Study

Cristina Menni, Anna May, Lorenzo Polidori, Panayiotis Louca, Jonathan Wolf, Joan Capdevila, Christina Hu, Sebastien Ourselin, Claire J Steves, Ana M Valdes, Tim D Spector**

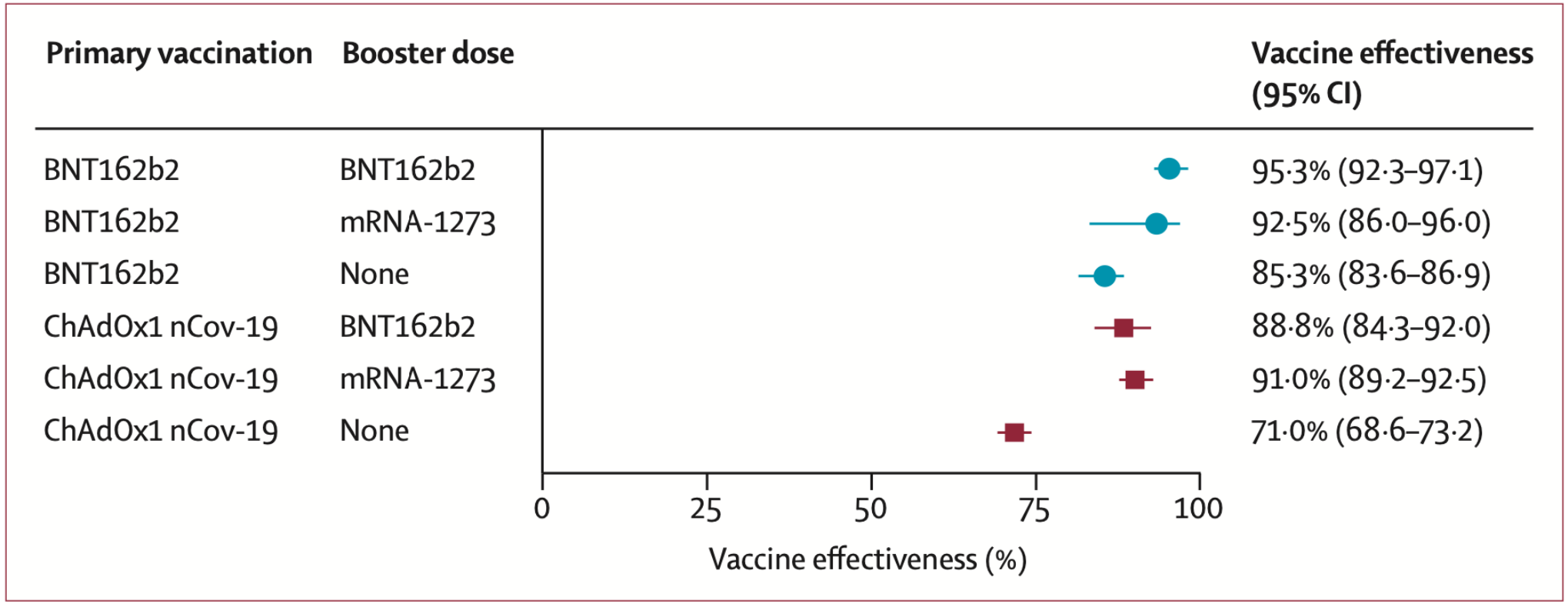


***Figure 2*: Effectiveness against infection of homologous and heterologous booster doses in individuals aged 55 years or older**

Vaccine effectiveness estimates for booster doses (or two doses) in 0–3 months after immunisation compared with no vaccination are shown.

COVID-19 vaccine waning and effectiveness and side-effects of boosters: a prospective community study from the ZOE COVID Study

Cristina Menni, Anna May, Lorenzo Polidori, Panayiotis Louca, Jonathan Wolf, Joan Capdevila, Christina Hu, Sebastien Ourselin, Claire J Steves, Ana M Valdes, Tim D Spector**

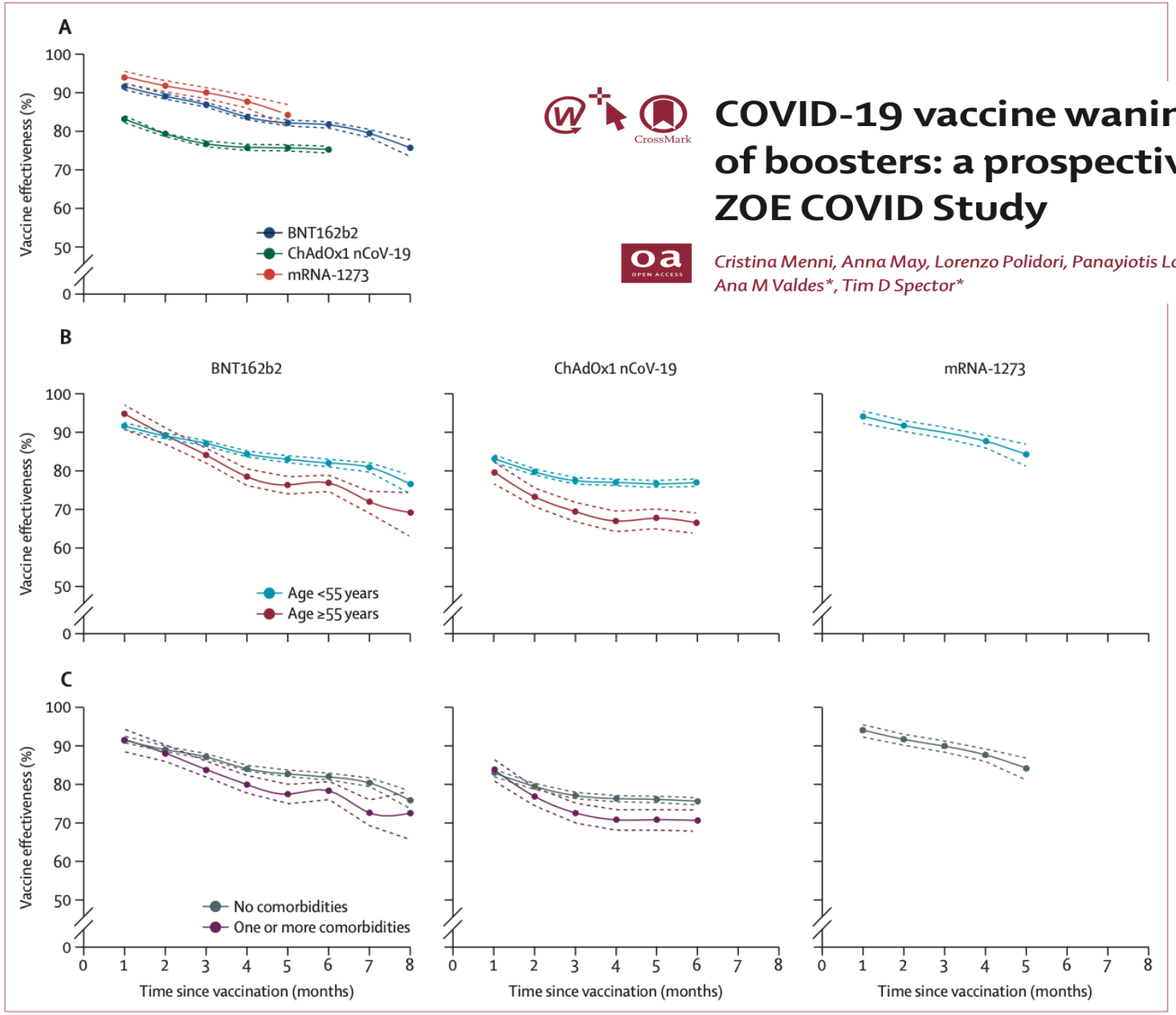
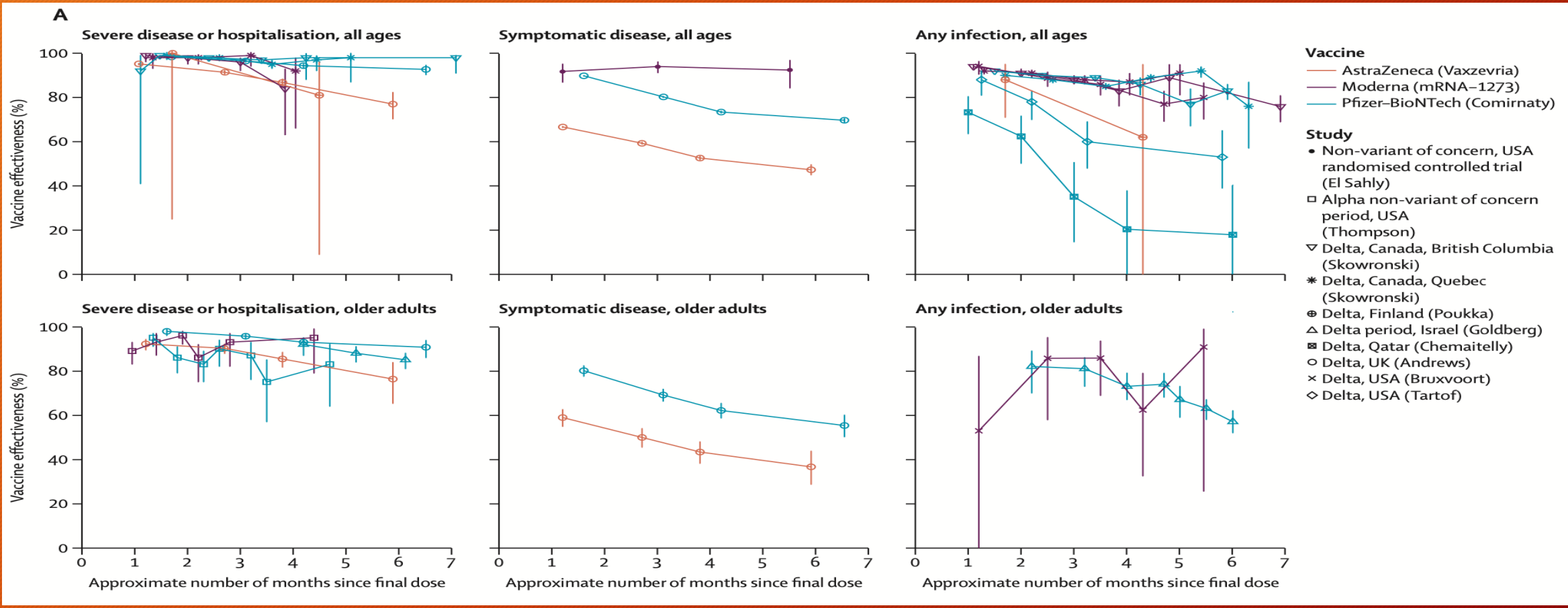


Figure 1: **Primary immunisation series effectiveness against infection over time, overall (A) and by age (B) and presence of comorbidities (C)**
wThe graphs represent the risk reduction for infection of the vaccinated group compared with the unvaccinated group by vaccine type and months since vaccination. Dotted lines indicate 95% CIs.

Duration of effectiveness of vaccines against SARS-CoV-2 infection and COVID-19 disease: results of a systematic review and meta-regression

Daniel R Feikin, Melissa M Higdon*, Laith J Abu-Raddad, Nick Andrews, Rafael Araos, Yair Goldberg, Michelle J Groome, Amit Huppert, Katherine L O'Brien, Peter G Smith, Annelies Wilder-Smith, Scott Zeger, Maria Deloria Knoll*, Minal K Patel**



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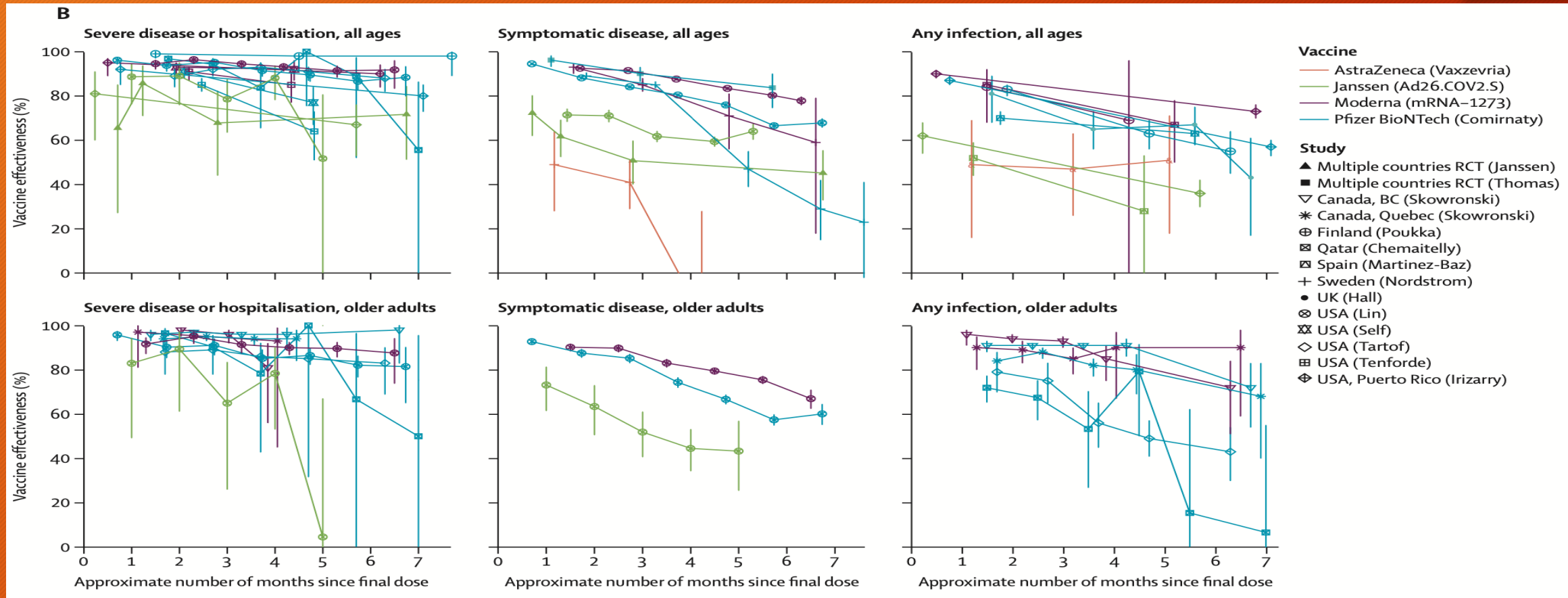

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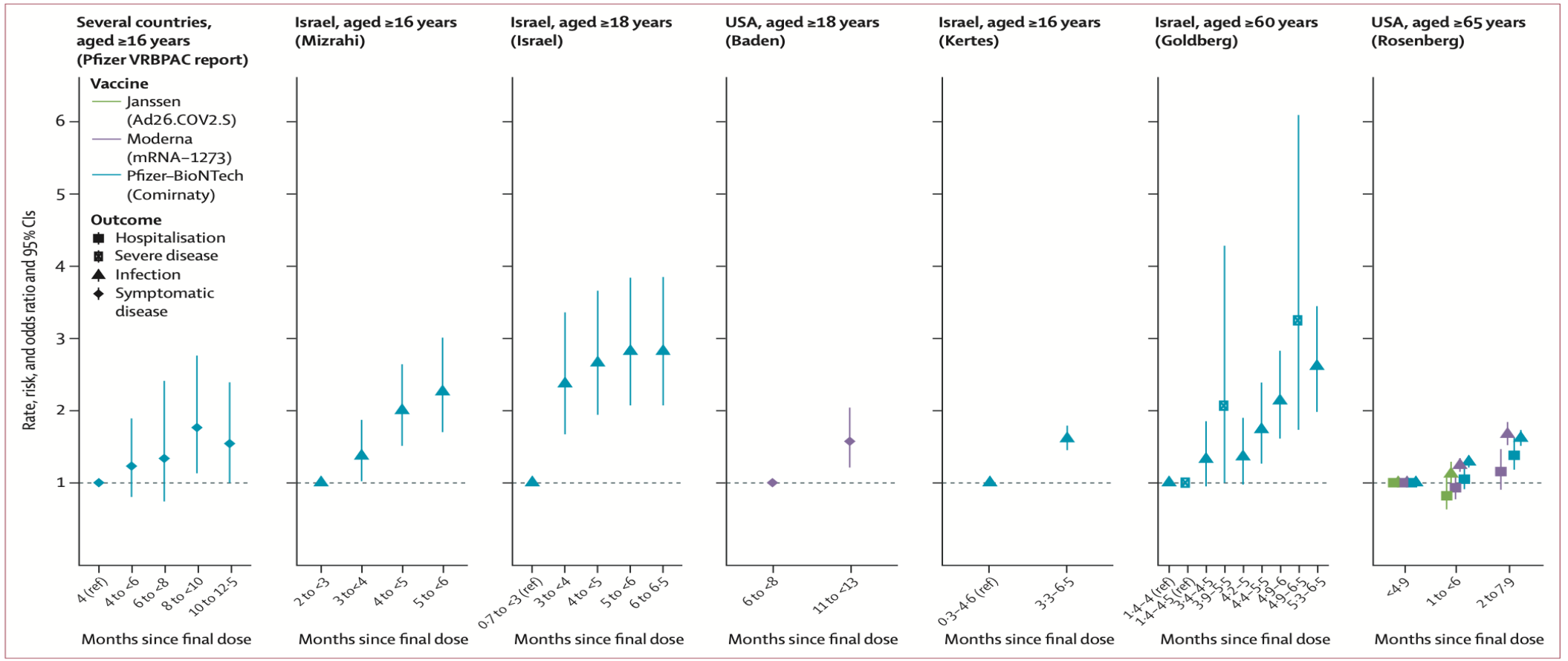
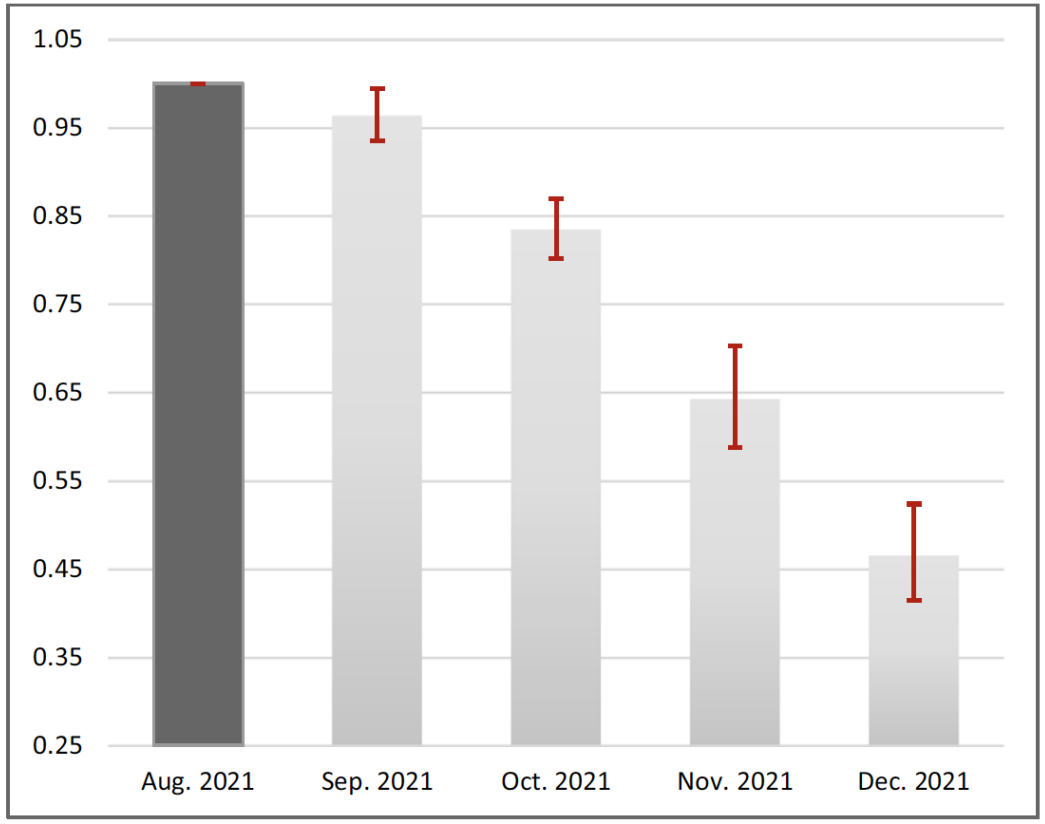


Figure 3: **Rate, risk, and odds ratios of COVID-19 breakthrough cases caused by the delta variant by time of vaccination**
X axis values overlap because of data availability in cited references.



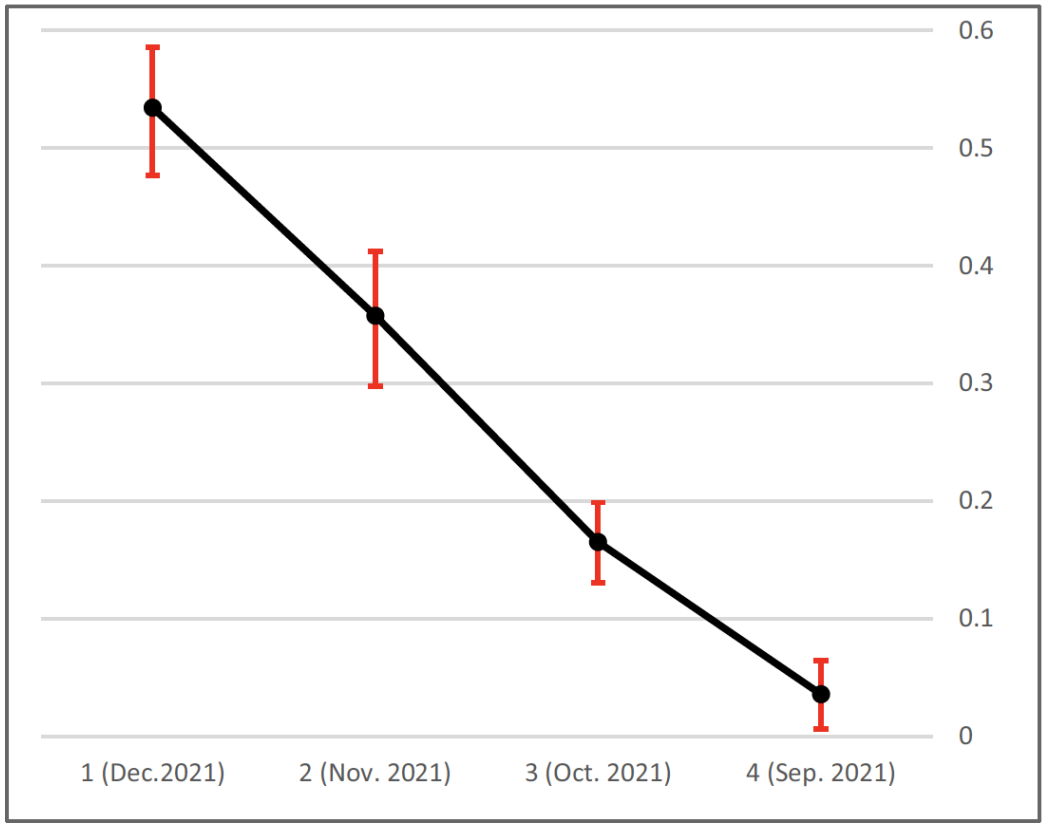


Fig. 2 Adjusted odds ratio (left) and vaccine effectiveness (right) against SARS-CoV-2 breakthrough infection. Left: Data are presented as adjusted OR, as a function of time in months (calendrical month) since the administration of the third dose, with error bars indicating the corresponding 95% Wald's C.I. Right: Data are presented as adjusted VE, as a function of time in months (calendrical month) since the administration of the third dose, with error bars indicating the corresponding 95% Wald's C.I.

NATURE COMMUNICATIONS | https://doi.org/10.1038/s41467-022-30884-6

Vaccine effectiveness of two-dose BNT162b2 against symptomatic and severe COVID-19 among adolescents in Brazil and Scotland over time: a test-negative case-control study

Pilar T V Florentino, Tristan Millington*, Thiago Cerqueira-Silva, Chris Robertson, Vinicius de Araújo Oliveira, Juracy B S Júnior, Flávia J O Alves, Gerson O Penna, Srinivasa Vital Katikireddi, Viviane S Boaventura, Guilherme L Werneck, Neil Pearce, Colin McCowan, Christopher Sullivan, Utkarsh Agrawal, Zoe Grange, Lewis D Ritchie, Colin R Simpson, Aziz Sheikh, Mauricio L Barreto, Igor Rudan†, Manoel Barral-Netto†, Enny S Paixão†*

The Lancet of Inf D

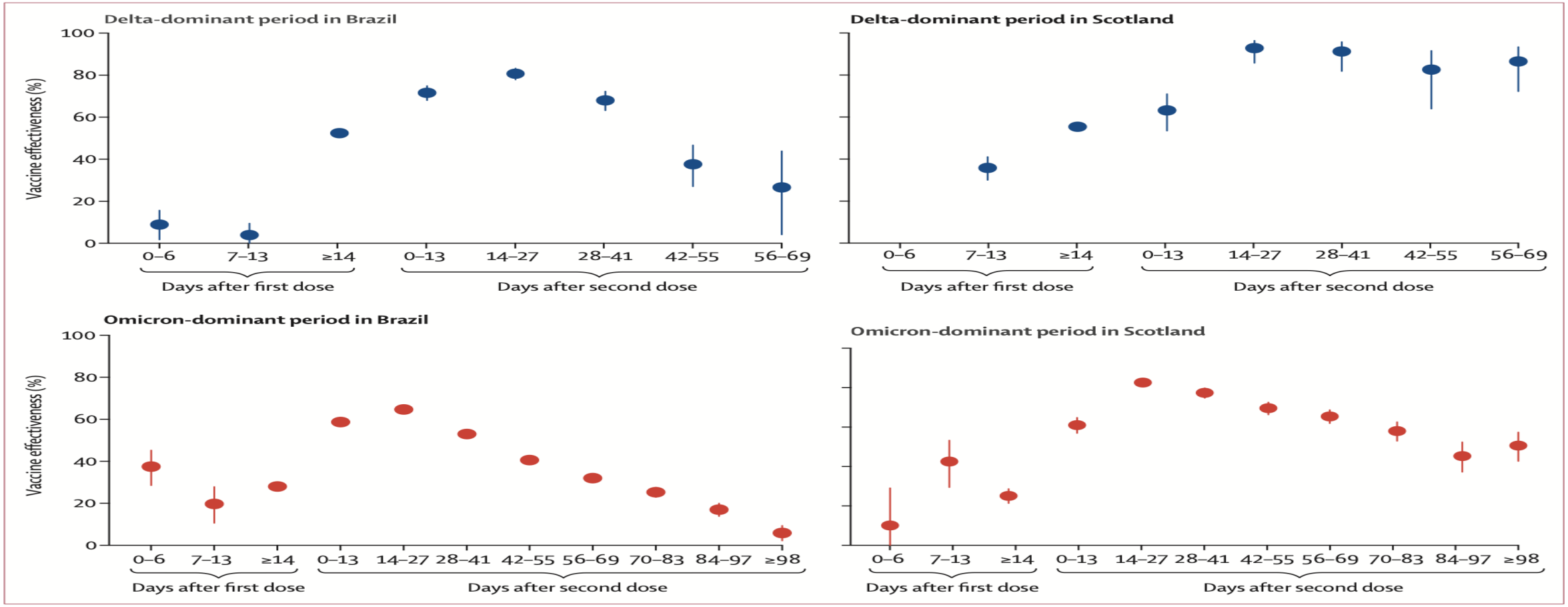


Figure 2: **Vaccine effectiveness against symptomatic infection by time since the first and second doses of BNT162b2 during the delta-dominant and omicron-dominant periods in Brazil and Scotland Bars indicate 95% CIs**

JAMA Network™

From: **Estimated Effectiveness of COVID-19 Vaccines Against Omicron or Delta Symptomatic Infection and Severe Outcomes**

JAMA Netw Open. 2022;5(9):e2232760. doi:10.1001/jamanetworkopen.2022.32760

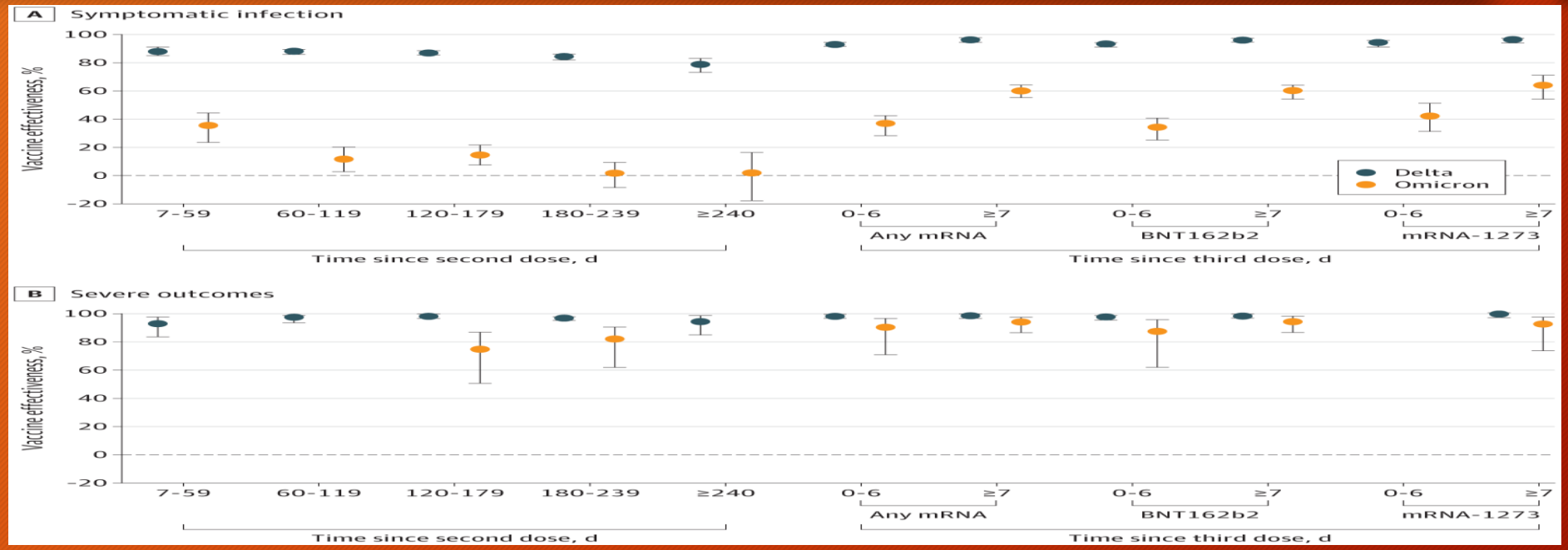


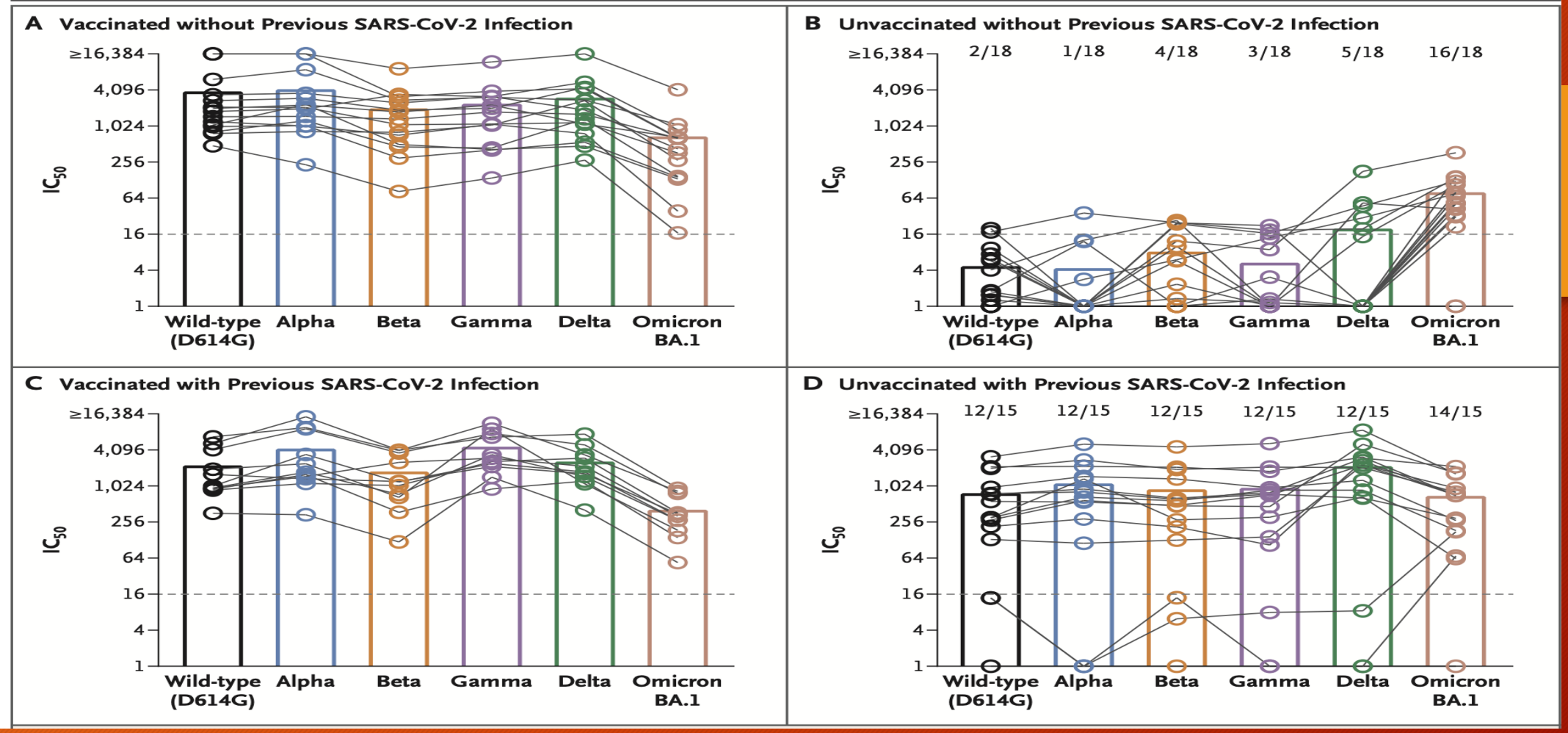
Figure Legend:

Estimates of Vaccine Effectiveness Against Symptomatic Omicron and Delta Infections and Severe Outcomes Associated With These Infections From December 6 to 26, 2021, by Time Since Latest DoseA and B, Markers indicate estimates, with vertical lines indicating 95% CIs. B, Severe outcomes included hospitalization and death. Omicron vaccine effectiveness estimates for 7 to 59 days, 60 to 119 days, and 240 days or more after the second dose are not presented owing to imprecision in the estimates and wide 95% CIs (ie, ≥100 percentage points). Vaccine effectiveness of the mRNA-1273 vaccine (Moderna) 0 to 6 days after the third dose was estimated as 100% based on 0 vaccinated test-positive hospitalized cases and therefore is not presented.

The NEW ENGLAND JOURNAL of MEDICINE

CORRESPONDENCE

Neutralization Profile after Recovery from SARS-CoV-2 Omicron Infection



Neutralizační titry vzorků séra získaných od pacientů, kteří se zotavili z infekce s variantou Omicron BA.1. Vzorky séra byly získány od 59 osob, které se zotavily z infekce B.1.1.529 (omikronové) varianty BA.1: 15 očkovaných osoby bez předchozí infekce koronavirem 2 (SARS-CoV-2) závažného akutního respiračního syndromu (Panel A); 18 neočkovaných osob bez předchozí infekce SARS-CoV-2 (Panel B); 11 očkovaných osob s předchozí infekcí variantou D614G (divoký typ), B.1.1.7 (alfa) nebo B.1.617.2 (delta) (Panel C); a 15 neočkovaných osob s předchozí infekcí divokým typem, alfa nebo delta variantou (panel D). Vzorky séra byly získány od každé osoby 5 až 42 dnů po prvním pozitivním testu polymerázové řetězové reakce

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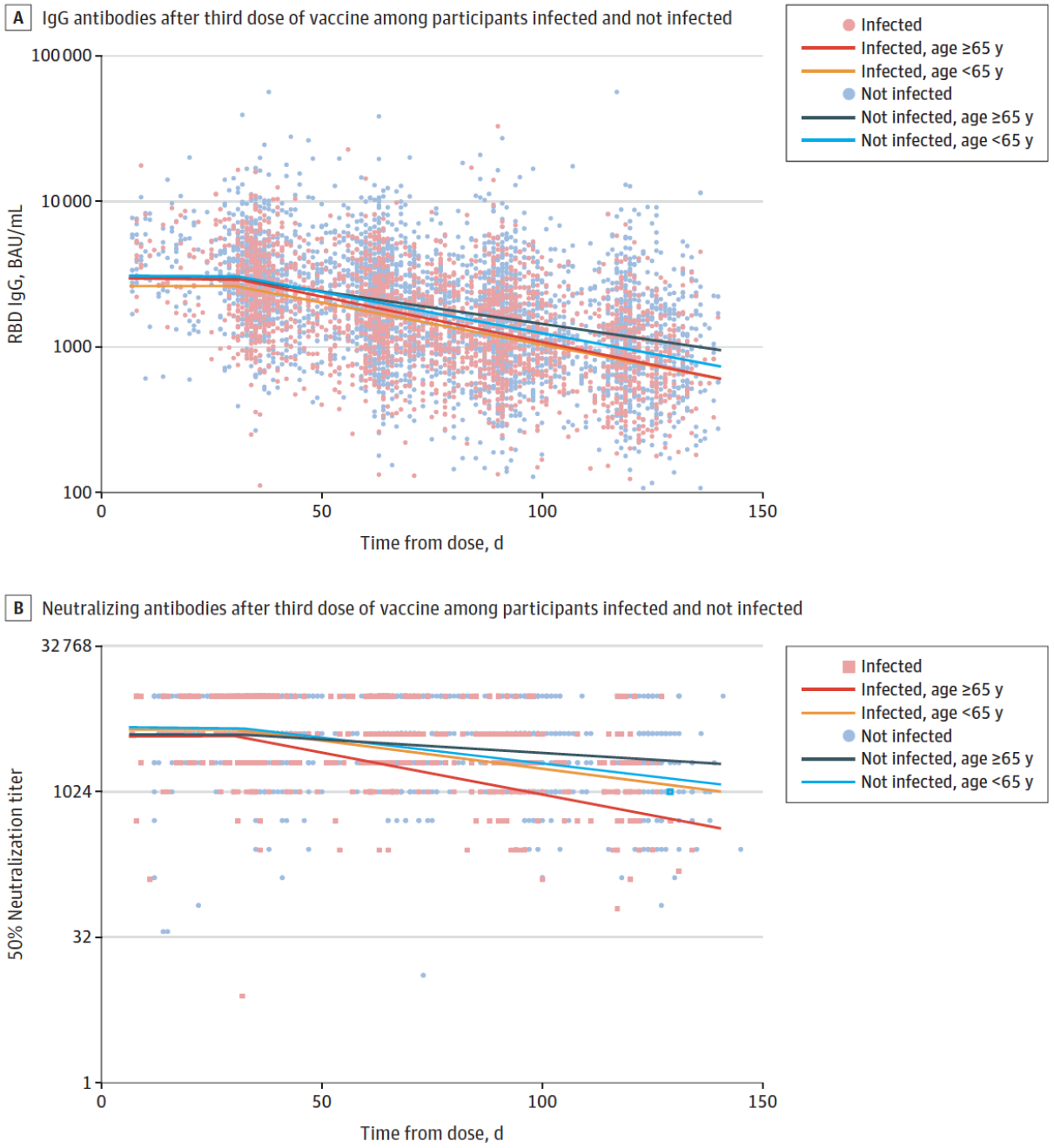
Original Investigation | Infectious Diseases

Durability of Immune Response After COVID-19 Booster Vaccination and Association With COVID-19 Omicron Infection

Mayan Gilboa, MD; Gili Regev-Yochay, MD; Michal Mandelboim, PhD; Victoria Indenbaum, PhD; Keren Asraf, PhD; Ronen Fluss, PhD; Sharon Amit, MD, PhD; Ella Mendelson, PhD; Ram Doolman, PhD; Arnon Afek, MD; Laurence S. Freedman, PhD; Yitshak Kreiss, MD; Yaniv Lustig, PhD

Figure 3. Distribution of Antibodies 150 Days After Third Doses Among Individuals Infected and Not Infected



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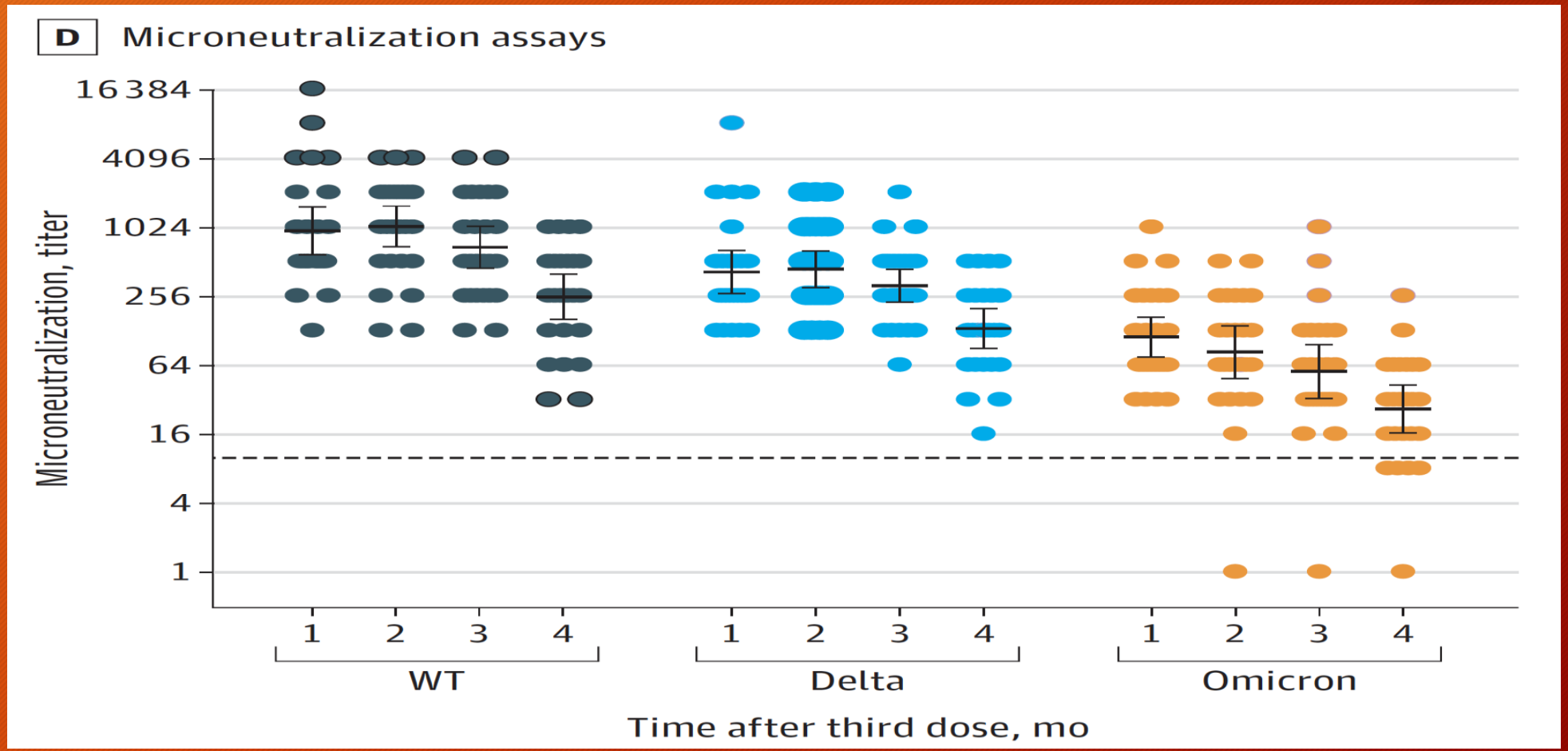

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Table 1. BNT162b2 Vaccine Effectiveness against Hospitalization for Covid-19 in South Africa, According to the Dominant Omicron Sublineage.*

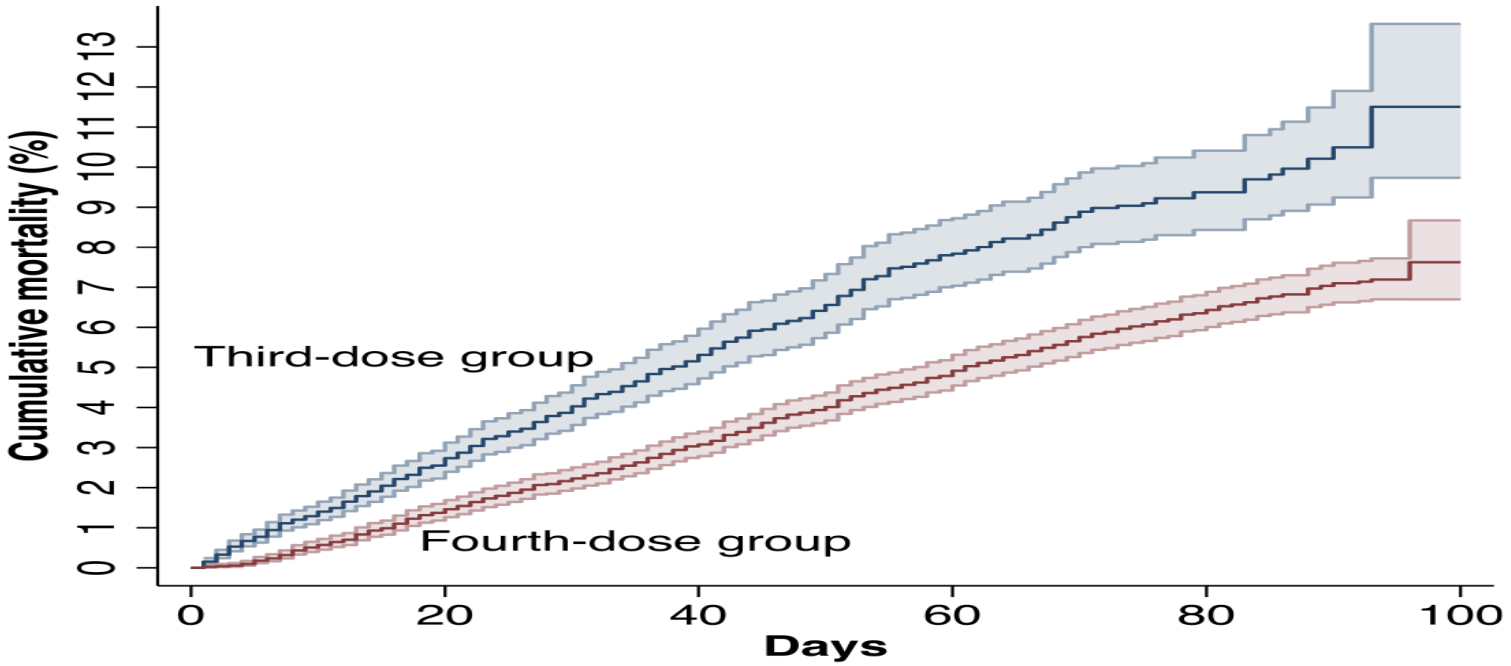
Time since Most Recent Vaccine Dose	VE of Dose 2		VE of Dose 3	
	BA.1–BA.2 Omicron Wave	BA.4–BA.5 Omicron Wave	BA.1–BA.2 Omicron Wave	BA.4–BA.5 Omicron Wave
	percent (95% CI)			
0–13 days	66.7 (38.3–82.0)	—	—	—
14–27 days	80.3 (62.8–89.5)	—	81.6 (68.1–89.4)	—
1–2 mo	61.3 (54.7–66.9)	—	66.4 (53.7–75.6)	68.8 (59.5–76.0)
3–4 mo	56.3 (51.6–60.5)	47.4 (19.9–65.5)	50.0 (4.4–73.9)	46.8 (35.3–56.2)
5–6 mo	45.6 (39.3–51.3)	26.3 (7.1–41.6)	—	—
7–8 mo	38.4 (16.9–54.4)	23.6 (11.1–34.3)	—	—
≥9 mo	—	19.3 (6.3–30.5)	—	—

* In South Africa, the BA.1 and BA.2 sublineages of the omicron variant were dominant from November 15, 2021, to February 28, 2022; the BA.4 and BA.5 sublineages were dominant from April 15 to June 24, 2022. Estimates of vaccine effectiveness (VE) are provided only if the P value was less than 0.05 for the between-group difference in the calculation of the odds ratio from the test-negative case–control design, if the number of polymerase-chain-reaction assays on admission was available, and if more than 10 admissions were observed for the estimate. Estimates of vaccine effectiveness have not been adjusted for multiplicity. CI denotes confidence interval.

Effectiveness of a fourth dose of mRNA COVID-19 vaccine against all-cause mortality in long-term care facility residents and in the oldest old: A nationwide, retrospective cohort study in Sweden

Peter Nordström,[a,1]* *Marcel Ballin,*[a,1] *and Anna Nordström*[a,b,c]

[a]Department of Community Medicine and Rehabilitation, Unit of Geriatric Medicine, Umeå University, Umeå, Sweden
[b]Department of Public Health and Clinical Medicine, Section of Sustainable Health, Umeå University, Umeå, Sweden
[c]School of Sport Sciences, UiT the Arctic University of Norway, Tromsø, Norway



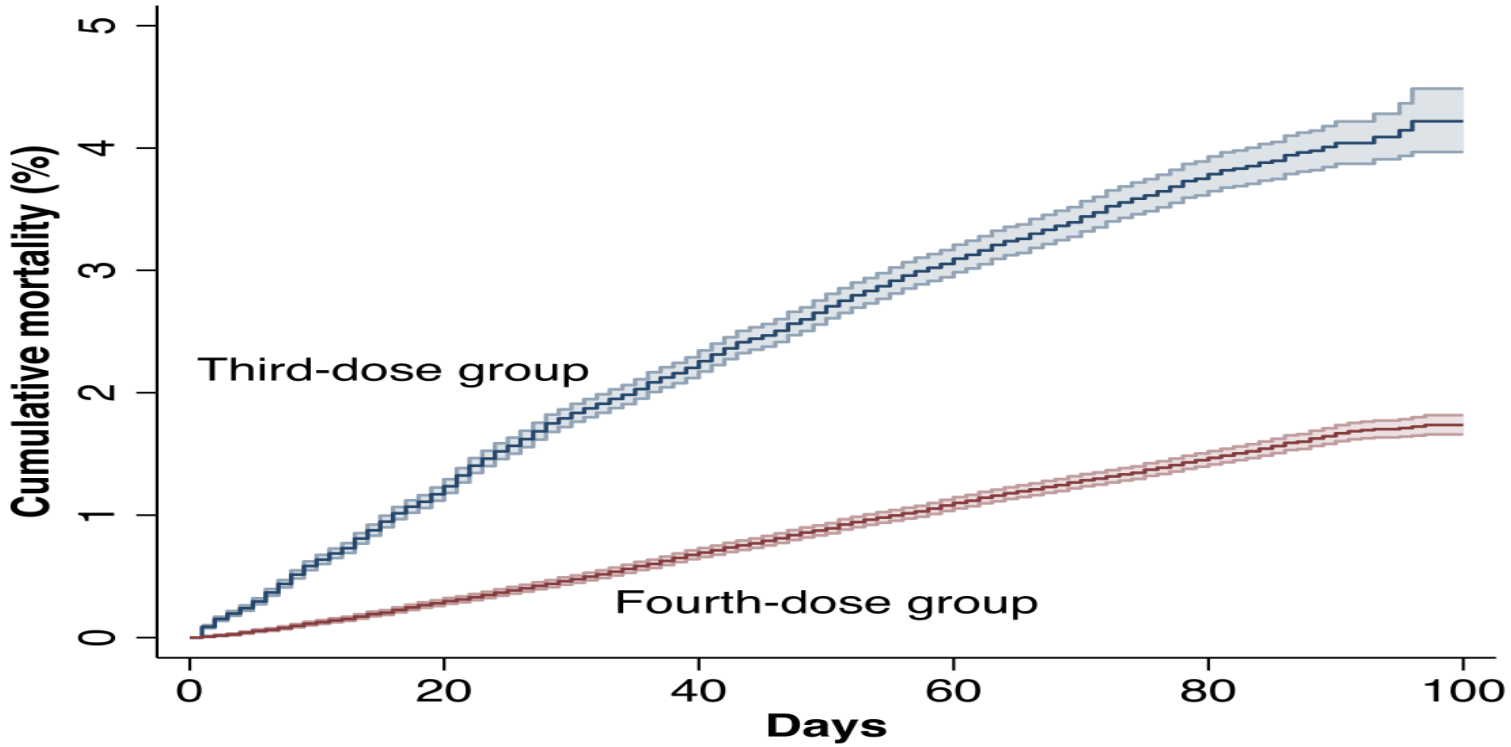
No. at risk						
Third-dose group	12262	5251	2949	2225	1051	12
Fourth-dose group	12262	12077	11871	11654	7858	85

Figure 2. Cumulative risk of death in the fourth-dose group and the third-dose group during the first 100 days of follow-up in the cohort of long-term care facility residents.

Effectiveness of a fourth dose of mRNA COVID-19 vaccine against all-cause mortality in long-term care facility residents and in the oldest old: A nationwide, retrospective cohort study in Sweden

Peter Nordström,[a,1] Marcel Ballin,[a,1] and Anna Nordström [a,b,c]*

[a]Department of Community Medicine and Rehabilitation, Unit of Geriatric Medicine, Umeå University, Umeå, Sweden
[b]Department of Public Health and Clinical Medicine, Section of Sustainable Health, Umeå University, Umeå, Sweden
[c]School of Sport Sciences, UiT the Arctic University of Norway, Tromsø, Norway



No. at risk

Third-dose group	197052	114945	71252	49661	17685	687
Fourth-dose group	197052	196398	195559	194697	98153	4080

Figure 3. Cumulative risk of death in the fourth-dose group and the third-dose group during the first 100 days of follow-up in the cohort including all individuals aged 80 years and older.

Letters | 13 September 2022

Effectiveness of a Fourth Dose of COVID-19 mRNA Vaccine Against Omicron Variant Among Elderly People in Singapore FREE

Celine Y. Tan, MBBS, Calvin J. Chiew, MPH, Vernon J. Lee, PhD, ... View all authors

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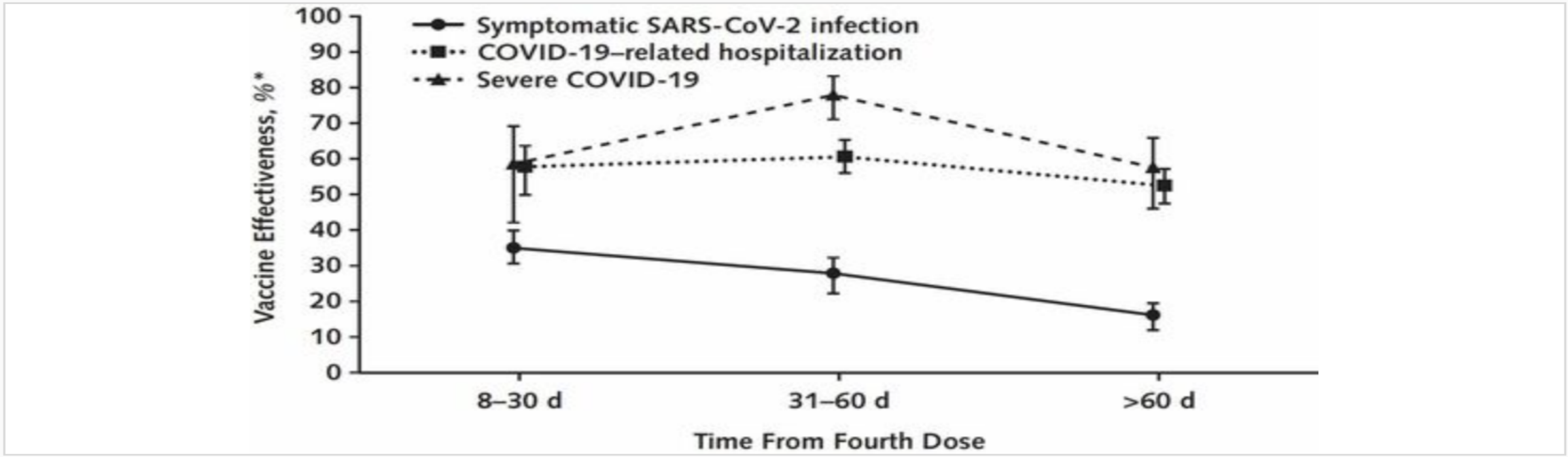

Figure. Vaccine effectiveness of fourth mRNA vaccine dose against symptomatic SARS-CoV-2 infection, COVID-19-related hospitalization, and severe COVID-19 disease over time, relative to participants vaccinated with 3 doses.

Effectiveness of a fourth dose of covid-19 mRNA vaccine against the omicron variant among long term care residents in Ontario, Canada: test negative design study

BMJ 2022 ; 378 doi: https://doi.org/10.1136/bmj-2022-071502 (Published 06 July 2022)
Cite this as: *BMJ* 2022;378:e071502

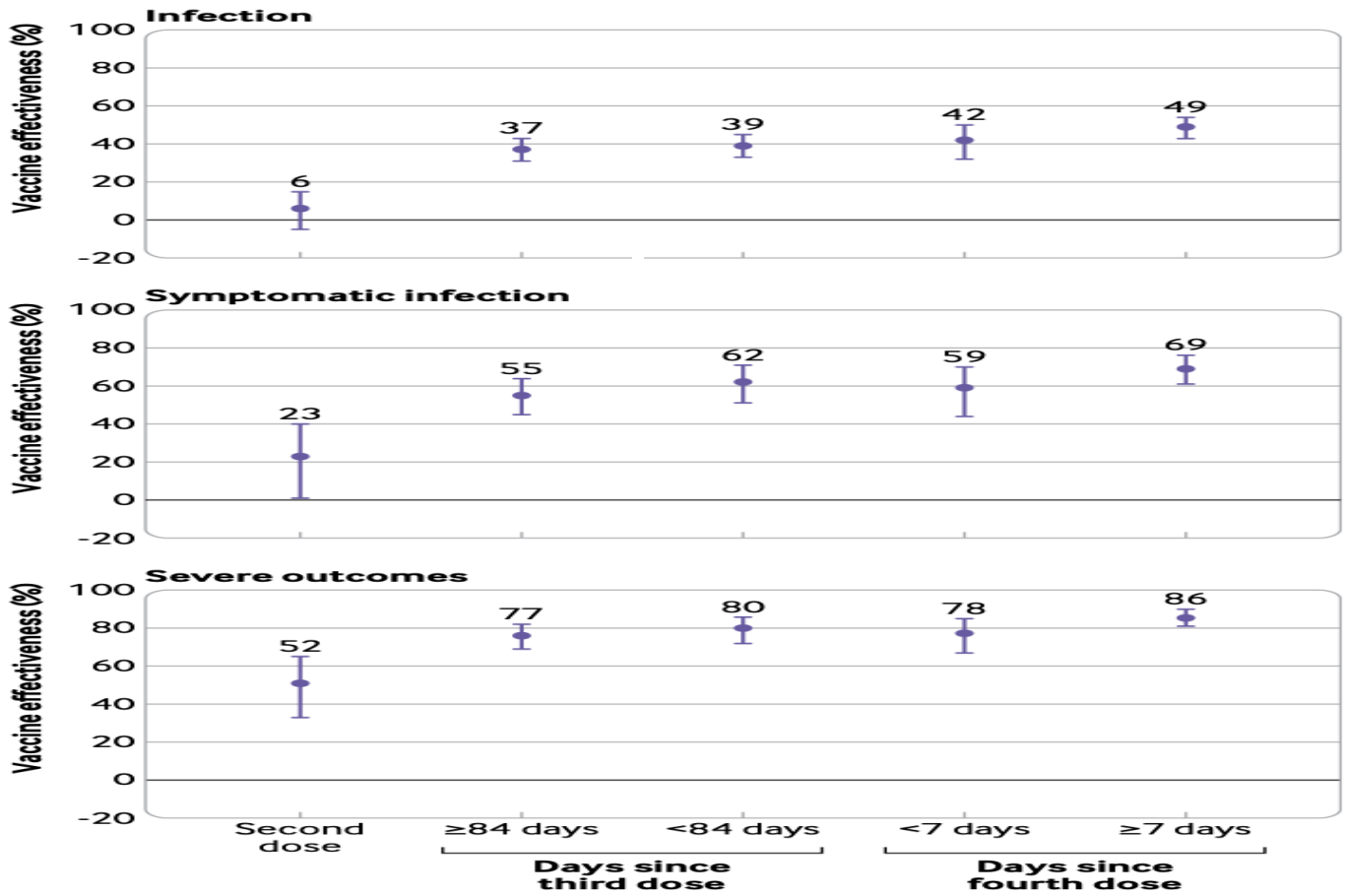

Fig 2 | Vaccine effectiveness of two, three, and four doses of mRNA covid-19 vaccine against omicron variant related outcomes among long term care residents in Ontario, Canada, compared with unvaccinated residents

Vliv dávky 4 na omicron

N Engl J Med. 2022 Apr 7;386(14):1377-1380. doi: 10.1056/NEJMc2202542. Epub 2022 Mar 16.

Efficacy of a Fourth Dose of Covid-19 mRNA Vaccine against Omicron

Gili Regev-Yochay [1], Tal Gonen [1], Mayan Gilboa [1], Michal Mandelboim [2], Victoria Indenbaum [2], Sharon Amit [3], Lilac Meltzer [3], Keren Asraf [3], Carmit Cohen [3], Ronen Fluss [3], Asaf Biber [3], Ital Nemet [2], Limor Kliker [2], Gili Joseph [3], Ram Doolman [3], Ella Mendelson [2], Laurence S Freedman [3], Dror Harats [3], Yitshak Kreiss [3], Yaniv Lustig [2]

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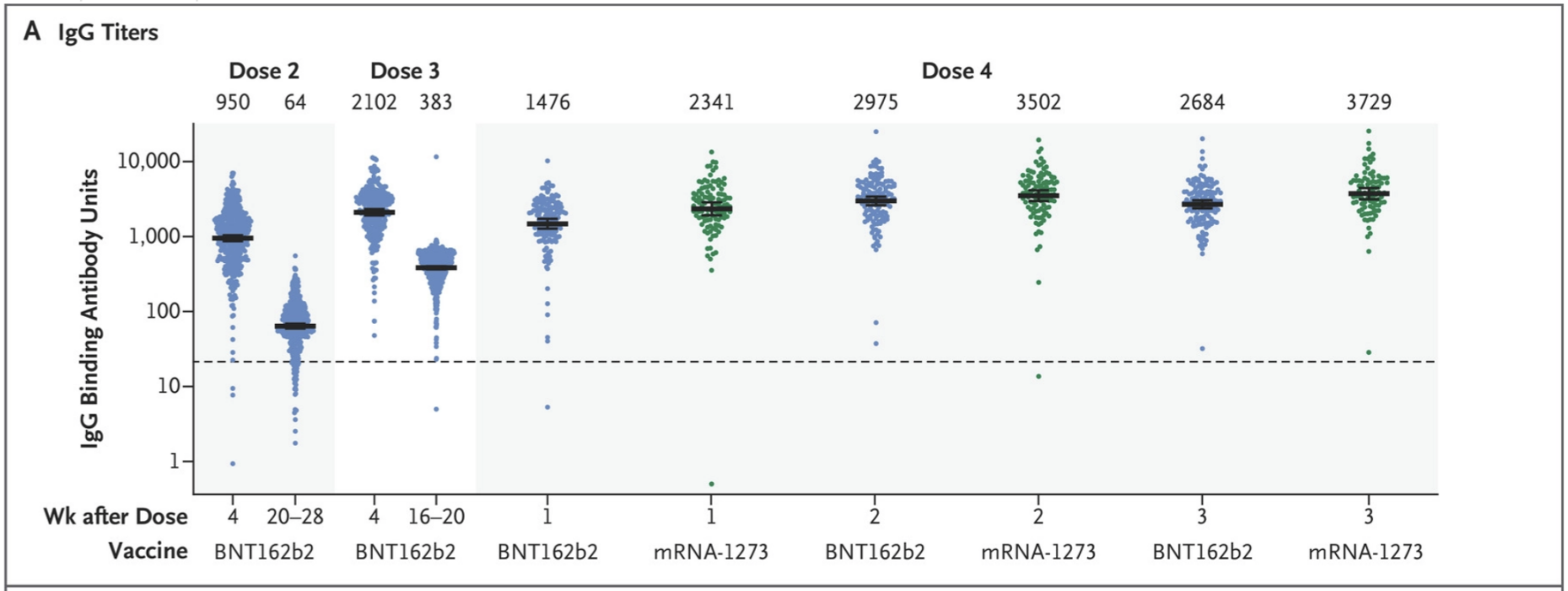

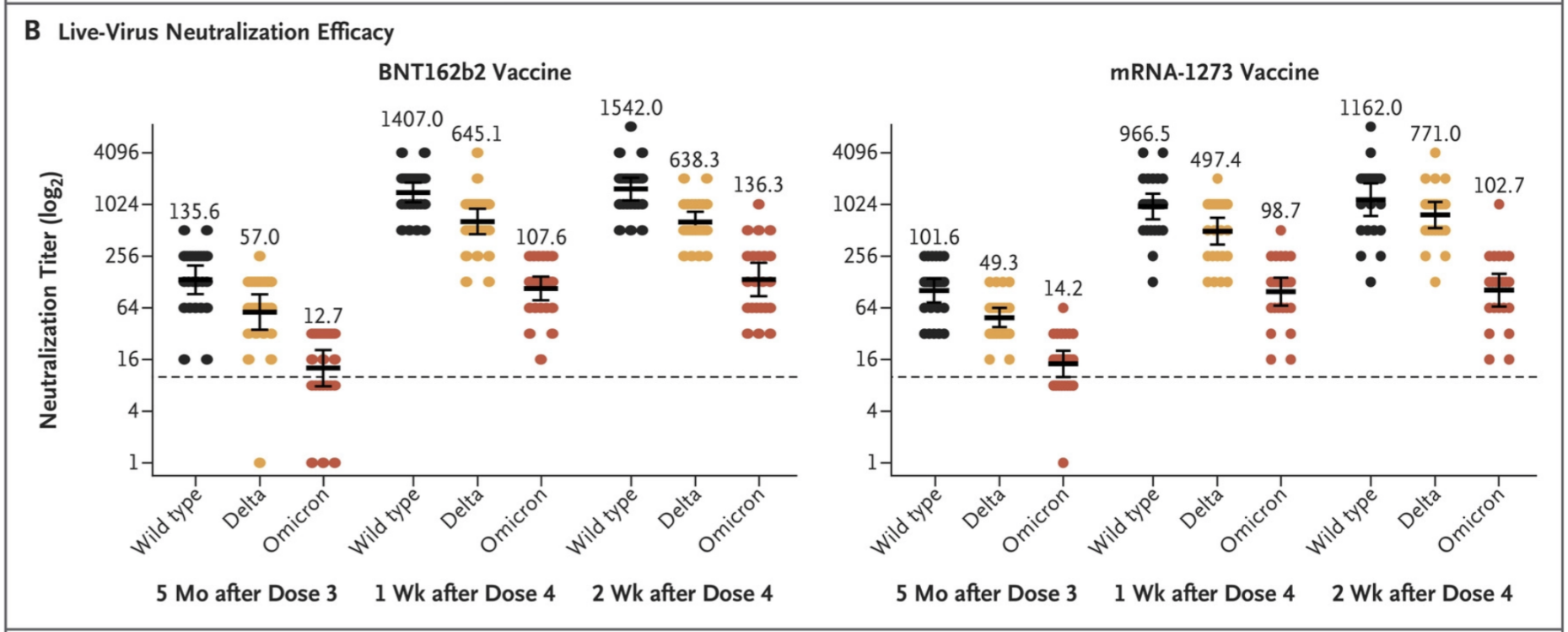

Omicron a imunita

Data podporují hypotézu, že varianty omicron jsou extrémně silné varianty pro únik z imunity, které vykazují malou zkříženou reaktivitu s dřívějšími variantami.

Neočkované osoby, které jsou infikovány pouze variantou omikron (bez předchozí infekce SARS-CoV-2), proto nemusí být dostatečně chráněny před infekcí jinou variantou SARS-CoV-2; pro vyšší ochranu je třeba očkování.

Účinnost očkování proti COVID-19

Výsledky studií v USA nadále naznačují vysokou účinnost očkování proti závažným onemocněním. Nedávné údaje také naznačují, že přeočkování může chránit před COVID-19 a několik zemí vyvinulo politiky ve prospěch booster dávkování.

Strategická poradní skupina expertů na imunizaci WHO od té doby aktualizovala svůj plán pro stanovení priorit vakcín proti COVID-19, přičemž zdůraznila větší přínos primárního očkování oproti posilování.

Účinnost u předchozího onemocnění

Zdá se pravděpodobné, že infekce (pravděpodobně s aktuálně cirkulující variantou) by sama o sobě posílila imunitu na úroveň, kdy by další vakcinace pravděpodobně nepřinesla podstatný další přínos. Nedávná data skutečně ukazují, že kombinace předchozí vakcinace a infekce poskytuje silnou ochranu proti budoucí infekci delta (B.1.617.2) variantou (s výjimkou imunokompromitovaných jedinců). V závislosti na jejich úrovni imunokompromitování mohou tito jedinci také méně pravděpodobně reagovat na další expozici antigenu.

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