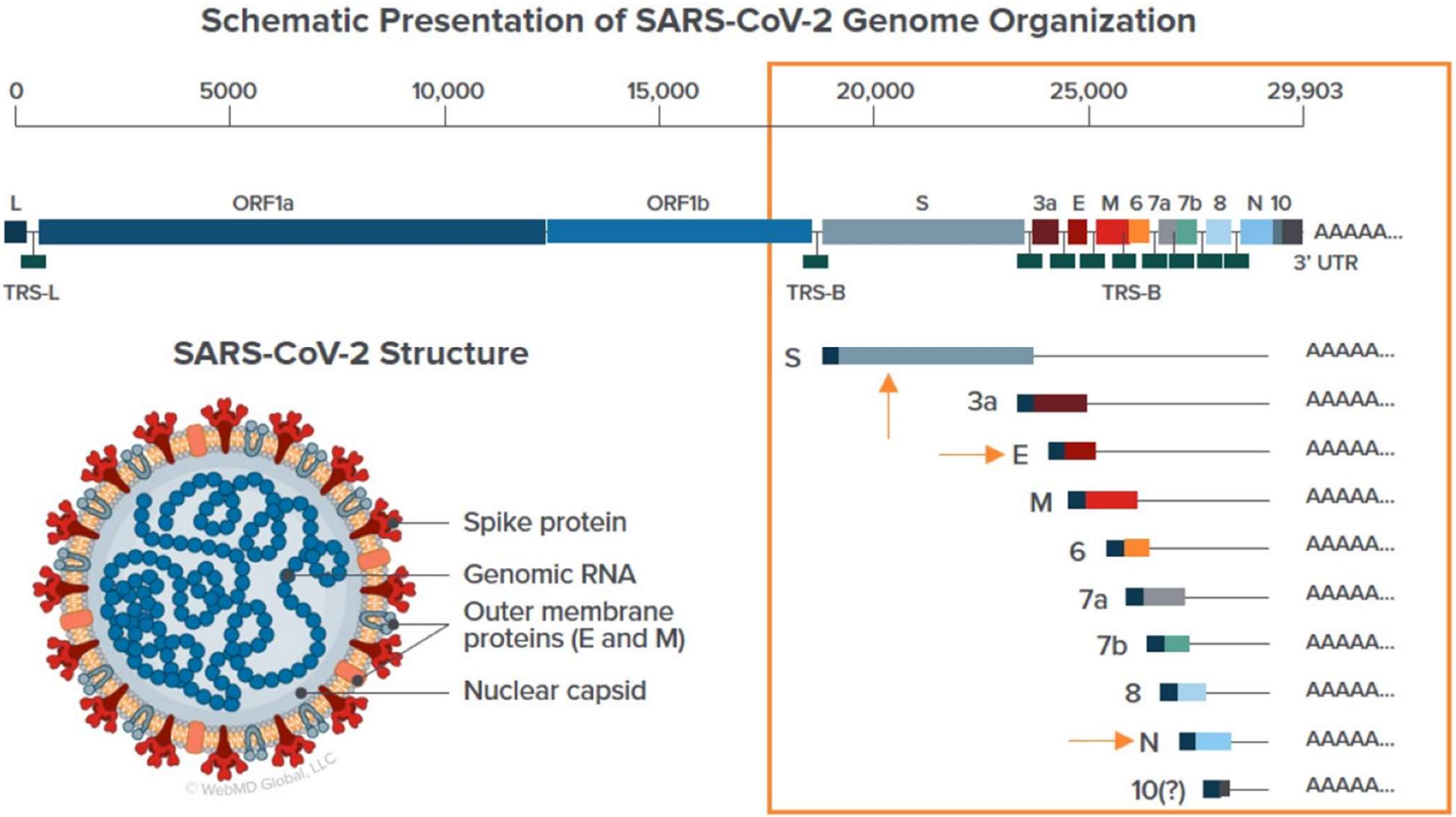
COVID-19疫苗施打現況效益

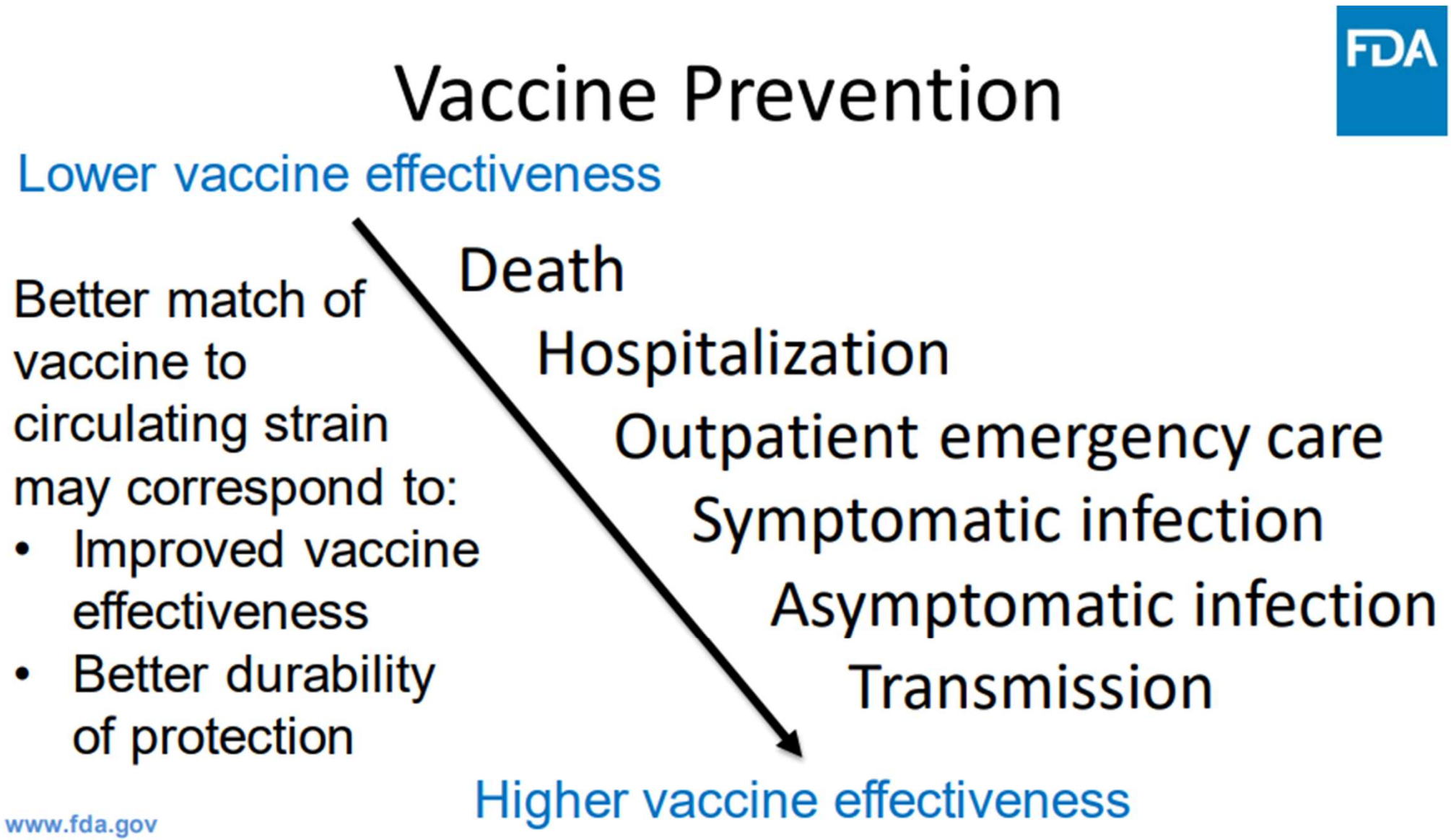
萬芳醫院 蘇迎士 醫師

Genome of SARS-CoV-2



Kim D, et al. Cell. 2020;181:914-921.

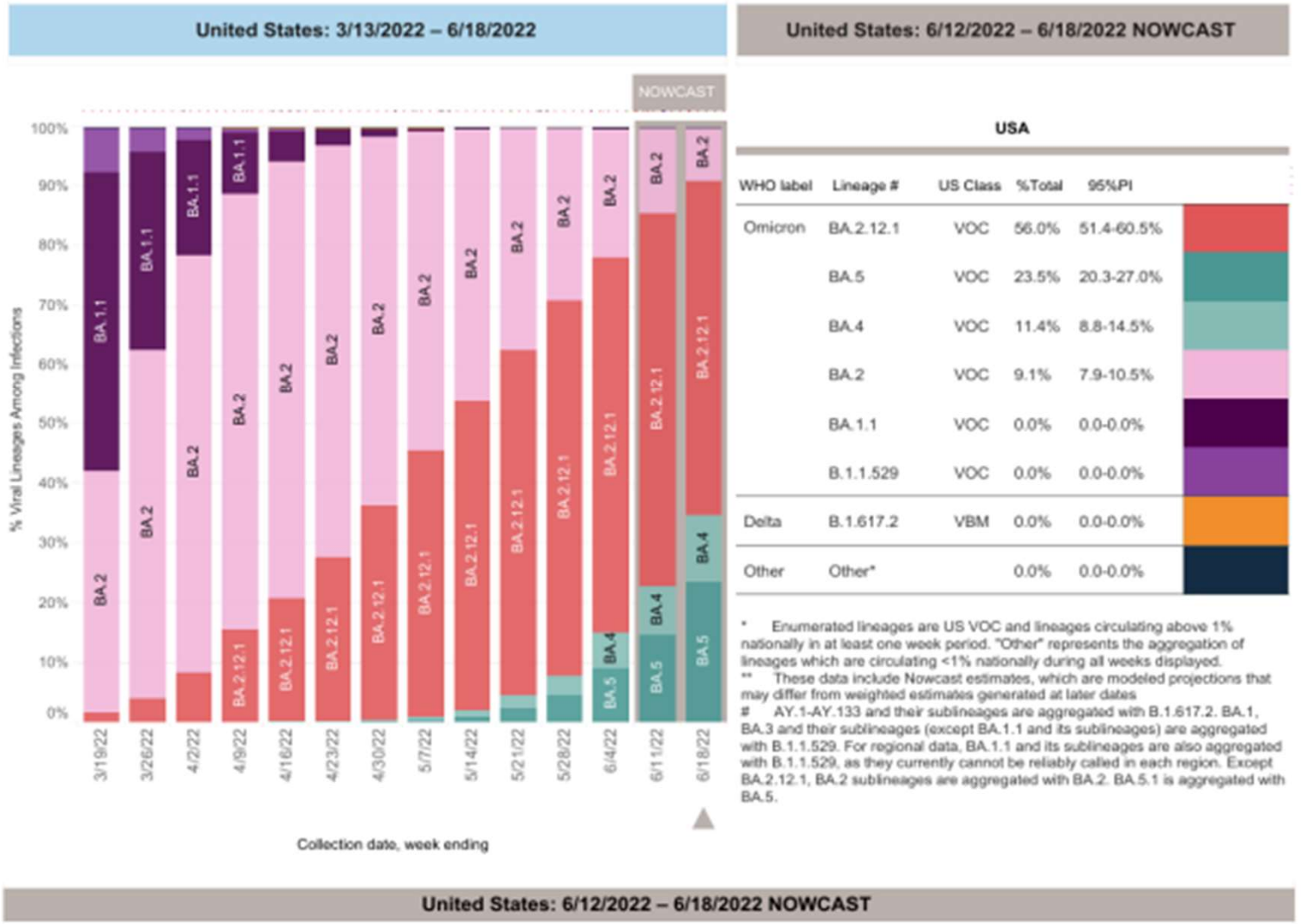
Vaccine Prevention



Better match of vaccine to circulating strain may correspond to:

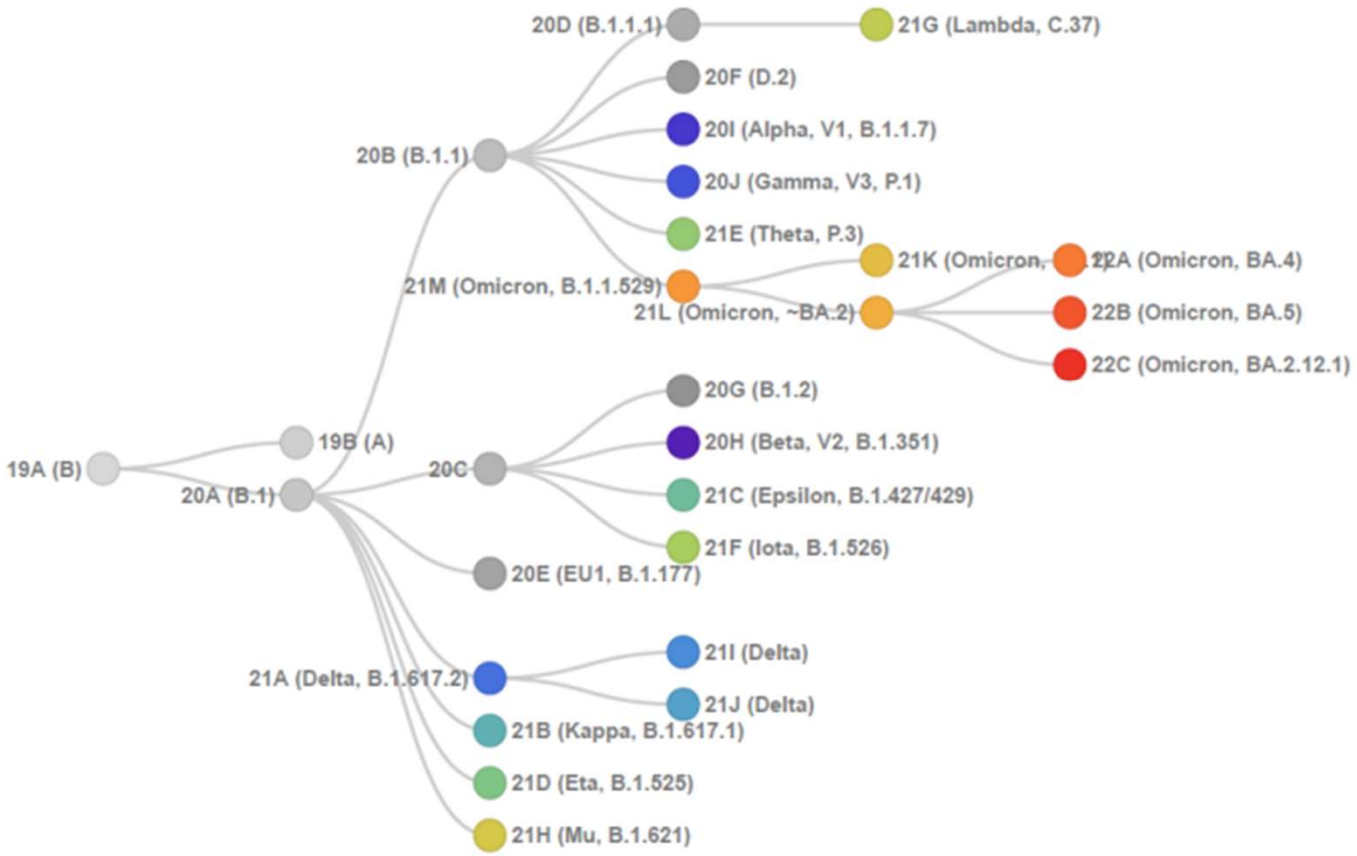
- Improved vaccine effectiveness
- Better durability of protection

Recent Evolution of SARS-CoV-2

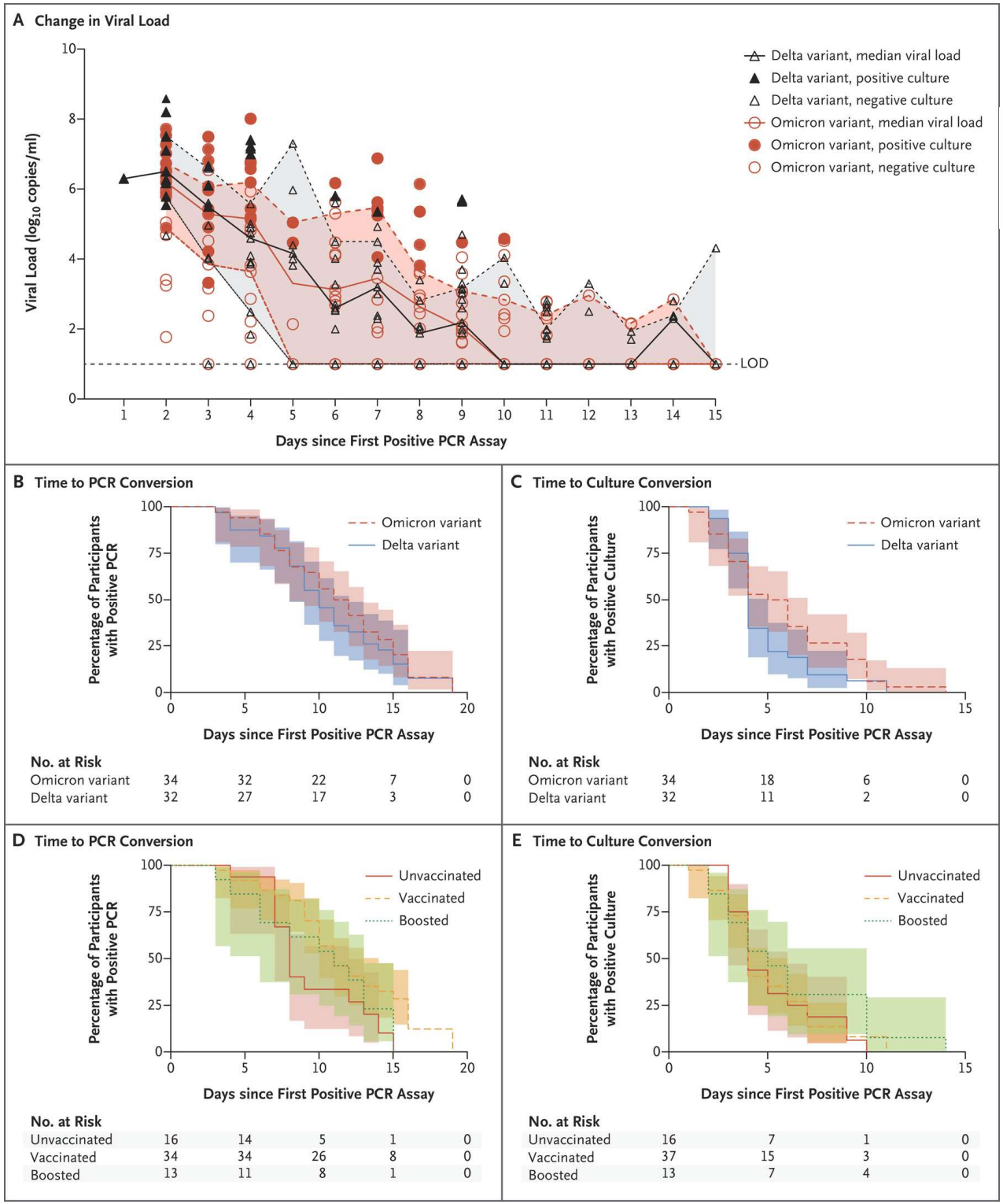


https://covid.cdc.gov/covid-data-tracker/#variant-proportions

Evolution of SARS-CoV-2 Variants



Phylogenetic relationships SARS-CoV-2 clades – from https://covariants.org/ using Nextstrain data (https://nextstrain.org/



Duration of Shedding of Culturable Virus in SARS-CoV-2 Omicron (BA.1) Infection

This letter was published on June 29, 2022, at NEJM.org.

Figure 1 (facing page). Viral Decay and Time to Negative Viral Culture.

Panel A shows viral-load decay from the time of the first positive polymerase-chain-reaction (PCR) assay. Viral loads from nasal-swab samples obtained from individual participants are shown. Each circle or triangle represents a sample obtained on the specified day. The median viral load at each time point for each variant is also shown. LOD denotes limit of detection. Panels B through E show Kaplan–Meier survival curves for the time from an initial positive PCR assay to a negative PCR assay, according to viral variant (Panel B) and vaccination status (Panel D), and the time from an initial positive PCR assay to a negative viral culture, according to viral variant (Panel C) and vaccination status (Panel E). In all panels, shaded areas indicate 95% confidence intervals. Sequencing showed that all omicron variant strains were the subvariant BA.1, inclusive of sublineages.

New Admissions of Patients with Confirmed COVID-19, United States

Aug 01, 2020 - Jun 27, 2022

By Jurisdiction and Age Group | By Jurisdiction

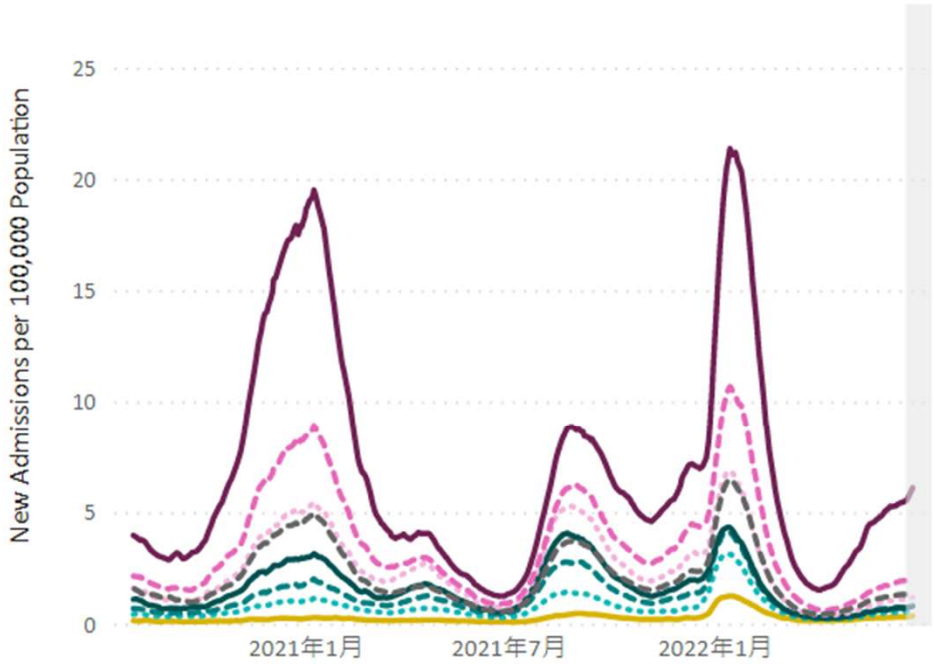
HHS Regions

Select a Jurisdiction: United States

Select an Age Group: All Ages

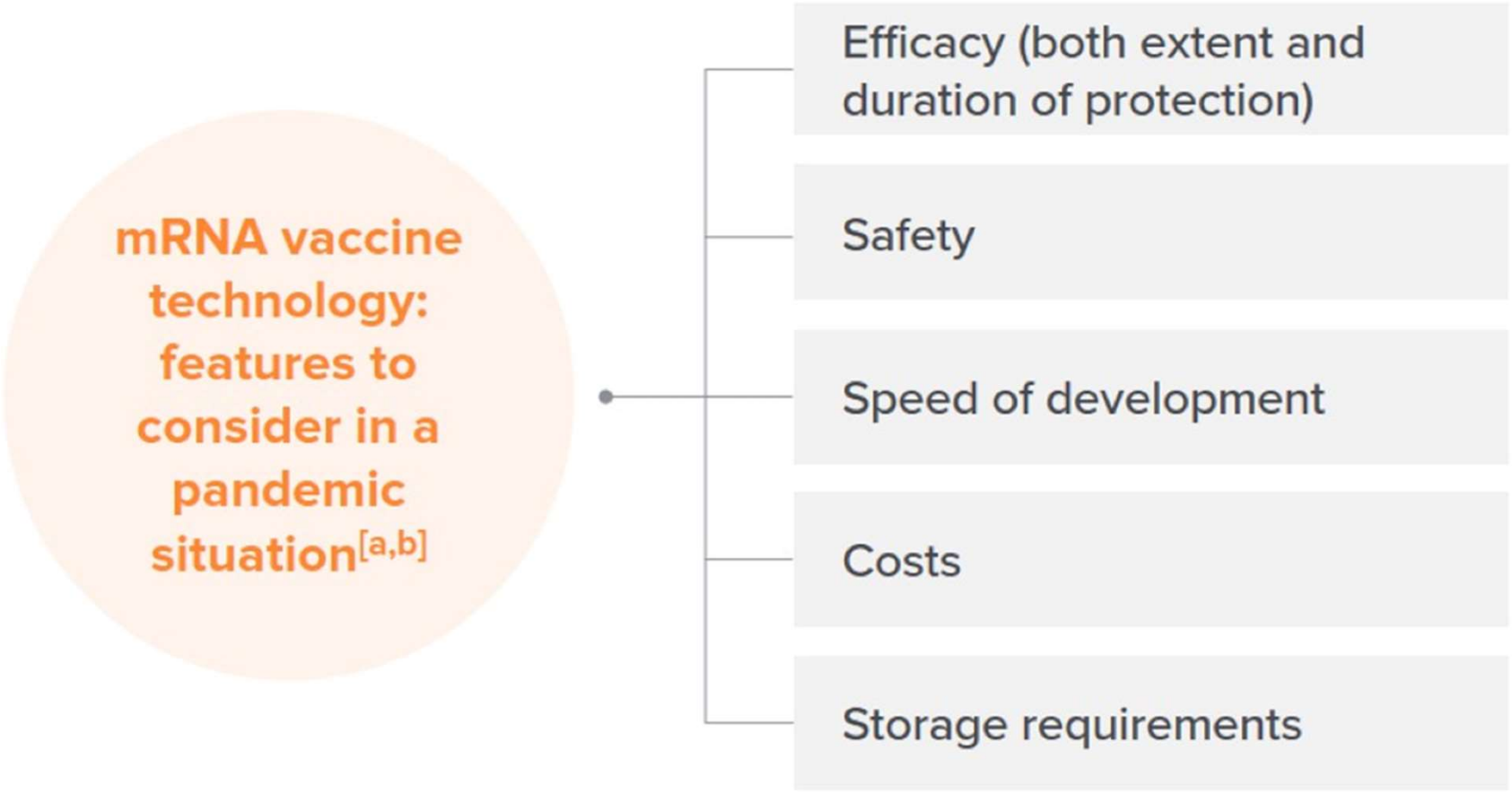
United States | All Ages

折線圖

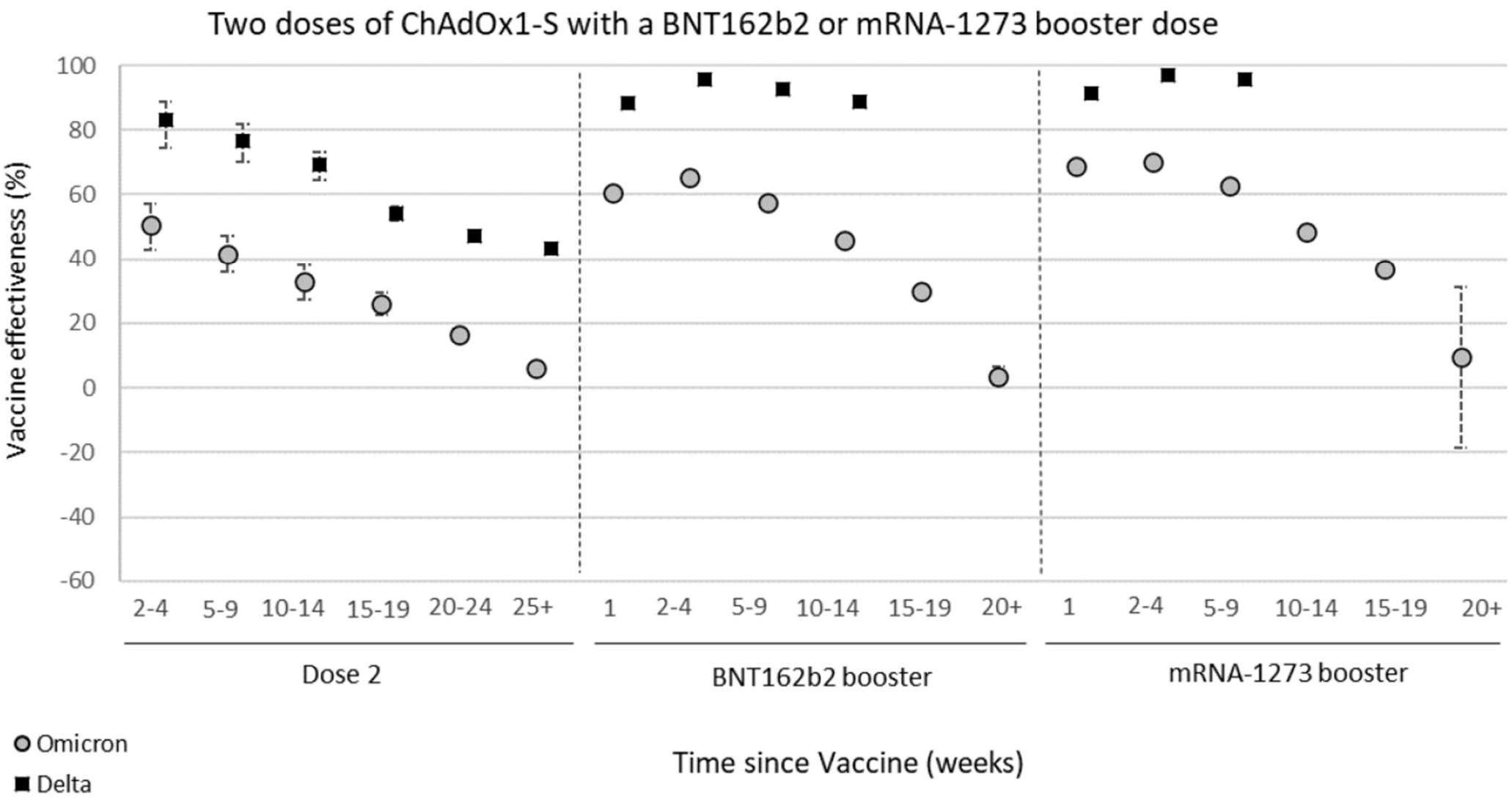


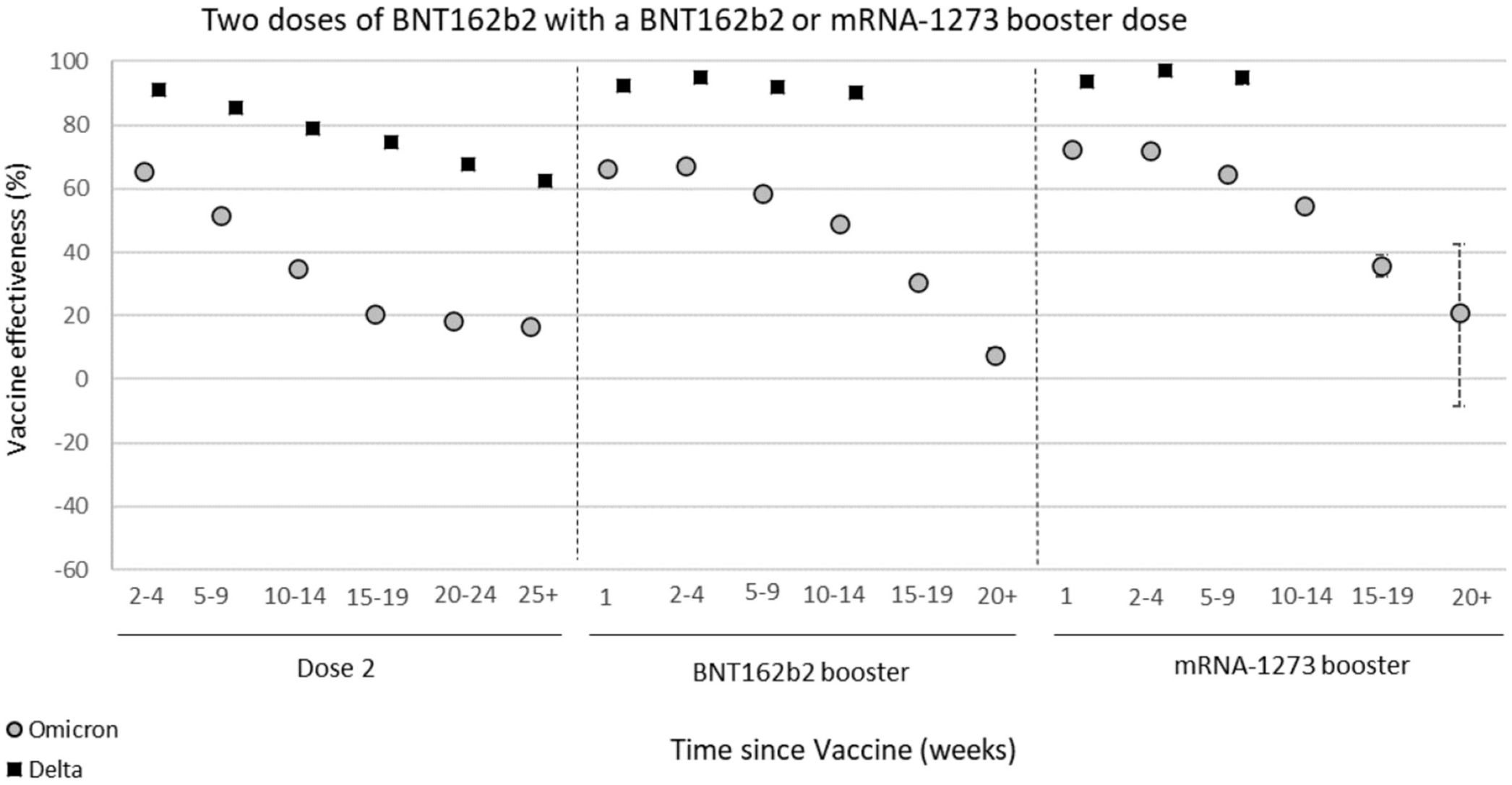
Age Group — 0 - 17 Years ····· 18 - 29 Years - - - 30 - 39 Years — 40 - 49 Years ····· 50 - 59 Years - - - 60 - 69 Years — 70+ Years - - - All Ages

mRNA Technology vs Other Vaccine Technologies



a. Dai L, et al. Nat Rev Immunol. 2021;21:73-82; b. Petsch B, et al. Nat Biotechnol. 2012;30:1210-1216.

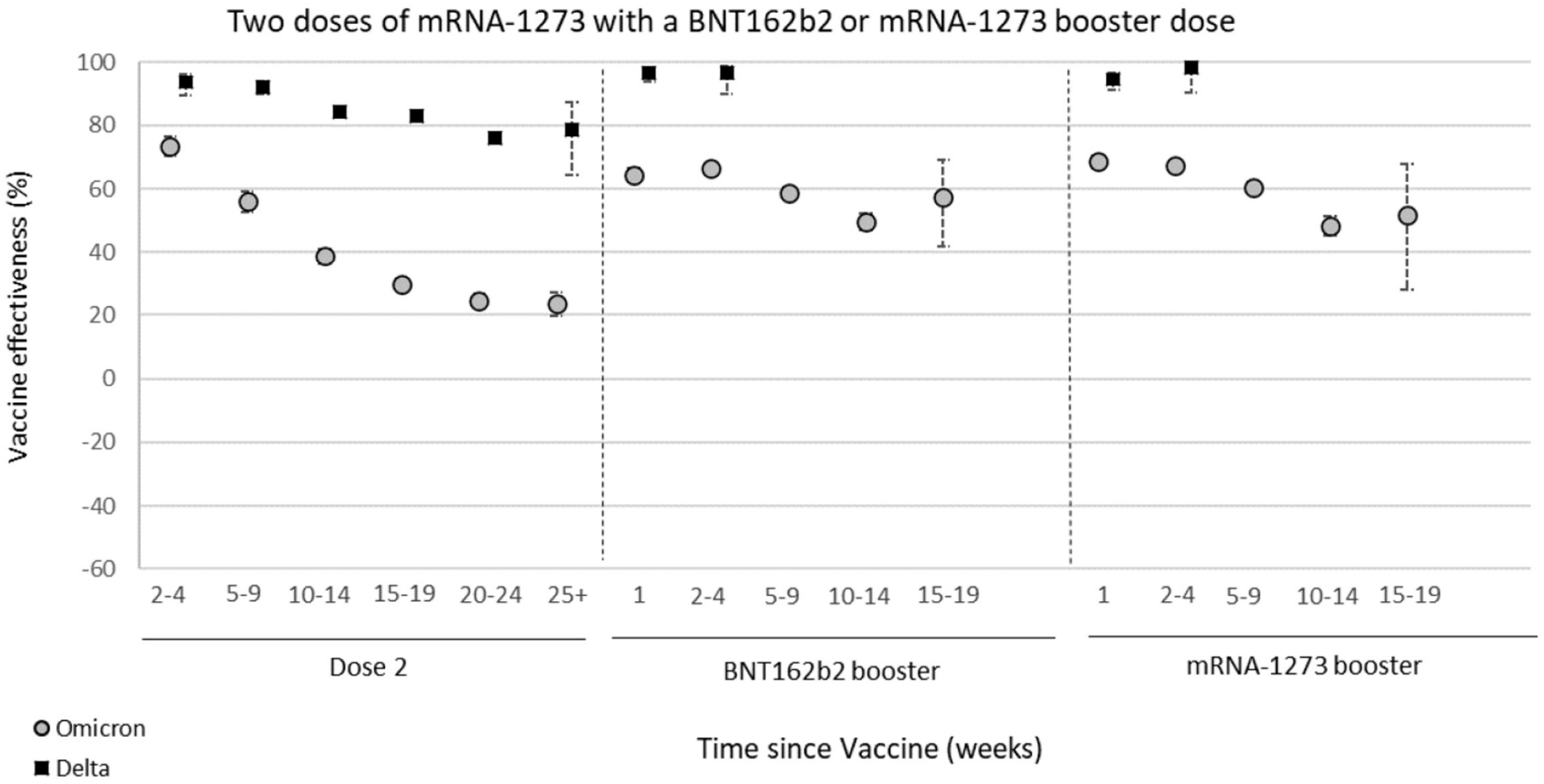

Two doses of ChAdOx1-S with a BNT162b2 or mRNA-1273 booster dose
Vaccine effectiveness (%)
100
80
60
40
20
0
-20
-40
-60
2-4
5-9
10-14
15-19
20-24
25+
1
2-4
5-9
10-14
15-19
20+
1
2-4
5-9
10-14
15-19
20+
Dose 2
BNT162b2 booster
mRNA-1273 booster
Omicron
Delta
Time since Vaccine (weeks)



COVID-19 vaccine surveillance report

Week 24

16 June 2022



COVID-19 vaccine surveillance report

Week 24

16 June 2022

Consensus vaccine effectiveness estimates

Table 3 summarises consensus estimates of vaccine effectiveness against different outcomes that have been reached by the UK Vaccine Effectiveness Expert Panel. These take into account estimates from UK studies by public health agencies and academic groups as well as international data.

Table 3. Consensus estimates of vaccine effectiveness against the Omicron variant

Vaccine product for primary course	Outcome	Second dose: 0 to 3 months	Second dose: 4 to 6 months	Second dose: 6+ months	Booster dose: All Periods	Booster dose: 0 to 3 months	Booster dose: 4 to 6 months	Booster dose: 6+ months
AstraZeneca	All Infection	30% (20 to 40%)	0 to 30% (range only)	0% (0 to 10%)	See Individual Periods	45% (35 to 55%)	15% (0 to 30%)	0% (0 to 10%)
	Symptomatic	40% (30 to 50%)	20% (5 to 30%)	5% (0 to 5%)	See Individual Periods	60% (50 to 70%)	40% (30 to 50%)	10% (0 to 20%)
	Hospitalisation	85% (60 to 90%)	70% (50 to 75%)	65% (45 to 85%)	See Individual Periods	90% (85 to 95%)	85% (85 to 95%)	70% (50 to 85%)
	Mortality	Insufficient Data	Insufficient Data	Insufficient Data	See Individual Periods	90% (85 to 98%)	Insufficient Data	Insufficient Data
	Transmission	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
Moderna	All Infection	30% (20 to 40%)	0 to 30% (range only)	30% (10 to 50%)	See Individual Periods	45% (35 to 55%)	15% (0 to 30%)	0% (0 to 10%)
	Symptomatic	55% (35 to 75%)	30% (15 to 35%)	15% (10 to 20%)	See Individual Periods	65% (55 to 75%)	40% (30 to 50%)	10% (0 to 20%)
	Hospitalisation	85 to 95% (range only)	75 to 85% (range only)	55 to 90% (range only)	See Individual Periods	85 to 95% (range only)	Insufficient Data	Insufficient Data
	Mortality	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
	Transmission	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
Pfizer	All Infection	30% (20 to 40%)	0 to 30% (range only)	20% (10 to 30%)	See Individual Periods	45% (35 to 55%)	15% (0 to 30%)	0% (0 to 10%)
	Symptomatic	50% (30 to 65%)	20% (15 to 30%)	15% (10 to 15%)	See Individual Periods	65% (55 to 75%)	45% (35 to 55%)	10% (0 to 20%)
	Hospitalisation	90% (85 to 95%)	80% (75 to 85%)	70% (55 to 90%)	See Individual Periods	90% (85 to 95%)	85% (85 to 95%)	70% (50 to 85%)
	Mortality	Insufficient Data	Insufficient Data	Insufficient Data	See Individual Periods	90% (85 to 98%)	Insufficient Data	Insufficient Data
	Transmission	Insufficient Data	Insufficient Data	Insufficient Data	0 to 25% (range only)	Insufficient Data	Insufficient Data	Insufficient Data

幼童莫德納疫苗會有新瓶身、新包裝 羅一鈞：力拚7月開打

中央流行疫情指揮中心發言人羅一鈞說，ACIP會跟召集人和委員們約時間，下週儘速召開會議，力拚幼兒莫德納疫苗在7月開打。（中央流行疫情指揮中心提供）

ACIP專家會議 COVID-19疫苗
兒童第2劑及醫護人員第2次接種建議

兒童疫苗接種建議

- ☑ 建議5-11歲兒童應完成**2劑**疫苗接種
- ☑ 建議2劑間隔**4-8週**以上
- ☑ 建議兒童族群**以同廠牌**疫苗完成2劑接種

特殊情形(如第1劑接種後出現嚴重不良反應、指揮中心評估疫苗供應情形等)下，可以不同廠牌疫苗完成2劑接種

醫事人員第2次追加劑接種建議

- ☑ 建議「第一類醫事人員(包含醫事執登人員及醫事機構非醫事人員)」**評估自身染疫風險與意願後，接種第2次追加劑**
- ☑ 建議與第1次追加劑**間隔5個月**

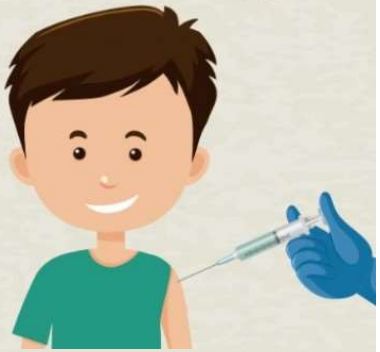
2022/06/11

中央流行疫情指揮中心

6/22起

Pfizer-BNT兒童疫苗第2劑開打

- ☑各地方政府依接種間隔4-8週逐續安排指定合醫療院所接種
- ☑後續視疫苗供應及接種情形於6月下旬至7月初校園接種
- ☑預訂6/22配撥共55萬劑(含前一批庫存量)提供地方政府接種作業使用



2022/06/21 中央流行疫情指揮中心

ACIP專家會議COVID-19疫苗接種建議

6個月至5歲幼兒莫德納 COVID-19疫苗接種建議

- 目前國內處於社區流行階段，建議6個月至5歲幼童接種莫德納 COVID-19疫苗接種，以降低染疫後重症及死亡之風險
- 經參考疫苗臨床試驗結果及各國疫苗接種政策，建議接種兩劑基礎劑，兩劑間隔4-8週以上。

5-11歲兒童COVID-19疫苗基礎加強劑及追加劑接種建議

- 對於免疫不全及免疫力低下且病情穩定者建議接種基礎加強劑(與第二劑間隔28天後接種)
- 對於完整接種基礎劑對象，建議於滿5個月(150天)後，接種追加劑。

2022/06/27

中央流行疫情指揮中心

ACIP專家會議COVID-19疫苗接種建議

機場港埠、居家檢疫、航空機組員及機構與社福照護系統相關工作人員第二次追加劑接種建議

- 建議機場港埠、居家檢疫、航空機組員及機構與社福照護系統相關工作人員接種第2次追加劑
- 建議2劑間隔5個月以上

Novavax COVID-19疫苗接種建議

- 建議使用於18歲以上民眾接種基礎劑、基礎加強劑，及第1次第2次追加劑
- 可與其他廠牌交替使用

ACIP專家會議COVID-19疫苗接種建議

3/3

COVID-19確診者疫苗接種建議

- 無論先前是否具 SARS-CoV-2感染史，建議應依各廠牌應接種劑次，完成 COVID-19 疫苗基礎劑及追加劑接種
- 依據現有有限資料顯示，延長SARS-CoV-2感染後接種COVID-19疫苗之間隔，可增加接種疫苗後誘發之免疫保護力，且感染後短期間重複感染機率較低，爰建議確診者可自發病日或確診日(無症狀感染者)起3個月且無急性症狀後，接種 COVID-19 疫苗

- 確診者若已無急性症狀且符合解隔條件，如符合下列情形，可經醫師評估適宜接種後，完成尚未完成之COVID-19疫苗劑次：
  - 因工作需求、工作性質等原因導致感染風險可能增加
  - 免疫力/免疫功能低下導致感染風險增加
  - 因應入境其他國家時疫苗接種紀錄查核之需

2022/06/27

中央流行疫情指揮中心

7月1日起

擴大實施「機場港埠、居家檢疫、航空機組員及機構與社福照護系統」相關工作人員爲第2次追加劑接種對象

- 機場港埠、居家檢疫、航空機組員及機構與社福照護系統相關工作人員**可評估自身染疫風險與意願後，接種第2次追加劑**
- 與第1次追加劑**間隔5個月以上**接種

2022/06/29

中央流行疫情指揮中心

首批Novavax疫苗
50.4萬劑
將於6/30上午抵臺

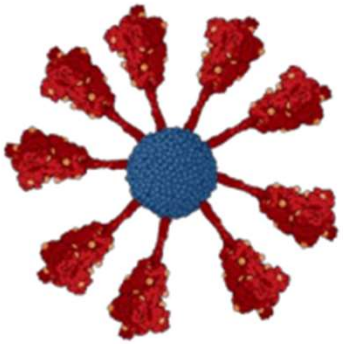
- 預計**7月8日起**提供接種
- 提供18歲以上民眾第1、2劑基礎劑、基礎加強劑，及第1次第2次追加劑接種，**每劑須接種0.5ml**
- **可與其他廠牌交替使用**

2022/06/29

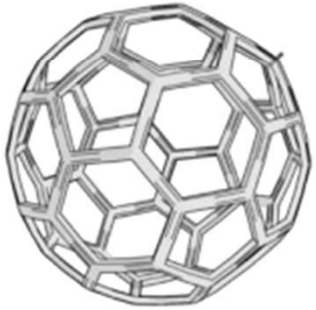
中央流行疫情指揮中心

Novavax Vaccine Platform
Recombinant Protein Plus Matrix-M™

Recombinant protein



Matrix-M adjuvant

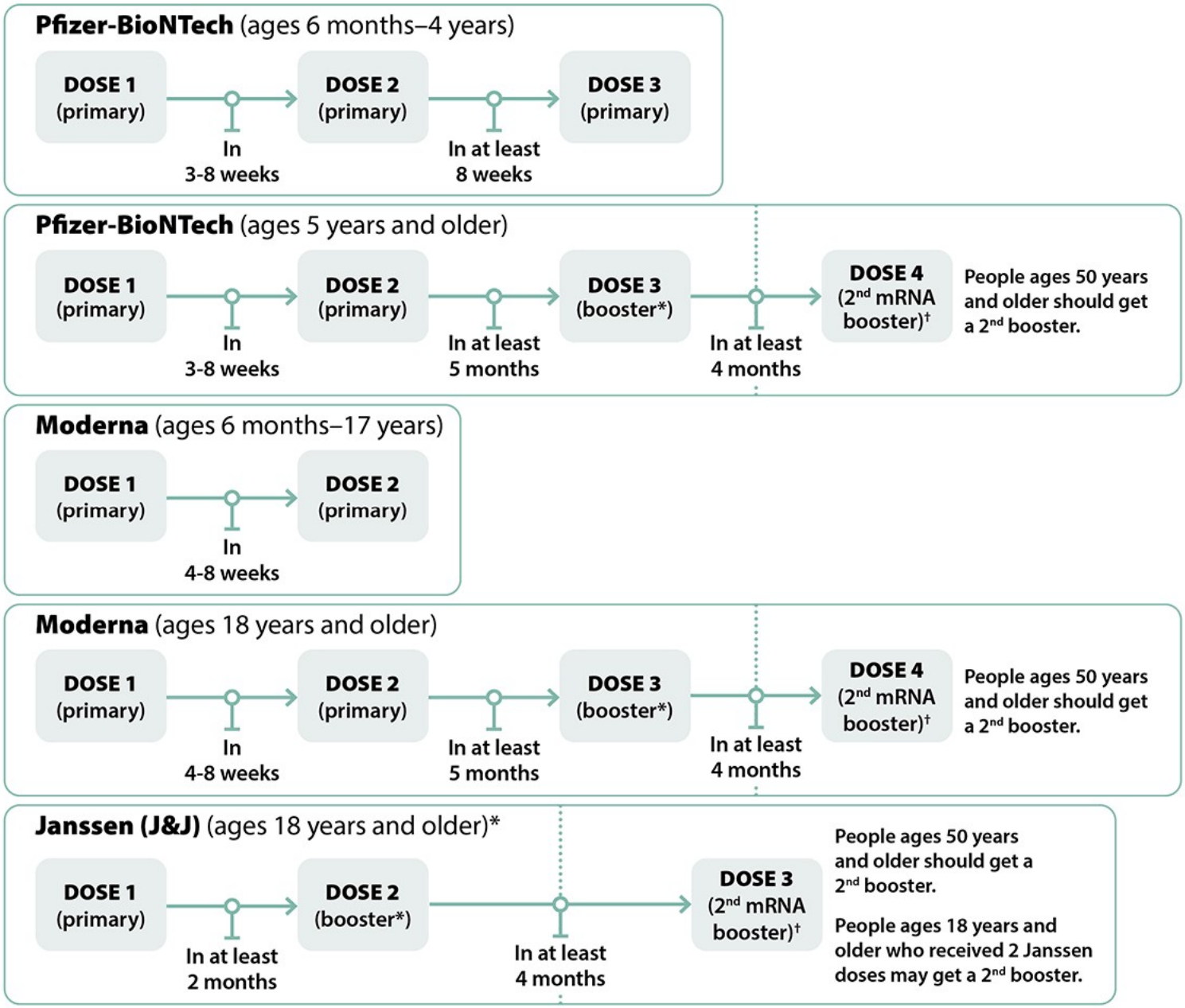


NVX-CoV2373

幼兒莫德納疫苗遲到！ 陳時中曝原因：文件問題

指揮中心指揮官陳時中說，本來第一批幼兒疫苗預計明天上午抵台，但因為文件問題延遲，指揮中心會盡速補件。（圖由指揮中心提供）

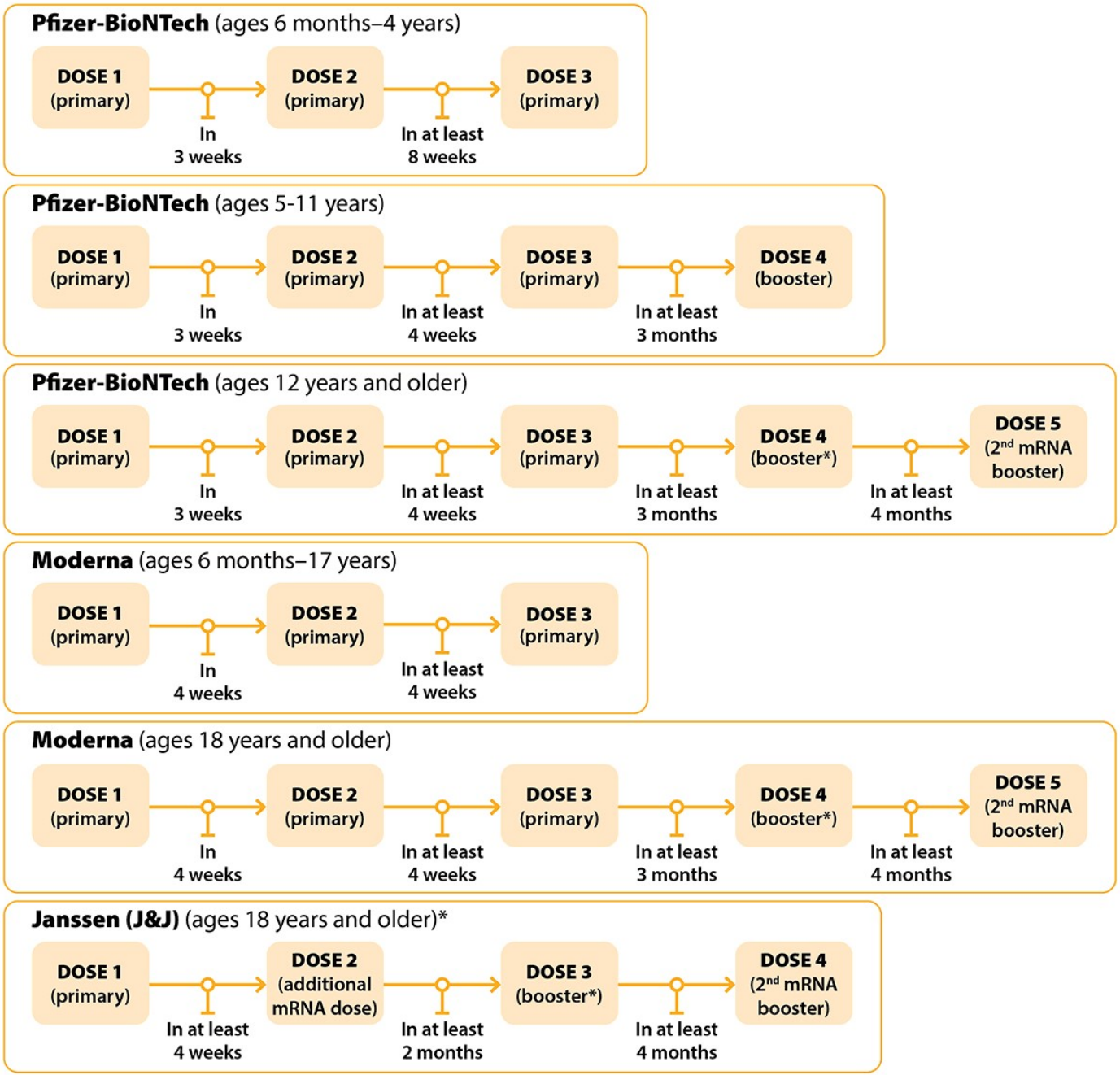
COVID-19 Vaccination Schedule for People who are **NOT** Moderately or Severely Immunocompromised



*Age-appropriate mRNA COVID-19 vaccines are preferred over Janssen COVID-19 Vaccine for primary and booster vaccination. Janssen COVID-19 Vaccine should only be used in limited situations. See: https://www.cdc.gov/vaccines/covid-19/clinical-considerations/interim-considerations-us.html#considerations-Janssen

†2nd booster dose for some groups

COVID-19 Vaccination Schedule for People who **ARE** Moderately or Severely Immunocompromised

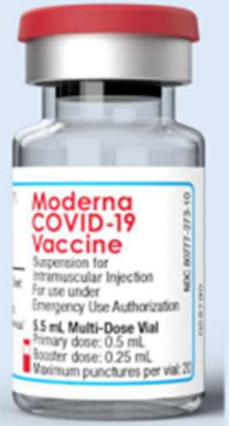


*Age-appropriate mRNA COVID-19 vaccines are preferred over Janssen COVID-19 Vaccine for primary and booster vaccination. Janssen COVID-19 Vaccine should only be used in limited situations. See: https://www.cdc.gov/vaccines/covid-19/clinical-considerations/interim-considerations-us.html#considerations-Janssen

Moderna COVID-19 Vaccine Products

Authorized Age group	 6 months–5 years (primary series)	 • 6–11 years (primary series) • 18 years and older (booster doses)	 • 12 years and older (primary series) • 18 years and older (booster doses)
Vial cap color	Dark blue	Dark blue	Red
Label border color	Magenta	Purple	Light blue
Dose (mRNA concentration)	25 mcg	50 mcg	100 mcg
Injection volume volume	0.25 mL	0.5 mL	0.5 mL(primary, age 12+); 0.25mL(booster, age 18+)
Dilution required	No	No	No
Doses per vial	10	5	Maximum of 11

MODERNA COVID-19 VACCINE PRESENTATIONS

Age Group	6 months through 5 years (*Primary Series*)	6 years through 11 years (*Primary Series*) *Currently unavailable (Use the vial with dark blue cap and a label with a purple border)*	6 years through 11 years (*Primary Series*) 18 years and older (*Booster Dose*)	12 years and older (*Primary Series*) 18 years and older (*Booster Dose*)
Vial Cap Color	Dark Blue	Dark Blue	Dark Blue	Red
Vial Label Border Color	**MAGENTA**	**TEAL**	**PURPLE**	**LIGHT BLUE**
Vial Image				
Primary Dose Volume	0.25 mL	0.5 mL	0.5 mL	0.5 mL
Booster Dose Volume	None	None	0.5 mL	0.25 mL
For storage and expiry information, see FDA-authorized Fact Sheet or scan QR code.	www.modernatx.com/ covid19vaccine-eua	www.modernatx.com/ covid19vaccine-eua	www.modernatx.com/ covid19vaccine-eua	www.modernatx.com/ covid19vaccine-eua

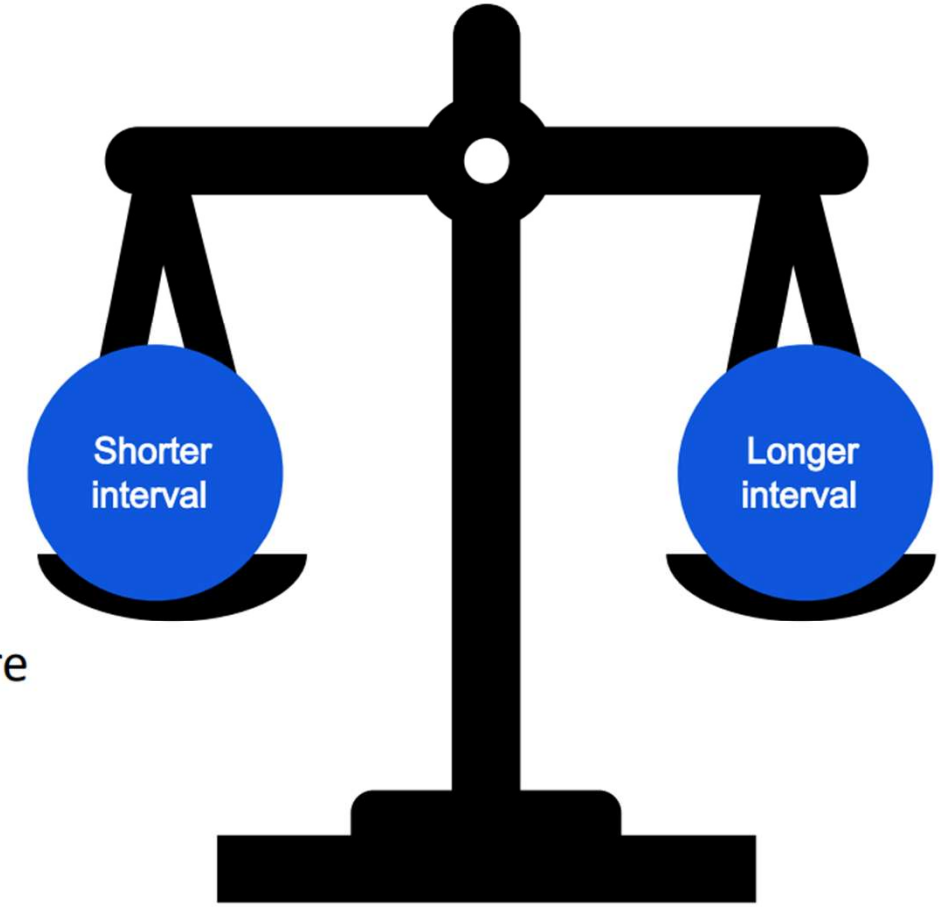
Pfizer-BioNTech COVID-19 Vaccine Formulations

	 Formulation for ages 6 months–4 years	 Formulation for ages 5–11 years	 Formulation for ages 12 years and older
Authorized for ages	6 months–4 years	5–11 years	12 years and older
Vial cap color	Maroon	Orange	Gray
Dose (mRNA concentration)	3 mcg	10 mcg	30 mcg
Injection volume volume	0.2 mL	0.2 mL	0.3 mL
Dilution required	Yes—2.2 mL	Yes—1.3 mL	No
Doses per vial	10 (after dilution)	10 (after dilution)	6

ACIP Presentation Slides: June 18, 2022 Meeting

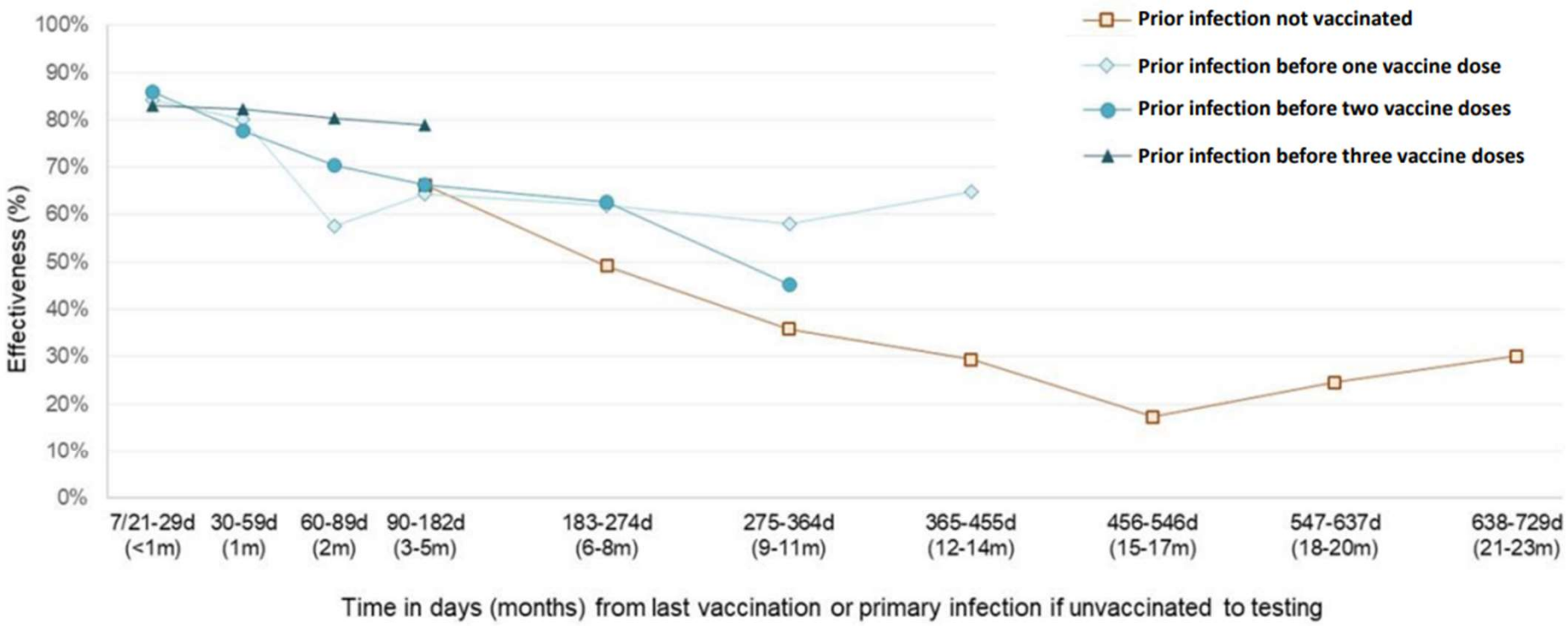
Considerations for Extended Interval Between Dose 1 & 2

- Immunocompromised
- High risk for severe disease
- Household members with high risk for severe disease
- High COVID-19 community levels



- Reduced myocarditis risk
- Adolescent and young adult males
- Optimize vaccine effectiveness

Reinfection occurs more frequently in those previously infected and not vaccinated compared to infected and vaccinated



Carazo S, Skowronski DM, Brisson M, et al. "Protection against Omicron re-infection conferred by prior heterologous SARS-CoV-2 infection, with and without mRNA vaccination" *medRxiv,* May 2022. Protection against Omicron re-infection conferred by prior heterologous SARS-CoV-2 infection, with and without mRNA vaccination | medRxiv

***Data on hospitalizations**:* Plumb ID, Feldstein LR, Barkley E, et al. Effectiveness of COVID-19 mRNA Vaccination in Preventing COVID-19–Associated Hospitalization Among Adults with Previous SARS-CoV-2 Infection — United States, June 2021–February 2022. MMWR Morb Mortal Wkly Rep 2022;71:549-555. DOI: http://dx.doi.org/10.15585/mmwr.mm7115e2

VAERS reporting rates of myocarditis (per 1 million doses administered) after mRNA COVID-19 vaccination, days 0–7 and 8–21 post-vaccination*,†

		0–7 days			8–21 days			0–7 days			8–21 days		
		Males			Males			Females			Females		
	Age (yrs)	Dose 1	Dose 2	Booster	Dose 1	Dose 2	Booster	Dose 1	Dose 2	Booster	Dose 1	Dose 2	Booster
Pfizer-BioNTech	5–11	0.2	2.6	0.0	0.6	0.0	0.0	0.2	0.7	0.0	0.2	0.0	0.0
Pfizer-BioNTech	12–15	5.3	46.4	15.3	1.2	1.2	0.9	0.7	4.1	0.0	0.4	0.2	0.9
Pfizer-BioNTech	16–17	7.2	75.9	24.1	1.7	3.2	1.3	0.0	7.5	0.0	0.7	0.4	0.0
Pfizer-BioNTech and Moderna	18–24	4.2	38.9	9.9	1.1	2.2	0.4	0.6	4.0	0.6	0.2	0.7	0.0
Pfizer-BioNTech and Moderna	25–29	1.8	15.2	4.8	0.4	1.1	0.5	0.4	3.5	2.0	0.2	0.0	0.8
Pfizer-BioNTech and Moderna	30–39	1.9	7.5	1.8	0.4	0.8	0.2	0.6	0.9	0.6	0.3	0.2	0.0
Pfizer-BioNTech and Moderna	40–49	0.5	3.3	0.4	0.2	0.5	0.0	0.4	1.6	0.6	0.2	0.2	0.0
Pfizer-BioNTech and Moderna	50–64	0.5	0.7	0.4	0.2	0.3	0.1	0.6	0.5	0.1	0.2	0.5	0.1
Pfizer-BioNTech and Moderna	65+	0.2	0.3	0.6	0.3	0.2	0.1	0.1	0.5	0.1	0.1	0.2	0.1

* As of May 26, 2022; reports verified to meet case definition by provider interview or medical record review; primary series and 1st booster doses only

† An estimated 1–10 cases of myocarditis per 100,000 person years occurs among people in the United States, regardless of vaccination status; adjusted for days 0–7 and 8–21 risk intervals, this estimated background is **0.2 to 2.2 per 1 million person-day 0–7 risk interval and 0.4 to 3.8 per 1 million person-day 8–21 risk interval** (peach shaded cells indicate that reporting rate exceeded estimated background incidence for the period)

BNT162b2 Vaccine Effectiveness against Omicron in Children 5 to 11 Years of Age

Chandra J. Cohen-Stavi, Ph.D., Ori Magen, M.D., Noam Barda, M.D., Ph.D., Shlomit Yaron, M.D., Alon Peretz, M.D., Doron Netzer, M.D., Carlo Giaquinto, M.D., Ali Judd, Ph.D., Leonard Leibovici, M.D., Miguel A. Hernán, M.D., Marc Lipsitch, D.Phil., Ben Y. Reis, Ph.D., Ran D. Balicer, M.D., Ph.D., and Noa Dagan, M.D., Ph.D.

ABSTRACT

BACKGROUND

Limited evidence is available on the real-world effectiveness of the BNT162b2 vaccine against coronavirus disease 2019 (Covid-19) and specifically against infection with the omicron variant among children 5 to 11 years of age.

METHODS

Using data from the largest health care organization in Israel, we identified a cohort of children 5 to 11 years of age who were vaccinated on or after November 23, 2021, and matched them with unvaccinated controls to estimate the vaccine effectiveness of BNT162b2 among newly vaccinated children during the omicron wave. Vaccine effectiveness against documented severe acute respiratory syndrome

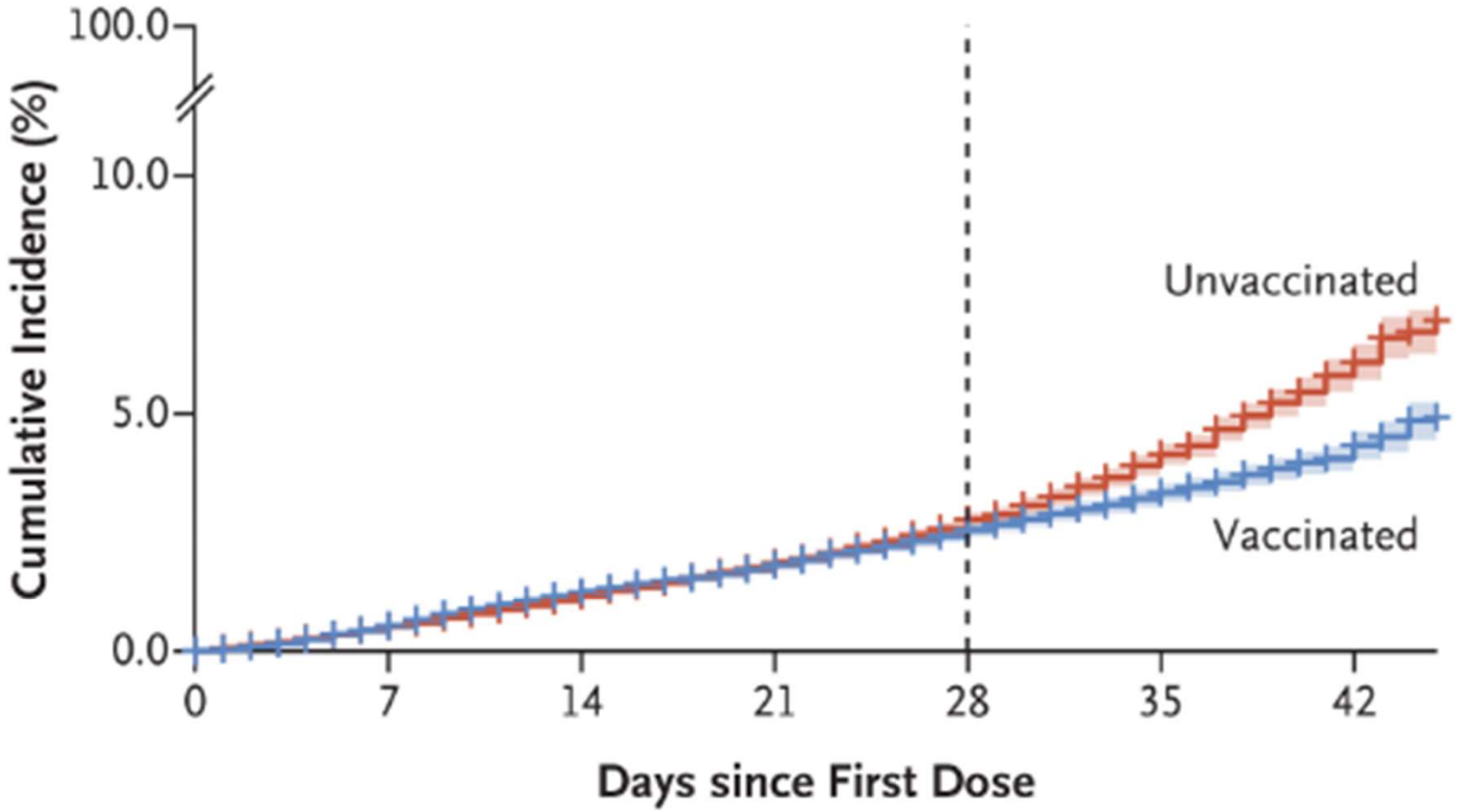
The authors' affiliations are listed in the Appendix. Dr. Dagan can be contacted at noada@clalit.org.il or at the Clalit Research Institute, Innovation Division, Clalit Health Services, 101 Arlozorov St., Tel Aviv 6209804, Israel.

Drs. Cohen-Stavi and Magen contributed equally to this article.

This article was published on June 29, 2022, at NEJM.org.

DOI: 10.1056/NEJMoa2205011

A **Documented SARS-CoV-2 Infection**



No. at Risk							
Unvaccinated	94,728	76,289	55,900	38,766	25,699	15,704	4403
Vaccinated	94,728	76,264	55,838	38,794	25,756	15,794	4468

Cumulative No. of Events							
Unvaccinated	0	433	849	1176	1458	1734	1912
Vaccinated	0	440	914	1180	1409	1571	1658

Table 3. **Vaccine Effectiveness against Documented SARS-CoV-2 Infection and Symptomatic Covid-19 at 7 to 21 Days after the Second Dose, Stratified According to Age Subgroup.**

Outcome	Total Population in Each Study Group*	Events in the Unvaccinated Group	Events in the Vaccinated Group	Risk in the Unvaccinated Group†	Risk in the Vaccinated Group†	Vaccine Effectiveness (95% CI)	Risk Difference (95% CI)
		number		*events/100,000*		*percent*	*events/100,000*
Documented SARS-CoV-2 infection‡							
Age 5 or 6 yr	5418	71	23	2867	922	68 (43 to 84)	1944 (977 to 2915)
Age 7 to 9 yr	9324	177	75	3575	1559	56 (41 to 68)	2016 (1279 to 2764)
Age 10 or 11 yr	7367	175	103	4586	2850	38 (18 to 53)	1736 (703 to 2753)
Symptomatic Covid-19							
Age 5 or 6 yr	5468	26	10	1190	367	69 (30 to 91)	822 (224 to 1444)
Age 7 to 9 yr	9445	45	20	971	491	49 (6 to 76)	480 (39 to 919)
Age 10 or 11 yr	7473	62	38	1614	1029	36 (0 to 61)	585 (−3 to 1195)

* The total population in each study group represents the total number of children in each study group at the first day of the relevant follow-up period.
† Risk was estimated with the use of the Kaplan–Meier estimator.
‡ Documented SARS-CoV-2 infection was confirmed on polymerase-chain-reaction testing.

Safety, immunogenicity, and reactogenicity of BNT162b2 and mRNA-1273 COVID-19 vaccines given as fourth-dose boosters following two doses of ChAdOx1 nCoV-19 or BNT162b2 and a third dose of BNT162b2 (COV-BOOST): a multicentre, blinded, phase 2, randomised trial

Alasdair P S Munro, Shuo Feng*, Leila Janani*, Victoria Cornelius*, Parvinder K Aley, Gavin Babbage, David Baxter, Marcin Bula, Katrina Cathie, Krishna Chatterjee, Kate Dodd, Yvanne Enever, Ehsaan Qureshi, Anna L Goodman, Christopher A Green, Linda Harndahl, John Haughney, Alexander Hicks, Agatha A van der Klaauw, Nasir Kanji, Vincenzo Libri, Martin J Llewelyn, Alastair C McGregor, Mina Maallah, Angela M Minassian, Patrick Moore, Mehmood Mughal, Yama F Mujadidi, Kyra Holliday, Orod Osanlou, Rostam Osanlou, Daniel R Owens, Mihaela Pacurar, Adrian Palfreeman, Daniel Pan, Tommy Rampling, Karen Regan, Stephen Saich, Tanveer Bawa, Dinesh Saralaya, Sunil Sharma, Ray Sheridan, Emma C Thomson, Shirley Todd, Chris Twelves, Robert C Read, Sue Charlton, Bassam Hallis, Mary Ramsay, Nick Andrews, Teresa Lambe, Jonathan S Nguyen-Van-Tam, Matthew D Snape†, Xinxue Liu†, Saul N Faust†, on behalf of the COV-BOOST study group‡*

Summary

Background Some high-income countries have deployed fourth doses of COVID-19 vaccines, but the clinical need, effectiveness, timing, and dose of a fourth dose remain uncertain. We aimed to investigate the safety, reactogenicity, and immunogenicity of fourth-dose boosters against COVID-19.

Methods The COV-BOOST trial is a multicentre, blinded, phase 2, randomised controlled trial of seven COVID-19 vaccines given as third-dose boosters at 18 sites in the UK. This sub-study enrolled participants who had received BNT162b2 (Pfizer-BioNTech) as their third dose in COV-BOOST and randomly assigned them (1:1) to receive a fourth dose of either BNT162b2 (30 µg in 0·30 mL; full dose) or mRNA-1273 (Moderna; 50 µg in 0·25 mL; half dose) via

Lancet Infect Dis 2022

Published Online
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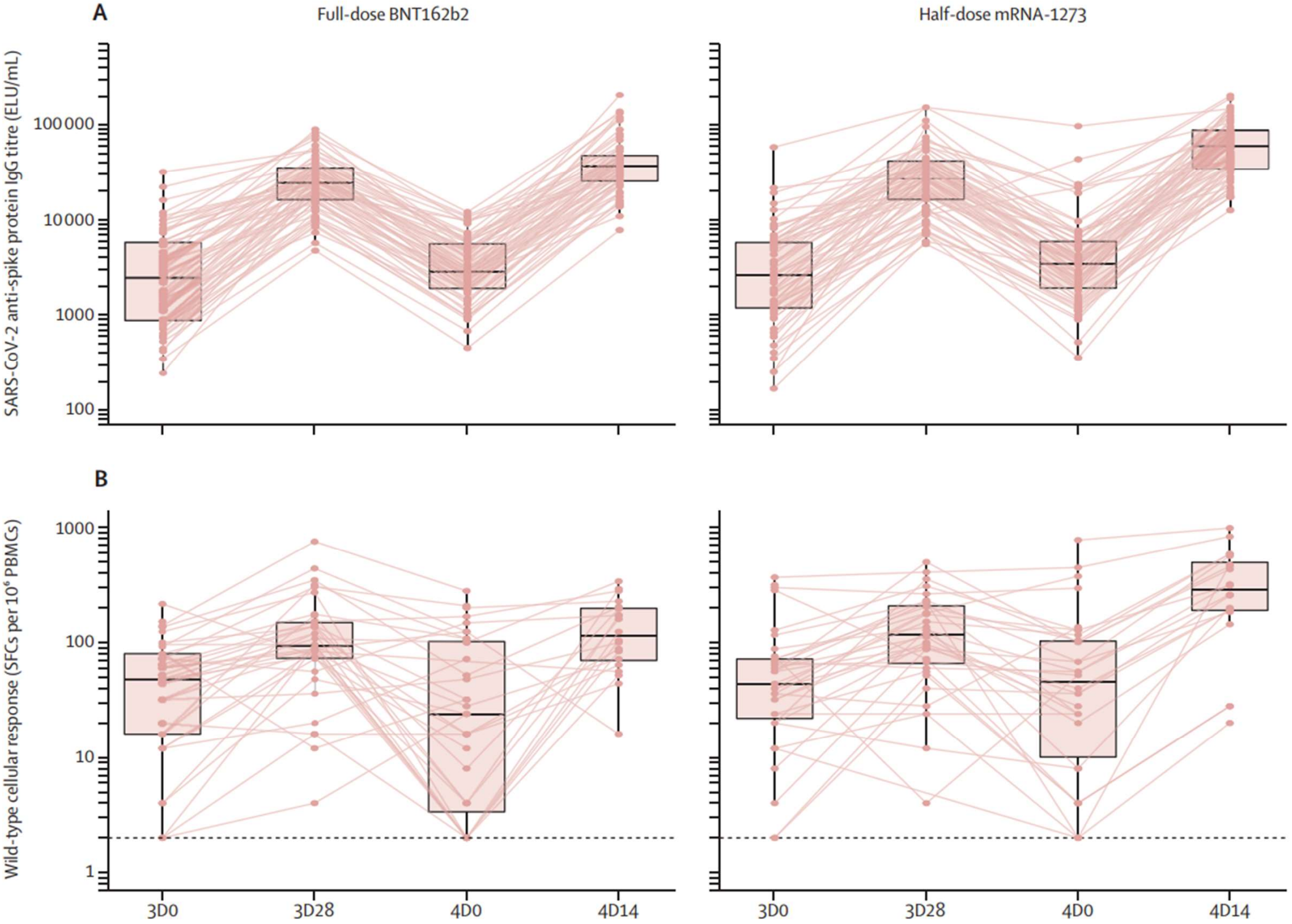
https://doi.org/10.1016/S1473-3099(22)00271-7

See Online/Comment
https://doi.org/10.1016/S1473-3099(22)00282-1

*Contributed equally as first


A
Full-dose BNT162b2
Half-dose mRNA-1273
SARS-CoV-2 anti-spike protein IgG titre (ELU/mL)
100 000
10 000
1000
100
B
Wild-type cellular response (SFCs per 10⁶ PBMCs)
1000
100
10
1
3D0
3D28
4D0
4D14

JAMA Internal Medicine | Original Investigation

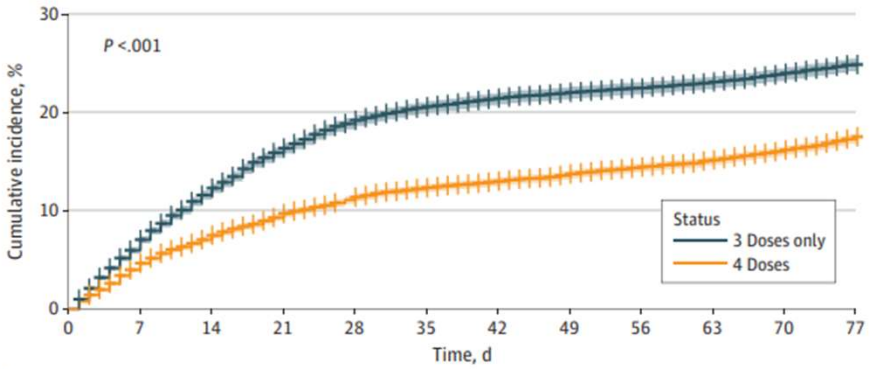
Association of Receipt of the Fourth BNT162b2 Dose With Omicron Infection and COVID-19 Hospitalizations Among Residents of Long-term Care Facilities

Khitam Muhsen, PhD; Nimrod Maimon, MD; Amiel Yaron Mizrahi, MSc; Boris Boltyansky, MSc; Omri Bodenheimer, MSc; Zafrira Hillel Diamant, MPA; Lea Gaon, MSc; Dani Cohen, PhD; Ron Dagan, MD

JAMA Intern Med. doi:10.1001/jamainternmed.2022.2658
Published online June 23, 2022.

Figure 2. Cumulative Incidence of the Study End Points by Study Group

A Overall SARS-CoV-2 infection



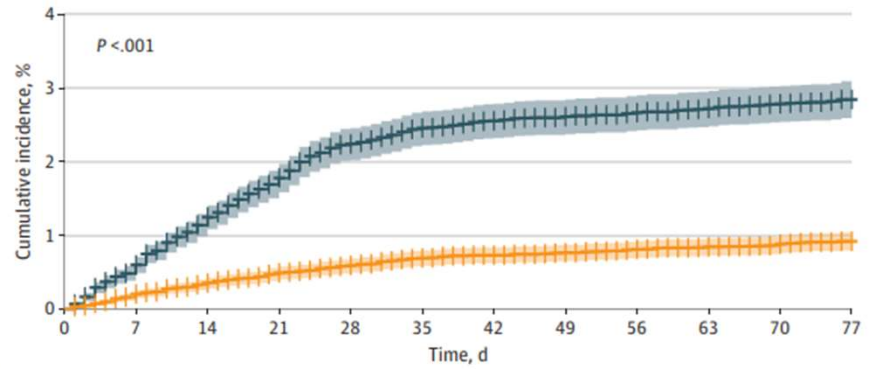
No. at risk

3 Doses only	19687	17428	15778	14547	13748	13222	12924	12744	12587	12427	11581	2244
4 Doses	24088	23095	22314	21742	21276	20970	20772	20574	20368	20162	19586	6031

Cumulative No. of events

3 Doses only	0	1345	2296	3012	3496	3729	3872	3969	4039	4140	4281	4370
4 Doses	0	1121	1804	2335	2735	2965	3125	3300	3469	3639	3879	4053

B Hospitalizations for mild to moderate COVID-19



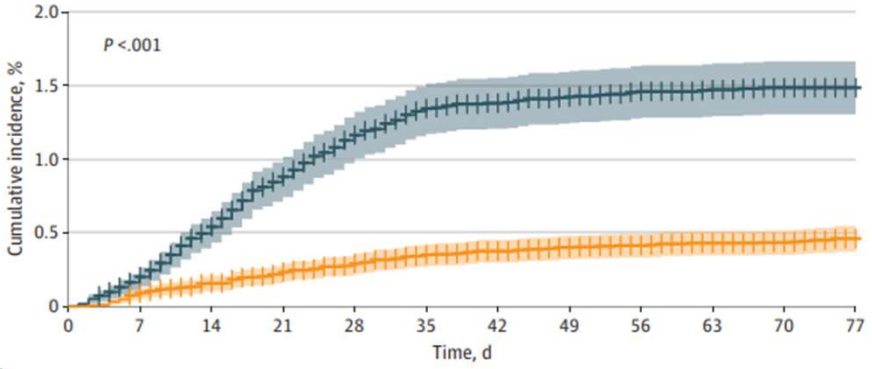
No. at risk

3 Doses only	19603	18221	17405	16793	16379	16069	15882	15780	15685	15592	14737	2970
4 Doses	24075	24003	23914	23837	23767	23705	23651	23601	23559	23506	23090	7345

Cumulative No. of events

3 Doses only	0	113	229	321	399	435	451	460	469	478	488	493
4 Doses	0	49	85	118	142	166	175	183	194	202	211	217

C Hospitalizations for severe COVID-19



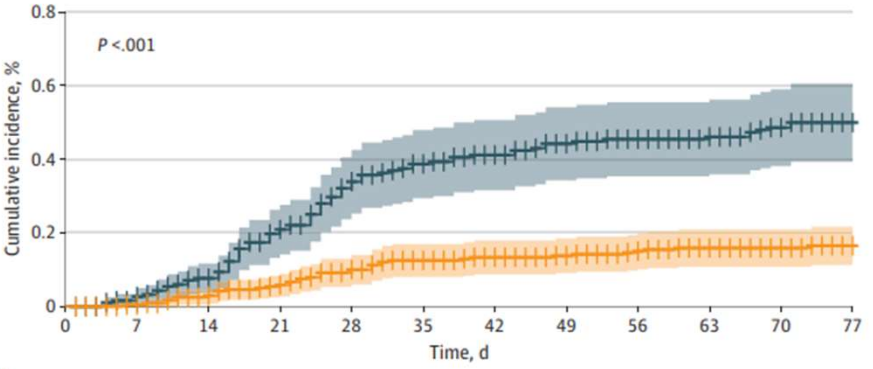
No. at risk

3 Doses only	19683	18351	17586	17004	16630	16316	16134	16031	15936	15847	14993	3039
4 Doses	24086	24034	23966	23907	23846	23790	23737	23687	23649	23598	23183	7377

Cumulative No. of events

3 Doses only	0	38	99	158	206	236	242	249	255	257	259	259
4 Doses	0	22	38	56	70	84	90	96	99	103	104	108

D COVID-19-related deaths



No. at risk

3 Doses only	19687	18376	17660	17109	16759	16464	16281	16174	16081	15991	15128	3079
4 Doses	24088	24053	23997	23948	23889	23841	23793	23747	23708	23655	23240	7400

Cumulative No. of events

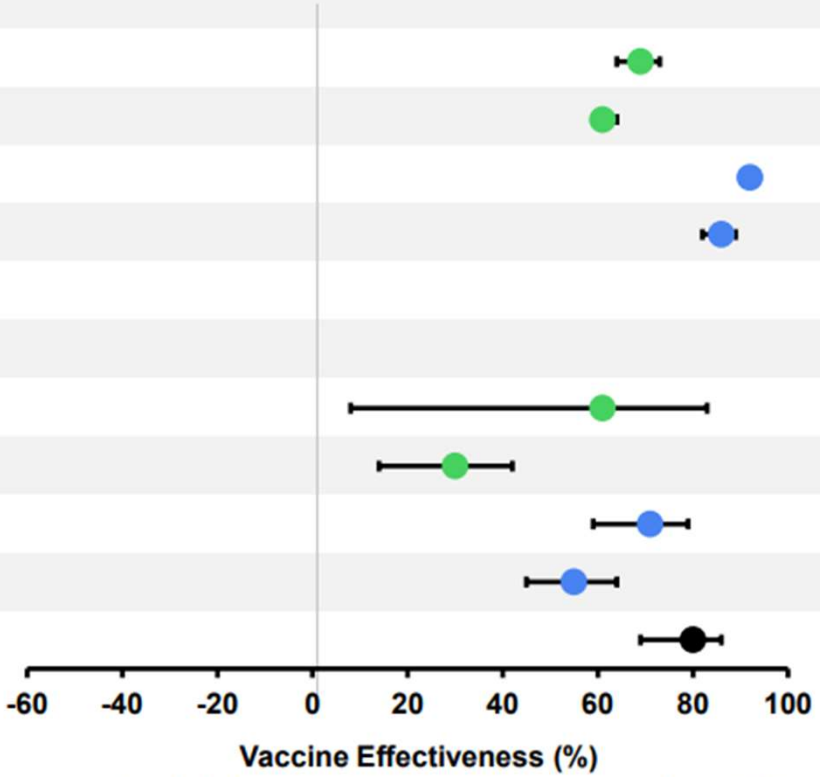
3 Doses only	0	5	14	37	59	67	71	76	78	79	83	85
4 Doses	0	1	7	14	24	30	32	33	36	38	38	39

Shaded lines represent 95% CIs. The follow-up began more than 7 days after vaccination with the fourth dose and a matching facility-specific starting follow-up date for the recipients of the 3 doses. *P* values were obtained by the log-rank test.

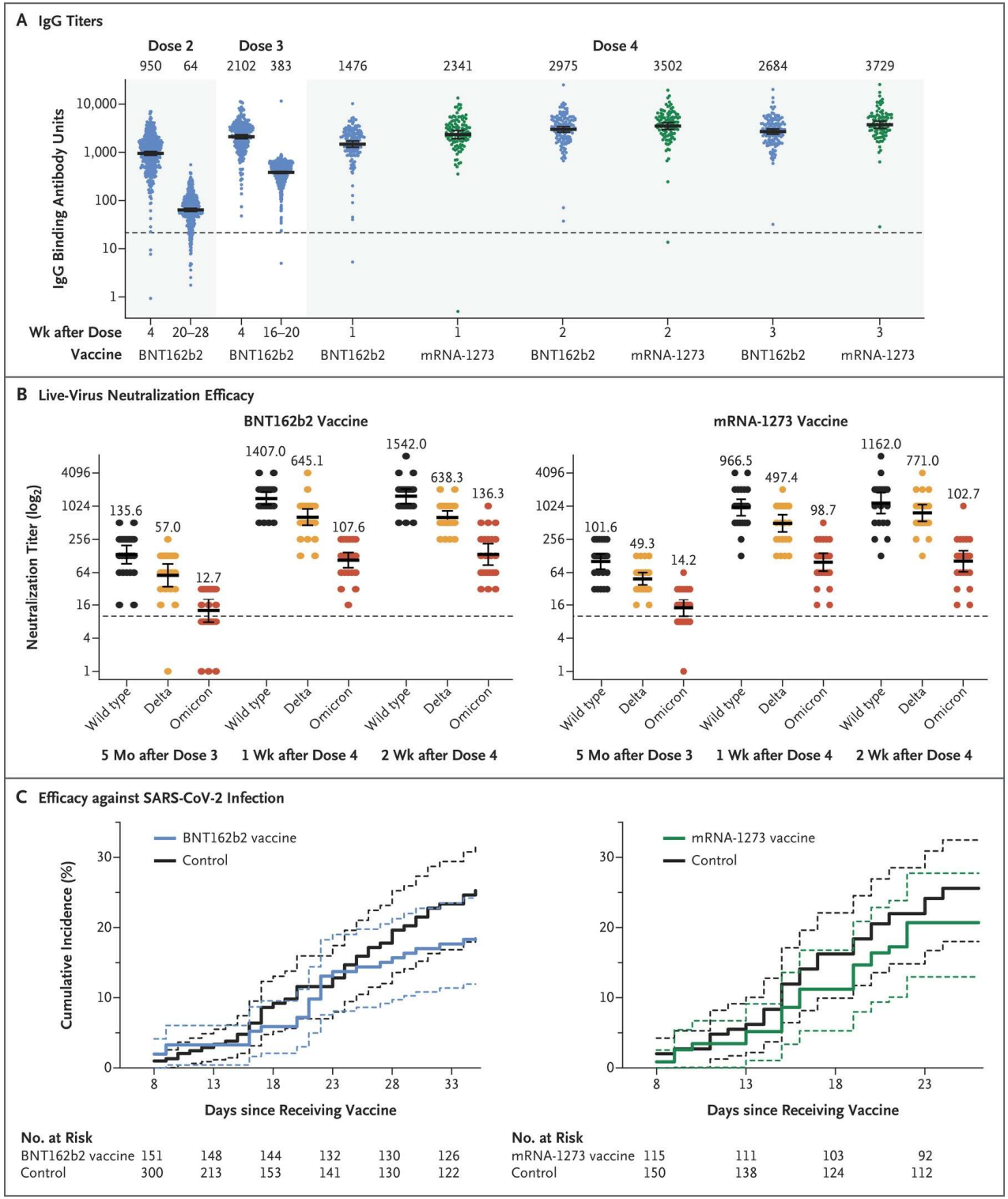
VISION: mRNA VE for hospitalization among immunocompetent adults ≥18 years by number of doses and time since last dose receipt and variant predominance, mid-Dec 2021–mid-May 2022

	Total	CLI cases	Days since most recent dose, median (IQR)	Adjusted VE % (95% CI)
BA.1 period (days since most recent dose)				
Unvaccinated	14,960	6,862		Ref.
2 doses (14-149)	1,247	297	105 (73, 129)	69 (64 - 73)
2 doses (≥150)	8,998	2,559	290 (252, 322)	61 (59 - 64)
3 doses (7-119)	9,229	780	72 (48, 94)	92 (91 - 93)
3 doses (≥120)	1,505	82	132 (125, 143)	86 (82 - 89)
BA.2/BA.2.12.1 period (days since most recent dose)				
Unvaccinated	4,654	290		Ref.
2 doses (14-149)	245	7	99 (71, 127)	61 (8 - 83)
2 doses (≥150)	3,574	235	368 (305, 408)	30 (14 - 42)
3 doses (7-119)	1,807	55	96 (76, 109)	71 (59 - 79)
3 doses (≥120)	5,629	336	166 (146, 186)	55 (45 - 64)
4 doses (7-59)*	737	40	23 (14, 32)	80 (69-86)

* Only estimated among adults ≥50 years of age



CDC, preliminary unpublished data. Individuals with prior infections excluded. Adjusted for calendar time, geographic region, age, sex, race, ethnicity, local virus circulation, respiratory or non-respiratory underlying medical conditions, and propensity to be vaccinated.



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

This letter was published on March 16, 2022, at NEJM.org.

Figure 1 (facing page). Immunogenicity and Efficacy of a Fourth Dose of mRNA Vaccine.

Panel A shows IgG titers after three doses of BNT162b2 plus a fourth dose of a messenger RNA (mRNA) vaccine (either BNT162b2 or mRNA-1273). Panel B shows live-virus neutralization efficacy against different strains (Hu-1 [wild type], B.1.617.2 [delta], and B.1.1.529 [omicron]) at different time points. In Panels A and B, geometric mean titers are shown, and I bars indicate the 95% confidence intervals; the dashed horizontal line indicates the cutoff for diagnostic positivity. Panel C shows the cumulative incidence of any severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection among BNT162b2 and mRNA-1273 recipients and their matched controls. The dashed lines indicate 95% confidence intervals.

June 29, 2022
8:06 PM GMT+8
Last Updated 9 hours ago

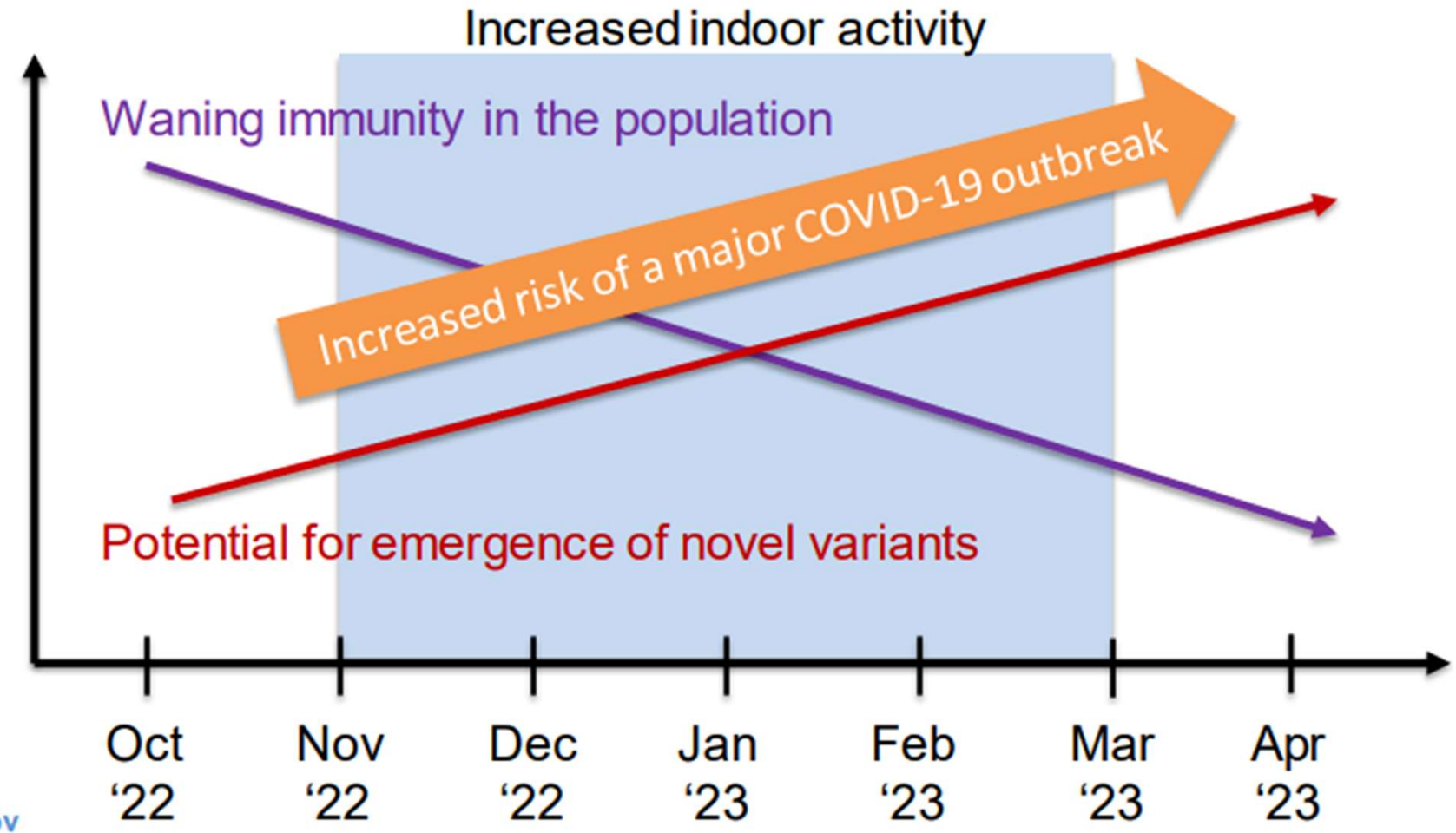
Healthcare & Pharmaceuticals

U.S. FDA advisers recommend change to COVID vaccine composition for fall

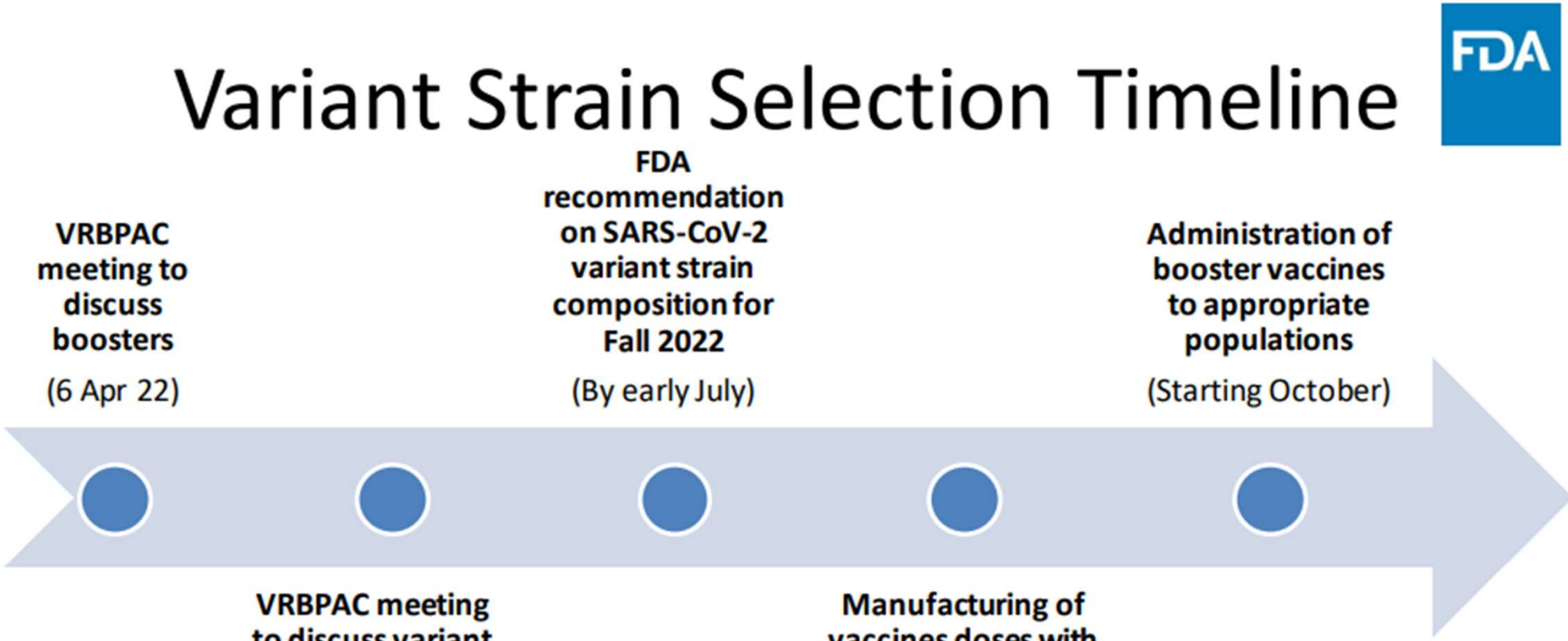
By Michael Erman and Leroy Leo

3 minute read

Potential Evolution of COVID-19



Variant Strain Selection Timeline



BioNTech, Pfizer to start testing universal vaccine for coronaviruses

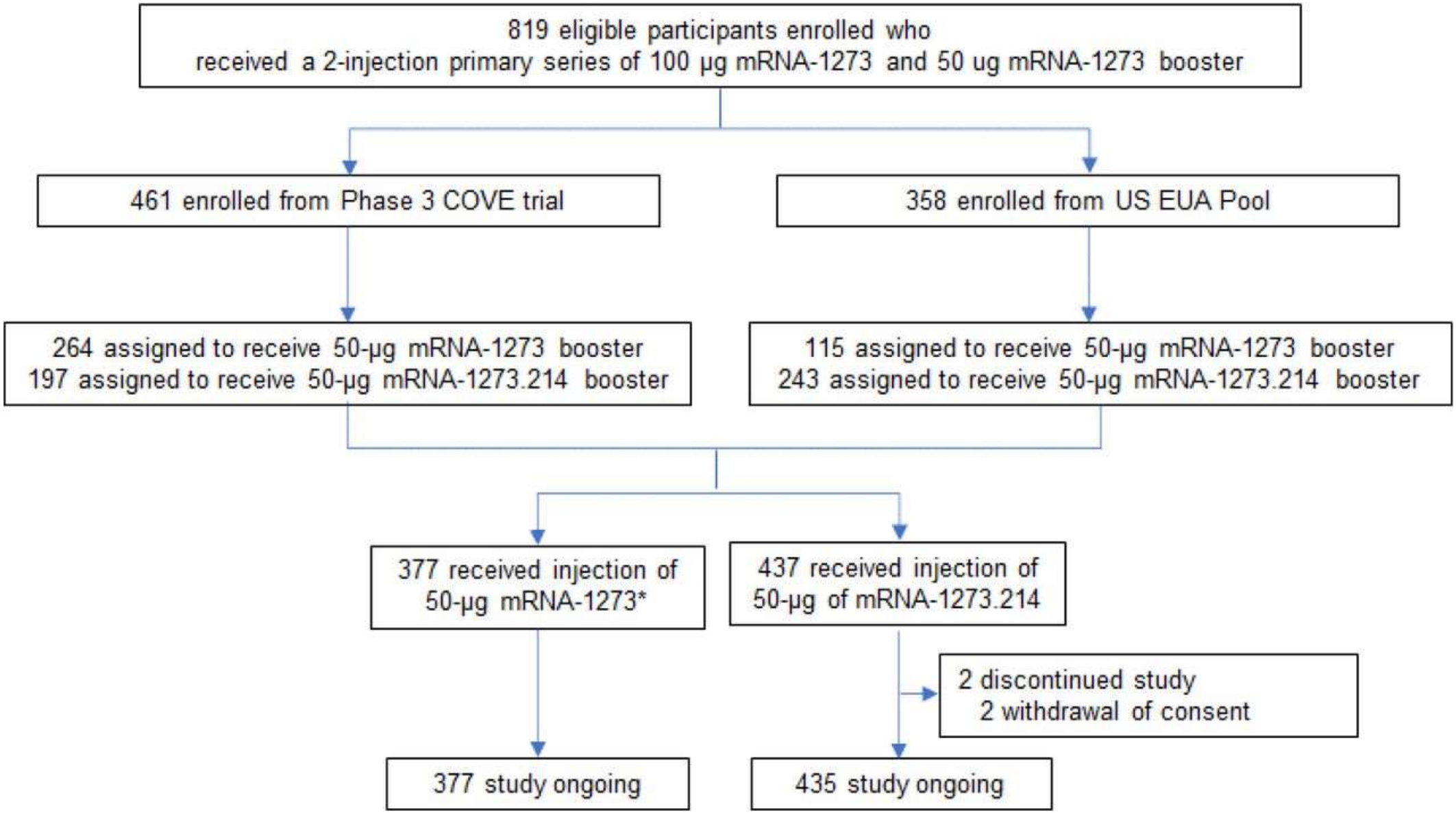
Ludwig Burger • June 29, 20226:45 AM PDTLast Updated 32 min ago

June 29 (Reuters) - Germany's BioNTech (22UAy.DE), Pfizer's (PFE.N) partner in COVID-19 vaccines, said the two companies would start tests on humans of next-generation shots that protect against a wide variety of coronaviruses in the second half of the year.

Their experimental work on shots that go beyond the current approach include T-cell-enhancing shots, designed to primarily protect against severe disease if the virus becomes more dangerous, and pan-coronavirus shots that protect against the broader family of viruses and its mutations.

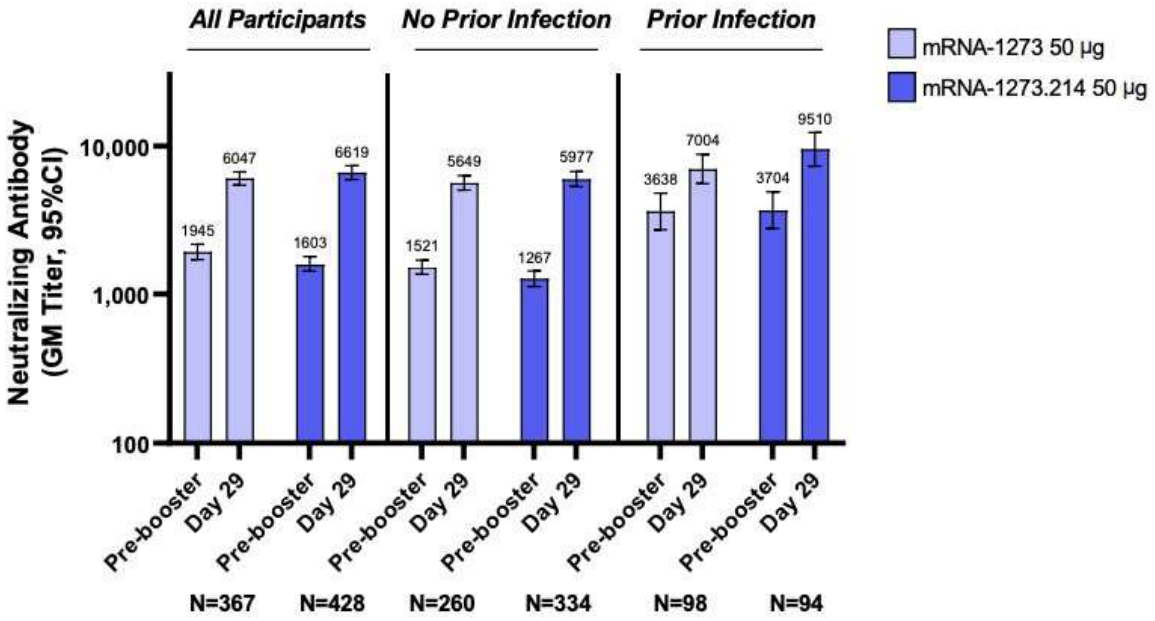
In presentation slides posted on BioNTech's website for its investor day, the German biotech firm said its aim was to "provide durable variant protection".

The two partners, makers of the Western world's most widely used COVID-19 shot, are currently discussing with regulators enhanced versions of their established shot to better protect against the Omicron variant and its sublineages. read more

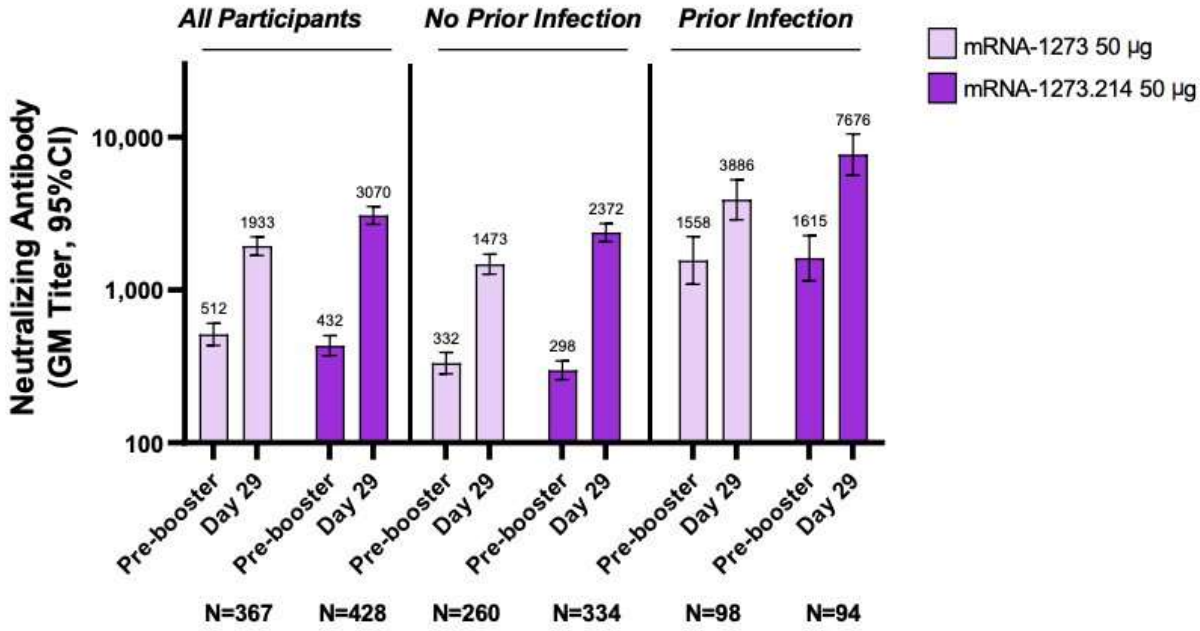


doi: https://doi.org/10.1101/2022.06.24.22276703

A. Ancestral SARS-CoV-2 (D614G)

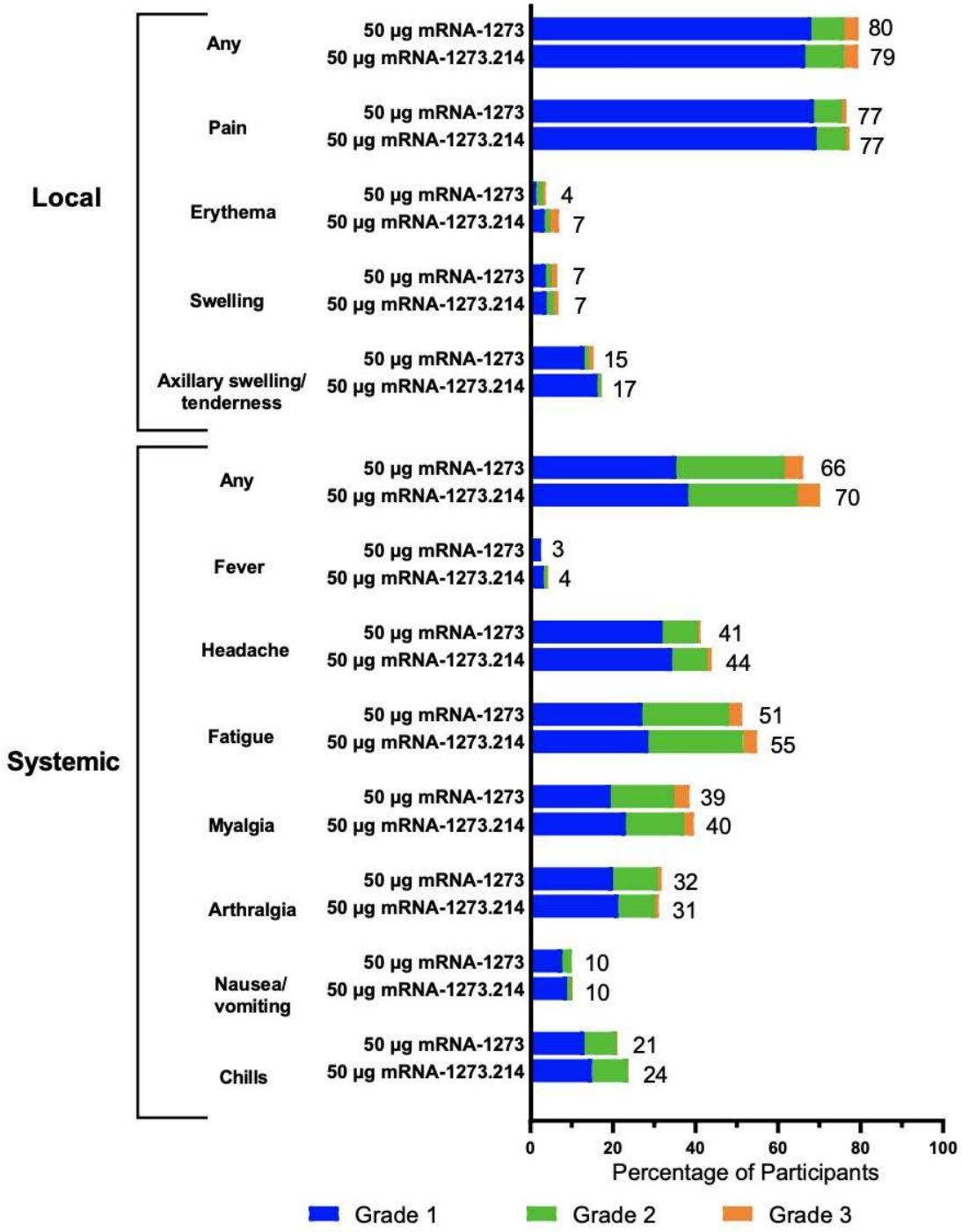


B. Omicron



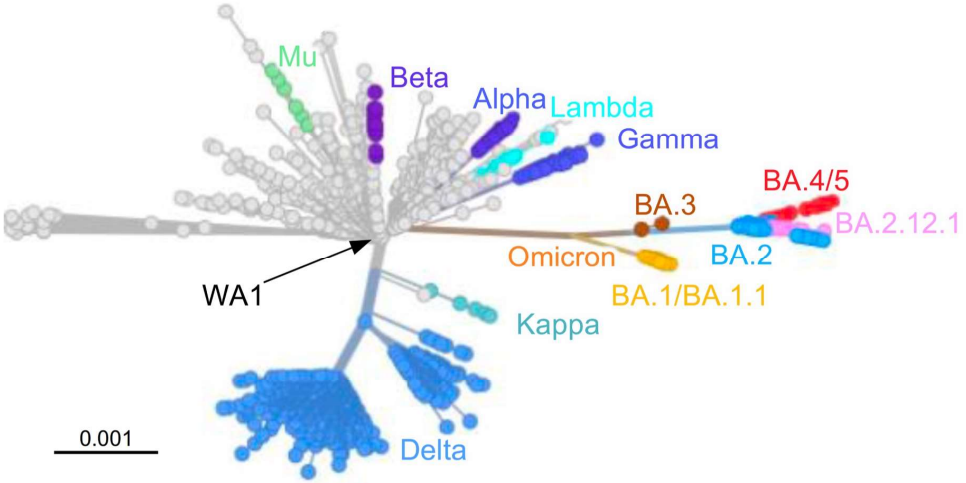
doi: https://doi.org/10.1101/2022.06.24.22276703

Figure 2. Solicited Local and Systemic Adverse Reactions

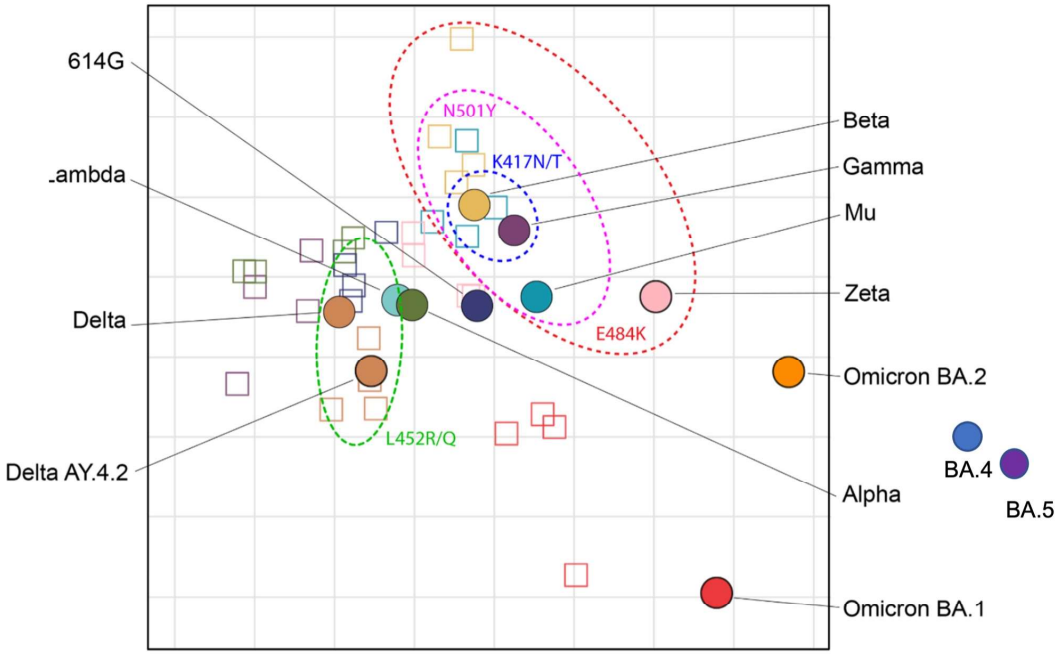


doi: https://doi.org/10.1101/2022.06.24.22276703

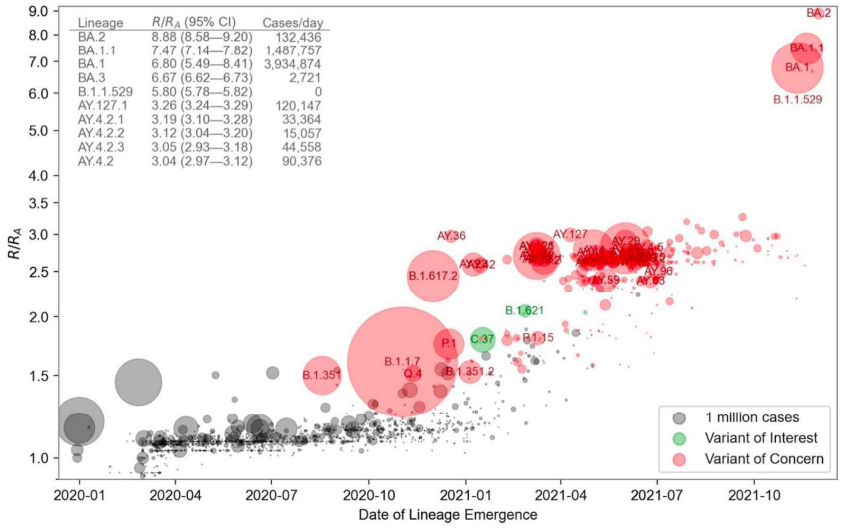
Genetic Distance of SARS-CoV-2 Variants



Antigenic Distance of SARS-CoV-2 Variants



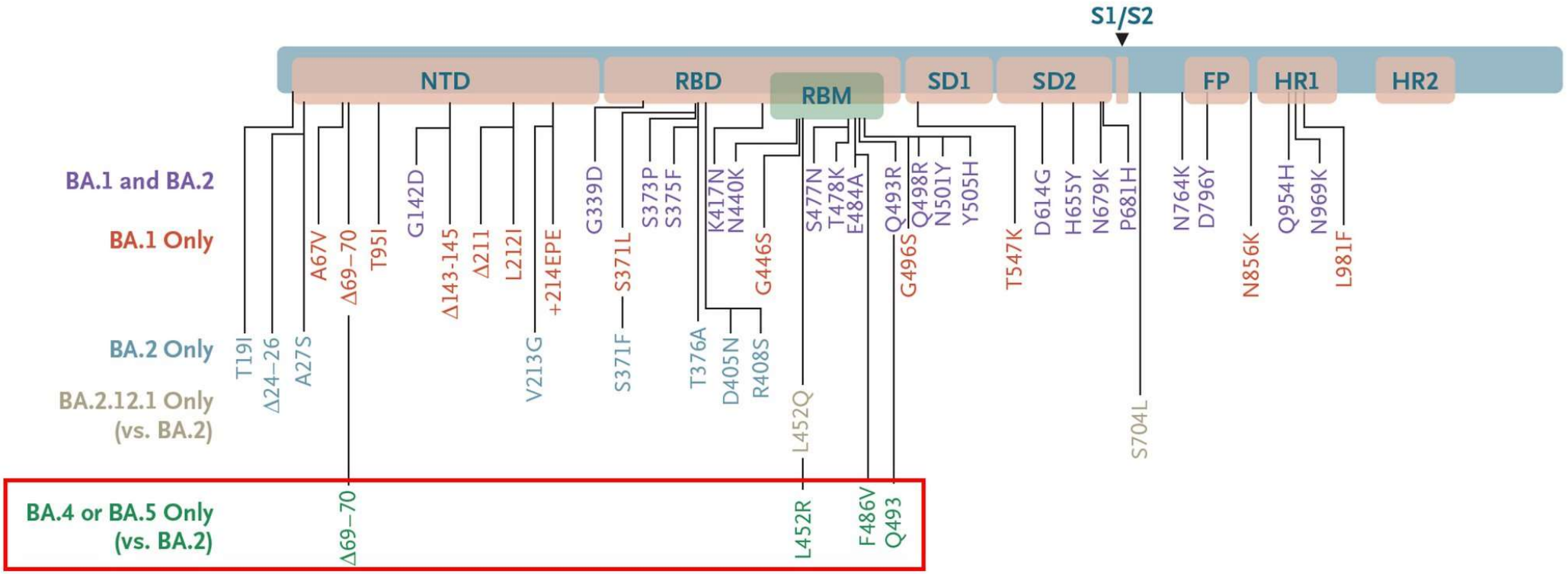
Fitness of SARS-CoV-2 Genomic Variants



Adapted from Science Immunology
https://www.science.org/doi/10.1126/sciimmunol.abq4450
Note that BA.4, BA.5 theoretical, not yet defined (mapped)

https://www.science.org/doi/10.1126/science.abm1208

From Science, Fitness based on 6.4 million SARS-CoV-2 genomes; Fitness is a composite of lineage growth, basic reproduction number, immune evasion, and generation time. Note this graph does not show BA.4/5 which would be off the chart


S1/S2
NTD
RBD
RBM
SD1
SD2
FP
HR1
HR2
BA.1 and BA.2
BA.1 Only
BA.2 Only
BA.2.12.1 Only (vs. BA.2)
BA.4 or BA.5 Only (vs. BA.2)
T19I
Δ24–26
A27S
A67V
Δ69–70
T95I
G142D
Δ143-145
Δ211
L212I
V213G
+214EPE
G339D
S371L
S371F
S373P
S375F
T376A
K417N
N440K
D405N
R408S
G446S
L452Q
L452R
S477N
T478K
E484A
F486V
Q493R
G496S
Q498R
N501Y
Y505H
T547K
D614G
H655Y
N679K
P681H
S704L
N764K
D796Y
N856K
Q954H
N969K
L981F
Δ69–70
Q493

PAHO

Pan American Health Organization

World Health Organization Americas

PAHO 120th ANNIVERSARY

Do it all to stop COVID-19,

including getting vaccinated as soon as it is your turn.

Pan American Health Organization
World Health Organization

PAHO

小結

- 第四劑對高齡及免疫缺失者仍有好處
- 兒童疫苗整體結果還須觀察
- 秋季應有新型疫苗產出
- 新變體應積極監測

蘇迎士
感染科醫師
歐盟流病斑
慈大藥毒所博士