



Universiteit Antwerpen
| Faculteit Geneeskunde en
Gezondheidswetenschappen

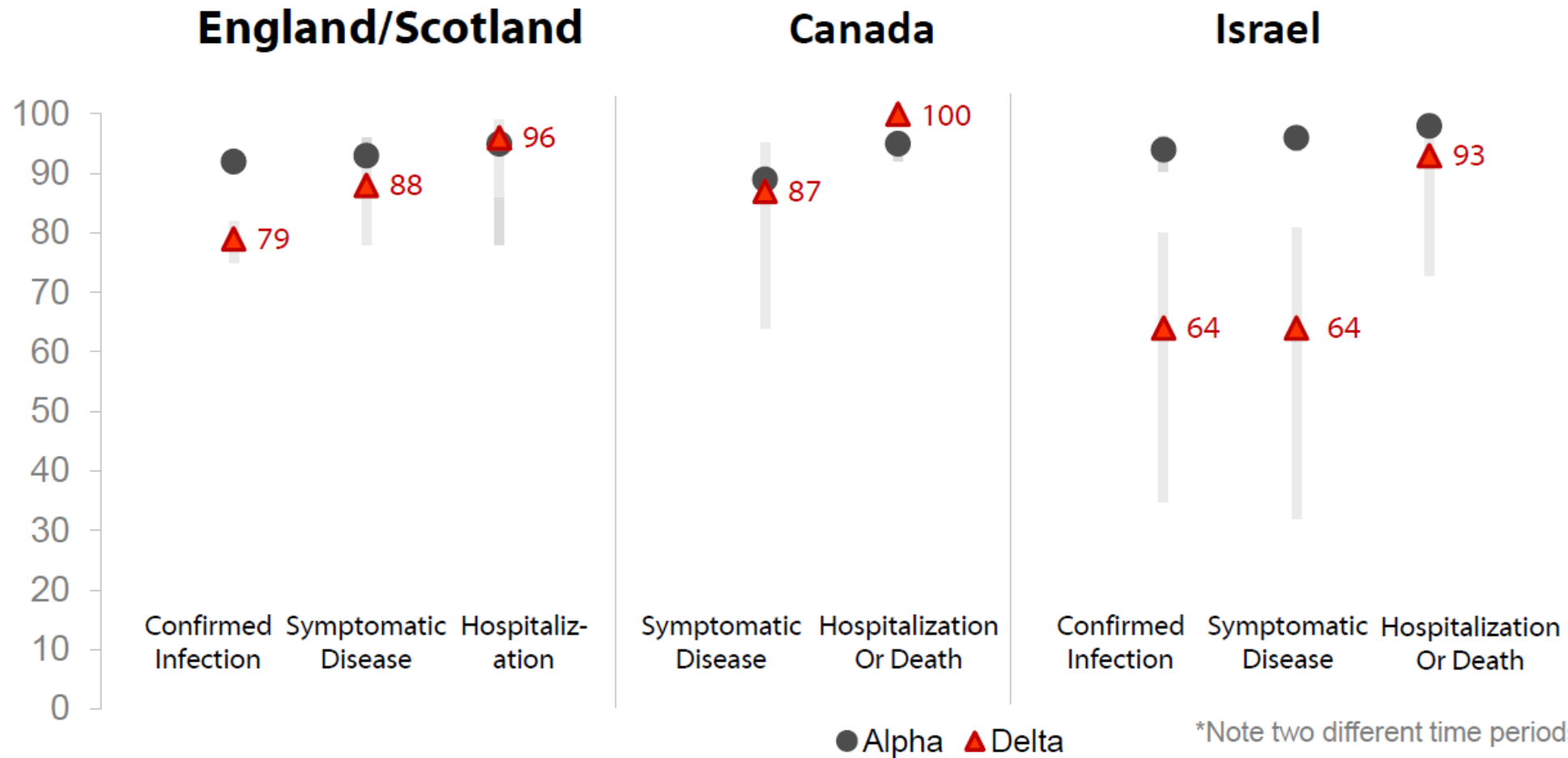
COVID-19 vaccins – July 5, 2022

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Pfizer 2-Dose Vaccine Effectiveness for Alpha vs. Delta



Sheikh et al. Lancet (2021): [https://doi.org/10.1016/S0140-6736\(21\)01358-1](https://doi.org/10.1016/S0140-6736(21)01358-1); Lopez Bernal et al. medRxiv preprint; <https://doi.org/10.1101/2021.05.22.21257658>; Stowe et al. PHE preprint: https://khub.net/web/phe-national/public-library/-/document_library/v2WsRK3ZIEig/view/479607266; Nasreen et al. medRxiv preprint: <https://doi.org/10.1101/2021.06.28.21259420>; <https://www.gov.il/en/departments/news/06072021-04>

UK Covid cases are high going into the winter, but vaccines have greatly reduced the share of cases that end in hospitalisation or death

Covid-19 metrics as a percentage of their peak value last winter

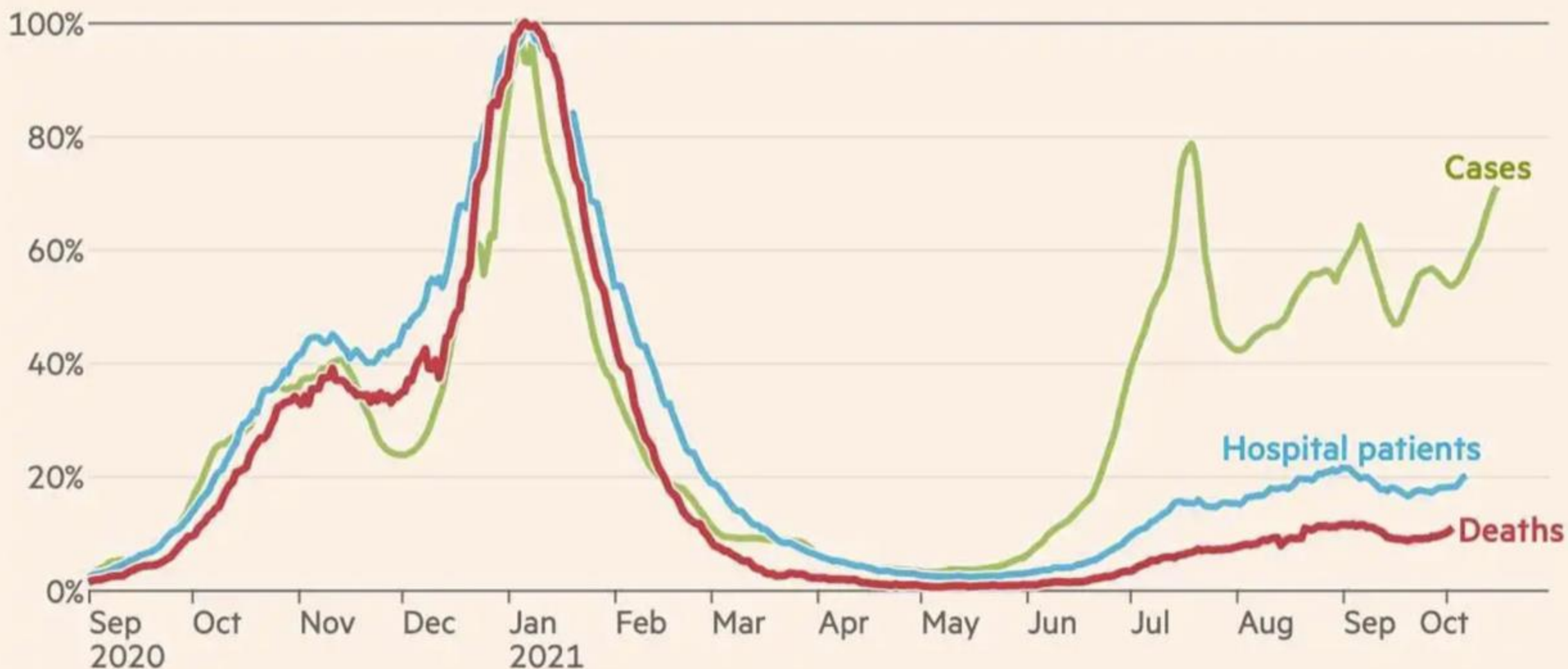
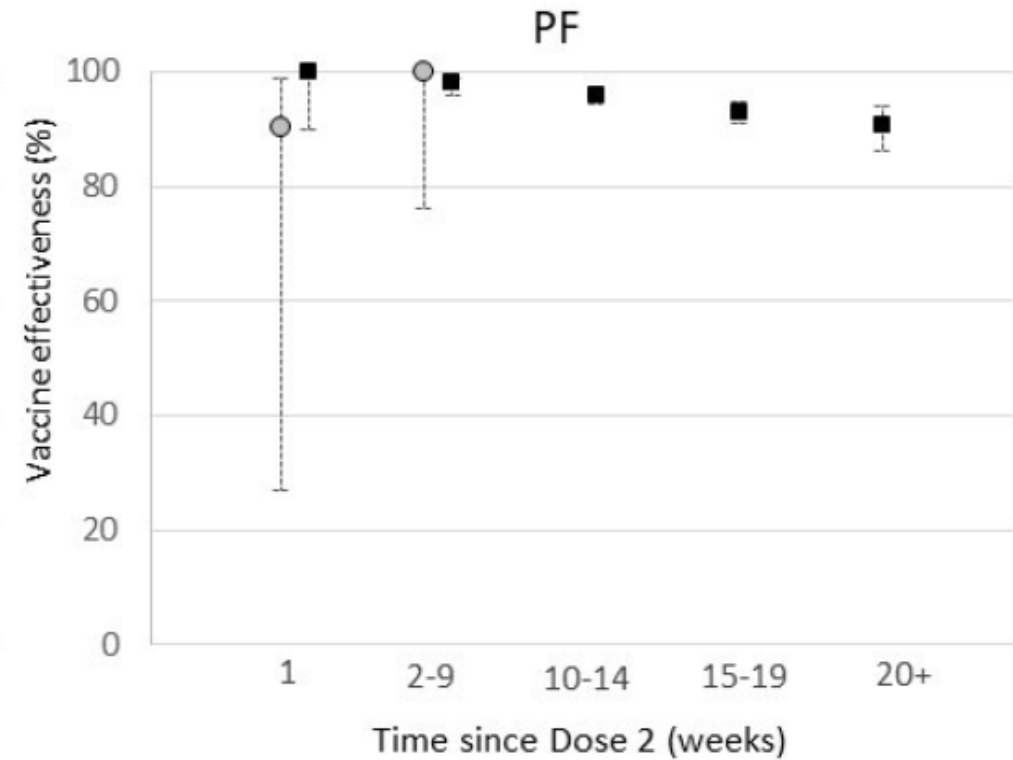
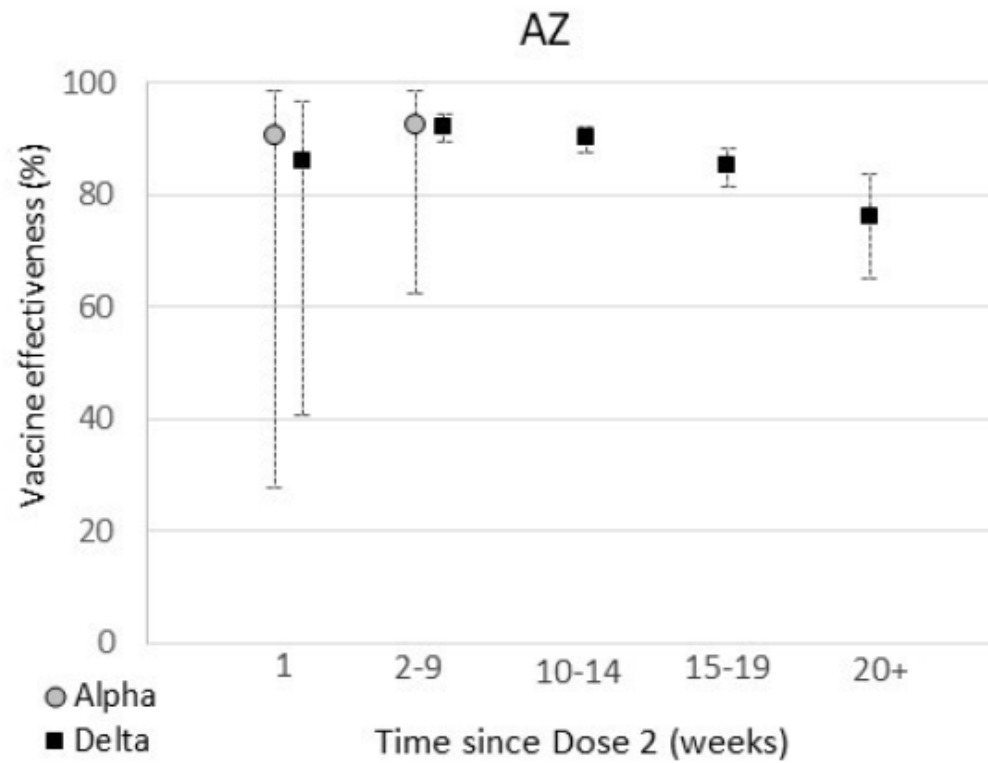


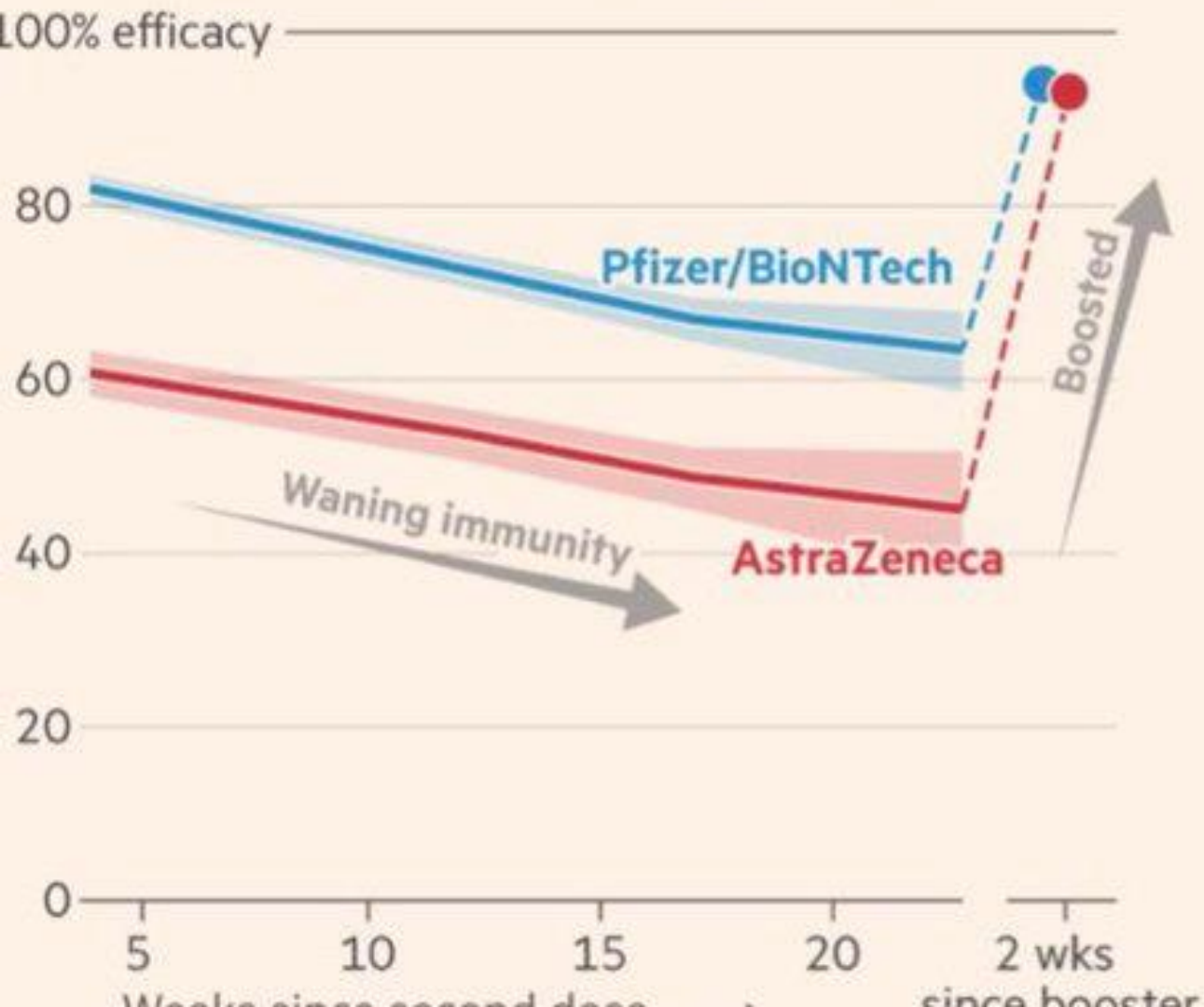
Figure 2. Vaccine effectiveness against hospitalisation by age group for Vaxzevria (AZ) and Comirnaty (PF), for a) 65+ years and b) 40 to 64 years.

a) 65+

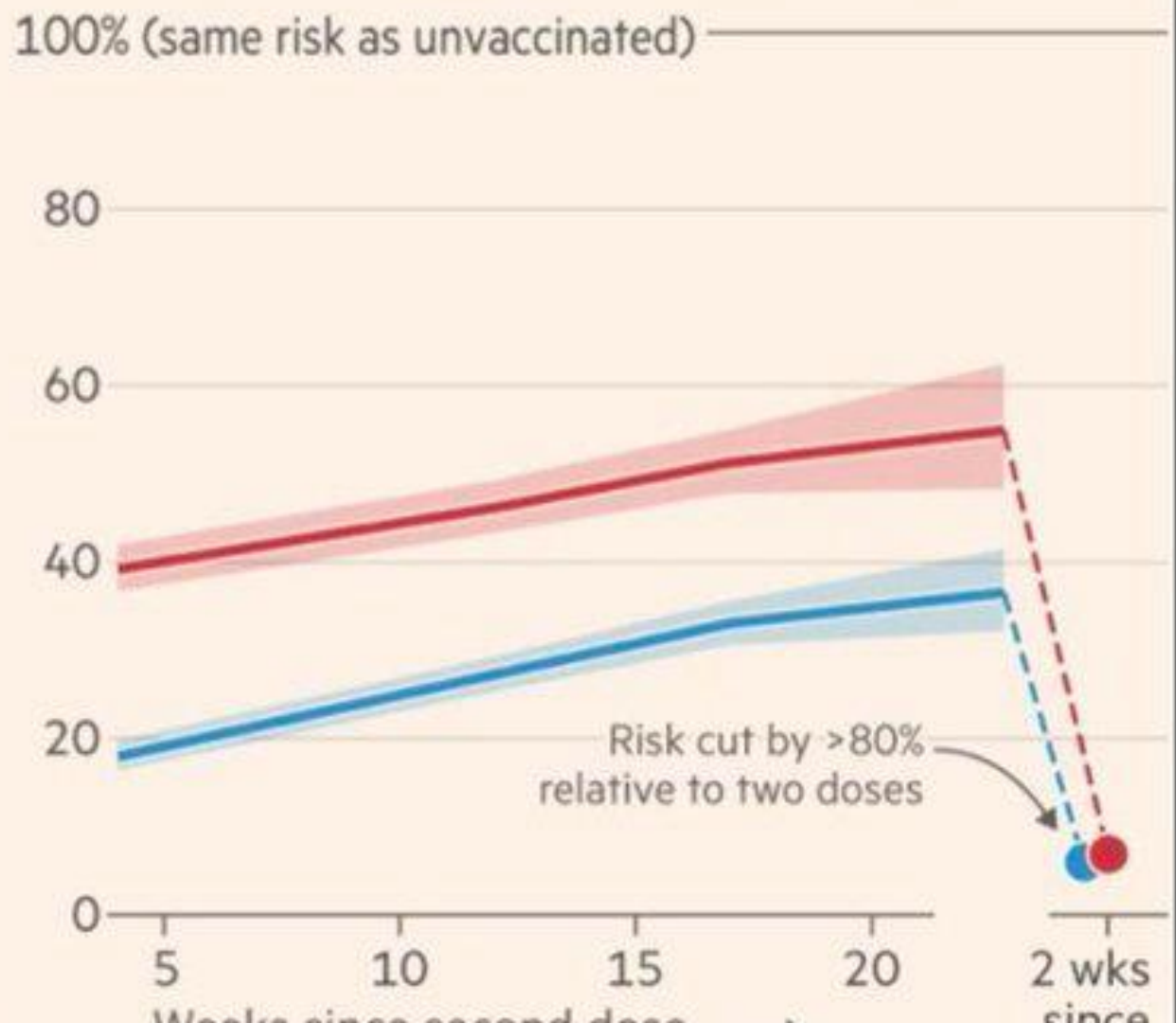


New data from England show boosters do not merely top up immunity, they elevate protection well above the peak level from two doses

Vaccine efficacy against symptomatic infection among people aged 50+*, by initial vaccine**



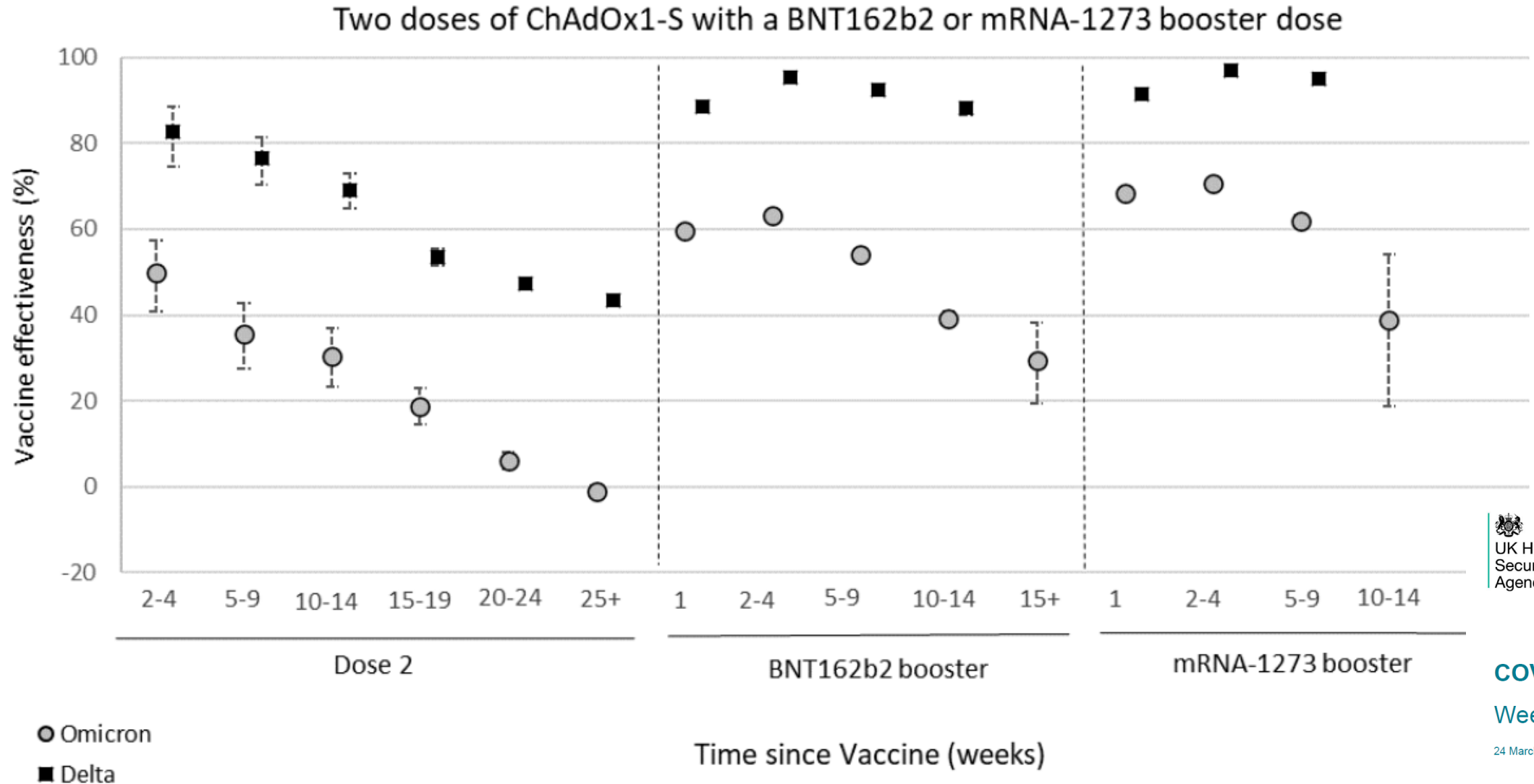
Relative risk of sympt. infection vs unvaccinated, among people aged 50+*, by initial vaccine**



1° booster?

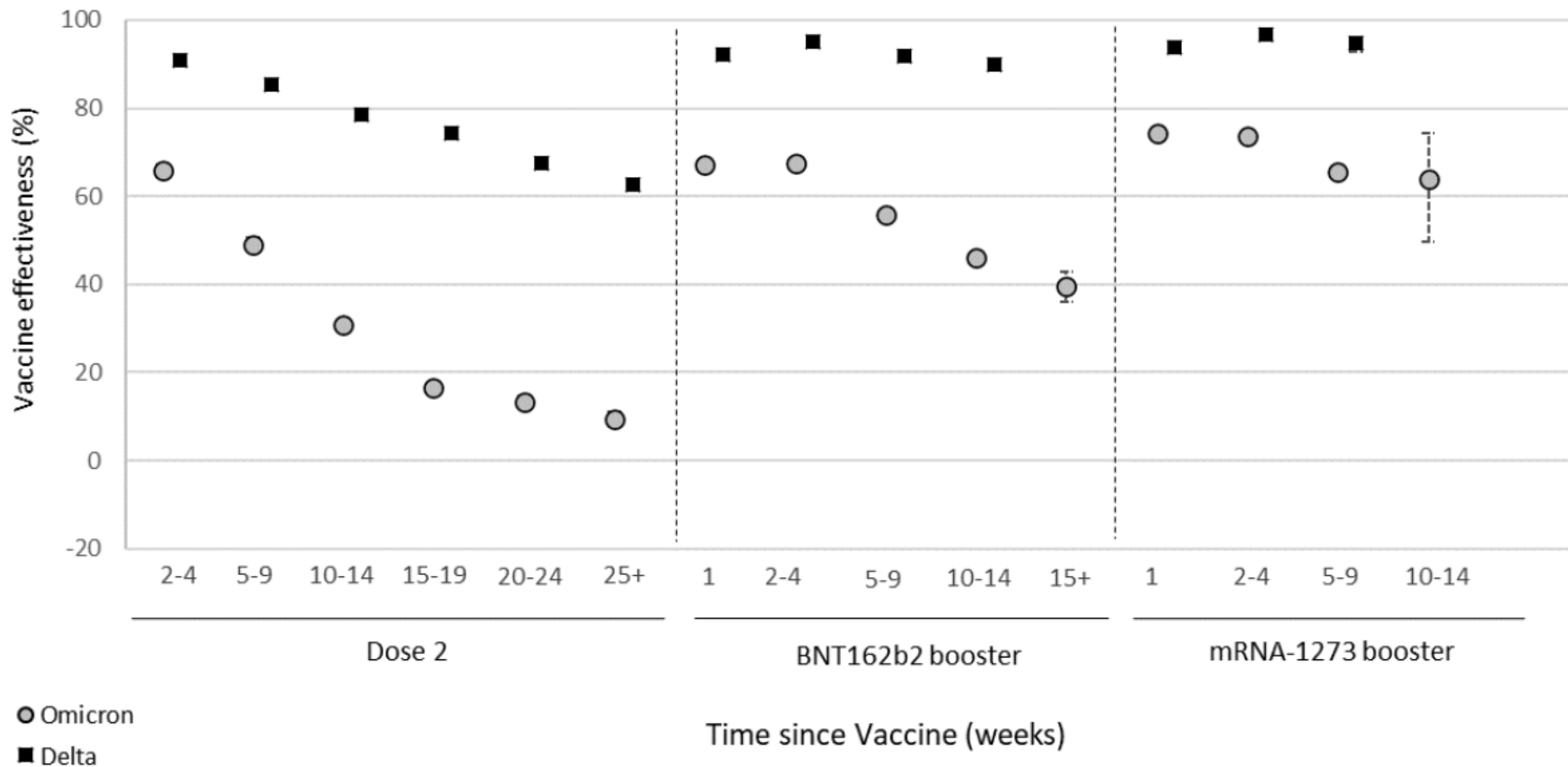
Figure 1. Vaccine effectiveness against symptomatic disease by period after the second and booster doses for Delta (black squares) and Omicron (grey circles) for a) recipients of 2 doses of AstraZeneca (ChAdOx1-S) vaccine as the primary course and Pfizer (BNT162b2) or Moderna (mRNA-1273) as a booster; b) recipients of 2 doses of Pfizer vaccine as the primary course and Pfizer or Moderna as a booster, and c) 2 doses of Moderna as a primary course and Pfizer or Moderna as a booster

a)

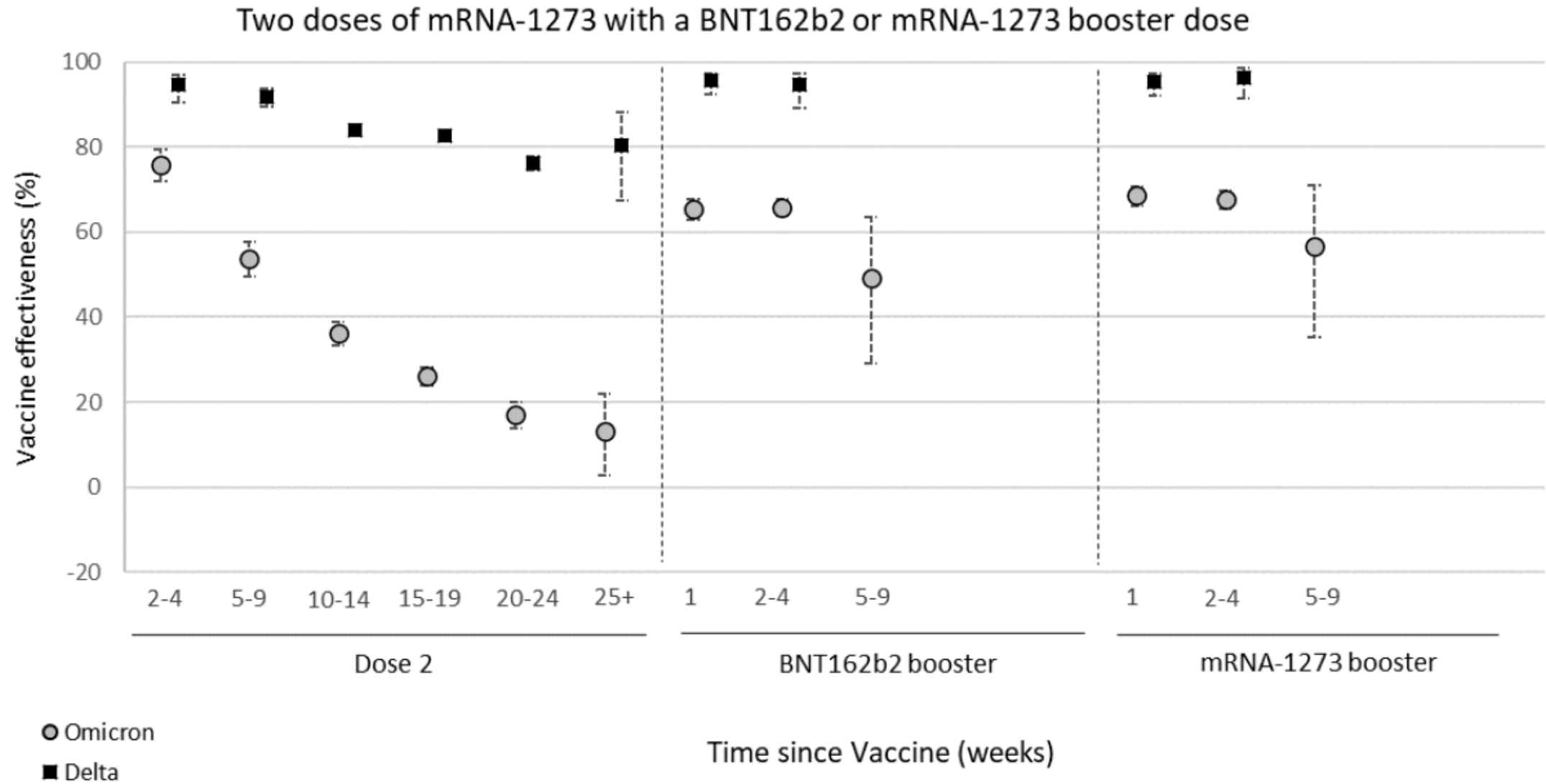


b)

Two doses of BNT162b2 with a BNT162b2 or mRNA-1273 booster dose



c)



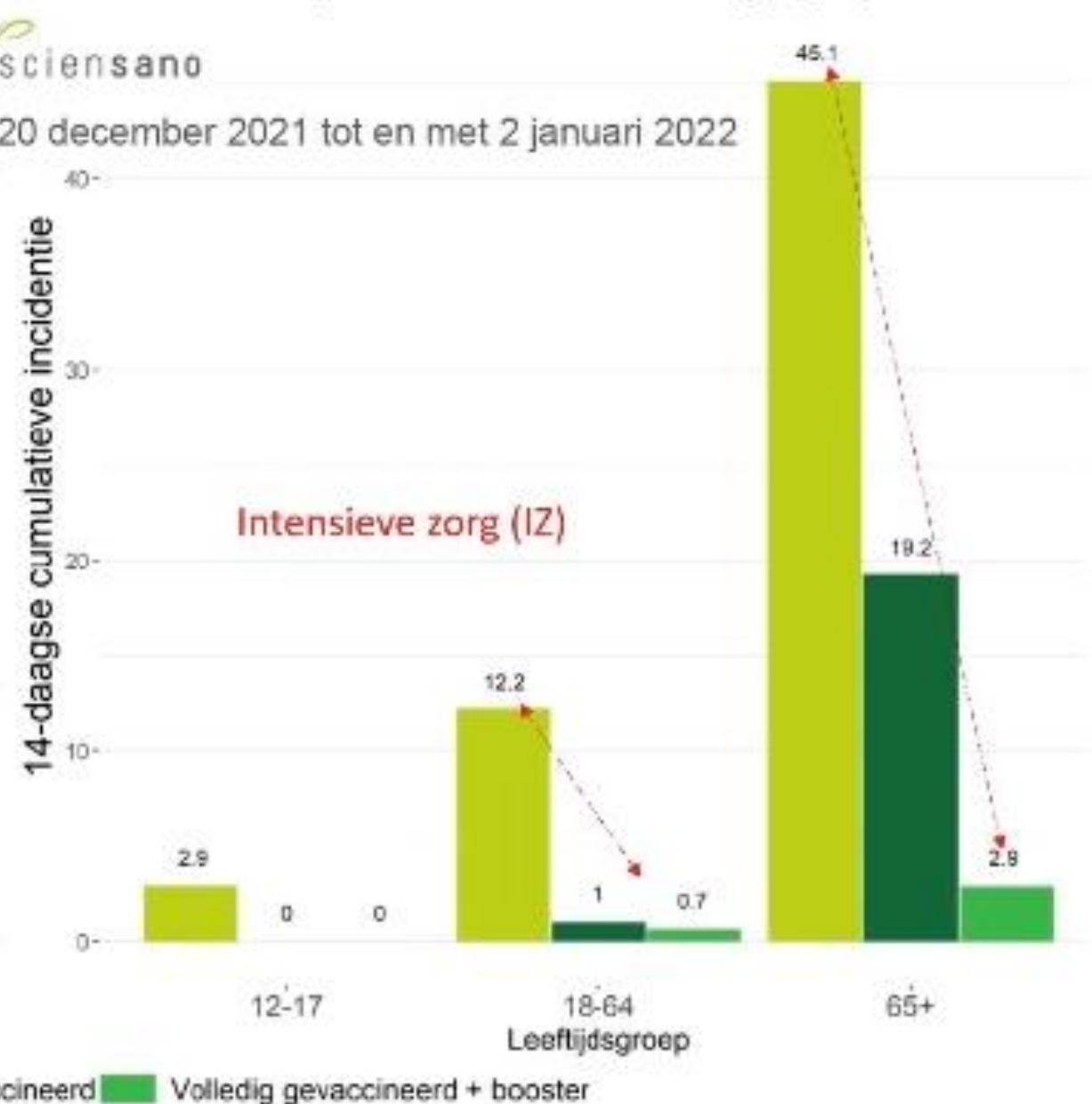
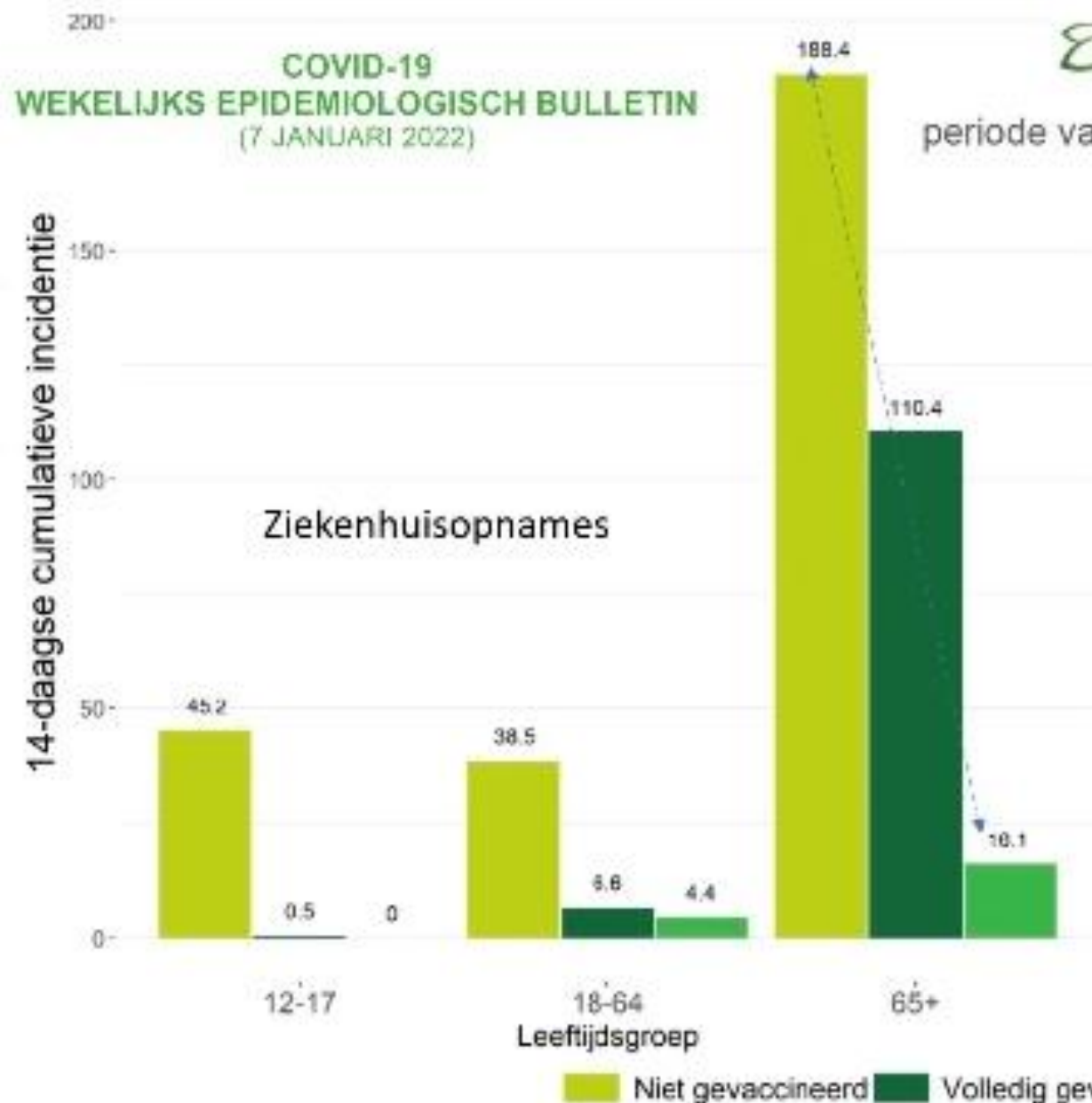
Vaccine Effectiveness (VE) vs Omicron Hospitalization	UKHSA* (95%CI)	Kaiser Southern California (95%CI)	CDC VISION Consortium (95%CI)
2 doses, waned (>4-6 months)	44% (30-54)	68% (56-76)	57% (39,70)
3 doses (+booster)	88% (84,91)	89% (84,92)	90% (80,94)
< 3 months	88% (84,91)	89% (83,92)	NA
> 3 months	83% (78,87)	90% (57,98)	NA

*UK used AZ for 2-doses, and mix of boosters with Pfizer and Moderna, NA –not available

@erictopol

14-daagse cumulatieve incidentie van het aantal
nieuwe COVID-19 hospitalisaties per 100 000 personen
per vaccinatiestatus en leeftijdsgroep

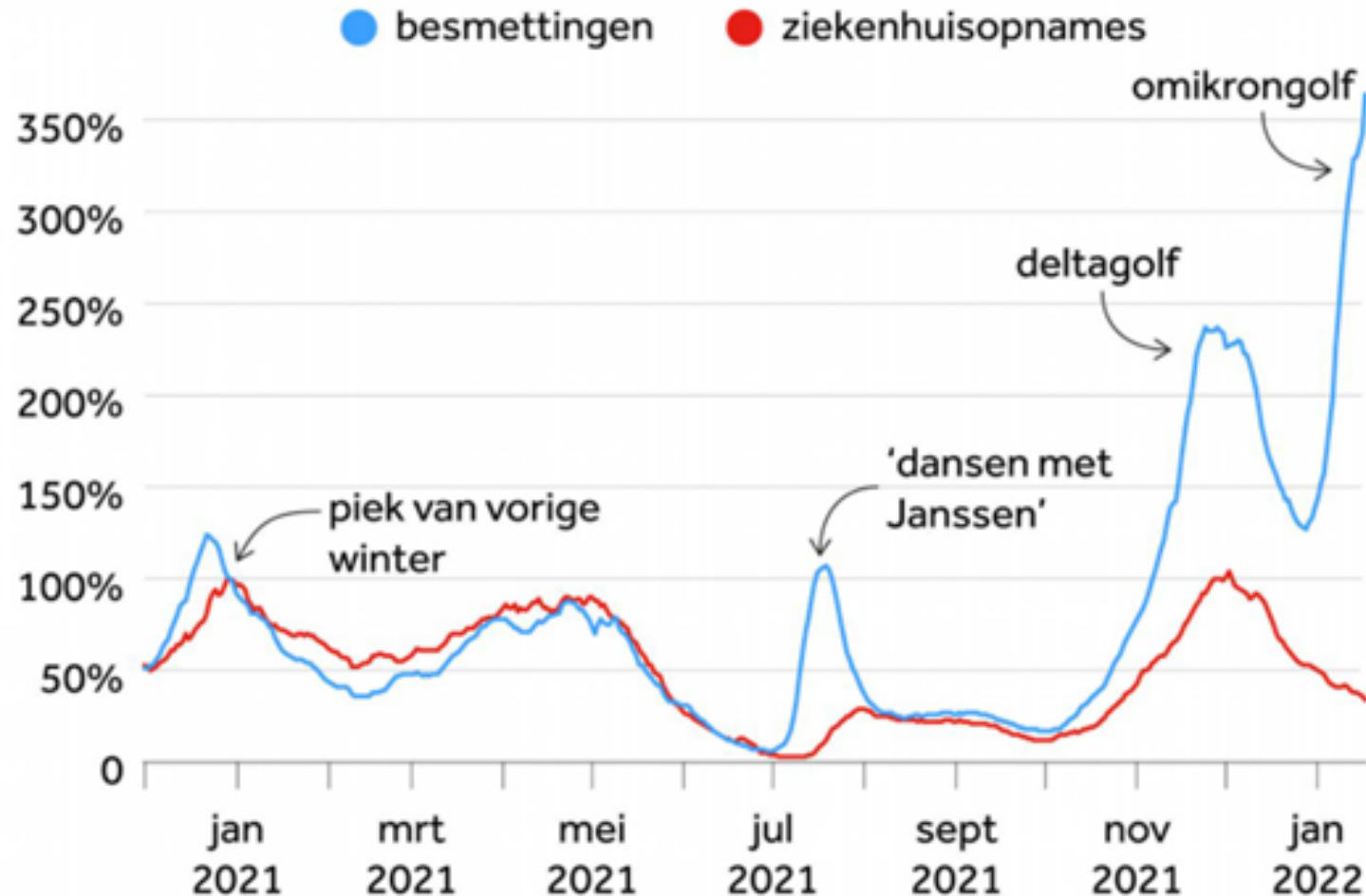
14-daagse cumulatieve incidentie van het aantal
nieuwe COVID-19 IZ opnames per 100 000 personen
per vaccinatiestatus en leeftijdsgroep



Nederland, 18 jan 2022

Ziekenhuisopnames blijven sterk achter

Procentuele groei ten opzichte van piek van vorige winter





Delta

BA.1

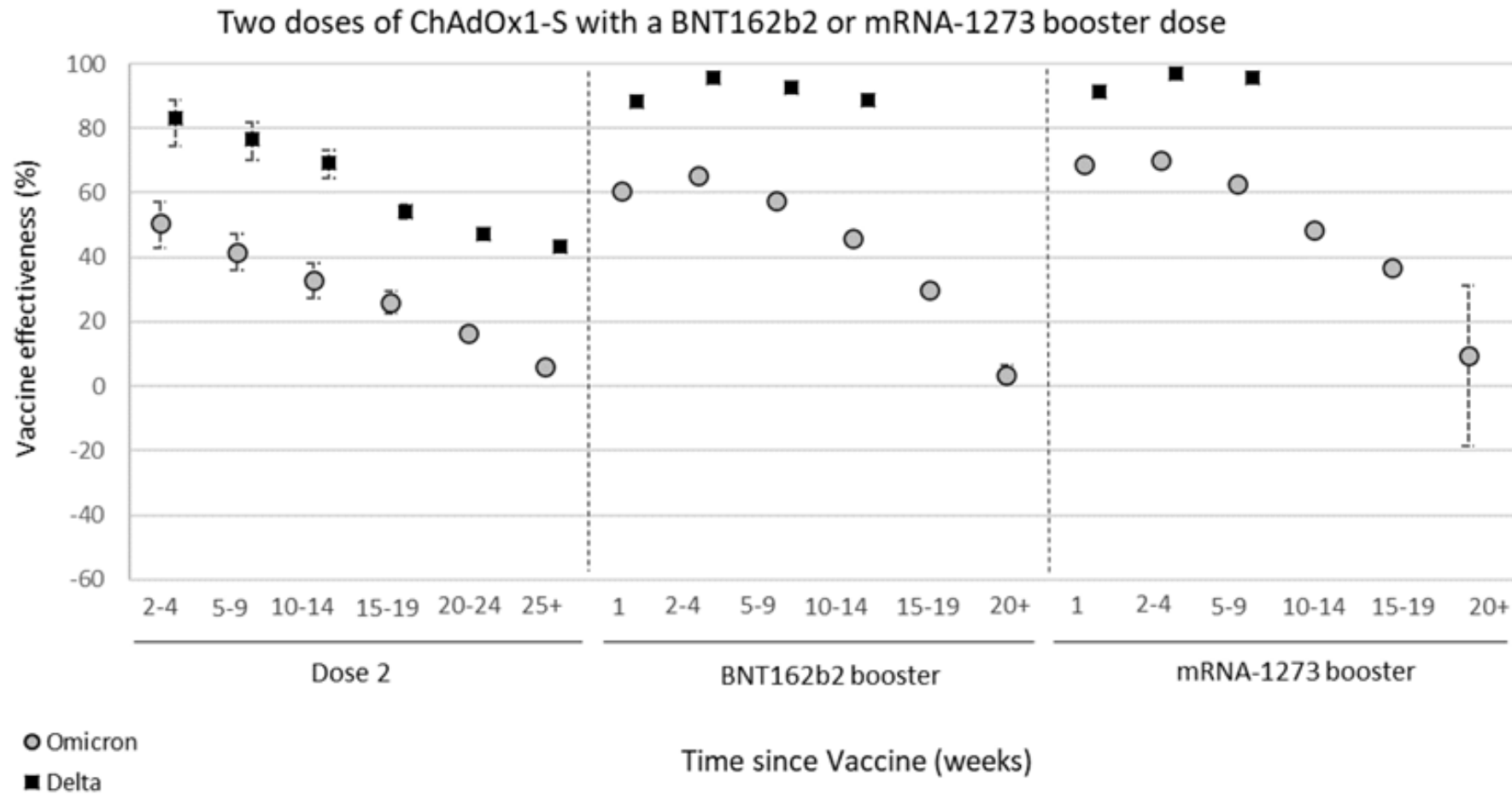
BA.1.1

BA.2

BA.2.12.1

Figure 1. Vaccine effectiveness against symptomatic disease by period after the second and booster doses for Delta (black squares) and Omicron (grey circles) for a) recipients of 2 doses of AstraZeneca (ChAdOx1-S) vaccine as the primary course and Pfizer (BNT162b2) or Moderna (mRNA-1273) as a booster; b) recipients of 2 doses of Pfizer vaccine as the primary course and Pfizer or Moderna as a booster, and c) 2 doses of Moderna as a primary course and Pfizer or Moderna as a booster

a)



Two doses of BNT162b2 with a BNT162b2 or mRNA-1273 booster dose

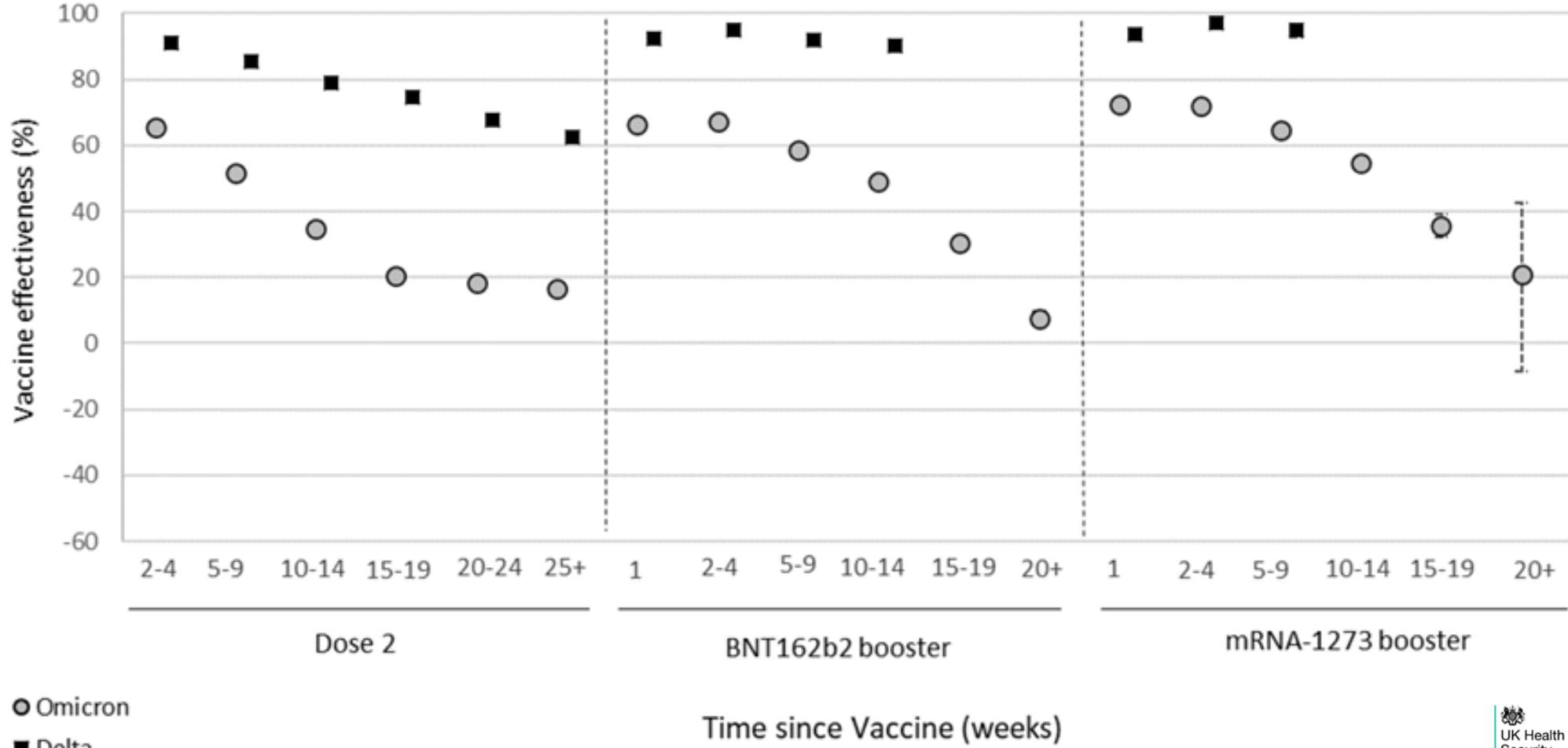


Figure 2. Vaccine effectiveness against symptomatic disease after 2 doses or a booster dose

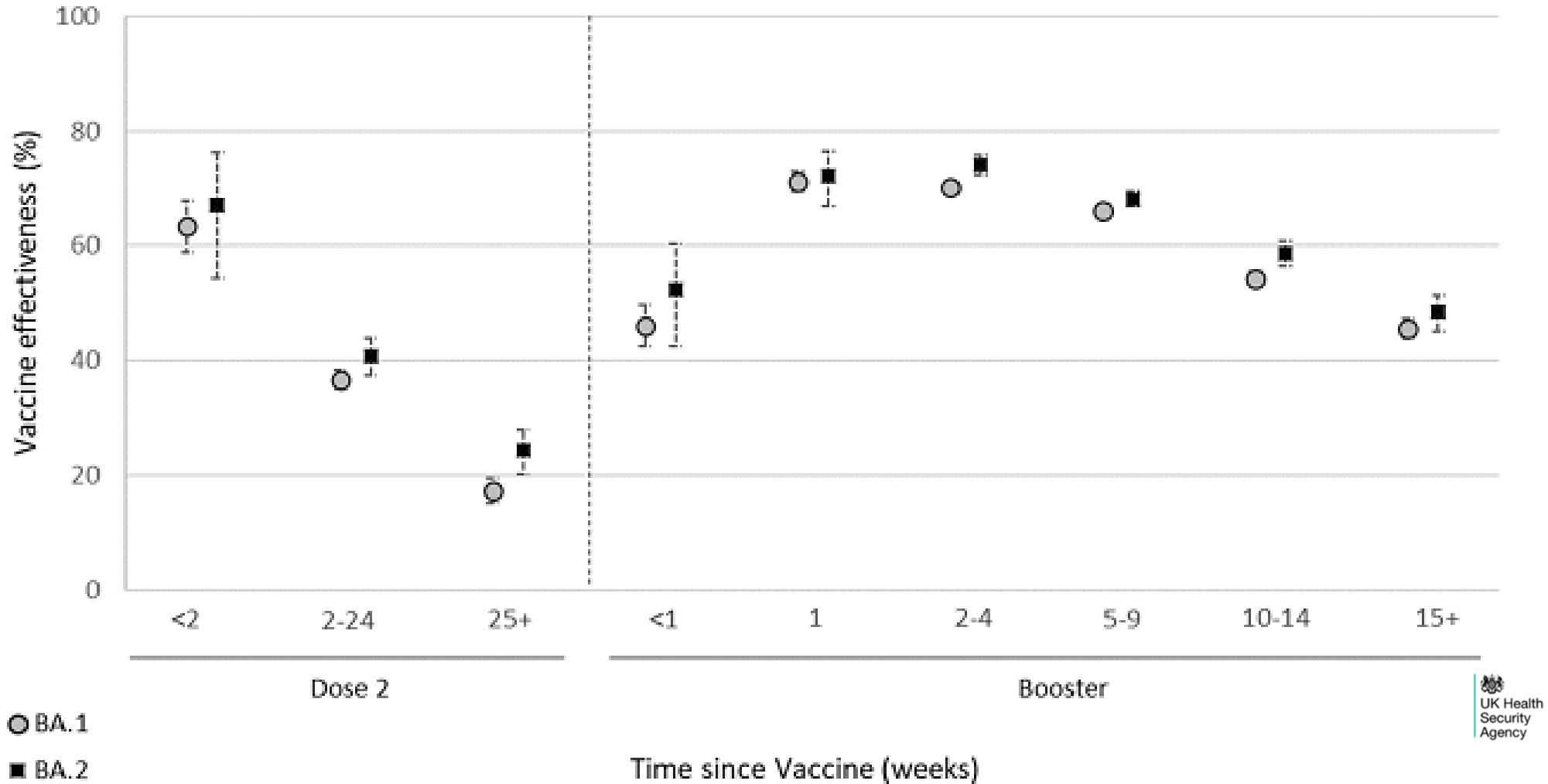


Table 1. vaccine effectiveness against hospitalisation using different definitions of hospitalisations in a) 18 to 64 year olds and b) 65 year olds and over

		ECDS symptomatic with onset date	SUS at least 2 days with ARI code in primary field	SUS at least 2 days and either oxygen, ventilation or ICU with ARI code in primary field
18 to 64				
	Interval	VE	VE	VE
Dose 1	0 to 27	48.5 (12.3 to 69.7)	36.2 (-33.9 to 69.6)	
	28+	48.7 (32.8 to 60.8)	44.1 (25.6 to 58)	75 (42.4 to 89.1)
Dose 2	0 to 13	39.6 (-31.5 to 72.2)	88.9 (58.4 to 97)	
	14 to 174	54.7 (45.3 to 62.4)	69 (58.1 to 77)	86.7 (63.6 to 95.1)
	175+	34.6 (21.7 to 45.4)	56.1 (46.4 to 64)	82.3 (67.7 to 90.3)
Booster	0 to 6	63.9 (52.2 to 72.8)	74.3 (55.9 to 85)	90.7 (56 to 98.1)
	7 to 13	80.1 (73.5 to 85.1)	90.9 (83.2 to 95.1)	
	14 to 34	82.4 (78.6 to 85.6)	88.6 (84.9 to 91.5)	97.1 (92.2 to 98.9)
	35 to 69	72.7 (67.2 to 77.2)	85.8 (82.4 to 88.5)	94.3 (88.9 to 97.1)
	70 to 104	66.9 (59.1 to 73.3)	80.2 (74.9 to 84.4)	89.9 (78.3 to 95.3)
	105+	53.6 (36.9 to 65.9)	67.4 (53.1 to 77.4)	75.9 (15.8 to 93.1)
65+				
	Interval	VE	VE	VE
Dose 1	0 to 27		43.9 (-41 to 77.7)	
	28+		53.4 (36.3 to 65.9)	78.3 (43.7 to 91.7)
Dose 2	0 to 13			
	14 to 174	77.8 (45 to 91)	82.3 (74.3 to 87.8)	90.9 (72.6 to 97)
	175+	66.7 (43.4 to 80.4)	57.7 (49.6 to 64.4)	73.4 (55.1 to 84.3)
Booster	0 to 6	85.8 (61.5 to 94.7)	77.9 (65.3 to 85.9)	89.2 (63.1 to 96.8)
	7 to 13	92.3 (76.3 to 97.5)	84.7 (76 to 90.2)	94.7 (71.6 to 99)
	14 to 34	92.4 (86 to 95.8)	91.3 (89.1 to 93.1)	95.8 (91.3 to 97.9)
	35 to 69	87 (79.2 to 91.8)	89.3 (87.3 to 90.9)	92.8 (88.4 to 95.6)
	70 to 104	84 (74.6 to 89.9)	88.1 (86.1 to 89.9)	92.5 (88.1 to 95.2)
	105+	76.9 (60.6 to 86.4)	85.3 (82.4 to 87.6)	86.8 (77.1 to 92.3)

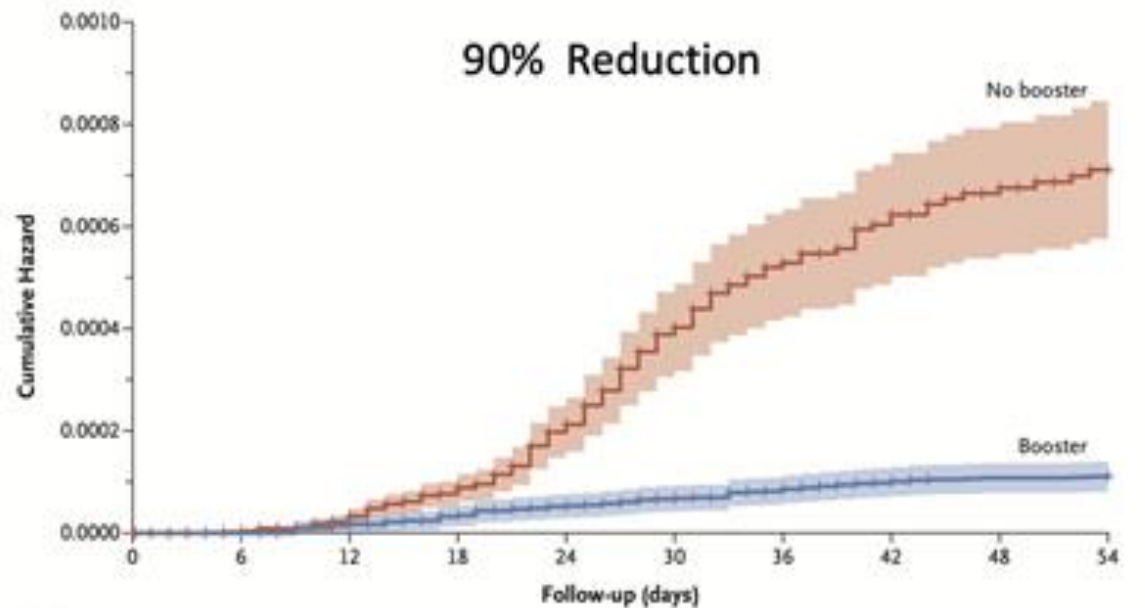
2° booster?



Mortality Reduction at Calit Health for Initial Booster and Second Booster

3rd shot vs 2 shots, age 50+

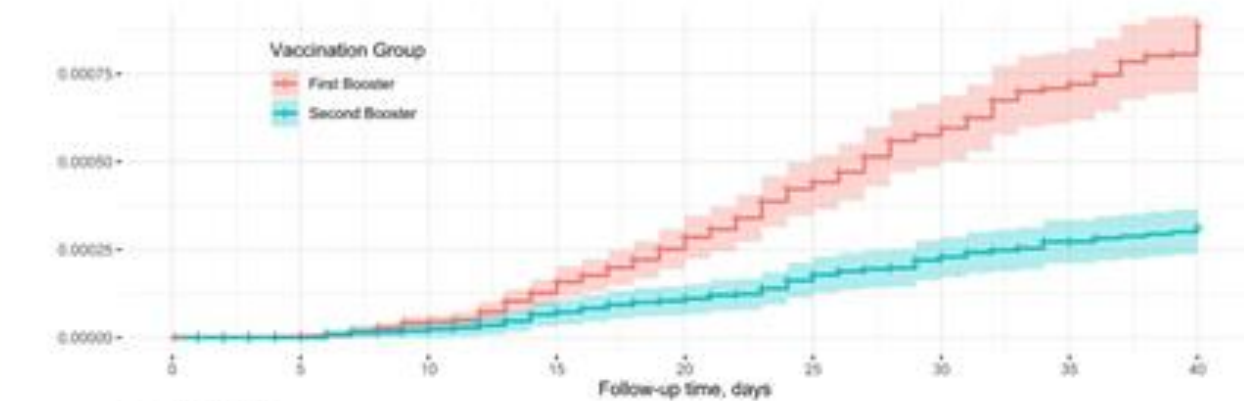
90% Reduction



No. at Risk	0	6	12	18	24	30	36	42	48	54
No booster	841,428	723,609	520,459	326,741	202,797	145,021	111,761	101,695	90,036	83,989
Booster	46,259	119,332	322,203	515,639	639,315	696,859	729,971	739,945	756,591	757,614

4th shot vs 3-shots, age 60+

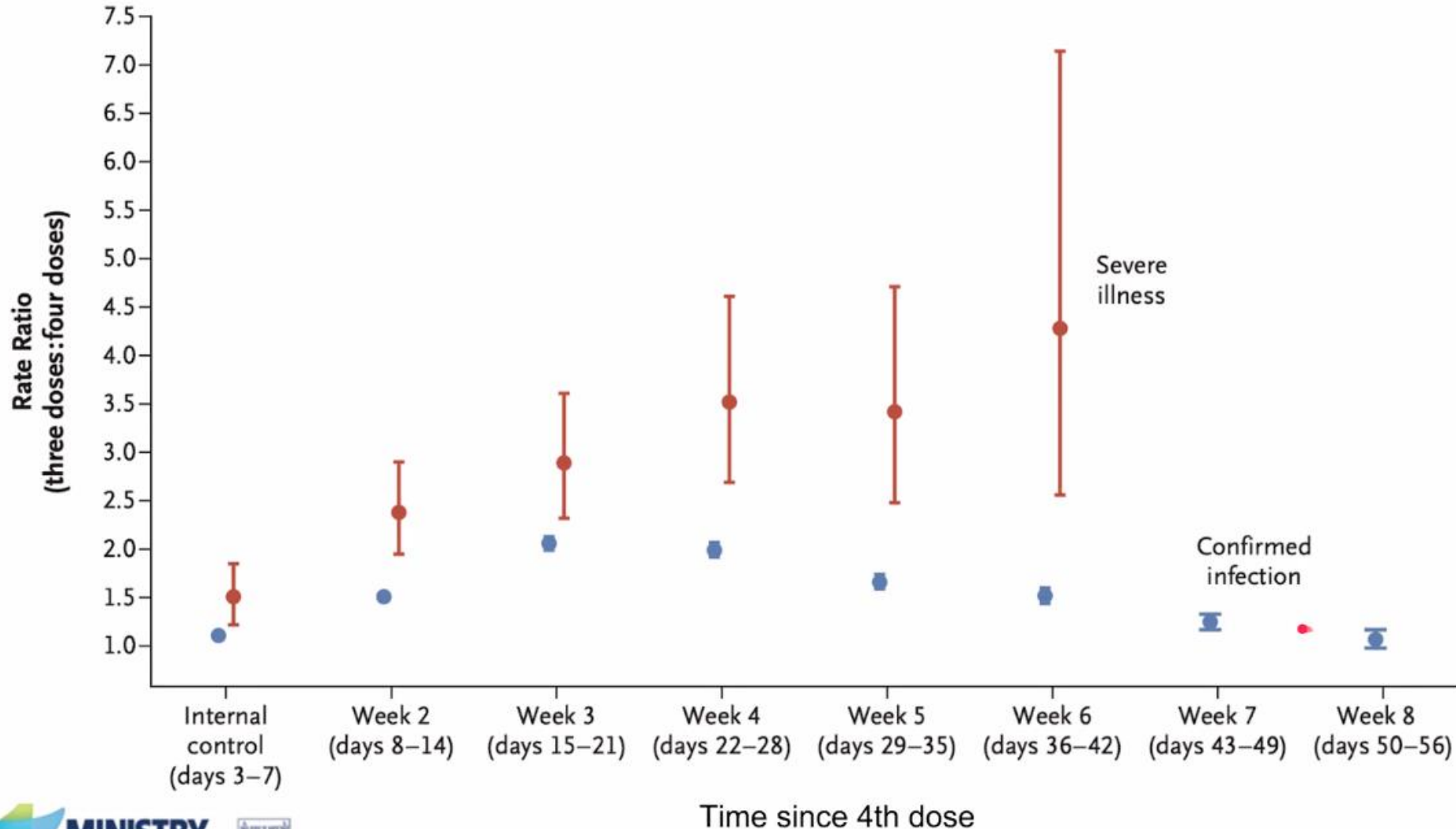
78% Reduction



Vaccination Group	0	5	10	15	20	25	30	35	40
First Booster	550648	453524	329688	284252	264512	250861	243292	238311	233847
Second Booster	12817	109774	233373	278549	298038	311424	318775	323619	328022

Protection as a function of time since 4th dose

Adjusted for age, gender, sector, and calendar day using quasi-Poisson regression



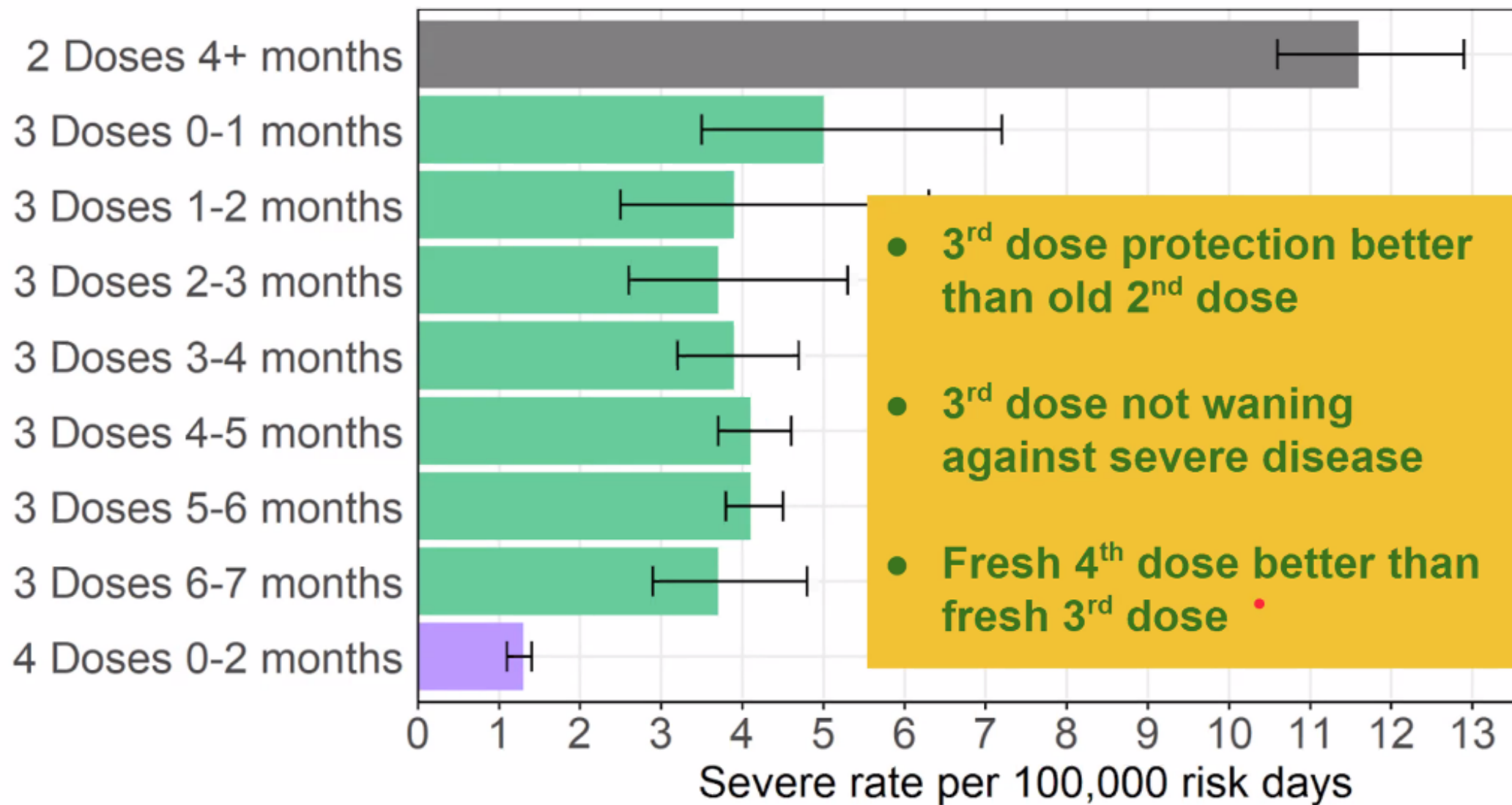
Analysis period for confirmed infection: all infections confirmed between Jan-10 to Mar-2, 2022.

Severe illness: all infections confirmed during Jan-10 to Feb-18, 2022 that deteriorated to severe illness during 14 days after confirmation.

*Severe disease (NIH definition): resting respiratory rate >30 breaths per minute, or O₂ saturation <94%, or PaO₂/FiO₂ <300

Adjusted for age, gender, sector, and epiweek; for those tested Jan 16, 2022 to Mar 12, 2022

Equal follow-up periods of 14 days from confirmation to severe disease

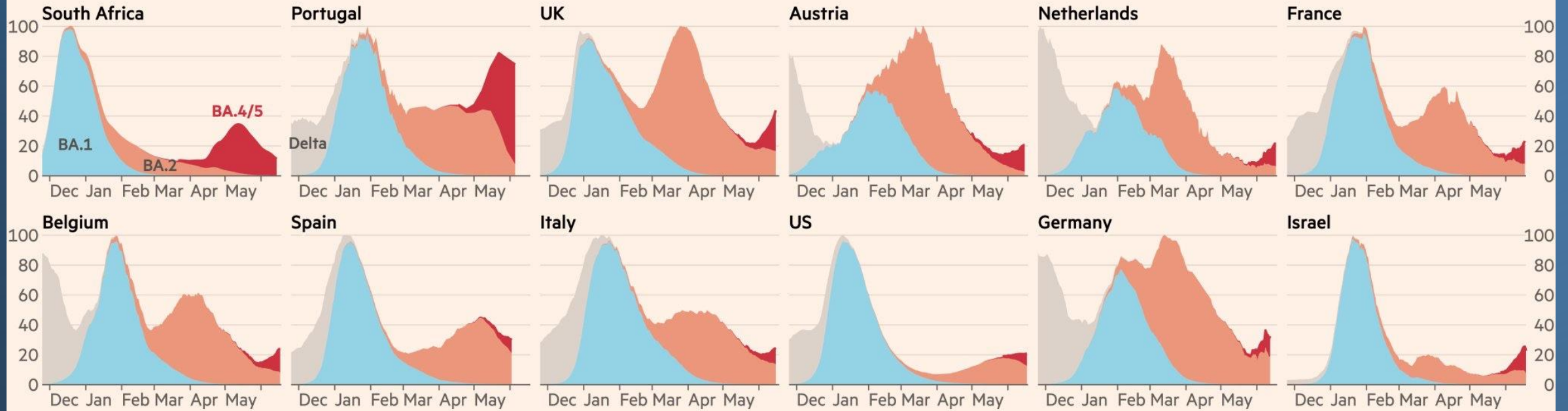


*Severe disease (NIH definition):
resting respiratory rate >30 breaths per minute,
or O2 saturation <94%,
or PaO2/FiO2 <300

FT, end of June 2022

The BA.4/5 Omicron sub-variants triggered waves of Covid hospitalisations in South Africa and Portugal, and are now sending numbers rising elsewhere

Covid hospitalisations as a % of most recent peak, broken down by variant*



*Each variant's share of hospitalisations estimated using method from Tom Wenseleers / @TWenseleers, then applied to total hospitalisations

Source: FT analysis of data from Johns Hopkins CSSE, World Health Organization, GISAID and COG-UK

FT graphic: John Burn-Murdoch / @jburnmurdoch

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During the last two weeks of baseline surveillance - 20/06/2022 to 03/07/2022 - (1006 sequences collected at this stage), BA.5 represented 74% (increasing trend), BA.2 represented 18% (decreasing trend) and BA.4 represented 8% (stable trend).

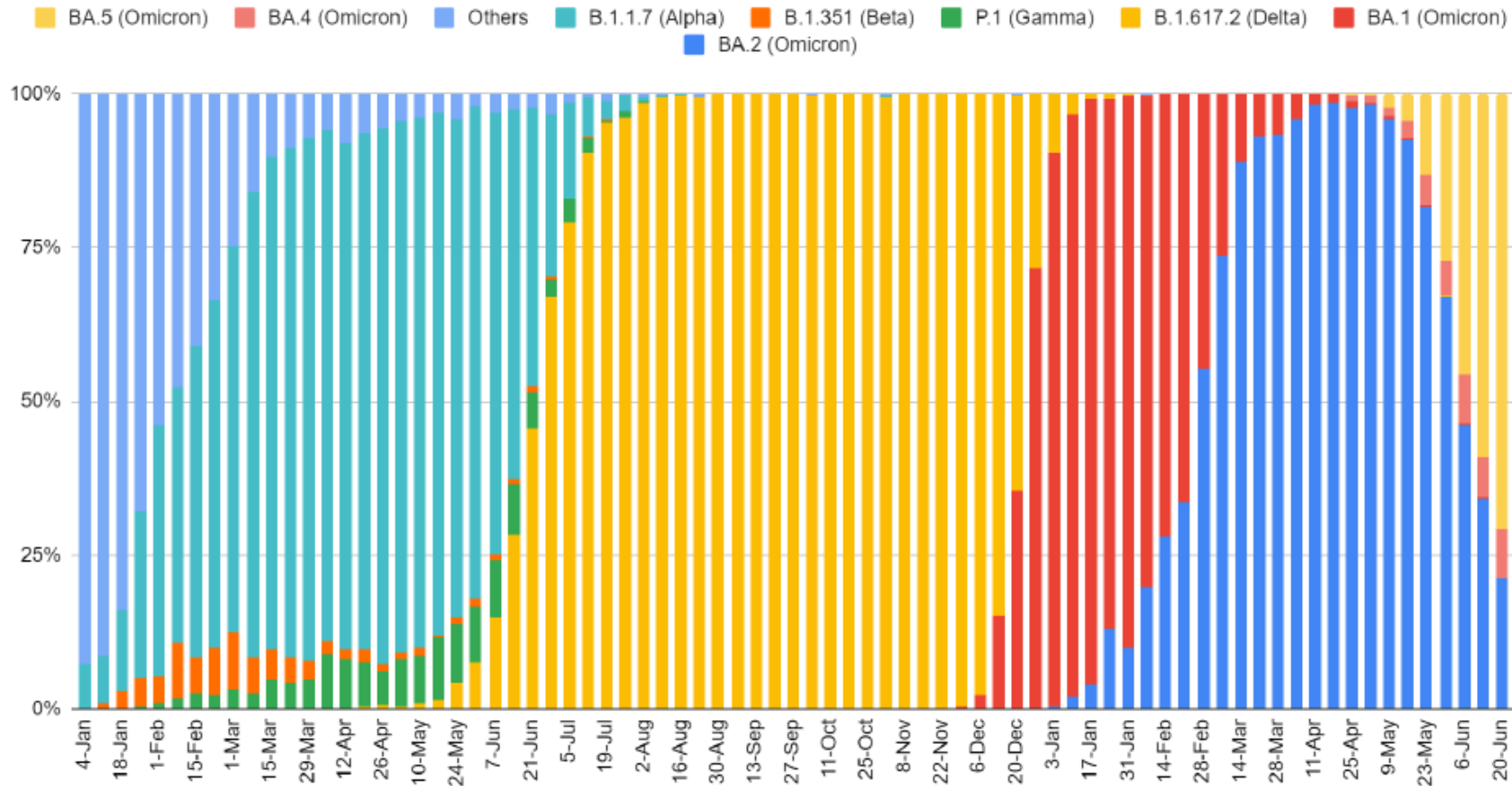


Table 4. Adjusted odds ratios of BA.4 and BA.5 cases as compared to BA.2 controls by vaccination status

Doses	Interval	Controls	Cases	Adjusted odds ratio	95% Confidence interval
		BA.2	BA.4		
Dose 2/3/4	< 25 weeks	8,663	123	1.13	(0.88-1.44)
Dose 2/3	>= 25 weeks	10,896	214	Baseline	
		BA.2	BA.5		
Dose 2/3/4	< 25 weeks	8,663	103	0.83	(0.64-1.08)
Dose 2/3	>= 25 weeks	10,896	232	Baseline	



SARS-CoV-2 variants of concern and variants under investigation in England

Technical briefing 43

24 June 2022

This report provides an update on previous [briefings](#) up to 20 May 2022

What should we do?

- **Extend 2^o booster to a larger part of the population?**
- **When?**
 - September 2022:
 - with monovalent BA1-Omicron-tailored or bi-valent (Wuhan-BA1 Omicron) vaccine
 - Might confer broader immunity also to novel variant
- **Protection is waning**
- **No immediate safety issues with 2nd booster**
- **Interval since last vaccination increases**
- **COVID-19 continues to circulate**

- **Precautionary measure?**