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VACCINEUDRULNING I DANMARK OG VACCINEEFFEKTIVITETS-STUDIER

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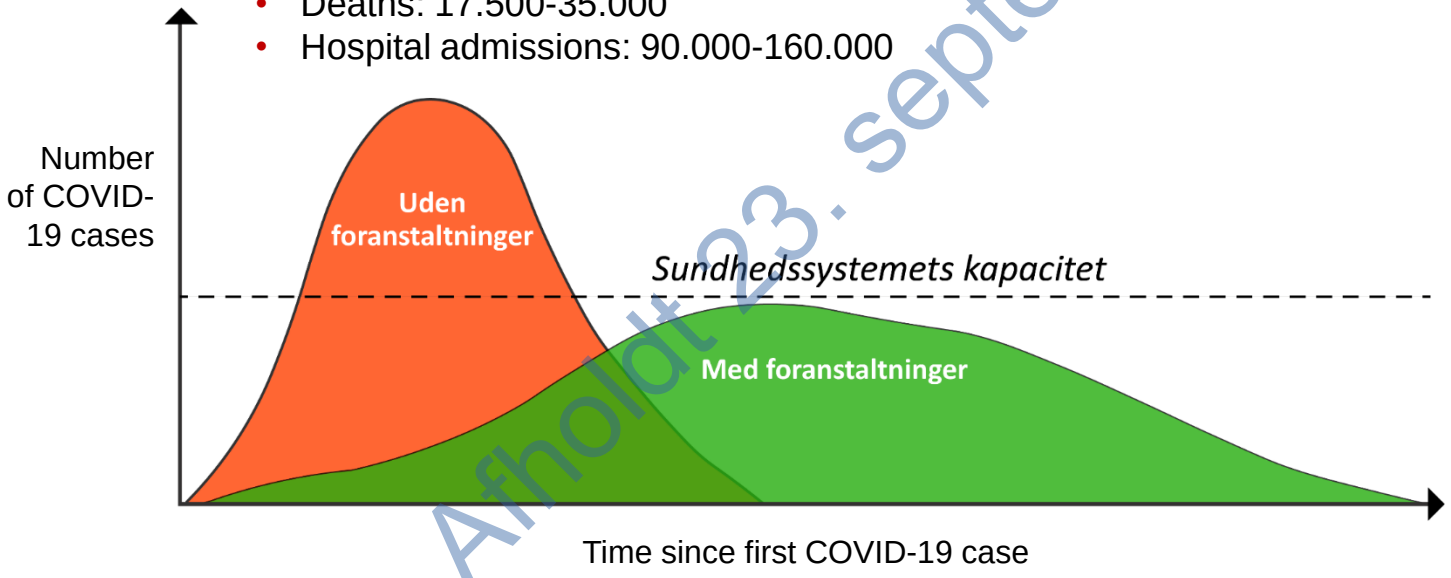
WORST CASE SCENARIO

Without vaccines and with the original SARS-CoV-2-variant

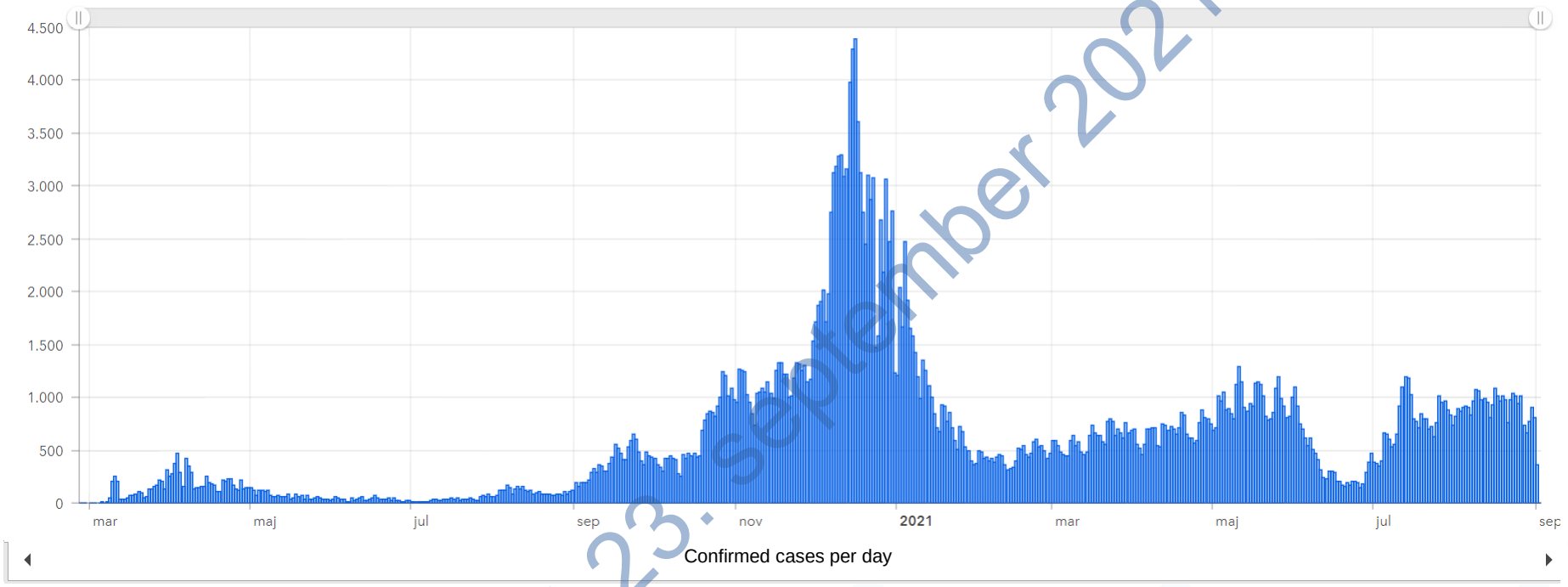
- R0 (basale reproduction number): 2,5
- IFR 0,5-1%
- Herd immunity: 60%
- Deaths: 17.500-35.000
- Hospital admissions: 90.000-160.000

Alfa and delta variants have higher R0

Herd immunity of 86% (delta-variant)



Confirmed cases



Confirmed cases per day

What happened?

Deaths	Admissions
2.584 (0,7 %)	16.919

Full vaccination

72,1 %

- AstraZeneca Covid-19 vaccine 3,4 %
- Janssen COVID-19 vaccine 1 %
- Moderna Covid-19 Vaccine 12,3 %
- Pfizer BioNTech Covid-19 vacc 83,2 %

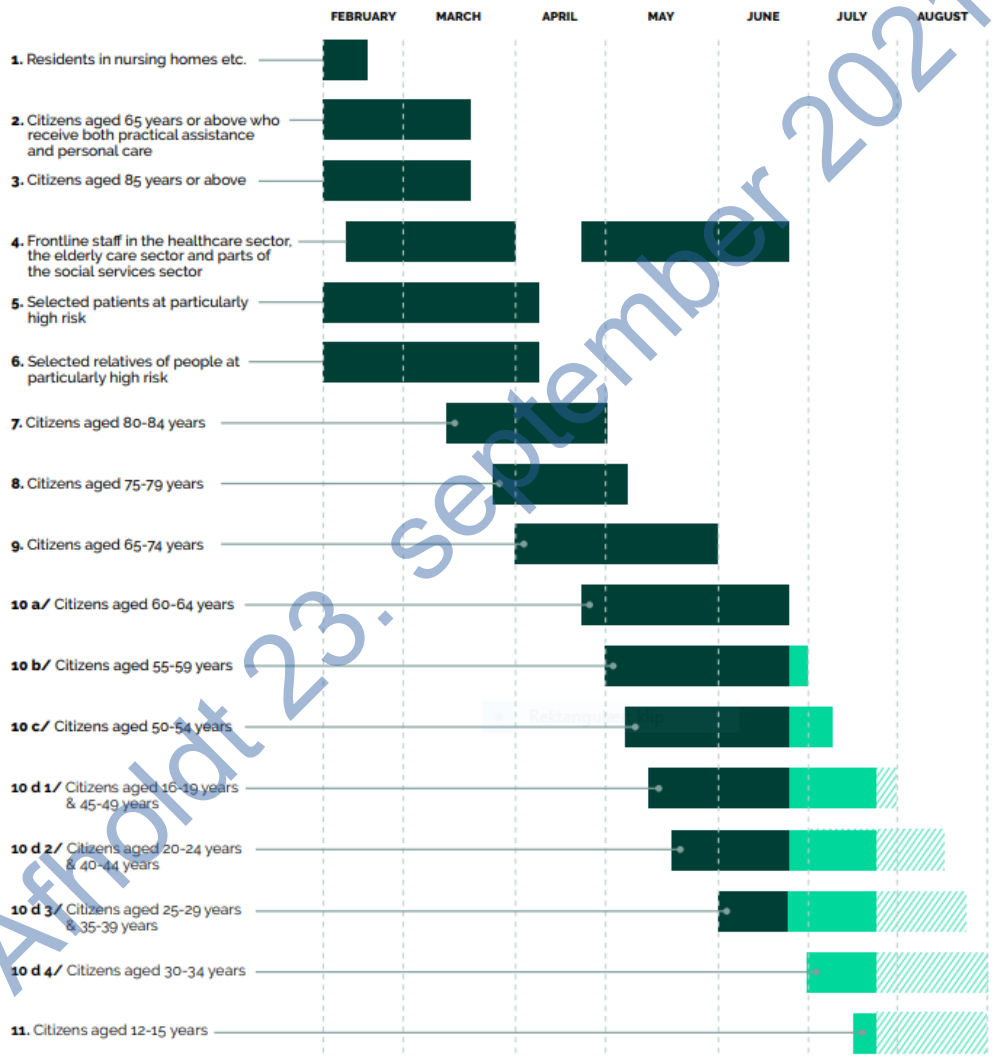
SUNDHEDSSTYRELSEN

corona | covid-19

Vaccination calendar

1 July 2021

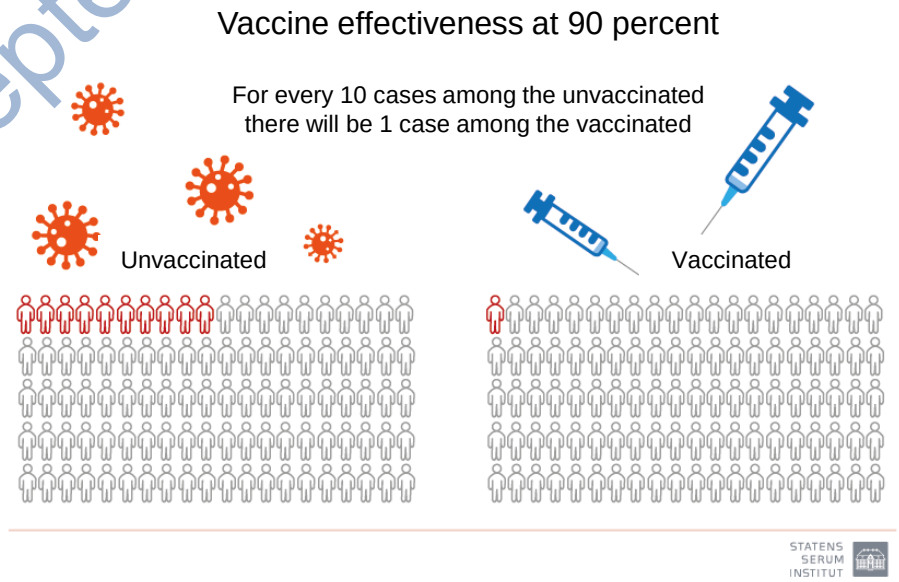
The vaccination calendar shows when we expect there will be doses available to vaccinate the different target groups.



VACCINE EFFECTIVENESS (VE)

- Describes the relative decrease in number of cases among vaccinated (compared to unvaccinated)

- VE= 1 – (incidence vaccinated/incidence unvaccinated)
- VE= 1 - 1/10
- VE= 90%



ELECTRONIC DATA CAPTURE

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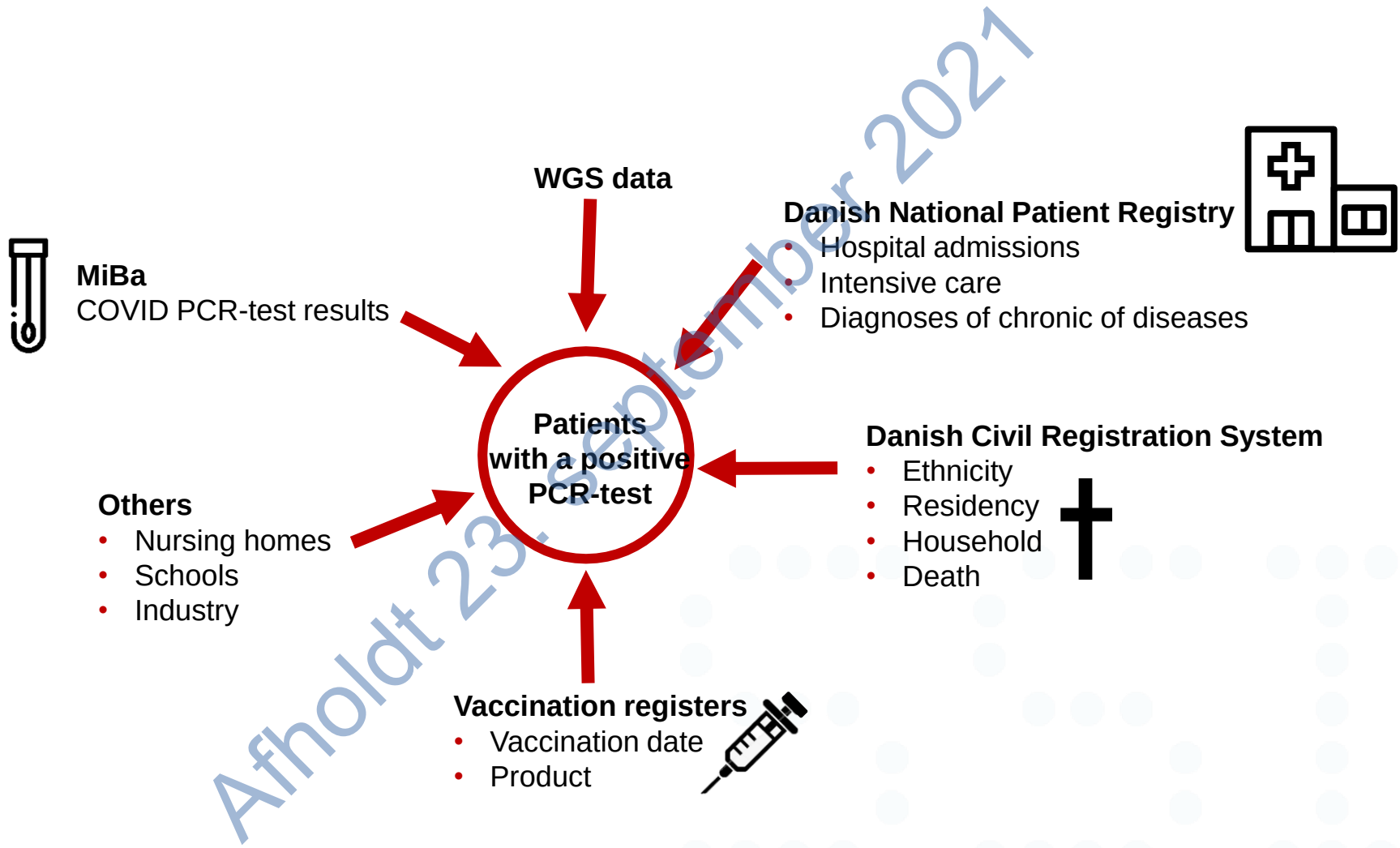
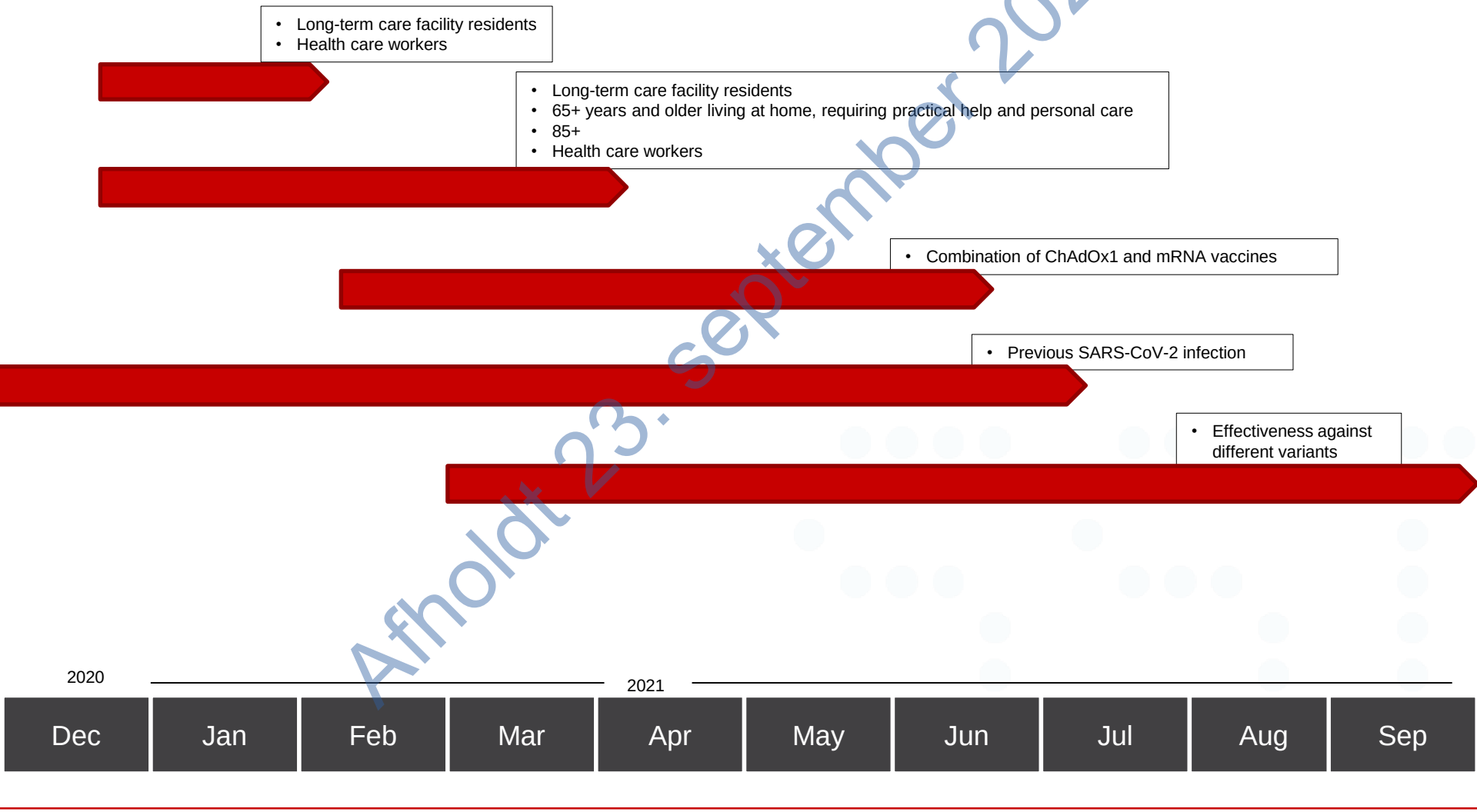
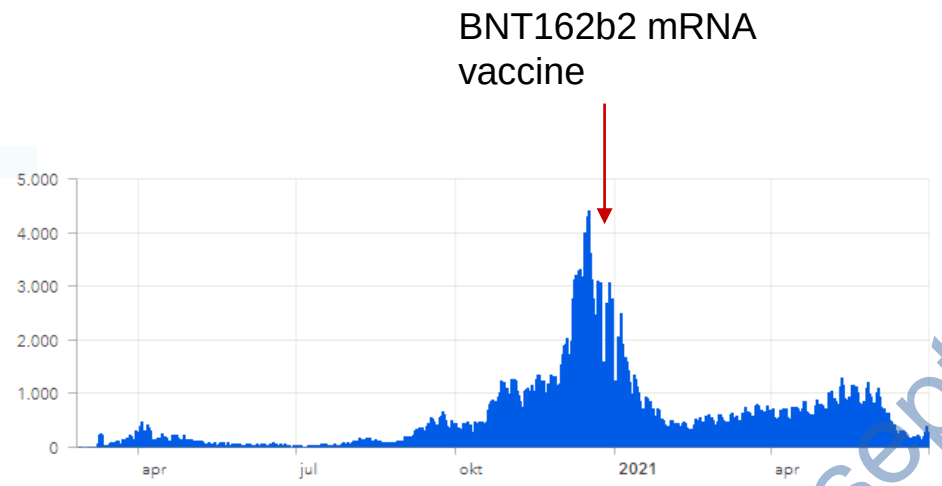
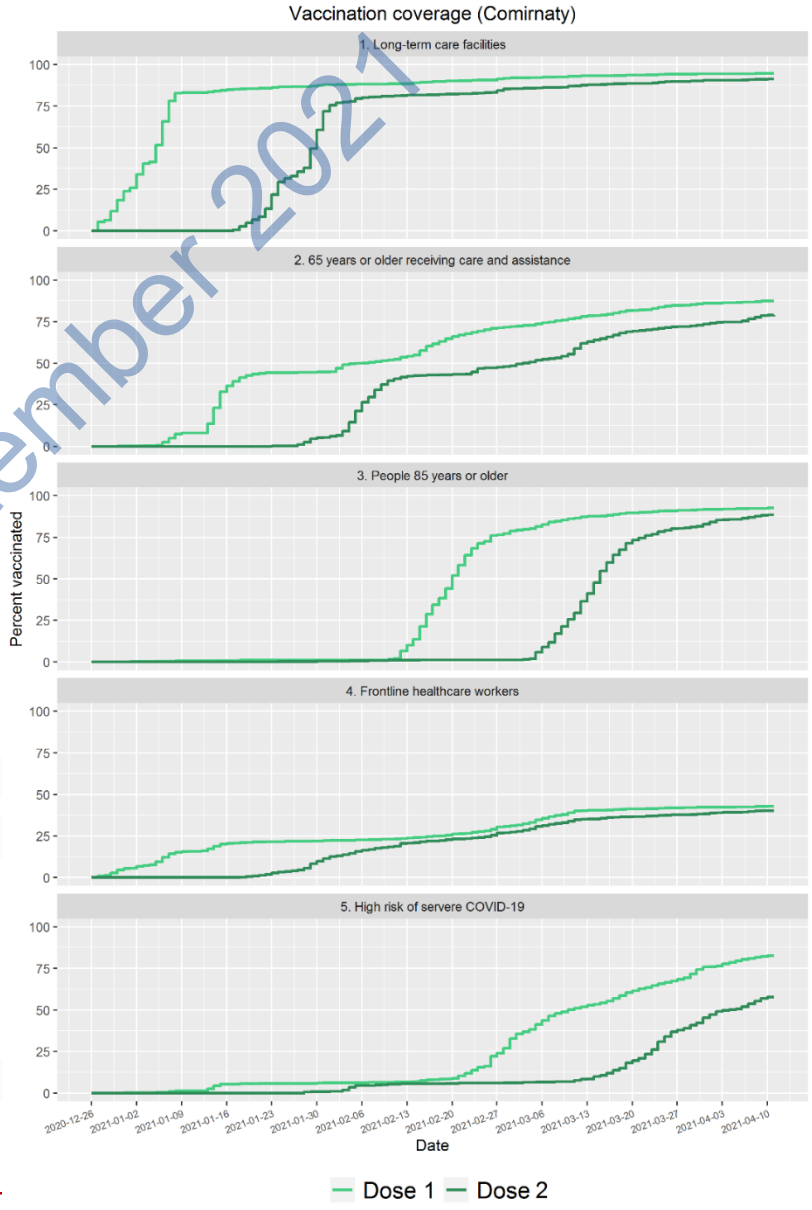


VACCINE EFFECTIVENESS STUDIES



Confirmed SARS-CoV-2 cases and vaccine coverage





Background

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- How effective is the BNT162b2 COVID-19 vaccine in a real world setting
  - Among the most vulnerable individuals who were first in line to receive the vaccines in Denmark
  - Against infections with SARS-CoV-2 but also against more severe outcomes
    - 46,101 long-term care facility (LTCF) residents
    - 61,805 individuals 65 years and older living at home but requiring practical help and personal care (65PHC)
    - 98,533 individuals ≥85 years of age (+85)
    - 425,799 health-care workers (HCWs)
    - 231,858 individuals with comorbidities that predispose for severe COVID-19 disease (SCD)

In conclusion

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Vaccine effectiveness >7 days after the second dose

Priority group	SARS-CoV-2 infection	COVID-19 related admissions	COVID-19 related death
Long-term care facility residents	53% (29%, 69%)	75% (46%, 89%)	89% (81%, 93%)
65 years and older living at home but requiring practical help and personal care	86% (78%, 91%)	87% (70%, 95%)	97% (88%, 99%)
≥85 years of age	77% (50%, 89%)	-	-
Health-care workers	80% (77%, 83%)	-	-
Individuals with comorbidities that predispose for severe COVID-19 disease	71% (58%, 80%)	81% (49%, 93%)	-
All priority groups	82% (79%, 84%)	93% (89%, 96%)	94% (90%, 96%)

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Vaccine effectiveness when combining the ChAdOx1 vaccine (AstraZeneca) as the first dose with an mRNA vaccine (Pfizer or Moderna) as the second dose

Mie Agermose Gram, Jens Nielsen, Astrid Blicher Schelde, Katrine Finderup Nielsen, Ida Rask Moustsen-Helms, Anne Katrine Bjørkholt Sørensen, Palle Valentiner-Branth and Hanne-Dorthe Emborg

BACKGROUND

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February 9, 2021	March 11, 2021	April 14, 2021	April 16, 2021
Introduced in the vaccination program	The ChAdOx1 was put on hold	Continued without the use of ChAdOx1	Offered a second dose of BNT162b2 mRNA or mRNA-1273

AIM

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Aim: to estimate the vaccine effectiveness (VE) against SARS-CoV-2 infection and COVID-19 related hospitalization and death following

- 1) one dose of the ChAdOx1 vaccine and
- 2) the combined ChAdOx1/mRNA vaccine schedule

CHARACTERISTICS

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Total study population, N	5,542,079
ChAdOx1 as the first dose, N	144,360
BNT162b2 mRNA as the second dose, N (%)	88,050 (61%)
mRNA-1273 as the second dose, N (%)	48,501 (33%)
Median time between first and second dose, days [IQR]	82 [78, 85]

RESULTS

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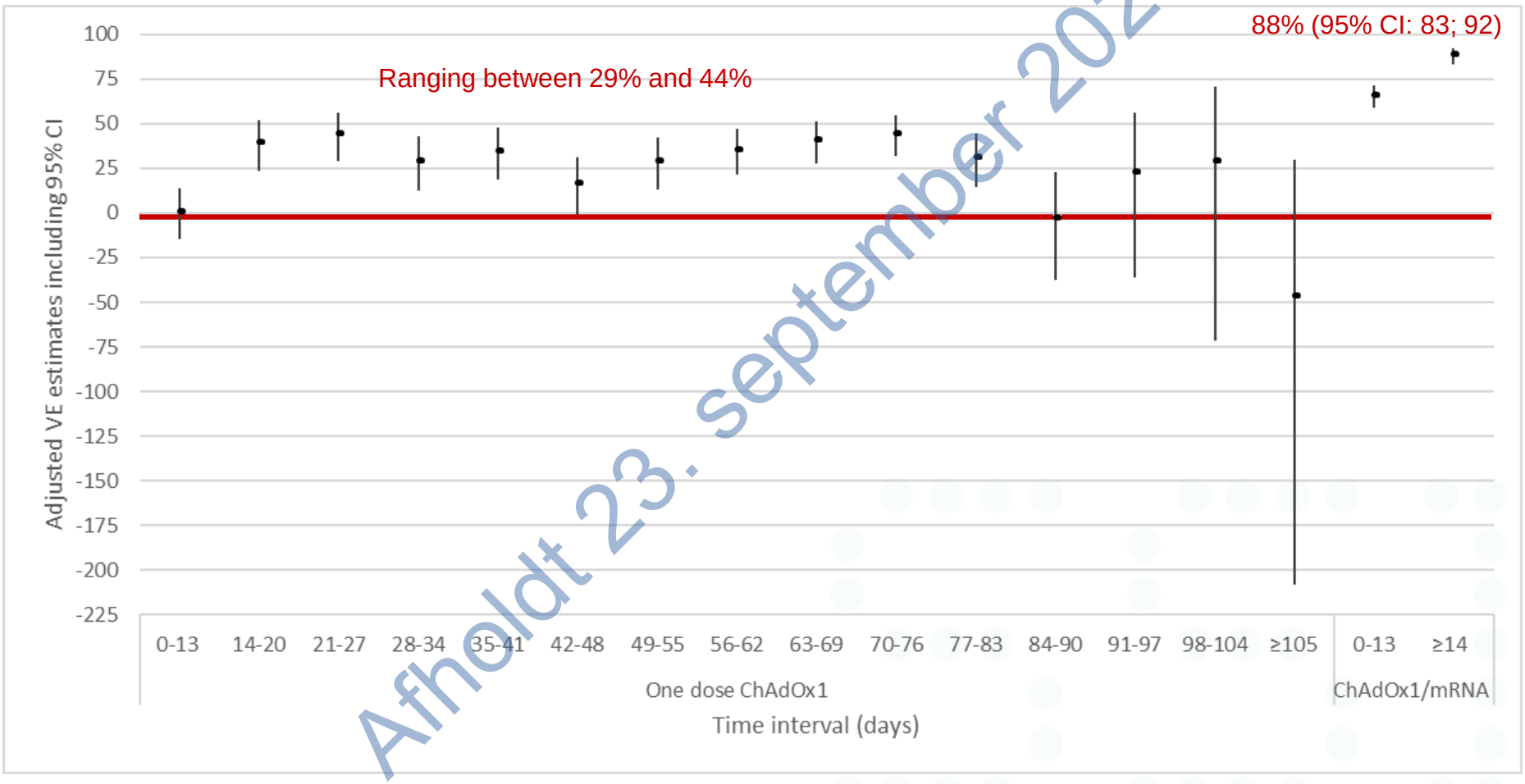

RESULTS

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VE against COVID-19 related hospitalization

- Adjusted VE of 93% (95% CI: 80; 98) ≥14 days after the first dose of ChAdOx1 vaccine.
- No cases were observed with the ChAdOx1/mRNA vaccine schedule.

VE against COVID-19 related death

- No cases were observed with neither the first dose of the ChAdOx1 or the ChAdOx1/mRNA vaccine schedule.

CONCLUSION

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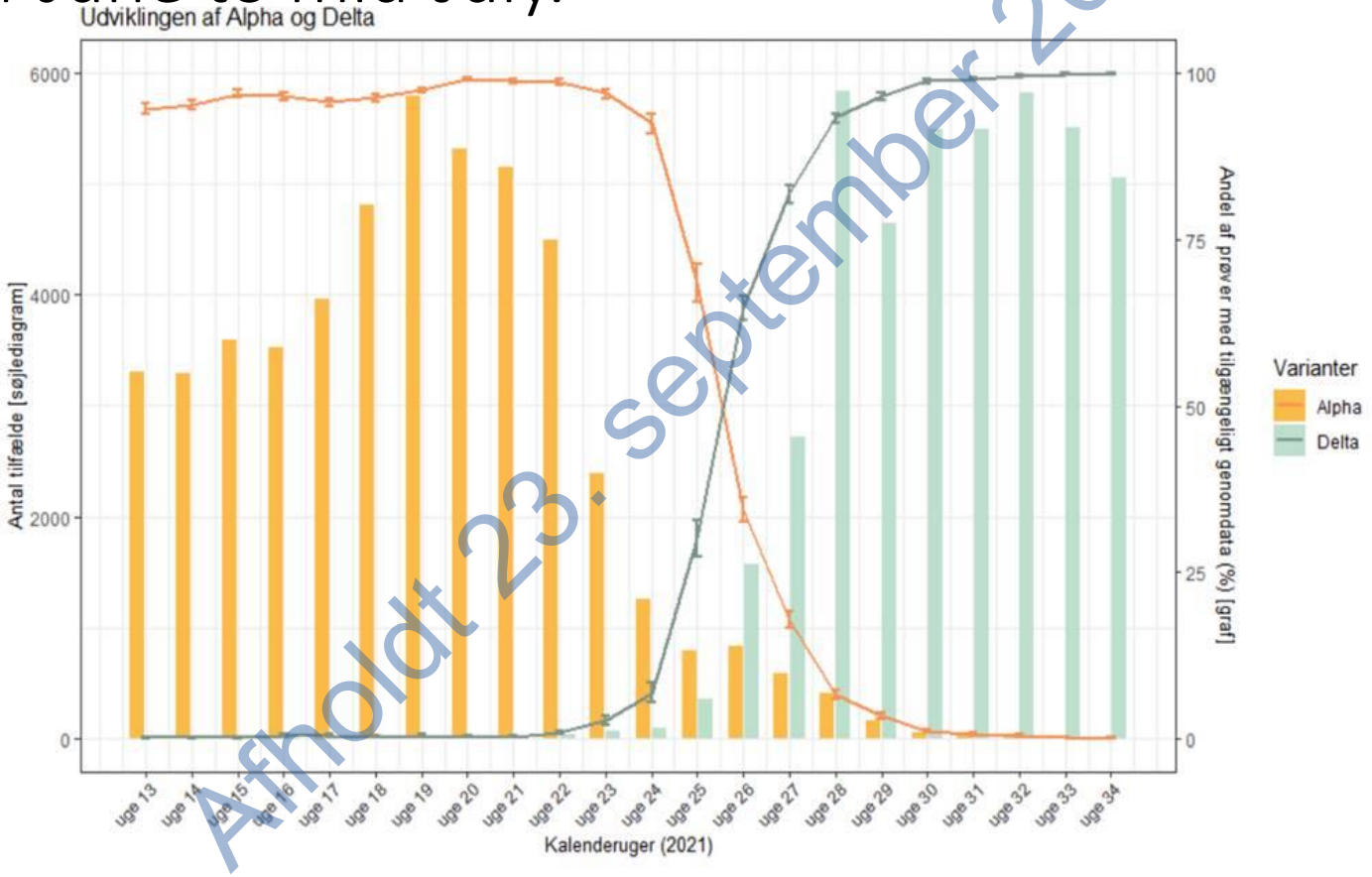
- High protection against SARS-CoV-2 infection with the combined vaccine schedule.
- The VE of 88% is similar to the VE of two doses with the BNT162b2 mRNA vaccine observed in previous studies.

Thank you for your attention

Link to preprint study
https://www.medrxiv.org/content/10.1101/2021.07.26.21261130v1

Delta replaces alpha as dominant variant from mid-June to mid-July.



Vaccine effectiveness against **ALPHA** infections (positive PCR test)

- Easier to estimate VE against Alpha
- Population still unvaccinated in spring 2021
- Observation period for analysis is from 1Jan2021-31July2021.

Vaccine effectiveness against **ALPHA** infections

Observation period from 1Jan2021-31July2021.

	Adjusted VE estimate (95% CI)
Unvaccinated	(ref)
Pfizer	84.5% (83.2-85.7%)
AstraZeneca*	94.7% (91.9-96.6%)
Moderna	97.4% (94.6-98.8%)

Notes: children <16 years not included. All estimates adjusted for age, sex and region. *Received AZ as first jab followed by either Pfizer (~2/3) or Moderna (~1/3) as second jab.

Vaccine effectiveness against **DELTA** infections (positive PCR test)

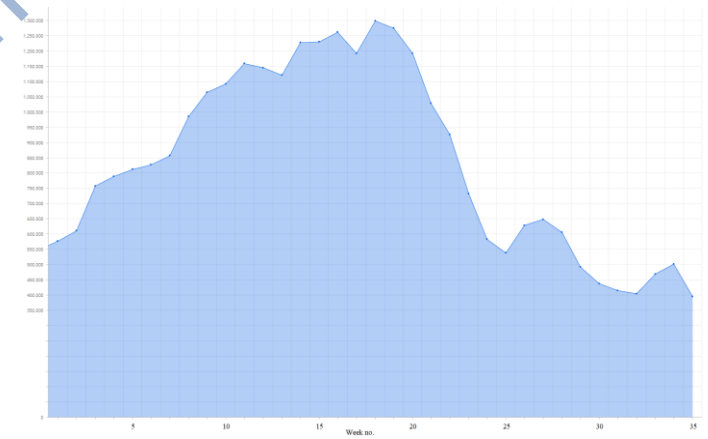
- VE against Delta is harder to estimate as most had been vaccinated (at least 1st dose) by mid-July
- Observation period for analysis is from 1Jun2021-15July2021.
- Beyond this period the reference group (unvaccinated individuals) becomes increasingly dissimilar to the vaccinated groups.

Vaccine effectiveness against **DELTA** infections

Observation period from 1Jun2021-15July2021.

	Adjusted VE estimate (95% CI)	…including adjustment for test activity
Unvaccinated	(ref)	(ref)
Pfizer	69.3% (64.3-73.7%)	59.9% (53.4-65.4%)
AstraZeneca*	71.0% (63.7-76.8%)	72.6% (65.6-78.1%)
Moderna	83.3% (70.3-90.6%)	73.5% (52.9-85.1%)

Notes: children <16 years not included. All estimates adjusted for age, sex and region. *Received AZ as first jab followed by either Pfizer (~2/3) or Moderna (~1/3) as second jab.



Weekly number of PCR tests from Jan– Sep 2021

Vaccine effectiveness against **hospitalisation with COVID-19**

Observation periods: 1 Jan – 31 Jul for Alpha; 1 Jun – 31 Aug for Delta.

	ALPHA		Delta	
	# hospital admissions	Adjusted VE estimate (95% CI)	# hospital admissions	Adjusted VE estimate (95% CI)
Unvaccinated	1,670	(ref)	437	(ref)
Pfizer	57	86.2% (81.4-89.7%)	140	94.9% (93.6-95.9%)
AstraZeneca*	0	100% (~-~%)	4	96.1% (89.6-98.6%)
Moderna	1	97.2% (79.7-99.6%)	5	98.2% (95.5-99.2%)

Notes: children <16 years not included. All estimates adjusted for age, sex and region.
*Received AZ as first jab followed by either Pfizer (~2/3) or Moderna (~1/3) as second jab.

Vaccine effectiveness against **hospitalisation wi**

Obs

www.gov.uk/government/news/vaccines-highly-effective-against-hospitalisation-from-delta-variant

GOV.UK

→ Coronavirus (COVID-19) | Guidance

Home > Coronavirus (COVID-19) > Vaccinatio

Press release

Vaccines highly effective against hospitalisation from Delta variant

New analysis by PHE shows for the first time that 2 doses of COVID-19 vaccines are highly effective against hospitalisation from the Delta (B.1.617.2) variant.

From: Public Health England
Published 14 June 2021

The analysis suggests:

- the Pfizer-BioNTech vaccine is 96% effective against hospitalisation after 2 doses
- the Oxford-AstraZeneca vaccine is 92% effective against hospitalisation after 2 doses

These are comparable with vaccine effectiveness against hospitalisation from the Alpha variant.

	admissions	estimate (95% CI)
Un	437	(ref)
Pfi	140	94.9% (93.6-95.9%)
Ast	4	96.1% (89.6-98.6%)
Mo	5	98.2% (95.5-99.2%)

Not …on.
*Re …nd jab.

In summary

- The vaccines are protective against infection.
- Somewhat less protective against delta infection.
- However protection against hospitalisation is very high for both alpha and delta.

Symptoms in vaccinated vs unvaccinated cases

Self-reported symptoms (yes/no) among covid-19 cases contacted by STPS from March to July 2021

	Number of respondents among alpha cases	% reporting symptoms among alpha cases	Number of respondents among delta cases	% reporting symptoms among delta cases
Unvaccinated	44,635	68.5% (68.0-68.9%)	5,561	75.6% (74.4-76.7%)
Pfizer	706	48.9% (45.2-52.6%)	778	63.4% (60.0-66.8%)
AstraZeneca*	18	38.9% (15.7-62.1%)	149	61.1% (53.2-68.9%)
Moderna	7	(not enough data)	24	29.2% (10.6-47.7%)

ALPHA Delta

Comparing the vaccines' relative protective effect against alpha and delta

- Analysis includes all PCR confirmed cases (alpha and delta) from weeks 21–34
- Comparison of proportion of delta cases in vaccinated versus unvaccinated cases
- Under the assumption of equal protection (null hypothesis) against alpha and delta the proportion of delta cases (out of all cases) should be the same among vaccinated and unvaccinated on any given day.

Comparing the vaccines' relative protective effect against alpha and delta

- Odds ratio in vaccinated versus unvaccinated of infection being due to delta:

  1.73 (95% CI: 1.27 to 2.34)

- Delta breaks through the vaccines' defences 73% more often than alpha.
- Vaccines are ~40% less effective against delta.

Undersøgelse effekten af tid siden vaccination i forhold til smitterisiko blandt Comirnaty®-vaccineret sundhedspersonale ≥16 år, der fik andet stik i januar-februar 2021.

Observationsperiode	Antal cases	Odds ratio (95% CI) angivet **per måned** siden vaccination fra matchet analyse*	Odds ratio (95% CI) angivet **per dag** siden vaccination fra matchet analyse*
01Mar-31Mar	75	1.57 (0.57; 4.36)	1.02 (0.98; 1.05)
01Apr-31Apr	128	1.32 (0.65; 2.68)	1.01 (0.98; 1.03)
01May-31May	160	0.99 (0.34; 2.90)	1.00 (0.96; 1.04)
01Jun-31Jun	68	1.03 (0.36; 2.98)	1.00 (0.96; 1.04)
01Jul-31Jul	224	0.55 (0.31; 0.98)	0.98 (0.96; 0.98)
01Aug-31Aug	442	1.83 (1.19; 2.81)	1.02 (1.01; 1.04)
01Sep-20Sep	224	2.62 (1.41; 4.85)	1.03 (1.01-1.05)

* matchet på alder, køn og region.

Resultaterne afspejler, at der i august og september måned ses en øget smitterisiko blandt de, der er vaccineret først versus sidst i perioden (17. januar til 16. februar 2021). Det er dermed ikke før i august og september 2021, at vi ser tendens til en aftagende effekt af Comirnaty®-vaccinen blandt denne population.

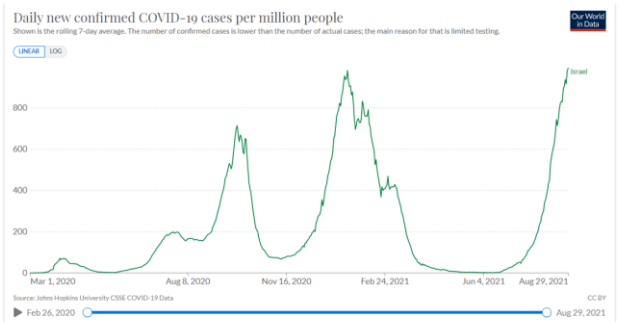
I regressionsmodellen inkluderes tid siden vaccination som en kontinuert variabel, og risikoen modelleres således som en kontinuert funktion over tid. Populationen er social- og sundhedspersonale færdigvaccineret med Comirnaty® i perioden 17. januar til 16. februar 2021 (n=86.183).

Booster, when and to whom?

ECDC*:
The available evidence at this time regarding 'real world' vaccine effectiveness and the duration of protection shows that all vaccines authorised in the EU/EEA are currently highly protective against COVID-19-related hospitalisation, severe disease and death, suggesting there is **no urgent need for the administration of booster doses of vaccines to fully vaccinated individuals in the general population.**

Versus Israeli numbers

Israel experiences **highest levels of infection** in the delta wave
in spite of **widespread (>60%) 2nd dose** vaccination



https://www.ecdc.europa.eu/en/publications-data/covid-19-public-health-considerations-additional-vaccine-doses