

Supplementary material

Article title: Estimated vaccine effectiveness against SARS-CoV-2 Delta and Omicron infections among health care workers and the general adult population in Norway, August 2021 – January 2022

Table of Contents

1. Data sources and linkages	1
2. Covid-19 cases and vaccine coverage	3
3. Risk ratios.....	3
4. Vaccine effectiveness.....	4
4.1 Overall vaccine effectiveness.....	4
4.2 Vaccine effectiveness by age group.....	6
4.3 Vaccine effectiveness after excluding individuals with underlying conditions.....	10
4.4 Vaccine effectiveness after excluding vaccinated individuals with AstraZeneca.....	10
4.5 Vaccine effectiveness by workplace and occupation positions among HCW.....	11
5. References	16

1. Data sources and linkages

All data in this study came from the national emergency preparedness register, Beredt C19 [1]. Beredt C19 contains individual-level data from central health registries, national clinical registries and other national administrative registries. The data sources and variables used are shown in Table S1.

Table S1. Data sources in the Norwegian preparedness registry (BeredtC19) used in this study and variables retrieved from each source

Norwegian Abbreviation	Full name of data source	Information obtained
DSF	The National Population Register	Age, Sex, County of residence*, Country of birth, Date of death
SYSVAK	The National Immunisation Register	Date of vaccination, Vaccine product type
MSIS	The Surveillance System for Infectious Diseases	Date of sample of SARS-CoV-2 positive test, Date of COVID-19 associated death
MSIS lab database	Table prepared in BeredtC19	Define virus variant for cases that have been screened successfully
SSB	Statistics Norway	“living crowded” (see definition below)
Beredt C19 risikogrupper	Table prepared in BeredtC19 Source: Norwegian Patient Registry (NPR): individual level data from all public specialist health-care services in Norway.	Defines risk groups (see definition below)
AA	The employer and employee Register	Provides data on occupation, time and place of working in health care

* The county of residence was updated in January 2022, which might lead to some errors for individuals who have moved the last half year

Reported cases of COVID-19 and reinfections: We included data on reported cases of laboratory-confirmed SARS-CoV-2 infection and deaths from the Norwegian Surveillance System for Communicable Diseases (MSIS). During the Delta (31 July to 12 November 2021) and Omicron (3 January to 30 January 2022) wave that were included in the study, reinfections in MSIS were registered if there were ≥ 6 months between two positive sampling dates for an individual, although this will exclude reinfections within a 6-month period, of which the Omicron variant could be of higher risk.

Laboratory testing for variants: Data on virus variants came from the MSIS laboratory database (national laboratory database), which receives SARS-CoV-2 test results from all Norwegian microbiology laboratories [2].

Additional definitions used:

Crowding: Individuals are considered to live in crowded conditions if the number of rooms is lower than the number of residents or one resident lives in one room, and the number of square metres (P-area) is below 25 sq. m. per person. If the number of rooms or the P-area is not specified, a household will be regarded as crowded if one of these criteria is met [3].

Risk groups: Some underlying medical conditions increase the risk of severe COVID-19 outcomes, regardless of age. These individuals have been prioritised in the vaccination campaigns in Norway. The underlying comorbidities that have been defined as increasing the risk of severe COVID-19 are divided into two groups:

High risk: people with diseases/conditions that carry a high risk of severe COVID-19:

- Organ transplant
- Immunodeficiency
- Haematological cancer in the last five years
- Other active cancers
- Neurological or neuromuscular diseases that cause impaired cough or lung function (e.g., ALS and cerebral palsy)
- Chronic kidney disease, or significant renal impairment.

Medium risk: people with diseases/conditions that entail a moderate risk of severe COVID-19:

- Chronic liver disease or significant hepatic impairment
- Diseases requiring immunosuppressive therapy
- Diabetes
- Chronic lung disease including cystic fibrosis and severe asthma which have required the use of high dose inhaled or oral steroids within the past year
- Obesity with a body mass index (BMI) of ≥ 35 kg/m²
- Dementia
- Chronic heart and vascular disease (apart from high blood pressure) and stroke

Type and place of occupation:

Healthcare workers and their positions were determined by categories based on STYRK-08-codes from the Norwegian State Registry of Employers and Employees according to Table S2 and Table S3.

Table S2: The occupations included as HCW and their positions and registry code in the Norwegian State Register of Employers and Employees.

English occupation title in article	Occupation title in registry	Occupation codes in registry
Doctor	Lege	2211, 2212
Specialist nurse	Spesialsykepleier, Jordmor	2221, 2222
Nurse	Sykepleier	2223, STYRK-98: 3231100
Health Professional	Helsefagarbeider	5321, STYRK-98: 5131123
Nursing staff	Pleiemedarbeider	5322, 5329
Others	Andre	2224, 2261, 2264, 2267, 2634, 3211, 3212, 3256, 3258, 9112, 1342, 2262, 2263, 2265, 2266, 2269, 2636, 3251, 3254

Table S3: The occupations included as HCW and their positions and registry code in the Norwegian State Register of Employers and Employees.

English workplace title in article	Workplace title in registry	Workplace codes in registry
Hospital	Somatiske sykehus	86.101, 86.102, 86.103
Specialist care	Annen spesialisthelsetjeneste	86.104, 86.105, 86.106, 86.107, 86.2 (except 86.211 og 86.230)
Primary care	Primærhelsetjeneste (ekskl. sykehjem)	86.211, 86.230
Home care	Hjemmetjenester	86.901, 88.101
Nursing homes	Sykehjem	87.101, 87.102
Other	Andre helsetjenester	Remaining codes under 86.X and 87.X, including 78.100 og 78.200 (recruitment agencies)

2. Covid-19 cases and vaccine coverage

At the start of the Delta period, the vaccine coverage for 2. doses was 68.5% for HCW and 24.1% for non-HCW in the study population. Coverage for three doses was 0.04% for HCW and 0.01% for non-HCW. At the start of the Omicron period, the vaccine coverage for two doses was 92.2% for HCW and 84.4% for non-HCW in the study population. Coverage for three doses was 54.6% for HCW and 20.6% for non-HCW.

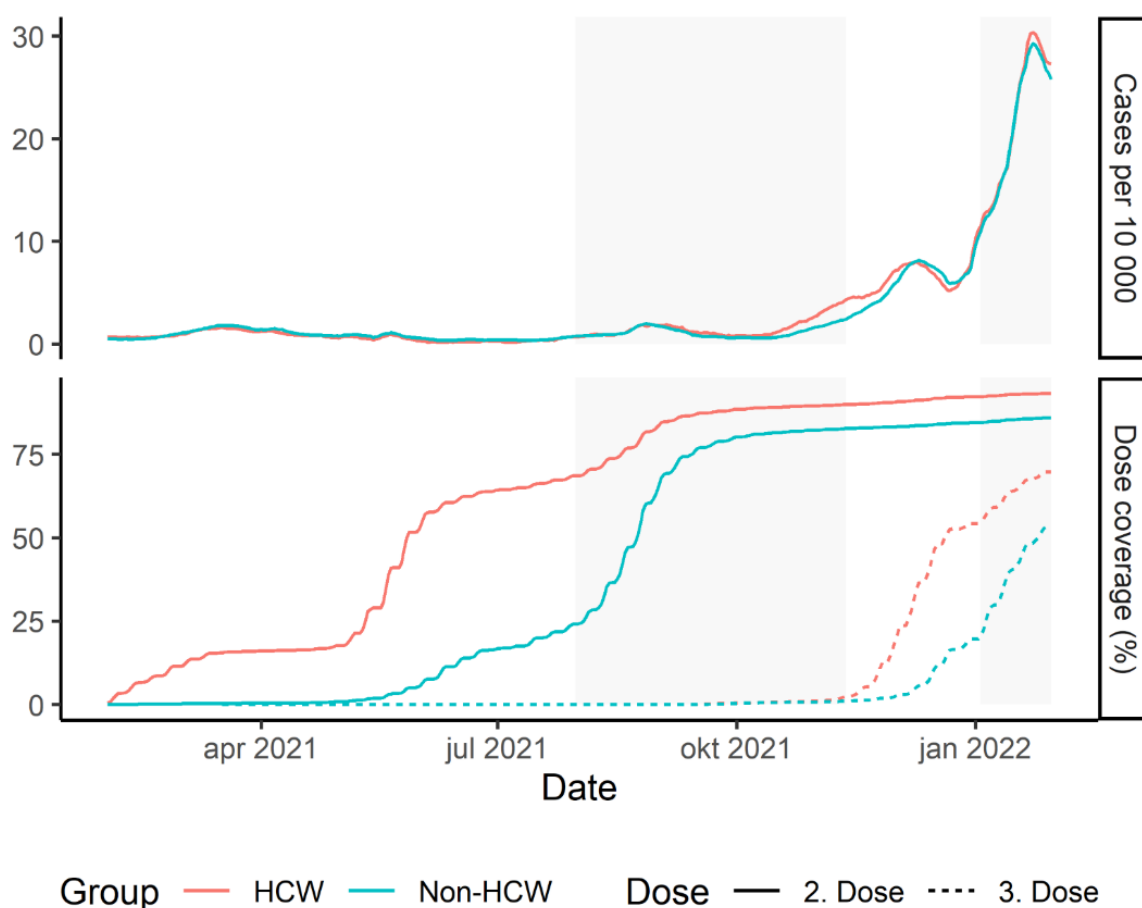


Figure S1: Weekly first-time infections and vaccine dose coverage among health care workers (HCW) and non-HCW before and during the study period. Shaded areas indicate Delta- and Omicron wave period, respectively.

3. Risk ratios

We present here the hazard ratios for registered SARS-CoV-2 infection during the Delta- and Omicron periods, for HCW workplace or positions, compared to non-HCW.

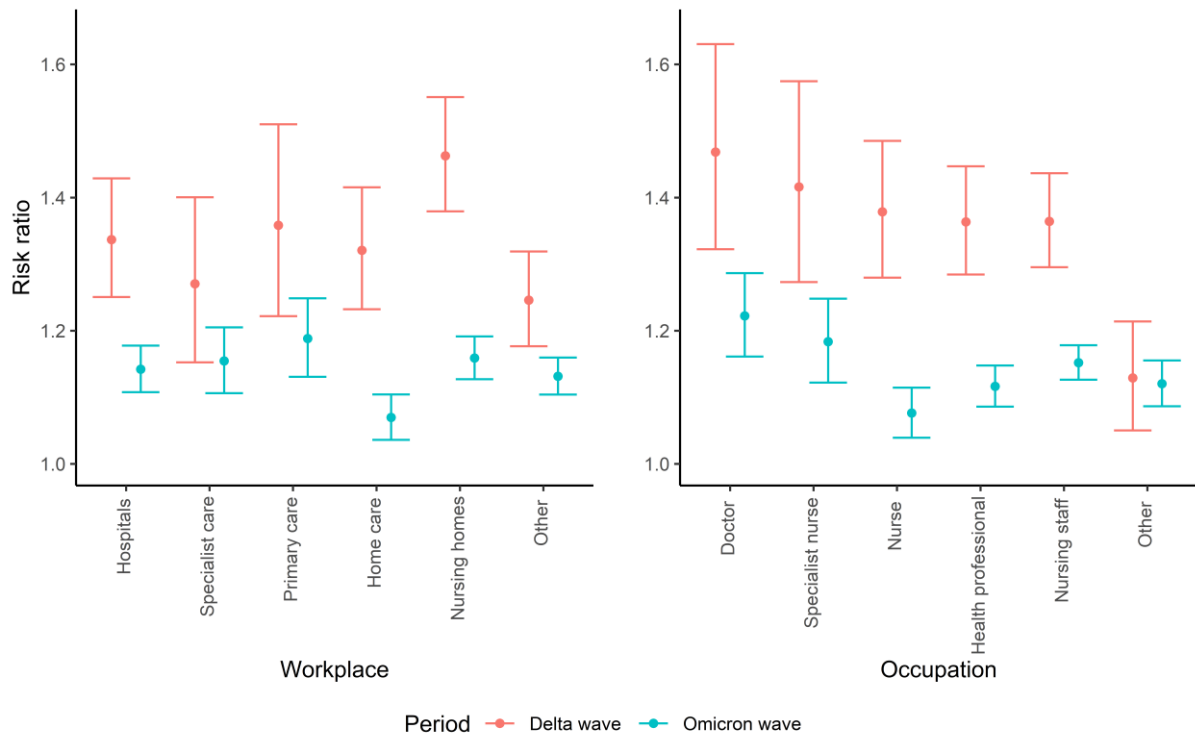


Figure S2: Risk ratio for infection among health care workers (HCW) compared to non-HCW for the Delta and Omicron periods.

4. Vaccine effectiveness

4.1 Overall vaccine effectiveness

We present here the results from our adjusted vaccine effectiveness analyses presented in the main article.

Table S4: Vaccine effectiveness among health care workers (HCW) and non-HCW during Delta wave in Norway.

Occupation group	Vaccine status	Vaccine effectiveness [95% CI]
Healthcare worker	1 dose >21 d	39.7 [32.8 – 45.9]
Healthcare worker	2 doses 7-112 d	71.4 [68.7 – 73.8]
Healthcare worker	2 doses 113-224 d	44 [39.0 – 48.5]
Healthcare worker	2 doses 225-336 d	8.7 [-2.1 – 18.3]
Healthcare worker	3 doses 7-112 d	76.3 [52.1 – 88.2]
Not healthcare worker	1 dose >21 d	20 [17.2 – 22.8]
Not healthcare worker	2 doses 7-112 d	68.6 [67.6 – 69.6]
Not healthcare worker	2 doses 113-224 d	39.4 [36.0 – 42.5]
Not healthcare worker	2 doses 225-336 d	10.2 [-15.9 – 30.5]
Not healthcare worker	3 doses 7-112 d	60.2 [43.3 – 72.1]

Table S5: Vaccine effectiveness among health care workers (HCW) and non-HCW during Omicron wave in Norway.

Occupation group	Vaccine status	Vaccine effectiveness [95% CI]
Healthcare worker	1 dose >21 d	-1.1 [-9.8 – 6.9]
Healthcare worker	2 doses 7-112 d	19.5 [13.7 – 24.9]
Healthcare worker	2 doses 113-224 d	-21.5 [-28.3 – -15.1]
Healthcare worker	2 doses 225-336 d	10.1 [3.8 – 16.0]
Healthcare worker	3 doses 7-112 d	33.3 [29.6 – 36.7]
Not healthcare worker	1 dose >21 d	-47.8 [-52.0 – -43.8]
Not healthcare worker	2 doses 7-112 d	-32.4 [-35.4 – -29.5]
Not healthcare worker	2 doses 113-224 d	-79.6 [-82.7 – -76.6]
Not healthcare worker	2 doses 225-336 d	-30.5 [-38.2 – -23.2]
Not healthcare worker	3 doses 7-112 d	10.7 [8.9 – 12.5]

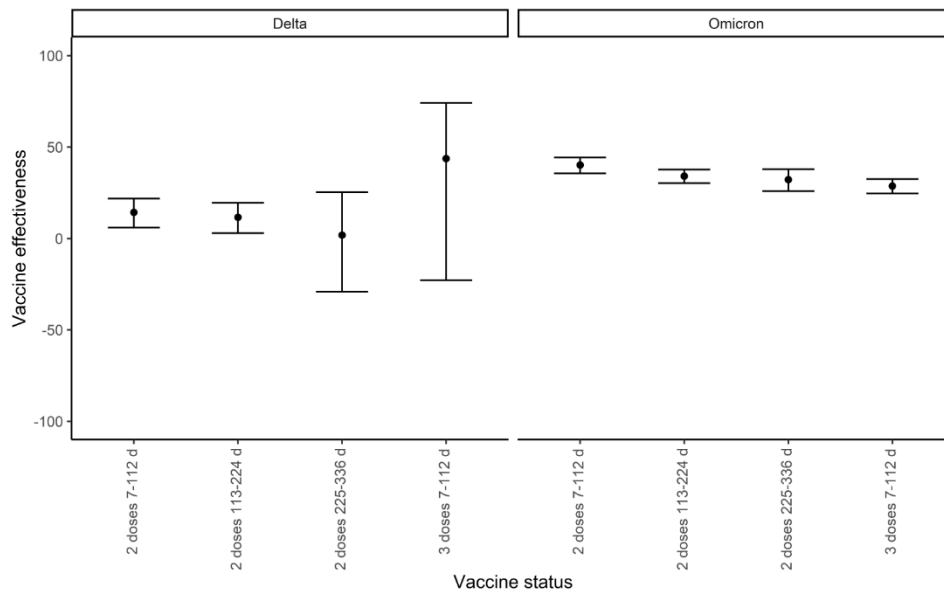


Figure S3: Difference in vaccine effectiveness for health care workers (HCW) as compared to non-HCW against infections during Delta and Omicron wave in Norway.

Table S6: Difference in vaccine effectiveness during Delta wave in Norway for health care workers (HCW) compared to non-HCW based on interaction analysis.

Vaccine status	Vaccine effectiveness [95% CI]
1 dose >21 d	29.1 [20.8 – 36.6]
2 doses 7-112 d	14.3 [6.0 – 21.8]
2 doses 113-224 d	11.6 [3.0 – 19.5]
2 doses 225-336 d	1.9 [-29.1 – 25.4]
3 doses 7-112 d	43.7 [-22.8 – 74.2]

Table S7: Difference in vaccine effectiveness during Omicron wave in Norway for health care workers (HCW) compared to non-HCW based on interaction analysis.

Vaccine status	Vaccine effectiveness [95% CI]
1 dose >21 d	31.1 [24.8 – 36.8]
2 doses 7-112 d	40.2 [35.6 – 44.4]
2 doses 113-224 d	34.1 [30.3 – 37.7]
2 doses 225-336 d	32.2 [25.9 – 37.9]
3 doses 7-112 d	28.7 [24.6 – 32.5]

4.2 Vaccine effectiveness by age group

Here we present the results from the analyses performed to assess vaccine effectiveness among different age groups.

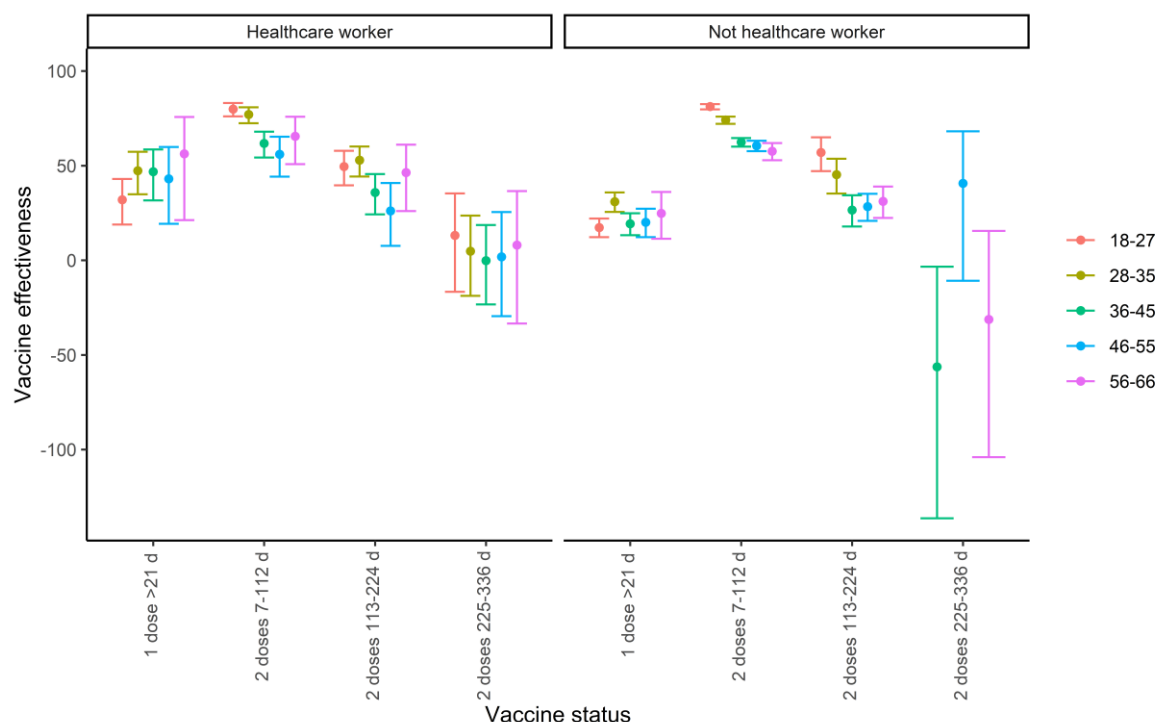


Figure S4: Vaccine effectiveness against infections among health care workers (HCW) and non-HCW in different age groups during Delta wave in Norway.

Table S8: Vaccine effectiveness against infections among health care workers (HCW) and non-HCW in different age groups during Delta wave in Norway.

Occupation group	Age group	Vaccine status	Vaccine effectiveness [95% CI]
Healthcare worker	18-27	1 dose >21 d	32 [18.9 – 43.0]
Healthcare worker	18-27	2 doses 7-112 d	79.9 [76.1 – 83.1]
Healthcare worker	18-27	2 doses 113-224 d	49.6 [39.6 – 57.9]
Healthcare worker	18-27	2 doses 225-336 d	13.2 [-16.6 – 35.4]
Healthcare worker	28-35	1 dose >21 d	47.3 [34.9 – 57.4]
Healthcare worker	28-35	2 doses 7-112 d	77 [72.4 – 80.8]
Healthcare worker	28-35	2 doses 113-224 d	52.9 [44.3 – 60.2]
Healthcare worker	28-35	2 doses 225-336 d	4.8 [-18.7 – 23.7]
Healthcare worker	36-45	1 dose >21 d	46.8 [31.7 – 58.6]
Healthcare worker	36-45	2 doses 7-112 d	61.8 [54.3 – 68.0]
Healthcare worker	36-45	2 doses 113-224 d	35.8 [24.3 – 45.6]
Healthcare worker	36-45	2 doses 225-336 d	-0.2 [-23.3 – 18.6]
Healthcare worker	46-55	1 dose >21 d	43.1 [19.3 – 59.9]
Healthcare worker	46-55	2 doses 7-112 d	56 [44.2 – 65.4]
Healthcare worker	46-55	2 doses 113-224 d	26.1 [7.6 – 40.9]
Healthcare worker	46-55	2 doses 225-336 d	1.8 [-29.5 – 25.5]
Healthcare worker	56-66	1 dose >21 d	56.3 [21.3 – 75.7]
Healthcare worker	56-66	2 doses 7-112 d	65.6 [50.8 – 75.9]
Healthcare worker	56-66	2 doses 113-224 d	46.4 [26.0 – 61.1]
Healthcare worker	56-66	2 doses 225-336 d	8 [-33.4 – 36.6]
Not healthcare worker	18-27	1 dose >21 d	17.3 [12.2 – 22.1]

Not healthcare worker	18-27	2 doses 7-112 d	81.2 [79.8 – 82.6]
Not healthcare worker	18-27	2 doses 113-224 d	57 [47.2 – 65.0]
Not healthcare worker	28-35	1 dose >21 d	30.9 [25.6 – 35.9]
Not healthcare worker	28-35	2 doses 7-112 d	74.1 [72.1 – 75.9]
Not healthcare worker	28-35	2 doses 113-224 d	45.3 [35.3 – 53.7]
Not healthcare worker	36-45	1 dose >21 d	19.3 [13.3 – 24.9]
Not healthcare worker	36-45	2 doses 7-112 d	62.4 [60.1 – 64.6]
Not healthcare worker	36-45	2 doses 113-224 d	26.6 [17.9 – 34.4]
Not healthcare worker	36-45	2 doses 225-336 d	-56.3 [-136.3 – -3.4]
Not healthcare worker	46-55	1 dose >21 d	20.1 [12.3 – 27.2]
Not healthcare worker	46-55	2 doses 7-112 d	60.6 [57.7 – 63.2]
Not healthcare worker	46-55	2 doses 113-224 d	28.4 [20.9 – 35.2]
Not healthcare worker	46-55	2 doses 225-336 d	40.6 [-10.8 – 68.2]
Not healthcare worker	56-66	1 dose >21 d	24.8 [11.4 – 36.2]
Not healthcare worker	56-66	2 doses 7-112 d	57.6 [52.9 – 61.9]
Not healthcare worker	56-66	2 doses 113-224 d	31.2 [22.4 – 39.0]
Not healthcare worker	56-66	2 doses 225-336 d	-31.2 [-104.0 – 15.6]

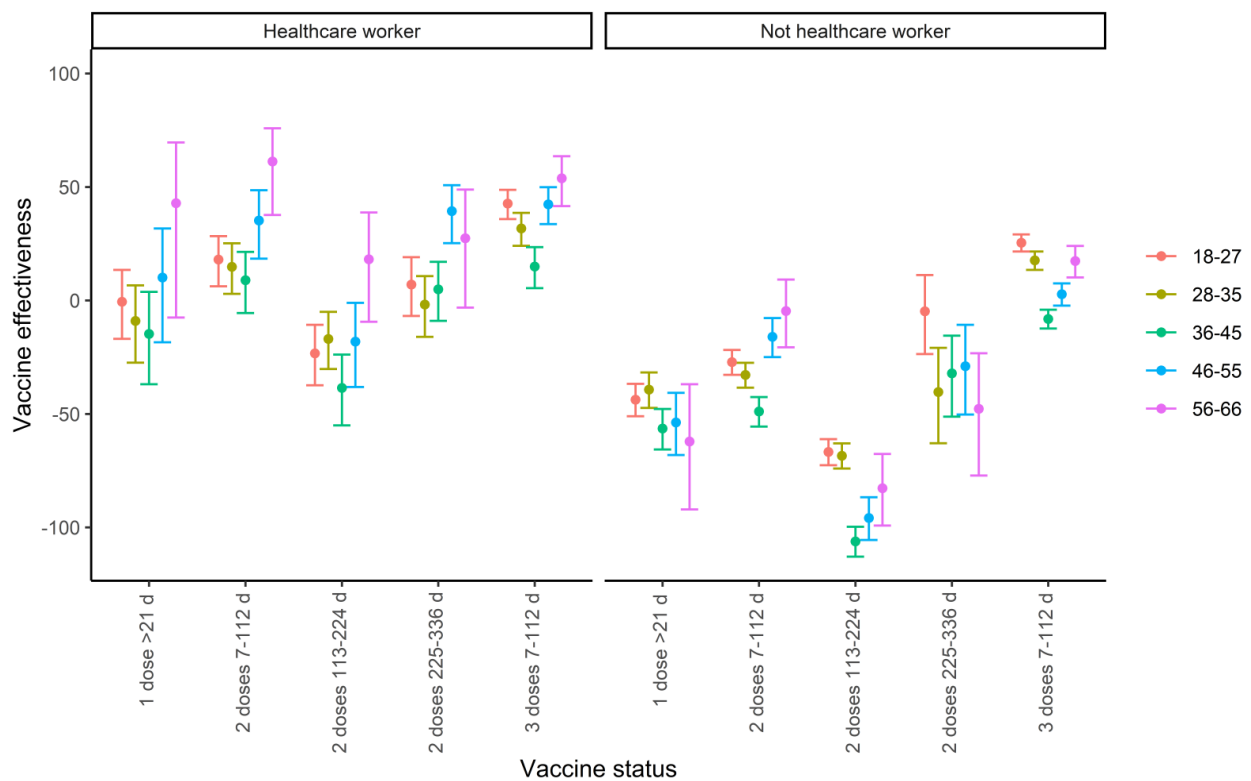


Figure S5: Vaccine effectiveness against infections among health care workers (HCW) and non-HCW in different age groups during Omicron wave in Norway.

Table S9: Vaccine effectiveness against infections among health care workers (HCW) and non-HCW in different age groups during Omicron wave in Norway.

Occupation group	Age group	Vaccine status	Vaccine effectiveness [95% CI]
Healthcare worker	18-27	1 dose >21 d	-0.3 [-16.2 – 13.4]
Healthcare worker	18-27	2 doses 7-112 d	18.1 [6.6 – 28.1]
Healthcare worker	18-27	2 doses 113-224 d	-22.6 [-36.3 – -10.3]
Healthcare worker	18-27	2 doses 225-336 d	6.4 [-7.2 – 18.2]
Healthcare worker	18-27	3 doses 7-112 d	42.2 [35.5 – 48.2]
Healthcare worker	28-35	1 dose >21 d	-3.4 [-20.4 – 11.1]
Healthcare worker	28-35	2 doses 7-112 d	16.9 [5.8 – 26.7]
Healthcare worker	28-35	2 doses 113-224 d	-14.4 [-26.8 – -3.2]
Healthcare worker	28-35	2 doses 225-336 d	1.5 [-11.8 – 13.1]
Healthcare worker	28-35	3 doses 7-112 d	33.1 [25.9 – 39.6]
Healthcare worker	36-45	1 dose >21 d	-12.1 [-32.7 – 5.4]
Healthcare worker	36-45	2 doses 7-112 d	11 [-2.5 – 22.7]
Healthcare worker	36-45	2 doses 113-224 d	-36.3 [-51.7 – -22.4]
Healthcare worker	36-45	2 doses 225-336 d	6.1 [-6.9 – 17.6]
Healthcare worker	36-45	3 doses 7-112 d	16.1 [7.2 – 24.1]
Healthcare worker	46-55	1 dose >21 d	12.3 [-13.8 – 32.4]
Healthcare worker	46-55	2 doses 7-112 d	35 [19.4 – 47.6]
Healthcare worker	46-55	2 doses 113-224 d	-15.4 [-33.9 – 0.5]
Healthcare worker	46-55	2 doses 225-336 d	33.8 [19.8 – 45.3]
Healthcare worker	46-55	3 doses 7-112 d	41.9 [33.6 – 49.1]
Healthcare worker	56-66	1 dose >21 d	41.4 [-2.8 – 66.6]
Healthcare worker	56-66	2 doses 7-112 d	60.5 [40.0 – 73.9]
Healthcare worker	56-66	2 doses 113-224 d	15.5 [-9.9 – 35.0]
Healthcare worker	56-66	2 doses 225-336 d	24.1 [-3.4 – 44.4]
Healthcare worker	56-66	3 doses 7-112 d	53.9 [42.9 – 62.8]
Not healthcare worker	18-27	1 dose >21 d	-41.4 [-48.4 – -34.7]
Not healthcare worker	18-27	2 doses 7-112 d	-25.8 [-31.2 – -20.6]
Not healthcare worker	18-27	2 doses 113-224 d	-64.5 [-70.1 – -59.0]
Not healthcare worker	18-27	2 doses 225-336 d	-6.2 [-23.2 – 8.5]
Not healthcare worker	18-27	3 doses 7-112 d	27.3 [23.7 – 30.7]
Not healthcare worker	28-35	1 dose >21 d	-38.6 [-46.4 – -31.2]
Not healthcare worker	28-35	2 doses 7-112 d	-31.2 [-36.6 – -26.1]
Not healthcare worker	28-35	2 doses 113-224 d	-66.7 [-72.2 – -61.4]
Not healthcare worker	28-35	2 doses 225-336 d	-38.1 [-58.0 – -20.8]
Not healthcare worker	28-35	3 doses 7-112 d	19.1 [15.2 – 22.7]
Not healthcare worker	36-45	1 dose >21 d	-55.7 [-64.4 – -47.4]
Not healthcare worker	36-45	2 doses 7-112 d	-46.7 [-53.0 – -40.7]
Not healthcare worker	36-45	2 doses 113-224 d	-101.2 [-107.6 – -95.1]
Not healthcare worker	36-45	2 doses 225-336 d	-30.4 [-46.3 – -16.2]
Not healthcare worker	36-45	3 doses 7-112 d	-5.7 [-9.6 – -1.9]
Not healthcare worker	46-55	1 dose >21 d	-50.7 [-63.8 – -38.7]
Not healthcare worker	46-55	2 doses 7-112 d	-14.1 [-22.4 – -6.5]
Not healthcare worker	46-55	2 doses 113-224 d	-91.6 [-100.5 – -83.0]
Not healthcare worker	46-55	2 doses 225-336 d	-27.8 [-44.9 – -12.7]

Not healthcare worker	46-55	3 doses 7-112 d	4 [-0.6 – 8.4]
Not healthcare worker	56-66	1 dose >21 d	-59.1 [-83.8 – -37.8]
Not healthcare worker	56-66	2 doses 7-112 d	2.8 [-10.1 – 14.2]
Not healthcare worker	56-66	2 doses 113-224 d	-70.6 [-84.3 – -58.0]
Not healthcare worker	56-66	2 doses 225-336 d	-48.7 [-70.6 – -29.7]
Not healthcare worker	56-66	3 doses 7-112 d	20.9 [14.9 – 26.6]

4.3 Vaccine effectiveness after excluding individuals with underlying conditions

Table S10: Vaccine effectiveness among health care workers (HCW) and non-HCW during Delta wave in Norway after excluding individuals with underlying conditions.

Occupation group	Vaccine status	Vaccine effectiveness [95% CI]
Healthcare worker	1 dose >21 d	37.8 [30.4 – 44.4]
Healthcare worker	2 doses 7-112 d	71.5 [68.6 – 74.1]
Healthcare worker	2 doses 113-224 d	42 [36.6 – 46.9]
Healthcare worker	2 doses 225-336 d	8.4 [-3.2 – 18.6]
Not healthcare worker	1 dose >21 d	18.1 [15.1 – 21.0]
Not healthcare worker	2 doses 7-112 d	69.5 [68.5 – 70.5]
Not healthcare worker	2 doses 113-224 d	39.4 [35.5 – 43.1]
Not healthcare worker	2 doses 225-336 d	9.4 [-21.6 – 32.5]

Table S11: Vaccine effectiveness among health care workers (HCW) and non-HCW during Omicron wave in Norway after excluding individuals with underlying conditions.

Occupation group	Vaccine status	Vaccine effectiveness [95% CI]
Healthcare worker	1 dose >21 d	-3.8 [-13.1 – 4.7]
Healthcare worker	2 doses 7-112 d	18.2 [12.0 – 23.9]
Healthcare worker	2 doses 113-224 d	-23.5 [-30.7 – -16.7]
Healthcare worker	2 doses 225-336 d	9.9 [3.2 – 16.1]
Healthcare worker	3 doses 7-112 d	32.7 [28.9 – 36.3]
Not healthcare worker	1 dose >21 d	-49.4 [-53.8 – -45.2]
Not healthcare worker	2 doses 7-112 d	-34.7 [-37.9 – -31.7]
Not healthcare worker	2 doses 113-224 d	-82.9 [-86.1 – -79.8]
Not healthcare worker	2 doses 225-336 d	-29.3 [-38.4 – -20.7]
Not healthcare worker	3 doses 7-112 d	9.1 [7.1 – 11.0]

4.4 Vaccine effectiveness after excluding vaccinated individuals with AstraZeneca

Table S12: Vaccine effectiveness among health care workers (HCW) and non-HCW during Delta wave in Norway after excluding individuals with at least one dose of AstraZeneca.

Occupation group	Vaccine status	Vaccine effectiveness [95% CI]
Healthcare worker	1 dose >21 d	39.4 [32.1 – 45.9]
Healthcare worker	2 doses 7-112 d	73.3 [70.6 – 75.8]
Healthcare worker	2 doses 113-224 d	46.5 [41.3 – 51.2]
Healthcare worker	2 doses 225-336 d	8.9 [-2.1 – 18.7]
Healthcare worker	3 doses 7-112 d	77.7 [49.9 – 90.1]
Not healthcare worker	1 dose >21 d	19.9 [17.1 – 22.7]
Not healthcare worker	2 doses 7-112 d	68.7 [67.7 – 69.7]
Not healthcare worker	2 doses 113-224 d	39.3 [35.8 – 42.5]
Not healthcare worker	2 doses 225-336 d	10.6 [-15.4 – 30.8]
Not healthcare worker	3 doses 7-112 d	61.8 [44.9 – 73.5]

Table S13: Vaccine effectiveness among health care workers (HCW) and non-HCW during Omicron wave in Norway after excluding individuals with at least one dose of AstraZeneca.

Occupation group	Vaccine status	Vaccine effectiveness [95% CI]
Healthcare worker	1 dose >21 d	-0.5 [-9.5 – 7.7]
Healthcare worker	2 doses 7-112 d	16.7 [10.5 – 22.4]
Healthcare worker	2 doses 113-224 d	-22.3 [-29.2 – -15.7]
Healthcare worker	2 doses 225-336 d	9.7 [2.3 – 16.6]
Healthcare worker	3 doses 7-112 d	36.1 [32.4 – 39.5]
Not healthcare worker	1 dose >21 d	-47.9 [-52.1 – -43.9]
Not healthcare worker	2 doses 7-112 d	-32.6 [-35.6 – -29.7]
Not healthcare worker	2 doses 113-224 d	-79.9 [-82.9 – -76.9]
Not healthcare worker	2 doses 225-336 d	-29.8 [-37.9 – -22.2]
Not healthcare worker	3 doses 7-112 d	10.9 [9.0 – 12.6]

4.5 Vaccine effectiveness by workplace and occupation positions among HCW

Here we present the results from the analyses performed to assess the vaccine effectiveness among different HCW occupations and workplaces.

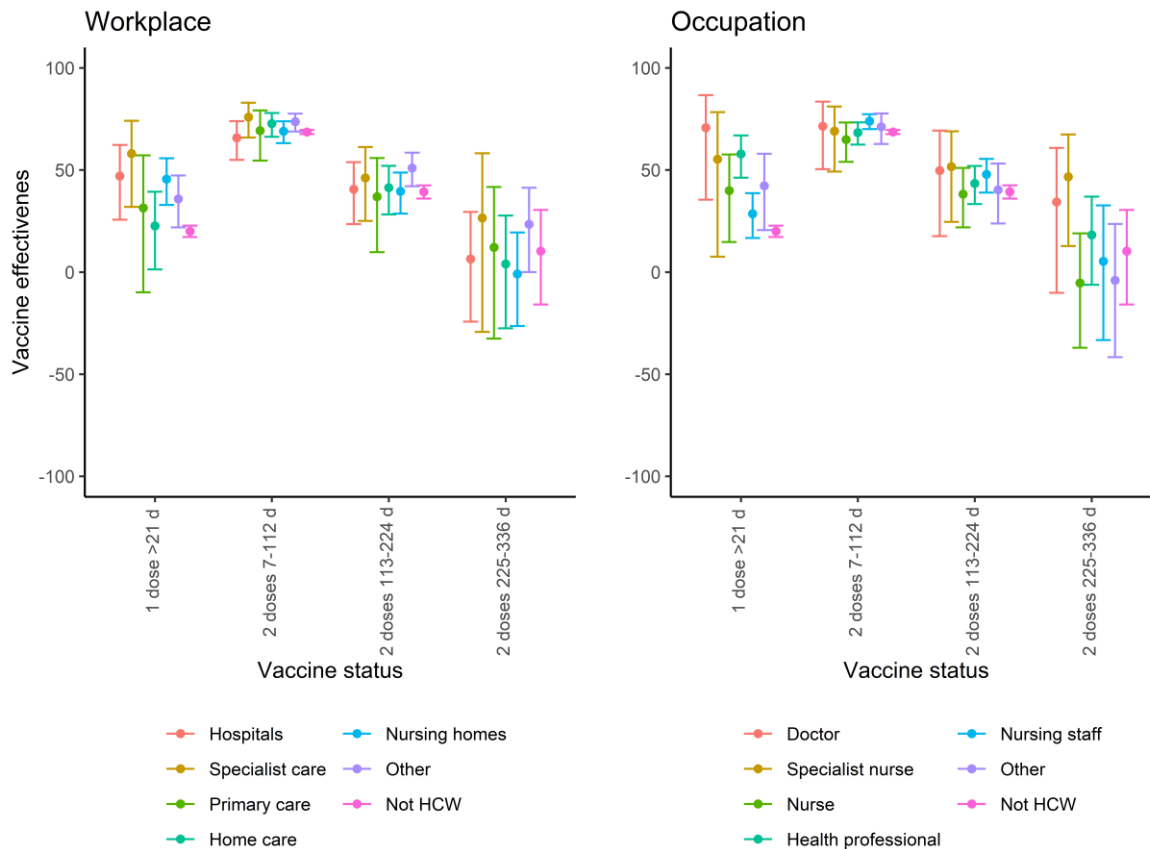


Figure S6: Vaccine effectiveness against infections during Delta wave in Norway, among non- health care workers (HCW) and HCW in different workplaces and occupation positions.

Table S14: Vaccine effectiveness against infections during Delta wave in Norway, among non-health care workers (HCW) and HCW in different occupation positions.

Occupation position/group	Vaccine status	Vaccine Effectiveness [95% CI]
Doctor	1 dose >7 d	70.7 [35.5 – 86.7]
Doctor	2 doses 7-112 d	71.4 [50.5 – 83.5]
Doctor	2 doses 113-224 d	49.7 [17.6 – 69.3]
Doctor	2 doses 225-336 d	34.4 [-10.1 – 60.9]
Health professional	1 dose >7 d	57.8 [46.3 – 66.9]
Health professional	2 doses 7-112 d	68.3 [62.4 – 73.3]
Health professional	2 doses 113-224 d	43.4 [33.3 – 52.0]
Health professional	2 doses 225-336 d	18.2 [-6.1 – 37.0]
Not HCW	1 dose >7 d	20 [17.2 – 22.8]
Not HCW	2 doses 7-112 d	68.6 [67.6 – 69.6]
Not HCW	2 doses 113-224 d	39.4 [36.0 – 42.5]
Not HCW	2 doses 225-336 d	10.2 [-15.9 – 30.5]
Nurse	1 dose >7 d	39.9 [14.8 – 57.6]
Nurse	2 doses 7-112 d	64.9 [54.0 – 73.3]
Nurse	2 doses 113-224 d	38.2 [21.9 – 51.0]
Nurse	2 doses 225-336 d	-5.3 [-37.0 – 19.0]
Nursing staff	1 dose >7 d	28.5 [16.7 – 38.7]
Nursing staff	2 doses 7-112 d	74 [70.0 – 77.4]
Nursing staff	2 doses 113-224 d	47.9 [39.0 – 55.5]
Nursing staff	2 doses 225-336 d	5.3 [-33.2 – 32.7]
Other	1 dose >7 d	42.2 [20.6 – 58.0]

Other	2 doses 7-112 d	71.2 [62.8 – 77.7]
Other	2 doses 113-224 d	40.3 [23.8 – 53.2]
Other	2 doses 225-336 d	-4 [-41.6 – 23.6]
Specialist nurse	1 dose >7 d	55.3 [7.6 – 78.4]
Specialist nurse	2 doses 7-112 d	69 [49.3 – 81.1]
Specialist nurse	2 doses 113-224 d	51.6 [24.6 – 69.0]
Specialist nurse	2 doses 225-336 d	46.7 [12.8 – 67.4]

Table S15: Vaccine effectiveness against infections during the Delta wave in Norway, among non-health care workers (HCW) and HCW in different occupation positions.

Occupation position/group	Vaccine status	Vaccine effectiveness [95% CI]
Doctor	1 dose >7 d	22.1 [-44.7 – 58.1]
Doctor	2 doses 7-112 d	30.8 [-7.1 – 55.3]
Doctor	2 doses 113-224 d	3.4 [-42.7 – 34.7]
Doctor	2 doses 225-336 d	48.6 [21.6 – 66.3]
Doctor	3 doses 7-112 d	32.7 [3.7 – 52.9]
Health professional	1 dose >7 d	-3 [-20.4 – 11.9]
Health professional	2 doses 7-112 d	25.8 [14.5 – 35.5]
Health professional	2 doses 113-224 d	-15.7 [-28.7 – -4.0]
Health professional	2 doses 225-336 d	0.5 [-13.1 – 12.5]
Health professional	3 doses 7-112 d	34.3 [27.2 – 40.7]
Not HCW	1 dose >7 d	-47.8 [-52.0 – -43.8]
Not HCW	2 doses 7-112 d	-32.4 [-35.4 – -29.5]
Not HCW	2 doses 113-224 d	-79.6 [-82.7 – -76.6]
Not HCW	2 doses 225-336 d	-30.5 [-38.2 – -23.2]
Not HCW	3 doses 7-112 d	10.7 [8.9 – 12.5]
Nurse	1 dose >7 d	-3.5 [-33.2 – 19.6]
Nurse	2 doses 7-112 d	26.2 [10.1 – 39.4]
Nurse	2 doses 113-224 d	-16.6 [-37.3 – 1.0]
Nurse	2 doses 225-336 d	9.8 [-7.7 – 24.4]
Nurse	3 doses 7-112 d	29.5 [18.2 – 39.1]
Nursing staff	1 dose >7 d	5.3 [-7.2 – 16.3]
Nursing staff	2 doses 7-112 d	14.7 [5.0 – 23.4]
Nursing staff	2 doses 113-224 d	-20.9 [-31.3 – -11.4]
Nursing staff	2 doses 225-336 d	9.6 [-1.8 – 19.8]
Nursing staff	3 doses 7-112 d	39.7 [34.3 – 44.7]
Other	1 dose >7 d	-18.3 [-49.4 – 6.3]
Other	2 doses 7-112 d	10.4 [-8.1 – 25.8]
Other	2 doses 113-224 d	-33.1 [-55.3 – -14.2]
Other	2 doses 225-336 d	2.8 [-16.8 – 19.1]
Other	3 doses 7-112 d	29.3 [18.0 – 39.1]
Specialist nurse	1 dose >7 d	21.7 [-45.8 – 57.9]
Specialist nurse	2 doses 7-112 d	35 [-1.5 – 58.4]
Specialist nurse	2 doses 113-224 d	-6.7 [-54.2 – 26.2]
Specialist nurse	2 doses 225-336 d	22.4 [-14.3 – 47.4]
Specialist nurse	3 doses 7-112 d	28.2 [-0.2 – 48.5]

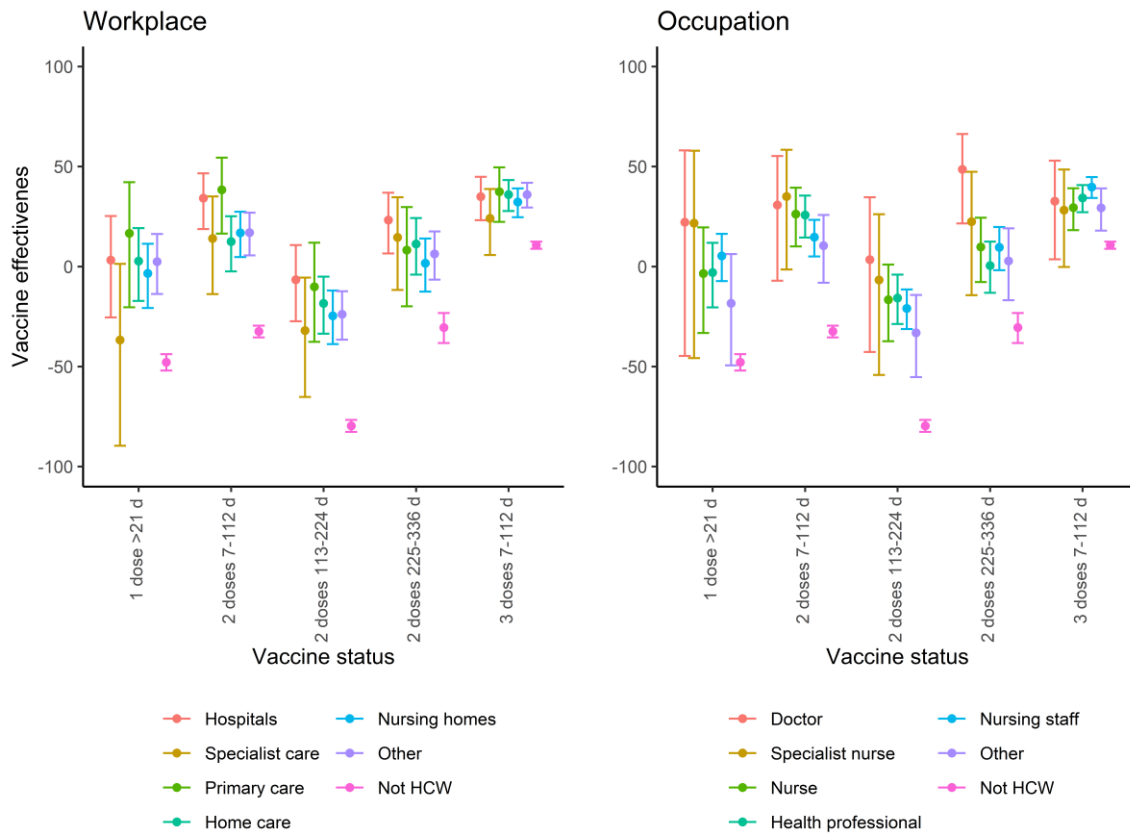


Figure S7: Vaccine effectiveness against infections during Omicron wave in Norway, among non-health care workers (HCW) and HCW of different workplaces and positions.

Table S16: Vaccine effectiveness against infections during Omicron wave in Norway among non-health care workers (HCW) and HCW of different workplaces.

Group by workplace	Vaccine status	Vaccine effectiveness [95% CI]
Home care	1 dose >21 d	2.7 [-17.1 – 19.2]
Home care	2 doses 7-112 d	12.5 [-2.4 – 25.2]
Home care	2 doses 113-224 d	-18.4 [-33.5 – -5.0]
Home care	2 doses 225-336 d	11.3 [-4.0 – 24.3]
Home care	3 doses 7-112 d	36 [27.8 – 43.3]
Hospitals	1 dose >21 d	3.2 [-25.4 – 25.3]
Hospitals	2 doses 7-112 d	34.2 [18.8 – 46.6]
Hospitals	2 doses 113-224 d	-6.6 [-27.3 – 10.7]
Hospitals	2 doses 225-336 d	23.2 [6.6 – 36.9]
Hospitals	3 doses 7-112 d	34.9 [23.2 – 44.9]
Not HCW	1 dose >21 d	-47.8 [-52.0 – -43.8]
Not HCW	2 doses 7-112 d	-32.4 [-35.4 – -29.5]
Not HCW	2 doses 113-224 d	-79.6 [-82.7 – -76.6]
Not HCW	2 doses 225-336 d	-30.5 [-38.2 – -23.2]
Not HCW	3 doses 7-112 d	10.7 [8.9 – 12.5]
Nursing homes	1 dose >21 d	-3.4 [-20.7 – 11.4]
Nursing homes	2 doses 7-112 d	16.8 [4.7 – 27.4]
Nursing homes	2 doses 113-224 d	-24.6 [-38.7 – -12.0]
Nursing homes	2 doses 225-336 d	1.7 [-12.5 – 14.1]
Nursing homes	3 doses 7-112 d	32.2 [24.7 – 39.1]
Other	1 dose >21 d	2.4 [-13.7 – 16.3]
Other	2 doses 7-112 d	17 [5.6 – 26.9]

Other	2 doses 113-224 d	-23.8 [-36.5 – -12.3]
Other	2 doses 225-336 d	6.3 [-6.5 – 17.6]
Other	3 doses 7-112 d	36 [29.5 – 41.9]
Primary care	1 dose >21 d	16.6 [-20.4 – 42.2]
Primary care	2 doses 7-112 d	38.3 [16.5 – 54.5]
Primary care	2 doses 113-224 d	-10.1 [-37.6 – 11.9]
Primary care	2 doses 225-336 d	8.2 [-19.9 – 29.7]
Primary care	3 doses 7-112 d	37.4 [22.3 – 49.6]
Specialist care	1 dose >21 d	-36.7 [-89.6 – 1.4]
Specialist care	2 doses 7-112 d	14.1 [-13.8 – 35.1]
Specialist care	2 doses 113-224 d	-32 [-65.2 – -5.5]
Specialist care	2 doses 225-336 d	14.6 [-11.7 – 34.6]
Specialist care	3 doses 7-112 d	24.1 [5.8 – 38.8]

Table S17: Vaccine effectiveness against infections during Omicron wave in Norway, among non-health care workers (HCW) and HCW of different positions.

Group by workplace	Vaccine status	Vaccine effectiveness [95% CI]
Doctor	1 dose >21 d	22.1 [-44.7 – 58.1]
Doctor	2 doses 7-112 d	30.8 [-7.1 – 55.3]
Doctor	2 doses 113-224 d	3.4 [-42.7 – 34.7]
Doctor	2 doses 225-336 d	48.6 [21.6 – 66.3]
Doctor	3 doses 7-112 d	32.7 [3.7 – 52.9]
Health professional	1 dose >21 d	-3 [-20.4 – 11.9]
Health professional	2 doses 7-112 d	25.8 [14.5 – 35.5]
Health professional	2 doses 113-224 d	-15.7 [-28.7 – -4.0]
Health professional	2 doses 225-336 d	0.5 [-13.1 – 12.5]
Health professional	3 doses 7-112 d	34.3 [27.2 – 40.7]
Not HCW	1 dose >21 d	-47.8 [-52.0 – -43.8]
Not HCW	2 doses 7-112 d	-32.4 [-35.4 – -29.5]
Not HCW	2 doses 113-224 d	-79.6 [-82.7 – -76.6]
Not HCW	2 doses 225-336 d	-30.5 [-38.2 – -23.2]
Not HCW	3 doses 7-112 d	10.7 [8.9 – 12.5]
Nurse	1 dose >21 d	-3.5 [-33.2 – 19.6]
Nurse	2 doses 7-112 d	26.2 [10.1 – 39.4]
Nurse	2 doses 113-224 d	-16.6 [-37.3 – 1.0]
Nurse	2 doses 225-336 d	9.8 [-7.7 – 24.4]
Nurse	3 doses 7-112 d	29.5 [18.2 – 39.1]
Nursing staff	1 dose >21 d	5.3 [-7.2 – 16.3]
Nursing staff	2 doses 7-112 d	14.7 [5.0 – 23.4]
Nursing staff	2 doses 113-224 d	-20.9 [-31.3 – -11.4]
Nursing staff	2 doses 225-336 d	9.6 [-1.8 – 19.8]
Nursing staff	3 doses 7-112 d	39.7 [34.3 – 44.7]
Other	1 dose >21 d	-18.3 [-49.4 – 6.3]
Other	2 doses 7-112 d	10.4 [-8.1 – 25.8]
Other	2 doses 113-224 d	-33.1 [-55.3 – -14.2]
Other	2 doses 225-336 d	2.8 [-16.8 – 19.1]
Other	3 doses 7-112 d	29.3 [18.0 – 39.1]
Specialist nurse	1 dose >21 d	21.7 [-45.8 – 57.9]
Specialist nurse	2 doses 7-112 d	35 [-1.5 – 58.4]
Specialist nurse	2 doses 113-224 d	-6.7 [-54.2 – 26.2]
Specialist nurse	2 doses 225-336 d	22.4 [-14.3 – 47.4]
Specialist nurse	3 doses 7-112 d	28.2 [-0.2 – 48.5]

5. References

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