SUPPLEMENTAL MATERIALS

SARS-CoV-2 vaccination and myocarditis or myopericarditis: A population based cohort study

Contents

Table S1. Description of study outcomes and covariates. 2
Table S2. Hazard ratio of myocarditis/myopericarditis within 28 days following vaccination in the cohort study, by vaccine type and age group. 3
Table S3. Hazard ratio of myocarditis/myopericarditis within 28 days following vaccination in the cohort study, by vaccine type and sex. 3
Table S4. Hazard ratio of myocarditis/myopericarditis within 28 days following vaccination in the cohort study, by vaccine type and vaccine dose number. 3
Table S5. Hazard ratio and rate ratio of myocarditis/myopericarditis 29 days or more following vaccination in the cohort study and in the SCCS study by vaccine type. 4
Table S6. Hazard ratio of a myocarditis/myopericarditis within 28 days following vaccination in the cohort study, by vaccine technology. 4
Table S7. Kaplan-Meier estimates of clinical outcomes among individuals with myocarditis/myopericarditis, by vaccination status, sex, and age. 5
Table S8. Person-years of follow-up in the Danish nationwide population cohort by age group, sex, vaccine dose number, vaccine priority group, and comorbidities, for individuals receiving ChAdOx1 nCoV-19 (AstraZeneca) or Ad26.COV2.S (Johnson & Johnson) vaccines, based on follow-up from October 1, 2020. 6
Table S9. Hazard ratio of myocarditis/myopericarditis within 28 days following vaccination in the cohort study, for vaccines not included in the national mass-vaccination program. 6
Table S10. Hazard ratio of myocarditis/myopericarditis within 28 days following vaccination in the cohort study, by vaccine type, with follow-up until October 5, 2021, using Firth’s bias reduction method. 7
Table S11. Hazard ratio of myocarditis/myopericarditis within 28 days following vaccination in the cohort study, by vaccine type, with follow-up until October 5, 2021, without exclusion of prior diagnosis of myocarditis or pericarditis prior to start of follow-up. 7
Table S12. Hazard ratio of myocarditis/myopericarditis within 28 days following vaccination in the cohort study, by vaccine type, with follow-up until October 5, 2021, without exclusion of prior diagnosis of myocarditis or pericarditis prior to start of follow-up. 7
Table S13. Hazard ratio of myocarditis/myopericarditis within 28 days following vaccination in the cohort study, by vaccine type, with follow-up until October 5, 2021 and without censoring following a positive SARS-CoV-2 PCR-test. 8
Table S14. Hazard ratio of myocarditis/myopericarditis within 14- and 56-day risk window following vaccination in the cohort study, by vaccine type, with follow-up until October 5, 2021. 8
Table S15. Hazard ratio of cardiac arrest or death within respectively 56-, 84-, and 112-day time windows following vaccination in the cohort study, by vaccine type, with follow-up until October 5, 2021. 8
Table S16. Characteristics of individuals who died during follow-up by vaccination status. 9
Table S17. Person-years of follow-up in the Danish nationwide population by SARS-CoV-2 status during follow-up, and by age group, sex, vaccine priority group, and comorbidities based on follow-up from October 1, 2020.1 10
Table S18. Hazard ratio of myocarditis/myopericarditis by SARS-CoV-2 status in the cohort study, with follow-up until October 5, 2021. 11
Table S19. Hazard ratio of cardiac arrest or death by SARS-CoV-2 status in the cohort study, with follow-up until October 5, 2021. 11
Figure S1. Flowchart of inclusion in ‘myocarditis/myopericarditis’ outcome definition. 12
Figure S2. Schematic illustration of follow-up time windows in the cohort study. 13
Figure S3. Temporal timing of myocarditis/myopericarditis events relative to vaccination for the assessment of the self-controlled cases series (SCCS) analysis. 14
Figure S4. Boxplot of maximum troponin levels among myocarditis/myopericarditis cases by vaccination status. 15
Figure S5. Frequency of myocarditis/myopericarditis events relative to SARS-CoV-2 infection. 16
| Diagnostic categories | ICD-10 codes |
|-----------------------|--------------|
| Myocarditis           | I40.0, I40.1, I40.9, I41.1, I41.8, I51.4 |
| Pericarditis          | I30.0, I30.8, I30.9, I30.1E |
| Asthma                | J45-J46      |
| Chronic pulmonary disease (incl. COPD) | J40-J44, J47, J60–J67, J68.4, J70.1, J70.3, J84.1, J92.0, J96.1, J98.2, J98.3 |
| Ischemic heart disease (myocardial infarction or angina pectoris) | I20-I23 |
| Heart failure         | I11.0, I13.0, I13.2, I42.0, I42.6, I42.7, I42.8, I42.9, I50.0, I50.1, I50.2, I50.3, I50.8, I50.9 |
| Atrial fibrillation or flutter | I48 |
| Diabetes mellitus     | E10.0, E10.1, E10.2-E10.8, E10.9, E11.0, E11.1, E11.2-E11.8, E11.9 |
| Inflammatory bowel disease | K50, K51 |
| Malignancy            | C00–C75, C76-C80, C81-C85, C88, C90, C91-95, C96 |
| Moderate to severe renal disease | I12, I13, N00–N05, N07, N11, N14, N17–N19, Q61 |
| Cardiac arrest        | I46          |

1 The lookback period for diagnoses of malignancy was five years. The remaining categories of comorbidities had a lookback period of ten years.
### Table S2. Hazard ratio of myocarditis/myopericarditis within 28 days following vaccination in the cohort study, by vaccine type and age group.

| Age Group | Unvaccinated (ref.) | BNT162b2 (Pfizer-BioNTech) | mRNA-1273 (Moderna) | HR (95% CI)* | aHR (95% CI)** |
|-----------|---------------------|-----------------------------|---------------------|--------------|----------------|
| 12-39 yrs |         | 149,192                     | 40,875              | 2.38 (1.39-4.08) | 1.48 (0.74-2.98) |
|           | 59 1,420,687          | 16 40,875                   | 8.40 (4.74-14.89)  | 5.24 (2.47-11.12) |  |
| 40-59 yrs | Unvaccinated (ref.) | 985,432                     | 13,347              | 1.08 (0.26-13.92) | 1.40 (0.17-11.16) |
|           | 39 985,432            | 10 172,888                  | 1.50 (0.75-3.00)   | 1.08 (0.44-2.70)  |  |
| ≥ 60 yrs  | Unvaccinated (ref.) | 807,832                     | 20,219              | 2.86 (1.01-8.08)  | 2.77 (0.90-8.50)  |
|           | 51 807,832            | 21 187,510                  | 1.76 (1.06-2.93)   | 1.41 (0.74-2.68)  |  |

* Adjusted for age and sex.
** Adjusted for age, sex, vaccine priority group, season, and clinical comorbidities.

### Table S3. Hazard ratio of myocarditis/myopericarditis within 28 days following vaccination in the cohort study, by vaccine type and sex.

| Sex       | Unvaccinated (ref.) | BNT162b2 (Pfizer-BioNTech) | mRNA-1273 (Moderna) | HR (95% CI)* | aHR (95% CI)** |
|-----------|---------------------|-----------------------------|---------------------|--------------|----------------|
| Male      | 122 1,628,595       | 26 253,135                  | 16 38,088           | 1.35 (0.88-2.07) | 0.82 (0.50-1.34) |
|           |                     |                             |                     | 5.31 (3.09-9.10) | 3.22 (1.75-5.93) |
| Female    | 33 1,585,356        | 22 256,455                  | 5 36,352            | 3.79 (2.19-6.56) | 3.73 (1.82-7.65) |
|           |                     |                             |                     | 5.70 (2.17-14.97) | 6.33 (2.11-18.96) |

* Adjusted for age.
** Adjusted for age, sex, vaccine priority group, season, and clinical comorbidities.

### Table S4. Hazard ratio of myocarditis/myopericarditis within 28 days following vaccination in the cohort study, by vaccine type and vaccine dose number.

| Vaccine Type | Unvaccinated (ref.) | BNT162b2 (Pfizer-BioNTech) | mRNA-1273 (Moderna) | HR (95% CI)* | aHR (95% CI)** |
|--------------|---------------------|-----------------------------|---------------------|--------------|----------------|
| First dose   | 155 3,213,951       | 21 249,656                  | 16 38,034           | 1.70 (1.08-2.69) | 1.30 (0.79-2.14) |
|              |                     |                             |                     | 1.52 (0.48-4.78) | 1.17 (0.36-3.79) |
| Second dose  | 27 259,934          | 18 36,406                   |                     | 2.09 (1.38-3.15) | 1.43 (0.88-2.33) |
|              |                     |                             |                     | 9.52 (5.76-15.74) | 6.99 (3.94-12.42) |

* Adjusted for age and sex.
** Adjusted for age, sex, vaccine priority group, season, and clinical comorbidities.
Table S5. Hazard ratio and rate ratio of myocarditis/myopericarditis 29 days or more following vaccination in the cohort study and in the SCCS study by vaccine type.

| Cohort study          | N     | Person-yrs | HR (95% CI)* | aHR (95% CI)** |
|-----------------------|-------|------------|--------------|----------------|
| Unvaccinated (ref.)   | 155   | 3,213,951  | 1            | 1              |
| BNT162b2 (Pfizer-BioNTech) | 38 | 796,280    | 0.89 (0.62-1.29) | 0.47 (0.28-0.79) |
| mRNA-1273 (Moderna)   | 4     | 79,541     | 0.93 (0.34-2.54) | 0.57 (0.20-1.66) |

| SCCS study            | RR (95% CI)*** | Firth RR (95% CI)**** |
|-----------------------|----------------|------------------------|
| Unvaccinated (ref.)   | 1              | 1                      |
| BNT162b2 (Pfizer-BioNTech) | 37 | 0.46 (0.25-0.84) | 0.47 (0.26-0.85) |
| mRNA-1273 (Moderna)   | 4              | 0.93 (0.26-3.39) | 0.99 (0.28-3.55) |

* Adjusted for age and sex.
** Adjusted for age, sex, vaccine priority group, season, and clinical comorbidities.
*** Adjusted for season.
**** Adjusted for season and analysed using Firth’s method for bias reduction.

Table S6. Hazard ratio of a myocarditis/myopericarditis within 28 days following vaccination in the cohort study, by vaccine type, in analyses with late start of follow-up (December 27, 2020).

| N     | Person-years | HR (95% CI)* | aHR (95% CI)** |
|-------|--------------|--------------|----------------|
| Unvaccinated (ref.) | 111 | 2,062,220 | 1 | 1 |
| BNT162b2 (Pfizer-BioNTech) | 48 | 509,590 | 1.71 (1.21-2.41) | 1.37 (0.92-2.04) |
| mRNA-1273 (Moderna) | 21 | 74,441 | 4.67 (2.88-7.57) | 3.92 (2.29-6.71) |

* Adjusted for age and sex.
** Adjusted for age, sex, vaccine priority group, season, and clinical comorbidities.

Table S7. Hazard ratio of myocarditis/myopericarditis within 28 days following vaccination in the cohort study, by vaccine technology.

| N     | Person-yrs | HR (95% CI)* | aHR (95% CI)** |
|-------|------------|--------------|----------------|
| Unvaccinated (ref.) | 155 | 3,213,951 | 1 | 1 |
| BNT162b2 + mRNA-1273 (mRNA) | 69 | 584,031 | 2.39 (1.80-3.18) | 1.64 (1.14-2.36) |
| ChAdOx1 nCoV-19 + Ad26.COV2.S (viral vector) | ≤3 | 13,387 | 1.88 (0.26-13.47) | 1.36 (0.18-10.02) |

* Adjusted for age and sex.
** Adjusted for age, sex, vaccine priority group, season, and clinical comorbidities.
**Defined as a hospital diagnosis of heart failure (as defined in Table S1) within 28 days of outcome.**

Cases included from only the 0-28 day time window following SARS-CoV-2 vaccination.

**Defined as a hospital diagnosis of heart failure (as defined in Table S1) within 28 days of outcome.**

|                  | Unvaccinated | BNT162b2*   | mRNA-1273*   |
|------------------|--------------|-------------|--------------|
|                  | % (95% CI)   | % (95% CI)  | % (95% CI)   |
| In hospital 72 hours after admission (%) | 47.7 (39.7 - 55.3) | 58.3 (43.2 - 70.8) | 40.0 (19.3 – 60.0) |
| Readmission within 28 days of discharge (%) | 15.6 (10.7 - 22.4) | 12.7 (5.9 - 26.1) | 0 (0 - 0) |
| Heart failure within 28 days of outcome** (%) | 4.5 (2.2 - 9.2) | 2.1 (0.3 - 13.9) | 0 (0 - 0) |
| Death within 28 days of outcome (%) | 1.9 (0.6 - 5.9) | 2.1 (0.3 - 13.9) | 0 (0 - 0) |

**Women**

|                  | % (95% CI)   | % (95% CI)  | % (95% CI)   |
|------------------|--------------|-------------|--------------|
| In hospital 72 hours after admission (%) | 51.5 (33.5 - 66.9) | 54.5 (32.1 - 72.4) | 60.0 (12.6 - 88.2) |
| Readmission within 28 days of discharge (%) | 33.3 (20 - 52.1) | 28.2 (13.8 - 52.4) | 0 (0 - 0) |
| Heart failure within 28 days of outcome** (%) | 3.0 (0.4 - 19.6) | 0 (0 - 0) | 0 (0 - 0) |
| Death within 28 days of outcome (%) | 3.0 (0.4 - 19.6) | 0 (0 - 0) | 0 (0 - 0) |

**Men**

|                  | % (95% CI)   | % (95% CI)  | % (95% CI)   |
|------------------|--------------|-------------|--------------|
| In hospital 72 hours after admission (%) | 46.7 (37.7 - 55.3) | 61.5 (40.3 - 77.1) | 33.3 (12.2 - 56.4) |
| Readmission within 28 days of discharge (%) | 10.8 (6.4 - 17.8) | 0 (0 - 0) | 0 (0 - 0) |
| Heart failure within 28 days of outcome** (%) | 4.9 (2.2 - 10.6) | 3.8 (0.6 - 24.3) | 0 (0 - 0) |
| Death within 28 days of outcome (%) | 1.7 (0.4 - 6.4) | 3.8 (0.6 - 24.3) | 0 (0 - 0) |

**Younger individuals (12-39 years)**

|                  | % (95% CI)   | % (95% CI)  | % (95% CI)   |
|------------------|--------------|-------------|--------------|
| In hospital 72 hours after admission (%) | 44.6 (32.3 - 56.2) | 58.8 (32.5 - 77.8) | 40.0 (16.5 - 62.8) |
| Readmission within 28 days of discharge (%) | 6.2 (2.4 - 15.7) | 5.9 (0.9 - 35) | 0 (0 - 0) |
| Heart failure within 28 days of outcome** (%) | 3.1 (0.8 - 11.7) | 0 (0 - 0) | 0 (0 - 0) |
| Death within 28 days of outcome (%) | 0 (0 - 0) | 0 (0 - 0) | 0 (0 - 0) |

**Older individuals (≥ 40 years)**

|                  | % (95% CI)   | % (95% CI)  | % (95% CI)   |
|------------------|--------------|-------------|--------------|
| In hospital 72 hours after admission (%) | 50.0 (39.3 - 59.8) | 58.1 (39.0 - 73.1) | 40.0 (5.2 - 75.3) |
| Readmission within 28 days of discharge (%) | 22.5 (15.1 - 32.6) | 16.5 (7.2 - 35.2) | 0 (0 - 0) |
| Heart failure within 28 days of outcome** (%) | 5.6 (2.4 - 12.9) | 3.2 (0.5 - 20.8) | 0 (0 - 0) |
| Death within 28 days of outcome (%) | 3.4 (1.1 - 10.1) | 3.2 (0.5 - 20.8) | 0 (0 - 0) |

* Cases included from only the 0-28 day time window following SARS-CoV-2 vaccination.

** Defined as a hospital diagnosis of heart failure (as defined in Table S1) within 28 days of outcome.
Table S9. Person-years of follow-up in the Danish nationwide population cohort by age group, sex, vaccine dose number, vaccine priority group, and comorbidities, for individuals receiving ChAdOx1 nCoV-19 (AstraZeneca) or Ad26.COV2.S (Johnson & Johnson) vaccines, based on follow-up from October 1, 2020.

|                          | ChAdOx1 nCoV-19 (AstraZeneca) vaccination risk time | Ad26.COV2.S (Johnson & Johnson) vaccination risk time |
|--------------------------|----------------------------------------------------|------------------------------------------------------|
| **Total person-years (%)** | 32,764 (100%)                                      | 10,898 (100%)                                       |
| **Age group**            |                                                    |                                                      |
| 12-39                    | 11,997 (36.6%)                                     | 9,391 (86.2%)                                       |
| 40-59                    | 16,889 (51.5%)                                     | 1,476 (13.5%)                                       |
| ≥ 60                     | 3,878 (11.8%)                                      | 31 (0.3%)                                            |
| **Female**               |                                                    |                                                      |
| Age group                |                                                    |                                                      |
| 12-39                    | 26,394 (80.6%)                                     | 1,992 (18.3%)                                       |
| 40-59                    | 6,370 (19.4%)                                      | 8,906 (81.7%)                                       |
| **Vaccinated with one dose** |                                                    |                                                      |
| Age group                |                                                    |                                                      |
| 12-39                    | 32,456 (99.1%)                                     | 10,897 (100%)                                       |
| 40-59                    | 309 (0.9%)                                         | 0 (0%)                                               |
| **Vaccine priority group** |                                                    |                                                      |
| Vulnerable individuals†   | 8 (0.0%)                                            | 0 (0.0%)                                             |
| Patients with increased risk of severe disease§ | 20 (0.1%) | 2 (0.0%) |
| Health care workers or similar activity¶ | 29,066 (88.7%) | 192 (1.8%) |
| Individuals prioritized by age criteria alone | 3,671 (11.2%) | 10,704 (98.2%) |
| Follow-up time until to December 31, 2020 | 0 (0.0%) | 0 (0.0%) |
| **Comorbidities**        |                                                    |                                                      |
| Any comorbidity listed below | 3,458 (10.6%)                                      | 456 (4.2%)                                          |
| Asthma                   | 973 (3.0%)                                         | 190 (1.7%)                                          |
| Chronic pulmonary disease | 225 (0.7%)                                         | 13 (0.1%)                                           |
| Ischemic heart disease   | 400 (1.2%)                                         | 16 (0.1%)                                           |
| Heart failure            | 87 (0.3%)                                          | 4 (0.0%)                                            |
| Atrial fibrillation or flutter | 230 (0.7%)                                      | 18 (0.2%)                                           |
| Diabetes mellitus        | 561 (1.7%)                                         | 68 (0.6%)                                           |
| Inflammatory bowel disease | 421 (1.3%)                                      | 84 (0.8%)                                           |
| Malignancy               | 836 (2.6%)                                         | 53 (0.5%)                                           |
| Moderate to severe renal disease | 166 (0.5%) | 30 (0.3%) |

1 Person-years by vaccine priority group from January 1, 2021 are in Table 1 assigned by vaccine priority assessed at February 22, 2021.
2 Individuals living in care homes or similar facilities, or individuals aged 65 years or older and receiving in-home assistance with activities of daily life.
3 Individuals clinically determined to be at increased risk of severe disease from SARS-CoV-2 infection.
4 Individuals working within the health care and social care sectors, and relatives in close contact with individuals at increased risk of severe disease.
**Table S10.** Hazard ratio of myocarditis/myopericarditis within 28 days following vaccination in the cohort study, for vaccines not included in the national mass-vaccination program.

|                  | N   | Person-yrs  | HR (95% CI)* | aHR (95% CI)** |
|------------------|-----|-------------|--------------|----------------|
| Unvaccinated (ref.) | 155 | 3,213,951   | 1            | 1              |
| ChAdOx1 nCoV-19 (AstraZeneca) | 0   | 10,703      | 0 (0.0)      | 0 (0.0)        |
| Ad26.COV2.S (Johnson & Johnson) | ≤3  | 2,684       | 5.66 (0.79-40.76) | 5.11 (0.70-37.16) |

* Adjusted for age and sex.
** Adjusted for age, sex, vaccine priority group, season, and clinical comorbidities.

**Table S11.** Hazard ratio of myocarditis/myopericarditis within 28 days following vaccination in the cohort study, by vaccine type, with follow-up until October 5, 2021, using Firth’s bias reduction method.

|                  | N   | Person-yrs  | HR (95% CI)* | aHR (95% CI)** |
|------------------|-----|-------------|--------------|----------------|
| Unvaccinated (ref.) | 155 | 3,213,951   | 1            | 1              |
| BNT162b2 (Pfizer-BioNTech) | 48  | 509,590     | 1.92 (1.38-2.66) | 1.35 (0.91-2.00) |
| mRNA-1273 (Moderna)     | 21  | 74,441      | 5.46 (3.41-8.74) | 3.98 (2.33-6.79) |

* Adjusted for age and sex, using Firth’s bias reduction method.
** Adjusted for age, sex, vaccine priority group, season, and clinical comorbidities, using Firth’s bias reduction method.

**Table S12.** Hazard ratio of myocarditis/myopericarditis within 28 days following vaccination in the cohort study, by vaccine type, with follow-up until October 5, 2021, without exclusion of prior diagnosis of myocarditis or pericarditis prior to start of follow-up.

|                  | N   | Person-yrs  | HR (95% CI)* | aHR (95% CI)** |
|------------------|-----|-------------|--------------|----------------|
| Unvaccinated (ref.) | 165 | 3,113,744   | 1            | 1              |
| BNT162b2 (Pfizer-BioNTech) | 48  | 388,735     | 1.78 (1.28-2.46) | 1.22 (0.83-1.80) |
| mRNA-1273 (Moderna)     | 21  | 41,505      | 5.10 (3.20-8.15) | 3.65 (2.15-6.18) |

* Adjusted for age and sex.
** Adjusted for age, sex, vaccine priority group, season, and clinical comorbidities.
*** Among individuals who previously received a myocarditis or pericarditis diagnosis code during January 1, 2017 to September 30, 2020, none developed our primary outcome within 28 days following vaccination with either BNT162b2 (2,363 individuals) or mRNA-1273 (309 individuals), by the end of follow-up.
** Table S13. ** Hazard ratio of myocarditis/myopericarditis within 28 days following vaccination in the cohort study, by vaccine type, with follow-up until October 5, 2021 and without censoring following a positive SARS-CoV-2 PCR-test.

|                        | N  | Person-yrs | HR (95% CI)* | aHR (95% CI)** |
|------------------------|----|------------|--------------|----------------|
| Unvaccinated (ref.)    | 161| 3,333,229  | 1            | 1              |
| BNT162b2 (Pfizer-BioNTech) | 49 | 533,186    | 1.84 (1.33-2.54) | 1.29 (0.88-1.91) |
| mRNA-1273 (Moderna)   | 23 | 78,034     | 5.64 (3.59-8.85) | 4.12 (2.47-6.88) |

* Adjusted for age and sex.
** Adjusted for age, sex, vaccine priority group, season, and clinical comorbidities.

** Table S14. ** Hazard ratio of myocarditis/myopericarditis within 14- and 56-day risk window following vaccination in the cohort study, by vaccine type, with follow-up until October 5, 2021.

|                        | N  | Person-yrs | HR (95% CI)* | aHR (95% CI)** |
|------------------------|----|------------|--------------|----------------|
| Myocarditis/myopericarditis (14-day risk window) | Unvaccinated (ref.) | 155 | 3,213,951 | 1          | 1          |
|                        | BNT162b2 (Pfizer-BioNTech) | 33  | 263,927   | 2.54 (1.74-3.71) | 1.89 (1.23-2.90) |
|                        | mRNA-1273 (Moderna) | 14  | 37,497    | 7.13 (4.07-12.47) | 5.46 (2.97-10.07) |
| Myocarditis/myopericarditis (56-day risk window) | Unvaccinated (ref.) | 155 | 3,213,951 | 1          | 1          |
|                        | BNT162b2 (Pfizer-BioNTech) | 58  | 804,147   | 1.46 (1.07-1.98) | 1.05 (0.71-1.56) |
|                        | mRNA-1273 (Moderna) | 23  | 112,000   | 3.90 (2.48-6.13) | 3.00 (1.77-5.09) |

* Adjusted for age and sex.
** Adjusted for age, sex, vaccine priority group, season, and clinical comorbidities.

** Table S15. ** Hazard ratio of cardiac arrest or death within respectively 56-, 84-, and 112-day time windows following vaccination in the cohort study, by vaccine type, with follow-up until October 5, 2021.

|                        | N  | Person-yrs | HR (95% CI)* | aHR (95% CI)** |
|------------------------|----|------------|--------------|----------------|
| Cardiac arrest or death (56 days) | Unvaccinated (ref.) | 25,933 | 3,214,646 | 1          | 1          |
|                        | BNT162b2 (Pfizer-BioNTech) | 8,239 | 804,179   | 0.83 (0.81-0.85) | 0.58 (0.56-0.60) |
|                        | mRNA-1273 (Moderna) | 633  | 112,028   | 0.42 (0.39-0.46) | 0.53 (0.49-0.58) |
| Cardiac arrest or death (84 days) | Unvaccinated (ref.) | 25,933 | 3,214,646 | 1          | 1          |
|                        | BNT162b2 (Pfizer-BioNTech) | 11,496 | 997,788   | 0.87 (0.85-0.89) | 0.59 (0.57-0.60) |
|                        | mRNA-1273 (Moderna) | 892  | 128,857   | 0.45 (0.42-0.48) | 0.56 (0.52-0.60) |
| Cardiac arrest or death (112 days) | Unvaccinated (ref.) | 25,933 | 3,214,646 | 1          | 1          |
|                        | BNT162b2 (Pfizer-BioNTech) | 14,779 | 1,118,511 | 0.91 (0.89-0.92) | 0.59 (0.57-0.61) |
|                        | mRNA-1273 (Moderna) | 1,149 | 140,227   | 0.47 (0.44-0.50) | 0.57 (0.54-0.61) |

* Adjusted for age and sex.
** Adjusted for age, sex, vaccine priority group, season, and clinical comorbidities.
### Table S16. Characteristics of individuals who died during follow-up by vaccination status.

|                          | Unvaccinated | Vaccinated with BNT162b2 | Vaccinated with mRNA-1273 |
|--------------------------|--------------|--------------------------|---------------------------|
| **Total deaths**         | 25,641 (84.6%) | 4,374 (14.4%) | 290 (1.0%) |
| **Sex**                  |              |                          |                           |
| Female                   | 11,946 (83.5%) | 2,236 (15.6%) | 127 (0.9%) |
| Male                     | 13,695 (85.6%) | 2,138 (13.4%) | 163 (1.0%) |
| **Age group (years)**    |              |                          |                           |
| 12-39                    | 473 (93.8%) | 26 (5.2%) | 5 (1.0%) |
| 40-59                    | 2,433 (90.0%) | 241 (8.9%) | 30 (1.1%) |
| ≥ 60                     | 22,735 (83.9%) | 4,107 (15.2%) | 255 (0.9%) |
| **Place of death**       |              |                          |                           |
| In-hospital              | 11,425 (86.0%) | 1,702 (12.8%) | 163 (1.2%) |
| Out-of-hospital          | 14,216 (83.5%) | 2,672 (15.7%) | 127 (0.7%) |
| **Comorbidities**        |              |                          |                           |
| Any of the following     | 16,922 (85.0%) | 2,820 (14.2%) | 173 (0.9%) |
| Asthma                   | 862 (83.2%) | 164 (15.8%) | 10 (1.0%) |
| Chronic pulmonary disease| 4,319 (83.1%) | 830 (16.0%) | 51 (1.0%) |
| Ischemic heart disease   | 2,770 (83.4%) | 515 (15.5%) | 37 (1.1%) |
| Heart failure            | 3,218 (83.0%) | 631 (16.3%) | 29 (0.7%) |
| Atrial fibrillation or flutter | 5,305 (83.2%) | 1,010 (15.8%) | 60 (0.9%) |
| Diabetes mellitus        | 3,843 (85.0%) | 639 (14.1%) | 40 (0.9%) |
| Inflammatory bowel disease| 307 (85.5%) | 46 (12.8%) | 6 (1.7%) |
| Malignancy               | 8,148 (87.6%) | 1,088 (11.7%) | 62 (0.7%) |
| Moderate to severe renal disease | 2,518 (84.3%) | 451 (15.1%) | 19 (0.6%) |
Table S17. Person-years of follow-up in the Danish nationwide population by SARS-CoV-2 status during follow-up, and by age group, sex, vaccine priority group, and comorbidities based on follow-up from October 1, 2020.¹

| Risk time of individuals who did not test positive for SARS-CoV-2 | Risk time of individuals who tested positive for SARS-CoV-2 within 0-28 days of test | Risk time of individuals who tested positive for SARS-CoV-2 from 29 days of test |
|---|---|---|
| **Total person-years** | 3,213,951 (100%) | 18,532 (100%) | 100,746 (100%) |
| **Age group** | | | |
| 12-39 | 1,420,687 (44.2%) | 10,541 (56.9%) | 61,144 (60.7%) |
| 40-59 | 985,432 (30.7%) | 5,576 (30.1%) | 29,609 (29.4%) |
| ≥ 60 | 807,832 (25.1%) | 2,415 (13.0%) | 9,993 (9.9%) |
| **Female** | | | |
| | 1,585,356 (49.3%) | 9,275 (50.0%) | 50,040 (49.7%) |
| **Male** | | | |
| | 1,628,595 (50.7%) | 9,257 (50.0%) | 50,706 (50.3%) |
| **Vaccine priority group** | | | |
| Vulnerable individuals¹ | 10,166 (0.3%) | 141 (0.8%) | 442 (0.4%) |
| Patients with increased risk of severe disease² | 18,000 (0.6%) | 131 (0.7%) | 730 (0.7%) |
| Health care workers or similar activity³ | 95,185 (3.0%) | 1,045 (5.6%) | 7,988 (7.9%) |
| Individuals prioritized by age criteria alone | 1,874,027 (58.3%) | 10,088 (54.4%) | 82,188 (81.6%) |
| **Comorbidities** | | | |
| Any comorbidity listed below | 1,216,573 (37.9%) | 7,128 (38.5%) | 9,399 (9.3%) |
| Asthma | 462,660 (14.4%) | 2,143 (11.6%) | 10,269 (10.2%) |
| Chronic pulmonary disease | 88,902 (2.8%) | 594 (3.2%) | 3,246 (3.2%) |
| Ischemic heart disease | 57,931 (1.8%) | 222 (1.2%) | 909 (0.9%) |
| Heart failure | 80,173 (2.5%) | 322 (1.7%) | 1,462 (1.5%) |
| Atrial fibrillation or flutter | 33,433 (1.0%) | 132 (0.7%) | 497 (0.5%) |
| Diabetes mellitus | 76,690 (2.4%) | 293 (1.6%) | 1,158 (1.1%) |
| Inflammatory bowel disease | 90,096 (2.8%) | 439 (2.4%) | 2,060 (2.0%) |
| Malignancy | 32,506 (1.0%) | 171 (0.9%) | 871 (0.9%) |
| Moderate to severe renal disease | 118,298 (3.7%) | 446 (2.4%) | 1,897 (1.9%) |

¹ Individuals living in care homes or similar facilities, or individuals aged 65 years or older and receiving in-home assistance with activities of daily life.

² Individuals clinically determined to be at increased risk of severe disease from SARS-CoV-2 infection.

³ Individuals working within the health care and social care sectors, and relatives in close contact with individuals at increased risk of severe disease.
Table S18. Hazard ratio of myocarditis/myopericarditis by SARS-CoV-2 status in the cohort study, with follow-up until October 5, 2021.

|                      | N     | Person-yrs | HR (95% CI)* | aHR (95% CI)** |
|----------------------|-------|------------|--------------|----------------|
| Uninfected (ref.)    | 155   | 3,213,951  | 1            | 1              |
| SARS-CoV-2 PCR-positive*** | ≤3     | 18,532     | 2.27 (0.56-9.15) | 2.09 (0.52-8.47) |

* Adjusted for age and sex.
** Adjusted for age, sex, vaccine priority group, season, and clinical comorbidities.
*** Within 0-28 days of positive SARS-CoV-2 PCR-test.

Table S19. Hazard ratio of cardiac arrest or death by SARS-CoV-2 status in the cohort study, with follow-up until October 5, 2021.

|                      | N     | Person-yrs | HR (95% CI)* | aHR (95% CI)** |
|----------------------|-------|------------|--------------|----------------|
| Uninfected (ref.)    | 25,933| 3,214,646  | 1            | 1              |
| SARS-CoV-2 PCR-positive*** | 1,532 | 18,538     | 17.53 (16.64-18.46) | 13.64 (12.94-14.38) |

* Adjusted for age and sex.
** Adjusted for age, sex, vaccine priority group, season, and clinical comorbidities.
*** Within 0-28 days of a positive SARS-CoV-2 PCR-test.
Figure S1. Flowchart of inclusion in ‘myocarditis/myopericarditis’ outcome definition. By A) myocarditis or pericarditis diagnosis only, B) myocarditis diagnosis only, and C) pericarditis diagnosis only*. Only cases within 0-28 days of vaccination are included among SARS-CoV-2 mRNA vaccinated.

* The number of ‘myocarditis/myopericarditis’ events by ICD-10 code were: I40.0 (≤3), I40.1 (≤3), I40.9 (68), I41.1 (≤3), I41.8 (≤3), I51.4 (40), I30.0 (57), I30.8 (≤3), I30.9 (47), and I30.1E (≤3). Minor differences between the events described in flowchart and in statistical analyses are attributable to readmissions and differential censoring in different analyses.
**Figure S2.** Schematic illustration of follow-up time windows in the cohort study. For an individual who was A) vaccinated with a first dose on May 15, 2021, a second dose on June 20, 2021, and was followed until end of follow-up on October 5, 2021; B) not vaccinated and followed until end of follow-up; C) vaccinated with a first dose on May 15, 2021, a second dose on June 20, 2021, and experienced an event on July 3, 2021; and D) not vaccinated and experienced an event on July 3, 2021.*

*The 28-day time window following the first dose was shortened if the second vaccine dose was received within the 28 days, when the 28-day time window of the second dose would start. In this case, the ‘0-28 days’ follow-up time windows following both doses would consist of less than 56 days in total.*
Figure S3. Temporal timing of myocarditis/myopericarditis events relative to vaccination for the assessment of the self-controlled cases series (SCCS) analysis. Frequency of ‘myocarditis/myopericarditis’ events in each week relative to the day of vaccination (the week of vaccination starts from day 0, the day of vaccination, a day 6 following vaccination), by vaccine type and dose. In total, 3,482,295 were vaccinated a first dose of BNT162b2 and 3,417,744 with a second dose of BNT162b2, while 498,814 were vaccinated with a first dose of mRNA-1273 and 483,270 were vaccinated with a second dose of mRNA-1273.

| Weeks from vaccination | First dose | Second dose |
|------------------------|------------|-------------|
| -12                    | 2          | 3           |
| -8                     | 4          | 2           |
| -4                     | 6          | 0           |
| 0                      | 8          | 12          |
| 4                      | 6          | 12          |
| 12                     | 2          | 0           |
| 18                     | 0          | 2           |
| 24                     | 2          | 4           |
| 30                     | 4          | 6           |
| 36                     | 6          | 8           |
| 42                     | 8          | 10          |
| 48                     | 10         | 12          |
| 54                     | 12         |             |

Day of vaccination

Number of events
Figure S4. Boxplot of maximum troponin levels among myocarditis/myopericarditis cases by vaccination status. Only cases within 0-28 days of vaccination are included among SARS-CoV-2 mRNA vaccinated. The assay-specific upper normal limits were used as cut-offs for defining increased troponin-I and troponin-T levels.
Figure S5. Frequency of myocarditis/myopericarditis events relative to SARS-CoV-2 infection. Events relative to the week of a positive SARS-CoV-2 PCR-test (day 1-7 following a positive SARS-CoV-2 PCR-test).