THE LANCET
Rheumatology

## Supplementary appendix

This appendix formed part of the original submission. We post it as supplied by the authors.

Supplement to: Boekel L, Kummer L Y, van Dam K P J, et al. Adverse events after first COVID-19 vaccination in patients with autoimmune diseases. *Lancet Rheumatol* 2021; published online June 18. https://doi.org/10.1016/S2665-9913(21)00181-8.

# Adverse events after first COVID-19 vaccination in patients with autoimmune diseases

*L. Boekel, L.Y. Kummer, P.J. van Dam, F. Hooijberg, Z.L.E. van Kempen, E.H. Vogelzang, L. Wieske, F. Eftimov, R. van Vollenhoven, T.W. Kuijpers, S.M. van Ham, S.W. Tas, J. Killestein, M. Boers, M.T. Nurmohamed, T. Rispens, G.J. Wolbink*

# Appendix

**Table of contents**

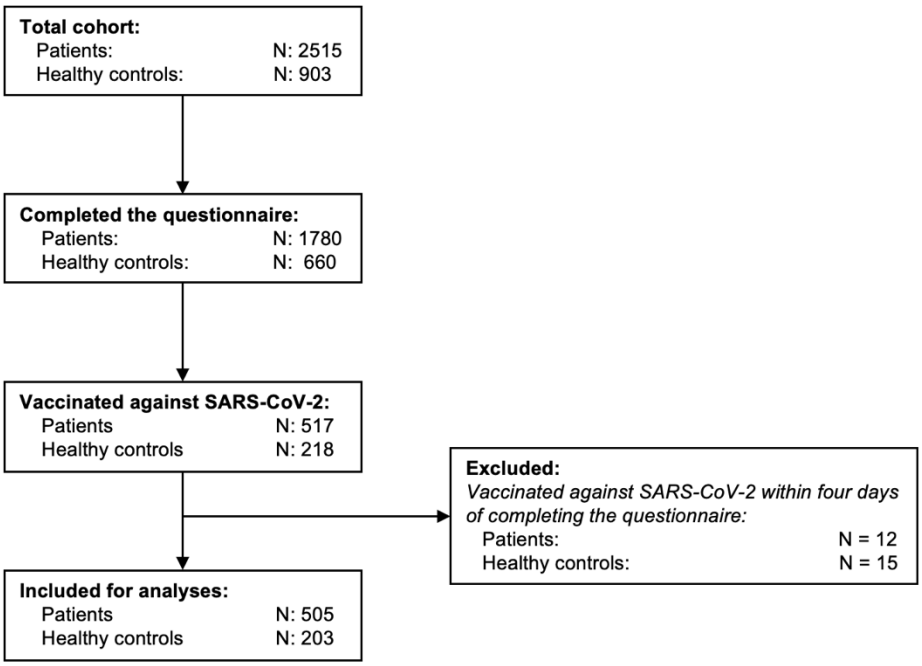


**Figure S1.** Flow-chart.

| Table S1. Characteristics of patients with autoimmune diseases compared to healthy controls who have been vaccinated against COVID-19. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Patient characteristics** | **All patients (n=505)** | | **Rheumatoid arthritis (n=204)** | | **Multiple sclerosis (n=81)** | | **Healthy controls (n=203)** | |
| Mean age – yr | 64 ± 11 | | 67 ± 8 | | 54 ± 13 | | 64 ± 11 | |
| Female sex – no. (%) | 329 | (65) | 149 | (73) | 55 | (68) | 133 | (66) |
| Male sex – no. (%) | 176 | (35) | 55 | (27) | 26 | (32) | 70 | (34) |
| White race* – no. (%) | 381/422 | (90) | 181/204 | (89) | N.A. | | 183/197 | (93) |
| Mean BMI | 26 ± 5 | | 26 ± 5 | | 25 ± 4 | | 25 ± 4 | |
| Coexisting conditions – no. (%) | | | | | | | | |
| Chronic pulmonary disease | 56 | (11) | 26 | (13) | 1 | (1) | 15 | (7) |
| Cardiovascular disease | 67 | (13) | 24 | (12) | 4 | (5) | 21 | (10) |
| Diabetes | 27 | (5) | 10 | (5) | 3 | (4) | 8 | (4) |
| Obesity | 91 | (18) | 39 | (19) | 7 | (9) | 14 | (7) |
| **Autoimmune disease type[1] – no. (%)** | | | | | | | | |
| Rheumatoid arthritis | 204 | (40) | 204 | (100) | 0 | (0) | N.A. | |
| Psoriatic arthritis | 49 | (10) | 11 | (5) | 0 | (0) | N.A. | |
| Ankylosing spondylitis | 39 | (8) | 3 | (1) | 0 | (0) | N.A. | |
| Axial or peripheral spondyloarthritis | 8 | (2) | 0 | (0) | 0 | (0) | N.A. | |
| Juvenile idiopathic arthritis | 5 | (1) | 1 | (0.5) | 0 | (0) | N.A. | |
| Systemic lupus erythematodes | 25 | (5) | 2 | (1) | 0 | (0) | N.A. | |
| Vasculitis | 10 | (2) | 2 | (1) | 0 | (0) | N.A. | |
| Polymyalgia rheumatica | 17 | (3) | 3 | (1) | 0 | (0) | N.A. | |
| Sjogren's disease | 28 | (6) | 10 | (5) | 0 | (0) | N.A. | |
| Other rheumatic diseases[2] | 86 | (17) | 2 | (1) | 0 | (0) | N.A. | |
| Multiple sclerosis | 81 | (16) | 0 | (0) | 81 | (100) | N.A. | |
| **Immunosuppressive medication[1] – no. (%)** | | | | | | | | |
| No immunosuppressive medication | 157 | (31) | 15 | (7) | 22 | (27) | N.A. | |
| csDMARDs | 236 | (47) | 171 | (84) | N.A. | | N.A. | |
| *Methotrexate* | 169 | (33) | 138 | (68) | N.A. | | N.A. | |
| *Other*[3] | 67 | (13) | 33 | (16) | N.A. | | N.A. | |
| Biologicals | 147 | (29) | 68 | (33) | 28 | (35) | N.A. | |
| *TNF inhibitor* | 93 | (18) | 49 | (24) | 0 | (0) | N.A. | |
| *IL-6 inhibitor* | 1 | (0.2) | 1 | (0.5) | 0 | (0) | N.A. | |
| *Anti-CD20 therapy* | 35 | (7) | 11 | (5) | 22 | (27) | N.A. | |
| *Other* | 18 | (4) | 7 | (3) | 6 | (7) | N.A. | |
| Immunomodulatory MS therapies | | | | | | | | |
| *Interferon-bèta* | 6 | (1) | N.A. | | 6 | (7) | N.A. | |
| *Other* | 24 | (5) | N.A. | | 24 | (30) | N.A. | |
| Oral glucocorticoids | 77 | (15) | 41 | (20) | 1 | (1) | 0 | (0) |
| **COVID-19 vaccination** | | | | | | | | |
| Vaccine type – no. (%) | | | | | | | | |
| *ChAdOx1 nCoV-19 (AstraZeneca)* | 231 | (46) | 97 | (48) | 48 | (59) | 104 | (51) |
| *BNT162b2 (Pfizer/BioNtech)* | 209 | (41) | 92 | (45) | 16 | (20) | 90 | (44) |
| *CX-024414 (Moderna)* | 65 | (13) | 15 | (7) | 17 | (21) | 9 | (4) |
| Vaccinated twice – no. (%) | 73 | (14) | 19 | (9) | 12 | (15) | 32 | (16) |
| Severity of adverse events – no. (%) | | | | | | | | |
| Mild | 258 | (51) | 107 | (52) | 53 | (65) | 106 | (52) |
| Moderate | 105 | (21) | 37 | (18) | 28 | (35) | 38 | (19) |
| Severe | 6 | (1) | 1 | (0.5) | 2 | (2) | 0 | (0) |

*Table 1. Values are displayed as mean ± standard deviation (SD) or frequencies with corresponding percentages (%). csDMARDs = conventional disease modifying anti-rheumatic drugs, TNF = anti-tumor necrosis factor, IL = interleukin. [1]One person can be diagnosed with more than one autoimmune disease type and receive more than one immunosuppressive drug. [2]Other rheumatic diseases included mixed connective tissue disease, sarcoidosis, systemic sclerosis and myositis. [3]Other csDMARDs included hydroxychloroquine, sulfasalazine, leflunomide and azathioprine. *Ethnicity was unknown in patients with multiple sclerosis, and there were some missing values in patients with rheumatic diseases and healthy controls. The provided proportions are based on the population in which ethnicity was known (valid percentages).*

**Table S2. Adverse events following the first COVID-19 vaccination in patients with autoimmune diseases compared to healthy controls.**

| | Patients with autoimmune diseases (n = 505) | | | Healthy controls (n = 203) | | |
|---|---|---|---|---|---|---|
| **All vaccines** | No. events (%) | No. moderate or severe events (%) | Median duration, days (IQR) | No. events (%) | No. moderate or severe events (%) | Median duration, days (IQR) |
| Allergic reaction | 4 (1) | 2 (0.4) | 3 (2-8) | 0 (0) | 0 (0) | N.A. |
| Injection site erythema | 22 (4) | 4 (1) | 4 (3-7) | 5 (2) | 0 (0) | 2 (2-6) |
| Swollen injection site | 33 (7) | 7 (1) | 4 (2-7) | 5 (2) | 0 (0) | 7 (4-8) |
| Painful injection site | 196 (39) | 34 (7) | 3 (2-4) | 82 (40) | 5 (2) | 3 (2-4) |
| Fever | 56 (11) | 29 (6) | 1 (1-2) | 21 (10) | 17 (8) | 1 (1-2) |
| Chills and shiver | 72 (14) | 28 (6) | 1 (1-2) | 33 (16) | 15 (7) | 1 (1-1) |
| Myalgia | 20 (4) | 11 (2) | 3 (2-5) | 6 (3) | 1 (0.5) | 2 (1-4) |
| Fatigue | 139 (28) | 76 (15) | 3 (2-5) | 51 (25) | 23 (11) | 2 (1-3) |
| Headache | 124 (25) | 47 (9) | 2 (1-3) | 45 (22) | 18 (9) | 2 (1-2) |
| Other | 72 (14) | 30 (6) | 2 (2-5) | 25 (12) | 12 (6) | 2 (1-7) |
| Increased disease activity[1] | 26 (5) | N.A. | N.A. | N.A. | N.A. | N.A. |
| Joint complaints[2] | 49 (10) | N.A. | N.A. | 3 (1) | N.A. | N.A. |
| | **Patients with autoimmune diseases (n = 231)** | | | **Healthy controls (n = 104)** | | |
| **ChAdOx1 nCoV-19** *AstraZeneca* | No. events (%) | No. moderate or severe events (%) | Median duration, days (IQR) | No. events (%) | No. moderate or severe events (%) | Median duration, days (IQR) |
| Allergic reaction | 4 (2) | 2 (1) | 3 (2-8) | 0 (0) | 0 (0) | N.A. |
| Injection site erythema | 9 (4) | 2 (1) | 5 (4-7) | 1 (1) | 0 (0) | 5 (N.A.) |
| Swollen injection site | 17 (7) | 4 (2) | 5 (4-7) | 4 (4) | 0 (0) | 6 (3-8) |
| Painful injection site | 89 (39) | 15 (6) | 4 (2-6) | 47 (45) | 2 (2) | 3 (2-5) |
| Fever | 39 (17) | 21 (9) | 1 (1-2) | 21 (20) | 17 (16) | 1 (1-2) |
| Chills and shiver | 52 (23) | 20 (9) | 1 (1-2) | 29 (28) | 15 (14) | 1 (1-1) |
| Myalgia | 11 (5) | 4 (2) | 3 (2-5) | 6 (6) | 1 (1) | 2 (1-4) |
| Fatigue | 83 (36) | 46 (20) | 3 (2-6) | 38 (37) | 18 (17) | 2 (1-3) |
| Headache | 81 (35) | 33 (14) | 2 (1-3) | 39 (38) | 15 (14) | 2 (1-2) |
| Other | 34 (15) | 18 (8) | 2 (1-10) | 17 (16) | 9 (9) | 2 (1-7) |
| Increased disease activity[1] | 14 (6) | N.A. | N.A. | N.A. | N.A. | N.A. |
| Joint complaints[2] | 31 (13) | N.A. | N.A. | 2 (2) | N.A. | N.A. |
| | **Patients with autoimmune diseases (n = 209)** | | | **Healthy controls (n = 90)** | | |
| **BNT162b2** *(Pfizer/BioNTech)* | No. events (%) | No. moderate or severe events (%) | Median duration, days (IQR) | No. events (%) | No. moderate or severe events (%) | Median duration, days (IQR) |
| Allergic reaction | 0 (0) | 0 (0) | N.A. | 0 (0) | 0 (0) | N.A. |
| Injection site erythema | 5 (2) | 2 (1) | 3 (2-10) | 4 (4) | 0 (0) | 2 (1-6) |
| Swollen injection site | 9 (4) | 2 (1) | 2 (2-4) | 1 (1) | 0 (0) | 7 (N.A.) |
| Painful injection site | 63 (30) | 7 (3) | 2 (2-3) | 28 (31) | 0 (0) | 2 (2-3) |
| Fever | 8 (4) | 4 (2) | 1 (1-2) | 0 (0) | 0 (0) | N.A. |
| Chills and shiver | 7 (3) | 5 (2) | 2 (1-3) | 2 (2) | 0 (0) | 1 (1-1) |
| Myalgia | 6 (3) | 5 (2) | 4 (1-6) | 0 (0) | 0 (0) | N.A. |
| Fatigue | 27 (13) | 10 (5) | 3 (2-6) | 13 (14) | 5 (6) | 3 (2-6) |
| Headache | 25 (12) | 7 (3) | 2 (2-5) | 6 (7) | 3 (3) | 2 (1-2) |
| Other | 22 (11) | 8 (4) | 3 (2-5) | 6 (7) | 1 (1) | 2 (N.A.) |
| Increased disease activity[1] | 9 (4) | N.A. | N.A. | N.A. | N.A. | N.A. |
| Joint complaints[2] | 13 (6) | N.A. | N.A. | 1 (1) | N.A. | N.A. |
| | **Patients with autoimmune diseases (n = 65)** | | | **Healthy controls (n = 9)** | | |
| **CX-024414** *(Moderna)* | No. events (%) | No. moderate or severe events (%) | Median duration, days (IQR) | No. events (%) | No. moderate or severe events (%) | Median duration, days (IQR) |
| Allergic reaction | 0 (0) | 0 (0) | N.A. | 0 (0) | 0 (0) | N.A. |
| Injection site erythema | 8 (12) | 2 (3) | 3 (2-9) | 0 (0) | 0 (0) | N.A. |
| Swollen injection site | 7 (11) | 1 (2) | 3 (2-10) | 0 (0) | 0 (0) | N.A. |
| Painful injection site | 44 (68) | 12 (18) | 3 (2-3) | 7 (78) | 3 (33) | 2 (2-2) |
| Fever | 9 (14) | 4 (6) | 2 (1-3) | 0 (0) | 0 (0) | N.A. |
| Chills and shiver | 13 (20) | 3 (5) | 1 (1-4) | 2 (22) | 0 (0) | 1 (N.A.) |
| Myalgia | 3 (5) | 2 (3) | 2 (N.A.) | 0 (0) | 0 (0) | N.A. |
| Fatigue | 29 (45) | 20 (31) | 3 (2-5) | 0 (0) | 0 (0) | N.A. |
| Headache | 18 (28) | 7 (11) | 2 (1-3) | 0 (0) | 0 (0) | N.A. |
| Other | 16 (25) | 4 (6) | 3 (2-4) | 2 (22) | 2 (22) | 4 (N.A.) |
| Increased disease activity[1] | 3 (5) | N.A. | N.A. | N.A. | N.A. | N.A. |
| Joint complaints[2] | 5 (8) | N.A. | N.A. | 0 (0) | N.A. | N.A. |

*Values are displayed as frequencies with corresponding percentages (%) or median with corresponding interquartile range (IQR). [1]Self-reported increase of disease activity up to two months following SARS-CoV-2 vaccination, the duration and severity of diseases flares were not assessed. [2] (Increase of) joint complaints up to two months following SARS-CoV-2 vaccination, these questions were only applied to patients with rheumatic diseases and healthy controls.*

**Table S3. Adverse events following the first COVID-19 vaccination in female participants compared to male participants.**

| | Female participants (n = 462) | | | Male participants (n = 245) | | |
|---|---|---|---|---|---|---|
| **All vaccines** | No. events (%) | No. moderate or severe events (%) | Median duration, days (IQR) | No. events (%) | No. moderate or severe events (%) | Median duration, days (IQR) |
| Allergic reaction | 3 (0.6) | 1 (0.2) | 3 (N.A.) | 1 (0.4) | 1 (0.4) | 3 (N.A.) |
| Injection site erythema | 24 (5) | 4 (0.9) | 4 (2-7) | 3 (1) | 0 (0) | 4 (N.A.) |
| Swollen injection site | 30 (7) | 7 (2) | 5 (2-7) | 8 (3) | 0 (0) | 4 (3-7) |
| Painful injection site | 200 (43) | 33 (7) | 3 (2-4) | 78 (32) | 6 (2) | 3 (2-4) |
| Fever | 58 (13) | 36 (8) | 1 (1-2) | 19 (8) | 10 (4) | 1 (1-3) |
| Chills and shiver | 79 (17) | 33 (7) | 1 (1-2) | 26 (11) | 10 (4) | 1 (1-2) |
| Myalgia | 19 (4) | 10 (2) | 2 (2-5) | 7 (3) | 2 (0.8) | 3 (1-7) |
| Fatigue | 139 (30) | 78 (17) | 3 (2-5) | 51 (21) | 21 (9) | 2 (1-5) |
| Headache | 131 (28) | 57 (12) | 2 (1-3) | 38 (16) | 8 (3) | 2 (1-3) |
| Other | 75 (16) | 37 (8) | 2 (1-7) | 22 (9) | 5 (2) | 2 (1-4) |
| Increased disease activity[1] | 17 (4) | N.A. | N.A. | 9 (4) | N.A. | N.A. |
| Joint complaints[2] | 36 (8) | N.A. | N.A. | 16 (7) | N.A. | N.A. |
| | **Female participants (n = 217)** | | | **Male participants (n = 118)** | | |
| **ChAdOx1 nCoV-19** *AstraZeneca* | No. events (%) | No. moderate or severe events (%) | Median duration, days (IQR) | No. events (%) | No. moderate or severe events (%) | Median duration, days (IQR) |
| Allergic reaction | 1 (0.8) | 1 (0.5) | 3 (N.A.) | 1 (0.8) | 1 (0.8) | 3 (N.A.) |
| Injection site erythema | 8 (4) | 2 (0.9) | 6 (4-7) | 2 (2) | 0 (0) | 4 (N.A.) |
| Swollen injection site | 15 (7) | 4 (2) | 5 (4-7) | 6 (5) | 0 (0) | 4 (4-6) |
| Painful injection site | 101 (47) | 15 (7) | 4 (2-6) | 35 (30) | 2 (2) | 3 (2-5) |
| Fever | 45 (21) | 31 (14) | 1 (1-2) | 15 (13) | 7 (6) | 1 (1-3) |
| Chills and shiver | 62 (29) | 28 (13) | 1 (1-2) | 19 (16) | 7 (6) | 1 (1-2) |
| Myalgia | 11 (5) | 4 (2) | 2 (1-3) | 6 (5) | 1 (0.8) | 3 (2-7) |
| Fatigue | 86 (40) | 48 (22) | 2 (2-5) | 35 (30) | 16 (14) | 2 (1-5) |
| Headache | 91 (42) | 42 (19) | 2 (1-3) | 29 (25) | 6 (5) | 2 (1-3) |
| Other | 39 (18) | 23 (11) | 2 (1-8) | 12 (10) | 4 (3) | 2 (1-8) |
| Increased disease activity[1] | 8 (4) | N.A. | N.A. | 6 (5) | N.A. | N.A. |
| Joint complaints[2] | 24 (11) | N.A. | N.A. | 9 (8) | N.A. | N.A. |
| | **Female participants (n = 195)** | | | **Male participants (n = 103)** | | |
| **BNT162b2** *(Pfizer/BioNTech)* | No. events (%) | No. moderate or severe events (%) | Median duration, days (IQR) | No. events (%) | No. moderate or severe events (%) | Median duration, days (IQR) |
| Allergic reaction | 0 (0) | 0 (0) | N.A. | 0 (0) | 0 (0) | N.A. |
| Injection site erythema | 9 (5) | 0 (0) | 3 (2-7) | 0 (0) | 0 (0) | N.A. |
| Swollen injection site | 10 (5) | 2 (1) | 2 (2-6) | 0 (0) | 0 (0) | N.A. |
| Painful injection site | 64 (33) | 5 (3) | 2 (2-3) | 27 (26) | 2 (2) | 2 (2-3) |
| Fever | 6 (3) | 2 (1) | 1 (1-3) | 2 (2) | 2 (2) | 2 (N.A.) |
| Chills and shiver | 6 (3) | 3 (2) | 2 (1-3) | 3 (3) | 2 (2) | 1 (N.A.) |
| Myalgia | 5 (3) | 4 (2) | 5 (2-7) | 1 (1) | 1 (1) | 1 (N.A.) |
| Fatigue | 30 (15) | 12 (6) | 3 (2-6) | 10 (10) | 3 (3) | 3 (2-4) |
| Headache | 24 (12) | 8 (4) | 2 (2-5) | 7 (7) | 2 (2) | 1 (1-4) |
| Other | 20 (10) | 8 (4) | 3 (2-7) | 8 (8) | 1 (1) | 2 (1-3) |
| Increased disease activity[1] | 7 (4) | N.A. | N.A. | 2 (2) | N.A. | N.A. |
| Joint complaints[2] | 9 (5) | N.A. | N.A. | 5 (5) | N.A. | N.A. |
| | **Female participants (n = 50)** | | | **Male participants (n = 24)** | | |
| **CX-024414** *(Moderna)* | No. events (%) | No. moderate or severe events (%) | Median duration, days (IQR) | No. events (%) | No. moderate or severe events (%) | Median duration, days (IQR) |
| Allergic reaction | 0 (0) | 0 (0) | N.A. | 0 (0) | 0 (0) | N.A. |
| Injection site erythema | 7 (14) | 2 (4) | 3 (2-10) | 1 (4) | 0 (0) | 3 (N.A.) |
| Swollen injection site | 5 (10) | 1 (2) | 3 (2-9) | 2 (8) | 0 (0) | 6 (N.A.) |
| Painful injection site | 35 (70) | 13 (26) | 3 (2-3) | 16 (67) | 2 (8) | 3 (2-4) |
| Fever | 7 (14) | 3 (6) | 2 (1-2) | 2 (8) | 1 (4) | 2 (N.A.) |
| Chills and shiver | 11 (22) | 2 (4) | 1 (1-1) | 4 (17) | 1 (4) | 3 (1-4) |
| Myalgia | 3 (6) | 2 (4) | 2 (N.A.) | 0 (0) | 0 (0) | N.A. |
| Fatigue | 23 (46) | 18 (36) | 3 (2-5) | 6 (25) | 2 (8) | 3 (1-6) |
| Headache | 16 (32) | 7 (14) | 2 (1-2) | 2 (8) | 0 (0) | 3 (N.A.) |
| Other | 16 (32) | 6 (12) | 3 (1-5) | 2 (8) | 0 (0) | 4 (N.A.) |
| Increased disease activity[1] | 2 (4) | N.A. | N.A. | 1 (4) | N.A. | N.A. |
| Joint complaints[2] | 3 (6) | N.A. | N.A. | 2 (8) | N.A. | N.A. |

*Values are displayed as frequencies with corresponding percentages (%) or median with corresponding interquartile range (IQR). [1]Self-reported increase of disease activity up to two months following SARS-CoV-2 vaccination, the duration and severity of diseases flares were not assessed. [2] (Increase of) joint complaints up to two months following SARS-CoV-2 vaccination, these questions were only applied to patients with rheumatic diseases and healthy controls.*

| Table S4. The risk of adverse events following the first COVID-19 vaccination in patients with autoimmune diseases compared to healthy controls. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Any adverse event | | | Systemic adverse event | | | Moderate/severe adverse event | | |
| **First vaccination** | | | | | | | | | |
| All patients | 1.1 | (0.7 – 1.6) | P = 0.73 | 1.1 | (0.8 – 1.6) | P = 0.60 | 1.1 | (0.8 – 1.8) | P = 0.48 |
| RA patients | 0.9 | (0.6 – 1.4) | P = 0.54 | 1.0 | (0.6 – 1.6) | P = 0.94 | 1.0 | (0.6 – 1.7) | P = 0.96 |
| MS patients | 1.2 | (0.6 – 2.4) | P = 0.55 | 1.5 | (0.8 – 2.9) | P = 0.18 | 1.4 | (0.7 – 2.8) | P = 0.32 |

*Values are displayed as odds ratios with corresponding 95% confidence intervals and P-values. Odds ratios are adjusted for age, sex and vaccine type. RA = rheumatoid arthritis, MS = multiple sclerosis.*

| Table S5. The risk of adverse events following the first COVID-19 vaccination in predefined subgroups. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Any adverse event | | | Systemic adverse event | | | Moderate/severe adverse event | | |
| **Vaccine type[1]** | | | | | | | | | |
| BNT162b2 (Pfizer/BioNtech) | 0.3 | (0.2 – 0.5) | P < 0.001 | 0.1 | (0.1 – 0.2) | P < 0.001 | 0.2 | (0.1 – 0.3) | P < 0.001 |
| CX-024414 **(**Moderna) | 2.0 | (0.9 – 4.8) | P = 0.11 | 0.5 | (0.3 – 1.0) | P = 0.04 | 0.6 | (0.3 – 1.2) | P = 0.14 |
| **Sex[2]** | | | | | | | | | |
| Female participants | 1.9 | (1.3 – 2.7) | P < 0.001 | 1.7 | (1.2 – 2.5) | P = 0.004 | 2.2 | (1.4 – 3.5) | P < 0.001 |
| **Age[3]** | | | | | | | | | |
| Participants ≤ 55 years | 2.4 | (1.3 – 4.4) | P = 0.01 | 1.8 | (1.1 – 2.5) | P = 0.03 | 3.5 | (2.0 – 6.0) | P < 0.001 |

*Values are displayed as odds ratios with corresponding 95% confidence intervals and P-values. [1]Odds ratios are compared to all participants who received ChAdOx1 nCoV-19 (AstraZeneca) and adjusted for age, sex and presence of autoimmune diseases. [2]Odds ratios are compared to all male participants and adjusted for age, presence of autoimmune diseases and vaccine type. [3]Odds ratios are compared to all participants older than 55 years and adjusted for sex, presence of autoimmune diseases and vaccine type.*

| Table S6. Psychological wellbeing of patients with autoimmune diseases compared to healthy controls 14 days or longer after COVID-19 vaccination. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Perceived sense of security – no. (%)** | **All patients (n=289)** | | **RA patients (n=111)** | | **MS patients (n=49)** | | **Healthy controls (n=120)** | |
| Safer | 217 | (75) | 81 | (72) | 36 | (74) | 91 | (76) |
| No change | 72 | (24) | 31 | (28) | 13 | (27) | 29 | (24) |
| Less safe | 0 | (0) | 0 | (0) | 0 | (0) | 0 | (0) |
| **Perceived quality of life* – no. (%)** | | | | | | | | |
| Improved | 58/288 | (20) | 21 | (19) | 8 | (16) | 17 | (14) |
| No change | 227/288 | (79) | 89 | (80) | 41 | (84) | 103 | (86) |
| Reduced | 3/288 | (1) | 1 | (1) | 0 | (0) | 0 | (0) |

*Values are displayed as frequencies with corresponding percentages (%). RA = rheumatoid arthritis, MS = multiple sclerosis. *Information on perceived quality of life was missing for one patient.*