***Table S1 Gingras Lab Generalized Estimating Equation Logistic Regression, Crude and adjusted Odds Ratios (Ordinal Scores)***

| **Characteristics** | **Ancestral variant** | | **Omicron BA1 variant** | | **BA5 variant** | |
| --- | --- | --- | --- | --- | --- | --- |
| **Crude**  **OR (95% CI)** | **Adjusted**  **OR (95% CI)a** | **Crude**  **OR (95% CI)** | **Adjusted**  **OR (95% CI)a** | **Crude**  **OR (95% CI)** | **Adjusted**  **OR (95% CI)a** |
| Female sex | 1.03 (0.57, 1.85) | 1.49 (0.71, 3.11) | 0.62 (0.38, 1.02) | 0.68 (0.37, 1.26) | 0.84 (0.52, 1.38) | 1.22 (0.67, 2.23) |
| Age at sample, years | 0.98 (0.73, 1.31) | 0.88 (0.59, 1.29) | 1.44 (1.12, 1.88) | 1.16 (0.84, 1.62) | 1.16 (0.91, 1.47) | 0.81 (0.59, 1.11) |
| White race\_ethnicity | 1.66 (0.71, 3.73) | 1.64 (0.56, 4.68) | 2.06 (1, 4.34) | 1.51 (0.63, 3.67) | 2.74 (1.32, 5.84) | 3.09 (1.27, 7.74) |
| Imid type IBD | 1 (0.45, 2.18) | 1.73 (0.61, 4.95) | 0.71 (0.36, 1.39) | 2.63 (1.05, 6.74) | 0.7 (0.37, 1.32) | 3.05 (1.26, 7.49) |
| Imid type RA | 1.25 (0.61, 2.51) | 3.29 (1.17, 9.52) | 1.12 (0.6, 2.11) | 3.3 (1.36, 8.35) | 0.98 (0.53, 1.81) | 2.73 (1.12, 6.85) |
| Vaccine type : Moderna mono | 2.51 (0.58, 17.4) | 1.99 (0.37, 15.9) | 2.88 (0.87, 9.61) | 1.78 (0.45, 7.1) | 1.65 (0.48, 5.51) | 1.24 (0.31, 4.88) |
| Vaccine type : Mixed mono | 1.57 (0.79, 3.21) | 1.67 (0.75, 3.81) | 1.2 (0.64, 2.24) | 1.11 (0.54, 2.28) | 0.91 (0.49, 1.68) | 0.83 (0.41, 1.67) |
| Vaccine type : Mixed bivalent | 7.32 (2.71, 25.65) | 9.35 (2.71, 39.7) | 3.19 (1.39, 7.83) | 4.03 (1.43, 12.3) | 4.53 (1.74, 14.32) | 6.60 (2.09, 24.90) |
| Number of vaccine :Three or more | 2.52 (1.41, 4.55) | 1.43 (0.67, 3.04) | 4.03 (2.42, 6.8) | 1.95 (1.02, 3.79) | 3.53 (2.14, 5.87) | 1.82 (0.96, 3.46) |
| Number days : 121 + days | 1.03 (0.44, 2.63) | 0.73 (0.25, 2.27) | 1.81 (0.86, 3.84) | 1.07 (0.42, 2.68) | 2.44 (1.17, 5.22) | 1.66 (0.63, 4.46) |
| Prednisone | 0.65 (0.31, 1.43) | 0.4 (0.16, 1.04) | 1.2 (0.61, 2.35) | 0.6 (0.26, 1.33) | 1.39 (0.71, 2.76) | 0.89 (0.38, 2.09) |
| Anti-TNF biologic | 0.85 (0.43, 1.74) | 0.74 (0.31, 1.79) | 0.79 (0.43, 1.41) | 1.11 (0.54, 2.27) | 0.72 (0.4, 1.29) | 0.73 (0.35, 1.51) |
| Ustekinumab | 1.15 (0.37, 4.33) | 1.17 (0.25, 6.3) | 1.19 (0.48, 2.89) | 0.95 (0.27, 3.2) | 1.36 (0.53, 3.56) | 0.93 (0.28, 3.19) |
| Rituximab | 0.28 (0.08, 0.96) | 0.61 (0.13, 3.13) | 0.46 (0.12, 1.6) | 0.41 (0.06, 2.31) | 0.48 (0.13, 1.65) | 0.38 (0.05, 2.17) |
| Other biologic | 0.84 (0.28, 2.81) | 0.95 (0.23, 4.76) | 1.83 (0.76, 4.45) | 2.01 (0.68, 6.02) | 1.78 (0.65, 5.02) | 2.6 (0.71, 9.72) |
| Methotrexate | 0.41 (0.23, 0.74) | 0.25 (0.11, 0.56) | 0.53 (0.32, 0.89) | 0.29 (0.14, 0.59) | 0.51 (0.3, 0.85) | 0.33 (0.16, 0.67) |
| Jak inhibitor | 0.89 (0.27, 3.45) | 2.46 (0.35, 19.7) | 1.41 (0.47, 4.4) | 6.9 (1.25, 41.77) | 1.85 (0.61, 5.99) | 11.2 (1.85, 75.57) |
| Other immuno | 0.85 (0.42, 1.77) | 0.81 (0.3, 2.27) | 0.71 (0.36, 1.37) | 0.45 (0.18, 1.12) | 0.65 (0.34, 1.24) | 0.42 (0.17, 1.04) |
| Past infection in the 6 months before sample | 3.78 (0.66, 71.25) | 4.85 (0.75, 95.9) | 4.66 (1.28, 19.12) | 8.92 (1.77, 49.9) | 4.77 (1.23, 23.27) | 19.3 (3.52, 124.1) |

a Adjusted for all variables shown.. c Other biologic included : abatacept, Vedolizumab , Tocilizumab and Secukinumab.. d Other immuno included : azathioprine, 6-mercaptopurine, leflunomide, and sulfasalazine. Here the reference for the number of vaccines was 2 doses. Here the reference for IMID type was "SLE, PsA,SpA".

***Table S2 Calgary Lab: Generalized Estimating Equation Logistic Regression, Crude and adjusted Odds Ratios (Ordinal Scores)***

| **Characteristics** | **Ancestral variant** | |
| --- | --- | --- |
| **Crude**  **OR (95% CI)** | **Adjusted**  **OR (95% CI)a** |
| Female sex | 0.96 (0.69, 1.32) | 1.02 (0.72, 1.45) |
| Age at sample, years | 0.93 (0.79, 1.09) | 0.86 (0.72, 1.03) |
| White race\_ethnicity | 1.00 (0.50, 2.03) | 0.99 (0.48, 2.12) |
| Vaccine type : Moderna mono | 1.18 (0.73, 1.90) | 1.27 (0.74, 2.13) |
| Vaccine type : Mixed mono | 1.84 (0.91, 3.69) | **2.37 (1.15, 4.83)** |
| Number of vaccine :Three or more | 5.33 (0.50, 59.7) | 1.10 (0.06, 19.9) |
| Number days : 121 + days | **0.2 (0.11, 0.34)** | **0.16 (0.09, 0.29)** |
| Prednisone | 0.80 (0.42, 1.50) | 0.92 (0.45, 1.82) |
| Anti-TNF biologic | **0.36 (0.26, 0.5)** | **0.48 (0.30, 0.75)** |
| Ustekinumab | 1.82 (1.27, 2.62) | 1.57 (0.97, 2.53) |
| Other biologic | **2.7 (1.72, 4.25)** | **2.75 (1.54, 4.93)** |
| Methotrexate | 0.70 (0.41, 1.17) | 0.64 (0.36, 1.14) |
| Jak inhibitor | 0.76 (0.15, 3.08) | 0.58 (0.10, 2.65) |
| Other immuno | 0.75 (0.44, 1.25) | 0.66 (0.35, 1.19) |
| Past infection in the 6 months before sample | **5.66 (3.08, 10.5)** | **5.99 (3.18, 11.4)** |

a Adjusted for all variables shown.. c Other biologic included : abatacept, Vedolizumab , Tocilizumab and Secukinumab.. d Other immuno included : azathioprine, 6-mercaptopurine, leflunomide, and sulfasalazine. Here the reference for the number of vaccines was 2 doses. Here, all patients had IBD and no patient was exposed to Rituximab. None had bivalent vaccine

***Table S3a: Flamand Lab: Generalized Estimating Equation Logistic Regression, Crude and adjusted Odds Ratios (Ordinal Scores)***

| **Characteristics** | **Ancestral variant** | |
| --- | --- | --- |
| **Crude**  **OR (95% CI)** | **Adjusted**  **OR (95% CI)a** |
| Female sex | 0.8 (0.27, 2.37) | 0.52 (0.12, 2.20) |
| Age at sample, years | 0.69 (0.41, 1.13) | 0.62 (0.29, 1.27) |
| Imid type RA | 0.62 (0.22, 1.67) | 0.52 (0.01, 30.5) |
| Number of vaccine :Four or more | 0.5 (0.01, 19.12) | 1.37 (0.02, 86.7) |
| Number days : 121 + days | 0.9 (0.21, 3.92) | 0.55 (0.06, 4.54) |
| Prednisone | 0.58 (0.21, 1.58) | 1.33 (0.26, 6.96) |
| Anti-TNF biologic | 0.81 (0.26, 2.58) | 0.79 (0.19, 3.11) |
| Other biologic | 2.1 (0.35, 13.15) | 0.53 (0.01, 63.1) |
| Methotrexate | 0.29 (0.1, 0.81) | 0.51 (0.01, 38.7) |
| Jak inhibitor | 2.1 (0.35, 13.15) | 0.77 (0.02, 33.4) |
| Other immuno | 4.77 (1.37, 18.87) | 9.16 (0.09, 123) |
| Past infection in the 6 months before sample | 1.63 (0.55, 4.98) | 0.70 (0.13, 3.56) |

a Adjusted for all variables shown.. c Other biologic included : abatacept, Vedolizumab , Tocilizumab and Secukinumab.. d Other immuno included : azathioprine, 6-mercaptopurine, leflunomide, and sulfasalazine. Here the reference for the number of vaccines was 3 doses. Here the reference for IMID type was "SpA".

\* Here the reference for vaccine type was "Pfizer monovalent". No one was exposed to rituximab and everyone was white.

\*\*I removed the type of vaccine, type of imid and ustekinumab from the models because of the non-convergence of the models

***Table S3b: Flamand Lab: Generalized Estimating Equation Logistic Regression, Crude and adjusted Odds Ratios (Ordinal Scores)***

| **Characteristics** | **Ominicron BA1 variant** | | **Ominicron BA5 variant** | |
| --- | --- | --- | --- | --- |
| **Crude**  **OR (95% CI)** | **Adjusted**  **OR (95% CI)a** | **Crude**  **OR (95% CI)** | **Adjusted**  **OR (95% CI)a** |
| Female sex | 1.16 (0.36, 3.87) | 1.94 (0.34, 11.2) | 1.06 (0.37, 3.09) | 1.74 (0.32, 10.0) |
| Age at sample, years | 0.71 (0.41, 1.21) | 0.43 (0.17, 1.01) | 0.45 (0.25, 0.76) | 0.26 (0.10, 0.60) |
| Imid type RA | 0.51 (0.16, 1.53) | - | 0.54 (0.19, 1.45) | - |
| Vaccine type : Moderna mono | 1.63 (0.08, 35.44) | 0.13 (0.01, 36.2) | 0.66 (0.04, 11.15) | 0.92 (0, 170.2) |
| Vaccine type : Mixed mono | 2.5 (0.32, 19.66) | 3.54 (0.19, 93.0) | 1.26 (0.19, 8.65) | 2.72 (0.2, 39.74) |
| Vaccine type : Mixed bivalent | 2.66 (0.52, 14.24) | 2.11 (0.17, 33.3) | 1.95 (0.42, 9.66) | 7.69 (0.71, 89.36) |
| Number of vaccine :Four or more | 1.39 (0.03, 66.93) | 22.7 (0.12, 85.3) | 2.44 (0.06, 94.6) | 33.9 (0.28, 623) |
| Number days : 121 + days | 1.19 (0.24, 5.63) | 0.17 (0.01, 2.51) | 0.85 (0.2, 3.58) | 0.51 (0.04, 7.15) |
| Prednisone | 0.91 (0.3, 2.69) | 0.87 (0.12, 5.83) | 0.54 (0.19, 1.45) | 0.1 (0.01, 0.68) |
| Anti-TNF biologic | 0.12 (0.02, 0.5) | 0.04 (0.01, 0.27) | 0.31 (0.08, 1.07) | 0.06 (0.01, 0.29) |
| Ustekinumab | 0.72 (0.05, 10.63) | - | 0.4 (0.03, 4.84) | - |
| Other biologic | 2.55 (0.46, 13.86) | 1.17 (0.10, 11.9) | 1.77 (0.29, 12.4) | 0.74 (0.07, 7.88) |
| Methotrexate | 0.42 (0.13, 1.29) | 0.41 (0.05, 3.14) | 0.42 (0.15, 1.17) | 2.02 (0.27, 17.1) |
| Jak inhibitor | 2.55 (0.46, 13.86) | 2.52 (0.08, 88.9) | 1.32 (0.25, 7.29) | 0.23 (0.01, 9.3) |
| Other immuno | 3.66 (1.05, 13.54) | 3.94 (0.44, 39.5) | 2.33 (0.73, 7.77) | 2.39 (0.28, 22.7) |
| Past infection in the 6 months before sample | 1.14 (0.35, 3.67) | 0.24 (0.03, 1.73) | 3.77 (1.24, 12.35) | 1.68 (0.23, 12.6) |

a Adjusted for all variables shown.. c Other biologic included : abatacept, Vedolizumab , Tocilizumab and Secukinumab.. d Other immuno included : azathioprine, 6-mercaptopurine, leflunomide, and sulfasalazine. Here the reference for the number of vaccines was 3 doses. Here the reference for IMID type was "SpA".

\* Here the reference for vaccine type was "Pfizer monovalent". No one was exposed to rituximab and everyone was white.

\*\*I removed the type of imid and ustekinumab from the multivariate models because of the non-convergence of the models.

***Table S4a; Card Lab: Generalized Estimating Equation Logistic Regression, Crude and adjusted Odds Ratios (Ordinal Scores)***

| **Characteristics** | **Ancestral variant** | |
| --- | --- | --- |
| **Crude**  **OR (95% CI)** | **Adjusted**  **OR (95% CI)a** |
| Female sex | 1.84 (0.70, 4.89) | 14.8 (2.48, 103) |
| Age at sample, years | 0.74 (0.47, 1.14) | 1.79 (0.85, 3.84) |
| White race\_ethnicity | 0.17 (0.01, 1.27) | 0.08 (0.01, 0.97) |
| Imid type IBD | 4.77 (0.59, 45.8) | 2.84 (0.21, 44.3) |
| Imid type RA | 4.21 (0.58, 37.0) | 7.00 (0.82, 73.6) |
| Vaccine type : Mixed mono | 1.33 (0.48, 3.79) | 4.42 (0.99, 22.1) |
| Number of vaccine :Three or more | 1.71 (0.17, 17.7) | 2.09 (0.12, 35.6) |
| Number days : 121 + days | 1.68 (0.38, 8.90) | 6.24 (0.85, 51.7) |
| Prednisone | 0.14 (0.03, 0.63) | 0.07 (0.01, 0.57) |
| Anti-TNF biologic | 0.74 (0.3, 1.84) | 0.29 (0.07, 1.15) |
| Ustekinumab | 1.07 (0.21, 6.09) | 5.84 (0.46, 109) |
| Rituximab | 0.29 (0.05, 1.53) | 3.05 (0.32, 32.4) |
| Other biologic | 8.18 (1.24, 161) | - |
| Methotrexate | 0.20 (0.08, 0.52) | 0.04 (0.01, 0.22) |
| Jak inhibitor | 2.44 (0.43, 18.9) | 2.63 (0.25, 33.4) |
| Other immuno | 1.05 (0.42, 2.66) | 2.71 (0.72, 10.9) |

a Adjusted for all variables shown.. c Other biologic included : abatacept, Vedolizumab , Tocilizumab and Secukinumab.. d Other immuno included : azathioprine, 6-mercaptopurine, leflunomide, and sulfasalazine. Here the reference for the number of vaccines was 2 doses. Here the reference for IMID type was "SpA". Here the reference for vaccine type was "Pfizer monovalent". No bivalent from Winnipeg data.

***Table S4b; Card Lab: Generalized Estimating Equation Logistic Regression, Crude and adjusted Odds Ratios (Ordinal Scores)***

| **Characteristics** | **Omicron BA1 variant** | | **BA5 variant** | |
| --- | --- | --- | --- | --- |
| **Crude**  **OR (95% CI)** | **Adjusted**  **OR (95% CI)a** | **Crude**  **OR (95% CI)** | **Adjusted**  **OR (95% CI)a** |
| Female sex | 0.77 (0.21, 3.25) | 0.57 (0.03, 7.57) | 1.4 (0.51, 4.06) | 6.15 (0.93, 50.26) |
| Age at sample, years | 1.11 (0.59, 2.33) | 2.02 (0.60, 11.69) | 0.58 (0.37, 0.9) | 0.61 (0.23, 1.45) |
| White race\_ethnicity | 0.63 (0.08, 13.16) | 0.08 (0.01, 3.53) | 0.2 (0.03, 1.07) | 0.10 (0.01, 0.96) |
| Imid type IBD | 0.62 (0.06, 14.63) | 0.04 (0.01, 7.08) | 2.71 (0.25, 62.78) | 9.26 (0.29, 530.3) |
| Imid type RA | 0.37 (0.04, 8.26) | 0.15 (0.01, 8.28) | 1.51 (0.15, 33.42) | 1.97 (0.15, 56.77) |
| Vaccine type : Mixed mono | 1.53 (0.36, 5.79) | 0.5 (0.02, 4.73) | 2.34 (0.86, 6.5) | 4.32 (0.98, 21.18) |
| Number of vaccine :Three or more | 0.24 (0.04, 1.96) | 0.01 (0.01, 0.56) | 0.71 (0.1, 6.05) | 3.53 (0.19, 125.3) |
| Number days : 121 + days | 4.19 (0.51, 26.7) | 7.76 (0.5, 149.3) | 4.04 (0.73, 23.82) | 3.97 (0.49, 33.19) |
| Prednisone | 0.14 (0.02, 0.79) | 0.09 (0.01, 0.69) | 0.51 (0.07, 2.55) | 0.49 (0.01, 10.33) |
| Anti-TNF biologic | 0.81 (0.16, 3.15) | 0.59 (0.03, 6.79) | 0.47 (0.15, 1.29) | 0.08 (0.01, 0.39) |
| Ustekinumab | 1.59 (0.08, 12.58) | 2.4 (0.07, 57.92) | 0.95 (0.12, 5.89) | 0.21 (0.01, 5.29) |
| Other biologic | 3.09 (0.39, 17.73) | 2.18 (0.09, 59.35) | 1.9 (0.32, 10.55) | 14.5 (1.11, 232.9) |
| Methotrexate | 0.69 (0.19, 2.65) | 0.11 (0.01, 1.44) | 0.28 (0.1, 0.73) | 0.5 (0.09, 2.67) |
| Jak inhibitor | 1.59 (0.08, 12.58) | 5.18 (0.06, 309.6) | 1.41 (0.17, 9.64) | 0.5 (0.02, 8.49) |
| Other immuno | 0.88 (0.18, 3.44) | 1.00 (0.09, 8.65) | 0.93 (0.33, 2.54) | 1.42 (0.31, 6.54) |

a Adjusted for all variables shown.. c Other biologic included : abatacept, Vedolizumab , Tocilizumab and Secukinumab.. d Other immuno included : azathioprine, 6-mercaptopurine, leflunomide, and sulfasalazine. Here the reference for the number of vaccines was 2 doses. Here the reference for IMID type was "SpA". Here the reference for vaccine type was "Pfizer monovalent". No bivalent from Winnipeg data.

***Table S5a; Bowdish Lab: Generalized Estimating Equation Logistic Regression, Crude and adjusted Odds Ratios (Ordinal Scores)***

| **Characteristics** | **Ancestral variant** | | **Omicron BA1 variant** | |
| --- | --- | --- | --- | --- |
| **Crude**  **OR (95% CI)** | **Adjusted**  **OR (95% CI)a** | **Crude**  **OR (95% CI)** | **Adjusted**  **OR (95% CI)a** |
| Female sex | 4.21 (1.25, 14.68) | 5.98 (1.24, 32.8) | 3.77 (1.18, 13.48) | 8.2 (1.49, 58.62) |
| Age at sample, years | 0.69 (0.43, 1.07) | 0.84 (0.44, 1.63) | 0.72 (0.47, 1.09) | 0.74 (0.39, 1.4) |
| White race\_ethnicity | 0.66 (0.14, 3.36) | 0.98 (0.1, 9.47) | 0.53 (0.11, 2.41) | 0.84 (0.10, 7.05) |
| Imid type RA | 0.24 (0.02, 3.74) | 0.01 (0.001, 0.41) | 0.2 (0.01, 2.55) | 0.02 (0.01, 0.59) |
| Vaccine type : Moderna mono | 1.25 (0.14, 9.82) | 3.93 (0.28, 60.5) | 0.78 (0.11, 5.18) | 0.71 (0.06, 9.43) |
| Vaccine type : Mixed mono | 0.41 (0.11, 1.49) | 0.48 (0.10, 2.32) | 1.12 (0.34, 3.69) | 1.67 (0.36, 8.2) |
| Vaccine type : Mixed bivalent | 0.63 (0.2, 1.99) | 0.73 (0.19, 2.81) | 1.25 (0.43, 3.62) | 0.81 (0.2, 3.31) |
| Number of vaccine :Four or more | 2.14 (0.85, 5.56) | 2.41 (0.81, 7.47) | 3.12 (1.32, 7.77) | 3.61 (1.24, 11.3) |
| Number days : 121 + days | 0.88 (0.06, 12.36) | 0.35 (0.01, 9.26) | 5.11 (0.39, 73.75) | 5.09 (0.24, 121) |
| Prednisone | 0.98 (0.36, 2.66) | 0.85 (0.23, 3.13) | 1.04 (0.43, 2.55) | 0.65 (0.18, 2.24) |
| Anti-TNF biologic | 1.27 (0.47, 3.46) | 1.53 (0.4, 6.05) | 0.52 (0.21, 1.26) | 0.29 (0.07, 1.08) |
| Other biologic | 0.25 (0.08, 0.73) | 0.09 (0.02, 0.34) | 0.3 (0.11, 0.77) | 0.07 (0.02, 0.25) |
| Methotrexate | 1.71 (0.69, 4.31) | 2.55 (0.77, 8.99) | 1.49 (0.66, 3.4) | 0.8 (0.26, 2.44) |
| Jak inhibitor | 0.6 (0.16, 2.2) | 0.42 (0.07, 2.53) | 0.42 (0.13, 1.35) | 0.22 (0.04, 1.07) |
| Other immuno | 0.96 (0.4, 2.32) | 2.76 (0.76, 10.6) | 0.96 (0.44, 2.10) | 1.09 (0.3, 3.93) |
| Past infection in the 6 months before sample | 1.69 (0.28, 9.36) | 0.88 (0.05, 15.9) | 5.73 (1.07, 35.55) | 4.46 (0.3, 70.26) |

a Adjusted for all variables shown.. c Other biologic included : abatacept, Vedolizumab , Tocilizumab and Secukinumab.. d Other immuno included : azathioprine, 6-mercaptopurine, leflunomide, and sulfasalazine. Here the reference for the number of vaccines was 3 doses. Here the reference for IMID type was "SpA". Here the reference for vaccine type was "Pfizer monovalent".