Annex

Table A Characteristics of HCWs with SARS-CoV-2 seropositivity (n=898), by hospital, April 2021

| Participant characteristics                  | Hospital 1 | Hospital 2 | Both Hospitals |
|----------------------------------------------|------------|------------|---------------|
|                                              | n          | n          | n             |
| Overall                                      | 623        | 275        | 898           |
| %                                            | 21%        | 13%        | 18%           |
| Median age (IQR) (years)                     | 39 (29-49) | 35 (27-44) | 38 (29-48)    |
| Age groups (years)                           |            |            |               |
| 18-29                                        | 159        | 90         | 249           |
| %                                            | 26%        | 33%        | 28%           |
| 30-39                                        | 154        | 84         | 238           |
| %                                            | 25%        | 31%        | 27%           |
| 40-49                                        | 157        | 51         | 208           |
| %                                            | 25%        | 19%        | 23%           |
| 50-59                                        | 119        | 39         | 158           |
| %                                            | 19%        | 14%        | 18%           |
| Over 60                                      | 34         | 11         | 45            |
| %                                            | 5.5%       | 4.0%       | 5.0%          |
| Sex                                          |            |            |               |
| Female                                       | 471        | 198        | 669           |
| %                                            | 76%        | 72%        | 74%           |
| Male                                         | 152        | 77         | 229           |
| %                                            | 24%        | 28%        | 26%           |
| Ethnicity                                    |            |            |               |
| Irish                                        | 401        | 194        | 595           |
| %                                            | 64%        | 71%        | 66%           |
| Any other white background                   | 56         | 38         | 94            |
| %                                            | 9.0%       | 14%        | 10%           |
| Asian background                             | 122        | 26         | 148           |
| %                                            | 20%        | 9.5%       | 16%           |
| African/other black background               | 29         | 10         | 39            |
| %                                            | 4.7%       | 3.6%       | 4.3%          |
| Other                                        | 15         | 7          | 22            |
| %                                            | 2.4%       | 2.5%       | 2.4%          |
| Country of birth                             |            |            |               |
| Ireland                                      | 386        | 181        | 567           |
| %                                            | 62%        | 66%        | 63%           |
| United Kingdom                               | 25         | 19         | 44            |
| %                                            | 4.0%       | 6.9%       | 4.9%          |
| India                                        | 60         | 16         | 76            |
| %                                            | 10%        | 5.8%       | 8.5%          |
| Philippines                                  | 53         | 1         | 54            |
| %                                            | 8.5%       | 0.4%       | 6.0%          |
| Poland                                       | 8          | 12         | 20            |
| %                                            | 1.3%       | 4.4%       | 2.2%          |
| USA                                          | 4          | 7          | 11            |
| %                                            | 0.6%       | 2.5%       | 1.2%          |
| Romania                                      | 12         | 3          | 15            |
| %                                            | 1.9%       | 1.1%       | 1.7%          |
| Nigeria                                      | 18         | 1         | 19            |
| %                                            | 2.9%       | 0.4%       | 2.1%          |
| Other                                        | 57         | 35         | 92            |
| %                                            | 9.1%       | 13%        | 10%           |
| Education                                    |            |            |               |
| Primary                                      | 7          | 0          | 7             |
| %                                            | 1.1%       | 0.0%       | 0.8%          |
| Secondary                                    | 105        | 28         | 133           |
| %                                            | 17%        | 10%        | 15%           |
| Third level                                  | 301        | 133        | 434           |
| %                                            | 48%        | 48%        | 48%           |
| Post-graduate                                | 210        | 114        | 324           |
| %                                            | 34%        | 41%        | 36%           |
| Role                                         |            |            |               |
| Admin                                        | 64         | 21         | 85            |
| %                                            | 10%        | 7.6%       | 9.5%          |
| Medical/dental                               | 55         | 61         | 116           |
| %                                            | 8.8%       | 22%        | 13%           |
| Nursing/ midwifery                           | 281        | 114        | 395           |
| %                                            | 45%        | 41%        | 44%           |
| Allied health                                | 89         | 29         | 118           |
| %                                            | 14%        | 11%        | 13%           |
| General support                              | 60         | 21         | 81            |
| %                                            | 10%        | 7.6%       | 9.0%          |
| Health care assistant                         | 70         | 23         | 93            |
| %                                            | 11%        | 8.4%       | 10%           |
| Other                                        | 4          | 6          | 10            |
| %                                            | 0.6%       | 2.2%       | 1.1%          |
| Lives with                                   |            |            |               |
| Alone                                        | 42         | 19         | 61            |
| %                                            | 6.7%       | 6.9%       | 6.8%          |
| With others                                  | 578        | 256        | 834           |
| %                                            | 92.8%      | 93%        | 92.9%         |
| Missing                                      | 3          | 0          | 3             |
| %                                            | 0.5%       | 0.0%       | 0.3%          |
| Lives with HCW                               |            |            |               |
| Yes                                          | 234        | 106        | 340           |
| %                                            | 38%        | 39%        | 38%           |
| No                                           | 376        | 164        | 540           |
| %                                            | 60%        | 60%        | 60%           |
| Missing                                      | 13         | 5          | 18            |
| %                                            | 2.1%       | 1.8%       | 2.0%          |
| Daily contact with COVID-19 patients         |            |            |               |
| Contact with COVID-19 patients               | 196        | 69         | 265           |
| %                                            | 31%        | 25%        | 30%           |
| Contact with patients without COVID-19       | 293        | 170        | 463           |
| %                                            | 47%        | 62%        | 52%           |
| No patient contact                           | 134        | 36         | 170           |
| %                                            | 22%        | 13%        | 19%           |
| Previous COVID-19 symptoms | No symptoms | 121 | 19% | 48 | 17% | 169 | 19% |
|----------------------------|-------------|-----|-----|-----|-----|-----|-----|
|                             | Had symptoms | 502 | 81% | 227 | 83% | 729 | 81% |
|                             | Missing      | 0   | 0.0%| 0   | 0.0%| 0   | 0.0%|
| Severity of symptoms        | No symptoms  | 121 | 19% | 48  | 17% | 169 | 19% |
|                             | Mild symptoms| 228 | 37% | 107 | 39% | 335 | 37% |
|                             | Significant symptoms | 262 | 42% | 102 | 37% | 364 | 41% |
|                             | Severe (hospitalised) | 12  | 1.9%| 18  | 6.5%| 30  | 3.3%|
|                             | Missing      | 0   | 0.0%| 0   | 0.0%| 0   | 0.0%|
| Previous positive COVID-19 PCR test | No | 190 | 30% | 45  | 16% | 235 | 26% |
|                             | Yes          | 433 | 70% | 230 | 84% | 663 | 74% |
| Symptoms at time of previous positive PCR test | No | 51  | 12% | 36  | 16% | 87  | 13% |
|                             | Yes          | 382 | 88% | 194 | 84% | 576 | 87% |
| Severity of symptoms at time of PCR test | No symptoms | 51  | 12% | 36  | 16% | 87  | 13% |
|                               | Mild symptoms | 143 | 33% | 83  | 36% | 226 | 34% |
|                               | Significant symptoms | 227 | 52% | 93  | 40% | 320 | 48% |
|                               | Severe (hospitalised) | 12  | 2.8%| 18  | 7.8%| 30  | 4.5%|
|                               | Missing      | 0   | 0.0%| 0   | 0.0%| 0   | 0.0%|
Table 2c Prevalence of SARS-CoV-2 seropositivity by participant characteristics, Hospital 1, April 2021

| Participant characteristics | Total | SARS-CoV-2 seropositive |
|-----------------------------|-------|-------------------------|
|                             | N     | n           | % (95% CI) | p-value* |
| Overall                     | 2945  | 623         | 21 (20 - 23) | -        |
| Age groups (years)          |       |             |            |          |
| 18-29                       | 653   | 159         | 24 (21 - 28) | 0.184    |
| 30-39                       | 765   | 154         | 20 (17 - 23) |          |
| 40-49                       | 811   | 157         | 19 (17 - 22) |          |
| 50-59                       | 565   | 119         | 21 (18 - 25) |          |
| Over 60                     | 151   | 34          | 23 (16 - 30) |          |
| Sex                         |       |             |            |          |
| Female                      | 2,278 | 471         | 21 (19 - 22) | 0.240    |
| Male                        | 667   | 152         | 23 (20 - 26) |          |
| Ethnicity                   |       |             |            |          |
| Irish                       | 2,091 | 401         | 19 (18 - 21) | <0.001   |
| Any other white background  | 257   | 56          | 22 (17 - 27) |          |
| Asian background            | 470   | 122         | 26 (22 - 30) |          |
| African or any other black background | 69 | 29 | 42 (30 - 55) |          |
| Other                       | 58    | 15          | 25 (15 - 39) |          |
| Country of birth            |       |             |            |          |
| Ireland                     | 2,025 | 386         | 19 (17 - 21) | 0.001    |
| United Kingdom              | 134   | 25          | 19 (12 - 26) |          |
| India                       | 225   | 60          | 27 (21 - 33) |          |
| Philippines                 | 198   | 53          | 27 (21 - 34) |          |
| Poland                      | 26    | 8           | 31 (14 - 52) |          |
| USA                         | 21    | 4           | 19 (5.4 - 42) |          |
| Romania                     | 40    | 12          | 30 (17 - 47) |          |
| Nigeria                     | 25    | 18          | 72 (51 - 88) |          |
| Other                       | 251   | 57          | 23 (18 - 28) |          |
| Education                   |       |             |            |          |
| Primary                     | 20    | 7           | 35 (15 - 59) | <0.001   |
| Secondary                   | 409   | 105         | 26 (22 - 30) |          |
| Third level                 | 1,280 | 301         | 24 (21 - 26) |          |
| Post-graduate               | 1,236 | 210         | 17 (15 - 19) |          |
| Role                        |       |             |            |          |
| Admin                       | 403   | 64          | 16 (12 - 20) | <0.001   |
| Medical/dental              | 357   | 55          | 15 (12 - 20) |          |
| Nursing/ midwifery          | 1097  | 281         | 26 (23 - 28) |          |
| Allied health               | 612   | 89          | 15 (12 - 18) |          |
| General support             | 243   | 60          | 25 (19 - 31) |          |
| Health care assistant       | 179   | 70          | 39 (32 - 47) |          |
| Other                       | 54    | 4           | 7.4 (2.1 - 18) |          |
| Lives with                  |       |             |            |          |
| Alone                       | 270   | 42          | 16 (11 - 20) | 0.019    |
| With others                 | 2,667 | 578         | 22 (20 - 23) |          |
| Missing                     | 8     | 3           | 38 (8.5 - 76) |          |
| Lives with HCW              |       |             |            |          |
| Yes                         | 928   | 234         | 25 (22 - 28) | <.001    |
| No                          | 1,964 | 376         | 19 (17 - 21) |          |
| Missing                     | 53    | 13          | 25 (14 - 38) |          |

*Calculated using the Chi-square test
Table 2d Prevalence of SARS-CoV-2 seropositivity by COVID-19 related characteristics, Hospital 1, April 2021

| COVID-19 related characteristics | Total | SARS-CoV-2 seropositive |
|----------------------------------|-------|-------------------------|
|                                 | N     | n                       | % (95% CI) | p-value*          |
| **Daily contact with COVID-19 patients** |       |                         |            | <0.001            |
| Contact with COVID-19 patients  | 726   | 196                     | 27 (24 - 30) |                   |
| Contact with patients without COVID-19 patients | 1,362 | 293                     | 22 (19 - 24) |                   |
| No patient contact              | 857   | 134                     | 16 (13 - 18) |                   |
| **Previous COVID-19 symptoms** |       |                         |            | <0.001            |
| No symptoms                     | 1571  | 121                     | 7.7 (6.4 - 9.1) |                   |
| Had symptoms                    | 1374  | 502                     | 37 (34 - 39) |                   |
| Missing                         | 0     | 0                       | -          |                   |
| **Severity of symptoms**        |       |                         |            | <0.001            |
| No symptoms                     | 1571  | 121                     | 7.7 (6.4 - 9.1) |                   |
| Mild symptoms                   | 932   | 228                     | 24 (22 - 27) |                   |
| Significant symptoms            | 420   | 262                     | 62 (58 - 67) |                   |
| Severe (hospitalised)           | 21    | 12                      | 57 (34 - 78) |                   |
| Missing                         | 0     | 0                       | -          |                   |
| **Previous positive COVID-19 PCR test** |       |                         |            | <0.001            |
| No                               | 2427  | 190                     | 7.8 (6.8 - 9.0) |                   |
| Yes                             | 518   | 433                     | 84 (80 - 87) |                   |
| **Symptoms at time of previous positive PCR** |       |                         |            | <0.001            |
| No                               | 95    | 51                      | 54 (43 - 64) |                   |
| Yes                             | 423   | 382                     | 90.3 (87 - 93.0) |                   |
| **Severity of symptoms at time of PCR test** |       |                         |            | <0.001            |
| No symptoms                     | 95    | 51                      | 54 (43 - 64) |                   |
| Mild symptoms                   | 162   | 143                     | 88 (82 - 92.8) |                   |
| Significant symptoms            | 248   | 227                     | 91.5 (87 - 94.7) |                   |
| Severe (hospitalised)           | 12    | 12                      | 100 (74 - 100) |                   |
| Missing                         | 1     | 0                       | -          |                   |

*Calculated using the Chi-square test
Table 2e Prevalence of SARS-CoV-2 seropositivity by participant characteristics, Hospital 2, April 2021

| Participant characteristics | Total N | SARS-CoV-2 seropositive n | % (95% CI) | p-value* |
|----------------------------|---------|--------------------------|------------|----------|
| Overall                    | 2140    | 275                      | 13 (11 - 14) | -        |
| Age groups (years)         |         |                          |            |          |
| 18-29                      | 455     | 90                       | 20 (16 - 24) | <0.001   |
| 30-39                      | 565     | 84                       | 15 (12 - 18) |          |
| 40-49                      | 603     | 51                       | 8.5 (6.4 - 11) |      |
| 50-59                      | 386     | 39                       | 10 (7.3 - 14) |          |
| Over 60                    | 131     | 11                       | 8.4 (4.3 - 15) |      |
| Sex                        |         |                          |            |          |
| Female                     | 1,681   | 198                      | 12 (10 - 13) | 0.005    |
| Male                       | 459     | 77                       | 17 (13 - 21) |          |
| Ethnicity                  |         |                          |            |          |
| Irish                      | 1,707   | 194                      | 11 (10 - 13) | 0.002    |
| Any other white background | 219     | 38                       | 17 (13 - 23) |          |
| Asian background           | 129     | 26                       | 20 (14 - 28) |          |
| African or any other black background | 48     | 10                       | 21 (10 - 35) |          |
| Other                      | 37      | 7                        | 19 (8.0 - 35) |      |
| Country of birth           |         |                          |            |          |
| Ireland                    | 1605    | 181                      | 11 (10 - 13) | <0.001   |
| United Kingdom             | 161     | 19                       | 12 (7.3 - 18) |          |
| India                      | 68      | 16                       | 24 (14 - 35) |          |
| Poland                     | 59      | 12                       | 20 (11 - 33) |          |
| USA                        | 34      | 7                        | 21 (8.7 - 38) |          |
| Philippines                | 16      | 1                        | 6.3 (0.2 - 30) |      |
| Nigeria                    | 10      | 1                        | 10 (0.3 - 45) |          |
| Romania                    | 5       | 3                        | 60 (14 - 95) |          |
| Other                      | 182     | 39                       | 19 (13 - 36) |          |
| Education                  |         |                          |            |          |
| Primary                    | 2       | 0                        | -           | 0.485    |
| Secondary                  | 200     | 28                       | 14 (10 - 20) |          |
| Third level                | 964     | 133                      | 14 (12 - 16) |          |
| Post-graduate              | 974     | 114                      | 12 (10 - 14) |          |
| Role                       |         |                          |            |          |
| Admin                      | 273     | 21                       | 7.7 (4.8 - 12) | <0.001   |
| Medical/dental             | 356     | 61                       | 17 (13 - 21) |          |
| Nursing/ midwifery         | 794     | 114                      | 14 (12 - 17) |          |
| Allied health              | 432     | 29                       | 6.7 (4.5 - 9.5) |      |
| General support            | 122     | 21                       | 17 (11 - 25) |          |
| Health care assistant      | 112     | 23                       | 21 (13 - 29) |          |
| Other                      | 51      | 6                        | 12 (4.4 - 24) |      |
| Lives with                 |         |                          |            |          |
| Alone                      | 194     | 19                       | 10 (6.0 - 15) | 0.180    |
| With others                | 1,943   | 256                      | 13 (12 - 15) |          |
| Missing                    | 3       | 0                        | -           |          |
| Lives with HCW             |         |                          |            |          |
| Yes                        | 643     | 106                      | 16 (14 - 20) | 0.001    |
| No                         | 1448    | 164                      | 11 (10 - 13) |          |
| Missing                    | 49      | 5                        | 10 (3.4 - 22) |      |

*Calculated using the Chi-square test
Table 2f Prevalence of SARS-CoV-2 seropositivity by COVID-19 characteristics, Hospital 2, April 2021

| COVID-19 related characteristics | Total | SARS-CoV-2 seropositive |
|----------------------------------|-------|--------------------------|
|                                  | N     | n           % (95% CI) | p-value* |
| Daily contact with COVID-19 patients |       |             |          |
| Contact with COVID-19 patients   | 410   | 69          17 (13 - 21) | <0.001   |
| Contact with patients without COVID-19 | 1,138 | 170         15 (13 - 17) |          |
| No patient contact               | 592   | 36          6.1 (4.3 - 8.3) |          |
| Previous COVID-19 symptoms       |       |             |          |
| No symptoms                      | 1342  | 48          3.6 (2.6 - 4.7) | <0.001   |
| Had symptoms                     | 797   | 227         28 (25 - 32)  |          |
| Missing                          | 1     | 0           -            |          |
| Severity of symptoms             |       |             |          |
| No symptoms                      | 1342  | 48          3.6 (2.6 - 4.7) | <0.001   |
| Mild symptoms                    | 570   | 107         19 (16 - 22)  |          |
| Significant symptoms             | 201   | 102         51 (48 - 58)  |          |
| Severe (hospitalised)            | 26    | 18          69 (44 - 86)  |          |
| Missing                          | 0     | 0           -            |          |
| Previous positive COVID-19 PCR   |       |             |          |
| No                               | 1846  | 45          2.4 (1.8 - 3.2) | <0.001   |
| Yes                              | 294   | 230         78 (73 - 83)  |          |
| Symptoms at time of previous positive PCR |   |             |          |
| No                               | 77    | 36          47 (35 - 58)  | <0.001   |
| Yes                              | 217   | 194         89 (85 - 93.2)|          |
| Severity of symptoms at time of PCR test | |             |          |
| No                               | 77    | 36          47 (35 - 58)  | <0.001   |
| Mild symptoms                    | 94    | 83          88 (80 - 94.0)|          |
| Significant symptoms             | 103   | 93          90.3 (83 - 95.2)|          |
| Severe (hospitalised)            | 20    | 18          90.0 (68 - 99.0)|          |
| Missing                          | 0     | 0           -            |          |

*Calculated using the Chi-square test

Table 2g Prevalence of SARS-CoV-2 seropositivity for general support staff, by role and hospital, PRECISE 2, April 2021

| Role                    | Hospital 1 | | | Hospital 2 | | | Both hospitals | |
|-------------------------|------------|---|---|------------|---|---|----------------|---|
|                         | Total      | Seropositive | % | Total      | Seropositive | % | Total      | Seropositive | % |
| Domestic/ Cleaning      | 62         | 15           24% | 45 | 9           20% | 107 | 24           22% |
| Catering               | 83         | 23           28% | 18 | 5           28% | 101 | 28           28% |
| Maintenance            | 27         | 6            22% | 24 | 1           4.2% | 51  | 7            14% |
| Security               | 33         | 6            18% | 14 | 3           21% | 47  | 9            19% |
| Porter                 | 20         | 6            30% | 13 | 1           7.7% | 33  | 7            21% |
| Chaplain               | 11         | 3            27% | 2  | 0           0.0% | 13  | 3            23% |
| Other                  | 7          | 1            14% | 0  | 2           33% | 6   | 2            33% |
| Driver                 | 0          | 0            - | 6  | 2           33% | 6   | 2            33% |
| Total                  | 243        | 60           25% | 122| 21          17% | 365 | 81           22% |
Table 2h Prevalence of asymptomatic SARS-CoV-2 infection, by hospital location and ethnicity, April 2021

|                                | Total seropositive | Asymptomatic SARS-CoV-2 infection | p-value* |
|--------------------------------|--------------------|-----------------------------------|----------|
|                                | N                  | n                   | % (95% CI) |          |
| St James's Hospital Total      | 623                | 121                 | 19 (16 - 23) | 0.009    |
| Irish                          | 401                | 82                  | 20 (17 - 25) |          |
| Other white background         | 56                 | 13                  | 23 (13 - 36) |          |
| Asian                          | 122                | 13                  | 11 (5.8 - 18) |          |
| African or other black background | 29              | 11                  | 38 (21 - 58) |          |
| Other                          | 15                 | 2                   | 13 (1.7 - 40) |          |
| Galway University Hospital Total | 275                | 48                  | 17 (13 - 22) | 0.531    |
| Irish                          | 194                | 35                  | 18 (13 - 24) |          |
| Other white background         | 38                 | 5                   | 13 (4.4 - 28) |          |
| Asian                          | 26                 | 5                   | 19 (6.6 - 39) |          |
| African or other black background | 10              | 3                   | 30 (6.7 - 65) |          |
| Other                          | 7                  | 0                   | -          |          |
| Both hospitals                 | 898                | 169                 | 19 (16 - 22) | 0.010    |
| Irish                          | 595                | 117                 | 20 (17 - 23) |          |
| Other white background         | 94                 | 18                  | 19 (12 - 29) |          |
| Asian                          | 148                | 18                  | 12 (7.4 - 19) |          |
| African or other black background | 39              | 14                  | 36 (21 - 53) |          |
| Other                          | 22                 | 2                   | 9.1 (1.1 - 29) |          |

*Calculated using the Chi-square test
Table 2i Undiagnosed SARS-CoV-2 infection, by HCW role and hospital location, April 2021

|                  | St James's Hospital | University Hospital Galway | Both hospitals |
|------------------|---------------------|----------------------------|---------------|
|                  | n   | %  | n   | %  | n   | %  |
| Admin            | 19  | 10%| 5   | 11%| 24  | 10%|
| Medical/dental   | 12  | 6.3%| 8   | 18%| 20  | 8.5%|
| Nursing/ midwifery | 79  | 42%| 19  | 42%| 98  | 42%|
| Allied health    | 32  | 17%| 6   | 13%| 38  | 16%|
| General support  | 22  | 12%| 4   | 8.8%| 26  | 11%|
| Health care assistant | 26  | 14%| 2   | 4.4%| 28  | 12%|
| Other            | 0   | 0.0%| 1   | 2.2%| 1   | 0.4%|
| Total            | 190 | 100%| 45  | 100%| 235 | 100%|

Table 3b Association between risk factors and SARS-CoV-2 seropositivity, Hospital 1, April 2021

| Participant characteristics | Unadjusted relative risk (95% CI) | P-value | Adjusted relative risk (95% CI) | P-value |
|-----------------------------|-----------------------------------|---------|---------------------------------|---------|
| Age groups (years)          |                                   |         |                                 |         |
| 18-29                       | 1.2 (0.9 - 1.4)                   | 0.174   | 1.2 (1.0 - 1.5)                 | 0.107   |
| 30-39                       | 1.0 (0.8 - 1.2)                   | 0.677   | 1.0 (0.8 - 1.3)                 | 0.909   |
| 40-49                       | 0.9 (0.7 - 1.1)                   | 0.437   | 1.0 (0.8 - 1.2)                 | 0.887   |
| 50-59                       | Ref.                              | Ref.    | Ref.                            | Ref.    |
| Over 60                     | 1.1 (0.8 - 1.5)                   | 0.697   | 1.0 (0.8 - 1.5)                 | 0.655   |
| Sex                         |                                   |         |                                 |         |
| Female                      | Ref.                              | Ref.    | Ref.                            | Ref.    |
| Male                        | 1.1 (0.9 - 1.3)                   | 0.237   | 1.2 (1.0 - 1.4)                 | 0.104   |
| Ethnicity                   |                                   |         |                                 |         |
| Irish                       | Ref.                              | Ref.    | Ref.                            | Ref.    |
| Any other white background  | 1.1 (0.9 - 1.5)                   | 0.312   | 1.1 (0.8 - 1.4)                 | 0.516   |
| Asian background            | 1.4 (1.1 - 1.6)                   | 0.001   | 1.1 (0.9 - 1.3)                 | 0.571   |
| African or other black background | 2.2 (1.6 - 2.9)     | <0.001  | 1.8 (1.3 - 2.4)                 | <0.001  |
| Country of birth | Ref. | OR (95% CI) | p-value |
|------------------|------|-------------|---------|
| Ireland          | Ref. | not entered |         |
| India            | 1.4  | 1.1 - 1.8   | 0.005   |
| Philippines      | 1.4  | 1.1 - 1.8   | 0.007   |
| United Kingdom   | 1.0  | 0.7 - 1.4   | 0.908   |
| Poland           | 1.6  | 0.9 - 2.9   | 0.108   |
| USA              | 1.0  | 0.4 - 2.4   | 0.999   |
| Romania          | 1.6  | 1.0 - 2.5   | 0.065   |
| Nigeria          | 3.8  | 2.9 - 4.9   | <0.001  |
| Other            | 1.2  | 0.9 - 1.5   | 0.162   |
| Education        |      |             |         |
| Primary          | 2.1  | 1.1 - 3.8   | 0.020   |
| Secondary        | 1.5  | 1.2 - 1.9   | <0.001  |
| Third level      | 1.4  | 1.2 - 1.6   | <0.001  |
| Post-graduate    | Ref. | Ref.        |         |
| Role             |      |             |         |
| Admin            | Ref. | Ref.        |         |
| Doctor\Dental    | 1.0  | 0.7 - 1.4   | 0.857   |
| Nursing          | 1.6  | 1.3 - 2.1   | <0.001  |
| HCA              | 2.5  | 1.8 - 3.3   | <0.001  |
| General support  | 1.6  | 1.1 - 2.1   | 0.006   |
| Allied HCW       | 0.9  | 0.7 - 1.2   | 0.559   |
| Other            | 0.5  | 0.2 - 1.2   | 0.123   |
| Lives with       |      |             |         |
| Alone            | Ref. | Ref.        |         |
| With others      | 1.4  | 1.0 - 1.9   | 0.024   |
| Lives with HCW   |      |             |         |
| No               | Ref. | Ref.        |         |
| Yes              | 1.3  | 1.1 - 1.5   | <0.001  |
| Workplace exposure to COVID-19 patients | | |
| No patient contact | Ref. | Ref.        |         |
| Daily contact with patients without COVID-19 | 1.4 | 1.1 - 1.7 | 0.001 |
| Daily contact with COVID-19 patients | 1.7 | 1.4 - 2.1 | <0.001 |
| Previous COVID-19 like symptoms | | |
| No               | Ref. | Ref.        |         |
| Yes              | 4.7  | 3.9 - 5.7   | <0.001  |
| Severity of symptoms | | |
| No symptoms      | Ref. | Ref.        |         |
| Mild symptoms    | 3.2  | 2.6 - 3.9   | <0.001  |
| Significant symptoms | 8.1 | 6.7 - 9.8 | <0.001 |
| Participant characteristics | Unadjusted relative risk (95% CI) | P-value | Adjusted relative risk (95% CI) | P-value |
|----------------------------|-----------------------------------|---------|---------------------------------|---------|
| Age groups (years)         |                                   |         |                                 |         |
| 18-29                      | 2.0 (1.4 - 2.8)                   | <0.001  | 1.7 (1.2 - 2.4)                 | 0.004   |
| 30-39                      | 1.5 (1.0 - 2.1)                   | 0.034   | 1.3 (0.9 - 1.9)                 | 0.120   |
| 40-49                      | 0.8 (0.6 - 1.2)                   | 0.380   | 0.8 (0.5 - 1.2)                 | 0.304   |
| 50-59                      | Ref.                              |         | Ref.                            |         |
| Over 60                    | 0.8 (0.4 - 1.6)                   | 0.570   | 0.8 (0.4 - 1.5)                 | 0.501   |
| Sex                        |                                   |         |                                 |         |
| Female                     | Ref.                              |         | Ref.                            |         |
| Male                       | 1.4 (1.1 - 1.8)                   | 0.004   | 1.3 (1.0 - 1.7)                 | 0.097   |
| Ethnicity                  |                                   |         |                                 |         |
| Irish                      | Ref.                              |         | Ref.                            |         |

Table 3c Association between risk factors and SARS-CoV-2 seropositivity, Hospital 2, April 2021

Severe symptoms (hospitalisation) 7.4 (4.9 - 11.2) <0.001
| Area                                      | Any other white background | Asian background | African or other black background | Other |
|-------------------------------------------|----------------------------|------------------|-----------------------------------|--------|
|                                           | 1.5 (1.1 - 2.1)            | 1.8 (1.2 - 2.6)  | 1.8 (1.0 - 3.2)                   | 1.7 (0.8 - 3.3) |
|                                           | 0.009                      | 0.002            | 0.036                             | 0.142  |
|                                           | 1.3 (1.0 - 1.7)            | 1.2 (0.8 - 1.8)  | 1.3 (0.7 - 2.4)                   | 1.4 (0.7 - 2.8) |
|                                           | 0.078                      | 0.333            | 0.388                             | 0.328  |

| Country of birth                          |                           |                  |                                  |        |
|-------------------------------------------|----------------------------|------------------|-----------------------------------|--------|
| Ireland                                   | Ref.                       | 2.1 (1.3 - 3.3)  | 0.001                            |
| India                                     |                            | 0.6 (0.1 - 3.7)  | 0.543                            |
| Philippines                               |                            | 1.0 (0.7 - 1.6)  | 0.841                            |
| United Kingdom                            |                            | 1.8 (1.1 - 3.0)  | 0.027                            |
| Poland                                    |                            | 1.8 (0.9 - 3.6)  | 0.080                            |
| USA                                       |                            | 5.3 (2.6 - 11)   | <0.001                           |
| Romania                                   |                            | 0.9 (0.1 - 5.7)  | 0.899                            |
| Nigeria                                   |                            | 1.7 (1.2 - 2.4)  | 0.001                            |
| Other                                     |                            |                  |                                  |        |

| Education                                 |                           |                  |                                  |        |
|-------------------------------------------|----------------------------|------------------|-----------------------------------|--------|
| Primary                                   |                           |                  |                                  |        |
| Secondary                                 |                            | 1.2 (0.8 - 1.8)  | 0.361                            |
| Third level                               |                            | 1.2 (0.9 - 1.5)  | 0.168                            |
| Post-graduate                             |                            |                  |                                  |        |

| Role                                      | Admin                      | Ref.              | Doctor/Dental                     | Ref.   |
|-------------------------------------------|----------------------------|------------------|-----------------------------------|--------|
|                                           | 2.2 (1.4 - 3.6)            | 0.001            | 0.9 (0.5 - 1.5)                   | 0.660  |
| Doctor/Dental                             | 1.9 (1.2 - 2.9)            | 0.006            | 1.0 (0.6 - 1.6)                   | 0.901  |
| Nursing                                   | 2.7 (1.5 - 4.6)            | <0.001           | 1.5 (0.8 - 2.7)                   | 0.180  |
| HCA                                       | 2.2 (1.3 - 3.9)            | 0.005            | 1.1 (0.6 - 2.1)                   | 0.704  |
| General support                           |                            |                  |                                  |        |
| Allied HCW                                |                            | 0.9 (0.5 - 1.5)  | 0.622                            |
|                                           |                            | 0.6 (0.3 - 1.0)  | 0.053                            |
| Other                                     |                            | 1.5 (0.6 - 3.6)  | 0.331                            |
|                                           |                            | 0.8 (0.3 - 1.8)  | 0.533                            |

| Lives with HCW                            |                           |                  |                                  |        |
|-------------------------------------------|----------------------------|------------------|-----------------------------------|--------|
| Alone                                     | Ref.                       |                  |                                  |        |
| With others                               |                            | 1.3 (0.9 - 2.1)  | 0.188                            |

| Workplace exposure to COVID-19 patients   | No                         | Ref.              | Yes                               | Ref.   |
|-------------------------------------------|---------------------------|------------------|-----------------------------------|--------|
| No patient contact                        |                           |                  |                                  |        |
| Daily contact with patients without COVID-19 | 2.5 (1.7 - 3.5)           | <0.001           | 1.9 (1.3 - 2.9)                   | 0.001  |
| Daily contact with COVID-19 patients      | 2.8 (1.9 - 4.1)           | <0.001           | 2.1 (1.4 - 3.3)                   | 0.001  |

| Previous COVID-19 like symptoms           | No                         | Ref.              | Yes                               | Ref.   |
|-------------------------------------------|---------------------------|------------------|-----------------------------------|--------|
| No                                        |                           |                  |                                  |        |
| Yes                                       |                            | 8 (5.9 - 10.7)   | <0.001                           |
| Severity of symptoms                  | No symptoms | Ref.      | p-value |
|---------------------------------------|-------------|-----------|---------|
| Mild symptoms                         | 5.2 (3.8 - 7.3) | <0.001   |
| Significant symptoms                  | 14.2 (10.4 - 19.3) | <0.001   |
| Severe symptoms (hospitalisation)     | 19.4 (13.3 - 28.2) | <0.001   |

**Table F.** Characteristics of fully vaccinated participants with PCR-confirmed infection i.e. vaccine breakthrough cases, both hospitals (n=23), PRECISE 2, April 2021

| Participant characteristics | PCR positive ≥14 days after second vaccine dose (N=23) |
|-----------------------------|-----------------------------------------------------|
|                            | n   | %    |
| **Hospital**                |     |      |
| Hospital 1                  | 18  | 78%  |
| Hospital 2                  | 5   | 22%  |
| **Age groups**              |     |      |
| 18-29                       | 2   | 8.7% |
| 30-39                       | 6   | 26%  |
| 40-49                       | 8   | 35%  |
| 50-59                       | 5   | 22%  |
| ≥60                         | 2   | 8.7% |
| **Sex**                     |     |      |
| Female                      | 15  | 65%  |
| Male                        | 8   | 35%  |
| **Ethnicity**               |     |      |
| Irish                       | 12  | 52%  |
| Any other white background  | 1   | 4.3% |
| Asian background            | 8   | 35%  |
| African or other black background | 2 | 8.7% |
| Other                       | 0   | 0.0% |
| **Country of birth**        |     |      |
| Ireland                     | 12  | 52%  |
| Country       | Count | Percentage |
|---------------|-------|------------|
| United Kingdom| 0     | 0.0%       |
| India         | 4     | 17%        |
| Philippines   | 4     | 17%        |
| Poland        | 1     | 4.3%       |
| USA           | 0     | 0.0%       |
| Other         | 0     | 0.0%       |

| Education       | Count | Percentage |
|-----------------|-------|------------|
| Primary         | 0     | 0.0%       |
| Secondary       | 2     | 8.7%       |
| Third level     | 11    | 48%        |
| Post-graduate   | 10    | 43%        |

| Role            | Count | Percentage |
|-----------------|-------|------------|
| Admin           | 0     | 0.0%       |
| Medical/dental  | 0     | 0.0%       |
| Nursing/ midwifery | 10   | 43%        |
| Allied health   | 5     | 22%        |
| General support | 2     | 8.7%       |
| Health care assistant | 4   | 17%        |
| Other           | 2     | 8.7%       |

| Workplace exposure to COVID-19 patients | Count | Percentage |
|----------------------------------------|-------|------------|
| No patient contact                     | 2     | 8.7%       |
| Daily contact with COVID-19 patients   | 9     | 39%        |
| Daily contact with patients without COVID-19 | 12 | 52%        |

| Lives with         | Count | Percentage |
|--------------------|-------|------------|
| Alone              | 1     | 4.3%       |
| With others        | 22    | 96%        |
| Missing            | 0     | 0.0%       |

| Lives with HCW     | Count | Percentage |
|--------------------|-------|------------|
| Yes                | 13    | 57%        |
| No                 | 10    | 43%        |

| Vaccine type       | Count | Percentage |
|--------------------|-------|------------|
| Pfizer             | 23    | 100%       |
| Other              | 0     | 0.0%       |

| Symptoms at the time of positive PCR test | Count | Percentage |
|------------------------------------------|-------|------------|
| Yes                                      | 5     | 22%        |
| No                                       | 18    | 78%        |
Table 4 Comparison of SARS-CoV-2 seroprevalence October 2020 and April 2021, by hospital

| Participant characteristics | Hospital 1 | Hospital 2 | Both hospitals |
|----------------------------|------------|------------|---------------|
|                            | Oct-20    | Apr-21    | change | Oct-20    | Apr-21    | change | Oct-20    | Apr-21    | change |
| Overall seroprevalence     | 15        | 21        | 6.2    | 4.1    | 13        | 18        | 7.7    |
| Age groups                 |           |           |        |        |           |           |        |           |           |        |
| (years)                    |           |           |        |        |           |           |        |           |           |        |
| 18-29                      | 20        | 24        | 4.3    | 4.7    | 20        | 15        | 15.1   | 13        | 22        | 9.5    |
| 30-39                      | 15        | 20        | 5.1    | 6      | 15        | 15        | 8.9    | 10        | 18        | 7.9    |
| 40-49                      | 13        | 19        | 6.4    | 3.5    | 8.5       | 5.0       | 8.2    | 15        | 6.5       |        |
| 50-59                      | 13        | 21        | 8.1    | 1.5    | 10        | 8.6       | 7.7    | 17        | 8.9       |        |
| Over 60                    | 17        | 23        | 5.5    | 2.7    | 8.4       | 5.7       | 9.9    | 16        | 6.1       |        |
| Sex                        |           |           |        |        |           |           |        |           |           |        |
| Female                     | 15        | 21        | 5.7    | 3.5    | 8.3       | 7.7       | 17     | 7.5       |           |        |
| Male                       | 16        | 23        | 6.8    | 6.3    | 17        | 10.5      | 12     | 20        | 8.3       |        |
| Ethnicity                  |           |           |        |        |           |           |        |           |           |        |
| Irish                      | 13        | 19        | 6.2    | 3.7    | 11        | 7.7       | 8.6    | 16        | 7.1       |        |
| Any other white background | 17        | 22        | 4.8    | 6.3    | 17        | 11.1      | 11     | 20        | 8.7       |        |
| Asian background           | 24        | 26        | 2.0    | 7.1    | 20        | 13.1      | 19     | 25        | 5.7       |        |
| African or any other black background | 23 | 42 | 19 | 2.1 | 21 | 18.7 | 14 | 33 | 19 |        |
| Other                      | 13        | 26        | 13     | -      | 19        | -         | 6.9    | 23        | 16        |        |
| Country of birth           |           |           |        |        |           |           |        |           |           |        |
| Ireland                    | 13        | 19        | 6.1    | 3.9    | 11        | 7.4       | 8.7    | 16        | 6.9       |        |
| United Kingdom             | 16        | 19        | 2.7    | 3.7    | 12        | 8.1       | 9.3    | 15        | 5.6       |        |
| India                      | 23        | 27        | 3.7    | 8.2    | 24        | 15.3      | 18     | 26        | 7.9       |        |
| Philippines                | 27        | 27        | -0.2   | 8.0    | 6.3       | -1.8      | 25     | 25        | 0.2       |        |
| Poland                     | 29        | 31        | 1.8    | 6.3    | 20        | 14        | 14     | 24        | 9.5       |        |
| USA                        | 14        | 19        | 5.0    | -      | 21        | -         | 5.0    | 20        | 15        |        |
| Other                      | 16        | 28        | 12     | 4      | 28        | 23.5      | 10     | 25        | 15        |        |
| Education                  |           |           |        |        |           |           |        |           |           |        |
| Primary                    | 15        | 35        | 20     | 0.0    | 0.0       | 0.0       | 14     | 32        | 18        |        |
| Secondary                  | 13        | 26        | 13     | 3.0    | 14        | 11        | 8.9    | 22        | 13        |        |
| Third level                | 18        | 24        | 5.5    | 4.3    | 14        | 9.5       | 11     | 19        | 8.3       |        |
| Post-graduate              | 14        | 17        | 3.0    | 4.1    | 12        | 7.6       | 9.0    | 15        | 5.7       |        |
| Role                       |           |           |        |        |           |           |        |           |           |        |
| Admin                      | 10        | 16        | 5.9    | 1.2    | 7.7       | 6.5       | 6.0    | 13        | 6.6       |        |
| Medical/dental             | 14        | 15        | 1.4    | 6.9    | 17        | 10.2      | 10     | 16        | 6.3       |        |
| Nursing/ midwifery | 21 | 26 | 4.6 | 4.7 | 14 | 9.7 | 13 | 21 | 7.9 |
|-------------------|----|----|-----|-----|----|-----|----|----|----|
| Allied health     | 10 | 15 | 4.5 | 2.5 | 6.7 | 4.2 | 6.7 | 11 | 4.6 |
| General support   | 12 | 25 | 13  | 1.7 | 17 | 15.5 | 7.6 | 22 | 15 |
| Health care assistant | 27 | 39 | 12  | 6.2 | 21 | 14.3 | 18 | 32 | 14 |
| Other             | 11 | 7.4 | -3.6 | 1.4 | 12 | 10.4 | 5.5 | 9.5 | 4.0 |
| Lives with        |    |    |     |     |    |     |    |    |    |
| Alone             | 8.2 | 16 | 7.4 | 3.1 | 10 | 6.7 | 5.9 | 13 | 7.2 |
| With others       | 16 | 22 | 5.7 | 4.2 | 13 | 9.0 | 10 | 18 | 8.1 |
| Missing           | 11 | 38 | 27  | -   | -  | -   | 9.1 | 27 | 18 |
| Lives with HCW    |    |    |     |     |    |     |    |    |    |
| Yes               | 21 | 25 | 4.2 | 4.9 | 16 | 11.6 | 13 | 22 | 8.6 |
| No                | 13 | 19 | 6.0 | 3.8 | 11 | 7.5 | 8.5 | 16 | 7.3 |
| Missing           | 17 | 25 | 8.0 | 2.1 | 10 | 8.1 | 9.9 | 18 | 7.7 |
| Daily contact with COVID-19 patients |    |    |     |     |    |     |    |    |    |
| Contact with COVID-19 patients | 21 | 27 | 6.0 | 7.1 | 17 | 9.7 | 15 | 23 | 8.3 |
| Contact with patients without COVID-19 | 17 | 22 | 4.5 | 4.6 | 15 | 10.3 | 11 | 19 | 7.5 |
| No patient contact | 9.5 | 16 | 6.1 | 1.3 | 6.1 | 4.8 | 5.9 | 12 | 5.8 |
| Previous COVID-19 symptoms |    |    |     |     |    |     |    |    |    |
| No symptoms       | 5.8 | 7.7 | 1.9 | 1.3 | 3.6 | 2.3 | 3.2 | 5.8 | 2.6 |
| Had symptoms      | 23 | 37 | 14  | 7.5 | 28 | 21  | 17 | 34 | 17 |
| Previous positive COVID-19 PCR test |    |    |     |     |    |     |    |    |    |
| No                | 6.8 | 7.8 | 1.0 | 1.5 | 2.4 | 0.9 | 4.2 | 5.5 | 1.3 |
| Yes               | 94.9 | 84 | -11 | 97.3 | 78 | -19.1 | 95.4 | 82 | -14 |