**Supplementary Table 1s. Socio-demographic characteristics of the Northern Ireland cohort aged 18+years**

**(N=1,196,364) and proportion of multimorbidity (≥2 physical health conditions) and activity limitation**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  **Activity limitationⱡ**  |
| **Variable** |  **Study population** **(N=1,196,364)** **n (%)** |  **Multimorbidity¶** **(N=164,473)** **n (row %)** | **None****(N=892,124)****n (row %)** | **A little****(N=129,913)****n (row %)** | **A lot****(N=174,327)****n (row %)** |
| **Multiple physical morbidity** |  |  |  |  |  |
|  None | 854,991 (71.5) | - | 797,300 (93.3) | 38,336 (4.5) | 19,355 (2.3 ) |
|  1 condition | 176,900 (14.8) | - |  82,664 (46.7) |  54,789 (31.0) |  39,447 (22.3) |
|  2 conditions | 92,068 (7.7) | - |  9,376 (10.2) |  26,251 (28.5) |  56,441 (61.3) |
|  3 conditions | 48,167 (4.0) | - | 2,003 (4.2) |  8,308 (17.3) |  37,856 (78.6) |
|  4+ conditions | 24,238 (2.0) | - |  781 (3.2) |  2,229 (9.2) |  21,228 (87.6) |
| **Limiting long-term illness** |  |  |  |  |  |
|  None | 892,124 (74.6) | 12,160 (1.36) | - | - | - |
|  A little | 129,913 (10.9) | 36,788 (28.3) | - | - | - |
|  A lot | 174,327 (14.6) | 115,525 (66.3) | - | - | - |
| **Self-reported poor mental health** |  |  |  |  |  |
|  No | 1,107,517 (92.6) | 126,954 (11.5) |  870,691 (78.6) |  110,091 (9.9) | 126,735 (11.4) |
|  Yes |  88,847 (7.4) |  37,519 (42.2) |  21,433 (24.1) |  19,822 (22.3) | 47,592 (53.6) |
| **Gender** |  |  |  |  |  |
|  Female | 628,662 (52.6) | 91,570 (14.6) |  461,039 (73.3) |  72,124 (11.5) | 95,499 (15.2) |
|  Male | 567,702 (47.5) | 72,903 (12.8) |  431,085 (75.9) |  57,789 (10.2) | 78,828 (13.9) |
| **Age (at 2011 Census)*,*years** |  |  |  |  |  |
|  18 - 24 | 138,596 (11.6) | 3,555 (2.6) |  128,711 (92.9) |  5,485 (4.0) | 4,400 (3.2) |
|  25 - 34 | 205,415 (17.2) | 6,524 (3.2) |  187,623 (91.3) |  8,962 (4.4) | 8,830 (4.3) |
|  35 - 44 | 222,155 (18.6) |  14,183 (6.4) |  189,998 (85.5) | 14,429 (6.5) | 17,728 (8.0) |
|  45 - 54 | 224,269 (18.8) | 26,362 (11.8) |  173,636 (77.4) | 20,980 (9.4) |  29,653 (13.2) |
|  55 - 64 | 176,641 (14.8) | 34,682 (19.6) |  115,325 (65.3) |  24,700 (14.0) |  36,616 (20.7) |
|  65 - 74 | 131,891 (11.0) | 36,320 (27.5) |  68,604 (52.0) |  27,570 (20.9) |  35,717 (27.1) |
|  75+ | 97,397 (8.1) | 42,847 (44.0) |  28,227 (29.0) |  27,787 (28.5) |  41,383 (42.5) |
| **Marital status** |  |  |  |  |  |
|  Never married | 328,183 (27.4) | 25,474 (7.8) |  270,961 (82.6) | 25,019 (7.6) | 32,203 (9.8) |
|  Married/cohabiting | 678,233 (56.7) |  82,546 (12.2) |  524,550 (77.3) |  69,764 (10.3) |  83,919 (12.4) |
|  Separated/divorced/widowed |  189,948 (15.9) |  56,453 (29.7) |  96,613 (50.9) |  35,130 (18.5) |  58,205 (30.6) |
| **Persons in household** |  |  |  |  |  |
|  Others | 989,599 (82.7) | 111,772 (11.3) |  777,844 (78.6) | 93,695 (9.5) | 118,060 (11.9) |
|  Single-person household | 206,765 (17.3) |  52,701 (25.5) |  114,280 (55.3) |  36,218 (17.5) |  56,267 (27.2) |
| **Religion** |  |  |  |  |  |
|  Protestant | 533,409 (44.6) | 80,268 (15.1) |  388,526 (72.8) |  65,357 (12.3) | 79,526 (14.9) |
|  Catholic | 465,061 (38.9) | 62,475 (13.4) |  348,058 (74.8) | 45,466 (9.8) | 71,537 (15.4) |
|  Other | 197,894 (16.5) | 21,730 (11.0) |  155,540 (78.6) | 19,090 (9.7) | 23,264 (11.8) |
| **Highest qualification** |  |  |  |  |  |
|  No qualification | 345,700 (28.9) | 98,316 (28.4) | 176,223 (51.0) |  60,270 (17.4) | 109,207 (31.6) |
|  Basic education | 409,044 (34.2) | 41,063 (10.0) | 327,763 (80.1) | 39,221 (9.6) |  42,060 (10.3) |
|  A–levels | 146,479 (12.2) | 7,935 (5.4) | 129,153 (88.2) |  9,468 (6.5) |  7,858 (5.4) |
|  1st degree or higher | 295,141 (24.7) |  17,159 (5.8) | 258,985 (87.8) | 20,954 (7.1) |  15,202 (5.2) |
| **House tenure/value** |  |  |  |  |  |
|  £200,000+ | 160,424 (13.4) |  11,769 (7.3) | 136,405 (85.0) | 13,051 (8.1) | 10,968 (6.8) |
|  £150,000–199,999 | 151,973 (12.7) |  13,649 (9.0) | 124,926 (82.2) | 14,126 (9.3) | 12,921 (8.5) |
|  £100,000–149,999 | 272,801 (22.8) | 32,004 (11.7) | 211,890 (77.7) |  28,786 (10.6) |  32,125 (11.8) |
|  £75,000–99,999 | 182,203 (15.2) | 25,987 (14.3) | 134,325 (73.7) |  20,571 (11.3) |  27,307 (15.0) |
|  < £75,000 | 126,080 (10.5) | 21,197 (16.8) |  88,234 (70.0) |  15,385 (12.2) |  22,461 (17.8) |
|  Private rent | 161,191 (13.5) | 21,456 (13.3) | 120,151 (74.5) |  16,349 (10.1) |  24,691 (15.3) |
|  Social rent | 141,692 (11.8) | 38,411 (27.1) |  76,193 (53.8) |  21,645 (15.3) |  43,854 (31.0) |
| **Area of residence** |  |  |  |  |  |
|  Rural | 322,067 (26.9) | 37,113 (11.5) | 248,498 (77.2) |  33,326 (10.4) |  40,243 (12.5) |
|  Intermediate | 637,013 (53.3) | 87,795 (13.8) | 475,625 (74.7) |  70,405 (11.1) |  90,983 (14.3) |
|  Urban | 237,284 (19.8) | 39,565 (16.7) | 168,001 (70.8) |  26,182 (11.0) |  43,101 (18.2) |
| **Income deprivation index quintile** |  |  |  |  |  |
|  1(least deprived) | 233,484 (19.5) |  23,096 (9.9) | 189,472 (81.2) | 22,960 (9.8) | 21,052 (9.0) |
|  2 | 253,058 (21.2) | 29,295 (11.6) | 197,322 (78.0) |  26,225 (10.4) |  29,511 (11.7) |
|  3 | 246,545 (20.6) | 31,770 (12.9) | 186,103 (75.5) |  26,671 (10.8) |  33,771 (13.7) |
|  4 | 241,478 (20.2) | 37,234 (15.4) | 172,736 (71.5) |  28,031 (11.6) |  40,711 (16.9) |
|  5 (most deprived) | 221,799 (18.5) | 43,078 (19.4) | 146,491 (66.1) |  26,026 (11.7) |  49,282 (22.2) |

¶Multimorbidity – two or more physical health conditions. ⱡDue to a limiting long-term illness (LLTI)

**Supplementary Table 2s. Association between limiting long-term illness and mental health status and death by suicide stratified by age groups**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Variable** | **18-34 years old (N=344,011)** **n (%)** |  **Suicide** **(N=286)**  **n (row %)** |  **Model 1****OR (95% CI)** | **Model 2****AOR (95% CI)** | **Model 3****AOR (95% CI)** | **Model 4****AOR (95% CI)** |
| **Limiting long-term illness** |  |   |  |  |  |  |
|  None | 316,334 (92.0) | 201 (0.06) | Reference | Reference | - | Reference |
|  A little | 14,447 (4.2) | 24 (0.17) | 2.62 (1.71–4.00) | 1.85 (1.20–2.85) | - | 1.19 (0.74–1.90) |
|  A lot | 13,230 (3.9) | 61 (0.46) | 7.29 (5.47–9.71) | 3.79 (2.77–5.19) | - | 2.04 (1.38–3.02) |
| **Self-reported poor mental health** |  |  |  |  |  |  |
|  No | 327,328 (95.2) | 213 (0.07) | Reference | - | Reference | Reference |
|  Yes | 16,683 (4.9) |  73 (0.44) | 6.75 (5.17–8.81) | - | 4.50 (3.36–6.02) | 3.18 (2.20–4.60) |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Variable** | **35-59 years old** **(N=536,965)** **n (%)** |  **Suicide** **(N=468)**  **n (row %)** |  **Model 1****OR (95% CI)** | **Model 2****AOR (95% CI)** | **Model 3****AOR (95% CI)** | **Model 4****AOR (95% CI)** |
| **Limiting long-term illness** |  |  |  |  |  |  |
|  None | 425,783 (79.3) | 239 (0.06) | Reference | Reference | - | Reference |
|  A little | 46,733 (8.7) | 82 (0.18) | 3.13 (2.43–4.02) | 2.35 (1.81–3.04) | - | 1.67 (1.26–2.20) |
|  A lot | 64,449 (12.0) | 147 (0.23) | 4.07 (3.31–5.00) | 2.42 (1.92–3.04) | - | 1.41 (1.08–1.85) |
| **Self-reported poor mental health** |  |  |  |  |  |  |
|  No | 483,525 (90.1) | 293 (0.06) | Reference | - | Reference | Reference |
|  Yes | 53,440 (10.0) | 175 (0.33) | 5.42 (4.49–6.54) | - | 3.64 (2.96–4.48) | 2.97 (2.33–3.79) |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Variable** | **60-90+ years** **(N=315,388)** **n (%)** |  **Suicide** **(N=123)**  **n (row %)** |  **Model 1****OR (95% CI)** | **Model 2****AOR (95% CI)** | **Model 3****AOR (95% CI)** | **Model 4****AOR (95% CI)** |
| **Limiting long-term illness** |  |  |  |  |  |  |
|  None | 150,007 (47.6) | 50 (0.03) | Reference | Reference | - | Reference |
|  A little | 68,733 (21.8) | 23 (0.03) | 1.00 (0.61–1.65) | 0.94 (0.57–1.55) | - | 0.84 (0.51–1.39) |
|  A lot | 96,648 (30.6) | 50 (0.05) | 1.55 (1.05–2.30) | 1.39 (0.92–2.11) | - | 1.07 (0.69–1.65) |
| **Self-reported poor mental health** |  |  |  |  |  |  |
|  No | 296,664 (94.1) | 96 (0.03) | Reference | - | Reference | Reference |
|  Yes | 18,724 (5.9) | 27 (0.14) | 4.46 (2.91–6.84) | - | 4.10 (2.64–6.35) | 4.00 (2.52–6.34) |

OR – odds ratio. AOR – adjusted odds ratio.

Model 1 - unadjusted model

Model 2 –LLTI adjusted for sociodemographics ( gender, marital status, single-person household, religion, highest qualification, house tenure/value, area of residence, income deprivation)

Model 3 – Mental health adjusted for sociodemographics

Model 4 – adjusted for LLTI, mental health and sociodemographics