

Supplementary file, table 1: Comparison of ELSA sample in waves 3 and 7

| | | Wave 3 | Wave 7 |
|---|---------------------------|-------------|--------------|
| | | N (%) | N (%) |
| Gender | | | |
| | Females | 56.5% | 56.2% |
| Age | Mean (S.D.) | 65.5 (7.9) | 72.8 (7.1) |
| SOCIAL NETWORK | | | |
| Marital status | N | 4306 | 4663 |
| | (Re)married/partnership | 2970 (69.0) | 2903 (62.3) |
| | Always single | 209 (4.9) | 207 (4.4) |
| | Divorced/separated | 472 (11.0) | 510 (10.9) |
| | Widowed/partner died | 655 (15.2) | 1,043 (22.4) |
| | <i>Missing (N)</i> | 357 | 0 |
| Has close relationship with 2+ family member/friend | N | 3907 | 4034 |
| | Yes | 3747 (95.9) | 3528 (87.5) |
| | <i>Missing (N)</i> | 756 | 629 |
| Active civic participation | N | 3723 | 3808 |
| | Yes | 2835 (76.2) | 2825 (74.2) |
| | <i>Missing(N)</i> | 940 | 855 |
| Part of job market | N | 4301 | 4652 |
| | Out of job market | 2511 (58.4) | 3928 (84.4) |
| | Employed/semi-employed | 1428 (33.2) | 530 (11.4) |
| | Looking after home/family | 362 (8.4) | 194 (4.2) |
| | <i>Missing(N)</i> | 362 | 11 |
| HEALTH CHARACTERISTICS | | | |
| Self-rated Health | N | n/a | 4443 |
| | Excel/v good/good | | 3125 (70.3) |
| | Fair/poor | | 1318 (29.7) |
| | <i>Missing(N)</i> | | 220 |
| Depressive symptoms | N | 4251 | 4384 |
| | Yes (3+ out of 8) | 787 (18.5) | 860 (19.6) |
| | <i>Missing(N)</i> | 412 | 279 |
| Activities of daily living | N | 4,306 | 4.661 |
| | Difficulty with 1+ | 959 (22.3) | 1,228 (26.4) |
| | <i>Missing(N)</i> | 357 | 2 |
| Limiting long-standing illness | N | 4303 | 4661 |
| | No | 1982 (46.1) | 1848(39.7) |
| | Yes, not limiting | 996 (23.2) | 947 (20.3) |
| | Yes, limiting | 1325 (30.8) | 1866 (40.0) |
| | <i>Missing(N)</i> | 360 | 2 |
| GEOGRAPHICAL CHARACTERISTICS | | | |
| Index of Multiple Deprivation | N | 4302 | 4478 |
| | 1 st quintile | 1170 (27.2) | 1163 (26.0) |
| | 2 nd | 1074 (25.0) | 1181 (26.4) |
| | 3 rd | 870 (20.2) | 899 (20.1) |
| | 4 th | 726 (16.9) | 735 (16.4) |
| | 5 th | 462 (10.7) | 500 (11.2) |
| | <i>Missing(N)</i> | 361 | 185 |
| Urban/rural distribution | | 4306 | 4507 |
| | Urban | 3128 (72.6) | 3271 (72.6) |
| | Town/fringe | 546 (12.7) | 565 (12.5) |

| | | | |
|-----------------------------|-----------------------------|-------------|-------------|
| | Village | 469 (10.9) | 497 (11.0) |
| | Hamlets /isolated dwellings | 163 (3.8) | 174 (3.9) |
| | <i>Missing(N)</i> | 357 | 156 |
| Geographical regions | N | 4302 | 4496 |
| | London | 376 (8.7) | 385 (8.6) |
| | North East | 275 (6.4) | 276 (6.1) |
| | North West | 479 (11.1) | 503 (11.2) |
| | Yorkshire and The Humber | 480 (11.2) | 487 (10.8) |
| | East Midlands | 462 (10.7) | 478 (10.6) |
| | West Midlands | 469 (10.9) | 494 (11.0) |
| | East of England | 553 (12.9) | 580 (12.9) |
| | South East | 715 (16.6) | 761 (16.9) |
| | South West | 493 (11.5) | 532 (11.8) |
| | <i>Missing(N)</i> | 361 | 167 |
| LONELINESS REPORT | | | |
| Individual-based loneliness | N | 3857 | 3891 |
| | No | 3119 (80.9) | 3208 (82.5) |
| | Yes (6+ out of 9) | 738 (19.1) | 683 (17.6) |
| | <i>Missing(N)</i> | 806 | 772 |
| Area-based loneliness | N | 3845 | 3890 |
| | No | 2891 (75.2) | 2993 (75.4) |
| | Yes (4+ out of 7) | 954 (24.8) | 957 (24.6) |
| | <i>Missing(N)</i> | 818 | 773 |

Individual-based loneliness: UCLA scale = 'University California Los Angeles' loneliness scale (3-question version)

Area-based loneliness: statement to 'Feel lonely living in this area' on 7-point Likert scale

Supplementary file, table 2: Comparison of wave 7 of analytical sample (those participating in waves 3, 6, and 7) and those who dropped-out

| | | Participation in waves 3, 6, and 7 | |
|---|---------------------------|------------------------------------|------------|
| | | Yes | No |
| | | % /mean (S.D) | |
| Gender | Males | 43.8 | 45.1 |
| Age | In Wave 7 | 72.8 (7.1) | 61.4 (8.5) |
| SOCIAL NETWORK | | | |
| Marital status | (Re)married/partnership | 62.3 | 70.5 |
| | Lives alone | 15.4 | 22.2 |
| | Widowed/partner died | 22.4 | 7.2 |
| Has close relationship with 2+ family member/friend | Yes | 87.5 | 92.0 |
| | No | 12.5 | 8.0 |
| Active civic participation | Yes | 74.2 | 67.4 |
| | No | 25.8 | 32.6 |
| Part of job market | Out of job market | 84.4 | 43.4 |
| | Employed/semi-employed | 11.4 | 50.8 |
| | Looking after home/family | 4.2 | 5.8 |
| HEALTH STATUS | | | |
| Self-rated health | Excellent /very good/good | 70.3 | 77.4 |
| | Fair/poor | 29.7 | 22.6 |
| Depressive symptoms | No | 80.4 | 80.7 |
| | 3+ out of 8 | 19.6 | 19.3 |
| Activities of daily living (ADL/IADL) | No difficulties | 73.6 | 82.3 |
| | Difficulty with 1+ | 26.4 | 17.7 |
| Long-standing illness | No illness | 39.7 | 50.9 |
| | Yes/Yes and limiting | 60.3 | 49.1 |
| Reported loneliness (UCLA scale) | No | 82.5 | 82.5 |
| | Yes (6+ out of 9) | 17.6 | 17.5 |
| Feel lonely living in this area | No | 75.4 | 75.0 |
| | Yes (4+ out of 7) | 24.6 | 25.0 |

Supplementary file, table 3. Bivariate regression analyses between two measures of loneliness and socio-demographic characteristics

| | | UCLA | Feel lonely living in this area |
|---|-----------------------------|-----------------------------|---------------------------------|
| | | OR (95%CI), p-value | OR (95%CI), p-value |
| Gender (ref=Male) | Female | 1.62 (1.4-1.9), <0.001 | 1.7 (1.5-2.0), <0.001 |
| Age | Per 1 year + | 1.02 (1.01-1.03), <0.001 | 1.02 (1.01-1.03), 0.001 |
| SOCIAL NETWORK | | | |
| Marital status (ref= (Re)married/in partnership) | Always single | 2.5 (1.7-3.6), <0.001 | 1.4 (0.9-1.9), 0.096 |
| | Divorced/separated | 3.2 (2.5-4.2), <0.001 | 2.1 (1.7-2.6), <0.001 |
| | Widowed/partner died | 3.7 (3.1-4.6), <0.001 | 2.3 (2.0-2.8), <0.001 |
| Has close relationship with 2+ family members/Friends (ref= No) | Yes | 0.4 (0.3-0.4), <0.001 | 0.6 (0.5-0.7), <0.001 |
| Active civic participation (ref= No) | Yes , in 1+ activities | 0.6 (0.5-0.7), <0.001 | 0.6 (0.5-0.8), <0.001 |
| Part of job market (ref= Out of job market) | Employed/semi-employed | 0.7 (0.5-0.9), 0.011 | 0.8 (0.6-1.0), 0.024 |
| | Looking after home/family | 1.1 (0.7-1.6), 0.642 | 1.2 (0.9-1.8), 0.220 |
| HEALTH STATUS | | | |
| Self-rated health (ref= Excellent/very good/good) | Fair/poor | 2.7 (2.3-3.2), <0.001 | 1.9 (1.6-2.2), <0.001 |
| Depressive symptoms (ref= No) | 3+ out of 8 | 7.4 (6.1-8.9), <0.001 | 2.9 (2.4-3.5), <0.001 |
| Activities of daily living ADL/IADL (ref=No difficulties) | Difficulty with 1+ activity | 2.4 (2.0-2.8), <0.001 | 1.6 (1.4 -1.9), <0.001 |
| Long-standing illness (ref= No) | Yes, not limiting | 1.1 (0.9-1.4), 0.334 | 1.2 (1.0-1.5), 0.039 |
| | Yes, limiting | 2.0 (1.7-2.4), <0.001 | 1.6 (1.4-1.9), <0.001 |

Supplementary file, table 4. Bivariate regression analyses between two measures of loneliness and geographical characteristics

| | | UCLA | Feel lonely living in this area |
|---|---|------------------------|---------------------------------|
| | | OR (95%CI), p-value | OR (95%CI), p-value |
| Index of Multiple Deprivation (IMD) (ref= 1 st quintile-least deprived) | 2 nd quintile | 1.4 (1.1-1.9), 0.006 | 1.3 (1.0-1.6), 0.018 |
| | 3 rd quintile | 1.4 (1.1-1.8), 0.016 | 1.3 (1.1-1.7), 0.013 |
| | 4 th quintile | 1.6 (1.2-2.1), 0.001 | 1.7 (1.3-2.1), <0.001 |
| | 5 th quintile (most deprived) | 2.0 (1.5-2.7), <0.001 | 1.9 (1.5-2.5), <0.001 |
| | <i>P for trend</i> | <0.001 | <0.001 |
| Urban/rural distribution (ref= Urban) | Town/fringe | 1.0 (0.8-1.3), 0.986 | 0.8 (0.6-1.0), 0.044 |
| | Village | 0.8 (0.6-1.1), 0.178 | 0.9 (0.7-1.1), 0.320 |
| | Hamlets /isolated dwellings | 0.9 (0.6-1.4), 0.539 | 0.9 (0.6-1.3), 0.559 |
| | <i>P for trend</i> | 0.206 | 0.137 |
| Geographical regions (ref= London) | North East | 1.1 (0.7-1.9), 0.591 | 0.7 (0.5-1.1), 0.115 |
| | North West | 1.5 (1.0-2.3), 0.058 | 0.8 (0.6-1.1), 0.193 |
| | Yorkshire and The Humber | 1.6 (1.1-2.5), 0.023 | 1.0 (0.7-1.4), 0.889 |
| | East Midlands | 1.6 (1.0-2.4), 0.041 | 0.8 (0.6-1.1), 0.233 |
| | West Midlands | 1.6 (1.1-2.5), 0.022 | 0.9 (0.6-1.2), 0.442 |
| | East of England | 1.2 (0.8-1.8), 0.304 | 1.0 (0.7-1.4), 0.850 |
| | South East | 1.2 (0.8-2.6), 0.311 | 1.0 (0.7-1.3), 0.875 |
| | South West | 1.7 (1.1-2.6), 0.013 | 1.0 (0.7-1.4), 0.873 |

Supplementary file, table 5: Loneliness by geographical characteristics in waves 3 and 7

| | | Wave 3 | | Wave 7 | |
|-------------------------------|---|-----------------------------------|---------------------------|-----------------------------------|---------------------------|
| | | Individually-based loneliness (%) | Area-based loneliness (%) | Individually-based loneliness (%) | Area-based loneliness (%) |
| Index of Multiple Deprivation | 1 st quintile (least deprived) | 15.1 | 21.9 | 13.3 | 19.4 |
| | 2 nd | 18.1 | 23.7 | 17.7 | 23.8 |
| | 3 rd | 19.2 | 24.1 | 17.4 | 24.3 |
| | 4 th | 21.8 | 29.5 | 19.5 | 28.9 |
| | 5 th | 28.8 | 29.9 | 23.2 | 31.6 |
| Urban/rural distribution | Urban | 19.5 | 25.7 | 17.7 | 25.3 |
| | Town/fringe | 19.0 | 23.4 | 17.7 | 21.0 |
| | Village | 18.2 | 23.0 | 15.1 | 23.1 |
| | Hamlets /isolated dwellings | 15.1 | 17.8 | 15.8 | 23.3 |
| Geographical regions | London | 17.5 | 25.5 | 13.0 | 25.9 |
| | North East | 16.9 | 21.0 | 14.6 | 20.1 |
| | North West | 20.8 | 21.6 | 18.3 | 21.8 |
| | Yorkshire and The Humber | 20.5 | 26.5 | 19.5 | 26.4 |
| | East Midlands | 22.1 | 26.0 | 18.8 | 22.0 |
| | West Midlands | 19.8 | 24.0 | 19.6 | 23.4 |
| | East of England | 16.2 | 25.8 | 15.6 | 26.5 |
| | South East | 18.2 | 25.0 | 15.5 | 25.5 |
| South West | 20.0 | 26.3 | 20.1 | 25.4 | |

Individual- based loneliness=UCLA scale =‘University California Los Angeles’ loneliness scale (3-question version)

Area-based loneliness= ‘How much do you feel lonely living in this area?’

Supplementary file, table 6 a,b: Cross-tabulation of reported loneliness measures (R-UCLA and 'Often feel lonely living in this area') by wave (N (%))

a) % of the whole sample

| | | Area-based loneliness | | | | | |
|-----------------------------|-------|-----------------------|------------|---------------|--------------|------------|---------------|
| | | Wave 3 | | | Wave 7 | | |
| | | No | Yes | Total | No | Yes | Total |
| Individual-based loneliness | No | 2,559 (67.0) | 538 (14.1) | 3,097 (81.0) | 2,561 (67.7) | 566 (15.0) | 3,127 (82.6) |
| | Yes | 317 (8.3) | 408 (10.7) | 725 (19.0) | 303 (8.0) | 355 (9.4) | 658 (17.4) |
| | Total | 2,876 (75.3) | 946 (24.8) | 3,822 (100.0) | 2,864 (75.7) | 921 (24.3) | 3,785 (100.0) |

b) % of those in particular area-based loneliness category

| | | Area-based loneliness | | | | | |
|-----------------------------|-------|-----------------------|-------------|---------------|---------------|-------------|---------------|
| | | Wave 3 | | | Wave 7 | | |
| | | No | Yes | Total | No | Yes | Total |
| Individual-based loneliness | No | 2,559 (89.0) | 538 (56.9) | 3,097 (81.0) | 2,561 (89.4) | 566 (61.5) | 3,127 (82.6) |
| | Yes | 317 (11.0) | 408 (43.1) | 725 (19.0) | 303 (10.6) | 355 (38.6) | 658 (17.4) |
| | Total | 2,876 (100.0) | 946 (100.0) | 3,822 (100.0) | 2,864 (100.0) | 921 (100.0) | 3,785 (100.0) |

Supplementary file, table 7: Cross-tabulation of urban/rural characteristic and IMD (in %), wave 6

| Urban/rural characteristic | Index of Multiple Deprivation | | | | | TOTAL |
|----------------------------|-------------------------------|--------------------------|--------------------------|--------------------------|---------------|-------|
| | Least deprived | 2 nd quintile | 3 rd quintile | 4 th quintile | Most deprived | |
| Urban | 17.8 | 15.7 | 14.4 | 14.1 | 10.7 | 72.7 |
| Town & Fringe | 4.6 | 4.8 | 1.7 | 1.1 | 0.4 | 12.5 |
| Village | 2.5 | 4.8 | 2.8 | 0.9 | 0.1 | 11.0 |
| Hamlet & Isolated dwelling | 1.1 | 1.1 | 1.3 | 0.3 | 0 | 3.7 |
| TOTAL | 26.0 | 26.4 | 20.1 | 16.4 | 11.2 | 100% |