**Supplemental Table S1 Baseline cognitive scores and cognitive decline in European countries**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Verbal fluency | Immediate recall | Delayed recall | Overall cognition |
|  | Mean ± SD | B (95% CI) | Mean ± SD | B (95% CI) | Median (IQR) | B (95% CI) | Mean ± SD | B (95% CI) |
| Western Europe |  |  |  |  |  |  |  |  |
|  Austria | 22.4 ± 8.8 | -0.28 (-0.35; -0.20) | 2.3 ± 1.7 | 0.01 (0.02; 0.03) | 4 (2) | 0.00 (-0.02; 0.02) | 0.4 ± 0.9 | -0.04 (-0.17; – 0.10) |
|  Germany | 20.9 ± 6.3 | -0.17 (-0.23; -0.10) | 5.3 ± 1.6 | -0.03 (-0.05; -0.01) | 4 (3) | -0.05 (-0.07; -0.03) | 0.3 ± 0.7 | -0.34 (-0.46; -0.22) |
|  Netherlands | 18.9 ± 5.6 | -0.16 (-0.21; -0.10) | 5.0 ± 1.6 | -0.03 (-0.05; -0.01) | 4 (3) | -0.04 (-0.06; -0.03) | 0.1 ± 0.7 | -0.31 (-0.42; -0.20) |
|  Switzerland | 19.2 ± 5.7 | -0.12 (-0.18; -0.07) | 5.3 ± 1.5 | -0.04 (-0.06; -0.01) | 4 (2) | -0.04 (-0.06; -0.02) | 0.3 ± 0.7 | -0.30 (-0.42; -0.18) |
|  Belgium | 18.7 ± 5.8 | -0.20 (-0.24; -0.17) | 4.7 ± 1.7 | -0.01 (-0.02; 0.01) | 3 (2) | -0.03 (-0.04; -0.02) | 0.0 ± 0.8 | -0.20 (-0.28; -0.11) |
|  Luxembourgh | 18.0 ± 5.3 | 0.37 (0.04; 0.69) | 5.1 ± 1.6 | 0.18 (0.03; 0.34) | 4 (2) | 0.03 (-0.10; 0.15) | 0.1 ± 0.7 | 0.83 (0.01 – 1.65) |
|  |  |  |  |  |  |  |  |  |
| Mediterranean countries |  |  |  |  |  |  |  |  |
|  Spain | 14.6 ± 6.0 | -0.25 (-0.31; -0.19) | 3.6 ± 1.6 | -0.05 (-0.07; -0.03) | 2 (2) | -0.05 (-0.06; -0.03) | -0.6 ± 0.7 | -0.39 (-0.51; -0.28) |
|  Italy | 13.6 ± 5.7 | -0.08 (-0.14; -0.01) | 4.1 ± 1.7 | -0.03 (-0.05; -0.01) | 3 (3) | -0.04 (-0.06; -0.02) | -0.5 ± 0.7 | -0.24 (-0.36; -0.11) |
|  France | 17.7 ± 6.6 | -0.32 (-0.38; -0.27) | 4.4 ± 1.7 | -0.02 (-0.04; 0.00) | 3 (2) | -0.01 (-0.02; 0.01) | -0.2 ± 0.8 | -0.21 (-0.33; -0.09) |
|  Greece | 13.2 ± 4.3 | -0.23 (-0.28; -0.17) | 4.2 ± 1.5 | -0.01 (-0.04; 0.01) | 3 (3) | -0.00 (-0.02 – 0.02) | -0.5 ± 0.7 | -0.13 (-0.27; 0.01) |
|  Portugal | 14.2 ± 6.0 | 0.62 (0.15; 1.09) | 4.1 ± 1.6 | -0.00 (-0.13; 0.12) | 3 (2) | 0.01 (-0.10; 0.12) | -0.4 ± 0.7 | 0.24 (-0.54; 1.01) |
|  |  |  |  |  |  |  |  |  |
| Scandinavia |  |  |  |  |  |  |  |  |
|  Sweden | 22.1 ± 6.5 | -0.25 (-0.32; -0.19) | 5.1 ± 1.5 | -0.06 (-0.08; -0.04) | 4 (2) | -0.07 (-0.08; -0.05) | 0.3 ± 0.7 | -0.52 (-0.64; -0.41) |
|  Denmark | 21.8 ± 6.4 | -0.31 (-0.40; -0.22) | 5.2 ± 1.6 | -0.08 (-0.11; -0.05) | 4 (2) | -0.08 (-0.10; -0.06) | 0.4 ± 0.7 | -0.65 (-0.81; -0.50) |
|  |  |  |  |  |  |  |  |  |
| Central and Eastern Europe |  |  |  |  |  |  |  |  |
|  Czech Republic | 20.5 ± 6.8 | -0.07 (-0.17; 0.03) | 5.1 ± 1.5 | -0.00 (-0.03; 0.03) | 3 (3) | -0.05 (-0.07; -0.03) | 0.2 ± 0.8 | -0.15 (-0.32; 0.01) |
|  Poland | 14.3 ± 5.0 | -0.19 (-0.29; -0.08) | 3.9 ± 1.6 | -0.08 (-0.12; -0.04) | 2 (2) | -0.05 (-0.09; -0.02) | -0.5 ± 0.7 | -0.52 (-0.77; -0.27) |
|  Slovenia | 19.7 ± 6.8 | -0.42 (-0.60; -0.25) | 4.4 ± 1.6 | 0.04 (-0.02; 0.10) | 3 (3) | 0.04 (-0.00; 0.08) | -0.1 ± 0.8 | 0.13 (-0.19; 0.45) |
|  Estonia | 21.2 ± 6.5 | -0.20 (-0.30; -0.10) | 5.1 ± 1.7 | -0.02 (-0.06; 0.01) | 3 (3) | -0.04 (-0.07; -0.02) | 0.2 ± 0.8 | -0.31 (-0.49; -0.13) |

SD, standard deviation; CI, confidence interval

**Supplemental Table S2** Annual decline in the scores of cognitive tests

|  |  |
| --- | --- |
| Region | Cognitive measure |
|  | Verbal fluency | Immediate recall | Delayed recall |
| Western Europe | -0.16 (-0.18; -0.13)\* | -0.03 (-0.03; -0.02)\* | -0.00 (-0.01; 0.01) |
| Mediterranean countries | -0.19 (-0.22; -0.17)\* | -0.01 (-0.01; -0.00) | -0.01 (-0.02; -0.00) |
| Scandinavia | -0.22 (-0.26; -0.18)\* | -0.06 (-0.07; -0.05)\* | -0.03 (-0.04; -0.02)\* |
| CEE | -0.08 (-0.12; -0.04)\* | -0.02 (-0.03; -0.01)\* | -0.00 (-0.02; 0.01) |

\*p˂.001

CEE, Central and Eastern Europe

*Results are unstandardized B coefficients with 95% confidence intervals, derived from linear mixed models, representing the annual decline in each cognitive score. The models are adjusted for baseline age, gender, education,* civil status, employment status, residence, cardiovascular disease, physical inactivity, body mass index, smoking, alcohol and depressive symptoms.

**Supplemental Table S3** Annual decline in composite cognitive score using imputed values on missing data on cognitive tests: results of a sensitivity analysis

|  |  |  |
| --- | --- | --- |
|  | Model 0: Intercept | Model 1: B (95% CI) |
| Sensitivity analysis 1 |  |  |
|  Western Europe (n=8795) | 34.3 | -0.30 (-0.34; -0.25)\* |
|  Mediterranean countries (n=9127) | 25.3 | -0.28 (-0.32; -0.24)\* |
|  Scandinavia (n=3693) | 34.9 | -0.62 (-0.67; -0.56)\* |
|  CEE (n=6502) | 32.0 | -0.30 (-0.37; -0.24)\* |
| Sensitivity analysis 2 |  |  |
|  Western Europe (n=8059) | 35.2 | -0.27 (-0.32; -0.22)\* |
|  Mediterranean countries (n=8127) | 26.2 | -0.27 (-0.31; -0.23)\* |
|  Scandinavia (n=3437) | 35.7 | -0.59 (-0.66; -0.53)\* |
|  CEE (n=5996) | 32.7 | -0.28 (-0.35; -0.21)\* |

*\*p˂.001*

*CI, confidence interval; CEE, Central and Eastern Europe*

*The population was selected in the following way: From 120 568 person who have ever done an interview, we selected 25 619 individuals from European countries who have participated in at least 2 waves, had a citizenship and were born in the country of interview, were older than 65 years at baseline (sensitivity analysis 1) and have not been diagnosed with Alzheimer´s disease / dementia / senility / Parkinson´s disease (sensitivity analysis 2). Model 0 contains only intercept; Model 1 is adjusted for baseline age and gender.*

**Supplemental Table S4**Annual percentage decline in POMS-transformed composite cognitive score in European regions

|  |  |
| --- | --- |
| Region | Model |
| 1 | 2 | 3 | 4 |
| B (95% CI) | B (95% CI) | B (95% CI) | B (95% CI) |
| Western Europe | -0.78 (-0.83; -0.72) | -0.75 (-0.81; -0.69) | -0.70 (-0.76; -0.65) | -0.66 (-0.72; -0.61) |
| Mediterranean countries | -0.13 (-0.19; -0.07) | -0.12 (-0.18; -0.06) | -0.07 (-0.12; -0.01) | -0.05 (-0.11; 0.01) |
| Scandinavia | -1.02 (-1.11; -0.94) | -1.01 (-1.09; -0.92) | -0.96 (-1.05; -0.88) | -0.89 (-0.98; -0.81) |
| CEE | -0.40 (-0.50; -0.31) | -0.37 (-0.46; -0.27) | -0.33 (-0.43; -0.23) | -0.30 (-0.40; -0.21) |

*POMS, proportion of maximum scaling; CI, confidence interval; CEE, Central and Eastern Europe*

*Model 1: adjusted for baseline age and gender*

*Model 2: + education,* civil status, employment status, residence

*Model 3: + depressive symptoms, alcohol, smoking*

*Model 4: + cardiovascular disease, body mass index, physical inactivity*