

## VII. Psychological Examinations

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### 1) Depression Scales

#### 1.The Center for Epidemiologic Studies Depression Scale (CES-D)

The Japanese version of the scale comprises 20 items with 4 options, the same as the original. This scale consists of 4 subscales as follows: somatic and retarded activity, depressed affect, positive affect, and interpersonal relations. Higher scores indicate higher depressive symptoms. A person with total score at and above 16 is supposed to have clinically significant depressive tendency.

CES-D :total score of 4 subscales (20 items. possible range 0-60)

|        | 40-49yr |     |     | 50-59yr |     |     | 60-69yr |     |     | 70-79yr |     |     | 80yr- |     |    | Total |     |      |
|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|----|-------|-----|------|
|        | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N  | Mean  | SD  | N    |
| Male   | 7.7     | 6.8 | 268 | 7.0     | 6.3 | 291 | 6.4     | 6.5 | 285 | 8.1     | 7.0 | 263 | 7.9   | 4.8 | 17 | 7.3   | 6.6 | 1124 |
| Female | 8.2     | 7.3 | 259 | 7.0     | 6.6 | 281 | 7.5     | 7.0 | 262 | 8.4     | 7.5 | 256 | 6.8   | 6.2 | 20 | 7.7   | 7.1 | 1078 |
| Total  | 7.9     | 7.1 | 527 | 7.0     | 6.4 | 572 | 6.9     | 6.7 | 547 | 8.2     | 7.3 | 519 | 7.3   | 5.5 | 37 | 7.5   | 6.9 | 2202 |

CES-D subscale 1: somatic and retarded activity (6 items. possible range 0-18)

|        | 40–49yr |     |     | 50–59yr |     |     | 60–69yr |     |     | 70–79yr |     |     | 80yr– |     |    | Total |     |      |
|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|----|-------|-----|------|
|        | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N  | Mean  | SD  | N    |
| Male   | 2.5     | 2.8 | 272 | 2.3     | 2.6 | 294 | 2.2     | 2.8 | 290 | 3.0     | 3.2 | 271 | 2.9   | 2.3 | 17 | 2.5   | 2.8 | 1144 |
| Female | 2.7     | 2.8 | 261 | 2.4     | 2.7 | 284 | 2.7     | 2.8 | 267 | 3.1     | 3.2 | 263 | 3.1   | 3.9 | 20 | 2.7   | 2.9 | 1095 |
| Total  | 2.6     | 2.8 | 533 | 2.4     | 2.6 | 578 | 2.5     | 2.8 | 557 | 3.0     | 3.2 | 534 | 3.0   | 3.2 | 37 | 2.6   | 2.9 | 2239 |

CES-D subscale 2: depressed affect (7 items. possible range 0–21)

|        | 40–49yr |     |     | 50–59yr |     |     | 60–69yr |     |     | 70–79yr |     |     | 80yr– |     |    | Total |     |      |
|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|----|-------|-----|------|
|        | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N  | Mean  | SD  | N    |
| Male   | 1.8     | 2.5 | 272 | 1.5     | 2.0 | 294 | 1.4     | 2.2 | 287 | 1.8     | 2.4 | 272 | 1.6   | 1.9 | 17 | 1.6   | 2.3 | 1142 |
| Female | 2.2     | 2.8 | 261 | 1.6     | 2.5 | 281 | 1.7     | 2.5 | 269 | 2.0     | 2.8 | 263 | 1.4   | 1.7 | 21 | 1.9   | 2.6 | 1095 |
| Total  | 2.0     | 2.7 | 533 | 1.6     | 2.2 | 575 | 1.6     | 2.4 | 556 | 1.9     | 2.6 | 535 | 1.5   | 1.8 | 38 | 1.8   | 2.5 | 2237 |

CES-D subscale 3: positive affect (4 items. possible range 0–12)

|        | 40–49yr |     |     | 50–59yr |     |     | 60–69yr |     |     | 70–79yr |     |     | 80yr– |     |    | Total |     |      |
|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|----|-------|-----|------|
|        | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N  | Mean  | SD  | N    |
| Male   | 3.0     | 2.5 | 271 | 2.8     | 2.7 | 295 | 2.5     | 2.6 | 291 | 3.0     | 2.7 | 270 | 2.8   | 2.4 | 17 | 2.9   | 2.6 | 1144 |
| Female | 3.0     | 2.7 | 259 | 2.7     | 2.6 | 284 | 2.9     | 2.7 | 269 | 3.0     | 3.0 | 264 | 2.1   | 1.9 | 21 | 2.9   | 2.7 | 1097 |
| Total  | 3.0     | 2.6 | 530 | 2.8     | 2.6 | 579 | 2.7     | 2.7 | 560 | 3.0     | 2.8 | 534 | 2.4   | 2.2 | 38 | 2.9   | 2.7 | 2241 |

CES-D subscale 4: interpersonal relations (2 items. possible range 0–6)

|        | 40–49yr |     |     | 50–59yr |     |     | 60–69yr |     |     | 70–79yr |     |     | 80yr– |     |    | Total |     |      |
|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|----|-------|-----|------|
|        | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N  | Mean  | SD  | N    |
| Male   | 0.3     | 0.7 | 271 | 0.3     | 0.7 | 294 | 0.3     | 0.7 | 290 | 0.3     | 0.7 | 270 | 0.6   | 0.9 | 17 | 0.3   | 0.7 | 1142 |
| Female | 0.3     | 0.8 | 261 | 0.2     | 0.6 | 284 | 0.3     | 0.8 | 270 | 0.3     | 0.8 | 266 | 0.1   | 0.5 | 21 | 0.3   | 0.7 | 1102 |
| Total  | 0.3     | 0.8 | 532 | 0.3     | 0.7 | 578 | 0.3     | 0.7 | 560 | 0.3     | 0.8 | 536 | 0.3   | 0.7 | 38 | 0.3   | 0.7 | 2244 |

CES-D: parameter of distribution using cutoff score

|                          |        | 40–49yr |      | 50–59yr |      | 60–69yr |      | 70–79yr |      | 80yr– |      | Total |      |
|--------------------------|--------|---------|------|---------|------|---------|------|---------|------|-------|------|-------|------|
|                          |        | N       | %    | N       | %    | N       | %    | N       | %    | N     | %    | N     | %    |
| Under score of 16        | Male   | 237     | 88.4 | 259     | 89.0 | 257     | 90.2 | 228     | 86.7 | 15    | 88.2 | 996   | 88.6 |
|                          | Female | 225     | 86.9 | 250     | 89.0 | 238     | 90.8 | 219     | 85.5 | 17    | 85.0 | 949   | 88.0 |
|                          | Total  | 462     | 87.7 | 509     | 89.0 | 495     | 90.5 | 447     | 86.1 | 32    | 86.5 | 1945  | 88.3 |
| At and above score of 16 | Male   | 31      | 11.6 | 32      | 11.0 | 28      | 9.8  | 35      | 13.3 | 2     | 11.8 | 128   | 11.4 |
|                          | Female | 34      | 13.1 | 31      | 11.0 | 24      | 9.2  | 37      | 14.5 | 3     | 15.0 | 129   | 12.0 |
|                          | Total  | 65      | 12.3 | 63      | 11.0 | 52      | 9.5  | 72      | 13.9 | 5     | 13.5 | 257   | 11.7 |

## 2. Geriatric Depression Scale (GDS)

GDS is another depression scale adopted in our research. Each of 15 items has yes/no response keys. Higher score indicates higher depressive symptoms. Total score of 6 and higher means significant depressive tendency. Only participants over 60 years old performed the scale in the NILS-LSA since this scale is designed specifically for older adults.

GDS (15 items. possible range 0–15. less than 60 years older unperformed)

| 40–49yr | 50–59yr | 60–69yr | 70–79yr | 80yr– | Total |
|---------|---------|---------|---------|-------|-------|
|---------|---------|---------|---------|-------|-------|

|        | Mean | SD | N | Mean | SD | N | Mean | SD  | N   | Mean | SD  | N   | Mean | SD  | N  | Mean | SD  | N    |
|--------|------|----|---|------|----|---|------|-----|-----|------|-----|-----|------|-----|----|------|-----|------|
| Male   | –    | –  | 0 | –    | –  | 0 | 2.8  | 2.6 | 288 | 3.7  | 3.2 | 272 | 3.7  | 2.9 | 17 | 3.2  | 2.9 | 577  |
| Female | –    | –  | 0 | –    | –  | 0 | 3.4  | 2.8 | 270 | 3.9  | 2.9 | 258 | 3.7  | 2.8 | 20 | 3.6  | 2.8 | 548  |
| Total  | –    | –  | 0 | –    | –  | 0 | 3.1  | 2.7 | 558 | 3.8  | 3.0 | 530 | 3.7  | 2.8 | 37 | 3.4  | 2.9 | 1125 |

GDS parameter of distribution using cutoff score

|                         |        | 60–69yr |      | 70–79yr |      | 80yr– |      | Total |      |
|-------------------------|--------|---------|------|---------|------|-------|------|-------|------|
|                         |        | N       | %    | N       | %    | N     | %    | N     | %    |
| Under score of 6        | Male   | 251     | 87.2 | 205     | 75.4 | 14    | 82.4 | 470   | 81.5 |
|                         | Female | 221     | 81.9 | 191     | 74.0 | 16    | 80.0 | 428   | 78.1 |
|                         | Total  | 472     | 84.6 | 396     | 74.7 | 30    | 81.1 | 898   | 79.8 |
| At and above score of 6 | Male   | 37      | 12.8 | 67      | 24.6 | 3     | 17.6 | 107   | 18.5 |
|                         | Female | 49      | 18.1 | 67      | 26.0 | 4     | 20.0 | 120   | 21.9 |
|                         | Total  | 86      | 15.4 | 134     | 25.3 | 7     | 18.9 | 227   | 20.2 |

## 2) Subjective Well-being

### 1. Life Satisfaction Index-K (LSI-K)

The LSI-K has 9 items with 2 or 3 point response format to measure overall subjective well-being. This scale also consists of 3 subscales include: satisfaction with life as a whole, psychological stability, and evaluation of own aging. Response to 3-point scale is dichotomized when calculating total score, so that the possible total score range is 0 to 9. Higher score indicates higher life satisfaction.

LSI-K: total score of 3 subscales (9 items. possible range 0–9)

|        | 40–49yr |     |     | 50–59yr |     |     | 60–69yr |     |     | 70–79yr |     |     | 80yr– |     |    | Total |     |      |
|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|----|-------|-----|------|
|        | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N  | Mean  | SD  | N    |
| Male   | 4.8     | 1.7 | 272 | 5.0     | 2.0 | 294 | 5.1     | 2.0 | 289 | 4.2     | 2.2 | 274 | 4.3   | 2.2 | 17 | 4.8   | 2.0 | 1146 |
| Female | 5.1     | 2.0 | 257 | 5.3     | 1.8 | 281 | 5.1     | 2.1 | 270 | 4.2     | 2.2 | 265 | 4.6   | 1.7 | 21 | 4.9   | 2.1 | 1094 |
| Total  | 4.9     | 1.9 | 529 | 5.1     | 1.9 | 575 | 5.1     | 2.1 | 559 | 4.2     | 2.2 | 539 | 4.5   | 1.9 | 38 | 4.8   | 2.0 | 2240 |

LSI-K subscale 1: satisfaction with life as a whole (4 items. possible range 0–4)

|        | 40–49yr |     |     | 50–59yr |     |     | 60–69yr |     |     | 70–79yr |     |     | 80yr– |     |    | Total |     |      |
|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|----|-------|-----|------|
|        | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N  | Mean  | SD  | N    |
| Male   | 1.4     | 1.1 | 273 | 1.7     | 1.2 | 294 | 1.8     | 1.2 | 289 | 1.7     | 1.2 | 274 | 1.7   | 1.4 | 17 | 1.7   | 1.2 | 1147 |
| Female | 1.7     | 1.2 | 257 | 2.0     | 1.1 | 283 | 2.0     | 1.3 | 270 | 1.9     | 1.3 | 265 | 2.0   | 1.2 | 21 | 1.9   | 1.2 | 1096 |
| Total  | 1.6     | 1.1 | 530 | 1.8     | 1.2 | 577 | 1.9     | 1.3 | 559 | 1.8     | 1.2 | 539 | 1.8   | 1.3 | 38 | 1.8   | 1.2 | 2243 |

LSI-K subscale 2: psychological stability (3 items. possible range 0–3)

|        | 40–49yr |     |     | 50–59yr |     |     | 60–69yr |     |     | 70–79yr |     |     | 80yr– |     |    | Total |     |      |
|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|----|-------|-----|------|
|        | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N  | Mean  | SD  | N    |
| Male   | 1.7     | 0.9 | 273 | 1.7     | 0.9 | 296 | 1.8     | 0.9 | 290 | 1.4     | 1.0 | 275 | 1.8   | 0.8 | 17 | 1.7   | 0.9 | 1151 |
| Female | 1.8     | 0.9 | 261 | 1.8     | 0.9 | 282 | 1.6     | 0.9 | 271 | 1.3     | 1.0 | 267 | 1.6   | 1.0 | 22 | 1.6   | 0.9 | 1103 |
| Total  | 1.7     | 0.9 | 534 | 1.7     | 0.9 | 578 | 1.7     | 0.9 | 561 | 1.4     | 1.0 | 542 | 1.7   | 0.9 | 39 | 1.6   | 0.9 | 2254 |

LSI-K subscale 3: evaluation of own aging (2 items. possible range 0-2)

|        | 40-49yr |     |     | 50-59yr |     |     | 60-69yr |     |     | 70-79yr |     |     | 80yr- |     |    | Total |     |      |
|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|----|-------|-----|------|
|        | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N  | Mean  | SD  | N    |
| Male   | 1.6     | 0.6 | 272 | 1.6     | 0.6 | 296 | 1.4     | 0.7 | 290 | 1.0     | 0.7 | 275 | 0.8   | 0.8 | 17 | 1.4   | 0.7 | 1150 |
| Female | 1.6     | 0.6 | 261 | 1.5     | 0.6 | 284 | 1.4     | 0.7 | 271 | 1.0     | 0.8 | 268 | 1.0   | 0.8 | 22 | 1.4   | 0.7 | 1106 |
| Total  | 1.6     | 0.6 | 533 | 1.6     | 0.6 | 580 | 1.4     | 0.7 | 561 | 1.0     | 0.8 | 543 | 0.9   | 0.8 | 39 | 1.4   | 0.7 | 2256 |

3) Personality

1. The Rosenberg Self-Esteem Scale

This scale comprises 10 items (4 options) to measure self-regard, an evaluation of one’s worthiness. Higher score indicates higher self-esteem.

Rosenberg Self-Esteem Scale:total score of 10 items (possible range 10-40)

|        | 40-49yr |     |     | 50-59yr |     |     | 60-69yr |     |     | 70-79yr |     |     | 80yr- |     |    | Total |     |      |
|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|----|-------|-----|------|
|        | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N  | Mean  | SD  | N    |
| Male   | 28.8    | 4.1 | 271 | 29.3    | 4.3 | 295 | 29.6    | 4.4 | 290 | 28.6    | 4.6 | 271 | 30.2  | 5.1 | 17 | 29.1  | 4.4 | 1144 |
| Female | 27.7    | 4.5 | 260 | 27.6    | 4.4 | 284 | 27.4    | 4.9 | 270 | 27.7    | 4.8 | 265 | 29.0  | 4.8 | 21 | 27.6  | 4.7 | 1100 |
| Total  | 28.3    | 4.3 | 531 | 28.5    | 4.4 | 579 | 28.6    | 4.8 | 560 | 28.2    | 4.7 | 536 | 29.6  | 4.9 | 38 | 28.4  | 4.6 | 2244 |

2. Neuroticism-Extraversion-Openness Five-Factor Inventory (NEO-FFI)

NEO-FFI is an abbreviate version of NEO-PI-R, which was designed to provide a general description of normal personality. This scale is comprised of 60 items with 5-point options. The five domains (factors) measured by NEO-FFI are as follows : neuroticism, extraversion, openness to experience, agreeableness, and consciousness.

NEO-FFI subscale 1: Neurotiicism (12 items. possible range 0-48)

|        | 40-49yr |     |     | 50-59yr |     |     | 60-69yr |     |     | 70-79yr |     |     | 80yr- |     |    | Total |     |      |
|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|----|-------|-----|------|
|        | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N  | Mean  | SD  | N    |
| Male   | 21.6    | 6.1 | 271 | 20.8    | 6.0 | 296 | 19.9    | 5.5 | 290 | 20.3    | 5.9 | 275 | 19.9  | 6.3 | 17 | 20.6  | 5.9 | 1149 |
| Female | 22.9    | 6.7 | 260 | 21.7    | 5.9 | 284 | 21.6    | 5.7 | 270 | 21.5    | 6.0 | 264 | 20.5  | 4.4 | 21 | 21.9  | 6.1 | 1099 |
| Total  | 22.3    | 6.4 | 531 | 21.2    | 6.0 | 580 | 20.7    | 5.7 | 560 | 20.9    | 6.0 | 539 | 20.2  | 5.3 | 38 | 21.3  | 6.0 | 2248 |

NEO-FFI subscale 2: Extraversion (12 items. possible range 0-48)

|        | 40-49yr |     |     | 50-59yr |     |     | 60-69yr |     |     | 70-79yr |     |     | 80yr- |     |    | Total |     |      |
|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|----|-------|-----|------|
|        | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N  | Mean  | SD  | N    |
| Male   | 23.8    | 5.5 | 271 | 24.5    | 5.3 | 296 | 24.8    | 5.4 | 290 | 24.3    | 5.0 | 275 | 23.3  | 5.5 | 17 | 24.3  | 5.3 | 1149 |
| Female | 24.8    | 5.7 | 260 | 25.7    | 5.7 | 283 | 26.0    | 5.7 | 269 | 25.1    | 6.0 | 263 | 26.3  | 4.6 | 21 | 25.4  | 5.8 | 1096 |
| Total  | 24.3    | 5.7 | 531 | 25.1    | 5.5 | 579 | 25.4    | 5.6 | 559 | 24.7    | 5.5 | 538 | 25.0  | 5.2 | 38 | 24.9  | 5.6 | 2245 |

NEO-FFI subscale 3: Openness to Experience (12 items. possible range 0-48)

|        | 40-49yr |     |     | 50-59yr |     |     | 60-69yr |     |     | 70-79yr |     |     | 80yr- |     |    | Total |     |      |
|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|----|-------|-----|------|
|        | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N  | Mean  | SD  | N    |
| Male   | 27.4    | 4.5 | 271 | 26.7    | 4.8 | 296 | 25.8    | 4.5 | 289 | 24.7    | 4.5 | 271 | 23.3  | 4.4 | 17 | 26.1  | 4.7 | 1144 |
| Female | 27.6    | 4.3 | 260 | 27.0    | 4.5 | 284 | 26.1    | 4.6 | 269 | 24.9    | 4.5 | 265 | 24.9  | 4.3 | 21 | 26.4  | 4.6 | 1099 |

|       |      |     |     |      |     |     |      |     |     |      |     |     |      |     |    |      |     |      |
|-------|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|----|------|-----|------|
| Total | 27.5 | 4.4 | 531 | 26.9 | 4.7 | 580 | 25.9 | 4.6 | 558 | 24.8 | 4.5 | 536 | 24.2 | 4.4 | 38 | 26.2 | 4.6 | 2243 |
|-------|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|----|------|-----|------|

NEO-FFI subscale 4: Agreeableness (12 items. possible range 0–48)

|        | 40–49yr |     |     | 50–59yr |     |     | 60–69yr |     |     | 70–79yr |     |     | 80yr– |     |    | Total |     |      |
|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|----|-------|-----|------|
|        | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N  | Mean  | SD  | N    |
| Male   | 29.9    | 4.4 | 271 | 30.7    | 4.4 | 296 | 31.1    | 4.4 | 287 | 31.4    | 4.2 | 271 | 32.6  | 5.1 | 17 | 30.8  | 4.4 | 1142 |
| Female | 32.0    | 4.7 | 261 | 33.0    | 4.7 | 283 | 32.3    | 4.3 | 271 | 33.3    | 4.4 | 265 | 33.9  | 4.7 | 21 | 32.7  | 4.6 | 1101 |
| Total  | 30.9    | 4.7 | 532 | 31.8    | 4.7 | 579 | 31.7    | 4.4 | 558 | 32.3    | 4.4 | 536 | 33.3  | 4.9 | 38 | 31.7  | 4.6 | 2243 |

NEO-FFI subscale 5: Conscientiousness (12 items. possible range 0–48)

|        | 40–49yr |     |     | 50–59yr |     |     | 60–69yr |     |     | 70–79yr |     |     | 80yr– |     |    | Total |     |      |
|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|----|-------|-----|------|
|        | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N  | Mean  | SD  | N    |
| Male   | 27.7    | 5.5 | 271 | 28.7    | 5.2 | 296 | 29.5    | 5.2 | 289 | 29.7    | 5.0 | 271 | 28.2  | 6.1 | 17 | 28.9  | 5.3 | 1144 |
| Female | 27.9    | 5.3 | 261 | 28.4    | 5.1 | 283 | 29.0    | 4.9 | 271 | 29.2    | 5.4 | 264 | 30.6  | 5.2 | 21 | 28.6  | 5.2 | 1100 |
| Total  | 27.8    | 5.4 | 532 | 28.5    | 5.1 | 579 | 29.3    | 5.0 | 560 | 29.4    | 5.2 | 535 | 29.6  | 5.6 | 38 | 28.8  | 5.2 | 2244 |

### 3. Autonomy Scale

The eight-item scale (5 options) is used to measure cognitive aspects about the self and the environment. Persons with higher score in the scale are supposed to consider themselves to be in control of what happens in life.

Autonomy (total score of 8 items. possible range 8–40)

|        | 40–49yr |     |     | 50–59yr |     |     | 60–69yr |     |     | 70–79yr |     |     | 80yr– |     |    | Total |     |      |
|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|----|-------|-----|------|
|        | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N  | Mean  | SD  | N    |
| Male   | 27.2    | 4.5 | 273 | 28.0    | 4.4 | 296 | 27.9    | 4.5 | 290 | 27.0    | 4.2 | 274 | 25.7  | 4.1 | 17 | 27.5  | 4.4 | 1150 |
| Female | 26.5    | 4.0 | 260 | 25.9    | 4.3 | 284 | 25.9    | 4.1 | 270 | 25.6    | 4.0 | 265 | 25.8  | 3.4 | 20 | 25.9  | 4.1 | 1099 |
| Total  | 26.9    | 4.3 | 533 | 26.9    | 4.5 | 580 | 26.9    | 4.4 | 560 | 26.3    | 4.2 | 539 | 25.7  | 3.7 | 37 | 26.8  | 4.3 | 2249 |

### 4. Type A Behavior Patterns

This scale comprises 23 items with 4-point options to measure Type A behavior patterns. Type A personalities are characterized by intensity, a high degree of competitiveness, hostility and impatience. Higher score indicates stronger Type A personality tendencies.

Type A Behavior Patterns (total score of 23 items. possible range 0–69)

|        | 40–49yr |     |     | 50–59yr |     |     | 60–69yr |     |     | 70–79yr |     |     | 80yr– |      |    | Total |     |      |
|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|------|----|-------|-----|------|
|        | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD   | N  | Mean  | SD  | N    |
| Male   | 34.1    | 8.2 | 271 | 34.5    | 7.8 | 296 | 32.6    | 8.5 | 290 | 30.1    | 9.1 | 273 | 28.0  | 8.3  | 17 | 32.8  | 8.5 | 1147 |
| Female | 32.9    | 8.0 | 261 | 30.6    | 8.3 | 284 | 30.7    | 8.1 | 270 | 27.3    | 9.0 | 263 | 28.9  | 13.0 | 20 | 30.3  | 8.6 | 1098 |
| Total  | 33.5    | 8.1 | 532 | 32.6    | 8.2 | 580 | 31.7    | 8.3 | 560 | 28.7    | 9.1 | 536 | 28.5  | 10.9 | 37 | 31.6  | 8.7 | 2245 |

### 4) Social Relations

1. Social Support from Friends and Acquaintances

Social support from friends and acquaintances is measured using 10-item scale (5 options). Higher score of the scale indicates higher perception of support from his/her social network excluding family.

Social support from friends and acquaintances (total score of 10 items. possible range 10–50)

|        | 40–49yr |     |     | 50–59yr |     |     | 60–69yr |     |     | 70–79yr |     |     | 80yr– |     |    | Total |     |      |
|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|----|-------|-----|------|
|        | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N  | Mean  | SD  | N    |
| Male   | 29.4    | 4.5 | 272 | 29.6    | 5.6 | 294 | 29.8    | 5.9 | 290 | 28.5    | 6.2 | 271 | 27.3  | 5.7 | 17 | 29.3  | 5.6 | 1144 |
| Female | 30.6    | 5.0 | 261 | 31.2    | 5.3 | 284 | 31.0    | 5.3 | 269 | 29.1    | 6.8 | 267 | 29.5  | 6.8 | 21 | 30.5  | 5.7 | 1102 |
| Total  | 30.0    | 4.8 | 533 | 30.4    | 5.5 | 578 | 30.4    | 5.6 | 559 | 28.8    | 6.5 | 538 | 28.5  | 6.3 | 38 | 29.9  | 5.7 | 2246 |

2. Social Exchanges

Social exchanges are measured using 12-item scale (4 options). This scale assesses three functional properties of social exchange (emotional support, instrumental support, and negative exchange). Exchanges with two specific social domains (family and others) are separately probed in the scale. Higher scores of the scale means higher perception of each exchange.

Social exchanges with family members, subscale 1: emotional support (4 items. possible range 4–16)

|        | 40–49yr |     |     | 50–59yr |     |     | 60–69yr |     |     | 70–79yr |     |     | 80yr– |     |    | Total |     |      |
|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|----|-------|-----|------|
|        | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N  | Mean  | SD  | N    |
| Male   | 12.2    | 2.2 | 271 | 12.3    | 2.2 | 296 | 12.6    | 2.2 | 289 | 12.4    | 2.3 | 273 | 11.8  | 2.9 | 17 | 12.3  | 2.2 | 1146 |
| Female | 12.6    | 2.2 | 261 | 12.7    | 2.0 | 283 | 12.7    | 2.3 | 270 | 12.4    | 2.5 | 263 | 12.1  | 2.4 | 21 | 12.6  | 2.2 | 1098 |
| Total  | 12.4    | 2.2 | 532 | 12.5    | 2.1 | 579 | 12.6    | 2.2 | 559 | 12.4    | 2.4 | 536 | 12.0  | 2.6 | 38 | 12.5  | 2.2 | 2244 |

Social exchanges with family members, subscale 2: instrumental support (4 items. possible range 4–16)

|        | 40–49yr |     |     | 50–59yr |     |     | 60–69yr |     |     | 70–79yr |     |     | 80yr– |     |    | Total |     |      |
|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|----|-------|-----|------|
|        | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N  | Mean  | SD  | N    |
| Male   | 12.2    | 2.1 | 271 | 12.1    | 2.0 | 296 | 12.4    | 2.1 | 289 | 12.1    | 2.3 | 273 | 11.2  | 2.5 | 17 | 12.2  | 2.2 | 1146 |
| Female | 11.8    | 2.0 | 261 | 12.1    | 2.1 | 284 | 12.1    | 2.1 | 270 | 12.0    | 2.3 | 264 | 12.0  | 2.1 | 21 | 12.0  | 2.1 | 1100 |
| Total  | 12.0    | 2.1 | 532 | 12.1    | 2.0 | 580 | 12.2    | 2.1 | 559 | 12.0    | 2.3 | 537 | 11.7  | 2.3 | 38 | 12.1  | 2.1 | 2246 |

Social exchanges with family members, subscale 3: negative exchanges (4 items. possible range 4–16)

|        | 40–49yr |     |     | 50–59yr |     |     | 60–69yr |     |     | 70–79yr |     |     | 80yr– |     |    | Total |     |      |
|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|----|-------|-----|------|
|        | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N  | Mean  | SD  | N    |
| Male   | 9.7     | 2.3 | 271 | 9.4     | 2.2 | 296 | 9.3     | 2.3 | 289 | 8.6     | 2.3 | 274 | 8.0   | 2.6 | 17 | 9.2   | 2.3 | 1147 |
| Female | 10.1    | 2.3 | 261 | 9.2     | 2.2 | 284 | 8.9     | 2.4 | 269 | 8.3     | 2.6 | 264 | 7.7   | 2.4 | 21 | 9.1   | 2.5 | 1099 |
| Total  | 9.9     | 2.3 | 532 | 9.3     | 2.2 | 580 | 9.1     | 2.3 | 558 | 8.4     | 2.4 | 538 | 7.8   | 2.4 | 38 | 9.2   | 2.4 | 2246 |

Social exchanges with friends and acquaintances, subscale 1: emotional support (4 items. possible range 4–16)

|        | 40–49yr |     |     | 50–59yr |     |     | 60–69yr |     |     | 70–79yr |     |     | 80yr– |     |    | Total |     |      |
|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|----|-------|-----|------|
|        | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N  | Mean  | SD  | N    |
| Male   | 11.0    | 2.3 | 271 | 11.0    | 2.5 | 295 | 10.8    | 2.8 | 289 | 10.5    | 2.7 | 271 | 9.5   | 3.0 | 17 | 10.8  | 2.6 | 1143 |
| Female | 12.4    | 2.3 | 261 | 12.3    | 2.3 | 284 | 12.0    | 2.3 | 269 | 11.6    | 2.8 | 263 | 11.0  | 2.8 | 21 | 12.1  | 2.4 | 1098 |
| Total  | 11.7    | 2.4 | 532 | 11.6    | 2.5 | 579 | 11.4    | 2.6 | 558 | 11.1    | 2.8 | 534 | 10.4  | 3.0 | 38 | 11.4  | 2.6 | 2241 |

Social exchanges with friends and acquaintances, subscale 2: instrumental support (4 items. possible range 4–16)

|        | 40–49yr |     |     | 50–59yr |     |     | 60–69yr |     |     | 70–79yr |     |     | 80yr– |     |    | Total |     |      |
|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|----|-------|-----|------|
|        | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N  | Mean  | SD  | N    |
| Male   | 8.8     | 2.6 | 271 | 8.8     | 2.6 | 295 | 8.8     | 2.8 | 289 | 8.8     | 2.8 | 270 | 8.8   | 2.4 | 17 | 8.8   | 2.7 | 1142 |
| Female | 9.6     | 2.8 | 260 | 9.9     | 2.8 | 284 | 9.5     | 2.7 | 269 | 9.2     | 3.0 | 263 | 9.7   | 3.5 | 21 | 9.5   | 2.8 | 1097 |
| Total  | 9.2     | 2.7 | 531 | 9.3     | 2.8 | 579 | 9.1     | 2.8 | 558 | 9.0     | 2.9 | 533 | 9.3   | 3.0 | 38 | 9.2   | 2.8 | 2239 |

Social exchanges with friends and acquaintances, subscale 3: negative exchanges (4 items. possible range 4–16)

|        | 40–49yr |     |     | 50–59yr |     |     | 60–69yr |     |     | 70–79yr |     |     | 80yr– |     |    | Total |     |      |
|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|----|-------|-----|------|
|        | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N  | Mean  | SD  | N    |
| Male   | 8.9     | 2.2 | 270 | 8.5     | 2.3 | 295 | 7.8     | 2.4 | 290 | 6.9     | 2.3 | 273 | 6.8   | 2.3 | 17 | 8.0   | 2.4 | 1145 |
| Female | 8.0     | 2.3 | 261 | 7.8     | 2.3 | 284 | 7.2     | 2.1 | 269 | 6.5     | 2.1 | 262 | 6.0   | 2.5 | 21 | 7.3   | 2.3 | 1097 |
| Total  | 8.5     | 2.3 | 531 | 8.1     | 2.4 | 579 | 7.5     | 2.3 | 559 | 6.7     | 2.2 | 535 | 6.4   | 2.4 | 38 | 7.7   | 2.4 | 2242 |

5) Stress-Related Factors

1.Life Events Checklist

Forty-three items are picked up from some traditional checklists to estimate stressful event experiences. Participants are asked to check off the events they confronted in recent past (between first and second examinations in the NILS–LSA). Total number of experienced events is calculated by summing up the responses to the list.

Total number of life events experienced between the surveys (possible range 0–44)

|        | 40–49yr |     |     | 50–59yr |     |     | 60–69yr |     |     | 70–79yr |     |     | 80yr– |     |    | Total |     |      |
|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|----|-------|-----|------|
|        | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N  | Mean  | SD  | N    |
| Male   | 2.9     | 2.3 | 270 | 3.4     | 2.3 | 295 | 3.6     | 2.3 | 290 | 2.8     | 1.9 | 273 | 3.6   | 1.8 | 17 | 3.2   | 2.2 | 1145 |
| Female | 3.0     | 2.4 | 261 | 3.4     | 2.3 | 284 | 2.8     | 1.8 | 269 | 2.5     | 1.6 | 266 | 2.5   | 2.0 | 22 | 2.9   | 2.1 | 1102 |
| Total  | 3.0     | 2.3 | 531 | 3.4     | 2.3 | 579 | 3.2     | 2.1 | 559 | 2.6     | 1.8 | 539 | 2.9   | 2.0 | 39 | 3.1   | 2.2 | 2247 |

2.Hassles scale

Hassles are stressors that have chronic and daily characteristics compared to life events. The hassles scale we adopt in the NILS–LSA includes thirty-four items with 3-point options. Persons with higher total score of the scale are supposed to be under much stress.

Hassles scale (34 items. possible range 34–102)

|        | 40–49yr |      |     | 50–59yr |     |     | 60–69yr |     |     | 70–79yr |     |     | 80yr– |     |    | Total |     |      |
|--------|---------|------|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|----|-------|-----|------|
|        | Mean    | SD   | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N  | Mean  | SD  | N    |
| Male   | 50.9    | 10.1 | 269 | 50.1    | 9.6 | 293 | 47.1    | 9.4 | 289 | 46.8    | 9.4 | 266 | 46.6  | 7.0 | 17 | 48.7  | 9.7 | 1134 |
| Female | 50.3    | 9.6  | 253 | 48.4    | 9.4 | 277 | 47.9    | 9.2 | 262 | 46.2    | 8.5 | 257 | 43.7  | 8.1 | 22 | 48.1  | 9.3 | 1071 |
| Total  | 50.6    | 9.9  | 522 | 49.2    | 9.5 | 570 | 47.5    | 9.3 | 551 | 46.5    | 9.0 | 523 | 44.9  | 7.7 | 39 | 48.4  | 9.5 | 2205 |

3.Stress Coping Scale

This scale includes 31 items (4 options) each of which comes under one of the 5 subscales as follows  
: active problem solving, escape avoidance, seeking social support, distancing, and suppressing behavior and affect.  
Higher score means frequent use of each coping strategy.

Stress coping scale, subscale 1: Planful Problem Solving (9 items. possible range 9–36)

|        | 40–49yr |     |     | 50–59yr |     |     | 60–69yr |     |     | 70–79yr |     |     | 80yr– |     |    | Total |     |      |
|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|----|-------|-----|------|
|        | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N  | Mean  | SD  | N    |
| Male   | 20.0    | 4.9 | 271 | 20.1    | 5.5 | 295 | 20.5    | 5.6 | 286 | 19.8    | 5.6 | 258 | 20.4  | 5.2 | 17 | 20.1  | 5.4 | 1127 |
| Female | 17.7    | 4.9 | 258 | 17.1    | 5.2 | 280 | 18.0    | 5.1 | 261 | 17.5    | 5.8 | 252 | 18.4  | 5.8 | 19 | 17.6  | 5.3 | 1070 |
| Total  | 18.9    | 5.0 | 529 | 18.6    | 5.6 | 575 | 19.3    | 5.5 | 547 | 18.7    | 5.8 | 510 | 19.4  | 5.5 | 36 | 18.9  | 5.5 | 2197 |

Stress coping scale, subscale 2: Distancing (5 items. possible range 5–20)

|        | 40–49yr |     |     | 50–59yr |     |     | 60–69yr |     |     | 70–79yr |     |     | 80yr– |     |    | Total |     |      |
|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|----|-------|-----|------|
|        | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N  | Mean  | SD  | N    |
| Male   | 11.0    | 2.6 | 271 | 11.1    | 2.6 | 294 | 11.5    | 2.7 | 287 | 11.3    | 3.0 | 259 | 12.1  | 2.8 | 17 | 11.2  | 2.7 | 1128 |
| Female | 11.0    | 2.6 | 259 | 10.9    | 3.1 | 282 | 11.2    | 3.0 | 260 | 11.1    | 3.2 | 252 | 11.5  | 3.8 | 19 | 11.0  | 3.0 | 1072 |
| Total  | 11.0    | 2.6 | 530 | 11.0    | 2.9 | 576 | 11.3    | 2.8 | 547 | 11.2    | 3.1 | 511 | 11.8  | 3.3 | 36 | 11.1  | 2.9 | 2200 |

Stress coping scale, subscale 3: Support Seeking (5 items. possible range 5–20)

|        | 40–49yr |     |     | 50–59yr |     |     | 60–69yr |     |     | 70–79yr |     |     | 80yr– |     |    | Total |     |      |
|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|----|-------|-----|------|
|        | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N  | Mean  | SD  | N    |
| Male   | 8.0     | 2.9 | 271 | 7.9     | 2.8 | 295 | 8.1     | 2.8 | 287 | 8.0     | 2.8 | 259 | 9.1   | 3.5 | 17 | 8.0   | 2.8 | 1129 |
| Female | 8.8     | 2.9 | 259 | 8.4     | 2.9 | 282 | 8.1     | 2.7 | 261 | 7.8     | 3.0 | 252 | 7.1   | 2.9 | 19 | 8.3   | 2.9 | 1073 |
| Total  | 8.4     | 2.9 | 530 | 8.2     | 2.9 | 577 | 8.1     | 2.7 | 548 | 7.9     | 2.9 | 511 | 8.0   | 3.3 | 36 | 8.2   | 2.9 | 2202 |

Stress coping scale, subscale 4: Escape Avoidance (7 items. possible range 7–28)

|        | 40–49yr |     |     | 50–59yr |     |     | 60–69yr |     |     | 70–79yr |     |     | 80yr– |     |    | Total |     |      |
|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|----|-------|-----|------|
|        | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N  | Mean  | SD  | N    |
| Male   | 10.6    | 2.6 | 271 | 11.9    | 3.2 | 295 | 12.6    | 3.4 | 287 | 13.7    | 3.7 | 258 | 13.4  | 3.4 | 17 | 12.2  | 3.4 | 1128 |
| Female | 11.6    | 3.1 | 259 | 12.6    | 3.7 | 279 | 13.8    | 3.6 | 260 | 14.2    | 4.1 | 253 | 14.9  | 4.4 | 19 | 13.1  | 3.8 | 1070 |
| Total  | 11.1    | 2.9 | 530 | 12.2    | 3.5 | 574 | 13.2    | 3.5 | 547 | 14.0    | 3.9 | 511 | 14.2  | 4.0 | 36 | 12.6  | 3.6 | 2198 |

Stress coping scale, subscale 5: Resigning (5 items. possible range 5–20)

|        | 40–49yr |     |     | 50–59yr |     |     | 60–69yr |     |     | 70–79yr |     |     | 80yr– |     |    | Total |     |      |
|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|----|-------|-----|------|
|        | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N  | Mean  | SD  | N    |
| Male   | 9.4     | 2.9 | 270 | 9.9     | 3.0 | 295 | 9.6     | 2.7 | 287 | 10.0    | 3.1 | 258 | 10.9  | 4.0 | 17 | 9.8   | 2.9 | 1127 |
| Female | 10.9    | 3.2 | 259 | 10.5    | 3.4 | 281 | 10.5    | 3.3 | 259 | 10.2    | 3.3 | 250 | 9.9   | 3.4 | 19 | 10.5  | 3.3 | 1068 |
| Total  | 10.1    | 3.1 | 529 | 10.2    | 3.2 | 576 | 10.0    | 3.0 | 546 | 10.1    | 3.2 | 508 | 10.4  | 3.7 | 36 | 10.1  | 3.1 | 2195 |

## 6) ADL Scales

### 1. The Tokyo Metropolitan Institute of Gerontology (TMIG) Index of Competence

This scale comprises thirteen items to measure higher physical and social functions such as instrumental activities of daily living (IADL). Each item has Yes (1)/No (0) response options. Higher score indicates higher competence level.

TMIG index of competence: total score of 13 items (possible range 0–13)

|        | 40–49yr |     |     | 50–59yr |     |     | 60–69yr |     |     | 70–79yr |     |     | 80yr– |     |    | Total |     |      |
|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|----|-------|-----|------|
|        | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N  | Mean  | SD  | N    |
| Male   | 12.2    | 1.1 | 273 | 12.0    | 1.3 | 296 | 12.1    | 1.3 | 290 | 12.1    | 1.3 | 275 | 11.2  | 1.5 | 17 | 12.1  | 1.3 | 1151 |
| Female | 12.5    | 0.9 | 261 | 12.6    | 0.7 | 283 | 12.4    | 1.1 | 270 | 12.3    | 1.4 | 266 | 11.5  | 2.0 | 21 | 12.4  | 1.1 | 1101 |
| Total  | 12.4    | 1.0 | 534 | 12.3    | 1.1 | 579 | 12.2    | 1.2 | 560 | 12.2    | 1.4 | 541 | 11.3  | 1.8 | 38 | 12.3  | 1.2 | 2252 |

## 2. The Katz Index

This scale generates the index of basic ADLs. The index permits ranking of individuals according to adequacy of performance in six functions (bathing, dressing, going to toilet, transferring, continence, and feeding). Adequacy is expressed as a grade (A to G). Level A means overall independence in the functions, and the opposite pole is level G, which means general dependence in ADL. None of the participants in the first-wave sample were graded as level D to G.

Katz index

|         |        | 40–49yr |       | 50–59yr |       | 60–69yr |      | 70–79yr |      | 80yr– |       | Total |      |
|---------|--------|---------|-------|---------|-------|---------|------|---------|------|-------|-------|-------|------|
|         |        | N       | %     | N       | %     | N       | %    | N       | %    | N     | %     | N     | %    |
| Level A | Male   | 272     | 100.0 | 294     | 99.7  | 288     | 99.3 | 266     | 97.8 | 17    | 100.0 | 1137  | 99.2 |
|         | Female | 261     | 100.0 | 284     | 100.0 | 269     | 99.6 | 259     | 96.6 | 20    | 90.9  | 1093  | 98.9 |
|         | Total  | 533     | 100.0 | 578     | 99.8  | 557     | 99.5 | 525     | 97.2 | 37    | 94.9  | 2230  | 99.1 |
| Level B | Male   | 0       | 0     | 0       | 0     | 2       | 0.7  | 6       | 2.2  | 0     | 0     | 8     | 0.7  |
|         | Female | 0       | 0     | 0       | 0     | 1       | 0.4  | 7       | 2.6  | 1     | 4.5   | 9     | 0.8  |
|         | Total  | 0       | 0     | 0       | 0     | 3       | 0.5  | 13      | 2.4  | 1     | 2.6   | 17    | 0.8  |
| Level C | Male   | 0       | 0     | 1       | 0.3   | 0       | 0    | 0       | 0    | 0     | 0     | 1     | 0.1  |
|         | Female | 0       | 0     | 0       | 0     | 0       | 0    | 2       | 0.7  | 0     | 0     | 2     | 0.2  |
|         | Total  | 0       | 0     | 1       | 0.2   | 0       | 0    | 2       | 0.4  | 0     | 0     | 3     | 0.1  |
| Level D | Male   | 0       | 0     | 0       | 0     | 0       | 0    | 0       | 0    | 0     | 0     | 0     | 0    |
|         | Female | 0       | 0     | 0       | 0     | 0       | 0    | 0       | 0    | 1     | 4.5   | 1     | 0.1  |
|         | Total  | 0       | 0     | 0       | 0     | 0       | 0    | 0       | 0    | 1     | 2.6   | 1     | 0.0  |

## 7) Intelligence and Cognitive Function Scales

### 1. Wechsler Adult Intelligence Scale–Revised Short Forms (WAIS–R–SF)

This short form of WAIS–R provides cost-effective and useful estimates of intelligence particularly for older participants since their attention and motivation could diminish easily if testing becomes prolonged. WAIS–R–SF has the following four subtests: information, similarities, picture completion, and digit symbol. Estimated intelligence quotient (EIQ) is derived from all four subtests. Intelligence level of individuals are ranked according to EIQ scores as low ( $EIQ < 80$ ), middle ( $80 \leq EIQ < 120$ ), and high ( $120 \leq EIQ$ ).

WAIS–R–SF: estimated total score with four-subtest full scale (possible range 6–76)

|      | 40–49yr |     |     | 50–59yr |     |     | 60–69yr |     |     | 70–79yr |     |     | 80yr– |     |    | Total |     |      |
|------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|----|-------|-----|------|
|      | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N  | Mean  | SD  | N    |
| Male | 44.9    | 6.8 | 272 | 45.9    | 7.3 | 293 | 44.4    | 8.0 | 289 | 44.3    | 8.3 | 272 | 44.6  | 8.3 | 17 | 44.9  | 7.7 | 1143 |

|        |      |     |     |      |     |     |      |     |     |      |     |     |      |     |    |      |     |      |
|--------|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|----|------|-----|------|
| Female | 44.7 | 7.2 | 260 | 44.5 | 7.6 | 284 | 40.6 | 7.5 | 269 | 40.1 | 8.5 | 269 | 35.8 | 7.6 | 20 | 42.3 | 8.0 | 1102 |
| Total  | 44.8 | 7.0 | 532 | 45.2 | 7.5 | 577 | 42.6 | 8.0 | 558 | 42.2 | 8.6 | 541 | 39.9 | 9.0 | 37 | 43.6 | 7.9 | 2245 |

WAIS-R-SF: estimated intelligence quotient (EIQ) with four-subtest full scale

|        | 40–49yr |      |     | 50–59yr |      |     | 60–69yr |      |     | 70–79yr |      |     | 80yr– |      |    | Total |      |      |
|--------|---------|------|-----|---------|------|-----|---------|------|-----|---------|------|-----|-------|------|----|-------|------|------|
|        | Mean    | SD   | N   | Mean    | SD   | N   | Mean    | SD   | N   | Mean    | SD   | N   | Mean  | SD   | N  | Mean  | SD   | N    |
| Male   | 108.1   | 13.0 | 272 | 110.1   | 12.4 | 293 | 107.4   | 13.1 | 289 | 106.9   | 13.3 | 272 | 107.4 | 13.3 | 17 | 108.1 | 13.0 | 1143 |
| Female | 108.0   | 13.6 | 260 | 107.8   | 12.9 | 284 | 101.0   | 12.3 | 269 | 100.1   | 13.6 | 269 | 93.2  | 12.2 | 20 | 104.1 | 13.7 | 1102 |
| Total  | 108.1   | 13.3 | 532 | 109.0   | 12.7 | 577 | 104.3   | 13.1 | 558 | 103.5   | 13.8 | 541 | 99.7  | 14.4 | 37 | 106.1 | 13.5 | 2245 |

WAIS-R-SF: parameter of distribution by EIQ levels

|                        |        | 40–49yr |      | 50–59yr |      | 60–69yr |      | 70–79yr |      | 80yr– |      | Total |      |
|------------------------|--------|---------|------|---------|------|---------|------|---------|------|-------|------|-------|------|
|                        |        | N       | %    | N       | %    | N       | %    | N       | %    | N     | %    | N     | %    |
| Low<br>(EIQ<80)        | Male   | 6       | 2.2  | 5       | 1.7  | 2       | 0.7  | 4       | 1.5  | 0     | 0    | 17    | 1.5  |
|                        | Female | 4       | 1.5  | 8       | 2.8  | 16      | 5.9  | 20      | 7.4  | 2     | 10.0 | 50    | 4.5  |
|                        | Total  | 10      | 1.9  | 13      | 2.3  | 18      | 3.2  | 24      | 4.4  | 2     | 5.4  | 67    | 3.0  |
| Middle<br>(80≤EIQ<120) | Male   | 211     | 77.6 | 220     | 75.1 | 227     | 78.5 | 222     | 81.6 | 13    | 76.5 | 893   | 78.1 |
|                        | Female | 210     | 80.8 | 221     | 77.8 | 231     | 85.9 | 228     | 84.8 | 18    | 90.0 | 908   | 82.4 |
|                        | Total  | 421     | 79.1 | 441     | 76.4 | 458     | 82.1 | 450     | 83.2 | 31    | 83.8 | 1801  | 80.2 |
| High<br>(120≤EIQ)      | Male   | 55      | 20.2 | 68      | 23.2 | 60      | 20.8 | 46      | 16.9 | 4     | 23.5 | 233   | 20.4 |
|                        | Female | 46      | 17.7 | 55      | 19.4 | 22      | 8.2  | 21      | 7.8  | 0     | 0    | 144   | 13.1 |
|                        | Total  | 101     | 19.0 | 123     | 21.3 | 82      | 14.7 | 67      | 12.4 | 4     | 10.8 | 377   | 16.8 |

WAIS-R-SF subtest 1: information (29 items. possible range 0–29)

|        | 40–49yr |     |     | 50–59yr |     |     | 60–69yr |     |     | 70–79yr |     |     | 80yr– |     |    | Total |     |      |
|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|----|-------|-----|------|
|        | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N  | Mean  | SD  | N    |
| Male   | 17.6    | 4.8 | 272 | 17.3    | 5.3 | 294 | 16.0    | 5.3 | 291 | 14.9    | 5.3 | 274 | 15.2  | 4.8 | 17 | 16.5  | 5.3 | 1148 |
| Female | 15.8    | 5.5 | 260 | 14.7    | 5.4 | 284 | 12.7    | 5.3 | 269 | 11.9    | 5.3 | 269 | 10.1  | 3.6 | 22 | 13.7  | 5.6 | 1104 |
| Total  | 16.7    | 5.2 | 532 | 16.0    | 5.5 | 578 | 14.5    | 5.6 | 560 | 13.4    | 5.5 | 543 | 12.3  | 4.8 | 39 | 15.1  | 5.6 | 2252 |

WAIS-R-SF subtest 2: similarities (14 items. possible range 0–28)

|        | 40–49yr |     |     | 50–59yr |     |     | 60–69yr |     |     | 70–79yr |     |     | 80yr– |     |    | Total |     |      |
|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|----|-------|-----|------|
|        | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N  | Mean  | SD  | N    |
| Male   | 17.4    | 4.1 | 272 | 15.3    | 4.9 | 294 | 13.1    | 5.5 | 291 | 11.7    | 5.5 | 274 | 13.2  | 5.1 | 17 | 14.4  | 5.5 | 1148 |
| Female | 16.8    | 4.2 | 260 | 14.7    | 4.9 | 284 | 11.9    | 4.7 | 269 | 10.1    | 5.4 | 269 | 8.0   | 5.9 | 21 | 13.2  | 5.5 | 1103 |
| Total  | 17.1    | 4.1 | 532 | 15.0    | 4.9 | 578 | 12.5    | 5.2 | 560 | 10.9    | 5.5 | 543 | 10.3  | 6.1 | 38 | 13.8  | 5.5 | 2251 |

WAIS-R-SF subtest 3: picture completion (21 items. possible range 0–21)

|        | 40–49yr |     |     | 50–59yr |     |     | 60–69yr |     |     | 70–79yr |     |     | 80yr– |     |    | Total |     |      |
|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|----|-------|-----|------|
|        | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N  | Mean  | SD  | N    |
| Male   | 13.7    | 2.2 | 272 | 12.6    | 2.6 | 293 | 11.3    | 3.2 | 291 | 10.4    | 3.5 | 274 | 10.4  | 3.9 | 17 | 12.0  | 3.2 | 1147 |
| Female | 13.4    | 2.6 | 260 | 12.1    | 3.0 | 284 | 9.5     | 3.4 | 269 | 8.3     | 3.9 | 269 | 6.6   | 3.6 | 21 | 10.7  | 3.8 | 1103 |

|       |      |     |     |      |     |     |      |     |     |     |     |     |     |     |    |      |     |      |
|-------|------|-----|-----|------|-----|-----|------|-----|-----|-----|-----|-----|-----|-----|----|------|-----|------|
| Total | 13.5 | 2.4 | 532 | 12.3 | 2.8 | 577 | 10.4 | 3.4 | 560 | 9.4 | 3.8 | 543 | 8.3 | 4.1 | 38 | 11.4 | 3.6 | 2250 |
|-------|------|-----|-----|------|-----|-----|------|-----|-----|-----|-----|-----|-----|-----|----|------|-----|------|

WAIS-R-SF subtest 4: digit symbol (possible range 0-93)

|        | 40-49yr |      |     | 50-59yr |      |     | 60-69yr |      |     | 70-79yr |     |     | 80yr- |      |    | Total |      |      |
|--------|---------|------|-----|---------|------|-----|---------|------|-----|---------|-----|-----|-------|------|----|-------|------|------|
|        | Mean    | SD   | N   | Mean    | SD   | N   | Mean    | SD   | N   | Mean    | SD  | N   | Mean  | SD   | N  | Mean  | SD   | N    |
| Male   | 66.7    | 12.0 | 272 | 58.9    | 11.1 | 293 | 48.0    | 11.0 | 289 | 38.3    | 9.7 | 272 | 36.1  | 10.1 | 17 | 52.8  | 15.4 | 1143 |
| Female | 70.4    | 10.8 | 260 | 61.3    | 11.0 | 284 | 46.3    | 11.1 | 269 | 37.2    | 9.3 | 269 | 32.8  | 8.7  | 20 | 53.4  | 16.7 | 1102 |
| Total  | 68.5    | 11.6 | 532 | 60.1    | 11.1 | 577 | 47.2    | 11.1 | 558 | 37.8    | 9.5 | 541 | 34.3  | 9.4  | 37 | 53.1  | 16.1 | 2245 |

2. Mini Mental State Examination (MMSE)

MMSE is a brief, easily-scored test of several cognitive functions. This scale comprises questions concerning orientation in place and time, immediate and delayed recall of three words, attention and calculation, language and praxis, and visual construction. Cognitive impaired person might fall in the total score of 23 or less in the scale. Only participants over 60 years old administer this scale because of the characteristic of the scale as a screening test for dementia.

MMSE: total score of 30 items (possible range 0-30. less than 60 years older unperformed)

|        | 40-49yr |    |   | 50-59yr |    |   | 60-69yr |     |     | 70-79yr |     |     | 80yr- |     |    | Total |     |      |
|--------|---------|----|---|---------|----|---|---------|-----|-----|---------|-----|-----|-------|-----|----|-------|-----|------|
|        | Mean    | SD | N | Mean    | SD | N | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N  | Mean  | SD  | N    |
| Male   | -       | -  | 0 | -       | -  | 0 | 28.2    | 1.7 | 287 | 27.5    | 2.0 | 271 | 27.6  | 2.0 | 17 | 27.8  | 1.9 | 575  |
| Female | -       | -  | 0 | -       | -  | 0 | 28.2    | 1.7 | 268 | 27.6    | 2.3 | 268 | 26.7  | 2.7 | 22 | 27.9  | 2.1 | 558  |
| Total  | -       | -  | 0 | -       | -  | 0 | 28.2    | 1.7 | 555 | 27.5    | 2.2 | 539 | 27.1  | 2.4 | 39 | 27.8  | 2.0 | 1133 |

MMSE: parameter of distribution using cutoff score

|                      |        | 60-69yr |      | 70-79yr |      | 80yr- |       | Total |      |
|----------------------|--------|---------|------|---------|------|-------|-------|-------|------|
|                      |        | N       | %    | N       | %    | N     | %     | N     | %    |
| Score of 24 and over | Male   | 280     | 97.6 | 261     | 96.3 | 17    | 100.0 | 558   | 97.0 |
|                      | Female | 265     | 98.9 | 253     | 94.8 | 19    | 86.4  | 537   | 96.4 |
|                      | Total  | 545     | 98.2 | 514     | 95.5 | 36    | 92.3  | 1095  | 96.7 |
| Score of 23 or less  | Male   | 7       | 2.4  | 10      | 3.7  | 0     | 0.0   | 17    | 3.0  |
|                      | Female | 3       | 1.1  | 14      | 5.2  | 3     | 13.6  | 20    | 3.6  |
|                      | Total  | 10      | 1.8  | 24      | 4.5  | 3     | 7.7   | 37    | 3.3  |