



Supplemental Materials for

Physical, Psychological, Cognitive and Social Frailty Domains in Community-Dwelling Adults Aged 45–85: a Cross-sectional Analysis of the Canadian Longitudinal Study on Aging (CLSA)

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Table S1a-S1d: Operationalization and frequency of cognitive frailty deficits at baseline

Table S2a-S2d: Average deficit value by age group and Spearman correlation results

Figure S1: Percentage of CLSA participants

Figure S2: Goodman and Kruskal's Gamma measuring agreement

Supplementary Tables and Figures

Table S1a. Operationalization and frequency of 43 physical frailty deficits at baseline (2011-2015)

Physical Frailty Deficit		Baseline	
Self-rated general health		N	Percent
0	Excellent	5995	19.92%
0.25	Very Good	12420	41.27%
0.5	Good	8877	29.49%
0.75	Fair	2315	7.69%
1	Poor	467	1.55%
Missing		23	0.08%
Eyesight rating			
0	Excellent	6850	22.76%
0.25	Very Good	11750	39.04%
0.5	Good	9172	30.47%
0.75	Fair	1957	6.50%
1	Poor/Blind	349	1.16%
Missing		19	0.06%
Hearing rating			
0	Excellent	6666	22.15%
0.25	Very Good	10090	33.52%
0.5	Good	9879	32.82%
0.75	Fair	2969	9.86%
1	Poor	465	1.55%
Missing		28	0.09%
BMI Classification			
0	18.5-24.9	8863	29.45%
0.3333333333	25.0-29.9	12088	40.16%
0.6666666667	30.0-34.9	5820	19.34%
1	≥35 or <18.5	3190	10.60%
Missing		136	0.45%
Older Americans Resources and Services (OARS) Multidimensional Assessment Questionnaire ¹			
OARS: Able to dress			
0	Yes	29951	99.51%
1	No	143	0.48%
Missing		3	0.01%
OARS: Able to get out of bed			
0	Yes	29960	99.54%
1	No	134	0.45%
Missing		3	0.01%
OARS: Able to feed			
0	Yes	30071	99.91%
1	No	23	0.08%

Supplementary Tables and Figures

Physical Frailty Deficit		Baseline	
Missing		3	0.01%
OARS: Able to take care of appearance			
0	Yes	30043	99.82%
1	No	51	0.17%
Missing		3	0.01%
OARS: Able to walk			
0	Yes	29468	97.91%
1	No	626	2.08%
Missing		3	0.01%
OARS: Able to take bath			
0	Yes	29796	99.00%
1	No	297	0.99%
Missing		4	0.01%
OARS: Trouble to get in time to bathroom			
0	No	28613	95.07%
1	Yes	1430	4.75%
Missing		54	0.18%
OARS: Able to take medicine			
0	Yes	29989	99.64%
1	No	101	0.34%
Missing		7	0.02%
OARS: Able to do housework			
0	Yes	28730	95.46%
1	No	1359	4.52%
Missing		8	0.03%
OARS: Able to prepare meals			
0	Yes	29857	99.20%
1	No	234	0.78%
Missing		6	0.02%
OARS: Able to go shopping			
0	Yes	29671	98.58%
1	No	420	1.40%
Missing		6	0.02%
OARS: Able to travel			
0	Yes	29837	99.14%
1	No	255	0.85%
Missing		5	0.02%
OARS: Able to handle money			
0	Yes	29967	99.57%
1	No	125	0.42%
Missing		5	0.02%
OARS: Able to use telephone			
0	Yes	30050	99.84%
1	No	44	0.15%

Supplementary Tables and Figures

Physical Frailty Deficit		Baseline	
Missing		3	0.01%
Arthritis (any type)			
0	No	21018	69.83%
1	Yes	8435	28.03%
Missing		644	2.14%
Asthma			
0	No	25973	86.30%
1	Yes	3984	13.24%
Missing		140	0.47%
Bowel disorder			
0	No	27026	89.80%
1	Yes	2938	9.76%
Missing		133	0.44%
Glaucoma			
0	No	28408	94.39%
1	Yes	1525	5.07%
Missing		164	0.54%
Allergies			
0	No	18323	60.88%
1	Yes	11498	38.20%
Missing		276	0.92%
Osteoporosis			
0	No	27118	90.10%
1	Yes	2689	8.93%
Missing		290	0.96%
High blood pressure or hypertension			
0	No	18817	62.52%
1	Yes	11101	36.88%
Missing		179	0.59%
Diabetes, borderline diabetes or high blood sugar			
0	No	24677	81.99%
1	Yes	5310	17.64%
Missing		110	0.37%
Heart attack or myocardial infarction			
0	No	28487	94.65%
1	Yes	1461	4.85%
Missing		149	0.50%
Cataracts			
0	No	28487	94.65%
1	Yes	1461	4.85%
Missing		149	0.50%
Back problems excluding fibromyalgia and arthritis			

Supplementary Tables and Figures

Physical Frailty Deficit		Baseline	
0	No	21593	71.74%
1	Yes	8384	27.86%
Missing		120	0.40%
Heart disease (including congestive heart failure)			
0	No	26411	87.75%
1	Yes	3503	11.64%
Missing		183	0.61%
Migraine headaches			
0	No	26131	86.82%
1	Yes	3858	12.82%
Missing		108	0.36%
Intestinal or stomach ulcers			
0	No	27677	91.96%
1	Yes	2275	7.56%
Missing		145	0.48%
Over-active thyroid gland			
0	No	28975	96.27%
1	Yes	724	2.41%
Missing		398	1.32%
Emphysema, chronic bronchitis, COPD			
0	No	28187	93.65%
1	Yes	1725	5.73%
Missing		185	0.61%
Angina (or chest pain due to heart disease)			
0	No	28603	95.04%
1	Yes	1324	4.40%
Missing		170	0.56%
Peripheral vascular disease or poor circulation			
0	No	28278	93.96%
1	Yes	1646	5.47%
Missing		173	0.57%
Urinary incontinence			
0	No	27478	91.30%
1	Yes	2516	8.36%
Missing		103	0.34%
Macular degeneration			
0	No	28603	95.04%
1	Yes	1280	4.25%
Missing		214	0.71%
Under-active thyroid gland			
0	No	25741	85.53%
1	Yes	3962	13.16%

Supplementary Tables and Figures

Physical Frailty Deficit		Baseline	
Missing		394	1.31%
Kidney disease or kidney failure			
0	No	29098	96.68%
1	Yes	867	2.88%
Missing		132	0.44%
Bowel incontinence			
0	No	29425	97.77%
1	Yes	582	1.93%
Missing		90	0.30%
Cancer			
0	No	25367	84.28%
1	Yes	4637	15.41%
Missing		93	0.31%
Life Space Index ² Composite Score			
0	≥60 Not Restricted	27522	91.45%
1	<60 Restricted	2572	8.55%
Missing		3	0.19%

¹Fillenbaum GG, Smyer MA. The development, validity, and reliability of the OARS multidimensional functional assessment questionnaire. *J Gerontol* 1981; 36(4):428-434.

²Stalvey BT, Owsley C, Sloane ME, Ball K. The life space questionnaire: A measure of the extent of mobility of older adults. *J Appl Gerontol* 1999; 18(4):460.

Table S1b: Operationalization and frequency of 30 psychological frailty deficits at baseline (2011-2015)

Psychological Frailty Deficit		Baseline	
Self-rated mental health		N	Percent
0	Excellent	8437	28.03%
0.25	Very Good	12577	41.79%
0.5	Good	7403	24.60%
0.75	Fair	1445	4.80%
1	Poor	208	0.69%
Missing		27	0.09%
Mood disorder			
0	No	24844	82.55%
1	Yes	5144	17.09%

Supplementary Tables and Figures

Psychological Frailty Deficit		Baseline	
Missing		109	0.36%
Anxiety disorder			
0	No	27379	90.97%
1	Yes	2597	8.63%
Missing		121	0.40%
Post-traumatic stress disorder			
0	No	28529	94.79%
1	Yes	1503	4.99%
Missing		65	0.22%
Satisfaction with Life Scale ¹			
SWLS scale: Satisfied with life			
0	Strongly agree	12536	41.65%
0.166666667	Agree	10573	35.13%
0.333333333	Slightly agree	2639	8.77%
0.5	Neither agree or disagree	1338	4.45%
0.666666667	Slightly disagree	1402	4.66%
0.833333333	Disagree	951	3.16%
1	Strongly disagree	613	2.04%
Missing		45	0.15%
SWLS: Life close to ideal			
0	Strongly agree	10058	33.42%
0.166666667	Agree	9814	32.61%
0.333333333	Slightly agree	2539	8.44%
0.5	Neither agree or disagree	2961	9.84%
0.666666667	Slightly disagree	1935	6.43%
0.833333333	Disagree	1576	5.24%
1	Strongly disagree	1131	3.76%
Missing		83	0.28%
SWLS: Have important things in life			
0	Strongly agree	13801	45.86%
0.166666667	Agree	10468	34.78%
0.333333333	Slightly agree	2434	8.09%
0.5	Neither agree or disagree	1157	3.84%
0.666666667	Slightly disagree	992	3.30%
0.833333333	Disagree	714	2.37%
1	Strongly disagree	453	1.51%
Missing		78	0.26%
SWLS: Would change almost nothing about life			
0	Strongly agree	7895	26.23%
0.166666667	Agree	8224	27.32%
0.333333333	Slightly agree	2714	9.02%

Supplementary Tables and Figures

Psychological Frailty Deficit		Baseline	
0.5	Neither agree or disagree	1784	5.93%
0.666666667	Slightly disagree	3622	12.03%
0.833333333	Disagree	3176	10.55%
1	Strongly disagree	2496	8.29%
Missing		186	0.62%
SWLS: Life conditions excellent			
0	Strongly agree	11019	36.61%
0.166666667	Agree	9120	30.30%
0.333333333	Slightly agree	2660	8.84%
0.5	Neither agree or disagree	2433	8.08%
0.666666667	Slightly disagree	2340	7.77%
0.833333333	Disagree	1560	5.18%
1	Strongly disagree	894	2.97%
Missing		71	0.24%
Center for Epidemiologic Studies Short Depression Scale (CES-D10) ²			
CES-D 10 : Frequency feel fearful or tearful			
0	Rarely or never	22128	73.52%
0.333333333	Some of the time	5192	17.25%
0.666666667	Occasionally	2221	7.38%
1	All the time	441	1.47%
Missing		115	0.38%
CES-D 10: Frequency feel happy			
0	All the time	19059	63.33%
0.333333333	Occasionally	7842	26.06%
0.666666667	Some of the time	2553	8.48%
1	Rarely or never	487	1.62%
Missing		156	0.52%
CES-D 10: Frequency feel could not get going			
0	Rarely or never	19424	64.54%
0.333333333	Some of the time	7174	23.84%
0.666666667	Occasionally	2613	8.68%
1	All the time	762	2.53%
Missing		124	0.41%
CES-D 10: Frequency trouble concentrating			
0	Rarely or never	17055	56.67%
0.333333333	Some of the time	7923	26.32%
0.666666667	Occasionally	3871	12.86%
1	All the time	1131	3.76%
Missing		117	0.39%
CES-D 10: Frequency feel depressed			
0	Rarely or never	24053	79.92%

Supplementary Tables and Figures

Psychological Frailty Deficit		Baseline	
0.333333333	Some of the time	3807	12.65%
0.666666667	Occasionally	1601	5.32%
1	All the time	517	1.72%
Missing		119	0.40%
CES-D 10: Frequency feel everything is an effort			
0	Rarely or never	19721	65.52%
0.333333333	Some of the time	6853	22.77%
0.666666667	Occasionally	2306	7.66%
1	All the time	1102	3.66%
Missing		115	0.38%
CES-D 10: Frequency sleep is restless			
0	Rarely or never	10431	34.66%
0.333333333	Some of the time	9267	30.79%
0.666666667	Occasionally	5728	19.03%
1	All the time	4547	15.11%
Missing		124	0.41%
CES-D 10: Frequency easily bothered			
0	Rarely or never	20702	68.78%
0.333333333	Some of the time	5464	18.15%
0.666666667	Occasionally	2942	9.78%
1	All the time	867	2.88%
Missing		122	0.41%
CES-D 10: Frequency feel hopeful about the future			
0	All the time	19159	63.66%
0.333333333	Occasionally	6523	21.67%
0.666666667	Some of the time	2984	9.91%
1	Rarely or never	1150	3.82%
Missing		281	0.93%
CES-D 10: Frequency feel lonely			
0	Rarely or never	22173	73.67%
0.333333333	Some of the time	4558	15.14%
0.666666667	Occasionally	2607	8.66%
1	All the time	638	2.12%
Missing		121	0.40%
Kessler 10-item psychological distress scale ³			
K10 scale: Frequency tired out			
0	None of the time	12305	40.88%
0.25	A little of the time	8610	28.61%
0.5	Some of the time	5826	19.36%
0.75	Most of the time	1466	4.87%
1	All of the time	491	1.63%
Missing		1399	4.65%

Supplementary Tables and Figures

Psychological Frailty Deficit		Baseline	
K10: Frequency nervous			
0	None of the time	15327	50.93%
0.25	A little of the time	8039	26.71%
0.5	Some of the time	4404	14.63%
0.75	Most of the time	744	2.47%
1	All of the time	229	0.76%
Missing		1354	4.50%
K10: Frequency could not calm down			
0	None of the time	26055	86.57%
0.25	A little of the time	1820	6.05%
0.5	Some of the time	687	2.28%
0.75	Most of the time	132	0.44%
1	All of the time	41	0.14%
Missing		1362	4.53%
K10: Frequency hopeless			
0	None of the time	24231	80.51%
0.25	A little of the time	2940	9.77%
0.5	Some of the time	1256	4.17%
0.75	Most of the time	218	0.72%
1	All of the time	92	0.31%
Missing		1360	4.52%
K10: Frequency restless or fidgety			
0	None of the time	15624	51.91%
0.25	A little of the time	7926	26.33%
0.5	Some of the time	4322	14.36%
0.75	Most of the time	579	1.92%
1	All of the time	282	0.94%
Missing		1364	4.53%
K10: Frequency can not sit still			
0	None of the time	23753	78.92%
0.25	A little of the time	3143	10.44%
0.5	Some of the time	1448	4.81%
0.75	Most of the time	256	0.85%
1	All of the time	118	0.39%
Missing		1379	4.58%
K10: Frequency of depression			
0	None of the time	19208	63.82%
0.25	A little of the time	6149	20.43%
0.5	Some of the time	2752	9.14%
0.75	Most of the time	453	1.51%
1	All of the time	176	0.58%
Missing		1359	4.52%
K10: Frequency everything an effort			
0	None of the time	17753	58.99%

Supplementary Tables and Figures

Psychological Frailty Deficit		Baseline	
0.25	A little of the time	6383	21.21%
0.5	Some of the time	3407	11.32%
0.75	Most of the time	805	2.67%
1	All of the time	368	1.22%
Missing		1381	4.59%
K10: Frequency nothing can cheer up			
0	None of the time	25944	86.20%
0.25	A little of the time	1802	5.99%
0.5	Some of the time	771	2.56%
0.75	Most of the time	169	0.56%
1	All of the time	51	0.17%
Missing		1360	4.52%
K10: Frequency feeling worthless			
0	None of the time	25118	83.46%
0.25	A little of the time	2345	7.79%
0.5	Some of the time	968	3.22%
0.75	Most of the time	212	0.70%
1	All of the time	101	0.34%
Missing		1353	4.50%
K10: Physical health problems caused by feelings			
0	None of the time	20957	69.63%
0.25	A little of the time	2773	9.21%
0.5	Some of the time	1907	6.34%
0.75	Most of the time	1189	3.95%
1	All of the time	1520	5.05%
Missing		1751	5.82%

¹Diener, E., Emmons, R.A., Larsen, R.J., Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment*, 49(1), 71-75, DOI: 10.1207/s15327752jpa4901_13.

²Andresen EM, Malmgren JA, Carter WB, Patrick DL. Screening for depression in well older adults: evaluation of a short form of the CES-D (Center for Epidemiologic Studies depression Scale). *Am J Prev Med* 1994; 10(2):77-84.

³Kessler, R.C., Barker, P.R., Colpe, L.J., Epstein, J.F., Gfroerer, J.C., Hiripi, E., Howes, M.J, Normand, S-L.T., Manderscheid, R.W., Walters, E.E., Zaslavsky, A.M. (2003). Screening for serious mental illness in the general population. *Archives of General Psychiatry*, 60(2), 184-189, DOI:10.1001/archpsyc.60.2.184.

Supplementary Tables and Figures

Table S1c: Operationalization and frequency of 17 cognitive frailty deficits at baseline (2011-2015)

Cognitive Frailty Deficit		Baseline	
Dementia or Alzheimer's disease		N	Percent
0	No	29944	99.49%
1	Yes	68	0.23%
Missing		85	0.28%
Memory problem			
0	No	29476	97.94%
1	Yes	519	1.72%
Missing		102	0.34%
Stroke or CVA			
0	No	29454	97.86%
1	Yes	522	1.73%
Missing		121	0.40%
TIA			
0	No	28890	95.99%
1	Yes	965	3.21%
Missing		242	0.80%
Multiple Sclerosis			
0	No	29819	99.08%
1	Yes	202	0.67%
Missing		76	0.25%
Parkinson's Disease			
0	No	29897	99.34%
1	Yes	125	0.42%
Missing		75	0.25%
Epilepsy			
0	No	29692	98.65%
1	Yes	322	1.07%
Missing		83	0.28%
Rey Auditory Verbal Learning Test ¹			
REYI Cognitive Impairment			
0	Percentile ≥ 0.50	16304	54.17%
0.25	$0.25 \leq \text{Percentile} < 0.50$	5846	19.42%
0.5	$0.10 \leq \text{Percentile} < 0.25$	4078	13.55%
0.75	$0.05 \leq \text{Percentile} < 0.10$	1989	6.61%
1	Percentile < 0.05	854	2.84%
Missing		1026	3.41%
REYII Cognitive Impairment			
0	Percentile ≥ 0.50	12639	41.99%
0.25	$0.25 \leq \text{Percentile} < 0.50$	9433	31.34%
0.5	$0.10 \leq \text{Percentile} < 0.25$	3366	11.18%

Supplementary Tables and Figures

Cognitive Frailty Deficit		Baseline	
0.75	0.05 ≤ Percentile < 0.10	1522	5.06%
1	Percentile < 0.05	1799	5.98%
Missing		1338	4.45%
Animal Fluency Score ²			
0	Percentile ≥ 0.50	14511	48.21%
0.25	0.25 ≤ Percentile < 0.50	6811	22.63%
0.5	0.10 ≤ Percentile < 0.25	4712	15.66%
0.75	0.05 ≤ Percentile < 0.10	1454	4.83%
1	Percentile < 0.05	1362	4.53%
Missing		1247	4.14%
Mental Alternation Test Score ^{1,3}			
0	Percentile ≥ 0.50	15309	50.87%
0.25	0.25 ≤ Percentile < 0.50	6098	20.26%
0.5	0.10 ≤ Percentile < 0.25	3885	12.91%
0.75	0.05 ≤ Percentile < 0.10	1394	4.63%
1	Percentile < 0.05	1369	4.55%
Missing		2042	6.78%
Stroop Test - Victoria Version ^{2,4,5}			
0	Percentile ≤ 0.50	12391	41.17%
0.25	0.75 ≥ Percentile > 0.50	11501	38.21%
0.5	0.90 ≥ Percentile > 0.75	5309	17.64%
0.75	0.95 ≥ Percentile > 0.90	399	1.33%
1	Percentile > 0.95	75	0.25%
Missing		422	1.40%
Miami Prospective Memory Test (PMT) ²			
PMT Event			
0	Not impaired	27623	91.78%
1	Impaired	2179	7.24%
Missing		295	0.98%
PMT Time			
0	Not impaired	26110	86.75%
1	Impaired	2974	9.88%
Missing		1013	3.37%
Controlled Oral Word Association Test (FAS) ²			
FAS score - F			
0	Percentile ≥ 0.50	13376	44.44%
0.25	0.25 ≤ Percentile < 0.50	6442	21.40%
0.5	0.10 ≤ Percentile < 0.25	4869	16.18%
0.75	0.05 ≤ Percentile < 0.10	1870	6.21%
1	Percentile < 0.05	1219	4.05%
Missing		2321	7.71%
FAS score - A			
0	Percentile ≥ 0.50	14340	47.65%

Supplementary Tables and Figures

Cognitive Frailty Deficit		Baseline	
0.25	0.25 ≤ Percentile < 0.50	6588	21.89%
0.5	0.10 ≤ Percentile < 0.25	4623	15.36%
0.75	0.05 ≤ Percentile < 0.10	992	3.30%
1	Percentile < 0.05	1232	4.09%
Missing		2322	7.72%
FAS score - S			
0	Percentile ≥ 0.50	13668	45.41%
0.25	0.25 ≤ Percentile < 0.50	6634	22.04%
0.5	0.10 ≤ Percentile < 0.25	4495	14.94%
0.75	0.05 ≤ Percentile < 0.10	1748	5.81%
1	Percentile < 0.05	1231	4.09%
Missing		2321	7.71%

¹Tuokko, H., Griffith, L. E., Simard, M., & Taler, V. (2017). Cognitive measures in the Canadian Longitudinal Study on Aging. *The Clinical Neuropsychologist*, 31(1), 233–250.

²Tuokko H, Griffith LE, Simard M, Taler V, O’Connell ME, Voll S, Kadlec H, Wolfson C, Kirkland S, Raina P. The Canadian longitudinal study on aging as a platform for exploring cognition in an aging population. *Clin Neuropsychology* 2020 Jan;34(1):174-203.

³Teng, E. (1995). The Mental Alternations Test (MAT). *The Clinical Neuropsychologist*, 9(3), 287.

⁴Troyer, A.K., Leach, L. & Strauss, E. (2006). Aging and Response Inhibition: Normative Data for the Victoria Stroop Test. *Aging, Neuropsychology, and Cognition*, 13(1), 20-35.

⁵Bayard, S., Erkes, J., Moroni, C. & CPCN-LR (2011). Victoria Stroop Test: normative data in a sample group of older people and the study of their clinical applications in the assessment of inhibition in Alzheimer's disease. *Archives of Clinical Neuropsychology*, 26(7),653-661.

Supplementary Tables and Figures

Table S1d: Operationalization and frequency of 39 social frailty deficits at baseline (2011-2015)

Social Frailty Deficit		Baseline	
Social Participation (SP) – Responses based on participation in the past 12 months			
SP: Desire to participate in more activities		N	Percent
0	No	14302	47.52%
1	Yes	15715	52.21%
Missing		80	0.27%
SP: Family or friendship-based activities outside the household			
0	At least once a day/week/month	27819	92.43%
1	Never or at least once a year	2220	7.38%
Missing		58	0.19%
SP: Church or religious activities & Educational and cultural activities			
0	At least once a day/week/month	20920	69.51%
1	Never or at least once a year	9131	30.34%
Missing		46	0.15%
SP: Sports or physical activities & Other recreational activities or hobbies			
0	At least once a day/week/month	25985	86.34%
1	Never or at least once a year	4064	13.50%
Missing		48	0.16%
SP: Service club or fraternal organization & Neighborhood, community, or professional activities & Volunteer or charity work			
0	At least once a day/week/month	16855	56.00%
1	Never or at least once a year	13192	43.83%
Missing		50	0.17%
MOS Social Support (SS) Survey ¹			
SS: Someone to help you if you were confined to bed			
0	Some/most/all of the time	27795	92.35%

Supplementary Tables and Figures

Social Frailty Deficit		Baseline	
1	None/a little of the time	2167	7.20%
Missing		135	0.45%
SS: Someone you can count on to listen to you when you need to talk			
0	Some/most/all of the time	29063	96.56%
1	None/a little of the time	959	3.19%
Missing		75	0.25%
SS: Someone to give you advice about a crisis			
0	Some/most/all of the time	28318	94.09%
1	None/a little of the time	1678	5.58%
Missing		101	0.34%
SS: Someone to take you to the doctor if needed			
0	Some/most/all of the time	28562	94.90%
1	None/a little of the time	1439	4.78%
Missing		96	0.32%
SS: Someone who shows you love and affection			
0	Some/most/all of the time	29068	96.58%
1	None/a little of the time	956	3.18%
Missing		73	0.24%
SS: Someone to have a good time with			
0	Some/most/all of the time	29052	96.53%
1	None/a little of the time	970	3.22%
Missing		75	0.25%
SS: Someone to give you information in order to help you			
0	Some/most/all of the time	28890	95.99%
1	None/a little of the time	1106	3.67%
Missing		101	0.34%
SS: Someone to confide in or talk to about yourself or your problems			
0	Some/most/all of the time	28183	93.64%
1	None/a little of the time	1818	6.04%
Missing		96	0.32%
SS: Someone who hugs you			

Supplementary Tables and Figures

Social Frailty Deficit		Baseline	
0	Some/most/all of the time	27630	91.80%
1	None/a little of the time	2378	7.90%
Missing		89	0.30%
SS: Someone to get together with for relaxation			
0	Some/most/all of the time	28471	94.60%
1	None/a little of the time	1553	5.16%
Missing		73	0.24%
SS: Someone to prepare your meals if you were unable to do it yourself			
0	Some/most/all of the time	26770	88.95%
1	None/a little of the time	3187	10.59%
Missing		140	0.47%
SS: Someone whose advice you really want			
0	Some/most/all of the time	27549	91.53%
1	None/a little of the time	2417	8.03%
Missing		131	0.44%
SS: Someone to do things with to help you get your mind off things			
0	Some/most/all of the time	27853	92.54%
1	None/a little of the time	2116	7.03%
Missing		128	0.43%
SS: Someone to help with daily chores if you were sick			
0	Some/most/all of the time	26986	89.66%
1	None/a little of the time	2992	9.94%
Missing		119	0.40%
SS: Someone to share your most private worries and fears with			
0	Some/most/all of the time	26646	88.53%
1	None/a little of the time	3291	10.93%
Missing		160	0.53%
SS: Someone to turn to for suggestions about how to deal with a personal problem			
0	Some/most/all of the time	27907	92.72%

Supplementary Tables and Figures

Social Frailty Deficit		Baseline	
1	None/a little of the time	2065	6.86%
Missing		125	0.42%
SS: Someone to do something enjoyable with			
0	Some/most/all of the time	29024	96.43%
1	None/a little of the time	994	3.30%
Missing		79	0.26%
SS: Someone who understands your problems			
0	Some/most/all of the time	28037	93.16%
1	None/a little of the time	1918	6.37%
Missing		142	0.47%
SS: Someone to love you and make you feel wanted			
0	Some/most/all of the time	28422	94.43%
1	None/a little of the time	1575	5.23%
Missing		100	0.33%
Social network: Last get together with children, siblings, relatives, close friends, or neighbours			
0	All live in the household	4054	37.78%
0.166666667	Within the last day or two	18216	44.96%
0.333333333	Within the last week or two	6893	14.70%
0.5	Within the past month	632	1.79%
0.666666667	Within the past 6 months	203	0.45%
0.833333333	Within the past year	31	0.15%
1	More than a year ago	37	0.07%
Missing		31	0.10%
Living Alone			
0	No	23248	77.24%
1	Yes	6822	22.67%
Missing		27	0.09%
Marital Status			
0	Married/Living with a partner in a common-law relationship	20651	68.61%
1	Other	9438	31.36%
Missing		8	0.03%
Neighborhood perceptions/Social cohesion			
Feel a part of local area			

Supplementary Tables and Figures

Social Frailty Deficit		Baseline	
0	Strong agree or Agree	26687	88.67%
1	Strongly disagree or disagree	1791	5.95%
Missing		1619	5.38%
Vandalism or graffiti are a big problem in local area			
0	Strongly disagree or Disagree	26745	88.86%
1	Strong agree or Agree	1862	6.19%
Missing		1490	4.95%
Often feel lonely living in local area			
0	Strongly disagree or Disagree	26594	88.36%
1	Strong agree or Agree	2009	6.68%
Missing		1494	4.96%
Most people in local area can be trusted			
0	Strong agree or Agree	26857	89.23%
1	Strongly disagree or Disagree	1149	3.82%
Missing		2091	6.95%
People would be afraid to walk alone after dark in local area			
0	Strongly disagree or Disagree	25108	83.42%
1	Strong agree or Agree	3132	10.41%
Missing		1857	6.17%
Most people in local area are friendly			
0	Strong agree or Agree	27846	92.52%
1	Strongly disagree or Disagree	583	1.94%
Missing		1668	5.54%
People in local area will take advantage of you			
0	Strongly disagree or Disagree	27343	90.85%
1	Strong agree or Agree	905	3.01%
Missing		1849	6.14%
Local area is kept very clean			
0	Strong agree or Agree	27556	91.56%
1	Strongly disagree or Disagree	1071	3.56%
Missing		1470	4.88%
Lots of people in local area who would help if in trouble			
0	Strong agree or Agree	26433	87.83%

Supplementary Tables and Figures

Social Frailty Deficit		Baseline	
1	Strongly disagree or Disagree	1283	4.26%
Missing		2381	7.91%
Self-perceived social standing ²			
On which step you stand on a 10-rung "social ladder" where rung 1=lowest social standing and 10=highest social standing			
0	Rung > 3	25551	84.90%
1	Rung 1-3	2461	8.18%
Missing		2085	6.93%
Education			
0	≥ Secondary school graduation	28404	94.37%
1	< Secondary school graduation	1643	5.46%
Missing		50	0.17%
Income satisfies basic needs			
0	Very well	15528	51.59%
0.25	Adequately	10477	34.81%
0.5	With some difficulty	1823	6.06%
0.75	Not very well	470	1.56%
1	Totally inadequate	200	0.66%
Missing		1599	5.31%

¹Sherbourne CD, Stewart AL. The MOS social support survey. Soc Sci Med 1991; 32(6):705-714.

²John D and Catherine T MacArthur Research Network on Socioeconomic Status and Health. The MacArthur Scale of Subjective Social Status. Last accessed May 14, 2010 [1998 Available from:

URL:<http://www.macses.ucsf.edu/Research/Psychosocial/subjective.html>

Supplementary Tables and Figures

Table S2a. Average deficit value by age group and Spearman correlation results for 43 physical frailty deficits at baseline (2011-2015)

Physical Domain Deficit	Age Group				Spearman Corr with Age	Spearman Corr p-value	Increase with Age	% increasing with age
	45-54	55-64	65-74	75-85				
Self-rated general health	0.318	0.323	0.316	0.345	0.029	<.0001	Y	83.7%
Eyesight rating	0.296	0.297	0.311	0.354	0.080	<.0001	Y	
Hearing rating	0.291	0.324	0.356	0.405	0.162	<.0001	Y	
BMI Classification	0.353	0.389	0.389	0.336	0.008	0.178	N	
OARS scale: Able to dress	0.005	0.007	0.010	0.023	0.057	<.0001	Y	
OARS scale: Able to get out of bed	0.002	0.001	0.001	0.003	0.010	0.089	N	
OARS scale: Able to feed	0.001	0.001	0.001	0.000	0.003	0.553	N	
OARS scale: Able to take care of appearance	0.003	0.005	0.004	0.008	0.016	0.004	Y	
OARS scale: Able to walk	0.009	0.016	0.021	0.047	0.083	<.0001	Y	
OARS scale: Able to take bath	0.004	0.004	0.004	0.006	0.008	0.181	N	
OARS scale: Trouble to get in time to bathroom	0.003	0.007	0.007	0.021	0.057	<.0001	Y	
OARS scale: Able to take medicine	0.020	0.031	0.042	0.113	0.136	<.0001	Y	
OARS scale: Able to do housework	0.000	0.001	0.002	0.004	0.037	<.0001	Y	
OARS scale: Able to prepare meals	0.007	0.011	0.012	0.032	0.063	<.0001	Y	
OARS scale: Able to go shopping	0.005	0.005	0.008	0.016	0.041	<.0001	Y	
OARS scale: Able to travel	0.002	0.003	0.003	0.006	0.019	0.001	Y	
OARS scale: Able to handle money	0.003	0.002	0.004	0.009	0.025	<.0001	Y	
OARS scale: Able to use telephone	0.020	0.039	0.056	0.091	0.111	<.0001	Y	
Arthritis (any type)	0.140	0.272	0.368	0.411	0.224	<.0001	Y	
Asthma	0.148	0.140	0.127	0.106	-0.046	<.0001	N	
Bowel disorder	0.086	0.098	0.106	0.105	0.024	<.0001	Y	
Glaucoma	0.012	0.034	0.066	0.118	0.164	<.0001	Y	
Allergies	0.415	0.404	0.370	0.328	-0.063	<.0001	N	
Osteoporosis	0.020	0.076	0.128	0.167	0.183	<.0001	Y	
High blood pressure or hypertension	0.198	0.343	0.461	0.549	0.265	<.0001	Y	

Supplementary Tables and Figures

Physical Domain Deficit	Age Group				Spearman Corr with Age	Spearman Corr p-value	Increase with Age	% increasing with age
	45-54	55-64	65-74	75-85				
Diabetes, borderline diabetes or high blood sugar	0.108	0.177	0.219	0.219	0.115	<.0001	Y	
Heart attack or myocardial infarction	0.011	0.038	0.065	0.101	0.145	<.0001	Y	
Cataracts	0.036	0.157	0.430	0.724	0.537	<.0001	Y	
Back problems excluding fibromyalgia and arthritis	0.257	0.282	0.295	0.288	0.029	<.0001	Y	
Heart disease (including congestive heart failure)	0.034	0.083	0.158	0.244	0.232	<.0001	Y	
Migraine headaches	0.147	0.141	0.121	0.090	-0.059	<.0001	N	
Intestinal or stomach ulcers	0.053	0.074	0.088	0.096	0.059	<.0001	Y	
Over-active thyroid gland	0.020	0.026	0.024	0.028	0.012	0.033	Y	
Emphysema, chronic bronchitis, COPD	0.033	0.051	0.071	0.087	0.084	<.0001	Y	
Angina (or chest pain due to heart disease)	0.010	0.029	0.062	0.097	0.149	<.0001	Y	
Peripheral vascular disease or poor circulation	0.029	0.043	0.066	0.099	0.107	<.0001	Y	
Urinary incontinence	0.043	0.070	0.095	0.154	0.133	<.0001	Y	
Macular degeneration	0.009	0.022	0.052	0.117	0.176	<.0001	Y	
Under-active thyroid gland	0.093	0.120	0.154	0.190	0.101	<.0001	Y	
Kidney disease or kidney failure	0.013	0.025	0.034	0.052	0.076	<.0001	Y	
Bowel incontinence	0.013	0.014	0.022	0.036	0.057	<.0001	Y	
Cancer	0.056	0.129	0.198	0.283	0.219	<.0001	Y	
Composite LSA Score	0.040	0.063	0.100	0.174	0.160	<.0001	Y	

Average value <0.01 for all age groups

Supplementary Tables and Figures

Table S2b. Average deficit value by age group and Spearman correlation results for 30 psychological frailty deficits at baseline (2011-2015)

Psychological Domain Deficit	Age Group				Spearman Corr with Age	Spearman Corr p-value	Increase with Age	% increasing with age
	45-54	55-64	65-74	75-85				
Self-rated mental health	0.286	0.273	0.250	0.273	-0.036	<.0001	N	3.3%
Mood disorder	0.190	0.201	0.162	0.102	-0.081	<.0001	N	
Anxiety disorder	0.100	0.099	0.081	0.052	-0.058	<.0001	N	
Post-traumatic stress disorder	0.067	0.057	0.039	0.027	-0.066	<.0001	N	
SWLS scale: Satisfied with life	0.203	0.200	0.171	0.167	-0.057	<.0001	N	
SWLS scale: Life close to ideal	0.269	0.267	0.238	0.244	-0.038	<.0001	N	
SWLS scale: Have important things in life	0.252	0.255	0.233	0.237	-0.026	<.0001	N	
SWLS scale: Would change almost nothing about life	0.171	0.168	0.150	0.152	-0.019	0.001	N	
SWLS scale: Life conditions excellent	0.368	0.362	0.355	0.343	-0.026	<.0001	N	
CES-D 10 scale: Frequency feel fearful or tearful	0.133	0.125	0.112	0.114	-0.051	<.0001	N	
CES-D 10 scale: Frequency feel happy	0.175	0.169	0.148	0.142	-0.069	<.0001	N	
CES-D 10 scale: Frequency feel could not get going	0.160	0.165	0.153	0.180	0.003	0.603	N	
CES-D 10 scale: Frequency trouble concentrating	0.232	0.211	0.193	0.212	-0.052	<.0001	N	
CES-D 10 scale: Frequency feel depressed	0.102	0.101	0.087	0.085	-0.044	<.0001	N	
CES-D 10 scale: Frequency feel everything is an effort	0.168	0.162	0.153	0.178	-0.008	0.159	N	
CES-D 10 scale: Frequency sleep is restless	0.387	0.392	0.374	0.369	-0.027	<.0001	N	
CES-D 10 scale: Frequency easily bothered	0.170	0.154	0.139	0.157	-0.043	<.0001	N	
CES-D 10 scale: Frequency feel hopeful about the future	0.188	0.180	0.164	0.181	-0.045	<.0001	N	
CES-D 10 scale: Frequency feel lonely	0.118	0.132	0.125	0.151	0.023	<.0001	N	
K10 scale: Frequency tired out	0.242	0.227	0.219	0.246	-0.014	0.022	N	
K10 scale: Frequency nervous	0.214	0.181	0.151	0.135	-0.150	<.0001	N	
K10 scale: Frequency could not calm down	0.041	0.033	0.028	0.025	-0.062	<.0001	N	
K10 scale: Frequency hopeless	0.067	0.058	0.047	0.051	-0.057	<.0001	N	
K10 scale: Frequency restless or fidgety	0.204	0.185	0.143	0.126	-0.143	<.0001	N	
K10 scale: Frequency can not sit still	0.085	0.070	0.050	0.038	-0.122	<.0001	N	
K10 scale: Frequency of depression	0.132	0.123	0.107	0.110	-0.052	<.0001	N	

Supplementary Tables and Figures

Psychological Domain Deficit	Age Group				Spearman Corr with Age	Spearman Corr p-value	Increase with Age	% increasing with age
	45-54	55-64	65-74	75-85				
K10 scale: Frequency everything an effort	0.158	0.146	0.137	0.158	-0.024	<.0001	N	
K10 scale: Frequency nothing can cheer up	0.043	0.037	0.031	0.027	-0.054	<.0001	N	
K10 scale: Frequency feeling worthless	0.049	0.046	0.041	0.050	-0.009	0.111	N	
K10 scale: Physical health problems caused by feelings	0.127	0.140	0.149	0.166	0.051	<.0001	Y	

Supplementary Tables and Figures

Table S2c. Average deficit value by age group and Spearman correlation results for 17 cognitive frailty deficits at baseline (2011-2015)

Cognitive Domain Deficit	Age Group				Spearman Corr with Age	Spearman Corr p-value	Increase with Age	% increasing with age
	45-54	55-64	65-74	75-85				
Dementia or Alzheimer's disease	0.000	0.002	0.002	0.006	0.037	<.0001	Y	82.4%
Memory problem	0.015	0.015	0.015	0.028	0.025	<.0001	Y	
Stroke or CVA	0.005	0.013	0.022	0.037	0.079	<.0001	Y	
TIA	0.009	0.019	0.039	0.082	0.134	<.0001	Y	
Multiple Sclerosis	0.008	0.009	0.006	0.002	-0.023	<.0001	N	
Parkinsonism	0.001	0.003	0.005	0.009	0.040	<.0001	Y	
Epilepsy	0.013	0.012	0.009	0.009	-0.016	0.006	N	
REYI Cognitive Impairment	0.117	0.155	0.226	0.378	0.307	<.0001	Y	
REYII Cognitive Impairment	0.152	0.199	0.273	0.419	0.318	<.0001	Y	
AFT Score	0.138	0.174	0.265	0.393	0.319	<.0001	Y	
MAT score	0.141	0.172	0.238	0.346	0.252	<.0001	Y	
Stroop	0.095	0.145	0.215	0.287	0.265	<.0001	Y	
PMT Event	0.056	0.068	0.093	0.080	0.056	<.0001	Y	
TMT Time	0.103	0.127	0.077	0.088	-0.023	<.0001	N	
FAS score - F	0.201	0.218	0.263	0.306	0.125	<.0001	Y	
FAS score - A	0.172	0.189	0.237	0.288	0.146	<.0001	Y	
FAS score - S	0.182	0.212	0.256	0.311	0.158	<.0001	Y	

Average value <0.01 for all age groups

Supplementary Tables and Figures

Table S2d. Average deficit value by age group and Spearman correlation results for 39 social frailty deficits at baseline (2011-2015)

Social Domain Deficit	Age Group				Spearman Corr with Age	Spearman Corr p-value	Increase with Age	% increasing with age
	45-54	55-64	65-74	75-85				
Social participation: Desire to participate in more activities (Past Year)	0.431	0.482	0.595	0.636	0.160	<.0001	Y	71.8%
Social participation: Family or Friendship activities	0.065	0.069	0.073	0.097	0.036	<.0001	Y	
Social participation: Church or religious activities & Educational and cultural activities	0.336	0.321	0.279	0.259	-0.064	<.0001	N	
Social participation: Sports or physical activities & Other recreational activities or hobbies	0.112	0.131	0.136	0.176	0.056	<.0001	Y	
Social participation: Service club or fraternal organization & Neighborhood, community, or professional activities & Volunteer or charity work	0.499	0.476	0.388	0.355	-0.118	<.0001	N	
Social support: Someone to help you if you were confined to bed	0.054	0.068	0.072	0.108	0.064	<.0001	Y	
Social support: Someone you can count on to listen to you when you need to talk	0.022	0.031	0.033	0.047	0.042	<.0001	Y	
Social support: Someone to give you advice about a crisis	0.035	0.048	0.065	0.089	0.082	<.0001	Y	
Social support: Someone to take you to the doctor if needed	0.045	0.047	0.044	0.060	0.013	0.019	Y	
Social support: Someone who shows you love and affection	0.023	0.032	0.032	0.043	0.034	<.0001	Y	
Social support: Someone to have a good time with	0.022	0.033	0.031	0.047	0.040	<.0001	Y	
Social support: Someone to give you information in order to help you	0.023	0.036	0.039	0.055	0.052	<.0001	Y	

Supplementary Tables and Figures

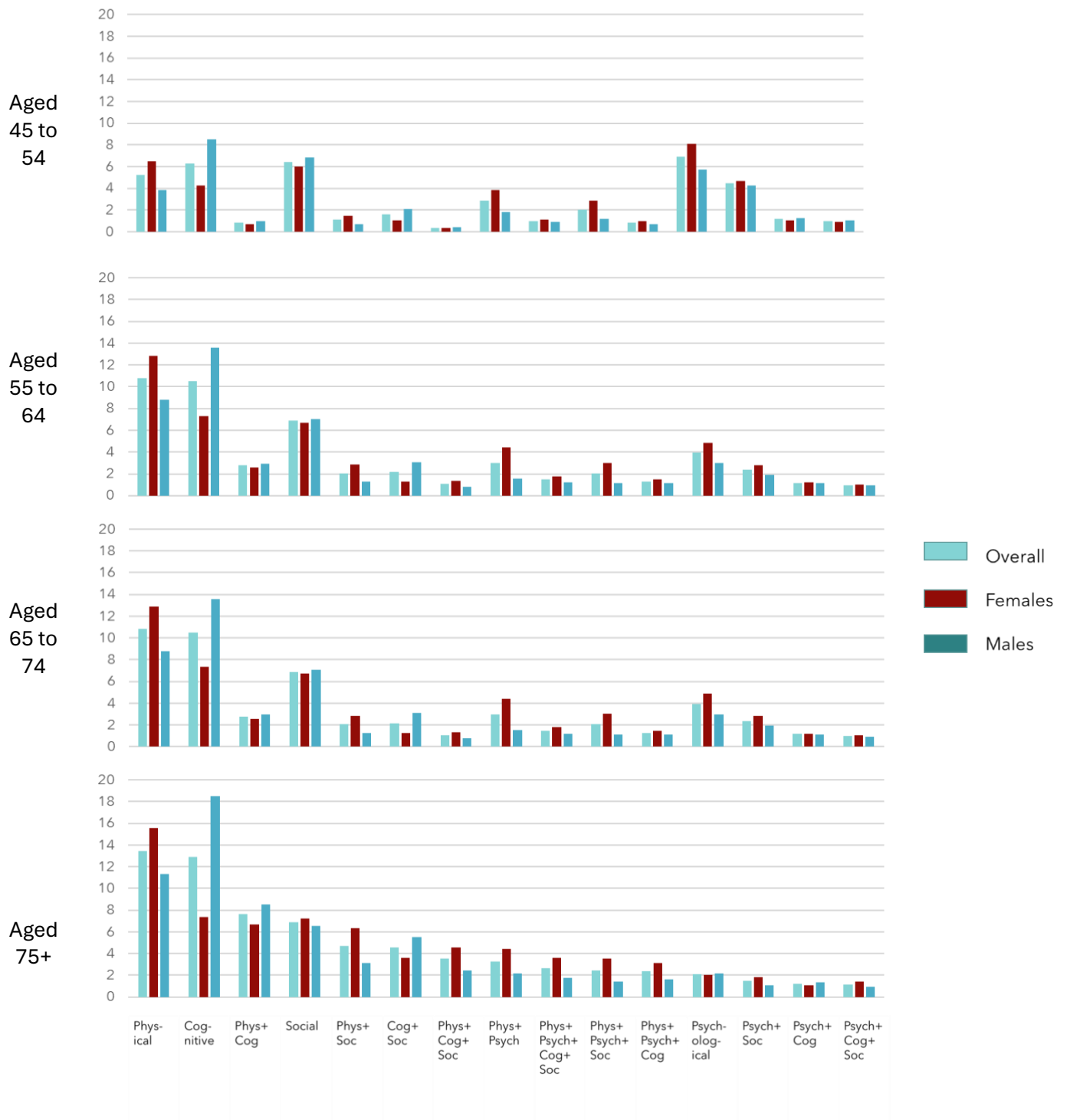
Social Domain Deficit	Age Group				Spearman Corr with Age	Spearman Corr p-value	Increase with Age	% increasing with age
	45-54	55-64	65-74	75-85				
Social support: Someone to confide in or talk to about yourself or your problems	0.041	0.056	0.064	0.093	0.070	<.0001	Y	
Social support: Someone who hugs you	0.058	0.083	0.080	0.103	0.052	<.0001	Y	
Social support: Someone to get together with for relaxation	0.045	0.055	0.046	0.064	0.021	0.0004	Y	
Social support: Someone to prepare your meals if you were unable to do it yourself	0.080	0.103	0.103	0.155	0.068	<.0001	Y	
Social support: Someone whose advice you really want	0.056	0.074	0.087	0.121	0.078	<.0001	Y	
Social support: Someone to do things with to help you get your mind off things	0.053	0.067	0.068	0.106	0.061	<.0001	Y	
Social support: Someone to help with daily chores if you were sick	0.083	0.100	0.098	0.127	0.043	<.0001	Y	
Social support: Someone to share your most private worries and fears with	0.075	0.103	0.110	0.173	0.095	<.0001	Y	
Social support: Someone to turn to for suggestions about how to deal with a personal problem	0.042	0.064	0.071	0.113	0.088	<.0001	Y	
Social support: Someone to do something enjoyable with	0.025	0.036	0.031	0.043	0.028	<.0001	Y	
Social support: Someone who understands your problems	0.049	0.063	0.059	0.095	0.054	<.0001	Y	
Social support: Someone to love you and make you feel wanted	0.040	0.057	0.052	0.061	0.026	<.0001	Y	
Social network: Last get together with children, siblings, relatives, close friends, or neighbours	0.141	0.206	0.217	0.219	0.259	<.0001	Y	
Living Alone	0.114	0.197	0.271	0.382	0.222	<.0001	Y	
Marital Status	0.243	0.286	0.327	0.447	0.141	<.0001	Y	

Supplementary Tables and Figures

Social Domain Deficit	Age Group				Spearman Corr with Age	Spearman Corr p-value	Increase with Age	% increasing with age
	45-54	55-64	65-74	75-85				
Feel a part of local area	0.074	0.068	0.054	0.051	-0.039	<.0001	N	
Vandalism or graffiti are a big problem in local area	0.077	0.065	0.059	0.055	-0.032	<.0001	N	
Often feel lonely living in local area	0.072	0.070	0.065	0.075	-0.001	0.807	N	
Most people in local area can be trusted	0.047	0.041	0.039	0.035	-0.022	0.000	N	
People would be afraid to walk alone after dark in local area	0.093	0.101	0.114	0.153	0.060	<.0001	Y	
Most people in local area are friendly	0.023	0.018	0.021	0.021	-0.003	0.630	N	
People in local area will take advantage of you	0.036	0.030	0.032	0.031	-0.010	0.102	N	
Local area is kept very clean	0.046	0.037	0.036	0.027	-0.032	<.0001	N	
Lots of people in local area who would help if in trouble	0.057	0.046	0.041	0.040	-0.030	<.0001	N	
Self-rated social standing	0.080	0.090	0.081	0.105	0.020	0.001	Y	
Education	0.022	0.033	0.069	0.123	0.150	<.0001	Y	
Income satisfies basic needs	0.159	0.147	0.132	0.130	-0.044	<.0001	N	

Supplementary Tables and Figures

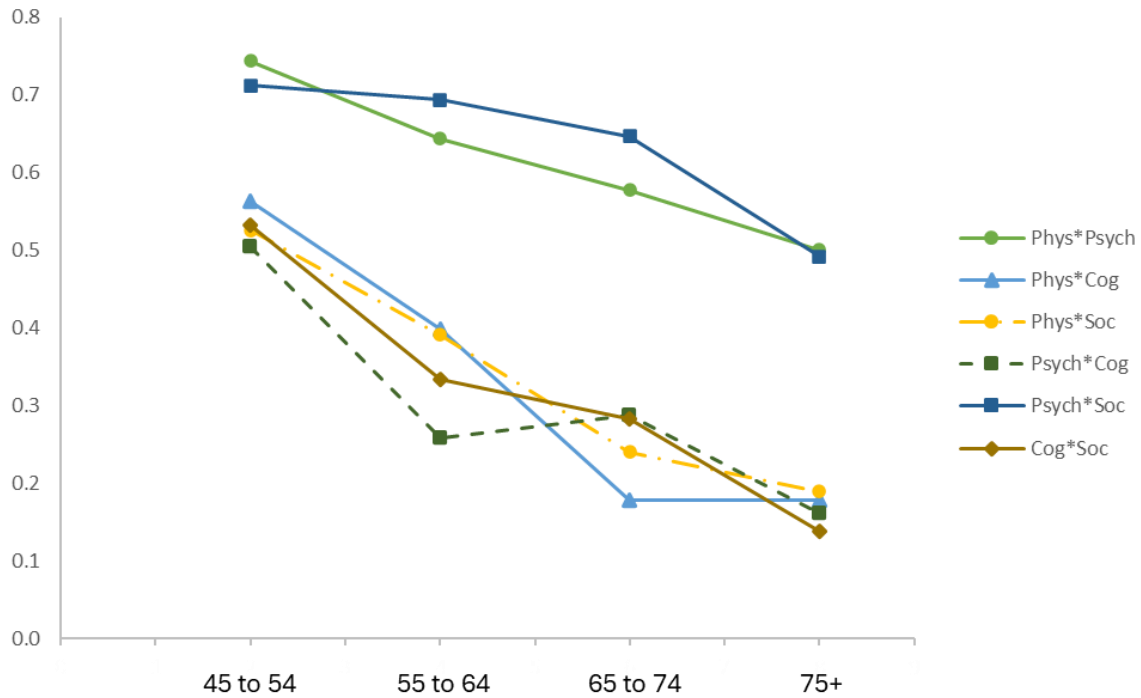
Figure S1: Percentage of CLSA participants (2010-2015) in each combination of frailty domains, stratified by sex and age



Supplementary Tables and Figures

Figure S2: Goodman and Kruskal's Gamma measuring agreement between each combination of binary frailty domains (highest quintile of frailty vs. not) for females (2a) and males (2b) in the CLSA from 2010-2015

2a.



2b.

