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Appendix A. Sample demographics

Table A1. Demographic characteristics of the unweighted sample

	Sample		
	Total n=36,701	Male n=19,379 (53%)	Female n=17,322 (47%)
Age	61.63 (9.94)	62.14 (10.10)	61.07 (9.76)
Cultural/racial background			
European	34,837 (95%)	18,316 (95%)	16,521 (95%)
Non-European	1,397 (4%)	803 (4%)	594 (3%)
Multiple origins	429 (1%)	232 (1%)	197 (1%)
Marital status			
In a relationship	26,162 (71%)	15,271 (79%)	10,891 (63%)
Widowed	2,987 (8%)	859 (4%)	2,201 (13%)
Divorced/separated	4,361 (12%)	1,687 (9%)	2,674 (15%)
Single	2,702 (7%)	1,297 (7%)	1,405 (8%)
Had a fall in the previous 12 months (Yes)	3,550 (10%)	1,665 (9%)	1,885 (5%)
Diagnosed with a chronic medical condition			
Cancer	5,006 (14%)	2,601 (13%)	2,405 (14%)
Cardiovascular	15,116 (41%)	8,787 (24%)	6,329 (37%)
Diabetes	5,392 (15%)	3,325 (17%)	2,067 (12%)
Mental health	6,116 (17%)	2,554 (13%)	3,562 (21%)
Musculoskeletal	17,580 (48%)	8,432 (44%)	9,148 (53%)
Neurological	1,923 (5%)	1,112 (6%)	811 (5%)
Respiratory	5,237 (14%)	2,490 (13%)	2,747 (16%)
Vision	9,375 (26%)	4,715 (24%)	4,660 (27%)
Number of medications			
None	7,493 (20%)	4,302 (22%)	3,191 (18%)
One	5,881 (16%)	3,083 (16%)	2,798 (16%)
Two	4,974 (14%)	2,609 (13%)	2,365 (14%)
3+	18,263 (50%)	9,334 (48%)	8,929 (52%)
Smoking behaviour			
Current smoker	3,045 (8%)	1,583 (8%)	1,462 (9%)
Former smoker	21,918 (60%)	12,365 (64%)	9,553 (55%)
Never smoked	11,549 (32%)	5,326 (28%)	6,223 (36%)
Self-reported general health			
Excellent	8,225 (22%)	4,084 (21%)	4,141 (24%)
Very good	15,914 (43%)	8,113 (42%)	7,801 (45%)
Good	10,113 (28%)	5,719 (30%)	4,394 (25%)
Fair	2,129 (6%)	1,274 (7%)	855 (5%)
Poor	297 (<1%)	176 (<1%)	121 (<1%)

	Sample		
	Total n=36,701	Male n=19,379 (53%)	Female n=17,322 (47%)
Education			
Less than secondary school graduation	2,013 (5%)	1,058 (5%)	955 (6%)
Secondary school graduation	3,875 (11%)	1,879 (10%)	1,966 (10%)
Some post-secondary education	2,577 (7%)	1,339 (7%)	1,238 (6%)
Post-secondary degree/diploma	28,165 (77%)	15,057 (78%)	13,208 (68%)
Household income			
less than \$20,000	1,387 (4%)	538 (3%)	849 (5%)
\$20,000 or more, but less than \$50,000	7,551 (21%)	3,443 (18%)	4,108 (24%)
50,000 or more, but less than \$100,000	12,621 (34%)	6,893 (36%)	5,728 (33%)
\$100,000 or more, but less than \$150,000	7,009 (19%)	4,049 (21%)	2,960 (17%)
\$150,000 or more	6,026 (16%)	3,623 (19%)	2,403 (14%)
Missing	2,107 (6%)	833 (4%)	1,274 (7%)
Type of dwelling			
House (detached, semi-detached, duplex or townhouse)	31,008 (85%)	16,662 (86%)	14,343 (83%)
Apartment or condominium	5,378 (15%)	2,569 (13%)	2,812 (16%)
Other	307 (<1%)	143 (1%)	164 (1%)
Classified as living in rural area	5,067 (14%)	2,659 (14%)	2,408 (14%)
Greenspace (Normalized difference vegetation index)			
Mean of NDVI within 500 m	0.42 (0.12)	0.42 (0.12)	0.41 (0.12)
Neighborhood safety			
Local area is kept very clean (agreed)	35,195 (96%)	18,564 (96%)	16,631 (96%)
People would be afraid to walk alone after dark in local area (agreed)	3,396 (9%)	1,302 (7%)	2,094 (12%)
Vandalism or graffiti are a big problem in local area (agreed)	2,068 (6%)	1,077 (6%)	991 (6%)
Physical activity (Total PASE score)	150.81 (74.88)	158.95 (77.69)	141.70 (70.51)
Physical represent last 12 months			
Agreed	24,996 (68%)	13,681 (71%)	11,315 (65%)
Neither	779 (2%)	405 (2%)	374 (2%)
Disagreed	10,805 (29%)	5,227 (27%)	5,577 (32%)
Season of physical activity measurement			
Winter (Jan-Mar)	6,659 (18%)	3,514 (18%)	3,145 (18%)
Spring (Apr-Jun)	10,262 (28%)	5,445 (28%)	4,817 (28%)
Summer (Jul-Sept)	10,688 (29%)	5,672 (29%)	5,016 (29%)
Autumn (Oct-Dec)	9,092 (25%)	4,748 (25%)	4,344 (25%)
Missing values were only recorded when greater than or equal to 5% of data were missing. Footnote: NDVI metrics, indexed to DMTI Spatial Inc. postal codes, were provided by CANUE (Canadian Urban Environmental Health Research Consortium).			

	Sample		
	Total n=36,701	Male n=19,379 (53%)	Female n=17,322 (47%)
1.USGS Landsat 5 TM TOA Reflectance (Orthorectified), 1984 to 2011, accessed July 2017, from https://explorer.earthengine.google.com/#detail/LANDSAT%2FL5_L1T_TOA . 2.USGS Landsat 8 TOA Reflectance (Orthorectified), 2013 to 2017, accessed July 2017, from https://explorer.earthengine.google.com/#detail/LANDSAT%2FL8_L1T_TOA . 3.Landsat 5 TM Annual Greenest-Pixel TOA Reflectance Composite, 1984 to 2012, accessed July 2017, from https://explorer.earthengine.google.com/#detail/LANDSAT%2FL5_L1T_ANNUAL_GREENEST_TOA . 4.Landsat 8 Annual Greenest-Pixel TOA Reflectance Composite, 2013 to 2015, accessed July 2017, from https://explorer.earthengine.google.com/#detail/LANDSAT%2FL8_L1T_ANNUAL_GREENEST_TOA . 5.CanMap Postal Code Suite v2015.3. [computer file] Markham: DMTI Spatial Inc., 2015. 6.Gorelick N, Hancher M, Dixon M, Ilyushchenko S, Thau D, Moore R. Google Earth Engine: Planetary-scale geospatial analysis for everyone. Remote Sensing of Environment. 2017;202:18-27.			

Table A2: Sample size per age and sex group

Age	Total	Male	Female	Age	Total	Male	Female	Age	Total	Male	Female
44	5	1	4	59	1285	665	620	74	528	251	277
45	449	224	225	60	1331	663	668	75	744	315	429
46	723	366	357	61	1261	559	702	76	761	326	435
47	842	424	418	62	1317	583	734	77	712	305	407
48	919	469	450	63	1349	651	698	78	547	238	309
49	1172	560	612	64	1260	555	705	79	581	244	337
50	1252	597	655	65	1199	593	606	80	461	199	262
51	1296	642	654	66	1036	493	543	81	383	147	236
52	1299	654	645	67	951	447	504	82	331	128	203
53	1380	687	693	68	994	445	549	83	255	101	154
54	1478	724	754	69	891	381	510	84	196	84	112
55	1083	558	525	70	793	359	434	85	130	57	73
56	1094	579	515	71	737	318	419	86	20	7	13
57	1141	573	568	72	652	281	371	87	1	0	1
58	1277	610	667	73	583	257	326	88	2	2	0

Appendix B: Inclusion/exclusion criteria validation

Table B1: Independent t-test results PASE scores based on sample criteria for females and males.

	Met inclusion criteria Mean (SD)	Did not meet inclusion criteria Mean (SD)	Significantly different t-value (DF) p-value
Total	150.81 (74.88)	110.12 (67.73)	t=52.861 (18,320), p<0.001
Females	141.70 (70.51)	105.40 (64.11)	t=38.279 (13,346), p<0.001
Males	158.95 (77.69)	118.64 (73.06)	t=30.511 (5,463.4), p<0.001

Appendix C: Results from sex stratification model building

Table C1: Generalized Akaike Information Criteria (GAIC) values for *realline* and *realplus* of distributions tested for males

Distribution name (acronym)	Male GAIC values
Sinh-archsinh – identity link (SHASH)	221923.33
Skew power exponential type 2 (SEP2)	221926.17
Skew power exponential type 1 (SEP1)	221937.9
Sinh-archsinh – origin link (SHASHo)	221947.04
Sinh-archsinh – origin link 2 (SHASHo2)	221947.04
Skew t distribution type 1 (ST1)	221951.17
Skew t distribution type 2 (ST2)	221951.17
Skew power exponential type 3 (SEP3)	222000.44
Skew normal type 2 (SN2)	222005.02
Skew t distribution type 3 (ST3)	222006.96
Skew t distribution – reparametrized (SST)	222006.96
Skew power exponential type 4 (SEP4)	222020.93
Johnson’s Su – identify link (JSU)	222025.9
Johnson’s Su – origin link (JSUo)	222025.93
Skew t distribution type 5 (ST5)	222062.45
Reverse Gumbel (RG)	222203.24
Ex-Gaussian (exGAUS)	222339.62
Skew t distribution type 4 (ST4)	222966.67
Generalized t (GT)	223586.41
T-family (TF)	223633.85
T-family 2 (TF2)	223633.85
Power exponential (PE)	223684.77
Power exponential 2 (PE2)	223684.77
Normal (NO)	223701.52
Skew normal type 1 (SN1)	223703.52
Logistic (LO)	223825.62
Normal exponential t (NET)	224597.09
Gumbel (GU)	231015.55
Exponential (EXP)	235207.66
Pareto – identify link (PARETO2)	235209.67
Pareto – origin link (PARETO2o)	235209.74

Green = top 5

Table C2: Generalized Akaike Information Criteria (GAIC) values for *realline* and *realplus* of distributions tested for females

Distribution name (acronym)	Female GAIC values
Skew power exponential type 4 (SEP4)	194251.45
Johnson's Su – identify link (JSU)	194267.14
Johnson's Su – origin link (JSUo)	194267.15
Skew t distribution type 1 (ST1)	194305.75
Skew t distribution type 5 (ST5)	194306.28
Skew t distribution type 2 (ST2)	194307.16
Reverse Gumbel (RG)	194323.8
Skew power exponential type 1 (SEP1)	194331.85
Sinh-archsinh – identity link (SHASH)	194332.21
Skew power exponential type 2 (SEP2)	194334.78
Skew t distribution type 3 (ST3)	194366.01
Skew t distribution – reparametrized (SST)	194366.01
Sinh-archsinh – origin link (SHASHo)	194399.65
Sinh-archsinh – origin link 2 (SHASHo2)	194399.65
Skew power exponential type 3 (SEP3)	194404.61
Skew normal type 2 (SN2)	194420.56
Ex-Gaussian (exGAUS)	194560.91
Skew t distribution type 4 (ST4)	195215.73
Generalized t (GT)	196061.99
T-family (TF)	196155.51
T-family 2 (TF2)	196155.51
Logistic (LO)	196236.05
Power exponential (PE)	196359.57
Power exponential 2 (PE2)	196359.57
Normal (NO)	196595.63
Skew normal type 1 (SN1)	196597.63
Normal exponential t (NET)	196780.79
Exponential (EXP)	206261.77
Pareto – identify link (PARETO2)	206263.8
Pareto – origin link (PARETO2o)	206263.88
Gumbel (GU)	206433.16

Green = top 5

Table C3: Ranking of top combinations by the Generalized Akaike Information Criteria of distributions and smoothing techniques in **males** using degrees of penalization for model complexity

Distribution	Smoothing technique	Degrees of freedom	Degree of penalty for model complexity							
			k=2		k=3.84		k=5		k=9	
			Ranking	GAIC	Ranking	GAIC	Ranking	GAIC	Ranking	GAIC
SHASHo2	cs	24.0	1	217934.95	1	217979.11	1	218006.95	1	218102.96
SHASH	cs	24.0	2	217936.03	2	217980.20	2	218008.04	2	218104.05
SHASHo	fp	24.0	3	217963.19	3	218007.35	3	218035.19	3	218131.19
SEP2	cs	24.0	4	217965.11	4	218009.27	4	218037.11	4	218133.11
SHASH	fp	24.0	5	217981.07	5	218025.23	5	218053.07	5	218149.07
SEP2	fp	24.0	6	217995.72	6	218039.88	6	218067.72	6	218163.71
SEP1	fp	24.0	7	217998.44	7	218042.60	7	218070.44	7	218166.44
SHASHo2	fp	24.0	8	218003.18	8	218047.34	8	218075.18	8	218171.18
SHASH	pb	17.6	9	218058.25	9	218090.65	9	218111.08	9	218181.51
SHASHo2	pb	17.1	10	218073.36	11	218104.83	11	218124.66	11	218193.06
SHASHo	pb	17.1	11	218073.78	12	218105.22	12	218125.04	12	218193.37
SEP1	pb	15.2	12	218075.75	10	218103.70	10	218121.32	10	218182.08
SEP1	cs	24.0	13	218249.73	13	218293.89	13	218321.73	13	218417.74
SEP2	pb	18.4	14	218730.57	14	218764.49	14	218785.88	15	218859.63
NO	pb	15.6	15	218768.37	15	218797.08	15	218815.19	16	218877.62
NO	cs	12.0	16	218774.00	16	218796.08	16	218810.00	14	218858.00
NO	fp	12.0	17	218851.16	17	218873.24	17	218887.16	17	218935.16

Table C4: Ranking of top combinations by the Generalized Akaike Information Criteria of distributions and smoothing techniques in females using degrees of penalization for model complexity

Distribution	Smoothing technique	Degrees of freedom	Degree of penalty for model complexity							
			k=2		k=3.84		k=5		k=9	
			Ranking	GAIC	Ranking	GAIC	Ranking	GAIC	Ranking	GAIC
SEP4	cs	20.0	1	200685.60	1	200722.41	1	200745.61	1	200825.61
SEP4	fp	20.0	2	200723.51	2	200760.31	2	200783.51	3	200863.51
JSU	pb	13.9	3	200744.36	3	200769.89	3	200785.99	2	200841.50
SEP4	pb	16.1	4	200766.75	4	200797.23	4	200816.44	4	200882.71
JSUo	cs	20.0	5	200779.68	5	200816.49	5	200839.69	5	200919.69
JSUo	fp	20.0	6	200788.30	6	200825.10	6	200848.30	6	200928.30
ST5	fp	20.0	7	200820.59	7	200857.39	7	200880.59	8	200960.59
ST1	fp	20.0	8	200829.59	8	200866.39	8	200889.59	10	200969.59
ST1	pb	11.4	9	200875.78	9	200896.79	9	200910.03	7	200955.68
JSUo	pb	10.2	10	200894.44	10	200913.24	10	200925.09	9	200965.95
ST5	pb	10.0	11	202508.46	11	202526.86	11	202538.46	11	202578.46
ST5	cs	20.0	12	200921.75	12	200958.56	12	200981.76	12	201061.77
NO	pb	16.0	13	202434.58	13	202464.06	13	202482.64	13	202546.72
NO	cs	10.0	14	202508.46	14	202526.86	14	202538.46	14	202578.46
NO	fp	10.0	15	202554.89	15	202573.29	15	202584.89	15	202624.89
JSU	fp	20.0	16	2962644.2	16	2962681.0	16	2962704.2	16	2962784.2
JSU	cs	20.0	17	3090191.0	17	3090227.8	17	3090251.0	17	3090331.0

Table C5: Cross-validation results

	Average percent of observed participants above and below thresholds from cross-validation									
	Sex	Threshold for comparison of observed vs. expected	GAMLSS		Quantile regression					
			SHASHo2cs	SEP4cs	Age only	Polynomial models			Smoothed using “arqss”	Fractional polynomials
						Second order	Third order	Fourth order		
All Year	Males	<5%	5.01		4.87	4.87	4.80	4.80	4.09	4.90
		<50%	50.36		51.66	51.66	51.76	51.74	51.48	51.73
		>95%	4.59		4.19	4.19	4.17	4.18	4.24	4.19
	Females	<5%		5.10	4.84	4.84	4.87	4.86	4.81	4.88
		<50%		49.31	49.18	49.18	49.20	49.16	49.21	49.18
		>95%		4.50	5.18	5.18	5.20	5.20	5.18	5.18

Appendix D: Final percentiles tables for females and males

Table D1: Percentiles by age – Females

Age (years)	Female Total PASE Score Percentiles								
	Percentiles								
	5th	10th	20 th	25th	50th	75th	80 th	90th	95th
45	57	75	102	115	172	234	250	291	326
46	57	75	102	114	170	231	246	287	322
47	56	74	101	112	168	228	243	284	318
48	56	74	100	111	166	225	240	280	314
49	56	74	99	110	164	221	236	276	311
50	56	73	98	109	161	218	233	273	307
51	56	73	97	108	159	215	230	270	304
52	55	72	96	107	157	212	227	266	300
53	55	72	95	106	155	209	223	263	297
54	54	71	94	105	152	206	220	259	294
55	54	70	93	103	150	202	216	255	290
56	53	69	92	102	147	199	213	252	286
57	53	68	91	100	145	195	209	247	282
58	52	68	90	99	142	191	205	243	277
59	52	67	88	97	139	187	200	238	272
60	51	66	87	96	136	183	196	233	267
61	51	66	86	94	134	179	192	228	261
62	50	65	85	93	131	175	188	223	255
63	50	64	83	91	128	171	183	218	250
64	49	63	82	90	125	167	179	213	244
65	49	62	81	88	123	164	175	209	239
66	48	61	79	87	121	161	172	204	234
67	47	60	78	85	118	157	169	201	230
68	47	59	76	84	116	154	165	197	226
69	46	58	75	82	114	152	162	194	222
70	45	57	74	81	112	149	160	190	219
71	44	56	72	79	110	146	157	187	216
72	43	55	71	77	108	144	154	184	212
73	42	54	69	76	105	141	151	181	209
74	41	52	68	74	103	138	149	178	205
75	40	51	67	73	101	136	146	175	202
76	39	50	65	71	99	133	143	172	198
77	38	49	64	70	97	131	140	168	194
78	37	48	62	68	95	128	137	165	191
79	36	46	60	66	93	125	135	162	187
80	34	45	59	64	91	123	132	159	184
81	33	43	57	63	88	120	129	156	181
82	31	41	55	61	86	117	126	153	178
83	30	40	53	59	84	115	124	150	175
84	28	38	51	56	81	112	121	147	172
85	26	36	49	54	79	109	118	144	169

Table D2: Percentiles by age – Males

Age (years)	Male Total PASE Score Percentiles								
	Percentiles								
	5th	10th	20 th	25th	50th	75th	80 th	90th	95th
45	61	85	118	131	195	265	282	325	357
46	61	85	117	131	193	263	279	322	354
47	61	85	117	130	191	260	277	319	351
48	61	84	116	129	189	257	274	316	349
49	61	84	115	128	188	255	271	313	346
50	60	83	114	127	186	252	269	310	343
51	60	83	114	126	184	249	266	307	341
52	60	83	113	125	182	246	262	304	337
53	60	82	112	124	179	243	259	300	334
54	60	82	111	123	177	239	255	296	329
55	60	81	110	121	174	235	250	291	324
56	60	81	109	120	171	230	246	286	319
57	60	81	107	118	168	226	241	281	313
58	60	80	106	117	165	221	236	275	307
59	60	79	105	115	161	216	231	269	301
60	60	78	103	113	158	211	225	263	295
61	59	77	101	111	155	207	220	257	289
62	58	76	100	109	151	202	215	252	283
63	57	75	98	107	148	197	210	246	277
64	57	74	96	105	145	193	206	241	271
65	56	73	94	103	142	188	201	235	265
66	55	71	93	101	139	184	197	230	259
67	54	70	91	100	137	181	193	226	254
68	53	69	90	98	134	177	189	221	249
69	52	68	88	96	132	174	185	217	245
70	51	67	87	95	130	171	182	213	240
71	49	65	85	93	127	168	179	209	236
72	48	64	84	92	125	165	176	206	233
73	47	62	82	90	123	162	173	203	229
74	45	61	81	88	121	159	170	200	226
75	44	60	79	87	119	157	167	197	223
76	42	58	78	85	117	154	164	194	219
77	41	56	76	83	115	151	162	191	216
78	39	55	74	81	113	149	159	188	213
79	37	53	72	79	110	146	156	185	210
80	35	51	70	77	108	144	154	182	208
81	33	49	68	75	106	141	151	179	205
82	30	46	66	73	104	139	148	177	202
83	28	44	64	71	101	136	146	174	200
84	26	42	62	69	99	133	143	171	197
85	23	40	59	67	97	131	141	169	194

Appendix E: Results from sex and season stratification model buildingTable E1: Generalized Akaike Information Criteria (GAIC) values for *realline* and *realplus* of distributions tested

Distribution name (acronym)	GAIC values for Males			
	Winter	Spring	Summer	Fall
Normal (NO)	40401.00	62999.51	65363.10	54889.66
Gumbel (GU)	41686.41	64808.65	67687.93	56741.52
Reverse Gumbel (RG)	40059.52	62589.10	64980.40	54518.22
Logistic (LO)	40423.31	196236.05	65362.15	54922.69
Normal exponential t (NET)	40553.57	63061.73	65598.01	55098.63
T-family (TF)	40391.76	62997.39	65325.80	54869.70
T-family 2 (TF2)	40391.76	62997.39	65325.80	54869.70
Power exponential (PE)	40401.29	63000.73	65340.95	54889.02
Power exponential 2 (PE2)	40401.29	63000.73	65340.95	54889.02
Skew normal type 1 (SN1)	40403.00	63001.51	65365.10	54891.66
Skew normal type 2 (SN2)	40032.39	62525.32	64926.81	54469.37
Ex-Gaussian (exGAUS)	40100.30	62636.19	64976.73	54562.11
Sinh-archsinh – identity link (SHASH)	40012.82	62500.53	64899.60	54452.51
Sinh-archsinh – origin link (SHASHo)	40016.48	62508.10	64907.86	54458.05
Sinh-archsinh – origin link 2 (SHASHo2)	40016.49	62508.10	64907.86	54458.05
Johnson's Su – identify link (JSU)	40045.42	62544.02	64910.44	54478.05
Johnson's Su – origin link (JSUo)	40045.47	62544.02	64910.44	54478.05
Skew power exponential type 1 (SEP1)	40020.62	62506.44	64903.36	54455.73
Skew power exponential type 2 (SEP2)	40018.28	62503.39	64901.38	54452.66
Skew power exponential type 3 (SEP3)	40029.52	62527.28	64920.53	54470.49
Skew power exponential type 4 (SEP4)	40047.96	62535.87	64910.64	54478.88
Skew t distribution type 1 (ST1)	40022.22	62513.86	64903.89	54459.67
Skew t distribution type 2 (ST2)	40022.22	62513.86	64903.90	54459.67
Skew t distribution type 3 (ST3)	40034.39	62527.32	64925.63	54471.17
Skew t distribution type 4 (ST4)	40256.23	62826.16	65125.82	54713.75
Skew t distribution type 5 (ST5)	40054.18	62556.28	64916.34	54487.54
Skew t distribution – reparametrized (SST)	40034.39	62527.32	64925.63	54471.17
Generalized t (GT)	40375.89	62995.12	65325.67	54837.07
Pareto – identify link (PARETO2)	42301.44	66079.31	69144.43	57683.73
Pareto – origin link (PARETO2o)	42301.44	66079.28	69144.40	57683.73
Exponential (EXP)	42299.44	66077.28	69142.40	57681.73

Green = top 5

Table E2: Generalized Akaike Information Criteria (GAIC) values for *realline* and *realplus* of distributions tested

Distribution name (acronym)	GAIC values for Females			
	Winter	Spring	Summer	Fall
Normal (NO)	35501.81	54519.16	56780.97	49715.34
Gumbel (GU)	36695.82	57465.28	59906.61	51995.31
Reverse Gumbel (RG)	35100.30	53886.65	56160.64	49089.54
Logistic (LO)	35521.25	54394.31	56630.51	49615.23
Normal exponential t (NET)	35644.33	54550.62	56780.75	49734.97
T-family (TF)	35491.65	54373.72	56613.83	49598.59
T-family 2 (TF2)	35491.65	54373.72	56613.83	49598.59
Power exponential (PE)	35502.79	54434.17	56670.36	49655.10
Power exponential 2 (PE2)	35502.79	54434.17	56670.36	49655.10
Skew normal type 1 (SN1)	35503.81	54521.16	56782.97	49717.34
Skew normal type 2 (SN2)	35060.01	53932.57	56216.42	49112.11
Ex-Gaussian (exGAUS)	35159.94	53945.41	56192.14	49162.40
Sinh-archsinh – identity link (SHASH)	35049.56	53899.48	56164.48	49099.39
Sinh-archsinh – origin link (SHASHo)	35054.30	53923.10	56188.48	49116.27
Sinh-archsinh – origin link 2 (SHASHo2)	35054.30	53923.10	56188.48	49116.27
Johnson's Su – identify link (JSU)	35092.42	53872.51	56142.84	49078.70
Johnson's Su – origin link (JSUo)	35092.45	53872.52	56142.84	49078.70
Skew power exponential type 1 (SEP1)	35055.78	53902.58	56172.15	49094.88
Skew power exponential type 2 (SEP2)	35056.37	53904.75	56177.56	49094.97
Skew power exponential type 3 (SEP3)	35061.94	53926.35	56198.88	49113.14
Skew power exponential type 4 (SEP4)	35074.79	53872.01	56145.35	49068.19
Skew t distribution type 1 (ST1)	35058.20	53890.62	56157.32	49089.99
Skew t distribution type 2 (ST2)	35058.20	53891.28	56158.40	49090.23
Skew t distribution type 3 (ST3)	35062.01	53910.93	56181.79	49104.83
Skew t distribution type 4 (ST4)	35347.31	54113.55	56344.29	49344.36
Skew t distribution type 5 (ST5)	35108.08	53881.03	56145.40	49092.63
Skew t distribution – reparametrized (SST)	35062.01	53910.93	56181.79	49104.83
Generalized t (GT)	35460.58	54356.17	56606.71	49564.00
Pareto – identify link (PARETO2)	37060.78	66079.31	59962.43	51804.15
Pareto – origin link (PARETO2o)	37060.79	66079.28	59962.40	51804.14
Exponential (EXP)	37058.78	66077.28	59960.40	51802.14

Green = top 5

Table E3: Cross-validation results

	Average percent of observed participants above and below thresholds from cross-validation									
	Sex	Threshold for comparison of observed vs. expected	GAMLSS		Age only	Quantile regression			Smoot hed using “ <i>argss</i> ”	Fractio nal polyno mials
			SHASH o2cs	SEP4c s		Polynomial models				
						Second order	Third order	Fourth order		
All Year	Males	<5%	5.01		4.87	4.87	4.80	4.80	4.09	4.90
		<50%	50.36		51.66	51.66	51.76	51.74	51.48	51.73
		>95%	4.59		4.19	4.19	4.17	4.18	4.24	4.19
	Female s	<5%		5.10	4.84	4.84	4.87	4.86	4.81	4.88
		<50%		49.31	49.18	49.18	49.20	49.16	49.21	49.18
		>95%		4.50	5.18	5.18	5.20	5.20	5.18	5.18
Jan - Mar	Males	<5%	5.19		5.50	5.50	5.51	5.53	5.38	5.44
		<50%	50.66		51.01	51.01	50.88	50.95	50.94	50.96
		>95%	4.75		4.40	4.40	4.44	4.55	4.44	4.47
	Female s	<5%		4.69	4.91	4.91	4.88	4.93	4.66	4.95
		<50%		49.92	49.19	49.19	49.20	49.34	49.12	49.36
		>95%		4.16	5.18	5.18	5.17	5.16	5.02	5.06
Apr - Jun	Males	<5%	5.19		5.50	5.50	5.51	5.53	5.38	5.44
		<50%	50.66		51.01	51.01	50.88	50.95	50.94	50.96
		>95%	4.75		4.40	4.40	4.44	4.55	4.44	4.47
	Female s	<5%		5.02	4.73	4.73	4.74	4.72	4.61	4.71
		<50%		47.62	48.37	48.37	48.41	48.34	48.56	48.50
		>95%		4.75	5.43	5.43	5.44	5.44	5.30	5.39
Jul - Sept	Males	<5%	5.54		4.62	4.62	4.78	4.81	4.60	4.74
		<50%	50.35		51.88	51.88	51.74	51.84	51.94	51.84
		>95%	4.77		4.50	4.50	4.52	4.54	4.46	4.51
	Female s	<5%		5.26	5.17	5.17	5.17	5.20	5.04	5.20
		<50%		49.37	49.77	49.77	49.73	49.76	49.81	49.81
		>95%		5.08	5.26	5.26	5.31	5.31	5.27	5.27
Oct - Dec	Males	<5%	5.19		5.54	5.54	5.54	5.50	5.53	4.63
		<50%	50.16		51.54	51.54	51.56	51.59	51.46	51.38
		>95%	4.48		4.62	4.62	4.56	4.55	4.57	4.63
	Female s	<5%		4.49	4.90	4.90	4.94	4.84	4.81	4.91
		<50%		47.97	48.77	48.77	48.77	48.77	49.04	48.83
		>95%		5.05	5.25	5.25	5.29	5.37	5.15	5.31