

9) Future of the NLS-LSA

We will continue the NLS-LSA to investigate the natural course of aging and the changes that lead to disease. The participants were examined every 2 years. The cohort of the NLS-LSA is a dynamic cohort, that is, new subjects participate in the study instead of those who do not attend their next examination. Participants who move out of the area are to be followed up by telephone interview or postal questionnaire. Medical records of the participants who die during follow-up will be checked to find out the cause of death.

Extensive tests and examinations should be repeated in longitudinal studies on aging. It is actually impossible to repeat many tests and examinations in multiple research facilities with the same protocols and methods. Thus, there are almost no comprehensive longitudinal studies on aging that have been followed up for a long period by multi-center collaboration in the U.S. or other countries.

However, cohort studies with common end points such as dementia and disturbance of ADL are also important for aging studies. For these studies, a relatively large number of subjects and cases during follow-up will be required to get significant analysis results. We are collaborating with other research facilities in Japan and other countries as shown in Fig. 6.

Comparative studies of the aging process accounting for regional and cultural differences between northern and southern areas, or between urban and rural areas, are also important. In these comparative studies, the number of common examinations and tests should be limited. The study design should be a cross-sectional or short-term longitudinal study, considering the difficulties involved continuing and repeating the examinations in all facilities with same protocols.

We are going to make the results of this study public through the Internet. We hope that the outcomes from this large longitudinal study of aging can serve the development of health science on aging.

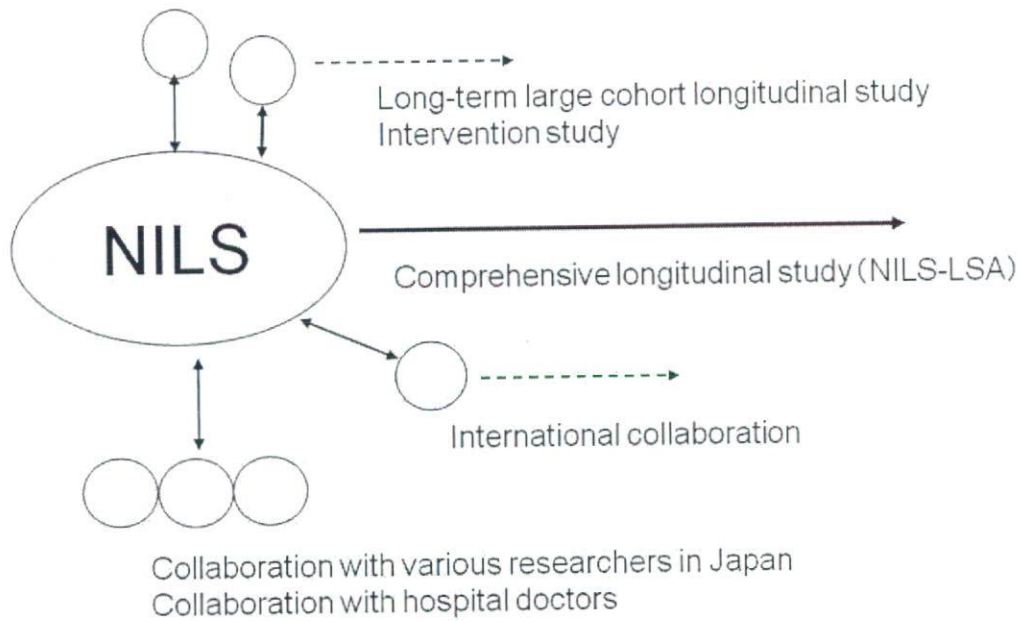


Fig. 6 Design of the longitudinal study by multi-center collaboration

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Anthropometry and Body Composition

Anthropometry and Body composition

- 1) Anthropometric measurements
Height, Weight, Length, Circumference
- 2) Body composition
(Dual energy x-ray absorptiometry, QDR4500A; Hologic)
- 3) Thickness of subcutaneous fat and thickness of muscle
(Ultrasound scanner, ECHOPAL; Hitachi Medical Corp.)
- 4) Intra-abdominal fat area and subcutaneous fat area at umbilicus level
(CT scan, SCT-6800TX; Shimadzu, Fat Scan; N2 Corp.)

1) Anthropometric measurements
Height, Weight, Length, Circumference

Height (cm)

	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	170.5	6.1	279	167.5	5.7	289	165.4	5.6	274	162.1	5.5	284	159.5	4.9	74	165.9	6.6	1200
Female	156.9	5.1	295	154.3	4.9	277	152.5	4.9	281	148.6	5.5	278	144.8	5.5	88	152.5	6.3	1219
Total	163.5	8.8	574	161.1	8.5	566	158.9	8.3	555	155.4	8.7	562	151.5	9.0	162	159.2	9.3	2419

Weight (kg)

	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	68.2	9.1	279	66.5	9.1	289	63.2	8.6	274	60.1	7.9	284	56.6	7.8	74	64.0	9.3	1200
Female	54.0	9.5	295	53.5	8.8	277	53.3	7.9	281	50.6	6.8	278	47.0	7.5	88	52.4	8.5	1219
Total	60.9	11.7	574	60.2	11.1	566	58.2	9.6	555	55.4	8.8	562	51.4	9.0	162	58.2	10.6	2419

Body mass index (kg/m²)

	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	23.4	2.7	279	23.7	2.7	289	23.1	2.7	274	22.9	2.7	284	22.2	2.7	74	23.2	2.7	1200
Female	21.9	3.6	295	22.5	3.5	277	22.9	3.2	281	22.9	2.9	278	22.4	3.4	88	22.5	3.3	1219
Total	22.7	3.3	574	23.1	3.1	566	23.0	3.0	555	22.9	2.8	562	22.3	3.1	162	22.9	3.1	2419

Trochanterion height (cm)

	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	81.3	3.9	279	79.7	3.8	289	78.6	3.7	274	77.8	3.4	284	77.1	3.1	74	79.2	3.9	1200
Female	76.1	3.3	295	74.4	3.0	277	74.0	3.2	281	72.4	3.2	278	71.4	3.4	87	74.0	3.5	1218
Total	78.6	4.4	574	77.1	4.3	566	76.2	4.2	555	75.1	4.3	562	74.0	4.3	161	76.6	4.5	2418

Waist circumference at midway (cm)

	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	82.0	7.7	279	83.6	7.9	289	82.7	8.2	274	83.2	8.4	284	81.0	9.1	74	82.8	8.1	1200
Female	71.2	9.0	295	73.6	9.2	277	75.5	8.9	281	76.9	8.4	278	75.4	9.4	88	74.3	9.2	1219
Total	76.5	10.0	574	78.7	9.9	566	79.1	9.3	555	80.1	9.0	562	77.9	9.6	162	78.5	9.6	2419

Waist circumference at umbilicus (cm)

	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	84.1	7.4	279	85.7	7.5	289	84.7	8.0	274	85.2	8.0	284	83.6	8.5	74	84.9	7.8	1200
Female	78.1	9.5	295	81.4	9.8	277	83.5	9.0	281	85.0	8.5	278	84.3	9.5	88	82.1	9.6	1219
Total	81.0	9.0	574	83.6	8.9	566	84.1	8.5	555	85.1	8.2	562	84.0	9.0	162	83.5	8.8	2419

Hip circumference (cm)

	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	94.8	4.8	279	93.7	4.8	289	91.5	4.8	274	90.2	4.6	284	88.9	4.8	74	92.3	5.1	1200
Female	91.8	6.1	295	91.3	5.9	277	90.2	5.2	281	88.8	4.8	278	87.6	5.7	88	90.3	5.7	1219
Total	93.2	5.7	574	92.5	5.5	566	90.9	5.0	555	89.5	4.7	562	88.2	5.3	162	91.3	5.5	2419

Thigh circumference at midway (cm)

	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	50.0	3.5	279	49.1	3.4	289	47.2	3.6	274	45.7	3.5	284	44.5	4.0	74	47.8	4.0	1200
Female	48.1	4.3	295	47.4	4.2	277	46.5	3.9	281	44.8	3.8	278	42.9	4.0	87	46.4	4.4	1218
Total	49.0	4.1	574	48.3	3.9	566	46.9	3.8	555	45.2	3.7	562	43.6	4.1	161	47.1	4.2	2418

Calf circumference (cm)

	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	36.9	2.6	279	36.5	2.5	289	35.3	2.6	274	34.1	2.4	284	33.5	2.6	74	35.6	2.8	1200
Female	34.5	3.0	295	34.2	2.6	277	33.8	2.6	281	32.5	2.2	278	31.8	2.4	88	33.6	2.8	1219
Total	35.7	3.0	574	35.4	2.8	566	34.5	2.7	555	33.4	2.5	562	32.6	2.6	162	34.6	2.9	2419

Upper-arm circumference (cm)

	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	29.0	2.4	279	28.9	2.2	289	28.1	2.2	274	26.9	2.2	284	25.9	2.4	74	28.1	2.5	1200
Female	26.4	3.1	295	26.7	2.8	277	27.0	2.5	281	26.4	2.7	278	25.2	2.7	88	26.5	2.8	1219
Total	27.7	3.1	574	27.8	2.8	566	27.5	2.4	555	26.7	2.4	562	25.6	2.6	162	27.3	2.8	2419

2) Body composition
Dual energy x-ray absorptiometry (DXA) (Hologic QDR-4500)

Head fat weight (kg)

	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	1.041	0.090	278	1.037	0.087	287	1.016	0.094	274	0.985	0.087	282	0.956	0.087	73	1.016	0.093	1194
Female	0.882	0.083	293	0.890	0.083	275	0.891	0.075	281	0.872	0.079	276	0.844	0.081	81	0.881	0.081	1206
Total	0.959	0.117	571	0.965	0.113	562	0.953	0.105	555	0.929	0.100	558	0.897	0.101	154	0.948	0.110	2400

Head lean weight (kg)

	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	4.100	0.338	278	4.076	0.312	287	3.992	0.340	274	3.864	0.329	282	3.748	0.317	73	3.992	0.346	1194
Female	3.566	0.308	293	3.525	0.309	275	3.479	0.274	281	3.375	0.281	276	3.252	0.290	81	3.472	0.307	1206
Total	3.826	0.419	571	3.806	0.415	562	3.732	0.401	555	3.622	0.391	558	3.487	0.391	154	3.731	0.418	2400

Left arm fat weight (kg)

	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	0.837	0.277	278	0.810	0.266	287	0.770	0.252	274	0.786	0.261	282	0.749	0.240	73	0.798	0.264	1194
Female	1.012	0.502	293	1.068	0.403	275	1.100	0.361	281	1.076	0.354	276	0.896	0.348	81	1.052	0.410	1206
Total	0.927	0.417	571	0.936	0.364	562	0.937	0.353	555	0.930	0.343	558	0.827	0.309	154	0.925	0.368	2400

Left arm lean weight (kg)

	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	3.076	0.439	278	3.020	0.381	287	2.841	0.376	274	2.614	0.349	282	2.395	0.348	73	2.858	0.439	1194
Female	1.837	0.303	293	1.797	0.276	275	1.777	0.230	281	1.681	0.221	276	1.579	0.203	81	1.761	0.267	1206
Total	2.440	0.724	571	2.421	0.697	562	2.302	0.616	555	2.153	0.551	558	1.966	0.496	154	2.306	0.658	2400

Right arm fat weight (kg)

	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	0.813	0.278	278	0.787	0.287	287	0.741	0.251	274	0.765	0.254	282	0.716	0.242	73	0.773	0.268	1194
Female	0.980	0.453	293	1.049	0.414	275	1.088	0.387	281	1.062	0.364	276	0.908	0.380	81	1.035	0.407	1206
Total	0.899	0.387	571	0.915	0.378	562	0.917	0.370	555	0.912	0.347	558	0.817	0.335	154	0.905	0.369	2400

Right arm lean weight (kg)

	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	3.362	0.469	278	3.316	0.434	287	3.107	0.435	274	2.838	0.372	282	2.586	0.361	73	3.121	0.489	1194
Female	2.036	0.324	293	2.000	0.295	275	1.979	0.255	281	1.852	0.257	276	1.727	0.245	81	1.952	0.296	1206
Total	2.682	0.775	571	2.672	0.756	562	2.536	0.666	555	2.350	0.588	558	2.134	0.527	154	2.533	0.711	2400

Trunk fat weight (kg)

	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	7.882	2.793	277	7.881	2.804	287	7.546	2.659	274	7.583	2.756	282	6.909	2.615	73	7.675	2.753	1193
Female	7.197	3.168	292	8.170	3.216	275	8.752	2.970	281	8.689	2.655	276	7.510	2.827	81	8.144	3.061	1205
Total	7.531	3.008	569	8.023	3.014	562	8.157	2.882	555	8.130	2.760	558	7.225	2.736	154	7.911	2.921	2398

Trunk lean weight (kg)

	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	25.986	2.997	277	25.838	2.971	287	24.616	2.776	274	23.034	2.607	281	21.797	2.573	72	24.686	3.135	1191
Female	19.246	2.487	291	18.724	2.315	275	18.210	2.072	281	17.149	1.877	276	16.345	1.989	80	18.211	2.364	1203
Total	22.533	4.348	568	22.357	4.448	562	21.373	4.030	555	20.118	3.720	557	18.928	3.555	152	21.432	4.264	2394

Left leg fat weight (kg)

	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	2.392	0.639	278	2.169	0.620	287	2.066	0.577	274	2.086	0.584	282	2.117	0.666	73	2.174	0.621	1194
Female	3.095	0.819	292	2.901	0.779	275	2.819	0.765	281	2.611	0.736	276	2.290	0.818	80	2.822	0.808	1204
Total	2.752	0.816	570	2.527	0.792	562	2.447	0.776	555	2.346	0.713	558	2.208	0.752	153	2.499	0.790	2398

Left leg lean weight (kg)

	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	8.486	1.114	278	8.211	1.094	287	7.623	1.011	274	7.049	0.915	282	6.553	0.971	73	7.764	1.203	1194
Female	5.800	0.976	292	5.602	0.839	275	5.443	0.758	281	5.013	0.599	276	4.779	0.623	80	5.423	0.860	1204
Total	7.110	1.702	570	6.935	1.631	562	6.519	1.409	555	6.042	1.279	558	5.626	1.199	153	6.589	1.569	2398

Right leg fat weight (kg)

	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	2.328	0.638	278	2.110	0.624	287	2.002	0.590	274	2.041	0.575	282	2.074	0.661	73	2.117	0.622	1194
Female	3.053	0.810	292	2.866	0.786	275	2.803	0.761	281	2.625	0.752	276	2.306	0.815	81	2.804	0.804	1205
Total	2.699	0.816	570	2.480	0.802	562	2.408	0.790	555	2.330	0.729	558	2.196	0.753	154	2.462	0.797	2399

Right leg lean weight (kg)

	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	8.667	1.127	278	8.400	1.109	287	7.833	1.021	274	7.263	0.940	282	6.771	0.938	73	7.964	1.207	1194
Female	5.946	1.014	292	5.769	0.843	275	5.624	0.778	281	5.142	0.648	276	4.913	0.673	81	5.577	0.890	1205
Total	7.273	1.731	570	7.113	1.646	562	6.714	1.429	555	6.214	1.334	558	5.793	1.232	154	6.765	1.596	2399

Total fat weight (kg)

	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	15286	4377	277	14799	4433	285	14141	4132	274	14123	4259	280	13522	4223	73	14523	4324	1189
Female	16182	5353	291	16954	5234	274	17453	4809	281	16904	4513	276	14724	4834	80	16724	5022	1202
Total	15745	4917	568	15855	4957	559	15818	4780	555	15504	4598	556	14150	4578	153	15629	4814	2391

Lean body weight (kg)

	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	53.7	6.0	277	52.8	5.8	285	50.0	5.5	274	46.7	5.1	278	43.8	5.0	72	50.4	6.4	1186
Female	38.4	5.1	291	37.4	4.6	274	36.5	4.0	281	34.2	3.5	275	32.6	3.6	80	36.4	4.7	1201
Total	45.9	9.4	568	45.3	9.3	559	43.2	8.3	555	40.5	7.6	553	37.9	7.1	152	43.3	9.0	2387

Percent body fat (%)

	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	21.9	4.1	277	21.6	4.0	285	21.7	4.3	274	23.0	4.7	280	23.1	5.2	73	22.1	4.4	1189
Female	29.1	5.1	291	30.6	5.1	274	31.9	4.9	281	32.7	5.2	276	30.5	5.8	80	31.0	5.3	1202
Total	25.5	5.9	568	26.0	6.4	559	26.8	6.9	555	27.8	6.9	556	27.0	6.6	153	26.6	6.6	2391

3) Thickness of subcutaneous fat, Thickness of muscle
(Ultrasound scanner, ECHOPAL; Hitachi Medical Corp.)

Thickness of subcutaneous fat at right of umbilicus (mm)

	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	17.2	6.4	279	16.2	5.2	289	14.4	5.1	274	14.2	5.1	284	13.1	5.4	74	15.4	5.6	1200
Female	18.7	8.8	295	20.9	8.5	277	21.6	7.6	281	20.8	7.5	278	16.9	7.4	87	20.2	8.2	1218
Total	18.0	7.8	574	18.5	7.4	566	18.1	7.4	555	17.5	7.2	562	15.2	6.8	161	17.8	7.4	2418

Thickness of musculus rectus abdominis at right of umbilicus (mm)

	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	11.1	1.9	279	10.5	1.9	289	9.8	2.0	274	9.1	1.7	284	8.3	2.0	74	10.0	2.1	1200
Female	8.5	1.8	295	7.8	1.6	277	7.6	1.6	281	7.3	2.3	278	6.7	1.9	87	7.7	1.9	1218
Total	9.7	2.2	574	9.2	2.2	566	8.7	2.1	555	8.2	2.2	562	7.4	2.1	161	8.9	2.3	2418

Thickness of subcutaneous fat at thigh (mm)

	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	6.8	2.0	279	6.1	2.0	289	5.6	1.7	274	5.6	1.9	284	5.8	2.1	74	6.0	2.0	1200
Female	10.8	2.8	295	10.3	2.7	276	9.5	2.8	281	8.6	3.1	278	7.2	2.8	87	9.6	3.0	1217
Total	8.9	3.2	574	8.1	3.2	565	7.6	3.0	555	7.1	3.0	562	6.5	2.6	161	7.8	3.2	2417

Thickness of musculus rectus femoris at thigh (mm)

	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	33.2	6.7	279	32.3	6.7	289	28.6	7.4	274	25.4	6.7	284	22.4	5.4	74	29.4	7.6	1200
Female	28.9	6.6	295	26.6	6.2	276	24.9	5.9	281	21.9	5.6	278	19.6	5.0	87	25.2	6.7	1217
Total	31.0	6.9	574	29.5	7.1	565	26.7	6.9	555	23.7	6.4	562	20.9	5.3	161	27.3	7.5	2417

Thickness of subcutaneous fat at anterior calf (mm)

	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	0.8	279	2.3	0.8	289	2.1	0.7	274	2.2	0.7	284	2.5	1.0	74	2.3	0.8	1200
Female	3.9	1.5	295	3.4	1.3	277	3.2	1.5	281	3.2	1.4	278	3.1	1.6	87	3.4	1.5	1218
Total	3.2	1.4	574	2.8	1.2	566	2.7	1.3	555	2.7	1.2	562	2.8	1.3	161	2.8	1.3	2418

Thickness of musculus tibialis anterior (mm)

	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	25.7	3.4	279	25.4	3.2	289	24.6	3.2	274	23.0	3.2	284	21.9	3.3	74	24.5	3.4	1200
Female	22.3	3.0	295	21.5	3.0	277	21.5	2.8	281	20.5	2.6	278	19.2	3.1	87	21.3	3.0	1218
Total	23.9	3.6	574	23.5	3.6	566	23.0	3.3	555	21.8	3.2	562	20.4	3.4	161	22.9	3.6	2418

Thickness of subcutaneous fat at upper-arm (mm)

	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	6.5	1.9	279	5.9	1.8	289	5.5	1.7	274	5.5	1.6	284	5.0	1.6	74	5.8	1.8	1200
Female	10.2	2.7	295	10.1	2.7	277	10.0	2.4	281	9.5	2.6	278	8.2	2.6	87	9.8	2.7	1218
Total	8.4	3.0	574	8.0	3.1	566	7.8	3.1	555	7.5	2.9	562	6.7	2.7	161	7.8	3.0	2418

Thickness of musculus triceps brachi (mm)

	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	23.4	5.1	279	23.6	5.0	289	22.0	5.5	274	19.2	4.9	284	17.1	4.2	74	21.7	5.5	1200
Female	18.1	4.7	295	18.3	4.6	277	18.1	4.3	281	17.5	4.3	278	15.8	4.5	87	17.8	4.5	1218
Total	20.7	5.6	574	21.0	5.5	566	20.0	5.3	555	18.3	4.7	562	16.4	4.4	161	19.8	5.4	2418

Thickness of subcutaneous fat at posterior mid-thigh (mm)

	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	5.7	1.6	279	5.1	1.5	289	4.8	1.6	274	4.8	1.4	284	4.9	1.6	74	5.1	1.6	1200
Female	9.3	3.0	295	8.4	3.0	277	7.7	2.9	281	7.3	3.0	278	6.5	2.8	87	8.1	3.1	1218
Total	7.6	3.0	574	6.7	2.9	566	6.3	2.7	555	6.0	2.6	562	5.8	2.5	161	6.6	2.9	2418

Thickness of subcutaneous fat at posterior calf (mm)

	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	5.0	1.3	278	4.3	1.4	289	4.1	1.3	274	4.2	1.2	284	4.6	1.6	74	4.4	1.4	1199
Female	7.1	1.6	295	6.3	1.7	277	5.8	1.8	281	5.6	1.9	278	5.1	1.6	87	6.1	1.8	1218
Total	6.1	1.8	573	5.3	1.8	566	5.0	1.8	555	4.9	1.7	562	4.9	1.7	161	5.3	1.8	2417

Thickness of musculus gastrocnemius and soleus (mm)

	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	57.8	6.1	278	55.9	5.9	289	53.8	6.4	274	51.4	5.9	284	50.2	5.7	74	54.5	6.5	1199
Female	50.9	6.6	295	49.2	6.2	277	48.1	6.1	281	46.6	5.6	278	45.7	6.1	87	48.5	6.4	1218
Total	54.2	7.2	573	52.7	6.9	566	50.9	6.9	555	49.0	6.2	562	47.7	6.3	161	51.5	7.1	2417

4) Intra-abdominal fat area, Subcutaneous fat area at umbilicus level
(CT scan, SCT-6800TX; Shimadzu, Fat Scan; N2 Corp.)

Intra-abdominal fat area at umbilicus by CT (cm²)

	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	77.5	34.1	277	96.4	45.7	286	98.0	44.0	274	97.4	45.0	283	88.5	48.9	74	92.1	43.7	1194
Female	40.7	31.0	292	53.8	31.2	277	68.1	40.7	280	77.9	36.3	276	70.2	36.9	86	60.6	37.7	1211
Total	58.6	37.4	569	75.5	44.6	563	82.8	44.9	554	87.8	42.0	559	78.7	43.7	160	76.3	43.7	2405

Subcutaneous fat area at umbilicus by CT (cm²)

	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	130.4	53.5	277	126.6	51.3	286	116.3	46.4	274	116.6	46.5	283	105.1	44.6	74	121.4	49.7	1194
Female	151.1	80.2	292	169.4	81.0	277	176.4	67.8	280	174.0	65.5	276	146.4	61.8	86	166.0	73.9	1211
Total	141.0	69.2	569	147.7	70.9	563	146.6	65.5	554	144.9	63.5	559	127.3	58.1	160	143.9	66.9	2405

Waist circumference at umbilicus by CT (cm)

	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	87.1	8.0	277	88.7	8.0	286	87.2	8.2	274	87.4	8.6	283	85.3	9.0	74	87.5	8.3	1194
Female	82.6	10.4	292	85.8	10.1	277	88.1	9.3	280	89.2	8.9	276	86.7	9.2	86	86.4	9.9	1211
Total	84.8	9.5	569	87.3	9.2	563	87.7	8.8	554	88.3	8.8	559	86.1	9.1	160	86.9	9.2	2405

Right psoas muscle area at umbilicus by CT (cm)

	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	13.6	2.4	277	12.5	2.7	286	11.2	2.4	274	10.0	2.1	279	8.7	1.9	71	11.6	2.8	1187
Female	7.7	1.6	289	7.2	1.6	274	6.8	1.6	275	6.3	1.5	264	5.8	1.6	79	6.9	1.7	1181
Total	10.6	3.6	566	9.9	3.4	560	9.0	3.0	549	8.2	2.6	543	7.2	2.3	150	9.3	3.3	2368

Left psoas muscle area at umbilicus by CT (cm)

	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	14.1	2.5	277	13.0	2.8	286	11.8	2.4	273	10.4	2.2	278	9.2	1.9	73	12.1	2.9	1187
Female	8.0	1.6	291	7.5	1.6	273	7.1	1.7	276	6.6	1.6	263	6.5	1.6	78	7.2	1.7	1181
Total	11.0	3.7	568	10.3	3.6	559	9.4	3.1	549	8.6	2.7	541	7.8	2.2	151	9.7	3.4	2368

Right paraspinal muscle area at umbilicus by CT (cm)

	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	22.4	3.8	275	21.8	3.7	285	20.9	3.7	273	19.5	3.4	282	17.7	4.2	74	20.9	3.9	1189
Female	18.6	2.8	291	18.4	3.0	277	17.4	3.2	278	16.6	3.5	268	15.7	3.7	81	17.6	3.3	1195
Total	20.5	3.8	566	20.1	3.8	562	19.1	3.9	551	18.1	3.7	550	16.6	4.0	155	19.3	4.0	2384

Left paraspinal muscle area at umbilicus by CT (cm)

	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	22.9	4.0	275	22.0	3.9	285	21.3	4.0	273	19.6	3.7	281	17.8	4.0	74	21.2	4.2	1188
Female	19.1	2.7	291	18.8	3.3	277	17.8	3.4	278	16.7	3.6	268	15.9	3.7	81	18.0	3.4	1195
Total	20.9	3.9	566	20.5	4.0	562	19.5	4.1	551	18.2	4.0	549	16.8	3.9	155	19.6	4.2	2383