

Frequency of beverage intakes
Green tea

		40 - 49yr		50 - 59yr		60 - 69yr		70 - 79yr		80yr -		Total	
		N	%	N	%	N	%	N	%	N	%	N	%
Male	Never	12	6.6	11	5.7	12	7.7	15	8.6	1	14.3	51	7.1
	Once a month	1	0.5	2	1.0	1	0.6	1	0.6	0	0	5	0.7
	2 to 3 times a mo.	4	2.2	1	0.5	3	1.9	0	0	0	0	8	1.1
	Once a week	2	1.1	6	3.1	1	0.6	1	0.6	0	0	10	1.4
	2 to 3 times a week	7	3.8	3	1.6	5	3.2	4	2.3	0	0	19	2.7
	4 to 6 times a week	10	5.5	2	1.0	4	2.6	1	0.6	0	0	17	2.4
	Once a day	32	17.5	37	19.2	17	10.9	8	4.6	0	0	94	13.2
	2 to 3 times a day	77	42.1	77	39.9	52	33.3	59	33.7	4	57.1	269	37.7
4 or more times	38	20.8	54	28.0	61	39.1	86	49.1	2	28.6	241	33.8	
Female	Never	14	8.5	8	4.8	3	1.7	7	3.9	0	0	32	4.6
	Once a month	3	1.8	0	0	1	0.6	2	1.1	0	0	6	0.9
	2 to 3 times a mo.	3	1.8	0	0	2	1.2	2	1.1	0	0	7	1.0
	Once a week	10	6.1	1	0.6	5	2.9	2	1.1	0	0	18	2.6
	2 to 3 times a week	13	7.9	3	1.8	5	2.9	2	1.1	1	9.1	24	3.5
	4 to 6 times a week	9	5.5	7	4.2	1	0.6	5	2.8	0	0	22	3.2
	Once a day	26	15.8	13	7.9	19	11.0	11	6.2	1	9.1	70	10.1
	2 to 3 times a day	59	35.8	68	41.2	64	37.0	56	31.5	3	27.3	250	36.1
4 or more times	28	17.0	65	39.4	73	42.2	91	51.1	6	54.5	263	38.0	
Total	Never	26	7.5	19	5.3	15	4.6	22	6.2	1	5.6	83	5.9
	Once a month	4	1.1	2	0.6	2	0.6	3	0.8	0	0	11	0.8
	2 to 3 times a mo.	7	2.0	1	0.3	5	1.5	2	0.6	0	0	15	1.1
	Once a week	12	3.4	7	2.0	6	1.8	3	0.8	0	0	28	2.0
	2 to 3 times a week	20	5.7	6	1.7	10	3.0	6	1.7	1	5.6	43	3.1
	4 to 6 times a week	19	5.5	9	2.5	5	1.5	6	1.7	0	0	39	2.8
	Once a day	58	16.7	50	14.0	36	10.9	19	5.4	1	5.6	164	11.7
	2 to 3 times a day	136	39.1	145	40.5	116	35.3	115	32.6	7	38.9	519	36.9
4 or more times	66	19.0	119	33.2	134	40.7	177	50.1	8	44.4	504	35.8	

Frequency of beverage intakes
Oolong tea

		40 - 49yr		50 - 59yr		60 - 69yr		70 - 79yr		80yr -		Total	
		N	%	N	%	N	%	N	%	N	%	N	%
Male	Never	20	10.9	37	19.2	36	23.1	89	50.9	3	42.9	185	25.9
	Once a month	5	2.7	6	3.1	5	3.2	5	2.9	0	0	21	2.9
	2 to 3 times a mo.	3	1.6	4	2.1	3	1.9	8	4.6	1	14.3	19	2.7
	Once a week	8	4.4	13	6.7	4	2.6	9	5.1	0	0	34	4.8
	2 to 3 times a week	21	11.5	19	9.8	19	12.2	6	3.4	1	14.3	66	9.2
	4 to 6 times a week	27	14.8	26	13.5	13	8.3	13	7.4	0	0	79	11.1
	Once a day	40	21.9	36	18.7	40	25.6	23	13.1	0	0	139	19.5
	2 to 3 times a day	49	26.8	42	21.8	29	18.6	12	6.9	1	14.3	133	18.6
	4 or more times	10	5.5	10	5.2	7	4.5	10	5.7	1	14.3	38	5.3
Female	Never	14	8.5	28	17.0	34	19.7	42	23.6	4	36.4	122	17.6
	Once a month	7	4.2	5	3.0	5	2.9	4	2.2	0	0	21	3.0
	2 to 3 times a mo.	2	1.2	4	2.4	5	2.9	6	3.4	0	0	17	2.5
	Once a week	5	3.0	11	6.7	9	5.2	2	1.1	0	0	27	3.9
	2 to 3 times a week	14	8.5	13	7.9	15	8.7	12	6.7	0	0	54	7.8
	4 to 6 times a week	15	9.1	25	15.2	23	13.3	17	9.6	2	18.2	82	11.8
	Once a day	42	25.5	42	25.5	34	19.7	49	27.5	1	9.1	168	24.3
	2 to 3 times a day	43	26.1	25	15.2	28	16.2	31	17.4	4	36.4	131	18.9
	4 or more times	23	13.9	12	7.3	20	11.6	15	8.4	0	0	70	10.1
Total	Never	34	9.8	65	18.2	70	21.3	131	37.1	7	38.9	307	21.8
	Once a month	12	3.4	11	3.1	10	3.0	9	2.5	0	0	42	3.0
	2 to 3 times a mo.	5	1.4	8	2.2	8	2.4	14	4.0	1	5.6	36	2.6
	Once a week	13	3.7	24	6.7	13	4.0	11	3.1	0	0	61	4.3
	2 to 3 times a week	35	10.1	32	8.9	34	10.3	18	5.1	1	5.6	120	8.5
	4 to 6 times a week	42	12.1	51	14.2	36	10.9	30	8.5	2	11.1	161	11.5
	Once a day	82	23.6	78	21.8	74	22.5	72	20.4	1	5.6	307	21.8
	2 to 3 times a day	92	26.4	67	18.7	57	17.3	43	12.2	5	27.8	264	18.8
	4 or more times	33	9.5	22	6.1	27	8.2	25	7.1	1	5.6	108	7.7

Frequency of beverage intakes
Carbonated beverages (such as cola, soda, etc.)

		40 - 49yr		50 - 59yr		60 - 69yr		70 - 79yr		80yr -		Total	
		N	%	N	%	N	%	N	%	N	%	N	%
Male	Never	92	50.3	132	68.4	122	78.2	138	78.9	4	57.1	488	68.3
	Once a month	41	22.4	25	13.0	10	6.4	13	7.4	0	0	89	12.5
	2 to 3 times a mo.	21	11.5	11	5.7	9	5.8	8	4.6	0	0	49	6.9
	Once a week	15	8.2	12	6.2	5	3.2	8	4.6	1	14.3	41	5.7
	2 to 3 times a week	6	3.3	9	4.7	8	5.1	7	4.0	1	14.3	31	4.3
	4 to 6 times a week	4	2.2	3	1.6	1	0.6	1	0.6	0	0	9	1.3
	Once a day	4	2.2	1	0.5	1	0.6	0	0	1	14.3	7	1.0
	2 to 3 times a day	0	0	0	0	0	0	0	0	0	0	0	0
Female	Never	112	67.9	133	80.6	150	86.7	151	84.8	10	90.9	556	80.3
	Once a month	16	9.7	12	7.3	7	4.0	11	6.2	0	0	46	6.6
	2 to 3 times a mo.	15	9.1	10	6.1	11	6.4	4	2.2	0	0	40	5.8
	Once a week	12	7.3	8	4.8	3	1.7	7	3.9	0	0	30	4.3
	2 to 3 times a week	4	2.4	2	1.2	2	1.2	3	1.7	0	0	11	1.6
	4 to 6 times a week	1	0.6	0	0	0	0	1	0.6	1	9.1	3	0.4
	Once a day	4	2.4	0	0	0	0	1	0.6	0	0	5	0.7
	2 to 3 times a day	1	0.6	0	0	0	0	0	0	0	0	1	0.1
Total	Never	204	58.6	265	74.0	272	82.7	289	81.9	14	77.8	1044	74.3
	Once a month	57	16.4	37	10.3	17	5.2	24	6.8	0	0	135	9.6
	2 to 3 times a mo.	36	10.3	21	5.9	20	6.1	12	3.4	0	0	89	6.3
	Once a week	27	7.8	20	5.6	8	2.4	15	4.2	1	5.6	71	5.0
	2 to 3 times a week	10	2.9	11	3.1	10	3.0	10	2.8	1	5.6	42	3.0
	4 to 6 times a week	5	1.4	3	0.8	1	0.3	2	0.6	1	5.6	12	0.9
	Once a day	8	2.3	1	0.3	1	0.3	1	0.3	1	5.6	12	0.9
	2 to 3 times a day	1	0.3	0	0	0	0	0	0	0	0	1	0.1

Frequency of beverage intakes
Isotonic drink

		40 - 49yr		50 - 59yr		60 - 69yr		70 - 79yr		80yr -		Total	
		N	%	N	%	N	%	N	%	N	%	N	%
Male	Never	58	31.7	112	58.0	100	64.1	144	82.3	4	57.1	418	58.5
	Once a month	35	19.1	25	13.0	16	10.3	5	2.9	1	14.3	82	11.5
	2 to 3 times a mo.	26	14.2	22	11.4	15	9.6	6	3.4	0	0	69	9.7
	Once a week	27	14.8	16	8.3	10	6.4	5	2.9	0	0	58	8.1
	2 to 3 times a week	20	10.9	9	4.7	10	6.4	9	5.1	1	14.3	49	6.9
	4 to 6 times a week	3	1.6	3	1.6	0	0	3	1.7	0	0	9	1.3
	Once a day	8	4.4	4	2.1	2	1.3	3	1.7	1	14.3	18	2.5
	2 to 3 times a day	5	2.7	1	0.5	2	1.3	0	0	0	0	8	1.1
	4 or more times	1	0.5	1	0.5	1	0.6	0	0	0	0	3	0.4
Female	Never	98	59.4	121	73.3	135	78.0	149	83.7	10	90.9	513	74.1
	Once a month	22	13.3	12	7.3	14	8.1	11	6.2	0	0	59	8.5
	2 to 3 times a mo.	14	8.5	18	10.9	5	2.9	4	2.2	1	9.1	42	6.1
	Once a week	17	10.3	6	3.6	6	3.5	7	3.9	0	0	36	5.2
	2 to 3 times a week	9	5.5	5	3.0	7	4.0	2	1.1	0	0	23	3.3
	4 to 6 times a week	2	1.2	1	0.6	2	1.2	2	1.1	0	0	7	1.0
	Once a day	0	0	2	1.2	3	1.7	3	1.7	0	0	8	1.2
	2 to 3 times a day	2	1.2	0	0	1	0.6	0	0	0	0	3	0.4
	4 or more times	1	0.6	0	0	0	0	0	0	0	0	1	0.1
Total	Never	156	44.8	233	65.1	235	71.4	293	83.0	14	77.8	931	66.2
	Once a month	57	16.4	37	10.3	30	9.1	16	4.5	1	5.6	141	10.0
	2 to 3 times a mo.	40	11.5	40	11.2	20	6.1	10	2.8	1	5.6	111	7.9
	Once a week	44	12.6	22	6.1	16	4.9	12	3.4	0	0	94	6.7
	2 to 3 times a week	29	8.3	14	3.9	17	5.2	11	3.1	1	5.6	72	5.1
	4 to 6 times a week	5	1.4	4	1.1	2	0.6	5	1.4	0	0	16	1.1
	Once a day	8	2.3	6	1.7	5	1.5	6	1.7	1	5.6	26	1.8
	2 to 3 times a day	7	2.0	1	0.3	3	0.9	0	0	0	0	11	0.8
	4 or more times	2	0.6	1	0.3	1	0.3	0	0	0	0	4	0.3

Average ethanol intakes per day (ml/day)
Japanese sake

	40 - 49yr			50 - 59yr			60 - 69yr			70 - 79yr			80yr -			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N									
Male	3.9	10.1	183	8.1	16.6	193	6.7	12.7	155	7.8	16.9	175	0.1	0.4	7	6.6	14.4	713
Female	0.6	3.3	165	0.8	5.0	165	1.0	5.1	173	1.5	5.1	178	0.0	0.0	11	0.9	4.7	692
Total	2.3	7.8	348	4.7	13.1	358	3.7	9.9	328	4.6	12.8	353	0.1	0.2	18	3.8	11.1	1405

Average ethanol intakes per day (ml/day)
Japanese distilled alcoholic beverages (Shochu)

	40 - 49yr			50 - 59yr			60 - 69yr			70 - 79yr			80yr -			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N									
Male	8.1	24.8	183	11.3	25.5	193	8.5	18.0	156	5.8	15.3	175	8.0	21.2	7	8.5	21.6	714
Female	2.0	8.0	165	0.9	4.3	165	2.1	9.9	173	1.0	6.2	178	0.7	2.4	11	1.5	7.4	692
Total	5.2	19.0	348	6.6	19.6	358	5.1	14.7	329	3.4	11.8	353	3.6	13.2	18	5.1	16.6	1406

Average ethanol intakes per day (ml/day)
Regular or draft beer

	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	6.4	9.6	183	8.3	11.5	193	5.5	9.6	156	2.8	6.1	175	2.7	6.6	7	5.8	9.6	714
Female	1.7	4.1	165	1.1	2.9	165	1.1	4.6	173	1.0	3.3	178	0.1	0.2	11	1.2	3.8	692
Total	4.2	7.9	348	5.0	9.3	358	3.2	7.7	329	1.9	5.0	353	1.1	4.1	18	3.5	7.7	1406

Average ethanol intakes per day (ml/day)
Light beer

	40 - 49yr			50 - 59yr			60 - 69yr			70 - 79yr			80yr -			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N									
Male	4.5	7.6	183	4.3	8.5	193	2.2	6.1	156	1.9	7.6	175	0.0	0.0	7	3.3	7.6	714
Female	2.1	5.8	165	1.0	3.7	165	0.4	2.1	173	0.5	2.7	178	0.1	0.2	11	1.0	3.8	692
Total	3.3	6.9	348	2.8	6.9	358	1.3	4.5	329	1.2	5.7	353	0.0	0.1	18	2.1	6.1	1406

Average ethanol intakes per day (ml/day)

Wine

	40 - 49yr			50 - 59yr			60 - 69yr			70 - 79yr			80yr -			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N									
Male	0.6	2.7	183	0.9	3.2	193	0.3	1.0	156	0.6	4.3	175	0.0	0.0	7	0.6	3.1	714
Female	0.7	2.4	165	0.5	2.1	165	0.2	1.2	173	0.6	2.4	178	0.0	0.0	11	0.5	2.1	692
Total	0.6	2.6	348	0.7	2.8	358	0.2	1.1	329	0.6	3.5	353	0.0	0.0	18	0.5	2.6	1406

Average ethanol intakes per day (ml/day)

Hard liquor (such as whisky, brandy, gin, vodka, rum, cocktails, etc.)

	40 - 49yr			50 - 59yr			60 - 69yr			70 - 79yr			80yr -			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N									
Male	1.8	6.2	183	1.6	6.4	193	1.5	5.1	156	1.4	4.6	175	0.0	0.0	7	1.6	5.6	714
Female	0.2	1.6	165	0.1	0.6	165	0.2	1.9	173	0.0	0.0	178	0.0	0.0	11	0.1	1.2	692
Total	1.1	4.7	348	0.9	4.8	358	0.8	3.8	329	0.7	3.3	353	0.0	0.0	18	0.9	4.2	1406

Average ethanol intakes per day (ml/day)

Total alcohol

	40 - 49yr			50 - 59yr			60 - 69yr			70 - 79yr			80yr -			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N									
Male	25.2	34.8	183	34.5	35.9	193	24.4	27.0	155	20.4	27.0	175	10.8	27.7	7	26.2	32.1	713
Female	7.2	12.5	165	4.4	9.8	165	5.1	14.8	173	4.6	9.9	178	0.8	2.4	11	5.2	11.9	692
Total	16.7	28.1	348	20.7	31.0	358	14.2	23.5	328	12.4	21.7	353	4.7	17.3	18	15.9	26.5	1405

V. Bone Analysis

V. Bone Analysis

1) Bone mineral weight and density

1. Dual energy X-ray absorptiometry (DXA)

- Whole body bone mineral weight
- Whole body bone mineral density
- Head bone mineral weight
- Head bone mineral density
- Left arm bone mineral weight
- Left arm bone mineral density
- Right arm bone mineral weight
- Right arm bone mineral density
- Left rib cage bone mineral weight
- Left rib cage bone mineral density
- Right rib cage bone mineral weight
- Right rib cage bone mineral density
- Thoracic spine bone mineral weight
- Thoracic spine bone mineral density
- Lumbar spine bone mineral weight
- Lumbar bone mineral density
- Pelvic bone mineral weight
- Pelvic bone mineral density
- Left leg bone mineral weight
- Left leg bone mineral density
- Right leg bone mineral weight
- Right leg bone mineral density
- Lumbar spine 2-4
- Right and left femoral neck
- Right and left trochanter region
- Right and left Wards triangle

2. Peripheral quantitative computed tomography (pQCT) (Fig.1)

D100: Cortical and trabecular bone density of ultradistal radius.

D50: Trabecular bone density over the core volume of ultradistal radius.

P100: Cortical bone density of proximal radius.

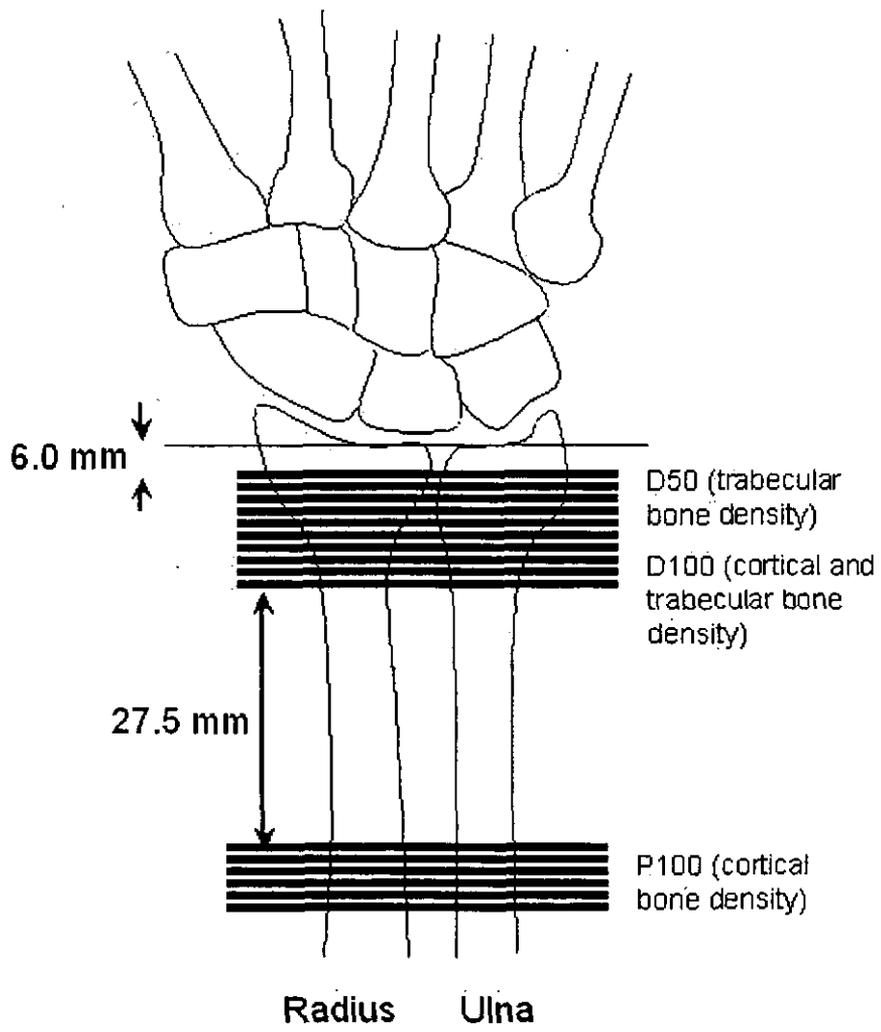


Fig: 1 Measurements of bone mineral density with pQCT (DENSISCAN 1000)

Bone mineral density

1. Dual energy X-ray absorptiometry (DXA) (Hologic QDR-4500)

Whole body bone mineral weight (g)

	40 - 49yr			50 - 59yr			60 - 69yr			70 - 79yr			80yr -			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N									
Male	2383.8	337.6	166	2332.5	334.3	210	2231.1	298.4	222	2101.2	325.5	194	1997.0	318.5	33	2247.7	342.1	825
Female	1983.4	256.5	188	1779.6	271.2	187	1548.1	231.1	194	1386.6	221.1	193	1251.0	264.7	23	1659.1	339.3	785
Total	2171.2	358.0	354	2072.1	412.2	397	1912.6	434.3	416	1744.8	453.1	387	1690.6	473.5	56	1960.7	450.2	1610

Whole body bone mineral density (g/cm²)

	40 - 49yr			50 - 59yr			60 - 69yr			70 - 79yr			80yr -			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N									
Male	1.128	0.101	166	1.113	0.095	210	1.098	0.097	222	1.065	0.106	194	1.048	0.109	33	1.098	0.103	825
Female	1.095	0.085	188	1.020	0.106	187	0.924	0.084	194	0.879	0.084	193	0.844	0.091	23	0.974	0.124	785
Total	1.110	0.094	354	1.069	0.111	397	1.017	0.126	416	0.972	0.134	387	0.965	0.143	56	1.038	0.130	1610

Head bone mineral weight (g)

	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	518.5	83.9	166	507.4	83.8	210	491.8	86.6	222	465.3	91.5	194	469.2	73.3	33	494.0	88.1	825
Female	550.0	93.7	188	495.8	107.3	187	416.6	79.8	194	387.2	79.5	193	369.7	79.2	23	458.8	111.3	785
Total	535.2	90.5	354	501.9	95.7	397	456.8	91.5	416	426.3	94.1	387	428.3	89.9	56	476.8	101.6	1610

Head bone mineral density (g/cm²)

	40 - 49yr			50 - 59yr			60 - 69yr			70 - 79yr			80yr -			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N									
Male	2.074	0.292	166	2.058	0.283	210	2.028	0.304	222	1.958	0.339	194	2.006	0.310	33	2.028	0.308	825
Female	2.349	0.336	188	2.139	0.397	187	1.843	0.301	194	1.773	0.306	193	1.702	0.311	23	2.013	0.409	785
Total	2.220	0.344	354	2.096	0.343	397	1.942	0.316	416	1.866	0.336	387	1.881	0.343	56	2.021	0.361	1610

Left arm bone mineral weight (g)

	40 - 49yr			50 - 59yr			60 - 69yr			70 - 79yr			80yr -			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N									
Male	174.3	24.9	166	172.5	26.5	210	165.5	25.8	222	156.2	25.1	194	149.5	25.4	33	166.2	26.7	825
Female	121.7	16.2	188	109.8	17.0	187	96.0	16.3	194	85.6	16.0	193	77.7	19.6	23	102.3	21.7	785
Total	146.4	33.5	354	143.0	38.5	397	133.1	41.0	416	121.0	41.1	387	120.0	42.4	56	135.1	40.2	1610

Left arm bone mineral density (g/cm²)

	40 - 49yr			50 - 59yr			60 - 69yr			70 - 79yr			80yr -			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N									
Male	0.785	0.054	166	0.778	0.060	210	0.764	0.059	222	0.743	0.060	194	0.730	0.064	33	0.766	0.061	825
Female	0.675	0.041	188	0.636	0.046	187	0.591	0.046	194	0.560	0.048	193	0.543	0.052	23	0.613	0.064	785
Total	0.727	0.072	354	0.711	0.089	397	0.683	0.102	416	0.652	0.107	387	0.653	0.110	56	0.691	0.098	1610

Right arm bone mineral weight (g)

	40 - 49yr			50 - 59yr			60 - 69yr			70 - 79yr			80yr -			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N									
Male	183.7	26.7	166	181.2	28.3	210	172.3	24.0	222	162.2	26.0	194	152.7	26.9	33	173.7	27.7	825
Female	128.7	16.9	188	116.7	17.8	187	102.0	15.9	194	90.3	15.7	193	80.7	20.2	23	108.4	22.5	785
Total	154.5	35.2	354	150.8	40.1	397	139.5	40.7	416	126.3	41.9	387	123.1	43.1	56	141.9	41.3	1610

Right arm bone mineral density (g/cm²)

	40 - 49yr			50 - 59yr			60 - 69yr			70 - 79yr			80yr -			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N									
Male	0.810	0.063	166	0.800	0.063	210	0.784	0.060	222	0.759	0.065	194	0.742	0.066	33	0.786	0.066	825
Female	0.695	0.044	188	0.658	0.049	187	0.606	0.047	194	0.573	0.047	193	0.549	0.058	23	0.630	0.067	785
Total	0.749	0.079	354	0.733	0.091	397	0.701	0.104	416	0.667	0.109	387	0.663	0.114	56	0.710	0.102	1610

Left rib cage bone mineral weight (g)

	40 - 49yr			50 - 59yr			60 - 69yr			70 - 79yr			80yr -			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N									
Male	88.2	16.2	166	85.6	15.6	210	82.9	15.3	222	77.2	15.8	194	71.5	16.5	33	82.9	16.3	825
Female	71.7	12.4	188	66.2	12.6	187	59.1	10.6	194	55.2	10.6	193	50.7	9.9	23	62.6	13.3	785
Total	79.4	16.5	354	76.4	17.2	397	71.8	17.8	416	66.2	17.4	387	62.9	17.4	56	73.0	18.0	1610

Left rib cage bone mineral density (g/cm²)

	40 - 49yr			50 - 59yr			60 - 69yr			70 - 79yr			80yr -			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N									
Male	0.645	0.066	166	0.630	0.067	210	0.628	0.067	222	0.609	0.072	194	0.597	0.079	33	0.626	0.070	825
Female	0.601	0.056	188	0.555	0.059	187	0.511	0.052	194	0.492	0.046	193	0.469	0.045	23	0.537	0.068	785
Total	0.622	0.064	354	0.594	0.074	397	0.573	0.084	416	0.550	0.084	387	0.544	0.092	56	0.583	0.082	1610

Right rib cage bone mineral weight (g)

	40 - 49yr			50 - 59yr			60 - 69yr			70 - 79yr			80yr -			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N									
Male	90.0	17.2	166	87.7	16.5	210	84.3	16.8	222	79.2	17.5	194	76.5	17.8	33	84.8	17.5	825
Female	72.7	13.0	188	69.8	13.5	187	65.2	13.8	194	61.2	16.6	193	51.7	9.4	23	66.7	15.0	785
Total	80.8	17.4	354	79.3	17.6	397	75.3	18.2	416	70.2	19.3	387	66.3	19.3	56	76.0	18.7	1610

Right rib cage bone mineral density (g/cm²)

	40 - 49yr			50 - 59yr			60 - 69yr			70 - 79yr			80yr -			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N									
Male	0.643	0.072	166	0.635	0.066	210	0.630	0.070	222	0.618	0.074	194	0.606	0.071	33	0.630	0.071	825
Female	0.598	0.058	188	0.559	0.066	187	0.518	0.054	194	0.504	0.071	193	0.480	0.037	23	0.542	0.073	785
Total	0.619	0.068	354	0.599	0.076	397	0.578	0.084	416	0.561	0.092	387	0.555	0.086	56	0.587	0.084	1610

Thoracic spine bone mineral weight (g)

	40 - 49yr			50 - 59yr			60 - 69yr			70 - 79yr			80yr -			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N									
Male	109.0	23.3	166	116.8	27.7	210	115.7	31.1	222	109.8	31.8	194	99.7	34.2	33	112.6	29.4	825
Female	97.2	20.0	188	86.8	19.9	187	76.6	19.0	194	71.6	16.7	193	62.5	17.9	23	82.3	21.5	785
Total	102.7	22.4	354	102.7	28.5	397	97.4	32.6	416	90.7	31.8	387	84.4	33.9	56	97.8	29.9	1610

Thoracic spine bone mineral density (g/cm²)

	40 - 49yr			50 - 59yr			60 - 69yr			70 - 79yr			80yr -			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N									
Male	0.833	0.105	166	0.852	0.120	210	0.870	0.135	222	0.864	0.158	194	0.860	0.183	33	0.856	0.134	825
Female	0.845	0.101	188	0.769	0.116	187	0.691	0.098	194	0.651	0.086	193	0.608	0.059	23	0.734	0.126	785
Total	0.839	0.103	354	0.813	0.125	397	0.786	0.149	416	0.758	0.166	387	0.757	0.191	56	0.797	0.144	1610

Lumbar spine bone mineral weight (g)

	40 - 49yr			50 - 59yr			60 - 69yr			70 - 79yr			80yr -			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N									
Male	60.4	14.3	166	59.2	14.5	210	59.8	15.9	222	57.7	17.2	194	58.1	20.5	33	59.2	15.8	825
Female	55.8	11.1	188	46.3	12.1	187	38.1	10.2	194	33.1	9.6	193	28.9	11.1	23	42.8	13.9	785
Total	58.0	12.9	354	53.1	14.9	397	49.7	17.3	416	45.4	18.6	387	46.1	22.5	56	51.2	17.0	1610

Lumbar bone mineral density (g/cm2)

	40 - 49yr			50 - 59yr			60 - 69yr			70 - 79yr			80yr -			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N									
Male	0.970	0.140	166	0.984	0.174	210	1.001	0.173	222	1.010	0.227	194	1.009	0.254	33	0.993	0.186	825
Female	1.051	0.145	188	0.924	0.155	187	0.823	0.129	194	0.788	0.131	193	0.757	0.161	23	0.891	0.174	785
Total	1.013	0.148	354	0.956	0.168	397	0.918	0.177	416	0.899	0.216	387	0.905	0.252	56	0.943	0.187	1610

Pelvic bone mineral weight (g)

	40 - 49yr			50 - 59yr			60 - 69yr			70 - 79yr			80yr -			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N									
Male	239.0	58.5	166	231.1	55.6	210	215.0	48.1	222	197.8	49.5	194	183.7	50.8	33	218.6	55.1	825
Female	202.7	42.7	188	171.7	40.4	187	143.6	31.7	194	117.5	31.3	193	104.6	25.9	23	156.9	48.9	785
Total	219.7	53.8	354	203.1	57.2	397	181.7	54.5	416	157.7	57.7	387	151.2	57.6	56	188.5	60.6	1610

Pelvic bone mineral density (g/cm2)

	40 - 49yr			50 - 59yr			60 - 69yr			70 - 79yr			80yr -			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N									
Male	1.138	0.144	166	1.124	0.149	210	1.103	0.138	222	1.061	0.153	194	1.006	0.138	33	1.102	0.149	825
Female	1.147	0.122	188	1.081	0.161	187	0.991	0.112	194	0.904	0.140	193	0.858	0.118	23	1.024	0.164	785
Total	1.143	0.133	354	1.104	0.156	397	1.051	0.138	416	0.983	0.166	387	0.945	0.149	56	1.064	0.161	1610

Left leg bone mineral weight (g)

	40 - 49yr			50 - 59yr			60 - 69yr			70 - 79yr			80yr -			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N									
Male	464.2	75.9	166	448.7	71.4	210	424.8	59.8	222	400.4	64.7	194	367.6	70.4	33	430.8	72.6	825
Female	342.6	47.4	188	309.5	46.2	187	277.8	43.5	194	244.3	51.6	193	216.6	55.1	23	290.9	60.9	785
Total	399.7	87.0	354	383.1	92.4	397	356.2	90.4	416	322.5	97.6	387	305.6	98.6	56	362.6	97.0	1610

Left leg bone mineral density (g/cm²)

	40 - 49yr			50 - 59yr			60 - 69yr			70 - 79yr			80yr -			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N									
Male	1.265	0.138	166	1.236	0.124	210	1.214	0.122	222	1.163	0.127	194	1.114	0.126	33	1.214	0.133	825
Female	1.090	0.080	188	1.033	0.095	187	0.957	0.081	194	0.909	0.145	193	0.859	0.084	23	0.992	0.126	785
Total	1.172	0.141	354	1.140	0.150	397	1.094	0.166	416	1.036	0.186	387	1.009	0.167	56	1.106	0.170	1610

Right leg bone mineral weight (g)

	40 - 49yr			50 - 59yr			60 - 69yr			70 - 79yr			80yr -			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N									
Male	456.6	73.4	166	442.3	68.1	210	419.1	58.9	222	395.5	63.6	194	368.6	66.5	33	425.0	70.2	825
Female	340.3	46.0	188	307.0	45.3	187	273.1	42.5	194	240.8	51.5	193	208.0	55.2	23	287.4	60.8	785
Total	394.8	83.8	354	378.6	89.4	397	351.0	89.5	416	318.4	96.7	387	302.6	100.7	56	357.9	95.2	1610

Right leg bone mineral density (g/cm²)

	40 - 49yr			50 - 59yr			60 - 69yr			70 - 79yr			80yr -			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N									
Male	1.240	0.127	166	1.219	0.114	210	1.193	0.122	222	1.149	0.118	194	1.107	0.110	33	1.195	0.125	825
Female	1.090	0.080	188	1.032	0.095	187	0.954	0.082	194	0.904	0.164	193	0.846	0.085	23	0.990	0.133	785
Total	1.160	0.129	354	1.131	0.141	397	1.082	0.159	416	1.027	0.189	387	1.000	0.164	56	1.095	0.165	1610

Lumbar spine 2-4 (g/cm²)

	40 - 49yr			50 - 59yr			60 - 69yr			70 - 79yr			80yr -			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N									
Male	0.972	0.131	169	0.981	0.155	211	0.999	0.166	223	1.004	0.216	195	0.985	0.243	34	0.990	0.174	832
Female	1.025	0.134	191	0.906	0.149	188	0.808	0.127	195	0.776	0.135	195	0.728	0.170	23	0.873	0.169	792
Total	1.000	0.135	360	0.945	0.157	399	0.910	0.177	418	0.890	0.213	390	0.881	0.250	57	0.933	0.181	1624

Lumbar spine 2-4 (percentage of Young Adult Mean (YAM))

	40 - 49yr			50 - 59yr			60 - 69yr			70 - 79yr			80yr -			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N									
Male	92.8	12.5	169	93.6	14.8	211	95.4	15.8	223	95.8	20.6	196	94.0	23.0	34	94.4	16.6	833
Female	101.3	13.3	191	89.5	14.7	188	79.8	12.6	195	76.7	13.4	195	72.0	16.6	23	86.3	16.7	792
Total	97.3	13.6	360	91.7	14.9	399	88.1	16.3	418	86.3	19.8	391	85.1	23.2	57	90.5	17.1	1625

Osteoporosis

		40 - 49yr		50 - 59yr		60 - 69yr		70 - 79yr		80yr -		Total	
		N	%	N	%	N	%	N	%	N	%	N	%
-	Male	144	85.2	175	82.9	191	85.7	155	79.1	25	73.5	690	82.8
	Female	185	96.9	150	79.8	99	50.8	70	35.9	7	30.4	511	64.5
	Total	329	91.4	325	81.5	290	69.4	225	57.5	32	56.1	1201	73.9
+	Male	25	14.8	36	17.1	32	14.3	41	20.9	9	26.5	143	17.2
	Female	6	3.1	38	20.2	96	49.2	125	64.1	16	69.6	281	35.5
	Total	31	8.6	74	18.5	128	30.6	166	42.5	25	43.9	424	26.1

Right femoral neck (g/cm²)

	40 - 49yr			50 - 59yr			60 - 69yr			70 - 79yr			80yr -			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N									
Male	0.789	0.121	169	0.788	0.106	211	0.768	0.110	223	0.715	0.110	196	0.670	0.107	34	0.761	0.116	833
Female	0.754	0.092	192	0.706	0.088	187	0.651	0.083	195	0.586	0.076	193	0.553	0.059	23	0.670	0.106	790
Total	0.771	0.108	361	0.749	0.106	398	0.713	0.114	418	0.651	0.115	389	0.622	0.107	57	0.717	0.120	1623

Right trochanter region (g/cm²)

	40 - 49yr			50 - 59yr			60 - 69yr			70 - 79yr			80yr -			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N									
Male	0.678	0.113	169	0.693	0.108	211	0.693	0.115	223	0.649	0.110	196	0.609	0.114	34	0.676	0.114	833
Female	0.641	0.086	192	0.608	0.099	187	0.551	0.087	195	0.487	0.088	193	0.458	0.098	23	0.568	0.109	790
Total	0.658	0.101	361	0.653	0.112	398	0.627	0.125	418	0.568	0.128	389	0.548	0.131	57	0.623	0.124	1623

Right Wards triangle (g/cm²)

	40 - 49yr			50 - 59yr			60 - 69yr			70 - 79yr			80yr -			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N									
Male	0.626	0.141	169	0.585	0.124	211	0.550	0.134	223	0.475	0.120	196	0.430	0.112	34	0.552	0.141	833
Female	0.635	0.117	192	0.558	0.122	187	0.455	0.122	195	0.372	0.109	193	0.342	0.097	23	0.500	0.155	790
Total	0.631	0.129	361	0.573	0.124	398	0.506	0.137	418	0.424	0.126	389	0.394	0.114	57	0.526	0.151	1623

Left femoral neck (g/cm²)

	40 - 49yr			50 - 59yr			60 - 69yr			70 - 79yr			80yr -			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N									
Male	0.802	0.125	169	0.801	0.109	211	0.774	0.113	223	0.724	0.112	196	0.672	0.109	34	0.770	0.120	833
Female	0.757	0.091	193	0.714	0.086	187	0.660	0.081	195	0.593	0.073	192	0.564	0.057	22	0.678	0.104	789
Total	0.778	0.110	362	0.760	0.107	398	0.721	0.114	418	0.659	0.115	388	0.629	0.106	56	0.725	0.121	1622

Left trochanter region (g/cm²)

	40 - 49yr			50 - 59yr			60 - 69yr			70 - 79yr			80yr -			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N									
Male	0.689	0.114	169	0.701	0.109	211	0.700	0.117	223	0.653	0.114	196	0.611	0.120	34	0.683	0.116	833
Female	0.641	0.085	193	0.613	0.102	187	0.559	0.085	195	0.495	0.083	192	0.469	0.073	22	0.574	0.106	789
Total	0.663	0.102	362	0.660	0.115	398	0.634	0.125	418	0.575	0.127	388	0.555	0.125	56	0.630	0.124	1622

Left Wards triangle (g/cm²)

	40 - 49yr			50 - 59yr			60 - 69yr			70 - 79yr			80yr -			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N									
Male	0.625	0.150	169	0.580	0.127	211	0.534	0.125	223	0.471	0.120	196	0.411	0.129	34	0.544	0.143	833
Female	0.630	0.119	193	0.553	0.119	187	0.439	0.110	195	0.362	0.102	192	0.343	0.078	22	0.491	0.153	789
Total	0.628	0.134	362	0.567	0.124	398	0.490	0.127	418	0.417	0.124	388	0.384	0.116	56	0.519	0.150	1622

2. Peripheral quantitative computed tomography (pQCT) (Densiscan 1000)

D50 (trabecular bone density over the core volume of ultradistal radius) (mg/cm³)

	40 - 49yr			50 - 59yr			60 - 69yr			70 - 79yr			80yr -			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N									
Male	295.4	74.1	156	277.9	63.9	194	261.6	61.4	207	236.5	70.2	182	222.1	59.8	33	264.9	70.3	772
Female	237.9	53.6	177	201.4	65.6	177	151.7	58.4	184	132.4	56.8	177	128.0	54.6	21	179.1	71.8	736
Total	264.8	70.1	333	241.4	75.1	371	209.9	81.3	391	185.1	82.4	359	185.5	73.7	54	223.0	83.0	1508

D100 (cortical and trabecular bone density of ultradistal radius) (mg/cm³)

	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	601.9	96.4	156	564.9	89.8	194	534.4	94.5	207	489.0	98.5	182	451.5	97.2	33	541.5	104.1	772
Female	611.2	83.8	177	537.2	97.9	177	432.0	91.9	184	383.7	81.3	178	355.4	67.8	21	486.5	126.2	737
Total	606.8	89.9	333	551.7	94.7	371	486.2	106.3	391	437.0	104.6	360	414.1	98.4	54	514.6	118.6	1509

P100 (cortical bone density of proximal radius) (mg/cm³)

	40 - 49yr			50 - 59yr			60 - 69yr			70 - 79yr			80yr -			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N									
Male	1291.7	132.0	156	1223.5	124.4	192	1177.3	142.0	205	1115.7	163.2	176	1055.7	196.9	33	1192.9	158.4	762
Female	1388.2	110.4	176	1252.5	147.8	177	1070.0	145.2	184	968.1	170.3	174	934.5	172.0	21	1162.5	219.1	732
Total	1342.8	130.1	332	1237.4	136.7	369	1126.5	153.0	389	1042.3	182.2	350	1008.5	195.3	54	1178.0	191.1	1494

VI. Blood and Urine Analysis

VI. Blood and Urine Analysis

Venous blood sample and urine were obtained after an overnight fast.

Urine is analyzed using semi-quantitative test tape.

1) Blood chemistry

Total protein (g/dl)

Total bilirubin (mg/dl)

Triglyceride (mg/dl)

Total cholesterol (mg/dl)

HDL-cholesterol (mg/dl)

Lipid peroxide (nmol/ml)

Uric acid (mg/dl)

Creatinine (mg/dl)

Calcium (mg/dl)

Phosphorus (mg/dl)

Glutamate oxaloacetate transaminase, GOT (IU/l)

Glutamate pyruvate transaminase, GPT (IU/l)

Alkaline phosphatase (IU/l)

Gamma-glutamyltransferase (IU/l)

Cholinesterase (IU/l)

Magnesium (mg/dl)

Iron ($\mu\text{g/dl}$)

Zinc ($\mu\text{g/dl}$)

Vitamin A (IU/dl)

Free triiodothyronine, Free T3 (pg/ml)

Free thyroxine, Free T4 (ng/dl)

Thyroid stimulating hormone, TSH ($\mu\text{g/ml}$)

Dehydroepiandrosterone sulfate, DHEA-S (ng/ml)

Sialic acid (mg/dl)

Fasting glucose (mg/dl)

Insulin ($\mu\text{U/ml}$)

Hemoglobin A1c (%)

Albumin (mg/dl) direct method

2) Serum fatty acid

Dihome-gamma-linolenic acid, DHLA ($\mu\text{g/ml}$)

Arachidonic acid, AA ($\mu\text{g/ml}$)

Eicosapentaenoic acid, EPA ($\mu\text{g/ml}$)

Docosahexaenoic acid, DHA ($\mu\text{g/ml}$)

EPA/AA ratio

3) Complete blood cell count

White blood cell count ($/\mu\text{l}$)

Red blood cell count ($\times 10000/\mu\text{l}$)

Hemoglobin (g/dl)

Hematocrit (%)

MCV (fl)

MCH (pg)

MCHC (%)

Platelet count ($\times 10000/\mu\text{l}$)

4) Urine analysis

Hemoglobin

Occult blood

Ketones

Bilirubin

Urobilinogen

Protein

Glucose

PH

Nitrite