

VIII. Visual and Auditory Examinations

[1\) Visual system](#)

[1. Refraction](#)

Autorefractometry was obtained with the NIDEK-ARK700A. Refractive errors, in spherical equivalent, were assessed.

[2. Visual acuity \(5 m\)](#)

Distant visual acuity was measured for each eye with a Landolt C letter at 5m. Presenting visual acuity was measured with the participant's current distance correction; when distance correction was not used, the unaided distant visual acuity was measured. Subsequently, best-corrected visual acuity for each eye was determined after objective autorefractometry and subjective refinement.

[3. Contrast sensitivity](#)

Contrast sensitivity was measured at 1.5, 3, 6, 12, 18 cycles per degree with Vistech VCTS-6500.

[4. Intraocular pressure \(mmHg\)](#)

[5. Retinal fundus camera](#)

Fundus photographs were taken with Topcon non-mydriatic retinal camera (TRC-NW5S) at 20 and 45 degree angles for each eye without pupil dilatation. Diabetic retinopathy, arteriosclerosis, and macular degeneration were assessed on the photograph at 45 degree angles. Vertical cup to disc ratio was measured on the photograph at 20 degree angles.

[6. Specular microscope](#)

Corneal thickness was obtained with the Topcon SP-2000 specular microscope.

[7. Heidelberg Retina Tomograph II](#)

The Heidelberg Retina Tomograph is a confocal laser scanning microscope for acquisition and analysis of three-dimensional images of the posterior segment. It enables the quantitative assessment of the retinal topography and precise follow-up of topographic changes. In the NLS-LSA, the topographic description of the optic nerve head was assessed.

[2\) Auditory system](#)

[1. Pure-tone audiometry](#)

Air conduction thresholds at 125,250,500,1000,2000,4000,8000Hz(dBHL)

Bone conduction thresholds at 250,500,1000,2000,4000Hz(dBHL)

Pure-tone audiometry (Audiometer RION AA-73A)

*If no response occurs at the maximum output level of this audiometer, the threshold is treated as following.

	Air conduction		Bone conduction	
	Maximum output level	Inputed level	Maximum output level	Inputed level
125Hz	70	75	-	-
250Hz	85	90	55	60
500Hz	100	105	65	70
1000Hz	100	105	70	75
2000Hz	100	105	70	75
4000Hz	100	105	60	65
8000Hz	95	100	-	-

2. Impedance audiometry

(1) Single frequency tympanometry

Tympanometric peak pressure in the single frequency tympanogram at 226Hz(daPa)
Static compliance in the single frequency tympanogram at 226Hz(ml)

(2) Multifrequency tympanometry

Middle ear resonance frequency(Hz)

1) Visual system

1. Refraction

Autorefraction was obtained with the NIDEK-ARK700A. Refractive errors, in spherical equivalent, were assessed.

Spherical Equivalent of Refractive Error – Right Eye (Diopters)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80 – yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	-1.62	1.53	265	-1.20	1.46	329	-0.45	1.30	291	-0.30	1.07	251	-0.51	1.26	36	-0.89	1.45	1172
Female	-1.44	1.45	293	-1.07	1.49	283	-0.25	1.31	282	-0.14	1.41	251	-0.80	1.26	30	-0.75	1.51	1139
Total	-1.52	1.49	558	-1.14	1.47	612	-0.35	1.30	573	-0.22	1.25	502	-0.64	1.26	66	-0.82	1.48	2311

Spherical Equivalent of Refractive Error – Leftt Eye (Diopters)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80 – yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	-1.57	1.54	265	-1.17	1.34	328	-0.40	1.17	292	-0.24	1.09	247	-0.67	1.22	34	-0.86	1.40	1166
Female	-1.39	1.43	294	-1.09	1.45	284	-0.26	1.38	279	-0.15	1.25	258	-0.57	0.98	30	-0.74	1.47	1145
Total	-1.48	1.48	559	-1.13	1.39	612	-0.33	1.27	571	-0.19	1.18	505	-0.63	1.11	64	-0.80	1.43	2311

2. Visual acuity: distant vision (5 m)

Distant visual acuity was measured for each eye with a Landolt C letter at 5m. Presenting visual acuity was measured with the participant's current distance correction; when distance correction was not used, the unaided distant visual acuity was measured. Subsequently, best-corrected visual acuity for each eye was determined after objective autorefraction and subjective refinement.

Presenting Visual Acuity – Right Eye

		40 – 49yr		50 – 59yr		60 – 69yr		70 – 79yr		80 – yr		Total	
		N	%	N	%	N	%	N	%	N	%	N	%
not recorded	Male	–	0.0	–	0.0	1	0.3	1	0.4	–	0.0	2	0.2
	Female	–	0.0	–	0.0	–	0.0	1	0.4	1	2.9	2	0.2
	Total	–	0.0	–	0.0	1	0.2	2	0.4	1	1.3	4	0.2
0.3 or worse	Male	2	0.8	14	4.2	4	1.3	9	3.4	2	4.7	31	2.6
	Female	3	1.0	5	1.8	9	3.1	19	6.9	5	14.7	41	3.5
	Total	5	0.9	19	3.1	13	2.2	28	5.2	7	9.1	72	3.0
0.3–0.6	Male	23	8.6	25	7.6	40	13.5	84	31.6	20	46.5	192	16.0
	Female	32	10.9	33	11.6	48	16.8	91	33.1	17	50.0	221	18.8
	Total	55	9.8	58	9.4	88	15.1	175	32.3	37	48.1	413	17.4
0.7 or better	Male	241	90.6	292	88.2	252	84.8	172	64.7	21	48.8	978	81.3
	Female	259	88.1	246	86.6	229	80.1	164	59.6	11	32.4	909	77.5
	Total	500	89.3	538	87.5	481	82.5	336	62.1	32	41.6	1887	79.4

Presenting Visual Acuity – Left Eye

		40 – 49yr		50 – 59yr		60 – 69yr		70 – 79yr		80 – yr		Total	
		N	%	N	%	N	%	N	%	N	%	N	%
not recorded	Male	–	0.0	1	0.3	–	0.0	–	0.0	–	0.0	1	0.1
	Female	–	0.0	–	0.0	1	0.3	–	0.0	–	0.0	1	0.1
	Total	–	0.0	1	0.2	1	0.2	–	0.0	–	0.0	2	0.1
0.3 or worse	Male	1	0.4	6	1.8	12	4.0	18	6.8	5	11.6	42	3.5
	Female	5	1.7	8	2.8	7	2.4	20	7.3	8	23.5	48	4.1
	Total	6	1.1	14	2.3	19	3.3	38	7.0	13	16.9	90	3.8
0.3–0.6	Male	18	6.8	29	8.8	33	11.1	72	27.1	16	37.2	168	14.0
	Female	19	6.5	32	11.3	51	17.8	93	33.8	10	29.4	205	17.5
	Total	37	6.6	61	9.9	84	14.4	165	30.5	26	33.8	373	15.7
0.7 or better	Male	247	92.9	295	89.1	252	84.8	176	66.2	22	51.2	992	82.5
	Female	270	91.8	244	85.9	227	79.4	162	58.9	16	47.1	919	78.3
	Total	517	92.3	539	87.6	479	82.2	338	62.5	38	49.4	1911	80.4

Best-corrected Visual Acuity – Right Eye

		40 – 49yr		50 – 59yr		60 – 69yr		70 – 79yr		80 – yr		Total	
		N	%	N	%	N	%	N	%	N	%	N	%
not recorded	Male	1	0.4	–	0.0	1	0.3	1	0.4	–	0.0	3	0.2
	Female	–	0.0	–	0.0	–	0.0	1	0.4	1	2.9	2	0.2
	Total	1	0.2	–	0.0	1	0.2	2	0.4	1	1.3	5	0.2
0.3 or worse	Male	–	0.0	3	0.9	1	0.3	3	1.1	1	2.3	8	0.7
	Female	–	0.0	1	0.4	1	0.3	11	4.0	4	11.8	17	1.4
	Total	–	0.0	4	0.7	2	0.3	14	2.6	5	6.5	25	1.1
0.3–0.6	Male	3	1.1	9	2.7	12	4.0	39	14.7	9	20.9	72	6.0
	Female	2	0.7	3	1.1	15	5.2	43	15.6	10	29.4	73	6.2
	Total	5	0.9	12	2.0	27	4.6	82	15.2	19	24.7	145	6.1
0.7 or better	Male	262	98.5	319	96.4	283	95.3	223	83.8	33	76.7	1120	93.1

Female	292	99.3	280	98.6	270	94.4	220	80.0	19	55.9	1081	92.2
Total	554	98.9	599	97.4	553	94.9	443	81.9	52	67.5	2201	92.6

Best-corrected Visual Acuity – Left Eye

		40 – 49yr		50 – 59yr		60 – 69yr		70 – 79yr		80 – yr		Total	
		N	%	N	%	N	%	N	%	N	%	N	%
not recorded	Male	–	0.0	1	0.3	–	0.0	–	0.0	–	0.0	1	0.1
	Female	–	0.0	–	0.0	1	0.3	–	0.0	–	0.0	1	0.1
	Total	–	0.0	1	0.2	1	0.2	–	0.0	–	0.0	2	0.1
0.3 or worse	Male	–	0.0	1	0.3	4	1.3	8	3.0	4	9.3	17	1.4
	Female	1	0.3	–	0.0	1	0.3	7	2.5	5	14.7	14	1.2
	Total	1	0.2	1	0.2	5	0.9	15	2.8	9	11.7	31	1.3
0.3–0.6	Male	–	0.0	6	1.8	15	5.1	40	15.0	8	18.6	69	5.7
	Female	1	0.3	6	2.1	22	7.7	40	14.5	9	26.5	78	6.6
	Total	1	0.2	12	2.0	37	6.3	80	14.8	17	22.1	147	6.2
0.7 or better	Male	266	100.0	323	97.6	278	93.6	218	82.0	31	72.1	1116	92.8
	Female	292	99.3	278	97.9	262	91.6	228	82.9	20	58.8	1080	92.1
	Total	558	99.6	601	97.7	540	92.6	446	82.4	51	66.2	2196	92.4

3. Contrast sensitivity

Contrast sensitivity was measured at 1.5, 3, 6, 12, 18 cycles per degree with Vistech VCTS-6500.

Contrast Sensitivity at 1.5 cycles/degree – Right Eye

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80 – yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	47.5	21.0	266	42.9	18.4	330	40.1	18.7	296	33.4	15.2	264	31.8	19.4	42	40.7	19.1	1198
Female	44.4	20.1	294	40.8	18.2	284	36.8	17.0	285	30.4	12.0	267	29.3	13.2	30	38.0	17.9	1160
Total	45.9	20.5	560	42.0	18.3	614	38.4	17.9	581	31.9	13.7	531	30.8	17.1	72	39.4	18.6	2358

Contrast Sensitivity at 3 cycles/degree – Right Eye

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80 – yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	100.4	41.1	266	84.1	34.1	330	78.6	35.8	296	63.5	29.6	264	54.6	27.0	42	80.8	37.5	1198
Female	91.0	38.2	294	83.1	32.8	284	69.5	28.6	285	58.6	29.5	267	55.7	27.7	30	75.4	34.8	1160
Total	95.4	39.9	560	83.6	33.5	614	74.1	32.7	581	61.0	29.6	531	55.1	27.1	72	78.1	36.3	2358

Contrast Sensitivity at 6 cycles/degree – Right Eye

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80 – yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	97.3	43.8	266	88.7	44.0	330	79.7	44.9	296	51.7	31.0	264	43.8	28.4	42	78.7	44.7	1198
Female	96.2	46.4	294	91.4	43.8	284	72.5	41.6	285	47.9	29.6	267	40.9	30.5	30	76.6	45.1	1160

Total	96.7	45.1	560	89.9	43.9	614	76.2	43.4	581	49.8	30.3	531	42.6	29.1	72	77.7	44.9	2358
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Contrast Sensitivity at 12 cycles/degree – Right Eye

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80 – yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	56.8	36.8	266	49.1	34.4	330	40.1	33.7	296	18.7	20.3	264	13.8	13.8	42	40.7	34.8	1198
Female	51.3	34.4	294	50.6	34.2	284	37.7	32.2	285	17.4	18.7	267	11.7	15.9	30	39.0	33.5	1160
Total	53.9	35.7	560	49.8	34.3	614	38.9	32.9	581	18.0	19.5	531	12.9	14.7	72	39.8	34.2	2358

Contrast Sensitivity at 18 cycles/degree – Right Eye

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80 – yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	16.5	12.2	266	14.6	11.8	330	11.8	10.6	296	5.4	6.2	264	2.6	4.3	42	11.9	11.3	1198
Female	16.3	12.0	294	15.4	11.6	284	11.2	11.1	285	5.0	5.9	267	4.6	7.8	30	11.9	11.4	1160
Total	16.4	12.1	560	15.0	11.7	614	11.5	10.8	581	5.2	6.1	531	3.5	6.0	72	11.9	11.3	2358

4. Intraocular pressure

Intraocular pressure was measured three times for each eye with a noncontact tomometer (NIDEK NT-3000) between 9 and 12 AM. The mean value of the three measurements was used for analysis.

Intraocular Pressure – Right Eye (mmHg)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80 – yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	13.55	2.43	265	13.20	2.67	331	12.71	2.60	296	12.45	2.39	265	12.26	3.00	43	12.96	2.59	1200
Female	12.47	2.41	294	12.58	2.50	284	12.58	2.45	286	12.12	2.27	273	11.82	3.16	33	12.42	2.44	1170
Total	12.98	2.48	559	12.91	2.61	615	12.65	2.53	582	12.28	2.33	538	12.07	3.06	76	12.69	2.53	2370

Intraocular Pressure – Left Eye (mmHg)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80 – yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	13.51	2.43	265	13.09	2.72	330	12.73	2.76	297	12.82	2.78	266	12.61	2.67	42	13.02	2.69	1200
Female	12.50	2.50	294	12.70	2.51	284	12.65	2.42	285	12.39	2.48	274	11.93	2.67	34	12.54	2.48	1171
Total	12.98	2.51	559	12.91	2.63	614	12.69	2.60	582	12.60	2.64	540	12.30	2.67	76	12.78	2.60	2371

5. Retinal fundus camera

Fundus photographs were taken with Topcon fundus camera (TRC-NW5S) at 20 and 45 degree angles for each eye without pupil dilatation.

Diabetic retinopathy, Arteriosclerosis, and macular degeneration were assessed on the photograph at 45 degree angles.

Vertical cup to disc ratio was measured on the photograph at 20 degree angles.

Cup-Disc Ratio of Optic Disc – Right Eye

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80 – yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	0.43	0.13	265	0.44	0.12	330	0.43	0.14	294	0.46	0.14	258	0.45	0.15	37	0.44	0.13	1184
Female	0.42	0.13	294	0.43	0.13	283	0.43	0.15	282	0.43	0.14	263	0.46	0.15	31	0.43	0.14	1153
Total	0.43	0.13	559	0.44	0.13	613	0.43	0.14	576	0.44	0.14	521	0.46	0.15	68	0.44	0.13	2337

Cup-Disc Ratio of Optic Disc – Left Eye

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80 – yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	0.43	0.13	265	0.44	0.13	328	0.43	0.14	294	0.45	0.14	258	0.45	0.14	37	0.44	0.13	1182
Female	0.42	0.12	293	0.43	0.13	283	0.44	0.14	284	0.44	0.13	263	0.47	0.15	32	0.43	0.13	1155
Total	0.43	0.12	558	0.44	0.13	611	0.43	0.14	578	0.45	0.14	521	0.46	0.15	69	0.44	0.13	2337

Diabetic Retinopathy – Right Eye

		40 – 49yr		50 – 59yr		60 – 69yr		70 – 79yr		80 – yr		Total	
		N	%	N	%	N	%	N	%	N	%	N	%
not recorded	Male	–	0.0	–	0.0	2	0.7	1	0.4	2	4.7	5	0.4
	Female	–	0.0	–	0.0	–	0.0	4	1.5	3	8.8	7	0.6
	Total	–	0.0	–	0.0	2	0.3	5	0.9	5	6.5	12	0.5
nothing	Male	265	99.6	329	99.4	289	97.3	255	95.9	36	83.7	1174	97.6
	Female	294	100.0	283	99.6	282	98.6	255	92.7	31	91.2	1145	97.6
	Total	559	99.8	612	99.5	571	97.9	510	94.3	67	87.0	2319	97.6
simple	Male	–	0.0	–	0.0	1	0.3	1	0.4	–	0.0	2	0.2
	Female	–	0.0	–	0.0	1	0.3	–	0.0	–	0.0	1	0.1
	Total	–	0.0	–	0.0	2	0.3	1	0.2	–	0.0	3	0.1
preproliferative	Male	1	0.4	–	0.0	3	1.0	–	0.0	–	0.0	4	0.3
	Female	–	0.0	–	0.0	–	0.0	1	0.4	–	0.0	1	0.1
	Total	1	0.2	–	0.0	3	0.5	1	0.2	–	0.0	5	0.2
invisible	Male	–	0.0	2	0.6	2	0.7	9	3.4	5	11.6	18	1.5
	Female	–	0.0	1	0.4	3	1.0	15	5.5	–	0.0	19	1.6
	Total	–	0.0	3	0.5	5	0.9	24	4.4	5	6.5	37	1.6

Diabetic Retinopathy – Left Eye

		40 – 49yr		50 – 59yr		60 – 69yr		70 – 79yr		80 – yr		Total	
		N	%	N	%	N	%	N	%	N	%	N	%
not recorded	Male	–	0.0	2	0.6	–	0.0	2	0.8	2	4.7	6	0.5
	Female	–	0.0	–	0.0	1	0.3	2	0.7	1	2.9	4	0.3
	Total	–	0.0	2	0.3	1	0.2	4	0.7	3	3.9	10	0.4
nothing	Male	264	99.2	327	98.8	289	97.3	251	94.4	38	88.4	1169	97.2
	Female	293	99.7	283	99.6	281	98.3	255	92.7	33	97.1	1145	97.6
	Total	557	99.5	610	99.2	570	97.8	506	93.5	71	92.2	2314	97.4
simple	Male	–	0.0	–	0.0	3	1.0	1	0.4	–	0.0	4	0.3
	Female	–	0.0	–	0.0	1	0.3	–	0.0	–	0.0	1	0.1
	Total	–	0.0	–	0.0	4	0.7	1	0.2	–	0.0	5	0.2

preproliferative	Male	1	0.4	–	0.0	–	0.0	1	0.4	–	0.0	2	0.2
	Female	1	0.3	–	0.0	–	0.0	1	0.4	–	0.0	2	0.2
	Total	2	0.4	–	0.0	–	0.0	2	0.4	–	0.0	4	0.2
invisible	Male	1	0.4	2	0.6	5	1.7	11	4.1	3	7.0	22	1.8
	Female	–	0.0	1	0.4	3	1.0	17	6.2	–	0.0	21	1.8
	Total	1	0.2	3	0.5	8	1.4	28	5.2	3	3.9	43	1.8

Arteriosclerosis (Keith-Wagener) – Right Eye

		40 – 49yr		50 – 59yr		60 – 69yr		70 – 79yr		80 – yr		Total	
		N	%	N	%	N	%	N	%	N	%	N	%
not recorded	Male	–	0.0	–	0.0	2	0.7	1	0.4	2	4.7	5	0.4
	Female	–	0.0	–	0.0	–	0.0	4	1.5	3	8.8	7	0.6
	Total	–	0.0	–	0.0	2	0.3	5	0.9	5	6.5	12	0.5
nothing	Male	102	38.3	56	16.9	22	7.4	3	1.1	1	2.3	184	15.3
	Female	143	48.6	86	30.3	33	11.5	5	1.8	1	2.9	268	22.8
	Total	245	43.8	142	23.1	55	9.4	8	1.5	2	2.6	452	19.0
K-W I	Male	144	54.1	216	65.3	186	62.6	120	45.1	16	37.2	682	56.7
	Female	136	46.3	158	55.6	187	65.4	116	42.2	13	38.2	610	52.0
	Total	280	50.0	374	60.8	373	64.0	236	43.6	29	37.7	1292	54.4
K-W II a	Male	19	7.1	53	16.0	75	25.3	114	42.9	18	41.9	279	23.2
	Female	14	4.8	37	13.0	54	18.9	120	43.6	13	38.2	238	20.3
	Total	33	5.9	90	14.6	129	22.1	234	43.3	31	40.3	517	21.8
K-W II b	Male	1	0.4	3	0.9	9	3.0	16	6.0	1	2.3	30	2.5
	Female	1	0.3	2	0.7	10	3.5	12	4.4	2	5.9	27	2.3
	Total	2	0.4	5	0.8	19	3.3	28	5.2	3	3.9	57	2.4
K-W III	Male	–	0.0	–	0.0	1	0.3	1	0.4	–	0.0	2	0.2
	Female	–	0.0	–	0.0	–	0.0	1	0.4	1	2.9	2	0.2
	Total	–	0.0	–	0.0	1	0.2	2	0.4	1	1.3	4	0.2
invisible	Male	–	0.0	3	0.9	2	0.7	11	4.1	5	11.6	21	1.7
	Female	–	0.0	1	0.4	2	0.7	17	6.2	1	2.9	21	1.8
	Total	–	0.0	4	0.7	4	0.7	28	5.2	6	7.8	42	1.8

Arteriosclerosis (Keith-Wagener) – Left Eye

		40 – 49yr		50 – 59yr		60 – 69yr		70 – 79yr		80 – yr		Total	
		N	%	N	%	N	%	N	%	N	%	N	%
not recorded	Male	–	0.0	2	0.6	–	0.0	2	0.8	2	4.7	6	0.5
	Female	–	0.0	–	0.0	1	0.3	2	0.7	1	2.9	4	0.3
	Total	–	0.0	2	0.3	1	0.2	4	0.7	3	3.9	10	0.4
nothing	Male	97	36.5	53	16.0	21	7.1	2	0.8	–	0.0	173	14.4
	Female	143	48.6	79	27.8	33	11.5	4	1.5	1	2.9	260	22.2
	Total	240	42.9	132	21.5	54	9.3	6	1.1	1	1.3	433	18.2
K-W I	Male	146	54.9	218	65.9	180	60.6	117	44.0	14	32.6	675	56.1
	Female	137	46.6	166	58.5	177	61.9	117	42.5	13	38.2	610	52.0
	Total	283	50.5	384	62.4	357	61.2	234	43.3	27	35.1	1285	54.1
K-W II a	Male	21	7.9	53	16.0	84	28.3	118	44.4	22	51.2	298	24.8
	Female	14	4.8	37	13.0	66	23.1	124	45.1	15	44.1	256	21.8

	Total	35	6.3	90	14.6	150	25.7	242	44.7	37	48.1	554	23.3
K-W II b	Male	1	0.4	3	0.9	6	2.0	15	5.6	2	4.7	27	2.2
	Female	–	0.0	1	0.4	6	2.1	9	3.3	3	8.8	19	1.6
	Total	1	0.2	4	0.7	12	2.1	24	4.4	5	6.5	46	1.9
K-W III	Male	–	0.0	–	0.0	1	0.3	1	0.4	–	0.0	2	0.2
	Female	–	0.0	–	0.0	–	0.0	–	0.0	–	0.0	–	0.0
	Total	–	0.0	–	0.0	1	0.2	1	0.2	–	0.0	2	0.1
imvisible	Male	1	0.4	2	0.6	5	1.7	11	4.1	3	7.0	22	1.8
	Female	–	0.0	1	0.4	3	1.0	19	6.9	1	2.9	24	2.0
	Total	1	0.2	3	0.5	8	1.4	30	5.5	4	5.2	46	1.9

Macular Degeneration – Right Eye

		40 – 49yr		50 – 59yr		60 – 69yr		70 – 79yr		80 – yr		Total	
		N	%	N	%	N	%	N	%	N	%	N	%
not recorded	Male	–	0.0	–	0.0	2	0.7	1	0.4	2	4.7	5	0.4
	Female	1	0.3	–	0.0	–	0.0	4	1.5	3	8.8	8	0.7
	Total	1	0.2	–	0.0	2	0.3	5	0.9	5	6.5	13	0.5
nothing	Male	261	98.1	315	95.2	252	84.8	209	78.6	33	76.7	1070	88.9
	Female	286	97.3	272	95.8	250	87.4	201	73.1	24	70.6	1033	88.1
	Total	547	97.7	587	95.4	502	86.1	410	75.8	57	74.0	2103	88.5
drusen	Male	1	0.4	8	2.4	19	6.4	11	4.1	–	0.0	39	3.2
	Female	4	1.4	5	1.8	6	2.1	17	6.2	2	5.9	34	2.9
	Total	5	0.9	13	2.1	25	4.3	28	5.2	2	2.6	73	3.1
atrophic change	Male	2	0.8	1	0.3	2	0.7	2	0.8	–	0.0	7	0.6
	Female	–	0.0	1	0.4	5	1.7	5	1.8	2	5.9	13	1.1
	Total	2	0.4	2	0.3	7	1.2	7	1.3	2	2.6	20	0.8
exudative change	Male	–	0.0	–	0.0	–	0.0	–	0.0	–	0.0	–	0.0
	Female	–	0.0	2	0.7	–	0.0	1	0.4	–	0.0	3	0.3
	Total	–	0.0	2	0.3	–	0.0	1	0.2	–	0.0	3	0.1
epiretinal membrane	Male	–	0.0	–	0.0	8	2.7	12	4.5	–	0.0	20	1.7
	Female	1	0.3	1	0.4	8	2.8	8	2.9	–	0.0	18	1.5
	Total	1	0.2	1	0.2	16	2.7	20	3.7	–	0.0	38	1.6
others	Male	–	0.0	–	0.0	1	0.3	2	0.8	–	0.0	3	0.2
	Female	–	0.0	–	0.0	–	0.0	2	0.7	1	2.9	3	0.3
	Total	–	0.0	–	0.0	1	0.2	4	0.7	1	1.3	6	0.3
imvisible	Male	2	0.8	7	2.1	13	4.4	29	10.9	8	18.6	59	4.9
	Female	2	0.7	3	1.1	17	5.9	37	13.5	2	5.9	61	5.2
	Total	4	0.7	10	1.6	30	5.1	66	12.2	10	13.0	120	5.1

Macular Degeneration – Left Eye

		40 – 49yr		50 – 59yr		60 – 69yr		70 – 79yr		80 – yr		Total	
		N	%	N	%	N	%	N	%	N	%	N	%
not recorded	Male	–	0.0	2	0.6	–	0.0	2	0.8	2	4.7	6	0.5
	Female	–	0.0	–	0.0	1	0.3	2	0.7	1	2.9	4	0.3
	Total	–	0.0	2	0.3	1	0.2	4	0.7	3	3.9	10	0.4

nothing	Male	258	97.0	307	92.7	248	83.5	197	74.1	25	58.1	1035	86.0
	Female	289	98.3	267	94.0	249	87.1	209	76.0	26	76.5	1040	88.7
	Total	547	97.7	574	93.3	497	85.2	406	75.0	51	66.2	2075	87.3
drusen	Male	4	1.5	6	1.8	15	5.1	15	5.6	–	0.0	40	3.3
	Female	4	1.4	8	2.8	8	2.8	11	4.0	2	5.9	33	2.8
	Total	8	1.4	14	2.3	23	3.9	26	4.8	2	2.6	73	3.1
atrophic change	Male	–	0.0	–	0.0	4	1.3	3	1.1	1	2.3	8	0.7
	Female	–	0.0	–	0.0	1	0.3	1	0.4	2	5.9	4	0.3
	Total	–	0.0	–	0.0	5	0.9	4	0.7	3	3.9	12	0.5
exudative change	Male	–	0.0	2	0.6	1	0.3	1	0.4	–	0.0	4	0.3
	Female	–	0.0	1	0.4	–	0.0	1	0.4	–	0.0	2	0.2
	Total	–	0.0	3	0.5	1	0.2	2	0.4	–	0.0	6	0.3
epiretinal membrane	Male	–	0.0	1	0.3	8	2.7	12	4.5	2	4.7	23	1.9
	Female	–	0.0	2	0.7	4	1.4	11	4.0	–	0.0	17	1.4
	Total	–	0.0	3	0.5	12	2.1	23	4.3	2	2.6	40	1.7
others	Male	–	0.0	–	0.0	1	0.3	–	0.0	1	2.3	2	0.2
	Female	–	0.0	–	0.0	–	0.0	1	0.4	–	0.0	1	0.1
	Total	–	0.0	–	0.0	1	0.2	1	0.2	1	1.3	3	0.1
invisible	Male	4	1.5	13	3.9	20	6.7	36	13.5	12	27.9	85	7.1
	Female	1	0.3	6	2.1	23	8.0	39	14.2	3	8.8	72	6.1
	Total	5	0.9	19	3.1	43	7.4	75	13.9	15	19.5	157	6.6

6. Specular microscope

Corneal thickness was obtained with the Topcon SP-2000 specular microscope.

Central Corneal Thickness – Right Eye (mm)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80 – yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	0.521	0.031	265	0.521	0.034	330	0.518	0.033	296	0.514	0.033	264	0.517	0.039	43	0.519	0.033	1198
Female	0.512	0.032	293	0.512	0.036	284	0.513	0.032	286	0.512	0.032	267	0.511	0.031	31	0.512	0.033	1161
Total	0.517	0.032	558	0.517	0.035	614	0.516	0.033	582	0.513	0.032	531	0.515	0.036	74	0.516	0.033	2359

Central Corneal Thickness – Left Eye (mm)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80 – yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	0.524	0.031	265	0.525	0.033	329	0.523	0.031	296	0.519	0.033	265	0.524	0.038	42	0.523	0.033	1197
Female	0.516	0.032	294	0.516	0.036	284	0.519	0.032	286	0.517	0.032	270	0.513	0.032	33	0.517	0.033	1167
Total	0.520	0.032	559	0.520	0.035	613	0.521	0.032	582	0.518	0.033	535	0.519	0.036	75	0.520	0.033	2364

7. Heidelberg Retina Tomograph II

The Heidelberg Retina Tomograph is a confocal laser scanning microscope for acquisition and analysis of three-dimensional images of the posterior segment. It enables the quantitative assessment of the retinal topography and precise follow-up of topographic changes. In the NILS-LSA, the topographic description of the optic nerve head was assessed.

HRT cup/disc area ratio – Right Eye

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80 – yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	0.20	0.12	262	0.21	0.12	327	0.20	0.12	282	0.23	0.14	239	0.21	0.13	29	0.21	0.12	1139
Female	0.18	0.12	294	0.20	0.12	279	0.21	0.14	279	0.21	0.13	233	0.21	0.15	26	0.20	0.13	1111
Total	0.19	0.12	556	0.20	0.12	606	0.21	0.13	561	0.22	0.14	472	0.21	0.14	55	0.20	0.13	2250

HRT cup/disc area ratio – Left Eye

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80 – yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	0.21	0.12	259	0.22	0.12	323	0.22	0.14	283	0.25	0.15	224	0.28	0.19	28	0.22	0.14	1117
Female	0.19	0.11	292	0.22	0.12	280	0.22	0.14	272	0.22	0.13	232	0.26	0.16	25	0.21	0.13	1101
Total	0.20	0.12	551	0.22	0.12	603	0.22	0.14	555	0.24	0.14	456	0.27	0.17	53	0.22	0.13	2218

HRT mean cup depth – Right Eye (mm)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80 – yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	0.19	0.08	262	0.19	0.08	327	0.18	0.08	282	0.19	0.08	239	0.18	0.06	29	0.19	0.08	1139
Female	0.19	0.08	294	0.18	0.07	279	0.18	0.08	279	0.17	0.08	233	0.18	0.07	26	0.18	0.08	1111
Total	0.19	0.08	556	0.19	0.07	606	0.18	0.08	561	0.18	0.08	472	0.18	0.07	55	0.18	0.08	2250

HRT mean cup depth – Left Eye (mm)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80 – yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	0.19	0.08	259	0.20	0.08	323	0.18	0.08	283	0.18	0.07	224	0.18	0.08	28	0.19	0.08	1117
Female	0.19	0.07	292	0.19	0.08	280	0.19	0.08	272	0.18	0.08	232	0.19	0.07	25	0.19	0.08	1101
Total	0.19	0.08	551	0.19	0.08	603	0.18	0.08	555	0.18	0.08	456	0.19	0.08	53	0.19	0.08	2218

2) Auditory system

1. Pure-tone audiometry (Audiometer RION AA-73A)

Air conduction threshold of right ear at 125Hz (dBHL)

	40–49yr			50–59yr			60–69yr			70–79yr			80–89yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	23.1	8.0	266	26.0	9.6	331	30.4	11.7	297	35.8	13.8	266	40.2	13.1	43	29.1	12.1	1203
Female	22.9	7.0	294	26.2	9.2	285	30.5	11.9	284	37.1	12.7	275	39.4	14.8	34	29.4	11.9	1172
Total	23.0	7.5	560	26.1	9.4	616	30.4	11.8	581	36.4	13.3	541	39.9	13.8	77	29.2	12.0	2375

Air conduction threshold of right ear at 250Hz (dBHL)

40–49yr			50–59yr			60–69yr			70–79yr			80–89yr			Total		
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	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	19.5	7.7	266	22.3	10.4	331	25.9	11.9	297	31.9	15.8	266	36.7	15.1	43	25.2	12.9	1203
Female	19.0	6.8	294	22.4	9.0	285	26.6	13.4	284	32.9	14.1	275	37.6	18.1	34	25.5	12.7	1172
Total	19.2	7.2	560	22.4	9.7	616	26.2	12.7	581	32.4	15.0	541	37.1	16.4	77	25.3	12.8	2375

	40-49yr			50-59yr			60-69yr			70-79yr			80-89yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	14.5	6.8	266	17.8	11.2	331	21.3	11.8	297	28.4	16.0	266	34.0	15.1	43	20.9	13.2	1203
Female	14.6	6.9	294	17.2	9.0	285	23.2	14.7	284	29.8	14.7	275	36.5	22.4	34	21.5	13.7	1172
Total	14.6	6.9	560	17.5	10.2	616	22.3	13.4	581	29.1	15.4	541	35.1	18.6	77	21.2	13.5	2375

	40-49yr			50-59yr			60-69yr			70-79yr			80-89yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	10.0	7.8	266	13.3	11.4	331	17.8	12.9	297	26.9	17.8	266	36.4	15.8	43	17.5	14.8	1203
Female	8.7	7.6	294	12.3	9.1	285	18.6	15.2	284	26.3	15.1	275	35.6	22.6	34	16.9	14.5	1172
Total	9.3	7.7	560	12.9	10.4	616	18.2	14.1	581	26.6	16.5	541	36.0	19.0	77	17.2	14.7	2375

	40-49yr			50-59yr			60-69yr			70-79yr			80-89yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	13.6	9.9	266	17.9	12.2	331	25.8	15.0	297	36.2	18.1	266	47.6	18.4	43	24.0	17.0	1203
Female	11.9	8.9	294	15.9	9.7	285	24.0	14.6	284	31.7	14.4	275	42.1	21.8	34	21.3	15.0	1172
Total	12.7	9.4	560	17.0	11.1	616	24.9	14.8	581	33.9	16.5	541	45.1	20.0	77	22.7	16.1	2375

	40-49yr			50-59yr			60-69yr			70-79yr			80-89yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	16.8	14.0	266	25.8	17.5	331	37.5	18.4	297	50.0	19.1	266	59.8	19.1	43	33.3	21.7	1203
Female	9.9	10.6	294	15.3	11.5	285	25.2	17.1	284	36.0	17.2	275	46.6	25.0	34	22.1	18.2	1172
Total	13.2	12.8	560	20.9	15.9	616	31.5	18.7	581	42.9	19.5	541	54.0	22.7	77	27.8	20.8	2375

	40-49yr			50-59yr			60-69yr			70-79yr			80-89yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	23.4	18.0	266	33.8	18.9	331	49.5	21.0	297	66.1	18.8	266	76.4	17.4	43	44.1	25.4	1203
Female	19.2	14.6	294	28.0	15.5	285	42.9	20.1	284	58.7	21.1	275	72.8	18.5	34	37.9	24.0	1172
Total	21.2	16.4	560	31.1	17.6	616	46.3	20.8	581	62.4	20.3	541	74.8	17.9	77	41.0	24.9	2375

	40–49yr			50–59yr			60–69yr			70–79yr			80–89yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	19.5	6.4	266	21.0	7.4	331	24.1	9.4	297	29.6	12.0	266	33.6	12.4	43	23.8	10.0	1203
Female	17.9	6.3	294	20.7	7.6	285	24.3	9.4	283	30.8	11.2	274	34.6	12.9	34	23.6	10.2	1170
Total	18.6	6.4	560	20.8	7.5	616	24.2	9.4	580	30.2	11.6	540	34.0	12.6	77	23.7	10.1	2373

Bone conduction threshold of right ear at 500Hz (dBHL)

	40–49yr			50–59yr			60–69yr			70–79yr			80–89yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	13.3	6.7	266	15.6	8.1	331	18.9	10.1	297	26.1	13.7	266	31.7	14.6	43	18.8	11.4	1203
Female	12.9	6.8	294	15.4	8.7	285	19.8	10.3	283	27.2	12.2	274	33.4	17.2	34	19.1	11.5	1170
Total	13.1	6.8	560	15.5	8.4	616	19.4	10.2	580	26.6	13.0	540	32.5	15.7	77	19.0	11.4	2373

Bone conduction threshold of right ear at 1000Hz (dBHL)

	40–49yr			50–59yr			60–69yr			70–79yr			80–89yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	9.8	7.1	266	12.4	8.9	331	17.2	11.9	297	25.7	15.2	266	35.6	14.6	43	16.8	13.2	1203
Female	8.9	7.5	294	13.4	9.3	285	18.1	10.9	283	26.3	13.3	274	34.0	16.9	34	17.0	12.7	1170
Total	9.4	7.3	560	12.8	9.1	616	17.6	11.4	580	26.0	14.3	540	34.9	15.6	77	16.9	12.9	2373

Bone conduction threshold of right ear at 2000Hz (dBHL)

	40–49yr			50–59yr			60–69yr			70–79yr			80–89yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	13.6	9.0	266	17.1	10.7	331	24.5	14.0	297	34.5	16.6	266	45.3	17.8	43	23.0	15.7	1203
Female	11.8	8.0	294	16.3	9.8	285	23.0	12.6	283	31.1	13.6	274	39.7	16.7	34	20.9	13.8	1170
Total	12.7	8.5	560	16.8	10.3	616	23.8	13.3	580	32.8	15.2	540	42.9	17.4	77	22.0	14.8	2373

Bone conduction threshold of right ear at 4000Hz (dBHL)

	40–49yr			50–59yr			60–69yr			70–79yr			80–89yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	17.3	12.2	266	25.4	14.8	331	36.2	16.1	297	46.8	15.3	266	53.5	13.6	43	32.0	18.5	1203
Female	10.3	9.0	294	15.9	10.9	285	24.6	14.2	283	34.9	15.1	274	41.9	16.7	34	21.8	15.9	1170
Total	13.6	11.2	560	21.0	13.9	616	30.5	16.3	580	40.7	16.3	540	48.4	16.0	77	27.0	18.0	2373

Air conduction threshold of left ear at 125Hz (dBHL)

	40–49yr			50–59yr			60–69yr			70–79yr			80–89yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	20.7	8.5	266	23.4	9.5	331	26.9	11.8	297	32.9	13.8	266	35.8	12.8	43	26.2	12.0	1203
Female	20.8	6.2	294	23.0	9.9	285	27.7	10.7	284	34.9	12.9	275	33.5	12.3	34	26.7	11.6	1172
Total	20.7	7.4	560	23.2	9.7	616	27.3	11.3	581	33.9	13.4	541	34.8	12.6	77	26.5	11.8	2375

Air conduction threshold of left ear at 250Hz (dBHL)

	40-49yr			50-59yr			60-69yr			70-79yr			80-89yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	16.8	8.7	266	19.3	10.3	331	23.0	13.4	297	29.2	15.9	266	33.1	13.8	43	22.4	13.3	1203
Female	16.5	6.2	294	19.2	10.9	285	23.0	12.3	284	31.6	15.0	275	32.1	12.7	34	22.7	12.9	1172
Total	16.7	7.5	560	19.2	10.6	616	23.0	12.8	581	30.4	15.5	541	32.7	13.3	77	22.5	13.1	2375

Air conduction threshold of left ear at 500Hz (dBHL)

	40-49yr			50-59yr			60-69yr			70-79yr			80-89yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	13.1	8.3	266	15.9	11.0	331	19.5	13.6	297	26.4	16.6	266	31.0	14.9	43	19.0	13.8	1203
Female	12.4	5.8	294	15.9	11.3	285	20.0	13.3	284	27.7	15.6	275	30.7	13.9	34	19.2	13.4	1172
Total	12.7	7.1	560	15.9	11.1	616	19.8	13.5	581	27.1	16.1	541	30.9	14.4	77	19.1	13.6	2375

Air conduction threshold of left ear at 1000Hz (dBHL)

	40-49yr			50-59yr			60-69yr			70-79yr			80-89yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	9.8	8.7	266	13.3	11.8	331	18.8	15.5	297	26.4	18.7	266	36.2	16.1	43	17.6	15.8	1203
Female	6.9	7.0	294	11.4	11.8	285	15.9	13.8	284	23.7	15.5	275	29.1	16.4	34	14.7	14.1	1172
Total	8.3	7.9	560	12.4	11.8	616	17.4	14.7	581	25.1	17.2	541	33.1	16.5	77	16.2	15.0	2375

Air conduction threshold of left ear at 2000Hz (dBHL)

	40-49yr			50-59yr			60-69yr			70-79yr			80-89yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	13.3	9.8	266	18.4	12.7	331	27.4	17.5	297	37.1	18.7	266	47.9	18.2	43	24.7	18.0	1203
Female	10.7	8.9	294	16.1	12.3	285	22.5	14.2	284	31.4	16.2	275	38.4	19.6	34	20.5	15.7	1172
Total	11.9	9.4	560	17.3	12.6	616	25.0	16.2	581	34.2	17.7	541	43.7	19.3	77	22.6	17.0	2375

Air conduction threshold of left ear at 4000Hz (dBHL)

	40-49yr			50-59yr			60-69yr			70-79yr			80-89yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	16.4	13.5	266	27.0	17.7	331	38.1	19.5	297	51.4	19.0	266	59.9	16.2	43	34.0	22.0	1203
Female	9.0	9.3	294	16.6	14.0	285	25.2	15.7	284	36.7	19.0	275	47.4	21.0	34	22.4	18.6	1172
Total	12.5	12.0	560	22.2	16.9	616	31.8	18.9	581	43.9	20.4	541	54.4	19.4	77	28.3	21.2	2375

Air conduction threshold of left ear at 8000Hz (dBHL)

	40-49yr			50-59yr			60-69yr			70-79yr			80-89yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	20.2	15.0	266	30.8	19.5	331	47.5	20.6	297	65.3	18.4	266	74.8	18.4	43	41.8	25.5	1203
Female	14.6	11.7	294	26.5	17.0	285	39.8	18.8	284	57.0	19.4	275	69.6	18.8	34	35.2	23.8	1172
Total	17.3	13.7	560	28.8	18.5	616	43.8	20.1	581	61.1	19.3	541	72.5	18.6	77	38.5	24.9	2375

Bone conduction threshold of left ear at 250Hz (dBHL)

	40–49yr			50–59yr			60–69yr			70–79yr			80–89yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	17.6	6.8	266	19.5	7.2	331	22.3	9.6	297	28.2	12.2	266	33.3	13.0	43	22.2	10.2	1203
Female	16.3	6.1	294	18.8	7.8	285	22.7	9.6	283	29.8	10.7	274	31.5	12.3	34	22.1	10.2	1170
Total	16.9	6.5	560	19.2	7.4	616	22.5	9.6	580	29.0	11.5	540	32.5	12.7	77	22.1	10.2	2373

Bone conduction threshold of left ear at 500Hz (dBHL)

	40–49yr			50–59yr			60–69yr			70–79yr			80–89yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	12.3	7.3	266	14.7	7.9	331	17.9	10.2	297	25.1	13.8	266	31.6	14.3	43	17.9	11.5	1203
Female	11.5	5.9	294	14.8	8.6	285	18.6	10.3	283	25.8	11.9	274	30.4	13.9	34	17.9	11.1	1170
Total	11.9	6.6	560	14.7	8.2	616	18.3	10.2	580	25.5	12.9	540	31.1	14.1	77	17.9	11.3	2373

Bone conduction threshold of left ear at 1000Hz (dBHL)

	40–49yr			50–59yr			60–69yr			70–79yr			80–89yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	8.9	7.5	266	12.0	8.9	331	17.0	12.1	297	25.1	16.2	266	35.7	15.9	43	16.3	13.6	1203
Female	7.5	7.3	294	11.4	9.5	285	16.0	11.0	283	23.9	13.0	274	30.3	16.9	34	15.0	12.4	1170
Total	8.2	7.4	560	11.7	9.2	616	16.6	11.5	580	24.5	14.6	540	33.3	16.5	77	15.7	13.0	2373

Bone conduction threshold of left ear at 2000Hz (dBHL)

	40–49yr			50–59yr			60–69yr			70–79yr			80–89yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	14.8	9.3	266	19.1	11.6	331	27.2	14.6	297	37.0	17.2	266	47.1	17.6	43	25.1	16.4	1203
Female	12.6	7.8	294	18.2	10.9	285	23.5	12.1	283	32.2	14.0	274	38.7	16.7	34	21.9	13.8	1170
Total	13.7	8.7	560	18.6	11.3	616	25.4	13.6	580	34.6	15.8	540	43.4	17.6	77	23.5	15.3	2373

Bone conduction threshold of left ear at 4000Hz (dBHL)

	40–49yr			50–59yr			60–69yr			70–79yr			80–89yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	17.3	13.1	266	26.6	15.2	331	36.6	16.3	297	48.3	15.1	266	54.7	11.1	43	32.8	18.9	1203
Female	10.2	8.1	294	17.5	11.8	285	25.2	13.4	283	35.9	15.5	274	45.4	16.4	34	22.7	16.2	1170
Total	13.6	11.3	560	22.4	14.5	616	31.0	16.0	580	42.0	16.5	540	50.6	14.4	77	27.8	18.3	2373

2. Impedance Audiometry

Tympanometric peak pressure in the single frequency tympanogram at 226Hz for right ear (daPa)

	40–49yr			50–59yr			60–69yr			70–79yr			80–89yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	2.9	14.1	263	−2.5	31.2	326	−6.1	38.0	287	−10.3	43.7	255	−14.1	50.4	40	−4.2	34.5	1171
Female	1.6	17.2	291	−1.1	26.1	281	−4.9	41.7	279	−12.8	47.3	263	−9.4	34.8	31	−4.3	35.2	1145

Total	2.2	15.8	554	-1.8	29.0	607	-5.5	39.8	566	-11.6	45.5	518	-12.0	44.1	71	-4.2	34.8	2316
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Static compliance in the single frequency tympanogram at 226Hz for right ear (ml)

	40-49yr			50-59yr			60-69yr			70-79yr			80-89yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	0.92	0.85	263	0.93	0.84	326	1.00	0.93	287	0.84	0.80	255	0.76	0.58	40	0.92	0.85	1171
Female	0.66	0.46	291	0.76	0.76	281	0.73	0.76	279	0.63	0.63	263	0.63	0.56	31	0.70	0.66	1145
Total	0.79	0.69	554	0.85	0.81	607	0.87	0.86	566	0.73	0.72	518	0.71	0.57	71	0.81	0.77	2316

Tympanometric peak pressure in the single frequency tympanogram at 226Hz for left ear (daPa).

	40-49yr			50-59yr			60-69yr			70-79yr			80-89yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	3.9	15.3	263	-4.1	33.0	318	-4.8	35.8	290	-7.3	42.2	260	-11.8	47.3	40	-3.4	33.9	1171
Female	3.5	21.7	294	-0.8	27.1	278	-9.6	41.3	277	-8.2	38.2	266	-16.3	51.3	31	-3.9	33.9	1146
Total	3.7	19.0	557	-2.5	30.4	596	-7.1	38.6	567	-7.7	40.2	526	-13.7	48.8	71	-3.7	33.9	2317

Static compliance in the single frequency tympanogram at 226Hz for left ear (ml)

	40-49yr			50-59yr			60-69yr			70-79yr			80-89yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	0.87	0.80	263	0.85	0.67	318	0.97	0.85	290	0.84	0.75	260	0.78	0.48	40	0.88	0.76	1171
Female	0.67	0.50	294	0.71	0.66	278	0.67	0.61	277	0.60	0.56	266	0.59	0.56	31	0.66	0.58	1146
Total	0.76	0.66	557	0.79	0.67	596	0.82	0.76	567	0.72	0.67	526	0.69	0.52	71	0.77	0.69	2317

Middle ear resonance frequency for right ear (Hz)

	40-49yr			50-59yr			60-69yr			70-79yr			80-89yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	851.2	243.1	260	825.7	236.7	313	819.9	239.1	274	860.9	486.0	233	861.8	247.0	38	838.8	307.7	1118
Female	912.5	246.7	287	848.7	239.7	271	876.0	258.1	271	880.1	285.6	246	939.3	268.5	28	881.3	258.3	1103
Total	883.4	246.7	547	836.4	238.2	584	847.8	250.1	545	870.8	395.6	479	894.7	257.2	66	859.9	285.0	2221

Middle ear resonance frequency for left ear (Hz)

	40-49yr			50-59yr			60-69yr			70-79yr			80-89yr			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	837.3	208.4	255	830.0	231.8	303	814.6	233.9	271	815.6	250.9	237	810.8	237.2	37	824.2	231.4	1103
Female	906.3	243.3	286	852.6	254.6	268	884.6	261.6	265	886.0	287.1	240	889.3	280.7	28	882.9	261.9	1087
Total	873.8	229.9	541	840.6	242.8	571	849.2	250.2	536	851.0	271.7	477	844.6	257.7	65	853.3	248.7	2190