# VIII. Visual and Auditory Examinations

## 1) Visual system

### 1. Refraction

Autorefraction 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 autorefraction 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-NW6S) at 30 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 30 degree angles.

### 6. Specular microscope

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

## 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-78)
*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)

3. Distortion product otoacoustic emission (DPOAE)

Signal-to-noise differences of the DPOAEs in the DP-gram (= DP amplitude above the noise floor) (dB SPL)

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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 | -1.64 | 1.55 | 284 | -1.38 | 1.51 | 292 | -0.67 | 1.34 | 292 | -0.30 | 1.02 | 242 | -0.70 | 0.96 | 50 | -1.01 | 1.46 | 1160 |
| Female | -1.63 | 1.56 | 293 | -1.11 | 1.46 | 282 | -0.46 | 1.49 | 271 | -0.16 | 1.36 | 257 | -0.82 | 1.55 | 52 | -0.86 | 1.58 | 1155 |
| Total | -1.64 | 1.56 | 577 | -1.25 | 1.49 | 574 | -0.57 | 1.41 | 563 | -0.23 | 1.21 | 499 | -0.76 | 1.29 | 102 | -0.94 | 1.52 | 2315 |

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 | -1.64 | 1.49 | 286 | -1.31 | 1.42 | 291 | -0.61 | 1.21 | 292 | -0.23 | 1.02 | 236 | -0.54 | 0.98 | 43 | -0.96 | 1.40 | 1148 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Female | -1.58 | 1.52 | 294 | -1.09 | 1.38 | 281 | -0.47 | 1.45 | 263 | -0.12 | 1.18 | 265 | -0.67 | 1.04 | 51 | -0.83 | 1.48 | 1154 |
| Total | -1.61 | 1.50 | 580 | -1.20 | 1.40 | 572 | -0.54 | 1.33 | 555 | -0.17 | 1.11 | 501 | -0.61 | 1.01 | 94 | -0.90 | 1.45 | 2302 |

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 | 2 | 0.7 | - | 0.0 | 2 | 0.2 |
| | Total | - | 0.0 | - | 0.0 | 1 | 0.2 | 3 | 0.6 | - | 0.0 | 4 | 0.2 |
| 0.3 or worse | Male | 2 | 0.7 | 6 | 2.0 | 8 | 2.7 | 14 | 5.5 | 4 | 7.5 | 34 | 2.9 |
| | Female | 2 | 0.7 | 2 | 0.7 | 11 | 4.0 | 26 | 9.1 | 10 | 16.9 | 51 | 4.3 |
| | Total | 4 | 0.7 | 8 | 1.4 | 19 | 3.3 | 40 | 7.4 | 14 | 12.5 | 85 | 3.6 |
| 0.3-0.6 | Male | 11 | 3.8 | 22 | 7.5 | 36 | 12.0 | 64 | 25.1 | 21 | 39.6 | 154 | 13.0 |
| | Female | 15 | 5.1 | 42 | 14.8 | 38 | 13.9 | 74 | 26.0 | 21 | 35.6 | 190 | 15.9 |
| | Total | 26 | 4.5 | 64 | 11.1 | 74 | 12.9 | 138 | 25.6 | 42 | 37.5 | 344 | 14.4 |
| 0.7 or better | Male | 273 | 95.5 | 267 | 90.5 | 255 | 85.0 | 176 | 69.0 | 28 | 52.8 | 999 | 84.0 |
| | Female | 277 | 94.2 | 239 | 84.5 | 224 | 82.1 | 183 | 64.2 | 28 | 47.5 | 951 | 79.6 |
| | Total | 550 | 94.8 | 506 | 87.5 | 479 | 83.6 | 359 | 66.5 | 56 | 50.0 | 1950 | 81.8 |

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 | 2 | 0.7 | - | 0.0 | - | 0.0 | 1 | 1.9 | 3 | 0.3 |
| | Female | - | 0.0 | - | 0.0 | - | 0.0 | - | 0.0 | - | 0.0 | - | 0.0 |
| | Total | - | 0.0 | 2 | 0.3 | - | 0.0 | - | 0.0 | 1 | 0.9 | 3 | 0.1 |
| 0.3 or worse | Male | 1 | 0.3 | 1 | 0.3 | 6 | 2.0 | 17 | 6.7 | 2 | 3.8 | 27 | 2.3 |
| | Female | 3 | 1.0 | 7 | 2.5 | 12 | 4.4 | 20 | 7.0 | 9 | 15.3 | 51 | 4.3 |
| | Total | 4 | 0.7 | 8 | 1.4 | 18 | 3.1 | 37 | 6.9 | 11 | 9.8 | 78 | 3.3 |
| 0.3-0.6 | Male | 15 | 5.2 | 23 | 7.8 | 35 | 11.7 | 71 | 27.8 | 22 | 41.5 | 166 | 14.0 |
| | Female | 11 | 3.7 | 32 | 11.3 | 37 | 13.6 | 88 | 30.9 | 20 | 33.9 | 188 | 15.7 |
| | Total | 26 | 4.5 | 55 | 9.5 | 72 | 12.6 | 159 | 29.4 | 42 | 37.5 | 354 | 14.9 |
| 0.7 or better | Male | 270 | 94.4 | 269 | 91.2 | 259 | 86.3 | 167 | 65.5 | 28 | 52.8 | 993 | 83.5 |
| | Female | 280 | 95.2 | 244 | 86.2 | 224 | 82.1 | 177 | 62.1 | 30 | 50.8 | 955 | 80.0 |
| | Total | 550 | 94.8 | 513 | 88.8 | 483 | 84.3 | 344 | 63.7 | 58 | 51.8 | 1948 | 81.7 |

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 | - | 0.0 | - | 0.0 | 1 | 0.3 | 1 | 0.4 | - | 0.0 | 2 | 0.2 |
| | Female | - | 0.0 | - | 0.0 | - | 0.0 | 2 | 0.7 | - | 0.0 | 2 | 0.2 |
| | Total | - | 0.0 | - | 0.0 | 1 | 0.2 | 3 | 0.6 | - | 0.0 | 4 | 0.2 |
| 0.3 or worse | Male | - | 0.0 | 2 | 0.7 | 4 | 1.3 | 7 | 2.7 | 1 | 1.9 | 14 | 1.2 |
| | Female | - | 0.0 | - | 0.0 | 2 | 0.7 | 13 | 4.6 | 6 | 10.2 | 21 | 1.8 |
| | Total | - | 0.0 | 2 | 0.3 | 6 | 1.0 | 20 | 3.7 | 7 | 6.3 | 35 | 1.5 |
| 0.3-0.6 | Male | 4 | 1.4 | 5 | 1.7 | 17 | 5.7 | 38 | 14.9 | 14 | 26.4 | 78 | 6.6 |
| | Female | 2 | 0.7 | 7 | 2.5 | 16 | 5.9 | 49 | 17.2 | 15 | 25.4 | 89 | 7.5 |
| | Total | 6 | 1.0 | 12 | 2.1 | 33 | 5.8 | 87 | 16.1 | 29 | 25.9 | 167 | 7.0 |
| 0.7 or better | Male | 282 | 98.6 | 288 | 97.6 | 278 | 92.7 | 209 | 82.0 | 38 | 71.7 | 1095 | 92.1 |
| | Female | 292 | 99.3 | 276 | 97.5 | 255 | 93.4 | 221 | 77.5 | 38 | 64.4 | 1082 | 90.6 |
| | Total | 574 | 99.0 | 564 | 97.6 | 533 | 93.0 | 430 | 79.6 | 76 | 67.9 | 2177 | 91.4 |

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 | 2 | 0.7 | - | 0.0 | - | 0.0 | 1 | 1.9 | 3 | 0.3 |
| | Female | - | 0.0 | - | 0.0 | - | 0.0 | - | 0.0 | - | 0.0 | - | 0.0 |
| | Total | - | 0.0 | 2 | 0.3 | - | 0.0 | - | 0.0 | 1 | 0.9 | 3 | 0.1 |
| 0.3 or worse | Male | - | 0.0 | - | 0.0 | 4 | 1.3 | 7 | 2.7 | 1 | 1.9 | 12 | 1.0 |
| | Female | 1 | 0.3 | 1 | 0.4 | 3 | 1.1 | 14 | 4.9 | 7 | 11.9 | 26 | 2.2 |
| | Total | 1 | 0.2 | 1 | 0.2 | 7 | 1.2 | 21 | 3.9 | 8 | 7.1 | 38 | 1.6 |
| 0.3-0.6 | Male | - | 0.0 | 3 | 1.0 | 13 | 4.3 | 37 | 14.5 | 14 | 26.4 | 67 | 5.6 |
| | Female | 2 | 0.7 | 1 | 0.4 | 17 | 6.2 | 40 | 14.0 | 14 | 23.7 | 74 | 6.2 |
| | Total | 2 | 0.3 | 4 | 0.7 | 30 | 5.2 | 77 | 14.3 | 28 | 25.0 | 141 | 5.9 |
| 0.7 or better | Male | 286 | 100.0 | 290 | 98.3 | 283 | 94.3 | 211 | 82.7 | 37 | 69.8 | 1107 | 93.1 |
| | Female | 291 | 99.0 | 281 | 99.3 | 253 | 92.7 | 231 | 81.1 | 38 | 64.4 | 1094 | 91.6 |
| | Total | 577 | 99.5 | 571 | 98.8 | 536 | 93.5 | 442 | 81.9 | 75 | 67.0 | 2201 | 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 | 46.3 | 21.1 | 286 | 44.9 | 20.2 | 293 | 39.5 | 15.8 | 298 | 35.5 | 14.0 | 252 | 32.2 | 14.7 | 53 | 41.3 | 18.5 | 1182 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Female | 42.5 | 18.1 | 294 | 41.4 | 16.9 | 283 | 38.1 | 14.4 | 273 | 32.8 | 13.0 | 279 | 31.9 | 15.2 | 55 | 38.5 | 16.2 1184 |
| Total | 44.4 | 19.7 | 580 | 43.2 | 18.7 | 576 | 38.9 | 15.1 | 571 | 34.1 | 13.5 | 531 | 32.0 | 14.9 | 108 | 39.9 | 17.5 2366 |

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 | 109.1 | 45.3 | 286 | 100.6 | 45.0 | 293 | 92.8 | 45.9 | 298 | 69.5 | 38.9 | 252 | 58.5 | 37.7 | 53 | 92.2 | 46.5 | 1182 |
| Female | 104.0 | 42.9 | 294 | 104.9 | 45.8 | 283 | 88.6 | 45.4 | 273 | 64.1 | 35.3 | 279 | 56.1 | 34.8 | 55 | 89.0 | 45.8 | 1184 |
| Total | 106.5 | 44.1 | 580 | 102.7 | 45.4 | 576 | 90.8 | 45.7 | 571 | 66.6 | 37.1 | 531 | 57.3 | 36.1 | 108 | 90.6 | 46.1 | 2366 |

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 | 114.3 | 50.3 | 286 | 108.4 | 51.1 | 293 | 92.2 | 50.0 | 298 | 58.9 | 37.2 | 252 | 39.6 | 24.3 | 53 | 92.1 | 52.4 | 1182 |
| Female | 114.3 | 52.6 | 294 | 113.9 | 52.3 | 283 | 94.4 | 53.8 | 273 | 53.9 | 36.7 | 279 | 40.5 | 30.0 | 55 | 92.0 | 55.4 | 1184 |
| Total | 114.3 | 51.4 | 580 | 111.1 | 51.7 | 576 | 93.3 | 51.8 | 571 | 56.3 | 37.0 | 531 | 40.1 | 27.2 | 108 | 92.1 | 53.9 | 2366 |

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 | 64.2 | 35.6 | 286 | 57.8 | 35.9 | 293 | 49.8 | 36.2 | 298 | 23.8 | 25.1 | 252 | 17.4 | 19.6 | 53 | 48.3 | 36.9 | 1182 |
| Female | 66.7 | 38.5 | 294 | 61.7 | 38.9 | 283 | 49.8 | 38.2 | 273 | 23.6 | 27.2 | 279 | 13.4 | 13.6 | 55 | 49.0 | 39.7 | 1184 |
| Total | 65.4 | 37.1 | 580 | 59.7 | 37.4 | 576 | 49.8 | 37.1 | 571 | 23.7 | 26.2 | 531 | 15.3 | 16.9 | 108 | 48.6 | 38.3 | 2366 |

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 | 20.2 | 14.1 | 286 | 18.1 | 13.1 | 293 | 14.5 | 12.3 | 298 | 7.8 | 9.3 | 252 | 4.2 | 7.1 | 53 | 14.9 | 13.2 | 1182 |
| Female | 22.0 | 14.1 | 294 | 20.0 | 13.5 | 283 | 14.4 | 12.3 | 273 | 6.4 | 7.7 | 279 | 4.9 | 6.8 | 55 | 15.3 | 13.6 | 1184 |
| Total | 21.1 | 14.1 | 580 | 19.0 | 13.3 | 576 | 14.4 | 12.3 | 571 | 7.1 | 8.6 | 531 | 4.5 | 6.9 | 108 | 15.1 | 13.4 | 2366 |

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 |
|---|---|---|---|---|---|---|

| | 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 | 12.85 | 2.54 | 285 | 12.73 | 2.65 | 295 | 12.51 | 2.79 | 299 | 11.87 | 2.52 | 254 | 12.02 | 3.21 | 53 | 12.49 | 2.68 | 1186 |
| Female | 12.39 | 2.61 | 294 | 12.05 | 2.50 | 283 | 12.26 | 2.45 | 273 | 12.00 | 2.81 | 284 | 10.99 | 3.00 | 59 | 12.12 | 2.63 | 1193 |
| Total | 12.62 | 2.59 | 579 | 12.40 | 2.60 | 578 | 12.39 | 2.64 | 572 | 11.94 | 2.67 | 538 | 11.48 | 3.13 | 112 | 12.30 | 2.66 | 2379 |

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 | 12.84 | 2.67 | 286 | 12.88 | 2.76 | 294 | 12.48 | 2.68 | 300 | 11.93 | 2.68 | 255 | 11.90 | 2.54 | 53 | 12.52 | 2.72 | 1188 |
| Female | 12.34 | 2.66 | 294 | 11.99 | 2.32 | 283 | 12.37 | 2.44 | 273 | 12.08 | 2.60 | 284 | 11.49 | 2.58 | 58 | 12.16 | 2.52 | 1192 |
| Total | 12.59 | 2.67 | 580 | 12.44 | 2.59 | 577 | 12.43 | 2.57 | 573 | 12.01 | 2.63 | 539 | 11.68 | 2.56 | 111 | 12.34 | 2.63 | 2380 |

5. Retinal fundus camera

Fundus photographs were taken with Topcon fundus camera (TRC-NW6S) at 30 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 30 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 | 0.50 | 0.11 | 286 | 0.51 | 0.10 | 295 | 0.51 | 0.10 | 294 | 0.52 | 0.12 | 248 | 0.57 | 0.11 | 51 | 0.51 | 0.11 | 1174 |
| Female | 0.49 | 0.10 | 294 | 0.49 | 0.10 | 282 | 0.50 | 0.12 | 270 | 0.53 | 0.12 | 275 | 0.54 | 0.10 | 54 | 0.50 | 0.11 | 1175 |
| Total | 0.49 | 0.10 | 580 | 0.50 | 0.10 | 577 | 0.51 | 0.11 | 564 | 0.52 | 0.12 | 523 | 0.55 | 0.10 | 105 | 0.51 | 0.11 | 2349 |

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 | 0.49 | 0.10 | 286 | 0.50 | 0.10 | 292 | 0.50 | 0.11 | 294 | 0.51 | 0.11 | 249 | 0.54 | 0.10 | 51 | 0.50 | 0.11 | 1172 |
| Female | 0.47 | 0.11 | 294 | 0.48 | 0.10 | 281 | 0.50 | 0.12 | 270 | 0.52 | 0.11 | 271 | 0.53 | 0.11 | 55 | 0.49 | 0.11 | 1171 |
| Total | 0.48 | 0.10 | 580 | 0.49 | 0.10 | 573 | 0.50 | 0.12 | 564 | 0.52 | 0.11 | 520 | 0.53 | 0.10 | 106 | 0.50 | 0.11 | 2343 |

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 | 3 | 1.0 | 5 | 2.0 | - | 0.0 | 8 | 0.7 |
| | Female | - | 0.0 | - | 0.0 | 1 | 0.4 | 3 | 1.1 | 1 | 1.7 | 5 | 0.4 |
| | Total | - | 0.0 | - | 0.0 | 4 | 0.7 | 8 | 1.5 | 1 | 0.9 | 13 | 0.5 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| nothing | Male | 284 | 99.3 | 295 | 100.0 | 288 | 96.0 | 240 | 94.1 | 52 | 98.1 | 1159 | 97.5 |
| | Female | 294 | 100.0 | 281 | 99.3 | 267 | 97.8 | 273 | 95.8 | 53 | 89.8 | 1168 | 97.8 |
| | Total | 578 | 99.7 | 576 | 99.7 | 555 | 96.9 | 513 | 95.0 | 105 | 93.8 | 2327 | 97.7 |
| simple | Male | - | 0.0 | - | 0.0 | 2 | 0.7 | 1 | 0.4 | - | 0.0 | 3 | 0.3 |
| | Female | - | 0.0 | - | 0.0 | 1 | 0.4 | - | 0.0 | - | 0.0 | 1 | 0.1 |
| | Total | - | 0.0 | - | 0.0 | 3 | 0.5 | 1 | 0.2 | - | 0.0 | 4 | 0.2 |
| preproliferative | Male | - | 0.0 | - | 0.0 | 3 | 1.0 | 1 | 0.4 | - | 0.0 | 4 | 0.3 |
| | Female | - | 0.0 | - | 0.0 | - | 0.0 | - | 0.0 | - | 0.0 | - | 0.0 |
| | Total | - | 0.0 | - | 0.0 | 3 | 0.5 | 1 | 0.2 | - | 0.0 | 4 | 0.2 |
| imvisible | Male | 2 | 0.7 | - | 0.0 | 4 | 1.3 | 8 | 3.1 | 1 | 1.9 | 15 | 1.3 |
| | Female | - | 0.0 | 2 | 0.7 | 4 | 1.5 | 9 | 3.2 | 5 | 8.5 | 20 | 1.7 |
| | Total | 2 | 0.3 | 2 | 0.3 | 8 | 1.4 | 17 | 3.1 | 6 | 5.4 | 35 | 1.5 |

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 | 0.7 | 4 | 1.3 | 3 | 1.2 | - | 0.0 | 9 | 0.8 |
| | Female | - | 0.0 | 1 | 0.4 | 2 | 0.7 | 3 | 1.1 | 2 | 3.4 | 8 | 0.7 |
| | Total | - | 0.0 | 3 | 0.5 | 6 | 1.0 | 6 | 1.1 | 2 | 1.8 | 17 | 0.7 |
| nothing | Male | 285 | 99.7 | 290 | 98.3 | 284 | 94.7 | 236 | 92.5 | 48 | 90.6 | 1143 | 96.1 |
| | Female | 294 | 100.0 | 280 | 98.9 | 265 | 97.1 | 267 | 93.7 | 54 | 91.5 | 1160 | 97.2 |
| | Total | 579 | 99.8 | 570 | 98.6 | 549 | 95.8 | 503 | 93.1 | 102 | 91.1 | 2303 | 96.6 |
| simple | Male | - | 0.0 | - | 0.0 | 3 | 1.0 | 1 | 0.4 | - | 0.0 | 4 | 0.3 |
| | Female | - | 0.0 | - | 0.0 | 1 | 0.4 | - | 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 | - | 0.0 | - | 0.0 | 3 | 1.0 | 1 | 0.4 | - | 0.0 | 4 | 0.3 |
| | Female | - | 0.0 | - | 0.0 | - | 0.0 | - | 0.0 | - | 0.0 | - | 0.0 |
| | Total | - | 0.0 | - | 0.0 | 3 | 0.5 | 1 | 0.2 | - | 0.0 | 4 | 0.2 |
| imvisible | Male | 1 | 0.3 | 3 | 1.0 | 6 | 2.0 | 14 | 5.5 | 5 | 9.4 | 29 | 2.4 |
| | Female | - | 0.0 | 2 | 0.7 | 5 | 1.8 | 15 | 5.3 | 3 | 5.1 | 25 | 2.1 |
| | Total | 1 | 0.2 | 5 | 0.9 | 11 | 1.9 | 29 | 5.4 | 8 | 7.1 | 54 | 2.3 |

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 | 3 | 1.0 | 5 | 2.0 | - | 0.0 | 8 | 0.7 |
| | Female | - | 0.0 | - | 0.0 | 1 | 0.4 | 3 | 1.1 | 1 | 1.7 | 5 | 0.4 |
| | Total | - | 0.0 | - | 0.0 | 4 | 0.7 | 8 | 1.5 | 1 | 0.9 | 13 | 0.5 |
| nothing | Male | 158 | 55.2 | 60 | 20.3 | 29 | 9.7 | 5 | 2.0 | 1 | 1.9 | 253 | 21.3 |
| | Female | 197 | 67.0 | 70 | 24.7 | 25 | 9.2 | 12 | 4.2 | 3 | 5.1 | 307 | 25.7 |
| | Total | 355 | 61.2 | 130 | 22.5 | 54 | 9.4 | 17 | 3.1 | 4 | 3.6 | 560 | 23.5 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| K-W Ⅰ | Male | 119 | 41.6 | 206 | 69.8 | 186 | 62.0 | 108 | 42.4 | 12 | 22.6 | 631 | 53.1 |
| | Female | 93 | 31.6 | 197 | 69.6 | 188 | 68.9 | 109 | 38.2 | 12 | 20.3 | 599 | 50.2 |
| | Total | 212 | 36.6 | 403 | 69.7 | 374 | 65.3 | 217 | 40.2 | 24 | 21.4 | 1230 | 51.6 |
| K-W Ⅱa | Male | 8 | 2.8 | 29 | 9.8 | 78 | 26.0 | 132 | 51.8 | 39 | 73.6 | 286 | 24.1 |
| | Female | 4 | 1.4 | 15 | 5.3 | 56 | 20.5 | 151 | 53.0 | 39 | 66.1 | 265 | 22.2 |
| | Total | 12 | 2.1 | 44 | 7.6 | 134 | 23.4 | 283 | 52.4 | 78 | 69.6 | 551 | 23.1 |
| imvisible | Male | 1 | 0.3 | - | 0.0 | 4 | 1.3 | 5 | 2.0 | 1 | 1.9 | 11 | 0.9 |
| | Female | - | 0.0 | 1 | 0.4 | 3 | 1.1 | 10 | 3.5 | 4 | 6.8 | 18 | 1.5 |
| | Total | 1 | 0.2 | 1 | 0.2 | 7 | 1.2 | 15 | 2.8 | 5 | 4.5 | 29 | 1.2 |

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 | 0.7 | 4 | 1.3 | 3 | 1.2 | - | 0.0 | 9 | 0.8 |
| | Female | - | 0.0 | 1 | 0.4 | 2 | 0.7 | 2 | 0.7 | 2 | 3.4 | 7 | 0.6 |
| | Total | - | 0.0 | 3 | 0.5 | 6 | 1.0 | 5 | 0.9 | 2 | 1.8 | 16 | 0.7 |
| nothing | Male | 155 | 54.2 | 55 | 18.6 | 23 | 7.7 | 5 | 2.0 | 1 | 1.9 | 239 | 20.1 |
| | Female | 200 | 68.0 | 69 | 24.4 | 25 | 9.2 | 11 | 3.9 | 1 | 1.7 | 306 | 25.6 |
| | Total | 355 | 61.2 | 124 | 21.5 | 48 | 8.4 | 16 | 3.0 | 2 | 1.8 | 545 | 22.9 |
| K-W Ⅰ | Male | 121 | 42.3 | 204 | 69.2 | 196 | 65.3 | 103 | 40.4 | 11 | 20.8 | 635 | 53.4 |
| | Female | 89 | 30.3 | 197 | 69.6 | 185 | 67.8 | 109 | 38.2 | 15 | 25.4 | 595 | 49.8 |
| | Total | 210 | 36.2 | 401 | 69.4 | 381 | 66.5 | 212 | 39.3 | 26 | 23.2 | 1230 | 51.6 |
| K-W Ⅱa | Male | 9 | 3.1 | 32 | 10.8 | 71 | 23.7 | 134 | 52.5 | 36 | 67.9 | 282 | 23.7 |
| | Female | 5 | 1.7 | 15 | 5.3 | 56 | 20.5 | 150 | 52.6 | 38 | 64.4 | 264 | 22.1 |
| | Total | 14 | 2.4 | 47 | 8.1 | 127 | 22.2 | 284 | 52.6 | 74 | 66.1 | 546 | 22.9 |
| imvisible | Male | 1 | 0.3 | 2 | 0.7 | 6 | 2.0 | 10 | 3.9 | 5 | 9.4 | 24 | 2.0 |
| | Female | - | 0.0 | 1 | 0.4 | 5 | 1.8 | 13 | 4.6 | 3 | 5.1 | 22 | 1.8 |
| | Total | 1 | 0.2 | 3 | 0.5 | 11 | 1.9 | 23 | 4.3 | 8 | 7.1 | 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 | 3 | 1.0 | 5 | 2.0 | - | 0.0 | 8 | 0.7 |
| | Female | - | 0.0 | - | 0.0 | 1 | 0.4 | 3 | 1.1 | 1 | 1.7 | 5 | 0.4 |
| | Total | - | 0.0 | - | 0.0 | 4 | 0.7 | 8 | 1.5 | 1 | 0.9 | 13 | 0.5 |
| nothing | Male | 269 | 94.1 | 266 | 90.2 | 236 | 78.7 | 182 | 71.4 | 36 | 67.9 | 989 | 83.2 |
| | Female | 287 | 97.6 | 268 | 94.7 | 225 | 82.4 | 207 | 72.6 | 31 | 52.5 | 1018 | 85.3 |
| | Total | 556 | 95.9 | 534 | 92.4 | 461 | 80.5 | 389 | 72.0 | 67 | 59.8 | 2007 | 84.2 |
| drusen | Male | 12 | 4.2 | 18 | 6.1 | 28 | 9.3 | 20 | 7.8 | 5 | 9.4 | 83 | 7.0 |
| | Female | 4 | 1.4 | 6 | 2.1 | 15 | 5.5 | 31 | 10.9 | 7 | 11.9 | 63 | 5.3 |
| | Total | 16 | 2.8 | 24 | 4.2 | 43 | 7.5 | 51 | 9.4 | 12 | 10.7 | 146 | 6.1 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| atrophic change | Male | - | 0.0 | 2 | 0.7 | 3 | 1.0 | 4 | 1.6 | 2 | 3.8 | 11 | 0.9 |
| | Female | - | 0.0 | - | 0.0 | 2 | 0.7 | 6 | 2.1 | 4 | 6.8 | 12 | 1.0 |
| | Total | - | 0.0 | 2 | 0.3 | 5 | 0.9 | 10 | 1.9 | 6 | 5.4 | 23 | 1.0 |
| exudative change | Male | - | 0.0 | - | 0.0 | 2 | 0.7 | 2 | 0.8 | - | 0.0 | 4 | 0.3 |
| | Female | - | 0.0 | 1 | 0.4 | - | 0.0 | - | 0.0 | - | 0.0 | 1 | 0.1 |
| | Total | - | 0.0 | 1 | 0.2 | 2 | 0.3 | 2 | 0.4 | - | 0.0 | 5 | 0.2 |
| epiretinal membrane | Male | 1 | 0.3 | 1 | 0.3 | 6 | 2.0 | 5 | 2.0 | - | 0.0 | 13 | 1.1 |
| | Female | - | 0.0 | 1 | 0.4 | 5 | 1.8 | 5 | 1.8 | 1 | 1.7 | 12 | 1.0 |
| | Total | 1 | 0.2 | 2 | 0.3 | 11 | 1.9 | 10 | 1.9 | 1 | 0.9 | 25 | 1.0 |
| imvisible | Male | 4 | 1.4 | 8 | 2.7 | 22 | 7.3 | 37 | 14.5 | 10 | 18.9 | 81 | 6.8 |
| | Female | 3 | 1.0 | 7 | 2.5 | 25 | 9.2 | 33 | 11.6 | 15 | 25.4 | 83 | 7.0 |
| | Total | 7 | 1.2 | 15 | 2.6 | 47 | 8.2 | 70 | 13.0 | 25 | 22.3 | 164 | 6.9 |

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 | 0.7 | 4 | 1.3 | 3 | 1.2 | - | 0.0 | 9 | 0.8 |
| | Female | - | 0.0 | 1 | 0.4 | 2 | 0.7 | 2 | 0.7 | 2 | 3.4 | 7 | 0.6 |
| | Total | - | 0.0 | 3 | 0.5 | 6 | 1.0 | 5 | 0.9 | 2 | 1.8 | 16 | 0.7 |
| nothing | Male | 276 | 96.5 | 266 | 90.2 | 245 | 81.7 | 189 | 74.1 | 34 | 64.2 | 1010 | 84.9 |
| | Female | 286 | 97.3 | 254 | 89.8 | 228 | 83.5 | 201 | 70.5 | 35 | 59.3 | 1004 | 84.1 |
| | Total | 562 | 96.9 | 520 | 90.0 | 473 | 82.5 | 390 | 72.2 | 69 | 61.6 | 2014 | 84.5 |
| drusen | Male | 4 | 1.4 | 12 | 4.1 | 21 | 7.0 | 16 | 6.3 | 3 | 5.7 | 56 | 4.7 |
| | Female | 3 | 1.0 | 5 | 1.8 | 14 | 5.1 | 26 | 9.1 | 5 | 8.5 | 53 | 4.4 |
| | Total | 7 | 1.2 | 17 | 2.9 | 35 | 6.1 | 42 | 7.8 | 8 | 7.1 | 109 | 4.6 |
| atrophic change | Male | 1 | 0.3 | - | 0.0 | 1 | 0.3 | 2 | 0.8 | 1 | 1.9 | 5 | 0.4 |
| | Female | - | 0.0 | - | 0.0 | 1 | 0.4 | 3 | 1.1 | 1 | 1.7 | 5 | 0.4 |
| | Total | 1 | 0.2 | - | 0.0 | 2 | 0.3 | 5 | 0.9 | 2 | 1.8 | 10 | 0.4 |
| exudative change | Male | - | 0.0 | - | 0.0 | - | 0.0 | 3 | 1.2 | - | 0.0 | 3 | 0.3 |
| | Female | - | 0.0 | - | 0.0 | - | 0.0 | - | 0.0 | - | 0.0 | - | 0.0 |
| | Total | - | 0.0 | - | 0.0 | - | 0.0 | 3 | 0.6 | - | 0.0 | 3 | 0.1 |
| epiretinal membrane | Male | - | 0.0 | 2 | 0.7 | 2 | 0.7 | 2 | 0.8 | 1 | 1.9 | 7 | 0.6 |
| | Female | - | 0.0 | 1 | 0.4 | 1 | 0.4 | 6 | 2.1 | - | 0.0 | 8 | 0.7 |
| | Total | - | 0.0 | 3 | 0.5 | 3 | 0.5 | 8 | 1.5 | 1 | 0.9 | 15 | 0.6 |
| imvisible | Male | 5 | 1.7 | 13 | 4.4 | 27 | 9.0 | 40 | 15.7 | 14 | 26.4 | 99 | 8.3 |
| | Female | 5 | 1.7 | 22 | 7.8 | 27 | 9.9 | 47 | 16.5 | 16 | 27.1 | 117 | 9.8 |
| | Total | 10 | 1.7 | 35 | 6.1 | 54 | 9.4 | 87 | 16.1 | 30 | 26.8 | 216 | 9.1 |

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 | 0.523 | 0.031 | 285 | 0.525 | 0.032 | 295 | 0.519 | 0.031 | 298 | 0.519 | 0.031 | 253 | 0.514 | 0.033 | 53 | 0.521 | 0.031 | 1184 |
| Female | 0.517 | 0.031 | 294 | 0.513 | 0.035 | 283 | 0.517 | 0.032 | 273 | 0.515 | 0.028 | 281 | 0.514 | 0.030 | 55 | 0.515 | 0.032 | 1186 |
| Total | 0.520 | 0.031 | 579 | 0.519 | 0.034 | 578 | 0.518 | 0.032 | 571 | 0.517 | 0.030 | 534 | 0.514 | 0.031 | 108 | 0.518 | 0.032 | 2370 |

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 | 0.526 | 0.031 | 286 | 0.529 | 0.032 | 293 | 0.523 | 0.030 | 296 | 0.524 | 0.032 | 252 | 0.521 | 0.031 | 53 | 0.525 | 0.031 | 1180 |
| Female | 0.521 | 0.031 | 294 | 0.517 | 0.035 | 283 | 0.522 | 0.032 | 272 | 0.521 | 0.029 | 282 | 0.517 | 0.031 | 56 | 0.520 | 0.031 | 1187 |
| Total | 0.524 | 0.031 | 580 | 0.523 | 0.034 | 576 | 0.523 | 0.031 | 568 | 0.523 | 0.030 | 534 | 0.519 | 0.031 | 109 | 0.523 | 0.031 | 2367 |

2) Auditory system

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

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

| | 40 | | | 50 | | | 60 | | | 70 | | | 80 | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N |
| Male | 20.1 | 7.6 | 285 | 22.5 | 8.0 | 295 | 27.6 | 12.0 | 300 | 32.5 | 13.2 | 254 | 37.8 | 15.0 | 52 | 26.0 | 11.8 | 1186 |
| Female | 19.8 | 5.8 | 293 | 23.1 | 9.0 | 282 | 27.7 | 11.7 | 273 | 34.4 | 13.6 | 283 | 39.9 | 11.5 | 59 | 26.9 | 12.1 | 1190 |
| Total | 19.9 | 6.7 | 578 | 22.8 | 8.5 | 577 | 27.6 | 11.9 | 573 | 33.5 | 13.4 | 537 | 38.9 | 13.2 | 111 | 26.4 | 12.0 | 2376 |

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

| | 40 | | | 50 | | | 60 | | | 70 | | | 80 | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N |
| Male | 18.4 | 7.8 | 285 | 20.3 | 8.0 | 295 | 25.0 | 13.4 | 300 | 30.6 | 14.5 | 254 | 35.8 | 17.6 | 52 | 23.9 | 12.7 | 1186 |
| Female | 17.8 | 6.0 | 293 | 21.0 | 8.9 | 282 | 25.5 | 13.3 | 273 | 32.7 | 15.2 | 283 | 37.5 | 14.4 | 59 | 24.8 | 13.1 | 1190 |
| Total | 18.1 | 6.9 | 578 | 20.7 | 8.5 | 577 | 25.2 | 13.3 | 573 | 31.7 | 14.9 | 537 | 36.7 | 15.9 | 111 | 24.4 | 12.9 | 2376 |

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

| | 40 | | | 50 | | | 60 | | | 70 | | | 80 | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N |
| Male | 14.2 | 7.0 | 285 | 16.4 | 8.3 | 295 | 21.4 | 15.0 | 300 | 28.0 | 15.7 | 254 | 32.6 | 17.0 | 52 | 20.3 | 13.5 | 1186 |
| Female | 13.8 | 6.7 | 293 | 16.8 | 9.4 | 282 | 22.3 | 14.8 | 273 | 30.1 | 16.4 | 283 | 37.1 | 16.6 | 59 | 21.5 | 14.4 | 1190 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total | 14.0 | 6.9 | 578 | 16.6 | 8.8 | 577 | 21.8 | 14.9 | 573 | 29.1 | 16.1 | 537 | 35.0 | 16.8 | 111 | 20.9 | 14.0 2376 |

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

| | 40 | | | 50 | | | 60 | | | 70 | | | 80 | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N |
| Male | 10.1 | 8.0 | 285 | 13.0 | 8.7 | 295 | 19.2 | 15.3 | 300 | 27.5 | 16.5 | 254 | 33.1 | 14.5 | 52 | 17.9 | 14.5 | 1186 |
| Female | 8.0 | 7.5 | 293 | 12.6 | 9.6 | 282 | 18.2 | 14.5 | 273 | 27.1 | 16.7 | 283 | 32.8 | 16.9 | 59 | 17.2 | 15.0 | 1190 |
| Total | 9.0 | 7.8 | 578 | 12.8 | 9.1 | 577 | 18.7 | 14.9 | 573 | 27.3 | 16.6 | 537 | 32.9 | 15.7 | 111 | 17.5 | 14.8 | 2376 |

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

| | 40 | | | 50 | | | 60 | | | 70 | | | 80 | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N |
| Male | 12.8 | 9.2 | 285 | 17.4 | 10.4 | 295 | 27.1 | 16.8 | 300 | 35.8 | 17.0 | 254 | 46.3 | 16.4 | 52 | 23.9 | 16.9 | 1186 |
| Female | 11.1 | 9.0 | 293 | 16.1 | 9.3 | 282 | 23.6 | 14.3 | 273 | 32.0 | 16.1 | 283 | 39.4 | 17.0 | 59 | 21.5 | 15.5 | 1190 |
| Total | 11.9 | 9.1 | 578 | 16.8 | 9.9 | 577 | 25.4 | 15.7 | 573 | 33.8 | 16.6 | 537 | 42.7 | 17.0 | 111 | 22.7 | 16.3 | 2376 |

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

| | 40 | | | 50 | | | 60 | | | 70 | | | 80 | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N |
| Male | 15.0 | 13.8 | 285 | 23.9 | 16.4 | 295 | 37.3 | 20.8 | 300 | 48.3 | 19.5 | 254 | 58.7 | 15.3 | 52 | 31.9 | 22.2 | 1186 |
| Female | 8.7 | 10.3 | 293 | 14.5 | 10.9 | 282 | 24.2 | 16.7 | 273 | 35.6 | 18.7 | 283 | 46.0 | 19.9 | 59 | 21.9 | 18.7 | 1190 |
| Total | 11.8 | 12.6 | 578 | 19.3 | 14.7 | 577 | 31.0 | 20.0 | 573 | 41.6 | 20.1 | 537 | 51.9 | 18.9 | 111 | 26.9 | 21.1 | 2376 |

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

| | 40 | | | 50 | | | 60 | | | 70 | | | 80 | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N |
| Male | 18.1 | 15.9 | 285 | 30.1 | 17.1 | 295 | 46.9 | 21.4 | 300 | 62.7 | 19.5 | 254 | 73.5 | 15.6 | 52 | 40.4 | 25.5 | 1186 |
| Female | 13.8 | 12.0 | 293 | 23.8 | 16.0 | 282 | 38.6 | 20.8 | 273 | 56.0 | 20.7 | 283 | 66.6 | 16.7 | 59 | 34.5 | 24.6 | 1190 |
| Total | 16.0 | 14.2 | 578 | 27.0 | 16.9 | 577 | 43.0 | 21.5 | 573 | 59.2 | 20.4 | 537 | 69.8 | 16.5 | 111 | 37.4 | 25.2 | 2376 |

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

| | 40 | | | 50 | | | 60 | | | 70 | | | 80 | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N |
| Male | 14.9 | 7.3 | 285 | 16.7 | 7.9 | 295 | 19.1 | 9.3 | 299 | 23.9 | 10.5 | 254 | 30.4 | 13.6 | 52 | 19.0 | 9.9 | 1185 |
| Female | 15.2 | 6.5 | 293 | 16.6 | 7.2 | 282 | 19.9 | 9.1 | 273 | 27.4 | 11.3 | 282 | 32.4 | 11.1 | 58 | 20.3 | 10.3 | 1188 |
| Total | 15.0 | 6.9 | 578 | 16.6 | 7.5 | 577 | 19.5 | 9.2 | 572 | 25.7 | 11.1 | 536 | 31.5 | 12.3 | 110 | 19.7 | 10.1 | 2373 |

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

| | 40 | | | 50 | | | 60 | | | 70 | | | 80 | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N |
| Male | 8.4 | 7.2 | 285 | 9.7 | 8.7 | 295 | 13.8 | 10.4 | 299 | 19.7 | 12.4 | 254 | 25.1 | 15.7 | 52 | 13.2 | 11.2 | 1185 |
| Female | 8.4 | 7.1 | 293 | 10.3 | 8.4 | 282 | 14.3 | 10.1 | 273 | 22.1 | 12.2 | 282 | 30.2 | 13.6 | 58 | 14.6 | 11.6 | 1188 |
| Total | 8.4 | 7.1 | 578 | 10.0 | 8.5 | 577 | 14.1 | 10.3 | 572 | 21.0 | 12.3 | 536 | 27.8 | 14.8 | 110 | 13.9 | 11.4 | 2373 |

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

| | 40 | | | 50 | | | 60 | | | 70 | | | 80 | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N |
| Male | 9.2 | 7.5 | 285 | 11.9 | 8.3 | 295 | 17.1 | 11.9 | 299 | 25.8 | 14.4 | 254 | 32.4 | 15.0 | 52 | 16.4 | 13.0 | 1185 |
| Female | 8.1 | 7.8 | 293 | 12.0 | 9.2 | 282 | 17.5 | 11.0 | 273 | 25.6 | 12.6 | 282 | 32.6 | 14.9 | 58 | 16.5 | 12.9 | 1188 |
| Total | 8.6 | 7.7 | 578 | 11.9 | 8.7 | 577 | 17.3 | 11.5 | 572 | 25.7 | 13.5 | 536 | 32.5 | 14.9 | 110 | 16.5 | 12.9 | 2373 |

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

| | 40 | | | 50 | | | 60 | | | 70 | | | 80 | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N |
| Male | 12.8 | 8.2 | 285 | 17.3 | 9.7 | 295 | 26.3 | 14.3 | 299 | 34.5 | 15.4 | 254 | 44.5 | 16.0 | 52 | 23.4 | 15.4 | 1185 |
| Female | 11.5 | 8.5 | 293 | 16.8 | 8.8 | 282 | 23.0 | 12.3 | 273 | 31.1 | 13.9 | 282 | 38.8 | 14.3 | 58 | 21.4 | 13.9 | 1188 |
| Total | 12.1 | 8.4 | 578 | 17.0 | 9.3 | 577 | 24.7 | 13.4 | 572 | 32.7 | 14.7 | 536 | 41.5 | 15.3 | 110 | 22.4 | 14.7 | 2373 |

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

| | 40 | | | 50 | | | 60 | | | 70 | | | 80 | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N |
| Male | 12.4 | 12.1 | 285 | 20.2 | 14.3 | 295 | 31.2 | 16.2 | 299 | 40.6 | 15.3 | 254 | 49.6 | 10.8 | 52 | 26.7 | 18.3 | 1185 |
| Female | 7.0 | 8.7 | 293 | 11.8 | 9.8 | 282 | 19.9 | 13.7 | 273 | 30.6 | 15.1 | 282 | 40.2 | 15.6 | 58 | 18.3 | 15.8 | 1188 |
| Total | 9.7 | 10.8 | 578 | 16.1 | 13.0 | 577 | 25.8 | 16.0 | 572 | 35.3 | 16.0 | 536 | 44.6 | 14.3 | 110 | 22.5 | 17.6 | 2373 |

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

| | 40 | | | 50 | | | 60 | | | 70 | | | 80 | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N |
| Male | 17.8 | 8.3 | 285 | 20.4 | 8.4 | 295 | 24.1 | 10.8 | 299 | 29.7 | 13.3 | 253 | 36.2 | 14.6 | 52 | 23.4 | 11.7 | 1184 |
| Female | 18.1 | 6.1 | 293 | 20.6 | 9.5 | 282 | 25.0 | 11.4 | 273 | 31.5 | 12.7 | 281 | 35.1 | 12.9 | 59 | 24.3 | 11.7 | 1188 |
| Total | 17.9 | 7.3 | 578 | 20.5 | 9.0 | 577 | 24.5 | 11.1 | 572 | 30.7 | 13.0 | 534 | 35.6 | 13.7 | 111 | 23.8 | 11.7 | 2372 |

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

| | 40 | | | 50 | | | 60 | | | 70 | | | 80 | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Male | 16.4 | 9.0 | 285 | 17.9 | 8.0 | 295 | 22.3 | 13.0 | 300 | 28.4 | 15.1 | 253 | 34.2 | 15.4 | 52 | 21.6 | 12.8 | 1185 |
| Female | 16.0 | 5.9 | 293 | 18.3 | 10.2 | 282 | 22.7 | 12.6 | 273 | 29.5 | 14.1 | 282 | 34.4 | 14.8 | 59 | 22.2 | 12.7 | 1189 |
| Total | 16.2 | 7.6 | 578 | 18.1 | 9.1 | 577 | 22.5 | 12.8 | 573 | 29.0 | 14.6 | 535 | 34.3 | 15.0 | 111 | 21.9 | 12.7 | 2374 |

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

| | 40 | | | 50 | | | 60 | | | 70 | | | 80 | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N |
| Male | 13.4 | 9.5 | 285 | 15.2 | 8.5 | 295 | 19.7 | 14.7 | 300 | 26.7 | 16.3 | 253 | 32.2 | 16.2 | 52 | 19.1 | 13.9 | 1185 |
| Female | 12.3 | 6.5 | 293 | 15.2 | 10.6 | 282 | 19.8 | 14.1 | 273 | 27.3 | 15.0 | 282 | 33.5 | 16.9 | 59 | 19.3 | 13.8 | 1189 |
| Total | 12.9 | 8.1 | 578 | 15.2 | 9.6 | 577 | 19.7 | 14.4 | 573 | 27.0 | 15.6 | 535 | 32.9 | 16.5 | 111 | 19.2 | 13.9 | 2374 |

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

| | 40 | | | 50 | | | 60 | | | 70 | | | 80 | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N |
| Male | 10.8 | 10.1 | 285 | 13.2 | 9.6 | 295 | 19.3 | 15.9 | 300 | 28.0 | 17.0 | 253 | 33.8 | 17.8 | 52 | 18.2 | 15.4 | 1185 |
| Female | 7.1 | 7.4 | 293 | 12.0 | 11.3 | 282 | 17.2 | 14.8 | 273 | 24.7 | 14.8 | 282 | 31.1 | 18.7 | 59 | 16.0 | 14.7 | 1189 |
| Total | 8.9 | 9.0 | 578 | 12.6 | 10.5 | 577 | 18.3 | 15.4 | 573 | 26.3 | 16.0 | 535 | 32.4 | 18.2 | 111 | 17.1 | 15.1 | 2374 |

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

| | 40 | | | 50 | | | 60 | | | 70 | | | 80 | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N |
| Male | 14.1 | 11.6 | 285 | 18.7 | 11.8 | 295 | 28.5 | 18.0 | 300 | 38.5 | 17.7 | 253 | 46.4 | 19.1 | 52 | 25.5 | 18.2 | 1185 |
| Female | 10.9 | 9.2 | 293 | 16.8 | 11.3 | 282 | 23.0 | 14.3 | 273 | 31.3 | 14.5 | 282 | 39.0 | 18.7 | 59 | 21.3 | 15.4 | 1189 |
| Total | 12.5 | 10.6 | 578 | 17.8 | 11.6 | 577 | 25.9 | 16.5 | 573 | 34.7 | 16.5 | 535 | 42.5 | 19.2 | 111 | 23.4 | 17.0 | 2374 |

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

| | 40 | | | 50 | | | 60 | | | 70 | | | 80 | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N |
| Male | 15.8 | 15.1 | 285 | 26.3 | 17.2 | 295 | 38.8 | 19.7 | 300 | 49.6 | 18.0 | 253 | 61.0 | 16.7 | 52 | 33.5 | 22.1 | 1185 |
| Female | 8.7 | 9.9 | 293 | 15.8 | 12.8 | 282 | 25.5 | 17.2 | 273 | 35.4 | 17.1 | 282 | 46.7 | 19.0 | 59 | 22.5 | 18.6 | 1189 |
| Total | 12.2 | 13.2 | 578 | 21.2 | 16.0 | 577 | 32.5 | 19.7 | 573 | 42.1 | 18.9 | 535 | 53.4 | 19.3 | 111 | 27.9 | 21.2 | 2374 |

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

| | 40 | | | 50 | | | 60 | | | 70 | | | 80 | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N |
| Male | 17.0 | 16.2 | 285 | 29.1 | 19.4 | 295 | 45.3 | 21.0 | 300 | 61.8 | 18.6 | 253 | 72.0 | 17.7 | 52 | 39.2 | 25.8 | 1185 |
| Female | 11.1 | 11.2 | 293 | 22.5 | 16.2 | 282 | 36.0 | 19.6 | 273 | 54.1 | 19.2 | 282 | 65.3 | 16.2 | 59 | 32.4 | 24.2 | 1189 |
| Total | 14.0 | 14.2 | 578 | 25.9 | 18.2 | 577 | 40.9 | 20.8 | 573 | 57.7 | 19.3 | 535 | 68.5 | 17.2 | 111 | 35.8 | 25.2 | 2374 |

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

| | 40 | | | 50 | | | 60 | | | 70 | | | 80 | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N |
| Male | 14.2 | 7.0 | 285 | 16.3 | 7.2 | 295 | 18.3 | 9.2 | 300 | 24.9 | 11.7 | 253 | 29.9 | 13.7 | 52 | 18.7 | 10.2 | 1185 |
| Female | 14.3 | 6.3 | 293 | 15.1 | 7.6 | 282 | 19.2 | 8.4 | 273 | 26.0 | 11.9 | 281 | 31.6 | 11.4 | 58 | 19.2 | 10.4 | 1187 |
| Total | 14.3 | 6.6 | 578 | 15.7 | 7.5 | 577 | 18.7 | 8.8 | 573 | 25.5 | 11.8 | 534 | 30.8 | 12.5 | 110 | 19.0 | 10.3 | 2372 |

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

| | 40 | | | 50 | | | 60 | | | 70 | | | 80 | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N |
| Male | 8.2 | 8.4 | 285 | 9.6 | 8.4 | 295 | 12.6 | 10.1 | 300 | 20.8 | 13.4 | 253 | 26.7 | 17.1 | 52 | 13.2 | 11.9 | 1185 |
| Female | 7.5 | 7.0 | 293 | 9.4 | 8.3 | 282 | 13.8 | 9.8 | 273 | 21.1 | 13.0 | 281 | 27.8 | 13.7 | 58 | 13.6 | 11.7 | 1187 |
| Total | 7.8 | 7.7 | 578 | 9.5 | 8.3 | 577 | 13.2 | 10.0 | 573 | 20.9 | 13.2 | 534 | 27.3 | 15.4 | 110 | 13.4 | 11.8 | 2372 |

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

| | 40 | | | 50 | | | 60 | | | 70 | | | 80 | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N |
| Male | 9.7 | 9.2 | 285 | 12.2 | 8.6 | 295 | 17.4 | 11.8 | 300 | 27.0 | 14.8 | 253 | 32.1 | 17.4 | 52 | 17.0 | 13.5 | 1185 |
| Female | 7.6 | 8.0 | 293 | 11.8 | 9.5 | 282 | 17.2 | 11.2 | 273 | 25.0 | 12.9 | 281 | 31.7 | 16.4 | 58 | 16.1 | 13.1 | 1187 |
| Total | 8.7 | 8.7 | 578 | 12.0 | 9.0 | 577 | 17.3 | 11.5 | 573 | 25.9 | 13.9 | 534 | 31.9 | 16.8 | 110 | 16.5 | 13.3 | 2372 |

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

| | 40 | | | 50 | | | 60 | | | 70 | | | 80 | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N |
| Male | 14.6 | 10.3 | 285 | 19.6 | 11.7 | 295 | 27.7 | 14.7 | 300 | 38.5 | 16.0 | 253 | 46.2 | 17.7 | 52 | 25.7 | 16.6 | 1185 |
| Female | 12.3 | 8.9 | 293 | 17.9 | 9.6 | 282 | 23.8 | 12.1 | 273 | 31.6 | 13.6 | 281 | 39.2 | 14.8 | 58 | 22.2 | 13.9 | 1187 |
| Total | 13.5 | 9.6 | 578 | 18.8 | 10.8 | 577 | 25.9 | 13.7 | 573 | 34.9 | 15.2 | 534 | 42.5 | 16.5 | 110 | 23.9 | 15.4 | 2372 |

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

| | 40 | | | 50 | | | 60 | | | 70 | | | 80 | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N |
| Male | 12.8 | 12.3 | 285 | 21.6 | 14.5 | 295 | 32.3 | 16.0 | 300 | 42.3 | 14.5 | 253 | 50.2 | 11.5 | 52 | 27.9 | 18.4 | 1185 |
| Female | 7.2 | 8.5 | 293 | 12.9 | 10.7 | 282 | 21.2 | 14.3 | 273 | 31.2 | 14.8 | 281 | 41.6 | 14.3 | 58 | 19.1 | 16.0 | 1187 |
| Total | 10.0 | 10.9 | 578 | 17.3 | 13.5 | 577 | 27.0 | 16.2 | 573 | 36.4 | 15.6 | 534 | 45.6 | 13.7 | 110 | 23.5 | 17.8 | 2372 |

2. Impedance Audiometry

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

| | 40 | | | 50 | | | 60 | | | 70 | | | 80 | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N |
| Male | 1.7 | 16.9 | 281 | -3.9 | 33.8 | 283 | -7.7 | 42.6 | 286 | -9.3 | 41.9 | 238 | -6.0 | 34.7 | 51 | -4.7 | 35.2 | 1139 |
| Female | 3.4 | 13.1 | 291 | -2.3 | 28.7 | 277 | -2.5 | 40.9 | 263 | -8.2 | 41.5 | 264 | -17.8 | 50.9 | 54 | -3.0 | 34.1 | 1149 |
| Total | 2.6 | 15.1 | 572 | -3.1 | 31.3 | 560 | -5.2 | 41.8 | 549 | -8.7 | 41.6 | 502 | -12.0 | 44.0 | 105 | -3.8 | 34.7 | 2288 |

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

| | 40 | | | 50 | | | 60 | | | 70 | | | 80 | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N |
| Male | 0.85 | 0.74 | 281 | 1.01 | 0.91 | 283 | 1.03 | 0.92 | 286 | 0.94 | 0.87 | 238 | 0.89 | 0.76 | 51 | 0.96 | 0.86 | 1139 |
| Female | 0.69 | 0.47 | 291 | 0.79 | 0.73 | 277 | 0.76 | 0.76 | 263 | 0.71 | 0.75 | 264 | 0.52 | 0.33 | 54 | 0.73 | 0.67 | 1149 |
| Total | 0.77 | 0.62 | 572 | 0.90 | 0.83 | 560 | 0.90 | 0.86 | 549 | 0.82 | 0.82 | 502 | 0.70 | 0.61 | 105 | 0.84 | 0.78 | 2288 |

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

| | 40 | | | 50 | | | 60 | | | 70 | | | 80 | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N |
| Male | 0.7 | 21.6 | 280 | -4.8 | 33.2 | 284 | -6.7 | 41.3 | 283 | -11.7 | 51.4 | 243 | 12.3 | 138.1 | 49 | -4.6 | 47.0 | 1139 |
| Female | 5.1 | 12.9 | 279 | -0.1 | 28.8 | 269 | -6.4 | 38.8 | 256 | -8.4 | 60.6 | 246 | -22.0 | 57.7 | 54 | -3.2 | 40.2 | 1104 |
| Total | 2.9 | 17.9 | 559 | -2.5 | 31.2 | 553 | -6.6 | 40.1 | 539 | -10.0 | 56.2 | 489 | -5.7 | 104.9 | 103 | -3.9 | 43.8 | 2243 |

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

| | 40 | | | 50 | | | 60 | | | 70 | | | 80 | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N |
| Male | 0.87 | 0.70 | 280 | 0.89 | 0.76 | 284 | 1.01 | 0.88 | 283 | 0.95 | 0.86 | 243 | 0.85 | 0.80 | 48 | 0.93 | 0.80 | 1138 |
| Female | 0.70 | 0.54 | 279 | 0.74 | 0.70 | 269 | 0.74 | 0.72 | 256 | 0.69 | 0.84 | 246 | 0.57 | 0.41 | 54 | 0.71 | 0.69 | 1104 |
| Total | 0.78 | 0.63 | 559 | 0.82 | 0.73 | 553 | 0.88 | 0.82 | 539 | 0.82 | 0.86 | 489 | 0.70 | 0.64 | 102 | 0.82 | 0.76 | 2242 |

Middle ear resonance frequency for right ear (Hz)

| | 40 | | | 50 | | | 60 | | | 70 | | | 80 | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N |
| Male | 860.6 | 247.1 | 271 | 819.7 | 212.7 | 272 | 830.8 | 248.2 | 262 | 859.5 | 270.6 | 212 | 788.0 | 245.9 | 46 | 839.4 | 244.4 | 1063 |
| Female | 914.5 | 242.5 | 267 | 852.1 | 242.2 | 260 | 905.7 | 266.9 | 238 | 903.2 | 273.9 | 231 | 889.8 | 277.6 | 44 | 893.3 | 257.5 | 1040 |
| Total | 887.3 | 246.1 | 538 | 835.5 | 227.9 | 532 | 866.4 | 259.7 | 500 | 882.3 | 272.9 | 443 | 837.8 | 265.4 | 90 | 866.1 | 252.4 | 2103 |

Middle ear resonance frequency for left ear (Hz)

| | 40 | 50 | 60 | 70 | 80 | Total |
|---|---|---|---|---|---|---|

| | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Male | 827.5 | 225.1 | 260 | 799.6 | 220.2 | 262 | 817.3 | 249.3 | 254 | 815.6 | 248.3 | 199 | 851.1 | 290.2 | 44 | 816.5 | 237.6 | 1019 |
| Female | 886.2 | 231.6 | 261 | 861.7 | 267.7 | 239 | 867.8 | 256.4 | 233 | 901.0 | 274.8 | 210 | 801.1 | 283.1 | 45 | 875.2 | 258.7 | 988 |
| Total | 856.9 | 230.1 | 521 | 829.2 | 245.8 | 501 | 841.5 | 253.7 | 487 | 859.4 | 265.4 | 409 | 825.8 | 286.1 | 89 | 845.4 | 249.9 | 2007 |

3. Distortion product otoacoustic emission (Otoacoustic Distortion Product Analyser, ILO92(F) Otodynamics)

2f1-f2 DPOAEs were measured by ILO 92 with the following parameters for the DP-gram: ratio of primary tones f2 / f1 =1.22 ; stimulus intensity of primary tones F1 =70dB SPL and F2 =70dB SPL. DP-gram were recorded in 8 points/octave over a frequency range of the f2 which extended from 1001 to 6165 Hz. In this manner, 22 points in total were measured.

DP amplitudes above the noise floor at seven f2 frequencies (f2 =1001,1416,2002,3088,4004,5652 and 6165) were analyzed by age groups.

DP amplitudes above the noise floor at f2=1001 Hz (Right ear)

| | 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 | 6.7 | 277 | 2.6 | 7.2 | 287 | 0.3 | 7.4 | 294 | -2.9 | 7.6 | 241 | -5.5 | 6.9 | 47 | 1.1 | 7.8 | 1146 |
| Female | 5.5 | 7.4 | 293 | 3.0 | 7.7 | 277 | -0.5 | 7.5 | 269 | -2.0 | 7.2 | 272 | -5.4 | 5.7 | 55 | 1.3 | 8.1 | 1166 |
| Total | 5.3 | 7.1 | 570 | 2.8 | 7.4 | 564 | -0.1 | 7.5 | 563 | -2.4 | 7.4 | 513 | -5.4 | 6.2 | 102 | 1.2 | 7.9 | 2312 |

DP amplitudes above the noise floor at f2=1001 Hz (Left ear)

| | 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 | 4.4 | 7.0 | 280 | 2.4 | 7.6 | 286 | 0.3 | 7.4 | 291 | -2.5 | 7.3 | 245 | -4.5 | 6.3 | 49 | 1.0 | 7.8 | 1151 |
| Female | 5.5 | 6.6 | 290 | 3.2 | 7.6 | 277 | 0.5 | 7.3 | 268 | -2.4 | 7.1 | 276 | -5.1 | 5.4 | 56 | 1.4 | 7.8 | 1167 |
| Total | 5.0 | 6.8 | 570 | 2.8 | 7.6 | 563 | 0.4 | 7.4 | 559 | -2.5 | 7.2 | 521 | -4.8 | 5.8 | 105 | 1.2 | 7.8 | 2318 |

DP amplitudes above the noise floor at f2=1416 Hz (Right ear)

| | 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 | 9.9 | 7.3 | 277 | 7.6 | 8.5 | 287 | 5.0 | 8.3 | 294 | 1.5 | 9.2 | 241 | -0.7 | 7.9 | 47 | 5.9 | 8.9 | 1146 |
| Female | 11.0 | 6.8 | 293 | 7.7 | 8.5 | 277 | 5.1 | 8.5 | 269 | 1.7 | 8.6 | 270 | -2.4 | 8.3 | 55 | 6.1 | 9.0 | 1164 |
| Total | 10.5 | 7.1 | 570 | 7.7 | 8.5 | 564 | 5.0 | 8.4 | 563 | 1.6 | 8.9 | 511 | -1.6 | 8.1 | 102 | 6.0 | 9.0 | 2310 |

DP amplitudes above the noise floor at f2=1416 Hz (Left ear)

| | 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 | 9.0 | 7.7 | 280 | 7.3 | 8.2 | 286 | 4.3 | 8.2 | 291 | 1.0 | 8.7 | 246 | -1.2 | 7.9 | 49 | 5.3 | 8.8 | 1152 |
| Female | 10.9 | 7.5 | 290 | 8.6 | 8.0 | 277 | 5.3 | 8.3 | 268 | 1.6 | 10.0 | 276 | -1.4 | 6.8 | 56 | 6.3 | 9.2 | 1167 |
| Total | 10.0 | 7.7 | 570 | 8.0 | 8.1 | 563 | 4.8 | 8.2 | 559 | 1.3 | 9.4 | 522 | -1.3 | 7.3 | 105 | 5.8 | 9.0 | 2319 |

DP amplitudes above the noise floor at f2=2002 Hz (Right ear)

| | 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 | 9.6 | 7.6 | 277 | 7.4 | 8.9 | 287 | 4.5 | 8.6 | 294 | 1.5 | 8.9 | 241 | -2.0 | 6.6 | 47 | 5.5 | 9.0 | 1146 |
| Female | 11.8 | 7.1 | 293 | 8.0 | 9.0 | 277 | 5.6 | 9.1 | 269 | 3.1 | 8.8 | 272 | -0.6 | 8.9 | 55 | 6.9 | 9.2 | 1166 |
| Total | 10.7 | 7.4 | 570 | 7.7 | 8.9 | 564 | 5.0 | 8.9 | 563 | 2.4 | 8.9 | 513 | -1.3 | 7.9 | 102 | 6.2 | 9.2 | 2312 |

DP amplitudes above the noise floor at f2=2002 Hz (Left ear)

| | 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 | 9.0 | 7.5 | 280 | 7.1 | 8.5 | 286 | 3.9 | 9.1 | 291 | 0.0 | 9.0 | 246 | -1.8 | 8.3 | 49 | 4.9 | 9.2 | 1152 |
| Female | 11.2 | 7.7 | 290 | 8.5 | 8.9 | 277 | 6.5 | 8.2 | 268 | 3.1 | 8.9 | 276 | 0.9 | 8.2 | 56 | 7.1 | 9.0 | 1167 |
| Total | 10.2 | 7.7 | 570 | 7.8 | 8.8 | 563 | 5.1 | 8.8 | 559 | 1.6 | 9.1 | 522 | -0.3 | 8.3 | 105 | 6.0 | 9.2 | 2319 |

DP amplitudes above the noise floor at f2=3088 Hz (Right ear)

| | 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 | 10.2 | 7.6 | 277 | 5.8 | 8.3 | 287 | 1.3 | 8.5 | 294 | -1.5 | 7.6 | 241 | -4.2 | 6.6 | 47 | 3.7 | 9.2 | 1146 |
| Female | 11.0 | 7.0 | 293 | 7.6 | 8.3 | 277 | 3.9 | 9.0 | 269 | 1.0 | 8.2 | 272 | -1.8 | 8.3 | 55 | 5.6 | 9.1 | 1166 |
| Total | 10.6 | 7.3 | 570 | 6.6 | 8.3 | 564 | 2.5 | 8.8 | 563 | -0.1 | 8.0 | 513 | -2.9 | 7.7 | 102 | 4.7 | 9.2 | 2312 |

DP amplitudes above the noise floor at f2=3088 Hz (Left ear)

| | 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 | 9.6 | 8.2 | 280 | 5.2 | 8.8 | 286 | 1.3 | 8.4 | 291 | -2.6 | 7.8 | 246 | -3.5 | 7.5 | 49 | 3.2 | 9.5 | 1152 |
| Female | 10.7 | 7.8 | 290 | 7.5 | 8.2 | 277 | 4.6 | 8.5 | 268 | 1.3 | 8.7 | 276 | -1.8 | 7.8 | 56 | 5.7 | 9.1 | 1167 |
| Total | 10.1 | 8.0 | 570 | 6.3 | 8.6 | 563 | 2.9 | 8.6 | 559 | -0.5 | 8.5 | 522 | -2.6 | 7.7 | 105 | 4.5 | 9.4 | 2319 |

DP amplitudes above the noise floor at f2=4004 Hz (Right ear)

| | 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 | 10.6 | 8.8 | 277 | 6.5 | 9.6 | 287 | 0.9 | 9.9 | 294 | -2.5 | 7.9 | 240 | -4.5 | 6.5 | 47 | 3.7 | 10.4 | 1145 |
| Female | 13.4 | 7.8 | 293 | 9.4 | 9.0 | 277 | 4.7 | 9.6 | 269 | 1.2 | 9.1 | 272 | -4.2 | 8.9 | 55 | 6.8 | 10.3 | 1166 |
| Total | 12.0 | 8.4 | 570 | 7.9 | 9.4 | 564 | 2.7 | 9.9 | 563 | -0.5 | 8.8 | 512 | -4.3 | 7.9 | 102 | 5.2 | 10.4 | 2311 |

DP amplitudes above the noise floor at f2=4004 Hz (Left ear)

| | 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 | 10.2 | 7.6 | 280 | 5.6 | 9.1 | 286 | 0.4 | 9.6 | 291 | -3.7 | 8.1 | 246 | -5.2 | 7.4 | 49 | 2.9 | 10.1 | 1152 |
| Female | 13.2 | 7.2 | 290 | 9.4 | 8.5 | 277 | 5.2 | 9.0 | 268 | 1.1 | 9.2 | 276 | -2.4 | 8.6 | 56 | 6.9 | 9.8 | 1167 |
| Total | 11.7 | 7.5 | 570 | 7.5 | 9.0 | 563 | 2.7 | 9.6 | 559 | -1.1 | 9.0 | 522 | -3.7 | 8.1 | 105 | 4.9 | 10.1 | 2319 |

DP amplitudes above the noise floor at f2=5652 Hz (Right ear)

| | 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 | 9.8 | 277 | 4.4 | 9.9 | 287 | -0.6 | 8.7 | 294 | -4.9 | 7.5 | 241 | -5.3 | 4.8 | 47 | 2.4 | 10.7 | 1146 |
| Female | 16.7 | 8.2 | 293 | 10.7 | 10.2 | 277 | 4.5 | 9.9 | 269 | -0.2 | 10.0 | 272 | -5.1 | 7.7 | 55 | 7.5 | 11.7 | 1166 |
| Total | 14.0 | 9.4 | 570 | 7.5 | 10.5 | 564 | 1.8 | 9.7 | 563 | -2.4 | 9.2 | 513 | -5.2 | 6.5 | 102 | 5.0 | 11.5 | 2312 |

DP amplitudes above the noise floor at f2=5652 Hz (Left ear)

| | 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 | 10.6 | 9.7 | 280 | 4.2 | 10.0 | 286 | -1.4 | 8.9 | 291 | -3.9 | 7.1 | 246 | -6.6 | 4.4 | 49 | 2.2 | 10.6 | 1152 |
| Female | 16.2 | 8.3 | 290 | 11.2 | 10.0 | 277 | 4.9 | 10.0 | 268 | -0.1 | 9.4 | 276 | -4.0 | 7.9 | 56 | 7.6 | 11.4 | 1167 |
| Total | 13.4 | 9.4 | 570 | 7.7 | 10.6 | 563 | 1.6 | 10.0 | 559 | -1.9 | 8.6 | 522 | -5.2 | 6.6 | 105 | 4.9 | 11.3 | 2319 |

DP amplitudes above the noise floor at f2=6165 Hz (Right ear)

| | 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 | 10.7 | 9.5 | 277 | 2.9 | 9.9 | 287 | -1.6 | 8.4 | 294 | -5.3 | 7.0 | 241 | -6.3 | 6.8 | 47 | 1.5 | 10.6 | 1146 |
| Female | 15.4 | 8.7 | 293 | 9.0 | 10.2 | 277 | 3.3 | 9.8 | 269 | -0.7 | 9.2 | 272 | -3.9 | 6.9 | 55 | 6.4 | 11.3 | 1166 |
| Total | 13.1 | 9.4 | 570 | 5.9 | 10.5 | 564 | 0.7 | 9.4 | 563 | -2.9 | 8.6 | 513 | -5.0 | 6.9 | 102 | 4.0 | 11.2 | 2312 |

DP amplitudes above the noise floor at f2=6165 Hz (Left ear)

| | 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 | 10.3 | 10.1 | 280 | 3.2 | 9.6 | 286 | -1.5 | 8.4 | 291 | -5.4 | 7.2 | 246 | -7.5 | 6.6 | 49 | 1.5 | 10.7 | 1152 |
| Female | 14.7 | 8.9 | 290 | 9.4 | 10.2 | 277 | 2.5 | 9.5 | 267 | -1.5 | 9.5 | 276 | -4.9 | 9.2 | 56 | 5.9 | 11.6 | 1166 |
| Total | 12.6 | 9.8 | 570 | 6.3 | 10.4 | 563 | 0.4 | 9.1 | 558 | -3.3 | 8.7 | 522 | -6.1 | 8.1 | 105 | 3.7 | 11.4 | 2318 |