Supplementary Table 1: Comparison of characteristics among the group of individuals with complete data, versus groups with incomplete data.

| Variable | Category | Complete data (I) ( n=21,492); col% | Group with partially missing at T1 & T2 (II) (n=6,273) | p (I, II) | No data at T2 but alive (III) (n=1,770) | p (I, III) | No data at T2 due to death (IV) (n=562) | p (I, IV) |
|---|---|---|---|---|---|---|---|---|
| Mean baseline (T0) PTA[1] (dB HL) (SD) | | 21.22 (14.17) | 23.83 (15.87) | <0.001 | 25.12 (15.96) | <0.001 | 32.96 (16.35) | <0.001 |
| Mean change in PTA between T0 & T1 (dB) (SD) | | 2.8 (5.5) | 2.9 (5.9) | 0.189 | n/a | | n/a | |
| Mean rate of change in PTA (dB/yr) (SD) | | 0.95 (1.90) | 0.97 (2.0) | 0.460 | n/a | | n/a | |
| PTA category at baseline (T0) (n, col%) | Normal (<=25 dBHL) | 14,733 (68.6) | 3,507 (60.1) | <0.001 | 907 (57.5) | <0.001 | 171 (37.0) | <0.001 |
| | Mild (25.1-40 dBHL) | 4,336 (20.2) | 1,211 (21.8) | | 391 (24.8) | | 138 (29.9) | |
| | Moderate (40.1-60 dBHL) | 2,106 (9.8) | 703 (12.7) | | 237 (15.0) | | 131 (28.4) | |
| | Severe or worse (60+ dBHL) | 317 (1.5) | 138 (2.5) | | 42 (2.7) | | 22 (4.8) | |
| ***Socio-demographic and economic characteristics*** | | | | | | | | |
| **Age (years)** | Mean ± sd | 62.26 (9.88) | 64.07 (10.75) | <0.001 | 64.52 (11.05) | <0.001 | 72.29 (9.54) | <0.001 |
| **Sex (col %)** | Male | 10,740 (49.97) | 2892 (46.10) | <0.001 | 804 (45.42) | <0.001 | 341 (60.68) | <0.001 |
| | Female | 10752 (50.03) | 3381 (53.90) | | 966 (54.58) | | 221 (39.34) | |
| **Race (col%)** | | | | | | | | |
| | White | 20697 (96.30) | 5906 (94.15) | <0.001 | 1620 (91.53) | <0.001 | 548 (97.51) | 0.133 |
| | Other | 795 (3.70) | 367 (5.85) | | 150 (8.47) | | 14 (2.49) | |
| **Education (col%)** | | | | | | | | |
| | Post-secondary degree graduation | 17063 (79.39) | 4718 (75.73) | | 1186 (67.20) | | 360 (64.29) | |
| | Some post-secondary education | 1489 (6.93) | 533 (8.56) | <0.001 | 146 (8.27) | <0.001 | 70 (7.70) | <0.001 |
| | Secondary school graduate | 1935 (9.00) | 604 (9.70) | | 227 (12.86) | | 73 (13.04) | |
| | Less than secondary school | 1005 (4.68) | 375 (6.02) | | 206 (11.67) | | 57 (4.82) | |
| **Household Income (col%)** | | | | | | | | |
| | Refused | 725 (3.37) | 297 (4.73) | | 87 (4.92) | | 21 (3.74) | |
| | Don't know | 491 (2.28) | 211 (3.36) | | 81 (4.58) | | 28 (4.98) | |
| | >=$150,000 | 3720 (17.31) | 897 (14.30) | | 154 (8.70) | | 28 (4.98) | |
| | $100,000-149,999 | 4210 (19.59) | 1008 (16.07) | <0.001 | 240 (13.56) | <0.001 | 66 (11.74) | <0.001 |
| | $50,000-99,999 | 7302 (33.98) | 1984 (31.63) | | 461 (26.05) | | 160 (28.47) | |
| | $20,000-49,999 | 4180 (19.45) | 1437 (22.91) | | 541 (30.56) | | 202 (35.94) | |
| | <$20,000 | 864 (4.02) | 439 (7.00) | | 206 (11.64) | | 57 (10.14) | |
| ***Cardiovascular risk factors*** | | | | | | | | |
| **Obesity (col%)** | | | | | | | | |
| | Yes | 5731 (26.67) | 1948 (32.02) | <0.001 | 580 (33.53) | <0.001 | 237 (43.25) | <0.001 |
| | No | 15761 (73.33) | 4135 (67.98) | | 1150 (66.47) | | 311 (56.75) | |
| **Diabetes (col%)** | | | | | | | | |
| | Yes | 3750 (17.49) | 1232 (19.69) | <0.001 | 401 (22.71) | <0.001 | 190 (33.87) | <0.001 |
| | No | 17742 (82.55) | 5025 (80.31) | | 364 (77.28) | | 371 (66.13) | |
| **Dyslipidemia (col%)** | | | | | | | | |
| | Yes | 6,469 (30.3) | 1,428 (36.1) | <0.001 | 434 (30.1) | 0.571 | 77 (19.0) | <0.001 |
| | No | 14,866 (69.7) | 2,523 (63.9) | | 1,005 (69.9) | | 329 (81.0) | |
| **Hypertension (col%)** | | | | | | | | |
| | Yes | 8882 (41.33) | 2827 (42.34) | <0.001 | 858(48.97) | <0.001 | 344 (61.87) | <0.001 |
| | No | 12610 (58.67) | 3336 (54.13) | | 894 (51.03) | | 212 (38.13) | |
| **Smoking (col%)** | | | | | | | | |
| | Never | 10397 (48.34) | 2943 (46.92) | <0.001 | 724 (40.90) | <0.001 | 178 (31.67) | |
| | Former | 9371 (43.60) | 2701 (43.06) | | 775 (43.79) | | 297 (52.85) | <0.001 |
| | Current | 1724 (8.02) | 628(8.47) | | 271 (15.31) | | 87 (15.48) | |
| **No. of risk factors** | Mean (SD) | 1.64 (1.09) | 1.84 (1.13) | <0.001 | 1.92 (1.14) | <0.001 | 2.13 (1.26) | <0.001 |
| **General CVD risk function** | Mean % (SD) | 14.7 (0.11) | 17.6 (0.13) | <0.001 | 17.5 (0.12) | <0.001 | 23.1 (0.13) | <0.001 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| ***Life-style characteristics*** | | | | | | | | |
| **Alcohol (col%)** | | | | | | | | |
| | Never | 2681 (12.47) | 951 (15.18) | <0.001 | 362 (20.48) | | 146 (26.02) | |
| | Less than once/month | 2423 (11.27) | 896 (14.31) | | 305 (17.25) | | 81 (14.44) | |
| | 1-4 times/month | 5913(27.51) | 1774 (28.33) | | 458 (25.90) | <0.001 | 121 (21.57) | <0.001 |
| | Multiple times/month | 6942 (32.30) | 1675 (26.74) | | 403 (22.79) | | 108 (19.25) | |
| | daily | 3533 (16.44) | 967 (15.44) | | 240 (13.57) | | 105 (18.72) | |
| **PASE**[2] | mean ± sd | 145.02 (73.15) | 131.36 (74.73) | <0.001 | 124.62 (74.87) | <0.001 | 83.79 (56.62) | <0.001 |

1. PTA: pure-tone threshold average (1000, 2000, 3000 and 4000 Hz in both ears)
2. PASE: Physical activity scale for the elderly

Supplementary Table 2: Age-standardized mean binaural mid-frequency pure-tone threshold average values at baseline (T0) (dB HL, 95% confidence interval). Age- standardization was performed to adjust for differences in age between comparator groups (e.g., between smokers and non-smokers; diabetics and non-diabetics, etc.) within each age/sex category. P-values are based on 2-tailed t-test between groups with and without each metabolic risk factor in each age/sex category.

| Risk factor | | Females | | | | | Males | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **45-54 years old** | **55-64 years old** | **65-74 years old** | **75-86 years old** | **All ages** | **45-54 years old** | **55-64 years old** | **65-74 years old** | **75-86 years old** | **All ages** |
| Smoking | Smoker | 12.9 (11.3-14.5) | 19.3 (17.5-21.2) | 26.5 (24.1-29.0) | 35.7 (33.0-47.6) | 20.9 (19.9-21.9) | 17.0 (15.2-17.7) | 21.2 (19.6-22.8) | 32.2 (29.1-35.2) | 42.3 (37.0-38.3) | 24.5 (23.3-25.7) |
| | Non-smoker | 11.1 (10.6-11.7) | 16.1 (15.6-16.7) | 23.0 (22.2-23.8) | 32.7 (31.7-33.7) | 18.4 (18.0-18.7) | 14.2 (13.3-15.0) | 20.6 (19.9-21.3) | 29.8 (28.5-31.0) | 40.3 (37.0-47.6) | 22.9 (22.4-23.4) |
| | P-value | **0.044** | **0.001** | **0.006** | **0.039** | **<0.001** | **0.001** | 0.532 | 0.153 | 0.550 | **0.014** |
| Hypertension | HTN | 13.6 (12.2-15.0) | 17.4 (16.5-18.3) | 22.8 (21.7-23.8) | 33.7 (32.5-35.0) | 19.5 (18.9-20.2) | 14.3 (13.3-15.4) | 20.8 (19.9-21.8) | 30.9 (29.2-32.5) | 39.2 (37.6-40.8) | 23.1 (22.4-23.7) |
| | No HTN | 10.9(10.4-11.4) | 16.0 (15.3-16.6) | 23.6 (22.5-24.6) | 32.8 (31.2-34.4) | 18.4 (18.0-18.8) | 14.6 (13.7-15.6) | 20.6 (19.6-21.5) | 28.5 (27.1-29.9) | 43.1 (41.2-44.9) | 23.0 (22.5-23.6) |
| | P-value | **<0.001** | **0.013** | 0.289 | 0.367 | **0.003** | 0.681 | 0.691 | **0.030** | **0.002** | 0.921 |
| Dyslipidemia | Dyslipidemia | 11.2 (10.7-11.6) | 16.2 (15.7-16.9) | 22.5 (21.6-23.4) | 32.4 (30.6-34.2) | 18.4 (18.1-18.7) | 13.9 (13.3-14.5) | 21.3 (20.4-22.2) | 28.9 (29.0-31.0) | 41.6 (39.5-43.7) | 23.3 (22.8-23.9) |
| | No-dyslipidemia | 11.2 (10.6-11.9) | 16.5 (15.9-17.0) | 22.8 (22.0-23,5) | 32.6 (32.6-34.5) | 18.3 (17.8-18.7) | 15.0 (14.2-15.9) | 21.3 (20.7-21.9) | 30.0 (27.6-30.2) | 41.6 (40.6-42.7) | 23.2 (22.8-23.6) |
| | P-value | 0.844 | 0.616 | 0.671 | 0.234 | 0.587 | **0.043** | 0.931 | 0.169 | 0.965 | 0.702 |
| Diabetes | Diabetes | 14.5 (12.5-16.4) | 18.2 (16.8-19.6) | 24.6 (23.0-26.2) | 34.4 (32.2-36.5) | 20.6 (19.6-21.5) | 14.4 (13.2-15.6) | 21.5 (20.3-22.7) | 31.0 (29.5-32.5) | 40.2 (38.0-42.4) | 23.5 (22.8-24.1) |
| | No diabetes | 11.0 (10.5-11.4) | 16.1 (15.5-16.7) | 22.8 (22.0-23.7) | 32.7 (31.6-33.9) | 18.3 (17.9-18.6) | 14.5 (13.6-15.4) | 20.4 (19.7-21.2) | 29.5 (28.0-30.9) | 40.9 (39.5-42.3) | 22.9 (22.4-23.4) |
| | P-value | **<0.001** | **0.001** | 0.061 | 0.189 | **<0.001** | 0.903 | 0.029 | 0.175 | 0.585 | 0.226 |
| Obesity | Obese | 12.8 (11.2-14.5) | 18.3 (17.2-19.5) | 23.0 (21.7-24.2) | 33.8 (31.7-35.9) | 19.6 (18.9-20.4 | 16.2 (14.9-17.5) | 22.4 (21.0-23.8) | 31.1 (29.3-33.0) | 40.2 (38.2-42.2) | 24.4 (23.6-25.2) |
| | Not obese | 11.1 (10.5-11.6) | 15.7 (15.1-16.4) | 23.2 (22.3-24.1) | 32.9 (31.8-34.0) | 18.3 (17.9-18.7) | 14.0 (13.1-14.9) | 19.9 (19.2-20.6) | 28.8 (27.6-30.1) | 41.8 (40.2-43.5) | 22.5 (22.0-23.0) |
| | P-value | **0.043** | **<0.001** | 0.750 | 0.459 | **0.002** | **0.001** | **0.001** | **0.045** | 0.209 | **<0.001** |

Supplementary Table 3. Age-standardized mean change in binaural mid-frequency pure-tone threshold average between T0 and T1 (dB, 95% confidence interval). Positive values reflect worsening hearing over time. Age standardization was performed to adjust for differences in age between comparator groups (e.g., between smokers and non-smokers; diabetics and non-diabetics, etc.) within each age/sex category. P-values are based on 2-tailed t-test between groups with and without the metabolic risk factor in each age/sex category

| Risk factor | | Female | | | | | Male | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **45-54 years old** | **55-64 years old** | **65-74 years old** | **75-86 years old** | **All ages** | **45-54 years old** | **55-64 years old** | **65-74 years old** | **75-86 years old** | **All ages** |
| Smoking | Smoker | 2.5 (1.4-3.6) | 1.3 (0.3-2.3) | 4.5 (3.2-5.7) | 4.5 (2.4-6.7) | 2.8 (2.2-3.4) | 3.2 (2.1-4.3) | 3.2 (2.4-4.1) | 3.7 (2.5-4.9) | 4.6 (3.7-5.5) | 3.5 (2.9-4.0) |
| | Non-smoker | 1.6 (1.1-2.1) | 2.5 (2.2-2.8) | 3.3 (2.8-3.8) | 4.7 (4.1-5.3) | 2.7 (2.5-2.9) | 1.9 (1.6-2.1) | 2.9 (2.5-3.3) | 3.7 (3.4-4.1) | 4.5 (3.9-5.0) | 2.9 (2.7-3.1) |
| | P-value | 0.130 | **0.022** | 0.095 | 0.857 | 0.708 | **0.022** | 0.472 | 0.995 | 0.814 | 0.061 |
| Hypertension | HTN | 0.5 (0.0-1.1) | 2.3 (1.9-2.7) | 3.3 (2.6-4.0) | 5.1 (4.4-5.9) | 2.3 (2.0-2.6) | 2.4 (1.7-3.1) | 3.1 (2.7-3.5) | 3.5 (3.1-4.0) | 4.6 (4.0-5.2) | 3.2 (2.8-3.5) |
| | No HTN | 1.9 (1.3-2.5) | 2.5 (2.1-2.8) | 3.3 (2.8-3.9) | 4.3 (3.6-5.0) | 2.7 (2.5-3.0) | 2.0 (1.7-2.4) | 2.8 (2.2-3.4) | 4.0 (3.5-4.4) | 4.3 (3.5-5.1) | 3.0 (2.7-3.2) |
| | P-value | **0.001** | 0.393 | 0.909 | 0.109 | **0.030** | 0.328 | 0.389 | 0.187 | 0.585 | 0.401 |
| Dyslipidemia | Dyslipidemia | 1.4 (0.9-1.8) | 2.1 (1.8-2.4) | 3.3 (2.8-3.8) | 4.3 (3.7-4.8) | 2.6 (2.3-2.8) | 1.9 (1.6-2.3) | 2.8 (2.5-3.1) | 3.3 (2.8-3.7) | 4.0 (3.1-4.9) | 2.8 (2.5-3.0) |
| | No-dyslipid. | 1.5 (1.2-1.8) | 2.5 (2.1-2.8) | 2.9 (2.5-3.2) | 4.5 (4.0-5.1) | 2.4 (2.2-2.6) | 1.9 (1.4-2.4) | 2.8 (2.4-3.3) | 3.6 (3.3-3.9) | 4.2 (3.7-4.6) | 2.9 (2.7-3.0) |
| | P-value | 0.563 | 0.135 | 0.136 | 0.450 | 0.327 | 0.906 | 0.135 | 0.237 | 0.783 | 0.531 |
| Diabetes | Diabetes | 0.3 (-0.5-1.0) | 2.3 (1.7-2.8) | 3.3 (2.4-4.2) | 4.7 (4.0-5.4) | 2.2 (1.8-2.5) | 1.5 (0.8-2.1) | 2.9 (2.3-3.5) | 3.4 (2.9-3.8) | 4.0 (3.3-4.8) | 2.7 (2.3-2.9) |
| | No diabetes | 1.9 (1.4-2.4) | 2.4 (2.1-2.7) | 3.3 (2.8-3.8) | 4.6 (4.0-5.3) | 2.8 (2.5-3.0) | 2.2 (1.9-2.6) | 3.0 (2.5-3.4) | 3.9 (3.4-4.3) | 4.7 (4.1-5.3) | 3.1 (2.9-3.4) |
| | P-value | **<0.001** | 0.649 | 0.907 | 0.871 | **0.010** | **0.034** | 0.840 | 0.118 | 0.187 | **0.015** |
| Obese | Obese | 1.5 (0.9-2.1) | 2.5 (1.9-3.0) | 3.3 (2.6-3.9) | 5.5 (4.6-6.5) | 2.7 (2.4-3.1) | 2.3 (1.6-2.9) | 2.5 (1.7-3.4) | 3.9 (3.2-4.5) | 4.3 (3.7-5.0) | 2.9 (2.6-3.4) |
| | Not obese | 1.7 (1.2-2.9) | 2.4 (2.0-2.7) | 3.3 (2.8-3.9) | 4.3 (3.8-4.8) | 2.7 (2.4-2.9) | 2.1 (1.7-2.4) | 3.1 (2.8-3.4) | 3.7 (3.3-4.1) | 4.3 (3.6-5.0) | 3.0 (2.8-3.2) |
| | P-value | 0.506 | 0.741 | 0.913 | **0.027** | 0.699 | 0.570 | 0.217 | 0.615 | 0.913 | 0.759 |

Supplementary Table 4: Full output of male and female ordinary least squares multivariable linear regression models for predictors of hearing at T0 (cross-sectional model, complete case analysis). The beta coefficient represents the marginal difference in binaural mid-frequency pure-tone average (dB HL) at T0 versus the reference group without the risk factor.

| **Binaural mid-frequency pure-tone average** | **Female**<br>β (95% CI, p value) | **Male**<br>β (95% CI, p value) |
|---|---|---|
| ***Socio-demographic characteristics*** | | |
| **Age** | **0.69 (0.65-0.73, <0.001)** | **0.81 (0.77-0.85, <0.001)** |
| **Race** | | |
| Other (ref) | | |
| White | -1.48 (-2.97-0.02, 0.053) | -0.18 (-1.84-1.49, 0.836) |
| **Education** | | |
| Post-secondary graduate (ref) | | |
| Some post-secondary graduate | 0.13 (-0.77-1.03, 0.777) | -0.24 (-1.29-0.82, 0.660) |
| Secondary School graduate | 0.47 (-0.25-1.20, 0.201) | **1.31 (0.32-2.31, 0.010)** |
| Less secondary | **1.37 (0.158-2.58, 0.027)** | **2.18 (0.60-3.76, 0.007)** |
| **Income** | | |
| Refused | -0.43 (-1.74-0.89, 0.522) | 1.42 (-0.7-3.50, 0.180) |
| Don't know | 0.85 (-1.11-2.81, 0.394) | 4.47 (1.73-7.23, 0.001) |
| >=$150,000 (ref) | | |
| $100,000-149,999 | -0.13 (-0.9-0.64, 0.737) | 0.64 (-0.12-1.4, 0.097) |
| $50,000-99,999 | 0.23 (-0.50-0.96, 0.540) | **1.38 (0.53-2.22, 0.001)** |
| $20,000-49,999 | 0.61 (-0.29-1.50, 0.184) | **1.86 (0.68-3.03, 0.002)** |
| <$20,000 | **2.68 (1.14-4.22, 0.001)** | **3.16 (0.89-5.43, 0.006)** |
| **Menopause** | | |
| No (ref) | | |
| Yes | **-1.61 (-2.36--0.9, <0.001)** | |
| Hysterectomy | **-1.27 (-2.21--0.33, 0.008)** | |
| ***Risk factors*** | | |
| **Obesity** | | |
| No (ref) | | |
| Yes | 0.20 (-0.49-0.89, 0.574) | **0.97 (0.18-1.78, 0.016)** |
| **Diabetes** | | |
| No (ref) | | |
| Yes | **0.89 (0.08-1.70, 0.031)** | **0.95 (0.10-1.81, 0.029)** |
| **Dyslipidemia** | | |
| No (ref) | | |
| Yes | -0.24 (-0.78-0.31, 0.384) | 0.46 (-0.21-1.14, 0.175) |
| **Hypertension** | | |
| No (ref) | | |
| Yes | 0.16 (-0.43-0.76, 0.587) | -0.37 (-1.03-0.30, 0.278) |
| **Smoking** | | |
| Never (ref) | | |
| Former | -0.003 (-0.52-0.51, 0.990) | 0.56 (-0.11-1.23, 0.103) |
| Current | **1.45 (0.29-2.60, 0.014)** | **1.71 (0.58-2.85, 0.003)** |
| ***Lifestyle characteristics*** | | |
| **Alcohol Consumption** | | |
| Never | **1.43 (0.35-2.51, 0.010)** | 1.12 (-0.20-2.45, 0.104) |
| Less than once per month | 0.65 (-0.35-1.64, 0.203) | 0.41 (-1.05-1.86, 0.584) |
| 1-4 times per month | **1.00 (0.16-1.85, 0.019)** | 0.07 (-0.95-1.09, 0.893) |

| | | |
|---|---|---|
| Multiple times per week | 0.08 (-0.72-0.89, 0.839) | -0.45 (-1.35-0.44, 0.318) |
| Daily (ref) | | |
| **PASE score** | -0.002 (-0.007-0.002, 0.311) | 0.002 (-0.002-0.007, 0.248) |
| **DCS** | | |
| AB_Calgary (ref) | | |
| BC _SFU_UBC | 0.87 (-0.49-2.14, 0.179) | -1.22 (-2.69-0.25, 0.104) |
| BC _Victoria | -0.95 (-2.04-0.14, 0.090) | 0.43 (-1.08-1.94, 0.578) |
| MB _Manitoba DCS | 1.76 (0.62-2.90, 0.003) | 2.31 (0.87-3.76, 0.002) |
| NL _Memorial | 1.27 (0.010-2.55, 0.052) | 1.53 (-0.32-3.10, 0.055) |
| NS _Dalhousie | 0.23 (-0.91-1.36, 0.696) | 0.94 (-0.45-2.33, 0.186) |
| ON _Hamilton | 1.73 (0.49-2.97, 0.006) | 0.79 (-0.67-2.26, 0.289) |
| ON _Ottawa | 0.55 (-0.62-1.71, 0.355) | -0.22 (-1.65-1.23, 0.769) |
| QC _McGill | 1.42 (0.23-2.61, 0.020) | 2.65 (0.88-4.43, 0.003) |
| QC _Sherbrooke | 0.79 (-0.34-1.91, 0.171) | 2.28 (0.82-3.75, 0.002) |

Supplementary Table 5: Independent cross-sectional and longitudinal associations between lifetime number of cigarettes smoked and pure tone average. Cross-sectional results are based on ordinary least squares multivariable linear regression, while longitudinal results are based on repeated measures linear mixed regression models. For cross-sectional results, the beta coefficient represents the marginal difference in pure-tone threshold average (dB HL) per 10,000 cigarettes smoked. For longitudinal results, the beta coefficient represents the marginal difference in change in pure-tone threshold average (dB HL/year) per 10,000 cigarettes smoked.

| | **Females** | | **Males** | |
|---|---|---|---|---|
| | **Cross-sectional β (dB) (95% CI, p)** | **Longitudinal β (dB/yr) (95% CI, p)** | **Cross-sectional β (dB) (95% CI, p)** | **Longitudinal β (dB/yr) (95% CI, p)** |
| Lifetime no. cigarettes (per 10,000) | 0.045 (-.002-0.093, 0.064) | 0.005 (.0002-0.011, 0.043) | 0.069 (0.031-0.106, <.001) | 0.009 (0.003-0.015, <.001) |

1. Cross-sectional models for each sex were adjusted for age, education, white race/ethnicity, income, obesity, diabetes, dyslipidemia, hypertension, smoking, alcohol consumption, PASE score, and CLSA data collection site. Female models also adjusted for menopause status. Cross-sectional results are obtained from a single model for all individual risk factors (for each sex). Separate longitudinal models were performed one risk factor at a time. Time (as a continuous variable) between data collection site visits was interacted with each individual risk factor. The time#risk factor measures of association are reported. Longitudinal models also adjusted for each of the other individual risk factors, age, education, income, alcohol consumption, PASE score, and CLSA data collection site. Female models also adjusted for menopause status.

Supplementary table 6. Comparison of significant (p<0.05) predictors of worse hearing (based on multivariable cross-sectional regression models) and hearing loss (based on multi-variable longitudinal regression models) across complete case and multiple imputation approaches. "X" signifies significant associations.

| | Complete case analysis | | | | Multiple imputation | | | |
|---|---|---|---|---|---|---|---|---|
| Variable | Cross-sectional | | Longitudinal | | Cross-sectional | | Longitudinal | |
| | Female | Male | Female | Male | Female | Male | Female | Male |
| ***Single Risk factors*** | | | | | | | | |
| Obesity | | X | X | | X | X | X | |
| Diabetes | X | X | | | X | X | | |
| Dyslipidemia | | | | | | | | X |
| Hypertension | | | X | X | | | X | X |
| Current smoker | X | X | | X | X | X | | |
| Former smoker | | | | X | | | | X |
| ***Composite score*** | | | | | | | | |
| Number of CV RF present | X | X | X | | X | X | X | |

*Note: The general cardiovascular risk function was not analyzed using multiple imputation. Some variables used to construct the risk function (e.g., body mass index) were not included in the imputation equations (and thus their missing values were not imputed) because they were not part of the main analysis. Thus, it was not possible to construct a risk function variable using imputed values of its constituent items.