**Supplementary materials**

**Residential exposure to road and railway traffic noise and incidence of dementia: the UK Biobank cohort study**

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**Supplementary Table 1a:** List of International Classification of Disease chapters (ICD10) used to select and define dementia outcomes.

|  |  |  |
| --- | --- | --- |
| Dementia outcome | ICD10 codes | UKB data fields |
| Alzheimer’s disease | G30 | [131037](https://biobank.ndph.ox.ac.uk/showcase/field.cgi?id=131037) |
|  | F00 | [130836](https://biobank.ndph.ox.ac.uk/showcase/field.cgi?id=130836) |
| Vascular Dementia | F01 | [130838](https://biobank.ndph.ox.ac.uk/showcase/field.cgi?id=130838) |
| Parkinson’s disease | G20 | [131022](https://biobank.ndph.ox.ac.uk/showcase/field.cgi?id=131022) |
|  | G22 | [131026](https://biobank.ndph.ox.ac.uk/showcase/field.cgi?id=131026) |

**Supplementary Table 1b** List of International Classification of Disease chapters (ICD10) used to define all-cause dementia from UKB algorithmically defined outcome data fields

|  |  |  |
| --- | --- | --- |
| Dementia outcome | ICD10 codes | UKB data fields |
| All-cause dementia | F00, F01, F02, F03, F05.1 G20, G22, G30, G31, I67.1 | [42018](https://biobank.ndph.ox.ac.uk/showcase/field.cgi?id=42018) |

**Supplementary Table 2:** List of covariables, their definition and assessment.

|  |  |  |  |
| --- | --- | --- | --- |
| UK Biobank field | Variable | Description  | Variable format |
| Socio-demographic |
| 21022 | Age at recruitment | Derived variable (dd/mm/yyyy) based on the date of birth and the date of attending initial assessment centre  | Continuous (37-73 years old) |
| 31 | Sex | Acquired from the central registry at recruitment, but in some cases updated by the participant. Hence this field may contain a mixture of the sex the NHS had recorded for the participant and self-reported sex. | Binary Male Female |
| 189 | Townsend deprivation index | Townsend deprivation index was calculated immediately prior to participant joining UK Biobank. Based on the preceding national census output areas. Each participant is assigned a score corresponding to the output area in which their postcode is located | Ordinal (continuous transformed to quintiles)1- Least deprived5- Most deprived |
| 20116 | Smoking status  | Self-reported smoking status | CategoricalNeverPrevious Current |
| 6138 | Education  | Self-reported qualification - touchscreen question "Which of the following qualifications do you have? (You can select more than one)" – College/university degree, A level or equivalent, O levels/GCSE or equivalent, CSEs or equivalent, NVQ or equivalent, Other professional qual (nursing/teaching), None of the above, prefer not to answer) | Binary Degree orNo degree  |
| 874864894884914904 | Physical activity | Derived variable generated from self-reported factors from the International Physical Activity Questionnaire short form. This included different physical activity type and duration (such as walking, moderate and vigorous physical activity, strenuous sports…etc). These factors were converted into a single measure of total physical activity in metabolic equivalent of task (MET) – hours per week weighted by intensity (walking, moderate or vigorous) | Continuous(hours/week)  |
| 1558 | Alcohol intake status  | Self-reported alcohol drinking frequency status (per week, month or occasionally)Touchscreen question "About how often do you drink alcohol?" If the participant activated the Help button, they were shown the message:

|  |
| --- |
| *If this varies a lot, please provide an average considering your intakeover the last year.*  |

 | CategoricalDaily or almost daily3-4 times a week1-2 times a week1-3 times a monthSpecial Occasion only NeverPrefer not to answer (*treated as missing data*) |
| Environmental measures |
| 24016240172401824003 | Nitrogen dioxide (NO2), 2010 | Annual average NO2 concentration (ug/m3) for 2005,2007, 2010, estimated using a Land Use regression model | Continuous  |
| 240192400524006 | Particulate matter (PM10, 2010) & (PM2.5, 2010) | Annual average PM10 & PM2.5 concentration for 2007, 2010 estimated using a Land Use regression model | Continuous  |

**Supplementary Table 3:** Metrics used to define cardiovascular risk score

|  |  |
| --- | --- |
| Health Metric | Definition |
| Smoking | Ideal | Never  |
| Intermediate | Former |
| Poor | Current |
| Body mass index, kg/m2 | Ideal | <25 kg/m2 |
| Intermediate | 25-29.99 kg/m2 |
| Poor | ≥30 kg/m2 |
| Physical activity, min/week | Ideal | ≥150 min/week moderate or≥75 min/week vigorous or≥150 combination |
| Intermediate | 30 to 149 min/week moderate or30 to 74 min/week vigorous or30 to 149 min/week combination |
| Poor | <30min/week moderate phys. activity |
| Healthy diet score  | Ideal | >4 fruits and vegetables/day |
| Intermediate | 2-4 fruits and vegetables/day |
| Poor | <2 fruits and vegetables/ day |
| Total cholesterol, mmol/L | Ideal | <5.2 mmol/L |
| Intermediate | 5.2 to 6.2 mmol/L |
| Poor | >6.2 mmol/L |
| Blood pressure, mm Hg | Ideal | <120/<80 mm Hg |
| Intermediate | 120-139/80-89 mm Hg |
| Poor | ≥140/90 mm Hg |
| Blood glucose, mmol/L † | Ideal | <5.6 mmol/L |
| Intermediate | 5.6-6.9 mmol/L |
| Poor | >6.9 mmol/L |
| Total CRS Score ‡ | Optimal | 11-14 points |
| Intermediate | 7-10 points |
| Poor | 0-6 points |

† Given that fasting plasma glucose values were reported in mmol/L, appropriate conversions were done as per the [World Health Organisation](https://www.who.int/data/gho/indicator-metadata-registry/imr-details/2380#:~:text=If%20fasting%20blood%20glucose%20is,separate%20tests%2C%20diabetes%20is%20diagnosed.) and American Diabetes Association guidelines (Fasting plasma glucose of ≥126 mg/dL = >6.9 mmol/L fasting plasma glucose of 100-125 mg/dL = 5.6 to 6.9 mmol/L and fasting plasma glucose of <100 mg/dL untreated = 5.6mmol/L). Similar conversions were done for total cholesterol

‡ The total cardiovascular risk score represents the sum of individual metric point values and ranges from 0 to 14. Each individual metric was scored as ideal (2 points), intermediate (1 point), or poor (0 points). We defined overall CVH as high (11-14 points), moderate (7-10 points), or low (0-6 points).

**Supplementary Table 4: Correlation matrix of the noise measure and environmental variables in UK Biobank**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Road Lden | Road Lnight | Rail Lden | Rail Lnight | Nitrogen dioxide | Particulate matter | Proximity to Greenspace |
|  |  |  |  |  |  |  |  |
| Road Lden | 1 |  |  |  |  |  |  |
| Road Lnight | 0.9997\* | 1 |  |  |  |  |  |
| Rail Lden | 0.0775\* | 0.0764\* | 1 |  |  |  |  |
| Rail Lnight | 0.0731\* | 0.0721\* | 0.9895\* | 1 |  |  |  |
| Nitrogen dioxide | 0.2243\* | 0.2222\* | 0.2113\* | 0.1860\* | 1 |  |  |
| Particulate matter | 0.2805\* | 0.2793\* | 0.3074\* | 0.2788\* | 0.8644\* | 1 |  |
| Proximity togreenspace | -0.0988\* | -0.0953\* | -0.3519\* | -0.3226\* | -0.6410\* | -0.7354\* | 1 |

\* Indicate r values are statistically significant (p-value <0.05)

**Supplementary table 5**: Subgroup analyses of the association between traffic noise and incident dementia (per 10db) in UK Biobank based on age, sex, sleep duration and presence of comorbidity

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | All-cause dementia | Alzheimer’s disease | Parkinson’s disease | Vascular dementia |
| Noise exposures | Subgroup | Categories | No of cases | Fully adjusted model | No of cases | Fully adjusted model | No of cases | Fully adjusted model | No of cases | Fully adjusted model |
|  |  |  |  | HR(95% CI) |  | HR(95% CI) |  | HR(95% CI) |  | HR(95% CI) |
| Road Lden  | Age | <60 years old | 897 | 1.058 (0.91 - 1.23) | 395 | 1.362 (1.116 - 1.663) | 696 | 0.936 (0.788 - 1.113) | 186 | 1.017 (0.668 - 1.548) |
|  | ≥60 years old | 6,747 | 1.046 (0.937 - 1.167) | 4,068 | 1.079 (0.933 - 1.249) | 2,934 | 1.044 (0.912 - 1.194) | 2,049 | 1.055 (0.863 - 1.289) |
| Sex | Female | 3,622 | 0.982 (0.843 - 1.143) | 2,351 | 1.038 (0.853 - 1.264) | 1,366 | 0.913 (0.746 - 1.116) | 942 | 1.232 (0.883 - 1.718) |
|  | Male | 4,022 | 1.076 (0.965 - 1.2) | 2,112 | 1.228 (1.06 - 1.424) | 2,264 | 1.031 (0.91 - 1.168) | 1,293 | 0.958 (0.772 - 1.189) |
| Sleep duration | <6hrs | 2,001 | 1.046 (0.892 - 1.225) | 1,008 | 1.143 (0.917 - 1.424) | 847 | 1.068 (0.883 - 1.292) | 602 | 1.128 (0.83 - 1.532) |
|  | ≥6hrs | 5,500 | 1.037 (0.932 - 1.154) | 3,310 | 1.151 (1.00 - 1.325) | 2,744 | 0.967 (0.851 - 1.099) | 1,586 | 1.002 (0.802 - 1.251) |
| Comorbidity | No | 2,470 | 1.143 (1.001 - 1.304) | 1,643 | 1.24 (1.05 - 1.465) | 1,398 | 1.024 (0.877 - 1.194) | 444 | 1.28 (0.922 - 1.775) |
|  | Yes | 5,174 | 0.973 (0.864 - 1.096) | 2,820 | 1.075 (0.91 - 1.271) | 2,232 | 0.972 (0.839 - 1.124) | 1,791 | 0.952 (0.767 - 1.18) |
|  |  |  |  |   |  |   |  |   |  |   |
| Road Lnight  | Age | <60 years old | 897 | 1.059 (0.908 - 1.234) | 395 | 1.366 (1.116 - 1.671) | 696 | 0.937 (0.786 - 1.118) | 186 | 1.011 (0.657 - 1.556) |
|  | ≥60 years | 6,747 | 1.046 (0.935 - 1.17) | 4,068 | 1.08 (0.931 - 1.253) | 2,934 | 1.045 (0.911 - 1.199) | 2,049 | 1.056 (0.861 - 1.296) |
| Sex | Female | 3,622 | 0.981 (0.841 - .146) | 2,351 | 1.039 (0.85 - 1.27) | 1,366 | 0.909 (0.74 - 1.117) | 942 | 1.233 (0.879 - 1.729) |
|  | Male | 4,022 | 1.076 (0.963 - 1.202) | 2,112 | 1.23 (1.058 - 1.429) | 2,264 | 1.034 (0.91 - 1.174) | 1,293 | 0.957 (0.768 - 1.193) |
|  | Sleep duration | <6hrs | 2,001 | 1.046 (0.89 - 1.23) | 1,008 | 1.141 (0.912 - 1.427) | 847 | 1.067 (0.879 - 1.296) | 602 | 1.129 (0.826 - 1.542) |
|  | ≥6hrs | 5,500 | 1.036 (0.92 - 91.156) | 3,310 | 1.154 (1.00 - 1.332) | 2,744 | 0.969 (0.85 - 1.104) | 1,586 | 1.00 (0.797 - 1.255) |
| Comorbidity | No | 2,470 | 1.143 (0.999 - 1.307) | 1,643 | 1.243 (1.05 - 1.472) | 1,398 | 1.021 (0.872 - 1.196) | 444 | 1.285 (0.922 - 1.79) |
|  | Yes | 5,174 | 0.972 (0.861 - 1.098) | 2,820 | 1.075 (0.906 - 1.275) | 2,232 | 0.975 (0.84 - 1.132) | 1,791 | 0.949 (0.761 - 1.183) |
|  |  |  |  |   |  |   |  |   |  |   |
| Rail Lden | Age | <60 years old | 817 | 1.09 (1.033 - 1.15) | 338 | 1.02 (0.938 - 1.11) | 630 | 0.992 (0.934 - 1.053) | 169 | 1.116 (0.974 - 1.279) |
|  | ≥60 years old | 6,078 | 0.991 (0.95 - 1.034) | 3,572 | 0.987 (0.934 - 1.043) | 2,658 | 1.074 (1.022 -1.129) | 1,769 | 1.026 (0.953 - 1.104) |
| Sex | Female | 3,243 | 0.983 (0.929 - 1.039) | 2,038 | 0.998 (0.928 - 1.073) | 1,235 | 0.992 (0.924 - 1.063) | 806 | 1.04 (0.917 - 1.179) |
|  | Male | 3,652 | 1.048 (1.006 - 1.093) | 1,872 | 0.986 (0.928 - 1.048) | 2,035 | 1.058 (1.011 - 1.107) | 1,132 | 1.041 (0.965 - 1.123) |
| Sleep duration | <6hrs | 1,788 | 1.027 (0.968 - 1.09) | 951 | 0.994 (0.912 - 1.083) | 760 | 1.01 (0.94 - 1.085) | 515 | 1.076 (0.961 - 1.205) |
|  | ≥6hrs | 4,979 | 1.021 (0.98 - 1.063) | 2,904 | 0.997 (0.943 - 1.054) | 2,493 | 1.046 (1.00 - 1.094) | 1,386 | 1.029 (0.95 - 1.114) |
| Comorbidity | No | 2,154 | 1.023 (0.971 - 1.078) | 1,397 | 1.003 (0.938 - 1.074) | 1,226 | 1.026 (0.969 - 1.086) | 359 | 0.968 (0.845 - 1.109) |
|  | Yes | 4,741 | 1.024 (0.981 - 1.07) | 2,513 | 0.984 (0.923 - 1.048) | 2,062 | 1.043 (0.99 - 1.098) | 1,579 | 1.063 (0.987 - 1.145) |
|  |  |  |  |   |  |   |  |   |  |   |
| Rail Lnight | Age | <60 years old | 817 | 1.108 (1.039 - 1.182) | 338 | 1.028 (0.929 - 1.139) | 630 | 0.989 (0.919 - 1.064) | 169 | 1.131 (0.962 - 1.33) |
|  | ≥60 years old | 6,078 | 0.989 (0.939 - 1.042) | 3,572 | 0.978 (0.914 - 1.047) | 2,658 | 1.078 (1.016 - 1.145) | 1,769 | 1.038 (0.949 - 1.135) |
| Sex | Female | 3,243 | 0.98 (0.915 - 1.05) | 2,038 | 0.997 (0.913 - 1.089) | 1,235 | 0.991 (0.91 - 1.08) | 806 | 1.052 (0.905 - 1.224) |
|  | Male | 3,652 | 1.058 (1.006 - 1.113) | 1,872 | 0.98 (0.909 - 1.055) | 2,035 | 1.059 (1.002 - 1.12) | 1,132 | 1.052 (0.96 - 1.154) |
|  | Sleep duration | <6hrs | 1,788 | 1.034 (0.962 - 1.111) | 951 | 0.996 (0.898 - 1.105) | 760 | 1.00 (0.916 - 1.091) | 515 | 1.103 (0.964 - 1.262) |
|  | ≥6hrs | 4,979 | 1.025 (0.975 - 1.076) | 2,904 | 0.992 (0.926 - 1.061) | 2,493 | 1.051 (0.995 - 1.111) | 1,386 | 1.036 (0.94 - 1.141) |
| Comorbidity | No | 2,154 | 1.03 (0.966 - 1.097) | 1,397 | 1.01 (0.93 - 1.097) | 1,226 | 1.021 (0.952 - 1.094) | 359 | 0.966 (0.817 - 1.142) |
|  | Yes | 4,741 | 1.029 (0.976 - 1.084) | 2,513 | 0.97 (0.897 - 1.05) | 2,062 | 1.048 (0.985 - 1.116) | 1,579 | 1.08 (0.987 - 1.18) |

**Supplementary table 6**: Sensitivity analyses of the association between transport noise and incident dementia in UK Biobank by excluding a history of stroke at baseline, adjusting for sleep duration, and hearing impairment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sensitivityanalyses | Noise exposure (2011) | All cause dementia | Alzheimer’s disease | Parkinson’s disease | Vascular dementia |
| No. of cases | Fully adjusted model | No. of cases | Fully adjusted model | No. of cases | Fully adjusted model | No. of cases | Fully adjusted model |
| HR  | HR  | HR  | HR  |
| (95% CI) | (95% CI) | (95% CI) | (95% CI) |
|  | **Road noise** |  |  |  |  |  |  |  |  |
| Excl. history of stroke at baseline | Road Lden,24hrs | per 10dB | 7,135 | 1.053(0.962 - 1.153) | 3,710 | 1.149(1.019 - 1.295) | 3,461 | 0.994(0.893 - 1.107) | 1,394 | 1.066(0.881 - 1.291) |
| Road Lnight | per 10dB | 7,135 | 1.053(0.96 - 1.155) | 3,710 | 1.150(1.018 - 1.299) | 3,461 | 0.995(0.892 - 1.11) | 1,394 | 1.067(0.878 - 1.296) |
|  |  |  |  |  |  |  |  |  |  |
| **Rail noise** |  |  |  |  |  |  |  |  |  |
| Rail Lden, 24hrs | per 10dB | 6,419 | 1.022(0.987 - 1.057) | 3,257 | 0.996(0.951 - 1.044) | 3,185 | 1.042(1.003 - 1.083) | 1,660 | 1.036(0.966 - 1.111) |
| Rail Lnight  | per 10dB | 6,419 | 1.026(0.984 - 1.070) | 3,257 | 0.994(0.938 - 1.052) | 3,185 | 1.044(0.996 - 1.093) | 1,660 | 1.045(0.961 - 1.138) |
|  |  |  |  |  |  |  |  |  |  |
| Adjusted for sleep duration | **Road noise** |  |  |  |  |  |  |  |  |  |
| Road Lden,24hrs | per 10dB | 7,501 | 1.041(0.952 - 1.137) | 3,710 | 1.150(1.021 - 1.294) | 3,461 | 0.997(0.896 - 1.108) | 2,188 | 1.037(0.865 - 1.242) |
| Road Lnight | per 10dB | 7,501 | 1.04(0.95 - 1.139) | 3,710 | 1.151(1.02 - 1.299) | 3,461 | 0.998(0.895 - 1.112) | 2,188 | 1.036(0.861 - 1.246) |
|  |  |  |  |  |  |  |  |  |  |
| **Rail noise** |  |  |  |  |  |  |  |  |  |
| Rail Lden, 24hrs | per 10dB | 6,767 | 1.023(0.989 - 1.058) | 3,257 | 0.993(0.948 - 1.04) | 3,253 | 1.035(0.996 - 1.076) | 1,901 | 1.043(0.977 - 1.113) |
| Rail Lnight  | per 10dB | 6,767 | 1.028(0.987 - 1.070) | 3,257 | 0.989(0.935 - 1.047) | 3,253 | 1.036(0.989 - 1.085) | 1,901 | 1.055(0.976 - 1.142) |
|  |  |  |  |  |  |  |  |  |  |
| Adjusted for hearing difficulty | **Road noise** |  |  |  |  |  |  |  |  |  |
| Road Lden,24hrs | per 10dB | 7,147 | 1.044(0.953 - 1.143) | 3,710 | 1.161(1.029 - 1.309) | 3,412 | 1.00(0.897 - 1.113) | 2,086 | 1.030(0.857 - 1.237) |
| Road Lnight | per 10dB | 7,147 | 1.043(0.951 - 1.144) | 3,710 | 1.162(1.028 - 1.313) | 3,412 | 1.001(0.896 - 1.117) | 2,086 | 1.029(0.853 - 1.242) |
|  |  |  |  |  |  |  |  |  |  |
| **Rail noise** |  |  |  |  |  |  |  |  |  |
| Rail Lden, 24hrs | per 10dB | 6,422 | 1.026(0.992 - 1.062) | 3,257 | 0.993(0.947 - 1.041) | 3,084 | 1.039(1.000 - 1.080) | 1,796 | 1.046(0.98 - 1.118) |
| Rail Lnight  | per 10dB | 6,422 | 1.032(0.99 - 1.075) | 3,257 | 0.988(0.932 - 1.047) | 3,084 | 1.041(0.993 - 1.091) | 1,796 | 1.059(0.978 - 1.147) |
|  |  |  |  |  |  |  |  |  |  |
| Restricted to non-movers | **Road noise** |  |  |  |  |  |  |  |  |  |
| Road Lden,24hrs | per 10dB | 5,390 | 1.050(0.943 - 1.168) | 3,169 | 1.201(1.046 - 1.379) | 2,695 | 0.953(0.837 - 1.083) | 1,593 | 1.037(0.83 - 1.295) |
| Road Lnight | per 10dB | 5,390 | 1.048(0.94 - 1.169) | 3,169 | 1.202(1.045 - 1.384) | 2,695 | 0.953(0.836 - 1.087) | 1,593 | 1.035(0.824 - 1.299) |
|  |  |  |  |  |  |  |  |  |  |
| **Rail noise** |  |  |  |  |  |  |  |  |  |
| Rail Lden, 24hrs | per 10dB | 4,842 | 1.011(0.971 - 1.052) | 2,779 | 0.973(0.921 - 1.029) | 2,432 | 1.056(1.01 - 1.104) | 1,364 | 1.007(0.93 - 1.091) |
| Rail Lnight  | per 10dB | 4,842 | 1.014(0.965 - 1.065) | 2,779 | 0.963(0.899 - 1.031) | 2,432 | 1.060(1.004 - 1.118) | 1,364 | 1.015(0.921 - 1.118) |
|  |  |  |  |  |  |  |  |  |  |

**Supplementary Table 7:** Interaction between cardiovascular health, air pollution and greenness with road and railway traffic noise and all-cause dementia in UK Biobank

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Road Lden | Road Lnight | Rail Lden | Rail Lnight |
|  | HR (95% CI) | HR (95% CI) | HR (95% CI) | HR (95% CI) |
| Cardiovascular risk score |  |  |  |
| Ideal  | Ref | Ref | Ref | Ref |
| Intermediate | 0.93 (0.631 - 1.37) | 0.935 (0.629 - 1.39) | 1.029 (0.885 - 1.197) | 1.032 (0.858 - 1.241) |
| Poor | 0.932 (0.628 - 1.384) | 0.943 (0.629 - 1.412) | 1.045 (0.896 - 1.218) | 1.05 (0.871 - 1.268) |
| PM2.5 |  |  |  |  |
| <9.9 | Ref | Ref | Ref | Ref |
| 9.9 - 10.6 | 1.153 (0.929 - 1.43) | 1.157 (0.928 - 1.442) | 1.018 (0.942 - 1.1) | 1.017 (0.926 - 1.118) |
| <10.6 | 1.059 (0.858 - 1.307) | 1.06 (0.855 - 1.314) | 0.995 (0.918 - 1.078) | 0.989 (0.898 - 1.09) |
| NO2 |  |  |  |  |
| <26.0 | Ref | Ref | Ref | Ref |
| 26.0 - 31.1 | 1.04 (0.817 - 1.325) | 1.045 (0.816 - 1.338) | 1.009 (0.928 - 1.096) | 1.001 (0.905 - 1.107) |
| >31.1 | 1.054 (0.863 - 1.287) | 1.056 (0.86 - 1.295) | 0.989 (0.914 - 1.069) | 0.98 (0.892 - 1.077) |
| Proximity to greenness |  |  |  |
| >20% | Ref | Ref | Ref | Ref |
| <20% | 1.085 (0.909 - 1.295) | 1.084 (0.905 - 1.298) | 1.001 (0.934 - 1.074) | 1.005 (0.923 - 1.093) |

**Supplementary table 8:** Association between road traffic noise (2009) and incident dementia and its subtypes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|   |   |   | Unadjusted | Model 1 a | Main model b |
| Outcome | **Exposure** | **Δ unit** | **Cases (n)** | **HR****95% CI** | **HR****95% CI** | **HR****95% CI** |
| All cause dementia | **Road noise**  |
| Daytime  | per 10 dB | 7,568 | 0.942 (0.893 - 0.995) | 0.94 (0.828 - 1.067) | 1.009 (0.874 - 1.164) |
| Lnight | per 10 dB | 7,568 | 0.942 (0.893 - 0.995) | 0.94 (0.828 - 1.067) | 1.009 (0.874 - 1.164) |
| Alzheimer’s disease | **Road noise** |
| Daytime | per 10 dB | 3,710 | 0.923 (0.86 - 0.992) | 0.933 (0.786 - 1.107) | 0.955 (0.783 - 1.165) |
| Lnight | per 10 dB | 3,710 | 0.923 (0.86 - 0.992) | 0.933 (0.786 - 1.107) | 0.955 (0.783 - 1.165) |
| Vascular dementia | **Road noise** |
| Daytime | per 10 dB | 2,235 | 0.999 (0.907 - 1.100) | 0.955 (0.749 - 1.216) | 1.076 (0.815 - 1.421) |
| Lnight | per 10 dB | 2,235 | 0.999 (0.907 - 1.100) | 0.955 (0.749 - 1.216) | 1.076 (0.815 - 1.421) |
| Parkinson’s disease | **Road noise** |
| Daytime  | per 10 dB | 3,461 | 0.933 (0.863 - 1.010) | 1.044 (0.907 - 1.202) | 1.142 (0.973 - 1.341) |
| Lnight  | per 10 dB | 3,461 | 0.933 (0.863 - 1.010) | 1.044 (0.907 - 1.202) | 1.142 (0.973 - 1.341) |