# Supplementary material

**Table S1**. PSS4 questions used in TAPAS Travel Survey

|  |  |  |
| --- | --- | --- |
| ***Q218.*** | **In the last month, how often have you felt that you were unable to control important things in your life?** | |
|  | **0** | *Never* |
|  | **1** | *Almost never* |
|  | **2** | *Nearly always* |
|  | **3** | *Always* |
|  | **997** | Don't Know |
|  | **998** | Refuse to Answer |
|  |  |  |
| ***Q219.*** | **In the last month, how often have you felt confident about your ability to handle your personal problems?** | |
|  | **0** | *Never* |
|  | **1** | *Almost never* |
|  | **2** | *Nearly always* |
|  | **3** | *Always* |
|  | **997** | Don't Know |
|  | **998** | Refuse to Answer |
|  |  |  |
| ***Q220.*** | **In the last month, how often have you felt that things were going your way?** | |
|  | **0** | *Never* |
|  | **1** | *Almost never* |
|  | **2** | *Nearly always* |
|  | **3** | *Always* |
|  | **997** | Don't Know |
|  | **998** | Refuse to Answer |
|  |  |  |
| ***Q221.*** | **In the last month, how often have you felt that difficulties were piling up so high that you could not overcome them?** | |
|  | **0** | *Never* |
|  | **1** | *Almost never* |
|  | **2** | *Nearly always* |
|  | **3** | *Always* |
|  | **997** | Don't Know |
|  | **998** | Refuse to Answer |

**Table S2**. PSS4 score distribution in TAPAS Travel Survey sample

|  |  |  |  |
| --- | --- | --- | --- |
| PSS-4 score | n | % | Cumulative % |
| 0 | 90 | 11.61 | 11.61 |
| 1 | 125 | 16.13 | 27.74 |
| 2 | 129 | 16.65 | 44.39 |
| 3 | 151 | 19.48 | 63.87 |
| 4 | 144 | 18.58 | 82.45 |
| 5 | 38 | 4.90 | 87.35 |
| 6 | 33 | 4.26 | 91.61 |
| 7 | 12 | 1.55 | 93.16 |
| 8 | 28 | 3.61 | 96.77 |
| 9 | 5 | 0.65 | 97.42 |
| 10 | 11 | 1.42 | 98.84 |
| 11 | 3 | 0.39 | 99.23 |
| 12 | 4 | 0.52 | 99.74 |
| 13 | 1 | 0.13 | 99.87 |
| 14 | 1 | 0.13 | 100.00 |
| Total | 775 | 100.00 |  |

**Table S3**. Descriptive analyses of participant perceived stress and its determinants according to bicycle commuting levels and bicycle commuting propensity.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Variables** | **Bicycle commuting levels** | | | | | | | | | |  | **Bicycle commuting propensity** | | | | | | | | | | | | |
| **Low**  **(109)** | |  | **Medium**  **(65)** | |  | **High**  **(224)** | |  | **p-valuea** |  | **Unwilling**  **(230)** | |  | **Willing**  **(160)** | |  | **Infrequent (109)** | |  | **Frequent**  **(289)** | |  | **p-valuea** |
| **n** | **%** |  | **n** | **%** |  | **n** | **%** |  |  | **n** | **%** |  | **n** | **%** |  | **n** | **%** |  | **n** | **%** |  |
| **Outcome** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Stressed (median)(Yes) | 49 | 45.37 |  | 12 | 19.05 |  | 57 | 26.15 |  | <0.001 |  | 107 | 46.93 |  | 55 | 34.81 |  | 49 | 45.37 |  | 69 | 24.56 |  | <0.001 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Individual determinants** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Age (median; P25-P75) | 36 | 28-42 |  | 36 | 28-45 |  | 35 | 29-41 |  | 0.777 |  | 37 | 30-46 |  | 36 | 29.5-45 |  | 36 | 28-42 |  | 35 | 29-41 |  | 0.111 |
| Total PA – min/week (median; P25-P75) | 494.99 | 299.99-734.99 |  | 454.99 | 359.99-689.99 |  | 484.99 | 339.99-779.99 |  | 0.567 |  | 364.99 | 209.99-600.00 |  | 404.99 | 209.99-629.99 |  | 494.99 | 299.99-734.99 |  | 480.00 | 339.99-744.99 |  | <0.001 |
| MVPA – min/week (median; P25-P75) | 240.00 | 134.99-480.00 |  | 294.99 | 189.99-390.00 |  | 300.00 | 177.49-479.99 |  | 0.092 |  | 90.00 | 0-244.99 |  | 90.00 | 0-240.00 |  | 240.00 | 134.99-480.00 |  | 300.00 | 179.99-450.00 |  | <0.001 |
| VPA – min/week (median; P25-P75) | 120.00 | 0-224.99 |  | 90.00 | 0-199.99 |  | 102.50 | 0-240.00 |  | 0.386 |  | 45.00 | 0-150.00 |  | 0 | 0-127.50 |  | 120.00 | 0-224.99 |  | 90.00 | 225.00 |  | <0.001 |
| Gender (Woman) | 49 | 44.95 |  | 33 | 50.77 |  | 94 | 41.96 |  | 0.446 |  | 151 | 65.65 |  | 83 | 51.88 |  | 49 | 44.95 |  | 127 | 43.94 |  | <0.001 |
| Country of birth (non-Spanish) | 19 | 17.59 |  | 7 | 10.77 |  | 30 | 13.39 |  | 0.412 |  | 16 | 6.96 |  | 25 | 15.63 |  | 19 | 17.59 |  | 37 | 12.80 |  | 0.014 |
| Working status (Student) | 17 | 15.60 |  | 10 | 15.38 |  | 24 | 10.71 |  | 0.364 |  | 24 | 10.43 |  | 29 | 18.13 |  | 17 | 15.60 |  | 34 | 11.76 |  | 0.112 |
| Education level (University studies completed or equivalent-level education) | 81 | 74.31 |  | 50 | 76.92 |  | 173 | 77.23 |  | 0.836 |  | 161 | 70.00 |  | 86 | 53.75 |  | 81 | 74.31 |  | 223 | 77.16 |  | <0.001 |
| Living with family/partner | 88 | 80.73 |  | 48 | 75.00 |  | 172 | 76.79 |  | 0.622 |  | 192 | 83.48 |  | 135 | 84.38 |  | 88 | 80.73 |  | 220 | 76.39 |  | 0.114 |
| Employed people in household (2-5) | 69 | 63.30 |  | 35 | 55.56 |  | 145 | 64.73 |  | 0.410 |  | 152 | 66.09 |  | 109 | 68.99 |  | 69 | 63.30 |  | 180 | 62.72 |  | 0.568 |
| MEDEA index |  |  |  |  |  |  |  |  |  | 0.627 |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.660 |
| 1st tertile (least deprived) | 35 | 32.11 |  | 23 | 35.38 |  | 75 | 33.48 |  |  |  | 81 | 35.22 |  | 49 | 30.63 |  | 35 | 32.11 |  | 98 | 33.91 |  |  |
| 2nd tertile | 38 | 34.86 |  | 27 | 41.54 |  | 76 | 33.93 |  |  |  | 66 | 28.70 |  | 56 | 35.00 |  | 38 | 34.86 |  | 103 | 35.64 |  |  |
| 3rd tertile (most deprived) | 36 | 33.03 |  | 15 | 23.08 |  | 73 | 32.59 |  |  |  | 83 | 36.09 |  | 55 | 34.38 |  | 36 | 33.03 |  | 88 | 30.45 |  |  |
| Children in household (Yes) | 31 | 28.44 |  | 18 | 28.13 |  | 79 | 35.27 |  | 0.340 |  | 94 | 40.87 |  | 57 | 35.85 |  | 31 | 28.44 |  | 97 | 33.68 |  | 0.128 |
| Children <3 years in household (Yes) | 3 | 2.75 |  | 5 | 7.94 |  | 20 | 8.93 |  | 0.114 |  | 20 | 8.73 |  | 16 | 10.00 |  | 3 | 2.75 |  | 25 | 8.71 |  | 0.158 |
| Self-perceived health (Very good/Excellent) | 43 | 39.45 |  | 27 | 41.54 |  | 113 | 50.45 |  | 0.123 |  | 90 | 39.13 |  | 50 | 31.25 |  | 43 | 39.45 |  | 140 | 48.44 |  | 0.004 |
| BMI (Overweight/Obese) | 25 | 22.94 |  | 14 | 21.54 |  | 49 | 21.88 |  | 0.969 |  | 73 | 31.88 |  | 51 | 32.08 |  | 25 | 22.94 |  | 63 | 21.8 |  | 0.021 |
| Chronic disease (Yes) | 11 | 10.09 |  | 8 | 12.31 |  | 17 | 7.59 |  | 0.458 |  | 18 | 7.83 |  | 7 | 4.38 |  | 11 | 10.09 |  | 25 | 8.65 |  | 0.293 |
| Stress releasing (Agreement) | 95 | 87.16 |  | 62 | 98.41 |  | 199 | 90.05 |  | 0.047 |  | 163 | 72.44 |  | 139 | 89.68 |  | 95 | 87.16 |  | 261 | 91.90 |  | <0.001 |
| Bicycle trip enjoyment (Agreement) | 103 | 94.50 |  | 65 | 100.00 |  | 212 | 95.93 |  | 0.175 |  | 116 | 51.79 |  | 133 | 84.71 |  | 103 | 94.50 |  | 277 | 96.85 |  | <0.001 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Environmental determinants** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Commute distance, estimated (km) (mean;SD) | 3.73 | 1.97 |  | 3.43 | 1.70 |  | 3.13 | 1.52 |  | 0.044 |  | 4.42 | 2.35 |  | 4.32 | 2.11 |  | 3.73 | 1.97 |  | 3.20 | 1.56 |  | <0.001 |
| Public bicycle stations (mean;SD) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Home, count in 400m buffer | 4.61 | 2.61 |  | 4.97 | 2.63 |  | 4.75 | 2.35 |  | 0.492 |  | 3.77 | 2.53 |  | 3.72 | 2.49 |  | 4.61 | 2.61 |  | 4.80 | 2.41 |  | <0.001 |
| Work/study, count in 400m buffer | 4.89 | 2.96 |  | 5.89 | 3.11 |  | 5.39 | 3.05 |  | 0.124 |  | 4.36 | 2.96 |  | 4.71 | 3.35 |  | 4.89 | 2.96 |  | 5.50 | 3.06 |  | <0.001 |
| Greenness, NDVI (mean;SD) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Home, average in 400m buffer | 0.83 | 1.30 |  | 0.75 | 0.98 |  | 0.59 | 0.94 |  | 0.635 |  | 0.90 | 1.03 |  | 0.91 | 1.16 |  | 0.83 | 1.30 |  | 0.62 | 0.95 |  | 0.002 |
| Work/study, average in 400m buffer | 0.60 | 0.82 |  | 0.37 | 0.57 |  | 0.58 | 0.90 |  | 0.136 |  | 0.68 | 1.11 |  | 0.74 | 1.01 |  | 0.60 | 0.82 |  | 0.53 | 0.84 |  | 0.328 |
| Commute route, average in RBA | 0.95 | 0.94 |  | 0.76 | 0.83 |  | 0.87 | 0.81 |  | 0.322 |  | 1.10 | 1.11 |  | 1.02 | 0.98 |  | 0.95 | 0.94 |  | 0.84 | 0.81 |  | 0.236 |
| NO2, (μg m−3) (mean;SD) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Home, concentration in 400m buffer | 74.76 | 18.70 |  | 77.24 | 16.14 |  | 78.40 | 17.90 |  | 0.186 |  | 75.59 | 17.08 |  | 74.51 | 17.20 |  | 74.76 | 18.70 |  | 78.14 | 17.49 |  | 0.063 |
| Work/study, concentration in 400m buffer | 76.49 | 21.63 |  | 83.02 | 18.82 |  | 77.81 | 21.37 |  | 0.091 |  | 78.50 | 23.84 |  | 78.64 | 24.11 |  | 76.49 | 21.63 |  | 79.00 | 20.90 |  | 0.727 |
| Commute route, concentration in RBA | 82.86 | 16.10 |  | 87.47 | 15.22 |  | 84.51 | 18.08 |  | 0.127 |  | 85.22 | 17.34 |  | 82.76 | 15.95 |  | 82.86 | 16.10 |  | 85.19 | 17.48 |  | 0.296 |
| Noise, >55dB (mean;SD) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Home, proportion in 400m buffer | 78.73 | 13.39 |  | 77.65 | 9.77 |  | 78.63 | 11.54 |  | 0.554 |  | 79.03 | 11.00 |  | 78.39 | 11.01 |  | 78.73 | 13.39 |  | 78.41 | 11.16 |  | 0.847 |
| Work/study, proportion in 400m buffer | 81.64 | 13.60 |  | 80.04 | 13.80 |  | 79.32 | 15.04 |  | 0.468 |  | 78.46 | 15.47 |  | 80.00 | 13.94 |  | 81.64 | 13.60 |  | 79.48 | 14.75 |  | 0.434 |
| Commute route, proportion in RBA | 78.62 | 9.13 |  | 75.40 | 9.26 |  | 77.21 | 9.64 |  | 0.057 |  | 77.12 | 8.43 |  | 78.08 | 8.78 |  | 78.62 | 9.13 |  | 76.80 | 9.57 |  | 0.160 |
| Bikeability (mean;SD) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Home, weighted average in 400m buffer | 6.29 | 1.44 |  | 6.49 | 1.23 |  | 6.54 | 1.27 |  | 0.330 |  | 5.88 | 1.45 |  | 6.00 | 1.45 |  | 6.29 | 1.44 |  | 6.53 | 1.26 |  | <0.001 |
| Work/study, weighted average in 400m buffer | 6.82 | 1.28 |  | 6.88 | 0.98 |  | 6.75 | 1.17 |  | 0.638 |  | 6.21 | 1.58 |  | 6.46 | 1.47 |  | 6.82 | 1.28 |  | 6.78 | 1.13 |  | <0.001 |
| Commute route, weighted average in RBA | 6.77 | 1.10 |  | 7.02 | 0.93 |  | 6.99 | 0.93 |  | 0.236 |  | 6.36 | 1.22 |  | 6.58 | 1.16 |  | 6.77 | 1.10 |  | 7.00 | 0.93 |  | <0.001 |

PA, Physical Activity; MVPA, Moderate-to-Vigorous Physical Activity; VPA, Vigorous Physical Activity; MEDEA, Mortalidad en áreas pequeñas Españolas y Desigualdades socioEconómicas y Ambientales, in Spanish (Environmental and socioEconomic Inequalities in Mortality in small Spanish areas, translated to English); BMI, Body Mass Index; NDVI, Normalized Difference Vegetation Index; RBA, Route-By-Area. Data are n and %, unless otherwise noted. There are missing data in: Perceived stress (13; 1.65%), Total PA (5; 0.63%), Country of birth (1; 0.13%), Living with family/partner (1; 0.13%), Employed people in household (4; 0.51), Children in household (2; 0.25%), Children <3years old in household (3; 0.38), BMI (2; 0.25%); Stress releasing (15; 1.90%), Bicycle trip enjoyment (12; 1.52%), Commute distance (20; 2.54%), Greenness (20; 2.54%), NO2 (20; 2.54%). aChi square test, except for Age, Total PA, MVPA, VPA, and all the Environmental determinants (U Mann Whitney test).

**Table S4**. Sensitivity bivariate analyses of the relationship between participant determinants and perceived stress (P75, P90).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Variable** | **Perceived stress (P75)** | | |  | **Perceived stress (P90)** | | |
| **RR (95% CI)** | | **p-value** |  | **RR (95% CI)** | | **p-value** |
|  |  |  |  |  |  |  |  |
| **Individual determinants** |  |  |  |  |  |  |  |
| Age | 1.00 | (0.99, 1.02) | 0.793 |  | 1.00 | (0.97, 1.02) | 0.662 |
| Total PA - min/week | 1.00 | (0.99, 1.00) | 0.113 |  | 1.00 | (0.99, 1.00) | 0.802 |
| MVPA - min/week | 1.00 | (0.99, 1.00) | 0.197 |  | 1.00 | (0.99, 1.00) | 0.701 |
| VPA - min/week | 1.00 | (0.99, 1.00) | 0.382 |  | 1.00 | (0.99, 1.00) | 0.743 |
| Gender (Woman) | 1.41 | (1.03, 1.93) | 0.032 |  | 1.69 | (1.04, 2.76) | 0.035 |
| Country of birth (non-Spanish) | 1.16 | (0.75, 1.78) | 0.515 |  | 1.14 | (0.58, 2.24) | 0.695 |
| Working status (Student) | 1.46 | (0.99, 2.14) | 0.051 |  | 1.04 | (0.53, 2.04) | 0.904 |
| Education level (University studies completed or equivalent-level education) | 0.78 | (0.57, 1.07) | 0.119 |  | 0.80 | (0.49, 1.30) | 0.369 |
| Living with family/partner | 1.00 | (0.68, 1.47) | 0.987 |  | 0.94 | (0.53, 1.68) | 0.841 |
| Employed people in household (2-5) | 0.67 | (0.50, 0.91) | 0.011 |  | 0.75 | (0.47, 1.20) | 0.231 |
| MEDEA index |  |  |  |  |  |  |  |
| 1st tertile (least deprived) | 1.00 |  |  |  | 1.00 |  |  |
| 2nd tertile | 1.42 | (0.96, 2.11) | 0.081 |  | 1.85 | (0.99, 3.46) | 0.054 |
| 3rd tertile (most deprived) | 1.45 | (0.97, 2.14) | 0.067 |  | 1.77 | (0.94, 3.33) | 0.076 |
| Children in household (Yes) | 1.05 | (0.76, 1.44) | 0.778 |  | 0.92 | (0.56, 1.51) | 0.743 |
| Children <3 years in household (Yes) | 0.61 | (0.30, 1.25) | 0.180 |  | 0.54 | (0.17, 1.68) | 0.289 |
| Self-perceived health (Very good/Excellent) | 0.65 | (0.47, 0.91) | 0.011 |  | 0.88 | (0.55, 1.42) | 0.604 |
| BMI (Overweight/Obese) | 1.08 | (0.77, 1.51) | 0.664 |  | 1.03 | (0.61, 1.73) | 0.922 |
| Chronic disease (Yes) | 1.58 | (1.01, 2.48) | 0.047 |  | 1.66 | (0.83, 3.32) | 0.150 |
| Stress releasing (Agreement) | 0.85 | (0.57, 1.27) | 0.423 |  | 0.94 | (0.49, 1.79) | 0.850 |
| Bicycle trip enjoyment (Agreement) | 0.74 | (0.52, 1.04) | 0.085 |  | 0.79 | (0.46, 1.37) | 0.409 |
|  |  |  |  |  |  |  |  |
| **Environmental determinants** |  |  |  |  |  |  |  |
| Commute distance, estimated (km) | 1.07 | (0.99, 1.14) | 0.053 |  | 1.03 | (0.92, 1.15) | 0.620 |
| Public bicycle stations |  |  |  |  |  |  |  |
| Home, count in 400m buffer | 0.99 | (0.93, 1.06) | 0.770 |  | 0.94 | (0.84, 1.04) | 0.253 |
| Work/study, count in 400m buffer | 0.96 | (0.91, 1.01) | 0.103 |  | 0.96 | (0.89, 1.03) | 0.242 |
| Greenness, NDVI |  |  |  |  |  |  |  |
| Home, average in 400m buffer | 0.95 | (0.79, 1.14) | 0.557 |  | 1.04 | (0.81, 1.33) | 0.768 |
| Work/study, average in 400m buffer | 1.09 | (0.94, 1.27) | 0.262 |  | 0.99 | (0.74, 1.32) | 0.936 |
| Commute route, average in RBA | 1.04 | (0.88, 1.22) | 0.655 |  | 1.18 | (0.95, 1.47) | 0.138 |
| NO2 (μg m−3) |  |  |  |  |  |  |  |
| Home, concentration in 400m buffer | 1.00 | (0.99, 1.00) | 0.390 |  | 1.00 | (0.98, 1.01) | 0.728 |
| Work/study, concentration in 400m buffer | 0.99 | (0.99, 1.00) | 0.042 |  | 0.99 | (0.98, 1.00) | 0.076 |
| Commute route, concentration in RBA | 1.00 | (0.99, 1.01) | 0.474 |  | 0.99 | (0.97, 1.00) | 0.138 |
| Noise, >55dB |  |  |  |  |  |  |  |
| Home, proportion in 400m buffer | 1.01 | (0.99, 1.02) | 0.483 |  | 1.00 | (0.98, 1.03) | 0.845 |
| Work/study, proportion in 400m buffer | 1.00 | (0.99, 1.01) | 0.549 |  | 1.00 | (0.98, 1.02) | 0.835 |
| Commute route, proportion in RBA | 1.00 | (0.98, 1.01) | 0.854 |  | 1.01 | (0.98, 1.04) | 0.444 |
| Bikeability |  |  |  |  |  |  |  |
| Home, weighted average in 400m buffer | 0.97 | (0.87, 1.08) | 0.532 |  | 0.92 | (0.78, 1.09) | 0.356 |
| Work/study, weighted average in 400m buffer | 0.92 | (0.82, 1.02) | 0.108 |  | 0.89 | (0.75, 1.07) | 0.216 |
| Commute route, weighted average in RBA | 0.88 | (0.77, 1.00) | 0.055 |  | 0.81 | (0.66, 0.99) | 0.042 |

RR, Relative Risk; PA, Physical Activity; MVPA, Moderate-to-Vigorous Physical Activity; VPA, Vigorous Physical Activity; MEDEA, Mortalidad en áreas pequeñas Españolas y Desigualdades socioEconómicas y Ambientales, in Spanish (Environmental and socioEconomic Inequalities in Mortality in small Spanish areas, translated to English); BMI, Body Mass Index; NDVI, Normalized Difference Vegetation Index; RBA, Route-By-Area. Complete case analysis excluding missing data of the variables of final models (Table S5; n=771). The variables that still present missing data and are not included in the final models are: Total PA (5; 0.63%), Living with family/partner (1; 0.13%), Children in household (2; 0.25%), Children <3years old in household (3; 0.38), BMI (2; 0.25%); Stress releasing (15; 1.90%), Bicycle trip enjoyment (12; 1.52%), Commute distance (20; 2.54%), Greenness (20; 2.54%), NO2 (20; 2.54%).

**Table S5**. Sensitivity analyses with multivariate models assessing the relationship between bicycle commuting and participant perceived stress (P75, P90).

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Variable** | **Perceived stress (P75)** | | | | | | | | | | | |  | **Perceived stress (P90)** | | | | | | | | | | | |
| **Model 1a**  **RR (95% CI)** | | **p-value** | **Model 2b**  **RR (95% CI)** | | **p-value** | **Model 3c**  **RR (95% CI)** | | **p-value** | **Model 4d**  **RR (95% CI)** | | **p-value** |  | **Model 1a**  **RR (95% CI)** | | **p-value** | **Model 2b**  **RR (95% CI)** | | **p-value** | **Model 3c**  **RR (95% CI)** | | **p-value** | **Model 4d**  **RR (95% CI)** | | **p-value** |
| **All sample (771)** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Bicycle commuting status |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Non-bicycle commuters | 1.00 |  |  | 1.00 |  |  | 1.00 |  |  | 1.00 |  |  |  | 1.00 |  |  | 1.00 |  |  | 1.00 |  |  | 1.00 |  |  |
| Bicycle commuters | 0.58 | (0.42, 0.79) | 0.001 | 0.58 | (0.42, 0.79) | 0.001 | 0.61 | (0.44, 0.85) | 0.004 | 0.64 | (0.46, 0.90) | 0.011 |  | 0.54 | (0.33, 0.89) | 0.014 | 0.56 | (0.34, 0.93) | 0.025 | 0.52 | (0.31, 0.88) | 0.014 | 0.56 | (0.33, 0.95) | 0.032 |
| Bicycle commuting levels |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Non-bicycle commuters | 1.00 |  |  | 1.00 |  |  | 1.00 |  |  | 1.00 |  |  |  | 1.00 |  |  | 1.00 |  |  | 1.00 |  |  | 1.00 |  |  |
| Low-level bicycle commuters | 1.04 | (0.71, 1.54) | 0.832 | 1.03 | (0.70, 1.53) | 0.868 | 1.08 | (0.73, 1.59) | 0.708 | 1.10 | (0.74, 1.64) | 0.626 |  | 1.20 | (0.68, 2.11) | 0.535 | 1.22 | (0.68, 2.21) | 0.505 | 1.14 | (0.63, 2.07) | 0.662 | 1.18 | (0.65, 2.14) | 0.589 |
| Medium-level bicycle commuters | 0.22 | (0.07, 0.66) | 0.007 | 0.20 | (0.07, 0.62) | 0.005 | 0.21 | (0.07, 0.65) | 0.007 | 0.22 | (0.07, 0.68) | 0.009 |  | 0.15 | (0.02, 1.05) | 0.056 | 0.14 | (0.02, 1.00) | 0.050 | 0.14 | (0.02, 0.95) | 0.044 | 0.15 | (0.02, 1.04) | 0.054 |
| High-level bicycle commuters | 0.45 | (0.29, 0.70) | <0.001 | 0.46 | (0.30, 0.72) | 0.001 | 0.50 | (0.32, 0.78) | 0.003 | 0.52 | (0.33, 0.82) | 0.005 |  | 0.34 | (0.16, 0.70) | 0.004 | 0.36 | (0.17, 0.75) | 0.006 | 0.33 | (0.15, 0.69) | 0.004 | 0.35 | (0.17, 0.73) | 0.005 |
| Bicycle commuting propensity |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Unwilling non-bicycle commuters | 1.00 |  |  | 1.00 |  |  | 1.00 |  |  | 1.00 |  |  |  | 1.00 |  |  | 1.00 |  |  | 1.00 |  |  | 1.00 |  |  |
| Willing non-bicycle commuters | 0.71 | (0.47, 1.06) | 0.090 | 0.74 | (0.49, 1.10) | 0.135 | 0.71 | (0.48, 1.06) | 0.095 | 0.72 | (0.48, 1.08) | 0.116 |  | 0.66 | (0.35, 1.22) | 0.183 | 0.70 | (0.38, 1.30) | 0.255 | 0.70 | (0.37, 1.30) | 0.253 | 0.71 | (0.38, 1.35) | 0.298 |
| Infrequent bicycle commuters | 0.92 | (0.61, 1.38) | 0.684 | 0.92 | (0.61, 1.39) | 0.695 | 0.94 | (0.63, 1.43) | 0.788 | 0.97 | (0.64, 1.48) | 0.890 |  | 1.03 | (0.57, 1.87) | 0.926 | 1.07 | (0.57, 2.01) | 0.831 | 1.00 | (0.53, 1.88) | 0.991 | 1.04 | (0.54, 1.98) | 0.915 |
| Frequent bicycle commuters | 0.35 | (0.23, 0.54) | <0.001 | 0.36 | (0.23, 0.55) | <0.001 | 0.38 | (0.24, 0.59) | <0.001 | 0.40 | (0.25, 0.62) | <0.001 |  | 0.25 | (0.12, 0.52) | <0.001 | 0.27 | (0.13, 0.56) | <0.001 | 0.25 | (0.12, 0.52) | <0.001 | 0.27 | (0.13, 0.56) | <0.001 |
| **Bicycle commuters sample (387)** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Bicycle commuting levels |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Low-level bicycle commuters | 1.00 |  |  | 1.00 |  |  | 1.00 |  |  | 1.00 |  |  |  | 1.00 |  |  | 1.00 |  |  | 1.00 |  |  | 1.00 |  |  |
| Medium-level bicycle commuters | 0.21 | (0.06, 0.66) | 0.008 | 0.19 | (0.06, 0.61) | 0.005 | 0.19 | (0.06, 0.60) | 0.005 | 0.19 | (0.06, 0.60) | 0.004 |  | 0.12 | (0.02, 0.92) | 0.041 | 0.11 | (0.02, 0.83) | 0.032 | 0.11 | (0.02, 0.80) | 0.028 | 0.11 | (0.02, 0.76) | 0.026 |
| High-level bicycle commuters | 0.43 | (0.26, 0.73) | 0.002 | 0.44 | (0.26, 0.75) | 0.002 | 0.44 | (0.26, 0.75) | 0.002 | 0.44 | (0.26, 0.73) | 0.002 |  | 0.28 | (0.12, 0.65) | 0.003 | 0.28 | (0.12, 0.65) | 0.003 | 0.27 | (0.12, 0.64) | 0.003 | 0.27 | (0.12, 0.60) | 0.001 |
| Bicycle commuting propensity |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Infrequent bicycle commuters | 1.00 |  |  | 1.00 |  |  | 1.00 |  |  | 1.00 |  |  |  | 1.00 |  |  | 1.00 |  |  | 1.00 |  |  | 1.00 |  |  |
| Frequent bicycle commuters | 0.38 | (0.23, 0.64) | <0.001 | 0.38 | (0.23, 0.63) | <0.001 | 0.38 | (0.23, 0.63) | <0.001 | 0.38 | (0.23, 0.62) | <0.001 |  | 0.25 | (0.11, 0.55) | 0.001 | 0.24 | (0.11, 0.55) | 0.001 | 0.24 | (0.10, 0.54) | 0.001 | 0.23 | (0.11, 0.51) | <0.001 |
| **Non-bicycle commuters sample (384)** | | | | | | | | | | | | | | | | | | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Bicycle commuting propensity |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Unwilling non-bicycle commuters | 1.00 |  |  | 1.00 |  |  | 1.00 |  |  | 1.00 |  |  |  | 1.00 |  |  | 1.00 |  |  | 1.00 |  |  | 1.00 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Willing non-bicycle commuters | 0.71 | (0.47, 1.06) | 0.090 | 0.72 | (0.48, 1.07) | 0.106 | 0.67 | (0.45, 1.00) | 0.051 | 0.69 | (0.46, 1.03) | 0.068 |  | 0.66 | (0.35, 1.22) | 0.183 | 0.68 | (0.36, 1.26) | 0.222 | 0.68 | (0.36, 1.26) | 0.221 | 0.71 | (0.37, 1.36) | 0.300 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

RR, Relative Risk. aUnadjusted. bAdjusted by Gender, Country of birth, Employed people in household, Chronic disease. cAdjusted by Age, Gender, Country of birth, Employed people in household, Chronic disease, Self-perceived health, Moderate-to-Vigorous Physical Activity (MVPA). dAdjusted by Age, Gender, Country of birth, Employed people in household, Chronic disease, Self-perceived health, MVPA, Public bicycle stations at work/study, Bikeability at work/study, Bikeability at commute route.