Supplementary Data

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Methods – Description of neighbourhood characteristics (environmental exposures)

A participant's neighbourhood was defined as an area within 1 km from their residential address following the street network (untrimmed street-network buffer of a 1 km radius), approximating the distance that an able-bodied adult can walk in 10-20 minutes (Adams et al., 2014), which is a frequently used neighbourhood definition (Cerin et al., 2013; Gunn et al., 2017). For the purpose of sensitivity analyses, we also used alternative definitions of neighbourhood – namely, 500 m and 1.6 km radii street-network buffers. ESRI's ArcGIS v.10.5 software (ESRI, Redlands) was used to generate spatial indicators of the neighbourhood environment.

Nine neighbourhood environmental characteristics were computed for each participant's neighbourhood. These included four built environment attributes [population density (persons/ha), street intersection density (≥3-arm intersections/km^2), percentage of commercial land use and non-commercial land use mix (an entropy score of non-commercial land uses ranging from 0 to 1)], two natural environment attributes (percentage of parkland and percentage of blue space), neighbourhood SES (Index of Relative Socioeconomic Advantage and Disadvantage, IRSAD) and two ambient air pollution measures [annual average concentrations of nitrogen dioxide (NO_2, unit: ppb) and fine particulate matter <2.5 μm in aerodynamic diameter ($PM_{2.5}$; unit: μg/m3)]. We used parkland rather than NDVI (Normalised Difference Vegetation Index) to define green natural environment because, in Australia, NDVI captures some green spaces irrelevant to recreational physical activity and other daily activities of most residents, such as agricultural land and impenetrable bushland. In fact, in our study, the correlation between NDVI and percentage of agricultural land ranged from 0.35 to 0.38 (i.e., it was substantial). Population density, the percentage of buffer area devoted to commercial land use and parkland, and other land uses included in the land use mix entropy score were derived using the Australian Bureau of Statistics (ABS) Mesh Block data from the 2011 Census (ABS, 2011). Mesh Blocks are the smallest geographical areas defined by the ABS for which Census data are available. Street intersection density was computed using road network data derived from the PSMA Australia's 2012 Transport & Topography dataset (PSMA, 2012). The percentage of buffer area covered by waterbodies or blue spaces (e.g., lakes, coastlines, rivers and reservoirs) was derived from national topographic spatial data for surface water features sourced from Geoscience Australia (Crossman & Li, 2015).

Concentrations of air pollutants were estimated at the participants' residential addresses using satellite-based land-use regression models. The models utilised spatial predictors of annual average NO_2 and $PM_{2.5}$ at fixed-site monitors (e.g., roads, industrial emissions), including time-varying information from satellites, to calculate concentrations at unmeasured locations (e.g., residential addresses) (Knibbs et al., 2014; Knibbs et al., 2016; Knibbs et al., 2018). Cross-validation revealed that the NO_2 model captured 81% of spatial variability in annual NO_2 (RMSE: 1.4 ppb), while the $PM_{2.5}$ model captured 63% of spatial variability (RMSE: 1 μg/m3). All neighbourhood measures were based on spatial data collected during AusDiab3 assessments (2011-12).

References

Adams, M. A., Frank, L. D., Schipperijn, J., Smith, G., Chapman, J., Christiansen, L. B., Coffee, N., Salvo, D., du Toit, L., Dygrýn, J., Hino, A. A. F., Lai, P.-c., Mavoa, S., Pinzón, J. D., Van de Weghe, N., Cerin, E., Davey, R., Macfarlane, D., Owen, N., & Sallis, J. F. (2014). International variation in neighborhood walkability, transit, and recreation environments using geographic information systems: the IPEN adult study. *International Journal of Health Geographics, 13*(1), 43. https://doi.org/10.1186/1476-072X-13-43

Australian Bureau of Statistics (ABS). (2011). *Australian Statistical Geography Standard (ASGS) Volume 1—Main Structure and Greater Capital City Statistical Areas (Cat No. 1270.0.55.001)*. Canberra, Australia: Australian Bureau of Statistics.

Cerin, E., Conway, T. L., Cain, K. L., Kerr, J., De Bourdeaudhuij, I., Owen, N., Reis, R. S., Sarmiento, O. L., Hinckson, E. A., Salvo, D., Christiansen, L. B., MacFarlane, D. J., Davey, R., Mitáš, J., Aguinaga-Ontoso, I., & Sallis, J. F. (2013). Sharing good NEWS across the world: developing comparable scores across 12 countries for the neighborhood environment walkability scale (NEWS). *BMC Public Health, 13*(1), 309. https://doi.org/10.1186/1471-2458-13-309
Crossman, S., & Li, O. (2015). *Surface Hydrology Polygons (National)*. Canberra, Australia: Geoscience Australia.

Gunn, L. D., King, T. L., Mavoa, S., Lamb, K. E., Giles-Corti, B., & Kavanagh, A. (2017). Identifying destination distances that support walking trips in local neighborhoods. *Journal of Transport & Health, 5,* 133-141. https://doi.org/https://doi.org/10.1016/j.jth.2016.08.009

Knibbs, L. D., van Donkelaar, A., Martin, R. V., Bechle, M. J., Brauer, M., Cohen D. D., Cowie, C. T., Dirgawati, M., Guo, Y., Hanigan, I. C., Johnson, F. H., Marks, G. B., Marshall, J. D., Pereira, G., Jalaludin, B., Heyworth, J. S., Morgan, G. G., & Barnett, A. G. (2018). Satellite-Based Land-Use Regression for Continental-Scale Long-Term Ambient PM2.5 Exposure Assessment in Australia. *Environmental Science & Technology*, *52*(21),12445-55. https://doi.org/10.1021/acs.est.8b02328

Knibbs, L. D., Coorey, C. P., Bechle, M. J., Cowie, C. T., Dirgawati, M., Heyworth, J. S., Marks, G. B., Marshall, J. D., Morawska, L., Pereira, G., & Hewson, M. G. (2016). Independent Validation of National Satellite-Based Land-Use Regression Models for Nitrogen Dioxide Using Passive Samplers. *Environmental Science & Technology*, *50*(22), 12331-12338. https://doi.org/10.1021/acs.est.6b03428

Knibbs, L. D., Hewson, M. G., Bechle, M. J., Marshall, J. D., & Barnett, A. G. (2014). A national satellite-based land-use regression model for air pollution exposure assessment in Australia. *Environmental Research*, *135*, 204-11. https://doi.org/10.1016/j.envres.2014.09.011

PSMA Australia Ltd. (2012). PSMA street network.

Methods – Description of cardiometabolic health indicators

The outcomes of this study were a series of cardiometabolic health indicators, including an indicator of adiposity [waist circumference (in cm)], an indicator of hypertension [mean arterial blood pressure (MAP; in mmHg)], an indicator of hyperglycaemia [glycated haemoglobin (HbA1c, in mmol/mol)], and three indicators of dyslipidaemia [low-density lipoprotein (LDL) cholesterol (mmol/L), high-density lipoprotein (HDL) cholesterol (mmol/L) and triglycerides (mmol/L)].

Biomedical examinations were performed at local test sites, including schools, church halls, community centres and other appropriate public facilities (Dunstan et al., 2002). Examinations were conducted between 7:00am and 2:00 pm following WHO recommendations for diabetes and other non-communicable diseases surveys. Following an initial collection of a fasting blood sample, participants moved through the biomedical examination procedure in a circuit-like fashion. The biomedical examinations took from 2.5 to 3hr and included the following components used in the present study:

- Interviewer-administered questionnaire (demographic characteristics; medical history; physical activity and sedentary behaviours)
- Physical measurements
    - Waist circumference measured with a tape measure
    - Blood pressure measured using a Dinamap/mercury sphygmomanometer
- Blood measurements (fasting)
    - Blood lipids assessed enzymatically with an Olympus AU600 analyser

- Glycated haemoglobin derived from Boronate affinity high performance liquid chromatography

Reference

Dunstan, D. W., Zimmet, P. Z., Welborn, T. A., Cameron, A. J., Shaw, J., de Courten, M., Jolley, D., & McCarty, D. J. (2002). The Australian Diabetes, Obesity and Lifestyle Study (AusDiab)—methods and response rates. Diabetes Research and Clinical Practice, 57(2), 119-129. https://doi.org/https://doi.org/10.1016/S0168-8227(02)00025-6

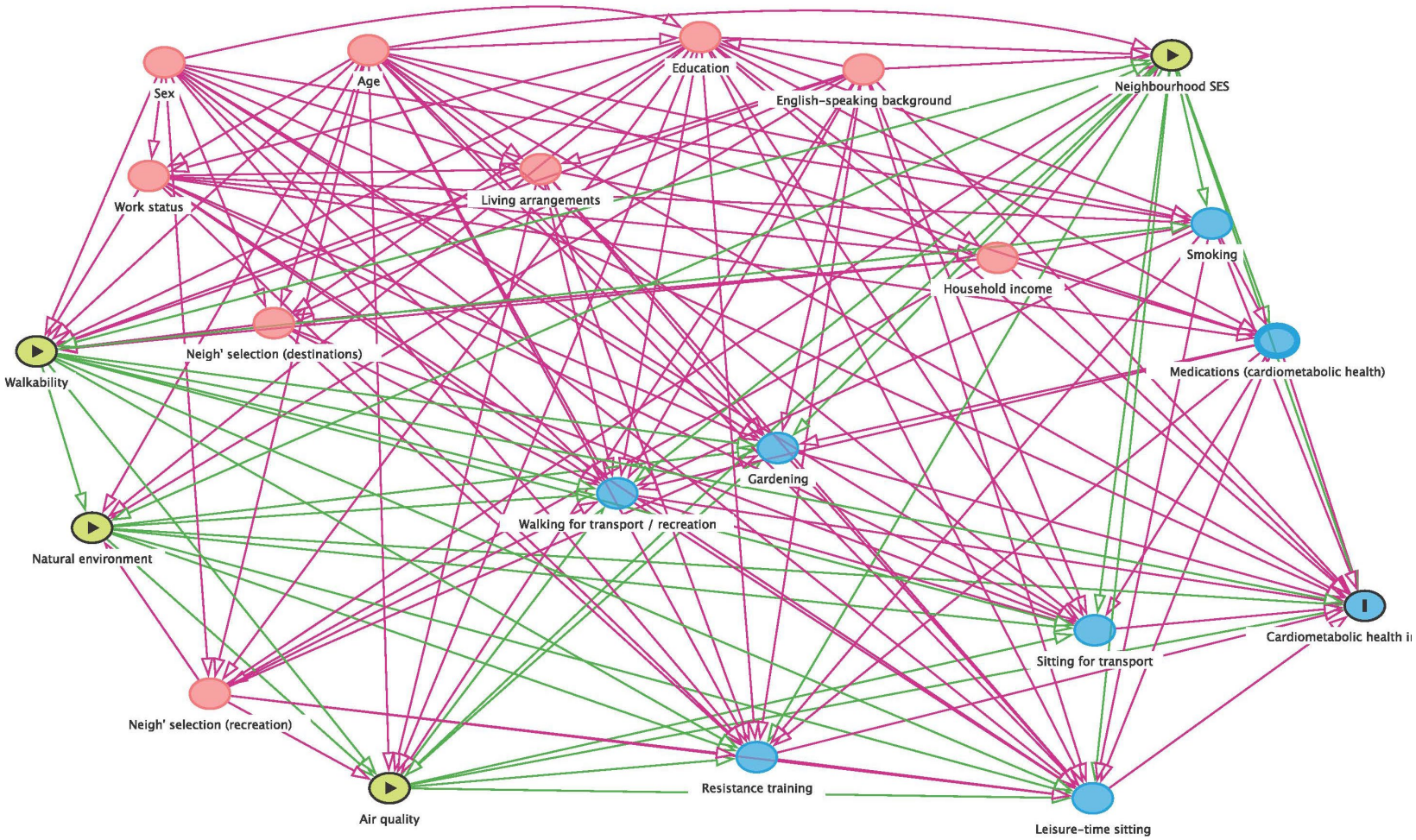


Figure S1. Directed acyclic graph (DAG) depicting the hypothesised relations between neighbourhood attributes and cardiometabolic health indicators via physical activity and sedentary behaviours. Through the DAG, we identified which covariates to include in the statistical analyses to sufficiently control for potential confounders. This particular DAG was used to inform the model of the main independent (total) effects of neighbourhood walkability, natural environment, socio-economic status (SES) and air quality on cardiometabolic health indicators. Variables with red circles denote the set of potential confounders.

Table S1. Outline of regression analyses

Step	Effect(s): Exposure(s)	Confounders / covariates	Regression models
Associations between the neighbourhood environment and cardiometabolic health indicators			
1	Main independent effects on cardiometabolic health indicators: Walkability index, natural environment index, neighbourhood IRSAD and air pollution index	Age, sex, English-speaking background, living arrangements, educational attainment, residential self-selection, work status, household income, taking medications relevant to a specific outcome (diabetes, hypertension and/or dyslipidaemia)	Six separate sets of GAMMs (one GAMM with linear terms for the environmental attributes; GAMMs with various combinations of smooth terms for environmental attributes), one set for each cardiometabolic health indicator. GAMMs with Gaussian variance and identity link functions were used for waist circumference, mean arterial blood pressure and LDL-cholesterol. For the remaining outcomes we employed Gamma variance and logarithmic link functions.
2	Moderating effects of neighbourhood IRSAD and air pollution index on associations between exposures and cardiometabolic health indicators: Walkability index and natural environment index	Age, sex, English-speaking background, living arrangements, educational attainment, residential self-selection, work status, household income, taking medications relevant to a specific outcome (diabetes, hypertension and/or dyslipidaemia)	As above + interaction terms of moderators by environmental exposures
Physical activity and sedentary behaviours as mediators of the associations between the neighbourhood environment and cardiometabolic health indicators			
3.1	Main independent effects and moderating effects of neighbourhood IRSAD and air pollution index on physical activity and sedentary behaviours: Walkability index, natural environment index, neighbourhood IRSAD and air pollution index	Age, sex, English-speaking background, living arrangements, educational attainment, residential self-selection, work status, household income, taking medications relevant to a specific outcome (diabetes, hypertension and/or dyslipidaemia)	Ten separate sets of GAMMs (one GAMM with linear terms for the environmental attributes; GAMMs with various combinations of smooth terms for environmental attributes), one set for each behavioural variable. GAMMs with binomial variance and logit link functions were used for the binary variables engagement in walking for transport, engagement in walking for recreation, engagement in vigorous gardening and

	[the model for sitting for transport included walking for transport as an explanatory variable] [the model of leisure-time sitting included physical activity variables as explanatory variables]		engagement in resistance training. For the remaining physical activity (non-zero frequency of walking for transport, walking for recreation, vigorous gardening and resistance training) and sedentary behaviour outcomes (leisure-time sitting; sitting for transport), we employed Gamma variance and logarithmic link functions. Interaction terms of moderators by environmental exposures included when statistically significant (p<.05)
3.2	Main direct independent effects and moderating effects of neighbourhood IRSAD and air pollution index on cardiometabolic health indicators: Walkability index, natural environment index; engagement and non-zero frequency of: walking for transport, walking for recreation, vigorous gardening and resistance training; sitting for transport and leisure-time sitting.	Age, sex, English-speaking background, living arrangements, educational attainment, residential self-selection, work status, household income, taking medications relevant to a specific outcome (diabetes, hypertension and/or dyslipidaemia)	Six separate sets of GAMMs (one GAMM with linear terms for the environmental attributes; GAMMs with various combinations of smooth terms for environmental attributes), one set for each cardiometabolic health indicator. GAMMs with Gaussian variance and identity link functions were used for waist circumference, mean arterial blood pressure and LDL-cholesterol. For the remaining outcomes we employed Gamma variance and logarithmic link functions. Interaction terms of moderators by environmental exposures included when statistically significant (p<.05)

Note. IRSAD, Index of Relative Social Advantage and Disadvantage; GAMM, generalised additive mixed model. Covariates here refer to variables that are associated with the outcome but not necessarily with the exposure and explain outcome variance.

Table S2. Associations of neighbourhood environmental attributes (1 km radius street-network buffers) with behaviours and of behaviours with cardiometabolic health indicators

Models	Outcome	Exposure	Moderator(s)	Moderator value(s)	Reg coef.	95% CI	*p*
3.1	Walking for transport (engagement)[a]	Walkability index	None		**1.093**	**1.047, 1.141**	**<.001**
		Natural environment index	None		0.942	0.875, 1.013	.111
		Neighbourhood IRSAD	n/a		1.022	0.986, 1.060	.228
		Air pollution index	n/a		**1.167**	**1.093, 1.249**	**<.001**
	Walking for transport (non-zero frequency)[b]	Walkability index	None		**1.022**	**1.004, 1.041**	**.019**
		Natural environment index	None		1.032	0.991, 1.075	.132
		Neighbourhood IRSAD	n/a		0.995	0.978, 1.012	.558
		Air pollution index	n/a		1.013	0.983, 1.044	.410
	Walking for recreation (engagement)[a]	Walkability index	None		**1.044**	**1.003, 1.086**	**.035**
		Natural environment index	None		0.980	0.926, 1.037	.481
		Neighbourhood IRSAD	n/a		1.014	0.981, 1.047	.413
		Air pollution index	n/a		0.970	0.913, 1.031	.326
	Walking for recreation (non-zero frequency)[b]	Walkability index	None		1.009	0.996, 1.022	.178
		Natural environment index	None		1.002	0.982, 1.021	.877
		Neighbourhood IRSAD	n/a		0.995	0.983, 1.006	.354
		Air pollution index	n/a		0.995	0.975, 1.015	.629
	Vigorous gardening (engagement)[a]	Walkability index	Neighbourhood IRSAD	M – 1 SD	**0.939**	**0.887, 0.994**	**.030**
				M	**0.904**	**0.867, 0.942**	**<.001**
				M + 1 SD	**0.870**	**0.826, 0.917**	**<.001**
			Interaction term		**0.986**	**0.973, 0.999**	**.037**
		Natural environment index	None		0.950	0.897, 1.007	.084
		Neighbourhood IRSAD	n/a		1.024	0.992, 1.058	.144
		Air pollution index	n/a		1.007	0.948, 1.068	.827
	Vigorous gardening (non-zero frequency)[b]	Walkability index	Air pollution index	M – 1 SD	**0.921**	**0.896, 0.947**	**<.001**
				M	**0.950**	**0.930, 0.971**	**<.001**
				M + 1 SD	0.980	0.956, 1.005	.120

		Interaction term		**1.020**	**1.010, 1.030**	**<.001**
	Natural environment index	None		0.972	0.939, 1.006	.109
	Neighbourhood IRSAD	n/a		1.002	0.985, 1.020	.792
	Air pollution index	n/a		1.026	0.993, 1.060	.124
Resistance training (engagement)[a]	Walkability index	Air pollution index	M – 1 SD	0.994	0.943, 1.048	.832
			M	1.017	0.977, 1.059	.418
			M + 1 SD	**1.040**	**1.000, 1.083**	**.049**
		Interaction term		**1.014**	**1.001, 1.030**	**.032**
	Natural environment index	None		**1.087**	**1.028, 1.149**	**.004**
	Neighbourhood IRSAD	n/a		**1.041**	**1.006, 1.076**	**.020**
	Air pollution index	n/a		1.036	0.976, 1.099	.243
Resistance training (non-zero frequency)[b]	Walkability index	None		1.006	0.985, 1.025	.657
	Natural environment index	None		1.003	0.977, 1.031	.800
	Neighbourhood IRSAD	n/a		**0.982**	**0.965, 0.999**	**.041**
	Air pollution index	n/a		1.004	0.973, 1.036	.810
Sitting for transport (hr/day)[b]	Walkability index	None		**0.982**	**0.965, 0.999**	**.039**
	Natural environment index	None		0.993	0.969, 1.019	.605
	Neighbourhood IRSAD	n/a		**1.034**	**1.020, 1.048**	**<.001**
	Air pollution index	n/a		1.001	0.975, 1.028	.940
	Walking for transport (engagement)	None		1.010	0.894, 1.141	.873
	Walking for transport (frequency)	None		1.001	0.975, 1.028	.926
Leisure-time sitting (hr/day)[b]	Walkability index	None		0.994	0.982, 1.006	.302
	Natural environment index	None		**0.982**	**0.965, 0.999**	**.036**
	Neighbourhood IRSAD	n/a		**0.989**	**0.980, 0.999**	**.025**
	Air pollution index	n/a		1.012	0.994, 1.030	.184
	Walking for transport (engagement)	None		**0.873**	**0.801, 0.950**	**.002**
	Walking for transport (frequency)	None		1.012	0.994, 1.031	.191

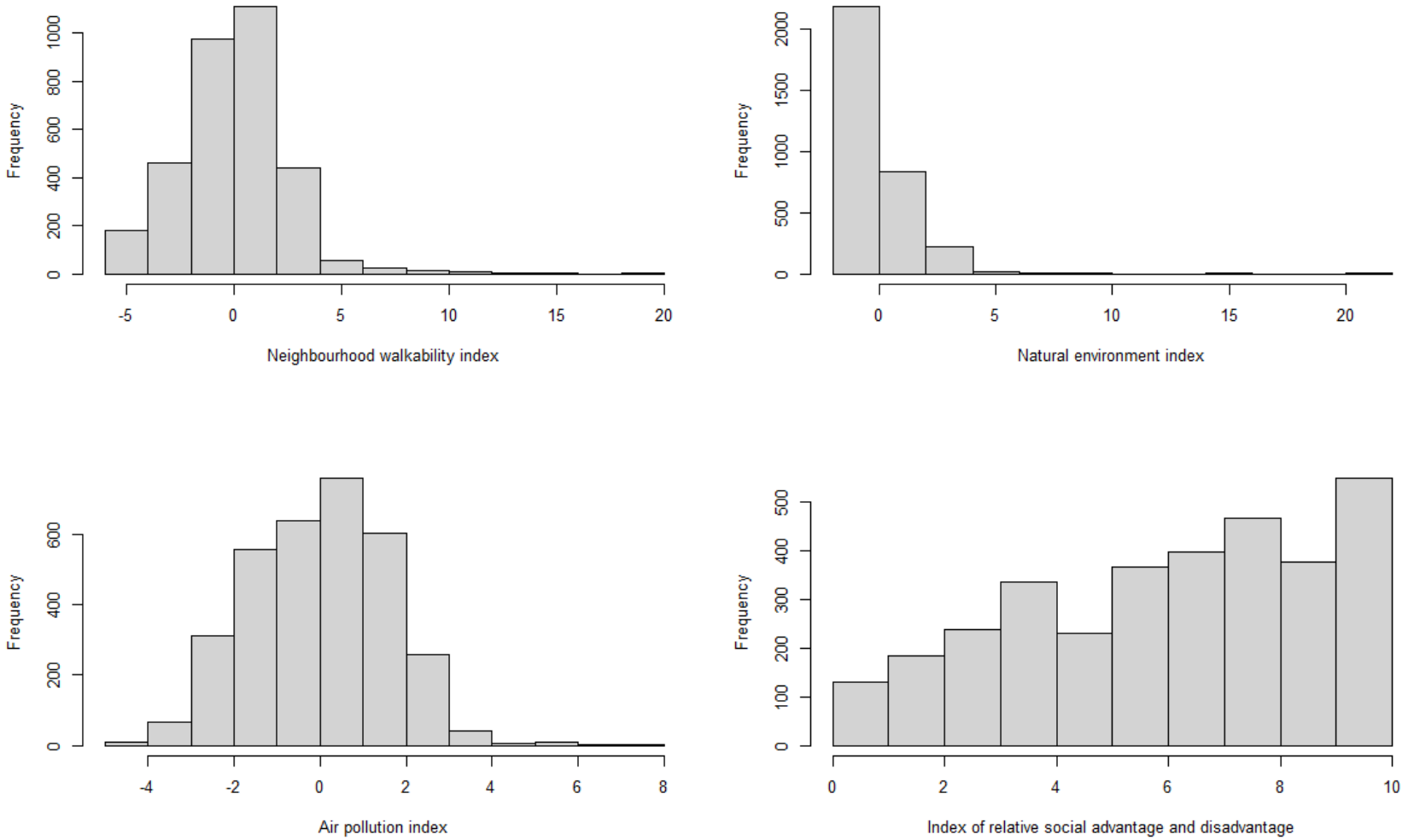
		Walking for recreation (engagement)	None	**0.935**	**0.872, 0.999**	**.048**
		Walking for recreation (frequency)	None	1.002	0.989, 1.016	.764
		Vigorous gardening (engagement)	None	1.027	0.961, 1.098	.427
		Vigorous gardening (frequency)	None	**0.962**	**0.940, 0.984**	**<.001**
		Resistance training (engagement)	None	**0.917**	**0.840, 0.998**	**.031**
		Resistance training (frequency)	None	1.008	0.987, 1.030	.461
Models	**Outcome**	**Exposure**	**Moderator(s)**	**Reg coef.**	**95% CI**	***p***
3.2	Waist circumference (cm)[c]	Walking for transport (engagement)	None	**-1.546**	**-3.097, -0.005**	**.047**
		Walking for transport (frequency)	None	0.026	-0.332, 0.384	.886
		Walking for recreation (engagement)	None	-1.025	-2.370, 0.319	.135
		Walking for recreation (frequency)	None	**-0.346**	**-0.607, -0.206**	**<.001**
		Vigorous gardening (engagement)	None	-0.707	-1.986, 0.573	.279
		Vigorous gardening (frequency)	None	-0.021	-0.464, 0.423	.927
		Resistance training (engagement)	None	**-3.172**	**-4.836, -1.508**	**<.001**
		Resistance training (frequency)	None	-0.078	-0.498, 0.342	.716
		Sitting for transport	None	**0.539**	**0.002, 1.076**	**.049**
		Leisure-time sitting	None	**0.806**	**0.453, 1.159**	**<.001**
	Mean arterial pressure (mmHg)[c]	Walking for transport (engagement)	None	-0.192	-1.690, 1.305	.801
		Walking for transport (frequency)	None	0.011	-0.314, 0.336	.947
		Walking for recreation (engagement)	None	0.485	-0.735, 1.704	.436
		Walking for recreation (frequency)	None	-0.188	-0.423, 0.046	.116
		Vigorous gardening (engagement)	None	0.260	-0.901, 1.421	.661
		Vigorous gardening (frequency)	None	-0.144	-0.548, 0.259	.483
		Resistance training (engagement)	None	0.343	-1.168, 1.854	.656
		Resistance training (frequency)	None	-0.071	-0.453, 0.310	.714
		Sitting for transport	None	0.019	-0.468, 0.506	.340
		Leisure-time sitting	None	0.254	-0.066, 0.575	.120

Glycated haemoglobin (mmol/mol)[b]	Walking for transport (engagement)	None	0.995	0.982, 1.009	.512
	Walking for transport (frequency)	None	1.000	0.997, 1.003	.875
	Walking for recreation (engagement)	None	1.000	0.989. 1.011	.976
	Walking for recreation (frequency)	None	0.999	0.997, 1.001	.315
	Vigorous gardening (engagement)	None	0.995	0.985, 1.006	.352
	Vigorous gardening (frequency)	None	1.002	0.998, 1.006	.287
	Resistance training (engagement)	None	0.990	0.977, 1.004	.166
	Resistance training (frequency)	None	0.998	0.994, 1.001	.196
	Sitting for transport	None	**1.006**	**1.001, 1.010**	**.013**
	Leisure-time sitting	None	**1.003**	**1.000, 1.005**	**.042**
HDL cholesterol (mmol/L)[b]	Walking for transport (engagement)	None	**1.031**	**1.000, 1.062**	**.046**
	Walking for transport (frequency)	None	0.997	0.991, 1.004	.463
	Walking for recreation (engagement)	None	1.011	0.984, 1.037	.440
	Walking for recreation (frequency)	None	**1.007**	**1.002, 1.012**	**.007**
	Vigorous gardening (engagement)	None	1.006	0.982, 1.031	.610
	Vigorous gardening (frequency)	None	0.999	0.990, 1.007	.740
	Resistance training (engagement)	None	**1.060**	**1.027, 1.094**	**<.001**
	Resistance training (frequency)	None	0.994	0.986, 1.002	.131
	Sitting for transport	None	**0.990**	**0.980, 1.000**	**.049**
	Leisure-time sitting	None	**0.988**	**0.981, 0.995**	**<.001**
LDL cholesterol (mmol/L)[c]	Walking for transport (engagement)	None	-0.075	-0.175, 0.026	.144
	Walking for transport (frequency)	None	**0.023**	**0.001, 0.045**	**.037**
	Walking for recreation (engagement)	None	0.032	-0.050, 0.115	.438
	Walking for recreation (frequency)	None	0.003	-0.012, 0.019	.680
	Vigorous gardening (engagement)	None	-0.021	-0.099, 0.057	.593
	Vigorous gardening (frequency)	None	0.013	-0.014, 0.040	.349
	Resistance training (engagement)	None	-0.038	-0.140, 0.063	.461
	Resistance training (frequency)	None	-0.002	-0.028, 0.024	.883
	Sitting for transport	None	0.008	-0.024, 0.041	.612
	Leisure-time sitting	None	0.005	-0.016, 0.027	.644
Triglycerides (mmol/L)[b]	Walking for transport (engagement)	None	0.968	0.903, 1.038	.363
	Walking for transport (frequency)	None	0.998	0.983, 1.013	.762

	Walking for recreation (engagement)	None	0.995	0.940, 1.053	.857
	Walking for recreation (frequency)	None	**0.984**	**0.973, 0.995**	**.003**
	Vigorous gardening (engagement)	None	0.998	0.945, 1.053	.932
	Vigorous gardening (frequency)	None	0.994	0.975, 1.012	.502
	Resistance training (engagement)	None	**0.879**	**0.819, 0.943**	**<.001**
	Resistance training (frequency)	None	1.004	0.986, 1.022	.678
	Sitting for transport	None	1.008	0.985, 1.031	.494
	Leisure-time sitting	None	**1.029**	**1.014, 1.044**	**<.001**

Note. IRSAD, Index of Relative Social Advantage and Disadvantage (a measure of neighbourhood socio-economic status); Reg coef., regression coefficient; CI, confidence intervals; *p*, *p*-value; M, mean; SD, standard deviation; n/a, not applicable. [a] values represent odds ratios (OR); [b] values represent exponentiated regression coefficients (e^b); [c] values represent untransformed regression coefficients (*b*).
Estimates in bold are significant at a 0.05 two-tailed probability level. Confounders and covariates for models 3.1 and 3.2 are reported in Table S1.

Figure S2. Distributions of neighbourhood environmental variables (1 km radius street-network buffers)



Associations between neighbourhood environmental variables

Table S3. Correlation matrix of neighbourhood environmental variables (1 km radius street-network buffers)

	Neighbourhood walkability index	Natural environment index	Air pollution index	IRSAD
Neighbourhood walkability index	1.000 (1.000)	-0.183[a] (-0.100)	0.488[a] (0.481)	-0.211 (-0.250)
Natural environment index	-0.183[a] (-0.100)	1.000 (1.000)	-0.042 (0.022)	0.129 (0.128)
Air pollution index	0.488[a] (0.481)	-0.042 (0.022)	1.000 (1.000)	0.063 (0.053)
IRSAD	-0.211 (-0.250)	0.129 (0.128)	0.063 (0.053)	1.000 (1.000)

Note. IRSAD, Index of Relative Social Advantage and Disadvantage (a measure of neighbourhood socio-economic status); values outside the brackets represent Pearson's correlation coefficients, while those in brackets are Spearman's correlation coefficients. All estimates are significant at a 0.05 probability level. [a] curvilinear association depicted below (see Figures S3).

As the associations of the neighbourhood walkability index with the natural environment index and the air pollution index were curvilinear, we report the F-test values of the smooth terms and plot the relationships derived from GAMMs with the neighbourhood walkability index as a predictor of the natural environment index and air pollution index (Figure S3; see below).

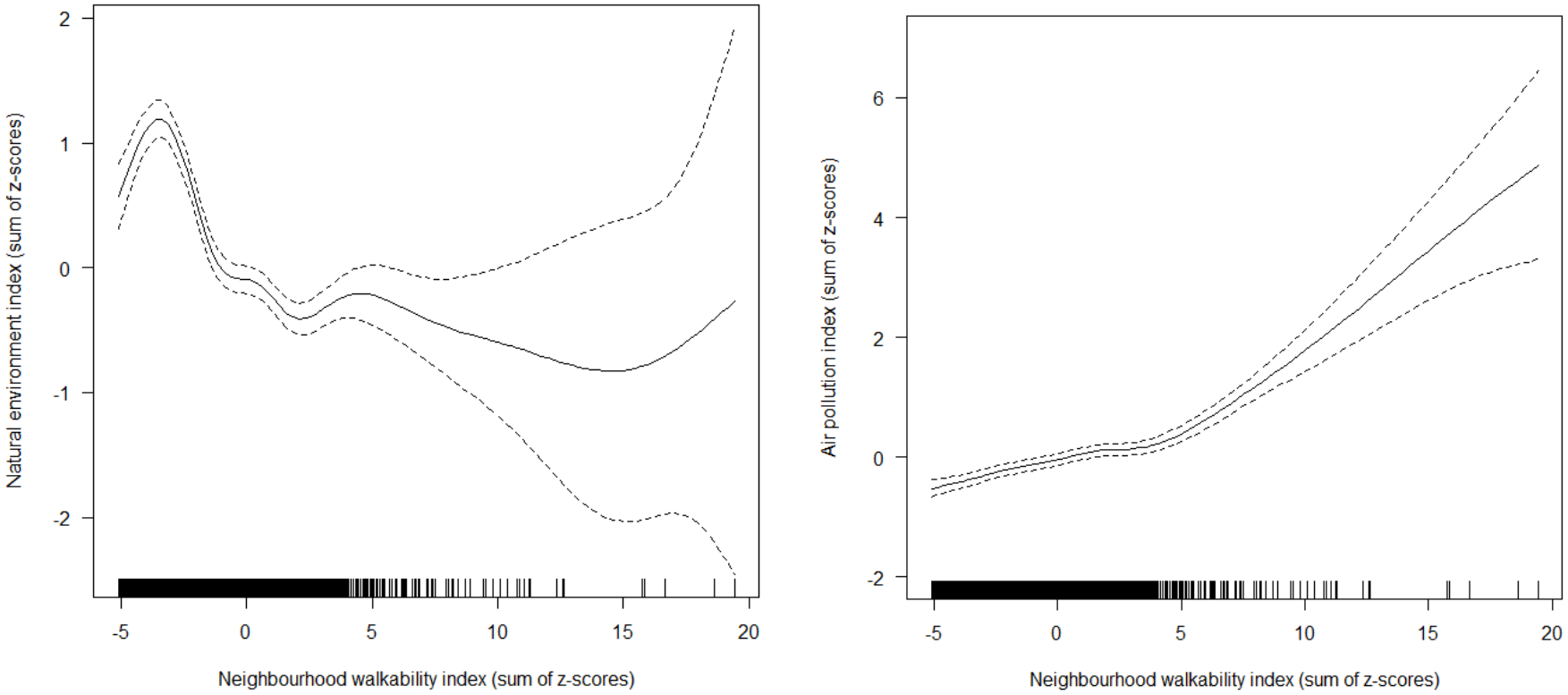


Figure S3. Associations of the neighbourhood walkability index with the natural environment index (left panel) and air pollution index (right panel) derived from GAMMs (generalised additive mix models). The F-ratio values of the smooth terms the neighbourhood walkability index as a predictor of the natural environment index and the air pollution index were F(8.46, 4131.54) = 50.72 (p<.001) and F(6.62, 4133.39) = 45.93 (p<.001), respectively.

Figure S4. Map of the geocoded addresses depicting the spatial distribution of participants' residential addresses across Australia (yellow dots)

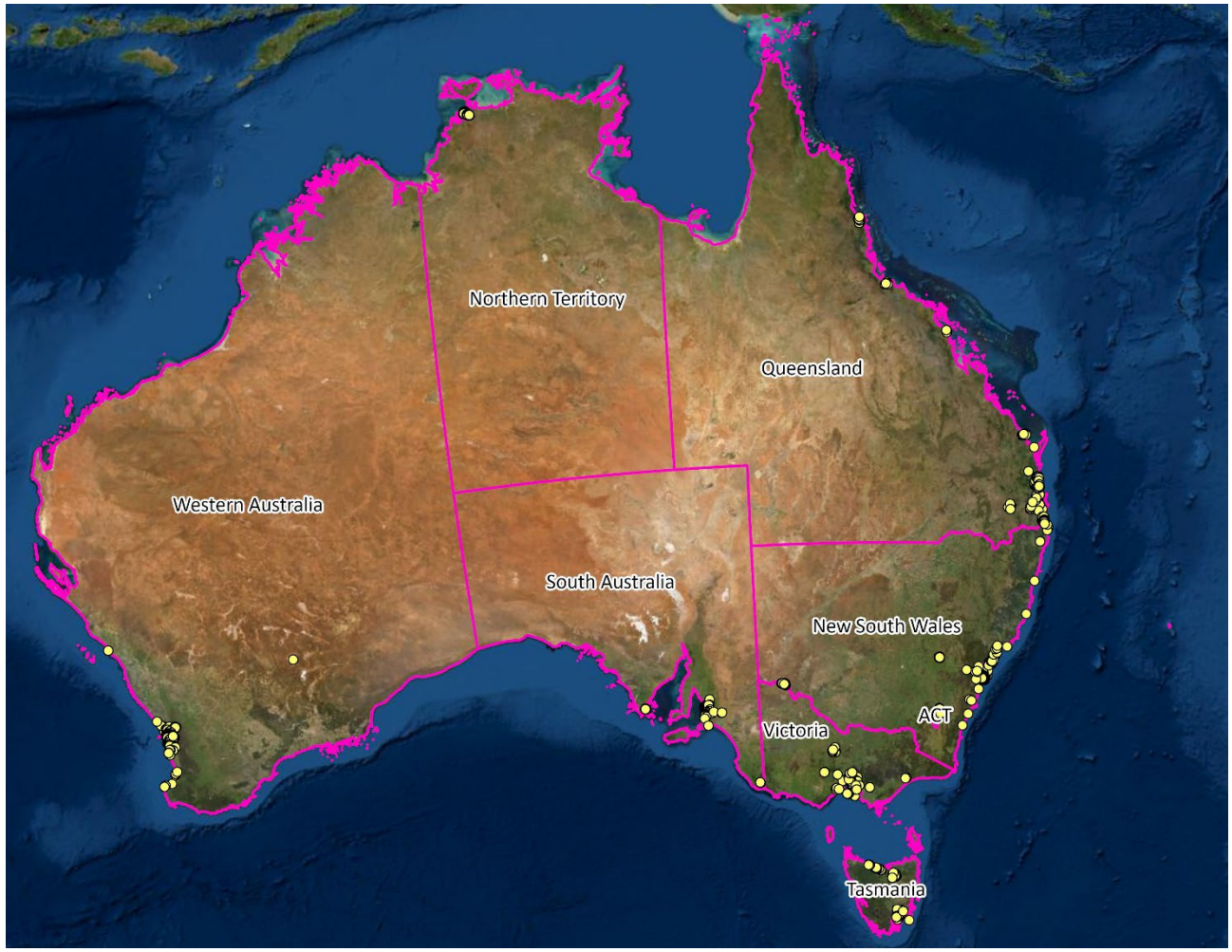


Table S4. Moderation effects of medication intake on exposure – cardiometabolic health indicator associations

Outcome	**Exposure(s) in interaction term** (1 km radius street-network buffers)	**Moderator: medication type**	**Effect estimate type**	**Reg coef.**	**95% CI**	***p***
Mean arterial pressure (mmHg)	Walkability index	Anti-hypertensive(s)	*b*	-0.160	-0.592, 0.272	.467
	Natural environment index	Anti-hypertensive(s)	*b*	0.026	-0.633, 0.684	.939
	Neighbourhood IRSAD	Anti-hypertensive(s)	*b*	-0.259	-0.596, 0.078	.131
	Ambient air pollution index	Anti-hypertensive(s)	*b*	-0.077	-0.724, 0.570	.815
	Walkability index by neighbourhood IRSAD by Ambient air pollution index [a]	Anti-hypertensive(s)	*b*	0.039	-0.031, 0.109	.276
Glycated haemoglobin (mmol/mol)	Walkability index	Diabetes medication	e^b	1.005	0.997, 1.012	.193
	Natural environment index	Diabetes medication	e^b	0.995	0.981, 1.009	.470
	Neighbourhood IRSAD	Diabetes medication	e^b	0.9995	0.994, 1.005	.877
	Ambient air pollution index	Diabetes medication	e^b	1.005	0.993, 1.017	.417
HDL cholesterol (mmol/L)	Walkability index	Lipid lowering medication	e^b	1.008	0.998, 1.018	.125
	Natural environment index	Lipid lowering medication	e^b	0.999	0.983, 1.015	.920
	Neighbourhood IRSAD	Lipid lowering medication	e^b	0.997	0.990, 1.005	.498
	Ambient air pollution index	Lipid lowering medication	e^b	0.988	0.976, 1.001	.061
	Walkability index by Ambient air pollution index [a]	Lipid lowering medication	e^b	1.002	0.998, 1.005	.411
	Natural environment index by Ambient air pollution index [a]	Lipid lowering medication	e^b	1.002	0.991, 1.012	.746
LDL cholesterol (mmol/L)	Walkability index	Lipid lowering medication	*b*	-0.001	-0.033, 0.031	.961
	Natural environment index	Lipid lowering medication	*b*	-0.013	-0.064, 0.037	.600
	Neighbourhood IRSAD	Lipid lowering medication	*b*	0.020	-0.004, 0.044	.103
	Ambient air pollution index	Lipid lowering medication	*b*	-0.007	-0.055, 0.040	.761
	Walkability index by neighbourhood IRSAD by Ambient air pollution index [a]	Lipid lowering medication	*b*	0.005	-0.001, 0.010	.069

Triglycerides (mmol/L)	Walkability index	Lipid lowering medication	e^b	1.001	0.978, 1.023	.956
	Natural environment index	Lipid lowering medication	e^b	1.001	0.966, 1.037	.962
	Neighbourhood IRSAD	Lipid lowering medication	e^b	0.998	0.981, 1.016	.842
	Ambient air pollution index	Lipid lowering medication	e^b	1.006	0.973, 1.041	.714
	Walkability index by neighbourhood IRSAD by Ambient air pollution index [a]	Lipid lowering medication	e^b	1.003	0.999, 1.006	.164

Note. This table reports the regression coefficient estimates of the 2-way environmental attribute by medication intake interaction terms for all cardiometabolic health indicators. [a] It also reports the regression coefficient estimates of the x-way interaction terms of medication intake by all environmental attributes included in the interaction term(s) that were significantly related to cardiometabolic health outcomes (as reported in Table S2). Models of waist circumference did not include any medication intake covariates/moderators as there is no formal pharmacological treatment for large waist circumference. *b* = regression coefficient representing the difference in outcome associated with a 1 unit increase in the exposure derived from Generalised Additive Mixed Models with Gaussian variance and identity link functions; e^b = exponentiated regression coefficient representing the proportional difference in outcome associated with a 1 unit increase in the exposure derived from Generalised Additive Mixed Models with Gamma variance and logarithmic link functions.

Table S5. Associations of neighbourhood environment attributes with cardiometabolic health indicators unadjusted for ambient air pollution: main effect models (unadjusted for physical activity and sedentary behaviours)

Neighbourhood environment attributes (1 km radius street network buffers)	**Waist circumference (cm)**	**Mean arterial pressure (mmHg)**	**Glycated haemoglobin (mmol/mol)**	**HDL cholesterol (mmol/L)**	**LDL cholesterol (mmol/L)**	**Triglycerides (mmol/L)**
	b (95% CI)	*b* (95% CI)	e^b (95% CI)	e^b (95% CI)	*b* (95% CI)	e^b (95% CI)
Walkability index	0.095 (-0.163. 0.353)	**0.212 (0.026, 0.399)**	**1.002 (1.000, 1.004)**	0.999 (0.995, 1.003)	0.002 (-0.010, 0.013)	1.005 (0.996, 1.014)
Natural environment index	**-0.478** (**-0.809, -0.120**)	-0.167 (-0.478, 0.144)	0.999 (0.996, 1.002)	1.001 (0.994, 1.007)	**-0.022 (-0.041, -0.003)**	1.000 (0.987, 1.014)
Neighbourhood IRSAD	**-0.365** (**-0.558, -0.171**)	**-0.326 (-0.508, -0.143)**	**1.002 (1.000, 1.004)**	**1.008 (1.005, 1.012)**	0.011 (-0.0001, 0.022)	**0.990 (0.983, 0.997)**

Note. IRSAD, Index of Relative Advantage and Disadvantage; *b*, unstandardised regression coefficient from model with Gaussian variance and identity link functions; e^b = exponentiated regression coefficient from models with Gamma variance and logarithmic link functions; CI, confidence intervals. Estimates in bold are significant at a 0.05 two-tailed probability level. All regression coefficients are adjusted for other environmental indices except for the air pollution index, age, sex, English-speaking background, educational attainment, household income, living arrangements, work status, neighbourhood self-selection and taking medications relevant to a specific outcome (diabetes, hypertension and/or dyslipidaemia).

Table S6. Descriptive statistics of neighbourhood environment attributes based on 500 m and 1.6 km radius street-network buffers (M ± SD)

Characteristics	500 m radius street-network buffer	1.6 km radius street-network buffer
Population density, persons/ha	19.8 ± 11.3	15.8 ± 9.3
Percentage of commercial land in residential buffer	1.8 ± 6.7	3.0 ± 5.9
Non-commercial land use mix, entropy score (0 to 1)	0.08 ± 0.13	0.42 ± 0.14
Street intersection density, intersections/km^2	73.0 ± 40.2	55.9 ± 27.7
Percentage of blue space (waterbody) in residential buffer	0.2 ± 1.9	0.3 ± 1.9
Percentage of parkland in residential buffer	8.2 ± 11.6	13.8 ± 12.4
Walkability index, sum of z-scores	0.0 ± 2.3	0.0 ± 2.4
Natural environment index, sum of z-scores	0.0 ± 1.4	0.0 ± 1.4

Table S7. Associations of neighbourhood environment attributes with cardiometabolic health indicators: main effect models (unadjusted for physical activity and sedentary behaviours)

Neighbourhood environment attributes	Buffer size (radius)	Waist circumference (cm)	Mean arterial pressure (mmHg)	Glycated haemoglobin (mmol/mol)	HDL cholesterol (mmol/L)	LDL cholesterol (mmol/L)	Triglycerides (mmol/L)
		b (95% CI)	*b* (95% CI)	e^b (95% CI)	e^b (95% CI)	*b* (95% CI)	e^b (95% CI)
Walkability index	500 m	-0.183 (-0.420, 0.054)	**0.324 (0.109, 0.539)**	1.000 (0.998, 1.002)	1.002 (0.998, 1.007)	-0.001 (-0.015, 0.012)	1.005 (0.996, 1.014)
	1.6 km	-0.197 (-0.442, 0.048)	**0.386 (0.165, 0.606)**	1.002 (0.9999, 1.005)	1.001 (0.996, 1.006)	-0.0003 (-0.014, 0.014)	1.004 (0.994, 1.013)
Natural environment index	500 m	**-0.500 (-0.829, -0.170)**	-0.043 (-0.340, 0.255)	0.999 (0.996, 1.002)	0.999 (0.992, 1.005)	**-0.023 (-0.042, -0.004)**	0.994 (0.981, 1.008)
	1.6 km	**-0.415 (-0.766, -0.064)**	**-0.378 (-0.694, -0.062)**	0.998 (0.995, 1.001)	0.998 (0.991, 1.005)	**-0.024 (-0.044, -0.004)**	1.001 (0.987, 1.014)
Neighbourhood IRSAD	500 m	**-0.475 (-0.675, -0.274)**	**-0.318 (-0.502, -0.134)**	1.002 (1.000, 1.004)	**1.009 (1.005, 1.013)**	0.006 (-0.006, 0.017)	**0.987 (0.980, 0.995)**
	1.6 km	**-0.466 (-0.771, -0.260)**	**-0.265 (-0.451, -0.079)**	**1.002 (1.000, 1.004)**	**1.009 (1.005, 1.013)**	0.007 (-0.004, 0.019)	**0.987 (0.979, 0.995)**
Ambient air pollution index	500 m	0.347 (-0.013, 0.708)	**-0.455 (-0.786, -0.124)**	**1.005 (1.001, 1.008)**	**0.992 (0.985, 0.999)**	0.004 (-0.017, 0.024)	1.005 (0.992, 1.019)
	1.6 km	0.395 (-0.004, 0.795)	**-0.641 (-1.003, -0.280)**	1.003 (0.999, 1.007)	**0.992 (0.995, 0.999)**	0.002 (-0.021, 0.024)	1.005 (0.990, 1.020)

Note. IRSAD, Index of Relative Advantage and Disadvantage; *b*, unstandardised regression coefficient from model with Gaussian variance and identity link functions; e^b = exponentiated regression coefficient from models with Gamma variance and logarithmic link functions; CI, confidence intervals. Estimates in bold are significant at a 0.05 two-tailed probability level. All regression coefficients are adjusted for other environmental indices, age, sex, English-speaking background, educational attainment, household income, living arrangements, work status, neighbourhood self-selection and taking medications relevant to a specific outcome (diabetes, hypertension and/or dyslipidaemia).

Table S8a. Associations of neighbourhood physical environment attributes with cardiometabolic health indicators: moderating effects of neighbourhood socio-economic status and air quality (unadjusted for physical activity and sedentary behaviours) – 500 m radius street-network buffers

Moderator	Moderator values	Mean arterial pressure (mmHg)[a]	LDL cholesterol (mmol/L)[b]	Triglycerides (mmol/L)[c]	Moderator	Moderator values	HDL cholesterol (mmol/L)[d]
		b (95% CI)	*b* (95% CI)	e^b (95% CI)			e^b (95% CI)
Exposure: Walkability index					***Exposure: Walkability index***		
Neighbourhood IRSAD	M – 1 SD	**0.629**	**0.024**	**1.020**	Air pollution index	M – 1 SD	0.996
Air pollution index	M – 1 SD	**(0.239, 1.018)**	**(0.004, 0.045)**	**(1.002, 1.037)**			(0.990, 1.002)
Neighbourhood IRSAD	M – 1 SD	**0.320**	0.007	1.004	Air pollution index	M	1.000
Air pollution index	M	**(0.012, 0.628)**	(-0.015, 0.029)	(0.990, 1.018)			(0.995, 1.005)
Neighbourhood IRSAD	M – 1 SD	0.012	-0.010	0.988	Air pollution index	M + 1 SD	1.004
Air pollution index	M + 1 SD	(-0.372, 0.396)	(-0.038, 0.017)	(0.971, 1.006)			(0.999, 1.009)
Neighbourhood IRSAD	M	**0.482**	0.014	**1.013**	Air pollution index	M + 2 SD	**1.008**
Air pollution index	M – 1 SD	**(0.186, 0.779)**	(-0.007, 0.035)	**(1.000, 1.026)**			**(1.002, 1.015)**
Neighbourhood IRSAD	M	**0.329**	0.003	1.005			
Air pollution index	M	**(0.100, 0.557)**	(-0.011, 0.017)	(0.995, 1.015)			
Neighbourhood IRSAD	M	0.175	-0.008	0.997			
Air pollution index	M + 1 SD	(-0.066, 0.416)	(-0.018, 0.002)	(0.986, 1.008)			
Neighbourhood IRSAD	M + 1 SD	**0.336**	0.004	1.007			
Air pollution index	M – 1 SD	**(0.081, 0.752)**	(-0.026, 0.035)	(0.989, 1.025)			
Neighbourhood IRSAD	M + 1 SD	**0.337**	-0.002	1.006			
Air pollution index	M	**(0.021, 0.653)**	(-0.025, 0.020)	(0.993, 1.020)			
Neighbourhood IRSAD	M + 1 SD	**0.338**	-0.009	1.006			
Air pollution index	M + 1 SD	**(0.044, 0.632)**	(-0.031, 0.013)	(0.993, 1.019)			

Note. IRSAD, Index of Relative Advantage and Disadvantage; *b*, unstandardised regression coefficient from model with Gaussian variance and identity link functions; e^b = exponentiated regression coefficient from models with Gamma variance and logarithmic link functions; CI, confidence intervals; M, mean; SD, standard deviation. Estimates in bold are significant at a 0.05 two-tailed probability level. Regression coefficients adjusted for other environmental indices, age, sex, English-speaking background, educational attainment, household income, living arrangements, work status, neighbourhood self-selection and medications relevant to a specific outcome. [a] 3-way interaction term, *b* = 0.036, 95% CI: 0.002, 0.071; *p*=.040; [b] 3-way interaction term, *b* = 0.003, 95% CI: 0.0004, 0.005; *p*=.021; [c] 3-way interaction term, e^b = 1.002, 95% CI: 1.000, 1.003; *p*=.028; [d] 2-way interaction term, e^b = 1.003, 95% CI: 1.001, 1.004; *p*=.005.

Table S8b. Associations of neighbourhood physical environment attributes with cardiometabolic health indicators: moderating effects of neighbourhood socio-economic status and air quality (unadjusted for physical activity and sedentary behaviours) – 1.6 km radius street-network buffers

Moderator	Moderator values	Mean arterial pressure (mmHg)[a]	LDL cholesterol (mmol/L)[b]	Triglycerides (mmol/L)[c]	Moderator	Moderator values	HDL cholesterol (mmol/L)
		b (95% CI)	*b* (95% CI)	e^b (95% CI)			e^b (95% CI)
Exposure: Walkability index					***Exposure: Walkability index[d]***		
Neighbourhood IRSAD	M – 1 SD	**0.761**	**0.025**	1.014	Air pollution index	M – 1 SD	0.996
Air pollution index	M – 1 SD	**(0.374, 1.148)**	**(0.0004, 0.050)**	(0.997, 1.031)			(0.990, 1.002)
Neighbourhood IRSAD	M – 1 SD	0.323	0.001	0.999	Air pollution index	M	0.999
Air pollution index	M	(-0.004, 0.650)	(-0.020, 0.022)	(0.985, 1.014)			(0.995, 1.004)
Neighbourhood IRSAD	M – 1 SD	-0.115	0.023	0.985	Air pollution index	M + 1 SD	1.003
Air pollution index	M + 1 SD	(-0.501, 0.270)	(0.048, 0.003)	(0.968, 1.002)			(0.998, 1.008)
Neighbourhood IRSAD	M	**0.601**	0.013	1.010			
Air pollution index	M – 1 SD	**(0.331, 0.871)**	(-0.005, 0.030)	(0.998, 1.022)	***Exposure: Natural environment index[e]***		
Neighbourhood IRSAD	M	**0.385**	0.001	1.002	Air pollution index	M – 1 SD	1.003
Air pollution index	M	**(0.161, 0.609)**	(-0.013, 0.015)	(0.993, 1.012)			(0.995, 1.010)
Neighbourhood IRSAD	M	0.170	-0.010	0.995	Air pollution index	M	0.996
Air pollution index	M + 1 SD	(-0.077, 0.417)	(-0.027, 0.006)	(0.984, 1.006)			(0.989, 1.003)
Neighbourhood IRSAD	M + 1 SD	**0.440**	-0.0001	1.006	Air pollution index	M + 1 SD	**0.990**
Air pollution index	M – 1 SD	**(0.071, 0.809)**	(-0.024, 0.023)	(0.990, 1.023)			**(0.978, 0.999)**
Neighbourhood IRSAD	M + 1 SD	**0.447**	0.001	1.006			
Air pollution index	M	**(0.150, 0.745)**	(-0.018, 0.020)	(0.993, 1.019)			
Neighbourhood IRSAD	M + 1 SD	**0.455**	0.002	1.005			
Air pollution index	M + 1 SD	**(0.148, 0.762)**	(-0.018, 0.021)	(0.992, 1.019)			

Note. IRSAD, Index of Relative Advantage and Disadvantage; *b*, unstandardised regression coefficient from model with Gaussian variance and identity link functions; e^b = exponentiated regression coefficient from models with Gamma variance and logarithmic link functions; CI, confidence intervals; M, mean; SD, standard deviation. Estimates in bold significant at a 0.05 two-tailed probability level. Regression coefficients are adjusted for other environmental indices, age, sex, English-speaking background, educational attainment, household income, living arrangements, work status, neighbourhood self-selection and medications relevant to a specific outcome. [a] 3-way interaction term, *b* = 0.053, 95% CI: 0.021, 0.084; *p*=.001; [b] 3-way interaction term, *b* = 0.003, 95% CI: 0.001, 0.005; *p*=.006; [c] 3-way interaction term, e^b = 1.002, 95% CI: 1.000, 1.003; *p*=.026; [d] 2-way interaction term, e^b = 1.002, 95% CI: 1.000, 1.004; *p*=.012; [e] 2-way interaction term, e^b = 0.996, 95% CI: 0.992, 0.9998; *p*=.042.

Table S9. Associations of neighbourhood environment attributes with cardiometabolic health indicators: direct main effects models (adjusted for physical activity and sedentary behaviours)

Neighbourhood environment attributes	Buffer size (radius)	Waist circumference (cm)	Mean arterial pressure (mmHg)	Glycated haemoglobin (mmol/mol)	HDL cholesterol (mmol/L)	LDL cholesterol (mmol/L)	Triglycerides (mmol/L)
		b (95% CI)	*b* (95% CI)	e^b (95% CI)	e^b (95% CI)	*b* (95% CI)	e^b (95% CI)
Walkability index	500 m	-0.125 (-0.360, 0.110)	**0.320 (0.088, 0.551)**	1.001 (0.999, 1.003)	1.001 (0.997, 1.006)	-0.004 (-0.018, 0.009)	1.006 (0.996, 1.016)
	1.6 km	-0.140 (-0.380, 0.101)	**0.387 (0.162, 0.612)**	**1.003 (1.001, 1.005)**	0.999 (0.995, 1.005)	-0.002 (-0.016, 0.013)	1.003 (0.994, 1.013)
Natural environment index	500 m	**-0.464** (**-0.787, -0.140**)	-0.046 (-0.343, 0.251)	0.999 (0.997, 1.002)	0.998 (0.992, 1.005)	**-0.023 (-0.042, -0.003)**	0.997 (0.984, 1.022)
	1.6 km	**-0.328 (-0.771, -0.084)**	**-0.418 (-0.731, -0.104)**	0.998 (0.995, 1.002)	0.998 (0.992, 1.005)	**-0.022 (-0.042, -0.002)**	1.000 (0.986, 1.013)
Neighbourhood IRSAD	500 m	**-0.421** (**-0.618, -0.225**)	**-0.340 (-0.529, -0.151)**	**1.002 (1.000, 1.004)**	**1.008 (1.005, 1.012)**	0.006 (-0.005, 0.017)	**0.988 (0.980, 0.995)**
	1.6 km	**-0.408 (-0.608, -0.207)**	**-0.340 (-0.553, -0.146)**	**1.002 (1.000, 1.004)**	**1.008 (1.004, 1.012)**	0.008 (-0.004, 0.019)	**0.986 (0.978, 0.994)**
Ambient air pollution index	500 m	**0.397 (0.044, 0.749)**	**-0.426 (-0.763, -0.090)**	**1.005 (1.002, 1.009)**	**0.991 (0.984, 0.998)**	0.004 (-0.016, 0.024)	1.008 (0.995, 1.022)
	1.6 km	**0.428 (0.039, 0.817)**	**-0.651 (-1.013, -0.290)**	1.003 (0.999, 1.007)	**0.992 (0.984, 0.999)**	0.002 (-0.020, 0.025)	1.008 (0.993, 1.013)

Note. IRSAD, Index of Relative Advantage and Disadvantage; *b*, unstandardised regression coefficient from model with Gaussian variance and identity link functions; e^b = exponentiated regression coefficient from models with Gamma variance and logarithmic link functions; CI, confidence intervals. Estimates in bold are significant at a 0.05 two-tailed probability level. All regression coefficients are adjusted for other environmental indices, age, sex, English-speaking background, educational attainment, household income, living arrangements, employment status, work status, neighbourhood self-selection, taking medications relevant to a specific outcome (diabetes, hypertension and/or dyslipidaemia) and physical activity and sedentary behaviour

Table S10a. Associations of neighbourhood physical environment attributes with cardiometabolic health indicators: direct moderating effects of neighbourhood socio-economic status and air quality (adjusted for physical activity and sedentary behaviours) – 500 m radius street-network buffers

Moderator	Moderator values	Mean arterial pressure (mmHg)[a]	Triglycerides (mmol/L)[b]
		b (95% CI)	e^b (95% CI)
Exposure: Walkability index			
Neighbourhood IRSAD	M – 1 SD	**0.623**	**1.020**
Air pollution index	M – 1 SD	**(0.234, 1.011)**	**(1.032, 1.038)**
Neighbourhood IRSAD	M – 1 SD	**0.317**	1.005
Air pollution index	M	**(0.008, 0.625)**	(0.991, 1.018)
Neighbourhood IRSAD	M – 1 SD	0.011	0.989
Air pollution index	M + 1 SD	(-0.374, 0.395)	(0.972, 1.006)
Neighbourhood IRSAD	M	**0.470**	**1.013**
Air pollution index	M – 1 SD	**(0.173, 0.767)**	**(1.000, 1.026)**
Neighbourhood IRSAD	M	**0.320**	1.006
Air pollution index	M	**(0.090, 0.550)**	(0.996, 1.016)
Neighbourhood IRSAD	M	0.170	0.999
Air pollution index	M + 1 SD	(-0.072, 0.412)	(0.988, 1.010)
Neighbourhood IRSAD	M + 1 SD	0.317	1.006
Air pollution index	M – 1 SD	(-0.010, 0.734)	(0.988, 1.024)
Neighbourhood IRSAD	M + 1 SD	**0.323**	1.008
Air pollution index	M	**(0.006, 0.640)**	(0.994, 1.021)
Neighbourhood IRSAD	M + 1 SD	**0.329**	1.009
Air pollution index	M + 1 SD	**(0.034, 0.624)**	(0.996, 1.022)

Note. IRSAD, Index of Relative Advantage and Disadvantage; *b*, unstandardised regression coefficient from model with Gaussian variance and identity link functions; e^b = exponentiated regression coefficient from model with Gamma variance and logarithmic link functions; CI, confidence intervals; M, mean; SD, standard deviation. Estimates in bold are significant at a 0.05 two-tailed probability level. All regression coefficients are adjusted for other environmental indices, age, sex, English-speaking background, educational attainment, household income, living arrangements, work status, neighbourhood self-selection and taking medications relevant to a specific outcome. [a] 3-way interaction term, *b* = 0.037, 95% CI: 0.002, 0.072; *p*=.039; [b] 3-way interaction term, e^b = 1.002, 95% CI: 1.000, 1.004; *p*=.013.

Table S10b. Associations of neighbourhood physical environment attributes with cardiometabolic health indicators: direct moderating effects of neighbourhood socio-economic status and air quality (adjusted for physical activity and sedentary behaviours) – 1.6 km radius street-network buffers

Moderator	Moderator values	Mean arterial pressure (mmHg)[a]	Triglycerides (mmol/L)[b]	Moderator	Moderator values	HDL cholesterol (mmol/L)
		b (95% CI)	e^b (95% CI)			e^b (95% CI)
Exposure: Walkability index				***Exposure: Natural environment index[c]***		
Neighbourhood IRSAD	M – 1 SD	**0.757**	1.014	Air pollution index	M – 1 SD	1.003
Air pollution index	M – 1 SD	**(0.372, 1.143)**	(0.997, 1.031)			(0.995, 1.010)
Neighbourhood IRSAD	M – 1 SD	0.328	0.999	Air pollution index	M	0.996
Air pollution index	M	(0.002, 0.653)	(0.986, 1.014)			(0.986, 1.003)
Neighbourhood IRSAD	M – 1 SD	-0.102	0.986	Air pollution index	M + 1 SD	**0.988**
Air pollution index	M + 1 SD	(-0.487, 0.282)	(0.969, 1.003)			**(0.978, 0.999)**
Neighbourhood IRSAD	M	**0.596**	1.010			
Air pollution index	M – 1 SD	**(0.326, 0.866)**	(0.998, 1.021)			
Neighbourhood IRSAD	M	**0.387**	1.003			
Air pollution index	M	**(0.163, 0.611)**	(0.994, 1.013)			
Neighbourhood IRSAD	M	0.178	0.997			
Air pollution index	M + 1 SD	(-0.069 0.425)	(0.986, 1.008)			
Neighbourhood IRSAD	M + 1 SD	**0.435**	1.005			
Air pollution index	M – 1 SD	**(0.066, 0.804)**	(0.990, 1.022)			
Neighbourhood IRSAD	M + 1 SD	**0.446**	1.007			
Air pollution index	M	**(0.149, 0.743)**	(0.994, 1.020)			
Neighbourhood IRSAD	M + 1 SD	**0.458**	1.008			
Air pollution index	M + 1 SD	**(0.151, 0.764)**	(0.995, 1.022)			

Note. IRSAD, Index of Relative Advantage and Disadvantage; *b*, unstandardised regression coefficient from model with Gaussian variance and identity link functions; e^b = exponentiated regression coefficient from models with Gamma variance and logarithmic link functions; CI, confidence intervals; M, mean; SD, standard deviation. Estimates in bold significant at a 0.05 two-tailed probability level. Regression coefficients are adjusted for other environmental indices, age, sex, English-speaking background, educational attainment, household income, living arrangements, work status, neighbourhood self-selection and medications relevant to a specific outcome. [a] 3-way interaction term, *b* = 0.052, 95% CI: 0.021, 0.084; *p*=.001; [b] 3-way interaction term, e^b = 1.002, 95% CI: 1.000, 1.003; *p*=.014; [c] 2-way interaction term, e^b = 0.995, 95% CI: 0.992, 0.999; *p*=.020.

Table S11a. Associations of neighbourhood environmental attributes (500 m radius street-network buffers) with behaviours and of behaviours with cardiometabolic health indicators

Models	Outcome	Exposure	Moderator(s)	Moderator value(s)	Reg coef.	95% CI	*p*
3.1	Walking for transport (engagement)[a]	Walkability index	None		**1.084**	**1.040, 1.130**	**<.001**
		Natural environment index	None		0.948	0.887, 1.014	.120
		Neighbourhood IRSAD	n/a		1.013	0.978, 1.049	.479
		Air pollution index	n/a		**1.194**	**1.122, 1.271**	**<.001**
	Walking for transport (non-zero frequency)[b]	Walkability index	None		**1.027**	**1.009, 1.045**	**.003**
		Natural environment index	None		1.016	0.980, 1.053	.390
		Neighbourhood IRSAD	n/a		0.996	0.979, 1.012	.593
		Air pollution index	n/a		1.010	0.982, 1.039	.478
	Walking for recreation (engagement)[a]	Walkability index	None		**1.050**	**1.009, 1.093**	**.016**
		Natural environment index	None		1.005	0.952, 1.061	.857
		Neighbourhood IRSAD	n/a		1.010	0.978, 1.043	.531
		Air pollution index	n/a		0.975	0.921, 1.033	.394
	Walking for recreation (non-zero frequency)[b]	Walkability index	None		1.008	0.995, 1.021	.224
		Natural environment index	None		0.998	0.980, 1.016	.807
		Neighbourhood IRSAD	n/a		0.994	0.983, 1.005	.281
		Air pollution index	n/a		0.997	0.978, 1.016	.753
	Vigorous gardening (engagement)[a]	Walkability index	None		**0.885**	**0.849, 0.922**	**<.001**
		Natural environment index	None		0.954	0.903, 1.009	.098
		Neighbourhood IRSAD	n/a		1.026	0.995, 1.059	.105
		Air pollution index	n/a		0.998	0.944, 1.055	.950
	Vigorous gardening (non-zero frequency)[b]	Walkability index	Air pollution index	M – 1 SD	**0.925**	**0.899, 0.952**	**<.001**
				M	**0.953**	**0.932, 0.974**	**<.001**
				M + 1 SD	0.981	0.956, 1.007	.151
			Interaction term		**1.019**	**1.009, 1.029**	**<.001**
		Natural environment index	None		**0.966**	**0.934, 0.999**	**.044**
		Neighbourhood IRSAD	n/a		1.010	0.993, 1.028	.255
		Air pollution index	n/a		1.006	0.976, 1.038	.683

Resistance training (engagement)[a]	Walkability index	None	**1.040**	**1.002, 1.081**	**.041**
	Natural environment index	None	**1.059**	**1.005, 1.116**	**.033**
	Neighbourhood IRSAD	n/a	**1.049**	**1.016, 1.084**	**.004**
	Air pollution index	n/a	1.031	0.974, 1.090	.291
Resistance training (non-zero frequency)[b]	Walkability index	None	1.010	0.990, 1.031	.332
	Natural environment index	None	1.010	0.984, 1.037	.444
	Neighbourhood IRSAD	n/a	**0.983**	**0.966, 0.999**	**.045**
	Air pollution index	n/a	1.001	0.971, 1.031	.972
Sitting for transport (hr/day)[b]	Walkability index	None	0.988	0.971, 1.005	.151
	Natural environment index	None	0.995	0.972, 1.019	.691
	Neighbourhood IRSAD	n/a	**1.036**	**1.022, 1.050**	**<.001**
	Air pollution index	n/a	0.995	0.970, 1.020	.675
	Walking for transport (engagement)	None	1.010	0.894, 1.141	.872
	Walking for transport (frequency)	None	1.001	0.975, 1.028	.951
Leisure-time sitting (hr/day)[b]	Walkability index	None	0.998	0.986, 1.010	.776
	Natural environment index	None	**0.983**	**0.967, 0.999**	**.038**
	Neighbourhood IRSAD	n/a	**0.989**	**0.980, 0.999**	**.028**
	Air pollution index	n/a	1.009	0.992, 1.026	.316
	Walking for transport (engagement)	None	**0.872**	**0.801, 0.950**	**.002**
	Walking for transport (frequency)	None	1.012	0.993, 1.031	.212
	Walking for recreation (engagement)	None	**0.939**	**0.876, 1.000**	**.049**
	Walking for recreation (frequency)	None	1.002	0.989, 1.015	.778
	Vigorous gardening (engagement)	None	1.027	0.961, 1.098	.424
	Vigorous gardening (frequency)	None	**0.962**	**0.941, 0.985**	**.001**
	Resistance training (engagement)	None	0.922	0.846, 1.005	.065
	Resistance training (frequency)	None	1.009	0.987, 1.031	.444

Models	Outcome	Exposure	Moderator(s)	Reg coef.	95% CI	*P*
3.2	Waist circumference (cm)[c]	Walking for transport (engagement)	None	**-1.557**	**-3.111, -0.004**	**.048**
		Walking for transport (frequency)	None	0.030	-0.328, 0.388	.869
		Walking for recreation (engagement)	None	-0.988	-2.332, 0.357	.150
		Walking for recreation (frequency)	None	**-0.348**	**-0.607, -0.090**	**.008**
		Vigorous gardening (engagement)	None	-0.719	-1.998, 0.560	.271
		Vigorous gardening (frequency)	None	-0.027	-0.470, 0.417	.906
		Resistance training (engagement)	None	**-3.193**	**-4.855, -1.530**	**<.001**
		Resistance training (frequency)	None	-0.072	-0.492, 0.348	.737
		Sitting for transport	None	**0.540**	**0.004, 1.076**	**.048**
		Leisure-time sitting	None	**0.806**	**0.453, 1.159**	**<.001**
	Mean arterial pressure (mmHg)[c]	Walking for transport (engagement)	None	-0.107	-1.607, 1.393	.889
		Walking for transport (frequency)	None	-0.001	-0.327, 0.325	.996
		Walking for recreation (engagement)	None	0.527	-0.695, 1.748	.398
		Walking for recreation (frequency)	None	-0.190	-0.425, 0.045	.113
		Vigorous gardening (engagement)	None	0.325	-0.837, 1.488	.583
		Vigorous gardening (frequency)	None	-0.175	-0.578, 0.229	.396
		Resistance training (engagement)	None	0.335	-1.189, 1.838	.674
		Resistance training (frequency)	None	-0.079	-0.461, 0.303	.684
		Sitting for transport	None	0.017	-0.470, 0.505	.945
		Leisure-time sitting	None	0.247	-0.074, 0.568	.131
	Glycated haemoglobin (mmol/mol)[b]	Walking for transport (engagement)	None	0.996	0.982, 1.009	.531
		Walking for transport (frequency)	None	1.000	0.997, 1.003	.857
		Walking for recreation (engagement)	None	1.000	0.989. 1.011	.986
		Walking for recreation (frequency)	None	0.999	0.997, 1.001	.321
		Vigorous gardening (engagement)	None	0.995	0.985, 1.005	.348
		Vigorous gardening (frequency)	None	1.002	0.998, 1.005	.310
		Resistance training (engagement)	None	0.990	0.977, 1.004	.166
		Resistance training (frequency)	None	0.998	0.994, 1.001	.197
		Sitting for transport	None	**1.006**	**1.001, 1.010**	**.014**
		Leisure-time sitting	None	**1.003**	**1.000, 1.005**	**.048**
	HDL cholesterol (mmol/L)[b]	Walking for transport (engagement)	None	**1.032**	**1.000, 1.065**	**.045**
		Walking for transport (frequency)	None	0.997	0.990, 1.004	.428

	Walking for recreation (engagement)	None	1.011	0.985, 1.037	.420
	Walking for recreation (frequency)	None	**1.007**	**1.002, 1.012**	**.009**
	Vigorous gardening (engagement)	None	1.007	0.982, 1.032	.594
	Vigorous gardening (frequency)	None	0.999	0.990, 1.007	.744
	Resistance training (engagement)	None	**1.059**	**1.025, 1.093**	**<.001**
	Resistance training (frequency)	None	0.994	0.986, 1.002	.138
	Sitting for transport	None	**0.990**	**0.980, 1.000**	**.050**
	Leisure-time sitting	None	**0.988**	**0.981, 0.995**	**<.001**
LDL cholesterol (mmol/L)[c]	Walking for transport (engagement)	None	-0.075	-0.176, 0.026	.144
	Walking for transport (frequency)	None	**0.024**	**0.002, 0.045**	**.035**
	Walking for recreation (engagement)	None	0.035	-0.048, 0.117	.409
	Walking for recreation (frequency)	None	0.003	-0.012, 0.019	.681
	Vigorous gardening (engagement)	None	-0.022	-0.100, 0.056	.576
	Vigorous gardening (frequency)	None	0.013	-0.015, 0.040	.365
	Resistance training (engagement)	None	-0.040	-0.141, 0.062	.444
	Resistance training (frequency)	None	-0.002	-0.027, 0.024	.902
	Sitting for transport	None	0.008	-0.024, 0.041	.620
	Leisure-time sitting	None	0.005	-0.016, 0.027	.643
Triglycerides (mmol/L)[b]	Walking for transport (engagement)	None	0.968	0.903, 1.038	.363
	Walking for transport (frequency)	None	0.998	0.982, 1.013	.751
	Walking for recreation (engagement)	None	0.996	0.941, 1.055	.894
	Walking for recreation (frequency)	None	**0.984**	**0.973, 0.995**	**.003**
	Vigorous gardening (engagement)	None	0.998	0.946, 1.054	.957
	Vigorous gardening (frequency)	None	0.993	0.974, 1.012	.458
	Resistance training (engagement)	None	**0.878**	**0.818, 0.943**	**<.001**
	Resistance training (frequency)	None	1.004	0.986, 1.022	.689
	Sitting for transport	None	1.008	0.985, 1.031	.517
	Leisure-time sitting	None	**1.028**	**1.013, 1.044**	**<.001**

Note. IRSAD, Index of Relative Social Advantage and Disadvantage (a measure of neighbourhood socio-economic status); Reg coef., regression coefficient; CI, confidence intervals; *p*, *p*-value; M, mean; SD, standard deviation; n/a, not applicable. [a] values represent odds ratios (OR); [b] values represent exponentiated regression coefficients (e^b); [c] values represent untransformed regression coefficients (*b*).
Estimates in bold are significant at a 0.05 two-tailed probability level. Confounders and covariates for models 3.1 and 3.2 are reported in Table S1.

Table S11b. Associations of neighbourhood environmental attributes (1.6 km radius street-network buffers) with behaviours and of behaviours with cardiometabolic health indicators

Models	Outcome	Exposure	Moderator(s)	Moderator value(s)	Reg coef.	95% CI	*p*
3.1	Walking for transport (engagement)[a]	Walkability index	None		**1.076**	**1.030, 1.124**	**<.001**
		Natural environment index	None		**0.909**	**0.844, 0.979**	**.012**
		Neighbourhood IRSAD	n/a		1.022	0.985, 1.059	.246
		Air pollution index	n/a		**1.170**	**1.091, 1.254**	**<.001**
	Walking for transport (non-zero frequency)[b]	Walkability index	None		**1.027**	**1.009, 1.045**	**.003**
		Natural environment index	None		1.016	0.980, 1.053	.390
		Neighbourhood IRSAD	n/a		0.996	0.979, 1.012	.593
		Air pollution index	n/a		1.010	0.982, 1.039	.478
	Walking for recreation (engagement)[a]	Walkability index	None		1.023	0.983, 1.065	.255
		Natural environment index	None		0.958	0.906, 1.013	.129
		Neighbourhood IRSAD	n/a		1.011	0.979, 1.045	.496
		Air pollution index	n/a		0.981	0.921, 1.045	.546
	Walking for recreation (non-zero frequency)[b]	Walkability index	None		1.008	0.995, 1.021	.224
		Natural environment index	None		0.998	0.980, 1.016	.807
		Neighbourhood IRSAD	n/a		0.994	0.983, 1.005	.281
		Air pollution index	n/a		0.997	0.978, 1.016	.753
	Vigorous gardening (engagement)[a]	Walkability index	Neighbourhood IRSAD	M – 1 SD	0.982	0.926, 1.040	.527
				M	**0.932**	**0.895, 0.971**	**<.001**
				M + 1 SD	**0.885**	**0.843, 0.930**	**<.001**
			Interaction term		**0.981**	**0.968, 0.994**	**.004**
		Natural environment index	None		1.000	0.946, 1.057	.996
		Neighbourhood IRSAD	n/a		1.030	0.997, 1.064	.076
		Air pollution index	n/a		0.995	0.935, 1.061	.899
	Vigorous gardening (non-zero frequency)[b]	Walkability index	Air pollution index	M – 1 SD	**0.925**	**0.899, 0.952**	**<.001**
				M	**0.953**	**0.932, 0.974**	**<.001**
				M + 1 SD	0.981	0.956, 1.007	.151
			Interaction term		**1.019**	**1.009, 1.029**	**<.001**
		Natural environment index	None		0.971	0.939, 1.004	.081

	Neighbourhood IRSAD	n/a		1.006	0.989, 1.024	.472
	Air pollution index	n/a		1.010	0.980, 1.042	.515
Resistance training (engagement)[a]	Walkability index	Air pollution index	M – 1 SD	0.991	0.944, 1.041	.714
			M	1.016	0.976, 1.056	.444
			M + 1 SD	1.041	0.997, 1.086	.066
		Interaction term		**1.016**	**1.001, 1.031**	**.040**
	Natural environment index	None		**1.071**	**1.015, 1.132**	**.013**
	Neighbourhood IRSAD	n/a		**1.039**	**1.005, 1.075**	**.023**
	Air pollution index	n/a		1.036	0.974, 1.103	.261
Resistance training (non-zero frequency)[b]	Walkability index	None		1.010	0.990, 1.031	.322
	Natural environment index	None		1.010	0.984, 1.037	.444
	Neighbourhood IRSAD	n/a		**0.983**	**0.966, 0.999**	**.045**
	Air pollution index	n/a		1.001	0.971, 1.031	.972
Sitting for transport (hr/day)[b]	Walkability index	None		**0.980**	**0.963, 0.997**	**.021**
	Natural environment index	None		1.010	0.985, 1.035	.427
	Neighbourhood IRSAD	n/a		**1.032**	**1.018, 1.047**	**<.001**
	Air pollution index	n/a		1.007	0.979, 1.035	.639
	Walking for transport (engagement)	None		1.012	0.895, 1.143	.853
	Walking for transport (frequency)	None		1.001	0.975, 1.028	.953
Leisure-time sitting (hr/day)[b]	Walkability index	None		0.992	0.980, 1.003	.136
	Natural environment index	None		0.996	0.980, 1.013	.672
	Neighbourhood IRSAD	n/a		**0.988**	**0.978, 0.997**	**.013**
	Air pollution index	n/a		1.016	0.997, 1.035	.093
	Walking for transport (engagement)	None		**0.875**	**0.803, 0.952**	**.002**
	Walking for transport (frequency)	None		1.012	0.994, 1.031	.198
	Walking for recreation (engagement)	None		0.939	0.876, 1.006	.064
	Walking for recreation (frequency)	None		1.002	0.989, 1.016	.442

		Vigorous gardening (engagement)	None	1.027	0.961, 1.098	.425
		Vigorous gardening (frequency)	None	**0.961**	**0.940, 0.983**	**<.001**
		Resistance training (engagement)	None	0.922	0.846, 1.005	.064
		Resistance training (frequency)	None	1.009	0.987, 1.031	.442
Models	**Outcome**	**Exposure**	**Moderator(s)**	**Reg coef.**	**95% CI**	***P***
3.2	Waist circumference (cm)[c]	Walking for transport (engagement)	None	**-1.559**	**-3.110, -0.009**	**.044**
		Walking for transport (frequency)	None	0.029	-0.328, 0.387	.873
		Walking for recreation (engagement)	None	-1.030	-2.374, 0.314	.133
		Walking for recreation (frequency)	None	**-0.348**	**-0.607, -0.090**	**.008**
		Vigorous gardening (engagement)	None	-0.676	-1.954, 0.603	.300
		Vigorous gardening (frequency)	None	-0.033	-0.477, 0.411	.884
		Resistance training (engagement)	None	**-3.197**	**-4.860, -1.535**	**<.001**
		Resistance training (frequency)	None	-0.070	-0.490, 0.349	.742
		Sitting for transport	None	**0.543**	**0.007, 1.080**	**.047**
		Leisure-time sitting	None	**0.811**	**0.458, 1.163**	**<.001**
	Mean arterial pressure (mmHg)[c]	Walking for transport (engagement)	None	-0.196	-1.693, 1.301	.798
		Walking for transport (frequency)	None	0.014	-0.311, 0.339	.931
		Walking for recreation (engagement)	None	0.551	-0.667, 1.770	.375
		Walking for recreation (frequency)	None	-0.194	-0.429, 0.040	.104
		Vigorous gardening (engagement)	None	0.242	-0.918, 1.402	.682
		Vigorous gardening (frequency)	None	-0.141	-0.544, 0.263	.494
		Resistance training (engagement)	None	0.387	-1.123, 1.897	.615
		Resistance training (frequency)	None	-0.081	-0.462, 0.300	.676
		Sitting for transport	None	0.028	-0.459, 0.514	.911
		Leisure-time sitting	None	0.267	-0.053, 0.587	.102
	Glycated haemoglobin (mmol/mol)[b]	Walking for transport (engagement)	None	0.995	0.982, 1.009	.504
		Walking for transport (frequency)	None	1.000	0.997, 1.003	.880
		Walking for recreation (engagement)	None	1.000	0.989. 1.011	.987
		Walking for recreation (frequency)	None	0.999	0.997, 1.001	.290
		Vigorous gardening (engagement)	None	0.995	0.985, 1.005	.338
		Vigorous gardening (frequency)	None	1.002	0.998, 1.006	.260

	Resistance training (engagement)	None	0.991	0.977, 1.004	.174
	Resistance training (frequency)	None	0.998	0.994, 1.001	.185
	Sitting for transport	None	**1.006**	**1.001, 1.010**	**.012**
	Leisure-time sitting	None	**1.003**	**1.000, 1.006**	**.049**
HDL cholesterol (mmol/L)[b]	Walking for transport (engagement)	None	1.032	0.999, 1.065	.055
	Walking for transport (frequency)	None	0.997	0.991, 1.004	.456
	Walking for recreation (engagement)	None	1.011	0.985, 1.037	.419
	Walking for recreation (frequency)	None	**1.007**	**1.002, 1.012**	**.008**
	Vigorous gardening (engagement)	None	1.007	0.982, 1.032	.606
	Vigorous gardening (frequency)	None	0.998	0.990, 1.007	.718
	Resistance training (engagement)	None	**1.059**	**1.026, 1.094**	**<.001**
	Resistance training (frequency)	None	0.994	0.986, 1.002	.140
	Sitting for transport	None	0.990	0.980, 1.000	.058
	Leisure-time sitting	None	**0.988**	**0.981, 0.995**	**<.001**
LDL cholesterol (mmol/L)[c]	Walking for transport (engagement)	None	-0.075	-0.176, 0.025	.142
	Walking for transport (frequency)	None	**0.023**	**0.001, 0.045**	**.036**
	Walking for recreation (engagement)	None	0.033	-0.049, 0.115	.432
	Walking for recreation (frequency)	None	0.003	-0.013, 0.019	.703
	Vigorous gardening (engagement)	None	-0.020	-0.098, 0.058	.618
	Vigorous gardening (frequency)	None	0.013	-0.014, 0.040	.359
	Resistance training (engagement)	None	-0.039	-0.141, 0.062	.448
	Resistance training (frequency)	None	-0.002	-0.027, 0.024	.899
	Sitting for transport	None	0.009	-0.024, 0.042	.589
	Leisure-time sitting	None	0.005	-0.016, 0.027	.613
Triglycerides (mmol/L)[b]	Walking for transport (engagement)	None	0.967	0.902, 1.038	.355
	Walking for transport (frequency)	None	0.998	0.983, 1.013	.785
	Walking for recreation (engagement)	None	0.998	0.942, 1.056	.932
	Walking for recreation (frequency)	None	**0.984**	**0.973, 0.995**	**.003**
	Vigorous gardening (engagement)	None	0.998	0.945, 1.054	.940
	Vigorous gardening (frequency)	None	0.993	0.974, 1.012	.476
	Resistance training (engagement)	None	**0.879**	**0.818, 0.943**	**<.001**
	Resistance training (frequency)	None	1.004	0.986, 1.022	.670
	Sitting for transport	None	1.008	0.985, 1.031	.517
	Leisure-time sitting	None	**1.029**	**1.013, 1.044**	**<.001**

Note. IRSAD, Index of Relative Social Advantage and Disadvantage (a measure of neighbourhood socio-economic status); Reg coef., regression coefficient; CI, confidence intervals; *p*, *p*-value; M, mean; SD, standard deviation; n/a, not applicable. [a] values represent odds ratios (OR); [b] values represent exponentiated regression coefficients (e^b); [c] values represent untransformed regression coefficients (*b*).
Estimates in bold are significant at a 0.05 two-tailed probability level. Confounders and covariates for models 3.1 and 3.2 are reported in Table S1.

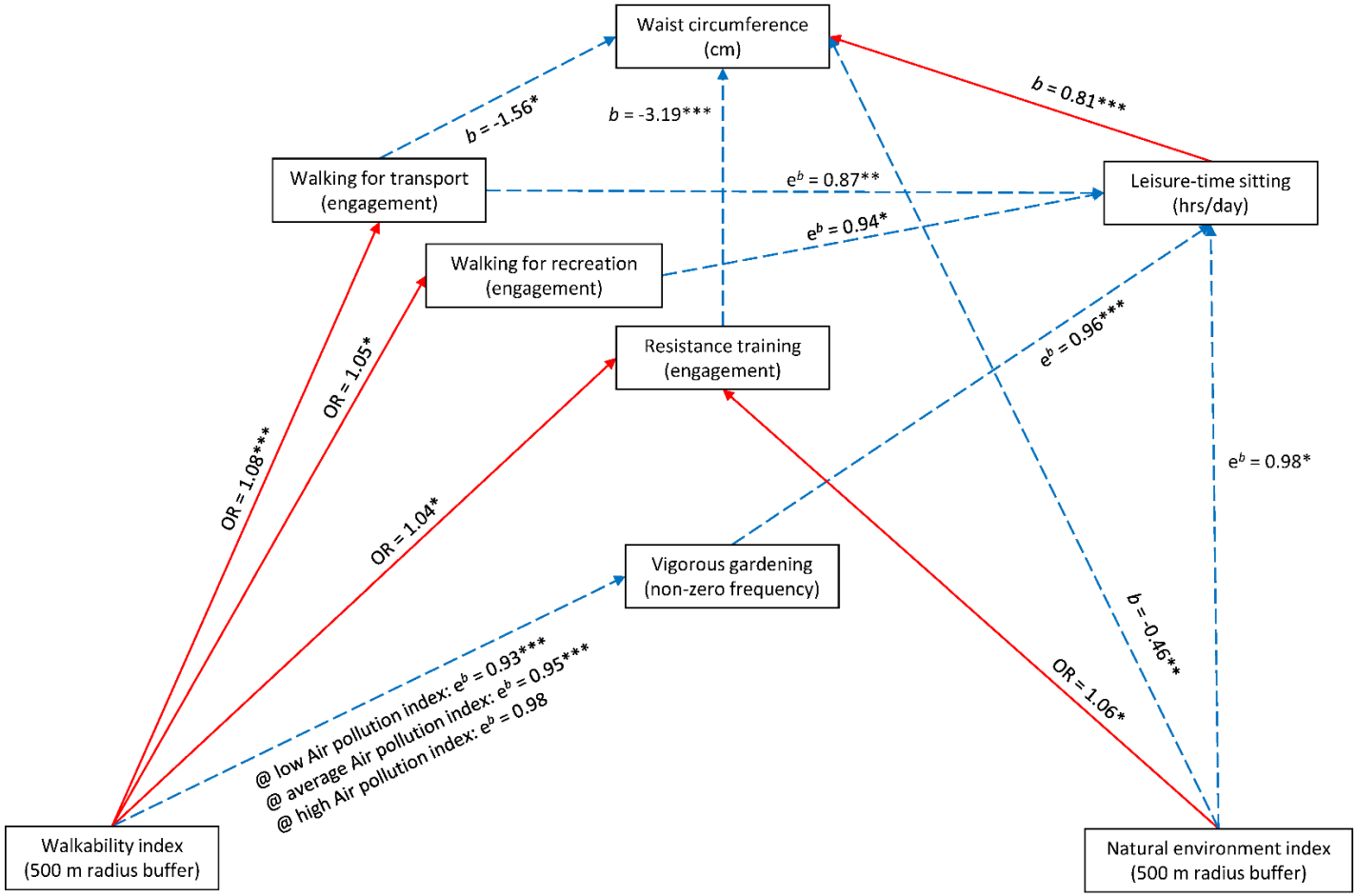


Figure S5a. Direct and indirect (behaviour-mediated) associations of the neighbourhood built and natural environment (measures based on 500 m radius street-network buffers) with waist circumference (cm). Arrows linking variables indicate significant associations. Red full arrows denote positive associations, while blue dashed arrows denote negative associations. @ denotes an association moderated by the Air pollution index and estimates of the association are given at different values of the Air pollution index (low = 1 standard deviation below the mean; average = mean; high = 1 standard deviation above the mean). OR = odds ratio from models with binomial variance and logit link functions (engagement in walking for different purposes and resistance training); *b* = regression coefficient from models with Gaussian variance and identify link functions (waist circumference); e^b = exponentiated regression coefficient from models with Gamma variance and logarithmic link functions (leisure-time sitting and non-zero frequency of vigorous gardening). * p<.05; ** p<.01; ***p< .001. Regression coefficients and their 95% confidence intervals are presented in Tables S9, S10a and S11a. Estimates of path coefficients were obtained using a set of regression models (one for each mediator and cardiometabolic health indicator) rather than simultaneously.

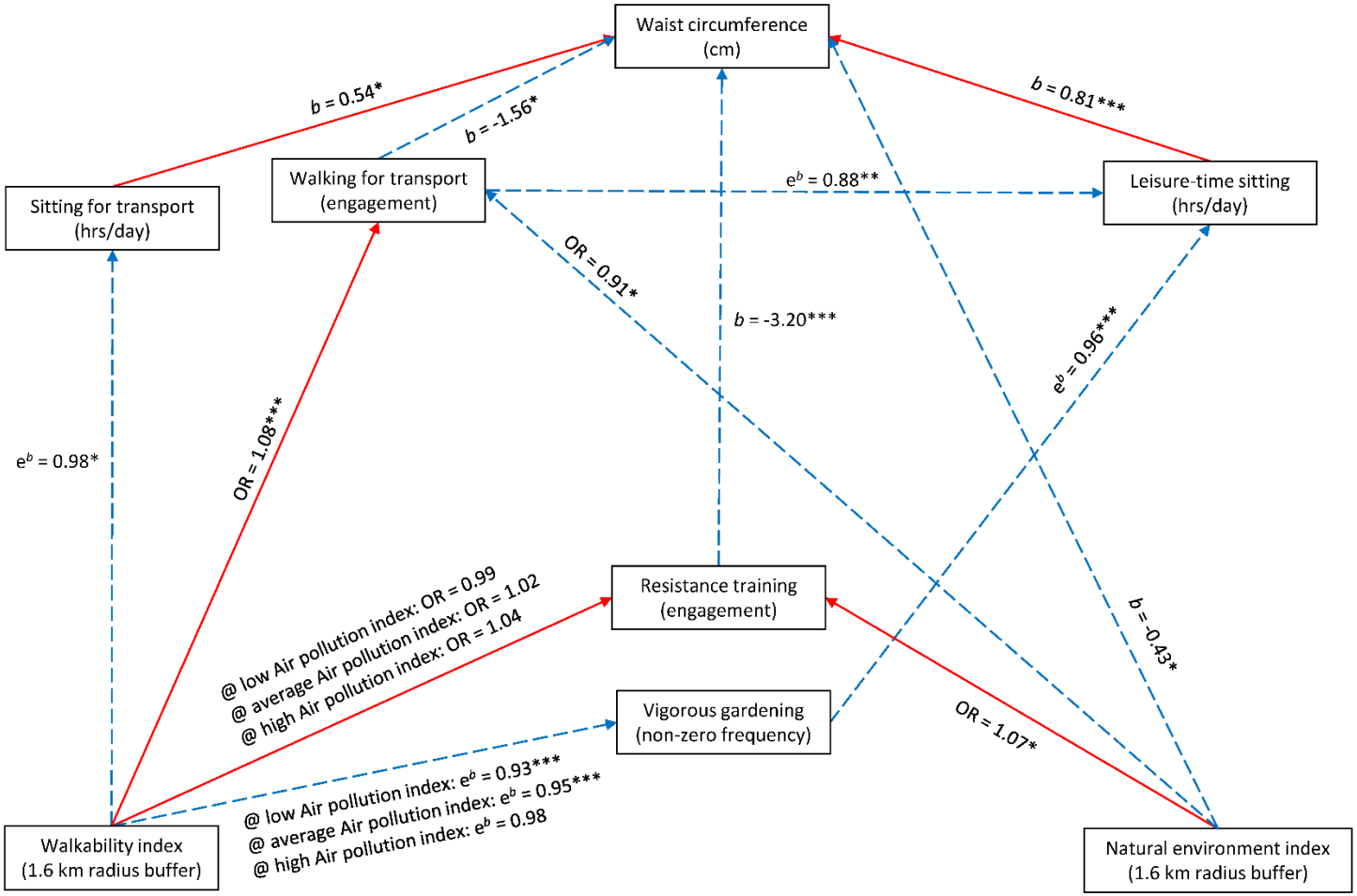


Figure S5b. Direct and indirect (behaviour-mediated) associations of the neighbourhood built and natural environment (measures based on 1.6 km radius street-network buffers) with waist circumference (cm). Arrows linking variables indicate significant associations. Red full arrows denote positive associations, while blue dashed arrows denote negative associations. @ denotes an association moderated by the Air pollution index and estimates of the association are given at different values of the Air pollution index (low = 1 standard deviation below the mean; average = mean; high = 1 standard deviation above the mean). OR = odds ratio from models with binomial variance and logit link functions (engagement in walking for transport and resistance training); *b* = regression coefficient from models with Gaussian variance and identify link functions (waist circumference); e^b = exponentiated regression coefficient from models with Gamma variance and logarithmic link functions (sitting for different purposes and non-zero frequency of vigorous gardening). * p<.05; ** p<.01; ***p< .001. Regression coefficients and their 95% confidence intervals are presented in Tables S9, S10b and S11b. Estimates of path coefficients were obtained using a set of regression models (one for each mediator and cardiometabolic health indicator) rather than simultaneously.

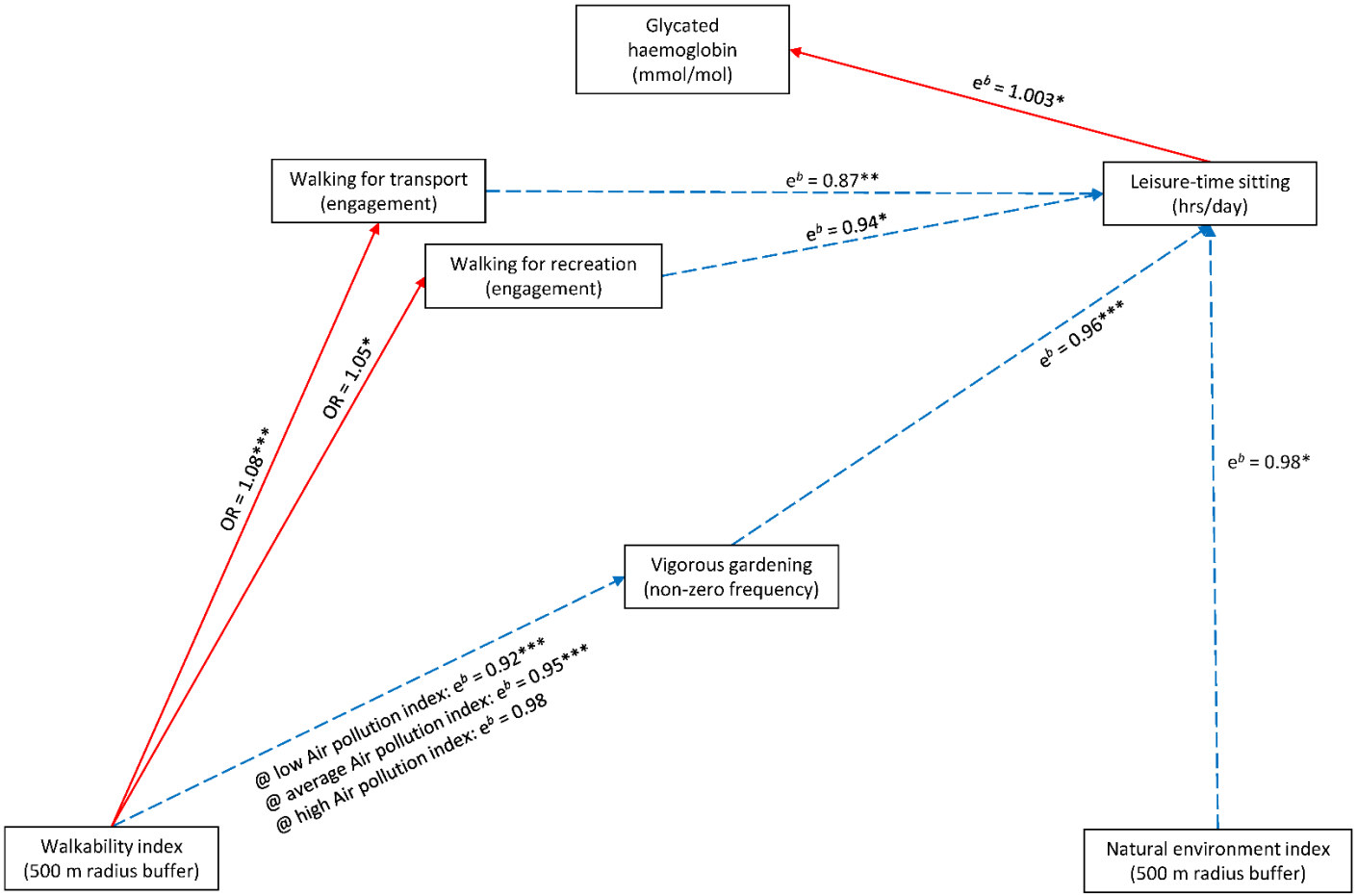


Figure S6a. Direct and indirect (behaviour-mediated) associations of the neighbourhood built and natural environment (measures based on 500 m radius street-network buffers) with glycated haemoglobin (mmol/mol). Arrows linking variables indicate significant associations. Red full arrows denote positive associations, while blue dashed arrows denote negative associations. @ denotes an association moderated by the Air pollution index and estimates of the association are given at different values of the Air pollution index (low = 1 standard deviation below the mean; average = mean; high = 1 standard deviation above the mean). OR = odds ratio from models with binomial variance and logit link functions (engagement in walking for different purposes); e^b = exponentiated regression coefficient from models with Gamma variance and logarithmic link functions (leisure-time sitting and non-zero frequency of vigorous gardening). * p<.05; ** p<.01; ***p< .001. Regression coefficients and their 95% confidence intervals are presented in Tables S9, S10a and S11a. Estimates of path coefficients were obtained using a set of regression models (one for each mediator and cardiometabolic health indicator) rather than simultaneously.

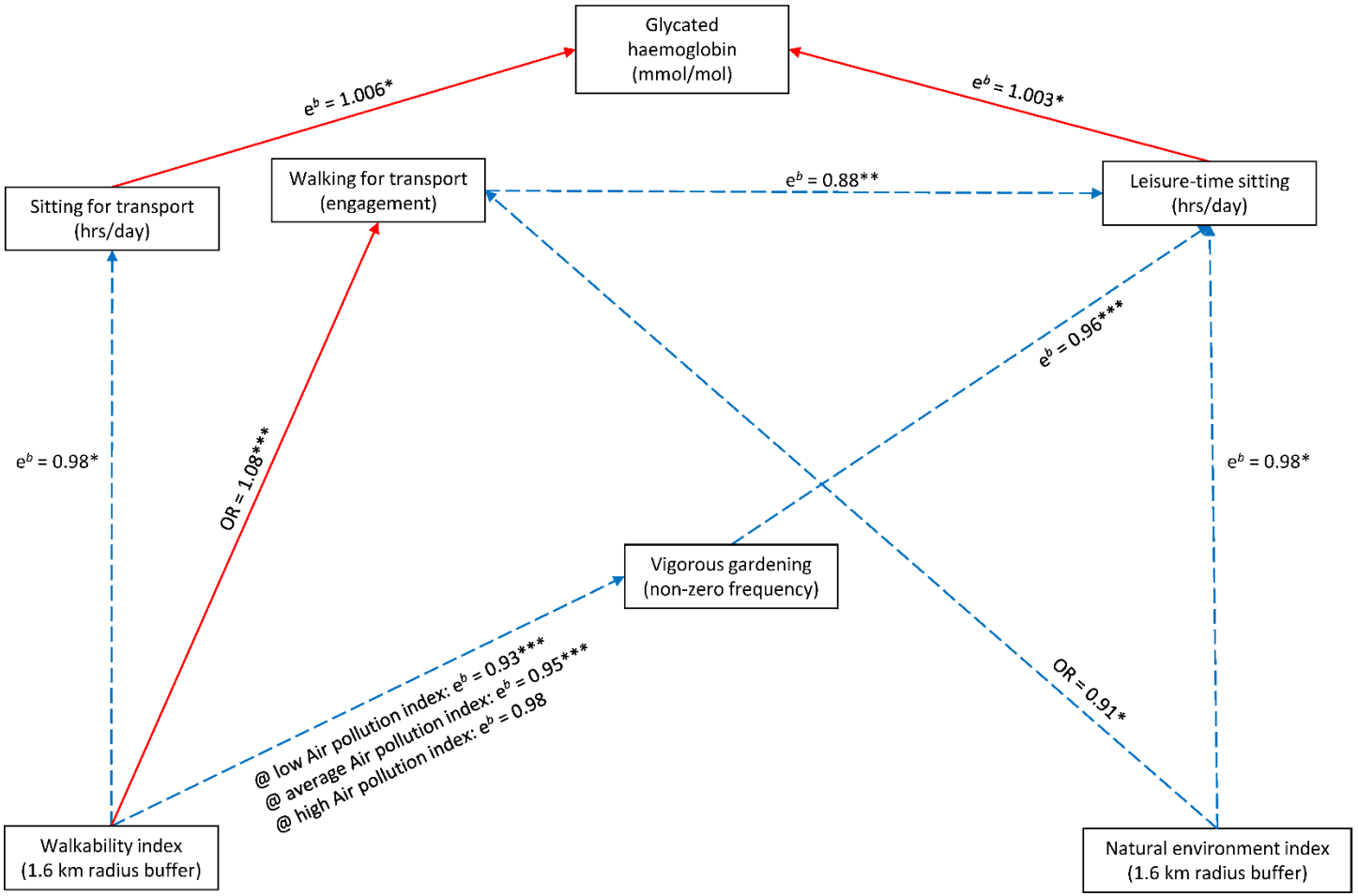


Figure S6b. Direct and indirect (behaviour-mediated) associations of the neighbourhood built and natural environment (measures based on 1.6 km radius street-network buffers) with glycated haemoglobin (mmol/mol). Arrows linking variables indicate significant associations. Red full arrows denote positive associations, while blue dashed arrows denote negative associations. @ denotes an association moderated by the Air pollution index and estimates of the association are given at different values of the Air pollution index (low = 1 standard deviation below the mean; average = mean; high = 1 standard deviation above the mean). OR = odds ratio from models with binomial variance and logit link functions (engagement in walking for transport); e^b = exponentiated regression coefficient from models with Gamma variance and logarithmic link functions (sitting for different purposes, non-zero frequency of vigorous gardening and glycated haemoglobin). * p<.05; ** p<.01; ***p< .001. Regression coefficients and their 95% confidence intervals are presented in Tables S9, S10b and S11b. Estimates of path coefficients were obtained using a set of regression models (one for each mediator and cardiometabolic health indicator) rather than simultaneously.

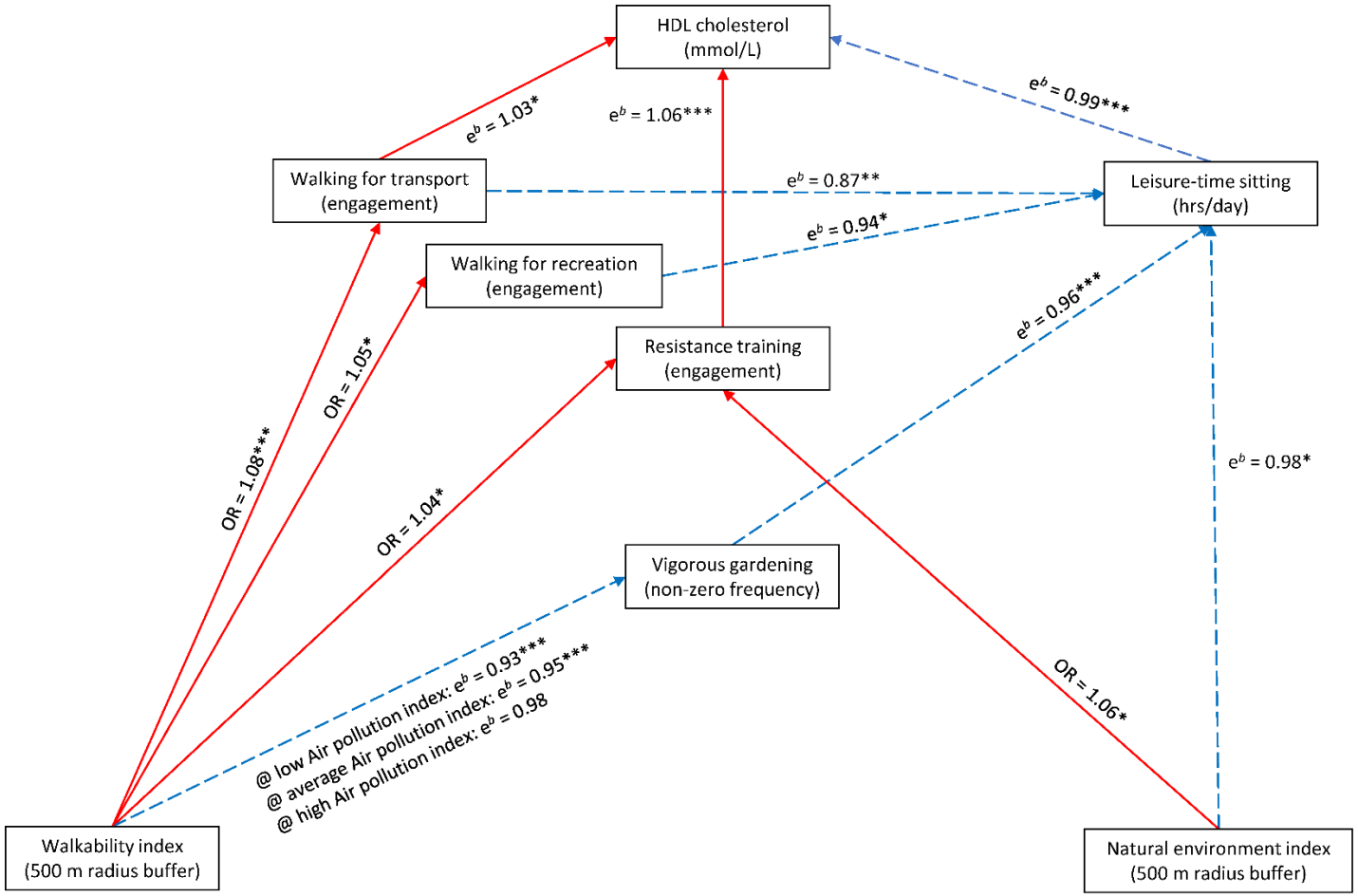


Figure S7a. Direct and indirect (behaviour-mediated) associations of the neighbourhood built and natural environment (measures based on 500 m radius street-network buffers) with HDL cholesterol (mmol/L). Arrows linking variables indicate significant associations. Red full arrows denote positive associations, while blue dashed arrows denote negative associations. @ denotes an association moderated by the Air pollution index and estimates of the association are given at different values of the Air pollution index (low = 1 standard deviation below the mean; average = mean; high = 1 standard deviation above the mean). OR = odds ratio from models with binomial variance and logit link functions (engagement in walking for different purposes and resistance training); e^b = exponentiated regression coefficient from models with Gamma variance and logarithmic link functions (leisure-time sitting, non-zero frequency of vigorous gardening and HDL cholesterol). * p<.05; ** p<.01; ***p< .001. Regression coefficients and their 95% confidence intervals are presented in Tables S9, S10a and S11a. Estimates of path coefficients were obtained using a set of regression models (one for each mediator and cardiometabolic health indicator) rather than simultaneously.

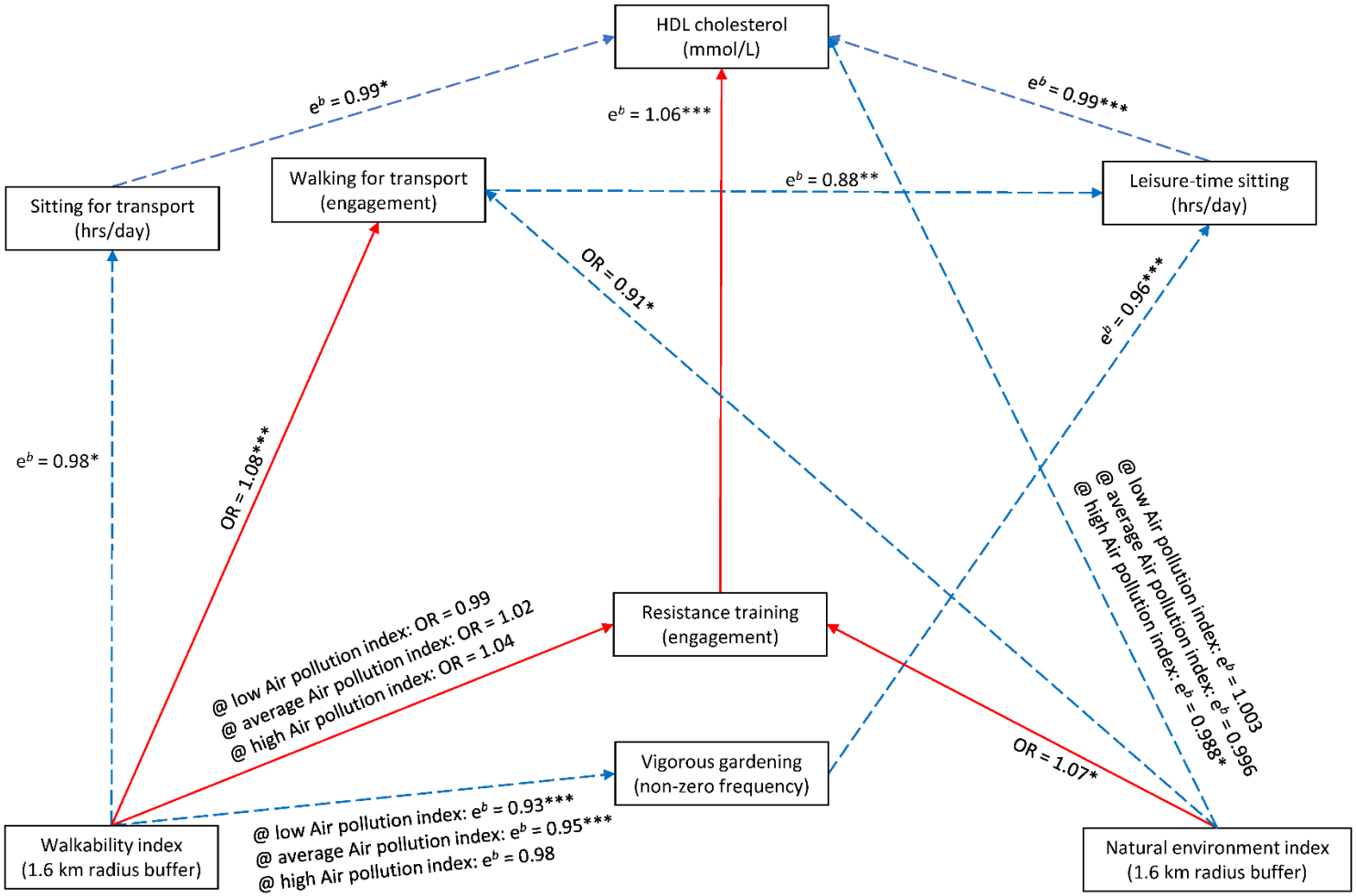


Figure S7b. Direct and indirect (behaviour-mediated) associations of the neighbourhood built and natural environment (measures based on 1.6 km radius street-network buffers) with HDL cholesterol (mmol/L). Arrows linking variables indicate significant associations. Red full arrows denote positive associations, while blue dashed arrows denote negative associations. @ denotes an association moderated by the Air pollution index and estimates of the association are given at different values of the Air pollution index (low = 1 standard deviation below the mean; average = mean; high = 1 standard deviation above the mean). OR = odds ratio from models with binomial variance and logit link functions (engagement in walking for transport and resistance training); e^b = exponentiated regression coefficient from models with Gamma variance and logarithmic link functions (sitting for different purposes, non-zero frequency of vigorous gardening and HDL cholesterol). * p<.05; ** p<.01; ***p< .001. Regression coefficients and their 95% confidence intervals are presented in Tables S9, S10b and S11b. Estimates of path coefficients were obtained using a set of regression models (one for each mediator and cardiometabolic health indicator) rather than simultaneously.

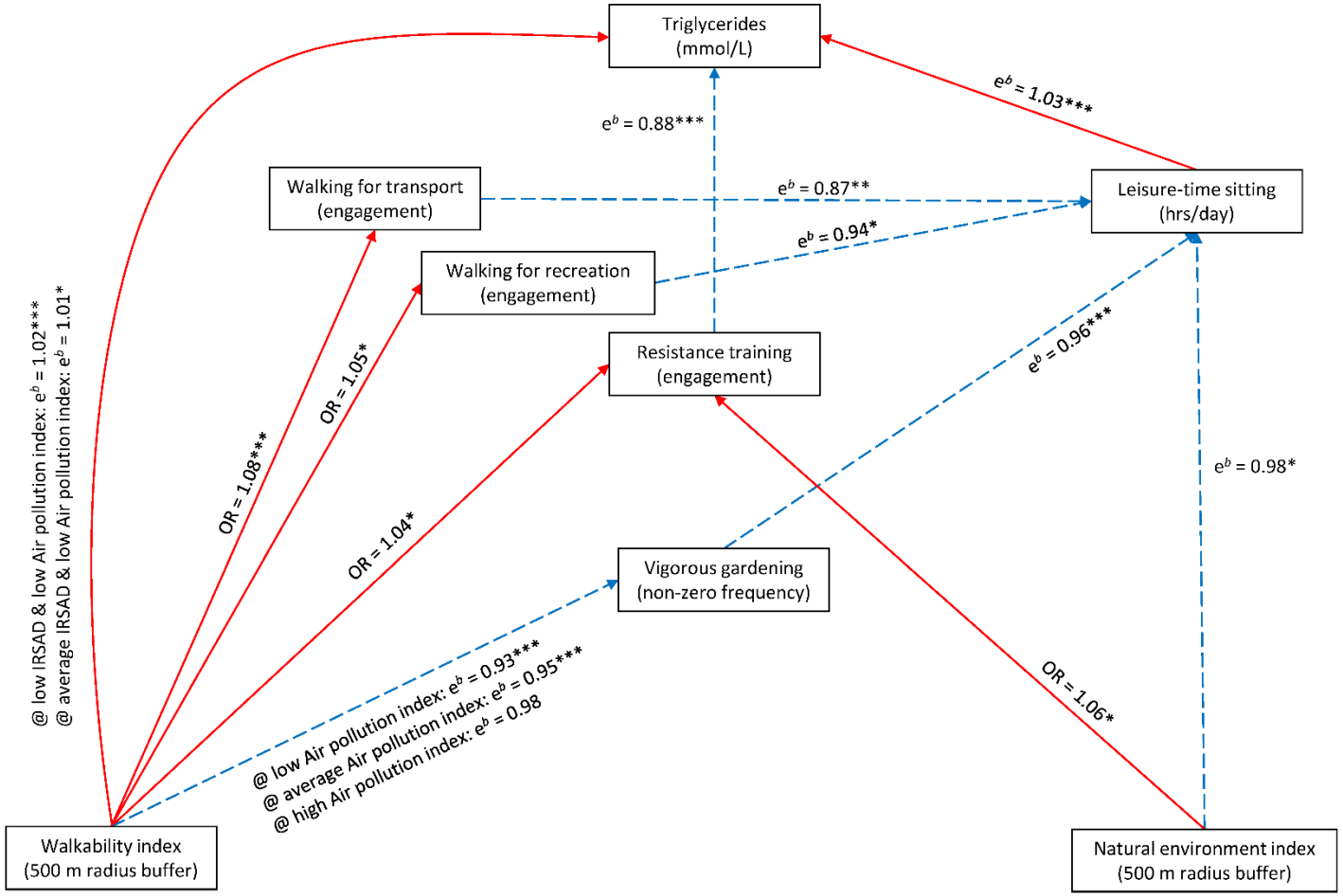


Figure S8a. Direct and indirect (behaviour-mediated) associations of the neighbourhood built and natural environment (measures based on 500 m radius street-network buffers) with triglycerides (mmol/L). Arrows linking variables indicate significant associations. Red full arrows denote positive associations, while blue dashed arrows denote negative associations. @ denotes an association moderated by the Air pollution index and/or the Index of Relative Advantage and Disadvantage (IRSAD) and estimates of the association are given at different values of the moderators (low = 1 standard deviation below the mean; average = mean; high = 1 standard deviation above the mean). OR = odds ratio from models with binomial variance and logit link functions (engagement in walking for different purposes and resistance training); e^b = exponentiated regression coefficient from models with Gamma variance and logarithmic link functions (leisure-time sitting, non-zero frequency of vigorous gardening and triglycerides). * p<.05; ** p<.01; ***p< .001. Regression coefficients and their 95% confidence intervals are presented in Tables S9, S10a and S11a. Estimates of path coefficients were obtained using a set of regression models (one for each mediator and cardiometabolic health indicator) rather than simultaneously.

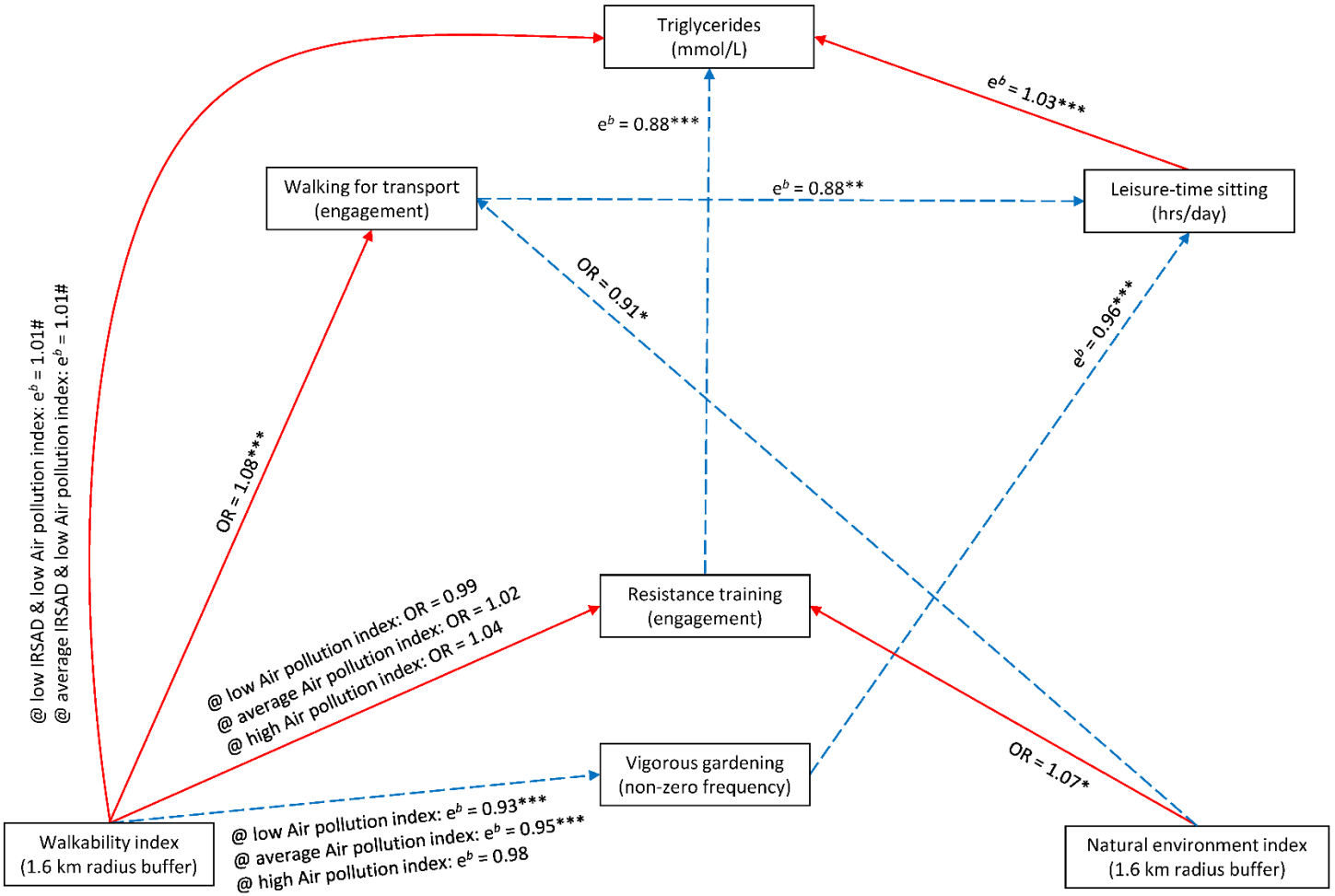


Figure S8b. Direct and indirect (behaviour-mediated) associations of the neighbourhood built and natural environment (measures based on 1.6 km radius street-network buffers) with triglycerides (mmol/L). Arrows linking variables indicate significant associations. Red full arrows denote positive associations, while blue dashed arrows denote negative associations. @ denotes an association moderated by the Air pollution index and/or the Index of Relative Advantage and Disadvantage (IRSAD) and estimates of the association are given at different values of the moderators (low = 1 standard deviation below the mean; average = mean; high = 1 standard deviation above the mean). OR = odds ratio from models with binomial variance and logit link functions (engagement in walking for transport and resistance training); e^b = exponentiated regression coefficient from models with Gamma variance and logarithmic link functions (leisure-time sitting, non-zero frequency of vigorous gardening and triglycerides). #p<.10; * p<.05; ** p<.01; ***p< .001. Regression coefficients and their 95% confidence intervals are presented in Tables S9, S10b and S11b. Estimates of path coefficients were obtained using a set of regression models (one for each mediator and cardiometabolic health indicator) rather than simultaneously.

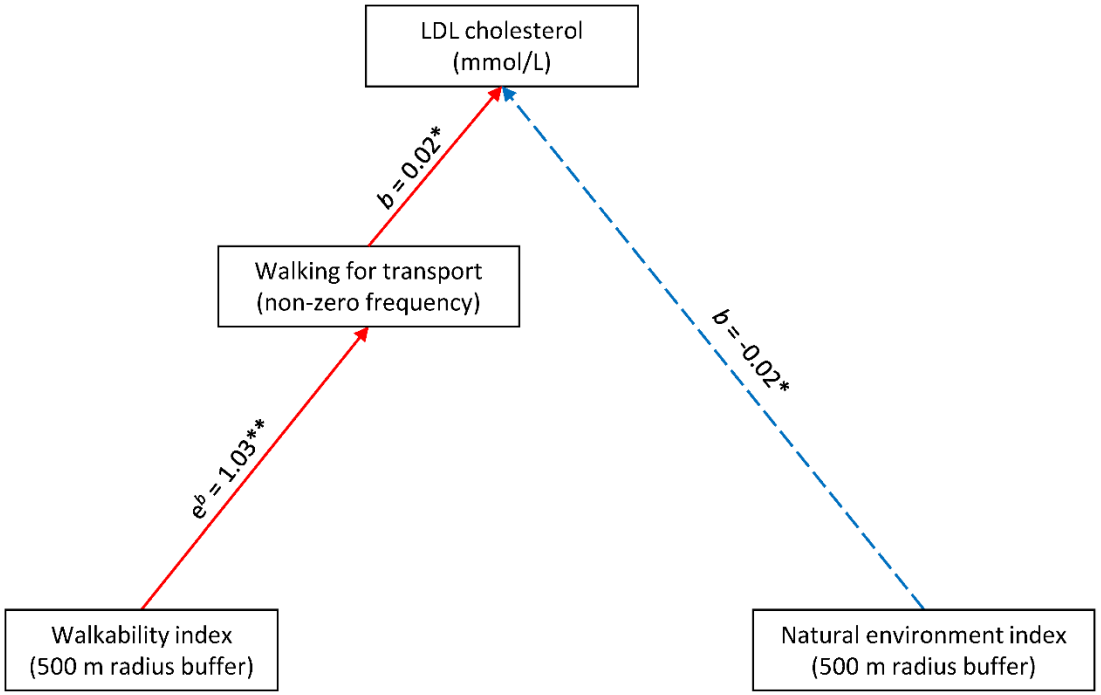


Figure S9a. Direct and indirect (behaviour-mediated) associations of the neighbourhood built and natural environment (measures based on 500 m radius street-network buffers) with LDL cholesterol (mmol/L). Arrows linking variables indicate significant associations. Red full arrows denote positive associations, while blue dashed arrows denote negative associations. *b* = regression coefficient from models with Gaussian variance and identify link functions (LDL cholesterol); e^b = exponentiated regression coefficient from models with Gamma variance and logarithmic link functions (non-zero frequency of walking for transport). * p<.05; ** p<.01. Regression coefficients and their 95% confidence intervals are presented in Tables S9, S10a and S11a. Estimates of path coefficients were obtained using a set of regression models (one for each mediator and cardiometabolic health indicator) rather than simultaneously.

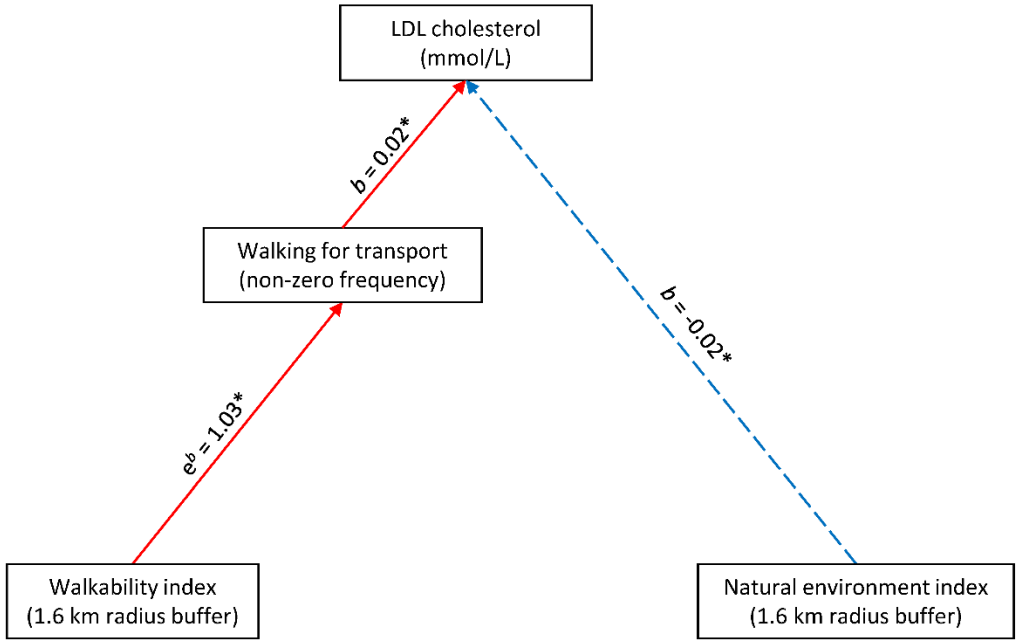


Figure S9b. Direct and indirect (behaviour-mediated) associations of the neighbourhood built and natural environment (measures based on 1.6 km radius street-network buffers) with LDL cholesterol (mmol/L). Arrows linking variables indicate significant associations. Red full arrows denote positive associations, while blue dashed arrows denote negative associations. *b* = regression coefficient from models with Gaussian variance and identify link functions (LDL cholesterol); e^b = exponentiated regression coefficient from models with Gamma variance and logarithmic link functions (non-zero frequency of walking for transport). * p<.05; ** p<.01. Regression coefficients and their 95% confidence intervals are presented in Tables S9, S10b and S11b Estimates of path coefficients were obtained using a set of regression models (one for each mediator and cardiometabolic health indicator) rather than simultaneously.