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Text ST1: Methodological approach for measuring Greenspace as Normalized Difference Vegetation Index (NDVI)

We used data from ‘The Bureau of Meteorology’, Australia

(<http://www.bom.gov.au/climate/austmaps/about-ndvi-maps.shtml>) for Greenspace data. Normalized Difference Vegetation Index (NDVI) is a method of quantification of vegetation by measuring the difference between near-infrared (NIR) (which vegetation strongly reflects) and red light (which vegetation absorbs).

The NDVI is calculated from these individual measurements as follows:

$$\text{NDVI} = \frac{(\text{NIR} - \text{Red})}{(\text{NIR} + \text{Red})}$$

Its value is always between -1 and +1. Vegetation NDVI in Australia typically ranges from 0.1 up to 0.7, with higher values associated with greater density and greenness of the plant canopy. NDVI decreases as leaves come under water stress, become diseased or die. Bare soil and snow values are close to zero, while water bodies have negative values. Further details about NDVI can be obtained from the bureau’s website (<http://www.bom.gov.au/climate/austmaps/about-ndvi-maps.shtml>)

For our study, we collected 6 monthly NDVI average (January- June, and July -December) for 2004-2018 from the BOM website in grid format. We also collected digital boundary map of Australia as ‘Shapefile’ from ‘Australian Bureau of Statistics’ (<https://www.abs.gov.au/statistics/standards/australian-statistical-geography-standard-asgs-edition-3/jul2021-jun2026/access-and-downloads/digital-boundary-files>). Then by using ArcGIS software (ArcGIS Pro, version 2.6.2, 2020 Esri Inc) we plotted the NDVI grid file on the digital boundary map of Australia (Shapefile) and calculated the average NDVI values of a specific area (we used Shapefile for ‘Postal Areas’ as LSAC study used ‘Postal Areas’ as sampling frames). Although BOM provided NDVI data as six monthlies average, we calculated the biannual average from six monthlies average as LSAC collected data from the participants biannually.

Text ST2: Methodological approach for Group-based trajectory modelling (GBTM)

GBTM is a specialized form of finite mixture modelling, designed to identify groups of individuals following similar developmental trajectories.^{1,2} Unlike hierarchical and latent class modelling, GBTM does not require parameters to be continuously distributed throughout the population according to the multivariate normal distribution. This offers the ability to classify children who belong to a distinct disease trajectory with group-specific time-related parameters and explore common risk factors and environmental exposures that may impact each identified group.³ The model was repeatedly fit in a stepwise manner to choose the appropriate number of trajectory groups, starting with two groups. GBTM does not identify the true number of trajectory groups because there is no true number. Instead, it identifies the distinctive features of the data.⁴ In our study, a total of 79 different GBTM models were generated by using a different number of trajectory groups, polynomial distribution, and orders. All models were then ranked as per their Bayesian Information Criteria (BIC) and Akaike information criterion (AIC). Based on relatively lowest BIC and AIC, the top 3-5 models were further evaluated for (i) the sample size in each group (a minimum of 7% of the total sample); (ii) the statistical significance of the polynomial coefficients; and (iii) a close correspondence between the estimated probability of group membership presented as an average posterior probability (>0.7).^{2,5} More detailed information on polynomial distributions and selection of the best model are presented in Table S3-4.

Table S1: List of exposure variables

	Topic	Variables	Response
1	Traffic condition on street	Heavy traffic on street	Agree, disagree
2	Neighbourhood housing	General condition of nearby buildings within 100 metres of the respondent's house	Good, bad
3	Neighbourhood liveability scale	Scale based on the mean of responses (1 Strongly agree; 2 Agree; 3 Neither disagree nor agree; 4 Disagree; 5 Strongly disagree) for the following question: I. This is a safe neighbourhood II. There are good parks, playgrounds and play spaces in this neighbourhood III. The state of footpaths, roads and street lighting is good in this neighbourhood	Number (Lower number in the scale indicates better condition)
4	Neighbourhood facilities scale	Scale based on the mean of responses (1 Strongly agree; 2 Agree; 3 Neither disagree nor agree; 4 Disagree; 5 Strongly disagree) for the following question: I. There is access to close, affordable, regular public transport in this neighbourhood II. There is access to basic shopping facilities in this neighbourhood. III. There is access to basic services such as banks, medical clinics, etc. in this neighbourhood	Number (Lower number in the scale indicates better condition)
5	Neighbourhood greenspace	Average Normalized Difference Vegetation Index (NDVI) value of that area for a specific year	This index defines values from -1.0 to 1.0. (Higher value indicates better greenspace)

Table S2: List of the adjusting variables

	Topic	variables	Response
1	Sex	Sex of the child	Male, female
2	Indigenous status	From Indigenous background?	Yes, no
3	Health status	Any current health condition	Yes, no
4	Pre-term birth	Pre-term birth	Yes, no
5	Current medication for asthma	Current medication for asthma	Yes, no
6	Maternal asthma medication during pregnancy	Maternal asthma medication during pregnancy	Yes, no
7	Smoking in pregnancy	Maternal cigarette smoking during pregnancy	Yes, no
8	Socioeconomic status	Socio-Economic Indexes for Areas (SEIFA) economic resources	Number

Table S3: Selection criteria of the best-fitting model for ‘heavy traffic on street’ trajectories (n=4174)

S3a)

SL	Group number	Polynomial distribution	BIC [€]	AIC [¥]	BIC rank	AIC rank
1	2	0 0	14541.18	14528.74	58	58
2	2	0 1	14546.18	14529.59	60	60
3	2	0 2	14551.31	14530.57	63	65
4	2	0 3	14556.13	14531.24	67	68
5	2	1 0	14545.88	14529.29	59	59
6	2	1 1	14550.79	14530.05	62	62
7	2	1 2	14555.91	14531.03	66	66
8	2	1 3	14560.74	14531.71	70	70
9	2	2 0	14550.35	14529.62	61	61
10	2	2 1	14555.25	14530.37	65	64
11	2	2 2	14560.40	14531.37	69	69
12	2	2 3	14565.21	14532.04	71	71
13	2	3 0	14555.18	14530.30	64	63
14	2	3 1	14560.08	14531.05	68	67
15	2	3 2	14565.22	14532.05	72	72
16	2	3 3	14569.89	14532.57	73	73
17	3	0 1 0	14346.38	14321.49	1	2
18	3	0 1 1	14350.93	14321.90	4	5
19	3	0 1 2	14356.01	14322.83	12	15
20	3	0 1 3	14361.04	14323.71	25	30
21	3	0 2 0	14351.33	14322.30	5	9
22	3	0 2 1	14355.88	14322.71	11	14
23	3	0 2 2	14361.00	14323.68	23	28
24	3	0 2 3	14366.02	14324.55	36	40
25	3	0 3 0	14356.46	14323.28	13	21

26	3	0 3 1	14361.01	14323.69	24	29
27	3	0 3 2	14366.13	14324.66	37	43
28	3	0 3 3	14371.16	14325.55	47	52
29	3	1 0 1	14350.26	14321.23	2	1
30	3	1 0 2	14355.34	14322.16	8	7
31	3	1 0 3	14360.36	14323.04	19	18
32	3	1 1 0	14350.74	14321.71	3	4
33	3	1 1 1	14355.38	14322.20	9	8
34	3	1 1 2	14360.46	14323.13	21	20
35	3	1 1 3	14365.48	14324.01	34	34
36	3	1 2 0	14355.69	14322.52	10	11
37	3	1 2 1	14360.33	14323.01	18	17
38	3	1 2 2	14365.45	14323.98	32	32
39	3	1 2 3	14370.47	14324.85	44	44
40	3	1 3 0	14360.83	14323.50	22	25
41	3	1 3 1	14365.47	14324.00	33	33
42	3	1 3 2	14370.58	14324.97	46	46
43	3	1 3 3	14375.61	14325.85	53	53
44	3	2 0 1	14354.86	14321.68	6	3
45	3	2 0 2	14359.94	14322.62	15	12
46	3	2 0 3	14364.96	14323.49	28	24
47	3	2 1 0	14355.33	14322.15	7	6
48	3	2 1 1	14359.97	14322.65	16	13
49	3	2 1 2	14365.05	14323.58	29	26
50	3	2 1 3	14370.08	14324.46	41	39
51	3	2 2 0	14360.42	14323.10	20	19
52	3	2 2 1	14365.07	14323.60	30	27
53	3	2 2 2	14370.17	14324.55	42	41
54	3	2 2 3	14375.19	14325.42	51	50
55	3	2 3 0	14365.56	14324.09	35	35

56	3	2 3 1	14370.20	14324.58	43	42
57	3	2 3 2	14375.30	14325.54	52	51
58	3	2 3 3	14380.33	14326.42	56	56
59	3	3 0 1	14359.82	14322.50	14	10
60	3	3 0 2	14364.90	14323.43	26	22
61	3	3 0 3	14369.93	14324.31	38	36
62	3	3 1 0	14360.29	14322.97	17	16
63	3	3 1 1	14364.94	14323.47	27	23
64	3	3 1 2	14370.02	14324.40	39	37
65	3	3 1 3	14375.04	14325.28	48	47
66	3	3 2 0	14365.39	14323.92	31	31
67	3	3 2 1	14370.03	14324.42	40	38
68	3	3 2 2	14375.14	14325.37	50	49
69	3	3 2 3	14380.16	14326.25	54	54
70	3	3 3 0	14370.47	14324.86	45	45
71	3	3 3 1	14375.12	14325.35	49	48
72	3	3 3 2	14380.22	14326.30	55	55
73	3	3 3 3	14385.27	14327.22	57	57
74	4	0 0 0 1	14342.31	14309.13	One group has <7% participants	
75	4	0 0 1 1	14347.45	14310.13	One group has <7% participants	
76	4	0 0 1 2	14352.59	14311.12	One group has <7% participants	
77	4	0 0 2 2	14357.67	14312.05	One group has <7% participants	
78	4	0 1 1 1	14352.44	14310.97	One group has <7% participants	
79	4	0 2 2 2	14367.29	14313.38	One group has <7% participants	

S3b)

Polynomial distribution	BIC [€]	AIC [¥]	Group% in model			APP [£]			p-value		
			[©] G1	G2	G3	G1	G2	G3	G1	G2	G3
0 1 0	14346.38	14321.49	56	34	9	0.91	0.82	0.82	0.571	0.333	0.095
1 0 1	14350.26	14321.23	56	34	9	0.91	0.81	0.84	0.568	0.342	0.089
1 1 0	14350.74	14321.71	56	34	9	0.91	0.81	0.85	0.567	0.345	0.086

BIC[€]= Bayesian information criterion; AIC[¥]= Akaike information criterion; APP[£]= average posterior probability; G[©]= group

Summary: All four groups polynomial distribution showed one of the groups had <7% participants. However, a model of three groups polynomial distribution (0 1 0) had best fitting model with relatively lower BIC and AIC values, none of their group's app value below 0.7, p-value >0.05, and none of their group's membership was below 7%

Table S4: Selection criteria of the best-fitting model for neighbourhood liveability scale trajectories (n=4174)

(S4a)

SL	Group number	Polynomial distribution	BIC [€]	AIC [¥]	BIC rank	AIC rank
1	2	0 0	27956.72	27940.13	79	79
2	2	0 1	27885.98	27865.24	78	78
3	2	0 2	27835.36	27810.47	76	77
4	2	0 3	27835.49	27806.45	77	76
5	2	1 0	27386.67	27365.93	75	75
6	2	1 1	27352.01	27327.12	72	72
7	2	1 2	27305.74	27276.71	69	69
8	2	1 3	27304.66	27271.47	68	68
9	2	2 0	27373.09	27348.20	73	73
10	2	2 1	27337.24	27308.21	70	70
11	2	2 2	27284.62	27251.44	65	66

12	2	2 3	27283.27	27245.94	64	65
13	2	3 0	27377.48	27348.44	74	74
14	2	3 1	27341.65	27308.47	71	71
15	2	3 2	27288.91	27251.58	67	67
16	2	3 3	27287.13	27245.65	66	64
17	3	0 1 0	26822.77	26793.73	58	62
18	3	0 1 1	26826.14	26792.95	61	61
19	3	0 1 2	26731.27	26693.94	51	56
20	3	0 1 3	26732.90	26691.42	52	54
21	3	0 2 0	26821.30	26788.11	57	60
22	3	0 2 1	26824.34	26787.01	60	59
23	3	0 2 2	26733.79	26692.31	53	55
24	3	0 2 3	26735.57	26689.94	54	52
25	3	0 3 0	26824.01	26786.68	59	58
26	3	0 3 1	26827.13	26785.65	62	57
27	3	0 3 2	26736.88	26691.25	55	53
28	3	0 3 3	26739.07	26689.29	56	51
29	3	1 0 1	26402.03	26368.85	50	50
30	3	1 0 2	26307.84	26270.51	46	47
31	3	1 0 3	26310.14	26268.66	47	46
32	3	1 1 0	26271.95	26238.76	38	41
33	3	1 1 1	26275.41	26238.07	41	40
34	3	1 1 2	26178.70	26137.22	17	22
35	3	1 1 3	26180.52	26134.89	18	20
36	3	1 2 0	26270.51	26233.18	36	39
37	3	1 2 1	26273.75	26232.27	39	38
38	3	1 2 2	26181.23	26135.60	19	21
39	3	1 2 3	26183.16	26133.38	21	19
40	3	1 3 0	26271.61	26230.13	37	37
41	3	1 3 1	26274.96	26229.33	40	36

42	3	1 3 2	26182.74	26132.97	20	18
43	3	1 3 3	26185.17	26131.25	22	17
44	3	2 0 1	26390.04	26352.71	48	49
45	3	2 0 2	26295.68	26254.20	42	45
46	3	2 0 3	26297.97	26252.34	43	43
47	3	2 1 0	26253.93	26216.60	30	35
48	3	2 1 1	26257.34	26215.86	34	34
49	3	2 1 2	26160.29	26114.66	5	16
50	3	2 1 3	26162.09	26112.31	7	14
51	3	2 2 0	26249.52	26208.04	24	31
52	3	2 2 1	26252.68	26207.05	28	30
53	3	2 2 2	26160.81	26111.04	6	13
54	3	2 2 3	26162.76	26108.83	11	11
55	3	2 3 0	26250.39	26204.76	25	28
56	3	2 3 1	26253.66	26203.89	29	25
57	3	2 3 2	26162.10	26108.18	8	9
58	3	2 3 3	26164.56	26106.48	14	7
59	3	3 0 1	26392.61	26351.13	49	48
60	3	3 0 2	26298.21	26252.58	44	44
61	3	3 0 3	26300.50	26250.72	45	42
62	3	3 1 0	26255.91	26214.43	33	33
63	3	3 1 1	26259.37	26213.74	35	32
64	3	3 1 2	26162.28	26112.50	9	15
65	3	3 1 3	26164.07	26110.15	13	12
66	3	3 2 0	26251.31	26205.68	26	29
67	3	3 2 1	26254.52	26204.74	31	27
68	3	3 2 2	26162.67	26108.75	10	10
69	3	3 2 3	26164.62	26106.54	15	8
70	3	3 3 0	26251.40	26201.63	27	24
71	3	3 3 1	26254.74	26200.82	32	23

72	3	3 3 2	26163.23	26105.15	12	6
73	3	3 3 3	26165.73	26103.51	16	4
74	4	0 0 0 1	26835.59	26798.26	63	63
75	4	0 0 1 1	26245.62	26204.14	23	26
76	4	0 0 1 2	26149.59	26103.97	4	5
77	4	0 0 2 2	26144.57	26094.79	3	3
78	4	0 1 1 1	26074.93	26029.3	2	2
79	4	0 2 2 2	26054.33	25996.26	1	1

S4b)

Polynomial distribution	BIC [€]	AIC [¥]	Group% in model			APP [£]			p-value		
			[©] G1	G2	G3	G1	G2	G3	G1	G2	G3
2 3	27283.27	27245.94	35	64	x	0.92	0.94	x	0.343	0.656	x
3 3	27287.13	27245.65	35	64	x	0.92	0.94	x	0.342	0.657	x
2 2	27284.62	27251.44	35	65	x	0.92	0.94	x	0.342	0.657	x

BIC[€]= Bayesian information criterion; AIC[¥]= Akaike information criterion; APP[£]= average posterior probability; G[©]= group

Summary: One group have <7% participants in all four groups model. Although three groups models had less AIC and BIC values, two trajectories groups in these models showed less difference from each other. So, we considered two groups model, and one 'two groups polynomial distribution (2 3)' had best fitting model with relatively lowest BIC and AIC values (among all the two groups models), comparative group's app values, and none of their group's membership was below 7%.

Table S5: Sensitivity analysis between the complete case and imputed data on the multivariable association of neighbourhood environmental factors with asthma-symptom trajectories (Model 1)

Variables	Complete case analysis (N= 3584)		Imputed data set (N =4174)	
	Transient high	Persistent high	Transient high	Persistent high
Heavy traffic on street				
Disagree	1	1	1	1
Agree	1.11(0.85,1.45)	1.25(0.98,1.60)	1.13(0.90,1.43)	1.31(1.07,1.62)
General condition of nearby buildings				
Good	1	1	1	1
Bad	1.60(0.66,3.86)	0.36(0.10,1.30)	0.81(0.34,1.87)	0.41(0.15,1.09)
Neighbourhood liveability scale	1.28(0.98,1.66)	1.44(1.13,1.84)	1.15(0.92,1.43)	1.33(1.08,1.63)
Neighbourhood facilities scale	0.94(0.78,1.12)	1.12(0.95,1.32)	1.01(0.87,1.16)	1.01(0.88,1.16)
NDVI value of the area	1.45(0.51,4.10)	0.45(0.17,1.20)	1.17(0.47,2.89)	0.54(0.23,1.26)

Association presented as risk ratio and their 95% confidence interval, 1= Reference value; Reference group for Trajectory is 'No/low asthma-symptom trajectory group'. Adjusted for sex, Indigenous status, SEIFA economic resources, any medical condition, pre-term birth, asthma medication of mother during pregnancy, maternal smoking during pregnancy.

Table S6: Sensitivity analysis between the complete case and imputed data on the multivariable association of neighbourhood environmental factors with asthma-symptom trajectories (Model 2)

Variables		Complete case analysis (N= 4146)		Imputed data set (N =4174)	
	Group %	Transient high	Persistent high	Transient high	Persistent high
Heavy traffic on street_ agree					
Never	55%	1	1	1	1
1-2 time points	37%	1.27(1.17,1.39)	1.16(1.06,1.27)	1.28(1.19,1.38)	1.24(1.15,1.34)
All 3 time points	8%	1.25(1.07,1.46)	1.32(1.13,1.54)	1.35(1.18,1.54)	1.47(1.29,1.68)
General condition of nearby buildings bad					
Never	97%	1	1	1	1
1-2 time points	3%	1.21(0.96,1.53)	0.87(0.67,1.12)	0.93(0.76,1.14)	0.85(0.69,1.04)
All 3 time points	<1%	Not done*	Not done*	Not done	Not done
Neighbourhood liveability scale (mean of 3 time points)		0.99(0.88,1.10)	1.30(1.16,1.46)	0.97(0.88,1.07)	1.37(1.24,1.51)
Neighbourhood facilities scale (mean of 3 time points)		1.21(1.12,1.30)	1.09(1.00,1.18)	1.16(1.08,1.23)	1.05(0.98,1.12)
NDVI value of the area (mean of 3 time points)		1.24(0.82,1.88)	0.77(0.50,1.18)	1.12(0.78,1.60)	0.81(0.56,1.17)

Association presented as risk ratio and their 95% confidence interval, 1= Reference value; Reference group for Trajectory is 'No/low asthma-symptom trajectory group'. Adjusted for sex, Indigenous status, SEIFA economic resources, any medical condition, pre-term birth, asthma medication of mother during pregnancy, maternal smoking during pregnancy, asthma medication.

Table S7: Sensitivity analysis between the complete case and imputed data on the multivariable association of neighbourhood environmental factors with asthma-symptom trajectories (Model 3)

Variables	Complete case analysis (N=4143)		Imputed data set (N =4174)	
	Transient high	Persistent high	Transient high	Persistent high
Prevalence of heavy traffic on street (trajectory groups)				
Low	1	1	1	1
Persistently moderate	1.16(1.07,1.27)	1.21(1.10,1.32)	1.21(1.12,1.31)	1.29(1.20,1.40)
Persistently high	1.37(1.20,1.56)	1.10(0.95,1.28)	1.40(1.25,1.58)	1.33(1.17,1.50)
Neighbourhood liveability score (trajectory groups)				
Low & declining	1	1	1	1
Moderate & static	1.20(1.09,1.31)	1.42(1.30,1.56)	1.16(1.07,1.25)	1.38(1.27,1.50)

Association presented as risk ratio and their 95% confidence interval, 1= Reference value; Reference group for Trajectory is 'No/low asthma-symptom trajectory group'. Adjusted for sex, Indigenous status, SEIFA economic resources, any medical condition, pre-term birth, asthma medication of mother during pregnancy, maternal smoking during pregnancy, asthma medication.

Table S8: Sensitivity analysis before and after incorporating inverse probability weighting (IPW) technique (Multivariable model 1)

Variables	Before IPW (N=4174)		After IPW (N=4174)	
	Transient high	Persistent high	Transient high	Persistent high
Heavy traffic on street				
Disagree	1	1	1	1
Agree	1.13(0.90,1.43)	1.31(1.07,1.62)	1.12(0.89,1.42)	1.33(1.08,1.64)
General condition of nearby buildings				
Good	1	1	1	1
Bad	0.81(0.34,1.87)	0.41(0.15,1.09)	0.75(0.30,1.86)	0.38(0.14,1.01)
Neighbourhood liveability scale	1.15(0.92,1.43)	1.33(1.08,1.63)	1.14(0.91,1.43)	1.32(1.06,1.63)
Neighbourhood facilities scale	1.01(0.87,1.16)	1.01(0.88,1.16)	1.01(0.87,1.18)	1.01(0.88,1.15)
NDVI value of the area	1.17(0.47,2.89)	0.54(0.23,1.26)	1.16(0.47,2.84)	0.53(0.23,1.22)

Association presented as risk ratio and their 95% confidence interval, 1= Reference value; Reference group for Trajectory is 'No/low asthma-symptom trajectory group'. Adjusted for sex, Indigenous status, SEIFA economic resources, any medical condition, pre-term birth, asthma medication of mother during pregnancy, maternal smoking during pregnancy.

Table S9: Sensitivity analysis before and after incorporating inverse probability weighting (IPW) technique (Multivariable model 2)

Variables		Before IPW (N=4174)		After IPW (N=4174)	
	Group %	Transient high	Persistent high	Transient high	Persistent high
Heavy traffic on street_ agree					
Never	55%	1	1	1	1
1-2 time points	37%	1.28(1.19,1.38)	1.24(1.15,1.34)	1.27(1.18,1.38)	1.25(1.16,1.35)
All 3 time points	8%	1.35(1.18,1.54)	1.47(1.29,1.68)	1.31(1.15,1.50)	1.47(1.30,1.67)
General condition of nearby buildings_ bad					
Never	97%	1	1	1	1
1-2 time points	3%	0.93(0.76,1.14)	0.85(0.69,1.04)	0.93(0.76,1.13)	0.85(0.69,1.04)
All 3 time points	<1%	Not done	Not done	Not done	Not done
Neighbourhood liveability scale (mean of 3 time points)		0.97(0.88,1.07)	1.37(1.24,1.51)	0.98(0.89,1.08)	1.35(1.22,1.49)
Neighbourhood facilities scale (mean of 3 time points)		1.16(1.08,1.23)	1.05(0.98,1.12)	1.15(1.07,1.23)	1.04(0.97,1.11)
NDVI value of the area (mean of 3 time points)		1.12(0.78,1.60)	0.81(0.56,1.17)	1.12(0.78,1.60)	0.81(0.56,1.18)

Association presented as risk ratio and their 95% confidence interval, 1= Reference value; Reference group for Trajectory is 'No/low asthma-symptom trajectory group'. Adjusted for sex, Indigenous status, SEIFA economic resources, any medical condition, pre-term birth, asthma medication of mother during pregnancy, maternal smoking during pregnancy, asthma medication.

Table S10: Sensitivity analysis before and after incorporating inverse probability weighting (IPW) technique (Multivariable model 3)

Variables	Before IPW (N=4174)		After IPW (N=4174)	
	Transient high	Persistent high	Transient high	Persistent high
Prevalence of heavy traffic on street (trajectory groups)				
Low	1	1	1	1
Persistently moderate	1.21(1.12,1.31)	1.29(1.20,1.40)	1.22(1.13,1.32)	1.30(1.20,1.41)
Persistently high	1.40(1.25,1.58)	1.33(1.17,1.50)	1.39(1.23,1.56)	1.35(1.20,1.53)
Neighbourhood liveability score (trajectory groups)				
Low & declining	1	1	1	1
Moderate & static	1.16(1.07,1.25)	1.38(1.27,1.50)	1.16(1.07,1.25)	1.37(1.26,1.49)

Association presented as risk ratio and their 95% confidence interval, 1= Reference value; Reference group for Trajectory is 'No/low asthma-symptom trajectory group'; Adjusted for sex, Indigenous status, SEIFA economic resources, any medical condition, pre-term birth, asthma medication of mother during pregnancy, maternal smoking during pregnancy, asthma medication.

Table S11: Baseline characteristics of the analytical cohort and rest of the participants (N=5107)

Variables	Analytic sample <i>n</i> = 4174 (82)	Rest of the participants <i>n</i> =933 (18)	<i>P</i> value
Male sex (n, %)	2145(51)	463(50)	0.330
Ethnicity- Indigenous (n, %)	133(3)	97(10)	<0.001
Low birth weight (n, %)	214/4152(5)	57/919(6)	0.201
Pre-term birth (n, %)	262/4139(6)	72/911(8)	0.084
Presence of any medical condition_ yes (n, %)	216(5)	67(7)	0.015
Maternal smoking during pregnancy_ yes (n, %)	546(15)	163(28)	<0.001
Asthma medication during pregnancy_ yes (n, %)	150/4165(4)	35(4)	0.820
SEIFA economic resources			
Lowest quantile	1519(36)	257(27)	<0.001
Second quantile	847(20)	244(26)	
Third quantile	875(21)	275(29)	
Highest quantile	933(22)	157(17)	

SE = standard error; SEIFA= Socio-Economic Indexes for Areas

Table S12: Prevalence (in %) of asthma-symptom and different neighbourhood environmental exposures over different time points among the cohort

Variable	Time points (age of the children)							
	0-1 y	2-3 y	4-5 y	6-7 y	8-9 y	10-11 y	12-13 y	14-15 y
Asthma-symptom (male, female)	15.37 (17,13)	24.52 (26,22)	18.45 (19,17)	17.66 (19,16)	12.28 (14,10)	10.48 (11,10)	8.74 (10,8)	12.59 (12,13)
Neighbourhood liveability scale	2.01	1.99	1.95	1.85	2.07	1.82	1.77	1.79
Neighbourhood facilities scale	1.92	1.92	1.92	1.92	1.93	1.92	1.91	1.93
Heavy traffic on street_ Yes	25.55	27.20	25.86	25.60	26.64	25.82	25.37	24.87
General condition of nearby buildings_ bad	1.53	1.40	1.34	1.17	1.55	1.10	1.23	1.08
NDVI value of the area	0.34	0.34	0.33	0.33	0.34	0.33	0.33	0.33

Table S13a: Bivariate analyses showing the association (risk ratio, 95% CI) between different neighbourhood environmental exposures and asthma-symptom trajectories ('low' vs. 'transient high' groups) over different time points

Variable	Time points (age of the children)							
	0-1 y	2-3 y	4-5 y	6-7 y	8-9 y	10-11 y	12-13 y	14-15 y
Heavy traffic on street_ Yes	1.20 (0.96,1.50)	1.24 (1.00,1.54)	1.36 (1.09,1.70)	1.23 (0.98,1.54)	1.35 (1.08,1.68)	1.43 (1.14,1.81)	1.31 (1.02,1.69)	1.14 (0.87,1.50)
Neighbourhood liveability scale	1.27 (1.03,1.56)	1.18 (0.98,1.42)	1.02 (0.85,1.23)	1.00 (0.84,1.20)	1.20 (1.05,1.37)	1.25 (1.04,1.50)	1.30 (1.07,1.58)	1.21 (0.99,1.48)
Neighbourhood facilities scale	1.07 (0.94,1.22)	1.11 (0.97,1.27)	1.17 (1.02,1.34)	1.04 (0.91,1.19)	1.09 (0.96,1.25)	1.12 (0.98,1.28)	1.13 (0.97,1.32)	1.15 (0.99,1.34)
General condition of nearby buildings_ bad	1.34 (0.65,2.76)	1.47 (0.68,3.18)	1.65 (0.75,3.59)	2.86 (1.40,5.81)	1.27 (0.59,2.73)	1.32 (0.50,3.46)	2.69 (1.19,6.11)	1.99 (0.73,5.38)
NDVI value of the area	1.53 (0.66,3.54)	1.18 (0.50,2.75)	1.63 (0.70,3.82)	1.80 (0.77,4.19)	1.34 (0.57,3.15)	1.49 (0.60,3.72)	2.02 (0.78,5.23)	1.03 (0.38,2.79)

Bold numbers indicate statistically significant

Table S13b: Bivariate analyses showing the association (risk ratio, 95% CI) between different neighbourhood environmental exposures and asthma-symptom trajectories ('low' vs. 'persistent high' groups) over different time points

Variable	Time points (age of the children)							
	0-1 y	2-3 y	4-5 y	6-7 y	8-9 y	10-11 y	12-13 y	14-15 y
Heavy traffic on street_ Yes	1.35 (1.10,1.65)	1.20 (0.97,1.47)	1.35 (1.10,1.67)	1.43 (1.16,1.75)	1.44 (1.17,1.78)	1.36 (1.09,1.69)	1.20 (0.95,1.51)	1.38 (1.09,1.75)
Neighbourhood liveability scale	1.48 (1.22,1.79)	1.24 (1.05,1.48)	1.28 (1.08,1.52)	1.18 (1.00,1.39)	1.23 (1.08,1.39)	1.16 (0.98,1.38)	1.10 (0.91,1.32)	1.11 (0.93,1.34)
Neighbourhood facilities scale	1.07 (0.94,1.21)	1.00 (0.89,1.14)	1.16 (1.02,1.31)	1.04 (0.92,1.18)	1.04 (0.92,1.18)	1.09 (0.96,1.24)	1.06 (0.92,1.22)	1.01 (0.87,1.17)
General condition of nearby buildings_ bad	0.63 (0.25,1.06)	1.50 (0.72,3.14)	1.79 (0.87,3.64)	1.56 (0.67,3.60)	0.81 (0.34,1.92)	1.34 (0.55,3.27)	2.29 (1.01,5.19)	2.30 (0.96,5.51)
NDVI value of the area	0.75 (0.34,1.63)	0.80 (0.37,1.75)	1.15 (0.52,2.53)	0.83 (0.38,1.83)	1.07 (0.48,2.38)	0.58 (0.25,1.34)	0.51 (0.21,1.24)	0.67 (0.27,1.66)

Bold numbers indicate statistically significant

Table S14: Number and percentage of participants having bad trajectories of both heavy traffic on street and neighbourhood liveability score.

Combination of trajectory groups	n (%)
Persistently moderate heavy traffic + Moderate & static liveability	942 (22%)
Persistently high heavy traffic + Moderate & static liveability	308 (7%)

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