Disproportionately Higher Exposure to Urban Heat in Lower-income Neighborhoods: A Multi-City Perspective

Supplementary Information

Table S1. Descriptive statistics for the cities included in this study

City	Population (Rank in Country)	Number of neighborhoods	Mean area of neighborhoods (sq. km)	Year of Data	Mean city elevation (land) (m)	Mean rural reference elevation (m)
Amsterdam	844,952 (1)	99	2.88	2014	2.47	0.62
Atlanta	495,377 (40)	135	3.80	2016	284.05	279.70
Bangkok	8,305,215 (1)	50	32.80	2009	6.87	5.79
Barcelona	1,610,427 (2)	73	1.40	2016	110.34	292.60
Beijing	21,705,000 (2)	16	1344.01	2015	368.92	435.82
Berlin	3,469,700 (1)	12	121.77	2014	46.61	49.65
Boston	658,291 (21)	180	0.96	2016	25.57	33.31
Buenos Aires	3,103,763 (1)	15	13.58	2017	22.26	9.87
Chicago	2,822,881 (3)	77	10.44	2016	187.66	191.14
Copenhagen	576,423 (1)	10	16.53	2014	9.87	6.13
Detroit	683,443 (18)	297	1.69	2016	192.78	192.30
Jakarta	10,154,584 (1)	42	15.50	2014	18.97	17.78
Johannesburg	4,434,819 (3)	130	14.16	2011	1588.88	1563.87
London	8,835,400 (1)	33	76.52	2013	46.38	65.31
Los Angeles	3,645,186 (2)	22	58.08	2016	227.43	429.19
Manila	12,877,253 (1)	17	34.09	2012	31.75	50.02
Melbourne	1,442,224 (2)	93	6.15	2016	43.63	25.66
Mexico City	8,918,653 (1)	16	99.48	2017	2645.87	2913.85
Montreal	1,961,019 (2)	34	18.18	2016	36.49	37.17

New York	8,537,735 (1)	55	18.71604	2016	19.49	20.80
Paris	2,220,445 (1)	20	8.000929	2014	55.92	51.47
Sao Paulo	11,253,503 (1)	96	17.41376	2010	783.35	797.59
Seoul	10,178,395 (1)	25	30.68424	2016	70.78	138.70
Singapore	3,933,570 (1)	55	14.21927	2015	20.35	20.47
Tokyo	9,143,041 (1)	23	33.18811	2013	23.52	12.79
Vancouver	633,190 (3)	118	1.481681	2016	52.46	41.37
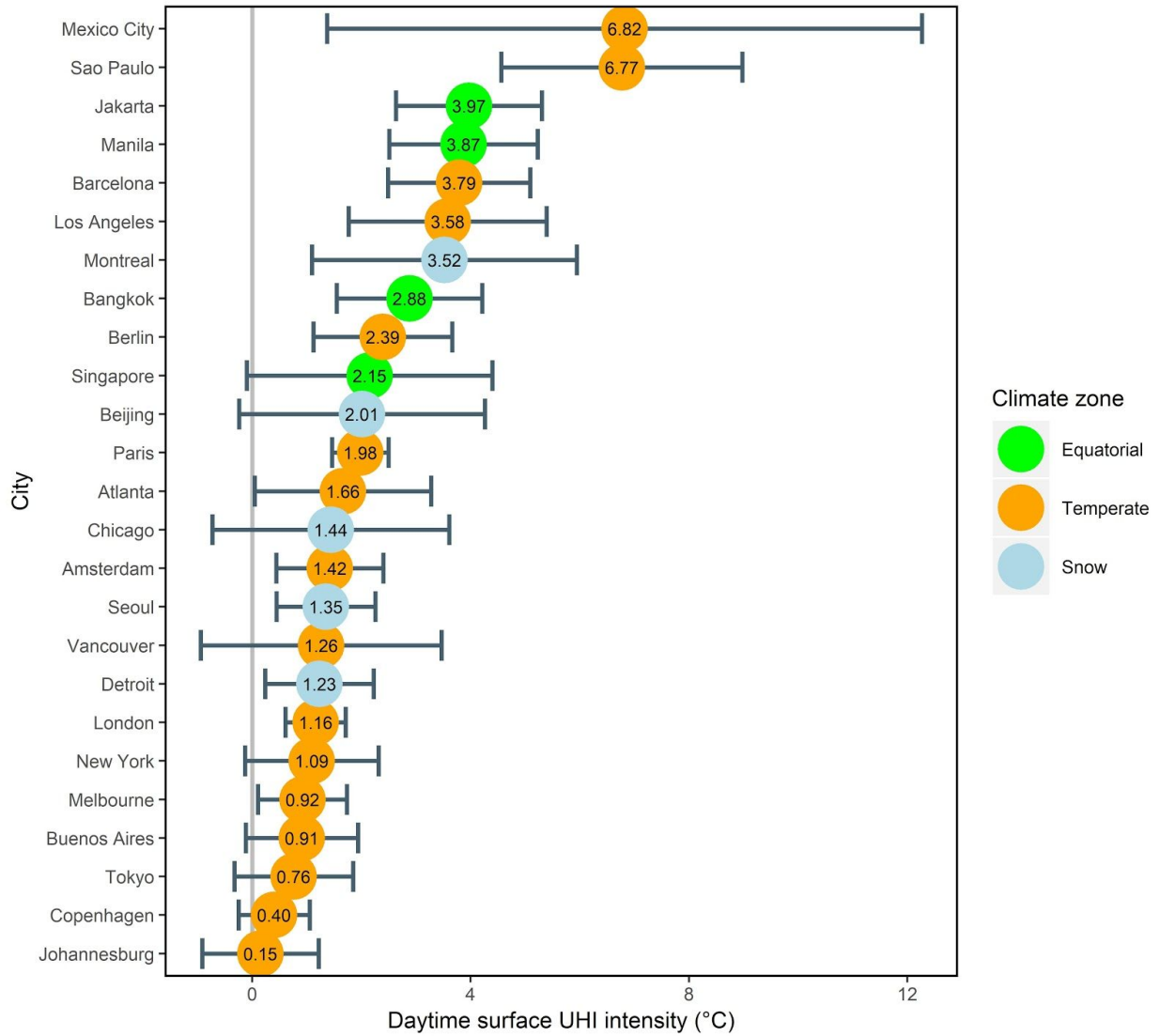
Fig. S1. 10-year (2008-2017) mean daytime surface UHI intensity of the cities considered. The mean UHI intensity of each city is given by the points, while the error bars represent the standard deviation across different neighborhoods of the city (i.e., variability of the UHI within cities). The color of the point represents the background climate zone the city is situated in and the grey vertical line is for a UHI value of 0 °C.
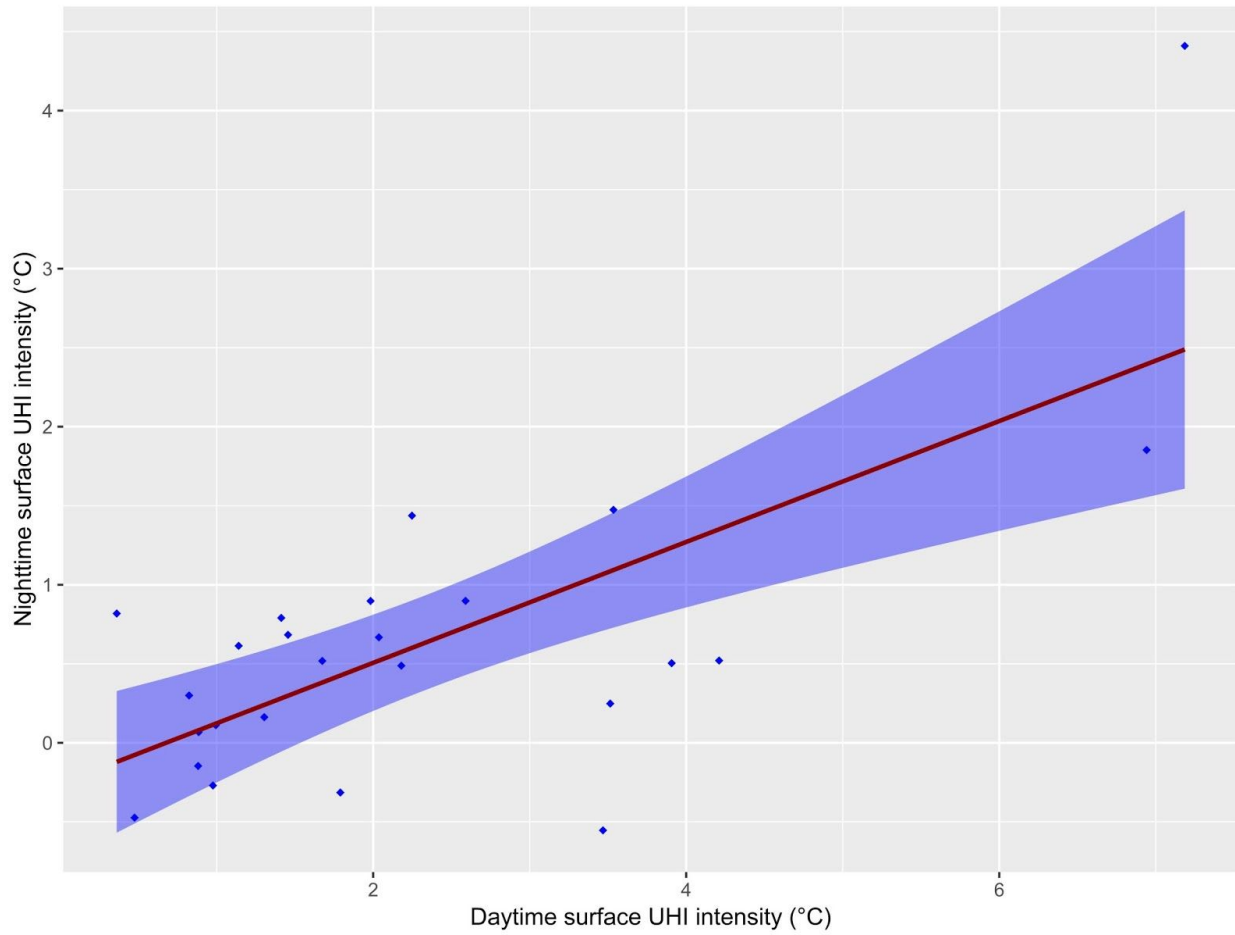
Fig. S2: Correlation between daytime and nighttime surface UHI intensity at the city scale. The dashed line is the line of best fit, while the shaded blue region is the 95% confidence interval of the fit.
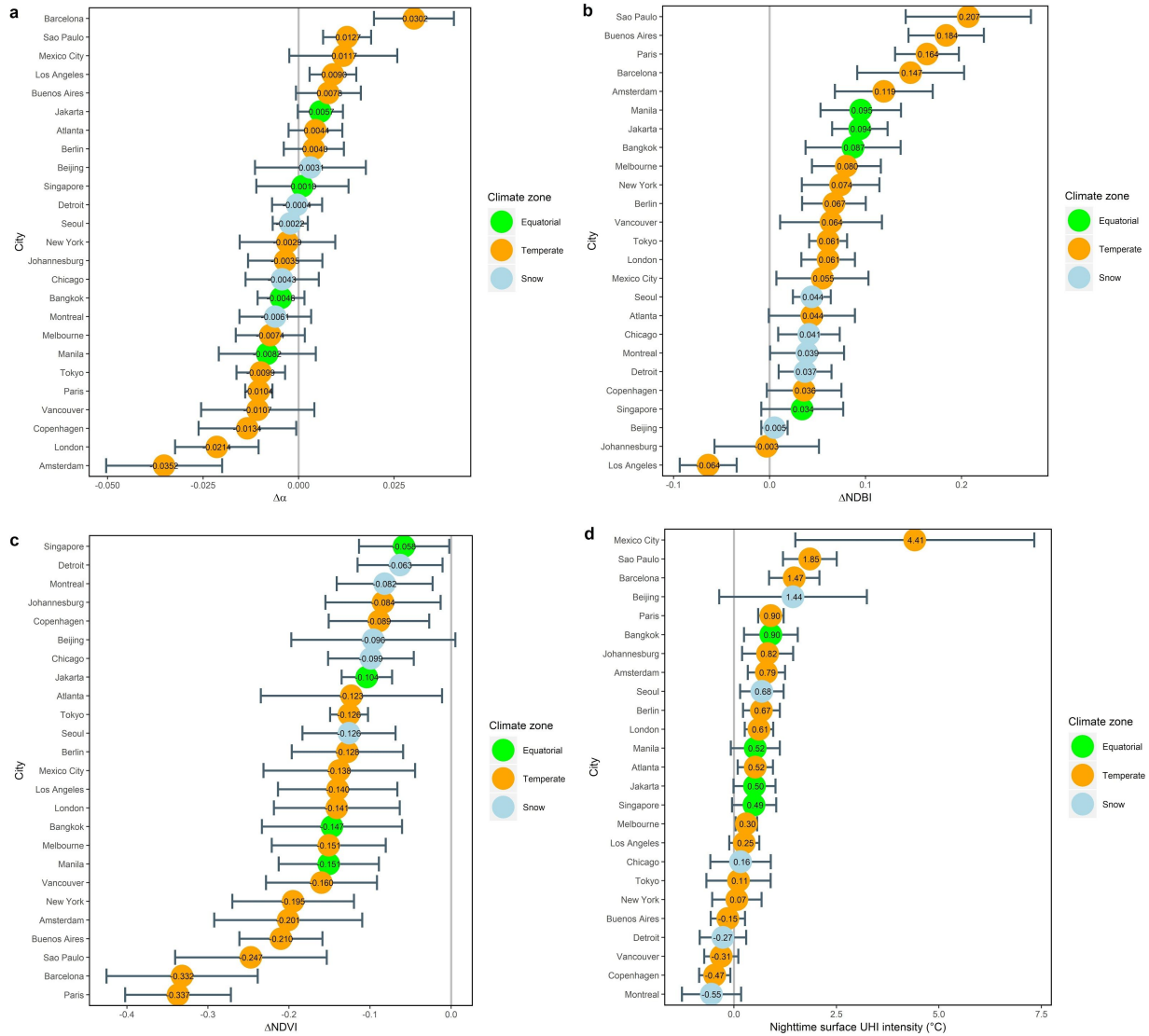
Fig. S3: (a) Δα, **(b)** ΔNDBI, **(c)** ΔNDVI, and **(d)** Nighttime surface UHI intensity of the cities considered in the present study. The mean value for each city is given by the points, while the error bars represent the standard deviation across different neighborhoods of the city. The color of the point represents the background climate zone the city is situated in and the grey vertical line is for a value of 0. The data are extracted for the same year as the available income data.
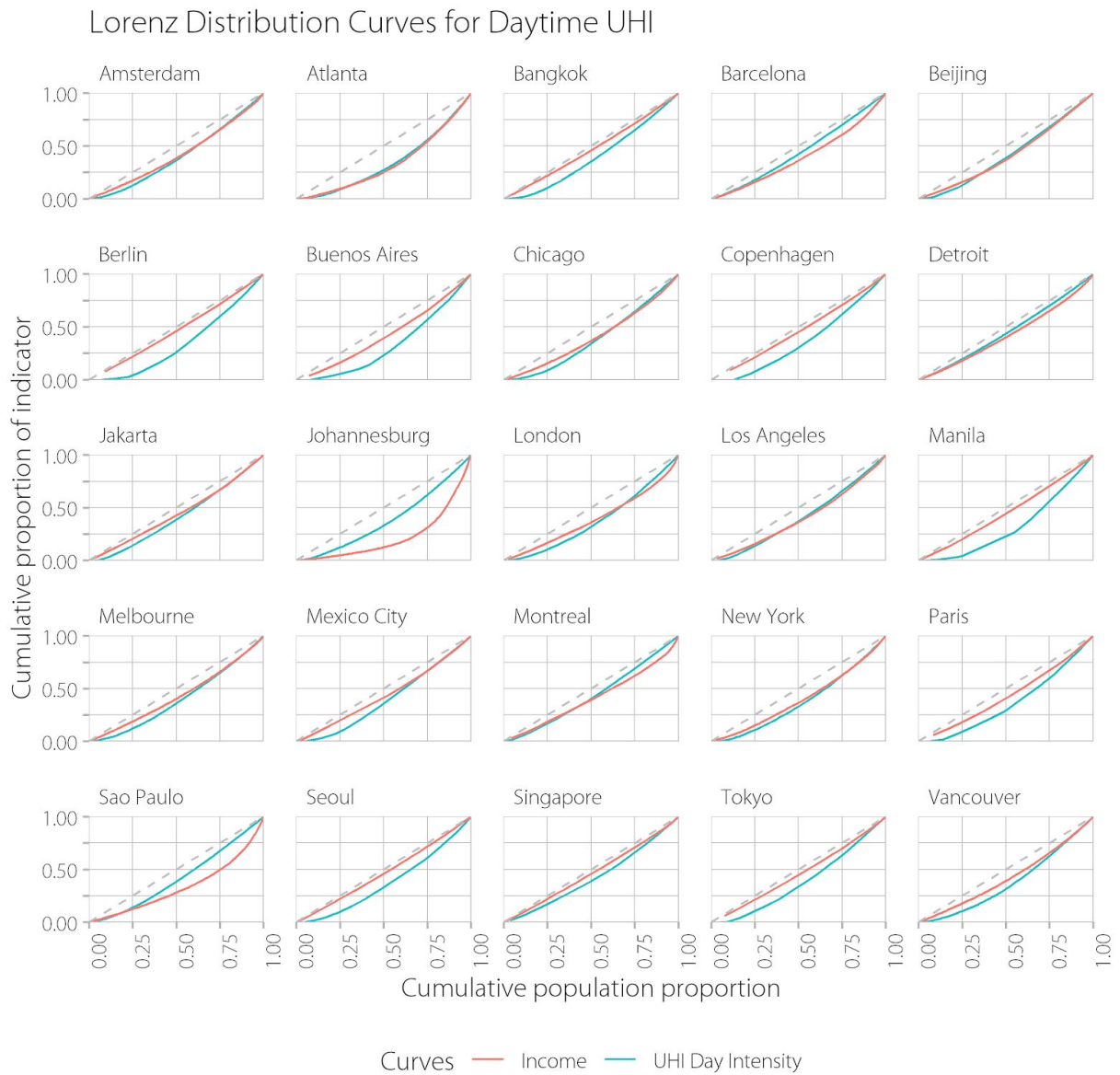
Lorenz Distribution Curves for Daytime UHI

Figure S4. Lorenz curves of daytime UHI (red) for each city in the study.
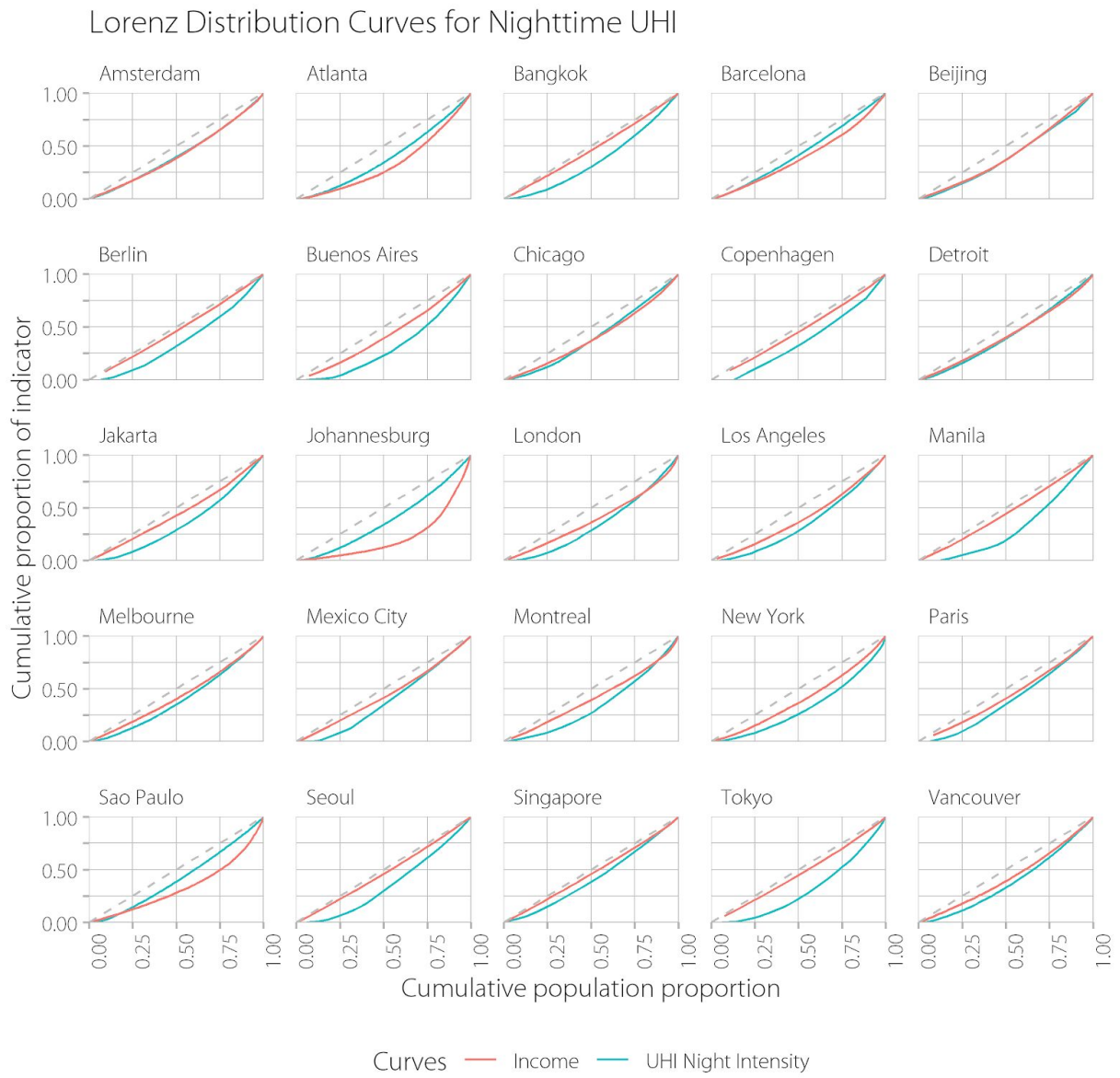
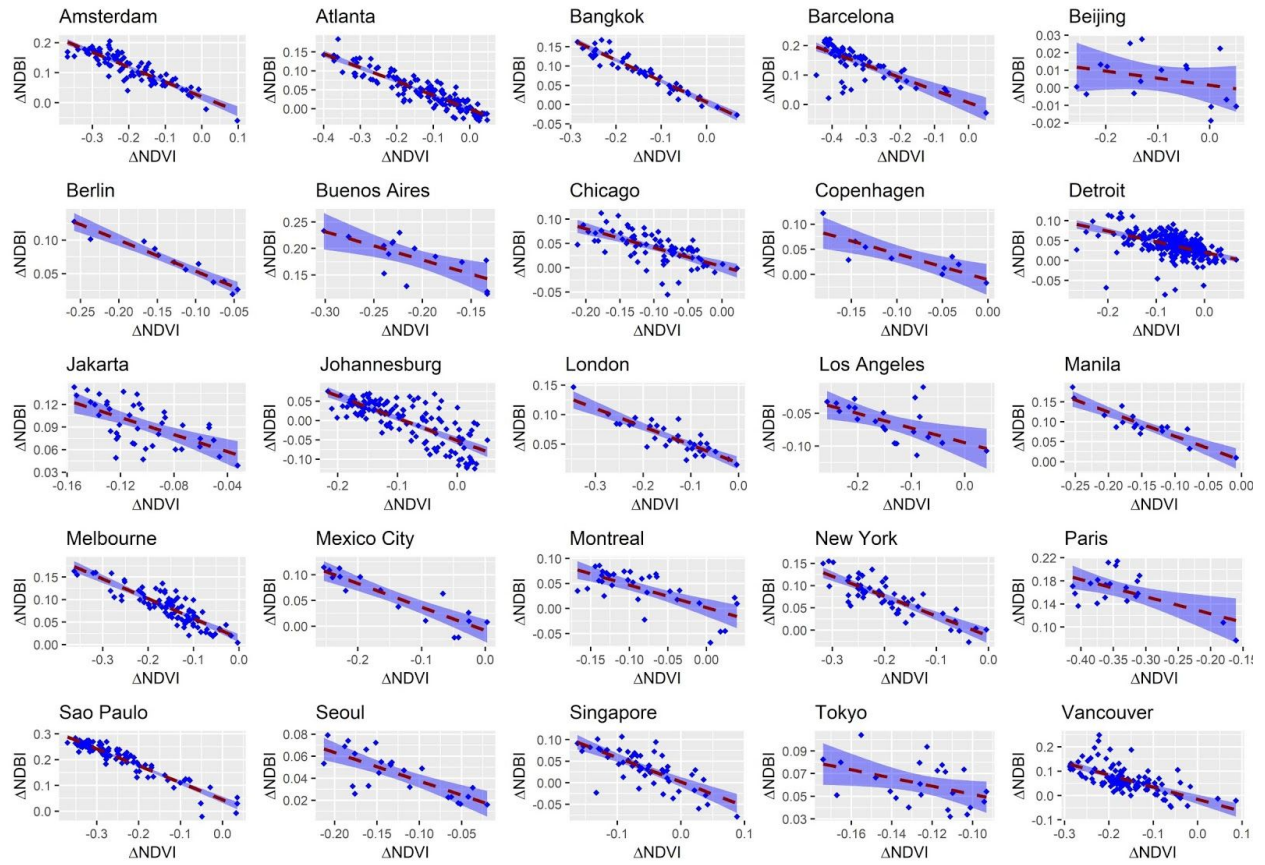**Figure S5**. Lorenz curves of nighttime UHI (red) for each city in the study.

Fig. S6: Association between neighborhood-scale ΔNDVI and ΔNDBI for each city. The dashed lines are the lines of linear fit and the shaded blue area is the 95% confidence interval.
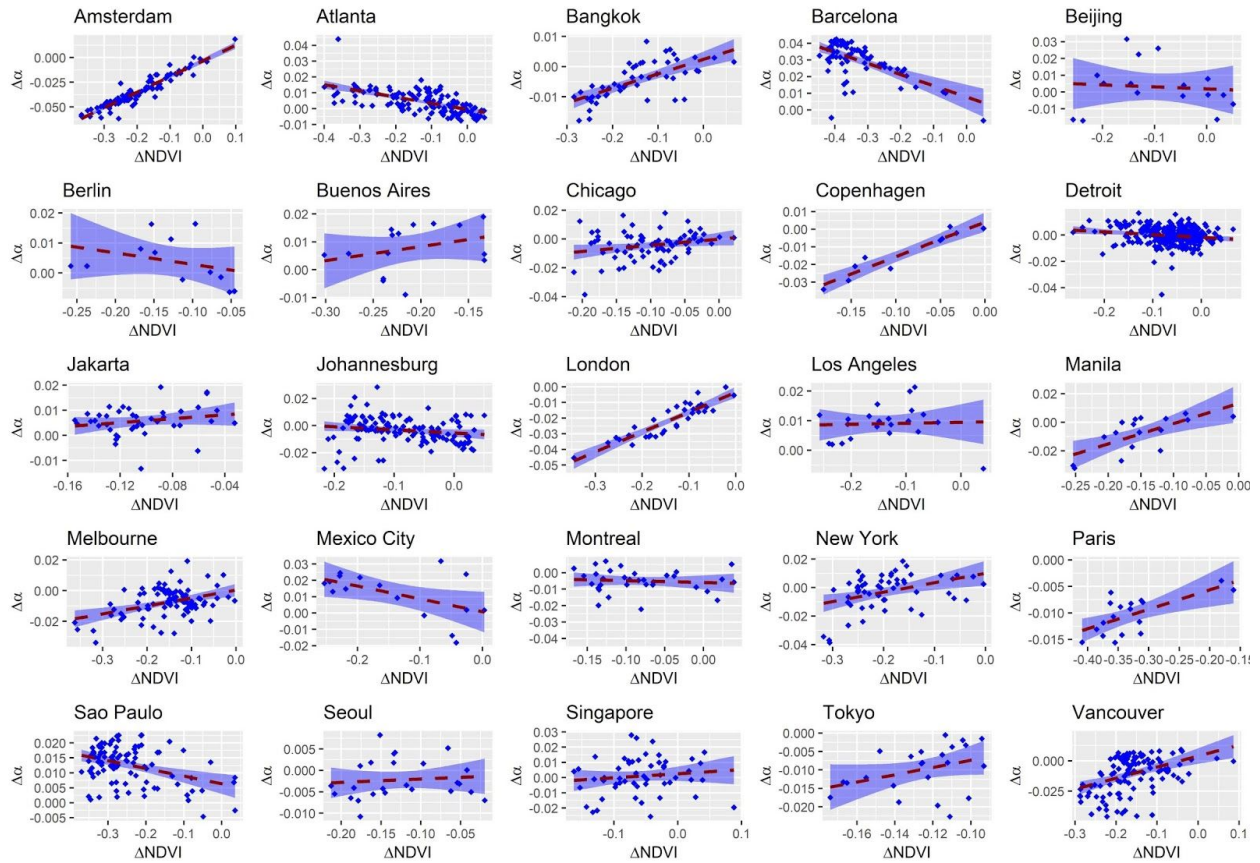
Fig. S7: Association between neighborhood-scale ΔNDVI and Δα for each city. The dashed lines are the lines of linear fit and the shaded blue area is the 95% confidence interval.
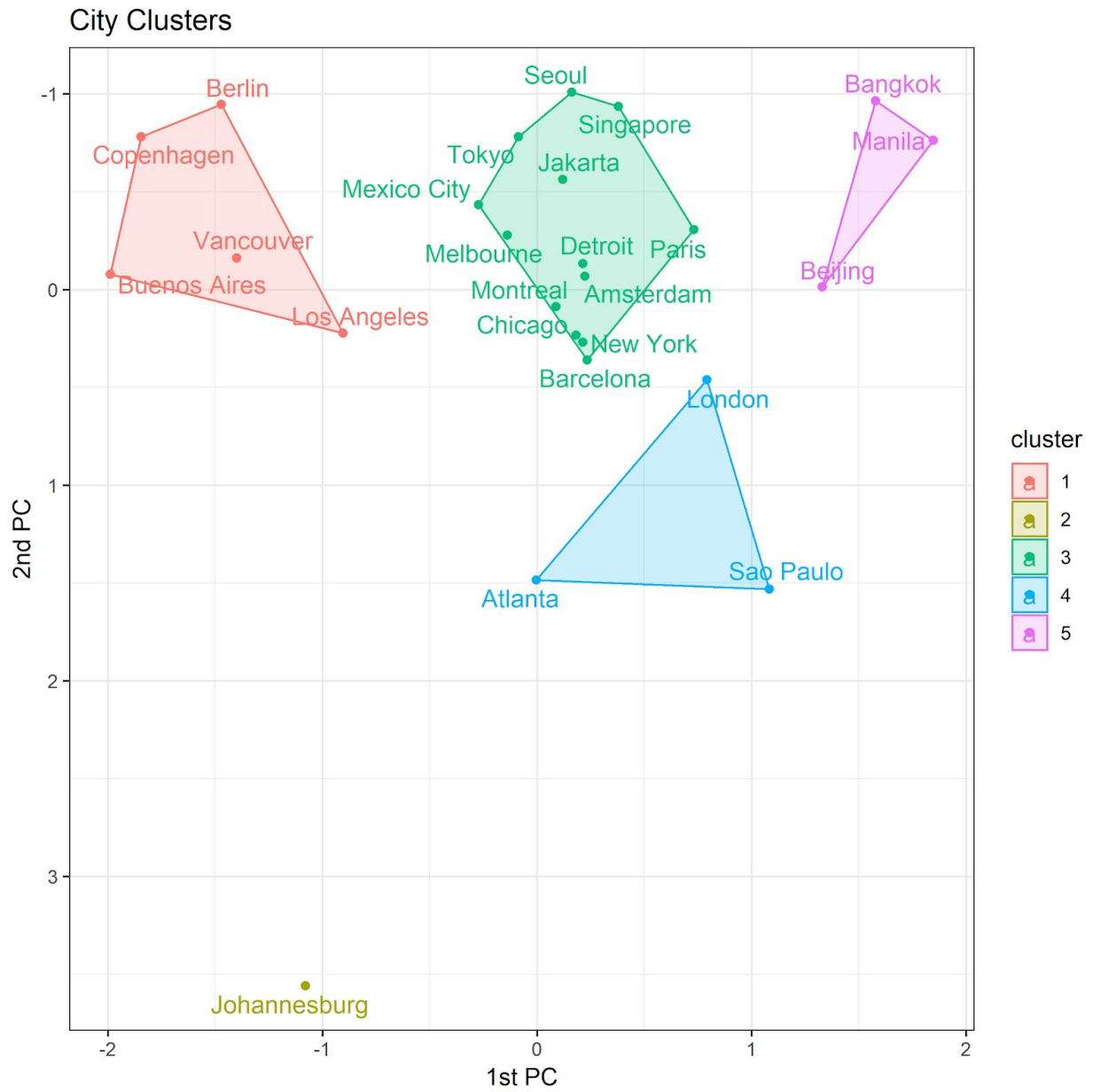
Figure S8. Cluster identification using daytime UHI concentration index and Gini coefficients for cities in the sample
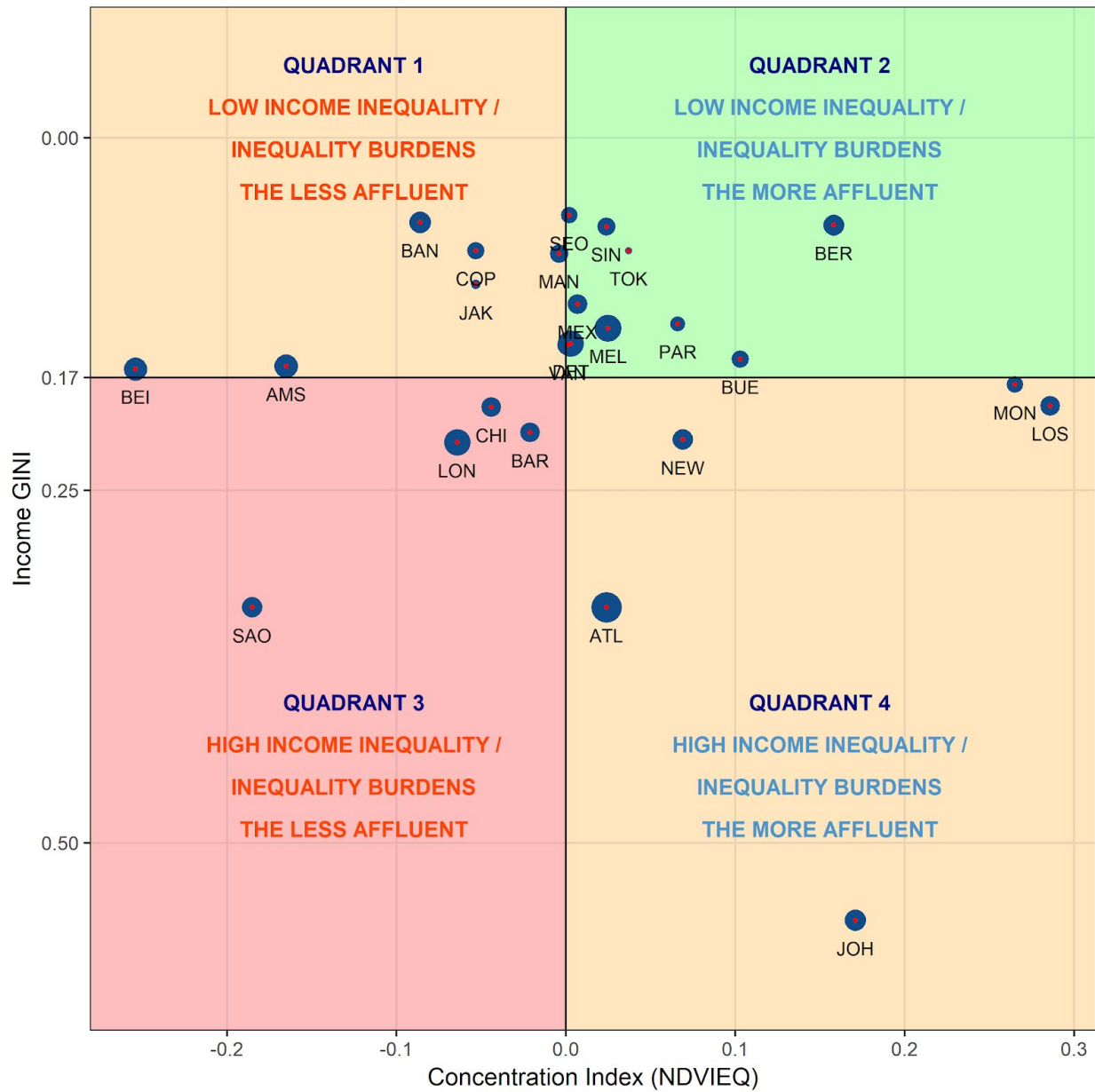
Figure S9. Four-quadrant plot of ΔNDVI concentration and Gini indices for cities in the study. The quadrant threshold (i.e., x-intercept) for the concentration index is 0, while the y-intercept for the income Gini is the mean Gini of the sample cities (0.17).