Appendix Table 1. Variable definitions

Metric	Method
Asthma diagnosis at an encounter	Asthma diagnosis was determined by having ≥1 International Classification of Disease (ICD)-9 codes of 493* or ICD-10 codes of J45* documented at an encounter during the study period. Only diagnoses provided in a healthcare context were used to eliminate bias from self-reported asthma
Asthma on Problem List	Asthma on problem list was determined by having ≥1 ICD-9 codes of 493* or ICD-10 codes of J45* documented on the patient's problem list during the study period. Asthma on the problem list is our proxy for documentation of asthma as a chronic condition. Only diagnoses provided in a healthcare context were used to eliminate self-reported asthma
Asthma Severity on Problem List	Asthma severity on problem list was determined by having a problem list documented with ≥1 of the following ICD-10 codes in 4 categories: 1) Mild intermittent asthma, uncomplicated (J45.20), with (acute) exacerbation (J45.21), with status asthmaticus (J45.22); 2) Mild persistent asthma, uncomplicated (J45.30), with (acute) exacerbation (J45.31), with status asthmaticus (J45.32); 3) Moderate persistent asthma, uncomplicated (J45.40), with (acute) exacerbation (J45.41), with status asthmaticus (J45.42; 4) Severe persistent asthma, uncomplicated (J45.50), with (acute) exacerbation (J45.51), with status asthmaticus (J45.52)
Body mass index (BMI) assessment	BMI and BMI percentile were calculated at the encounter level using the `childsds` package in R based on age, sex, weight, and height. Overweight was defined as BMI over the 85th percentile at a given encounter and obese was defined as over the 95th percentile at a given encounter. Biologically implausible values were flagged as 8 standard deviations over or 4 under the mean BMI. To measure at the patient level, encounter-level data was reduced to never, sometimes, or always mutually exclusive categories for both overweight and obese.
Medication Administration	Type of administration was first categorized based on prescription unit where: chewable tablet, disintegrating tablet, extended release capsule, extended release tablet, oral capsule, oral tablet, oral solution, oral strip, oral suspension, and granules corresponded to "swallowed;" injectable solution, injectable suspension, and prefilled syringe corresponded to "injected;" inhalant powder, metered dose inhaler, oral powder, and oral spray corresponded to "inhaled;" and nasal corresponded to "nasal." If a route of administration was not determined in the first round, a text search was performed connecting the keywords: tablets, capsules, and granules to "swallowed;" suspension, injection, and syringe to "injected;" inhaler, nebulizer, and spray to "inhaled;" and nasal to "nasal."
Medication Category	Medication names were reduced by removing common words shorter than 5 characters after cleaning the most frequent abbreviations, and the remaining medication keyword combinations were reviewed by the PI physician and categorized into one of seven categories: 1) albuterol/rescue inhaler, 2) inhaled corticosteroid, 3) oral steroid, 4) other inhaler, 5) other non-inhaler, 6) peak air meter, and 7) remove. The medications included in this study were oral steroids (dexamethasone, methylprednisolone, prednisolone, and prednisone), inhaled corticosteroids (beclomethasone, betamethasone, budesonide, ciclesonide, dexamethasone, flunisolide, fluticasone, mometasone, prednisolone, and triamcinolone), and albuterol/rescue inhalers (albuterol, levalbuterol, formotorol, metaproterenol, and pirbuterol).
Social Deprivation Index (SDI) Score	The SDI is a composite measure of deprivation using information about income, education, employment, housing, household characteristics, transportation, and demographics from the 2011-2015 American Community Survey. The SDI score is a standardized measure of the SDI that allows comparison across different areas. The SDI score is available from the Robert Graham Center for census tracts. Thus, each patient was assigned a census tract where, based on addresses recorded in the EHR, the patient resided cumulatively, over one or more address(es), for the longest duration during the study period. Patients were then linked to the SDI score for their respective census tract. The SDI score distribution in the study population was categorized into quartiles. (Appendix Table 3)

Appendix Table 2. Composition of the Social Deprivation Index*

Domain	Variable
Income	Percent population less than 100% FPL (income in past 12 months)
Education	Percent population ≥25 years of age with less than 12 years of education
Employment	Percent non-employed (not seeking employment)
Employment	Percent unemployed (actively seeking employment)
Housing	Percent population living in renter-occupied housing units
Housing	Percent population living in crowded housing (occupants per room >1.01 to 1.50 occupants per room)
Household Characteristics	Percent single-parent households with dependents <18 years old
Transportation	Percent population with no car
Demographics	Percent population black
Demographics	Percent high needs population (<5 years and ≥65 years and over)

*Data from The Robert Graham Center https://www.graham-center.org/rgc/maps-data-tools/sdi/social-deprivation-index.html

Supplemental material | BMJ Publishing Group Limited (BMJ) disclaims all liability and responsibility arising from any reliance placed on this supplemental material which has been supplied by the author(s) | *BMJ Open*

3

Appendix Table 3. Unadjusted Asthma Diagnosis and Care Outcomes Overall and by Social Deprivation Index Score Quartile* (N=34,266)

	Overall (N%)	Quartile 1 (0-56) (N%)	Quartile 2 (57-79) (N%)	Quartile 3 (80-92) (N%)	Quartile 4 (93-100) (N%)
Asthma on problem list					
Yes	25,844 (75.4)	5,100 (70.7)	5,954 (73.2)	6,432 (75.7)	8,358 (80.1)
No	8,422 (24.6)	2,106 (29.2)	2,175 (26.8)	2,059 (24.3)	2,082 (19.9)
Asthma severity on problem list					
Yes	7,254 (21.2)	1,273 (17.7)	1,555 (19.1)	1,735 (20.4)	2,691 (25.8)
No	27,012 (78.8)	5,933 (82.3)	6,574 (80.9)	6,756 (79.6)	7,749 (74.2)
Prescriptions per year	**Overall** (mean/95%CI)	**Quartile 1 (0-56)** (mean/95%CI)	**Quartile 2 (57-79)** (mean/95%CI)	**Quartile 3 (80-92)** (mean/95%CI)	**Quartile 4 (93-100)** (mean/95%CI)
Albuterol	1.88 (1.75-2.00)	1.43 (1.15-1.70)	1.83 (1.58-2.08)	1.90 (1.70-2.12)	2.19 (1.95-2.43)
Inhaled steroids	0.52 (0.48-0.56)	0.36 (0.32-0.40)	0.50 (0.40-0.59)	0.51 (0.46-0.57)	0.65 (0.56-0.74)
Oral steroids	0.35 (0.30-0.39)	0.28 (0.19-0.37)	0.35 (0.25-0.45)	0.40 (0.29-0.51)	0.34 (0.27-0.42)

*Quartile 1 of the social deprivation index score represents neighborhoods with the least deprivation and Quartile 4 represents neighborhoods with the most deprivation

Appendix Table 4. Adjusted Rates of Asthma Medication Prescription (N=34,266)			
	Albuterol Prescription Adjusted IRR (95% CI)	Inhaled Steroid Prescription Adjusted IRR (95% CI)	Oral Steroid Prescription Adjusted IRR (95% CI)
Social Deprivation Index Score*			
Quartile 1	Ref	Ref	Ref
Quartile 2	1.08 (1.02-1.14)	1.04 (0.93-1.17)	1.00 (0.88-1.13)
Quartile 3	1.15 (1.09-1.22)	1.08 (0.96-1.22)	1.07 (0.92-1.24)
Quartile 4	1.22 (1.13-1.32)	1.16 (0.99-1.34)	1.03 (0.86-1.24)
Ethnicity			
Non-Hispanic White	Ref	Ref	Ref
Latino	1.18 (1.09-1.28)	1.13 (0.97-1.31)	1.37 (1.21-1.56)
Non-Hispanic Black	1.55 (1.44-1.67)	1.62 (1.46-1.80)	1.46 (1.21-1.76)
Age at first encounter			
3-5 years	Ref	Ref	Ref
6-10 years	0.73 (0.70-0.77)	0.79 (0.71-0.88)	0.46 (0.42-0.51)
11-13 years	0.70 (0.66-0.74)	0.73 (0.65-0.83)	0.35 (0.30-0.41)
14-17 years	0.68 (0.62-0.73)	0.61 (0.52-0.72)	0.29 (0.23-0.38)
Sex			
Female	Ref	Ref	Ref
Male	1.13 (1.11-1.16)	1.16 (1.11-1.22)	1.25 (1.18-1.33)
Insurance Type			
Private insurance used at ≥1 clinic visit	Ref	Ref	Ref
Never insured	1.16 (1.01-1.32)	1.00 (0.80-1.25)	1.08 (0.83-1.41)
Public insurance used at ≥1 clinic visit	1.19 (1.11-1.28)	1.08 (0.97-1.20)	0.91 (0.79-1.06)
Public and private insurance	0.93 (0.86-1.01)	0.83 (0.73-0.94)	0.75 (0.64-0.88)
Visits per Year			
Less than 1	Ref	Ref	Ref
1 to 2	1.80 (1.73-1.89)	2.07 (1.90-2.25)	1.90 (1.71-2.11)
3 to 4	2.80 (2.65-2.97)	3.98 (3.59-4.42)	3.92 (3.41-4.52)
5 or more	5.00 (4.61-5.42)	8.11 (7.10-9.27)	8.69 (7.25-10.41)
BMI Category			
Never overweight/obese	Ref	Ref	Ref
≥1 visit with overweight/obese BMI	0.89 (0.86-0.93)	0.86 (0.81-0.92)	0.89 (0.83-0.97)
Always overweight/obese	0.95 (0.92-0.98)	0.96 (0.90-1.03)	0.96 (0.90-1.04)
Percent Federal Poverty Level			
Always ≥138	Ref	Ref	Ref
Above & below 138	0.76 (0.70-0.82)	0.74 (0.65-0.84)	0.68 (0.58-0.81)
Always <138	0.87 (0.81-0.94)	0.85 (0.74-0.97)	0.79 (0.67-0.94)
Not documented	1.03 (0.91-1.18)	0.99 (0.84-1.17)	1.09 (0.85-1.39)
Neighborhood Change			
No	Ref	Ref	Ref
Yes	0.97 (0.93-1.01)	0.97 (0.92-1.04)	0.91 (0.84-0.98)
Smoking exposure			
Never exposed	Ref	Ref	Ref
Ever exposed	1.05 (0.98-1.12)	1.10 (0.99-1.22)	0.97 (0.87-1.08)
Unknown if exposed	1.05 (0.98-1.13)	1.06 (0.95-1.18)	0.90 (0.79-1.03)

*Quartile 1 of the social deprivation index score represents neighborhoods with the least deprivation and Quartile 4 represents neighborhoods with the most deprivation