OBJECTIVE
To assess prescription opioid use and associated costs among children and adolescents with asthma in the US by using a nationally representative database.

METHODS
Study Design, Data Source, and Patient Population
This study analyzed data from the Medical Expenditure Panel Survey (MEPS) and was conducted among the non-institutionalized population that collects personal and household-level information on respondents' sociodemographic characteristics, health status, access to care, clinical diagnoses, and related charges and payments. Among children and adolescents (3 to 17 years) with asthma:

- MEPS is a cross-sectional survey of the US civilian non-institutionalized population that collects personal and household-level information on sociodemographic characteristics, health status, access to care, clinical diagnoses, and related charges and payments.
- Asthma was defined as any diagnosis with a Clinical Classification Software code of 493.xx (ICD-9-CM) or 493.0x (ICD-10-CM) indicating asthma.

Data Analyses
A key background characteristic that was assessed included patient demographics, type of prescription and medical diagnoses (grouped by cardiorespiratory, dental, ear-nose-throat, gastrointestinal, dermatological, neurologic, musculoskeletal, dermatological, and psychiatric comorbidities).

Study design methods were used to generate national estimates of prescription opioid use and overall total health care and personnel-related expenditures.

A multivariate logistic regression model was used to assess determinants of prescription opioid use among children and adolescents.

All costs were adjusted to 2017 U.S. dollars using the medical care component of the Consumer Price Index.

RESULTS

Among the total of 75.9 million children and adolescents, an estimated 254,110 with asthma received at least one prescription opioid from 2011 to 2015.

- Prescription opioids were received by an estimated 4.2% (95% confidence interval [CI] 3.9-4.6%) of children and adolescents with asthma compared with 2.4% (95% CI 2.2-2.7%) of patients without asthma (P value < 0.0001).

- Characteristics of patients who received prescription opioids, by asthma status, are presented in Table 1.

- Among patients with asthma, the most common opioids prescribed were hydrocodone (47.4%), tramadol (30.0%) and oxycodone (8.0%) (Figure 1).

- The most common diagnoses associated with opioid prescriptions among patients with asthma were trauma (55.2%) and cardiopulmonary conditions (9.9%) among children and adolescents without asthma, they were trauma (29.8%) and dental conditions (9.6%) (Figure 1).

- The average total per-patient health care expenditure was $9,761 (95% CI, $4,740-$14,781) for opioid users with asthma versus $7,183 (95% CI, $4,341-$11,025) for opioid users without asthma (Figure 3).

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Figure 1. Most commonly prescribed opioids among children and adolescents in the US, 2011-2015.

Figure 3. All-cause expenditures among children and adolescents receiving prescription opioids in the US, 2015-2016.

REFERENCES
5. Indian River Medical Center. Prescription drug dosage, dosage form, route of administration, and frequency distribution for each category of drugs. 2016. Indian River Medical Center, Indian River, FL 32969 USA.

LIMITATIONS
- The diagnosis of asthma is self-reported or parent-reported, which may be inaccurate.
- The study did not include nondrug treatment, and it is possible that use of prescription opioids could be overestimated due to recall bias and interview error. It may not be totally accurate.
- Some common diseases with secondary data such as asthma and conditions typically managed using prescription opioids may not have been captured due to the relatively small sample size and interview error may impact for study findings.

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Prescription opioid use among children and adolescents with asthma in the United States: National estimates from 2011 to 2015
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BACKGROUND
- Prescription opioid use remains one of the most commonly prescribed medications in the United States (US), particularly in children and adolescents, which pose a major public health concern along with significant economic burden on society.
- Deaths due to prescription opioid overdose increased by an age-adjusted rate of 6.5% from 2010 to 2016.
- Among adolescents with non-cancer pain conditions, prescription opioid use was 15.6% of privately insured adolescents and 20.5% of Medicaid (Arkansas)–covered adolescents in 2005.3
- Opioids are reported to be the leading cause of serious injury or death among children and adolescents.
- Among patients with asthma, the average total per-patient health care expenditure was $9,761 (95% CI, $4,740-$14,781) for opioid users with asthma versus $7,183 (95% CI, $4,341-$11,025) for opioid users without asthma (Figure 3).
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