

Characteristics of healthcare cost drivers among US patients with eosinophilic esophagitis with high versus non-high all-cause costs: an analysis of insurance claims data



Poster number: B0200

Presented at the American College of Gastroenterology Annual Scientific Meeting, Charlotte, NC, USA, October 21–26, 2022

Xiao Xu¹; Justin Kwiatek¹; Mirna Chehade²; Seema Aceves³; Ekaterina Maslova⁴; Danuta Kielar⁴; Heide Stirnadel-Farrant⁴; Juliana Meyers⁵; Sean Candrilli⁵; Rohit Katial¹

¹BioPharmaceuticals Medical, AstraZeneca, Gaithersburg, MD, USA; ²Mount Sinai Center for Eosinophilic Disorders, Departments of Pediatrics and Medicine, Icahn School of Medicine at Mount Sinai, New York, NY, USA; ³Division of Allergy, Immunology, University of California-San Diego, San Diego, CA, USA; ⁴BioPharmaceuticals Medical, AstraZeneca, Cambridge, UK; ⁵RTI Health Solutions, Research Triangle Park, NC, USA

Background

- Eosinophilic esophagitis (EoE) is a chronic inflammatory disorder with an estimated US prevalence of 57 cases per 100,000 people (range 39–153/100,000) between 2009–2011.¹
- Symptoms include dysphagia, feeding difficulties (in children), food impaction, chest and abdominal pain, reflux, and vomiting.²⁻⁴
- Consequently, EoE is associated with significant healthcare resource utilization (HCRU) and costs, especially compared with patients without the disease.^{5,6} However, data concerning HCRU and cost drivers are limited.

Study objective

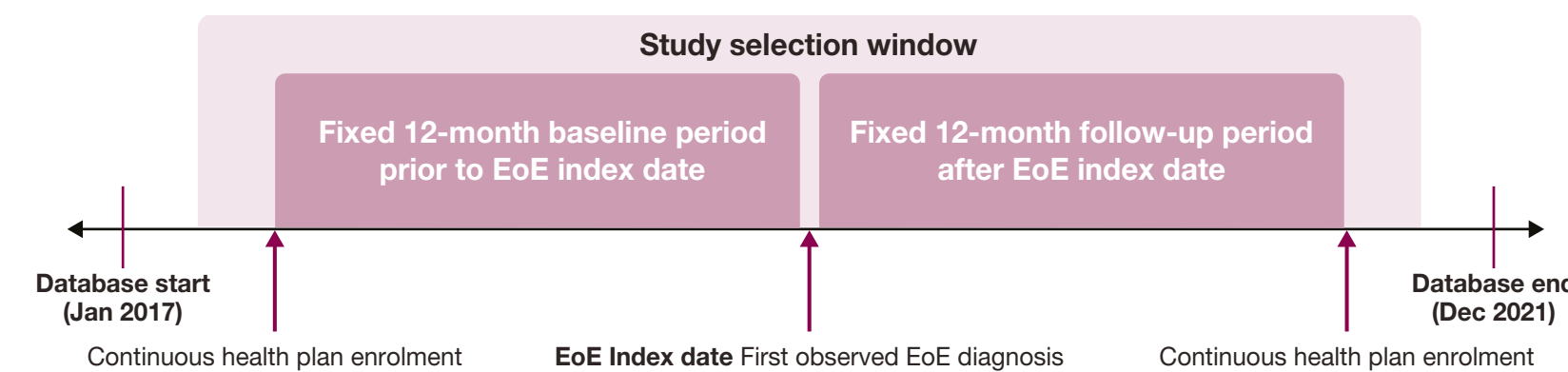
- To describe demographics, co-morbidities, and cost drivers in patients with newly diagnosed (incident) EoE, comparing those considered high-cost with those considered non-high-cost.

Methods

Study design

- Retrospective analysis of 2017–2021 MarketScan Commercial and Medicare administrative claims of patients with EoE. This study is part of the CONSTELLATION real world evidence program in rare eosinophil-associated diseases.

Figure 1. Study Schema

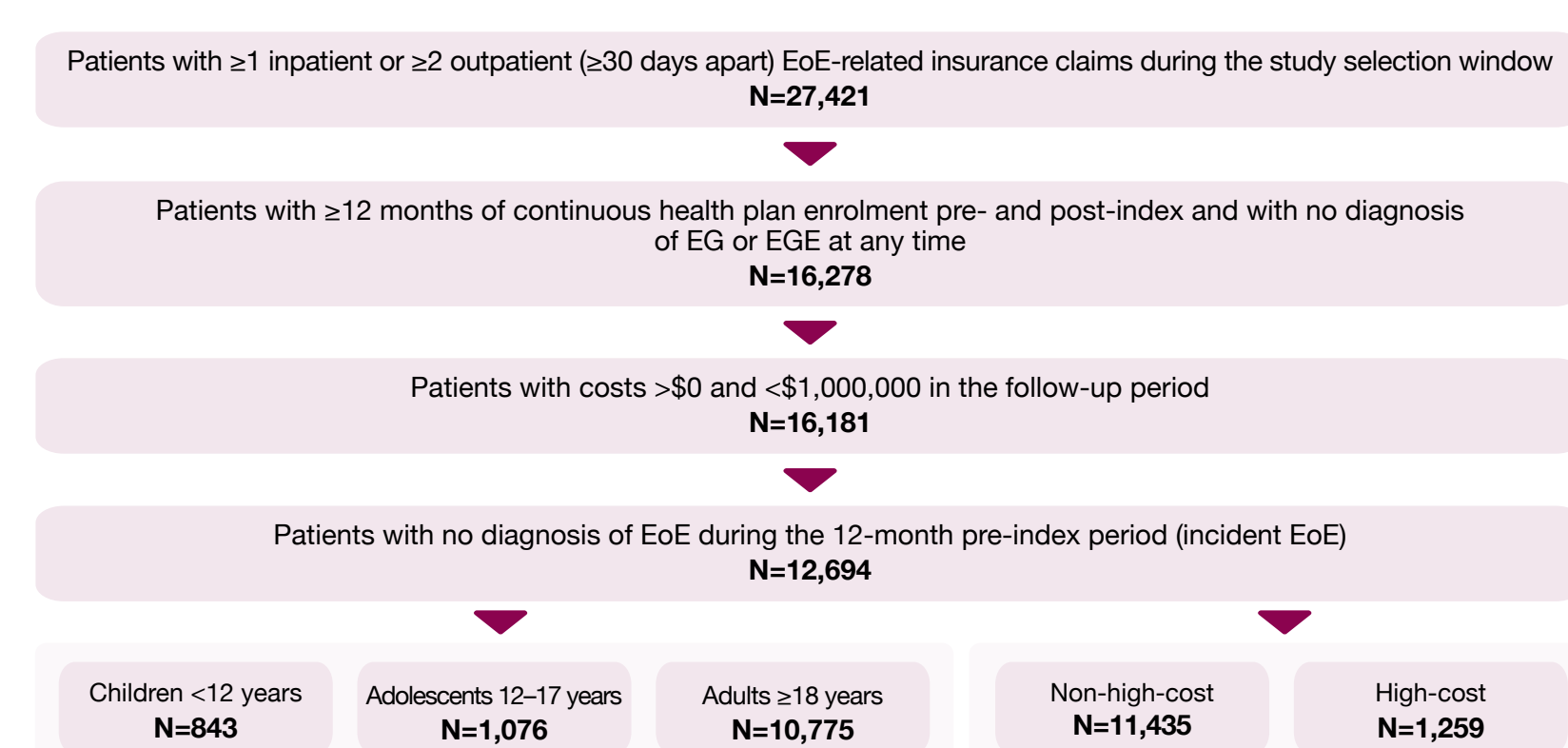


EoE, eosinophilic esophagitis.

Patient selection and attrition

- Patient selection criteria are presented in Figure 2.
- Patients were stratified by all-cause post-index HCRU cost group (high [\geq \$30,000] vs non-high [$<$ \$30,000]) and by patient age at index date (<12 years, 12–17 years, \geq 18 years).

Figure 2: Patient selection and attrition



EG, eosinophilic gastroenteritis; EGE, eosinophilic gastroenteritis; EoE, eosinophilic esophagitis.

Outcome measures and statistical analysis

- Descriptive analyses of patient demographics, Charlson Comorbidity Index [CCI] score, proportion of patients with specific co-morbidities, and all-cause and EoE-related costs are presented for patients with incident EoE, stratified by all-cause post-index HCRU cost group and age at index date.

- All-cause costs included those for all claims, regardless of the diagnosis, while EoE-related costs included EoE procedures and all claims with an EoE diagnosis or symptom.

References
1. Debon ES. Gastroenterol Clin North Am 2014;43:201-218; 2. Croese J, et al. Gastrointest Endosc 2003;58(4):516-22; 3. Piarthi JR, et al. Mod Pathol 2006;19(1):30-6; 4. Mukher DJ, et al. J Pediatr Gastroenterol Nutr 2013;56(3):263-70; 5. Lu M, et al. Clin Gastroenterol 2022;56(2):133-40; 6. Jensen E, et al. Am J Gastroenterol 2019;114(5):626-32.

Results

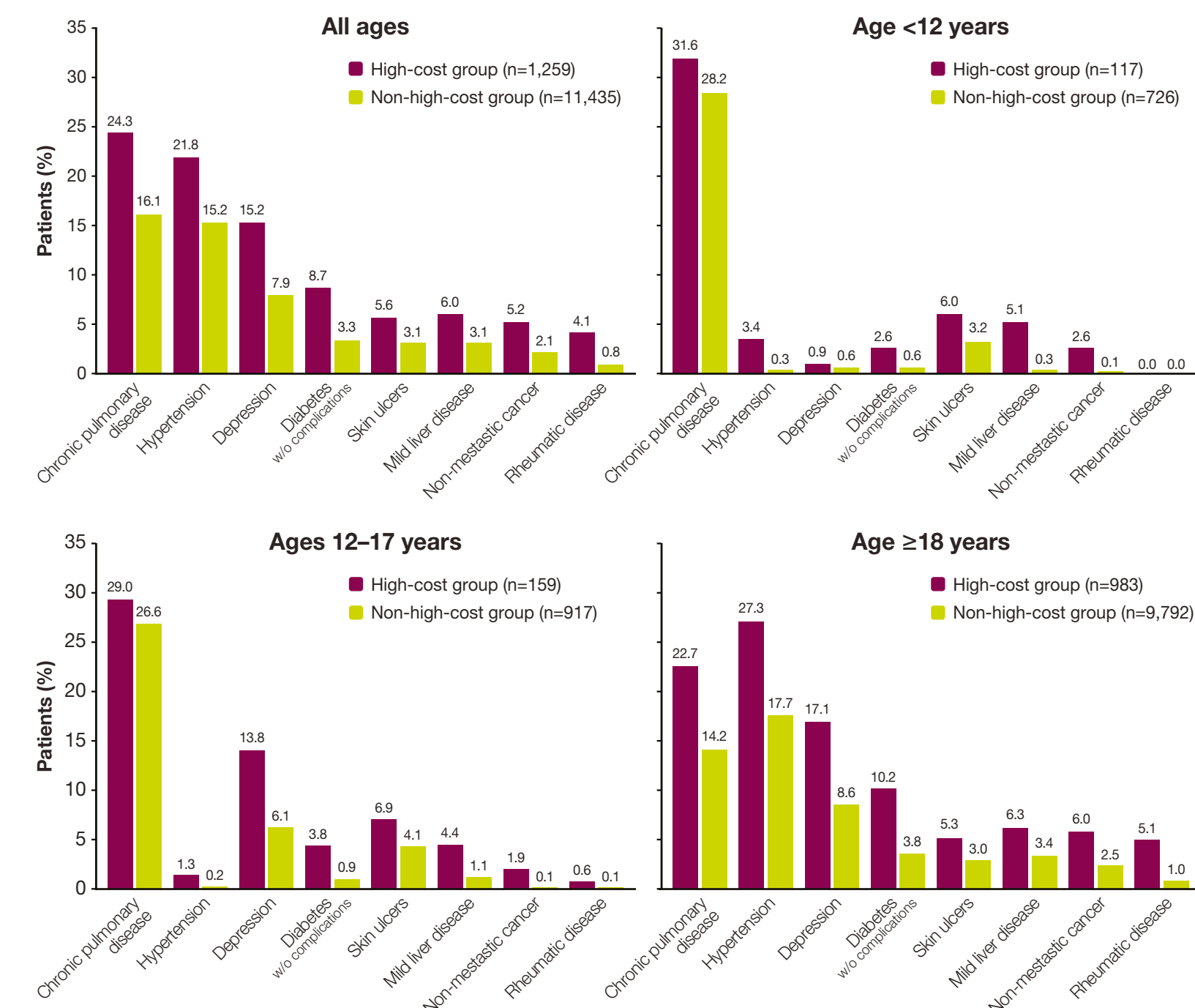
Demographics

- The study identified 12,694 patients with incident EoE (mean age: 38 years, 63% male).
- The high-cost group (9.9% of patients) appeared to have a higher proportion of children, adolescents and females than the non-high-cost group (90.1% of patients) (Table 1).

Co-morbidities during the baseline period

- The high-cost group had a higher mean CCI score than the non-high-cost group (Table 1).
- The most common Charlson co-morbidities are shown in Figure 3.
- Patients in the high-cost group were 5.1, 2.6 and 2.5 times more likely to have rheumatic disease, diabetes and cancer than patients in the non-high-cost group.

Figure 3: Burden of co-morbidities during the baseline period, by age and cost group.



All-cause and EoE-related costs

- Mean (SD) annual all-cause and EoE-related costs for all patients were:
 - Pre-diagnosis: \$9,643 (\$34,618) and \$2,824 (\$12,703), respectively.
 - Post-diagnosis: \$14,573 (\$34,379) and \$6,603 (\$16,767), respectively.
- The high-cost group had 7.4-fold higher all-cause annual costs pre-index than the non-high cost group (Figure 4).
 - Pharmacy costs were a more notable cost driver in the high-cost group pre- and post-diagnosis (35% and 26%) than in the non-high-cost group (15% and 16%).
 - Other key post-diagnosis cost drivers for the high-cost group were inpatient hospital visits (24%; mostly unrelated to EoE) and outpatient hospital visits (30%).
 - Key post-diagnosis cost drivers for the non-high-cost group were outpatient hospital visits (42%) and physician office visits (20%).
 - Inpatient costs increased 120% post-diagnosis in the high-cost group, but decreased 66% in the non-high-cost group.
- The high-cost group had 5.5-fold higher EoE-related annual costs pre-index than the non-high-cost group (Figure 4).
 - For EoE-related costs, the main cost drivers in the high-cost group both pre- and post-EoE diagnosis were inpatient hospital visits (38.8% and 41.5%) and outpatient hospital visits (28.7% and 35.1%).
- When compared by age group, adolescents had higher mean costs than adults in the high-cost and non-high-cost groups, both pre- and post-diagnosis (Figure 5).

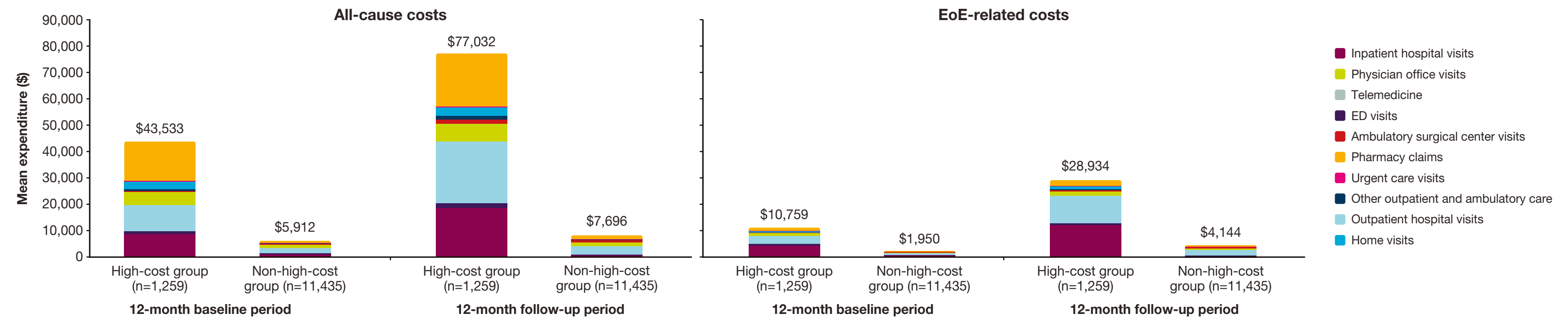
Acknowledgements
This study was funded by AstraZeneca, and is part of the CONSTELLATION real world evidence program in rare eosinophil-associated diseases. We would like to thank Lucy Cooper and Samantha Blakemore of InScience Communications, Springer Healthcare, for providing medical writing support, which was funded by AstraZeneca in accordance with Good Publication Practice (GPP 2022) guidelines (http://www.ismp.org/gpp-2022).

Table 1. Per patient group demographics and CCI score

| Characteristic | High-cost group | | | Overall | Non-high-cost group | | | Overall |
|-----------------------------|-----------------|-------------|------------|--------------|---------------------|-------------|--------------|---------------|
| | <12 years | 12–17 years | ≥18 years | | <12 years | 12–17 years | ≥18 years | |
| N (%) | 117 (9.3) | 159 (12.6) | 983 (78.1) | 1,259 | 726 (6.4) | 917 (8.0) | 9,792 (85.6) | 11,435 |
| Male, n (%) | 75 (64.1) | 103 (64.8) | 518 (52.7) | 696 (55.3) | 514 (70.8) | 646 (70.5) | 6,207 (63.4) | 7,367 (64.4) |
| Commercial insurance, n (%) | 117 (100.0) | 159 (100.0) | 970 (98.7) | 1,246 (99.0) | 726 (100.0) | 917 (100.0) | 9,621 (98.3) | 11,264 (98.5) |
| CCI*, mean (SD) | 0.9 (1.4) | 0.9 (1.1) | 1.5 (1.9) | 1.4 (1.8) | 0.4 (0.7) | 0.5 (0.8) | 0.7 (1.1) | 0.7 (1.1) |

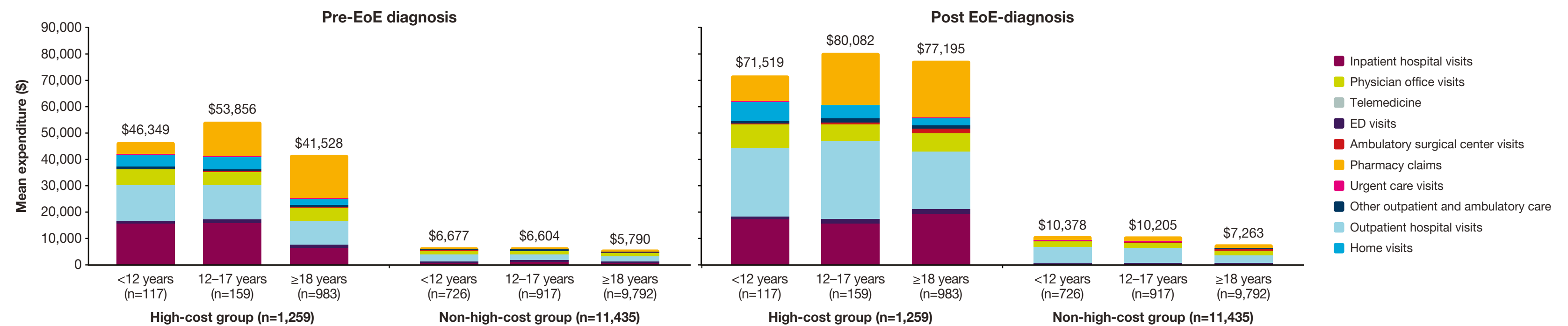
*The CCI score (calculated during the baseline period) contains 20 categories of co-morbidities, as defined by ICD-9-CM and ICD-10-CM diagnosis and procedure codes, with associated weights corresponding to the severity of the comorbid condition of interest. CCI, Charlson co-morbidity index; EoE, eosinophilic esophagitis; SD, standard deviation.

Figure 4. All-cause and EoE-related per patient costs, pre- and post-EoE diagnosis, by cost group



Numbers above the bars represent the mean annual per patient costs. ED, emergency department; EoE, eosinophilic esophagitis.

Figure 5. All-cause per patient costs pre-EoE and post-EoE diagnosis, by age and cost group



Numbers above the bars represent the mean annual per patient costs. ED, emergency department; EoE, eosinophilic esophagitis.

Limitations

- Diagnoses are based on insurance billing codes, hence subject to inaccuracies.
 - Misclassified patients may have a lower cost, thereby bringing the mean cost down, so our data may be conservative estimates of cost.
- EoE-related costs are likely to be underestimated, as not all EoE-related procedures could be included in the cost estimates.
- EoE is a chronic progressive disease; some patients with stable disease may be incorrectly classified as incident cases, while those with mild disease may not yet have been diagnosed.
- The dataset only includes filled claims for prescription medication and medical foods. Since over-the-counter medications and those paid for out-of-pocket have not been accounted for, the average costs presented here may again be underestimated.

Conclusions

- The high-cost group contained a higher proportion of children, adolescents and females, and had a higher burden of co-morbidities than the non-high-cost group.
- While inpatient stay-related costs decreased for the non-high-cost group, the high-cost group experienced a substantial increase in these costs following EoE diagnosis. Given that the majority of increases in post-diagnostic costs were non-EoE related, it is likely that this difference results from the higher burden of co-morbidities seen in the high-cost group.
- In the high-cost group, the highest EoE-related costs during both the baseline and follow-up periods were for inpatient hospital visits and outpatient hospital visits.
- Differences in co-morbidities may help identify patients who are more likely to be in the high-cost group. Nonetheless, the differences observed between these two groups require further evaluation in order to improve targeting of treatment.

Disclosures
Xiao Xu, Justin Kwiatek, Ekaterina Maslova, Danuta Kielar, Heide Stirnadel-Farrant, and Rohit Katial are employees of, and own stock in, AstraZeneca; Mirna Chehade reports consulting fees from Regeneron, Alkermes, Adarex/Elcadi, Shire/Takeda, AstraZeneca, Sanofi, Bristol Myers Squibb and Phathom; and research funding from Regeneron, Alkermes, Shire/Takeda, AstraZeneca, Adarex/Elcadi and Danone; Seema Aceves is a co-inventor of oral viscous budesonide, UCSD patent, Takeda license and reports consulting and speaker fees from Regeneron, AstraZeneca, Bristol-Myers Squibb and MacScope/WeMD; Juliana Meyers and Sean Candrilli are employees of RTI Health Solutions who were contracted by AstraZeneca to conduct this analysis.