Background

- The National Heart, Lung, and Blood Institute (NHLBI) Guidelines for the Diagnosis and Management of Asthma recommend a stepwise approach to asthma management with the goal of maintaining asthma control and reducing the risk of exacerbations.
- Although medications and treatments reduce the frequency of exacerbations, they still occur among the treated asthma population.

Objectives

- To characterize the treated US adult asthma population, including those who experienced an exacerbation, with respect to demographics, clinical characteristics and healthcare resource utilization, overall and by NHLBI step.

Methods

Study Design:

- Retrospective cohort study of treated asthma patients during 2013-2014 in the OptumClinics® Data Mart commercial claims database.

Inclusion Criteria:

- Continuous enrollment (medical and pharmacy benefits) between 01 January 2013 through 31 December 2014.
- Age ≥18 years on 01 January 2014 (index date).
- ≥1 diagnosis code for asthma (ICD-9 493.xx) before 01 January 2013 and 31 December 2013 (baseline period).
- ≥2 asthma medication dispensations during the baseline (2013), with ≥1 asthma medication dispensed in the 90-days prior to index date.
- Medications during the 90-days prior to index date were used for NHLBI Step classification.

Exclusion Criteria:

- ≥1 diagnosis code for COPD, cystic fibrosis, acute respiratory failure or lung cancer during the study period (2013-2014).

Analysis:

-Demographics, comorbidities, clinical characteristics (e.g., eosinophil counts), and healthcare utilization during the baseline year were described for asthma patients overall and for the subgroup who had ≥1 exacerbation during the follow-up period (2014).
-Exacerbations, healthcare resource utilization, and associated costs were described during 2014 (follow-up period).
-Exacerbations were defined as an asthma-related emergency room visit, hospitalization, or oral corticosteroid treatment (asthma claim within <= 14 days of OCS dispensing).
-Healthcare resource utilization (HCRU) and costs were described for the overall population and subgroup with an exacerbation.

Results

- 72,156 asthma patients met the study inclusion/exclusion criteria, of which 10,590 (14.7%) patients had ≥1 exacerbation during the year of follow-up (2014).
- Approximately 4/5 of patients were classified as NHLBI Step 1-2, 4/5% as NHLBI Step 3-4, and 11% as Steps 5-6 (Table 1).
- Among patients with an exacerbation, there were higher proportions of patients with allergic rhinitis, blood eosinophil counts ≥300 cells/µL, and asthma-related healthcare resource utilization (outpatient, ER visits, hospitalizations) during the baseline period compared to the overall population (Table 1).

Table 1. Demographics, clinical characteristics, and baseline healthcare resource utilization (2013)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Overall Population (n=72,156)</th>
<th>Baseline during Follow-Up (n=10,590)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, median (IQR)</td>
<td>49 (19-64)</td>
<td>48 (19-64)</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>Black: 23.9% (17,141)</td>
<td>Black: 23.3% (2,485)</td>
</tr>
<tr>
<td>And White: 76.1% (55,015)</td>
<td>And White: 76.7% (8,105)</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>Male: 50.2% (36,195)</td>
<td>Male: 50.5% (2,773)</td>
</tr>
<tr>
<td>And female: 49.8% (36,061)</td>
<td>And female: 49.5% (2,817)</td>
<td></td>
</tr>
<tr>
<td>Asthma exacerbations</td>
<td>15,643 (20.7)</td>
<td>15,643 (20.7)</td>
</tr>
<tr>
<td>Asthma exacerbations</td>
<td>15,643 (20.7)</td>
<td>15,643 (20.7)</td>
</tr>
<tr>
<td>Asthma exacerbations</td>
<td>15,643 (20.7)</td>
<td>15,643 (20.7)</td>
</tr>
<tr>
<td>Asthma exacerbations</td>
<td>15,643 (20.7)</td>
<td>15,643 (20.7)</td>
</tr>
<tr>
<td>Asthma exacerbations</td>
<td>15,643 (20.7)</td>
<td>15,643 (20.7)</td>
</tr>
</tbody>
</table>

Conclusions

- Exacerbations were observed among patients classified at each of the 6 NHLBI steps, which is a proxy for disease severity, and were more frequent with increasing step.
- Exacerbations and asthma-related healthcare utilization highlight continued unmet need in the US asthma population.
- Additional research and strategies to address the multifactorial drivers of this continued burden, such as adherence to medications, are needed.

References

- The presenting author is an employee of GSK and co-author, JF. Smith reports employment and stock shares in GSK, DA is a research fellow.
- This study was funded by GSK (ISRN 12/01 16/1718).

Characteristics of Treated Asthma Patients Experiencing Exacerbations in a US Database

Figures 1-4. Mean Asthma-Related Costs during 2013 (left) and 2014 (right) by NHLBI Step Classifications

Figures 2 & 3. Asthma-Related HCRU during follow-up (2014) by NHLBI Step Classifications

Table 2. Demographics, clinical characteristics, and HCRU by NHLBI Step (2014)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
<th>Step 4</th>
<th>Step 5</th>
<th>Step 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asthma exacerbations</td>
<td>1,931 (18.3)</td>
<td>1,817 (17.2)</td>
<td>1,931 (18.3)</td>
<td>1,817 (17.2)</td>
<td>1,931 (18.3)</td>
<td>1,817 (17.2)</td>
</tr>
<tr>
<td>Asthma exacerbations</td>
<td>4,633 (43.7)</td>
<td>4,633 (43.7)</td>
<td>4,633 (43.7)</td>
<td>4,633 (43.7)</td>
<td>4,633 (43.7)</td>
<td>4,633 (43.7)</td>
</tr>
<tr>
<td>Asthma exacerbations</td>
<td>9,275 (60.4)</td>
<td>9,275 (60.4)</td>
<td>9,275 (60.4)</td>
<td>9,275 (60.4)</td>
<td>9,275 (60.4)</td>
<td>9,275 (60.4)</td>
</tr>
</tbody>
</table>

Mean of annual healthcare costs during the follow-up period (2014) by NHLBI Step Classifications

- Mean cost during the follow-up increased by NHLBI step and were higher among those with an exacerbation relative to the overall population (Figure 4).

- Frequency of exacerbation during follow-up increased by NHLBI step (Figure 1).