

Healthcare resource utilization by severity of disease among adult patients with asthma in the United States

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BACKGROUND

- Healthcare utilization (HCRU) among patients with asthma in the United States (US) is not well-characterized.
- Prior studies have generally focused on patients with severe disease. Less is known about utilization patterns across the broader asthma population, including those with mild-to-moderate disease. This limits our understanding of real-world treatment burden and opportunities for intervention at the population level.
- The aim of this study was to characterize and evaluate HCRU among patients with asthma across disease severity levels.

PATIENT POPULATION

- This study utilized structured and unstructured data from electronic health records (EHR) and claims data from US-based health systems in the Verantos Research Network.
- Patients were included if they had at least 2 encounters indicating a diagnosis of asthma between January 1, 2015 and June 30, 2023 and were 18 years or older at asthma index, defined as the date of the earliest of the qualifying encounters. The study end date was December 31, 2023.
- Severity of disease was identified using a combination of ICD-9/10 and SNOMED codes from structured electronic health record (EHR) data and a peer-reviewed, advanced methodology leveraging artificial intelligence in unstructured EHR data.^a

POPULATION CHARACTERISTICS

Table 1: Demographic characteristics among patients with asthma

	Mild	Moderate	Severe
Patients with asthma, n (%)			
Of a total of 4,942	3,524 (71%)	1,117 (23%)	301 (6%)
Follow-up, in months			
Median (Q1, Q3)	60 (29, 85)	28 (8, 59)	21 (6, 48)
Age at index			
Median (Q1, Q3)	48 (33, 58)	51 (37, 60)	52 (38, 61)
Sex			
Female, n (%)	2,414 (69%)	719 (64%)	199 (66%)
Race, n (%)			
White	627 (18%)	186 (17%)	53 (18%)
Black or African American	1,585 (45%)	546 (49%)	161 (53%)
Asian	161 (4.6%)	55 (4.9%)	9 (3.0%)
Other	83 (2.4%)	39 (3.5%)	5 (1.7%)
Unknown	1,068 (30%)	291 (26%)	73 (24%)
Ethnicity, n (%)			
Hispanic or Latino	705 (20%)	210 (19%)	53 (18%)
Not Hispanic or Latino	2,121 (60%)	725 (65%)	216 (72%)
Unknown	698 (20%)	182 (16%)	32 (11%)
History of smoking			
At baseline, n (%)	516 (15%)	188 (17%)	69 (23%)

ANALYSIS

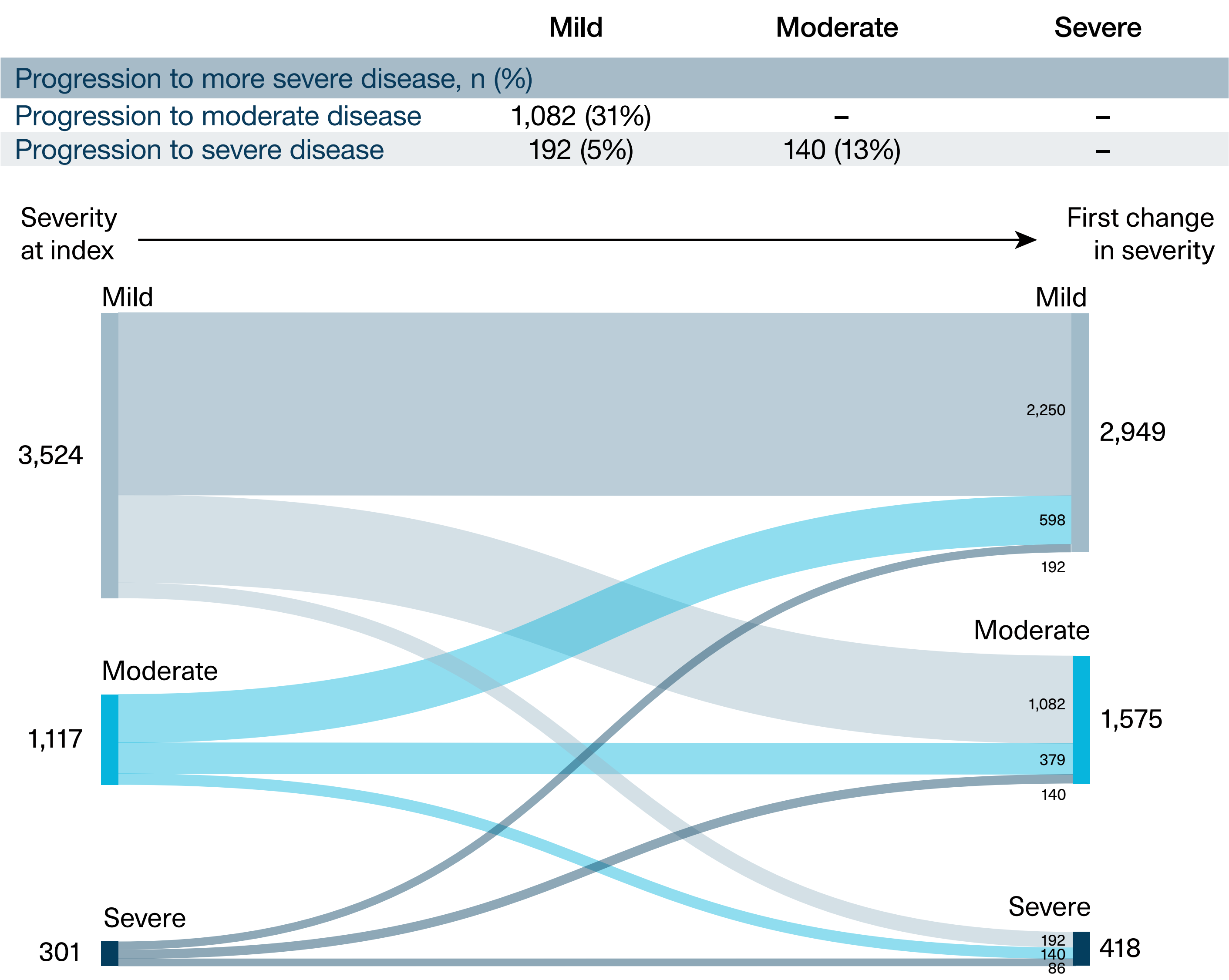
- The follow-up period was defined as the asthma index date until the first of: last contact, death, change in disease severity, or study end date.
- Patient demographic characteristics were described using frequency (n) and percentage (%) for categorical variables and median and interquartile range (IQR, 25th/75th percentiles) for continuous variables.
- The first change, if any, to more or less severe disease during follow-up was identified and characterized in a Sankey plot.
- HCRU was evaluated as rates per 100 person-years and corresponding 95% confidence intervals (95% CI) of asthma-related outpatient care, emergency department (ED) visits, and hospital admissions over the follow-up period.

RESULTS

- Table 1: There were 4,942 eligible patients with a median follow-up time of 51 months (IQR 20 – 80). At index, patients were predominantly female, white, non-Hispanic, and older. The majority (71%) had mild asthma.
- Figure 1: A third (36%) of patients with mild asthma and 13% of patients with moderate asthma at index progressed to more severe disease during follow-up.
- Figures 2a-2c: Patients with severe asthma had an outpatient visit utilization rate 1.25x that of patients with mild asthma. Similarly, rates of ED visits and inpatient admissions for patients with severe asthma were 1.8x and 10x higher, respectively.

CHANGE IN ASTHMA DISEASE SEVERITY

Figure 1: Change in asthma disease severity during follow-up



HEALTHCARE RESOURCE UTILIZATION

Figure 2a: Rate of asthma-related outpatient visits, by severity of disease

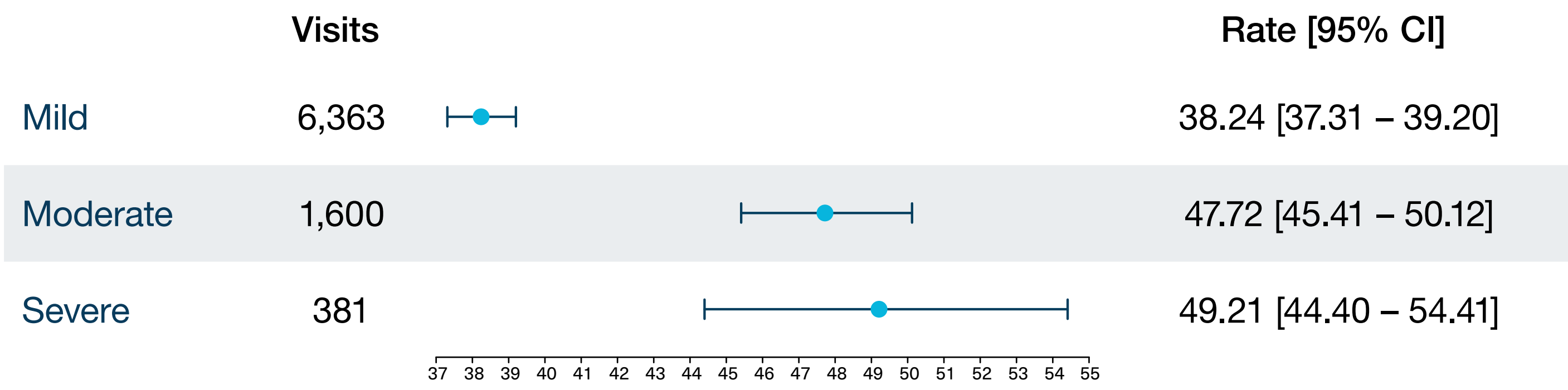


Figure 2b: Rate of asthma-related emergency department visits, by severity of disease

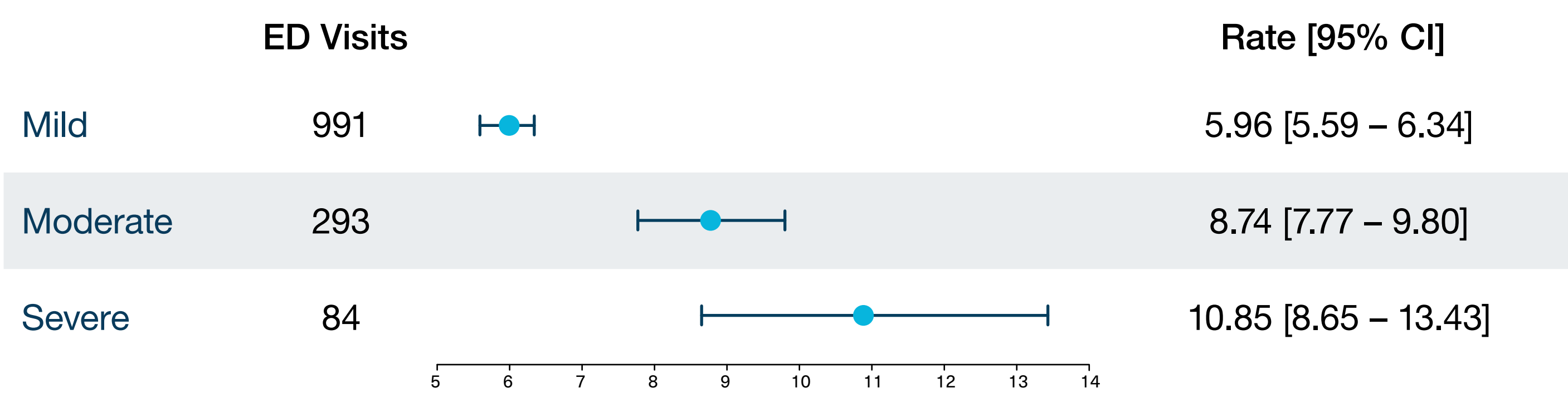
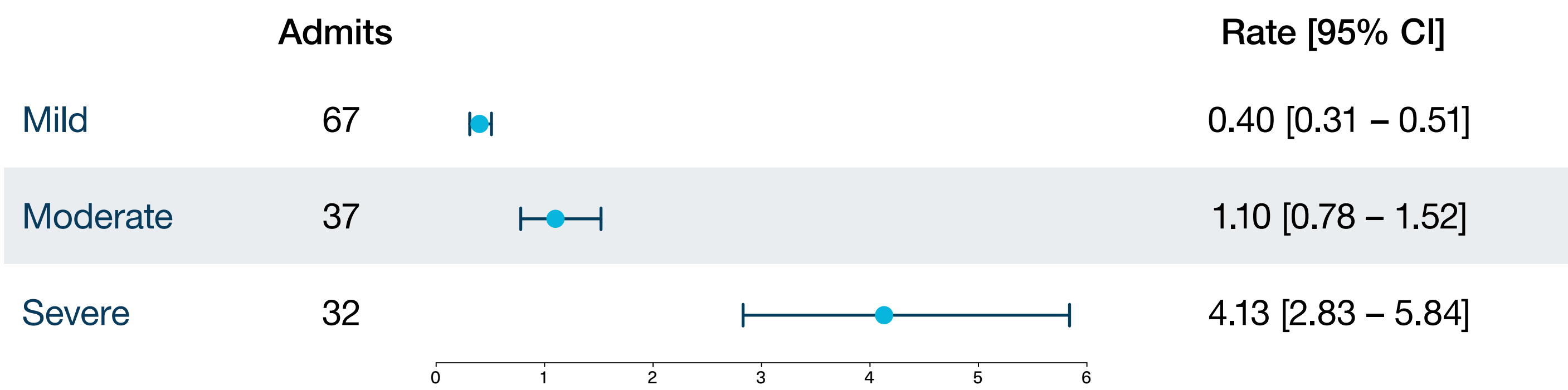


Figure 2c: Rate of asthma-related inpatient admissions, by severity of disease



CONCLUSIONS

- Consistent with studies in non-US patient populations,^{b,c,d,e} this study demonstrated that HCRU increased monotonically with greater disease severity among asthma patients in the US.
- Additionally, a sizable proportion of patients progressed to more severe disease during the observation period.
- These findings suggest an opportunity to reduce overall HCRU burden through better patient management, particularly for patients with mild and moderate asthma.

References

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