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Impact of COVID-19 on patients with asthma in US routine care

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*At the time of study

Digital poster

Introduction

Individuals with asthma are generally more susceptible to respiratory viral infections than the general population, which can be a major cause of acute and severe asthma exacerbation; however, the impact of COVID-19 on patients with asthma is unclear[1,2]

Several studies have reported a reduction in asthma exacerbation rates during the pandemic[3–7]

It is uncertain if the reported declines were short term and whether the easing of COVID-19 restrictions has led to an increase in exacerbation rates to pre-pandemic levels

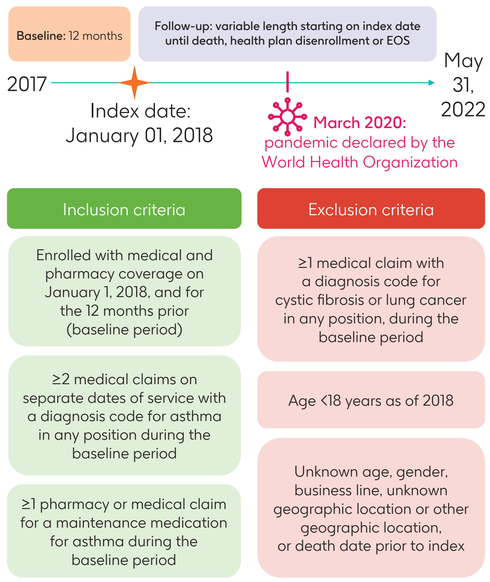
Up-to-date data on the impact of COVID-19 on asthma exacerbations are needed

The objective of this study was to describe changes in the rate of exacerbations among patients with asthma in the US before and during the dynamic periods of the COVID-19 pandemic

Methods

- A longitudinal cohort of patients with asthma was identified using US administrative claims data from the Optum Research Database
- The index date was January 1, 2018, and was included in the follow-up period (**Figure 1**)
- The follow-up period was variable in length and ended with the earliest date of the following: death, health plan disenrollment, or the end of the study period (May 31, 2022)

Figure 1: **Study design**



- Baseline characteristics, the monthly proportion of patients with exacerbations and monthly exacerbation rates were described overall and by exacerbation components
  - Claims-based components of exacerbations included hospitalizations, ED visits, and SCS
- The severity of each exacerbation event was categorized as hospitalization-defined, ED-visit defined, or SCS-defined (average daily dose of ≥20 mg of prednisone or equivalent, or injectable steroid)
- Exacerbations occurring within 14 days of each other were considered a single exacerbation episode and were classified according to the highest severity contributing event

Results

A cohort of 143,053 patients with asthma was identified

Patient demographics are shown in **Table 1**

- Mean (SD) age was 59.8 (17.2) years, and 69.4% of patients were female

Common comorbidities included hypertension (60.6%), allergic rhinitis (40.8%), GERD (37.9%), COPD (29.0%), sinusitis (27.5%), diabetes (27.3%), cardiovascular disease (26.1%), and depression (23.1%) (**Table 2**)

Table 1: **Patient demographics**

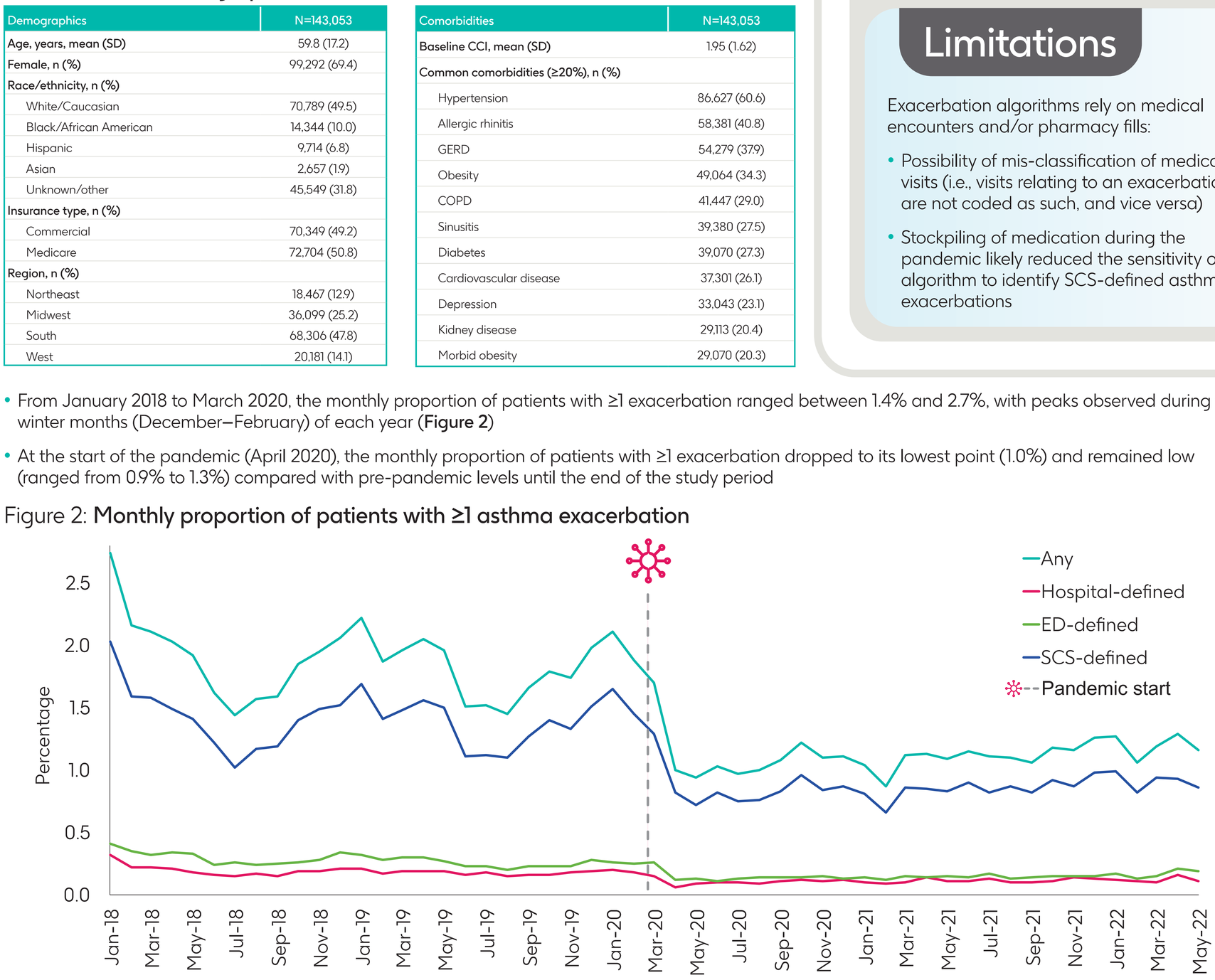
Demographics	N=143,053
Age, years, mean (SD)	59.8 (17.2)
Female, n (%)	99,292 (69.4)
Race/ethnicity, n (%)	
White/Caucasian	70,789 (49.5)
Black/African American	14,344 (10.0)
Hispanic	9,714 (6.8)
Asian	2,657 (1.9)
Unknown/other	45,549 (31.8)
Insurance type, n (%)	
Commercial	70,349 (49.2)
Medicare	72,704 (50.8)
Region, n (%)	
Northeast	18,467 (12.9)
Midwest	36,099 (25.2)
South	68,306 (47.8)
West	20,181 (14.1)

Table 2: **Baseline comorbidities**

Comorbidities	N=143,053
Baseline CCI, mean (SD)	1.95 (1.62)
Common comorbidities (≥20%), n (%)	
Hypertension	86,627 (60.6)
Allergic rhinitis	58,381 (40.8)
GERD	54,279 (37.9)
Obesity	49,064 (34.3)
COPD	41,447 (29.0)
Sinusitis	39,380 (27.5)
Diabetes	39,070 (27.3)
Cardiovascular disease	37,301 (26.1)
Depression	33,043 (23.1)
Kidney disease	29,113 (20.4)
Morbid obesity	29,070 (20.3)

- From January 2018 to March 2020, the monthly proportion of patients with ≥1 exacerbation ranged between 1.4% and 2.7%, with peaks observed during the winter months (December–February) of each year (**Figure 2**)
- At the start of the pandemic (April 2020), the monthly proportion of patients with ≥1 exacerbation dropped to its lowest point (1.0%) and remained low (ranged from 0.9% to 1.3%) compared with pre-pandemic levels until the end of the study period

Figure 2: **Monthly proportion of patients with ≥1 asthma exacerbation**



- Exacerbation rates varied with seasonality across the study periods, with an apparent decrease in April 2020 (**Figure 3**)
- Hospitalization-defined, ED visit-defined, and SCS-defined exacerbations decreased proportionately
- Exacerbation rates did not return to pre-pandemic levels, despite slight increases from April 2020 to the end of the study period in May 2022

Figure 3: **Monthly asthma exacerbation rate**

Conclusions

- Asthma exacerbation rates decreased during the COVID-19 pandemic and did not appear to return to pre-pandemic levels by May 2022
- Temporal trends in asthma exacerbations were observed in this cohort, with the highest rates during the winter months
- It is unclear whether the observed changes in asthma outcomes are attributable to changes in behaviors, care, or environmental factors
- COVID-19 remains a potential confounder in claims-based analyses of asthma outcomes

Limitations

Exacerbation algorithms rely on medical encounters and/or pharmacy fills:

- Possibility of mis-classification of medical visits (i.e., visits relating to an exacerbation are not coded as such, and vice versa)
- Stockpiling of medication during the pandemic likely reduced the sensitivity of the algorithm to identify SCS-defined asthma exacerbations

Abbreviations

CCI, Charlson Comorbidity Index; COPD, chronic obstructive pulmonary disease; COVID-19, coronavirus disease 2019; ED, emergency department; EOS, end of study; GERD, gastroesophageal reflux disease; SCS, systemic corticosteroids; SD, standard deviation; US, United States.

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Disclosures

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