COPD exacerbations pre, during and post COVID-19 pandemic in the US

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*At the time of study

Conclusions

Rates of COPD exacerbations appeared to decrease during the COVID-19 pandemic and remained lower than pre-pandemic levels, until May 2022

These observed decreases in exacerbations may be attributable to decreases in respiratory triggers, changes in healthcare-seeking behaviors, and/or other factors

Background

COPD exacerbations can negatively impact health-related quality of life, increase rates of hospitalizations and readmissions, and worsen disease progression[1]

The COVID-19 pandemic is expected to have a significant and long-lasting impact on the clinical burden and disease management of patients with COPD

To evaluate the indirect impact of the COVID-19 pandemic on patients with COPD in the USA by describing changes in the rate of exacerbations over time

Methods

- This was a retrospective cohort study of patients diagnosed with COPD, using administrative claims data from the US Optum Research database. Study inclusion and exclusion criteria are outlined in **Table 1**
- Patient cohorts were identified independently for each calendar year (**Figure 1**)
  - 2018 cohort – for patients with COPD
    - Index date: January 1, 2018, and was included in the follow-up period
  - 2020 COVID-19 cohort – for patients with COPD and COVID-19
    - Index date: 1st of the calendar month in which the patient was diagnosed with COVID-19, and was also included in the follow-up period
- The follow-up period for both cohorts varied in length and ended with the earliest date of either death, health plan disenrollment, or end of study period
- Baseline characteristics and monthly rates of any moderate* or severe† COPD exacerbations were described
  - The proportion of patients with exacerbations was counted yearly in the baseline period, and monthly and yearly in the follow-up period
    - The index date for the 2020 COVID-19 cohort led to data being collected by months of follow-up

Figure 1: **Study design**

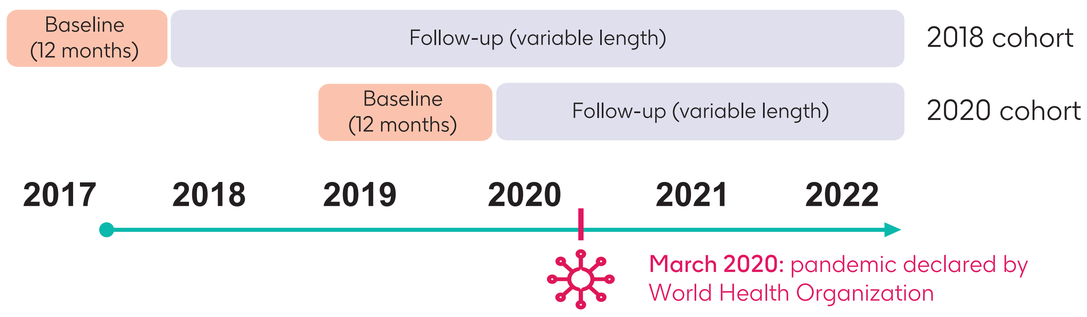


Table 1: **Inclusion and exclusion criteria**

Inclusion criteria	Exclusion criteria
Enrolled with medical and pharmacy coverage on January 1, 2018 (2018 cohort)/January 1, 2020 (2020 cohort), and for the 12 months prior (baseline period). Additionally for the 2020 COVID-19 cohort, patients needed to be enrolled between January 1, 2020, and the month of earliest COVID-19 diagnosis	≥1 medical claim with a diagnosis code for cystic fibrosis or lung cancer in any position during the baseline period
≥2 medical claims on separate dates of service with a diagnosis code for COPD in any position during the baseline period	Aged <40 years as of the year of patient identification
≥1 pharmacy or medical claim for a maintenance medication for COPD during the baseline period	Unknown age, gender, business line, unknown or other geographic location, or a death date prior to January 1 in the calendar year cohort

*Moderate exacerbations were defined as an emergency, outpatient, or telemedicine visit with a COPD code plus an oral corticosteroid and/or antibiotic prescription. †Severe exacerbations were defined as a hospitalization with a COPD code.

Results

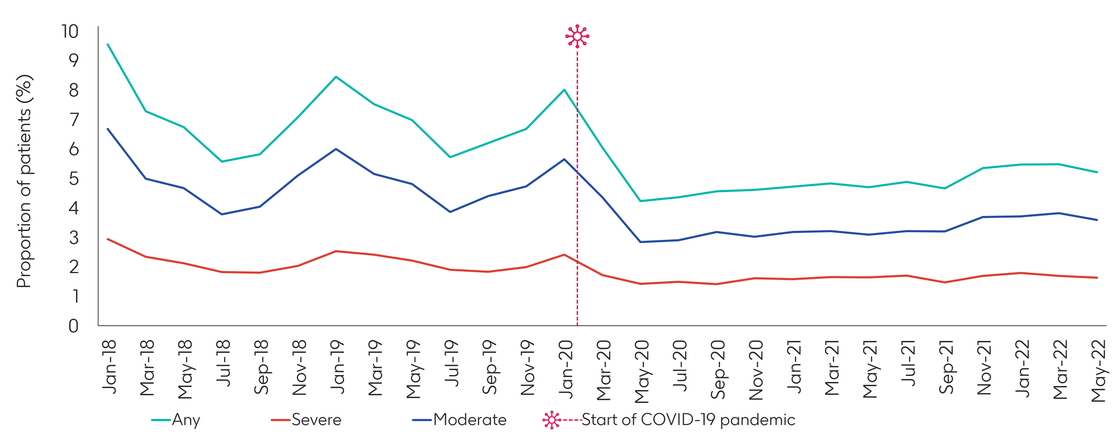
- Overall, 139,128 patients were included in the 2018 cohort and 31,595 patients were included in the 2020 COVID-19 cohort
- Baseline demographics and clinical characteristics are shown in **Table 2**

Table 2: **Baseline demographics and clinical characteristics by calendar year cohort**

Characteristic	2018 cohort (n=139,128)	2020 cohort (n=31,595)
Mean (SD) age at index, years	71.8 (9.8)	72.6 (9.9)
Female sex, n (%)	81,005 (58.2)	19,004 (60.2)
Baseline AHRQ CCS comorbidities (top 5), n (%)		
Hypertension	115,102 (82.7)	27,336 (86.5)
Other lower respiratory disease	107,874 (77.5)	23,851 (75.5)
Disorders of lipid metabolism	101,350 (72.9)	23,983 (75.9)
Diseases of the heart	97,124 (69.8)	24,112 (76.3)
Other nutritional, endocrine and metabolic disorders	72,968 (52.5)	19,000 (60.1)

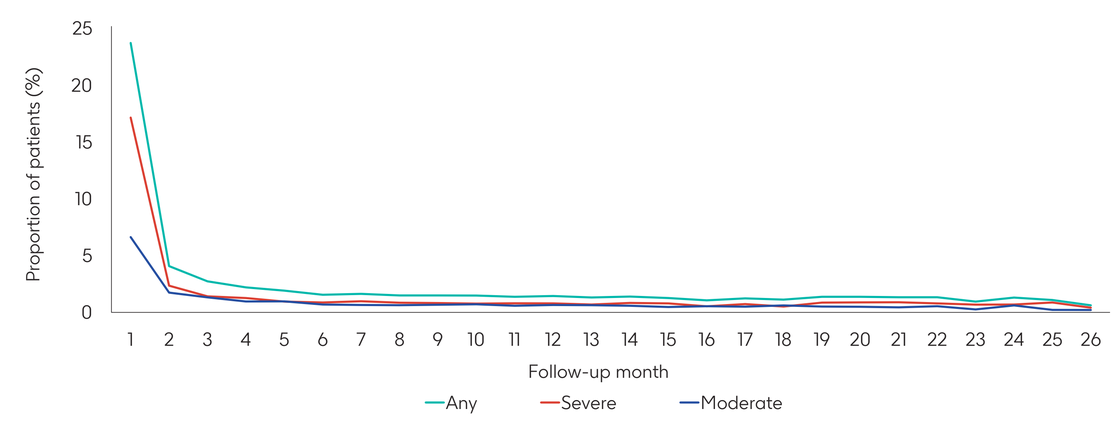
- In the 2018 cohort, from January 2018 to March 2020, the monthly proportion of patients with ≥1 exacerbation (any) ranged between 5.5% and 9.6%, with peaks observed from December to February of each year (**Figure 2**)
- At the beginning of the pandemic in April 2020, the monthly proportion of patients with ≥1 exacerbation (any) dropped to its lowest point (4.2%) and remained low, compared with pre-pandemic levels (4.2%–5.8%), until the end of the study period
  - Similar trends were observed for patients with ≥1 moderate or ≥1 severe exacerbation

Figure 2: **Monthly proportion of patients with ≥1 COPD-related exacerbation (2018 cohort)**



- In the 2020 COVID-19 cohort, the proportion of patients who experienced ≥1 exacerbation (any) with a concomitant diagnosis code for COVID-19 was high during the month of first diagnosis (23.7%), but then dropped substantially and remained low (<5%) in subsequent months (**Figure 3**)
  - Similar trends were observed for patients with ≥1 moderate or ≥1 severe exacerbation

Figure 3: **Monthly proportion of patients with ≥1 COPD-related exacerbation and a concomitant diagnosis code for COVID-19 (2020 COVID-19 cohort)**



Limitations

- The results from this study are most applicable to prevalent COPD populations instead of newly diagnosed populations
- The exacerbation algorithms used in this study relied on medical encounters and/or pharmacy fills; stockpiling of rescue medication during the pandemic could have reduced the sensitivity of the algorithm to identify moderate COPD exacerbations. Therefore, while telemedicine visits were incorporated into the algorithm, exacerbations among patients who stockpiled rescue medications were missed
- The lack of a general control cohort limits the generalizability of the study findings outside of the adult COPD population

Abbreviations

AHRQ CCS, Agency for Healthcare Research and Quality Clinical Classifications Software; COPD, chronic obstructive pulmonary disease; COVID-19, coronavirus disease 2019; SD, Standard deviation.

References

1. Global Initiative for Chronic Obstructive Lung Disease 2023 report. https://goldcopd.org/2023-gold-report-2 (accessed October 2023.

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Digital poster

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