EE730

Health Care Resource Utilization (HCRU) in Chronic Obstructive Pulmonary Disease (COPD), and Asthma Patients with Moderate-to-Severe Disease

COPD

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BACKGROUND

- Asthma and chronic obstructive pulmonary disease (COPD) are significant public health concerns, with a high prevalence and a substantial economic burden.[1–3] Both diseases significantly impact individuals' quality of life, daily activities, and health outcomes.[4]
- Exacerbations in patients with COPD or asthma are likely to increase healthcare resource utilisation (HCRU) and healthcare costs, significantly adding to the overall burden.[5]
- There is a lack of real-world evidence evaluating HCRU in patients with uncontrolled COPD and asthma.

Objective

- **To assess all-cause and COPD- or asthma-related HCRU in patients with uncontrolled disease who have experienced severe and moderate exacerbations.**

Conclusions

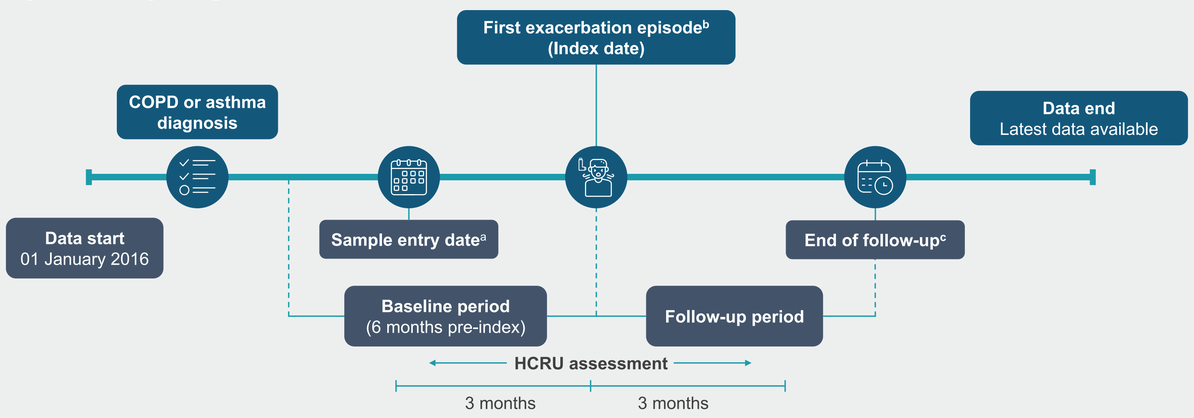
- **The study highlights a high HCRU in both the uncontrolled COPD or asthma cohorts. Additionally, patients with uncontrolled COPD generally experienced more intensive HCRU, expressed in terms of hospital admissions, intensive care unit (ICU) stays, emergency room (ER) visits, and outpatient visits, than their asthma counterparts.**
- **Limitations of this study include the potential misclassification of uncontrolled COPD and asthma as these are inferred from diagnosis, treatment, and procedure data recorded in claims. Additionally, the severity of the cohort is defined based on the severity of exacerbation episodes, which may introduce bias in the analysis.**

METHODS & RESULTS

Data source and study design

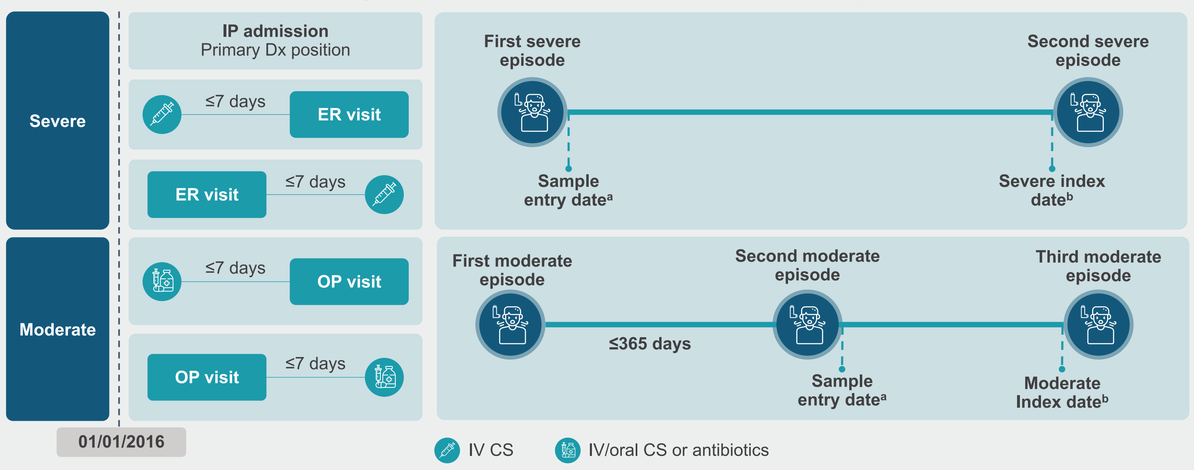
- In this retrospective cohort study, we identified patients from the Optum Clinformatics claims data between 01 January 2016 and 30 November 2023.
- The study cohort consisted of patients with uncontrolled COPD (aged ≥40 years) or asthma (aged ≥6 years), defined as those having ≥2 moderate exacerbation episodes within a 12-month period or ≥1 severe exacerbation episode, who enrolled continuously for at least 6 months before and after the index date. The study design is depicted in **Figure 1**.
- The index date was defined as the date of the first severe exacerbation episode (for severe exacerbation cohorts) or the first moderate exacerbation episode (for moderate exacerbation cohorts) starting after the sample entry date (SED) (i.e. the earliest date when a patient met the criteria for uncontrolled disease; **Figure 2)**.

Figure 1. Study design



[a]The earliest date when a patient met the criteria for uncontrolled disease. Patients were considered to have uncontrolled disease if they had either (i) ≥2 moderate exacerbation episodes that were <12 months apart or (ii) ≥1 severe exacerbation episode.
[b]First severe exacerbation episode (severe exacerbation cohorts) or first moderate exacerbation episode (moderate exacerbation cohorts) starting after the sample entry date.
[c]Earliest between end of continuous enrolment for the patient (6 months post-index), end of data availability or date of death.
HCRU was assessed 3 months before index exacerbation, during the index exacerbation, and within 3 months after end of index exacerbation and reported as non-annualised absolute values.
COPD, chronic obstructive pulmonary disease; HCRU, healthcare resource utilisation.

Figure 2. Definition of exacerbation events and episodes



[a]Sample entry date is the earliest between the end date of the second moderate exacerbation episode or the end date of the first severe exacerbation episode. Severe exacerbation events occurring within 14 days are consolidated into a single severe exacerbation episode. Similarly, moderate exacerbation events within the same timeframe are combined into one moderate exacerbation episode. Moderate events that overlap with severe events are collapsed as part of severe episodes.
[b]Index date refers to the date of first exacerbation episode starting after the sample entry date.
A severe exacerbation was defined as an ER visit for COPD/asthma, and a diagnosis claim of IV CS within 7 days of the visit. A moderate exacerbation was defined as an OP visit for COPD/asthma, and a diagnosis claim of IV/oral CS or antibiotics within 7 days of the visit.
COPD, chronic obstructive pulmonary disease; CS, corticosteroids; Dx, diagnosis claim; ER, emergency room; IP, inpatient; IV, intravenous; OP, outpatient.

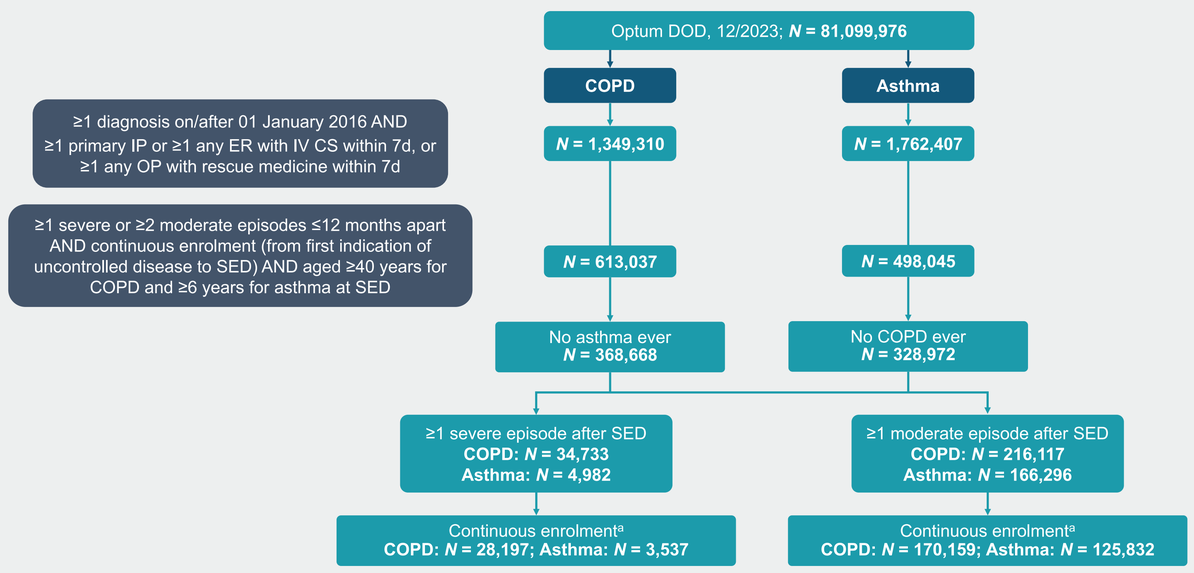
Outcomes

- We reported the all-cause and COPD- and asthma-related HCRU during the index exacerbation and within 3 months after the end of index exacerbation. The results were summarised descriptively.

Patient demographics

- A total of 28,197 patients were included in the severe exacerbation COPD cohort, and 3,537 in the severe exacerbation asthma cohort. Additionally, 170,159 patients were included in the moderate exacerbation COPD cohort and 125,832 in the moderate exacerbation asthma cohort. The attrition for the COPD and asthma cohorts is shown in **Figure 3**.
- Patients in the COPD cohort were older than those in the asthma cohort (~72 years vs. ~47 years). In both cohorts, the proportion of females was higher (asthma, >68%; COPD, ~53%).
- Most of the study patients were white (>58%), followed by black (>10%). In the COPD cohort, a majority of patients were enrolled in Medicare (>89%), whereas in the asthma cohort, over 62% of patients had commercial insurance coverage.

Figure 3. Attrition for the COPD and asthma cohorts

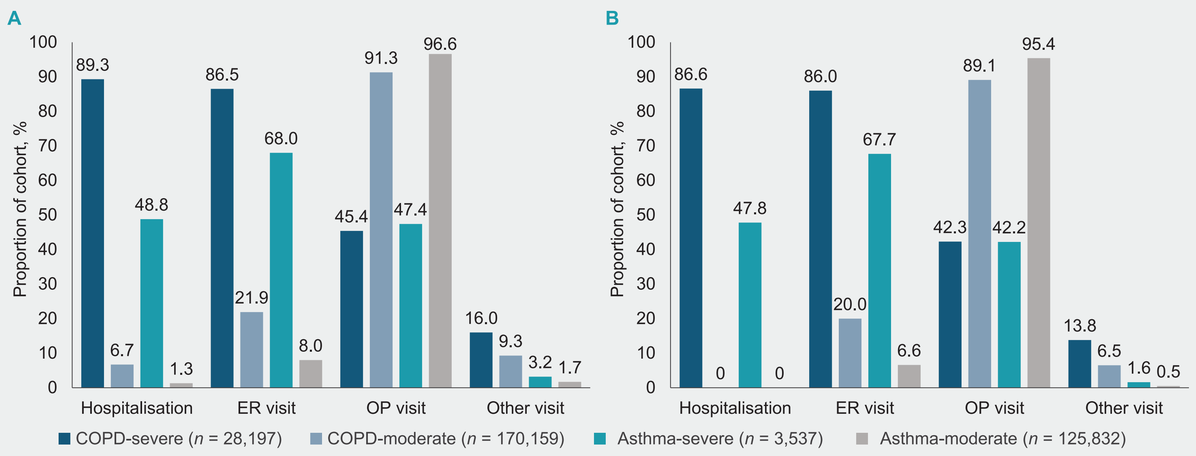


[a]From ≥6 months baseline to ≥6 months follow-up/ death, if earlier.
COPD, chronic obstructive pulmonary disease; CS, corticosteroids; DOD, date of death; ER, emergency room; IP, inpatient; IV, intravenous; OP, outpatient; SED, sample entry date; 7d, 7 days.

HCRU outcomes at the index exacerbation

- Both COPD cohorts had a higher proportion of patients with all-cause and disease-related inpatient (IP) admissions, ICU stays, ER visits, and the number of IP days at the index exacerbation than the asthma cohorts (**Figure 4** and **Table 1**).

Figure 4. (A) All-cause and (B) asthma- and COPD-related HCRU at the index exacerbation

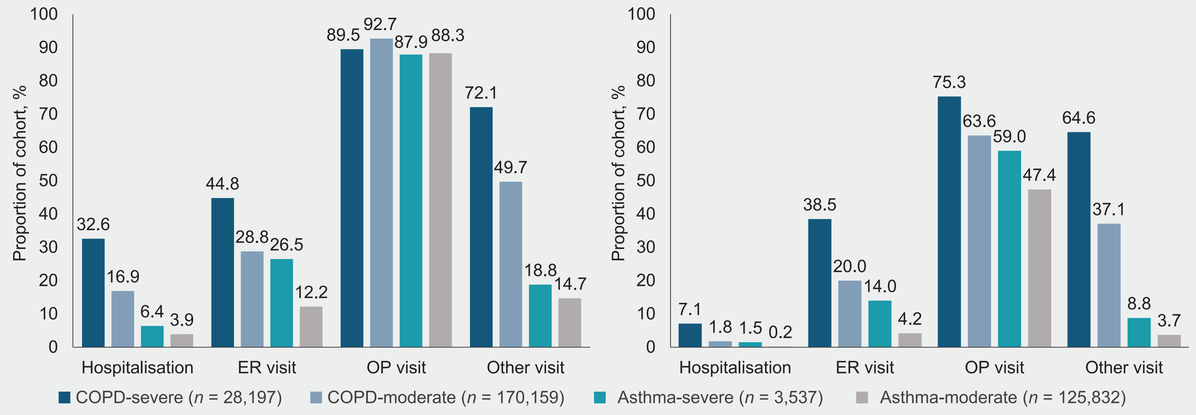


COPD, chronic obstructive pulmonary disease; ER, emergency room; HCRU, healthcare resource utilisation; OP, outpatient.

HCRU outcomes at 3 months after the index exacerbation

- In the 3 months following the index exacerbation, both COPD cohorts had more patients with ≥1 disease-related IP admission (severe: 1,954 [7.1%]; moderate: 3,125 [1.8%]) than the asthma cohorts (severe: 54 [1.5%]; moderate: 222 [0.2%]).
- Additionally, both COPD cohorts had more patients with ≥1 disease-related ER visit (severe: 10,591 [38.5%]; moderate: 33,907 [20.0%]) than the asthma cohorts (severe: 494 [14.0%]; moderate: 5,328 [4.2%]), as well as ≥1 ICU stay and the number of IP days (**Figure 5** and **Table 1**).

Figure 5. Follow-up HCRU at 3 months after the index exacerbation: (A) all-cause and (B) asthma- and COPD-related



COPD, chronic obstructive pulmonary disease; ER, emergency room; HCRU, healthcare resource utilisation; OP, outpatient.

Table 1. HCRU parameters at the index exacerbation and at 3 months after the index exacerbation

HCRU parameters	Index exacerbation				3 months after the index exacerbation			
	COPD cohorts		Asthma cohorts		COPD cohorts		Asthma cohorts	
	Severe *N* = 28,197	Moderate *N* = 170,159	Severe *N* = 3,537	Moderate *N* = 125,832	Severe *N* = 28,197	Moderate *N* = 170,159	Severe *N* = 3,537	Moderate *N* = 125,832
Follow-up observability								
Observability, days, mean (SD)	10.1 (9.3)	4.6 (5.1)	6.7 (7.6)	3.6 (4.1)	84.4 (19.7)	88.8 (11.2)	90.6 (5.4)	90.8 (3.2)
Hospitalisations (patients with ≥1 hospitalisations), mean (SD)								
≥1 ICU stay, *n* (%)[a]	7,377 (29.3)	3,618 (31.7)	414 (24.0)	304 (18.7)	4,189 (46.7)	12,048 (41.9)	62 (27.3)	1,207 (24.8)
Number of any hospitalisations	1.1 (0.3)	1.0 (0.2)	1.0 (0.2)	1.0 (0.2)	1.4 (0.7)	1.3 (0.6)	1.2 (0.5)	1.2 (0.5)
Number of COPD/asthma-related IP admissions	1.0 (0.2)	0.0 (0.0)	1.0 (0.2)	0.0 (0.0)	0.2 (0.5)	0.1 (0.3)	0.3 (0.5)	0.0 (0.2)
Number of IP days	5.9 (4.6)	2.9 (2.3)	4.3 (2.5)	3.0 (2.1)	10.4 (9.6)	9.3 (8.7)	6.6 (6.1)	7.4 (8.0)
Number of COPD/asthma-related IP days	5.6 (4.6)	0.0 (0.0)	4.2 (2.5)	0.0 (0.0)	1.4 (3.6)	0.6 (2.3)	1.2 (2.6)	0.2 (1.0)
Other visits (patients with ≥1 other visits), mean (SD)								
Number of other visits	2.4 (2.4)	1.8 (1.9)	1.4 (1.1)	1.7 (2.3)	8.5 (8.7)	6.5 (8.1)	3.9 (5.9)	4.1 (6.8)
Number of COPD/asthma-related other visits	2.0 (2.3)	1.2 (1.4)	0.8 (1.2)	0.5 (1.0)	7.0 (7.9)	4.3 (6.1)	2.0 (4.3)	1.1 (3.7)
ER visits (patients with ≥1 ER visits), mean (SD)								
Number of ER visits	1.2 (0.7)	1.2 (0.6)	1.2 (0.5)	1.2 (0.6)	2.0 (2.1)	1.8 (1.8)	1.9 (2.1)	2.0 (2.2)
Number of COPD/asthma-related ER visits	1.2 (0.6)	1.1 (0.6)	1.1 (0.4)	1.0 (0.6)	1.5 (1.7)	1.1 (1.2)	0.8 (1.0)	0.5 (1.0)
OP visits (patients with ≥1 OP visits), mean (SD)								
Number of OP visits	2.4 (2.6)	1.7 (1.5)	2.2 (2.0)	1.5 (1.1)	6.7 (5.5)	6.8 (5.9)	5.9 (5.4)	6.2 (5.7)
Number of COPD/asthma-related OP visits	1.8 (1.9)	1.3 (1.1)	1.6 (1.4)	1.2 (0.7)	2.7 (2.9)	1.8 (2.5)	1.6 (2.0)	1.1 (1.7)
Number of OP visits with PCP	1.0 (1.5)	0.8 (1.1)	0.8 (1.1)	0.7 (0.8)	2.3 (3.2)	2.3 (3.4)	1.7 (2.5)	1.7 (2.6)
Number of OP visits with pulmonologist	0.3 (0.8)	0.2 (0.4)	0.2 (0.7)	0.1 (0.3)	0.6 (1.0)	0.3 (0.8)	0.4 (0.9)	0.2 (0.6)
Number of OP visits with allergist	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.1)	0.0 (0.1)

[a]The *n* (%) was calculated from the total number of patients with ≥1 hospitalisations.
COPD, chronic obstructive pulmonary disease; ER, emergency room; HCRU, healthcare resource utilisation; ICU, intensive care unit; IP, inpatient; OP, outpatient; PCP, primary care provider; SD, standard deviation.

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CONFLICTS OF INTEREST

EMH, **RL**, **NP-I**, **KH**, **DM**, and **TQ** are employees of Sanofi and may hold stocks and/or stock options in the company. **W-HC** was an employee of Sanofi at the time of study conduct.

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