

Real-World Assessment of Healthcare Resource Utilisation and Direct Medical Costs in Patients with COPD Receiving LAMA/LABA Therapy in England

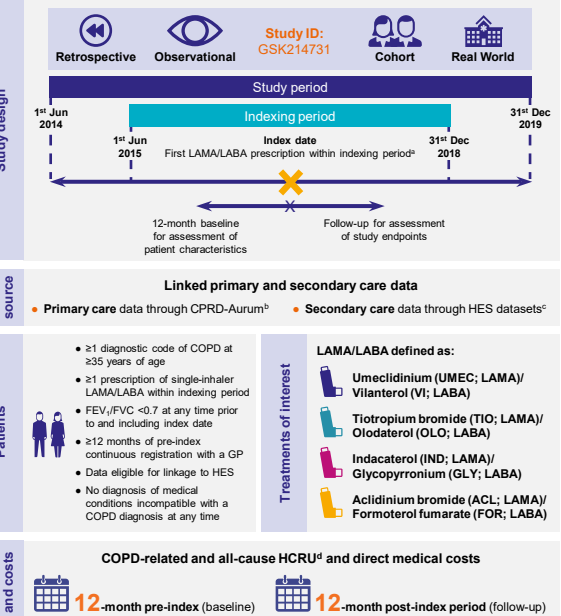
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Background

- Chronic obstructive pulmonary disease (COPD) is associated with a substantial clinical and economic burden, with significant associated healthcare resource utilisation (HCRU) and direct and indirect costs.^{1,2}
- The Global Initiative for Chronic Obstructive Lung Disease (GOLD) recommends a long-acting muscarinic antagonist/long-acting β_2 -agonist (LAMA/LABA) combination as maintenance therapy for patients with COPD who suffer from dyspnoea or are at increased risk of exacerbations.³
- This study aimed to describe HCRU and direct medical costs in patients with COPD who newly initiated single-inhaler LAMA/LABA therapy in a general practice (GP) setting in England.

Methods



*The first single-inhaler LAMA/LABA prescription within the indexing period was defined as the 'index date'. Only patients with no LAMA/LABA prescriptions (single or multiple inhaler combinations) prior to the index date (incident users) were included in the analysis. *Anonymised electronic health record database of primary care interactions in England. *Contains details on all inpatient admissions, outpatient appointments, and emergency department attendances at NHS hospitals in England. *Included GP consultations, outpatient attendances, A&E visits, and inpatient stays (hospitalisations). A&E, accident & emergency; CPRD, Clinical Practice Research Datalink; FEV₁, forced expiratory volume in 1 second; FVC, forced vital capacity; HES, Hospital Episode Statistics database; NHS, National Health Service.

References

- Iheanacho I, et al. *Int J Chron Obstruct Pulmon Dis* 2020;15:439–60.
- Ehteshami-Afshar S, et al. *Int J Tuberc Lung Dis* 2016;20:11–23.
- GOLD Report 2021. Available from: <http://goldcopd.org/> [accessed June 2021].

Results

Population

- In total, 10,991 new single-inhaler LAMA/LABA users were identified (UMEC/VI, n=5,315; TIO/OLO, n=1,333; IND/GLY, n=1,999; ACL/FOR, n=2,344) (**Table 1**).
- Baseline characteristics (mean age: 69.5 years; female: 44.4%) were similar across index treatments (**Table 1**).

Table 1. Baseline characteristics of patients during the baseline period					
	UMEC/VI (n=5,315)	TIO/OLO (n=1,333)	IND/GLY (n=1,999)	ACL/FOR (n=2,344)	All combinations (n=10,991)
Age at index, years, mean (SD)	69.6 (10.6)	69.6 (10.3)	69.4 (10.2)	69.4 (10.3)	69.5 (10.5)
Female, n (%)	2,335 (43.9)	638 (47.9)	926 (46.3)	979 (41.8)	4,878 (44.4)
BMI, kg/m ² , mean (SD)*	27.7 (6.6)	27.5 (6.5)	27.6 (6.9)	27.8 (6.6)	27.7 (6.6)
Current smoker, n (%)	2,159 (40.6)	554 (41.6)	886 (44.3)	915 (39.0)	4,514 (41.1)
FEV ₁ /FVC, mean (SD) ^b	58.8 (12.7)	59.0 (12.7)	59.1 (13.3)	58.4 (13.1)	58.8 (12.9)
Percent predicted FEV ₁ , mean (SD) ^c	60.5 (17.5)	61.1 (17.7)	60.7 (17.6)	60.2 (17.7)	60.6 (17.6)

*UMEC/VI: n=4,645; TIO/OLO: n=1,203; IND/GLY: n=1,776; ACL/FOR: n=2,044; All combinations: n=9,668; *UMEC/VI: n=4,108; TIO/OLO: n=1,014; IND/GLY: n=1,489; ACL/FOR: n=1,738; All combinations: n=8,349; *UMEC/VI: n=4,155; TIO/OLO: n=1,078; IND/GLY: n=1,522; ACL/FOR: n=1,893; All combinations: n=8,648. BMI, body mass index; SD, standard deviation.

HCRU

- Overall, 65.2% of patients had at least one COPD-related GP consultation during baseline compared with 93.3% during follow-up (**Table 2**).

Table 2. HCRU during the baseline and follow-up period					
Users ^a , n (%)	UMEC/VI (n=5,315)	TIO/OLO (n=1,333)	IND/GLY (n=1,999)	ACL/FOR (n=2,344)	All combinations (n=10,991)
Baseline period					
GP consultations					
COPD-related	3,336 (62.8)	855 (64.1)	1,349 (67.5)	1,622 (69.2)	7,162 (65.2)
All-cause	5,277 (99.3)	1,328 (99.6)	1,982 (99.2)	2,333 (99.5)	10,920 (99.4)
Outpatient visits					
COPD-related	692 (13.0)	227 (17.0)	393 (19.7)	371 (15.8)	1,683 (15.3)
All-cause	3,517 (66.2)	916 (68.7)	1,415 (70.8)	1,581 (67.5)	7,429 (67.6)
Inpatient stays					
COPD-related	1,079 (20.3)	319 (23.9)	512 (25.6)	444 (18.9)	2,354 (21.4)
All-cause	1,744 (32.8)	494 (37.1)	743 (37.2)	761 (32.5)	3,742 (34.1)
A&E visits					
COPD-related	69 (1.3)	12 (0.9)	26 (1.3)	29 (1.2)	136 (1.2)
All-cause	1,473 (27.7)	430 (32.3)	675 (33.8)	576 (24.6)	3,154 (28.7)
Follow-up period					
GP consultations					
COPD-related	4,593 (86.4)	1,109 (83.2)	1,667 (83.4)	2,052 (87.6)	9,421 (85.3)
All-cause	4,899 (92.3)	1,216 (91.3)	1,792 (89.6)	2,163 (92.7)	10,070 (91.3)
Outpatient visits					
COPD-related	721 (13.6)	244 (18.3)	364 (18.2)	303 (13.0)	1,632 (14.9)
All-cause	3,288 (61.9)	848 (63.6)	1,266 (63.4)	1,503 (64.2)	6,905 (63.4)
Inpatient stays					
COPD-related	1,236 (23.3)	349 (26.2)	466 (23.4)	583 (25.0)	2,634 (24.0)
All-cause	1,603 (30.2)	420 (31.5)	610 (30.5)	750 (32.0)	3,383 (30.7)
A&E visits					
COPD-related	54 (1.0)	6 (0.5)	11 (0.6)	26 (1.1)	97 (0.9)
All-cause	1,321 (24.7)	371 (27.8)	526 (26.3)	590 (25.2)	2,808 (25.6)

^aDefined as patients who had at least one unit of use for each respective healthcare service.

- A similar proportion of patients experienced COPD-related outpatient visits during baseline and follow-up (15.3% vs 16.2%) (**Table 2**).
- During baseline, patients indexed on UMEC/VI experienced the fewest COPD-related outpatient visits (13.0%) (**Table 2**).
- During follow-up, patients indexed on UMEC/VI and ACL/FOR experienced fewer COPD-related outpatient visits than those indexed on TIO/OLO or IND/GLY (14.7% and 14.0% vs 20.0% and 20.3%, respectively) (**Table 2**).

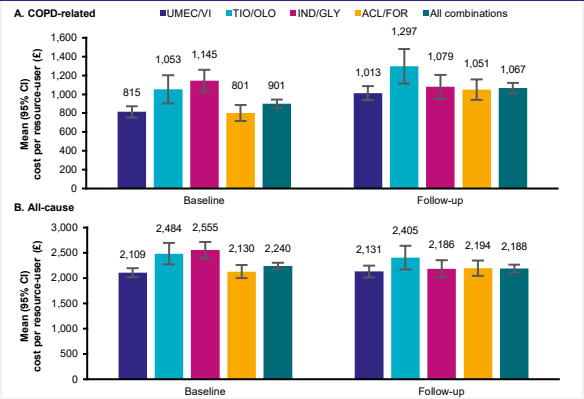
- The proportion of patients with COPD-related inpatient stays increased from baseline (21.4%) to follow-up (26.1%) (**Table 2**).
- During baseline, patients indexed on ACL/FOR experienced the lowest COPD-related inpatient stays (18.9%) and those indexed on IND/GLY the highest (25.6%) (**Table 2**).
- During follow-up, COPD-related inpatient stays were similar across all indexed treatments.
- In total, 1.2% of all patients had COPD-related A&E visits during baseline and 1.0% during follow-up (**Table 2**).

- All-cause HCRU was similar during baseline and follow-up (**Table 2**).

Direct costs

- Mean total COPD-related direct healthcare costs per patient increased from baseline (£901) and during follow-up (£1,067) (**Figure 1A**).
- Mean COPD-related costs slightly increased between baseline and follow-up for patients treated with UMEC/VI, TIO/OLO or ACL/FOR, but slightly decreased for those treated with IND/GLY (**Figure 1A**).
- Mean all-cause direct costs were generally similar between baseline and follow-up, with the exception of IND/GLY for which costs decreased during follow-up (£2,555 vs £2,186, respectively) (**Figure 1B**).
- In patients with ≥1 inpatient stay, mean inpatient stay costs accounted for the greatest portion of total COPD-related costs, and increased from baseline (£3,333) to follow-up (£3,659) across all index treatments (**Figure 2A**).

Figure 1. (A) COPD-related and (B) all-cause direct healthcare costs^a



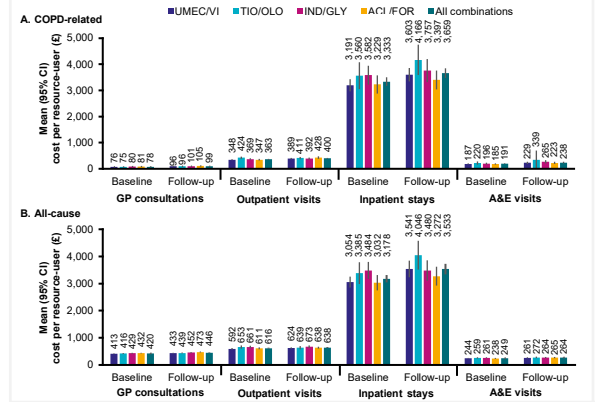
^aCalculated for all patients, including those with no healthcare service use. CI, confidence interval.

Conclusions

- Limitations include potential misdiagnosis of COPD, medications potentially prescribed for asthma, and privately-insured patients not being included in the dataset.
- COPD-related HCRU and direct costs were generally similar between baseline and follow-up across index treatments.
- The proportion of patients with COPD-related GP consultations increased after single-inhaler treatment initiation, likely due to follow-up care associated with the new treatment.
- Inpatient stays were the greatest contributor to COPD-related costs among patients who used healthcare services.
- Overall, COPD-related costs did not increase substantially after first initiation of single-inhaler LAMA/LABA treatment in England.

- Similarly, increases in mean costs from baseline to follow-up and across all index treatments were seen for outpatient visits (£363 vs £400), A&E visits (£191 vs £238), and GP consultations (£78 vs £99) among patients who used each respective service (**Figure 2A**).
- Changes in COPD-related and all-cause costs from baseline to follow-up were generally similar across index treatments (**Figure 2**).
- Mean costs for COPD-related and all-cause inpatient stays were generally greatest among patients indexed on IND/GLY and TIO/OLO when compared with all other treatment groups, during baseline and follow-up, respectively (**Figure 2**).

Figure 2. (A) COPD-related and (B) all-cause mean costs among patients with resource use^a



Cost categories are not mutually exclusive, as all-cause costs include COPD-related costs. ^aCalculated for patients who had at least one unit of use for each respective healthcare service.

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