

**Medicare Advantage Population in the United States: Outcomes of Patients With Asthma
Treated With ICS/LABA Before and After Initiation With Fluticasone
Furoate/Umeclidinium/Vilanterol (FF/UMEC/VI)**

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SUPPLEMENTARY MATERIALS

Table S1. NDC drug codes for ICS/LABA-containing controllers

Agent	NDC drug codes
Budesonide/formoterol	00186037020, 00186037028, 00186037220, 00186037228, 50090140300, 54569646600, 54868593600, 54868593700, 68258896601
Fluticasone/salmeterol	00093360782, 00093360882, 00093360982, 00173069500, 00173069502, 00173069504, 00173069600, 00173069602, 00173069604, 00173069700, 00173069702, 00173069704, 00173071500, 00173071520, 00173071522, 00173071600, 00173071620, 00173071622, 00173071700, 00173071720, 00173071722, 00173071761, 21695019601, 21695019701, 21695036160, 23490754001, 23490754101, 23490754201, 33261087301, 33261087401, 49999081960, 49999098460, 49999098560, 50090073000, 50090073100, 50090073200, 54569524100, 54569524200, 54569524300, 54569676200, 54569676300, 54569678200, 54868451600, 54868451700, 54868451800, 55045338801, 55045338801, 58016460401, 58016481201, 58016481301, 59310080506, 59310081206, 59310082206, 68115065701, 68115076001, 68115092460, 68258303101, 68258893806
Fluticasone/vilanterol	00173085910, 00173085914, 00173088210, 00173088214, 54569666500
Mometasone/formoterol	00085461001, 00085461005, 00085720601, 00085720607, 50090191600, 54569661100, 54569661200

Abbreviations: ICS: inhaled corticosteroid; LABA: long-acting β_2 agonist; NDC: National Drug Code.

Table S2. Asthma-related exacerbations pre- and post-FF/UMEC/VI initiation

Asthma-related exacerbations	Pre-initiation ^a N = 2598	Post-initiation ^b N = 2598	Odds ratio (95% CI) ^c	Rate ratio (95% CI) ^d	Mean difference (95% CI) ^e	P-value ^{c,e}
Observation period, days, mean ± SD [median]	349.8 ± 58.5 [365]	352.6 ± 56.5 [365]				
Total person-years of observation	2,490	2,510				
Prevalence of exacerbations by type						
Patients with ≥1 overall exacerbation, n (%)	1380 (53.1)	1016 (39.1)	0.57 (0.51, 0.62)	-	-	<0.001*
Patients with ≥1 IP/ED-defined exacerbation, n (%)	513 (19.7)	408 (15.7)	0.76 (0.67, 0.85)	-	-	<0.001*
Patients with ≥1 urgent care-defined exacerbation, n (%)	98 (3.8)	55 (2.1)	0.54 (0.40, 0.74)	-	-	<0.001*
Patients with ≥1 SCS-defined exacerbation, n (%)	1119 (43.1)	776 (29.9)	0.56 (0.51, 0.62)	-	-	<0.001*
Rates of exacerbation by type						
Overall exacerbation ^f	1.11	0.76	-	0.69 (0.65, 0.73)	-	<0.001*
IP/ED-defined exacerbation ^g	0.33	0.25	-	0.76 (0.68, 0.85)	-	<0.001*
Urgent care-defined exacerbation ^h	0.05	0.03	-	0.52 (0.37, 0.72)	-	<0.001*
SCS-defined exacerbation ⁱ	0.78	0.51	-	0.66 (0.61, 0.71)	-	<0.001*
Duration of asthma exacerbations, mean ± SD [median]	1.59 ± 3.76 [0]	1.82 ± 5.90 [0]	-	-	0.23 (-0.22, 0.68)	0.309

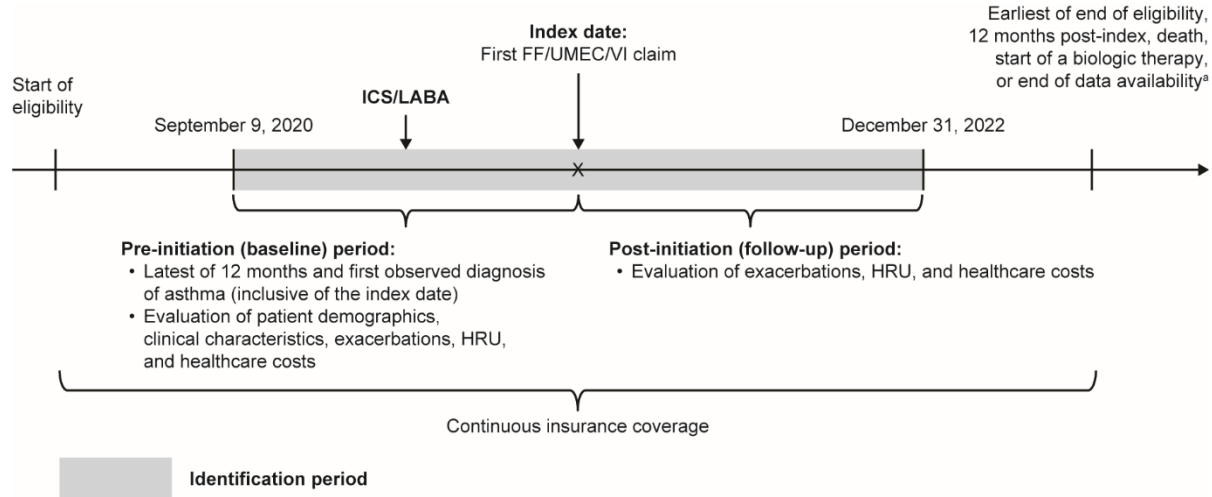
Abbreviations: CI: confidence interval; CMS: Centers for Medicare & Medicaid Services, ED: emergency department; FF/UMEC/VI: fluticasone furoate/umeclidinium/vilanterol; GEE: generalized estimating equations; IP: inpatient; OCS: oral corticosteroid; SCS: systemic corticosteroid; SD: standard deviation; SE: standard error.

Notes:

- a. The pre-initiation period was defined from the latest of 12 months before the index date and the first observed diagnosis of asthma to the index date (inclusive).
- b. The post-initiation period spanned from after the index date to the earliest of 12 months after the index date, death, end of eligibility, start of biologic therapy, or end of data availability.
- c. Patients with at least one asthma-related exacerbation in the pre-initiation and post-initiation periods were compared using odds ratios from a logistic regression with accompanying 95% CIs and p-values using robust SEs.
- d. Rate ratios, 95% CIs, and p-values estimated from GEE Poisson regression models with robust SEs to account for the correlation of observations within the same patient were used to compare rates of asthma-related exacerbations between the pre-initiation and post-initiation periods.
- e. Durations of asthma-related exacerbations were compared between pre- and post-initiation periods using mean differences from a linear regression model with accompanying 95% CIs and p-values using robust SEs.
- f. Overall asthma-related exacerbations include both SCS-defined exacerbation and IP/ED-defined exacerbation. Two or more exacerbations within 14 days of each other were considered as one exacerbation and classified according to the highest severity.
- g. IP/ED-defined exacerbation was defined as an IP visit or as an ED visit that resulted in a hospitalization with a primary diagnosis of asthma within one day after the ED visit.
- h. Urgent care-defined exacerbations were determined based on CMS “place of service” code 20 <https://www.cms.gov/medicare/coding-billing/place-of-service-codes/code-sets>.
- i. SCS-defined exacerbation was defined as an asthma-related OP visit (i.e., OP visits that were associated with medical claims with a primary diagnosis of asthma) with an SCS (i.e., OCS or parenteral corticosteroid) medical or pharmacy claim within ±5 days.

*Statistically significant

Figure S1. Study design scheme



Abbreviations: FF/UMEC/VI: fluticasone furoate/umeclidinium/vilanterol; HRU: healthcare resource utilization; ICS: inhaled corticosteroid; LABA: long-acting β_2 agonist.

Note:

- a. The start of another biologic therapy is a censoring event that can happen while patients are continuously enrolled and may censor their post-initiation period.