

Oral corticosteroid burden and healthcare resource utilization in patients with chronic rhinosinusitis with nasal polyps undergoing functional endoscopic sinonasal surgery: A real-world retrospective cohort study

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BACKGROUND

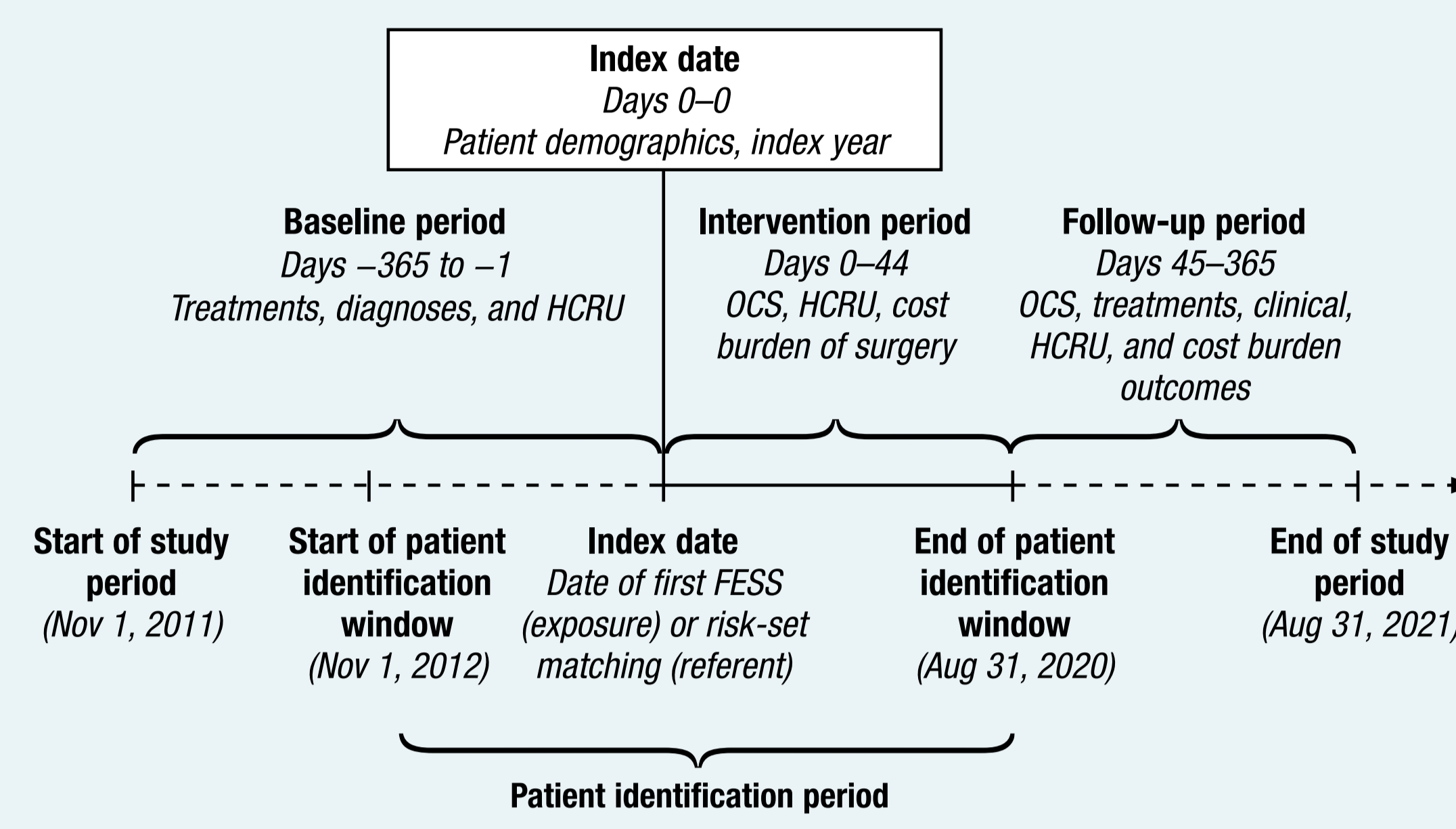
- Chronic rhinosinusitis with nasal polyps (CRSwNP) is an inflammatory disease of the nasal cavity and paranasal sinuses, associated with high symptom burden and poor health-related quality of life¹
- Functional endoscopic sinus surgery (FESS) may be used when medical management is inadequate
 - However, oral corticosteroid (OCS) burden may remain high following FESS indicating unmet need^{2,3}
- The comparative value of surgery over medical management alone is understudied in CRSwNP, including the potential reduction in post-surgery OCS burden

OBJECTIVE

- To compare the patterns, burden, and costs of OCS use and healthcare resource utilization (HCRU) in patients with CRSwNP who underwent FESS vs those who did not in real-world settings in the US

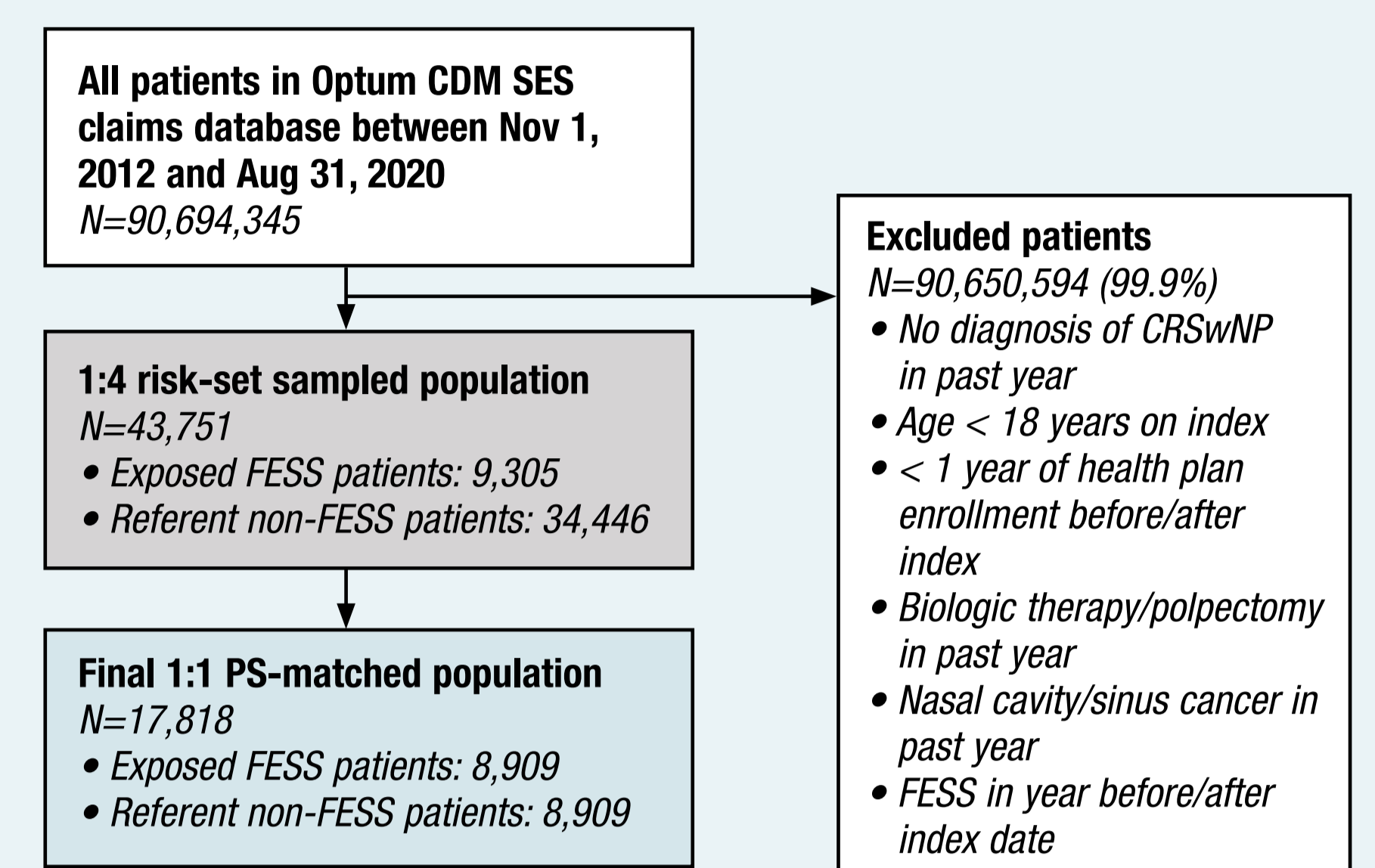
METHODS & ANALYSES

Figure 1. Retrospective cohort study using Optum CDM SES claims data (2011–2021)



CDM SES, Clinformatics® Data Mart Socio-Economic Status; FESS, functional endoscopic sinus surgery; HCRU, healthcare resource utilization; OCS, oral corticosteroid.

Figure 2. Patient selection



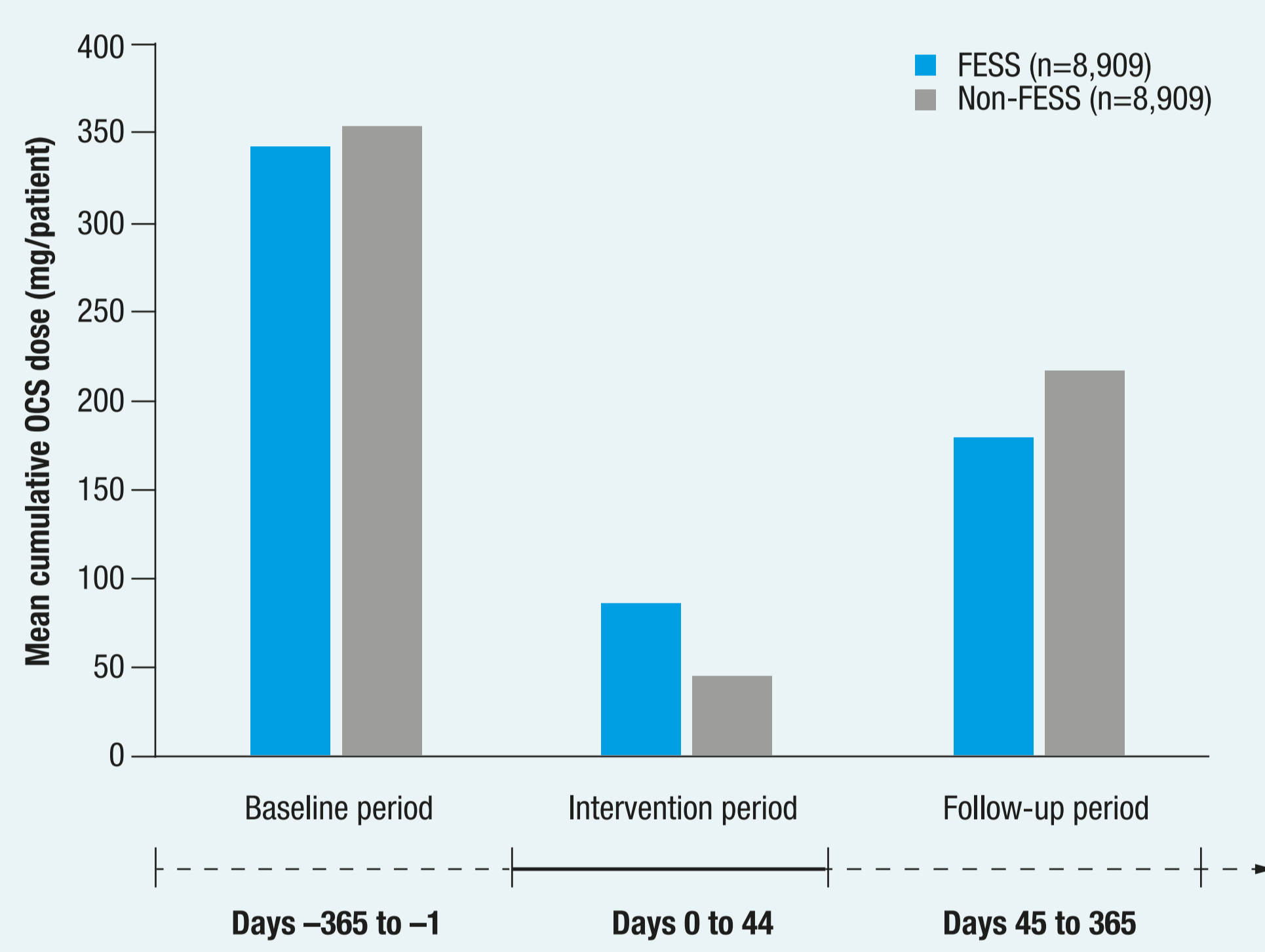
CDM SES, Clinformatics® Data Mart Socio-Economic Status; CRSwNP, chronic rhinosinusitis with nasal polyps; FESS, functional endoscopic sinus surgery; HCRU, healthcare resource utilization; PS, propensity score.

- CRSwNP patients who underwent FESS and with no FESS were risk-set sampled using a 1:4 matching ratio, then 1:1 propensity score matched at baseline (Figures 1, 2)
 - Patient data were extracted from the Optum Clinformatics Data Mart Socio-Economic Status (CDM SES) claims database (patient identification period Nov 1, 2012–Aug 31, 2020)
 - Intervention and follow-up periods were defined as Days 0–44 and Days 45–365, respectively

- OCS burden was assessed by mean (SD) cumulative dose of OCS in mg of prednisone equivalents per patient
- HCRU was assessed by mean (SD) number of HCRU events per patient
 - Measured mean (SD) cumulative number of inpatient days per hospitalized patient
- Costs were assessed by mean (SD) costs per patient
 - Based on standard cost amounts (\$US) reported in Optum CDM SES database

RESULTS

Figure 3. OCS use among FESS and non-FESS patients pre- and post-index date (PS-matched population)



FESS, functional endoscopic sinus surgery; OCS, oral corticosteroid; PS, propensity score.

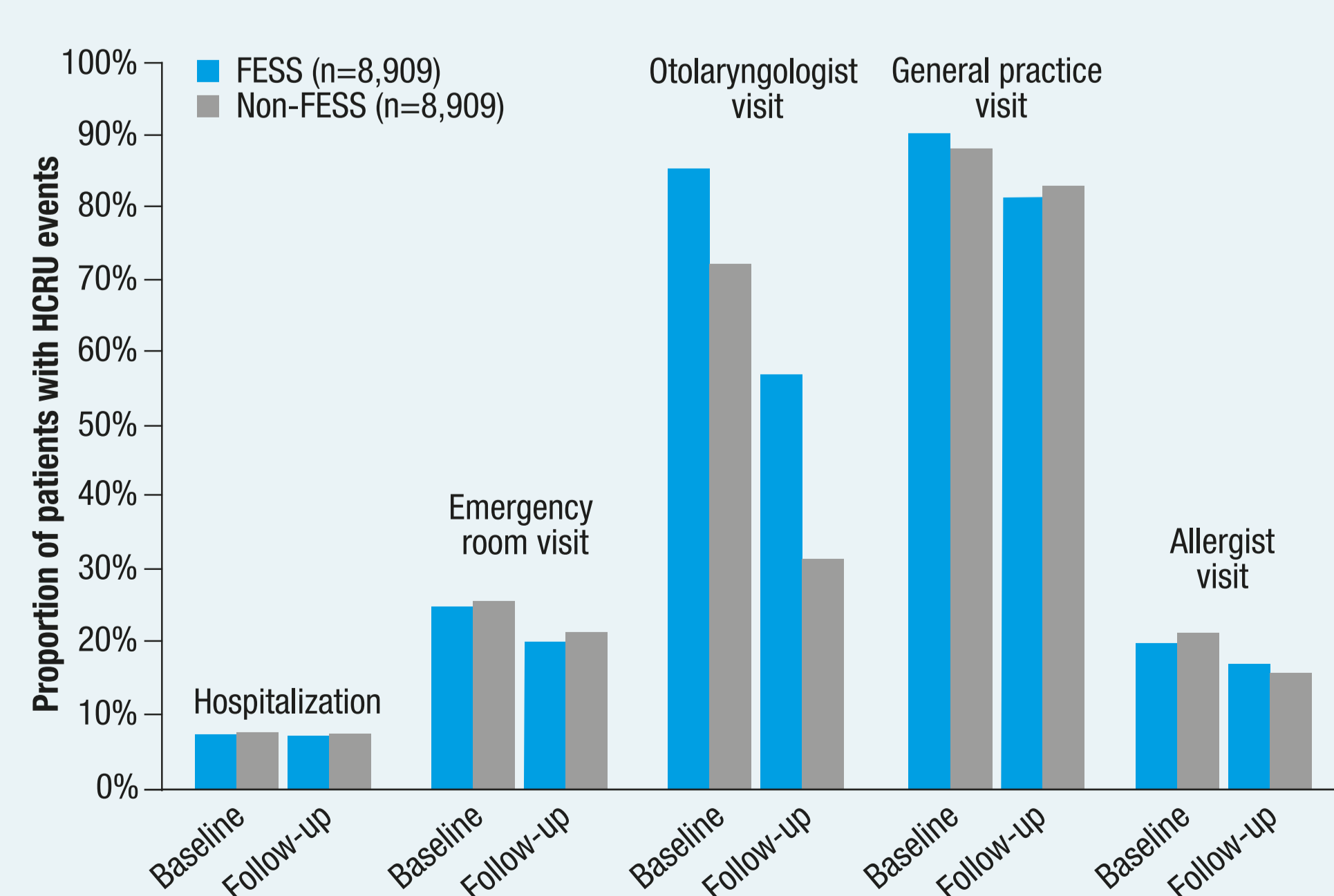
- OCS burden was substantial in both groups during baseline and follow-up period (Figure 3)
- FESS patients had a modestly lower average cumulative OCS dose of ~40 mg per patient (95% CI –64 to –16; $P < 0.01$) vs non-FESS patients during follow-up
- A similar proportion of patients in each group filled an OCS prescription during follow-up (34.6% FESS vs 36.0% non-FESS) (Table 1)

Table 1. OCS use among patients who filled a prescription pre- and post-index date

	Baseline period		Intervention period		Follow-up period	
	FESS (8,909)	Non-FESS (8,909)	FESS (8,909)	Non-FESS (8,909)	FESS (8,909)	Non-FESS (8,909)
Proportion of patients with OCS use, %	63.3	64.3	35.0	16.2	34.6	36.0
Cumulative OCS dose ^a among users, mean (SD)	540 (709)	555 (760)	245 (221)	271 (273)	521 (786)	612 (906)
Number of fills among users, mean (SD)	2.09 (1.49)	2.10 (1.71)	1.18 (0.45)	1.23 (0.54)	2.14 (2.01)	2.42 (2.40)
Days, supply among users, mean (SD)	23 (38)	26 (47)	13 (26)	19 (55)	25 (47)	32 (57)

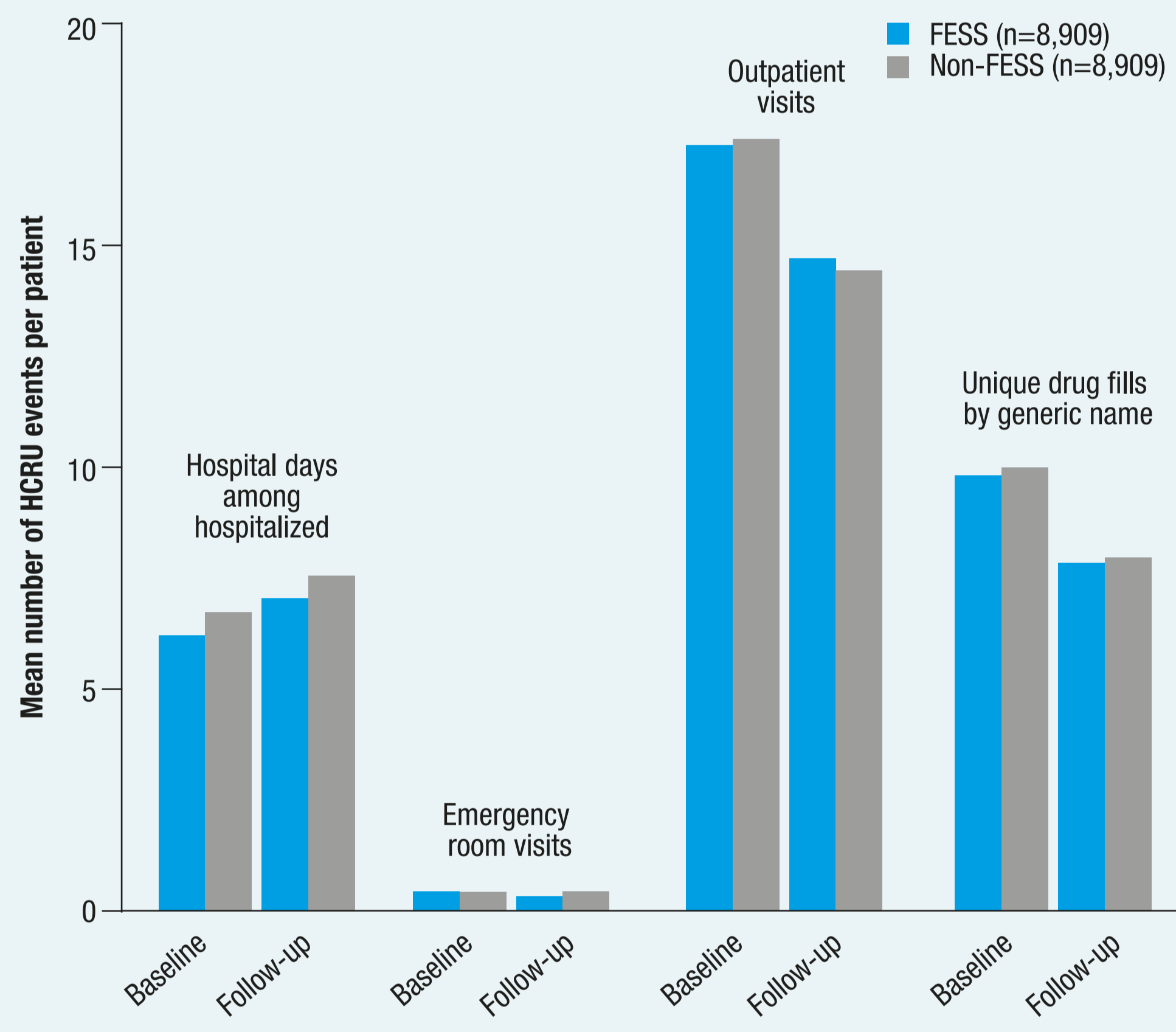
^aDose was reported as mg per patient in prednisone equivalents. Daily dose of > 100 mg was recorded as missing. FESS, functional endoscopic sinus surgery; OCS, oral corticosteroid; SD, standard deviation.

Figure 4. Proportion of FESS and non-FESS patients with HCRU events during baseline and follow-up period



FESS, functional endoscopic sinus surgery; HCRU, healthcare resource utilization.

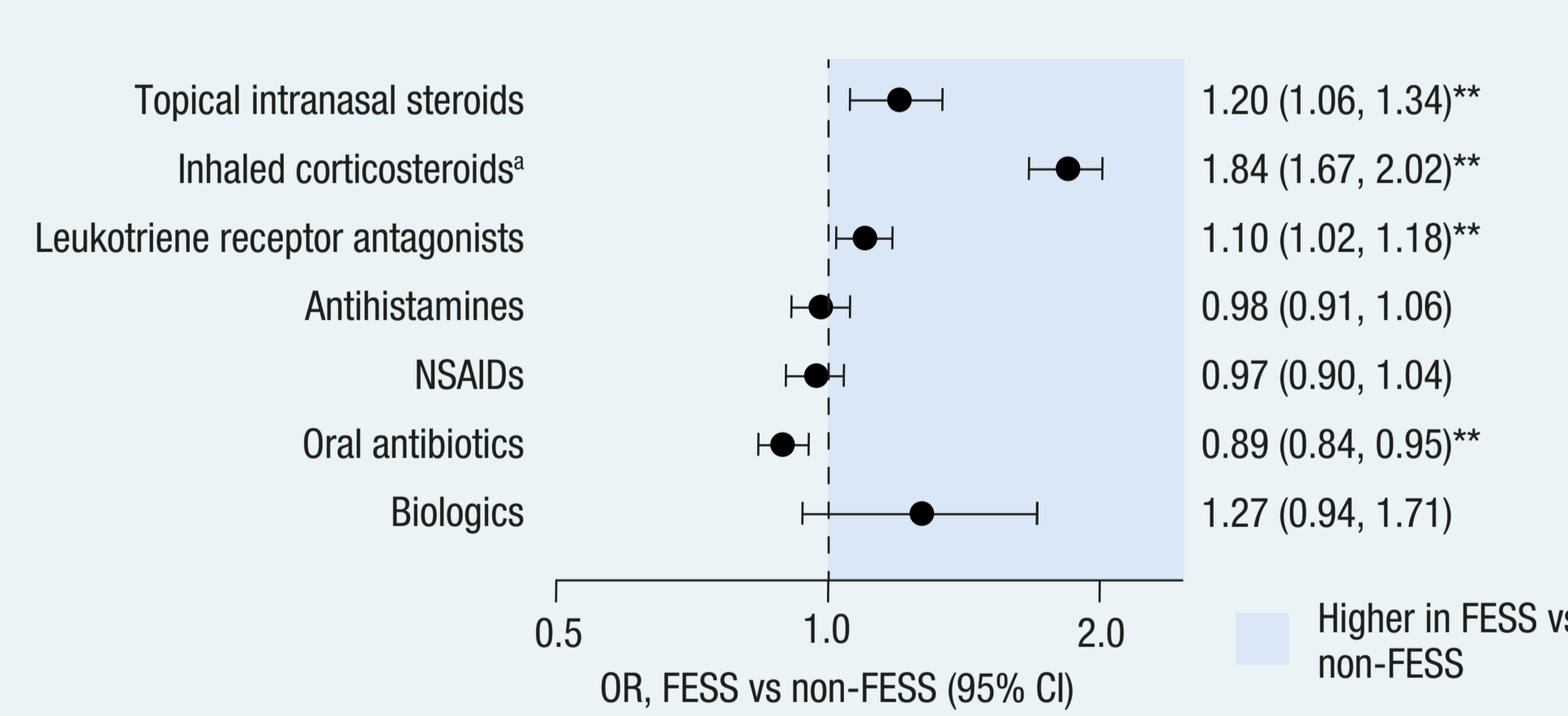
Figure 5. Number of HCRU events among FESS and non-FESS patients during baseline and follow-up period^a



^aRate was reported as mean number of events per patient, allowing patients to experience more than one event. FESS, functional endoscopic sinus surgery; HCRU, healthcare resource utilization.

- Apart from the FESS itself, HCRU did not differ greatly between groups, except during follow-up when more FESS patients had an otolaryngologist visit (57% FESS vs 32% non-FESS) (Figure 4)

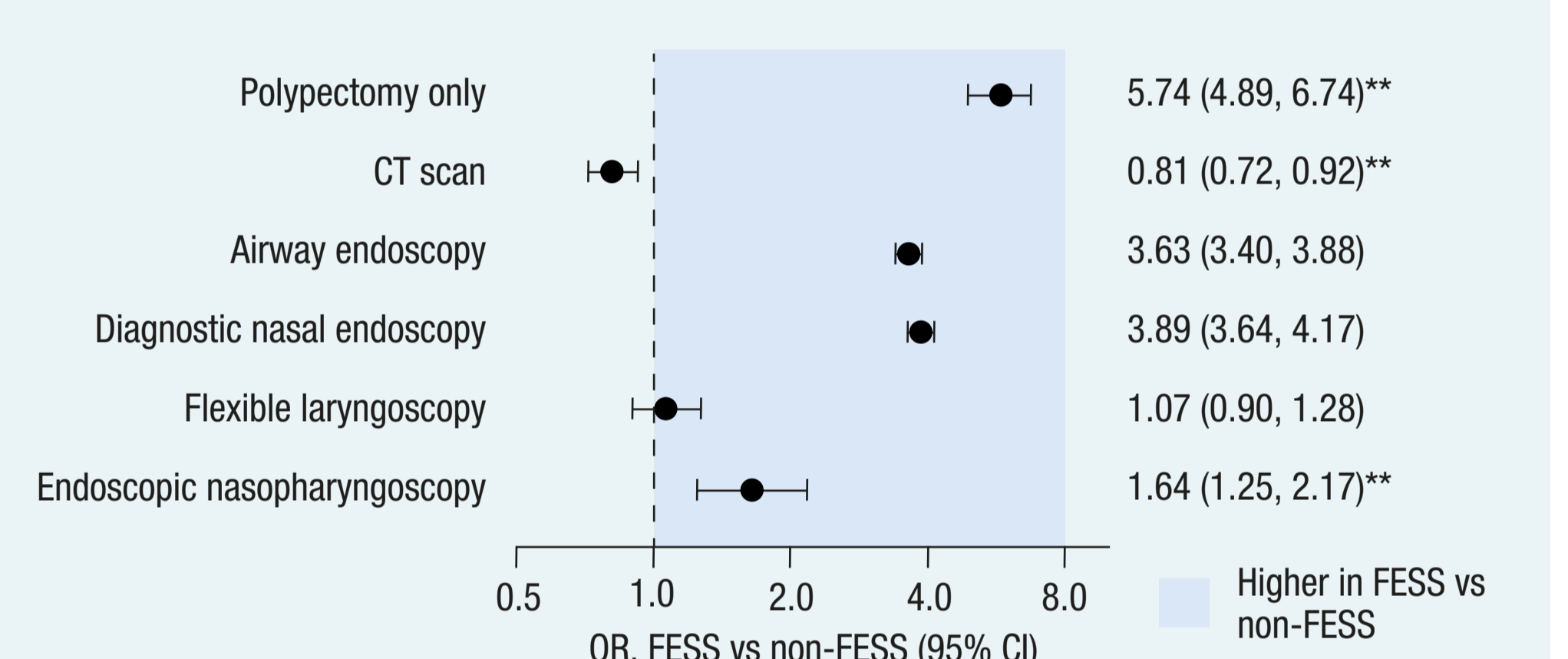
Figure 6. Medications for CRSwNP during follow-up period



** $P < 0.01$. ^aIntranasal corticosteroids available over the counter so not all inhaled corticosteroids may be captured. CI, confidence interval; CRSwNP, chronic rhinosinusitis with nasal polyps; FESS, functional endoscopic sinus surgery; NSAID, non-steroidal anti-inflammatory drug; OR, odds ratio.

- Except for inhaled corticosteroids (OR 1.84 [95% CI 1.67 to 2.02]), use of medications for CRSwNP did not differ greatly between FESS and non-FESS patients during follow-up (Figure 6)

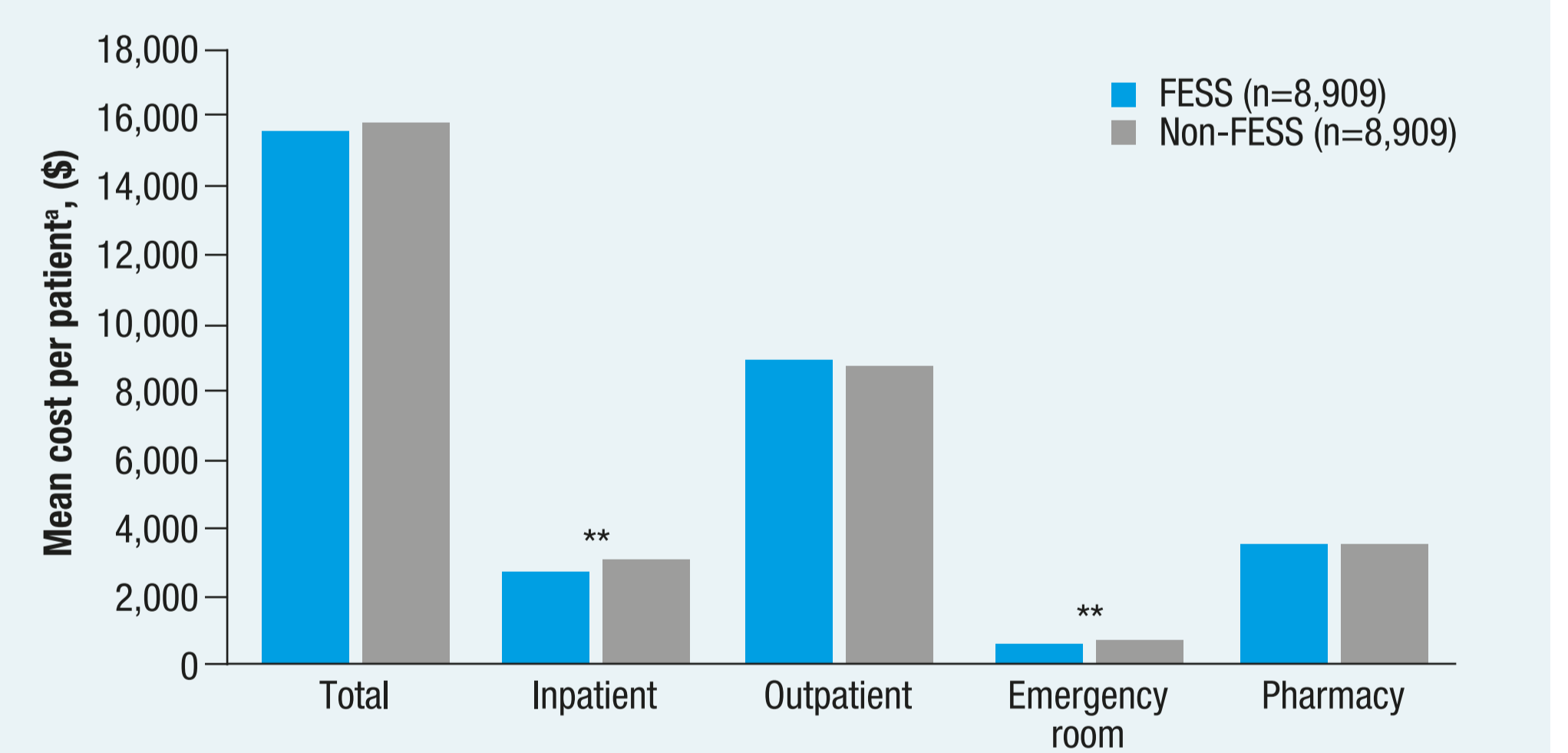
Figure 7. Procedures or diagnostic tests during follow-up period



** $P < 0.01$. CI, confidence interval; CT, computed tomography; FESS, functional endoscopic sinus surgery; OR, odds ratio.

- More FESS than non-FESS patients had a polypectomy and endoscopy in follow-up (Figure 7)

Figure 8. Mean costs among FESS and non-FESS patients during follow-up period



** $P < 0.01$. ^aCost was inflation-adjusted to 2020 dollars (\$US). Costs during the intervention period were summed across all healthcare encounters captured in the data over the first 45 days including before and after index. FESS, functional endoscopic sinus surgery.

- Mean total estimated cost of the FESS intervention was \$26,295 (95% CI 25,436 to 27,155); however, only \$267 (–915 to 381) in average cost savings was observed among FESS (\$15,659) vs non-FESS (\$15,926) patients during follow-up (Figure 8)

CONCLUSIONS

- OCS burden was high at baseline regardless of FESS (63% of FESS vs 64% of non-FESS) and was still substantial in both groups during follow-up (35% vs 36%)
 - FESS patients had modestly lower average cumulative OCS dose vs non-FESS patients in follow-up (mean difference in cumulative dose: –40 mg per patient [95% CI –64 to –16]; $P < 0.01$)

- Mean total estimated cost of the FESS intervention period was \$26,295 (95% CI 25,436 to 27,155)
 - However, only \$267 (–915 to 381) in average cost savings was observed in FESS vs non-FESS patients during follow-up
- In real-world US clinical practice, patients with CRSwNP have similar OCS and HCRU burden, regardless of whether they undergo FESS surgery, signifying substantial treatment burden and unmet need in both groups

References: 1. Khan A, et al. Rhinology. 2019;57(1):32-42. 2. Fokkens WJ, et al. Rhinology. 2020;58(suppl_S29):1-464. 3. Fokkens WJ, et al. Allergy. 2019;74(12):2312-2319.

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