



## Introduction

- Chronic rhinosinusitis with nasal polyps (CRSwNP) accounts for 20-33% of cases of chronic rhinosinusitis (CRS)<sup>1</sup>
- Healthcare burden associated with CRS is well-documented<sup>1-5</sup>, and may be more intense for CRSwNP
- Evidence regarding the added burden of nasal polyps compared to CRS without nasal polyps (CRSsNP) is mixed<sup>6,7</sup>, but suggests a relatively high frequency of extensive sinus surgeries<sup>8</sup>; further investigation of CRSwNP-related burden in relation to surgical procedures using newer data is needed

## Objective

To compare characteristics of sinus surgery visits associated with CRSwNP vs. CRSsNP

## Methods

### Study Design and Data Source

- Retrospective, cross-sectional analysis of administrative data from 7 states in the State Ambulatory Surgery and Services Databases (SASD)\* from 2012-2015
  - Visit-level data from outpatient and hospital-owned ambulatory surgery facilities in Colorado (CO), Florida (FL), Iowa (IA), Kentucky (KY), North Carolina (NC), New York (NY), and Wisconsin (WI)
  - All payer types represented in data

### Patient Population

- Visits for patients ≥18 years old were included if they:
  - Had a diagnosis of CRSwNP (ICD-9-CM: 471.x; ICD-10-CM: J33.x) or CRSsNP (ICD-9-CM: 473.x; ICD-10-CM: J32.x and without a code of ICD-9-CM: 471.x; ICD-10-CM: J33.x)
  - Received a selected surgical procedure according to Current Procedural Terminology® (CPT) code for commonly performed interventions<sup>8</sup>
    - Endoscopic sinus surgery (ESS): 31233, 31235, 31254, 31255, 31256, 31267, 31276, 31287, 31288, 31295, 31296, 31297
    - Maxillary antrostomy (MA): 31256, 31267
    - Ethmoidectomy: 31200, 31201, 31205, 31254, 31255
    - Sphenoidotomy: 31287, 31288
    - Frontal sinusotomy (FS): 31276
    - Septoplasty: 30520
- Visits were excluded for
  - Patients <18 years old
  - Patients with a diagnosis of cystic fibrosis

### Measures

- Healthcare resource utilization, by CRS subtype
  - Proportions of visits involving above selected surgical procedures
  - Number of operated sinus types (1-4; maxillary, ethmoid, sphenoid, or frontal) per surgery visit
  - Proportion of peri-operative complications (indicated by ICD-9/10-CM or CPT code)
    - Orbital hemorrhage, orbital edema, cerebrospinal fluid (CSF) leak, blood transfusion
  - Length of stay (LOS), days
  - Ambulatory follow-up visits
  - Discharge status
- Baseline measures, by CRS subtype
  - Demographic characteristics
    - Age, sex, race
    - Primary payer (Medicare, Medicaid, Private, Self-pay, No charge, Other or Missing)
  - Comorbidities
    - Chronic Condition Indicator (number of chronic conditions) \*

### Statistical Analysis

- Descriptive statistics generated for all measures for visits associated with CRSwNP vs. CRSsNP
- Means and standard deviations (SD) used to summarize continuous variables; frequencies and percentages summarized categorical variables

\* SASD and the Chronic Condition Indicator are part of the family of databases and software tools developed for the Healthcare Cost and Utilization Project (HCUP) and sponsored by the Agency for Healthcare Research and Quality (AHRQ).

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## Results

### Demographics and Comorbidities

- A total of 142,313 visits associated with CRSwNP (n=41,346) or CRSsNP (n=100,967) and involving a selected surgical procedure were identified
- Visits were located in the following states: NY (32.9%), NC (14.2%), KY (6.2%), FL (30.1%), WI (11.8%), CO (1.1%), and IA (3.8%) (**Figure 1**)
- Mean [SD] age was higher for visits associated with CRSwNP vs. CRSsNP (49.9 [15.6] vs. 47.8 [15.9]; p<0.001) (**Table 1**)
- Patients with visits associated with CRSwNP (vs. CRSsNP) were predominantly male (59.1% vs. 45.0%), White (74.8% vs. 77.8%) and privately-insured (65.9% vs. 67.6%) (p<0.0001 for all) (**Table 1**)
  - Other payer types used to cover visits (CRSwNP vs. CRSsNP) included Medicare (19.0% vs. 18.6%), Medicaid (8.3% vs. 8.4%), Self-pay (1.5% vs. 1.4%), No charge (0.2% vs. 0.1%), and Other or Missing (3.9% vs. 3.9%) (**Table 1**)
- Mean [SD] number of chronic conditions was similar for CRSwNP visits vs. CRSsNP (2.1 [1.7] vs. 2.2 [1.7]; p=0.2102)

Figure 1: States Represented, 2012 – 2015

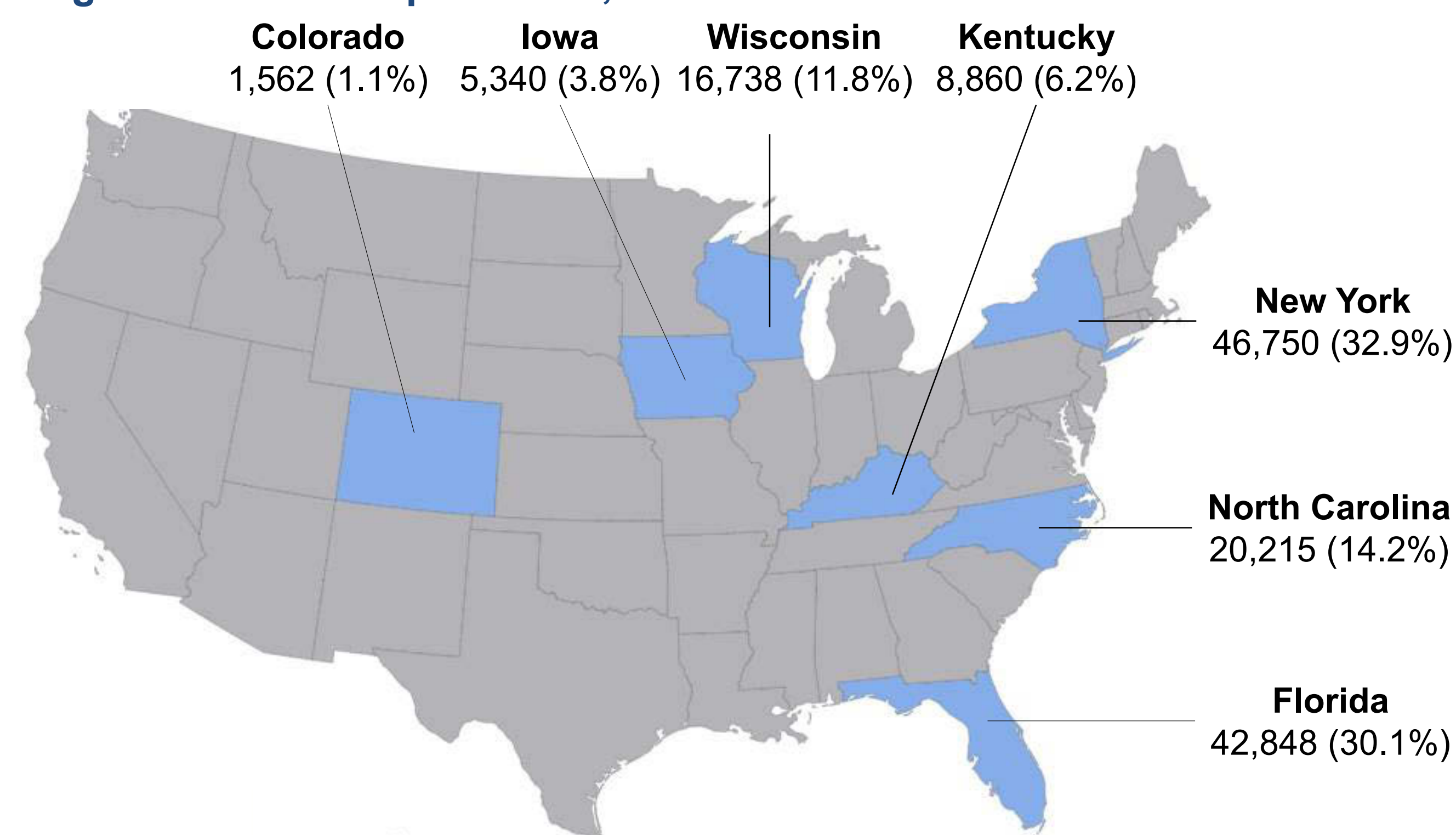


Table 1: Baseline Demographic Characteristics

|  | Surgery Visits With a Diagnosis of CRS |               |         |
|--|--|---------------|---------|
|  | CRSwNP                                 | CRSsNP        | p-value |
| <b>No. of visits</b>                       | 41,346                                 | 100,967       |         |
| <b>Age at admission (years), mean (SD)</b> | 49.9 (15.6)                            | 47.8 (15.9)   | <0.001  |
| <b>Age category at admission, n (%)</b>    |  |               | <0.0001 |
| 18-34                                      | 7,900 (19.1)                           | 23,957 (23.7) |         |
| 35-44                                      | 7,287 (17.6)                           | 19,516 (19.3) |         |
| 45-54                                      | 9,456 (22.9)                           | 21,640 (21.4) |         |
| 55-64                                      | 8,594 (20.8)                           | 18,800 (18.6) |         |
| 65 or older                                | 8,109 (19.6)                           | 17,054 (16.9) |         |
| <b>Sex (male), n (%)</b>                   | 24,429 (59.1)                          | 45,457 (45.0) | <0.0001 |
| <b>Race, n (%)</b>                         |  |               | <0.0001 |
| White                                      | 30,905 (74.8)                          | 78,554 (77.8) |         |
| Black                                      | 3,351 (8.1)                            | 5,503 (5.5)   |         |
| Hispanic                                   | 3,229 (7.8)                            | 6,490 (6.4)   |         |
| Asian or Pacific Islander                  | 809 (2.0)                              | 1,547 (1.5)   |         |
| Native American                            | 122 (0.3)                              | 344 (0.3)     |         |
| Other                                      | 2,342 (5.7)                            | 7,127 (7.1)   |         |
| Missing                                    | 588 (1.4)                              | 1,402 (1.4)   |         |
| <b>Primary payer, n (%)</b>                |  |               | <0.0001 |
| Medicare                                   | 8,288 (20.1)                           | 18,799 (18.6) |         |
| Medicaid                                   | 3,440 (8.3)                            | 8,475 (8.4)   |         |
| Private insurance                          | 27,265 (65.9)                          | 68,262 (67.6) |         |
| Self-pay                                   | 636 (1.5)                              | 1,389 (1.4)   |         |
| No charge                                  | 94 (0.2)                               | 107 (0.1)     |         |
| Other/Missing                              | 1,623 (3.9)                            | 3,935 (3.9)   |         |

CRS: chronic rhinosinusitis; CRSwNP: chronic rhinosinusitis with nasal polyps; CRSsNP: chronic rhinosinusitis without nasal polyps; SD: standard deviation.

### Healthcare Resource Utilization

- CRS-related surgery visits (CRSwNP vs. CRSsNP) involving a selected procedure were most commonly for ESS (95.0% vs. 93.8%), MA (83.1% vs. 77.5%), and ethmoidectomy (85.1% vs. 72.7%), followed by septoplasty (39.4% vs. 53.7%), frontal sinusotomy (46.2% vs. 33.8%), and sphenoidotomy (45.2% vs. 26.5%) (**Figure 2**)
  - Visits associated with polyps vs. without polyps had higher proportions of selected procedures in all categories except septoplasty
- Visits associated with CRSwNP more frequently involved surgeries on 3 or 4 sinus types than those for CRSsNP (59.3% vs. 41.4%) (**Figure 3**)
- Visits associated with either CRS subtype were mostly elective (>99%, not shown), had routine discharges (91.9%), and mean LOS of less than one day (**Table 2**)
- Most procedures were without peri-operative complications (>99%) in either subtype (**Table 2**)
- Less than 15% of visits associated with either subtype (CRSwNP vs. CRSsNP) had follow-up visits within 30 days (14.9% vs. 13.9%) (**Table 2**)

Figure 2: Proportions of Visits with Selected Surgical Procedures

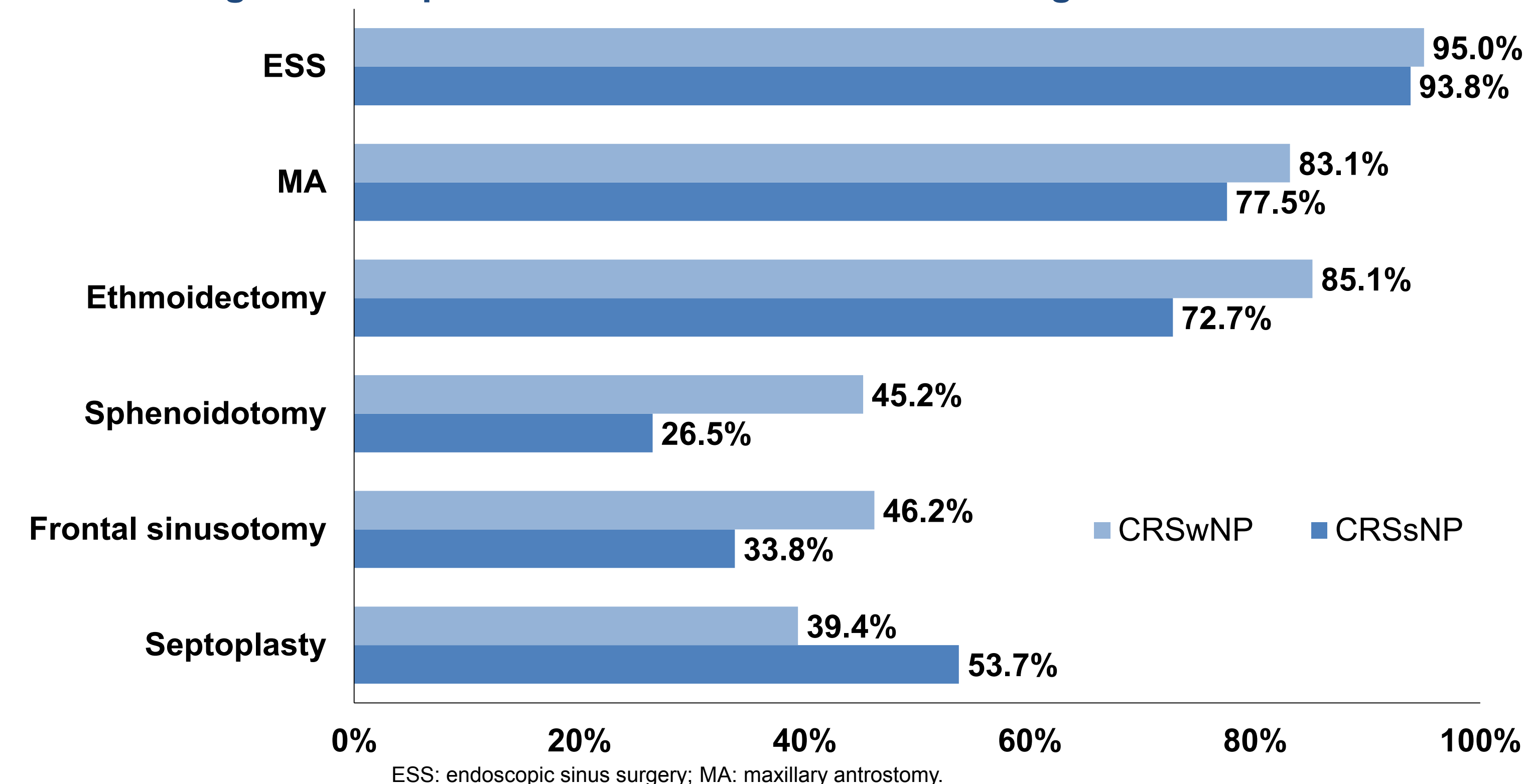


Figure 3: Proportions of Visits by Number of Operated Sinus Types

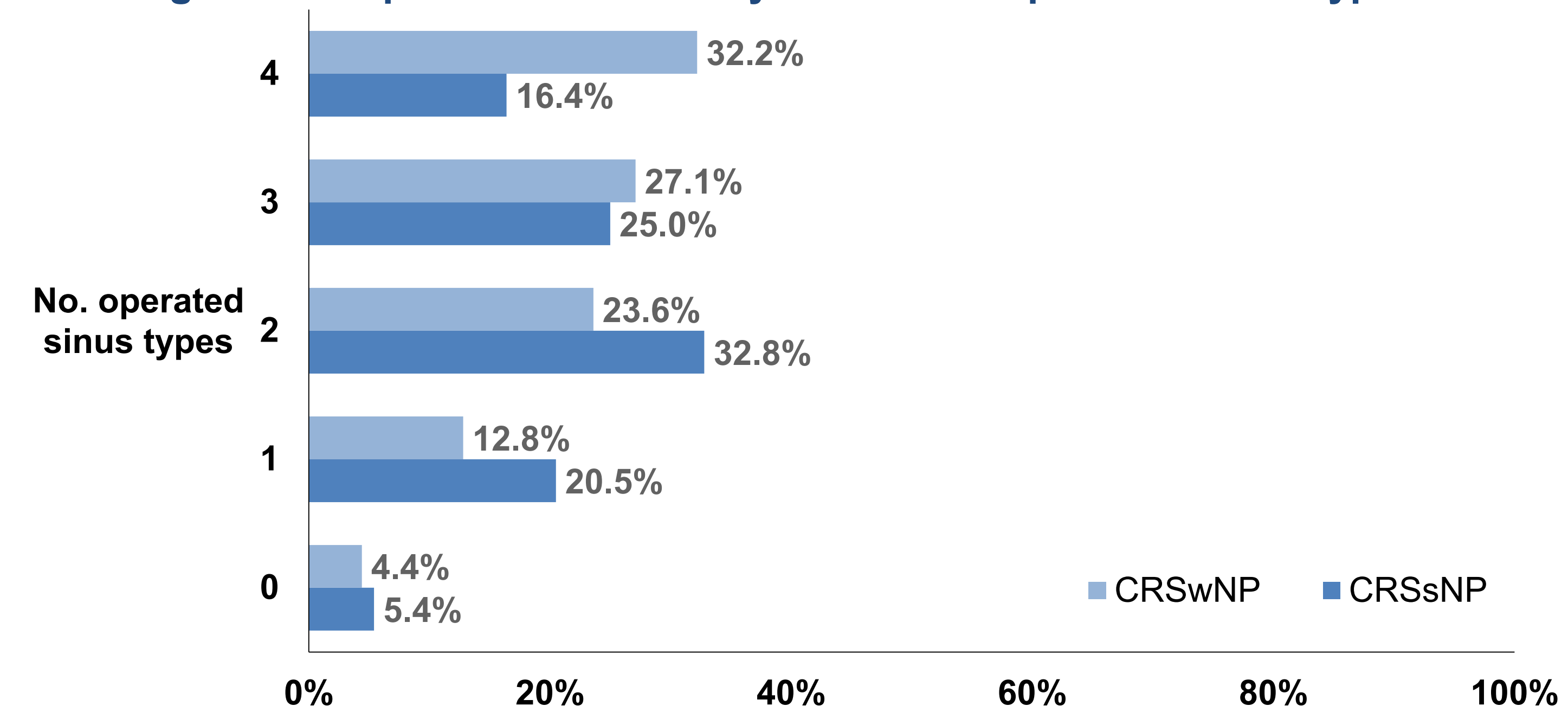


Table 2: Characteristics of Visits with a Diagnosis of CRSwNP or CRSsNP

|  | Surgery Visits With a Diagnosis of CRS |                |                |
|--|--|----------------|----------------|
|  | CRSwNP                                 | CRSsNP         | p-value        |
| <b>No. of visits</b>   | 41,346                                 | 100,967        |                |
| <b>Length of stay (days), mean (SD)</b>                              | 0.06 (0.3)                             | 0.05 (0.3)     | <0.0001        |
| <b>Discharge status, n (%)</b>                                       |  |                | 0.4894         |
| Routine  | 38,009 (91.9)                          | 92,735 (91.9)  |                |
| Transfer to short-term hospital                                      | 38 (0.1)                               | 90 (0.1)       |                |
| Transfer other   | 24 (0.1)                               | 40 (0.04)      |                |
| Home health care   | 30 (0.1)                               | 72 (0.1)       |                |
| Against medical advice   | - <sup>a</sup>                         | - <sup>a</sup> |                |
| Died in hospital   | - <sup>a</sup>                         | - <sup>a</sup> |                |
| Missing  | 3,242 (7.8)                            | 8,012 (7.9)    |                |
| <b>Peri-operative complications, n (%)</b>                           |  |                |                |
| Orbital hemorrhage   | - <sup>a</sup>                         | - <sup>a</sup> | - <sup>a</sup> |
| Orbital edema  | - <sup>a</sup>                         | - <sup>a</sup> | - <sup>a</sup> |
| Cerebrospinal fluid leak   | 38 (0.1)                               | 99 (0.1)       | 0.7343         |
| Blood transfusion  | - <sup>a</sup>                         | - <sup>a</sup> | - <sup>a</sup> |
| <b>No. chronic conditions, mean (SD)</b>                             | 2.1 (1.7)                              | 2.2 (1.7)      | 0.0136         |
| <b>Ambulatory follow-up<sup>b</sup> visits within 30 days, n (%)</b> | 2,661 (14.9)                           | 5,935 (13.9)   | 0.0009         |

CRS: chronic rhinosinusitis; CRSwNP: chronic rhinosinusitis with nasal polyps; CRSsNP: chronic rhinosinusitis without nasal polyps; SD: standard deviation.

<sup>a</sup> Frequencies <11: reported in accordance with AHRQ confidentiality statute.

<sup>b</sup> Total no. visits with data for follow-up visits: CRSwNP: 17,813, CRSsNP: 42,696; All: 60,509. Available for Florida, Iowa, and Wisconsin (excluding Wisconsin 2012).

## Limitations

- SASD are a collection of encounter-level data. Reported counts and proportions for any SASD database are for visits and do not necessarily reflect individual patients; hence, individuals may have multiple visits recorded in the databases

## Conclusion

- Surgical visits associated with chronic rhinosinusitis with nasal polyps involved more of the selected sinus surgery procedures (known to be common surgical interventions) vs. visits without polyps
- Visits associated with CRSwNP involving the selected surgical procedures also involved more sinus types vs. those for CRSsNP

## References

- Hamilos DL. UpToDate [Internet]. 2016.
- Bhattacharyya N, et al. The Laryngoscope [Internet]. 2019.
- Soler ZM, et al. Am J Rhinol Allergy. 2012 Mar 1;26(2):110–6.
- Rosenfeld RM, et al. Otolaryngol-Head Neck Surg. 2015 Apr;152(2\_suppl):S1–39.
- DeConde AS, et al. Am J Rhinol Allergy. 2016 Mar 1;30(2):134–9.
- Bhattacharyya N. Ann Otol Rhinol Laryngol. 2009 Mar;118(3):185–9.
- Smith SS, et al. J Allergy Clin Immunol. 2013 Nov;132(5):1230–2.
- Ference EH, et al. Am J Rhinol Allergy. 2018 Jan 1;32(1):34–9.