META-ANALYSIS

Global Incidence and Prevalence of Chronic Rhino-sinusitis: A Systematic Review and Meta-Analysis (2000–2025)

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ABSTRACT

Introduction: Chronic rhinosinusitis (CRS) is a persistent inflammatory condition of the nasal and paranasal sinuses that lasts for 12 weeks or longer despite treatment. CRS has different subtypes, including CRSwNP, CRSsNP, and AFRS. It is a prevalent condition, but its prevalence varies significantly across regions and clinical subtypes.

Objective: The primary objective was to estimate the global incidence and prevalence of CRS and its subtypes. The secondary objective was to investigate the pooled prevalence of comorbidities in patients presenting with CRS, determine the global pooled prevalence of chronic rhinosinusitis (CRS) diagnosed by different methods, and analyse trends over the 25-year period.

Methods: A meta-analysis was conducted from May 21 to September 9, 2025 on population-based cross-sectional, cohort and case-control studies reporting the incidence and prevalence of CRS, including CRSwNP, CRSsNP, and AFRS, published PubMed, Google Scholar, ScienceDirect databases, reference lists and registers from 2000 and 2025. Data were extracted into Excel and analysed using JASP software. Random-effects meta-analyses were conducted to estimate pooled prevalence with 95% confidence intervals, including subgroup analyses by disease type, gender, geographical area, publication year, diagnostic method, smoking status, and comorbidities.

Results: Of 776 records identified, 49 studies met the eligibility criteria, and 43 were included in the meta-analysis. The global pooled prevalence of CRS was 10.48% (95% CI, 10.01%-11.66%, based on 30 studies). For CRSwNP, the pooled prevalence was 1.8% (95% CI, 1.0% – 2.5%; based on 12 studies). Pooled prevalence was higher in Asia at 14.5% (95% CI, 9.8%–19.2%) than in Europe, North America, and South America. Pooled prevalence was higher in females compared with males; smokers compared with non-smokers; and those with comorbidities such as asthma, allergic rhinitis, diabetes mellitus, and nasal septal deviation. AFRS pooled prevalence was 3.5% (95% CI, 0.6%-6.3%). Pooled prevalence of CRS increased from 2003 to 2025 (2003-2010: 4.7%; 95% CI, 1.8%-7.6%; 2021-2025:19.8%; 95% CI, 12.6%-27.0%). CRS pooled incidence was 1.1% (95% CI, 0.20%–2.00%). Global pooled prevalence of CRS diagnosed by EPOS questionnaires was greater than CRS diagnosed by ICD codes at 14.2% (95% CI, 10.2%-18.3%) and 2.8% (95% CI, 1.30%-4.30%), respectively.

Conclusion: Chronic rhinosinusitis (CRS) is a common condition worldwide, with prevalence varying geographically. The highest prevalence is observed in Asia, followed by Europe and North America, while South America shows the lowest rates. CRS with nasal polyps (CRSwNP) and allergic fungal rhinosinusitis (AFRS) are less frequent subtypes. While CRS affects a substantial proportion of the population, the incidence of new cases remains relatively low.

Key words: chronic rhinosinusitis, prevalence, incidence, meta-analysis, systematic review.

INTRODUCTION

Rhinosinusitis is an inflammation of the sinonasal mucosa.[1] It can be classified into acute rhinosinusitis (ARS) or chronic rhinosinusitis (CRS).[2] Clinically, CRS is classified into CRS with nasal polyp (CRSwNP), CRS without nasal polyposis (CRSsNP), and allergic fungal rhinosinusitis (AFRS).[3] Studies have shown that the prevalence of chronic sinusitis is 11%

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in the UK [4] and 10.9% in Europe.[7] It caused 13.6 million outpatient visits in the USA in 2001.[5] In Iraq, sinusitis is ranked as the fifth most common disease.[6]

Many factors increase the chance of having the disease, such as active and passive smoking.[8,9] Asthma and allergies are common comorbidities associated with CRS, further complicating its management.[10] Physical examination, endoscopy, and sinus imaging, especially computed tomography, provide objective evidence for the diagnosis of chronic rhinosinusitis.[11] However, in clinical studies, questionnaires are used in a way comparable to clinical-based diagnosis.[12,13]

In a systematic review conducted by Min HK et al, the global pooled prevalence of CRS is 8.71% (95% CI, 6.69-11.33), and the global pooled prevalence of CRSwNP is 0.65% (95% CI, 0.56-0.75). The global pooled incidence was 0.73 (95% CI,0.28 to 1.88).[14] Amiri's systematic review reported that the pooled prevalence of sinusitis in Iran was 53% (CI 95%: 40% to 65%).[15] On the other hand, a systematic review conducted by Zhang found that the pooled prevalence of CRS in China was 10% (95% CI: 0.06–0.13, I^2 = 99.6%).[16]

The rationale of this study is to estimate the pooled global prevalence and incidence of chronic rhinosinusitis (CRS), including all subtypes CRSwNP, CRSsNP, and AFRS.

The primary objective of this review was to measure the pooled global prevalence and incidence of chronic rhinosinusitis (CRS), including all its subtypes—CRSwNP, CRSsNP, and AFRS—published from 2000 to 2025. The secondary objectives were to measure the pooled prevalence of comorbidities in patients presenting with CRS, the prevalence of chronic rhinosinusitis (CRS) diagnosed using various approaches such as questionnaires and ICD codes, and the trends over the 25 years.

METHODS

Information sources and search strategy: A comprehensive literature search was conducted from May 21, 2025, to September 9, 2025, through Databases (Pubmed, ScienceDirect and Google Scholar), and registration platforms (Open Science Framework [OSF]and PROSPERO) by two investigators. We targeted articles published between 2000 and 2025. MeSH terms, free text words and Boolean operators were used. In addition to database searching, a manual search of the reference lists of all eligible full-text articles was conducted to identify additional relevant studies. For more information, see **Table 1**.

Table 1 | Literature Review Keywords

No.	Database	Text Words/MeSH Terms
1	Pubmed keywords	• ("Nasal polyps"[MeSH] OR "CRSwNP"[Text Word]) AND (prevalence OR incidence OR epidemiology) AND (cross sectional OR cohort OR case control). • ("Rhinosinusitis" [MeSH] OR "Chronic Rhinosinusitis" [Text Word]) AND (prevalence OR incidence OR epidemiology) AND (cross sectional OR cohort OR case control). • ("Allergic ("Fungal Sinusitis" [MeSH] OR "AFRS" [Text Word]) AND (prevalence OR incidence OR epidemiology) AND (cross sectional OR cohort OR case control).
2	ScienceDirect keywords	• ("Chronic Fungal Rhinosinusitis" OR "Fungal CRS" OR "Chronic fungal sinusitis" OR "AFRS") AND (prevalence OR incidence OR epidemiology) AND (cross sectional OR cohort OR case control) • ("Nasal polyps" OR "CRSwNP") AND (prevalence OR incidence OR epidemiology) AND (cross sectional OR cohort OR case control) AND (cross sectional OR cohort OR case control). • ("Chronic Rhinosinusitis" OR "Rhinosinusitis") AND (prevalence OR incidence OR epidemiology) AND (cross sectional OR cohort OR case control).
3	Google Scholar keywords	• ("Chronic Fungal Rhinosinusitis" OR "Fungal CRS" OR "Chronic fungal sinusitis" OR "AFRS") AND (prevalence OR incidence OR epidemiology) AND (cross sectional OR cohort OR case control). • ("Nasal polyps" OR "CRSwNP") AND (prevalence OR incidence OR epidemiology) AND (cross sectional OR cohort OR case control). • ("Chronic Rhinosinusitis" OR "Rhinosinusitis") AND (prevalence OR incidence OR epidemiology) AND (cross sectional OR cohort OR case control).

Selection Process and Data Collection Process: The total number of records identified was 776. After removal of duplicates, 359 records were screened based on title and abstract by two investigators using Rayyan, a web-based software program for systematic review management. All references that needed screening were uploaded to Rayyan as a CSV file exported from Microsoft Excel 2010. Any discrepancies were resolved by consultation with a third investigator. Full-text assessment of 49 studies was performed by the same two investigators using Rayyan to organise and manually label records as Include, Exclude, May be excluded, or Exclude with reason according to eligibility criteria. Any disagreements were resolved through discussion with the third investigator. Finally, 43 studies were included in the quantitative analysis.

All data were initially extracted by the principal investigator using Microsoft Excel (version 2010). The spreadsheet included study identifiers (first author, year of publication), study design, study period, total sample size, age group, type of sinusitis, diagnostic method, setting, sample size, prevalence by gender (%), prevalence (%), and incidence/year (%). Additionally, when reported, data regarding risk factors for CRS (number of events and totals in exposed/non-exposed groups, odds ratios) were also extracted and summarised separately. Only the final validated and relevant data were transferred into the main manuscript (in Word format). EndNote version 2025, a reference management software and browser extension, was used for citation and reference organisation.

Protocol Registration: The protocol for this systematic review was submitted to the Research Ethics Committee at the Baghdad Al-Rusafa Health Directorate and received official approval in March 2025. The protocol was registered in PROSPERO (registration no. CRD420251122430) by two investigators (Muhammed RK, a practitioner pharmacist and Ayoob HA, an ENT consultant).

Eligibility Criteria: According to the PICO framework, participants were drawn from community-based samples during surveys or from large patient populations recruited across multiple healthcare settings, including primary care, outpatient clinics, hospitals, and referral centres, in several cities or provinces, all of whom were representative of the general population. The included studies primarily targeted adults. Participants were mainly adults, although some studies included adolescents, children and older adults. The intervention was the diagnostic method used for CRS detection, such as questionnaires, diagnostic nasal endoscopy (DNE), or ICD-9/10–based diagnosis.

Exposure included patients with chronic rhinosinusitis who have comorbidities, including asthma, allergic rhinitis and deviated nasal septum. Comparators or controls consisted of CRS patients without comorbidities. Main outcomes included CRS pooled prevalence and incidence estimates; CRSwNP, CRSsNP, and AFRS pooled prevalence estimates; Continents pooled prevalence estimates of CRS; CRS pooled prevalence estimates by gender, diagnostic methods, and publication year.

This systematic review included regional or national population-based cross-sectional, case-control, and cohort studies that reported the incidence or prevalence of chronic rhinosinusitis (CRS), including CRSwNP, CRSsNP, and AFRS, such as the following; registry-based retrospective cross sectional or cohort studies using ICD-9/10 codes (medical records from primary care, ambulatory care, referral centers, hospitals, emergency departments and health insurance registries), cohort studies or cross-sectional surveys using a validated questionnaire (EPOS, SF-36, SNOT-22 or other types of validated questionnaire), cross sectional surveys in which CRS was initially identified by a validated questionnaire and subsequently diagnosed by a physician using nasal endoscopy or other investigations, cross sectional surveys in which a validated questionnaire identified CRS via previous self-reported, physician-diagnosis. Epidemiological case–control studies and cross-sectional surveys or studies. Cross-sectional studies with

population-adjusted prevalence estimates by age and sex; studies published in English.

Excluded studies based on title and abstract were review articles, studies focusing on risk factors, causes, symptoms, or comorbid conditions, and articles on acute rhinosinusitis. Case reports, case series, single-centre hospital-based case-control studies, and single-centre hospital or clinic-based cross-sectional. In addition, multi-centre hospital-based case-control, cohort, or cross-sectional studies, and studies that did not specify the type of sinusitis were excluded. Further exclusions included studies focusing primarily on diagnosis, treatment, economic burden, or quality of life associated with CRS, as well as occupational or birth cohort studies, poster or conference abstracts, non-empirical articles, non-English articles, grey literature, and studies with an NOS score < 7.

Study risk of bias assessment (RoB): Quality assessment of the included studies was performed using the Newcastle–Ottawa Scale (NOS)[17] for cohort and case-control studies, which is a nine-point scale allocating points based on three domains: Selection (0–4 points), comparability (0–2 points), and outcome (for cohort) or exposure (for case-control) (0–3 points). According to the NOS, studies were categorised as poor (0–3 points), fair (4–6 points), or good (7–9 points) quality.

For cross-sectional studies, the adapted NOS version with a ten-point scale was used. In this adapted scale, points were allocated as follows: Selection (0–5), comparability (0–2), and outcome/exposure (0–3). Studies were then categorised as poor (0–3 points), fair (4–6 points), or good (7–10 points) quality.[18]

Certainty Assessment: The certainty of evidence was assessed using the GRADEpro GDT tool. It assesses evidence based on several criteria, including RoB, inconsistency, indirectness, imprecision, and other relevant factors. The GRADEpro GDT tool was specifically applied as it is suitable for evaluating the certainty of evidence regarding diagnostic methods.

Effect measures, Data synthesis, and Statistical Analysis: The Excel file containing data from the included studies was saved and exported to CSV format, which was then imported into JASP software, version 0.95.4.0. Three investigators performed statistical analysis.

The primary effect measure used in this review was the incidence and prevalence proportions (effect sizes), expressed as decimals. For each study, the incidence and prevalence proportions, along with their corresponding standard errors, were entered into the JASP spreadsheet.

Standard error = $\sqrt{p(1-p)/n}$

Where p is the prevalence proportion, and n is the population size.

CI equation:

CI= SE *1.96 - P = Lower limit of CI

CI=SE*1.96 + P = Upper limit CI

Where: P is the prevalence proportion, and the SE is the standard error.

Random-effects meta-analyses were performed to calculate pooled prevalence estimates with 95% confidence intervals (95% CI).

Statistical Analysis: Meta-analyses were conducted using a random-effects model using JASP 0.95.4.0. Pooled estimates with 95% CIs were utilised to compare the global prevalence and incidence of CRS. Egger's test was employed to identify potential publication bias. A comprehensive subgroup analysis was conducted across several variables, including disease type, gender, geographic area, publication year, and diagnostic method. Separate meta-analyses were performed for each subgroup using the SWADA (Separate Within-And-Across-Data Analysis) approach, in which analyses were conducted for each subgroup rather than combining all subgroups in a single analysis. Each subgroup (e.g., overall CRS, CRS with nasal polyps, CRS with fungal involvement) was analysed independently in its own dataset to address inconsistencies arising from unbalanced subgroup distributions and to

improve subgroup and interaction estimates.[19] Heterogeneity was evaluated using the I2 statistic,[20] which measures heterogeneity among studies (with higher values indicating greater heterogeneity), and the Cochran's Q statistic.[21] Statistical significance was defined as a $p < 0.05$.

RESULTS

Study Selection: The review met almost all criteria of the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) 2020 statement.[22]

Initially, 776 records were identified: 774 from databases (Google Scholar = 357, PubMed = 303, ScienceDirect = 114) and 2 from PROSPERO registers. Duplicate records (n = 417) were removed before screening. The remaining 359 records were screened based on title and abstract. Of these, 310 studies were excluded. The remaining 49 reports were retrieved and assessed for eligibility based on full-text review. All studies were successfully retrieved (n = 49). Following full-text assessment, six studies were excluded. Finally, 43 studies met all inclusion criteria and were included in the systematic review. For more information, see the PRISMA flow diagram, Figure 1 and Table 2, which list the types and numbers of excluded studies during title and

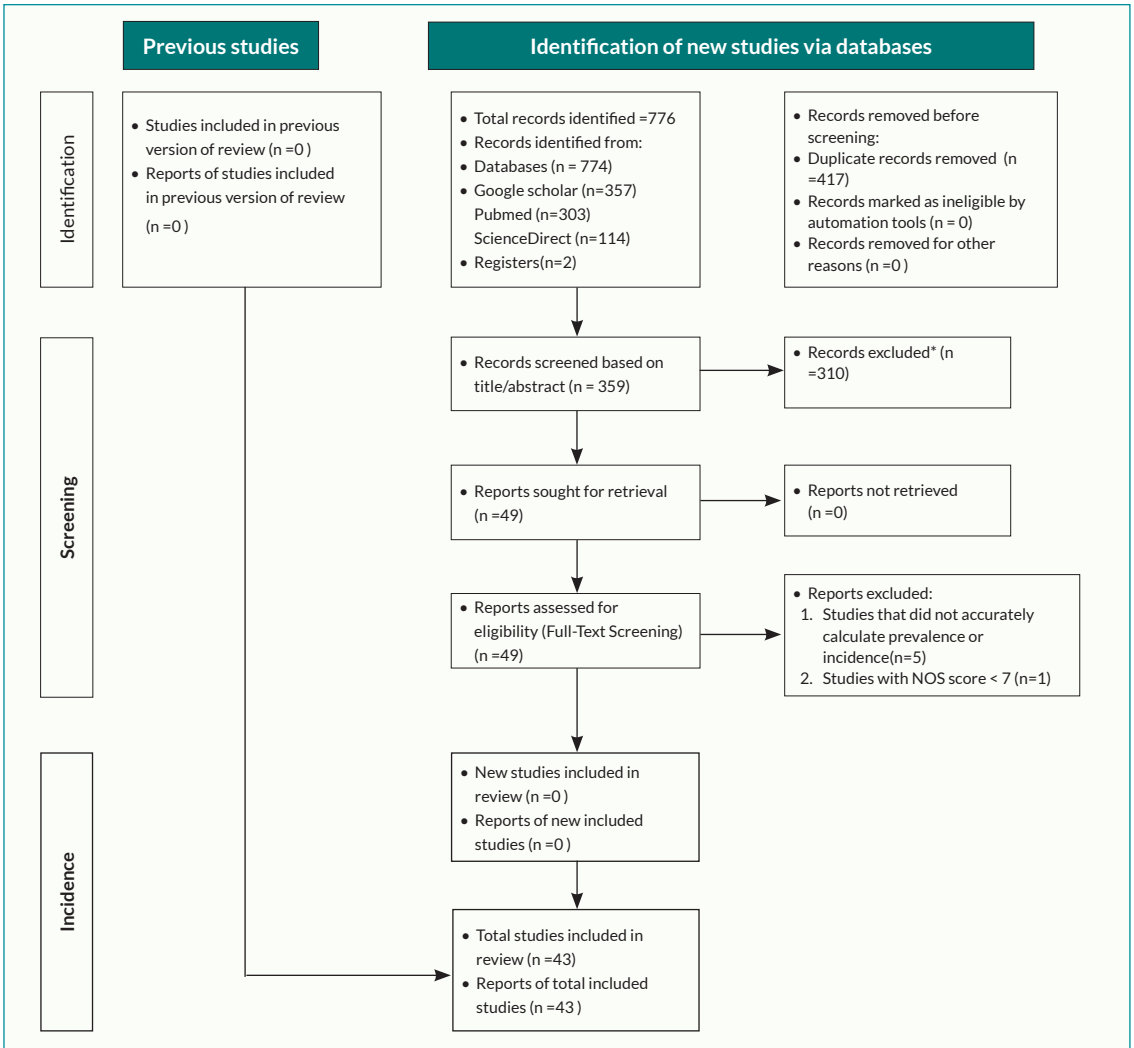

Figure 1 | PRISMA 2020 flow diagram for updated systematic reviews.

Table 2 | Types and numbers of excluded studies during title and abstract screening

Stage for exclusion	Studies	Reason for Exclusion
Title and abstract	58	Review articles
Title and abstract	96	Articles on risk factors (occupational, socio-demographic, environmental, socioeconomic), causes (bacterial/fungal aetiology at hospitals or referral centres), symptoms and comorbid conditions (at hospitals or referral centres)
Title and abstract	10	Articles on acute rhinosinusitis
Title and abstract	14	Case series
Title and abstract	2	Single-centre hospital-based case-control studies
Title and abstract	46	Single-centre hospital/clinic-based cross-sectional studies
Title and abstract	36	Studies focused on diagnosis, treatment, economic burden and QoL associated with CRS.
Title and abstract	3	Multi-centre hospital-based case-control/cohort/cross-sectional studies
Title and abstract	13	Case report
Title and abstract	7	Studies do not specify the type of sinusitis
Title and abstract	4	Occupational/Birth cohort studies
Title and abstract	1	Non-empirical article (model-based estimation study)
Title and abstract	16	Poster/Conference abstracts
Title and abstract	2	Non-English articles
Title and abstract	2	Protocols (grey literatures)
Total	310	

abstract screening.

Study RoB Assessment: The methodological quality of the included studies was assessed by two investigators using the Newcastle–Ottawa Scale (NOS). Studies that assessed as good and to very good indicating a generally low risk of bias were imcluded in the final analysis, which were 43.

Study Characteristics: All studies were performed in a single country and included population-based studies regarding CRS and its subtypes, CRSwNP, CRSsNP, and AFRS from 2000 to 2025. Table 4 shows 43 studies across four continents (Asia, North America, Europe, and South America). Most studies focused on chronic rhinosinusitis (CRS), while fewer addressed subtypes such as CRSwNP, CRSsNP, and AFRS. Some studies had more than one outcome, such as CRS, CRSwNP, and CRSsNP. Participants were mainly adults, although some studies included adolescents, children, and older adults. Diagnostic methods varied across studies, including self-reported symptoms based on EPOS criteria, physician diagnoses using DNE, and medical records using ICD codes. The majority of studies were cross-sectional, with a few cohort and case-control designs. Table 3 provided key information regarding the incidence and prevalence of chronic rhinosinusitis (CRS) and its subtypes across various countries.

CRS prevalence by Comorbidities and associated behaviours: Only five studies reported both CRS patients with comorbidities and CRS control groups. CRS pooled prevalence estimates was higher among individuals with allergic rhinitis, asthma, and nasal septal deviation, while smoking and diabetes showed weaker or inconsistent associations. For more information, see Table 4.

Syntheses and reporting bias. For overall CRS, the pooled prevalence was 11.4% (95% CI, 8.3%-14.5%), with considerable heterogeneity (I^2=99.99%). For CRSwNP, the pooled prevalence was 1.8% (95% CI, 1.00% – 2.5%), also with high heterogeneity (I^2 = 99.93%). Subgroup analysis by region showed the highest pooled prevalence in Asia, at 14.5% (95% CI,9.8% – 19.2%). Evidence of publication bias was detected for the overall CRS prevalence estimate, as indicated by Egger's regression test (z = 5.29, p < 0.001). Similarly, potential

Table 3 | Prevalence and Incidence Rates of Chronic Rhino-sinusitis based on National and Regional based studies.

No.	Authors /year	Study period	Setting	Type of sinusitis	Sample size	Age group	Diagnostic Method	Prevalence by Gender (%)	Prevalence (%)
1	Pilan RRM et al. (2012) [23]*	2010-2011	Regional population, São Paulo, Brazil, South America	CRS	2003	Children, adolescents, adults	EPOS 2012 questionnaire	M: 908(45.4), F:1095 (54.6)	5.51%
2	Kim YS et al. (2011) [24]*	2009-2010	National population, South Korea, Asia	CRS	4098	Adolescents, adults, older adults	EPOS 2007 questionnaire	M: 1758 (42.9), F: 2340 (57.1)	6.95%
3	Thilsing T et al. (2012) [25]*	2009-2011	Regional population, Funen Island, Denmark Europe	CRS	3099	Children, adolescents, adults, older adults	EPOS 2007 questionnaire	M: 1537 (49.6), F:1562 (50.4)	7.80%
4	Shi JB et al. (2015) [26]*	2012	Regional population, seven cities across mainland China, Asia	CRS	10636	Adults	EPOS 2007 questionnaire	NR	8.00%
5	Hakami NA et al (2024) [27]*	2020	Regional population, Jazan Saudi Arabia , Asia	CRS	1081	Adults	SNOT-22 and EPOS 2020-questionnaire	M: 594 (54.9), F: 487 (45.1)	32.30%
6	Ostovar A et al. (2019) [28]*	2016	Regional population, Bushehr Iran, Asia	CRS	5,201	Adults	EPOS 2012 questionnaire	M: 2548 (49), F: 2653 (51)	28.40%
7	Hoffmans R et al (2018) [29]*	2008	Regional population, 3 regions in ,Netherlands, Europe	CRS	8347	General population (age not specified)	EPOS 2012 questionnaire	M: 3756 (45), F:4591 (55)	16%
8	Alotaibi AD et al. (2023) [30]*	2022-2023	National population, Saudi Arabia	CRS	3602	Adults	Electronic validated questionnaire	M: 949 (26.3), F:2653 (73.7)	26.30%
9	Habib AR et al (2015)[31]**	1998-2011	National population, Canada, North America	CRS	11,155	Adults	Self-reported, physician-diagnosed CRS using validated questionnaire	M: 4,507(40.4), F: 6,648 (59.6)	5.34%
10	Lee H et al (2024) [32]*	1998-2021	National population , South Korea , South Korea, Asia	CRS	146,264	Adults	Self-reported, physician-diagnosed CRS using validated questionnaire	NR	3.70%
11	Xu Y et al. (2016) [33]***	2004-2014	Regional population, Alberta, Canada, North America	CRS	2 925 930	General population, age not specified	Insurance registries using ICD-9 codes	M:1474669(50.4), F:1451261 (49.6)	Prevalence: 2% Incidence: 0.25%
12	Palmer JN et al. (2019) [34]*	2014 – 2015	National population, USA, North America	CRS, CRSwNP-CRSsNP	10336	Adults	EPOS 2012 questionnaire	NR	CRS 11.5% , CRSwNP 1.1% CRSsNP 10.4%
13	Kim JH et al. (2016)[35]*	2009	National population, South Korea, Asia	CRS	7394	Adolescents, adults, and older adults	EPOS 2012 questionnaire	M:3194 (43.2), F 4200 (56.8)	10.78%
14	Shashy RG et al. (2004)[36]***	2000	Regional population, Primary care and referral center of Olmsted County, USA , North America	CRS	2405	Infants, children, Adolescents, adults, and older adults	Medical records using ICD-9 codes	M:778 (32.3), F: 1627 (67.7)	1.96%
15	Fu QL et al. (2012)[37]*	2010-2011	Regional population, Guangzhou, China, Asia	CRS	1,411	Adolescents, adults, and older adults	SF-36 based questionnaire	M:688 (48.8), F: 723 (51.2)	8.40%
16	Cho YS et al. (2010) [38]*	2008	National population, South Korea, Asia	CRS CRSwNP	4930	Children, adolescents, adults, and older adults	Physician-diagnosed CRS using DNE and validated questionnaire	NR	CRS 7.12% CRSwNP 2.53%
17	Clarhed UK et al. (2018) [39]*	2013	Regional, population, Telemark, Norway, Europe	CRS	14,906	Adolescents and adult	EPOS 2012 questionnaire	M:6,584 (44.2), Female 8,322 (55.8)	9%
18	Gao WX et al. (2016)[40]*	2012-2014	Regional population, Seven Chinese cities from various provinces, China, Asia	CRS	10633	General population, age not specified	EPOS 2012 questionnaire	M:5135 (48.3), F: 5498 (51.7)	7.99%
19	Nabavizadeh SH et al (2022) [41]*	2020	Regional population outpatient clinics , 12 provinces, Iran , Asia	CRS	4988	Adults	EPOS 2012 questionnaire	NR	22%
20	Wang XD et al (2016) [42]*	2011	Regional population ,18 major cities , China, Asia	CRS	47216	Adults	Validated questionnaire	NR	2.10%
21	Hirsch AG et al. (2017) [43]*	2013-2015	Regional population ,primary care , 45 counties ,Pennsylvania, USA, North America	CRS	23 700	Adults	EPOS 2012 - electronic questionnaire	M:8840 (37.3), F:14860 (62.7)	11.90%

22	Dietz de Loos D et al (2018) [44]*	2012-2013	Regional Population, Academic Medical Centre, AMC, Netherlands, Europe	CRS	834	Adults	EPOS- 2 012 electronic questionnaire	M:309 (37.1), F: 525 (62.9)	12.80%
23	Mullol J et al (2024) [45]*	2012 – 2020	National population, primary care and hospital, seven regions, Spain, Europe	CRS CRSwNP CRSsNP	50,413	Adults	Electronic health record (HER)using ICD-9 codes	M: 31096 (61.7), F: 19317 (38.3)	CRS 5.1 % CRSwNP 0.8% CRSsNP 4.3%
24	Ahn J et al. (2016) [46]*	2008–2012	National population, South Korea , Asia	CRS CRSwNP CRSsNP	28,912	Adults	Physician-diagnosed CRS using DNE and validated questionnaire	NR	CRS 8.4% CRSwNP 2.6% CRSsNP 5.8%
25	Alhazmi WA et al (2021)[47]*	2021	National population, ,Saudi Arabia, Asia	CRS	4963	Adults	SNOT-22- online questionnaire	M: 1887 (38), F: 3076 (62)	22.50%
26	Gilani S et al (2017)[48]*	2021	National population, Ambulatory care, USA, North America	CRS	185,531	Paediatrics	Healthcare visit registry using ICD 9 codes	NR	2.10%
27	Hwang CS et al (2019)[49]*	2008-2012	National population , South Korea, Asia	CRS	19 939	Adults	EPOS 2012 - electronic questionnaire	NR	5.69%
28	Chen Y et al (2003)[50]*	1996 -1997	National population, household visits, 10 provinces, Canada, North America	CRS	73364	Adults	Self-reported, physician-diagnosed CRS using validated questionnaire	M:34241 (46.6), F: 39123 (53.4)	5%
29	Nirouei M et al (2023)[51]*	2020	Regional population, ,Kashan, Iran, Asia	CRS	337	Adults	EPOS 2020 -questionnaire	M: 75 (22.3), F: 262 (77.7)	27.70%
30	Alqarni NA et al(2025)[52]*	2024-2025	Regional population, Bisha, Saudi Arabia, Asia	CRS	416	Adults	EPOS 2020 -questionnaire	M: 117 (28.1), F: 299 (71.9)	27.70%
31	Alnemare AK et al (2023)[53]*	2017-2021	National population, Saudi Arabia, Asia	CRSwNP	386	Adults	EPOS 2020 questionnaire	M: 114 (29.5), F: 272 (70.5)	8%
32	Raciborski F et al (2021)[54]**	2008–2018	National population, Poland, Europe	CRSwNP	391,210	Adults	Health insurance records using ICD-10 codes	NR	0.52%
33	Sanchez-Collado I et al. (2022) [55]**	2013–2017	Regional population primary, hospital, ambulance emergency care, Catalonia ,Spain, Europe	CRSwNP	30189	Adults	Medical records using ICD-9 codes	M: 17,867 (59.2), F: 12,322 (40.8)	0.49%
34	Starry A et al. (2022) [56]**	2015-2019	Regional population, 2 Provinces , Germany, Europe	CRSwNP	374,115	Adults	Insurance records using ICD-10 codes	NR	0.55%
35	Klossek JM et al (2005)[57]*	2002	National population, France, Europe	CRSwNP	10,033	Adults	Validated diagnostic questionnaire with algorithm-scoring system	M: 4812 (48.0), F:5221 (52.0)	2.11%
36	Johansson L et al (2003)[58]*	2000	Regional population, Skövde, Sweden, Europe	CRSwNP	1,900	Adults	Physician-diagnosed using DNE	NR	2.70%
37	Campion NJ et al(2021)[59]*	2017-2019	National population , ENT outpatient clinic ,Vienna, Austria, Europe	CRSwNP	10,259	Children, Adolescents, adults, older adults	EMR data (SNOT-20 GAV and nasal endoscopy)	M: 4602 (44.9), F: 5657 (55.1)	1.95%
38	Wojas O et al (2021)[60]*	2005-2008	Regional population, 8 cities and rural area, , Poland, Europe	CRSwNP	18,458	Children, adolescents, adults	Validated questionnaire	M: 8536 (46.25), F: 9922 (53.75)	1.10%
39	Sundaresan AS et al (2018) [61]**	2014	Regional Population, primary care , ,Pennsylvania, U.S.A, North America	CRS	4966	Adults, older adults	EPOS 2012 questionnaires	NR	Prevalence: NR Incidence: 1.9%
40	Tan BK et al (2013)[62]**	2001-2010	Regional Population primary care, ,Pennsylvania, U.S.A, North America	CRS	4966	Children, adolescents, adults, older adults	Electronic health record (EHR) data using ICD-9 codes	M: 6,940 (42.8), F: 9,296 (57.2)	Prevalence: NR Incidence: 1.13 %
41	Philpott CM et al (2018) [63]***	2012-2014	National population-,secondary and tertiaryENT/rhinology clinics ,Wales and Scotland, UK, Europe	AFRS in CRS	1,470	Adults, older adults	Physician-diagnosed using endoscopy and/or CT scan (EPOS criteria)	M:864 (58.8), F: 606 (41.2)	3.06%
42	Debbaneh P et al (2024)[64]**	2010-2019	Regional population , ,Northern California, U.S.A, North America	AFRS in CRSwNP	17,510	Adults, older adults	EMR using ICD-9/10 codes	M: 9518 (54.4), F: 7992 (45.6)	1.20%
43	Chakrabarti A et al. (2015) [65]*	2013-2014	Regional population, rural India, Asia	AFRS in CRS	66,375	Adults, Older adults	Physician diagnosed CRS via nasal endoscopy, CT, lab tests	NR	0.06%

*: Cross sectional study. **: Cohort study, *** :Case control. M: Male, F: Female

Table 4 | CRS prevalence by Comorbidities and associated behaviours in selected studies

No	Author/year of publication	Commonly reported comorbidities and associated behaviours	CRS Group with comorbidities and associated behaviours (Exposed group)				CRS Group without comorbidities and associated behaviours (Control group)			
			Total No. (N)	Events (n)	Prev.	OR	Total No.(N)	Events (n)	Prev.	OR
1	Pilan RRM et al. (2012)	Asthma	131	19	16.47%	3.88	1868	84	4.82%	1
		Allergic rhinitis	351	53	15.14%	5.02	1649	51	3.44%	1
		Smoking	289	18	6.53%	1.34	1378	64	4.95%	1
2	Kim YS et al. (2011)	Allergic rhinitis	1035	171	16.5%	3.64	3063	111	3.62%	1
		Asthma	147	22	14.9%	2.468	3951	263	6.65%	1
		NSD	142	81	57.0%	24.73	4067	200	4.91%	1
		DM	269	34	12.6%	2.06	3829	251	6.55%	1
3	Kim JH et al. (2016)	Allergic rhinitis	740	200	27.03%	3.90	6631	595	8.97%	1
		Asthma	226	54	23.89%	2.67	7145	741	10.37%	1
		Smoking	1641	195	11.88%	1.04	5730	600	10.47%	1
		DM	570	57	10.00%	0.72	6823	739	10.83%	1
		NSD	3127	389	12.44%	1.34	4206	399	9.49%	1
4	Nabavizadeh SH (2022)	Allergic rhinitis	1102	605	54.9%	3.56	3878	989	25.5%	1
		Asthma	314	141	44.9%	3.15	4665	961	20.6%	1
		Smoking	550	153	27.8%	1.42	4435	949	21.4%	1
5	Alqarni NA et al (2025)	DM	22	8	36.4%	NR	395	73	18.5%	NR
		Smoking	37	13	35.1%	NR	379	68	17.9%	NR
		NSD	62	23	37.1%	NR	354	58	16.4%	NR
		Asthma	44	18	40.9%	NR	373	63	16.9%	NR

publication bias was present in the Asian ($z = 3.73$, $p < 0.001$). Table 5 summarises the pooled prevalence estimates with their confidence intervals.

Forest plot of the prevalence of chronic rhinosinusitis (CRS): Figure 2 represents a forest plot of the prevalence of chronic rhinosinusitis (CRS) with 95% confidence intervals (CI) based on a random-effects meta-analysis. Each square represents the point prevalence estimate reported by an individual study. Each square represents the point prevalence estimate reported by an individual study .The horizontal line through each square indicates the 95% confidence interval, reflecting the precision of estimate of that study. The vertical dashed line represents the overall pooled prevalence. The diamond at the bottom of the plot represents the overall pooled prevalence of CRS. Overall pooled prevalence: 10.84% (95% CI: 10.01–11.66). The analysis shows very high between-study heterogeneity: $I^2 = 99.8\%$.

Trends in CRS Prevalence: The line graph clearly demonstrates a progressive increase in the prevalence of chronic rhinosinusitis (CRS) over time. From 2003 to 2010, the prevalence was relatively low and stable at 4.7%. From 2011 to 2015, it rose slightly but consistently to 7.0%. A more notable increase was observed between 2016 and 2020, when prevalence reached 9.9%, showing a sharp upward trend compared to earlier years. Finally, from 2021 to 2025, the prevalence rose dramatically, reaching its highest level at 19.8%. See Figure 3.

Certainty of evidence: The certainty of evidence was assessed by the GRADEpro GDT tool, including the following domains (risk of bias, inconsistency, indirectness, and imprecision, other considerations). The pooled prevalence of CRS and its subtypes varied by diagnostic method. Self-reported EPOS questionnaires showed very low certainty, and ICD-based CRS had low certainty. Most studies had low risk of bias and indirectness, but heterogeneity was generally high. A summary of the evidence for different diagnostic approaches to chronic rhinosinusitis (CRS) and

Table 5 | Meta-Analysis of CRS Incidence and Prevalence with Subgroup and publication Bias Assessment

No.	Outcome	No. of studies	Regression Coefficients			Residual Heterogeneity statistics						Egger's regression test	
			Pooled prevalence estimate + CI	S.E	REM P value	I^2 statistics			Cochran's Q test			z	P value
						I^2	95% CI for I2	τ^2	Q	DF	P value		
Main meta-analysis													
1	CRS (overall incidence)	3	1.1% (0.20% – 2.00%)	0.005	0.023	99.12%	99.36%-99.97%	6.60×10−5	184.49	2	< 0.001	6.92	**< 0.001**
2	CRS (overall) prevalence	30	11.4% (8.3%-14.5%)	0.016	< 0.001	99.99%	99.98%-99.99%	0.007	18697.95	29	< 0.001	5.29	**< 0.001**
Subgroup Analysis													
1) Phenotype													
1	CRSwNP prevalence	12	1.8% (1.00% – 2.5%)	0.004	< 0.001	99.93%	99.87%-99.98%	1.71× 10−4	959.85	11	< 0.001	5.88	< 0.001
2	CRSsNP Prevalence	3	6.8%(3.2%-10.4%)	0.018	< 0.001	99.77%	99.26%-99.99%	0.001	415.68	2	< 0.001	20.37	**< 0.001**
3	AFRS prevalence	3	3.5%(0.6%-6.3%)	0.014	0.016	99.76%	99.23%-99.99%	6.15 × 10−4	1562.11	5	< 0.001	-0.10	0.91
2) Continent													
1	Asia CRS prevalence	17	14.5%(9.8% – 19.2%)	0.024	< 0.001	99.96%	99.94%-99.98%	0.010	7636.27	16	< 0.001	3.73	**< 0.001**
2	Europe CRS prevalence	5	10.1%(6.3% – 13.9%)	0.019	< 0.001	99.64%	99.02%-99.95%	0.002	1099.80	4	< 0.001	1.08	**0.27**
3	North America CRS prevalence	7	5.7%(2.5%-8.9%)	0.016	< 0.001	99.98%	99.96%-99.99%	0.002	4726.60	6	< 0.001	1.53	**0.12**
3) Publication year													
1	CRS prevalence from 2003 to 2010	3	4.7%(1.8%-7.6%)	0.015	< 0.002	99.17%	97.05%-99.97%	6595× 10−4	146.13	2	< 0.001	0.18	**0.85**
2	CRS prevalence from 2011 to 2015	6	7.0% (5.9%–8.0%)	0.005	< 0.001	92.01%	85.97%-98.75%	1509 × 10-4	80.78	5	< 0.001	0.90	**0.36**
3	CRS prevalence from 2016 to 2020	13	9.9%(6.0% – 13.7%)	0.020	< 0.001	99.99%	99.98%-99.99%	0.005	10166.42	12	< 0.001	2.68	**< 0.007**
4	CRS prevalence from 2021 to 2025	8	19.8%(12.6%-27.0%)	0.03	< 0.001	99.96%	99.91%-99.99%	0.01	3506.09	7	< 0.001	2.13	**0.03**
4) Diagnostic method													
1	CRS prevalence by EPOS Questionnaire	17	14.2%(10.2%-18.3%)	0.021	< 0.001	99.83%	99.69%-99.93%	0.007	2923.74	16	< 0.001	3.45	**< 0.001**
2	CRS prevalence by ICD codes	4	2.8%(1.30%-4.30%)	0.008	< 0.001	99.97%	99.94%-99.99%	2.37×10−4	17690.90	3	< 0.001	-0.527	**0.598**
5) Gender													
1	CRS prevalence in Male	21	40.7%(35.1%-46.3%)	0.028	< 0.001	99.94%	99.90%-99.97%	0.017	56279.65	20	< 0.001	-0.97	**0.33**
2	CRS prevalence in Female	22	53.6%(47.0%-60.3%)	0.034	< 0.001	99.96%	99.93%-99.98%	0.025	53914.66	21	< 0.001	1.79	**0.07**
6) Comorbidities and associated behaviors													
1	CRS with asthma	5	27.7% (15.5%-39.9%)	0.062	0.001>	94.23%	83.34%-99.31%	0.018	73.12	4	0.001>	0.81	**0.41**
2	CRS without asthma	5	13.8%(8.2%-19.4%)	0.029	0.001>	98.07%	94.59%-99.76%	0.004	435.45	4	0.001>	0.69	**0.48**
3	CRS with AR	4	20.3%(15.2%-25.5%)	0.026	0.001>	94.09%	78.23%-99.61%	0.002	33.93	3	0.001>	-0.57	**0.56**
4	CRS without AR	4	10.3%(0.2%-20.4%)	0.052	0.045	99.80%	99.39%-99.98%	0.011	318.50	3	0.001>	4.37	**< 0.001**
5	CRS with NSD	3	35.2%(9.5%-61%)	0.131	0.007	97.63%	91.28%-99.93%	0.05	127.60	2	0.001>	0.95	**0.34**
6	CRS without NSD	3	10%(3.7%-16.4%)	0.033	0.002	99.02%	95.88%-99.97%	0.003	90.20	2	0.001>	2.44	**0.015**
7	CRS with DM	3	16.1%(4.3%-27.9%)	0.060	0.008	94.10%	0.00%-99.93%	0.009	7.45	2	0.024	2.72	**0.006**
8	CRS without DM	3	11.7%(5.1%-18.4%)	0.034	0.001>	99.14%	96.35%-99.98%	0.003	84.44	2	0.001>	2.28	**0.022**
9	Smokers with CRS	4	19.2%(6.8%-13.6%)	0.063	0.002	98.45%	94.35%-99.90%	0.015	89.84	3	0.001>	0.70	**0.48**
10	Non-smokers with CRS	4	13.6%(6.3%-20.9%)	0.037	0.001>	99.26%	97.69%-99.94%	0.005	397.51	3	0.001>	0.64	**0.52**

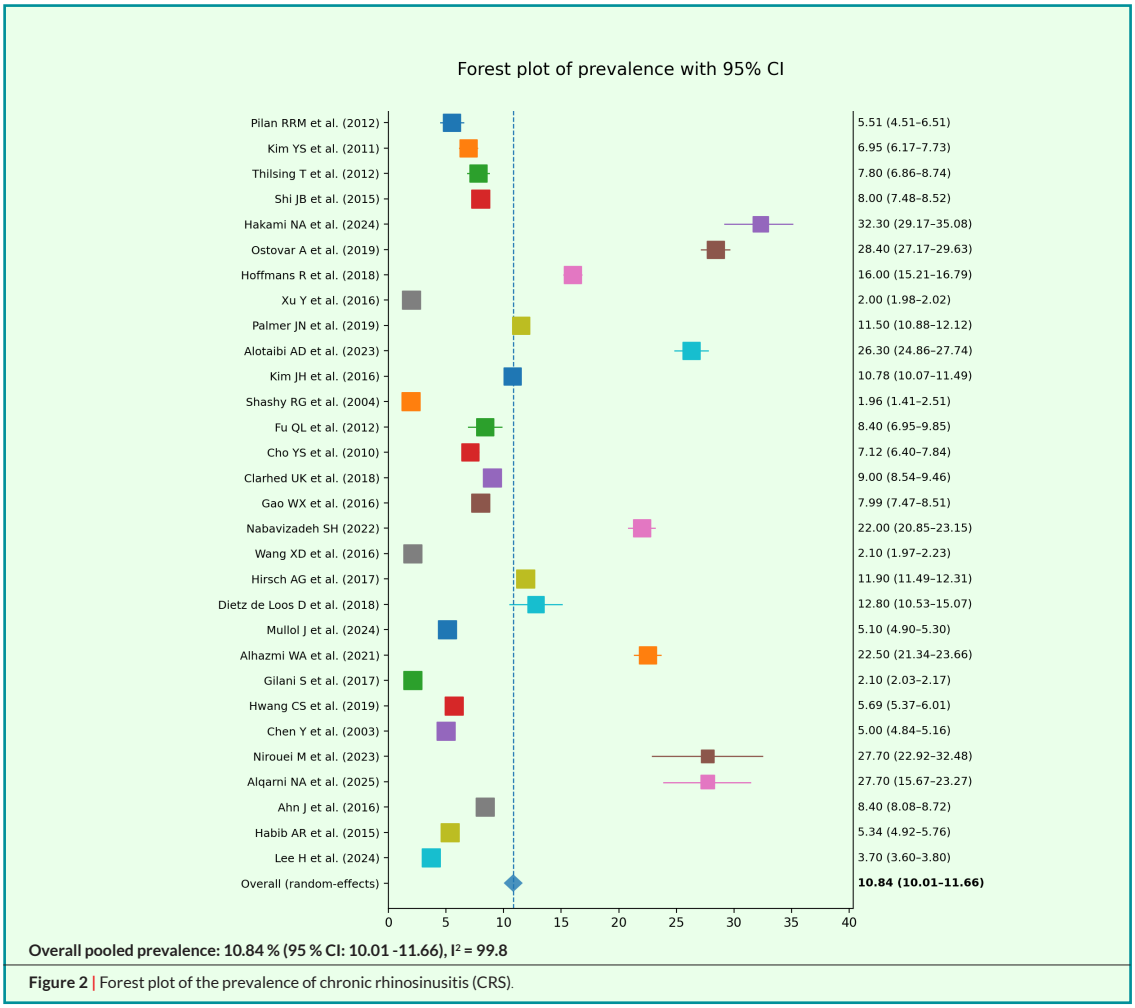

Figure 2 | Forest plot of the prevalence of chronic rhinosinusitis (CRS).

its subtypes is presented in Table 6.

DISCUSSION

In this global systematic review and meta-analysis, Data were collected from 43 studies across 18 countries and four continents, focusing on the worldwide incidence, prevalence, comorbidities, and diagnostic methods of CRS and its subtypes. The global pooled prevalence of CRS was 11.4%, and the global pooled incidence was 1.1%. Furthermore, the pooled prevalence of CRS increased from 4.7% between 2003and 2010 to 19.8% between 2021 and 2025. Differences in diagnostic criteria and methods over time may explain these trends, where diagnostic accuracy can vary with disease prevalence and setting, as noted by Leeflang et al.[66] Earlier studies may not have followed standardised diagnostic criteria such as those outlined in EPOS 2020, which emphasise symptom duration (≥12 weeks), core nasal symptoms, and objective confirmation via endoscopy or imaging, and such methodological differences may partially explain the observed variation in CRS prevalence.[67] Furthermore, there is a significant increase in CRS-related publication quantity and quality over the last 3 decades.[68]

Our review found that CRS is more prevalent in females than in males, at 53.6% (95% CI, 47.0%-60.3%) and 40.7% (95% CI, 35.1%-46.3%), respectively. Our review found that self-reported CRS pooled prevalence by EPOS Questionnaire Criteria is higher than CRS pooled prevalence by ICD codes,

Figure 3 | Time trends in the prevalence of CRS, 2003-2025. Pooled estimates, % for prevalence.

Table 6 | Summary of findings for certainty of evidence regarding Diagnostic methods

Outcome	No. of studies	Study design	Factors that may decrease the certainty of evidence					Test accuracy CoE
			Risk of bias	Indirectness	Inconsistency	Imprecision	Publication bias	
Prevalence of CRS diagnosed using EPOS questionnaires	17	Cross sectional	Not serious	Not serious	Very serious	Not serious	Strongly suspected	Very low
Prevalence of CRS diagnosed using ICD codes	3	Cross sectional	Not serious	Not serious	Very serious	Not serious	undetected	Low

at 14.2% (95% CI, 10.2%-18.3%) and 2.8% (95% CI, 1.30%-4.30%), respectively. These findings are supported by a systematic review by Macdonald et al., which similarly found that the choice of diagnostic method substantially affects prevalence estimates: self-reported questionnaires tend to overestimate prevalence due to symptom overlap with other conditions, and ICD codes underestimating cases because of reliance on administrative recording. [69] These differences in prevalence rates according to diagnostic method can be explained by the fact that the high prevalence rates reported by EPOS-based questionnaires may be because EPOS guidelines include nasal endoscopy findings and lack more detailed symptom severity levels, which can lead to overestimating disease control severity compared to patient-reported experiences, resulting in higher prevalence estimates.[70]

Our pooled analysis demonstrated that chronic rhinosinusitis (CRS) was most prevalent among patients with nasal septal deviation, with a pooled prevalence of 35.2% (95% CI, 9.5–61.0), compared with those without deviation, 10.0% (95% CI: 3.7–16.4). This could be explained by the fact that only extremely severe NSD appears to contribute to the aetiology of CRS. [71] Patients with asthma also had a markedly higher prevalence of CRS, 27.7% (95% CI: 15.5–39.9), compared with 13.8% (95% CI: 8.2–19.4) in those without asthma. A study found that both Asthma and CRS are driven by complex interactions between airway epithelial cells and immune cells in response to environmental triggers such as allergens, microorganisms, and irritants.[72] Similarly, allergic rhinitis was associated with a higher prevalence of 20.3% (95% CI: 15.2–25.5) versus 10.3% (95% CI: 0.2–20.4) in non-allergic individuals. Research found that CRS may exhibit significant symptomatic overlap with allergic rhinitis (AR). [73] Smoking increased CRS prevalence to 19.2% (95% CI: 6.8–31.6) compared with 13.6% (95% CI: 6.3–20.9) in non-smokers. Several possible mechanisms explain how smoking causes alterations, including reduced mucociliary clearance, diminished ciliary regeneration, and increased inflammatory cytokines.[74] Diabetes mellitus also showed a modest increase, with a

prevalence of 16.1% (95% CI: 4.3–27.9) among people with diabetes compared with 11.7% (95% CI: 5.1–18.4) in non-diabetics. This is because patients with diabetes mellitus (DM) are known to be liable to infection. DM patients may be prone to gram-negative bacterial sinus infections.[75]

In our systematic review, the pooled prevalence of AFRS in our study was 3.5% (95% CI, 0.6%-6.3%), including Northern California, rural India, and the UK. This could be attributed to the fact that AFRS is reported in areas with warm, dry and humid climates. [76] Rural northern India reported a correlation between a high incidence of FRS and the wheat-harvesting season in winter months, when fungal spore counts in the air increase due to wheat thrashing. [77] Northern states of the US have a lower frequency of AFRS than Southern states.[78] Postulated criteria of allergic fungal sinusitis are present in the majority of patients with chronic rhinosinusitis in Europe.[79] In our review, the pooled prevalence of CRSsNP is higher than that of CRSwNP, at 6.8% and 1.8%, respectively. This is because chronic rhinosinusitis without nasal polyps (CRSsNP) is more prevalent than chronic rhinosinusitis with nasal polyps (CRSwNP).[80] Regarding geographic patterns, our analysis revealed the highest pooled prevalence in Asia, at 14.5%(95% CI 9.8% – 19.2%), followed by Europe with a prevalence of 10.1%(95% CI: 6.3% – 13.9%), North America with 5.7% (95% CI: 2.5%-8.9%), and South America, at 5.51% (95% CI: 4.51%-6.51%). The high rate of chronic rhinosinusitis in Asia is linked to neutrophilic inflammation, often driven by environmental factors such as pollution and infections common in the region. Additionally, lifestyle and environmental changes, such as urbanisation, have led to an increase in eosinophilic inflammation, further raising disease prevalence.[81]

Our findings were generally similar to those of Min HK et al. (2025),[14] although our pooled estimates were slightly higher across all outcomes. Our meta-analysis found an overall pooled CRS prevalence of 11.4% (95% CI, 8.3%-14.5%), while Min et al. (2025) found the overall pooled prevalence of chronic rhinosinusitis (CRS) was 8.71% (95% CI, 6.69%–11.33%). Our review found that the global pooled incidence of CRS was 1.1% (0.20%–2.00%), while Min HK et al. showed that the global pooled incidence of CRS was 0.73 (95% CI, 0.28 to 1.88). Our pooled estimate of CRS with nasal polyps (CRSwNP) was 1.8% (95% CI: 1.00%–2.5%), whereas Min et al reported a global pooled prevalence of 0.65% (95% CI: 0.56%–0.75%).

Our analysis revealed the highest pooled prevalence in Asia, at 14.5%(95% CI 9.8% – 19.2%), followed by Europe with a prevalence of 10.1%(95% CI,6.3% – 13.9%), North America with 5.7% (95% CI,2.5%-8.9%) , and South America, at 5.51%(95% CI, 3.99%–7.58%). In contrast to our findings, Min HK et al. revealed a different pattern the highest CRS prevalence in Europe at 11.38 % (95% CI,8.14 to 15.92), followed by Asia with a prevalence of 8.24% (95% CI,5.08% to 13.37%), North America with 8.01% (95% CI, 4.62% to 13.90%), South America has the exact pooled prevalence of our results, at 5.51%(95% CI, 4.51%-6.51%)

In our study, pooled prevalence of CRS increased from 2003 to 2025 (2003-2010: 4.7%; 95% CI, 1.8%-7.6%; 2021-2025:19.8%; 95% CI, 12.6%-27.0%). Similarly, Min HK (2025) reported that the pooled prevalence of CRS increased from 1980 to 2020 (1980-2000: 4.72%; 95% CI, 2.12-10.49; 2014-2020: 19.40%; 95% CI, 12.12-31.07), indicating a comparable upward trend over time.

Our study found that the prevalence of chronic rhinosinusitis (CRS) was highest among patients with nasal septal deviation, at 35.2% (95% CI, 9.5–61.0) compared with 10.0% (95% CI, 3.7–16.4) in those without deviation. CRS prevalence was also higher in patients with asthma (27.7%; 95% CI, 15.5–39.9) than in those without asthma (13.8%; 95% CI, 8.2–19.4). For patients with allergic rhinitis, the prevalence was 20.3% (95% CI, 15.2–25.5) compared with 10.3% (95% CI, 0.2–20.4) in non-allergic individuals. Smoking increased CRS prevalence to 19.2% (95% CI, 6.8–31.6) compared with 13.6% (95% CI, 6.3–20.9) in non-smokers. Finally, patients with diabetes

mellitus had a slightly higher prevalence, 16.1% (95% CI, 4.3–27.9), compared with 11.7% (95% CI, 5.1–18.4) in non-diabetics. Closely similar to our findings, Min HK et al. found that allergic rhinitis showed the strongest association with chronic rhinosinusitis, with a pooled prevalence of 24.88 (95% CI: 12.91–47.97) compared with those without allergic rhinitis, 7.39 (95% CI: 3.13–17.44). Asthma was also significantly associated with a pooled prevalence of 20.90 (95% CI: 12.34–35.39) compared with non-asthmatics, 7.70 (95% CI: 4.36–13.60). Current smoking demonstrated an elevated risk, pooled prevalence 10.87 (95% CI: 7.22–16.37), compared with non-smoking, 8.24 (95% CI: 5.41–12.54). Diabetes mellitus showed a smaller but still notable effect, with a pooled prevalence of 11.01 (95% CI: 8.78–13.80) compared with non-diabetics, 8.45 (95% CI: 5.17–13.81).

In our systematic review, the pooled prevalence of AFRS in our study was 3.5% (95% CI, 0.6%-6.3%). In comparison to our review, a systematic review by AlQahtani et al. evaluated the impact of climatic, socioeconomic, and geographic factors on the prevalence of allergic fungal rhinosinusitis (AFRS), revealing that AFRS has a worldwide distribution pattern with a pooled prevalence of 7.8% (ranging from 0.2% to 26.7%) among chronic rhinosinusitis (CRS) cases.[82]

Limitations of the study: The reliance on publicly accessible databases such as PubMed, Google Scholar and ScienceDirect might have excluded some relevant high-quality studies. Separate meta-analyses were carried out as part of subgroup analyses due to greater inconsistency and heterogeneity among the included studies. Additionally, differences in diagnostic criteria and data collection methods across studies may have contributed to variability in reported prevalence rates and the low certainty of the evidence. There is also a scarcity of population-based studies on specific subtypes of CRS, such as allergic fungal rhinosinusitis (AFRS), especially in the Gulf region. Furthermore, no population-based studies from Africa were found, and only limited data were available from South America.

Recommendations for Practice, Policy, and Future Research: The considerable variation in CRS prevalence across countries suggests the need for more standardised diagnostic approaches and consistent reporting methods. Additionally, the lack of population-based studies in regions such as Africa and South America emphasises the importance of conducting epidemiological research in underrepresented areas. Future population-based research should also address the limited data on specific CRS subtypes, such as AFRS, to support better-informed clinical and policy decisions.

CONCLUSION

Globally, chronic rhinosinusitis (CRS) is a prevalent disease, with regional variations in prevalence. Asia has the highest prevalence, followed by North America and Europe, while South America has the lowest rates. Less common subtypes include allergic fungal rhinosinusitis (AFRS) and CRS with nasal polyps (CRSwNP). Even though a significant portion of the population is affected by CRS, the number of new cases remains quite low. Sex, smoking, concomitant conditions like asthma, allergic rhinitis, diabetes, and nasal septal deviation all affect the prevalence and distribution of CRS. Questionnaires, endoscopic examinations, imaging, and coding systems are all used in the diagnosis process. The scarcity of information on certain CRS subtypes should also be addressed in future population-based studies.

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Abbreviations list: 36-Item Short Form Health Survey **(SF-36)**, Allergic Fungal Rhinosinusitis **(AFRS)**, Allergic rhinitis **(AR)**, Certainty of Evidence **(CoE)**, Chronic Rhinosinusitis **(CRS)**, Chronic Rhinosinusitis with Nasal Polyps **(CRSwNP)**, Chronic Rhinosinusitis without nasal polyps **(CRSsNP)**, Cochran's Q test **(Q)**, Comma-Separated Values **(CVS)**, Confidence Interval **(CI)**, Diabetes mellitus **(DM)**, Diagnostic Nasal Endoscopy **(DNE)**, Ear, nose and throat **(ENT)**, Electronic Medical Record (**EMR**), European Position Paper on Rhinosinusitis and Nasal Polyps **(EPOS)**, Guideline Development Tool **(GRADEpro GDT)**, International Classification of Diseases **(ICD)**, International Prospective Register of Systematic Reviews **(PROSPERO)**, I-squared statistic **(I^2)**, Jeffrey's Amazing Statistics Program **(JASP)**, Medical Subject Headings **(Mesh terms)**, Nasal septal deviation **(NSD)**, Newcastle-Ottawa Scale **(NOS)**, Not reported **(NR)**, Odds ratio **(OR)**, Open Science Framework **(OSF)**, Population, Intervention, Comparison, & Outcome **(PICO)**, Preferred Reporting Items for Systematic Reviews and Meta-Analyses **(PRISMA)**, Probability value **(P value)**, Risk of Bias **(RoB)**, Separate Within-And-Across-Data Analysis **(SWADA approach)**, Sinonasal Outcome Test-20, German Adapted Version (**SNOT-20 GAV**), Standard error (**ER**) Standardised test statistic **(Z-value)**, The United States of America **(USA)**, United Kingdom **(UK)**.

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