Epidemiology of Chronic Suppurative Otitis Media in the United States

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Abstract

Our study aimed to evaluate the prevalence, incidence, and associated demographic factors of chronic suppurative otitis media (CSOM), utilizing a nationwide healthcare claims database. This retrospective study utilized outpatient administrative claims data from the Truven Health MarketScan Research Database from 2007 to 2021. The database (11,246,909,584 claims with 148,147,615 unique patients) includes health data from the private-sector, Medicare/Medicaid, managed care providers, and EMR providers. Included patients had a diagnosis of CSOM based on ICD-9-CM and ICD-10 codes. Prevalence and health utilization were estimated by age, gender, and geographic region. In the United States (US), the estimated CSOM prevalence and incidence was 0.46% and 0.03%, respectively. Among CSOM patients (n=679,906), mean age (SD) was 8.1 (15.4) years, and 52.8% were male. Most patients (81.1%) were aged 0-10 years. CSOM prevalence was lower in females (OR = 0.64, 95% CI 0.64-0.65, p-value < 0.001), less common in older age (OR = 0.94, 95% CI 0.94-0.94, p < 0.001) and highest in the South region (OR = 2.08, 95% CI 2.06-2.09, p-value < 0.001). Our results show CSOM prevalence (0.46%) is similar to other developed countries. CSOM prevalence was highest in those aged 0-10, in males and in the South region. Further epidemiological studies are warranted to characterize the impact of CSOM on the US healthcare system.

Introduction

- CSOM affects an estimated 330 million individuals worldwide. This condition is characterized by chronic inflammation and infection of the middle ear with a tympanic membrane (TM) perforation.

- According to the World Health Organization (WHO) 2004 report, Western Pacific countries have the highest rates, ranging from 2.3% to 10%, while Europe has the lowest rates, ranging from 0.2% to 0.6%.7 In Africa and South and Central America, the average prevalence rate is around 3%.

- In the US , epidemiological studies on CSOM have primarily focused on high-risk subpopulations, such as Native Americans and Alaskan Inuits, where prevalence rates have been reported to reach up to 10%.
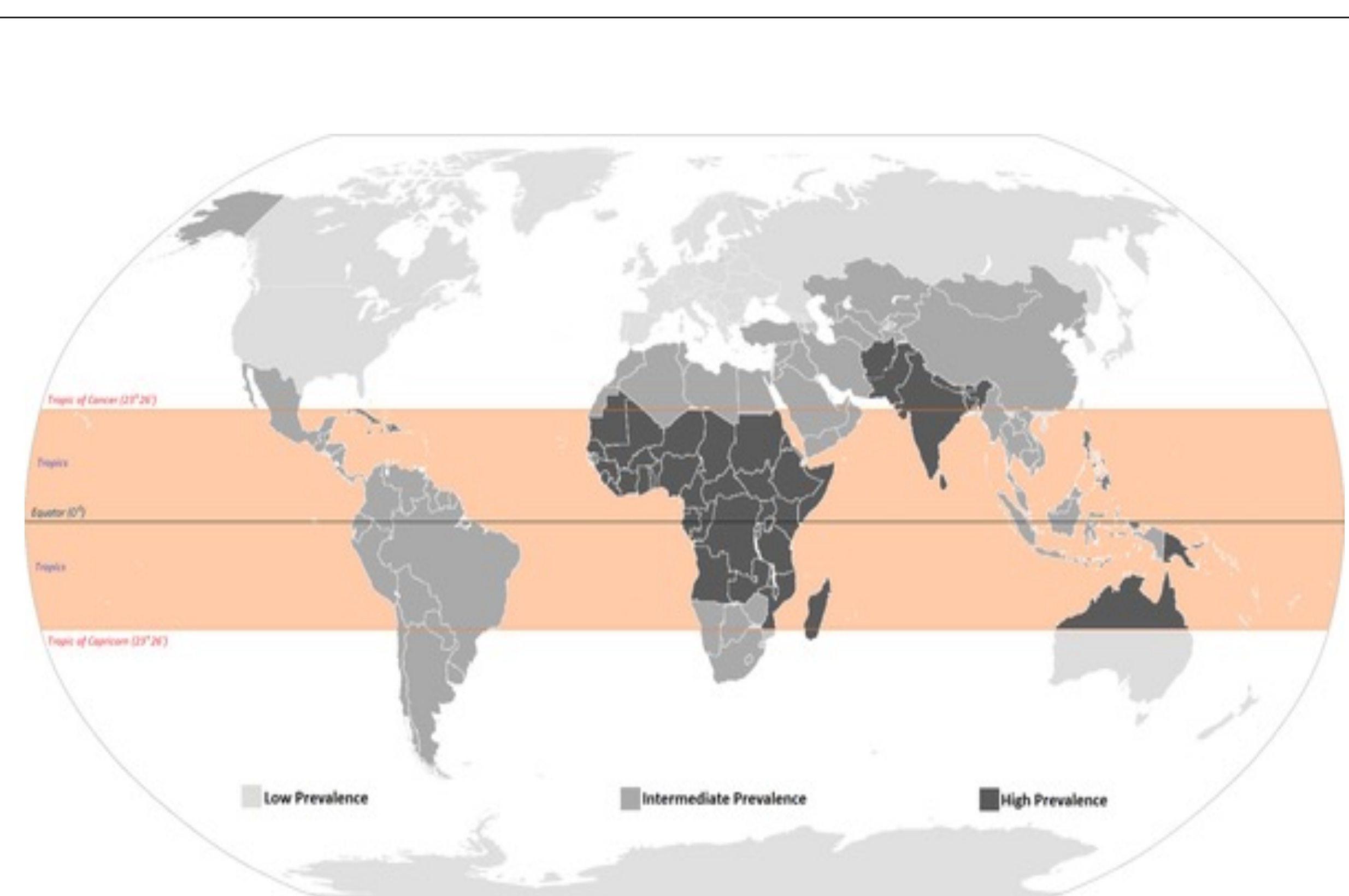

Fig.1.Prevalence of CSOM worldwide

Higher number of cases have been reported closer to the equator and in tropical regions.

Materials and methods

- Utilized the comprehensive Truven Health Marketscan database spanning 15 years (2007-2021).
- Included a vast dataset of 11,246,909,584 claims from 148,147,615 unique patients.
- Identified patients with CSOM diagnoses using specific ICD-9 and ICD-10 codes.
- Calculated prevalence and incidence rates, excluding patients with inaccurate or insufficient data.
- Examined procedural codes for surgeries and outpatient clinic visits to assess healthcare utilization.
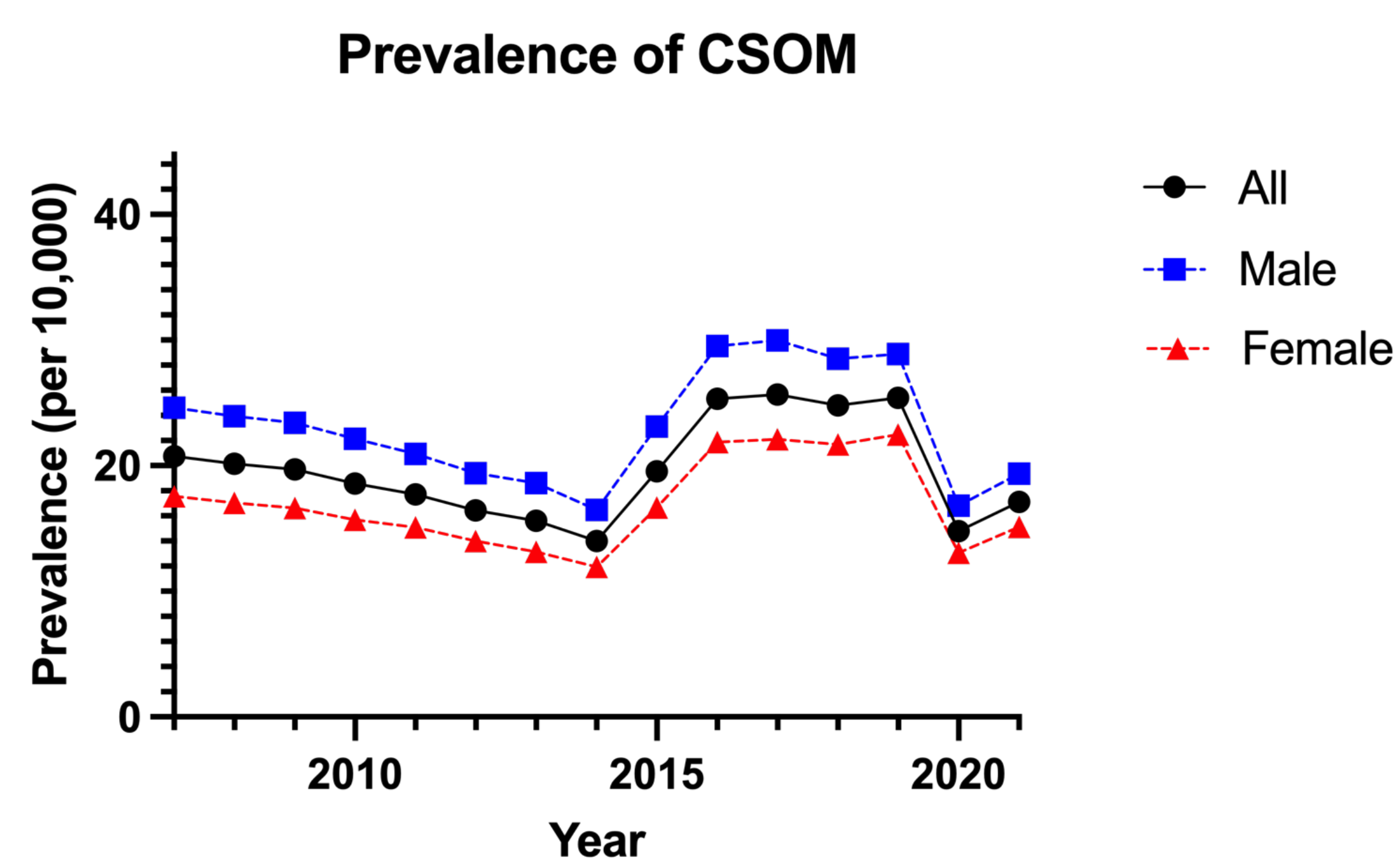
Results

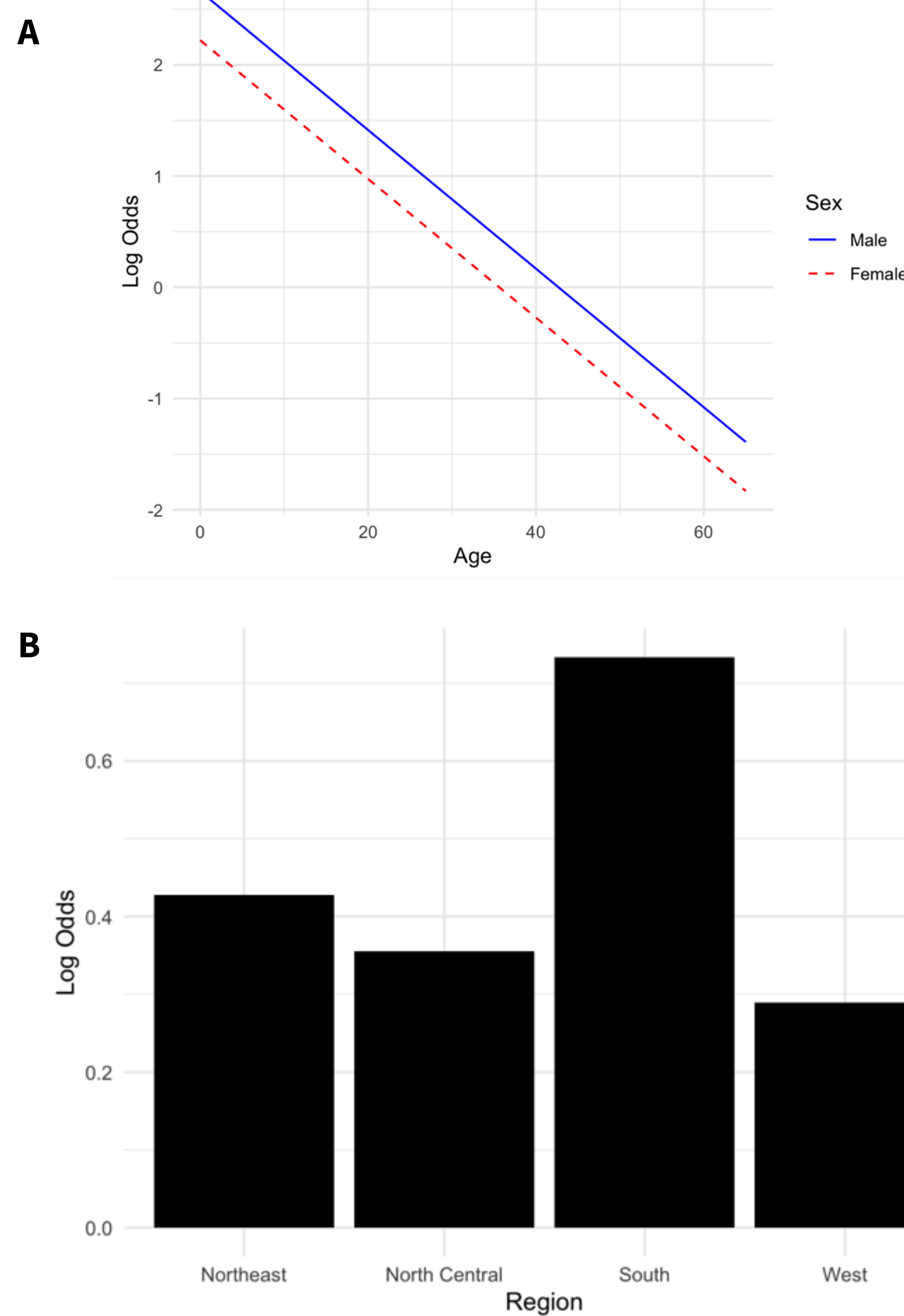Fig. 2: Prevalence of CSOM from 2007-2021, measured per 10,000 patients.

Fig. 3: 3A) Logistical odds of age and sex associated with being diagnosed with CSOM. 3B) Logistical odds of geographic region associated with being diagnosed with CSOM.

Results

Health Utilization of CSOM

Variable	CSOM Cohort (N=679,906)
Outpatient visits: N (SEM, range)	3.5 (0.006,1-465)
1-3 visits: N (%)	482,195 (70.9)
4-10 visits: N (%)	159,309 (23.4)
>10 visits: N (%)	38,402 (5.6)
Average number of annual outpatient visits N (SEM, range)	2.8 (0.03)
Average outpatient cost per patient N (SEM, range)	$416.1 (1.6, 1.1-9357)
Prescriptions: N (SEM, range)	6.6 (0.01, 1-289)
Patients taking each medical therapy: N (%)	
Antibiotics	
Penicillin	321,950 (47.4)
Fluoroquinolone	206,803 (30.4)
Aminoglycoside	65,208 (9.6)
Antiseptics	
Acetic Acid	5,443 (0.8)
Antifungals	
Fluconazole	17,334 (2.5)
Ketoconazole	14,008 (2.1)
Average Prescription Cost per patient: N (SEM, range)	$483.9 (2.9, 1.03-75,415.7)
Patients received surgery: N (%)	9,253 (1.4)
Tympanoplasty with mastoidectomy	5,173 (0.8)
Tympanoplasty without mastoidectomy	4,454 (0.6)
Average surgical cost per patient: N (SEM, range)	$2,144.08 (23.6, 1-46,516)
Average total cost per patient: N (SEM, range)	$516.41 (1.7,1.4-218,845.6)

Table 1: Health Utilization of CSOM, including outpatient clinic visits, prescriptions, surgical costs, and total cost the cochlea at 10 days compared to control
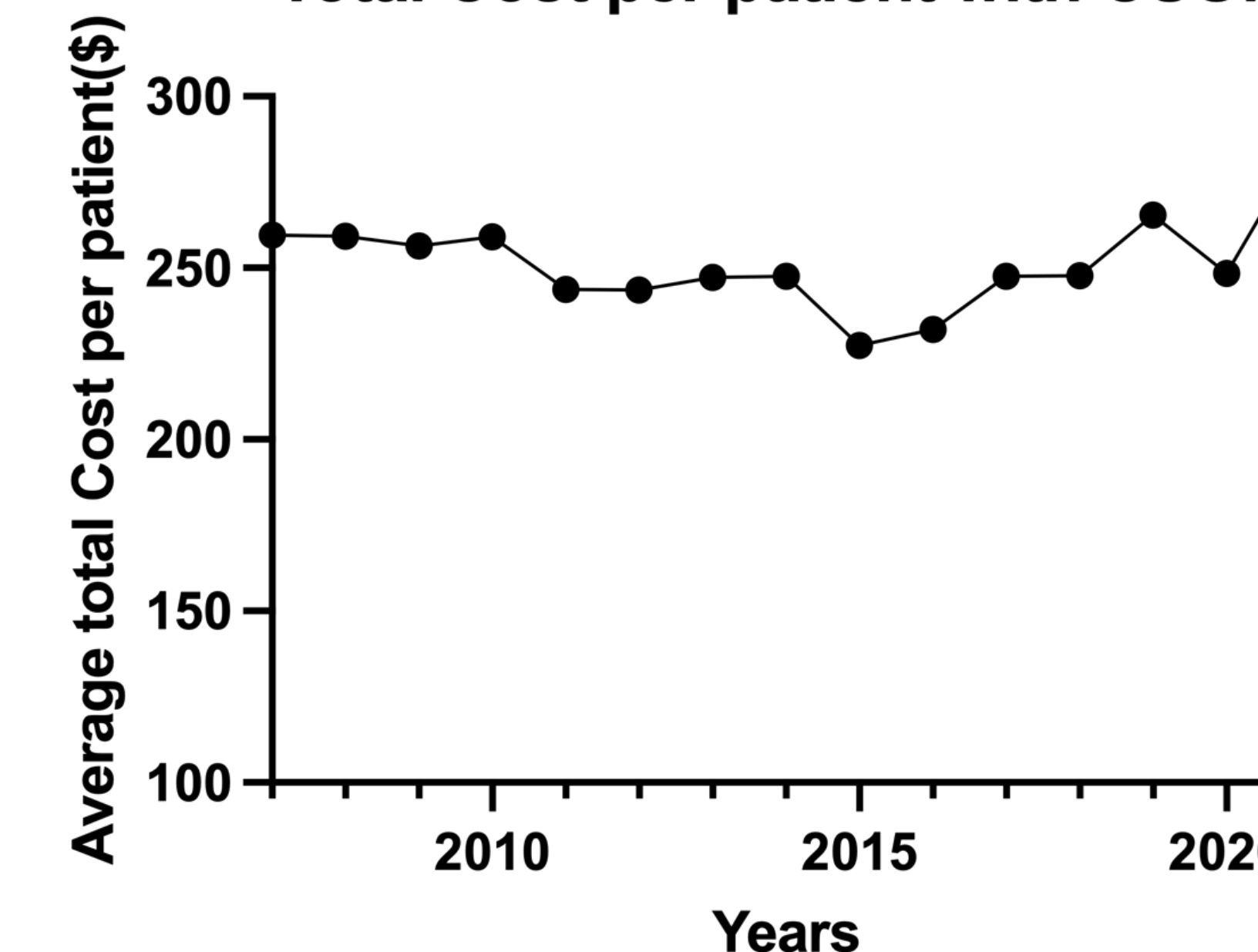

Figure 4: Average cost per patient with CSOM from 2007-2021

Summary

- CSOM prevalence in the US is estimated at 0.46%, with an annual incidence of 0.03%.
- The economic cost of CSOM in the US, when considering comprehensive factors, may range from $8.1 to $8.7 billion USD annually.
- Further research should aim to include a more representative patient cohort and improve diagnostic methods to better understand CSOM's impact on the US healthcare system.

References

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