

Antibiotic Prescribing for Acute Otitis Media in Commercially Insured Pediatric Patients in the United States

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Introduction

- Acute otitis media (AOM) is one of the most common childhood diseases
- Considered self-limiting (most patients recover without need for antibiotics)
- AOM guidelines from 2013 stress more accurate diagnosis and watchful waiting for most patients where antibiotics are only warranted if symptoms persist 3 days after diagnosis
- Study examines how physicians are following the 2013 guidelines

Aims: To describe diagnosis and antibiotic prescribing patterns in pediatric AOM and to identify determinants of AOM treatment

Methods

- Retrospective cohort study
- IBM MarketScan Commercial Claims Research Databases from 2008-2018
- Identified outpatient encounters with a primary diagnosis of AOM, ICD-9-CM (381.0x, 382.0x) and ICD-10-CM (H65.19x, H66.00x), with no previous diagnoses in prior 6 months
- Included patients 1-12 years old at time of diagnosis
- Exposure to antibiotics determined by pharmacy claim within 3 days of diagnosis was considered a treated episode
- Watchful waiting episodes were diagnoses with no pharmacy claims for antibiotics within 3 days of diagnosis
- State healthcare quality was determined from USNews Rankings (top 10 states are high, bottom 10 states are low, all other states are middle)
- Plotted the monthly proportion of treated AOM episodes and AOM diagnoses to examine secular trends relative to new AOM guidelines
- Conducted logistic regression analysis to determine patient characteristics associated with treatment versus watchful waiting

Results

- 2,640,920 episodes found
- 2,033,697 (77.0%) episodes in the treatment group
- 607,223 (23.0%) episodes in the watchful waiting group
- In the watchful waiting group, 18,793 (3.1%) episodes received treatment on days 4-7 after diagnosis
- Majority of treated episodes received amoxicillin (51.3%)

Figure 1. Study Design Diagram

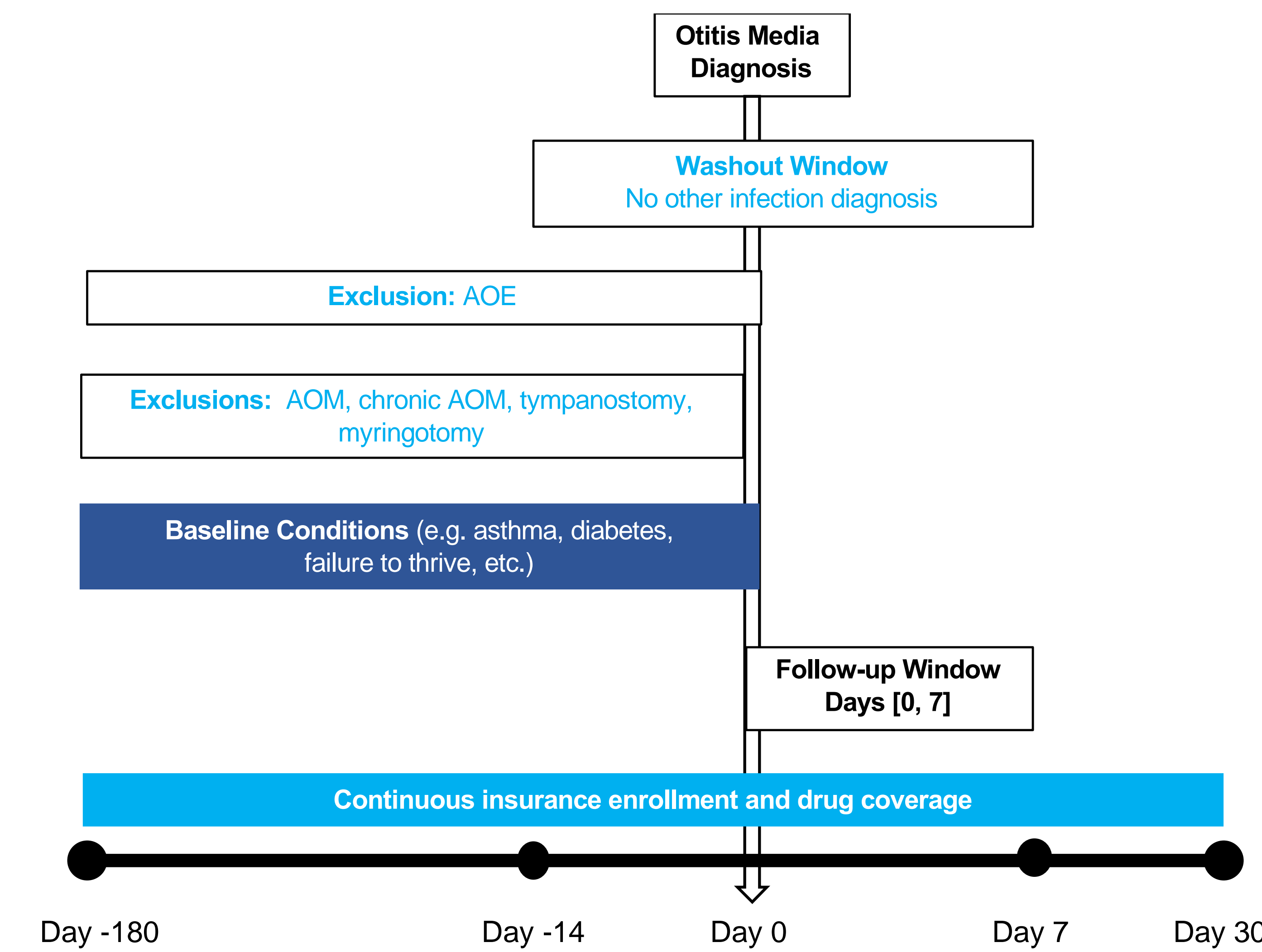


Figure 2. AOM Episode Selection

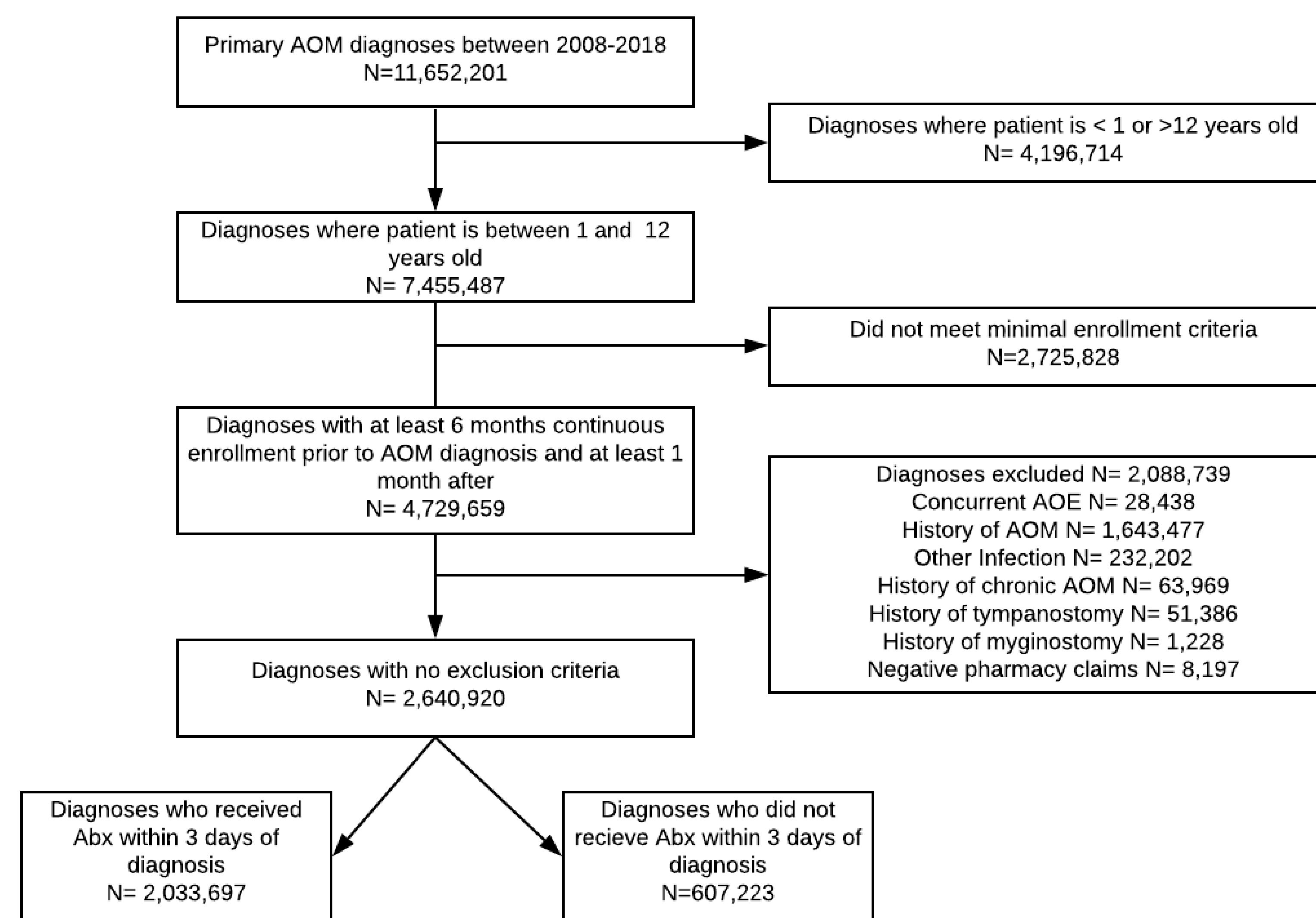


Table 1. Factors Associated with AOM Treatment

Characteristics	Odds Ratio	95% CI
Age (in years)	1.008	1.007 - 1.009
Male	0.996	0.989 - 1.002
State Healthcare Quality Ranking		
High	1	
Middle	0.983	0.967 - 1.00
Low	1.395	1.369 - 1.423
Insurance Type		
Comprehensive	1	
Restrictive	1.023	0.992 - 1.023
High-Deductible	1.043	1.011 - 1.043
Physician Specialty		
Pediatrician	1	
Medical Doctor	0.914	0.901 - 0.928
Internal Medicine	1.182	1.152 - 1.214
Multispecialty Group	1.149	1.128 - 1.171
Emergency Medicine	1.221	1.186 - 1.258
Family Practice	1.211	1.198 - 1.225
Otolaryngology (ENT)	0.116	0.114 - 0.118
Nurse Practitioner	1.488	1.453 - 1.524
Physician Assistant	1.406	1.354 - 1.460

Figure 3. Proportion of AOM Episodes

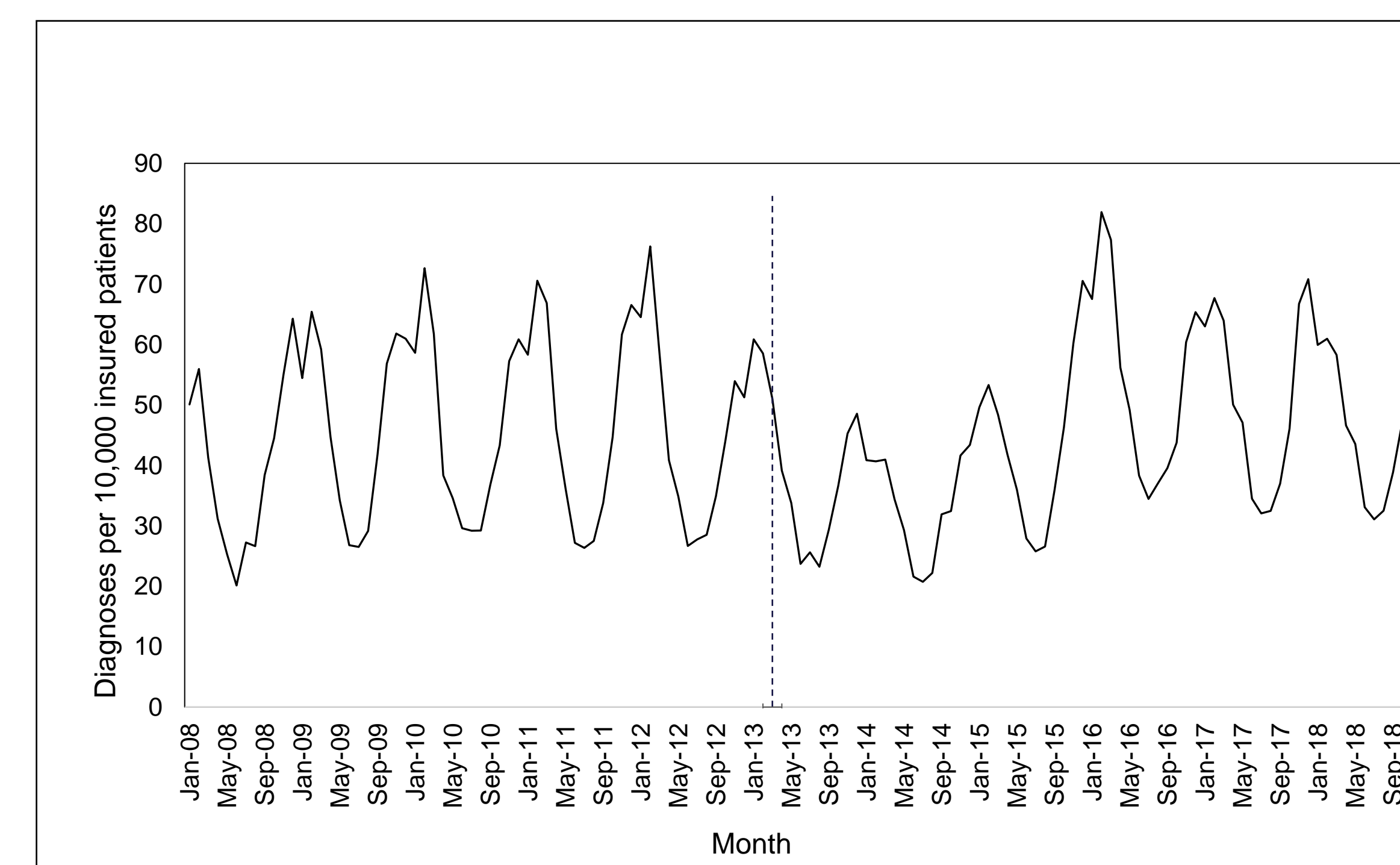


Figure 3 shows the proportion of AOM episodes per pediatric insured patients across the study period. There was a slight decrease, without statistical assessment, in the proportion of episodes around the 2013 guideline release; however they returned to previous numbers.

Figure 4. Proportion of Treated AOM Episodes

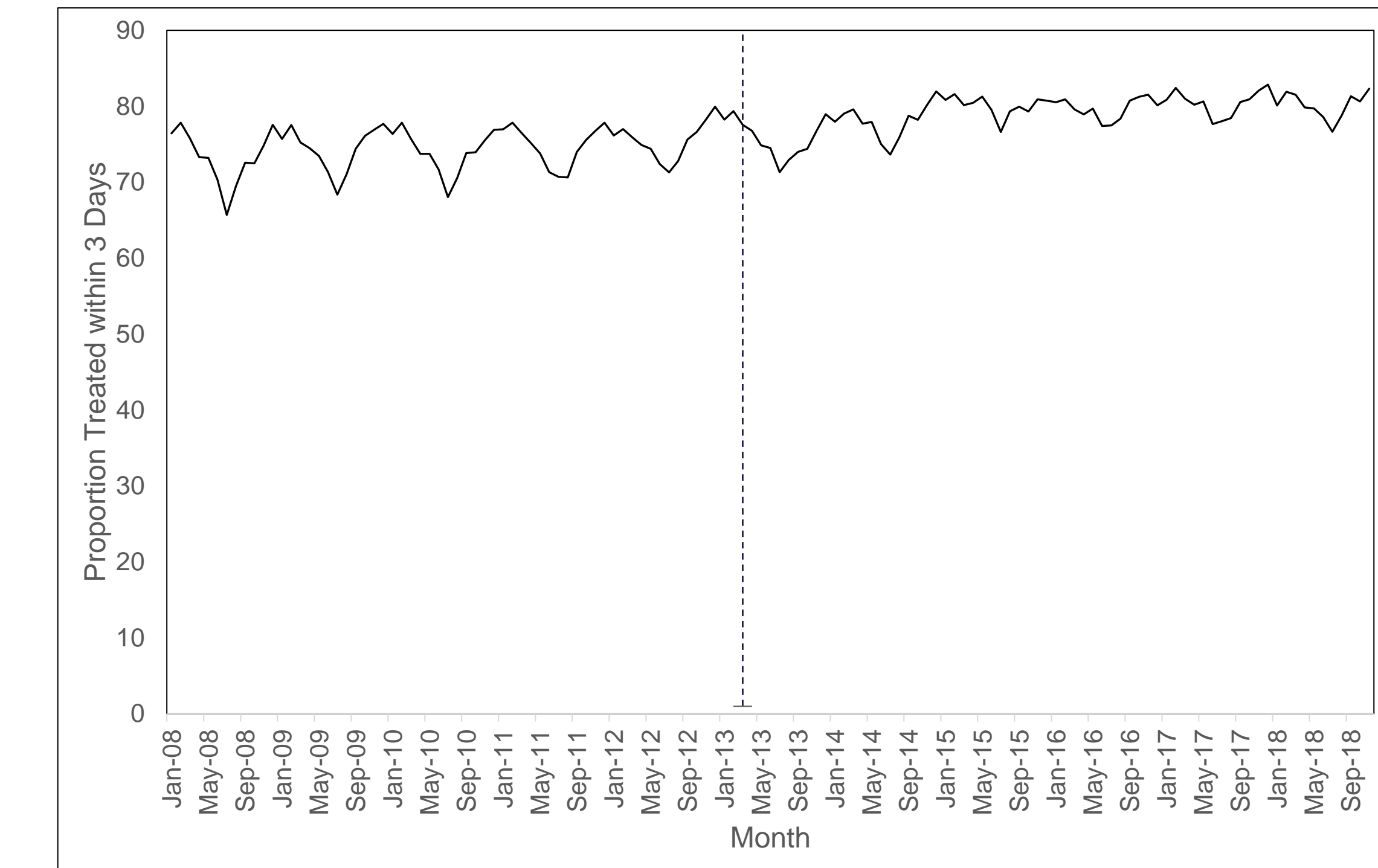


Figure 4 shows the proportion of treated AOM episodes increased marginally from 74.5% in 2008-2013 to 79.0% in 2013-2018. There was no appreciable impact of the AOM guideline release in March 2013 (dotted line).

Discussion

- No impact on prescribing habits after 2013 guideline release
- Visual inspection suggests a decrease in the proportion of AOM episodes after 2013 guideline release with rebound thereafter
- ENTs were less likely to treat episodes compared to pediatricians (OR 0.116, 95% CI 0.114 - 0.118)
- Patients with AOM episodes from low healthcare quality states were more likely to be treated than patients from high healthcare quality states (OR 1.395, 95% CI 1.369 - 1.423)
- Majority of providers were more likely to treat episodes within 3 days compared to pediatricians
- Only 3.1% of watchful waiting episodes received treatment within 4 - 7 days of diagnosis indicating success of the watchful waiting approach and no antibiotics needed for resolution of AOM
- Results are consistent with previous studies assessing impact of guidelines that found minimal changes after guideline release and a return to pre-guideline levels shortly thereafter