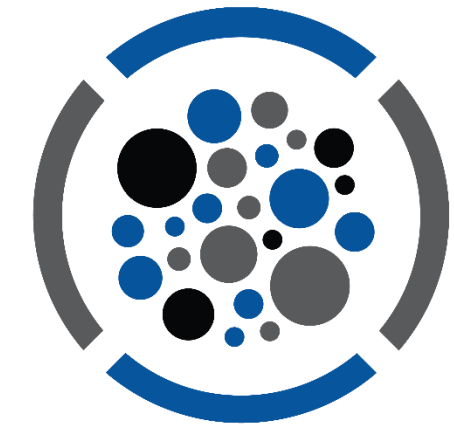


# Pediatric Antibiotic Use in the North Carolina Medicaid Population



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## Background

- The majority of antibiotic prescribing occurs in the outpatient setting
- 6 of the 7 highest prescribing states are located in the Appalachian region
- Overall rates of prescribing in North Carolina (NC) approximate the national average, but patient and provider characteristics associated with antibiotic prescribing across the state are unknown

## Methods

- Data source: 2013-2019 NC Medicaid pharmacy and medical claims for children < 21 years of age
- National Drug Codes (NDCs) were used to identify antibiotic prescriptions
- Rates of antibiotic prescribing were reported as number of prescriptions per 1000 children overall, and stratified by demographic groups
- Rural-urban continuum codes were used to classify counties into urban, suburban and rural areas
- A geographic information system was used to depict rates of antibiotic use by county
- A previously defined algorithm was used to classify prescriptions as always appropriate, sometimes appropriate or never appropriate<sup>1</sup>

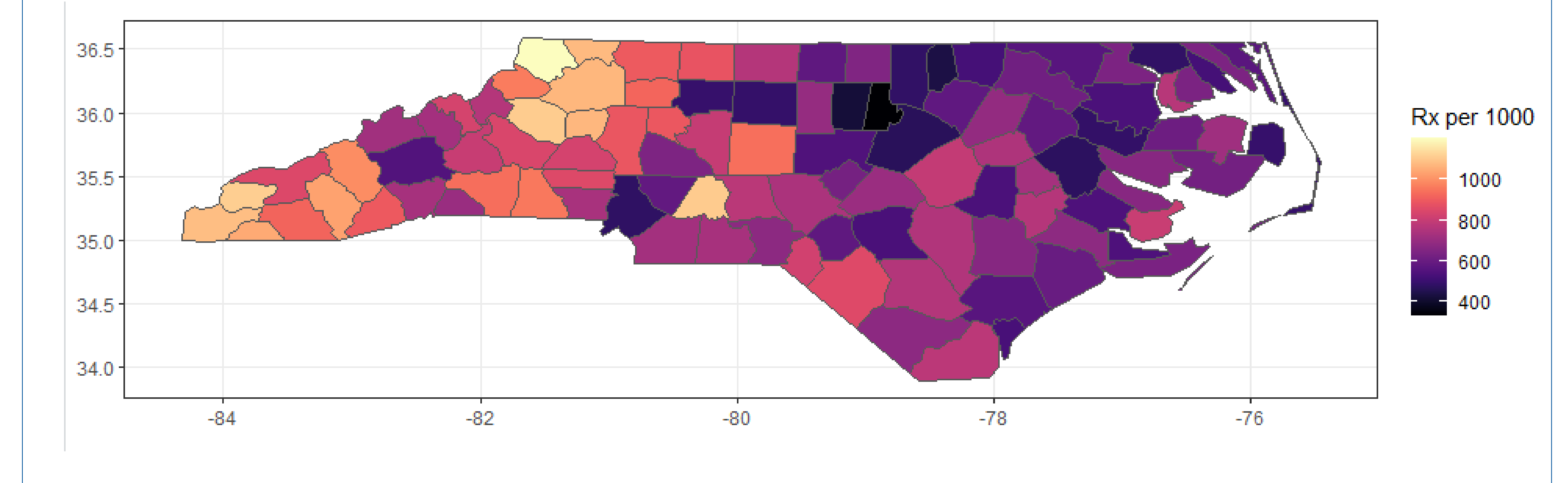
Table 1: Prescribing Rates Over Time

	2013	2014	2015	2016	2017	2018	2019
<b>Overall</b>	720	644	640	639	629	576	596
<b>Sex</b>							
Male	691	613	608	606	593	541	563
Female	750	676	673	673	666	612	613
<b>Age (years)</b>							
0-2	1071	949	943	946	931	877	877
3-9	789	709	710	713	698	632	681
10-20	524	473	470	471	472	434	443
<b>Race/Ethnicity</b>							
White non-Hispanic	894	801	798	798	783	719	746
Black non-Hispanic	526	475	471	477	472	432	444
Hispanic	666	582	570	547	536	491	514
Other	686	590	589	601	607	557	589
<b>Residence</b>							
Urban	682	606	604	606	592	545	558
Suburban	820	746	738	733	732	662	752
Rural	846	750	769	749	781	707	706

## Results: Antibiotic Prescribing

- Overall rates of antibiotic prescribing decreased from 720 prescriptions per 1000 children in 2013 to 596 prescriptions per 1000 children in 2019 (Table 1)
- Rates were consistently higher in children who were female, younger, white non-Hispanic, and lived in rural areas (Table 1)
- Antibiotic prescriptions by county are presented in Figure 1. There was a pronounced East to West gradient in prescribing, with higher rates in Western NC
- Pediatricians wrote 46% of antibiotic prescriptions to children overall. However, they only wrote 31% of prescriptions in rural areas, where general practitioners (26%) and nurse practitioners (14%) also prescribed to children

Figure 1: Prescribing Rates by County, 2013-2019



## Results: Inappropriate Prescribing

- 23% of prescriptions were inappropriate, with a decrease from 27% in 2013 to 20% in 2019
- Patient characteristics associated with inappropriate prescribing included younger age (25% inappropriate), black race (26% inappropriate) and living in a rural area (26% inappropriate)
- Nurse practitioners had the lowest (20%) proportion of inappropriate prescriptions, followed by pediatricians (21%), physician assistants (23%), emergency medicine providers (24%) and general practitioners (26%).
- Medical offices, urgent cares, and emergency departments had similar rates (21-23%) of inappropriate prescribing. Rates were higher (29%) in other settings. These include rural health clinics (26%), federally qualified health clinics (28%), outpatient hospitals (28%) and ambulatory surgery centers (41%)

## Conclusions

- Although NC is not a high-prescribing state overall, we found notable differences in prescribing by key demographic and geographic factors. These data suggest that specific Appalachian characteristics, rather than rurality alone, may be associated with increased antibiotic prescribing
- Statewide antimicrobial stewardship efforts should focus on providers and settings with high levels of inappropriate prescribing

**Reference:** 1. Chua KP, Fischer MA, Linder JA. Appropriateness of outpatient antibiotic prescribing among privately insured US patients: ICD-10-CM based cross sectional study. *BMJ* 2019; 364 doi: <https://doi.org/10.1136/bmj.k5092>

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