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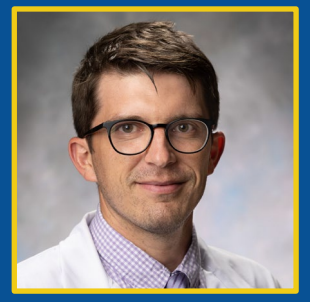
Kaylie Magidson, DDS

Presenter

Pediatric Dental Resident

New York University College of Dentistry



Beau D. Meyer, DDS, MPH

Presenter

Associate Professor—The Ohio State University College of Dentistry

Nationwide Children's Hospital

Kimia Imani, MS

Presenter

DDS/PhD Candidate

University of Washington School of Dentistry

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COVID-19 Public Health Emergency Impact on Pediatric Antibiotic Prescribing for Medicaid-enrolled Children

Kaylie Magidson[1], Lauren Feldman[1], Carla Shoff[2], Luping Qu[2], Natalia I. Chalmers[2]

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Research supported in part by HRSA grant K02HP30808

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Introduction

- Healthcare professionals in the U.S. prescribed 211.1M outpatient oral antibiotic prescriptions in 2021, 37.2M of which were prescribed to children and adolescents
- Dentists are the third highest outpatient antibiotic prescribers, prescribing 10-12% of all outpatient antibiotic prescriptions
- Almost 3M antimicrobial-resistant infections occur yearly, resulting in 35,000 deaths in the US
- Concerns for over-treatment, prolonged treatment duration, and use of broad-spectrum agents have prompted calls to create a heightened awareness of current antibiotic prescription guidelines

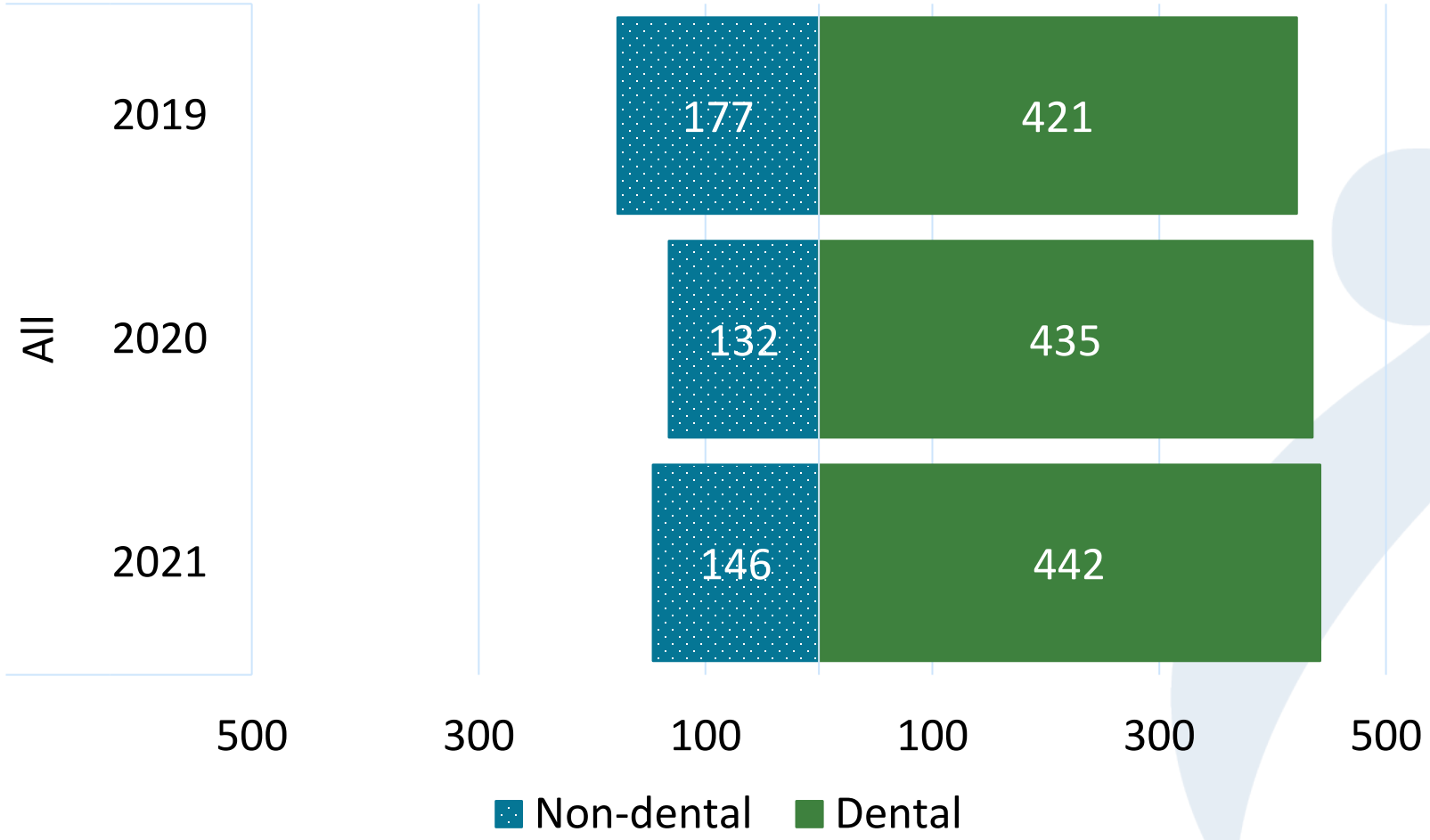
Objectives

- Describe the rate and patterns of pediatric antibiotic prescribing among pediatric Medicaid beneficiaries
- Examine variations in pediatric antibiotic prescribing for Medicaid-enrolled children at the state level
- Evaluate the impact of the COVID-19 public health emergency on antibiotic prescribing trends for children enrolled in Medicaid/CHIP by dental and non-dental providers

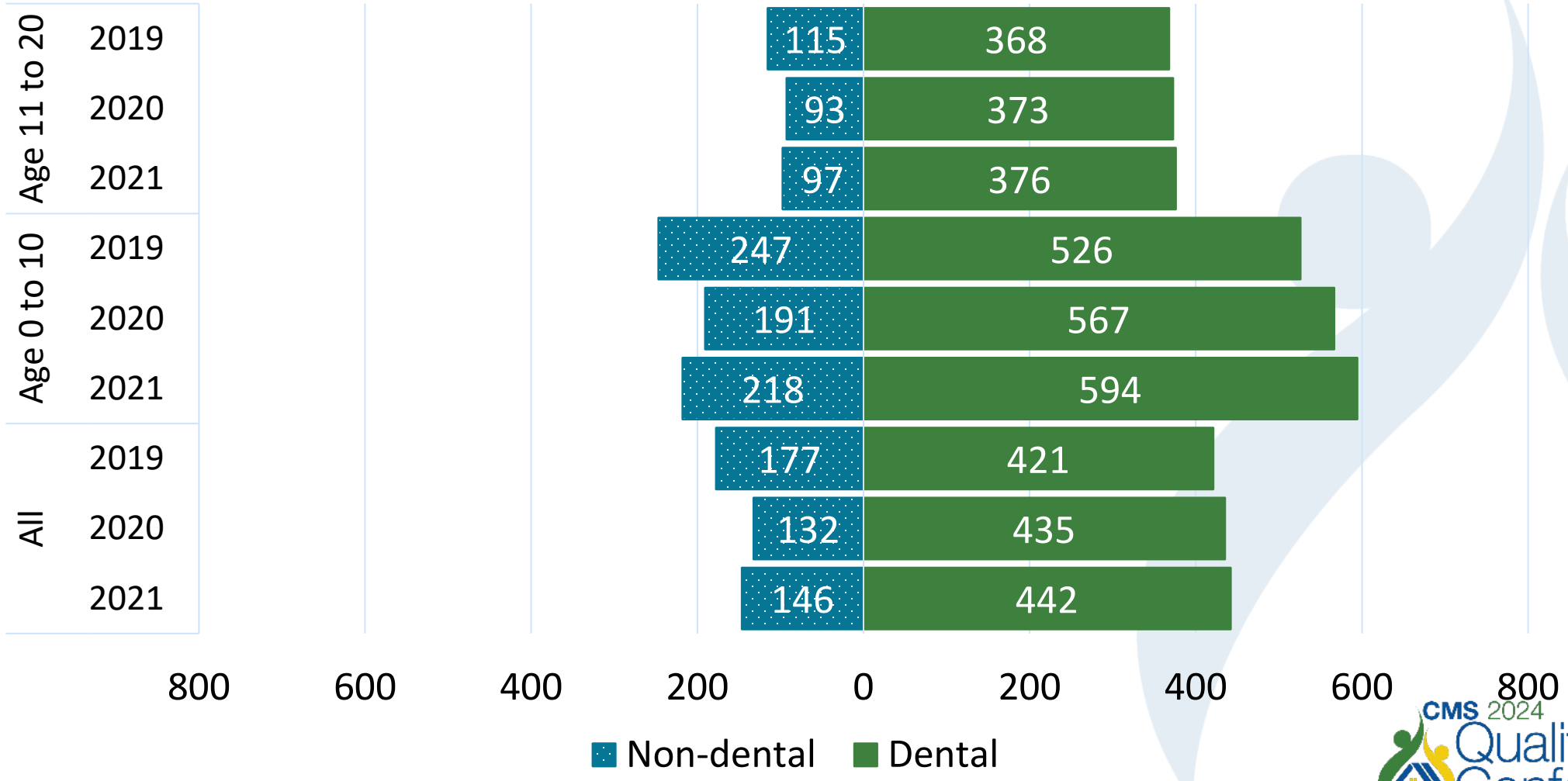
Methods

- Outpatient prescription claims filled from 2019 - 2021
- Centers for Medicare & Medicaid Services (CMS) unredacted 2019- 2021 Transformed Medicaid Statistical Information System (T-MSIS) Analytic Files (TAF) Research Identifiable Files (RIF)
- Medicaid and CHIP beneficiaries aged 0 to 20 (non-dually eligible)
  - Antibiotic utilizers – Medicaid and CHIP beneficiaries with an oral antibiotic prescription filled at a pharmacy during the study period
- Oral antibiotic prescription rates and average day supply by provider type
  - Unique prescribers identified by NPI
- Demographic characteristics: age, sex, race and ethnicity, rural/urban residence, and state

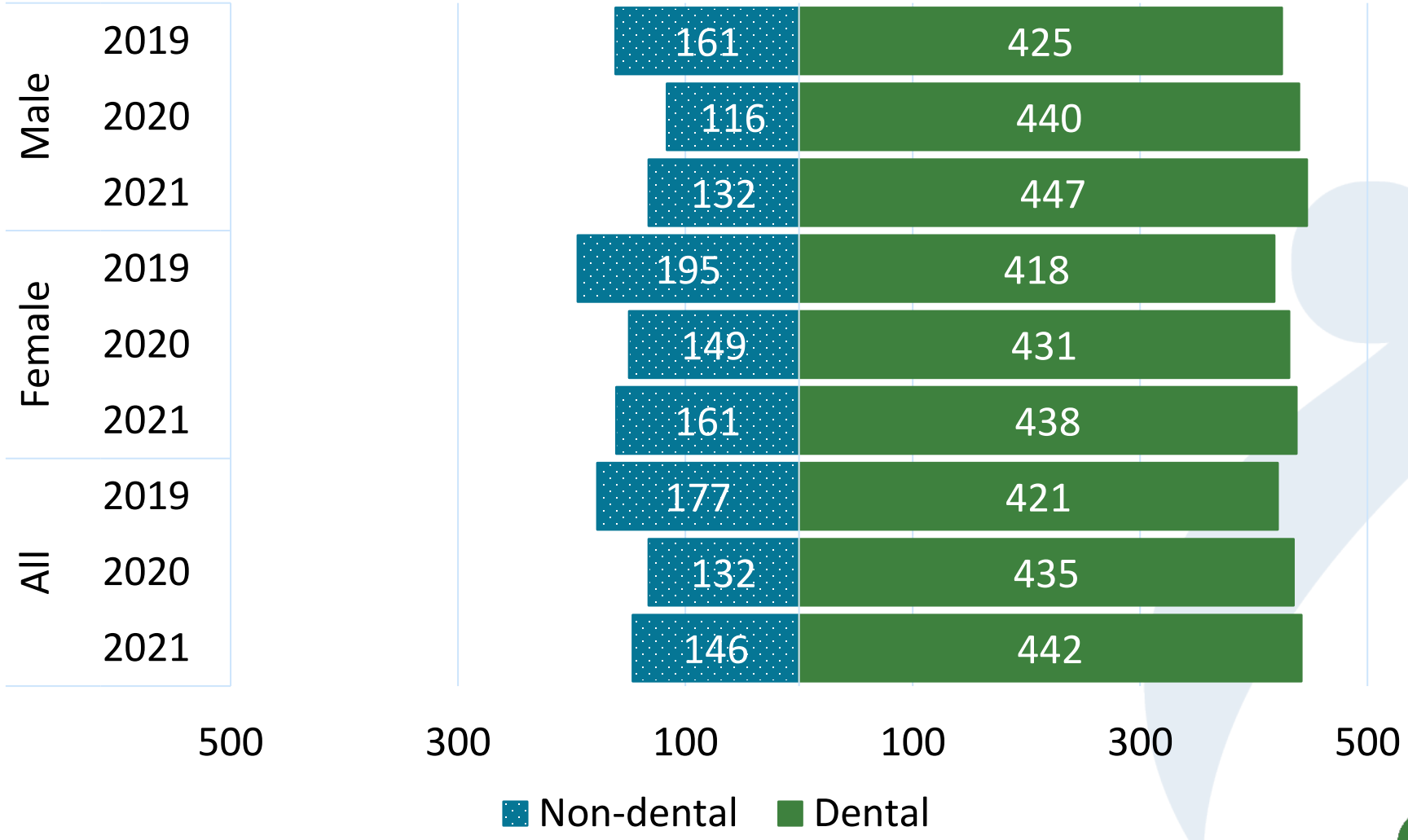
Rate of Pediatric Antibiotics Prescriptions per 1,000 Prescriptions by Prescriber and Year



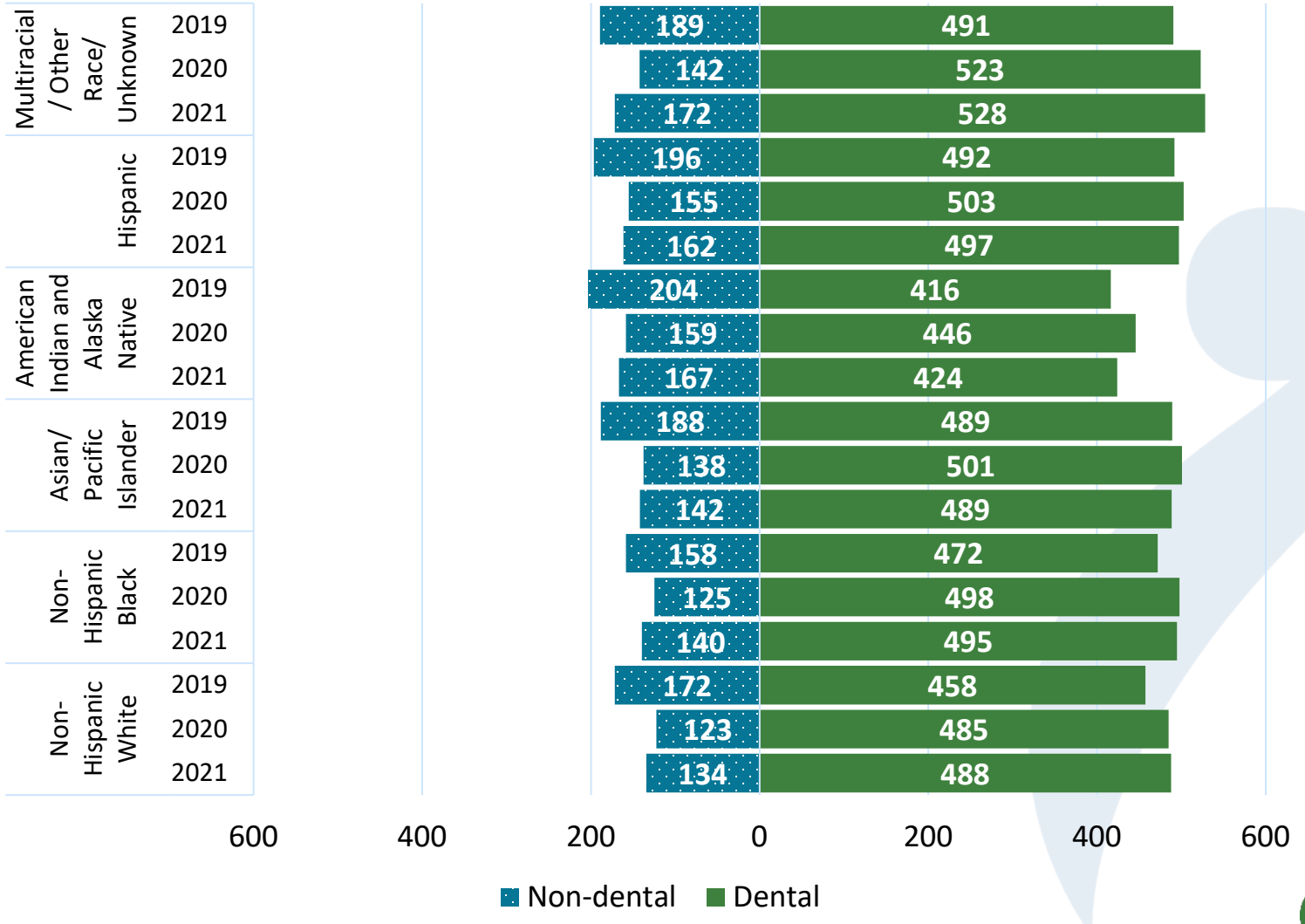
Rate of Pediatric Antibiotics Prescriptions per 1,000 Prescriptions by Prescriber, Year, and Age Group



Rate of Pediatric Antibiotics Prescriptions per 1,000 Prescriptions by Prescriber, Year, and Sex



Rate of Pediatric Antibiotics Prescriptions per 1,000 Prescriptions by Prescriber, Year, and Race and Ethnicity



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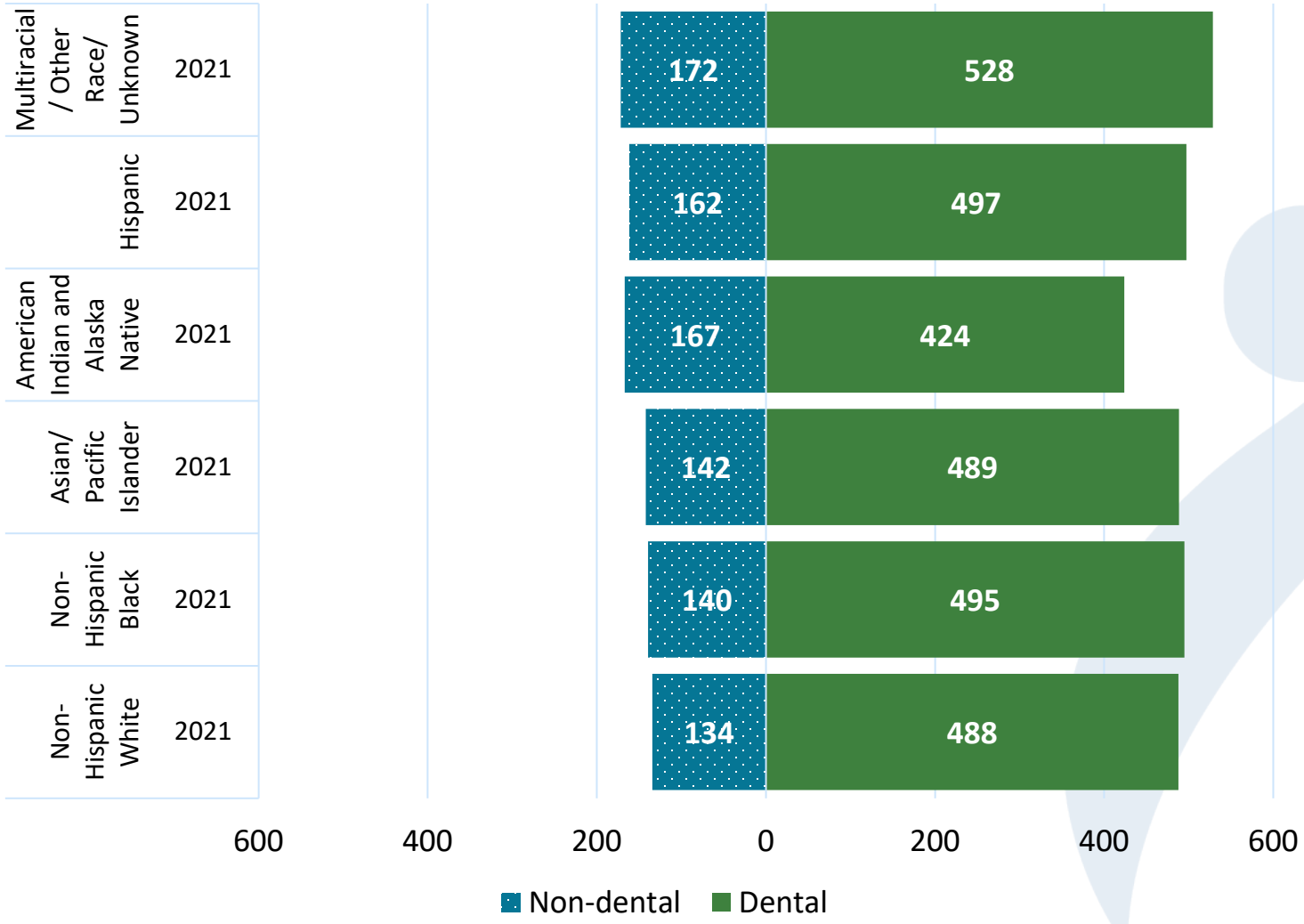
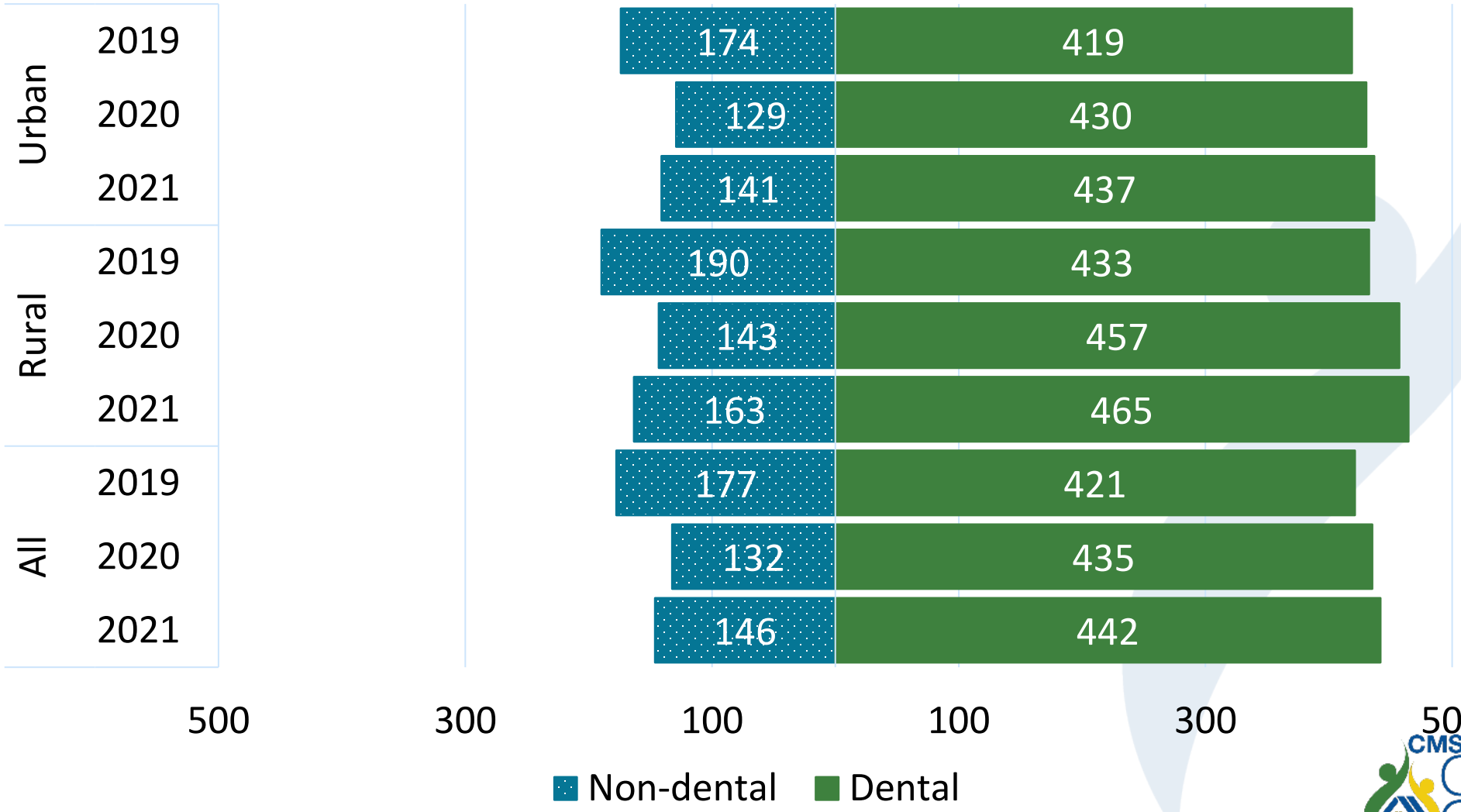
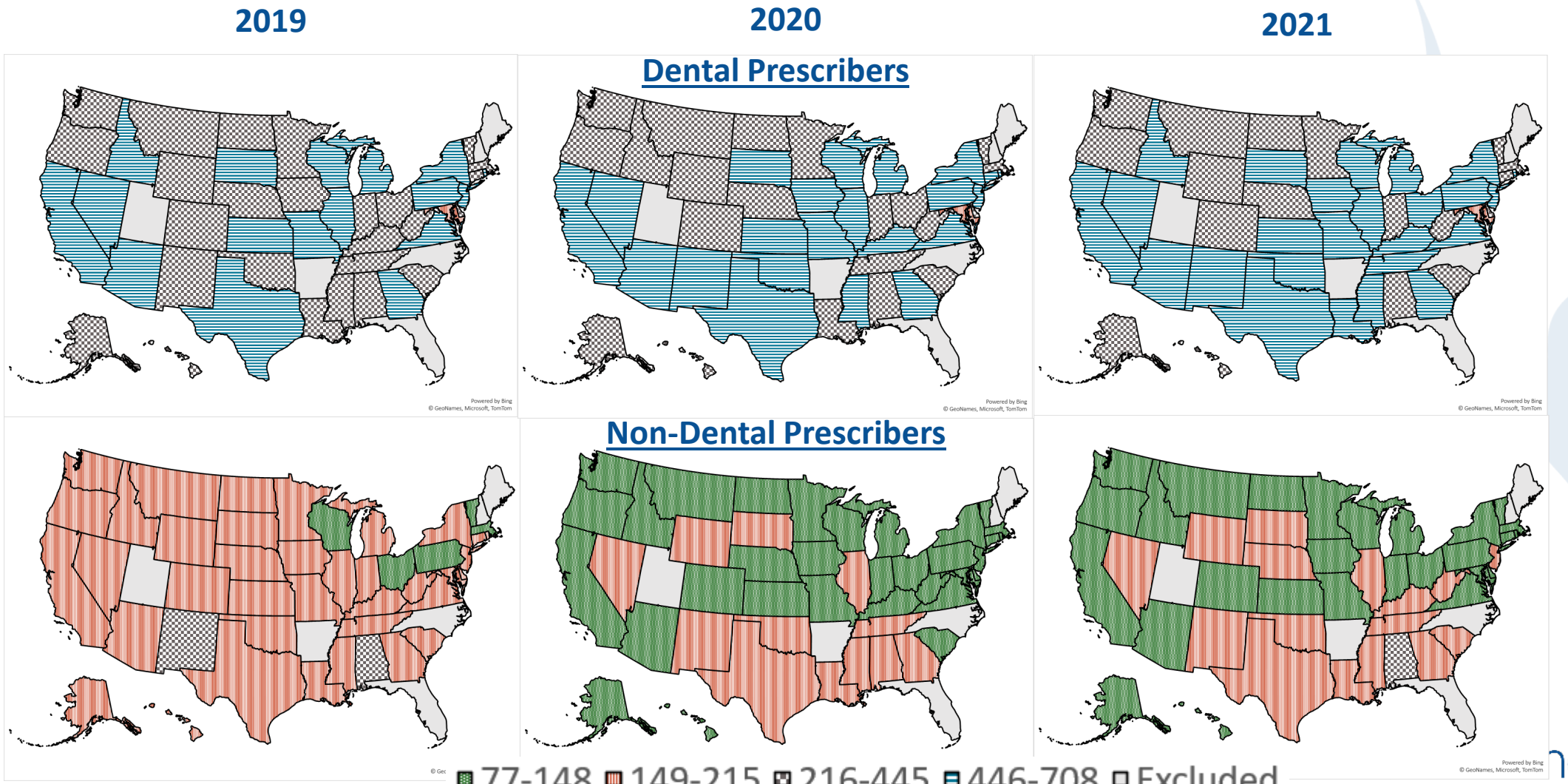
Rate of Pediatric Antibiotics Prescriptions per 1,000 Prescriptions by Prescriber and Race and Ethnicity, 2021



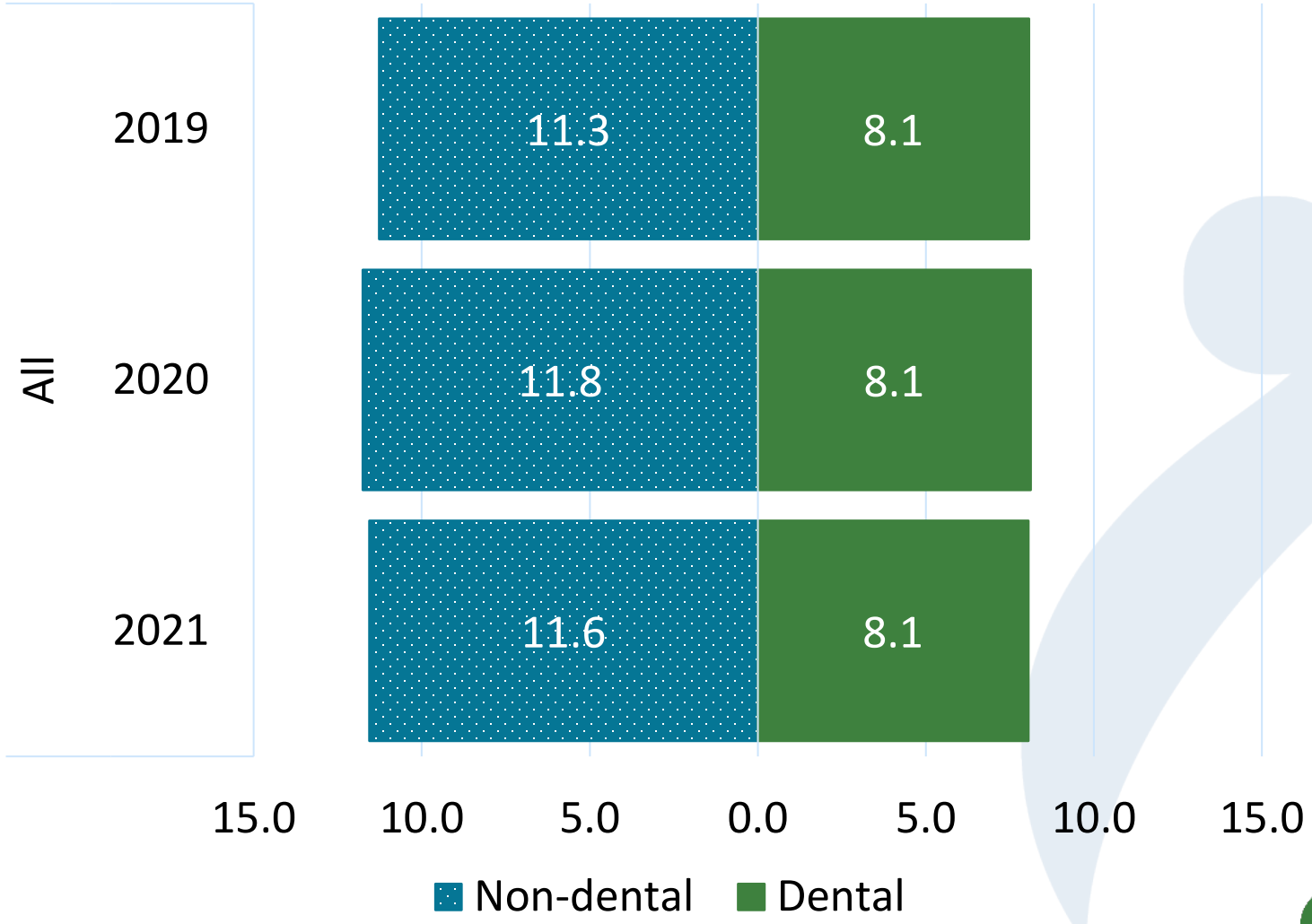
Rate of Pediatric Antibiotics Prescriptions per 1,000 Prescriptions by Prescriber, Year, and Residence Designation



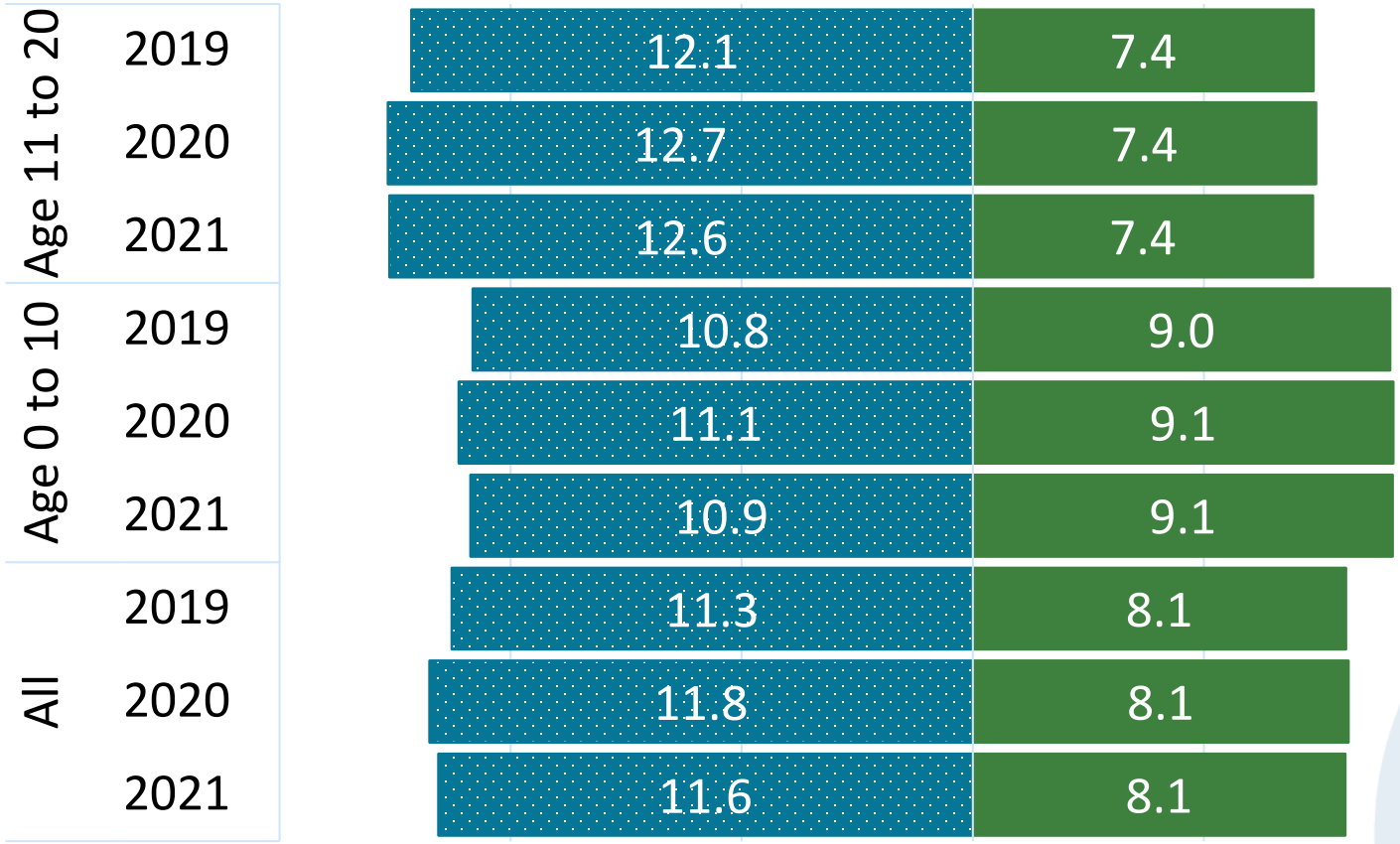
Geographic Variation of Dental and Non-Dental Pediatric Antibiotics Prescriptions Rates per 1,000 Prescriptions, 2019-2021



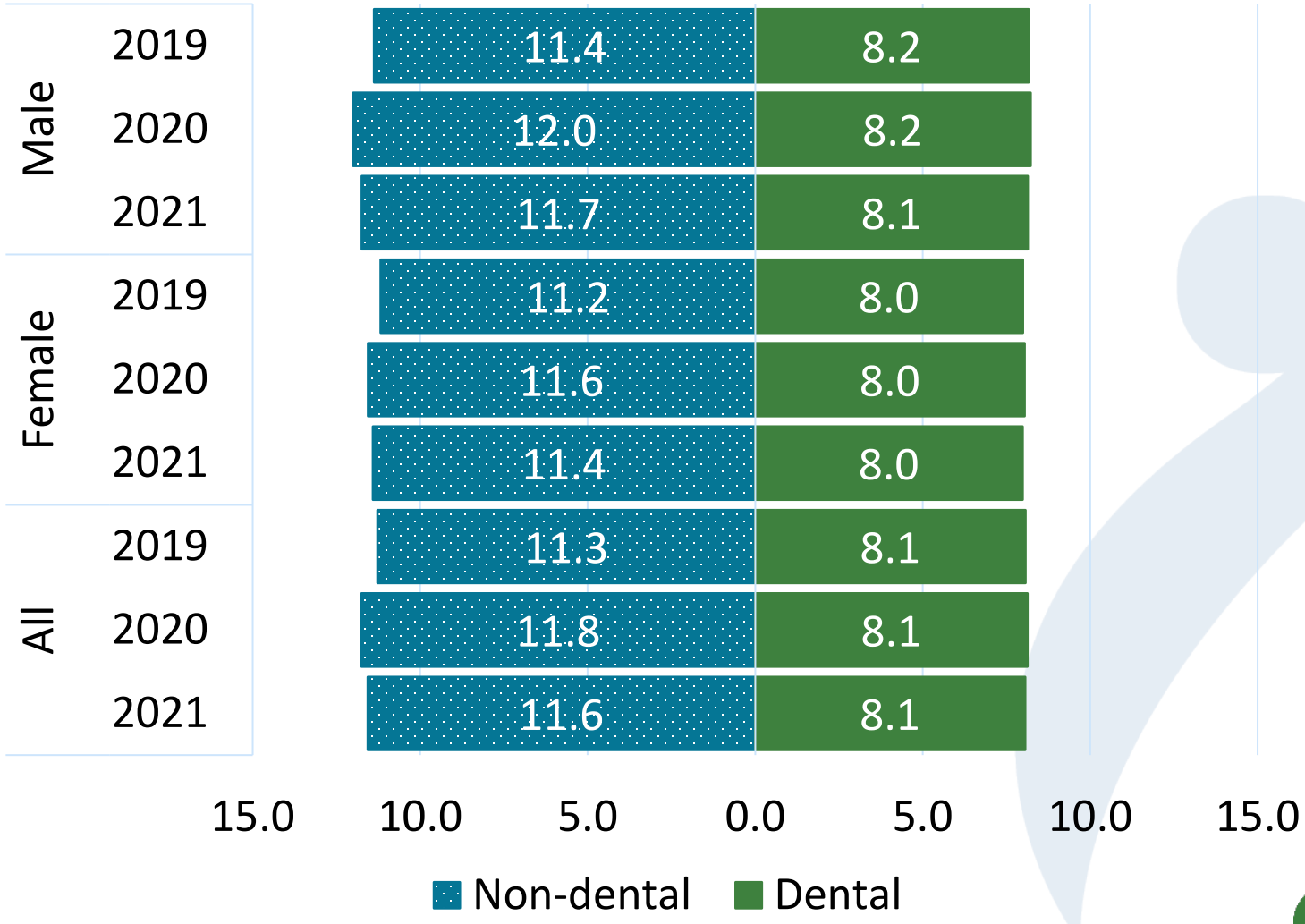
Average Day Supply of Pediatric Antibiotic Prescriptions by Prescriber and Year



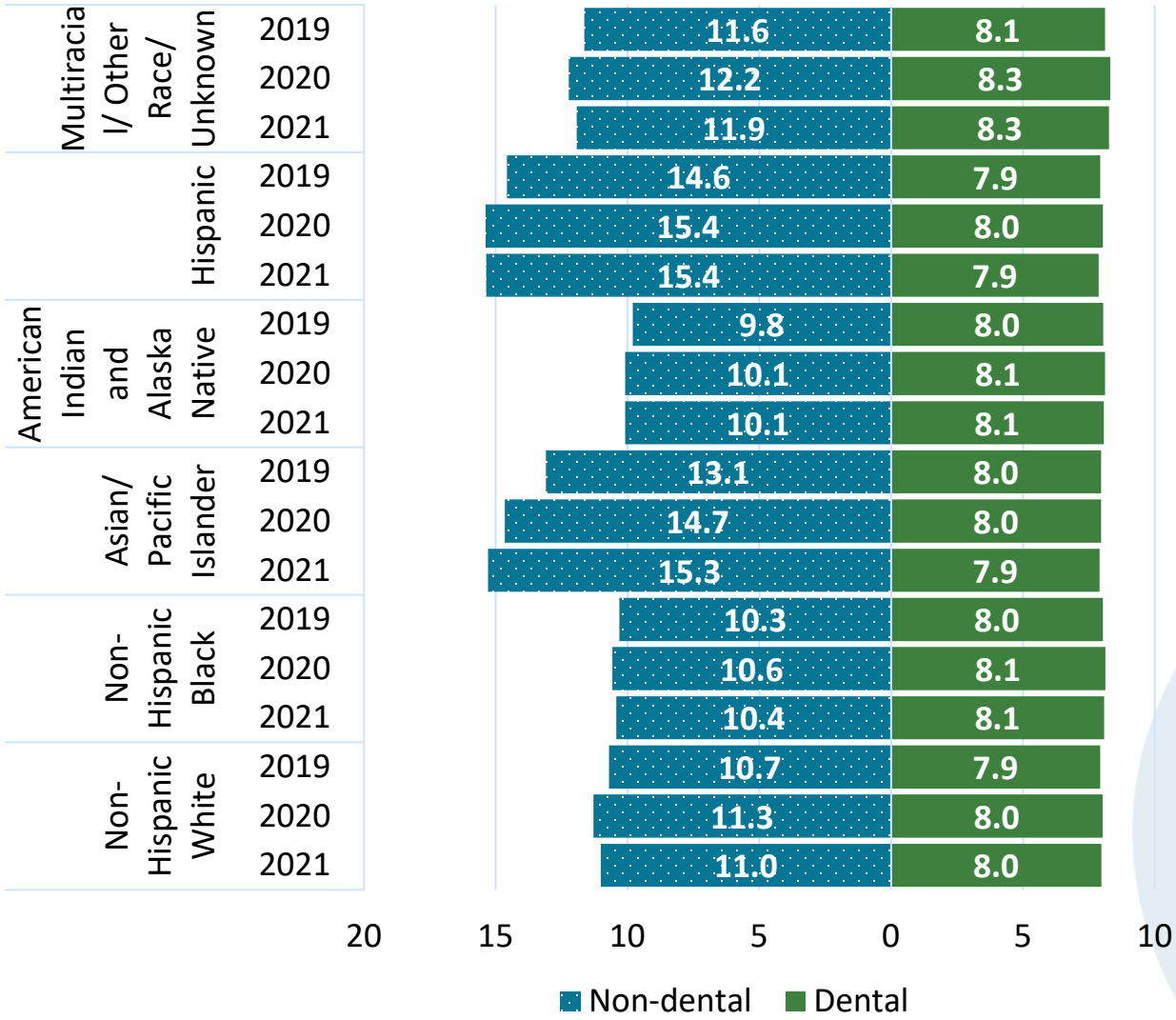
Average Day Supply of Pediatric Antibiotic Prescriptions by Prescriber, Year, and Age Group



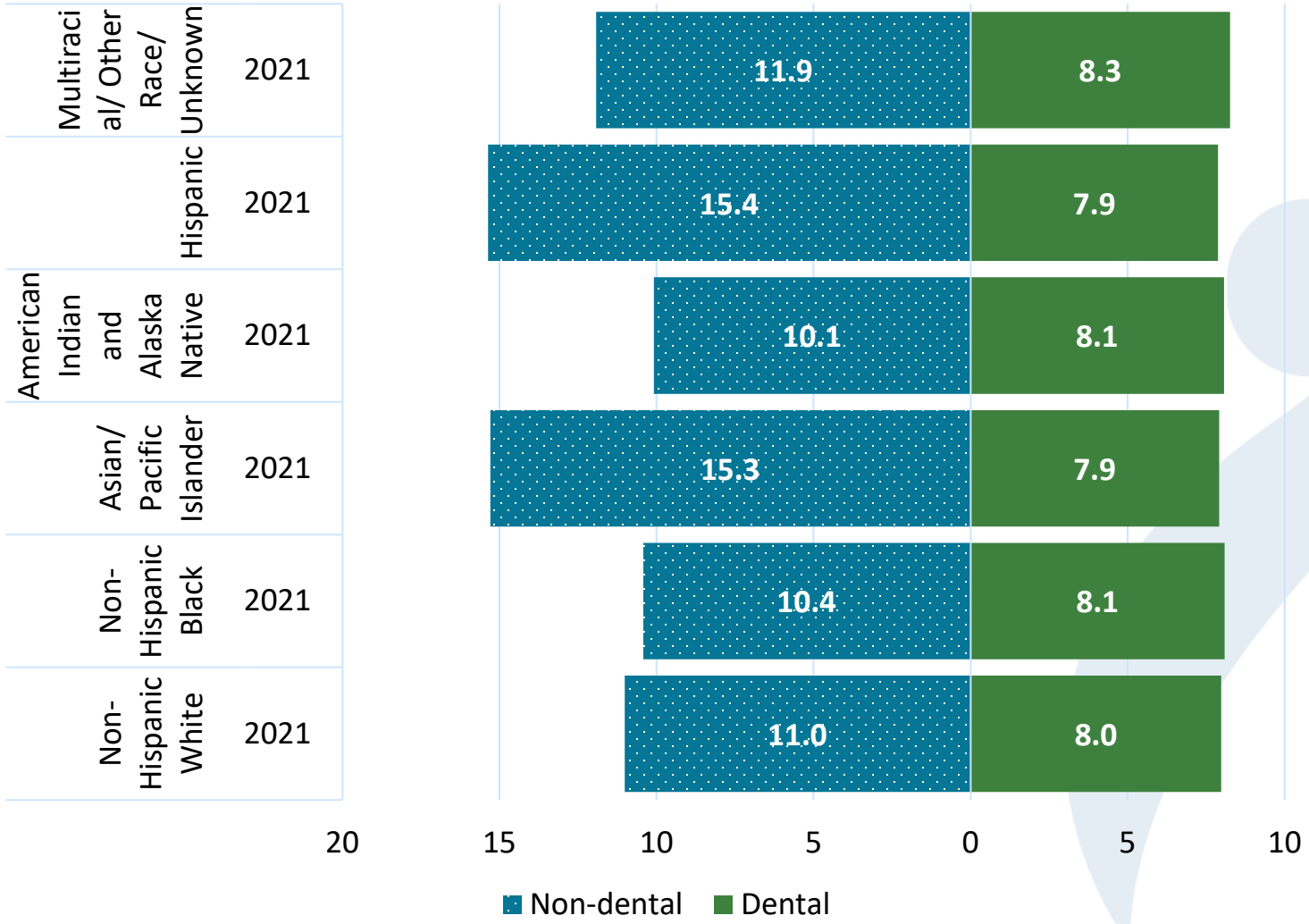
Average Day Supply of Pediatric Antibiotic Prescriptions by Prescriber, Year, and Sex



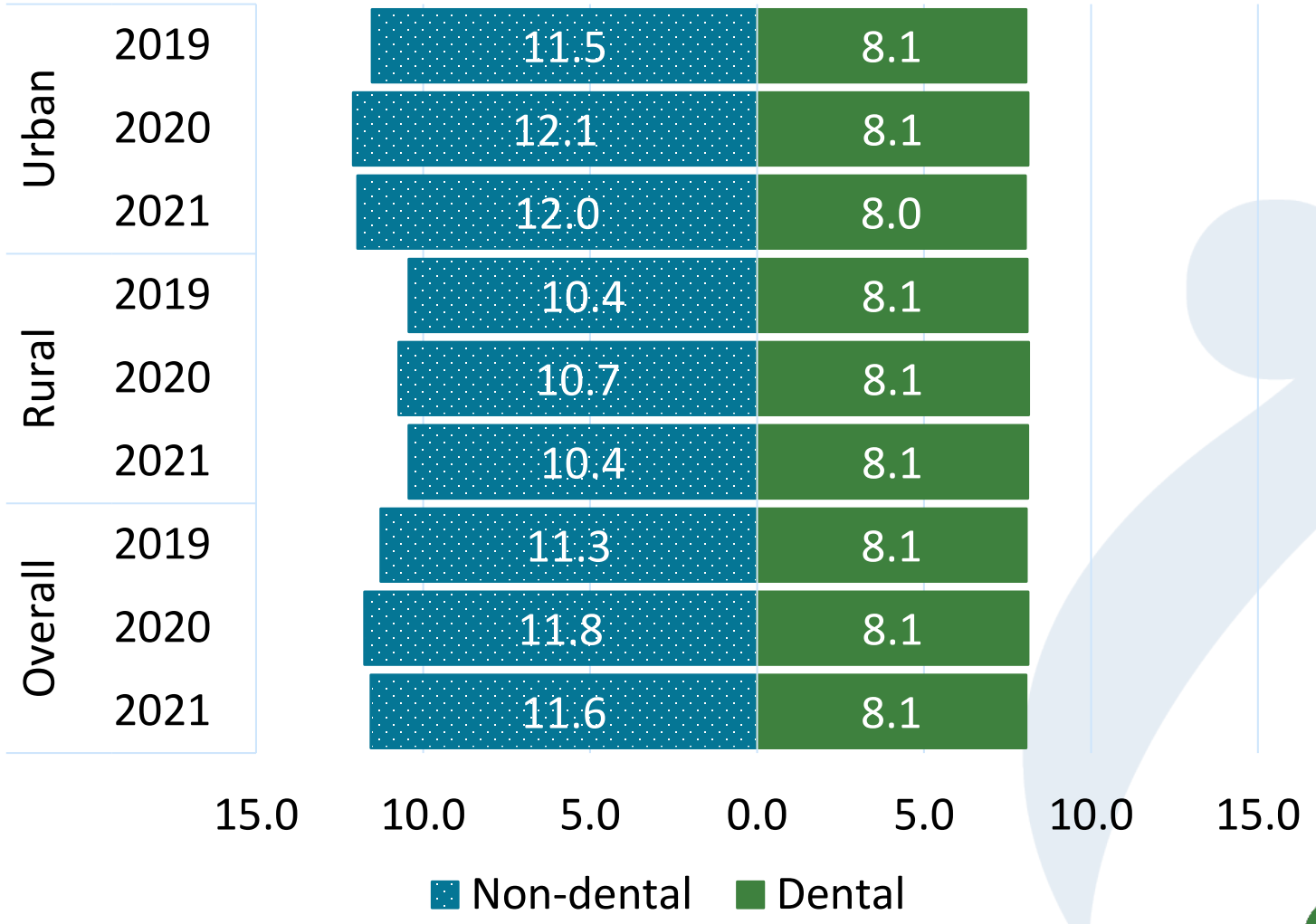
Average Day Supply of Pediatric Antibiotic Prescriptions by Prescriber, Year, and Race/Ethnicity



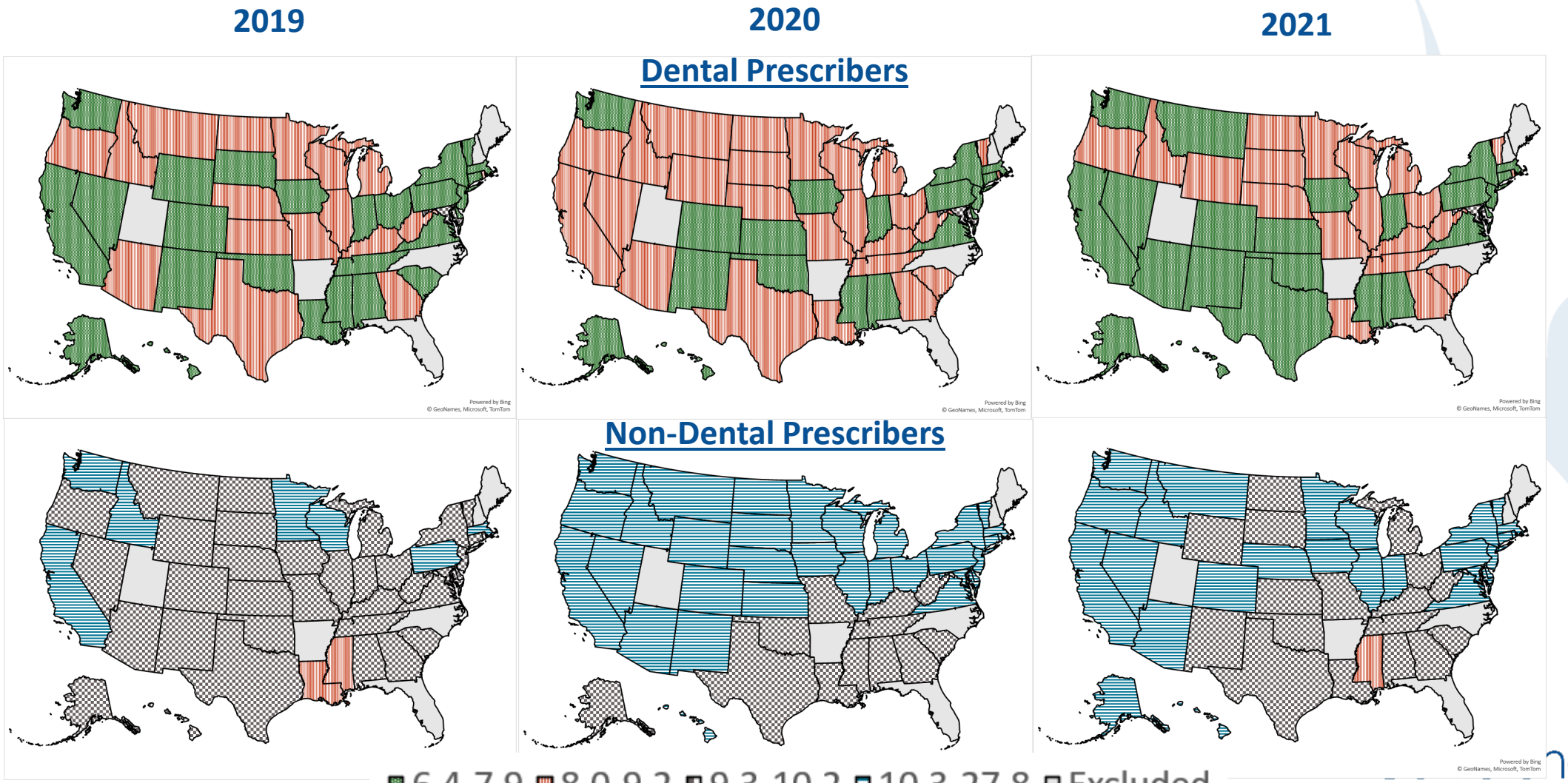
Average Day Supply of Pediatric Antibiotic Prescriptions by Prescriber and Race/Ethnicity, 2021



Average Day Supply for Pediatric Antibiotic Prescriptions by Prescriber, Year, and Residence Designation



Geographic Variation of Average Day Supply for Pediatric Antibiotic Prescriptions by Dental and Non-dental Prescribers, 2019-2021



Conclusions

- Fluctuations in the number of 2019-2021 antibiotic prescriptions for Medicaid-enrolled children are consistent with previous non-dental prescribing reports due to the COVID-19 PHE
  - Dental prescriptions stayed relatively constant during this period
- 40% of prescription claims from dentists are for antibiotics, and dentists prescribe antibiotics at roughly 3x the rate of non-dental prescribers
  - The rate of antibiotic prescriptions was higher in rural vs urban residence designation
  - Southern states have the highest rates of antibiotic prescriptions per 1,000 prescriptions
- Dentists prescribe antibiotics for an average of 8 days, less than non-dental prescribers, who average 12 days
  - Non-Hispanic Asians and Hispanics are prescribed longer duration of antibiotics by non-dental prescribers

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COVID-19 Public Health Emergency Impact on Silver Diamine Fluoride Utilization Among Medicaid-Enrolled Children

Beau D Meyer[1], Carla Shoff[2], Natalia I. Chalmers[2]

[1] The Ohio State University College of Dentistry

[2] Centers for Medicare & Medicaid Services

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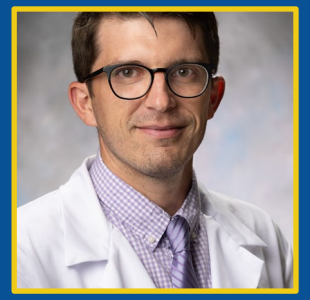

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Background

- Tooth decay, or dental caries, is a common and preventable chronic disease among U.S. children.
- For children aged 2 to 5 years, about 33% of Mexican American and 28% of non-Hispanic Black children have had cavities in their primary teeth, compared with 18% of non-Hispanic White children. Children and adolescents from low-income families, including those covered by Medicaid and the Children's Health Insurance Program (CHIP), are about twice as likely to have untreated tooth decay as their higher-income peers.[1]
- COVID-19 PHE profoundly impacted dental services utilization and the healthcare system.[2]
- SDF can be used as part of an ongoing caries management plan to optimize individualized patient care consistent with the goals of a dental home. SDF application is a minimally invasive approach that may prevent or delay the need for more extensive and expensive procedures.[3]

Silver Diamine Fluoride

- Silver diamine fluoride (SDF) is a colorless or blue-tinted liquid with a pH between 10 and 13, which is comprised of approximately 24.4% to 28.8% (weight/volume) silver, 5.0% to 5.9% fluoride and 8.0% ammonia.[1]
- The U.S. Food and Drug Administration (FDA) has classified SDF as a Class II medical device, and it is cleared for use in the treatment of tooth sensitivity, which is the same type of clearance as fluoride varnish and must be professionally applied.[1]
- SDF is unique in killing the bacteria and hardening the teeth, thus arresting and preventing caries. The use of SDF for caries prevention or arrest is off-label, similar to fluoride varnish.[2]
- After the use of SDF, notable tooth discoloration can be observed, as seen in the image on the right.[3]

1 ADA Silver Diamine Fluoride https://www.ada.org/en/resources/research/science-and-research-institute/oral-health-topics/silver-diamine-fluoride

2 Crystal YO, Niederman R. Silver Diamine Fluoride Treatment Considerations in Children's Caries Management. Pediatr Dent. 2016 Nov 15;38(7):466-471. PMID: 28281949; PMCID: PMC5347149.

3 Hu S, Meyer B, Duggal M. A silver renaissance in dentistry. Eur Arch Paediatr Dent. 2018 Aug;19(4):221-227. doi: 10.1007/s40368-018-0363-7. Epub 2018 Aug 9. PMID: 30094547.

Objectives

- Examine and describe variations in SDF utilization among Medicaid-enrolled children at the state level
- Evaluate the impact of the COVID-19 PHE on SDF utilization

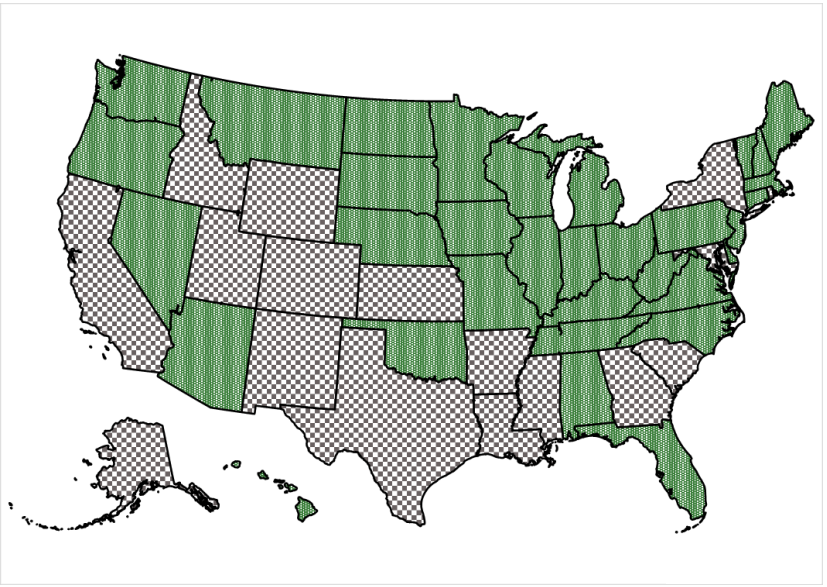
Methods

- Centers for Medicare & Medicaid Services (CMS) unredacted 2019- 2021 Transformed Medicaid Statistical Information System (T-MSIS) Analytic Files (TAF) Research Identifiable Files (RIF)
- Children and adolescents enrolled in Medicaid up to 20 years old who are non-dually eligible for Medicare
- Any dental visit is defined as beneficiaries who had visits with CDT [1] codes D0100-D9999
- SDF visit is defined as beneficiaries who had treatment visits with either CDT code:
  - D1354: application of caries arresting medicament – per tooth
  - D1355: caries preventive medicament application – per tooth
- Statistical analysis: descriptive statistics and clustered robust standard error model

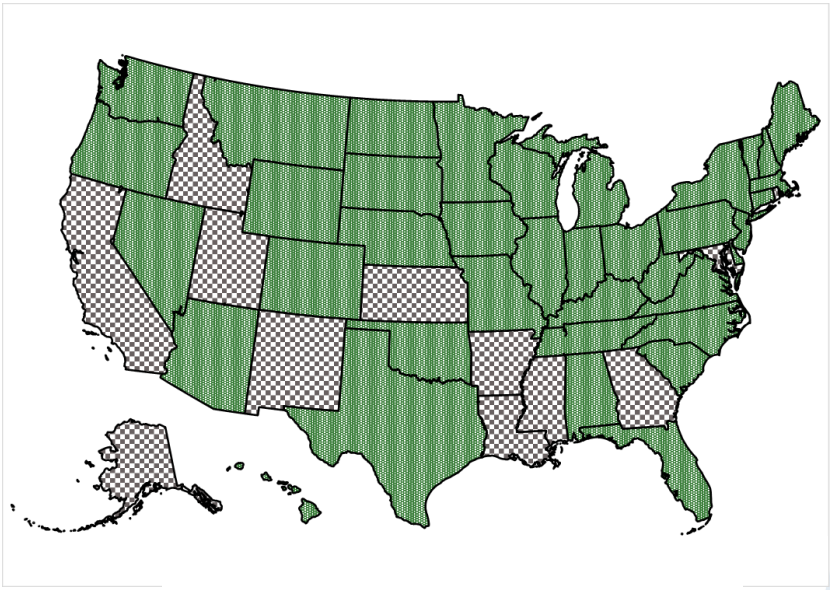
1 ADA Code on Dental Procedures and Nomenclature https://www.ada.org/publications/cdt

Pediatric SDF Coverage by State and Year

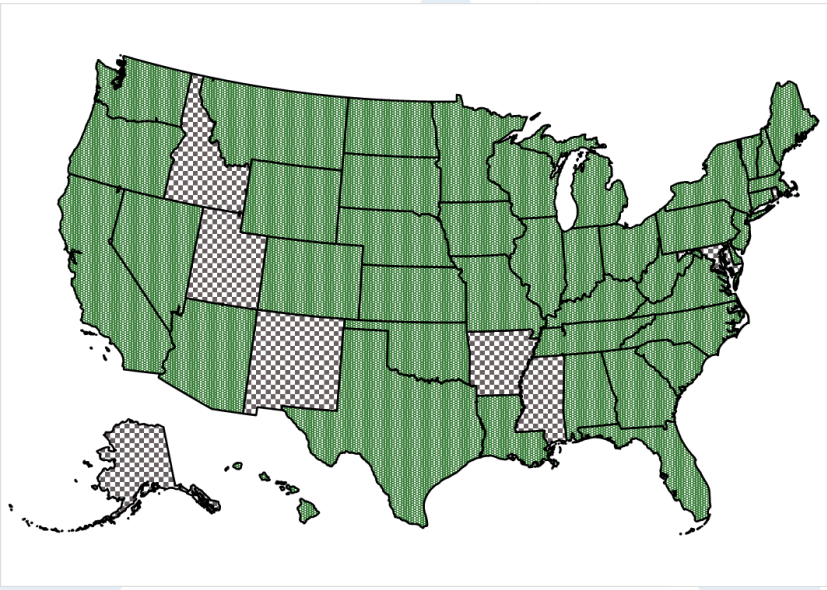
2019



2020



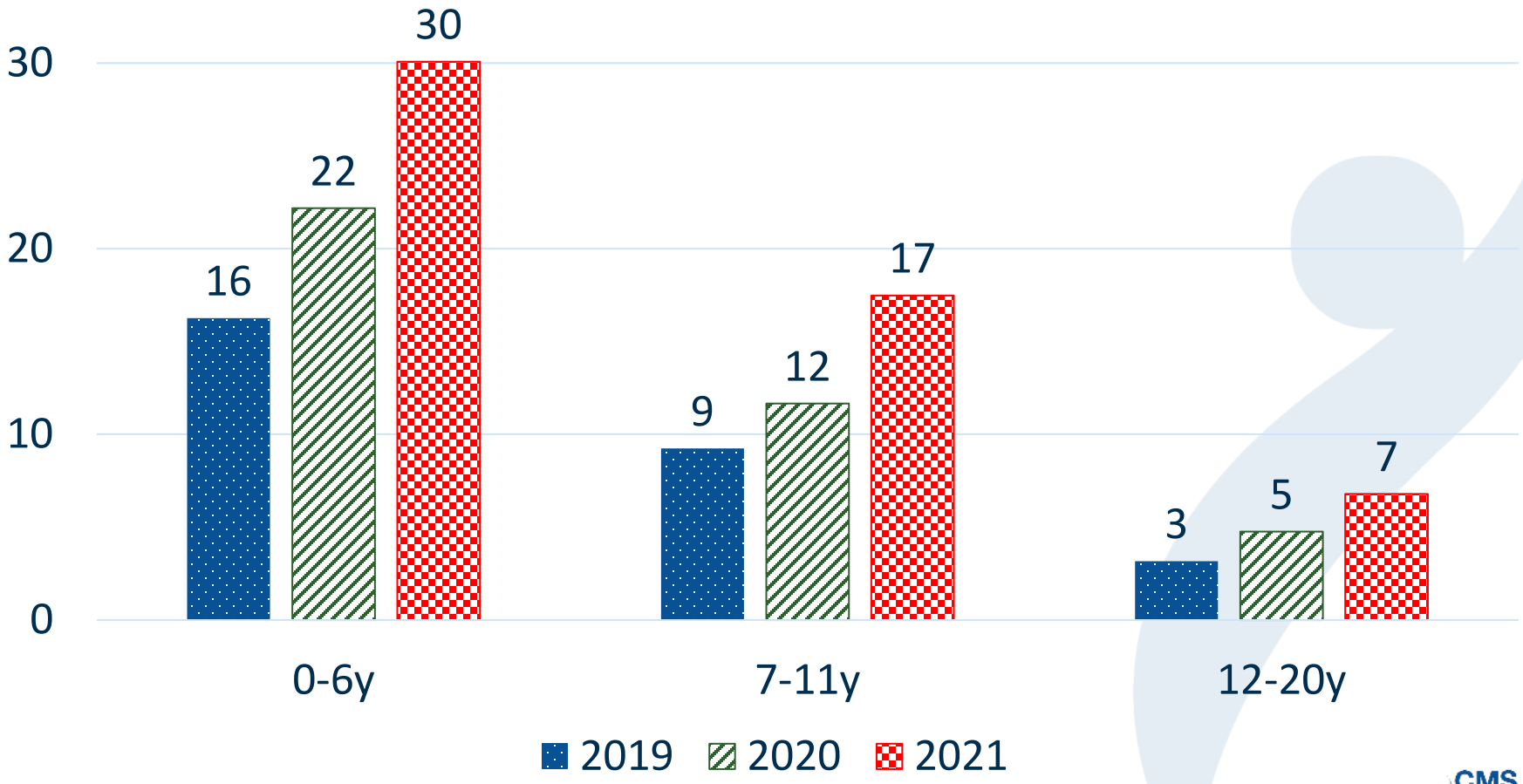
2021



Not Covered Covered

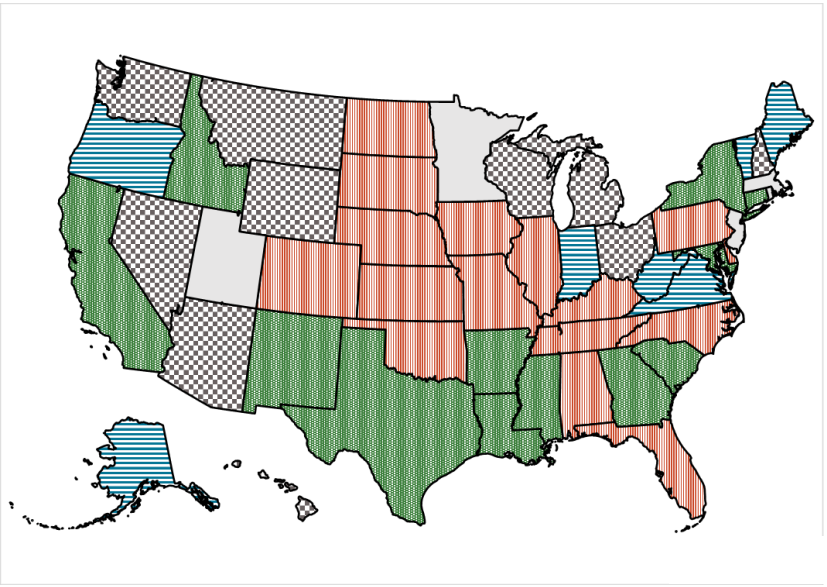
Source: Authors analysis of state Medicaid coverage for SDF

Pediatric SDF Utilization Rates per 1,000 Medicaid/CHIP Beneficiaries with a Dental Visit by Age and Year

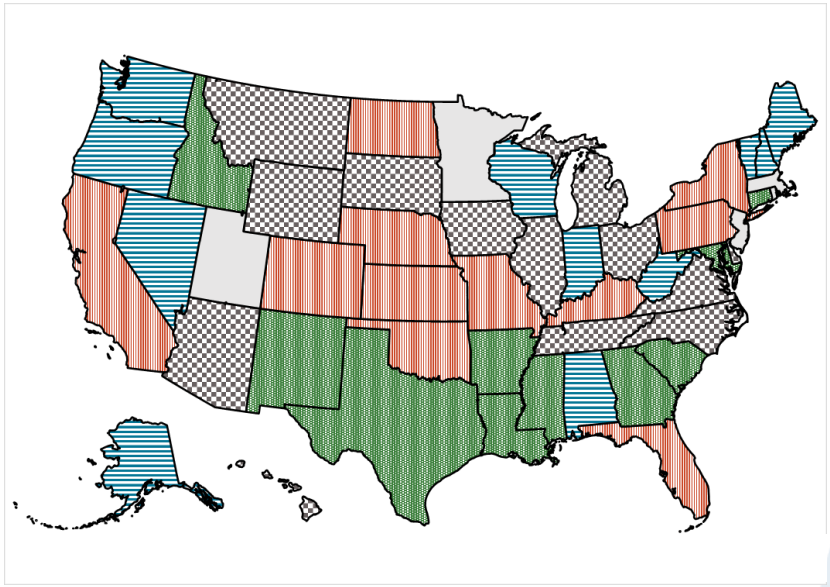


Geographic Variation of Pediatric SDF Rates per 1,000 Medicaid/CHIP Beneficiaries with a Dental Visit by State and Year

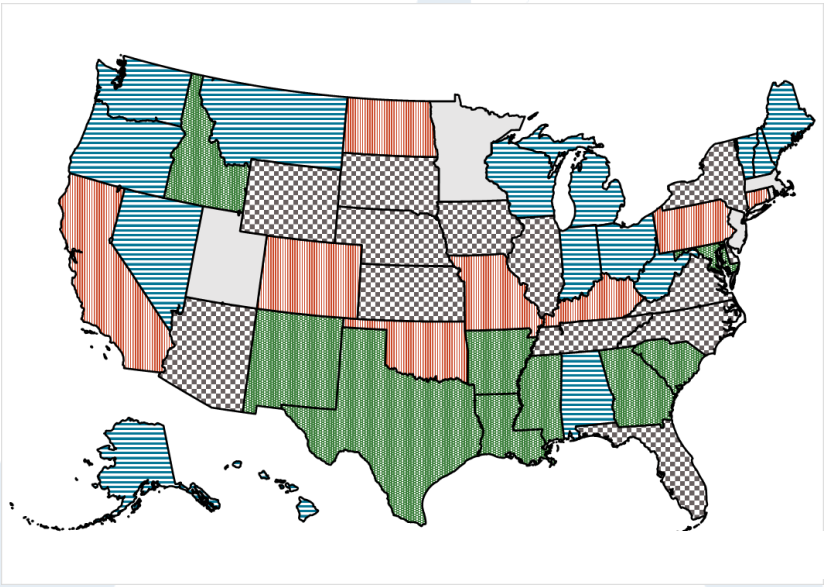
2019



2020

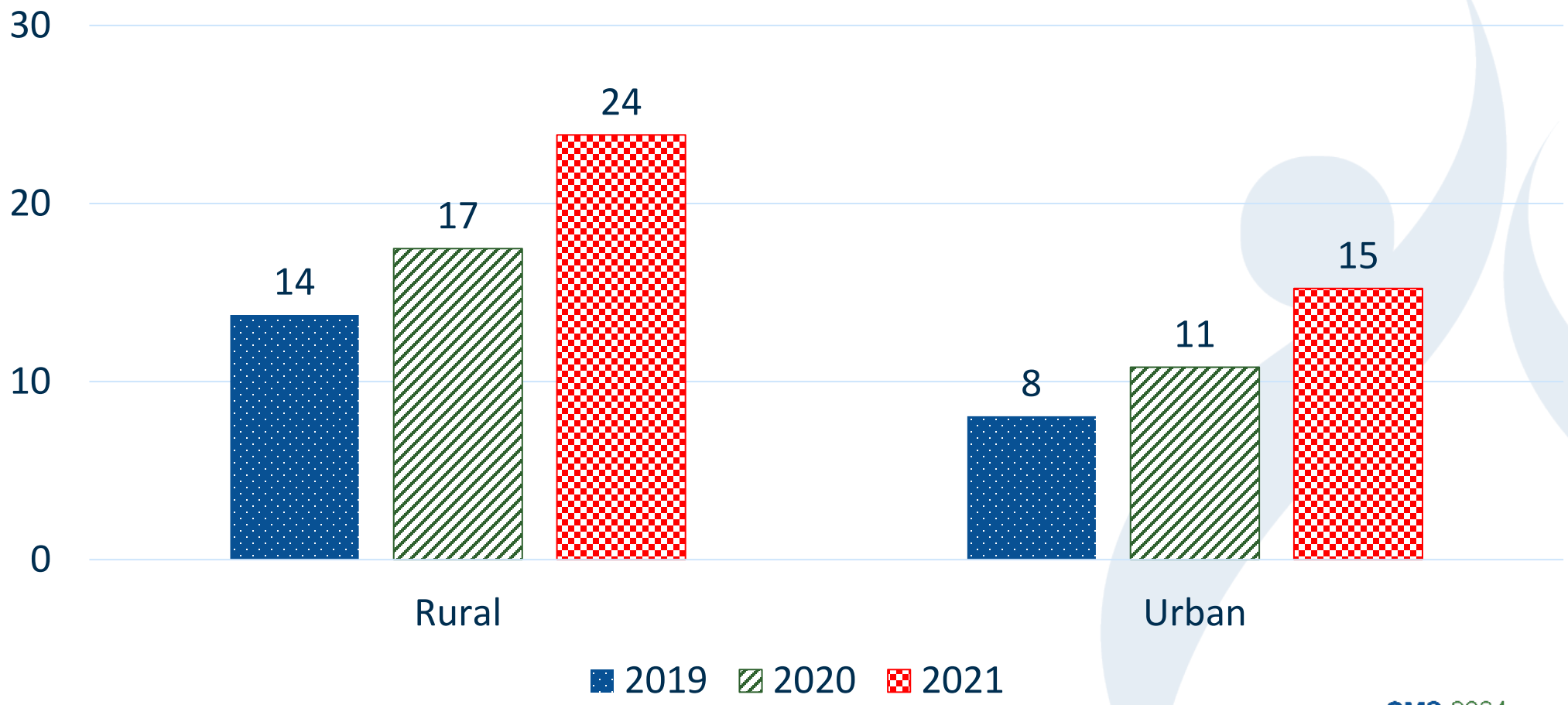


2021

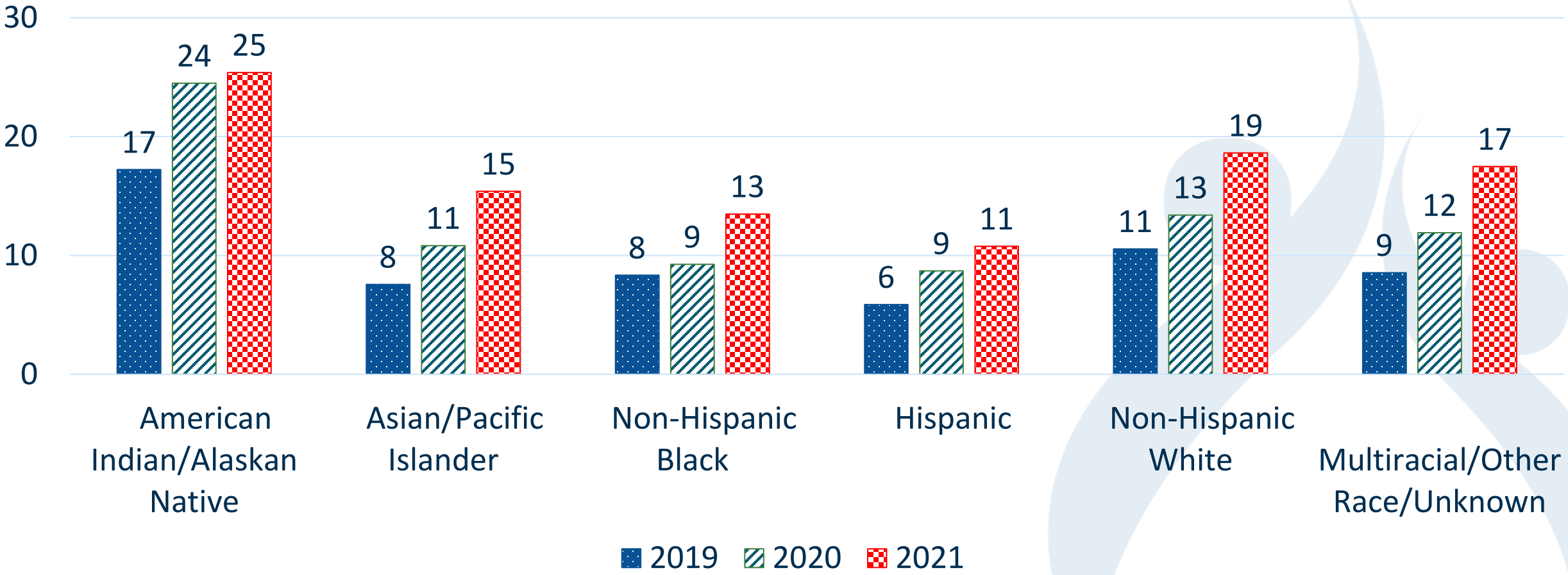


0-5 6-12 13-25 26-97 Excluded

Pediatric SDF Utilization Rates per 1,000 Medicaid/CHIP Beneficiaries with a Dental Visit by Rural/Urban and Year



Pediatric SDF Utilization Rates per 1,000 Medicaid/CHIP Beneficiaries with a Dental Visit by Race/Ethnicity and Year



Clustered Robust Standard Error Model Predicting the Odds of Pediatric Medicaid/CHIP Beneficiaries Receiving SDF

	aOR[a]		aOR[a]
Age Groups (Ref. Age 0 to 6)		Residence Designation (Ref. Urban)	
Age 7 to 11	0.63 [b]	Rural	1.33 [b]
Age 12 to 20	0.26 [b]	State SDF Coverage Status (Ref. No Coverage)	
Sex (Ref. Male)		Coverage	15.32 [b]
Female	1.00		
Race and Ethnicity (Ref. Non-Hispanic White)			
American Indian/Alaskan Native	1.53 [b]		
Asian/Pacific Islander	1.20 [b]		
Non-Hispanic Black	0.94 [b]		
Hispanic	1.18 [b]		
Multiracial/Other Race/Unknown	1.18 [b]		

Notes: a Models adjusted for all variables in the table, and model is clustered at the state level. The model includes the 17,439,678 beneficiaries that live in the 27 states that can be reported because of no claims data and race and ethnicity data quality concerns.; b $p<0.05$.

Conclusions

- The COVID-19 PHE significantly impacted Silver Diamine Fluoride utilization among Medicaid-enrolled children. Pediatric SDF utilization per 1,000 Medicaid beneficiaries with a dental visit steadily increased from 2019 to 2021
- Children between 0 and 6 were the primary recipients of SDF treatment.
- The pediatric utilization of SDF treatments among Medicaid/CHIP beneficiaries who had a dental visit varied based on race and place of residence.
  - American Indian/Alaskan Native beneficiaries had the highest and Non-Hispanic Black beneficiaries the lowest utilization rates
  - Rural beneficiaries had higher utilization than urban beneficiaries

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Utilization of Emergency Departments for Non-Traumatic Dental Conditions Among Medicaid-Enrolled Children with Special Healthcare Needs in the U.S., 2019

Kimia Imani[1], Carla Shoff[2], Luping Qu[2], Donald L. Chi[1], Natalia I. Chalmers[2]

[1] University of Washington School of Dentistry, Department of Oral Health Sciences

[2] Office of the Administrator, Centers for Medicare & Medicaid Services

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Background

- Children and Youth with Special Health Care Needs are children who have or are at increased risk for chronic physical, developmental, behavioral, or emotional conditions. They also require health and related services of a type or amount beyond that required by children generally. [1]
- Nearly 1 out of every 5 children in the United States has a special healthcare need.[2]
- There are many CSHCN in the United States who may be at increased risk for poor oral health, including tooth decay [3]
- Emergency departments have been identified as both an indication of a lack of access to the traditional primary care dental system and an expensive and mostly ineffective alternative source of care. EDs generally provide only palliative care for oral problems (e.g., antibiotics and pain medication), addressing the symptoms but not the cause of the problems. [4]

1 HRSA Focus Area Children and Youth with Special Health Care Needs https://mchb.hrsa.gov/programs-impact/focus-areas/children-youth-special-health-care-needs-cyshcn
2 CDC Children and Youth with Special Healthcare Needs in Emergencies https://www.cdc.gov/childrenindisasters/children-with-special-healthcare-needs.html
3 Chi DL. Oral Health for US Children with Special Health Care Needs. Pediatr Clin North Am. 2018 Oct;65(5):981-993. doi: 10.1016/j.pcl.2018.05.007. PMID: 30213358.
4 ASTDD Emergency Department Data Collection Resources https://www.astdd.org/astdd-emergency-department-data-resources/

Study Objectives

- Evaluate whether CSHCN have higher odds of ED use for NTDC compared to children without SHCN
- Examine whether the odds of an opioid prescription after an ED visit for NTDC differed between children with and without SHCN

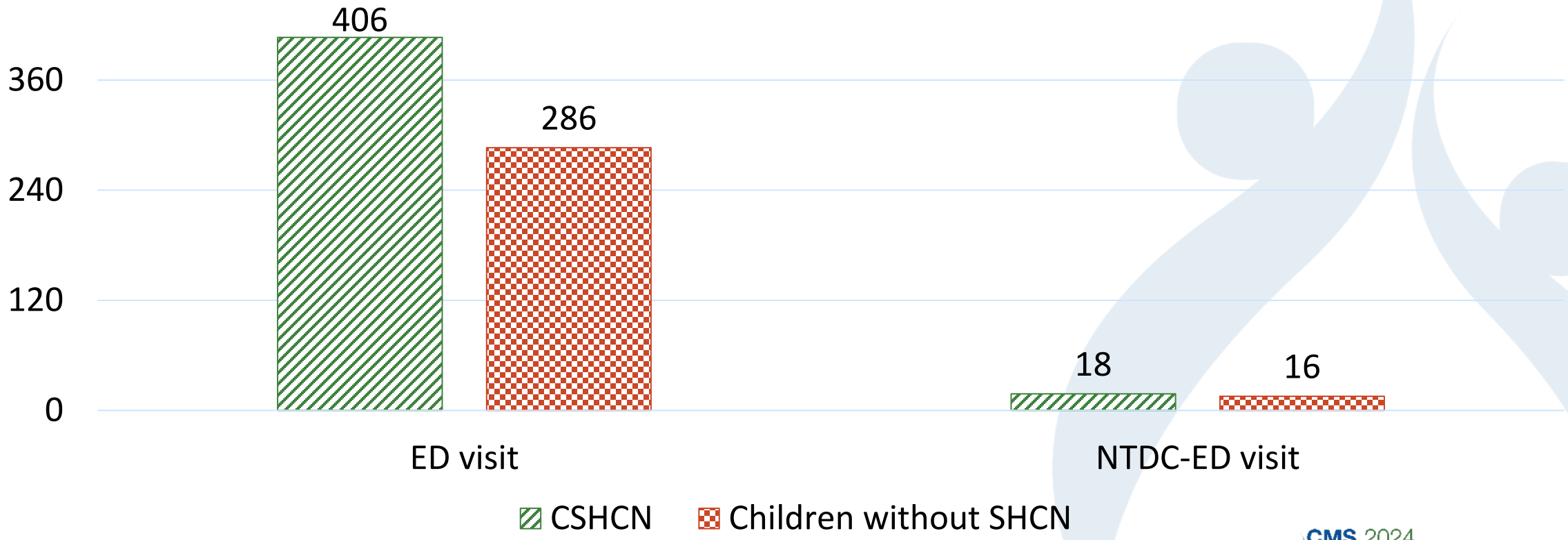
Methods

- Data: Centers for Medicare & Medicaid Services (CMS) unredacted 2019 Transformed Medicaid Statistical Information System (T-MSIS) Analytic Files (TAF) Research Identifiable Files (RIF)
- Children and adolescents enrolled in Medicaid up to 20 years old who are non-dually eligible for Medicare
- Children with special healthcare needs (CSHCN) are identified based on Imani, Hill, Chi, et al. 2023.
- Emergency departments (ED) for non-traumatic dental conditions (NTDC) are identified using the ASTDD classification and methodology [1]
- Statistical analysis: descriptive statistics and clustered-robust standard error models

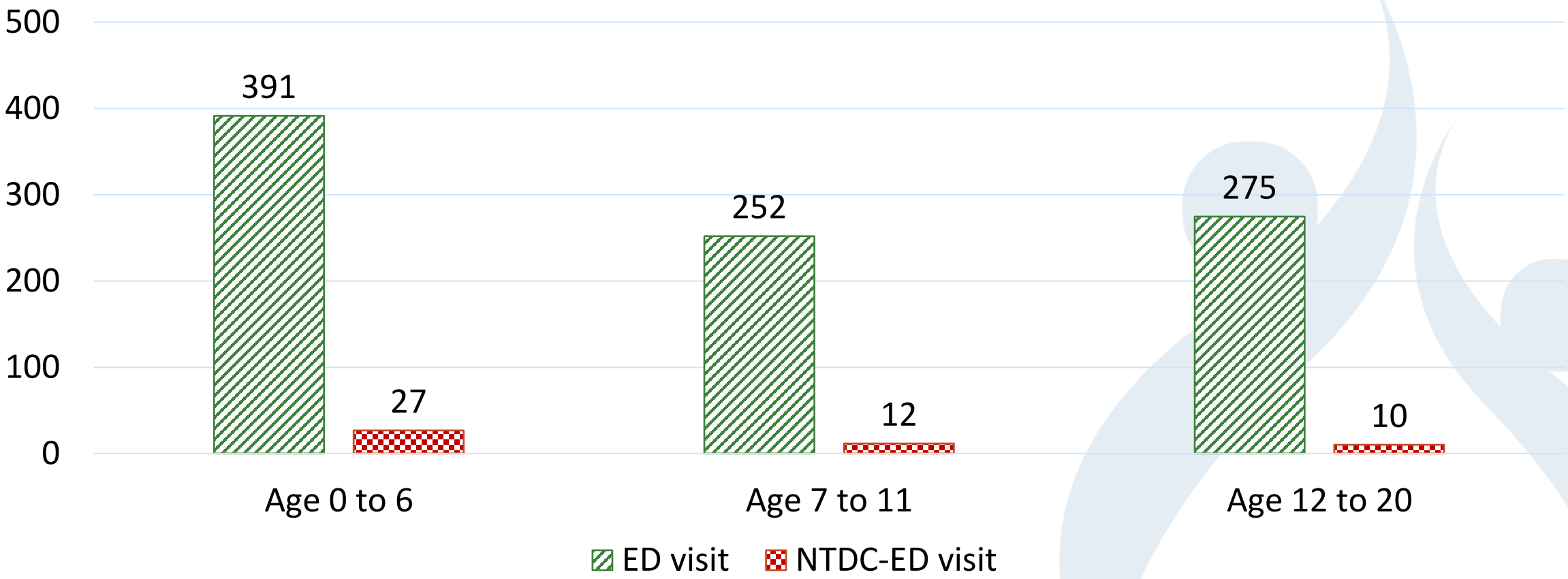
1 ASTDD Emergency Department Data Collection Resources https://www.astdd.org/astdd-emergency-department-data-resources/

Pediatric ED and NTDC ED Visits Rates Per 1,000 Medicaid/CHIP Beneficiaries by Special Healthcare Need (SHCN) Status

In 2019, approximately 16% of all children enrolled in Medicaid/CHIP were children with special healthcare needs.



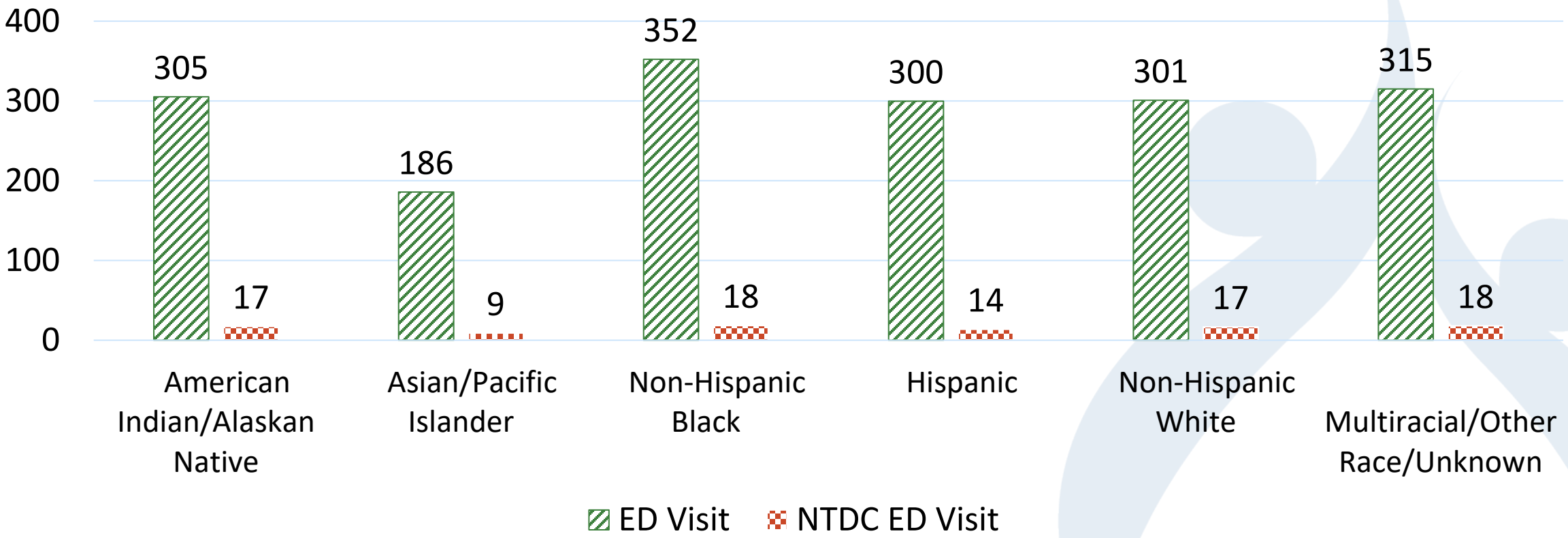
Pediatric ED and NTDC Visit Rates per 1,000 Medicaid/CHIP Beneficiaries by Age Group



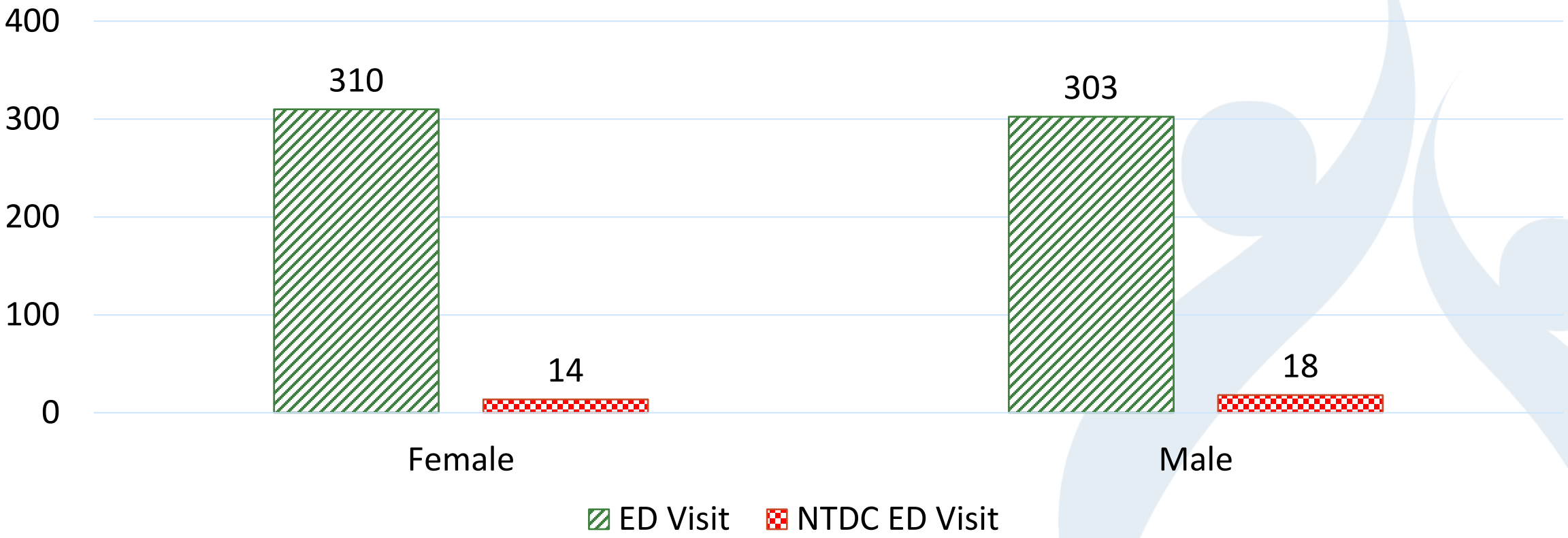
Top Diagnoses for NTDC Emergency Department Visits by Age Group

Age 0 to 6	Age 7 to 11	Age 12 to 20
Dental caries	Periapical abscess without sinus	Other disorders of teeth and supporting structures
Teething syndrome	Dental caries	Periapical abscess without sinus
Stomatitis	Other disorders of teeth and supporting structures	Jaw pain

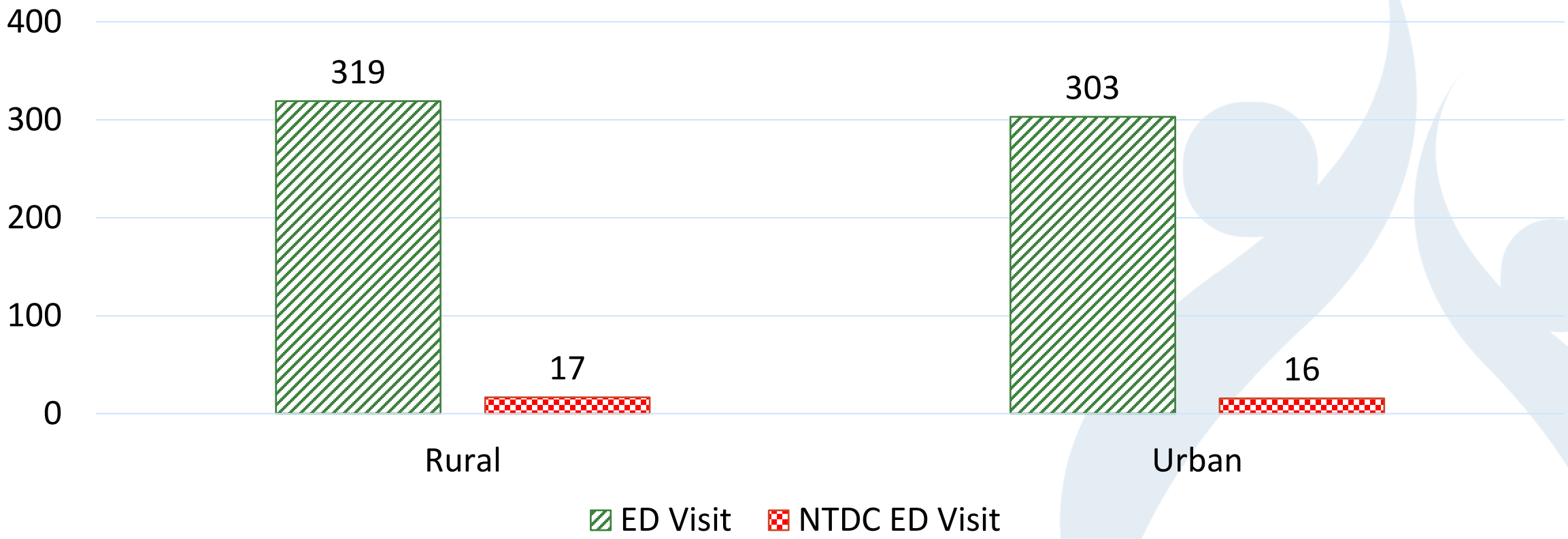
Pediatric ED and NTDC ED Visit Rates per 1,000 Medicaid/CHIP Beneficiaries by Race/Ethnicity



ED Visit Rates per 1,000 Medicaid/CHIP Beneficiaries by Sex

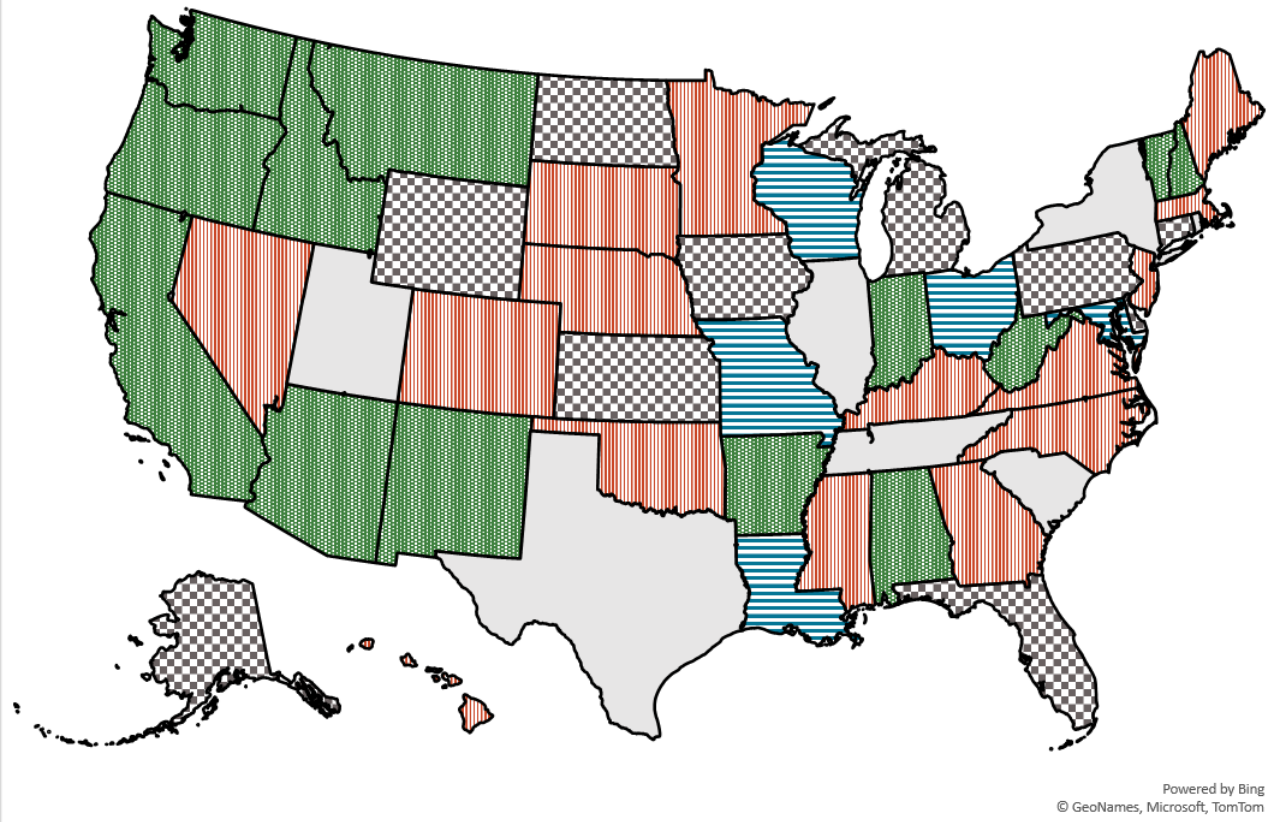


Pediatric ED and NTDC ED Visit Rates per 1,000 Medicaid/CHIP Beneficiaries by Residence Designation

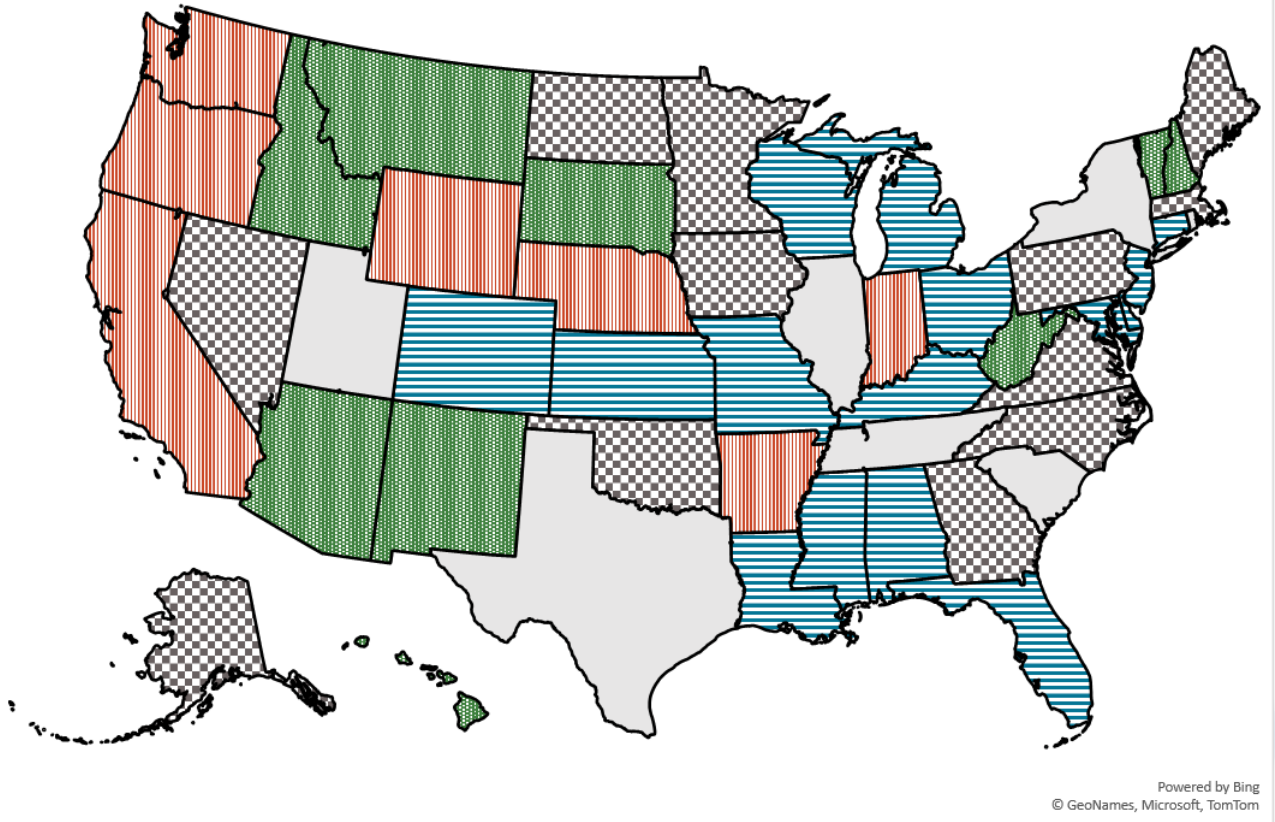


Pediatric Rate of NTDC ED Visits per 1,000 Medicaid/CHIP Beneficiaries

Beneficiaries without SHCN

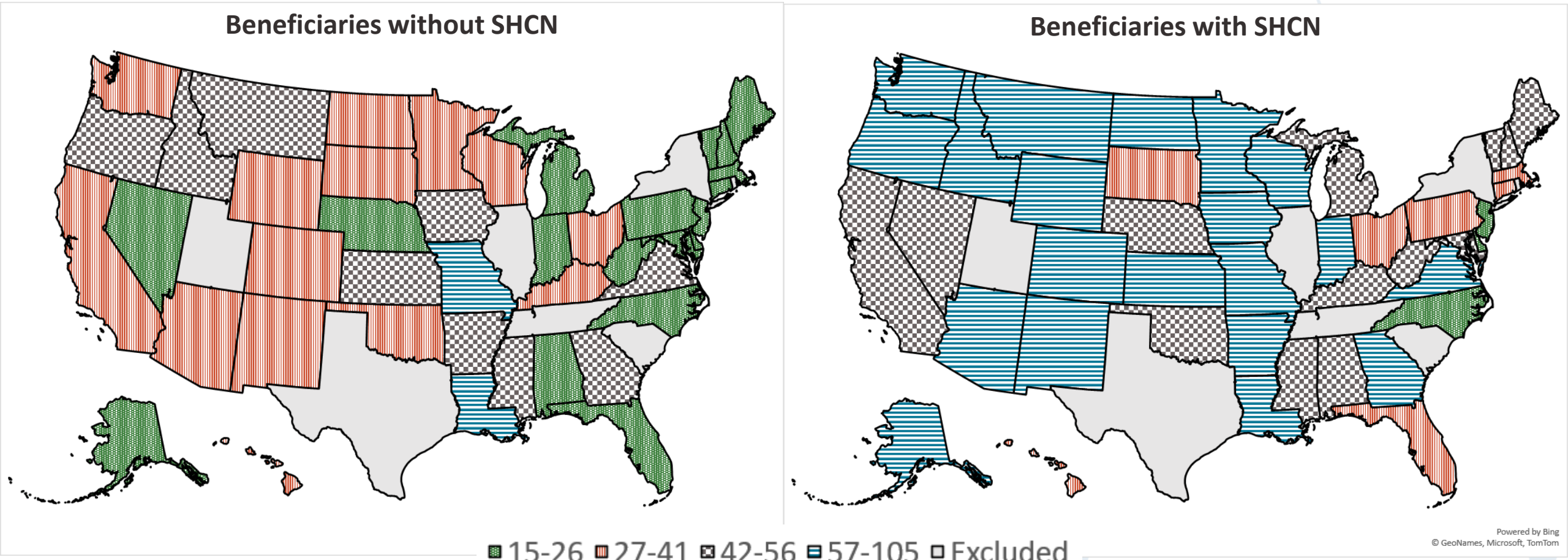


Beneficiaries with SHCN

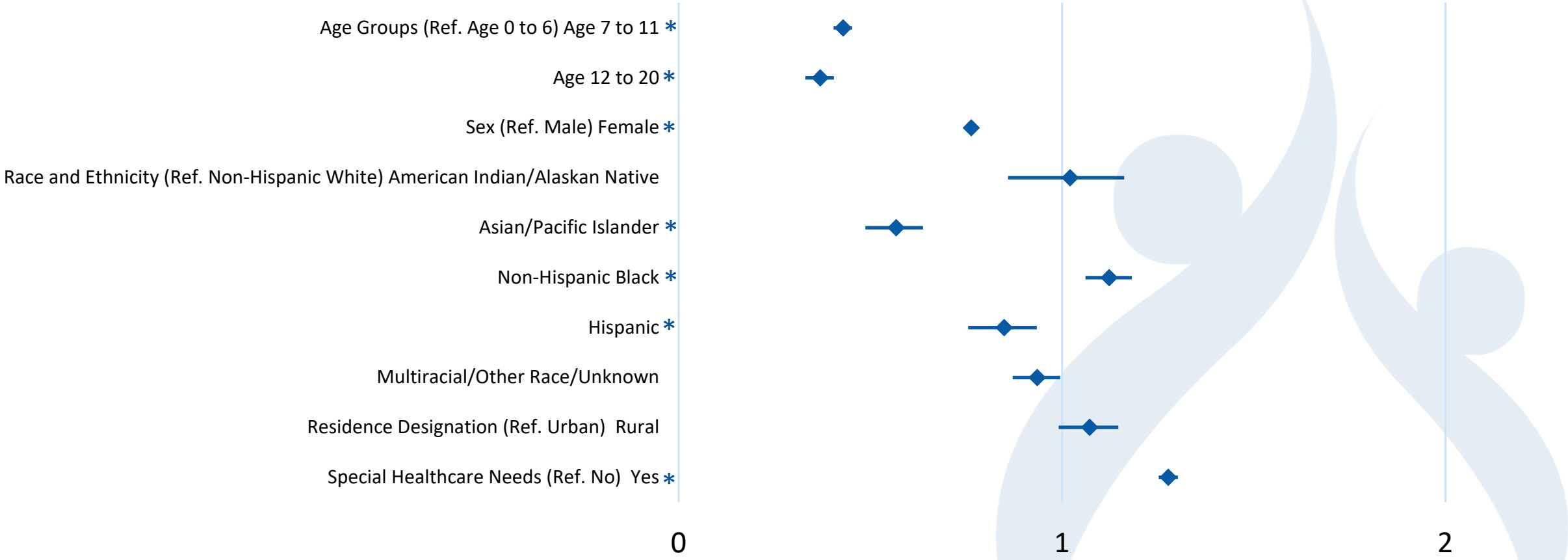


9-14 15-16 17-18 19-26 Excluded

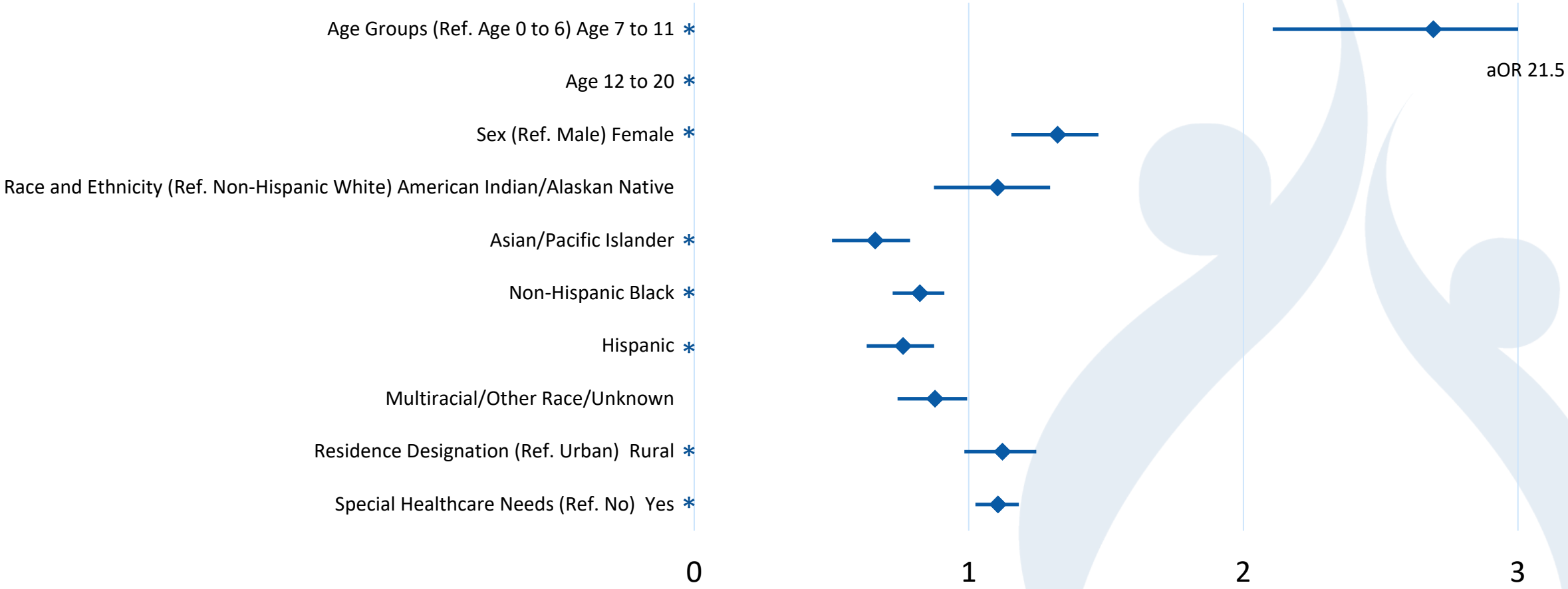
Pediatric Rate of Opioid Prescriptions Following an NTDC ED Visit per 1,000 Medicaid/CHIP Beneficiaries



Clustered Robust-Standard Error Model Predicting the Odds of Experiencing an Emergency Department Visit for a Non-Traumatic Dental Condition



Clustered Robust-Standard Error Model Predicting the Odds of Receiving an Opioid Prescription Following an Emergency Department Visit for a Non-Traumatic Dental Condition



Conclusions

- The odds of emergency department visits for non-traumatic dental conditions among pediatric Medicaid beneficiaries varied based on age, sex, race, and special healthcare needs:
  - Adolescents and young adults have lower odds compared to children under six years
  - Females have lower odds compared to males
  - Non-Hispanic Black beneficiaries had the highest odds and Asian/Pacific Islander beneficiaries the lowest odds, compared to Non-Hispanic whites
  - Beneficiaries with special healthcare needs have increased odds of ED for NTDC
- The odds of receiving an opioid prescription following an emergency department visit for a non-traumatic dental condition varied by age, sex, race/ethnicity, rural/urban residence, and special healthcare needs.

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Question and Answer Session

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