

Improving Early Childhood Caries for American Indian 3- to 5-Year-Old Children Through Interprofessional Outreach: 2018–2022

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We sought to determine the effectiveness of an interprofessional health team in improving access to oral health care among American Indian children enrolled in Head Start. Our team provided preventive treatments and case management during 11 visits from 2018 to 2022. Case management reduced the time between referral and dental treatment from a median of 166 days to 58.3 days over four years. An interprofessional team is an effective way to improve access to oral health care among rural American Indian Head Start children. (*Am J Public Health*. Published online ahead of print February 2, 2023:e1–e4. <https://doi.org/10.2105/AJPH.2022.307205>)

Dental and public health experts have drawn attention to the persistent disparities with respect to early childhood caries (ECC) among American Indian and Alaska Native (AI/AN) children over the past 20 years and called for better prevention efforts and an interdisciplinary approach. Current recommendations emphasize increased integration of oral health education and preventive care in early childhood intervention programming.

INTERVENTION AND IMPLEMENTATION

Our interprofessional team delivered an intervention over four years with a Tribal Head Start program to address gaps in access to dental care among young children. The goals were to reduce rates of untreated decay and to decrease the time to dental treatment. Services included prophylaxis, fluoride

varnish application, dental sealant placement and repair, and silver diamine fluoride application. Also, in response to COVID-19, we added synchronous and asynchronous tele-dentistry in November 2020 including X-rays, intraoral photos, limited examinations, and consultations.

Our team consisted of nursing students, nurse practitioners, a project coordinator, and dental hygienists who traveled to eight Head Start classrooms in the fall, winter, and spring. All children were assessed for vision and hearing acuity, oral health status, height, and weight. We employed case management principles including oral health guidance to families and assistance in making appointments.

At each visit, we provided a letter to parents and oral health supplies for home and supervised twice-daily classroom brushing. Services were free of charge to families; however, Montana

Medicaid was billed for those with public insurance.

PLACE, TIME, AND PERSONS

The goals of Tribal Head Start are to offer preschool nutrition services and family support services for low-income children three to five years of age who live on Native American lands. Children in the study ($n = 475$) attended the Northern Cheyenne Tribal Head Start program between 2018 and 2022. The Northern Cheyenne Nation, home to 5000 Montana residents, includes parts of Rosebud and Big Horn counties, both designated as dental professional shortage areas.¹

PURPOSE

ECC (commonly known as tooth decay), the most prevalent infectious disease

among children, is rooted in both individual and environmental factors.² The prevalence of ECC is high among preschool-aged children across the United States but as much as five times higher among AI/AN preschoolers than among preschoolers in general.^{3,4} In addition, AI/AN children have decay that presents earlier and is more severe.³

Although the epidemiology of ECC among indigenous children is complex, access to care is the most glaring obstacle to oral health in Montana's AI communities. Eleven of Montana's 56 counties lack a residing dentist, and 86 locations are designated dental shortage areas.¹ In response, the American Academy of Pediatrics³ and the State of Montana Oral Health Strategic Plan⁵ have recommended integration of oral health education, preventive care, and an interdisciplinary approach involving the Special Supplemental Nutrition Program for Women, Infants, and Children; Head Start; and other maternal and child programs.⁶ Further recommendations include workforce expansion^{7,8} and having allied health care providers operate to their full scope of practice.^{9,10}

EVALUATION AND ADVERSE EFFECTS

Our team visited classrooms during the fall, winter, and spring of each year except during 2020–2021, when we visited only twice because of the pandemic. We provided 313 cleanings, 442 fluoride varnish applications, 801 sealant placements or repairs, and 99 applications of silver diamine fluoride for 475 preschoolers. We referred 161 children, of whom 123 completed treatment (76.4%; 59 boys).

The median number of days between referral and treatment improved over the project period from 166 days to 58.3 days (Figure 1 and Table A, available as a supplement to the online version of this article at <http://www.ajph.org>). Outdated telephone numbers, long distances to dentists, and disappointment when the first appointment is a consultation rather than treatment are ongoing challenges to prompt treatment.

ECC rates (mean = 58.7%; SD = 4.0%) remained stable over the project period relative to the baseline rate of 57.4%

and remained below the 71.3% national average among AI/AN children three to five years old. This rate was above the 24.9% rate among White children.⁴ The average untreated caries rate was 33.8% (SD = 10.7%), which was below the 37.7% baseline rate, below the 43.4% national average among AI/AN children three to five years of age, and higher than the 10.0% rate among White children.⁴ Untreated caries rates stayed below the national benchmark for the first eight visits but exceeded the national average for the final three visits (with rates of 62.9%, 53.6%, and 46.7%), when supervised classroom toothbrushing was suspended during the COVID-19 pandemic (Figure 2). The associated increase in caries rates is noteworthy. New guidance for reopened classroom toothbrushing emphasizes safety for children and staff with children brushing at their desks rather than at the sink.¹¹ This not only reduces transmission of droplets but increases the time fluoride is on the teeth.

The program offered benefits for students as well as the Head Start

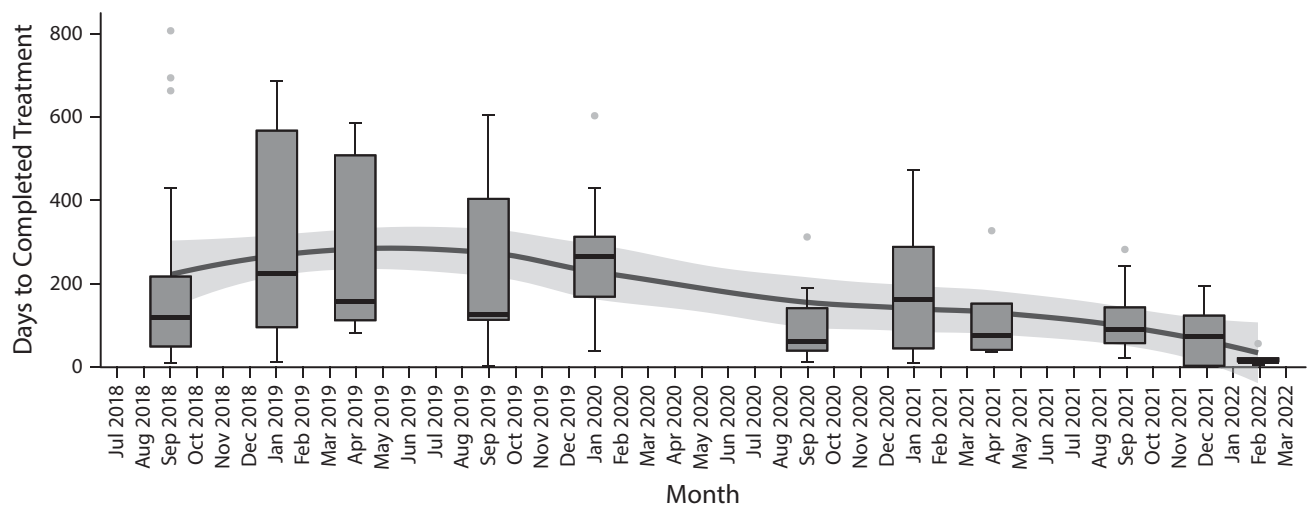


FIGURE 1— Variations in Time to Treatment Among Northern Cheyenne Nation Head Start Children Referred to Dental Treatment: Montana, 2018–2022

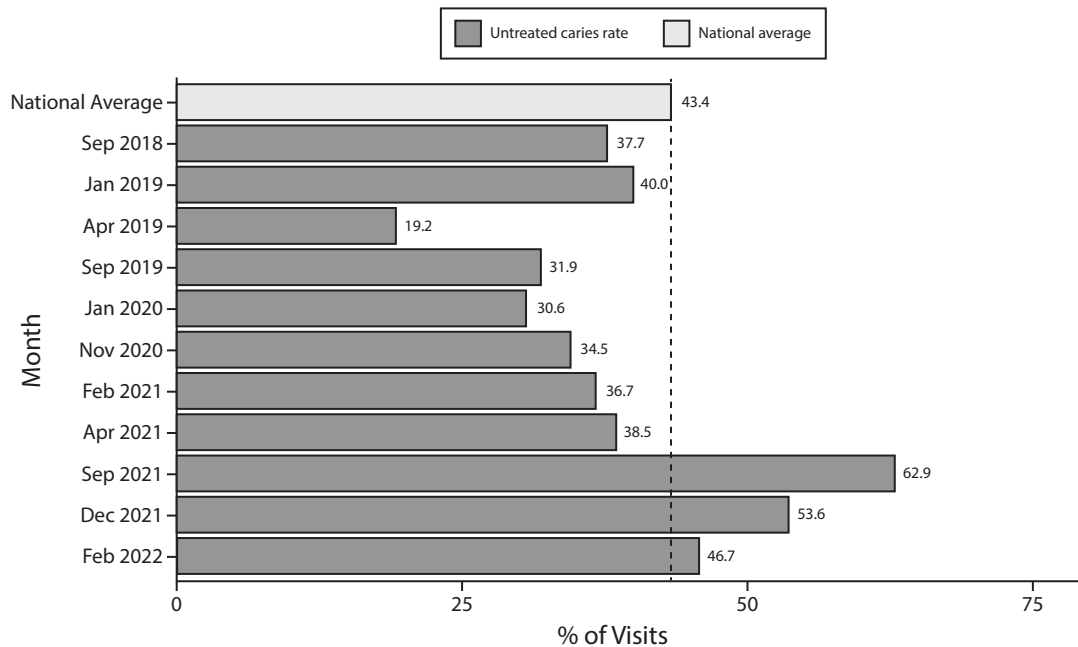


FIGURE 2— Untreated Caries Rates Among Northern Cheyenne Nation Head Start Children, by Visit, Relative to the 2019 National Average: Montana, 2018–2022

Note. In April 2019, the classroom caries rate was 19.2%, which was 24.2 percentage points less than the national benchmark.⁴

program. At the outset of the project, the Head Start program was challenged to meet health program performance standards. Today, the program is in compliance with completion rates for medical examinations (74%), hearing examinations (79%), vision screenings (81%), and dental screenings (82%).¹²

SUSTAINABILITY

Our integrated team of nursing students, nurse practitioners, dental hygienists, and tribal leaders was able to establish a sustainable model that is expanding to three other AI communities in the new project period (2022–2026). Our team will grow to include an educational therapist and a psychiatric mental health nurse practitioner to help Head Start comply with required developmental assessments and interventions.

The Northern Cheyenne Nation invited us to provide school-based care

in its kindergarten through 12th-grade classrooms, where wrap-around services can be enhanced with monthly clinics. These expansions are funded through a combination of federal, state, and private grants, but we see this as a transitional measure. The tribal health department is currently activating an agreement in which it will contract with the Indian Health Service to independently provide health care services using the provisions of the Indian Self Determination Act. With planning for this transition under way, the department will be able to conduct third-party billing for these school-based services while contracting with the nurse-led interprofessional team to provide care.

PUBLIC HEALTH SIGNIFICANCE

Two lessons from this study suggest that community-based research can

result in immediate action, far earlier than upon dissemination of results. First, one sociopolitical effect of this study occurred when the state of Montana expanded the authorization to apply silver diamine fluoride to limited-access permit-endorsed dental hygienists operating under general supervision of the team dentist. Our inaugural application of silver diamine fluoride was in September 2019, and the results demonstrate that enhancing the autonomy of dental hygienists is both safe and effective. Second, because of the COVID-19 pandemic, we successfully implemented the use of teledentistry to address gaps in access to care among AI children enrolled in a Head Start program in a rural area.

The results from our study support the hypothesis that receipt of care from the interprofessional team would have reduced Head Start preschool children's time to treatment by a

dentist after identification of ECC. Reduced time to treatment is significant in that it reflects reduced pain from dental caries along with other effects of ECC on young children such as eating disturbances, speech and language issues, school attendance, and missed work for parents.

Our study demonstrated the success of an interprofessional team in providing critical dental services. The partnership among tribal communities, university researchers, and clinicians has served as a model for this program to grow across the state of Montana. Since initiation of the intervention, we have reached four tribal nations and prepared five campuses of nursing students for rural practice. We have developed a curriculum addressing social determinants of health, medical-dental integration, and multicultural care. In the literature,^{3,6,10} effectiveness of mobile dental units partnering with schools and Head Start programs has a convincing evidence base. Our results suggest that interprofessional teams with members operating to their full scope of practice not only provide missing pieces to the puzzle of access to dental care in rural areas but bring oral health into the whole picture of school readiness, overall health, and general well-being. *AJPH*

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CONTRIBUTORS

L. S. Larsson originated the study, collected and analyzed the data, wrote the results section, and revised and edited drafts of the article.

C. Hodgson wrote the review of literature, methods, and implications sections and revised and edited drafts of the article.

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CONFLICTS OF INTEREST

The authors have no potential or actual conflicts of interest to disclose.

HUMAN PARTICIPANT PROTECTION

Informed consent documents and the research process were approved by Chief Dull Knife College and Montana State University.

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