The Oral Health of Montana's Kindergarten Children, 2021-2023

QUICK FACTS

- 46% children had a history of tooth decay.
- 19% had untreated tooth decay.
- Children in schools with over 75% participation in the NSLP had significantly higher tooth decay and untreated decay.
- Since the last survey in 2015-2016, there have been no significant changes in the dental health of Montana's kindergarten children.

Overall Recommendation

The findings support the continued need for early preventive dental care. Because teeth develop before birth and start to appear in the mouth when a child is about 6 months of age, efforts to prevent tooth decay must start during pregnancy and continue throughout childhood.

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Tooth decay is a serious public health problem that can affect a child's overall health and well-being. It can lead to pain and disfigurement, low self-esteem, nutritional problems, and lost school days. Children with oral health problems are three times more likely to miss school due to dental pain, and absences caused by pain are associated with poorer school performance.[1] Even though tooth decay can be prevented, many children in Montana still get cavities. To assess the current oral health status of Montana's young school children, the Montana Department of Public Health and Human Services coordinated a statewide oral health survey of kindergarten children attending Montana's public schools. A total of 1,015 kindergarten children received a dental screening at 29 schools during the 2021-2022 and 2022-2023 school years. This data brief presents information on the prevalence of tooth decay in the primary and permanent teeth of Montana's kindergarten children compared to the general 5-year-old U.S. population screened between 2011-2016 as part of the National Health and Nutrition Examination Survey (NHANES). It also describes oral health disparities and trends since Montana's last kindergarten oral health survey in 2015-2016.

Data source and methods

The survey assessed the oral health of kindergarten children from a representative sample of Montana's non-virtual public schools. The sampling frame consisted of all non-virtual public schools with 10 or more children in kindergarten.

To assure representation by urbanicity and socioeconomic status, the sampling frame was ordered by county population density (metropolitan, micropolitan, non-core) then by the percentage of students in each school eligible for the National School Lunch Program (NSLP). A systematic probability proportional to size cluster sampling scheme was used to select a sample of 33 schools. If a school declined to participate, efforts were made to screen a replacement school randomly selected from the same

sampling interval. Children were screened at 29 schools; three metropolitan and one non-core school did not participate. Of the 1736 kindergarten children enrolled in the 29 participating schools, 1015 were screened for an overall response rate of 58%.

The following information was collected for each child: presence of untreated decay, presence of treated decay, and urgency of need for dental care. The Basic Screening Survey clinical indicator definitions and data collection protocols was used for data collection.[2]

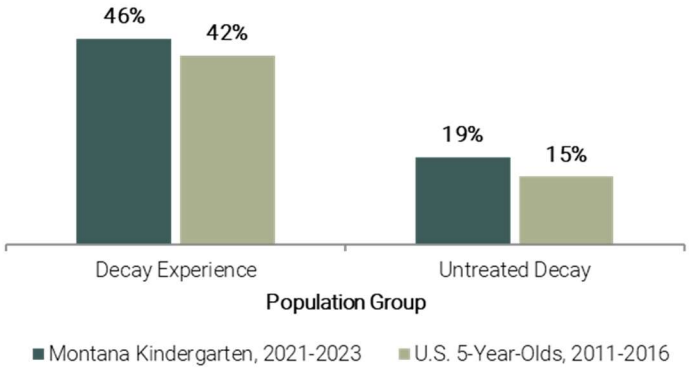
All statistical analyses were performed using the complex survey procedures within SAS (Version 9.4; SAS Institute Inc., Cary, NC). Sample weights were used to produce population estimates based on selection probabilities. It should be noted that the National Health and Nutrition Examination Survey (NHANES) data for 5-year-old children is from 2011-2016 which, as of February 2023, is the most current data available.

Prevalence of decay experience and untreated decay

Decay experience means that a child has had tooth decay in the primary (baby) and/or permanent (adult) teeth in his or her lifetime. Decay experience can be past (fillings, crowns, or teeth that have been extracted because of decay) or present (untreated tooth decay or cavities). In 2021-2023, 46% [95% confidence interval (CI): 39.9-51.8] of kindergarten children in Montana had decay experience; higher than the national average for 5-year-olds, 42.1% (CI:35.9-48.5).

Left untreated, tooth decay can have serious consequences, including needless pain and suffering, difficulty chewing (which compromises children's nutrition and can slow their development), difficulty speaking and lost days in school. About 19% (CI:14.7-24.1) of Montana's kindergarten children had untreated tooth decay; higher than the national average of 15% (CI:11.9-18.7) for 5-year-old children in the general U.S. population (NHANES, 2011-2016, Figure 1).

Figure 1. Percentage of Montana kindergarten children with decay experience and untreated decay compared to 5-year-old children in the general U.S. population.

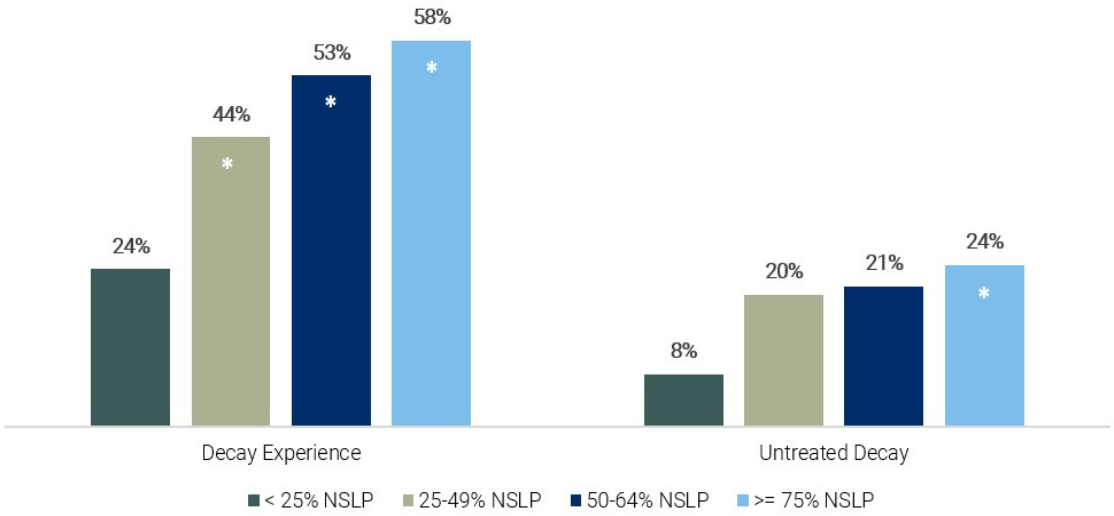


Oral health disparities

In Montana, children attending lower income schools, schools where 75% or more are eligible for National School Lunch Program (NSLP), have a significantly higher prevalence of both decay experience and untreated tooth decay compared to children attending the highest income schools (< 25% eligible for NSLP). To be eligible for NSLP, children must live

in a household with an annual income below 185% of the federal poverty level (Figure 2 and Table 1).

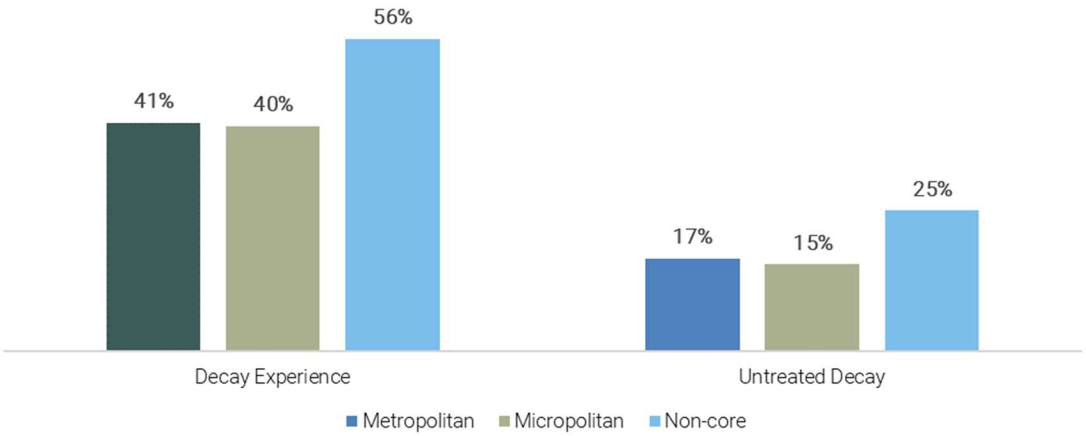
Figure 2. Prevalence of decay experience and untreated tooth decay among Montana's kindergarten children by percentage of students in schools eligible for the National School Lunch Program (NSLP), 2021-2023.



* Significantly higher than < 25% NSLP (p<0.05)

When compared to children living in Montana's metropolitan and micropolitan counties, children living in Montana non-core counties have a higher prevalence of decay experience and untreated tooth decay, but the difference is not statistically significant (Figure 3, Table 1).

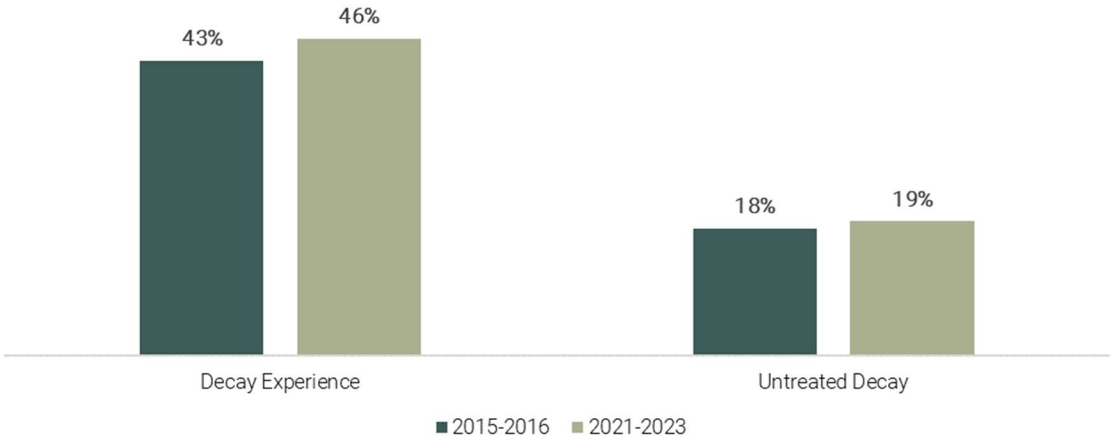
Figure 3. Prevalence of decay experience and untreated tooth decay among Montana's kindergarten children by county population density, 2021-2023.



Trends

The Montana Department of Public Health and Human Services conducted a similar kindergarten oral health survey during the 2015-2016 school year. The percentage of Montana's kindergarten children with decay experience and untreated decay has not changed significantly over the past seven years (Figure 4, Tables 2 & 3).

Figure 4. Prevalence of decay experience and untreated tooth decay among Montana's kindergarten children by survey year, 2015-16 and 2021-2023.



Recommendations

The results of the survey highlight the need for improvements in the oral health of children living in Montana. Access to culturally appropriate, community-based prevention programs, screening and referral services, and preventive and restorative dental care must be improved. Several strategies have been identified in the Montana Oral Health Strategic Framework developed by oral health stakeholders.

- Improve access to preventive and restorative dental care.
- Provide education and preventive services in non-dental settings such as primary care, Women, Infants and Children (WIC) Supplemental Nutrition Program, Early Head Start, Head Start, home visiting and other early childhood programs geared toward children 0-5 years of age and pregnant women.
- Utilize new dental technology, silver diamine fluoride and self-assembling peptides, to prevent and re-mineralize areas of decay without invasive procedures (drill and filling).

Because teeth develop before birth and start to appear in the mouth when a child is about 6 months of age, efforts to prevent tooth decay must start during pregnancy and continue throughout childhood.

Definitions

Untreated decay: dental cavities or tooth decay that have not received appropriate treatment.

Decay experience: untreated decay or a dental filling, crown, or other type of restorative dental material. Also includes teeth that were extracted because of tooth decay.

References

1. Jackson SL, Vann WF Jr, Kotch JB, Pahel BT, Lee JY. Impact of poor oral health on children's school attendance and performance. Am J Public Health 2011;101:1900-6.
2. Association of State and Territorial Dental Directors. Basic screening surveys: an approach to monitoring community oral health. Available at: http://www.astdd.org/basic-screening-survey-tool.

Data Tables

Table 1. Percentage of Montana's kindergarten children with decay experience and untreated tooth decay by selected characteristics, 2021-2023

Characteristic	Decay Experience			Untreated Decay		
	Percentage Yes	Lower 95% CL	Upper 95% CL	Percentage Yes	Lower 95% CL	Upper 95% CL
ALL CHILDREN	45.8	39.9	51.8	19.4	14.7	24.1
Gender						
Female	40.9	32.0	49.8	16.6	11.3	21.9
Male	51.1	43.7	58.5	22.4	16.6	28.2
NSLP Participation						
< 25% of students	23.7	16.5	30.8	7.8	2.0	13.6
25-49% of students	43.6	37.3	49.9	19.9	13.1	26.8
50-74% of students	52.9	46.6	59.1	21.1	9.7	32.5
≥ 75% of students	58.2	42.7	73.7	24.3	13.5	35.1
Population Density						
Metropolitan	40.6	28.9	52.2	16.5	8.6	24.5
Micropolitan	40.0	32.5	47.6	15.4	11.2	19.5
Non-Core	55.6	44.2	66.9	25.0	14.9	35.2

NSLP = National School Lunch Program (also referred to as the Free/Reduced Price Lunch Program)
CL = Confidence Limit

Table 2. Percentage of Montana's kindergarten children with **decay experience** by selected characteristics and survey year, 2015-2016 vs. 2021-2023

Characteristic	2015-2016			2021-2023		
	Percentage Yes	Lower 95% CL	Upper 95% CL	Percentage Yes	Lower 95% CL	Upper 95% CL
ALL CHILDREN	42.6	36.9	48.3	45.8	39.9	51.8
Gender						
Female	40.8	33.6	47.9	40.9	32.0	49.8
Male	44.5	39.1	49.8	51.1	43.7	58.5
NSLP Participation						
< 25% of students	32.1	26.4	37.8	23.7	16.5	30.8
25-49% of students	34.9	28.3	41.6	43.6	37.3	49.9
50-74% of students	53.3	42.4	64.2	52.9	46.6	59.1
≥ 75% of students	64.4	42.2	86.6	58.2	42.7	73.7
Population Density						
Metropolitan	36.6	30.9	42.2	40.6	28.9	52.2
Micropolitan	33.2	26.7	39.6	40.0	32.5	47.6
Non-Core	58.1	43.7	72.5	55.6	44.2	66.9

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Table 3. Percentage of Montana's kindergarten children with **untreated decay** by selected characteristics, 2015-2016 vs. 2021-2023

Characteristic	2015-2016			2021-2023		
	Percentage Yes	Lower 95% CL	Upper 95% CL	Percentage Yes	Lower 95% CL	Upper 95% CL
ALL CHILDREN	18.4	13.6	23.2	19.4	14.7	24.1
Gender						
Female	18.2	12.2	24.1	16.6	11.3	21.9
Male	18.6	13.8	23.4	22.4	16.6	28.2
NSLP Participation						
< 25% of students	9.0	7.1	10.9	7.8	2.0	13.6
25-49% of students	15.9	6.6	25.2	19.9	13.1	26.8
50-74% of students	26.6	16.9	36.3	21.1	9.7	32.5
≥ 75% of students	24.9	12.9	36.9	24.3	13.5	35.1
Population Density						
Metropolitan	10.8	6.5	15.0	16.5	8.6	24.5
Micropolitan	12.4	7.0	17.8	15.4	11.2	19.5
Non-Core	32.3	20.2	44.4	25.0	14.9	35.2

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