

WISCONSIN — DEPARTMENT OF HEALTH SERVICES



**2013 — Healthy Smiles / Healthy Growth
Wisconsin's Third Grade Children**



ACKNOWLEDGEMENTS

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For additional information on the Wisconsin Oral Health Program, please visit the website at http://dhs.wisconsin.gov/health/Oral_Health/

For additional information on the Wisconsin Nutrition, Physical Activity and Obesity Program, please visit the website at <http://www.dhs.wisconsin.gov/physical-activity/>

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TABLE OF CONTENTS

Executive Summary 3

Introduction 5

Methods 9

Results 12

Conclusions 26

Data Tables 28

References 35

Appendix A: Department of Health Services Public Health Regions 37

Appendix B: CDC Growth Charts 38

Appendix C: Number of Outlier Values 40





During the 2012-13 school year, the Wisconsin Department of Health Services, completed the *Healthy Smiles / Healthy Growth*, a statewide survey on the oral health and height / weight status of Wisconsin's third grade children. More than 2,800 third grade children in public schools participated in the survey. Dental screenings and height / weight measurements were completed by dental hygienists and dentists following the protocol of a Basic Screening Survey from the Association of State and Territorial Dental Directors. Results were compared to similar surveys conducted in 2001-02 and the 2007-08 school years. Overall, it was found that in the 2012-13 school year, tooth decay and obesity continue to be a problem for Wisconsin's children. Seven key findings were identified.

Key Findings – Oral Health

- Tooth decay is a significant public health problem, as 53 percent of Wisconsin third grade children have caries experience.
- Over 18 percent of Wisconsin third grade children have untreated dental decay and three percent have an urgent condition causing pain and / or infection. While this is an improvement over previous surveys, there are still approximately 2,000 Wisconsin third graders in public schools requiring urgent dental care because of pain or infection.

- Over 60 percent of third grade children in Wisconsin have at least one dental sealant on a permanent molar. This is an improvement over previous surveys and a positive finding as dental sealants are a well-accepted clinical intervention to prevent dental caries.
- The oral health disparity gap seems to be shrinking for access to dental sealants as children of all races and socioeconomic groups have similar levels of dental sealants. The school-based sealant programs are likely to play a major role in expanding availability of dental sealants to all children.

Key Findings – Growth Status

- Seventeen percent of Wisconsin third grade children are obese; and one-third of children are either overweight or obese.
- Children who attend schools with high levels of Free / Reduced Meals Program (FRMP) eligibility have greater rates of obesity. Children attending schools with the highest level of FRMP (≥ 75 percent) had the highest level of children who were classified as obese (27 percent).
- Overweight and obesity differ among Wisconsin's racial and ethnic groups. Third grade children of racial and ethnic minority groups had higher levels of overweight and obesity in comparison to White children during both measurement periods. Overall, 14 percent of White, 21 percent of African American, 30 percent of Hispanic / Latino, 17 percent of Asian, and 21 percent of Other children were classified as obese during 2012-13 school year.



INTRODUCTION

"...Oral health refers to the health of our mouth, and ultimately, supports and reflects the health of the entire body."¹

Surgeon General Regina M. Benjamin

Tooth decay (dental caries) is an infectious disease and is the most common chronic disease of children, with approximately 42 percent of children aged 2-11 years having dental caries in their primary teeth.² Dental caries affects both children and adults, but there is also a strong body of evidence that it is one of the most preventable diseases. During childhood, tooth decay is the single most common chronic disease, four times more common than asthma and seven times more common than hay fever.³ Tooth decay still affects more than half of all children by the third grade and by the time children finish high school, about 80 percent have decay.³ Many believe that tooth decay is a natural and minor occurrence that deserves little attention or program funding. If left untreated, however, tooth decay can lead to difficulty speaking, chewing and swallowing; loss of self-esteem; needless pain; and lost school days.





Poor dental health can be associated with missed school days. It has been estimated that more than 54 million school hours are lost yearly because of dental disease.⁴ More recent reports validate that poor oral health increases the likelihood of missed school days. A 2011 study of North Carolina children reported that children with poor oral health status were nearly three times more likely to miss a school day due to dental pain as compared with children with good oral health.⁵ A 2012 study of Los Angeles disadvantaged children, reported an average of 2.2 absent days per school year for dental problems, and parents averaged 2.5 absent days from work per year because of their children's dental problems.⁶ Poor oral health status can be associated with more than just dental cavities as children with acute oral health problems are more likely to feel worthless, shy, unhappy and depressed and are less likely to make friends than those without oral health problems.⁷ Teachers often do not correlate the effects of pain, anxiety, fatigue, irritability, depression and withdrawal from activities, to an oral health problem.⁸

The mouth reflects general health and well-being. Studies point to associations between oral infections and diabetes, heart disease, stroke, and preterm and low-weight births.³ While the prevalence and severity of tooth decay has declined among U.S. school-aged children, it remains a significant problem in some populations – particularly certain racial and ethnic groups and low-income children.

“Obesity continues to be a major public health problem. We need intensive, comprehensive and ongoing efforts to address obesity. If we don’t, more people will get sick and die from obesity-related conditions, such as heart disease, stroke, type 2 diabetes and certain types of cancer – some of the leading causes of death.”¹²

Thomas R. Frieden, MD, MPH
Director, Centers for Disease Control and Prevention

Low-income children and racial and ethnic minority groups have more untreated decay than the U.S. population as a whole. National data for the combined years of 2007 to 2010 indicate that 15.6 percent of children ages 6 to 19 years have untreated dental caries in the U.S. White children have the lowest rates of 12.8 percent while 22.4 percent of African American children and 21.9 percent for Mexican American children have untreated dental caries. Additionally those below 100 percent of the poverty level have a rate of 24.7 percent.⁹

In addition to untreated decay, the survey assessed the presence of dental sealants on first molars. Dental sealants are an evidence-based preventive procedure that the Wisconsin Oral Health Program supports. The Wisconsin Seal-A-Smile program is a collaborative effort between Children’s Health Alliance of Wisconsin (CHAW) and the Wisconsin Department of Health Services (DHS). The mission of the Wisconsin Seal-A-Smile Program is to improve the oral health of Wisconsin children through school-based / school-linked dental sealant programs. There are numerous meta-analyses and systematic reviews that confirm the effectiveness of dental sealants in preventing cavities in the occlusal (biting) surfaces of molar teeth.¹⁰⁻¹¹

Oral health is an integral part of overall health. Not all children experience the same levels of dental health, even though most dental disease is preventable and there are evidence-based strategies to prevent dental disease. The school-based sealant programs have been shown to be effective by removing barriers to accessing dental sealants and providing fluoride varnish to children at increased risk for dental disease.

Wisconsin mirrors the nation in the childhood overweight and obesity public health crisis. Childhood obesity has more than doubled in children and tripled in adolescents in the past 30 years.¹³⁻¹⁴ Two measurements of Wisconsin third grade children's weight (2008, 2013) indicate overweight and obesity is a public health problem in Wisconsin. Studies reveal that being overweight or obese has a profound impact on children's health throughout their lives.

The immediate problems caused by obesity include high blood pressure, high cholesterol, impaired glucose tolerance, insulin resistance and type 2 diabetes. All of the complications associated with obesity are risk factors for heart disease and diabetes. Obese children and adolescents have a greater risk of social and psychological problems such as discrimination and poor self-esteem, which can continue into adulthood.¹⁵ Obese children are more likely to become obese adults.¹⁶⁻¹⁸ Children who are overweight or obese as preschoolers are five times as likely, as normal-weight children, to be overweight or obese as adults. Adult obesity is associated with a number of serious health conditions including heart disease, diabetes, and some cancers. If children are overweight, obesity in adulthood is likely to be more severe.¹⁹⁻²⁰

The third grade survey of children's height and weight measurements provided an opportunity to monitor overweight and obesity rates in Wisconsin. There are surveillance systems in place to monitor younger and older children, but a gap existed for school-aged children. Low income children enrolled in the Women, Infants and Children Supplemental Nutrition Program (WIC), have routine height and weight measurements. In 2011, 17 percent of these children aged 2 to 4 years were classified as overweight, while 14 percent were classified as obese, with wide variation among racial and ethnic groups.²¹ The Youth Risk Behavior Survey (YRBS) found that 15 percent of high school students reported information that classified them as overweight, and 10 percent were classified as obese.²² The Nutrition, Physical Activity, and Obesity Prevention Program staff welcomed an opportunity to partner with the Oral Health Program to add a height and weight measurement as a component of the third grade survey to have a sample of overweight and obesity trends for school-aged children.

METHODS



Healthy Smiles / Healthy Growth included a representative sample of third grade students in Wisconsin public schools. All public schools with at least 10 children enrolled in third grade during the 2011-12 school year were included in the sampling frame, which contained 1,055 schools and 59,336 students. The sampling frame was stratified by the Wisconsin DHS five public health regions (Appendix A) and ordered within each region by the percent of students eligible for the Free / Reduced Meals Program (FRMP) program. FRMP participation rates are used as a surrogate for income. Probability proportional to size sampling was used to randomly select programs within each region. In all regions except the Northern region, eight percent of schools were selected. The Northern region is less populated and was oversampled, with ten percent of schools selected instead of eight, to ensure an adequate sample size for regional estimates. Passive consent was used for all schools except for three, which required active consent to participate. Parents were able to opt out of either portion of the survey or out of both.

If a school refused to participate, another school in that region with a similar FRMP eligibility rate was randomly selected as the replacement. If the replacement school refused to participate, there were no additional efforts to replace that school. Initially 90 schools were selected to participate and each school represented a strata.

Dentists and dental hygienists completed the screenings using gloves, flashlights, and disposable mouth mirrors. The diagnostic criteria outlined in the Association of State and Territorial Dental Director's publication *Basic Screening Surveys: An Approach to Monitoring Community Oral Health: Preschool & School Children* were used. The hygienists and dentists attended a training session, which included a review of the dental diagnostic criteria (Table 1), and the standardized protocols and specialized equipment for obtaining and recording the height and weight measurements (anthropometric procedures), with a hands-on calibration session.

Table 1: Basic Screening Survey Indicator Definitions

Basic Screening Survey Indicator	Definition
Treated Decay	The presence of any type of filling, including temporary fillings. Treated decay also includes teeth that were extracted due to decay.
Untreated Decay	The presence of a dental cavity (caries) in which the screener can readily observe breakdown of the enamel surface. This protocol only includes cavitated lesions as untreated decay.
Caries Experience	This is a calculated indicator from treated decay and untreated decay. All children with either treated or untreated decay or both have caries experience.
Urgency of Need for Dental Care	Children with no obvious problems were coded as having no treatment needs. Children with untreated decay without accompanying signs or symptoms of pain, infection, or swelling were coded as having early treatment needs, while those with accompanying signs or symptoms were coded as having urgent treatment needs.
Dental Sealants	The presence of at least one sealant on a permanent molar tooth. The sealant can cover all or part of the pits or fissures or can be partially lost and is still counted.

Demographic indicators including date of birth, gender, and race / ethnicity were obtained from school records. Due to small numbers among American Indian/Alaska Native, Native Hawaiian / Pacific Islander, and multi-racial groups these responses were combined with those who were missing race / ethnicity into an Other category for analysis and reporting.

At the schools, the screeners and staff collected a child's height using a portable stadiometer. Two height measurements, within 1/4 inch, were obtained for each child, and the average of the two was recorded. The two height measurements increase the validity of the Body Mass Index (BMI) calculations. Body weight was measured using an electronic digital scale and the average of two readings

within 0.2 pounds was recorded. Children removed shoes, coats, and bulky outerwear for weight measurements. DPH staff calculated the children's BMI categories from the height and weight measurements. BMI is a reliable indicator of body fatness for most children; it is age-and sex-specific. BMI does not measure body fat directly, but can be considered an alternative for direct measures of body fat.

The data were adjusted to account for the complex sampling scheme and non-response. Data analysis, which included frequencies, cross tabulations, logistic regression, and 95 percent confidence intervals, was completed using SAS versions 9.2 and 9.3. BMI analysis was based on CDC sex-specific BMI-for-age growth charts to plot the BMI on the growth charts (for either girls or boys) as shown in Appendix B.²³ This resulted in a BMI percentile ranking for each child in the sample. Percentiles are the most commonly used indicator to assess size and growth patterns. The percentile indicates the relative position of the child's BMI number among children of the same sex and age. Table 2 displays the BMI-for-age and weight status categories and corresponding percentiles. BMI was also evaluated for potential outliers based on values that were too low or too high for height-for-age, weight-for-age, weight-for-height, and BMI-for-age (Appendix C). These fixed exclusion ranges were calculated from the World Health Organization (WHO). All BMI outliers were excluded from analysis. Risk factors, such as sex, age, race, and percent of students eligible for the FRMP program, were evaluated for a possible relationship with childhood overweight and obesity. Bivariate logistic regression analyses were adjusted for age while multivariate logistic analyses were adjusted for sex, age, race, and percent of students eligible for the FRMP program.

Table 2. BMI-for-age, Weight Categories and Definitions

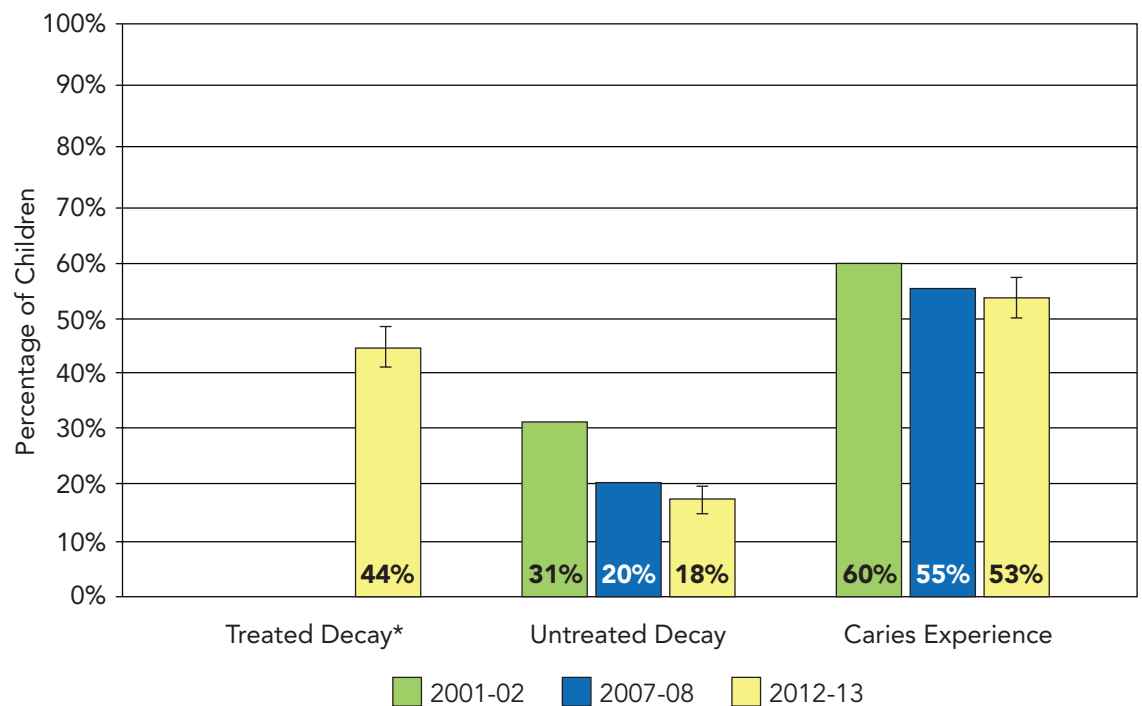
BMI Category	Definition
Underweight	BMI below the 5th percentile
Healthy weight	BMI between the 5th and 85th percentiles
Overweight	BMI between the 85th and 94th percentiles
Obese	BMI at or above the 95th percentiles

The oral health of Wisconsin third grade children was previously reported in similar surveys conducted in 2001-02 and the 2007-08 school years. The reports were titled *Make Your Smile Count, The Oral Health of Wisconsin's Third Grade Children*. Height and weight data were not collected during the 2001-02 survey, but were collected in the 2007-08 survey.

RESULTS

Third grade children were screened at 69 schools from February to May 2013, representing a state-wide sample. A total of 2,832 children participated in the survey, and 2,780 had dental data for analysis, while 2,757 children had height and weight data for analysis. Ninety schools within the five public health regions were selected in the sample. Only 69 schools were able to participate, which is a 77 percent participation rate at the school strata level. At the child level, the total participation rate for all schools was 81 percent. Schools that used passive consent had a participation rate of 84 percent compared to only 38 percent among the three schools requiring active consent.

Figure 1. Percentage of Wisconsin's Third Grade Children with Treated Decay, Untreated Decay, and Caries Experience, 2001-02, 2007-08, and 2012-13.

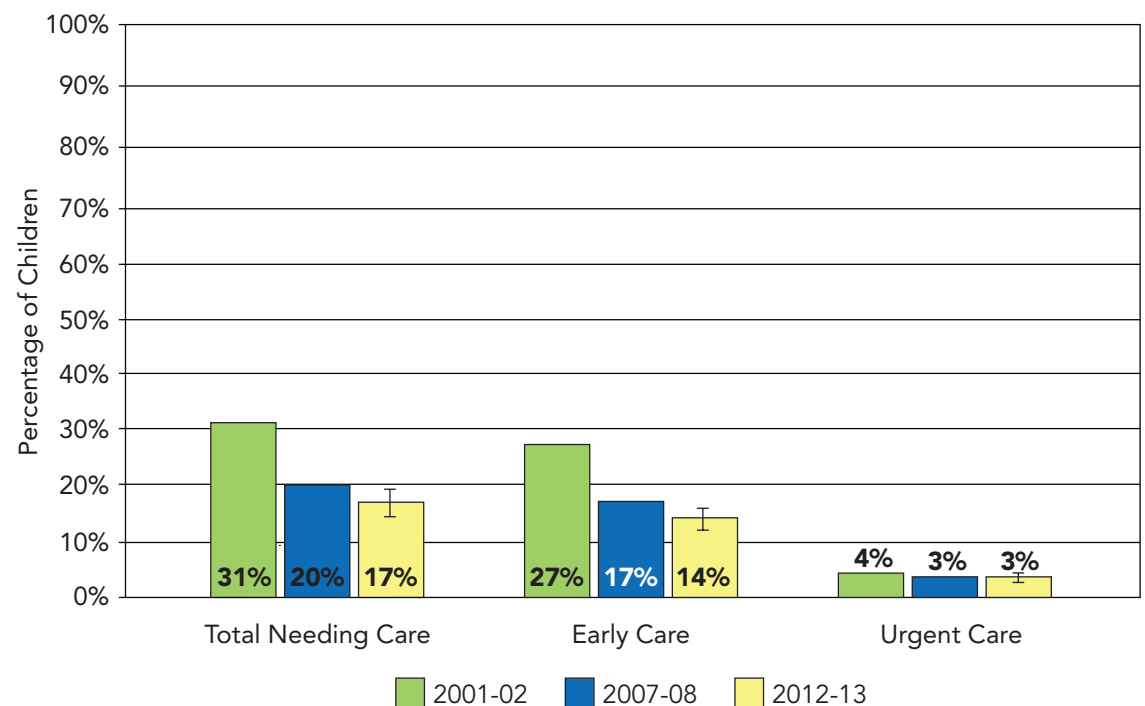


*The BSS protocol did not capture treated decay in previous surveys and thus these data are not available.

Caries experience is a combination of treated and untreated decay in the primary (baby) and / or permanent (adult) teeth. In Wisconsin, the 2012-13 survey found that 53 percent of third graders had caries experience and almost 1 out of 5 had at least one tooth with untreated decay. Additionally, 44 percent of children had treated decay.

Untreated decay among Wisconsin children has decreased from 31 percent in 2001-02, to 20 percent in 2007-08 to 18 percent in the latest survey. Additionally, caries experience has decreased for each of the three surveys to the current level of 53 percent. The reductions in untreated decay and caries experience suggest that third grade children are experiencing less dental decay and those with caries are better able to access dental services.

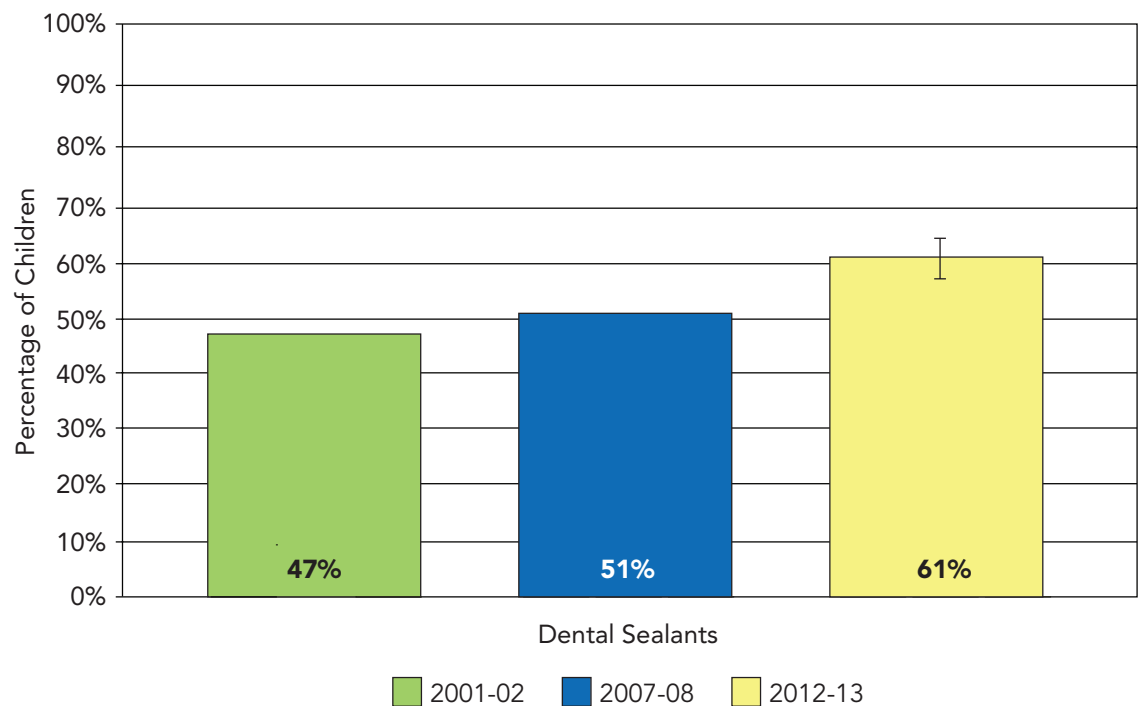
Figure 2. Percentage of Wisconsin's Third Grade Children Needing Early or Urgent Dental Care, 2001-02, 2007-08, and 2012-13.



Seventeen percent of the third grade children screened for the 2012-13 survey required dental care, which means that the child exhibited a dental condition that needed to be addressed by a dentist. Fourteen percent required early care, because the child needed to be seen by a dentist but was not experiencing signs of pain or infection. Three percent of children in the sample were identified as requiring urgent care, meaning that the oral condition usually involves pain or swelling and needs to be addressed within 24 to 48 hours. In 2012-13, there were about 61,000 third grade children in Wisconsin public schools, meaning that approximately 2,000 children in third grade may need urgent dental care because of pain or infection.

The total percent of third grade children needing dental care has decreased from 31 percent in 2001-02, to 20 percent in 2007-08 to 17 percent in the latest survey. Additionally, the percent of children requiring early care has decreased for each of the three surveys to the current level of 14 percent. There have been minimal changes in the percentage of children requiring urgent care. This lack of the change in urgent care is concerning as those children are often in pain and suffering from infections, which if left untreated can result in life-threatening complications.

Figure 3. Percentage of Wisconsin's Third Grade Children with Dental Sealants, 2001-02, 2007-08, and 2012-13.



Dental sealants are plastic coatings applied to the chewing surfaces of back teeth. They are a safe, effective, evidence-based way to prevent tooth decay on the biting surfaces of molar teeth. Sealants have been shown to significantly reduce the risk of developing decay. In Wisconsin, 61 percent of third grade children screened in 2012-13 had at least one dental sealant on their first permanent molars.

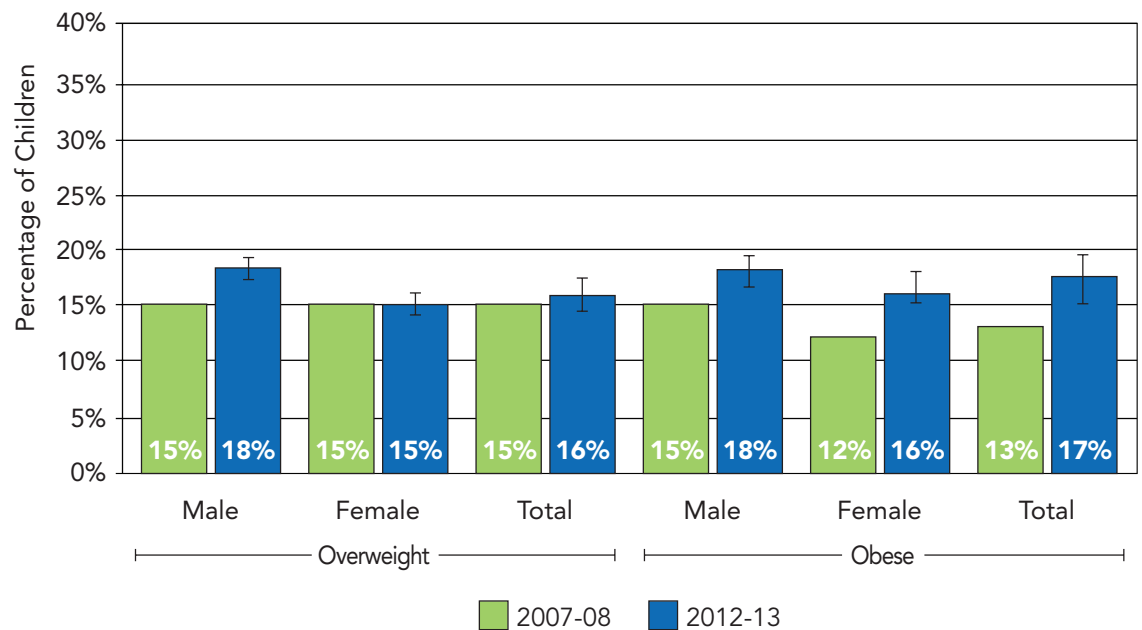
The sharp increase in dental sealants from 47 percent in 2001-02 to the current level of 61 percent suggests that Wisconsin third grade children have increased access to dental sealants from both private and public programs.

The Wisconsin Seal-A-Smile Program is a collaboration between the Department of Health Services Oral Health Program and CHAW. The Wisconsin Seal-A-Smile Program provides dental sealants to children in schools where at least 35 percent of the children qualify for FRMP. In 2012-13, approximately 23,000 dental sealants were placed in the Wisconsin Seal-A-Smile Programs.

The Wisconsin Seal-A-Smile Program has expanded dramatically since the 2000-01 school year. In 2000-01, the program received \$54,000 in funding from General Purpose Revenue (GPR). Total funding for the 2013-14 school year was \$627,212. Just over \$370,000 of funding for the program is from GPR and \$250,000 from Delta Dental of Wisconsin foundation. Additionally, code changes that allow dental hygienists working in public health settings to bill Medicaid have allowed programs to require less Seal-A-Smile Program funding. Accordingly, the number of schools served by the Wisconsin Seal-A-Smile Program has increased from approximately 280 in the 2008-09 school year to almost 550 in the 2012-13 school year.



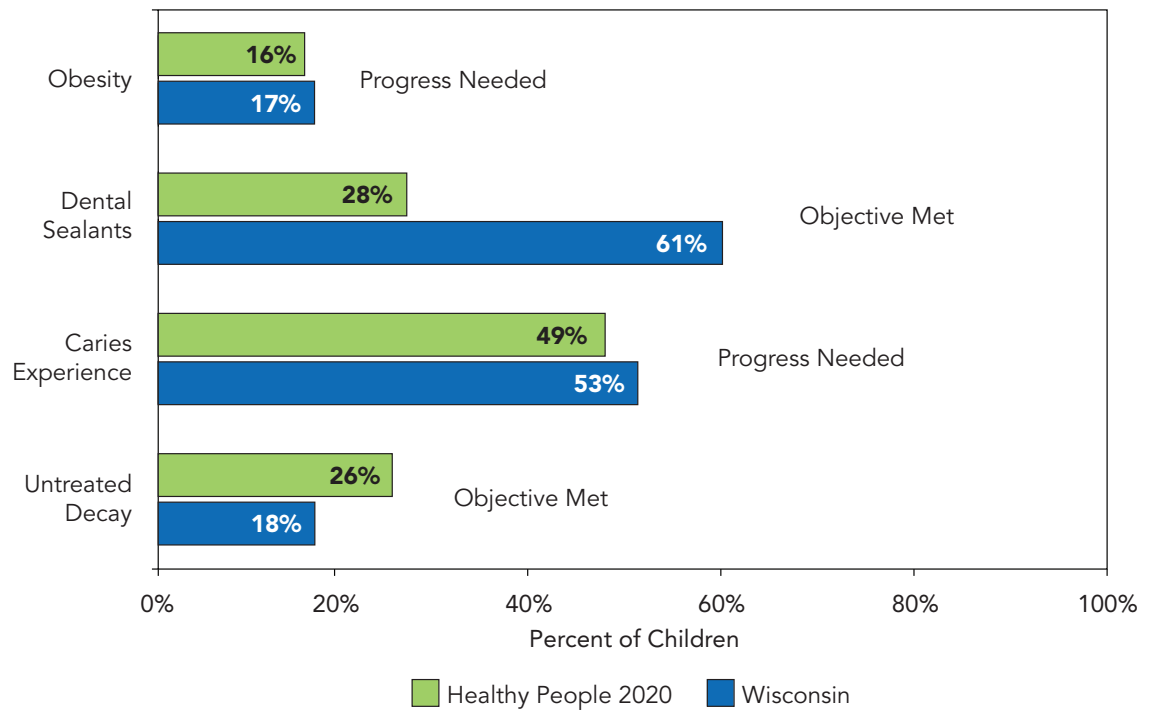
Figure 4. Percentage of Wisconsin's Third Grade Children Who are Overweight and Obese, 2007-08 and 2012-13



Note: Confidence interval bars based on sample standard errors from 2012-13 survey results are included above. The 2007-08 results were not available to derive confidence intervals.

Overall, the results indicate that 17 percent of third grade children are obese; and one-third of children are either overweight or obese. There are small gender differences. The 2012-13 survey results found that 16 percent of children were classified as overweight (18 percent of boys and 15 percent of girls); while 17 percent of children were classified as obese (18 percent of boys and 16 percent of girls). When comparing 2007-08 to 2012-13 survey results, there have been increases in boys who are overweight and obese and girls who are obese.

The survey results assisted in answering questions regarding comparisons of Wisconsin children to the U.S regarding overweight and obesity. A federal, ongoing study that uses actual measurements of height and weight for children aged 6-11 years old found that 20 percent of boys and 16 percent of girls were classified as obese in 2009-10.²⁴

Figure 5. Progress toward Healthy People 2020 Health Objectives.

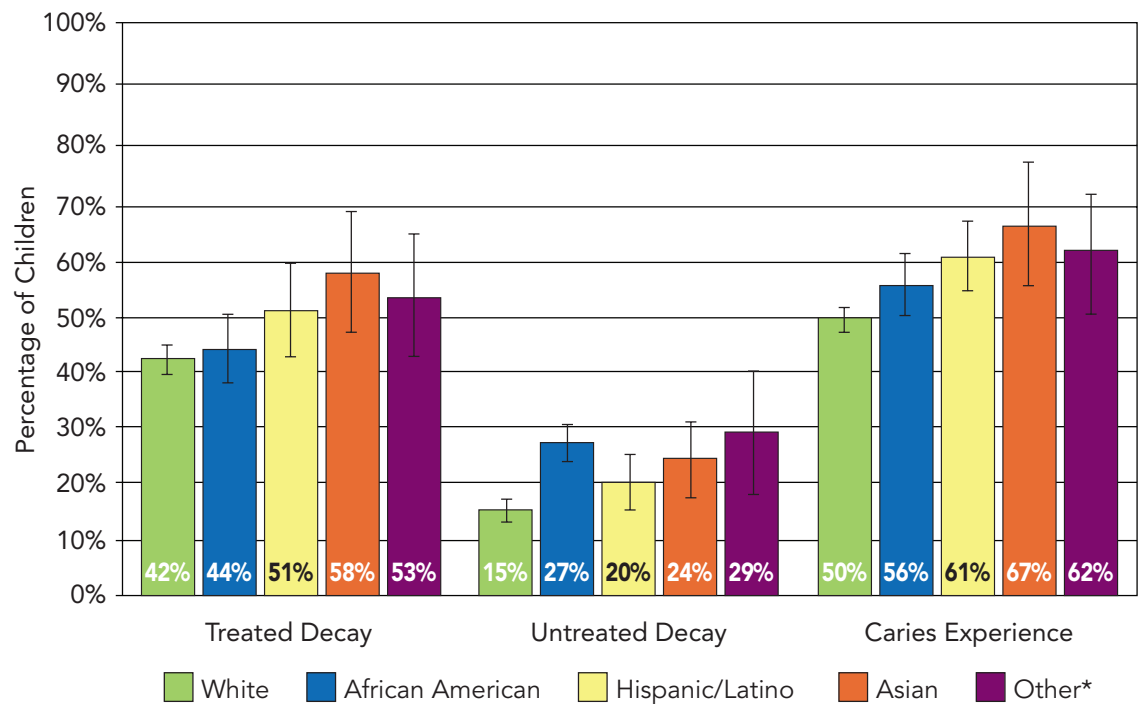
Healthy People 2020 (HP 2020) provides 10-year national objectives for improving the health of Americans. These objectives provide comparison targets for states and communities, HP 2020 contains four objectives relevant to this report and population:

- Reduce the proportion of children aged 6 to 11 years who are considered obese to 16 percent
- Increase the proportion of children aged 6 to 9 years with dental sealants to 28 percent
- Reduce the proportion of children aged 6 to 9 years with caries experience to 49 percent
- Reduce the proportion of children aged 6 to 9 years with untreated decay to 26 percent

Wisconsin has met and exceeded the HP 2020 objectives for dental sealants and untreated decay. The finding that 61 percent of Wisconsin third graders have at least one dental sealant far outpaces the national objective of 28 percent. Additionally, the finding that 18 percent of Wisconsin third graders have untreated

decay is better than the national target of 26 percent. Wisconsin narrowly missed the obesity objective as 17 percent of third graders are obese as compared to the national objective of 16 percent. However significant disparities remain. Wisconsin is just short of the target for caries experience as 53 percent of third grade children had dental caries as compared to the national objective of 49 percent. Though Wisconsin did not meet the caries experience objective, Wisconsin made progress and is on target to meet the objective in the next five-year cycle.

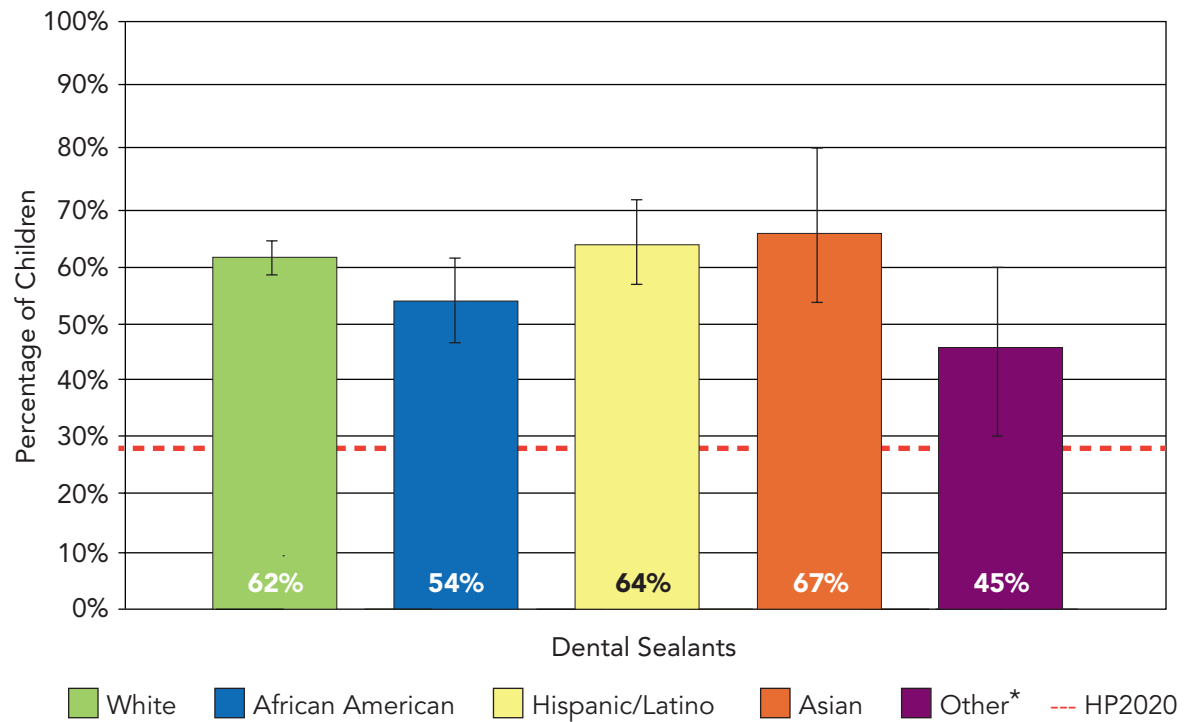
Figure 6. Percentage of Wisconsin's Third Grade Children with Treated Decay, Untreated Decay, and Caries Experience by Race / Ethnicity, 2012-13.



* Other includes: American Indian / Alaska Native, Native Hawaiian / Pacific Islander, multi-racial and unknown.

In Wisconsin, African American, Hispanic / Latino and Asian third grade children have higher caries experience levels as compared to white children. The prevalence of treated decay was highest among Asian children, though the sample size is small for that population. Untreated decay is highest among African American children (27 percent) and children categorized as Other (29 percent) and lowest among White children (15 percent). This finding suggests that children of African American and Other descent may have barriers to receiving dental treatment.

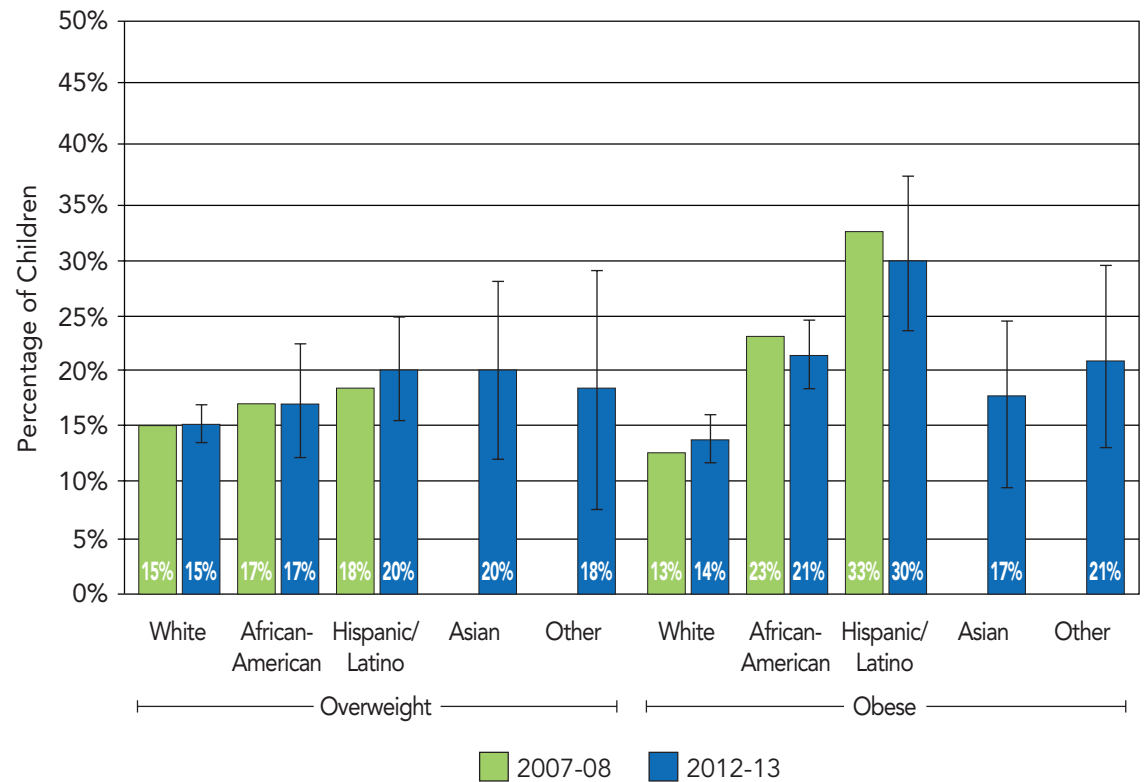
Figure 7. Percentage of Wisconsin's Third Grade Children with Dental Sealants by Race / Ethnicity, 2012-13.



* Other includes: American Indian / Alaska Native, Native Hawaiian / Pacific Islander, multi-racial and unknown.

In Wisconsin, children from all races and ethnicities exceed the HP 2020 target of 28 percent for dental sealants. Almost all groups exceeded 50 percent for dental sealants, which suggests that dental sealants are equally available to children in all socioeconomic classes. The success of dental sealants is due to a combination of private practitioners applying sealants to the patients that they treat, and public school-based sealant programs targeting children attending schools with a high proportion of low income students.

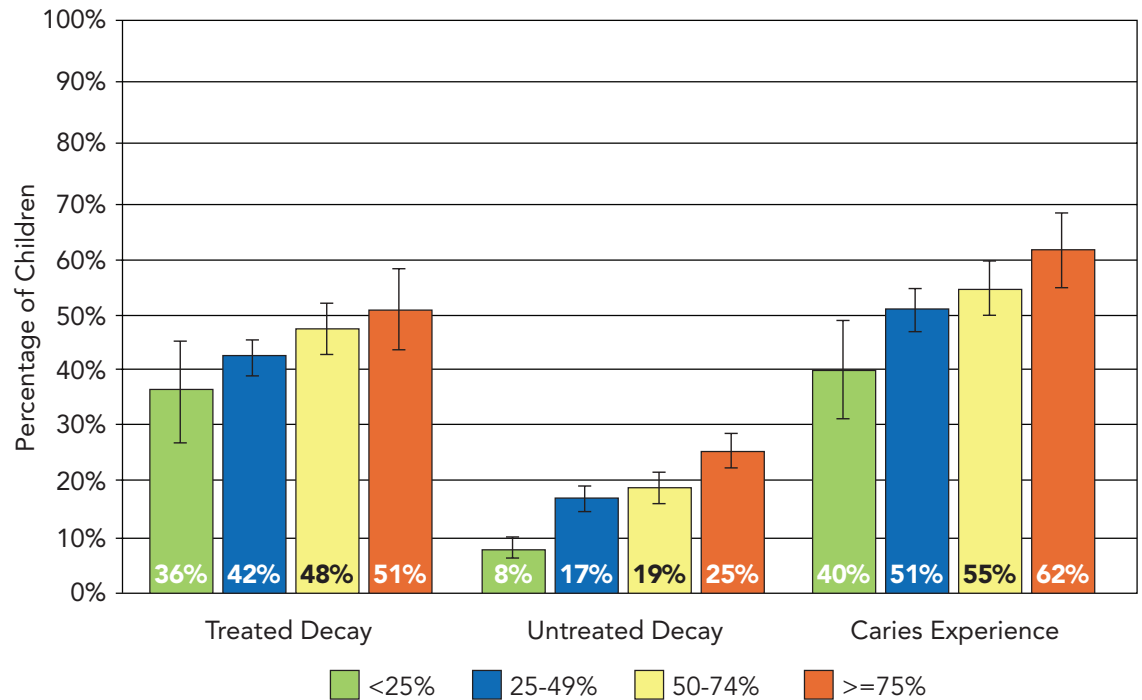
Figure 8. Percentage of Wisconsin Third Grade Children Classified as Overweight and Obese by Race / Ethnicity, 2007-08 and 2012-13



Note: Data were not available for Asian or Other for 2007-08. Large 95% confidence intervals are a result of the small sample size of certain races and ethnicities.

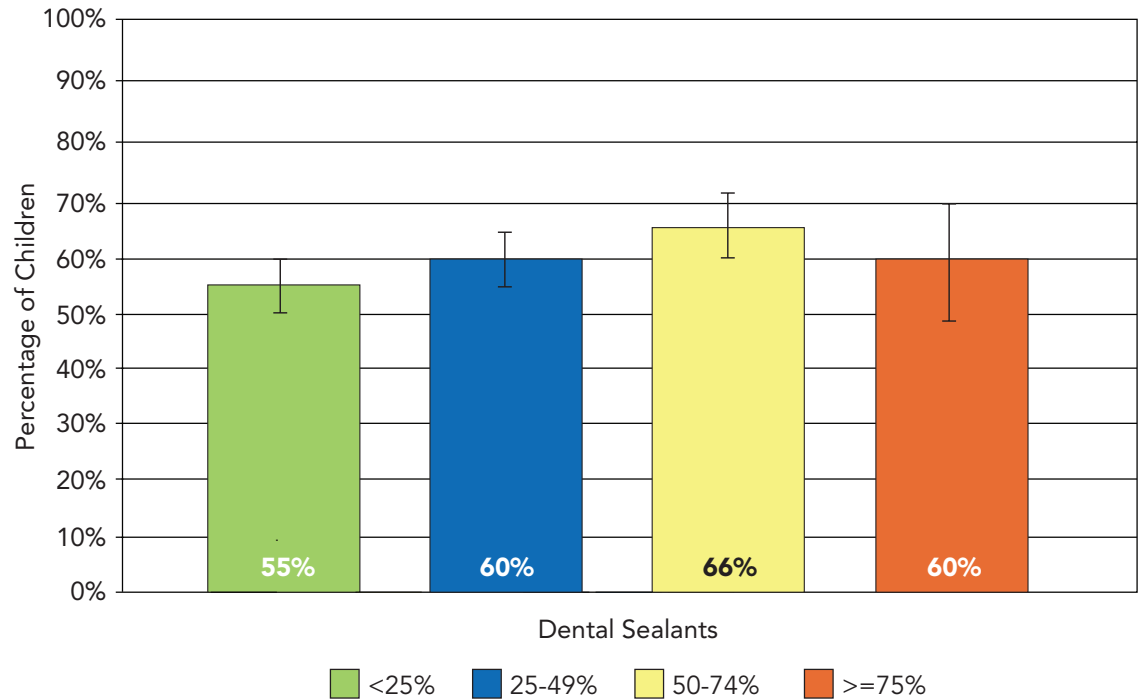
This survey found that 15 percent of White, 17 percent of African American, 20 percent of Hispanic / Latino and Asian, and 18 percent of Other third grade children were classified as overweight. All groups that had data for comparison increased or remained the same from the 2007-08 school year to the 2012-13 school year. This finding suggests that Wisconsin made little progress in reducing the percentage of overweight among third grade children. Results for the percentage of obesity among third grade children in Wisconsin were mixed. White children classified as obese increased slightly from 2007-08 to 2012-13 (13 to 14 percent). There were reductions among African American (23 to 21 percent) and Hispanic / Latino children (33 to 30 percent).

Figure 9. Percentage of Wisconsin's Third Grade Children with Treated Decay, Untreated Decay, and Caries Experience by Percentage of Children in Schools Eligible for Free / Reduced Meal Program, 2012-13.



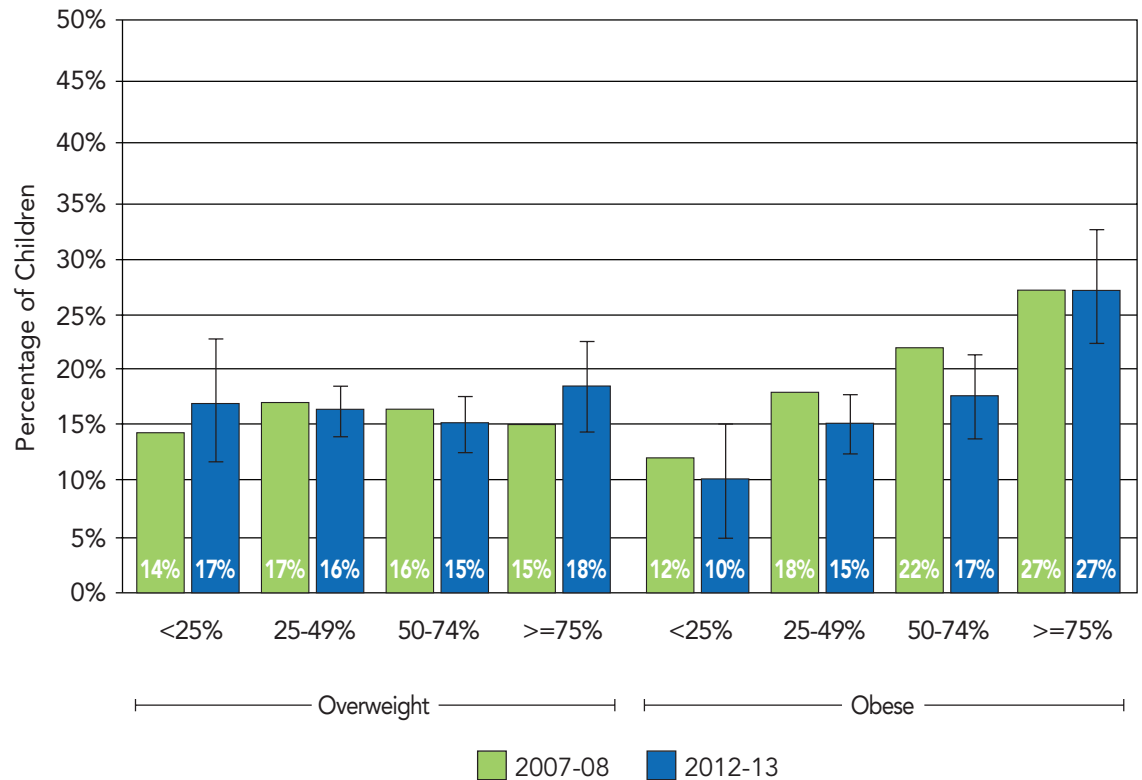
In Wisconsin, children from all socioeconomic backgrounds have dental caries experience, though those that attend schools with higher FRMP rates have higher levels of decay, both in the treated and untreated categories. In schools with a FRMP rate of 75 percent or greater, 62 percent of the children had caries experience, as compared to only 40 percent of children attending schools with a FRMP rate of less than 25 percent. Only 8 percent of children attending schools with less than 25 percent FRMP rates had untreated decay compared to 25 percent of children at schools with the highest free and reduced rates. This suggests a disparity by income as children whose parents have lower income levels, using FRMP rates as a surrogate for income, have higher levels of oral disease.

Figure 10. Percentage of Wisconsin's Third Grade Children with Dental Sealants by Percentage of Children in Schools Eligible for Free / Reduced Meal Program, 2012-13.



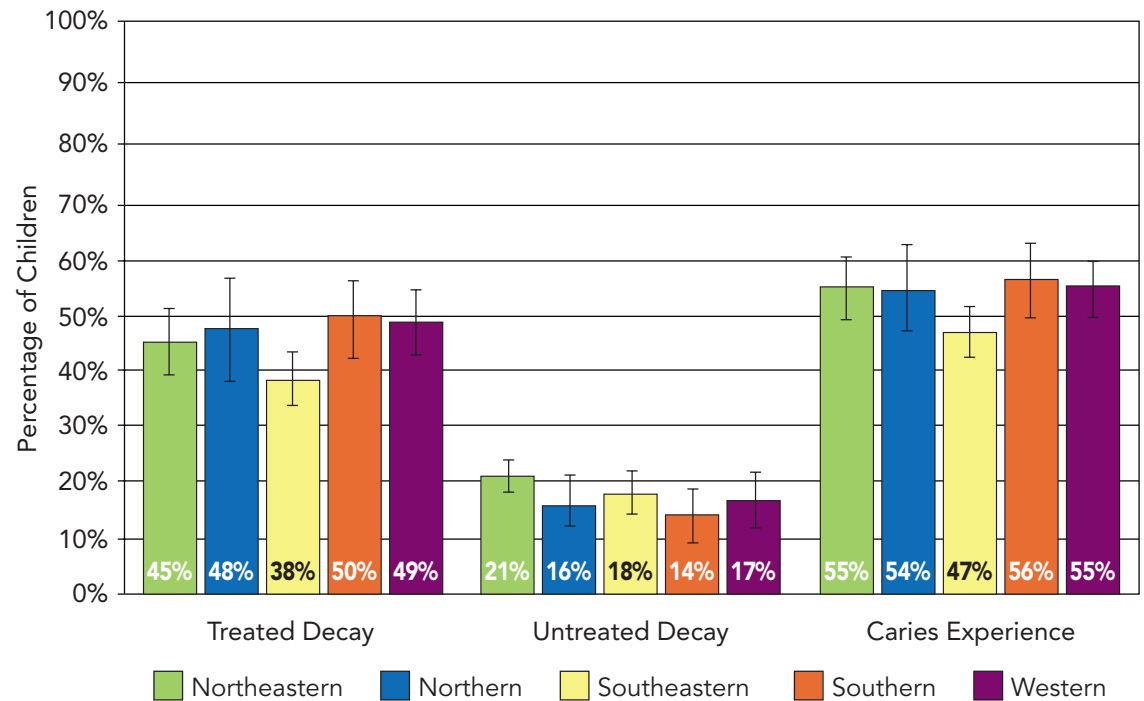
In Wisconsin, children from all socioeconomic backgrounds have good access to dental sealants. This survey found that children attending schools with less than 25 percent FRMP rates had slightly lower sealant rates (55 percent) compared to the three higher categories of FRMP rates. This finding would suggest that public school-based programs have allowed children attending schools with high levels of FRMP eligibility to have similar access to dental sealants as children attending schools with low eligibility. A greater proportion of children attending schools with lower levels of FRMP eligibility have private dental insurance.

Figure 11. Percentage of Wisconsin's Third Grade Children Who are Overweight and Obese by Percent of Children in Schools Eligible for Free / Reduced Meal Program, 2007-08 and 2012-13



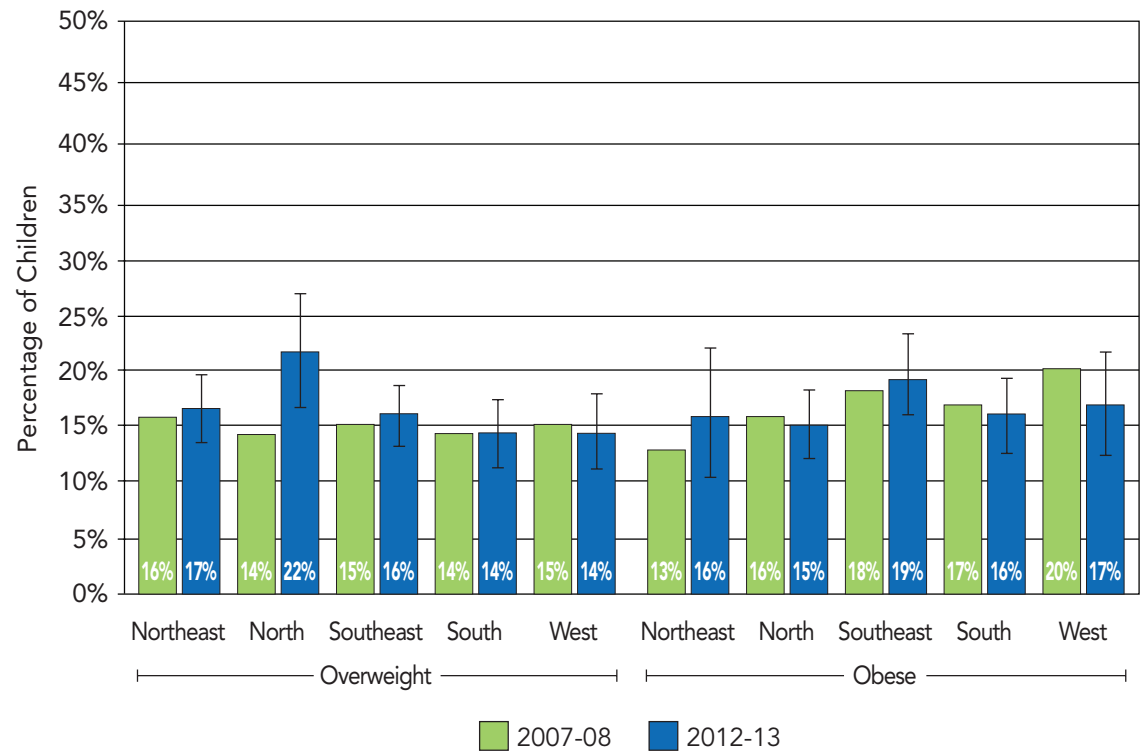
In Wisconsin, 15 to 18 percent of third grade children are considered overweight when the children's weight classifications are stratified by varying levels of FRMP rates. Overweight classifications increased from the previous survey (2007-08) in all FRMP categories except for the 50 to 74 percent FRMP. The results showed little variation in the percentage of overweight children by the FRMP. In contrast, the results indicated large differences in obesity rates by FRMP eligibility rates. Schools with FRMP rates less than 25 percent had only 10 percent of the children classified as obese, while over 27 percent of children in schools with over 75 percent of children eligible for FRMP were obese. These findings suggest the burden of obesity is not shared equally among Wisconsin's many and diverse groups and communities.

Figure 12. Percentage of Wisconsin's Third Grade Children with Treated Decay, Untreated Decay, and Caries Experience by Region, 2012-13



The survey sample was stratified by Department of Health Services, Public Health Region in order to produce regional estimates and assess if geographic disparities exist. While there are some differences by region, the differences are not of a large enough magnitude to make conclusions about regional differences. The Southeastern region had less treated decay and less caries experience compared to the other regions. The Northeastern region appeared to have slightly more untreated decay (21 percent), while the Southern region had the least (14 percent).

Figure 13. Percentage of Wisconsin's Third Grade Children Classified as Overweight and Obese by Region, 2007-08 and 2012-1



Childhood overweight and obesity do not appear to differ by the DHS Public Health Regions, except for a slight increase in the Northern region. When comparing 2007-08 to 2012-13 survey results, an increase of overweight third grade children in the Northern region was the only notable change (14 percent to 22 percent).

CONCLUSIONS



Wisconsin's *Healthy Smiles / Healthy Growth* survey of third grade children revealed positive trends. Caries experience has decreased over previous surveys and the prevalence of dental sealants has increased. Though caries experience levels demonstrate that dental decay is still a problem for Wisconsin children, the decrease in caries experience suggests that prevention programs are working. The most visible prevention programs are the school-based dental sealant programs. The finding that 61 percent of third grade children have access to dental sealants is important, but even more important is the finding that children of all socioeconomic classes have nearly equal access to sealants. However, even with equal access to dental sealants, the burden of oral disease is higher among children from minority populations and schools with higher rates of FRMP eligibility.

The dental sealant findings in this report directly support the oral health objectives of *Healthiest Wisconsin 2020: Everyone Living Better, Longer (HW 2020)*.²⁵ *HW 2020* is the public health agenda for the State of Wisconsin and includes the following oral health objective. "By 2020, assure access to ongoing oral health education and comprehensive prevention, screening, and early intervention and the treatment of disease in order to promote healthy behaviors and improve and maintain oral health." One of the indicators for this objective is the percentage of third graders with dental sealants and untreated decay.

Although these survey results show that 17 percent of children are considered obese, there are disparities among children that warrant widespread and sustained action to accelerate progress in obesity prevention efforts. The disparities are seen by race and by income, when using FRMP eligibility rates as a surrogate for income.

HW2020 includes an objective on obesity prevention. *“By 2020, Wisconsin will reduce disparities in obesity rates for populations of differing races, ethnicities, sexual identities and orientations, gender identities, and educational or economic status.”* Reviewing the survey results in light of this objective, Wisconsin faces challenges to reduce disparities among third grade children. In recent years, Wisconsin public and private partnerships have supported many initiatives that address childhood overweight and obesity. Such initiatives include school and community-based programs to provide at least 60 minutes of physical activity per day; access to healthy and affordable foods and beverages in childcare, schools and communities; standards-based nutrition and physical education; and school health advisory councils and wellness policies. The Wisconsin Nutrition, Physical Activity and Obesity State Plan provides guidance and resources for obesity prevention as it is imperative that all sectors work together for a comprehensive approach to preventing and reducing overweight and obesity.

By recognizing and understanding the health needs of Wisconsin’s children, key stakeholders can work to develop environments, systems and policies that will ensure all children receive the preventive services and treatment they need for optimal oral health and growth. This survey demonstrates that there continue to be barriers to improving the health of Wisconsin’s children; especially low-income and minority children. In order to reverse these trends, preventive services, through both public and private health care providers, must be emphasized.

The results will help guide the next steps to strengthen prevention efforts and implement strategies that lead to increased treatment access for underserved populations. It is important to work with key partners and stakeholders to increase the utilization of dental sealants in the public and private dental sector. Opportunities to expand school-based dental sealant programs should be identified in order to provide comprehensive dental treatment in areas where access continues to be an issue.

Future analysis of this data may be conducted to explore possible connections between oral health and growth status.

Table 3 – Participating Children and Schools Compared to Original Sample and Schools in Sampling Frame (Unweighted)

Variable	# Schools	# 3rd Graders	FRMP%	% White	% African American	% Hispanic
Sampling Frame	1,055	59,336	45.8	73.3	9.6	10.1
Original Sample	90	4,793	46.8	73.6	10.5	9.5
Participating Schools	69	3,483	50.1	73.1	10.8	10.7
Participating Children	69	2,832	NA	70.6	12.4	11.5

Note: The sampling frame for this survey included public elementary schools with at least 10 students enrolled in third grade in the 2011-12 school year.

Table 4 – Race/Ethnicity, Gender and Age of Participating Third Grade Children (Unweighted)

Variable	Percent or Mean
Race/Ethnicity (n= 2,790)	
White	70.6
African American / Black	12.4
Hispanic / Latino	11.5
Asian	3.3
American Indian	0.7
Native Hawaiian / Pacific Islander	0.1
Other/Unknown	1.3
Gender (n=2,824)	
Male	49.9
Female	50.1
Age (n=2,829)	
8 years	41.9
9 years	56.7
10 years	1.4
Age (n=2,829)	
Mean (standard error)	8.6 (0.015)

Table 5 – Height, Weight and BMI Stratified by Gender of Participating Third Grade Children

Variable	Males	Females
Height (cm)		
Number of Children	1,381	1,394
Mean (SE)	135.6 (0.19)	135.0 (0.21)
95% CI for Mean	135.2 – 136.0	134.6 – 135.4
Weight (kg)		
Number of Children	1,378	1,388
Mean (SE)	34.3 (0.26)	33.9 (0.31)
95% CI for Mean	33.8 – 34.8	33.3 – 34.5
BMI		
Number of Children	1,377	1,388
Mean (SE)	18.5 (0.13)	18.4 (0.13)
95% CI for Mean	18.2 – 18.7	18.2 – 18.7

Table 6 – BMI-For-Age Cutoffs Stratified by Gender of Third Grade Children

Variable	Males % (95% CI) (n=1373)	Females % (95% CI) (n=1384)	Both Genders % (95% CI) (n=2757)
Underweight < 5th percentile	1.5 (0.8 – 2.1)	2.2 (1.2 – 3.2)	1.8 (1.2 – 2.4)
Healthy weight 5th to < 85th percentile	62.6 (59.4 – 65.9)	66.8 (63.7 – 70.0)	64.7 (62.1 – 67.4)
Overweight 85th to < 95th percentile	17.6 (15.5 – 19.8)	15.0 (12.9 – 17.1)	16.3 (14.8 – 17.9)
Obese ≥ 95th percentile	18.3 (15.4 – 21.2)	16.0 (13.6 – 18.4)	17.1 (14.9 – 19.4)

Table 7 – Third Grade Children with Caries Experience and Need for Care

Variable	Frequency	SE	95% CI
Treated decay	44.3%	1.46	41.4 – 47.2
Untreated decay	17.8%	0.96	15.9 – 19.7
Caries experience	52.5%	1.46	49.6 – 55.5
Early Care	14.0%	0.81	12.3 – 15.6
Urgent care	3.3%	0.38	2.6 – 4.1
Total needing care	17.3%	0.95	15.4 – 19.2
Dental sealants	61.0%	1.83	57.4 – 64.7
No dental sealants	39.0%	1.83	35.3 – 42.6

Table 8 – Oral Health of Third Grade Children Stratified by Race / Ethnicity

Variable	White (n=1,933)	African American (n=343)	Hispanic Latino (n=315)	Asian (n=91)	Other* (n=60)
Treated Decay (%) (95% CI)	42.2 (38.8 – 45.6)	43.7 (37.1 – 50.2)	51.1 (42.4 – 59.8)	57.7 (46.1 – 69.3)	52.9 (41.2 – 64.7)
Caries Experience (%) (95% CI)	49.6 (46.4 – 52.8)	56.3 (50.0 – 62.7)	60.6 (52.1 – 69.0)	66.9 (57.1 – 76.8)	62.1 (51.5 – 72.6)
Untreated decay (%) (95% CI)	15.3 (13.4 – 17.3)	26.5 (22.8 – 30.2)	20.3 (16.1 – 24.5)	24.0 (16.9 – 31.1)	28.6 (16.5 – 40.7)
Need early treatment (%) (95% CI)	12.4 (10.6 – 14.2)	19.2 (15.8 – 22.7)	16.6 (12.8 – 20.4)	16.4 (9.7 – 23.1)	22.0 (12.6 – 31.4)
Need urgent treatment (%) (95% CI)	2.7 (1.7 – 3.6)	4.7 (2.7 – 6.7)	3.7 (1.2 – 6.2)	7.6 (2.7 – 12.5)	6.6 (0.7 – 12.5)
Dental sealants (%) (95% CI)	62.0 (58.1 – 65.8)	53.6 (45.2 – 62.0)	63.5 (55.0 – 72.1)	67.0 (53.6 – 80.4)	45.3 (29.6 – 61.0)

* Other includes: American Indian / Alaska Native, Native Hawaiian / Pacific Islander, multi-racial and unknown.

Note: The number of children listed for each race category is the number of children within that category who participated. Because of missing data, the number for each cell differs slightly.

Table 9 – BMI-For-Age Cutoffs Stratified by Race/Ethnicity

Variable	White % (95% CI) (n=1,930)	African American % (95% CI) (n=332)	Hispanic Latino % (95% CI) (n=313)	Asian % (95% CI) (n=90)	Other* % (95% CI) (n=58)
Underweight < 5th percentile	1.7 (1.1 – 2.3)	1.2 (0.0 – 2.4)	2.2 (0.3 – 4.2)	6.0 (0.9 – 11.1)	1.9 (0.0 – 5.3)
Healthy Weight 5th to < 85th percentile	68.7 (66.2 – 71.1)	61.2 (54.4 – 68.0)	47.2 (40.1 – 54.2)	57.0 (46.6 – 67.4)	59.5 (43.5 – 75.5)
Overweight 85th to < 95th percentile	15.3 (13.5 – 17.0)	17.1 (11.8 – 22.4)	20.2 (15.6 – 24.8)	20.0 (11.7 – 28.2)	17.5 (5.5 – 29.4)
Obese ≥ 95th percentile	14.4 (12.3 – 16.5)	20.5 (16.6 – 24.4)	30.4 (23.5 – 37.3)	17.0 (9.2 – 24.9)	21.1 (12.7 – 29.6)

* Other includes: American Indian / Alaska Native, Native Hawaiian / Pacific Islander, multi-racial and unknown.

Note: The number of children listed for each race category is the number of children within that category who participated. Because of missing data, the number for each cell differs slightly.

Table 10 – Oral Health of Wisconsin’s Third Grade Children Stratified by Free / Reduced Meal Program (FRMP) Status of School

Variable	“Higher Income” < 25% FRMP (n=280)	25-49% FRMP (n=1,375)	50-74% FRMP (n=670)	“Lower Income” ≥ 75% FRMP (n=507)
Treated decay (%) (95% CI)	35.9 (26.7 – 45.1)	42.3 (38.7 – 45.9)	47.5 (41.9 – 53.1)	50.5 (42.3 – 58.7)
Caries experience (%) (95% CI)	40.4 (31.5 – 49.4)	50.7 (47.4 – 54.0)	54.9 (49.6 – 60.1)	61.8 (54.4 – 69.2)
Untreated decay (%) (95% CI)	7.9 (5.1 – 10.7)	16.8 (14.4 – 19.1)	18.9 (15.3 – 22.6)	25.1 (21.7 – 28.5)
Need early treatment (%) (95% CI)	6.8 (4.1 – 9.4)	12.8 (10.6 – 14.9)	16.8 (13.6 – 20.0)	18.0 (15.4 – 20.6)
Need urgent treatment (%) (95% CI)	0.7 (0.0 – 1.5)	3.7 (2.5 – 4.9)	2.1 (0.9 – 3.3)	5.4 (3.6 – 7.1)
Dental sealants (%) (95% CI)	54.6 (49.6 – 59.6)	60.4 (54.5 – 66.3)	66.1 (59.2 – 73.1)	59.5 (49.0 – 70.1)

Table 11 – BMI-For-Age Cutoffs Stratified by Free / Reduced Meal Program (FRMP) Status of School

Variable	Percentage of Children in School FRMP			
	"Higher Income" < 25% FRMP (n=277)	25-49% FRMP (n=1,332)	50-74% FRMP (n=657)	"Lower Income" ≥ 75% FRMP (n=491)
Underweight < 5th percentile	1.1 (0.0 – 2.1)	2.0 (1.0 – 3.0)	2.3 (1.0 – 3.5)	1.3 (0.3 – 2.2)
Healthy Weight 5th to <85th percentile	71.9 (65.1 – 78.6)	66.9 (63.9 – 69.7)	65.0 (61.2 – 68.9)	53.7 (46.5 – 60.9)
Overweight 85th to <95th percentile	16.9 (11.6 – 22.2)	16.1 (13.8 – 18.4)	15.3 (12.9 – 17.8)	18.0 (13.9 – 22.0)
Obese ≥ 95th percentile	10.1 (5.2 – 15.1)	15.1 (12.9 – 17.4)	17.4 (13.9 – 20.8)	27.1 (21.3 – 32.9)

Table 12 – Oral Health of Third Grade Children Stratified by Public Health Region

Variable	Northeast (n=754)	North (n=309)	Southeast (n=927)	South (n=411)	West (n=379)
Treated Decay (%) (95% CI)	44.9 (38.7 – 51.1)	48.1 (39.0 – 57.2)	37.9 (33.7 – 42.2)	49.9 (49.2 – 56.0)	48.8 (43.1 – 54.5)
Caries experience (%) (95% CI)	54.9 (48.7 – 61.2)	54.4 (46.3 – 62.5)	47.3 (42.5 – 52.2)	55.9 (49.5 – 62.2)	54.6 (49.2 – 60.0)
Untreated Decay (95% CI)	21.0 (17.6 – 24.5)	16.3 (11.4 – 21.2)	17.8 (14.1 – 21.5)	14.2 (9.8 – 18.7)	16.8 (12.0 – 21.6)
Need early treatment (%) (95% CI)	14.6 (12.0 – 17.3)	15.1 (10.0 – 20.2)	13.7 (10.8 – 16.6)	12.7 (9.3 – 16.1)	14.2 (9.2 – 19.2)
Need urgent treatment (%) (95% CI)	6.4 (4.5 – 8.3)	1.2 (0.4 – 2.1)	2.6 (1.5 – 3.7)	1.5 (0.0 – 3.1)	2.7 (1.1 – 4.2)
Dental sealants (%) (95% CI)	67.5 (59.6 – 75.4)	72.9 (64.1 – 81.8)	58.0 (52.7 – 63.3)	48.0 (40.9 – 55.1)	63.1 (52.1 – 74.1)

Note: The number of children listed for each region is the number of children within that region who participated. Because of missing data, the number for each cell differs slightly.

Table 13 – BMI-For-Age Cutoffs Stratified by Public Health Region of Third Grade Children

Variable	Public Health Region				
	Northeast (n=756)	North (n=308)	Southeast (n=915)	South (n=406)	West (n=372)
Underweight < 5th percentile	1.7 (1.0 – 2.4)	0.9 (0.0 – 1.8)	1.4 (0.6 – 2.3)	3.0 (0.7 – 5.3)	2.2 (0.8 – 3.7)
Healthy Weight 5th to <85th percentile	65.0 (58.5 – 71.6)	62.6 (57.3 – 68.0)	62.9 (58.3 – 67.4)	67.7 (62.8 – 72.6)	66.3 (61.5 – 71.2)
Overweight 85th to <95th percentile	17.0 (14.5 – 19.5)	21.5 (16.2 – 26.9)	16.3 (13.5 – 19.1)	13.7 (10.2 – 17.1)	14.3 (10.6 – 18.0)
Obese ≥95% percentile	16.2 (10.4 – 22.0)	14.9 (11.6 – 18.2)	19.4 (15.7 – 23.1)	15.6 (11.5 – 19.8)	17.1 (12.8 – 21.4)

Table 14 – Age Adjusted Odds Ratios for Third Grade Children Classified as Overweight (≥85th percentile)

Variable	Bi-Variable Models		Multi-Variable Models	
	Odds Ratio (95% CI)	P-value	Odds Ratio (95% CI)	P-value
Sex				
Female	Reference		Reference	
Male	1.22 (0.99 – 1.50)	0.064	1.21 (0.99 – 1.50)	0.068
Race/Ethnicity				
White	Reference		Reference	
African American	1.16 (0.78 – 1.72)	0.478	1.20 (0.79 – 1.82)	0.386
Hispanic/Latino	1.40 (1.05 – 1.88)	0.024	1.43 (1.00 – 2.03)	0.044
Asian	1.38 (0.81 – 2.35)	0.238	1.39 (0.82 – 2.36)	0.228
Other	1.18 (0.51 – 2.69)	0.700	1.17 (0.51 – 2.71)	0.712
Income of School				
<75% FRMP	Reference		Reference	
≥75% FRMP	1.15 (0.86 – 1.55)	0.350	1.03 (0.75 – 1.42)	0.848

Table 15 – Age Adjusted Odds Ratios for Third Grade Children Classified as Obese (≥ 95 th percentile)

Variable	Bi-Variable Models		Multi-Variable Models	
	Odds Ratio (95% CI)	P-value	Odds Ratio (95% CI)	P-value
Sex				
Female	Reference		Reference	
Male	1.18 (0.97 – 1.43)	0.10	1.19 (0.98 – 1.44)	0.074
Race/Ethnicity				
White	Reference		Reference	
African American	1.53 (1.12 – 2.10)	0.008	1.03 (0.64 – 1.65)	0.91
Hispanic/Latino	2.60 (1.82 – 3.72)	<0.001	2.04 (1.43 – 2.89)	<0.001
Asian	1.22 (0.71 – 2.10)	0.468	1.15 (0.67 – 1.99)	0.607
Other	1.59 (0.95 – 2.69)	0.080	1.58 (0.94 – 2.65)	0.083
Income of School				
<75% FRMP	Reference		Reference	
≥ 75 % FRMP	2.08 (1.52 – 2.86)	<0.001	1.88 (1.42 – 2.5)	<0.001

Note: Tables 14 and 15 include odds ratios for overweight and obesity classifications among the third grade students. Odds ratios are ratios of the probability that an event will occur versus the probability that the event will not occur. For this report's purpose the event is overweight or obesity classification. Odds ratio statistics show that the characteristics of Hispanic/Latino ethnicity and attendance at a school with ≥ 75 percent FRMP eligibility level have the highest odds of children being classified as obese.

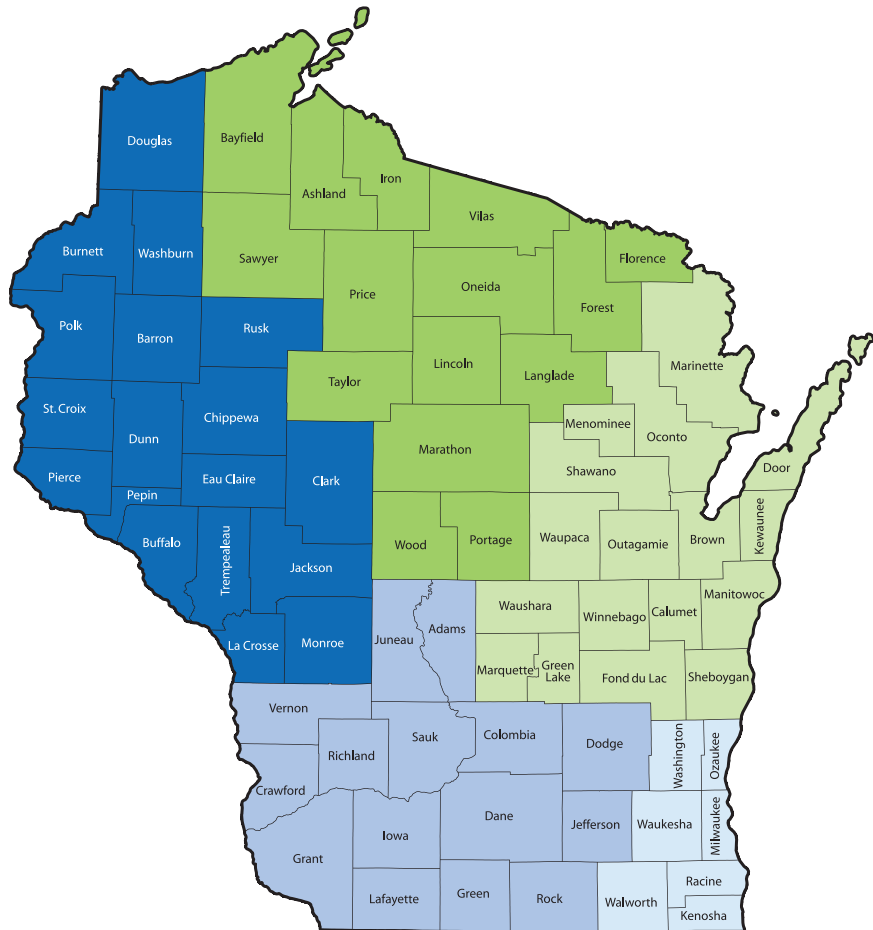
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APPENDIX A

Wisconsin Department of Health Services Regions by County



- Northeastern
- Northern
- Southeastern
- Southern
- Western

**Number of Outlier Values (based on WHO fixed exclusion ranges)
Among Participating Third Grade Children**

Variable	Too Low	Too High
Height-for-age	1	14
Weight-for-age	0	14
Weight-for-height	0	1
BMI-for-age	4	9



Wisconsin
Department of Health Services

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