
2010-2011 Youth BMI Surveillance Project Report

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Executive Summary

Introduction: Obesity continues to be a major public health burden in the U.S. and Nebraska, where about 1 in 4 adults and nearly 1 in 5 youth are obese. Obese adults are at increased risk for many health conditions, including hypertension, type 2 diabetes, coronary heart disease, stroke, certain cancers, and osteoarthritis. Obese youth are more likely than youth at healthy weight to become overweight or obese adults, and therefore are more at risk for associated adult health problems. Due to the negative consequences of obesity, preventing its onset in childhood is an important public health goal.

Purpose: Surveillance of body mass index (BMI) is an important step in planning and evaluating childhood obesity prevention and control efforts. The purpose of the 2010-2011 Youth BMI Surveillance Project was to provide schools the opportunity to submit their student height and weight data to DHHS staff who would subsequently compile, analyze, and report the data. The resulting state-level prevalence estimates could then be used by schools and public health practitioners in their prevention planning and evaluation efforts.

Methods: In September 2010, notification letters were mailed to school administrators serving all public and non-public schools with at least one student in grades 1, 4, 7 or 10. The data collection form used for this project was a modified version of the Centers for Disease Control and Prevention (CDC) Children's BMI Tool for Schools, which computes BMI-for-age for a group of students. Due to several methodological limitations, the data presented in this report are not weighted. Results are thus not generalizable to all Nebraska students, but only represent characteristics of students from schools that submitted data.

Results: A total of 303 schools from 61 school districts submitted data on 25,313 students for the project during the 2010-2011 academic school year. Results indicated that nearly 1 in 5 Nebraska students in grades 1, 4, 7 and 10 were obese. Additionally, more than 1 in 6 students in those grades were considered overweight. Significant differences in prevalence of overweight and/or obesity were observed by sex, grade level, and race/ethnicity.

Conclusions: School nurses and other staff are encouraged to calculate and monitor their students' BMI. The data can then be used in discussions with community leaders, policy makers, and school board members about the importance of preventing overweight and obesity among youth in their community. With quality data, schools are also more likely to obtain funding to support policy and environmental interventions designed to improve nutrition and physical activity levels among students. When aggregated across schools, student BMI data can serve similar purposes at the state level. Thus, future efforts to compile, analyze, and report student BMI data in Nebraska are warranted.

Introduction

Obesity continues to be a major public health burden in the U.S. and Nebraska, where about 1 in 4 adults are considered obeseⁱ. In the past 15 years, the prevalence of obesity among U.S. and Nebraska adults has increased nearly 60%. Similarly, childhood obesity has more than tripled in the past 30 years. Nationally, the prevalence of obesity among children aged 6 to 11 years increased from 6.5% in 1980 to 19.6% in 2008. The prevalence of obesity among adolescents aged 12 to 19 years increased from 5.0% to 18.1%^{ii,iii}. Height and weight data collected during the 2002-2003 academic school year showed that 16% of Nebraska students in grades K-12 were obese^{iv}.

Obese adults are at increased risk for many health conditions, including hypertension, type 2 diabetes, coronary heart disease, stroke, certain cancers, and osteoarthritis. Obese youth are more likely than youth at healthy weight to become overweight or obese adults, and therefore are more at risk for associated adult health problems. Due to the negative health—and ultimately, economic—consequences of obesity, preventing its onset in childhood is an important public health goal.

Surveillance of body mass index (BMI) is an important step in planning and evaluating childhood obesity prevention and control efforts. In Nebraska, current efforts rely on self- or parent-reported BMI, for example, as measured by the Youth Risk Behavior Survey (YRBS) and the National Survey of Children's Health (NSCH). Unfortunately, there are significant limitations associated

with these types of measures, including overestimation of height and underestimation of weight, both of which lead to misclassification of BMI. Ideally, obesity prevalence estimates should be based on accurate height and weight measures.

In Nebraska, height and weight measures are a standard component of routine school health screenings. The DHHS School and Child Health Program estimates that at least three-quarters of Nebraska schools collect such information on an annual basis for some or most students. However, there is currently no coordinated compilation or utilization of this data statewide.

In 2004, the Overweight Among Nebraska Youth project was the first attempt to coordinate such data statewide. During the 2002-2003 academic school year, data were collected on 40,154 students in grades K-12 from 234 Nebraska schools. For the first time ever, this project provided accurate and generalizable estimates of childhood obesity in Nebraska. Unfortunately, due to staffing and funding limitations, the project was not repeated.

The purpose of the 2010-2011 Youth BMI Surveillance Project was to provide schools the opportunity to submit their student height and weight data to DHHS staff who would subsequently compile, analyze, and report the data. The resulting state-level prevalence estimates could then be used by schools and public health practitioners in their prevention planning and evaluation efforts. The following report summarizes the methods and results from this project.

Methods

In September 2010, notification letters were mailed to school administrators serving all public and non-public schools with at least one student in grades 1, 4, 7 or 10 according to Nebraska Department of Education 2009-2010 membership data (n=1,206). Special education schools were excluded. In addition, an email was distributed on the school nurse listserv by the DHHS School and Child Health Program Manager.

The letters described the purpose of the project and provided directions for accessing the project website where school personnel could download or view instructions for completing a data collection form; download the data collection form; and submit (upload) a completed data collection form. The project website was passphrase-protected and inaccessible via a general internet search.

The data collection form used for this project was a modified version of the Centers for Disease Control and Prevention (CDC) Children's BMI Tool for Schools. The CDC Children's BMI Tool for Schools is an Excel spreadsheet intended for use by school and other professionals who want to compute Body Mass Index (BMI)-for-age for a group of up to 2,000 students. The spreadsheet computes BMI and BMI percentiles for individual students in a school using height and weight measurements, sex, date of birth, and date of measurement information that are entered. It provides a school summary of students' BMI-for-age categories and graphs for prevalence of overweight and

obesity, and prevalence of overweight and obesity by sex.

Weight status categories for calculated BMI-for-age percentile ranges are outlined in Table 1. These categories are based on national expert committee recommendations.

Table 1. Weight status categories for children and teens

Weight status category	Percentile range
Underweight	Less than the 5th percentile
Healthy weight	5th percentile to less than the 85th percentile
Overweight	85th to less than the 95th percentile
Obese	Equal to or greater than the 95th percentile

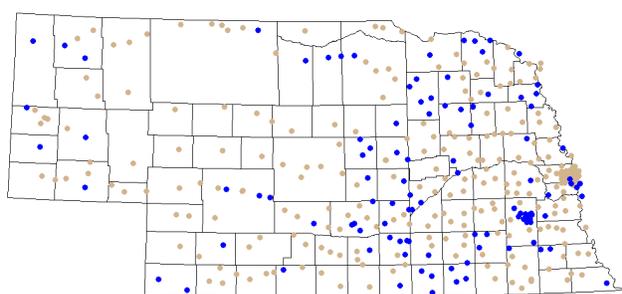
The Excel spreadsheet was modified for this project to include six additional data fields: student race, student ethnicity, school name, school city/county, contact name, and contact phone number.

In January 2011, a postcard reminder was sent to all schools that had either not already submitted data by that time, or had not been identified as a school that had closed, refused to participate, or was otherwise unable to provide the requested data (n=1,006).

A total of 303 schools from 61 school districts submitted data on 25,313 students for the project. Several school districts provided district-wide data, as opposed to school level data, for students in grades 1, 4, 7, and/or 10.

Due to several methodological limitations, the data presented in this report are not weighted. Results are thus not generalizable to all Nebraska students, but only represent characteristics of students from schools that submitted data. However, results reflect data from geographically diverse schools (Figure 1).

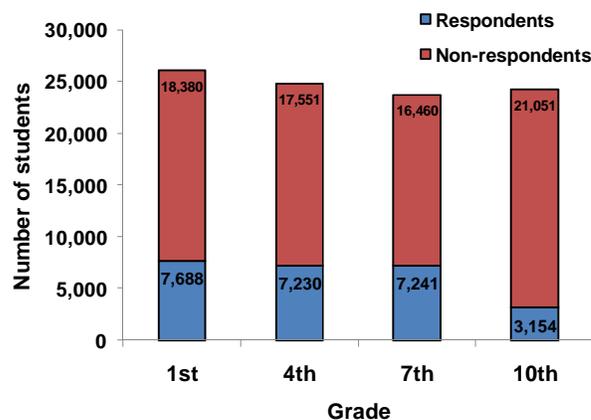
Figure 1. Map of respondent and non-respondent schools



• Respondent schools • Non-respondent schools

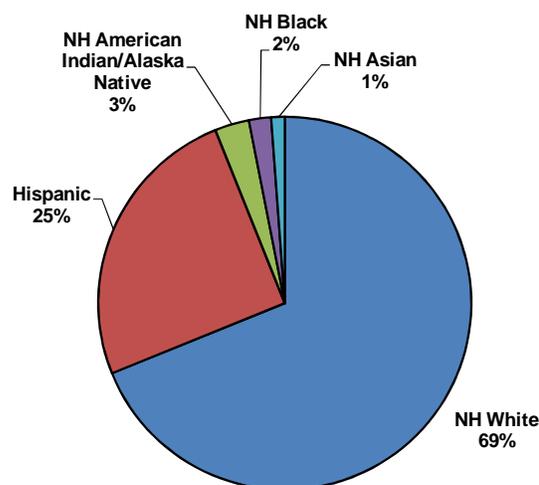
Furthermore, the gender distribution of respondents (51% female) is similar to the gender distribution of all Nebraska students enrolled in public and non-public schools (49% female). Data in this report reflect approximately 30% of Nebraska students in grades 1, 4, and 7, but only 13% of students in grade 10 (Figure 2).

Figure 2. Number of respondent vs. non-respondent students, by grade



Student race and ethnicity were optional variables on the project data collection form. As a result, race and ethnicity information was included for only 34% of students; of these students, 69% were non-Hispanic (NH) white and 25% were Hispanic. During the 2010-2011 academic school year, approximately 75% of students enrolled in public or non-public schools in Nebraska were non-Hispanic white, and 13% were Hispanic.

Figure 3. Respondents' race/ethnicity

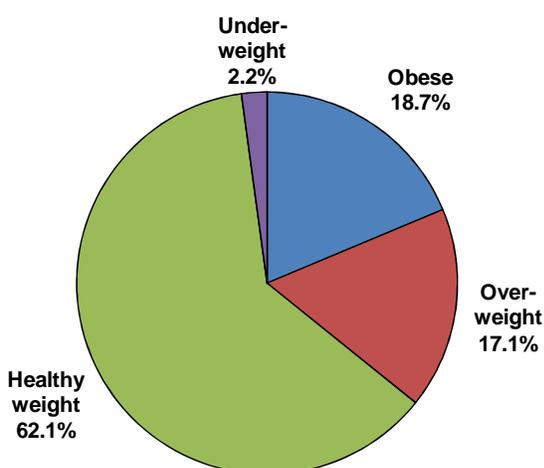


Results

Overall Prevalence

- During the 2010-2011 academic school year, nearly 1 in 5 Nebraska students in grades 1, 4, 7 and 10 were obese (Figure 4). This estimate mirrors data from the 2007-2008 National Health and Nutrition Examination Survey which showed that nearly 1 in 5 (18.7%) U.S. children ages 6-19 years were obeseⁱⁱ.

Figure 4. Weight status among Nebraska students*



*Nebraska students from respondent schools only

- Additionally, more than 1 in 6 students in those grades were considered overweight. In total, slightly more than 1 in 3 students in grades 1, 4, 7 and 10 whose height and weight data was submitted as part of this project were either overweight or obese.

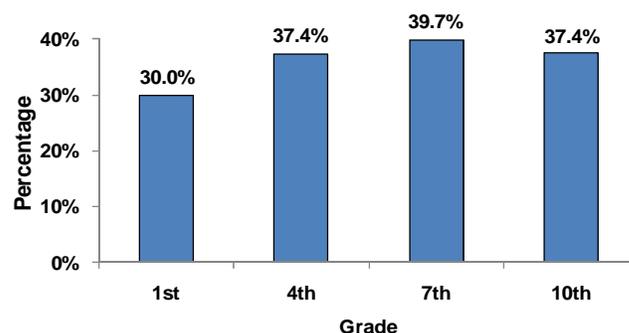
Sex Differences

- Male students in Nebraska were significantly more likely to be obese than female students (Table 2).
- Similar differences by sex in obesity prevalence among school-aged youth have been demonstrated nationally. National statistics show that females ages 12-19 years are less likely (16.8%) to be obese than male students of the same age (19.3%); however, these differences are not statistically significantⁱⁱ.

Grade Differences

- Nebraska students in grade 1 were significantly less likely to be overweight or obese compared to students in grade 4, 7, or 10 (Figure 5).

Figure 5. Percentage of Nebraska students* who are overweight or obese, by grade



*Nebraska students from respondent schools only

- Nationally, the prevalence of overweight and obesity among children ages 2-5 years (21.2%) is lower than among

children ages 6-11 years (35.5%) and adolescents ages 12-19 years (34.2%)ⁱⁱ.

Racial/Ethnic Differences

- Due to small numbers of respondents, prevalence information is only available for racial/ethnic groups of students where n>50.
- Native American/American Indian and Hispanic students in Nebraska were

significantly more likely to be obese than white students (Table 2). There were no significant differences in the percentage of overweight students across race/ethnic groups (Table 3).

- The prevalence of obesity among Hispanic students in Nebraska (30.9%) is much higher than national obesity prevalence estimates for school-aged youth ages 6-19 years (23.2%)ⁱⁱ.

Table 2. Prevalence of obesity among Nebraska students in grades 1, 4, 7 and 10, by sex, grade, and race/ethnicity, 2010-2011

	n	Percentage	95% Confidence Interval	
			Lower limit	Upper limit
Overall	4725	18.7%	18.2%	19.2%
Sex				
Male	2646	20.6%	19.9%	21.3%
Female	2079	16.8%	16.1%	17.4%
Grade				
1st	1109	14.5%	13.7%	15.3%
4th	1451	20.1%	19.2%	21.0%
7th	1557	21.6%	20.6%	22.5%
10th	608	19.3%	17.9%	20.7%
Race/ethnicity				
NH American Indian	103	40.6%	34.5%	46.9%
Hispanic	661	30.9%	28.9%	32.9%
NH White	997	17.0%	16.0%	17.9%

Table 3. Prevalence of overweight among Nebraska students in grades 1, 4, 7 and 10, by sex, grade, and race/ethnicity, 2010-2011

	n	Percentage	95% Confidence Interval	
			Lower limit	Upper limit
Overall	4320	17.1%	16.6%	17.6%
Sex				
Male	2145	16.7%	16.0%	17.3%
Female	2175	17.5%	16.9%	18.2%
Grade				
1st	1189	15.5%	14.7%	16.3%
4th	1248	17.3%	16.4%	18.2%
7th	1312	18.2%	17.3%	19.1%
10th	571	18.1%	16.8%	19.5%
Race/ethnicity				
NH American Indian	51	20.1%	15.4%	25.5%
Hispanic	405	18.9%	17.3%	20.7%
NH White	985	16.8%	15.8%	17.7%

Table 4. Prevalence of overweight and obesity among Nebraska students in grades 1, 4, 7 and 10, by sex, grade, and race/ethnicity, 2010-2011

	n	Percentage	95% Confidence Interval	
			Lower limit	Upper limit
Overall	9045	35.8%	35.2%	36.4%
Sex				
Male	4791	37.2%	36.4%	38.1%
Female	4254	34.3%	33.5%	35.1%
Grade				
1st	2298	30.0%	28.9%	31.0%
4th	2699	37.4%	36.3%	38.5%
7th	2869	39.7%	38.6%	40.9%
10th	1179	37.4%	35.7%	39.1%
Race				
NH American Indian,	154	60.6%	54.3%	66.7%
NH Black	68	41.5%	33.8%	49.4%
Hispanic	1066	49.8%	47.7%	52.0%
NH White	1982	33.7%	32.5%	34.9%

Conclusions

According to the 2010-2011 Youth BMI Surveillance Project, nearly 1 in 5 students in Nebraska are obese, and an additional 1 in 6 are overweight. Data from this project are not weighted, and thus only reflect the prevalence of overweight and obesity among students whose heights and weights were submitted as part of this project. However, overall prevalence estimates from this project are very similar to national estimates. Observed differences by gender, grade level, and race/ethnicity also reflect group differences reported nationally.

Surveillance of BMI remains an important step in planning and evaluating childhood obesity prevention and control efforts. Measuring BMI is relatively easy, inexpensive, noninvasive, and quick^v. However, BMI is not a diagnostic tool. For example, the individual weight status of a student athlete might be wrongly categorized due to their increased muscle mass, rather than excessive body fat.

Nonetheless, BMI is a reliable indicator of body fatness for most children and teens.

School nurses and other staff are encouraged to calculate and monitor their students' BMI using tools such as the Children's BMI Tool for Schools or the modified version used for this project. The collected data can then be used in discussions with community leaders, policy makers, and school board members about the importance of preventing overweight and obesity among youth in their community. With quality data, schools are also more likely to obtain funding to support policy and environmental interventions designed to improve nutrition and physical activity levels among students. When aggregated across schools, student BMI data can serve similar purposes at the state-level. Thus, future efforts to compile, analyze, and report student BMI data in Nebraska are warranted.

Preventing Childhood Obesity

The DHHS School Health program provides guidelines, training, and other resources for schools and school health professionals. The program provides BMI screening guidelines and competencies; resources and model individualized health care plans for the overweight or obese child; and resources on health conditions which may appear with obesity, including asthma and diabetes. www.dhhs.ne.gov/schoolhealth

The DHHS Nutrition and Activity for Health (NAFH) program is currently implementing the following initiatives in an effort to prevent childhood obesity in Nebraska. www.dhhs.ne.gov/nafh

Foster Healthy Weight in Youth

In partnership with Teach a Kid to Fish, Creighton University School of Medicine, and the Nebraska Medical Association, Foster Healthy Weight in Youth describes and equips primary care providers with tools to effectively assess, prevent and treat childhood overweight and obesity. www.nebmed.org/copp.aspx

Whatcha' Doin?

Whatcha' Doin? is a campaign for high school students that promotes eating fruits and vegetables and being active through peer-to-peer marketing tactics. www.whatchadoin.org

Little Voices for Healthy Choices

The Little Voices for Healthy Choices initiative empowers Nebraska's childcare facilities to nurture healthy, active

environments for children ages 0-5 years. The initiative has three components: (1) the Nutrition and Physical Activity Self-Assessment for Child Care (NAP SACC); (2) communication of the importance of healthy child care environments; and (3) a healthy child care recognition award. www.dhhs.ne.gov/NAFH/littlevoicesforhealthychoices.htm

Coordinated School Health

Coordinated School Health (CSH) asserts that schools can improve students' academic performance and overall physical well being by promoting health in a systematic way. It emphasizes needs assessments; planning based on data, sound science, and analysis of gaps and redundancies in school health programming; and evaluation. www.education.ne.gov/CSH

Nebraska Physical Activity and Nutrition State Plan

The 2011-2016 Nebraska Physical Activity and Nutrition State Plan promotes evidence-based strategies designed to increase consumption of fruits and vegetables; decrease consumption of high-energy-dense foods; decrease the consumption of sugar-sweetened beverages; increase physical activity; decrease television viewing; and increase breastfeeding initiation, duration, and exclusivity. The plan addresses these priority goals in five distinct settings: child care, schools, workplaces, healthcare and communities. www.partnersnhealth.org

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^{iv} Nebraska Health and Human Services System. *Overweight Among Nebraska Youth - 2002/2003 Academic School Year*. Lincoln, NE: Nebraska Health and Human Services System, Department of Health and Human Services, Office of Disease Prevention and Health Promotion; 2004.

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