A Review of the

Clark County School District Height and Weight Data Collection, 2010-2011 School Year

Southern Nevada Health District
P.O. Box 3902, Las Vegas, NV 89127
(702) 759-1000 | www.SNHD.info

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This report provides an initial assessment of data on childhood obesity collected via a collaborative relationship between the Clark County School District and the Southern Nevada Health District.

AUTHORS:

Michael Tsai, MPH
Chronic Disease Epidemiologist, Office of Epidemiology

Thomas R. Coleman, MD, MS
Director of Community Health

John P. Middaugh, MD
Interim Chief Health Officer

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According to a systematic review of national survey data, obesity rates among adults in the United States more than doubled between 1980 and 2003[1] and remain high with 69% of adults classified as either overweight or obese and 36% as obese.[2] Although the overall obesity rate among adults has remained relatively steady since 2003, obesity rates have continued to climb in men, non-Hispanic black women, and Mexican American women.[2] Some estimates predict that if current trends continue, approximately half of all men and women in the United States will be obese by 2030.[3]

Similar to the increasing trend in adult obesity from 1985 to 2010 (Figures 1-6), between 1980 and 2008, the prevalence of obesity tripled nationally among school-age children and adolescents and remains high at nearly 17%.[4-6] Overweight children and adolescents are more likely to become overweight or obese adults.[7] Overweight children are at risk for a number of diseases and conditions, including diabetes, cardiovascular disease, and certain types of cancers as adults.[8] Some states have used height and weight screenings to assist in reversing the trend of increasing obesity among school-age children.[9,10]

According to the Surgeon General of the United States, the nation needs to take preventive actions to address unhealthy eating and unhealthy physical activity patterns in our children.[11] In its policy statement addressing the growing problem of obesity among children, the American Academy of Pediatrics recommended the use of body mass index (BMI) measurements as a preventive tool to see if a child's weight gain is excessive or appropriate relative to height gain.[12] BMI is an estimate for human body fat based on an individual's weight and height. BMI does not actually measure the percentage of body fat. However, BMI can be used to gauge an individual's risk for developing additional health issues, as heart disease, diabetes, and high blood pressure are all linked to an individual being overweight.[8]

Background

The Nevada Legislature established the Committee on Health Care Subcommittee to Study Medical and Societal Costs and Impacts of Obesity during the 2003-2004 interim session. Recognizing that lack of data was a concern, several key stakeholders, including the Health Committee of the Las Vegas Valley League of Women Voters, mobilized coalitions and advocates to support a bill requiring collection of height and weight data. During the 2007 Legislative Session, Assembly Bill 354 was passed, making changes to Nevada Revised Statute (NRS) 392.420. Section 2 was revised to include the provision of the following screening:

"In addition to the requirements of subsection 1, each school district shall conduct examinations of height and weight of a representative sample of pupils in at least one grade of the:

(a) Elementary schools within the school district;

(b) Middle schools or junior high schools within the school district; and

(c) High schools within the school district.

The Health Division of the Department of Health and Human Services shall define 'representative sample' in collaboration with the school districts for purposes of this subsection."[13]

In 2009, Assembly Bill 191 extended the period for data collection of height and weight data beyond the sunset date of June 30, 2010 to June 30, 2015. It also allows a school district to conduct examinations on grades other than 4, 7, and 10.[14]

The Southern Nevada Health District (SNHD) collaborated with the Clark County School District (CCSD) to analyze the data collected as a result of Assembly Bill 354 to help establish a baseline estimate of weight status among school-age students in Clark County, as well as to identify areas of improvement within the data collection process to improve the accuracy of future data collection and reports regarding weight status. CCSD is the fifth largest school district in the country, with a total enrollment of 309,476 students in 352 schools (213 of which are elementary schools) for the 2009-2010 school year. It encompasses all of Clark County, Nevada, including five municipalities and a total of 7,910 square miles.[15]

This report examines the data collected by the CCSD during the 2010-2011 school year, provides an initial analysis of the weight status of the selected schools and participants, and compares the results to other sources, such as the Youth Risk Behavior Surveillance System (YRBSS) and the National Health and Nutrition Examination Survey (NHANES), which collect similar data. It also identifies potential areas of improvement regarding data collection and how the results from these data can be used.

Methods

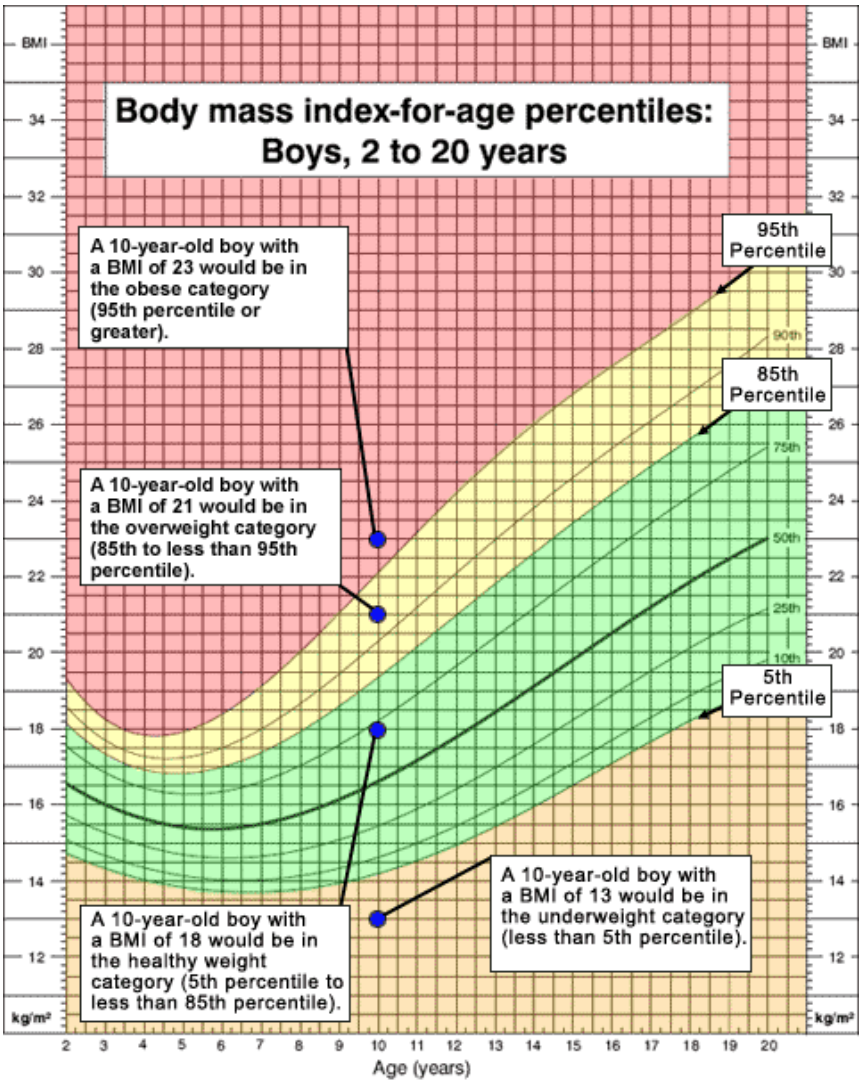
On September 6, 2007, a meeting was held in Carson City at the Nevada State Health Division (NSHD) with the Chief School Nurses from the 17 Nevada school districts and other interested parties regarding data collection required under Assembly Bill 354. The nurses agreed to collect data from a convenience sample on the heights and weights of 4th, 7th, and 10th graders. These grades were selected based on existing screenings for vision, hearing, and scoliosis, as well as the even spacing of ages between those grades. CCSD chose to collect measurements on a sample of its students within these grade levels due to the large population size of its student body. Using a sample methodology provided by NSHD, a total of 19 schools (12 elementary, 4 middle, and 3 high schools) were selected to participate.

CCSD staff was instructed to collect data for height and weight measurements using a protocol provided by CCSD (Appendix B), and values were entered into HealthOffice® (Walled Lake, MI), the software program used by CCSD to manage student health records. Measurements were compiled, along with birthdates, screening dates, race, and ethnicity, and provided to SNHD for analysis. The dataset received by SNHD contained examination data from height and weight screenings conducted through August 8, 2011. The 2010-2011 school year was selected for analysis because of consistency, as all schools within the sample were on the same 9-month schedule, and completeness of data collection. Although data were collected in prior years, data collection for some schools within the sample was incomplete and a number of elementary schools were 12-month schools. Analysis was only done on data collected after the 12-month schedule was discontinued in order to eliminate any confusion as to whether a student screened during a summer month should be part of the sample for the previous or current school year.

BMI expresses the weight-for-height relationship as a ratio, that is, weight (in kilograms)/[height (in meters^2)].[16] While BMI is calculated the same way for children and adults, the values cannot be interpreted in the same way.[17] Since body fat levels change with age and differ by gender, Centers for Disease Control and Prevention (CDC) BMI-for-age growth charts are used to account for these differences and translate a BMI number into a percentile for a child's sex and age. BMI-for-age weight status categories and the corresponding percentiles are shown in the following table:

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 following example demonstrates how sample BMI numbers would be interpreted for a 10-year-old boy:



BMI percentiles for the CCSD dataset were calculated using a CDC-developed SAS® (Cary, NC) macro. Along with the ability to calculate BMI and to determine the percentile assignment for each student record, the program also identifies outlier observations, or observations that are considered to be biologically implausible values (BIV). Typically these outliers are the result of data entry errors or mismeasurement rather than from true extreme growth. The range for these outliers was defined as being too low or too high based on the World Health Organization (WHO) fixed exclusion ranges.[18]

The dataset contained two separate fields for race and ethnicity. However, the data contained in one field did not always reconcile with what was expected in the other. For example, race data was sometimes entered in the ethnicity field where expected entries should only be "Hispanic" or "Non-Hispanic." Additionally, race values would occasionally be coded as missing for some entries, but race data would be entered in the ethnicity field. To reconcile these inconsistencies for analysis, if a student had a missing value in the race field but was classified by race data in the ethnicity field, that information was used to sort a student into the appropriate race category. If a student was classified as "Hispanic" in the ethnicity field, that information was used, regardless of any race value entered in the race field.

Results

Data for the 2010-2011 school year contained observations for 3,934 students from the 19 selected schools. However, after analyzing the data using the CDC-developed SAS® macro, only 3,842 were identified by the program to have BMI values that were within the "acceptable normal range" (Figure 7). The results presented here refer only to those values and are subset by race/ethnicity only for Non-Hispanic white, Non-Hispanic black, and Hispanic students for ease of comparison to other published datasets. Although data were available for other racial/ethnic groups, the number of students for those individual groups was too low to generate any meaningful results when stratifying by gender and grade. Table 1 presents the data within the "acceptable normal range" for the 2010-2011 school year stratified by grade, gender, and selected racial/ethnic groups.

Overall, among students sampled in 4th, 7th, and 10th grades, Hispanic students had the highest proportion of overweight or obese students (48.0%), as well as the highest proportion of overweight only (21.0%) and obese only (27.0%). Hispanic male students also had the highest proportion for overweight or obese students (51.4%), overweight only (20.6%), and obese only (30.8%), when examining students by gender. For females, Hispanic students had the highest proportion of overweight or obese (44.6%) and overweight only (21.2%), while Non-Hispanic black students had the highest proportion of obese only (26.1%). When reviewing overall trends over grade levels, there was a decrease in proportion for Non-Hispanic black students who were overweight only and Hispanic students who were obese only from 4th through 10th grade. Similarly, when examining proportion over grade levels by gender, there was a decrease in obese only proportion for all males, as well as Hispanic males. For females, this trend was also seen in overweight or obese, Non-Hispanic black; overweight only, Non-Hispanic black; overweight or obese, Hispanic; and obese only, Hispanic students.

Although it is important to look at these values at the local level, the ability to compare them to other local sources and national data is just as critical. The YRBSS monitors six types of health-risk behaviors that contribute to the leading causes of death and disability among youth and adults, as well as the prevalence of obesity and asthma among youth and young adults. YRBSS includes a national school-based survey conducted by CDC and state, territorial, tribal, and local surveys conducted by state, territorial, and local education and health agencies and tribal governments.[19]

CDC's Communities Putting Prevention to Work (CPPW) program funds communities to reduce chronic disease related to obesity and tobacco using the evidence- and practice-based MAPPS (Media, Access, Point of decision information, Price, and Social support services) strategies. This effort is expected to produce broad, high-impact, sustainable, health outcomes through environmental change strategies. Through evidence-based strategies, these communities are responsible for improving access to nutrition, increasing physical activity, and reducing the consumption and initiation of tobacco use as well as exposure to secondhand smoke. As part of the project, a modified YRBSS survey, that included standard YRBSS physical activity, nutrition, and tobacco

Table 1. Percentage of High* BMI in CCSD Students in Selected Schools for 2010-2011 School Year (4th, 7th and 10th Grades) (Figure 8)

Weight Status	4th Grade (n=1165)	7th Grade (n=1484)	10th Grade (n=1193)	Overall Sample
BOTH SEXES				
All racial/ethnic groups (n=3842)				
Overweight or Obese	41.6	43.9	39.0	41.7
Overweight Only	17.8	20.0	17.3	18.5
Obese Only	23.8	23.9	21.7	23.2
Non-Hispanic white (n=945)				
Overweight or Obese	26.7	40.1	35.0	34.4
Overweight Only	13.2	20.6	14.6	16.6
Obese Only	13.5	19.5	20.4	17.8
Non-Hispanic black (n=468)				
Overweight or Obese	42.2	41.9	41.7	41.9
Overweight Only	20.2	18.2	15.6	17.5
Obese Only	22.0	23.7	26.1	24.4
Hispanic (n=1723)				
Overweight or Obese	51.1	49.1	43.6	48.0
Overweight Only	19.0	22.7	20.8	21.0
Obese Only	32.1	26.4	22.8	27.0
MALES				
All racial/ethnic groups (n=1899)				
Overweight or Obese	46.0	47.0	40.6	44.6
Overweight Only	17.7	19.9	16.3	18.1
Obese Only	28.3	27.1	24.3	26.5
Non-Hispanic white (n=487)				
Overweight or Obese	31.5	40.5	38.5	36.9
Overweight Only	13.5	20.8	13.5	16.2
Obese Only	18.0	19.7	25.0	20.7
Non-Hispanic black (n=212)				
Overweight or Obese	38.9	38.5	43.2	40.6
Overweight Only	16.7	17.1	20.5	18.4
Obese Only	22.2	21.4	22.7	22.2
Hispanic (n=838)				
Overweight or Obese	55.7	53.5	45.2	51.4
Overweight Only	20.2	23.0	18.4	20.6
Obese Only	35.5	30.5	26.8	30.8
FEMALES				
All racial/ethnic groups (n=1943)				
Overweight or Obese	37.3	41.0	37.3	38.7
Overweight Only	17.9	20.0	18.3	18.8
Obese Only	19.4	21.0	19.0	19.9
Non-Hispanic white (n=458)				
Overweight or Obese	21.9	39.8	29.3	31.6
Overweight Only	12.9	20.4	16.3	17.0
Obese Only	9.0	19.4	13.0	14.6
Non-Hispanic black (n=256)				
Overweight or Obese	45.4	44.8	40.7	42.9
Overweight Only	23.6	19.2	12.2	16.8
Obese Only	21.8	25.6	28.5	26.1
Hispanic (n=885)				
Overweight or Obese	46.9	45.0	42.0	44.6
Overweight Only	17.9	22.5	23.1	21.2
Obese Only	29.0	22.5	18.9	23.4

*BMI Percentile ≥ 85

questions, was conducted to assess baseline levels of certain health and risk behaviors at the beginning of the project period. The 2010 YRBSS conducted through the CPPW grant estimated the prevalence of overweight or obese high school students in Clark County to be 27.5%.[20] In addition, combined overweight or obese prevalence estimates for all Non-Hispanic black (35.9%), Hispanic (33.2%), and Non-Hispanic white (20.8%) high school students overall were lower than estimates calculated for 10th grade students in the CCSD dataset. Table 2 compares the data from Clark County to comparable CPPW YRBSS estimates from 2009-2010.

Table 2. Comparison of Percentage of High* BMI, CPPW YRBSS (9th-12th Grades, 2009-2010) and Selected CCSD Students (10th Grade, 2010-2011)

Weight Status	MALES		FEMALES		ALL	
All racial/ethnic groups	*YRBSS*	*CCSD*	*YRBSS*	*CCSD*	*YRBSS*	*CCSD*
Overweight or Obese	29.7	40.6	25.1	37.3	27.5	39.0
Overweight Only	16.2	16.3	15.6	18.3	15.9	17.3
Obese Only	13.5	24.3	9.5	19.0	11.6	21.7
Non-Hispanic white						
Overweight or Obese	22.5	38.5	18.8	29.3	20.8	35.0
Overweight Only	13.4	13.5	12.3	16.3	12.9	14.6
Obese Only	9.1	25.0	6.5	13.0	7.9	20.4
Non-Hispanic black						
Overweight or Obese	-	43.2	-	40.7	35.9	41.7
Overweight Only	-	20.5	-	12.2	18.7	15.6
Obese Only	-	22.7	-	28.5	17.2	26.1
Hispanic						
Overweight or Obese	37.0	45.2	29.3	42.0	33.2	43.6
Overweight Only	18.7	18.4	20.0	23.1	19.4	20.8
Obese Only	18.3	26.8	9.3	18.9	13.8	22.8

*BMI Percentile ≥ 85

NHANES is a program of studies designed to assess the health and nutritional status of adults and children in the United States. The survey is unique in that it combines interviews and physical examinations. The examination component consists of medical, dental, and physiological measurements, as well as laboratory tests administered by highly trained medical personnel. Findings from this survey are used to determine the prevalence of major diseases and risk factors for diseases in the United States. NHANES findings are also the basis for national standards for such measurements as height, weight, and blood pressure.[21] The ability to compare local data collected in Clark County to national estimates, like the ones available from NHANES, provides a reference point to place local results into perspective. Table 3 compares the data from Clark County to comparable NHANES estimates from 2009-2010.

The NHANES conducted in 2009-2010[22] estimated the prevalence of overweight or obese school-age children (aged 6-19) to be 33.2%. In comparison, the CCSD data collected during the 2010-2011 school year found a higher proportion of overweight or obese Clark County students (41.7%). Furthermore, the proportion of obese only students in Clark County (23.2%) was also higher than the NHANES estimate of 18.2%. When comparing students sampled in Clark County to NHANES estimates by gender, estimates in Clark County were also higher than national values. For males, the proportion of Clark County students who were overweight or obese was higher (44.6%) than the national estimate of 34.0%. The proportion of female students in Clark County who were overweight or obese was 38.7%, compared to the national estimate of 32.4%. Similarly, when comparing

Table 3. Comparison of Percentage of High* BMI, NHANES (6-19 years old, 2009-2010) and Selected CCSD Students (4th, 7th, 10th Grades, 2010-2011) (Figures 9-11)

Weight Status	MALES		FEMALES		ALL	
All racial/ethnic groups	*NHANES*	*CCSD*	*NHANES*	*CCSD*	*NHANES*	*CCSD*
Overweight or Obese	34.0	44.6	32.4	38.7	33.2	41.7
Overweight Only	14.2	18.1	15.9	18.8	15.0	18.5
Obese Only	19.8	26.5	16.5	19.9	18.2	23.2
Non-Hispanic white						
Overweight or Obese	31.1	36.9	26.6	31.6	29.0	34.4
Overweight Only	13.9	16.2	13.6	17.0	13.8	16.6
Obese Only	17.2	20.7	13.0	19.9	15.2	17.8
Non-Hispanic black						
Overweight or Obese	38.8	40.6	44.7	42.9	41.8	41.9
Overweight Only	13.4	18.4	18.6	16.8	16.1	17.5
Obese Only	25.4	22.2	26.1	26.1	25.7	24.4
Hispanic						
Overweight or Obese	41.5	51.4	40.9	44.6	41.7	48.0
Overweight Only	16.2	20.6	20.5	21.2	18.8	21.0
Obese Only	25.3	30.8	20.4	23.4	22.9	27.0

*BMI Percentile ≥ 85

Clark County students to national estimates by gender for obese only individuals, estimates were also higher in Clark County for males (26.5% vs. 19.8%) and females (19.9% vs. 16.5%) than comparable NHANES data. In 2009-2010, NHANES statistics showed that non-Hispanic, white school-age children had the lowest prevalence of overweight or obese individuals (29.0%) when compared to non-Hispanic, black (41.8%) and Hispanic (41.7%). In Clark County, a similar trend was seen: non-Hispanic, white students had the lowest proportion of overweight or obese individuals at 34.4%, non-Hispanic, black at 41.9%, and Hispanic at 48.0%. Although available NHANES estimates do not stratify respondents by grade, it is important to note that when Clark County students were subset by grade level (Table 1), the proportion of overweight or obese students, as well as only obese only students, was still higher than overall national estimates for school-age children.

Discussion

DISTRIBUTION OF SAMPLE

When interpreting and applying the results of this analysis, it is important to keep in mind that the data presented are from a convenience sample of Clark County students. Students were selected for screening based upon current screenings required for students during the 4th, 7th, and 10th grade years. Common criticisms of convenience sampling are sampling bias and that the sample selected was not representative of the entire population.[23] Therefore, while the estimates shown here can provide an anecdotal perspective on the current weight status among CCSD students, they may not be generalizable for the entire CCSD student population and have low external validity.

Differences in factors such as socioeconomic status could also affect the comparability of schools included in the sample. NHANES estimates showed that low-income children and adolescents are more likely to be obese than their higher income counterparts.[24] Eligibility for free or reduced lunch is one common indicator of

Table 4. Percentage of Students Eligible for Free/Reduced Lunch Among Sampled Schools

School	Eligible
Clark County School District (overall)	**50.8**
A Tech	3.8
Rex Bell Elementary	85.7
M. J. Christensen Elementary	44.4
Del Sol High	58.0
P. A. Diskin Elementary	70.7
Victoria Fertitta Middle	35.8
Roger D. Gehring Elementary	42.7
Lomie Gray Heard Elementary	24.8
Marc A. Kahre Elementary	46.1
Clifford J. Lawrence Junior High	47.4
Jacob E. Manch Elementary	89.7
Mojave High	54.9
D'Vorre & Hall Ober Elementary	21.9
Dell H. Robison Middle	80.1
Lewis E. Rowe Elementary	73.2
Wayne N. Tanaka Elementary	39.8
Vegas Verdes Elementary	90.3
Thurman White Middle	46.9
Gwendolyn Woolley Elementary	84.6

Source: Nevada Annual Reports of Accountability[25]

poverty status. Table 4 shows the percentage of students in sampled schools eligible for Free/Reduced Lunch, compared to overall district eligibility.

The percentages provided in Table 4 show that some sampled schools had a proportion of students eligible for Free/Reduced Lunch that was higher than the overall eligibility for CCSD. While eligibility for Free/Reduced Lunch is available publicly at the school level, that information was not available to SNHD on an individual basis for sampled students. Access to this information would allow the sample to be compared to the overall Free/Reduced Lunch eligibility for CCSD to determine if the sample is biased towards students from low-income families.

DATA COLLECTION

Assembly Bill 354 was an unfunded mandate that placed the burden of data collection upon the schools and school districts without providing funding support. Understanding that the data needed to be collected regardless, CCSD staff involved in the data collection used whatever equipment was available, leading to non-standardized equipment and data collection methods. The lack of uniform equipment and screening procedures could lead to variance in the measurements between schools, affect the accuracy of individual measurements, and reduce the accuracy and precision of the overall estimates.

Understanding the need for uniform equipment and consistency in methodology between screeners, funds from the CPPW grant were allocated to CCSD prior to the 2011-2012 school year to establish a Prevention First position responsible for coordinating screenings with schools, developing a more robust data collection protocol, and conducting trainings for CCSD staff involved in data collection. Stadiometers and scales for selected schools were also purchased with CPPW funds. Issues with accuracy, reliability, and consistency of the data collection should be reduced significantly as a result of these activities.

LIMITATIONS

When comparing population parameters, it is common practice to use confidence intervals to assess the reliability of the estimate. Confidence intervals can also be used to

judge whether or not a "statistically significant" difference exists between two estimates. However, this type of comparison is limited to surveys and samples that are considered to be unbiased based upon an evaluation of the methodology used in collecting data. Given the concerns regarding the validity of the current sample drawn from CCSD schools, point estimates for weight status should not be considered to be an unbiased estimate of the overall CCSD population. In addition, due to the validity concerns associated with the current sample because of methodological issues with data collection, not only would it be inappropriate to use confidence intervals, but also any other statistical test to compare the CCSD data with other known sources. The point estimates were intended only to provide a frame of reference when comparing the results of this analysis to YRBSS and NHANES, and not as a measure of precision.

Conclusion and Recommendations

When comparing the results of this analysis to other data sources for CCSD students, the proportion of students with an unhealthy weight was higher than other current data. However, in the case of the 2010 CPPW YRBSS estimates, height and weight data were self-reported by students and not measured. Some research has shown that bias in reporting weight and height can be much higher in overweight or obese adolescents than normal/underweight adolescents.[26] The ability to measure height and weight data, as opposed to relying on self-reported data from students, can provide a much more accurate estimate to base decisions regarding policies and programs.

In addition to the convenience sample used to select the grade levels, the sample drawn from CCSD schools utilized a systematic sample stratified by school type (elementary, middle, and high). However, systematic sampling is traditionally used when a given population is homogeneous. Differences in factors such as socioeconomic status and distribution of race/ethnicity could affect the comparability of schools included in the sample. As previously noted, when reviewing overall trends over grade levels for the sampled CCSD students, some groups displayed a decreasing trend for prevalence for unhealthy weight status. These trends are contrary to NHANES data and may indicate that the current CCSD sample is biased. As shown by the difference in the proportion of students represented in the current sample for free or reduced lunch eligibility and race/ethnicity, weighting of the data is needed to remove bias from the sample to better represent the overall population. Given the methodological issues identified for the current sample, in order to accurately represent the entire CCSD student population, a new sample needs to be drawn that addresses differences between grade levels and schools within the district for common demographic variables.

In Section G of the School Nurse Handbook for CCSD, students who fail vision or hearing screenings are issued medical referrals.[27] Similar referrals for students who are determined to be of unhealthy weight are made but it would be useful to have additional community resources developed as studies have shown that weight status is linked to academic performance.[28,29] The U.S. Preventive Services Task Force (USPSTF) found

that effective comprehensive weight-management programs incorporating counseling and other interventions that targeted diet and physical activity, and moderate to high-intensity programs showed results that include improved weight status.[30] Since the current sample suggests that CCSD students may be more overweight or obese when compared to individuals of similar age nationally, if these results were replicated with an unbiased sample, implementation of a referral system for unhealthy weight combined with expansion of the current sample to include more schools and students, and ultimately all schools and students, should be strongly considered. Medical referrals, along with more students screened, could, in the long term, prevent the progression of unhealthy weight in the general population as students become adults.

The mandate set forth by Assembly Bill 354 and extended by Assembly Bill 191 provides CCSD and SNHD a unique opportunity to address the significant public health issue of childhood obesity through the monitoring of BMI levels for a large portion of the school-age population in Clark County. While the challenges of working within the fifth largest school district in the nation can be difficult to overcome, states such as South Dakota[9] and Indiana[3,] have similar requirements for their school districts. Trends identified by these screenings can help create policies and programs that promote healthier environments for this at-risk population. The ability to do so depends on collecting the most accurate and reliable data possible.

Southern Nevada Health District
P.O. Box 3902, Las Vegas, NV 89127
(702) 759-1000 | www.SNHD.info

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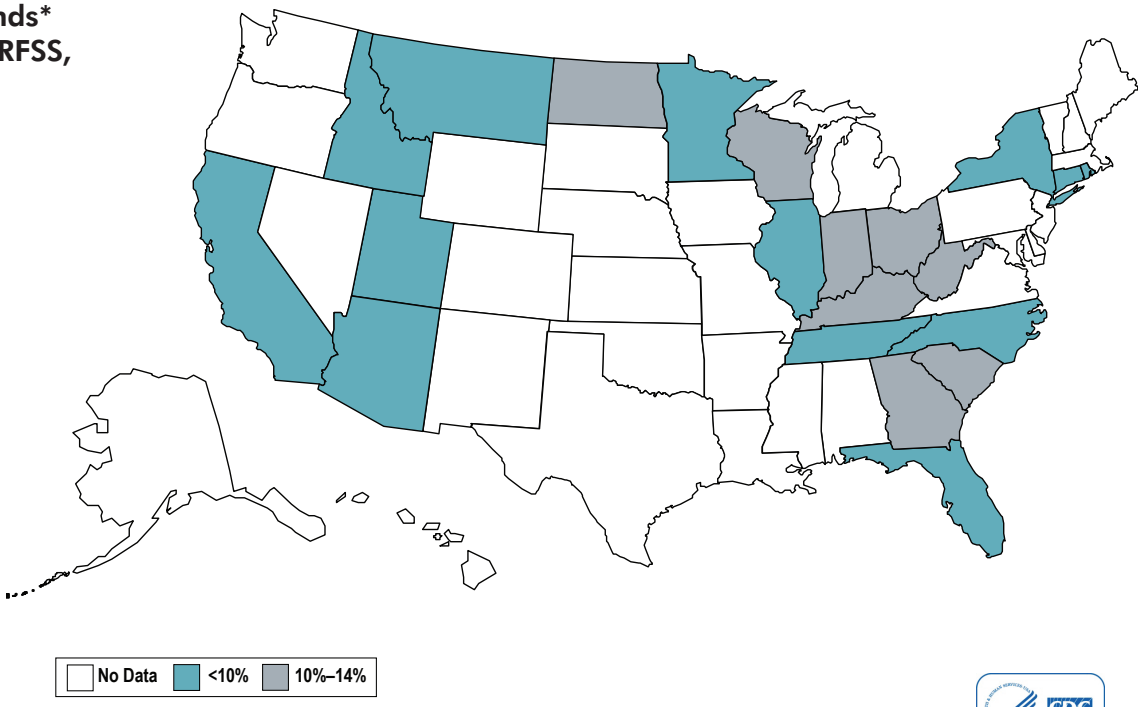
Appendix A

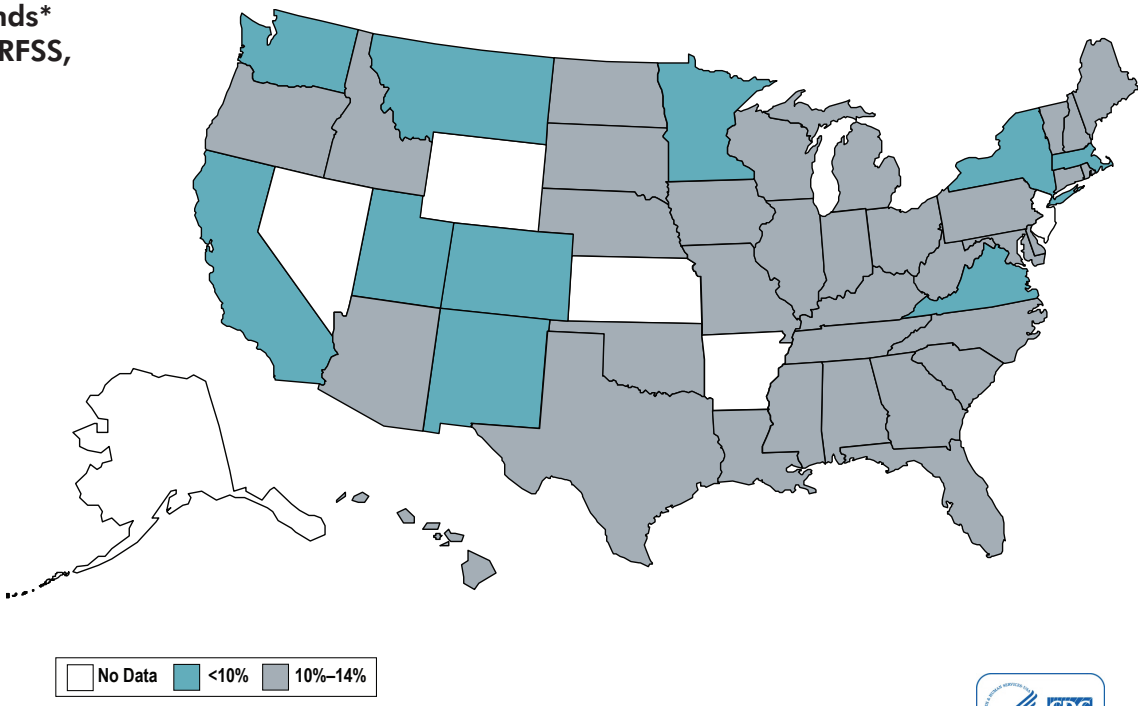
Figure 1. Obesity Trends* Among U.S. Adults (BRFSS, 1985)



Source: Behavioral Risk Factor Surveillance System, CDC.

*BMI ≥ 30, or ~30 lbs. overweight for 5'4" person

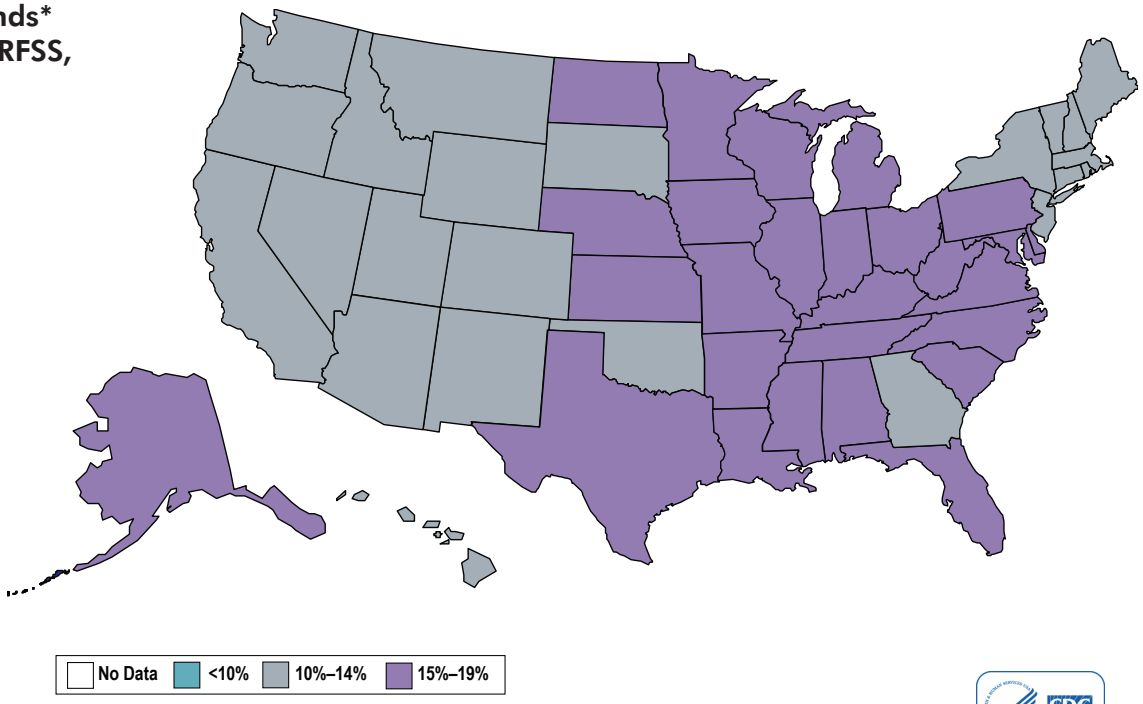
Figure 2. Obesity Trends* Among U.S. Adults (BRFSS, 1990)



Source: Behavioral Risk Factor Surveillance System, CDC.

*BMI ≥ 30, or ~30 lbs. overweight for 5'4" person

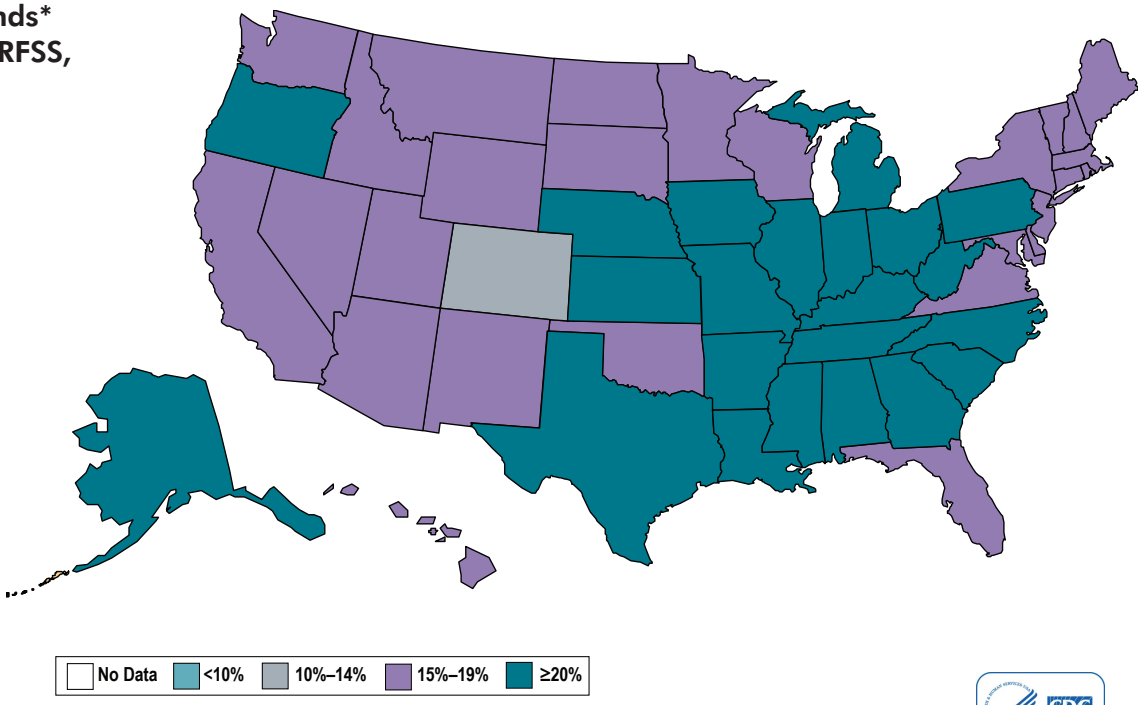
Figure 3. Obesity Trends* Among U.S. Adults (BRFSS, 1995)



Source: Behavioral Risk Factor Surveillance System, CDC.

*BMI ≥ 30, or ~30 lbs. overweight for 5'4" person

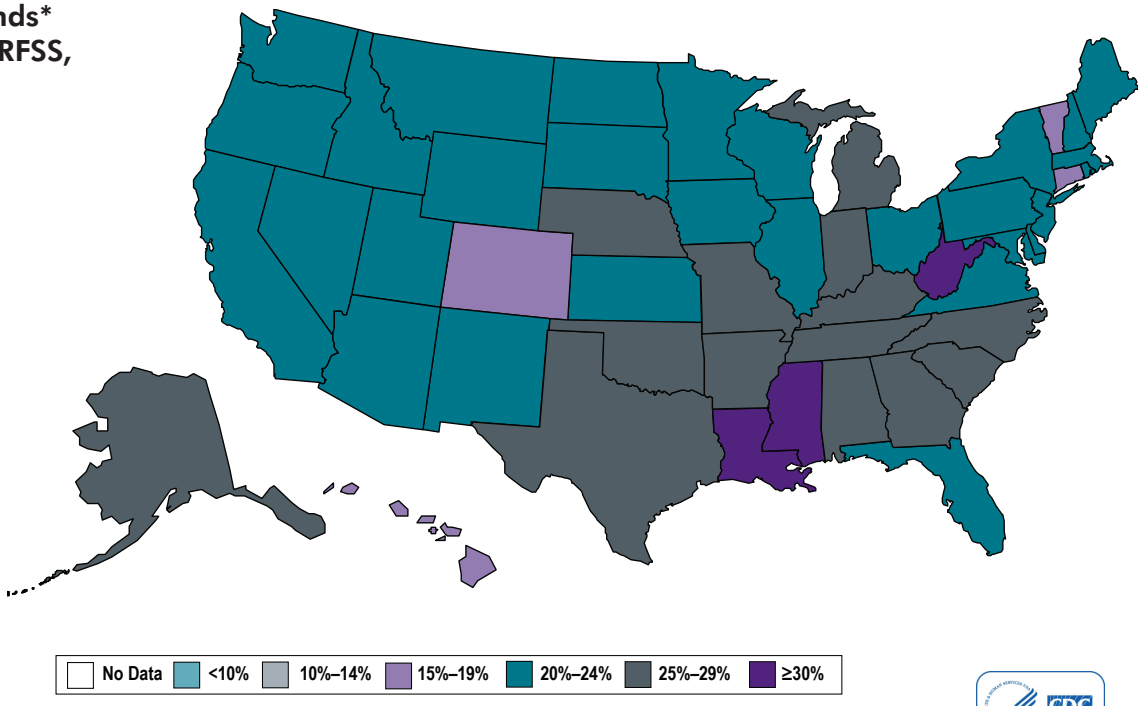
Figure 4. Obesity Trends* Among U.S. Adults (BRFSS, 2000)



Source: Behavioral Risk Factor Surveillance System, CDC.

*BMI ≥ 30, or ~30 lbs. overweight for 5'4" person

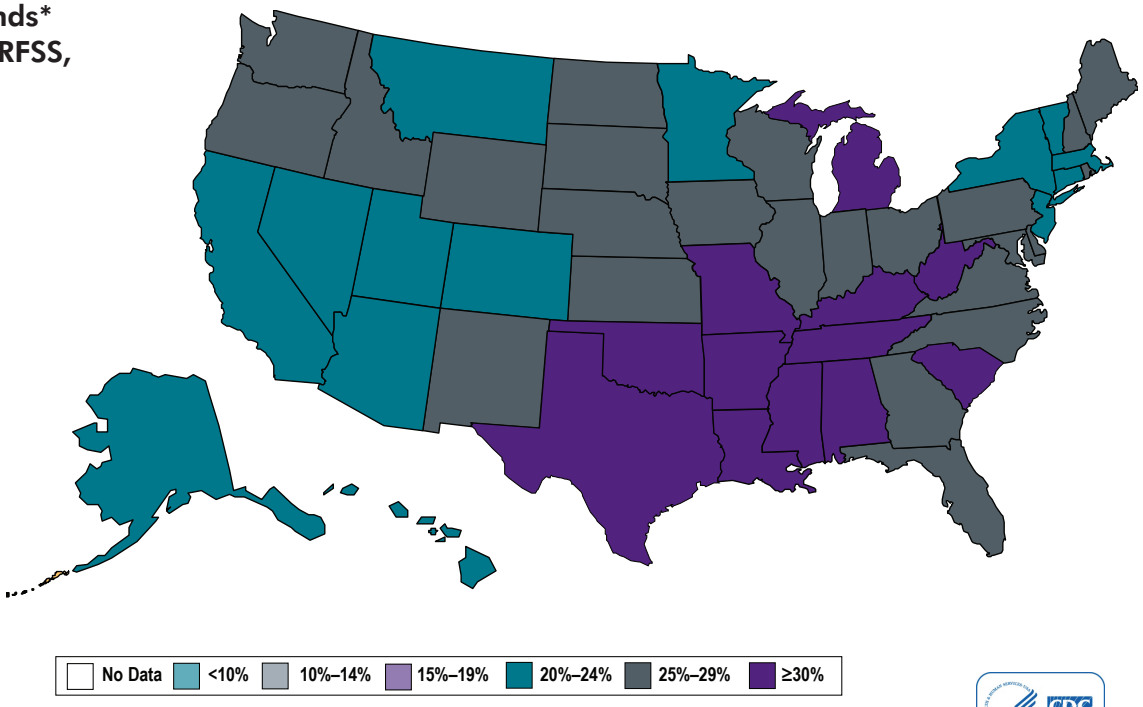
Figure 5. Obesity Trends* Among U.S. Adults (BRFSS, 2005)



Source: Behavioral Risk Factor Surveillance System, CDC.

*BMI ≥ 30, or ~30 lbs. overweight for 5'4" person

Figure 6. Obesity Trends* Among U.S. Adults (BRFSS, 2010)



Source: Behavioral Risk Factor Surveillance System, CDC.

*BMI ≥ 30, or ~30 lbs. overweight for 5'4" person

Figure 7. List of Sampled CCSD Schools by Type (2010-2011 School Year)

Elementary (n=1165)	Middle/Junior (n=1484)	High School (n=1193)
Rex Bell	Victoria Fertitta	A Tech
M. J. Christensen	Clifford J. Lawrence	Del Sol High
P.A. Diskin	Dell H. Robison	Mojave High
Roger D. Gehring	Thurman White	
Lomie Gray Heard		
Marc A. Kahre		
Jacob E. Manch		
D'Vorre & Hall Ober		
Lewis E. Rowe		
Wayne N. Tanaka		
Vegas Verdes		
Gwendolyn Woolley		

Figure 8. Weight Status of CCSD Sampled Students by Grade (2010-2011 School Year)

BMI Classification	4th Grade		7th Grade		10th Grade	
	Number	Percent	Number	Percent	Number	Percent
Underweight	41	3.5	42	2.8	29	2.4
Healthy Weight	640	54.9	791	53.3	699	58.6
Overweight	207	17.8	296	20.0	206	17.3
Obese	278	23.8	355	23.9	259	21.7
Total	1165	100.0	1484	100.0	1193	100.0

Figure 9. Comparison of Weight Status, NHANES (2010) and CCSD Sampled Students (2010-2011)

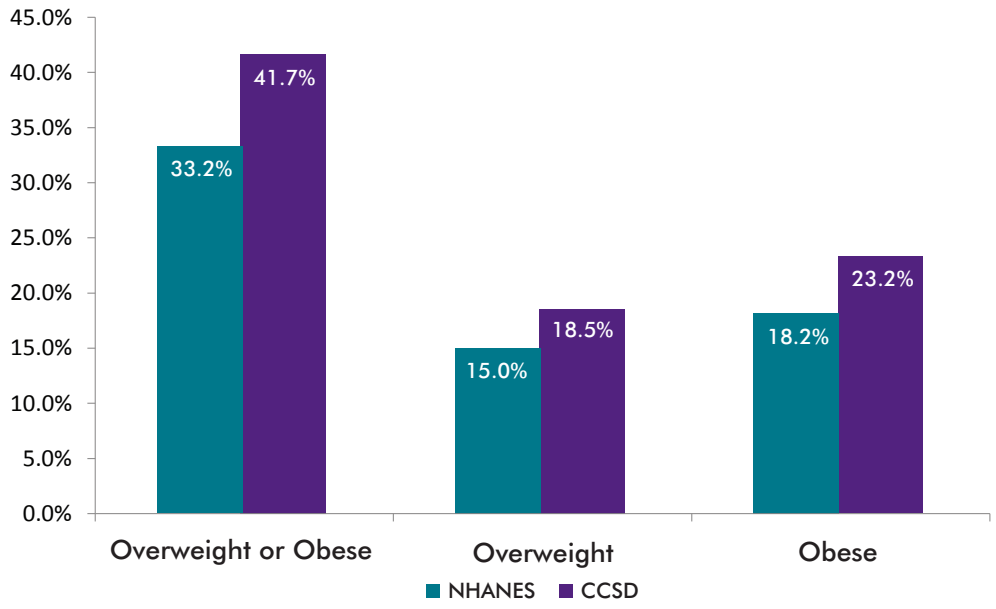


Figure 10. Comparison of Weight Status by Gender, NHANES (2010) and CCSD Sampled Students (2010-2011)

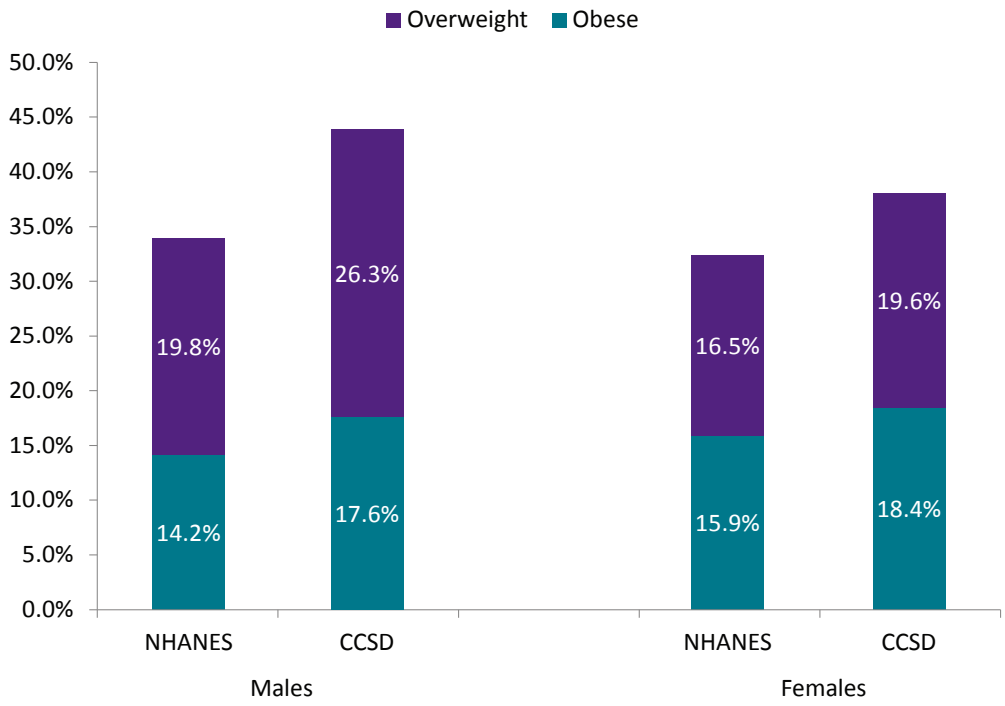


Figure 11. Comparison of Weight Status by Race/ Ethnicity, NHANES (2010) and CCSD Sampled Students (2010-2011)

BMI Classification	White or Caucasian, Non-Hispanic		Black or African American, Non-Hispanic		Hispanic	
	NHANES	CCSD	NHANES	CCSD	NHANES	CCSD
Overweight/Obese	29.0%	34.4%	41.8%	41.9%	41.2%	48.0%
Overweight	13.8%	16.6%	16.1%	17.5%	18.3%	21.0%
Obese	15.2%	17.8%	25.7%	24.4%	22.9%	27.0%

Appendix B

CCSD HEIGHT/WEIGHT PROCEDURES

Height/Weight Measurement

The Nevada Legislature mandates height and weight measurement on a representative sample of students in each district in Nevada. The Clark County School District has designated grades 4, 7, and 10 to be used for this screening. The 19 schools in the district to be sampled were chosen by the Nevada State Health Division.

Height and weight measurements can be delegated with training. School nurses are responsible to train personnel and oversee the process. The FASA Screening Team or school nurse team may be utilized as time and scheduling permits to complete the screening. Other options include involving nursing students in the completion of the screening.

Documents pertaining to height and weight screening, including the Notification of Site Administrator memo, and the Height/Weight Screening Parent Notification Letter and Measurement Protocols may be found on the School Nurse site→Screening Team→Height/Weight Screening.

Screening Preparation

Site school nurse should prepare for this screening as follows:

- Schedule with School Nurse Team.
- Alternatively, schedule screening with FASA Screening Team.

Height/Weight Preparation

- Obtain measuring equipment from Health Services, if needed.
- Notify parents of the date that screening will take place via newsletter is optional.
- Set screening schedule with the following considerations:
    - Allow 10-20 minutes per class; stagger screening during a period.
    - Schedule at the same time as scoliosis screening if screening Middle School.
    - Make sure you do not schedule screening during a teacher's lunch period.
- Print class lists for screeners to record results.
- Notify teachers of the screening date two to three weeks prior to screening.
- Distribute screening schedule to teachers one to two days prior to screening.
- A list of students exempted from screening per parent request should be provided to screeners and teachers.
- Volunteers may be utilized as runners if needed.
- Provision should be made for privacy, utilizing screens or separate rooms as needed. Do not report measurements aloud.

- If possible, have 2 or more computers ready for inputting screening results. If using a FASA Screening Team, the FASAs will enter the results. At the nurse's direction, FASAs may assist in sending referrals for results outside of normal range. Follow the directions outlined for entering group results as designated on School Nurse site under Healthmaster icon.

Screening Procedure

Height Measurement

1. Student should remove shoes and outer garments that may interfere with height measure.
2. Student should step into/onto measurement area with heels together and placed at the back of the measurement surface. Arms should hang loosely at the side, legs should be straight, shoulders should be relaxed, and the student should look straight ahead, with the head in a horizontal plane.
3. The heels and back of the head should be against the vertical surface of the measurement area (e.g., the wall or stadiometer). The student should inhale and stand up tall while the measurement is being taken. The hair should be compressed by the measuring device, and the device should be level.
4. The measurement should read to the nearest ½ inch.
5. Measures will be recorded in Healthmaster and NEVER READ ALOUD, to protect confidentiality.

Weight Measurement

1. Students should empty pockets and remove shoes and outer garments that may interfere with weight measurement.
2. Student will stand on a scale which has been placed on a flat, hard surface. Weight should be equally distributed over both feet, and the heels and balls of the feet should be on the scale if the feet are longer than the scale. Arms should hang loosely at the side.
3. Student will be asked to stand straight, without leaning to one side. Head will be stationary.
4. Measurement will be taken to the nearest pound.
5. Measurement will be taken when the scale stabilizes. A record of weight measurement will be recorded in Healthmaster and NEVER READ ALOUD, to protect confidentiality.
6. If the body weight exceeds the scales's maximum, the weight recordings will be left blank and notes entered into Healthmaster.

Please Note: A stadiometer and professional grade scale should be used it at all possible. Utilization of screens is recommended to protect privacy and prevent embarrassment of students.