Body Mass Index of Nevada Students
School Year 2013-2014

Office of Public Health Informatics and Epidemiology
Division of Public and Behavioral Health
Department of Health and Human Services

August 2015 | Version 1.0

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Many individuals contributed to collecting the information provided in this report. We thank all the leaders and collaborators who made this report possible, especially the data collection work of the county school district nursing staff of the 17 Nevada counties, without whom this unfunded endeavor would not have been possible and the Division of Public and Behavioral Health staff:

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BACKGROUND
BMI of Nevada Students: School Year 2013-2014

Purpose
This report provides Nevada student height and weight measurement data collected from 4th, 7th, and 10th grade students from statewide county school districts for the 2013-2014 school year.

The information provided is directed towards parents, health care providers, and health care professionals as a guideline of the current physical height and weight student obesity status of Nevada children in the data sampling as required by NRS 392.420.

AB 354 requires that Nevada school districts measure their students of one grade of elementary schools, one grade of junior high and middle schools, and one grade of high schools for height and weight. The Division of Public and Behavioral Health (DPBH) of the Department of Health and Human Services defined the “representative sample” of the data collected.

Childhood Obesity
Approximately 17% (or 12.5 million) of United States’ children and adolescents 2 – 19 years of age are obese, and since 1980, obesity prevalence among children and adolescents has almost tripled. Childhood obesity is a growing problem and is a result of eating too many calories and not getting enough physical activity. American society has become characterized by environments that promote increased consumption of less healthy food and physical inactivity. The availability of less healthy foods and sugar drinks on school campuses, advertising of less healthy foods, increasing portion sizes, and the lack of daily quality exercises are some of the major contributors to obesity among children and adolescents in the United States, as identified by the Centers for Disease Control and Prevention (CDC).

Obese children are more likely to have: high blood pressure and high cholesterol; increased risk of impaired glucose tolerance; insulin resistance and type 2 diabetes; breathing problems such as sleep apnea and asthma; joint problems and musculoskeletal discomfort; fatty liver disease, gallstones, and gastro-esophageal reflux. In addition, obese children and adolescents have a greater risk of social and psychological problems such as discrimination and poor self-esteem. Obese children are more likely to become obese adults and adult obesity is associated with several serious health conditions including heart disease, diabetes, and some cancers.

Legislative History
During the 2007 Legislative Session, AB 354 was passed to amend NRS 392.420 to require that physical examinations in schools include a height and weight measurement for a sample of students. These measurements were to be performed by a school nurse or designee of a school nurse and reported to the State Health Officer to monitor the health status of Nevada students but exclude identifying information related to any individual student. The provisions of this bill were schedule to expire on June 30, 2010; however, AB 191 extended these provisions until June 30, 2015.
As a result of the 2013 Legislative Session, SB 442 was passed to amend NRS 392.420 to require that height and weight measurements be taken only in counties whose population is 100,000 or more (Clark and Washoe Counties) rather than all counties as was previously required. The legislative requirements for the collection of student height and weight data expired on June 30, 2015.

Collaboration with School Districts
On September 6, 2007, a meeting was held in Carson City at the Nevada State Health Division with Chief Nurses and other interested parties regarding collecting the data required under AB 354. The Nurses agreed to collect data on the heights and weights of 4th, 7th, and 10th graders. Due to the large number of students enrolled in Clark and Washoe County School Districts, it was agreed that they would collect measurements on a sample of their students. The sampling method was determined by the Nevada State Health Division. The remaining districts collected information on all students in the 4th, 7th, and 10th grades.

Data Collection and Compilation
Data for Clark and Washoe school districts were compiled and submitted to DPBH and was subsequently imported into a SAS (Statistical Analysis System) database. Student height weight data that was outside the acceptable normal range for age and sex as determined by the Centers for Disease Control and Prevention (CDC) was removed from the sample.

Methods/Technical Notes
This report is based upon annual student height and weight measurements of a data sample of 9,596 for 4th, 7th, and 10th grade students, collected in Clark and Washoe Counties, during the 2013-2014 school year.

After cleaning the data, it was then weighted to reflect the total Nevada enrollment for 4th, 7th, and 10th grades.

BMI was reported as calculated per CDC guidelines for student height and weight.
The CDC Weight Classification

BMI is calculated using an individual’s measured weight and height. BMI can be used as an indicator of body fatness for most children and teens. BMI does not measure body fat directly, but research has shown that it correlates to body fat. BMI is an alternative to the direct measurement of body fat and is an inexpensive method of screening for weight categories.

BMI is the ratio of weight to height and calculated using the following formula:

\[
\text{BMI} = \frac{\text{Weight in pounds}}{\text{Height in inches}^2} \times 703
\]

For children and adolescents aged 2-19, weight status is determined using the age- and sex-specific percentiles for BMI because children’s body composition varies as they age and between boys and girls. The following table shows the weight status categories for children and youth defined by CDC using the BMI-for-age calculation.

<table>
<thead>
<tr>
<th>Percentile Range</th>
<th>Weight Status Category</th>
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<tbody>
<tr>
<td>Less than 5th Percentile</td>
<td>Underweight</td>
</tr>
<tr>
<td>5th to less than 85th Percentile</td>
<td>Normal Weight</td>
</tr>
<tr>
<td>85th to less than 95th Percentile</td>
<td>Overweight</td>
</tr>
<tr>
<td>Greater than or equal to 95th Percentile</td>
<td>Obese</td>
</tr>
</tbody>
</table>

http://www.cdc.gov/healthyweight/assessing/bmi/childrens_bmi
Data Summary
BMI of Nevada Students: School Year 2013-2014

Data and Report Layout
This report was produced using the student height and weight data collected for Clark and Washoe County students during the 2013-2014 school year. The total number of participants was 9,596 individuals composed of 3,341 fourth graders, 3,423 seventh graders, and 2,832 tenth graders. The total Nevada enrollment for school year 2013-2014 for fourth, seventh, and tenth graders was 28,888, 29,786, and 28,952 respectively for a total of 87,626 (Table 3). In the sampling plan it was decided that Washoe and Clark Counties (being more populated) would conduct a representative sample of students. Table 2 details the Clark and Washoe County School participation rates, and Table 3 details student participation rates by students and district.

Table 2: Total Number of Schools per District and the Total Number of Participating Schools with the School Participation Rate in Percent (School Year 2013-2014)

<table>
<thead>
<tr>
<th>District</th>
<th>Total Number of Schools per District</th>
<th>Number of participating Schools</th>
<th>School Participation rate (Percent)</th>
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<tbody>
<tr>
<td>Clark</td>
<td>356</td>
<td>263</td>
<td>73.9</td>
</tr>
<tr>
<td>Washoe</td>
<td>103</td>
<td>22</td>
<td>21.4</td>
</tr>
</tbody>
</table>

Table 3: Total Enrollment, Participation (N), and Participation Rates (Percent) by County and Grade (School Year 2013-2014)

<table>
<thead>
<tr>
<th>State District</th>
<th>Fourth Grade</th>
<th>Seventh Grade</th>
<th>Tenth Grade</th>
<th>Combined Grades</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>total</td>
<td>N</td>
<td>*Rate</td>
<td>total</td>
</tr>
<tr>
<td>Clark &amp; Washoe</td>
<td>28,888</td>
<td>3,341</td>
<td>11.6</td>
<td>29,786</td>
</tr>
<tr>
<td>Clark</td>
<td>24,003</td>
<td>1,978</td>
<td>8.2</td>
<td>24,839</td>
</tr>
<tr>
<td>Washoe</td>
<td>4,885</td>
<td>1,363</td>
<td>27.9</td>
<td>4,947</td>
</tr>
</tbody>
</table>

*Participation rates were determined from total enrollments received from the Department of Education.
Section I: Weight Classification of 4th, 7th, and 10th Graders Collectively

2013-2014 School Year BMI Data by District, and Race/Ethnicity, Grade, and Sex

**BMI Data by School District**

**Figure 1:** The percentages of Clark County fourth, seventh, and tenth graders collectively who are at a healthy weight is around 55%.

**Figure 2:** The percentages of Washoe County fourth, seventh, and tenth graders collectively who are at a healthy weight is around 62%.
**Figure 3:** The percentages of Clark County and Washoe County combined for fourth, seventh, and tenth graders collectively who are at a healthy weight is around 58%.

**BMI Data by Race/Ethnicity**

**Figure 4:** The percentage of fourth, seventh, and tenth graders collectively who are underweight is low among all race/ethnicities.
**Figure 5:** Among race/ethnicity groups, of fourth, seventh, and tenth graders collectively, Hispanics have a significantly lower rate of students with a healthy weight than other racial groups, with the exception of Native Americans/Hawaiians.

![Percent of Fourth, Seventh, and Tenth Graders for Clark and Washoe Counties Collectively Who Are at a Healthy Weight by Race/Ethnicity (2013-2014 School Year)](chart1)

**Figure 6:** The percentage of fourth, seventh, and tenth graders collectively who are overweight range from 15.4% to 19.6% among race/ethnicity groups.

![Percent of Fourth, Seventh, and Tenth Graders For Clark and Washoe Counties Collectively Who Are Overweight by by Race/Ethnicity (2013-2014 School Year)](chart2)
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BMI Data by District

Figure 14: The percentage of Clark County fourth graders who are at a healthy weight is 55.1%.

![Weight Classification of Clark County Fourth Graders](image)

Figure 15: The percentages of Washoe County fourth graders who are at a healthy weight is 61.8%.

![Weight Classification of Washoe County Fourth Graders](image)
**Figure 16**: The percentage of fourth graders for Clark County and Washoe County combined who are obese is 21.5%.

![Weight Classification of Clark and Washoe County Fourth Graders Combined (2013-2014 School Year)](image)

**BMI Data by Race/Ethnicity**

**Figure 17**: The percentage of Clark County and Washoe County fourth graders who are underweight is low for all racial/ethnic groups.

![Percent of Clark County and Washoe County Fourth Graders Who Are Underweight by Race/Ethnicity (2013 - 2014 School Year)](image)
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**Figure 19:** The percent of Clark County and Washoe County fourth graders who are overweight by race/ethnicity ranges from 13.8% to 18.0%.
Figure 20: The percentage of Clark County and Washoe County fourth graders who are obese ranges from 13.9% to 28.6%.

BMI Data by Sex

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**BMI Data by District**

**Figure 22:** The percentage of Clark County seventh graders who are at a healthy weight is 54.4%.

![Weight Classification of Clark County Seventh Graders](image)

**Figure 23:** The percentage of Washoe County seventh graders who are at a healthy weight is 62.6%.

![Weight Classification of Washoe County Seventh Graders](image)
Figure 24: The percentage of Clark County and Washoe County seventh graders combined who are at a healthy weight is 57.9%.

BMI Data by Race/Ethnicity

Figure 25: The percentage of seventh graders who are underweight is low in all racial/ethnic categories.
Figure 26: The percentage of Clark County and Washoe County seventh graders combined who are at a healthy weight is significantly higher among Whites than Blacks or Hispanics.

![Graph showing the percentage of Clark County and Washoe County seventh graders at a healthy weight by race/ethnicity.]

Figure 27: The percentage of Clark County and Washoe County seventh graders combined that are overweight ranges from 16.0% to 20.7% across race/ethnicity groups.

![Graph showing the percentage of Clark County and Washoe County seventh graders who are overweight by race/ethnicity.]

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**Figure 28:** The percentage of Clark County and Washoe County seventh graders combined who are obese is highest in the Native American/Hawaiian and the Hispanic population; due to wide confidence intervals in the Native American/Hawaiian population this difference is not significant.

**BMI Data by Sex**

**Figure 29:** A higher percentage of Clark County and Washoe County female seventh graders are at a healthy weight than seventh grade males and conversely there is a higher percentage of obese seventh grade males than females. These differences are significant.
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2013-2014 School Year BMI Data by District, and Race/Ethnicity, and Sex

BMI Data by District

Figure 30: 56.5% of Clark County tenth graders are at a healthy weight.

![Weight Classification of Clark County Tenth Graders (2013-2014 School Year)](image)

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![Weight Classification of Washoe County Tenth Graders (2013-2014 School Year)](image)
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**BMI Data by Sex**

*Figure 37:* The percentage of Clark County and Washoe County tenth graders who are obese is significantly higher in males than females.
Citations
BMI of Nevada Students: School Year 2013-2014


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Recommended Citation

Office of Public Health Informatics and Epidemiology, Nevada Division of Public and Behavioral Health,

http://dpbh.nv.gov/Programs/Office_of_Public_Health_Informatics_and_Epidemiology_(OPHIE)/

This report was produced by the Office of Public Health Informatics and Epidemiology through the Behavioral Risk Factor Surveillance System Grant (number 1U58DP006028-01) and the Maternal and Child Health Block Grant (number B04MC26680).