## Body Mass Index of Nevada Students

## School Year 2012-2013

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## Acknowledgements

BMI of Nevada Students: School Year 2012-2013

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## Background

BMI of Nevada Students: School Year 2012-2013

## Purpose

This report provides Nevada student height and weight measurement data collected from $4^{\text {th }}, 7^{\text {th }}$, and $10^{\text {th }}$ grade students from statewide county school districts for the 2012-2013 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 Health Division (now known as the Division of Public and Behavioral Health) 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. ${ }^{\text {i }}$ 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). ${ }^{\text {ii }}$

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 come cancers.ii'

## 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 rather than all counties as was previously required.

## 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 $4^{\text {th }}, 7^{\text {th }}$, and $10^{\text {th }}$ 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 $4^{\text {th }}, 7^{\text {th }}$, and $10^{\text {th }}$ grades.

## Data Collection and Compilation

Although a spreadsheet template to be used for height/weight data collection was distributed, data was also submitted in PDF format and hard copy. Data for each school district was then compiled and subsequently imported into a SAS (Statistical Analysis System) database. Data was then cleaned to include only $4^{\text {th }}, 7^{\text {th }}$, and $10^{\text {th }}$ grades. Student height, weight, and Body Mass Index (BMI) data that is outside the acceptable normal range for age and sex as determined by the Centers for Disease Control and Prevention (CDC).

## Methods/Technical Notes

This report is based upon annual student height and weight measurements of a data sample of 16,733 Nevada $4^{\text {th }}, 7^{\text {th }}$, and $10^{\text {th }}$ grade students, collected in 14 counties, during the 2012-2013 school year.

After cleaning the data, it was then weighted to reflect the total Nevada enrollment for $4^{\text {th }}, 7^{\text {th }}$, and $10^{\text {th }}$ grades. ${ }^{\text {iv }}$

BMI was reported as calculated per CDC guidelines for student height and weight. ${ }^{\text {.iii }}$

## 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:
Weight in pounds
$\mathrm{BMI}=$
X 703
Height in inches ${ }^{2}$

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 1: The Percentile Range for Child and Adolescent Weight Categories

| Percentile Range | Weight Status Category |
| :--- | :--- |
| Less than $5^{\text {th }}$ Percentile | Underweight |
| $5^{\text {th }}$ to less than $85^{\text {th }}$ Percentile | Normal Weight |
| $85^{\text {th }}$ to less than $95^{\text {th }}$ Percentile | Overweight |
| Greater than or equal to $95^{\text {th }}$ Percentile | Obese |

http://www.cdc.gov/healthyweight/assessing/bmi/childrens_bmi

## Data Summary

BMI of Nevada Students: School Year 2012-2013

## Data and Report Layout

This report was produced using the student height and weight data collected for Nevada students during the 2012-2013 school year. Eleven of Nevada's 17 school districts submitted data; however, one district (Esmeralda) had too few students to produce reliable estimates (Table 2). Nevada's total number of participants was 16,733 individuals composed of 5,707 fourth graders, 6,190 seventh graders, and 4,836 tenth graders. The total Nevada enrollment for school year 2011-2012 for fourth, seventh, and tenth graders was $32,162,32,747$, and 31,952 respectively for a total of 96,861 (Table 3 ). In the sampling plan it was decided that Washoe and Clark Counties (being more populated) would conduct a representative sample of students, and all other districts, who responded to NSHD, agreed to collect data on their entire student population. Table 2 details total enrollment, participation, and participation rates by district and grade.

Table 2: Total Number of Schools per District and the Total Number of Participating Schools with the School Participation Rate in Percent (School Year 2012-2013)

| District | Total Number of Schools per District | Number of participating Schools | School Participation Rate (Percent) |
| :---: | :---: | :---: | :---: |
| Carson City | 11 | 8 | 72.7 |
| Churchill | 5 | 5 | 100.0 |
| Clark | 343 | 270 | 78.7 |
| Douglas | 13 | * | * |
| Elko | 29 | 26 | 89.7 |
| Esmeralda | 3 | * | * |
| Eureka | 3 | * | * |
| Humboldt | 10 | 10 | 100.0 |
| Lander | 4 | 4 | 100.0 |
| Lincoln | 9 | * | * |
| Lyon | 17 | 14 | 82.4 |
| Mineral | 5 | 4 | 80.0 |
| Nye | 24 | * | * |
| Pershing | 4 | 3 | 75.0 |
| Storey | 4 | * | * |
| Washoe | 101 | 23 | 22.8 |
| White Pine | 8 | 7 | 87.5 |

- No data was submitted from these Districts.

Table 3: Total Enrollment, Participation (N), and Participation Rates (Percent) by County and Grade
(School Year 2012-2013)

| State District | Fourth Grade |  |  | Seventh Grade |  |  | Tenth Grade |  |  | Combined Grades |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Total | N | *Rate | Total | N | **Rate | Total | N | *Rate | Total | N | *Rate |
| Nevada | 32,162 | 5,707 | 17.7 | 32,747 | 6,190 | 18.9 | 31,952 | 4,836 | 15.1 | 96,861 | 16,733 | 17.3 |
| Carson City | 603 | 452 | 75.0 | 585 | 475 | 81.2 | 583 | 441 | 75.6 | 1,771 | 1,368 | 77.2 |
| Churchill | 255 | 253 | 99.2 | 247 | 216 | 87.4 | 297 | 273 | 91.9 | 799 | 742 | 92.9 |
| Clark | 23,573 | 1,936 | 8.2 | 24,059 | 1,808 | 7.5 | 23,221 | 1,118 | 4.8 | 70,853 | 4,862 | 6.9 |
| Douglas | 454 | - | - | 475 | - | - | 551 | - | - | 1,480 | - | - |
| Elko | 698 | 705 | 101.0 | 758 | 704 | 92.9 | 755 | 596 | 78.9 | 2,211 | 2,005 | 90.7 |
| Esmeralda | 5 | ~ | ~ | 8 | ~ | ~ | N/A | ~ | ~ | N/A | ~ | $\sim$ |
| Eureka | 14 | - | - | 17 | - | - | 19 | - | - | 50 | - | - |
| Humboldt | 266 | 254 | 95.5 | 266 | 251 | 94.4 | 263 | 223 | 84.8 | 795 | 728 | 91.6 |
| Lander | 68 | 71 | 104.4 | 82 | 80 | 97.6 | 91 | 83 | 91.2 | 241 | 234 | 97.1 |
| Lincoln | 54 | - | - | 78 | - | - | 94 | - | - | 226 | - | - |
| Lyon | 611 | 479 | 78.4 | 630 | 622 | 98.7 | 591 | 558 | 94.4 | 1,832 | 1,659 | 90.6 |
| Mineral | 45 | 39 | 86.7 | 37 | 35 | 94.6 | 31 | 26 | 83.9 | 113 | 100 | 88.5 |
| Nye | 355 | - | - | 380 | - | - | 447 | - | - | 1,182 | - | - |
| Pershing | 45 | 37 | 82.2 | 68 | 61 | 89.7 | 53 | 47 | 88.7 | 166 | 145 | 87.3 |
| Storey | 30 | - | - | 29 | - | - | 32 | - | - | 91 | - | - |
| Washoe | 4,977 | 1,376 | 27.6 | 4,916 | 1,826 | 37.1 | 4,810 | 1,375 | 28.6 | 14,703 | 4,577 | 31.1 |
| White Pine | 109 | 105 | 96.3 | 112 | 112 | 100.0 | 114 | 96 | 84.2 | 335 | 313 | 93.4 |

~ The sample size was too small for reliable results.

- No data was submitted from these districts.
*Participation rates were determined from total enrollments received from the Department of Education. N/A = Not applicable- no high school within this district.


## Section I: Weight Classification of $4^{\text {th }}, 7^{\text {th }}$, and $10^{\text {th }}$ Graders Collectively

2011-2012 School Year BMI Data by District, and Race/Ethnicity, Grade, and Sex

## BMI Data by School District

Figure 1: The percentages of fourth, seventh, and tenth graders collectively who are underweight are low across all districts.


Figure 2: The percentages of fourth, seventh, and tenth graders collectively who are at a healthy weight range from $51.5 \%$ to $61.6 \%$ across districts with a state average of $59.0 \%$.


Figure 3: The percentages of fourth, seventh, and tenth graders collectively who are overweight is consistent across counties with a statewide average of $17.2 \%$.


Figure 4: The percentage of fourth, seventh, and tenth graders collectively who are obese range from $17.0 \%$ to $30.2 \%$ across districts with a state average of $21.0 \%$.


## BMI Data by Race/Ethnicity

Figure 5: The percentage of fourth, seventh, and tenth graders collectively who are underweight is small among all races.


Figure 6: Among race/ethnicity groups, of fourth, seventh, and tenth graders collectively, whites have the highest rates of healthy weight at $64.5 \%$ with Native Americans/Hawaiians having the lowest at 46.6\%.


Figure 7: The percentage of fourth, seventh, and tenth graders collectively who are overweight range from $15.9 \%$ to $18.5 \%$ among race/ethnicity groups.


Figure 8: The percentage of fourth, seventh, and tenth graders collectively who are obese range from $16.5 \%$ among Whites to $32.5 \%$ among Native Americans and Hawaiians.


## BMI Data by Grade and Sex

Figure 9: The distribution of fourth, seventh, and tenth graders collectively among weight categories are similar.


Figure 10: Data indicates that slightly more females have a healthy weight than males and that males have a slightly higher obesity rate than females.


## Individual school district BMI data

Figure 11: The rates of fourth, seventh, and tenth graders who are overweight and obese in Carson City County are $18.2 \%$ and $20.9 \%$ respectively compared to the statewide average of $17.2 \%$ and $21.0 \%$.


Figure 12: The rates of fourth, seventh, and tenth graders who are overweight and obese in Churchill County are $17.3 \%$ and $19.9 \%$ respectively compared to the statewide average of $17.2 \%$ and $21.0 \%$.


Figure 13: The rates of fourth, seventh, and tenth graders who are overweight and obese in Clark County are $17.8 \%$ and $23.5 \%$ respectively compared to the statewide average of $17.2 \%$ and $21.0 \%$.


Figure 14: The rates of fourth, seventh, and tenth graders collectively who are overweight and obese in Elko County are $16.7 \%$ and $21.9 \%$ respectively compared to the statewide average of $17.2 \%$ and $21.0 \%$.


Figure 15: The rates of fourth, seventh, and tenth graders collectively who are overweight and obese in Humboldt County are $18.0 \%$ and $20.6 \%$ respectively compared to the statewide average of $17.2 \%$ and 21.0\%.


Figure 16: The rates of fourth, seventh, and tenth graders collectively who are overweight and obese in Lander County are $13.8 \%$ and $27.4 \%$ respectively compared to the statewide average of $17.2 \%$ and 21.0\%.


Figure 17: The rates of fourth, seventh, and tenth graders collectively who are overweight and obese in Lyon County are $17.0 \%$ and $19.6 \%$ respectively compared to the statewide average of $17.2 \%$ and $21.0 \%$.


Figure 18: The rates of fourth, seventh, and tenth graders collectively who are overweight and obese in Mineral County are $16.3 \%$ and $30.2 \%$ respectively compared to the statewide average of $17.2 \%$ and 21.0\%.


Figure 19: The rates of fourth, seventh, and tenth graders collectively who are overweight and obese in Pershing County are $17.6 \%$ and $18.1 \%$ respectively compared to the statewide average of $17.2 \%$ and 21.0\%.


Figure 20: The rates of fourth, seventh, and tenth graders collectively who are overweight and obese in Washoe County are $16.5 \%$ and $18.6 \%$ respectively compared to the statewide average of $17.2 \%$ and 21.0\%.


Figure 21: The rates of fourth, seventh, and tenth graders collectively who are overweight and obese in White Pine County are $18.2 \%$ and $17.0 \%$ respectively compared to the statewide average of $17.2 \%$ and 21.0\%.


Section II: $4^{\text {th, }} 7^{\text {th }}$, and $10^{\text {th }}$ Graders Collectively who are Overweight or Obese
2012-2013 School Year BMI Data by Grade, Sex, Race/Ethnicity, and School District
BMI Data for Overweight and Obese Categories Combined by District Grade and Sex
Figure 22: The percentages of fourth, seventh, and tenth graders collectively who are either overweight or obese by district range from $35.1 \%$ to $46.5 \%$ with a statewide average of $38.2 \%$.


Figure 23: The percentage of fourth, seventh, and tenth graders collectively who are either overweight or obese among racial/ethnic groups is highest among Native American/Hawaiian and Hispanics, 50.4\% and $45.8 \%$ respectively.


Figure 24: The percent of fourth, seventh, and tenth graders collectively who are overweight or obese are similar.


Figure 25: The percent of fourth, seventh, and tenth graders collectively who are overweight or obese is slightly higher among males.


## Section III: Weight Classification of $4^{\text {th }}$ Graders

2011-2012 School Year BMI Data by District, and Race/Ethnicity, and Sex

## BMI Data by District

Figure 26: The average of underweight students across Nevada's School Districts is $3.7 \%$.


Figure 27: The percentages of fourth graders who are at a healthy weight range from $52.1 \%$ to $66.8 \%$ across districts with a state average of 60.4\%.


Figure 28: The percentage of fourth graders who are overweight by district ranges from $13.5 \%$ to $17.1 \%$.


Figure 29: The percentage of fourth graders who are obese by district ranges from $16.5 \%$ to $31.0 \%$ with a statewide average of 20.8\%.


## BMI Data by Race/Ethnicity

Figure 30: The percentage of fourth graders who are underweight is low for all racial/ethnic groups.

| Percent of Fourth Graders Who Are Underweight by Race/Ethnicity (2012-2013 School Year) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
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| ㄴ 60 <br> U  <br> 足  <br> a 50 <br>  40 <br>  30 <br>  20 <br>  10 <br>  0 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  | 3.6 | 3.6 | 3.2 | 6.6 | 5.8 | 4.6 |
|  | I | 工 | $\pm$ | I | I | I |
|  | White | Black | Hispanic | Native Am./Hawaiian | Asian/Pacific Islander | Unknown |

Figure 31: The percentage of fourth graders who are at a healthy weight is highest among Whites at $67.7 \%$ and lowest among Native Americans/Hawaiians at 44.4\% respectively.


Figure 32: The percentage of fourth graders who are overweight range from $13.3 \%$ to $19.9 \%$, with Whites and Blacks being the lowest and Native American/Hawaiians the highest.


Figure 33: The percentage of fourth graders who are obese is highest in the Native American/Hawaiian and the Hispanic population, $29.1 \%$ and $28.3 \%$ respectively, and lowest among whites, $15.3 \%$.


## BMI Data by Sex

Figure 34: A higher percentage of female fourth graders are at a healthy weight than fourth grade males and conversely there is a higher percentage of obese fourth grade males than females.


## Section IV: Weight Classification of $7^{\text {th }}$ Graders

2011-2012 School Year BMI Data by District, and Race/Ethnicity, and Sex

## BMI Data by District

Figure 35: The percentages of seventh graders who are underweight are low across all districts.


Figure 36: The percentage of seventh graders who are at a healthy weight range from $53.2 \%$ to $62.5 \%$ with a statewide average of $57.6 \%$.


Figure 37: The percentage of seventh graders who are overweight is similar across districts ranging from 14.8 to $20.0 \%$.


Figure 38: The obesity rate of seventh graders across districts ranges from $16.9 \%$ in Washoe County and 24.1\% in Clark County.


## BMI Data by Race/Ethnicity

Figure 39: The percentage of seventh graders who are underweight is low in all racial/ethnic categories.


Figure 40: The percentage of seventh graders who are at a healthy weight is highest among Whites at 63.7\% and lowest among Native Americans/Hawaiians at 47.6\%.


Figure 41: The percentage of seventh graders that are overweight ranges from 16.7 to $20.1 \%$.


Figure 42: The percentage of seventh graders who are obese is highest in the Native American/Hawaiian and the Hispanic population, $34.1 \%$ and $28.0 \%$ respectively, and lowest among whites, $15.9 \%$.


## BMI Data by Sex

Figure 43: A higher percentage of 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.


## Section V: Weight Classification of $\mathbf{1 0}^{\text {th }}$ Graders

2011-2012 School Year BMI Data by District, and Race/Ethnicity, and Sex

## BMI Data by District

Figure 44: The percentages of tenth graders who are underweight are low across all districts.


Figure 45: The percentage of seventh graders who are at a healthy weight range from $55.6 \%$ to $66.7 \%$ with a statewide average of $59.1 \%$.


Figure 46: The percentages of seventh graders who are overweight range from 9.6 to $20.9 \%$.


Figure 47: The obesity rate of tenth graders across districts range from 14.6\% in White Pine County to 32.5\% in Lander County.


## BMI Data by Race/Ethnicity

Figure 48: The percentage of tenth graders who are underweight is low for all race/ethnicity groups.


Figure 49: The percentage of tenth graders who are at a healthy weight is highest among Asian/Pacific Islanders and Whites at $67.3 \%$ and $62.1 \%$ respectively.


Figure 50: The percentage of tenth graders who are overweight is similar among all racial categories ranging from $14.6 \%$ to $20.9 \%$


Figure 51: The percentage of tenth graders who are obese is highest in the Native American/Hawaiian population and lowest in the Asian/Pacific Islander population, $33.8 \%$ and $13.1 \%$ respectively.


## BMI Data by Sex

Figure 52: The weight classification breakout for tenth graders by sex is similar, with females reporting slightly more overweight and less obese than males.


## Citations

BMI of Nevada Students: School Year 2011-2012
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