

Body Mass Index of Nevada Students

School Year 2011-2012

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Office of Public Health Informatics and Epidemiology
Division of Public and Behavioral Health
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ACKNOWLEDGEMENTS

BMI of Nevada Students: School Year 2011-2012

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 2011-2012

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 2011-2012 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.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).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 some cancers.ⁱⁱⁱ

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 scheduled 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 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

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 4th, 7th, and 10th 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 17,693 Nevada 4th, 7th, and 10th grade students, collected in 14 counties, during the 2011-2012 school year.

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

BMI was reported as calculated per CDC guidelines for student height and weight.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:

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

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 1: The Percentile Range for Child and Adolescent Weight Categories

Percentile Range	Weight Status Category
Less than 5 th Percentile	Underweight
5 th to less than 85 th Percentile	Normal Weight
85 th to less than 95 th Percentile	Overweight
Greater than or equal to 95 th Percentile	Obese

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

Data Summary

BMI of Nevada Students: School Year 2011-2012

Data and Report Layout

This report was produced using the student height and weight data collected for Nevada students during the 2011-2012 school year. Fourteen 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 17,693 individuals composed of 5,974 fourth graders, 6,119 seventh graders, and 5,600 tenth graders. The total Nevada enrollment for school year 2011-2012 for fourth, seventh, and tenth graders was 33,604, 34,175, and 33,387 respectively for a total of 101,166 (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 2011-2012)

District	Total Number of Schools per District	Number of Participating Schools	School Participation Rate (percent)
Carson City	11	–	–
Churchill	6	6	100.0
Clark	369	307	83.2
Douglas	13	–	–
Elko	30	27	90.0
Esmeralda	6	6	100.0
Eureka	4	4	100.0
Humboldt	16	15	93.8
Lander	6	6	100.0
Lincoln	10	–	–
Lyon	19	17	89.5
Mineral	6	5	83.3
Nye	23	20	87.0
Pershing	4	4	100.0
Storey	4	–	–
Washoe	111	23	20.7
White Pine	8	8	100.0

- No data was submitted from these Districts.

**Table 3: Total Enrollment, Participation (N), and Participation Rates (Percent) by County and Grade
(School Year 2011-2012)**

	Fourth Grade			Seventh Grade			Tenth Grade			Combined Grades		
State District	total	N	**Rate	total	N	**Rate	total	N	**Rate	total	N	**Rate
Nevada	33,604	5,974	17.8	34,175	6,119	17.9	33,387	5,600	16.8	101,166	17,693	17.5
Carson City	568	–	–	639	–	–	596	–	–	1,803	–	–
Churchill	260	246	94.6	306	297	97.1	314	296	94.3	880	839	95.3
Clark	24,224	2,736	11.3	24,447	2,162	8.8	23,329	1,435	6.2	72,000	6,333	8.8
Douglas	501	–	–	501	–	–	599	–	–	1,601	–	–
Elko	687	708	103.1	748	660	88.2	774	604	78.0	2,209	1,972	89.3
Esmeralda	9	~	~	5	~	~	.	~	~	.	~	~
Eureka	19	17	89.5	13	13	100.0	23	23	100.0	55	53	96.4
Humboldt	269	254	94.4	253	251	99.2	274	198	72.3	796	703	88.3
Lander	75	73	97.3	77	73	94.8	96	64	66.7	248	210	84.7
Lincoln	60	–	–	77	–	–	106	–	–	243	–	–
Lyon	596	497	83.4	644	624	96.9	646	519	80.3	1,886	1,640	87.0
Mineral	34	35	102.9	39	38	97.4	36	33	91.7	109	106	97.2
Nye	405	0	0.0	447	391	87.5	805	824	102.4	1,325	1,215	91.7
Pershing	51	44	86.3	52	29	55.8	49	14	28.6	152	87	57.2
Storey	33	–	–	36	–	–	33	–	–	102	–	–
Washoe	4,998	1,257	25.2	4,848	1,484	30.6	4,978	1,492	30.0	14,824	4,233	28.6
White Pine	107	100	93.5	94	94	100.0	98	98	100.0	299	292	97.7

~ 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 and in some cases the participation rates were slightly higher than 100%.

**The Rosemary Clarke Middle School expanded to include High School in the school year 2011-2012. Therefore, 332 reported tenth graders were not included in district totals. These 332 students were added to the Nye county tenth grade total enrollment.

N/A = Not applicable- no high school within this district.

Section I: Weight Classification of 4th, 7th, and 10th 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.

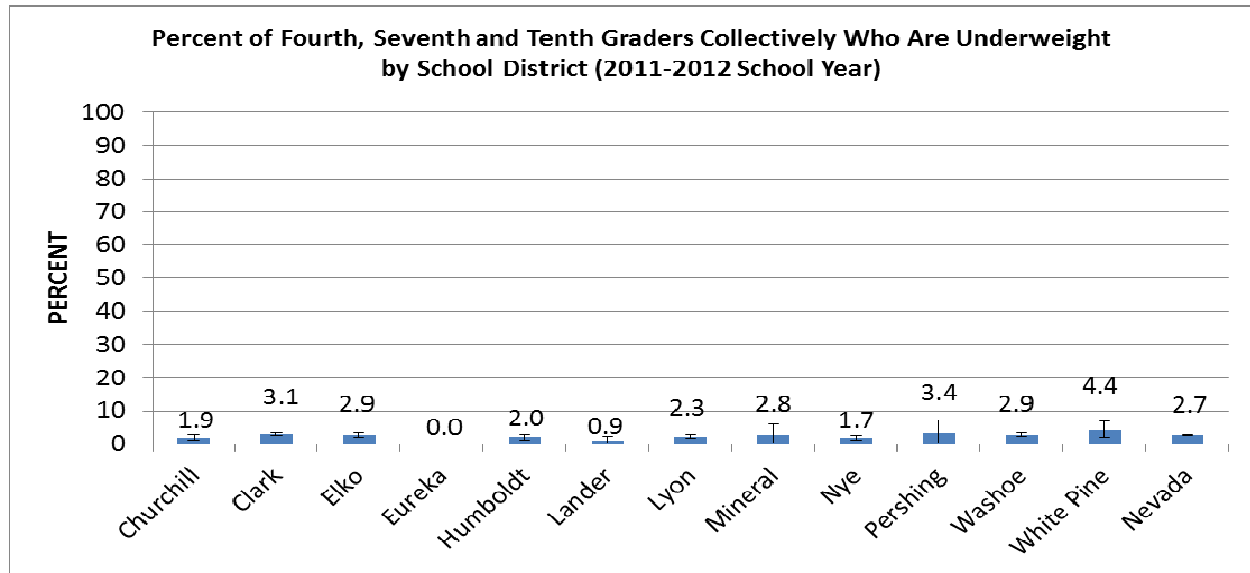


Figure 2: The percentages of fourth, seventh, and tenth graders collectively who are at a healthy weight range from 54.2% to 71.8% across districts with a state average of 58.5%.

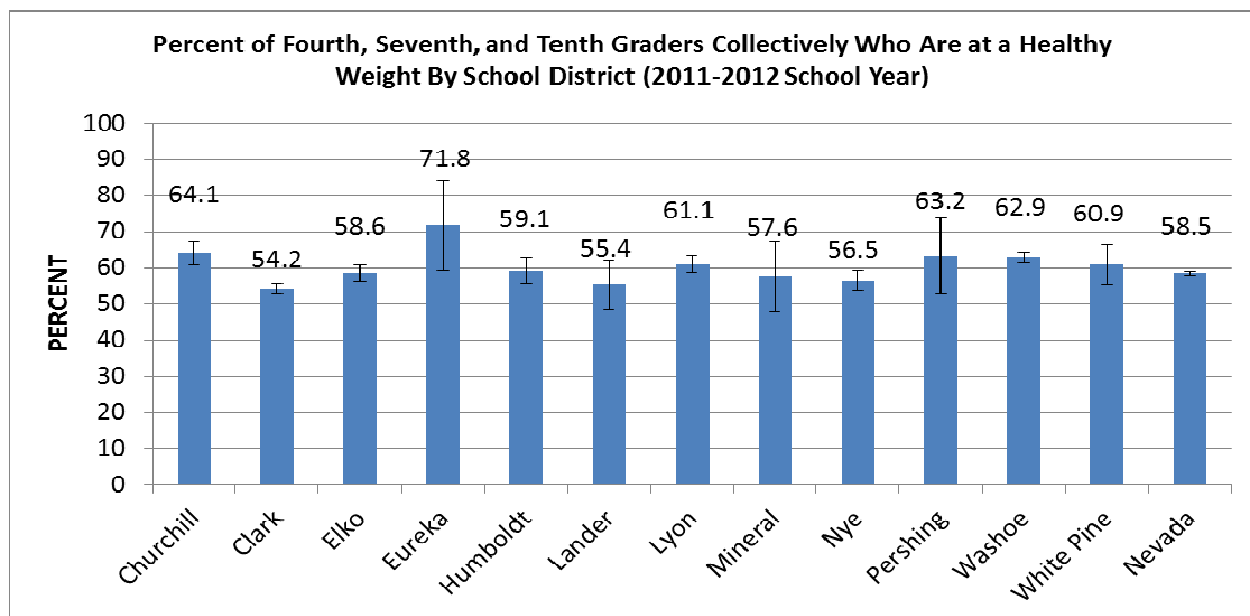


Figure 3: With the exception of Eureka County with an overweight percentage of 11.2%, the percentages of fourth, seventh, and tenth graders collectively who are overweight is consistent across counties with a statewide average of 17.9%.

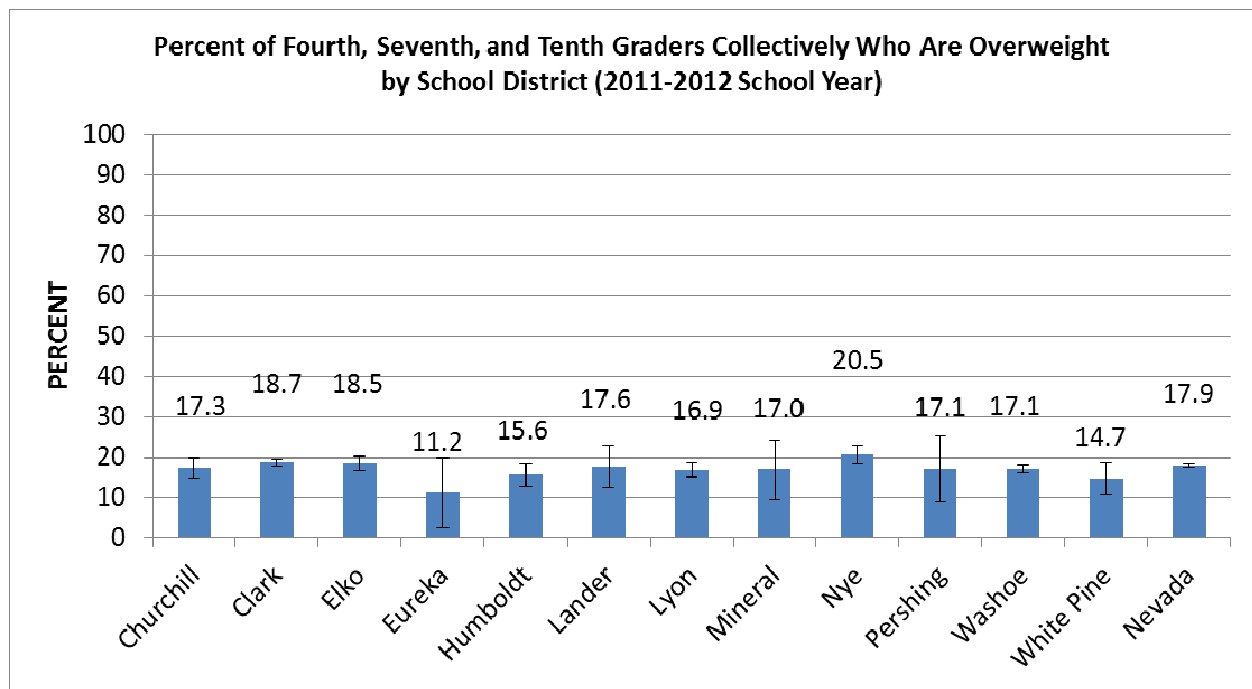
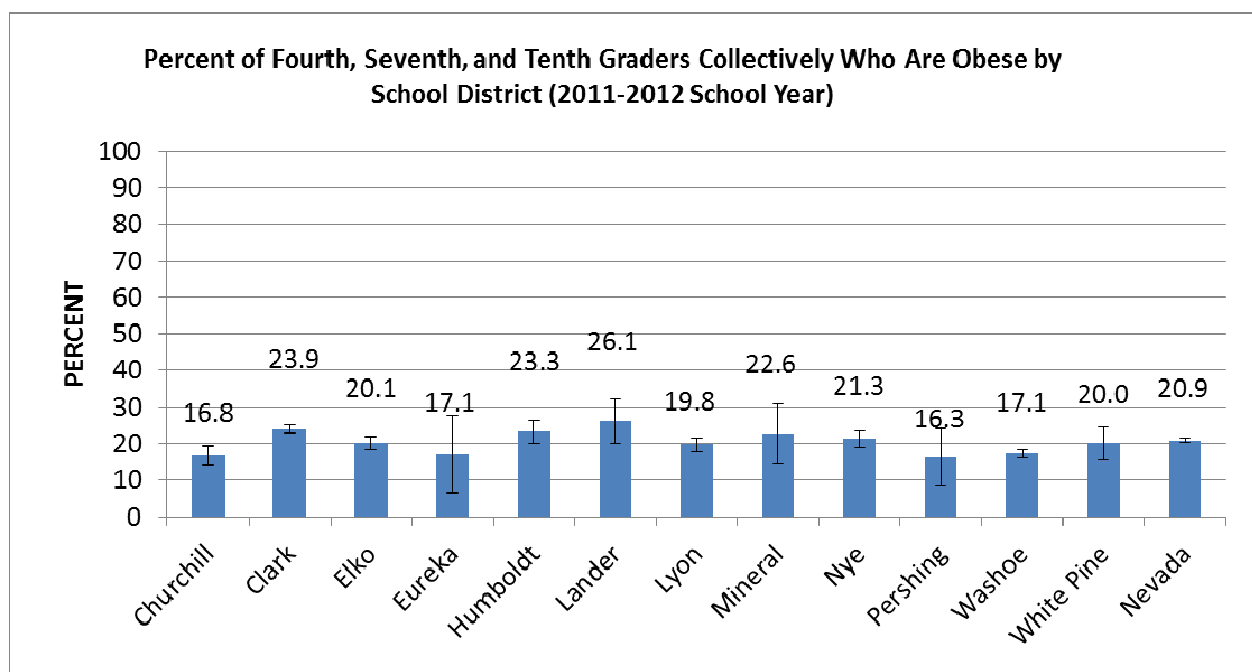


Figure 4: The percentage of fourth, seventh, and tenth graders collectively who are obese range from 16.8% to 26.1% across districts with a state average of 20.9%.



BMI Data by Race/Ethnicity

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

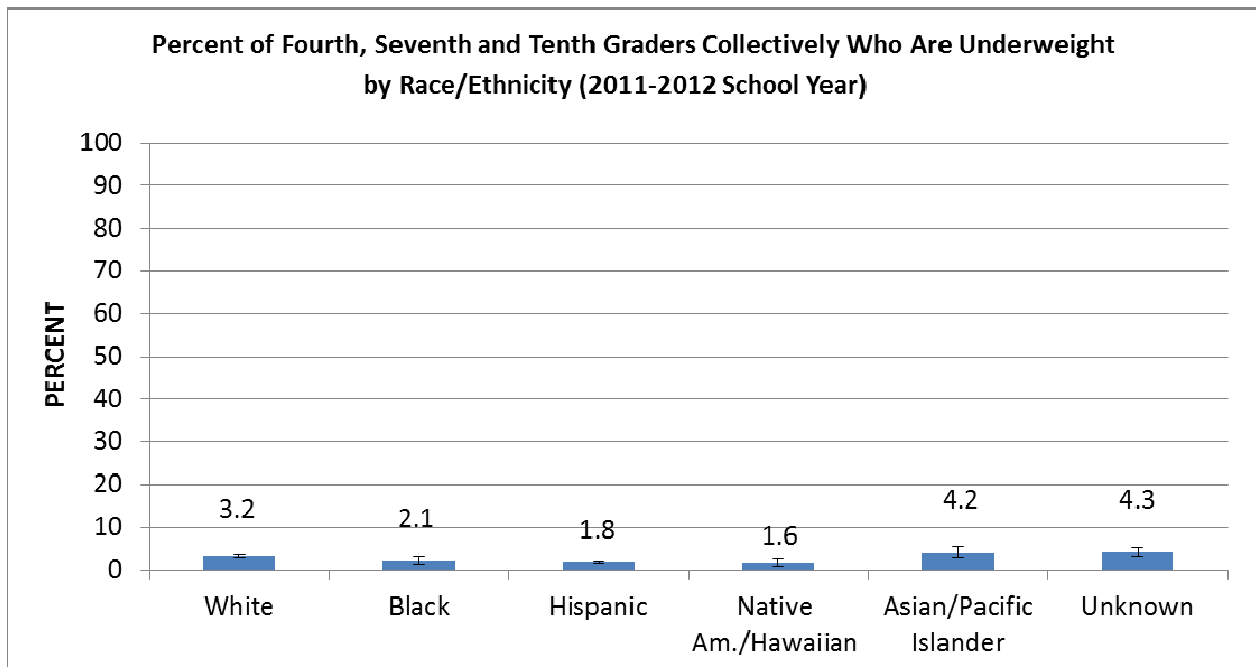


Figure 6: Among race/ethnicity groups, of fourth, seventh, and tenth graders collectively, whites have the highest rates of healthy weight at 64.4% with Native Americans/Hawaiians having the lowest at 49.1%.

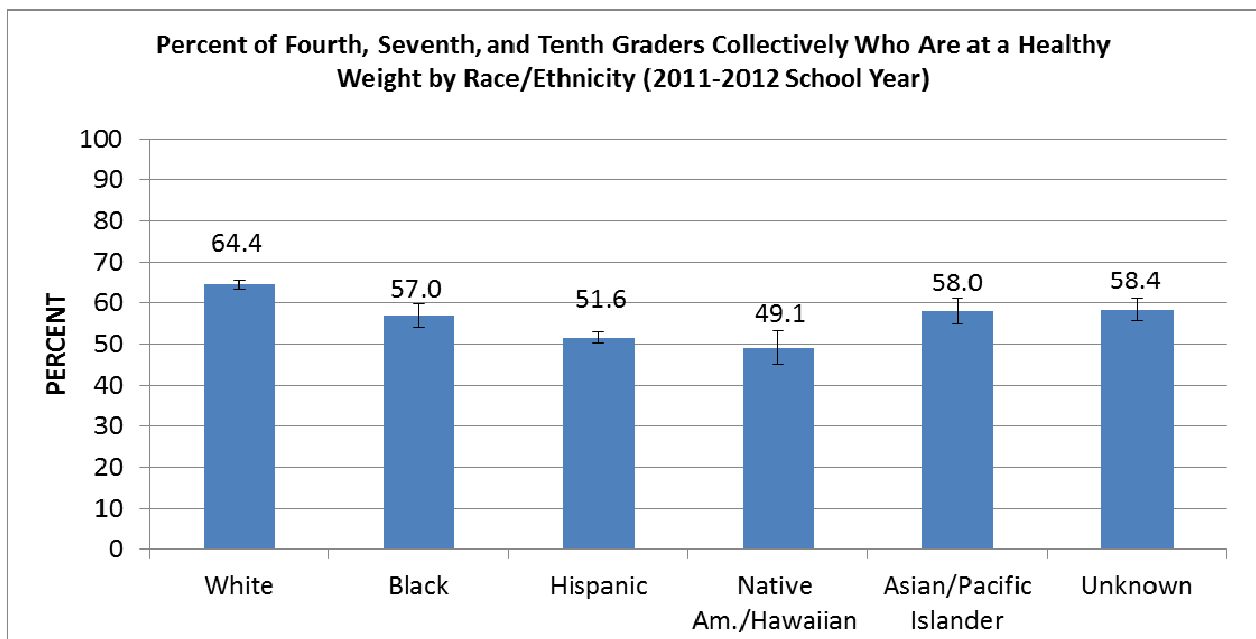


Figure 7: The percentage of fourth, seventh, and tenth graders collectively who are overweight range from 15.9% to 20.5% among race/ethnicity groups.

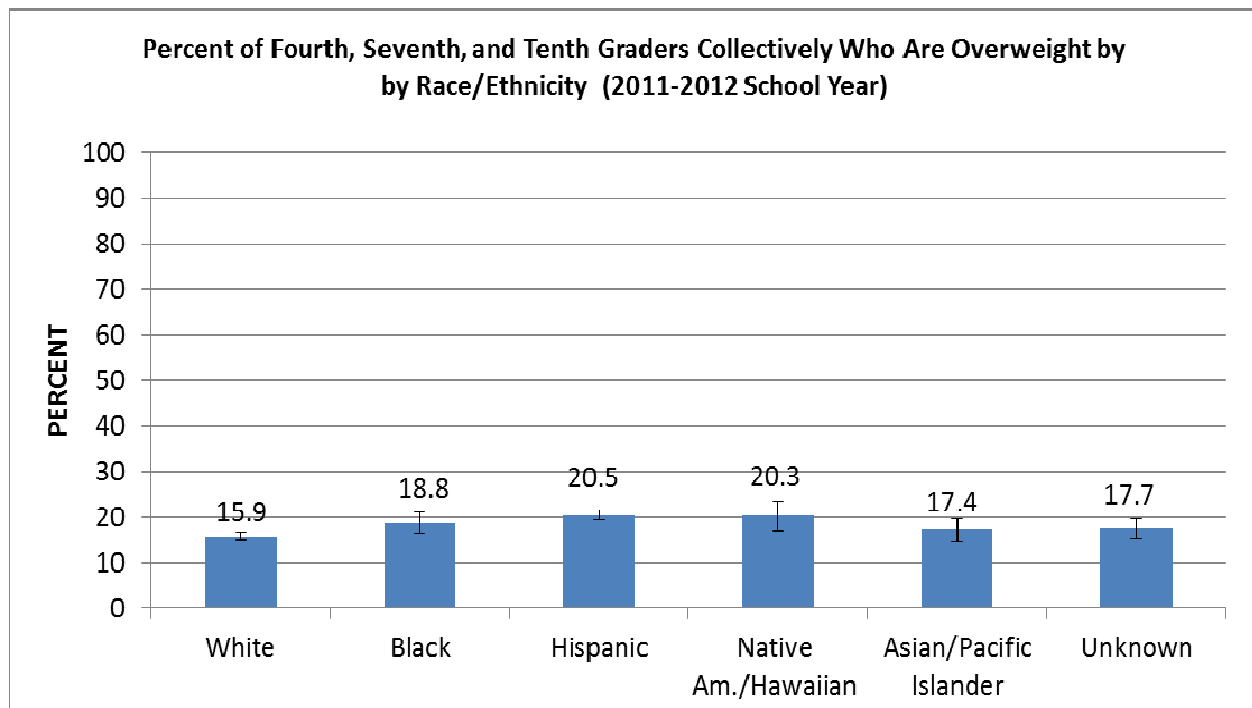
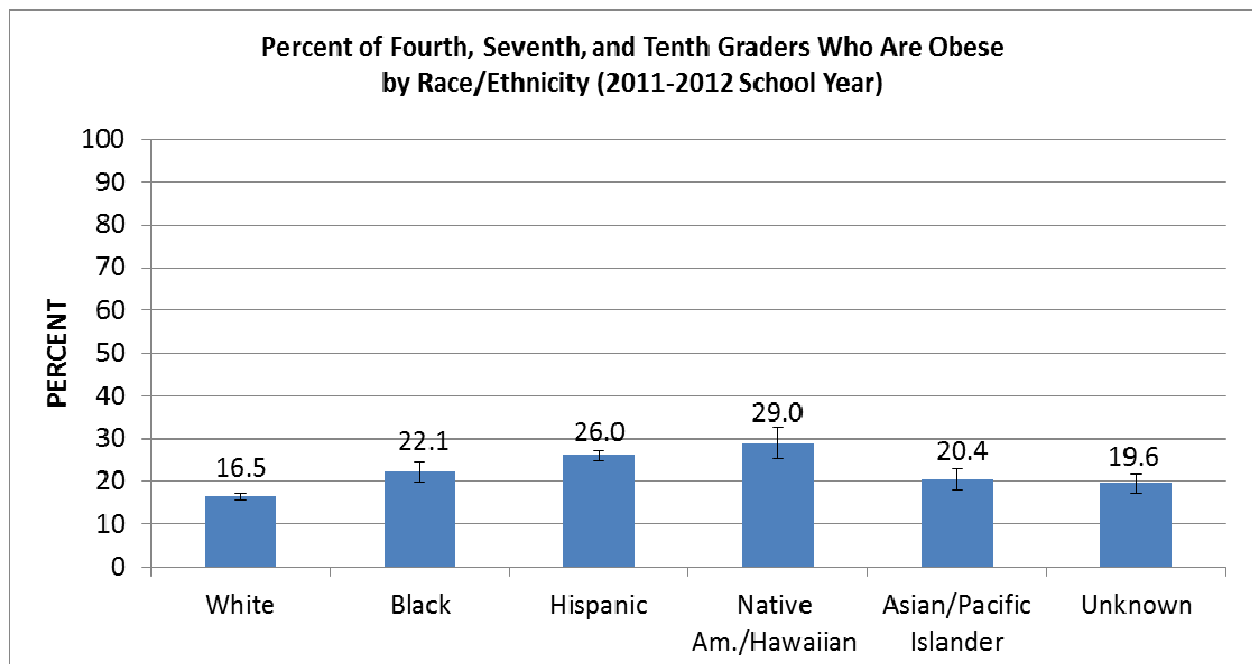


Figure 8: The percentage of fourth, seventh, and tenth graders collectively who are obese range from 16.5% among Whites to 29% among Native Americans and Hawaiians.



BMI Data by Grade and Sex

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

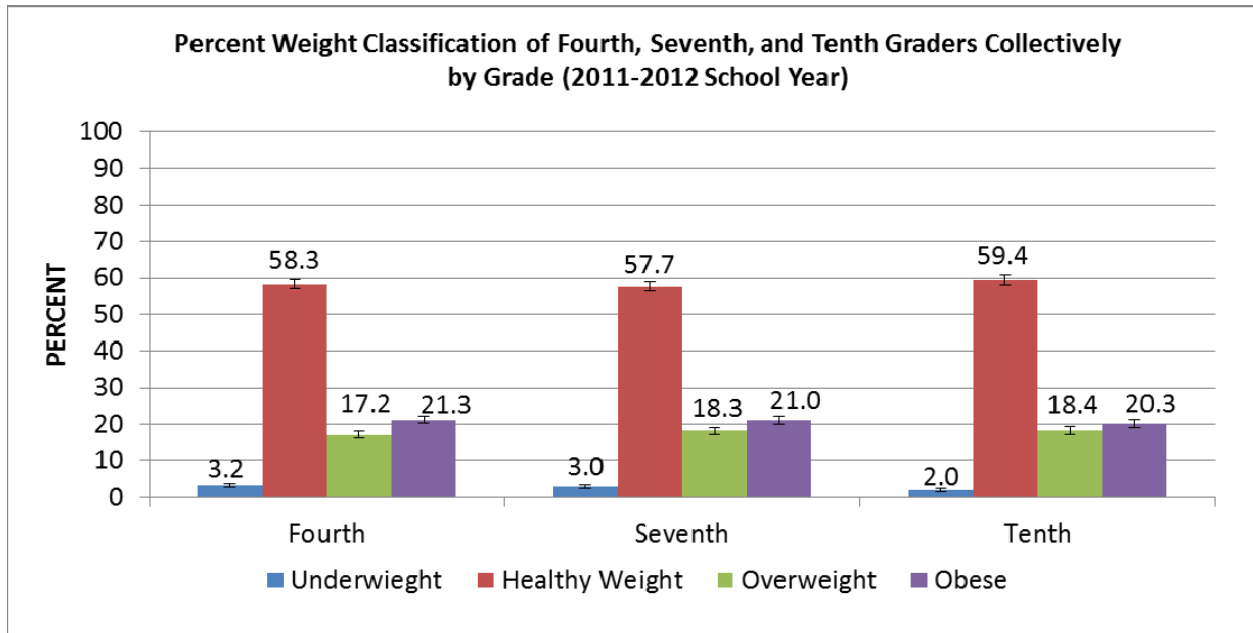
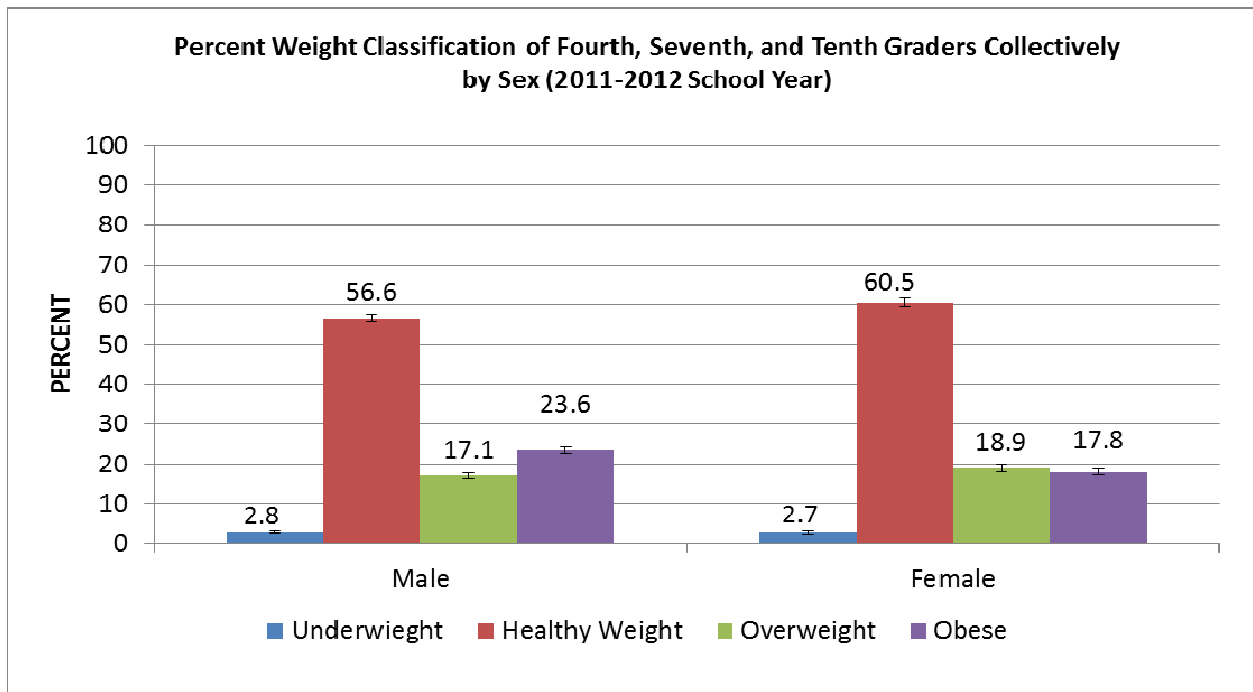


Figure 10: Data indicates that slightly more females have a healthy weight than males and that males have a slightly higher obesity rate than females.



Individual school district BMI data

Figure 11: The rates of fourth, seventh, and tenth graders who are overweight in Churchill County are 17.3% and 16.8% respectively compared to the statewide average of 17.9% and 20.9%.

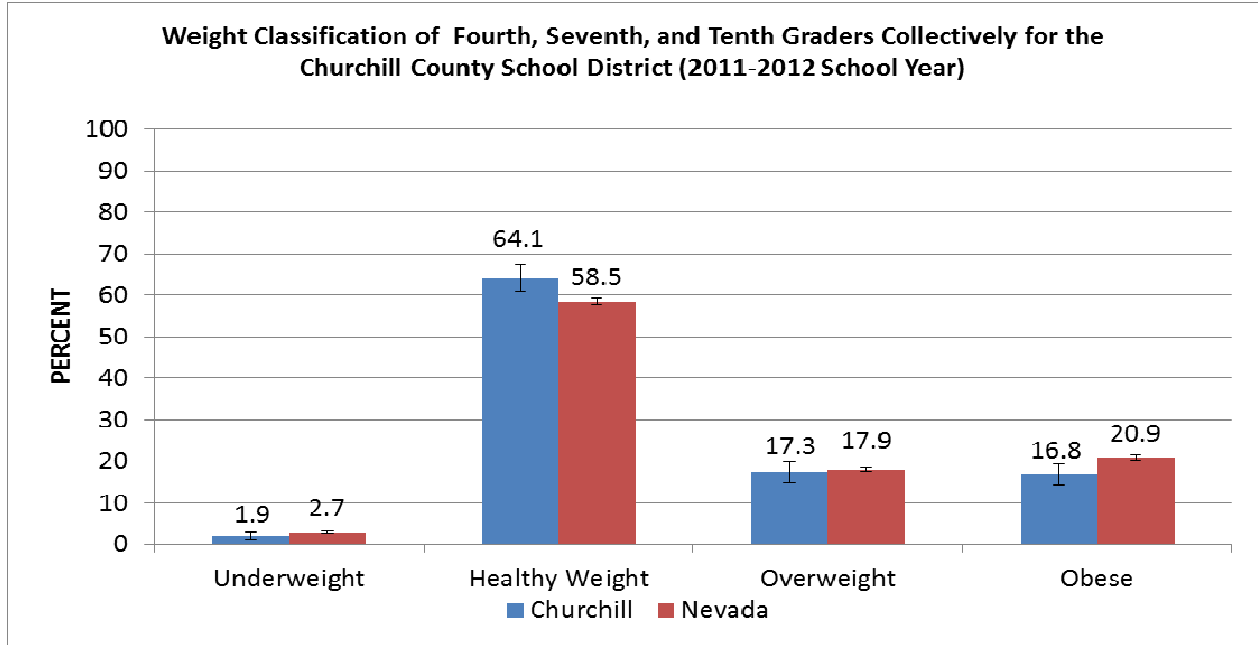


Figure 12: The rates of fourth, seventh, and tenth graders who are overweight in Clark County are 18.7% and 23.9% respectively compared to the statewide average of 17.9% and 20.9%.

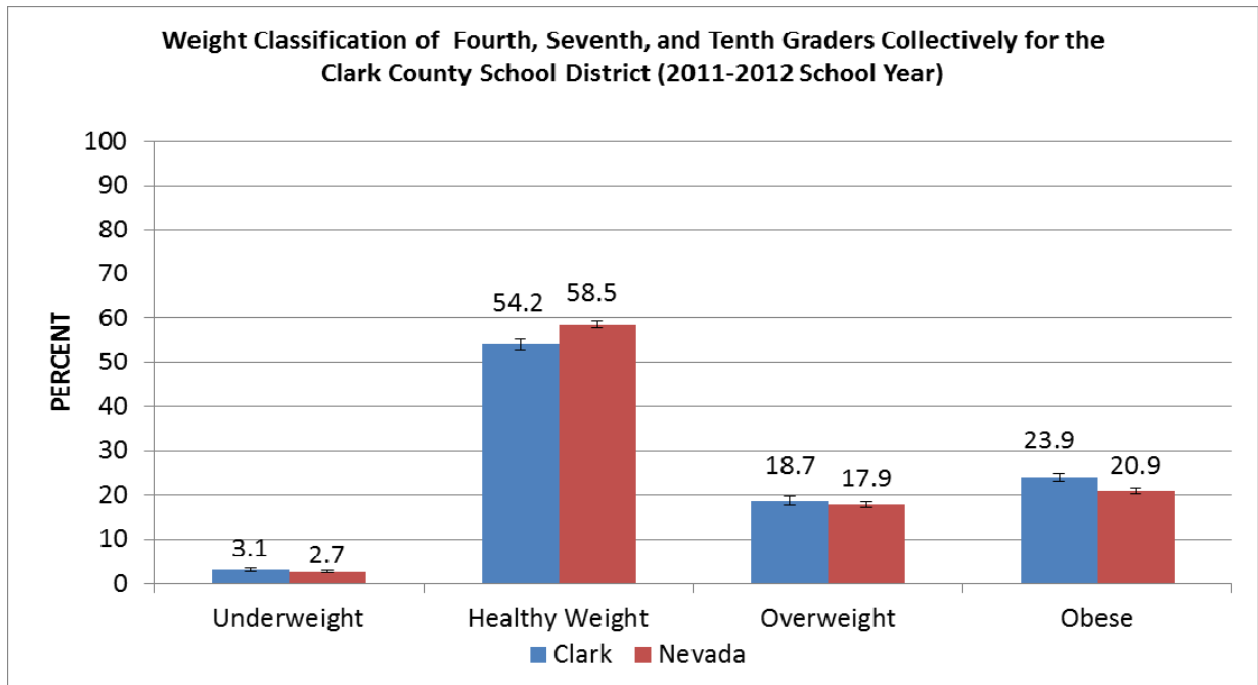


Figure 13: The rates of fourth, seventh, and tenth graders collectively who are overweight in Elko County are 18.5% and 20.1% respectively compared to the statewide average of 17.9% and 20.9%.

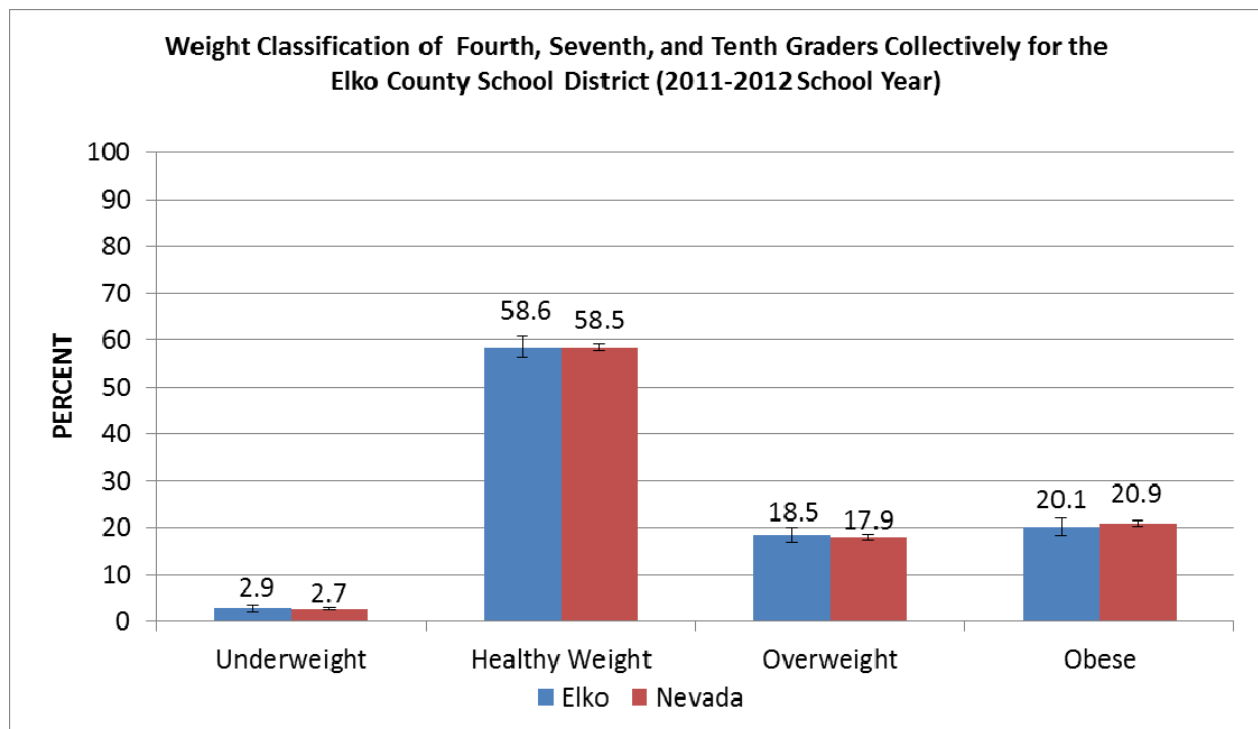


Figure 14: The rates of fourth, seventh, and tenth graders collectively who are overweight in Eureka County are 11.2% and 17.1% respectively compared to the statewide average of 17.9% and 20.9%.

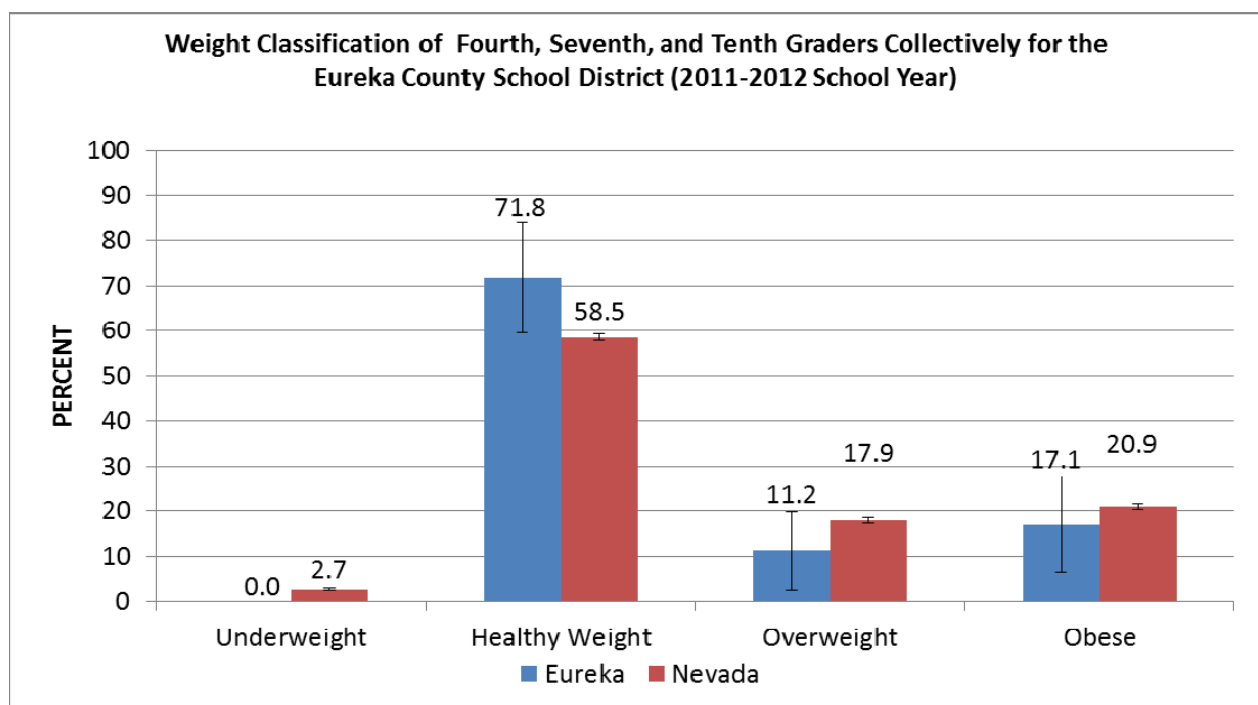


Figure 15: The rates of fourth, seventh, and tenth graders collectively who are overweight in Humboldt County are 15.6% and 23.3% respectively compared to the statewide average of 17.9% and 20.9%.

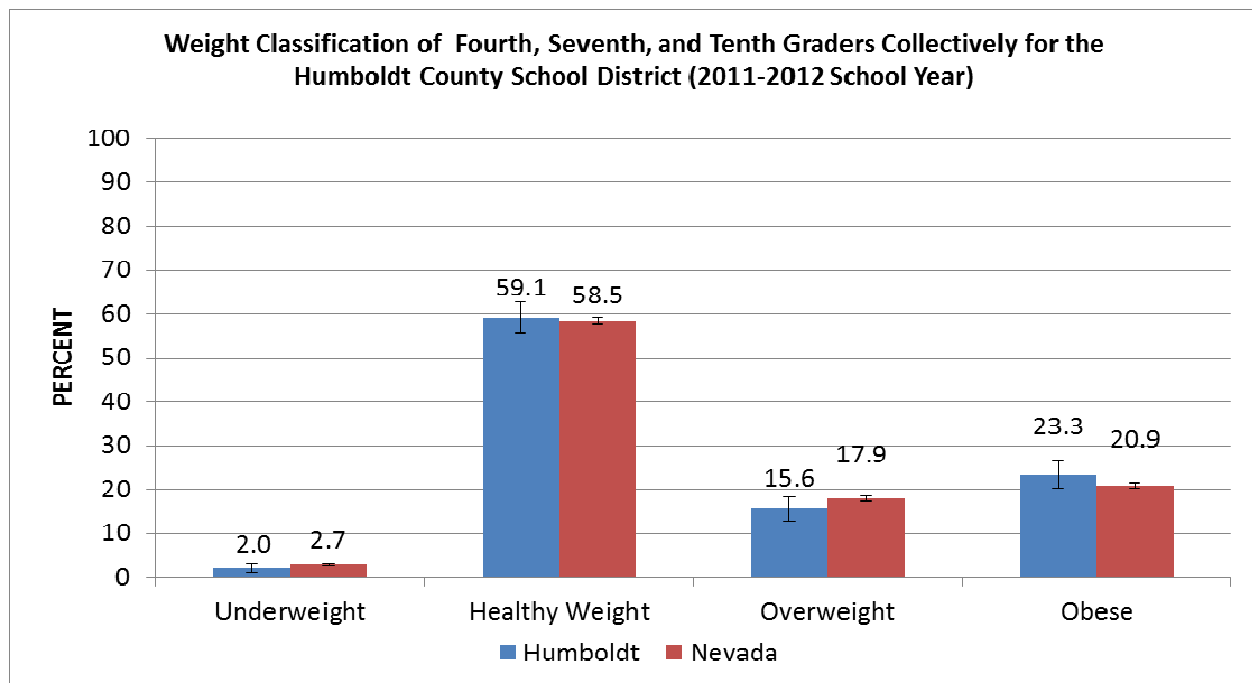


Figure 16: The rates of fourth, seventh, and tenth graders collectively who are overweight in Lander County are 17.6% and 26.1% respectively compared to the statewide average of 17.9% and 20.9%.

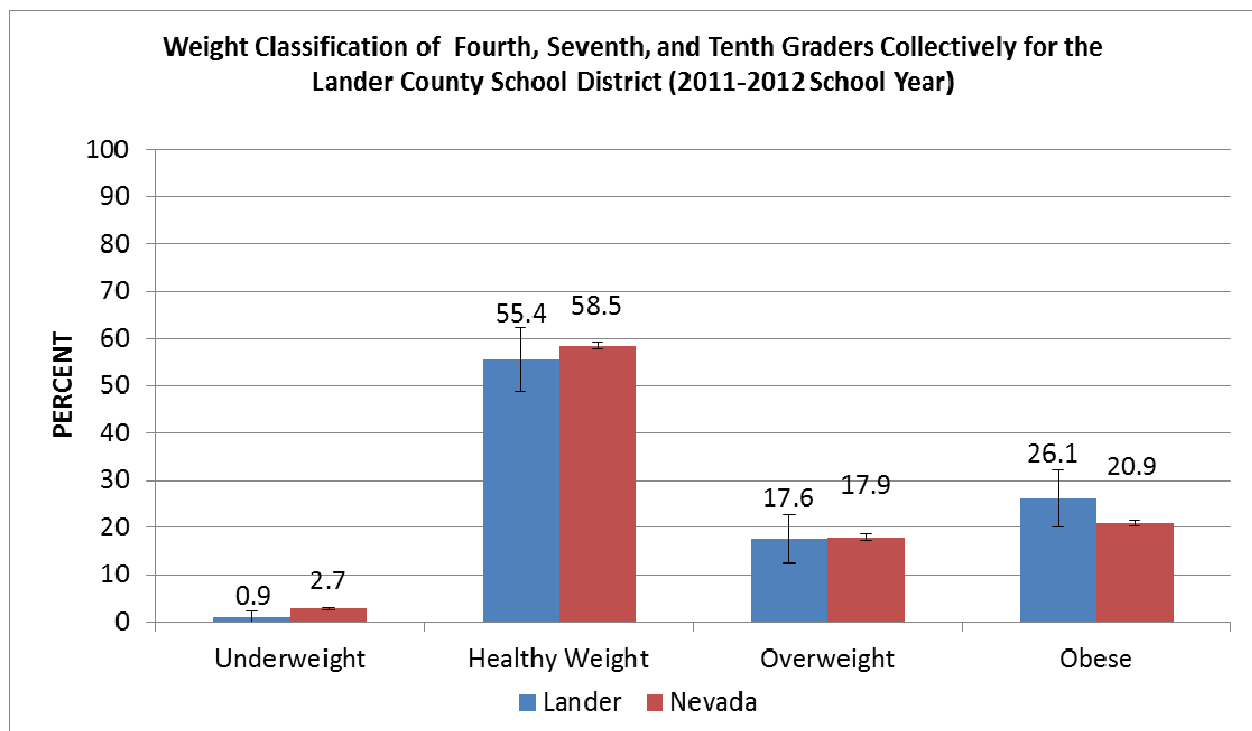


Figure 17: The rates of fourth, seventh, and tenth graders collectively who are overweight in Lyon County are 16.9% and 19.8% respectively compared to the statewide average of 17.9% and 20.9%.

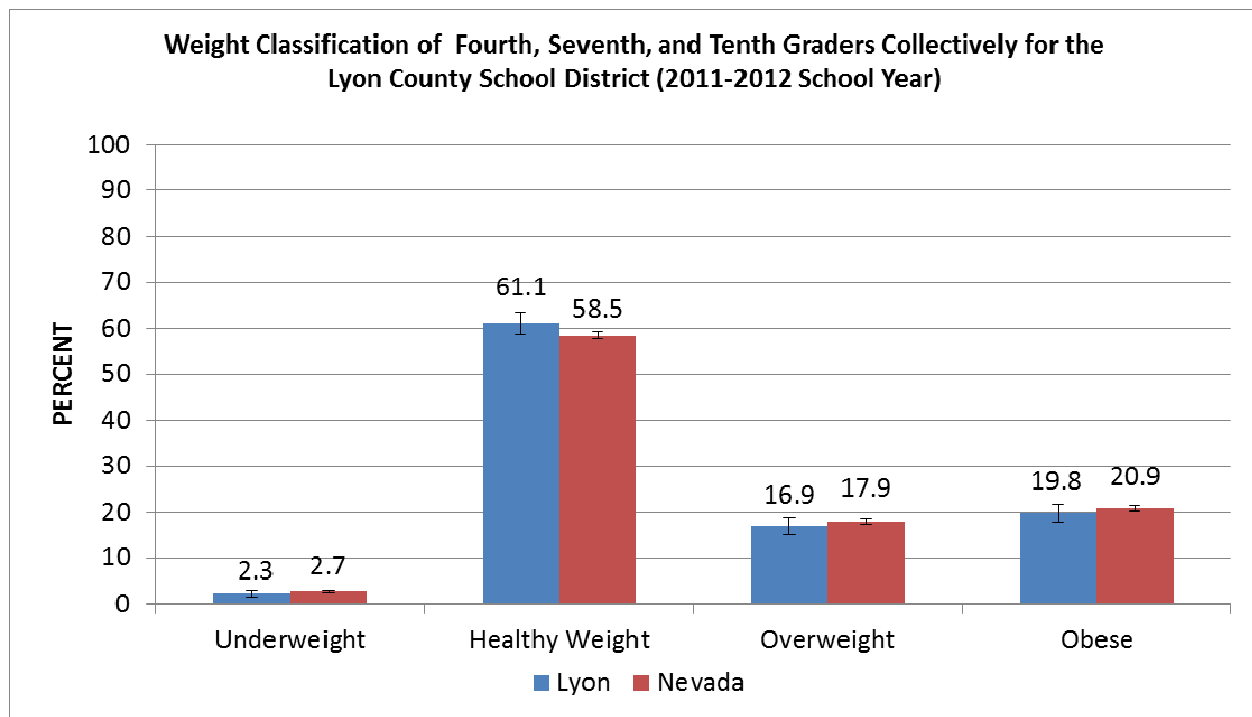


Figure 18: The rates of fourth, seventh, and tenth graders collectively who are overweight in Mineral County are 17.0% and 22.6% respectively compared to the statewide average of 17.9% and 20.9%.

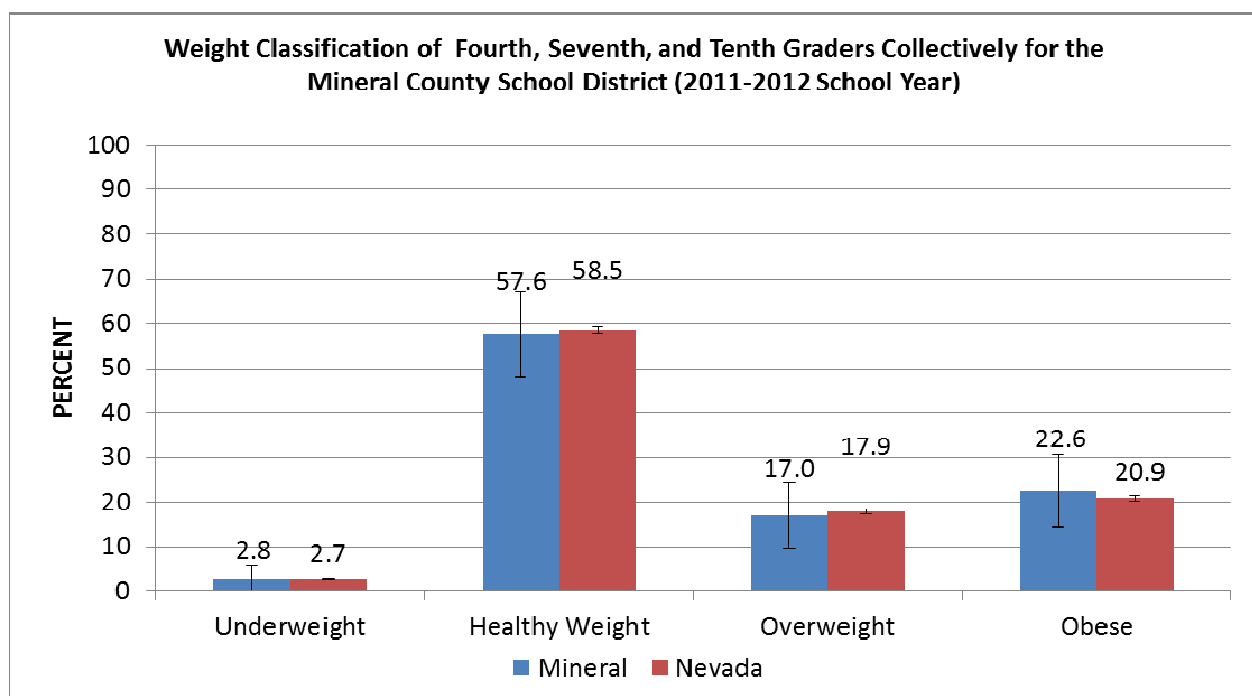


Figure 19: The rates of fourth, seventh, and tenth graders collectively who are overweight in Nye County are 20.5% and 21.3% respectively compared to the statewide average of 17.9% and 20.9%.

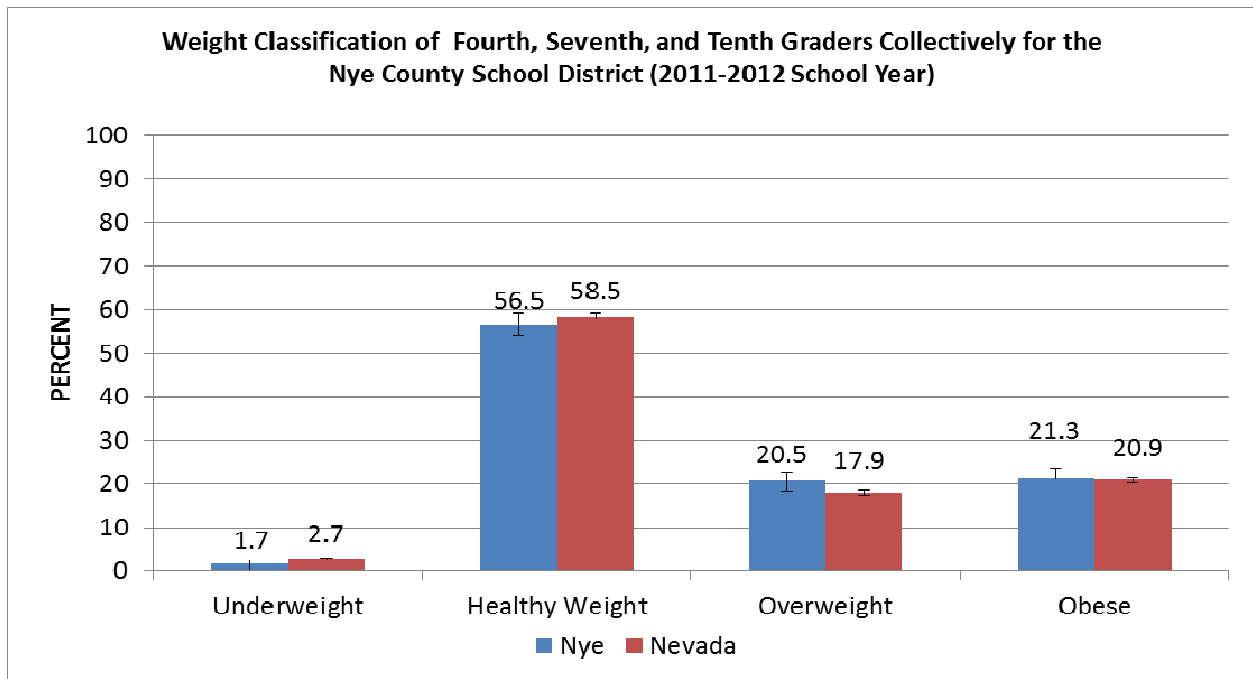


Figure 20: The rates of fourth, seventh, and tenth graders collectively who are overweight in Elko County are 17.1% and 16.3% respectively compared to the statewide average of 17.9% and 20.9%.

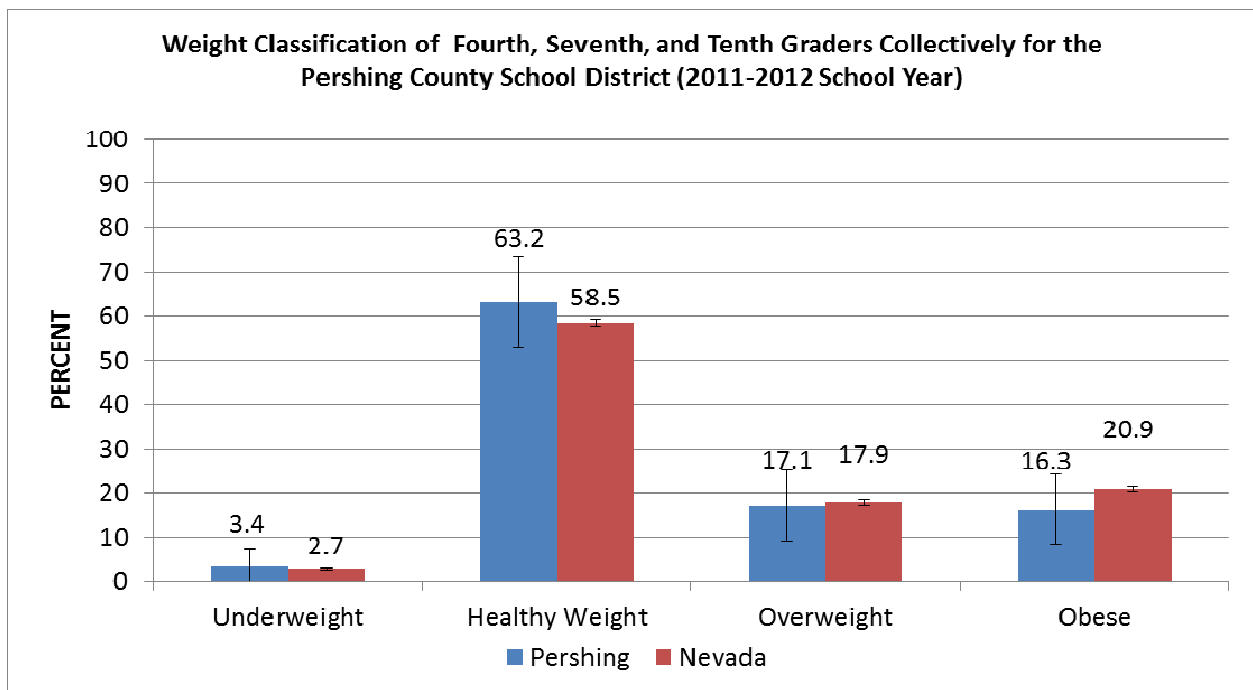


Figure 21: The rates of fourth, seventh, and tenth graders collectively who are overweight in Washoe County are 17.1% and 17.1% respectively compared to the statewide average of 17.9% and 20.9%.

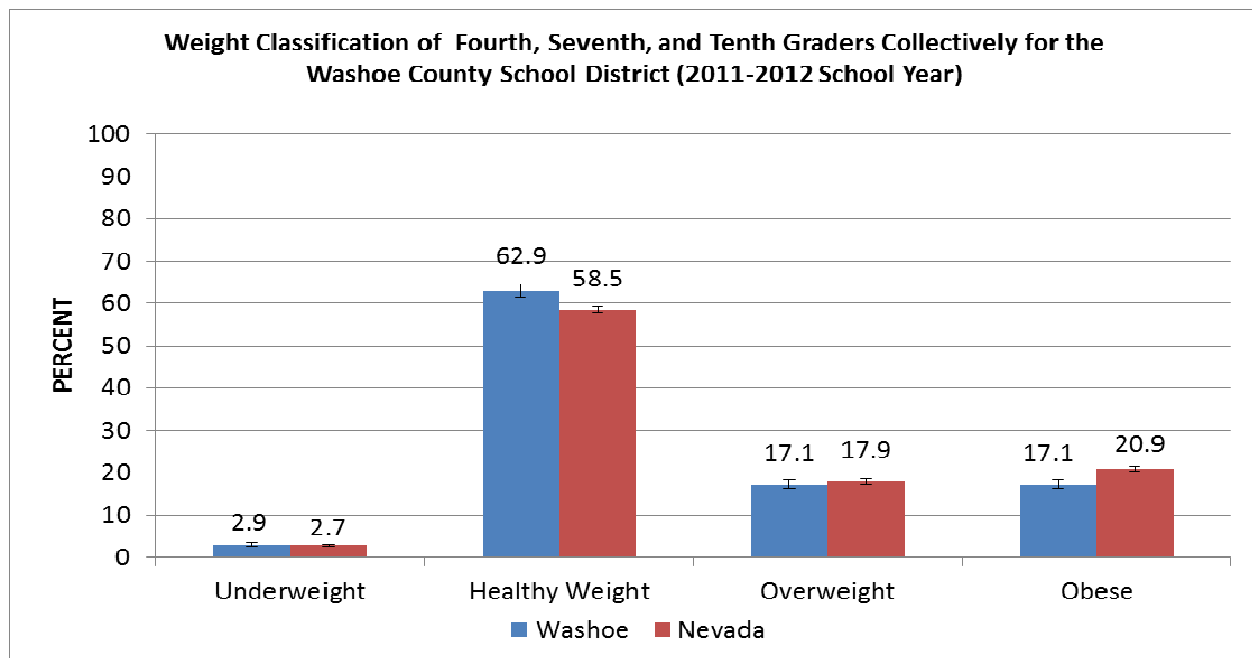
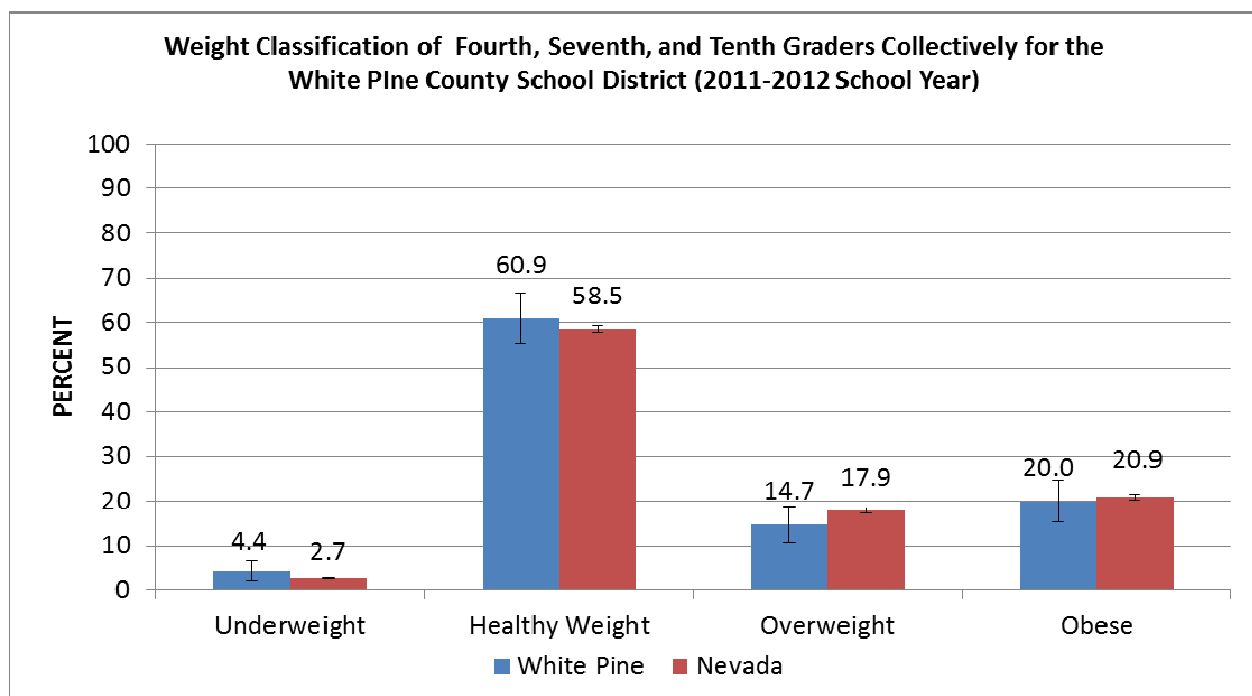


Figure 22: The rates of fourth, seventh, and tenth graders collectively who are overweight in White Pine County are 14.7% and 20.0% respectively compared to the statewide average of 17.9% and 20.9%.



Section II: 4th, 7th, and 10th Graders Collectively who are Overweight or Obese

2011-2012 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 23: The percentages of fourth, seventh, and tenth graders collectively who are either overweight or obese by district range from 28.3% to 43.7% with a statewide average of 38.8%.

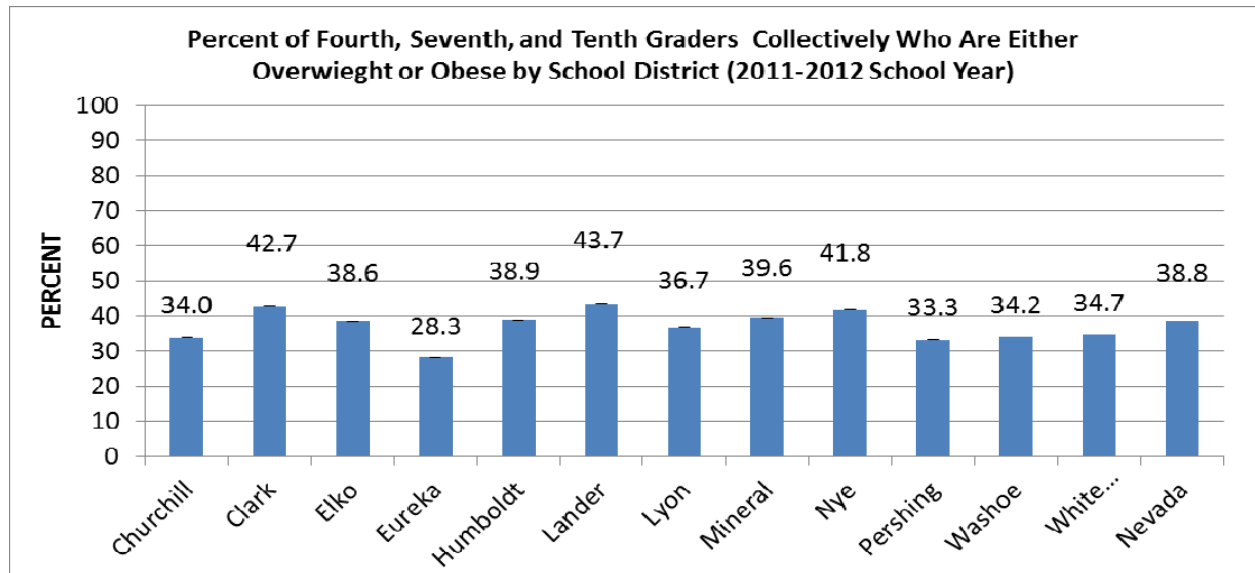


Figure 24: The percentage of fourth, seventh, and tenth graders collectively who are either overweight or obese among racial/ethnic groups is highest among Native American/Hawaiian and Hispanics, 49.3% and 46.6% respectively.

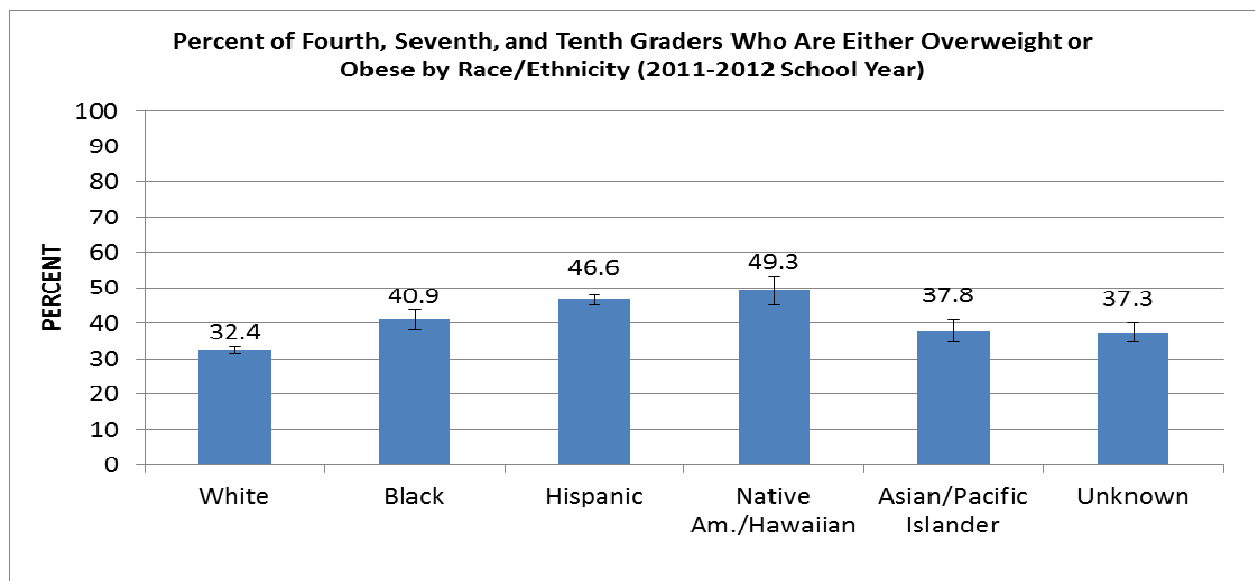


Figure 25: The percent of fourth, seventh, and tenth graders collectively who are overweight or obese are the same.

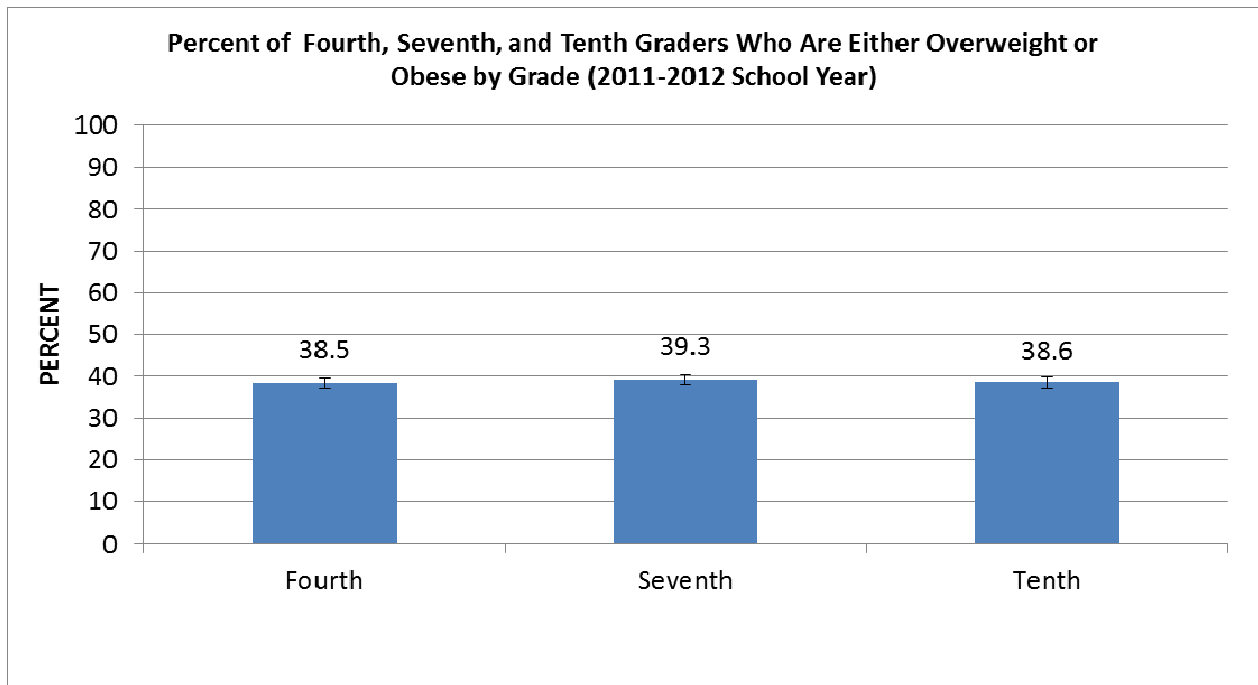
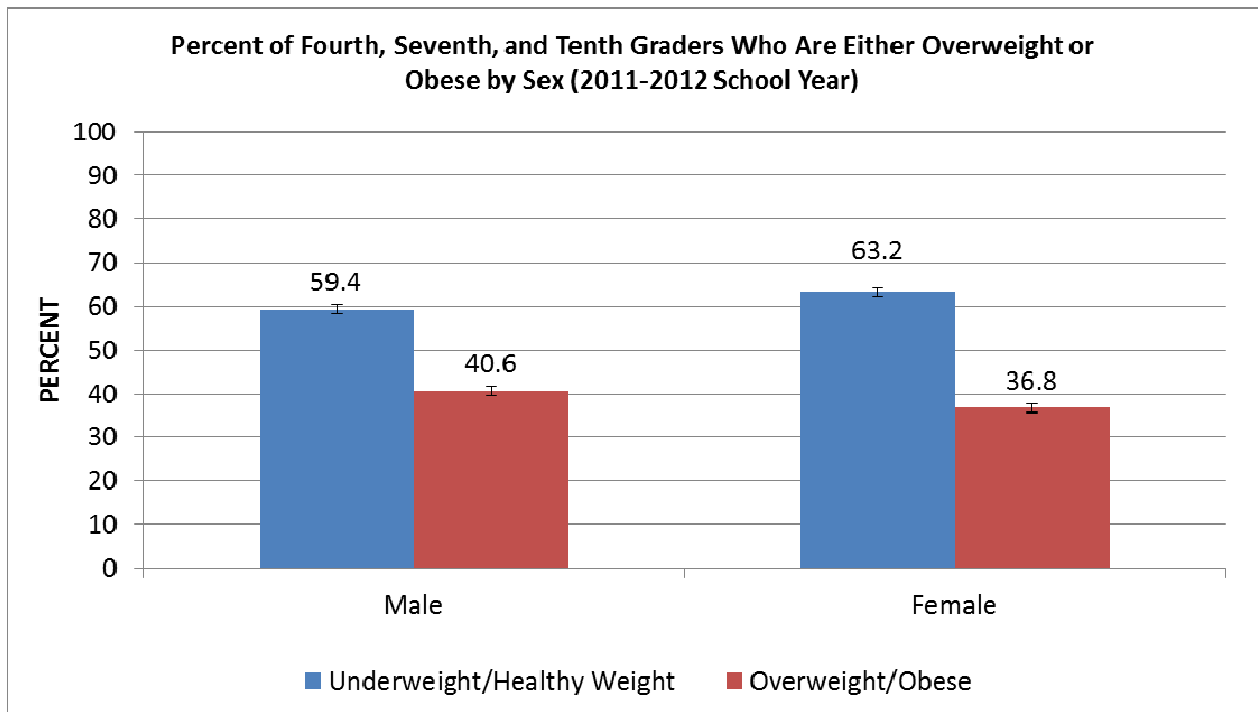


Figure 26: The percent of fourth, seventh, and tenth graders collectively who are overweight or obese is slightly higher among males.



Section III: Weight Classification of 4th Graders

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

BMI Data by District

Figure 27: With the exception of White Pine, less than 4% of fourth graders in all districts are underweight.

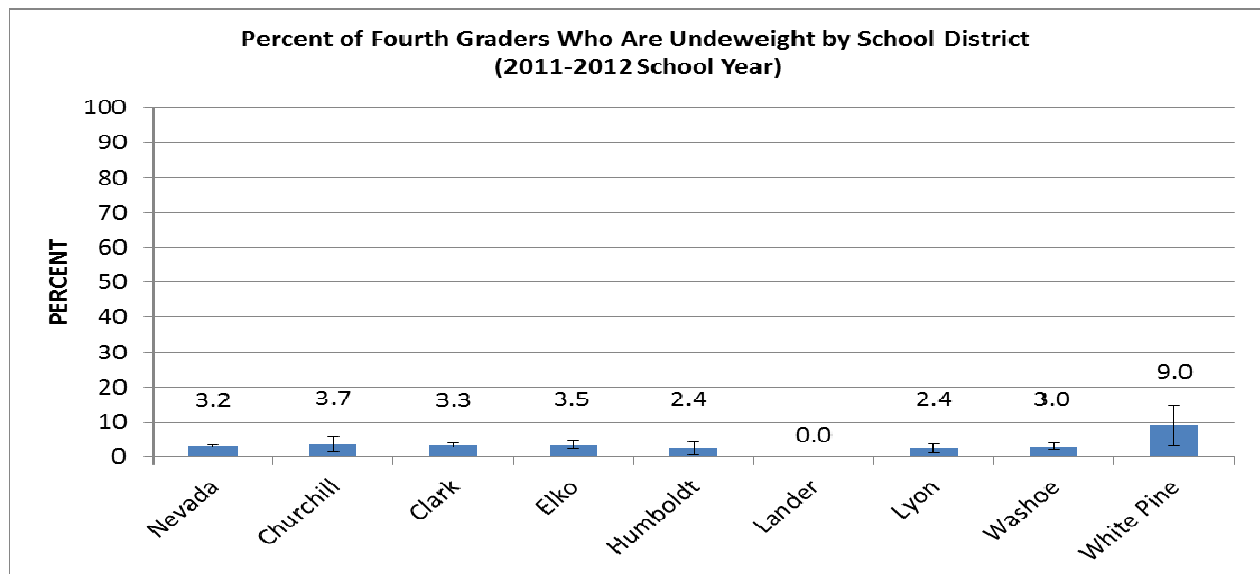


Figure 28: The percentages of fourth graders who are at a healthy weight range from 50.7% to 67.9% across districts with a state average of 58.3%.

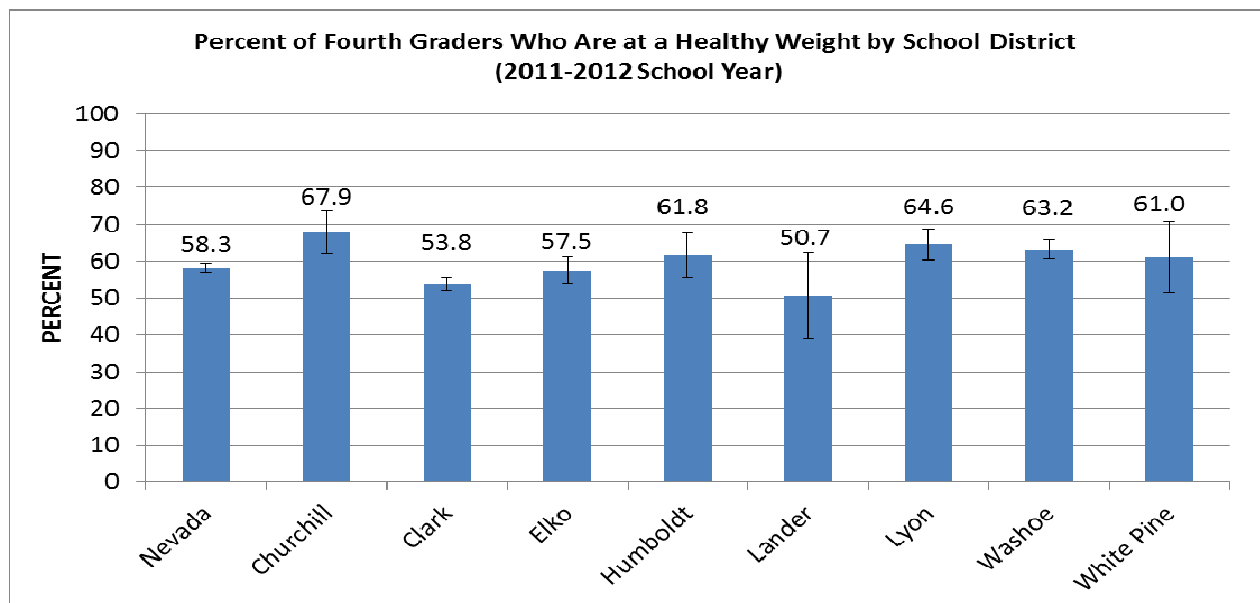


Figure 29: The percentage of fourth graders who are overweight by district ranges from 13.5% to 20.5% with a national average of 17.2%.

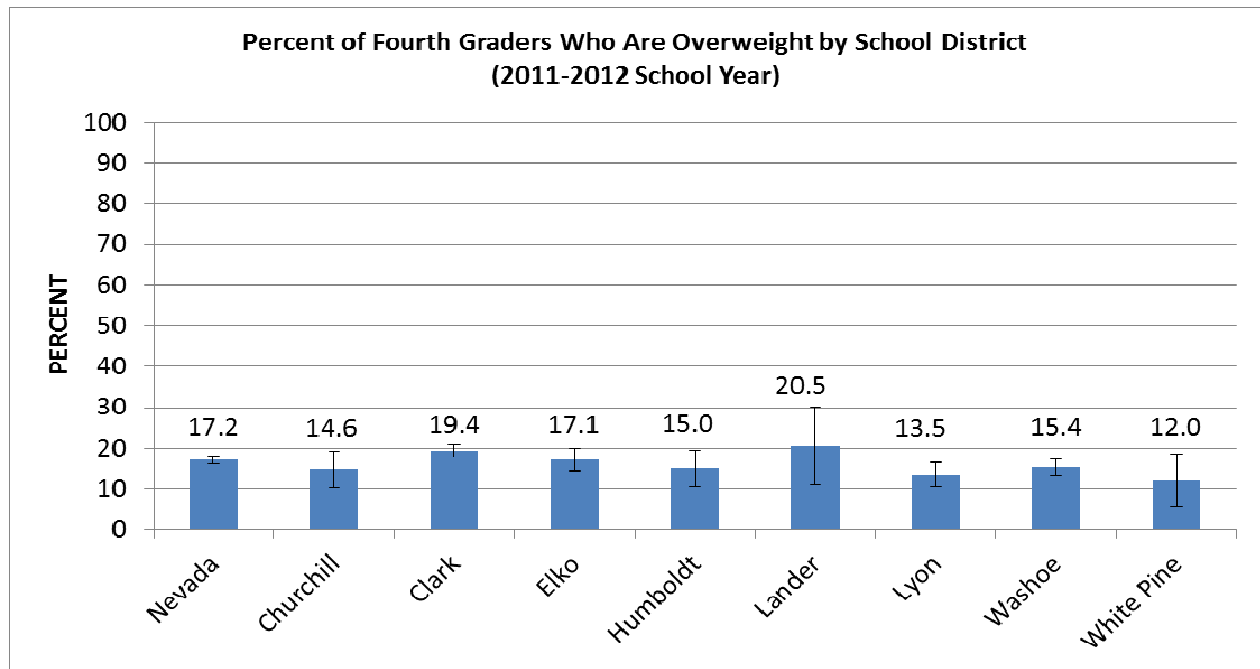
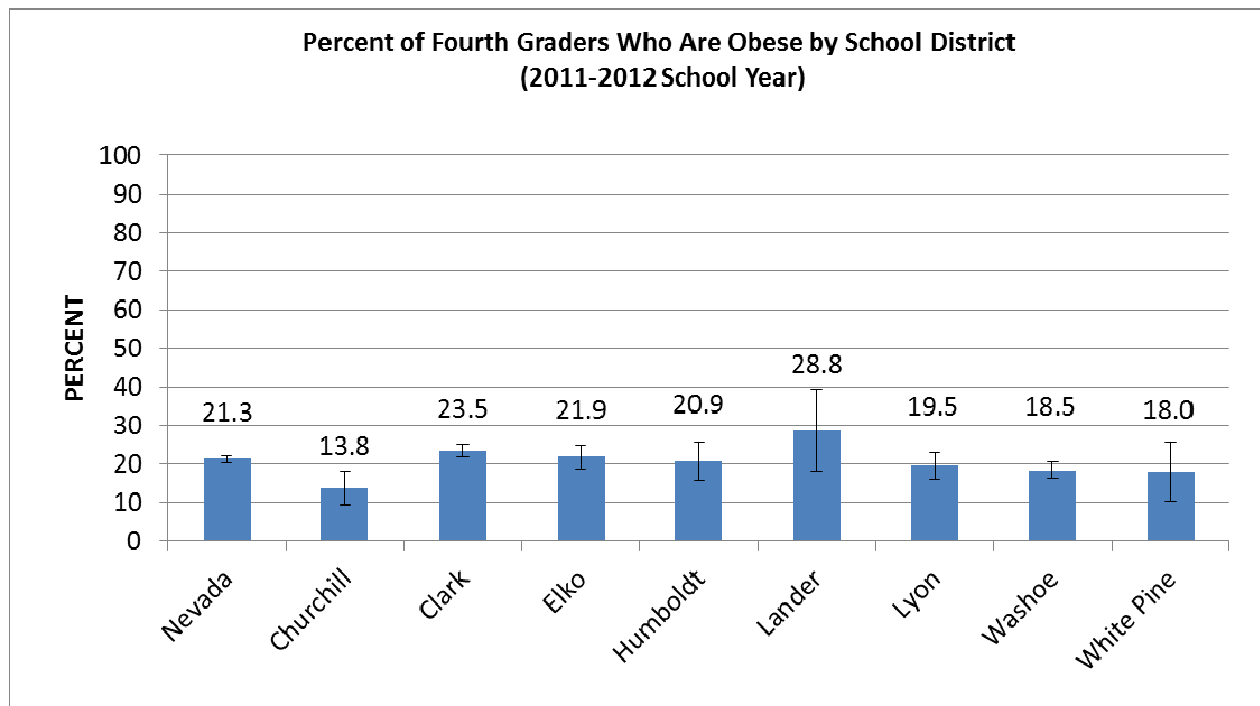


Figure 30: The percentage of fourth graders who are obese by district ranges from 13.8% to 28.8% with a statewide average of 21.3%.



BMI Data by Race/Ethnicity

Figure 31: The percentage of fourth graders who are underweight is low for all racial/ethnic groups.

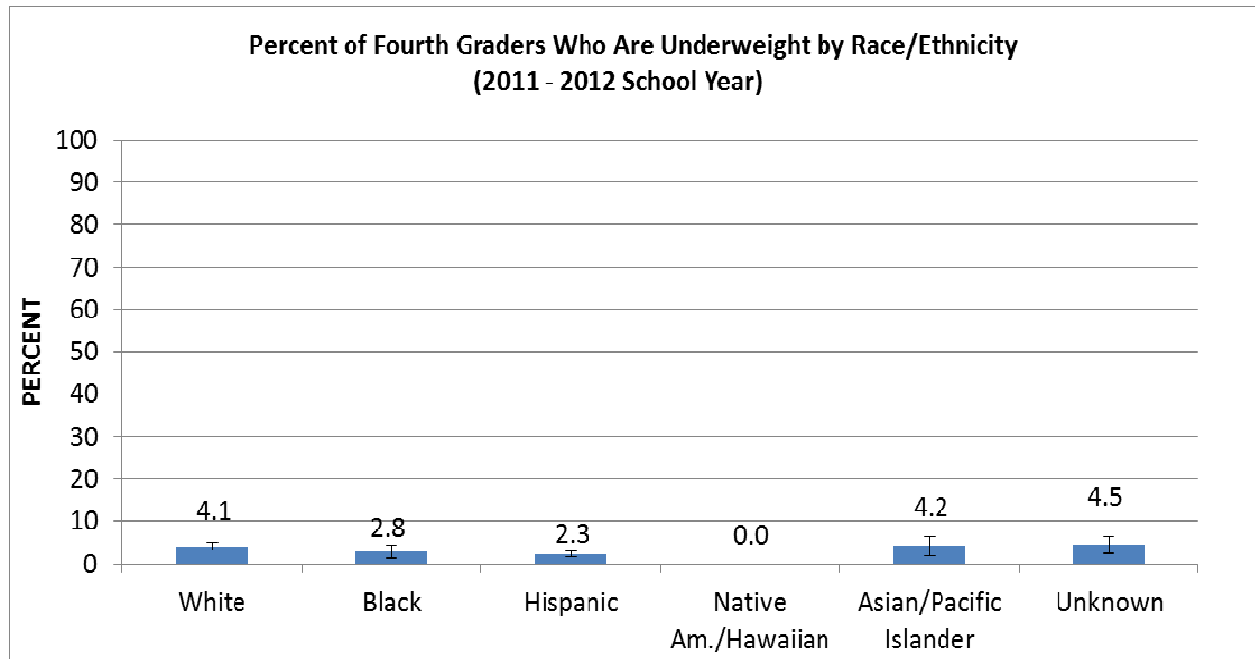


Figure 32: The percentage of fourth graders who are at a healthy weight is highest among Whites at 67.4% and lowest among Native Americans/Hawaiians and Hispanics, 50.0% and 50.2% respectively.

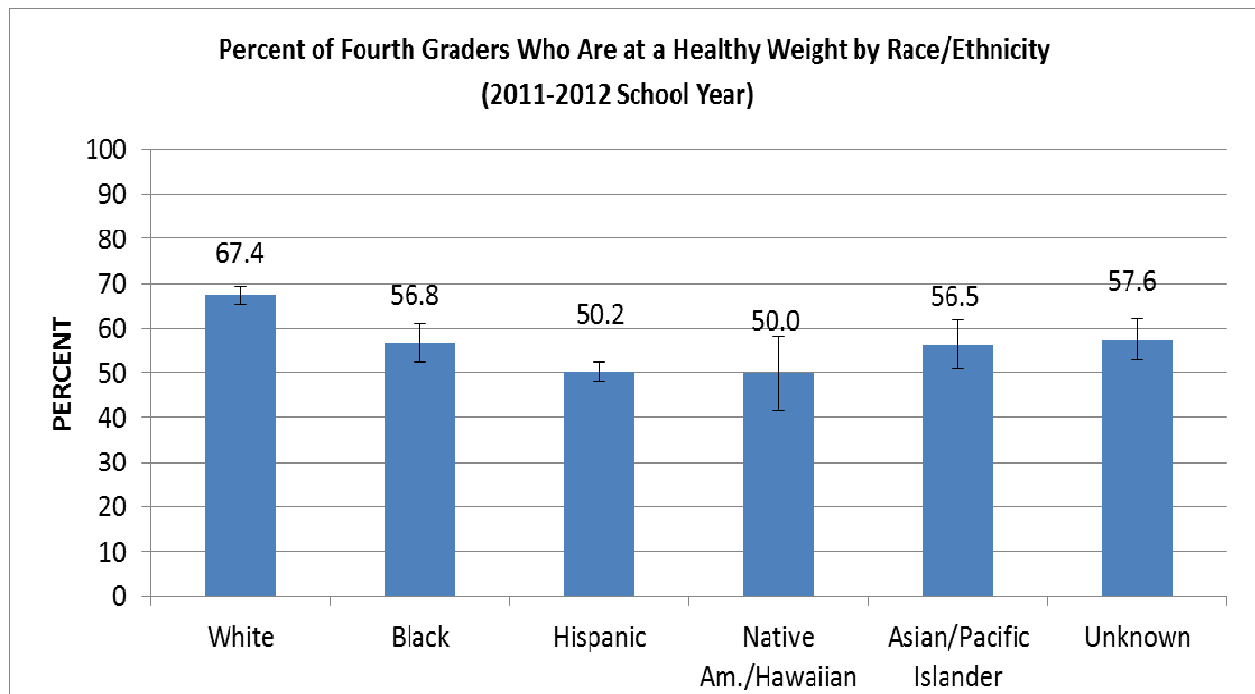


Figure 33: The percentage of fourth graders who are overweight range from 13.2% to 21.4%, with Whites being the lowest and Native American/Hawaiians the highest

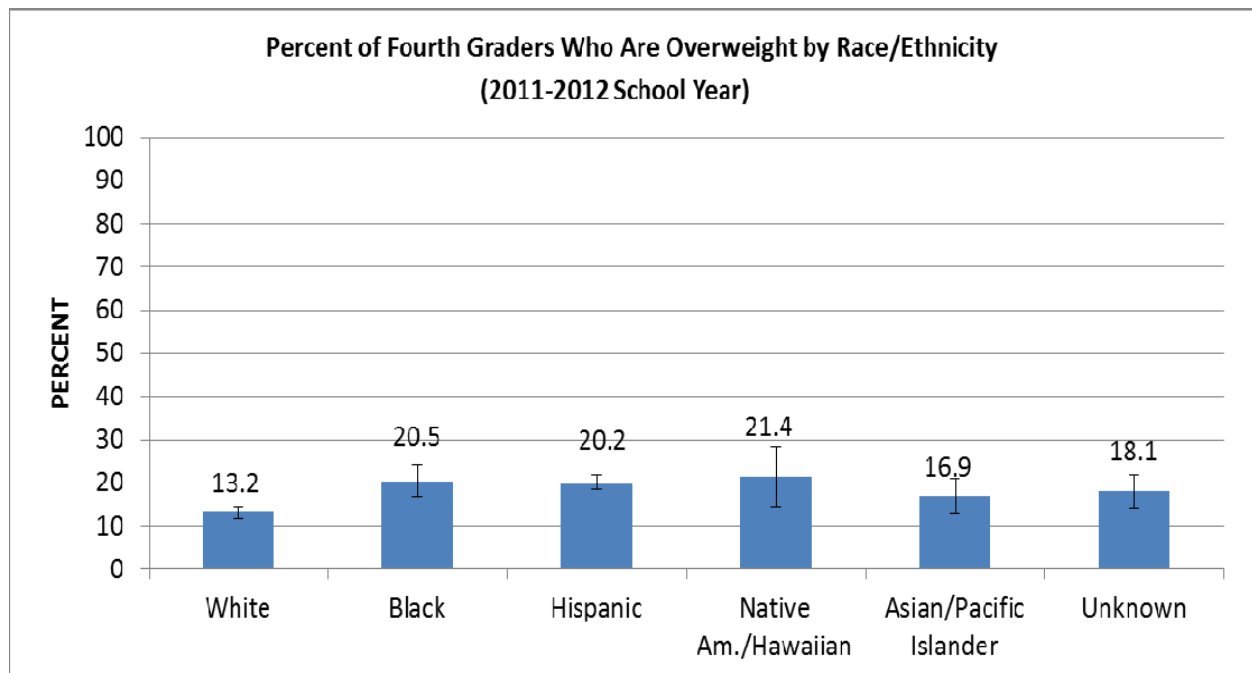
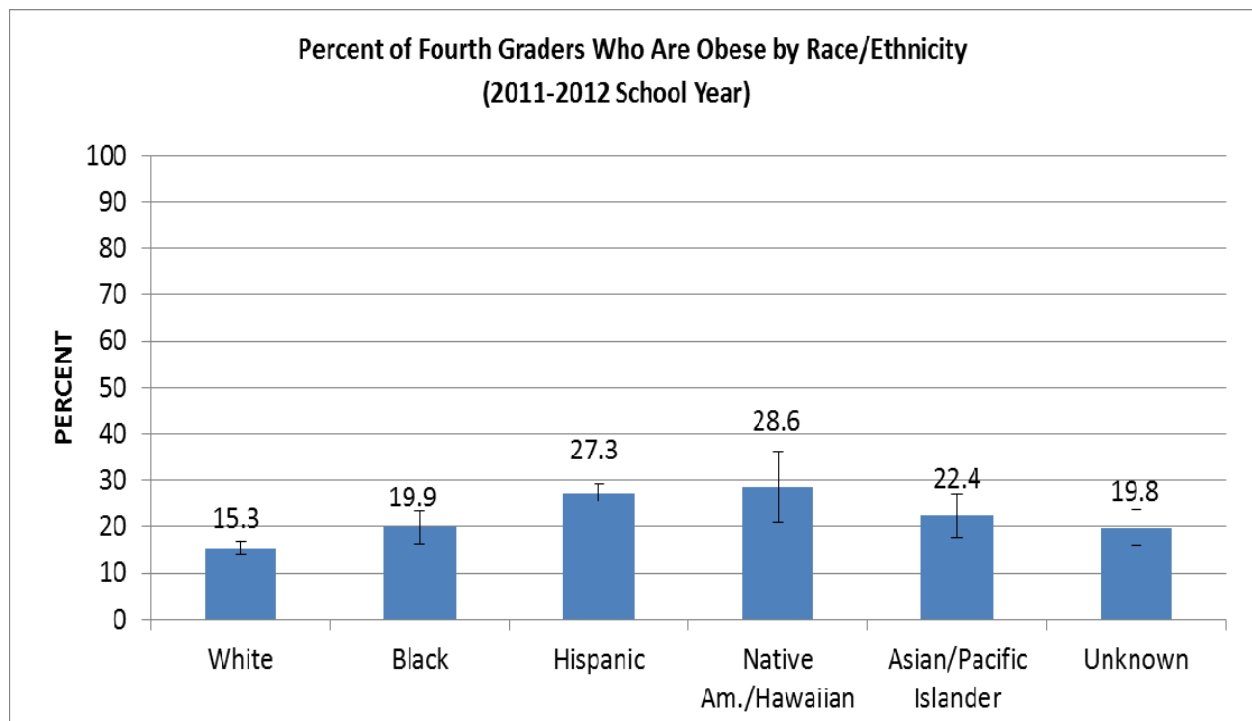
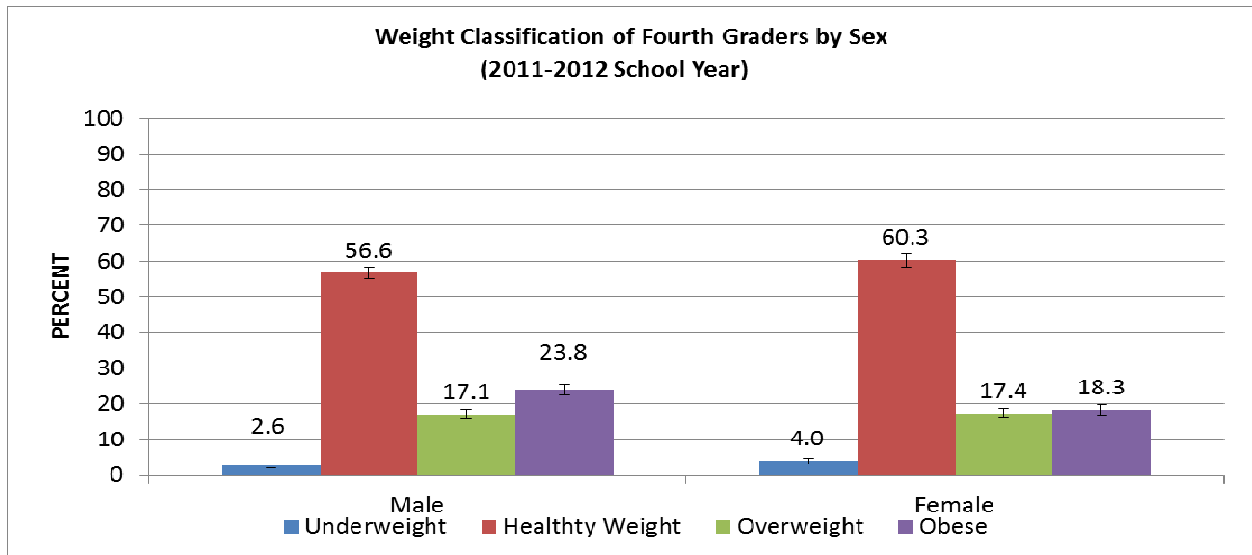


Figure 34: The percentage of fourth graders who are obese is highest in the Native American/Hawaiian and the Hispanic population, 28.6% and 27.3% respectively, and lowest among whites, 15.3%.



BMI Data by Sex

Figure 35: 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 7th Graders

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

BMI Data by District

Figure 36: The percentages of seventh graders who are underweight are low across all districts.

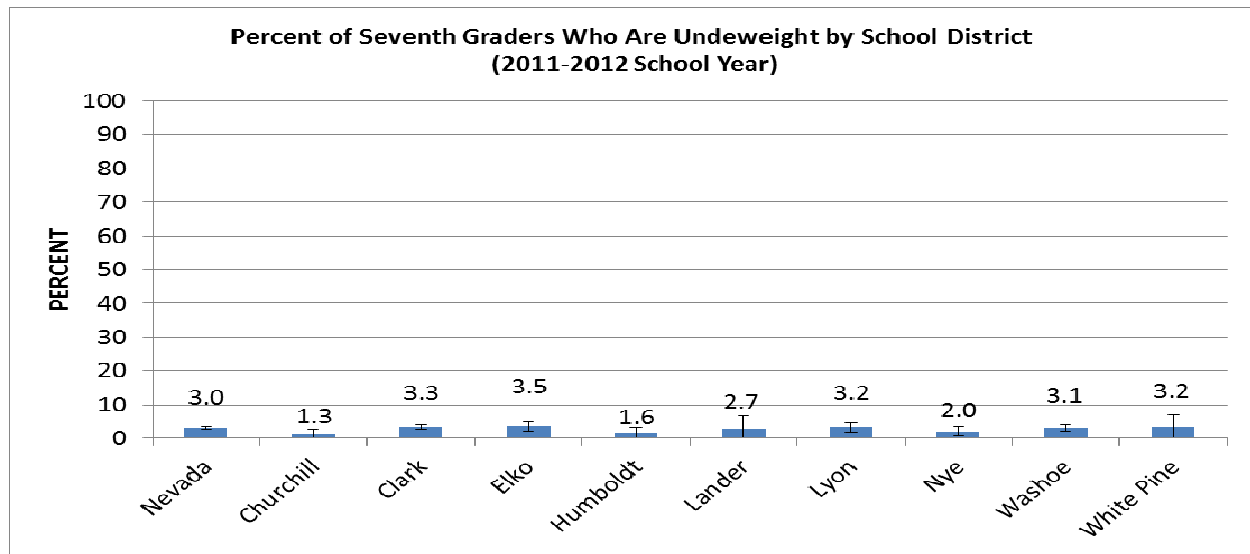


Figure 37: The percentage of seventh graders who are at a healthy weight range from 53.6% to 62.8% with a statewide average of 57.7%.

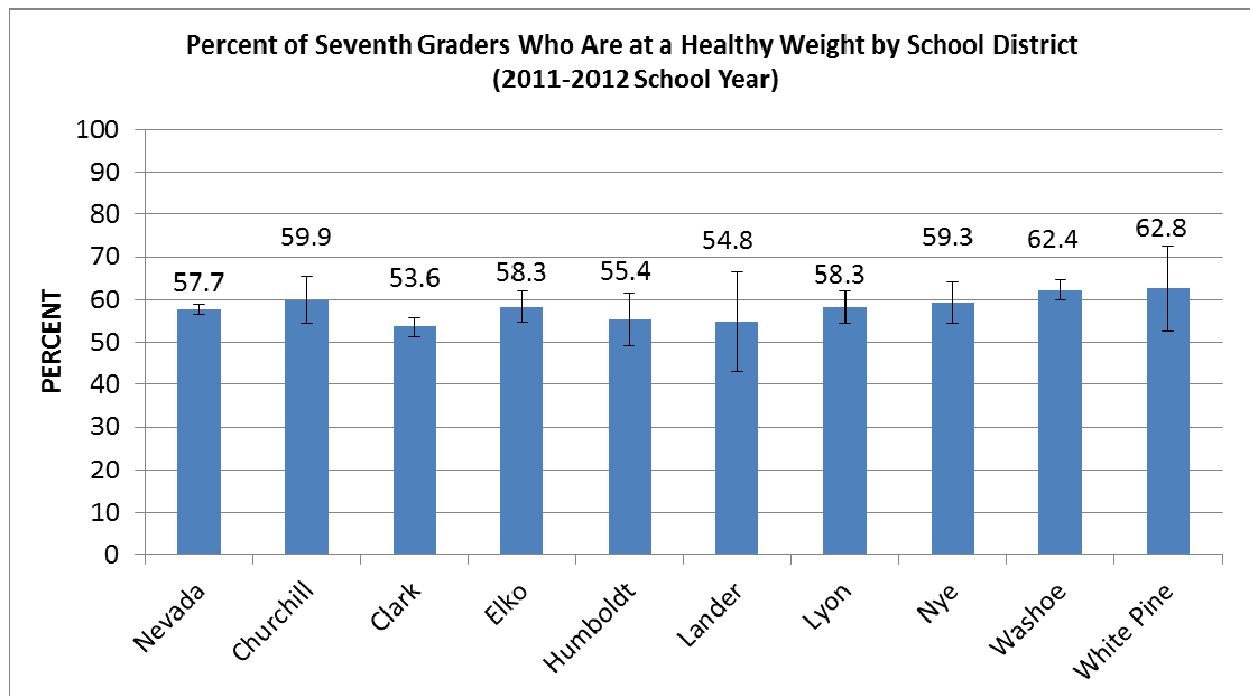


Figure 38: The percentage of seventh graders who are overweight is similar across districts ranging from 16.4 to 19.7%.

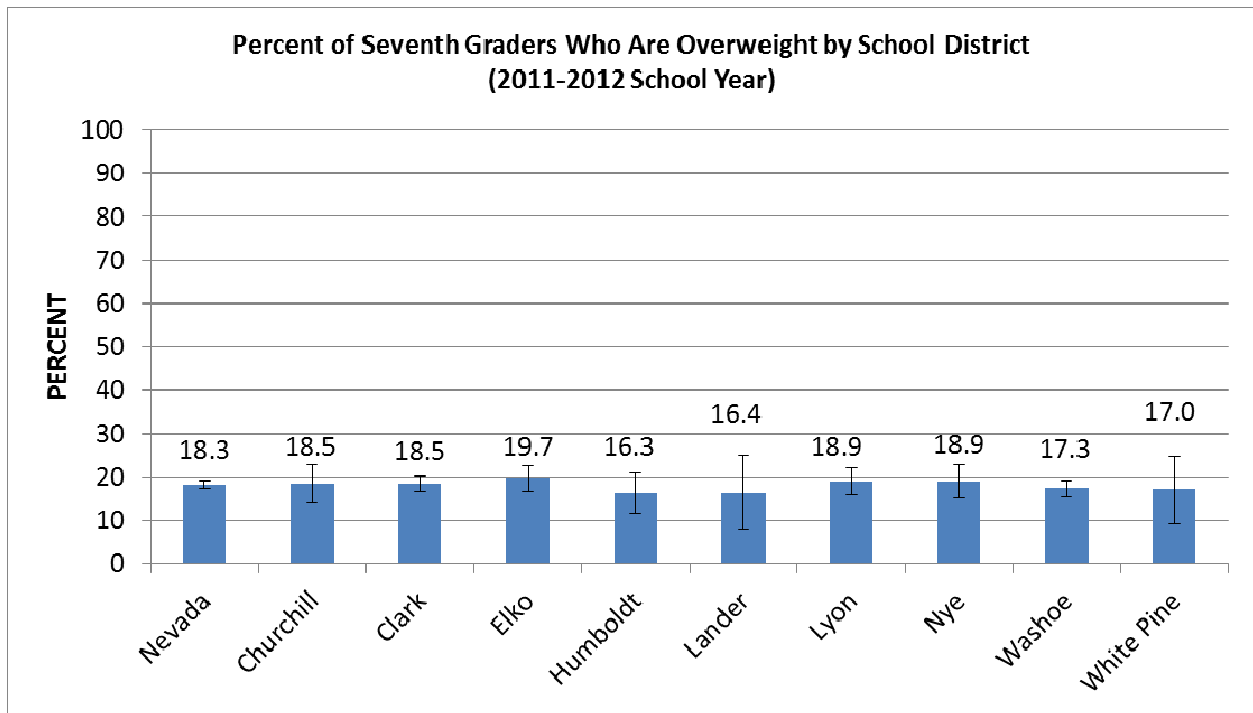
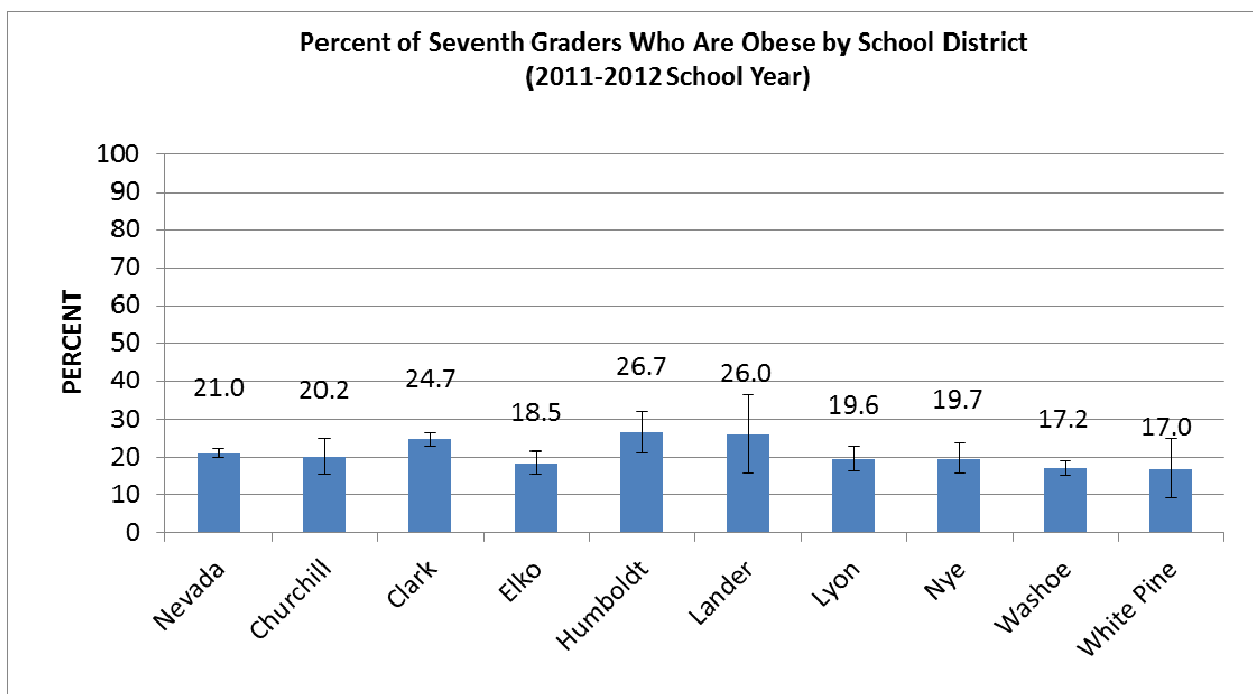


Figure 39: The obesity rate of seventh graders across districts ranges from 17.2% in Washoe County and 26.0% in Lander County.



BMI Data by Race/Ethnicity

Figure 40: The percentage of seventh graders who are underweight is low in all racial/ethnic categories.

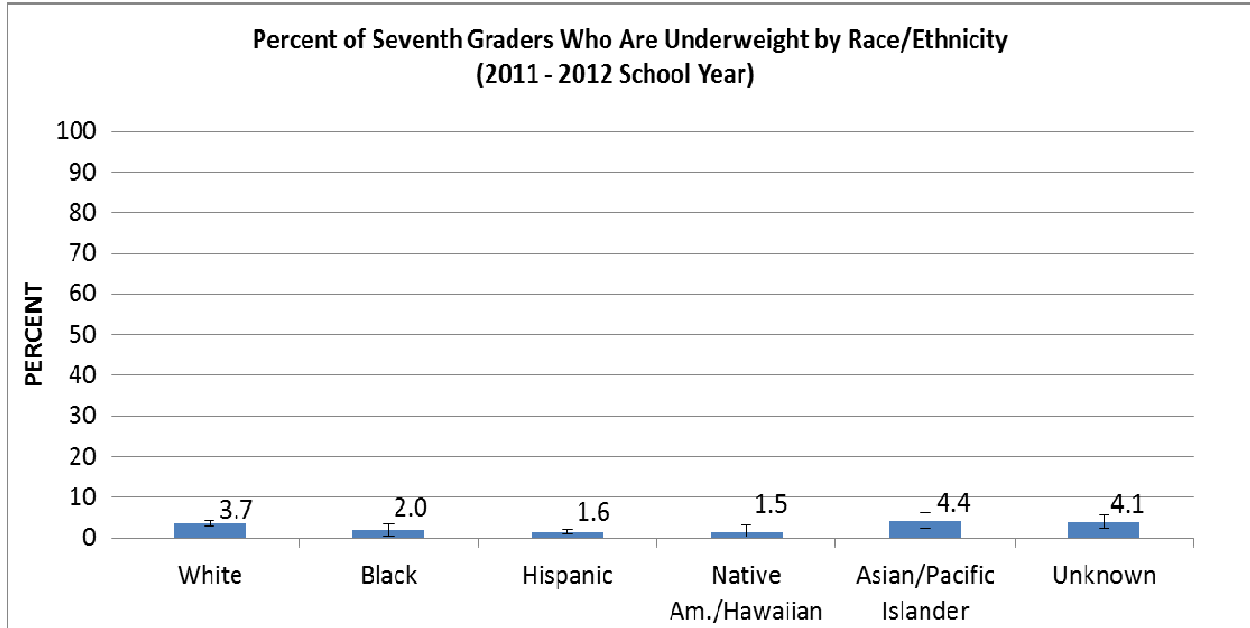


Figure 41: The percentage of seventh graders who are at a healthy weight is highest among Whites at 63.8% and lowest among Native Americans/Hawaiians at 44.2%.

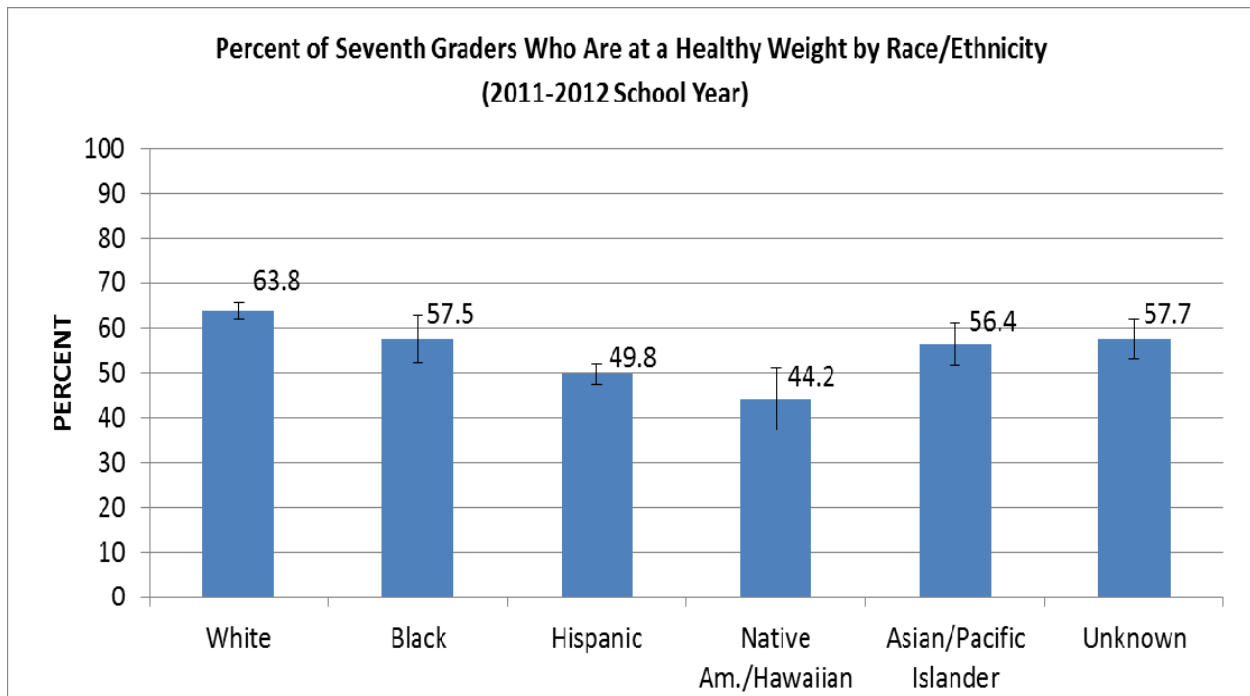


Figure 42: The percentage of seventh graders that are overweight is similar across all race/ethnicity categories.

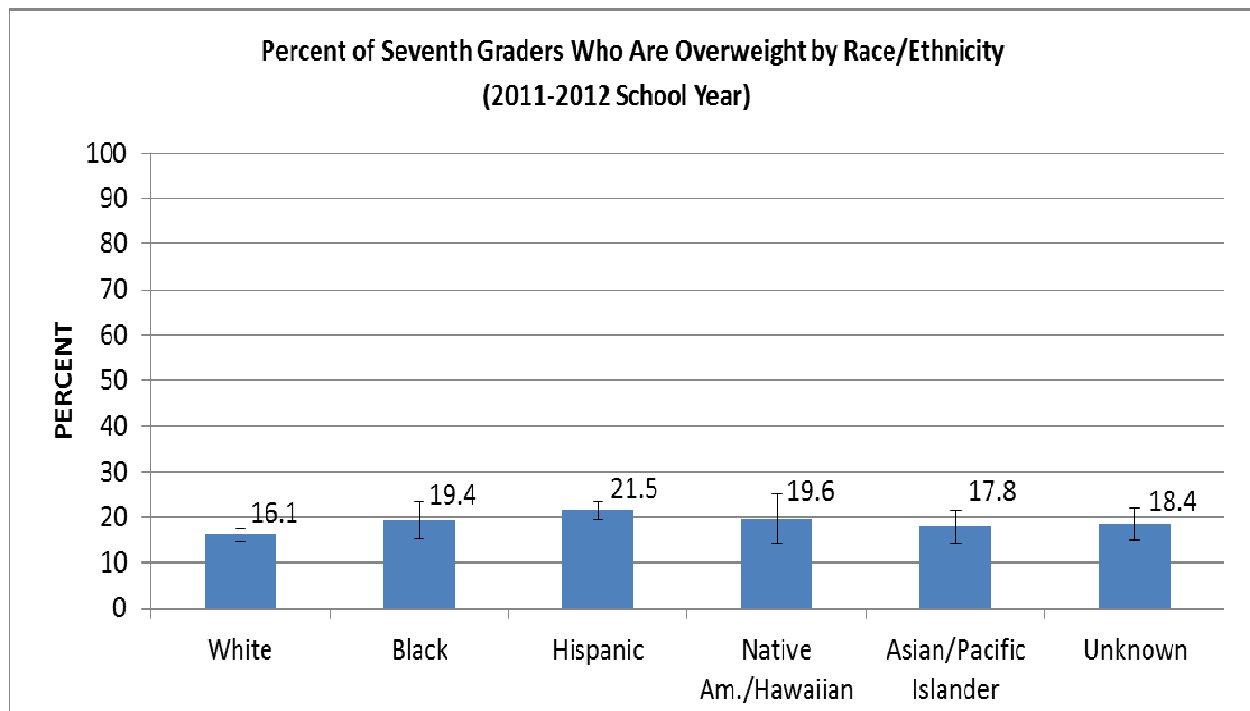
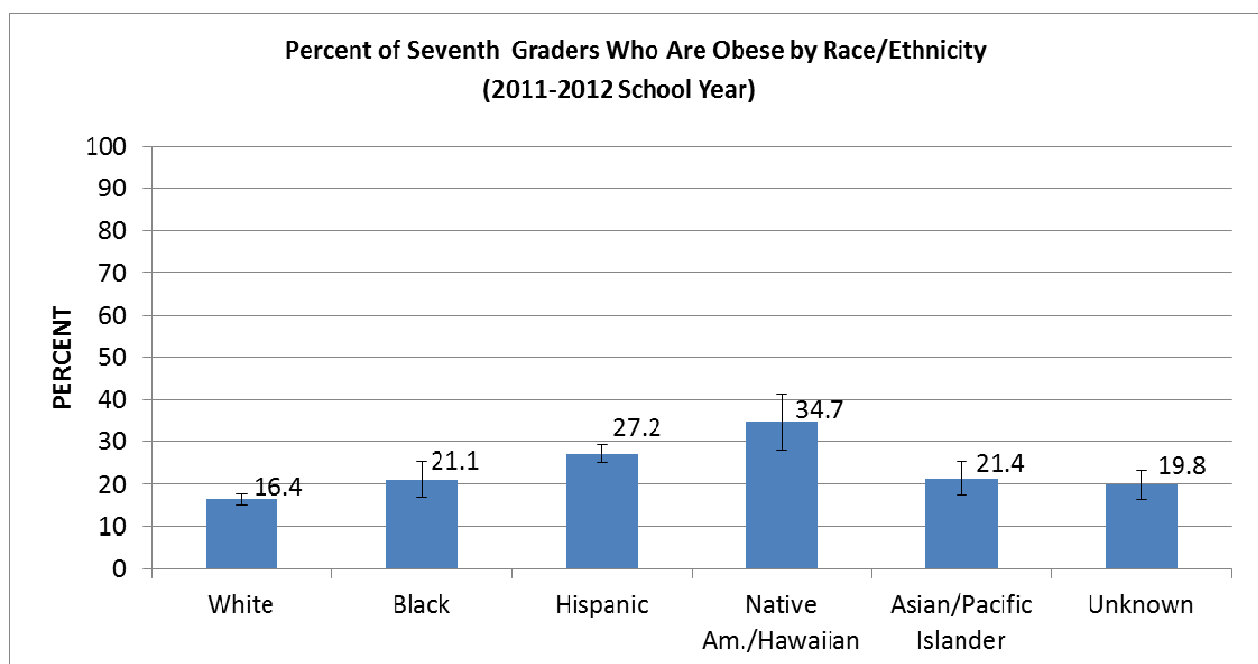
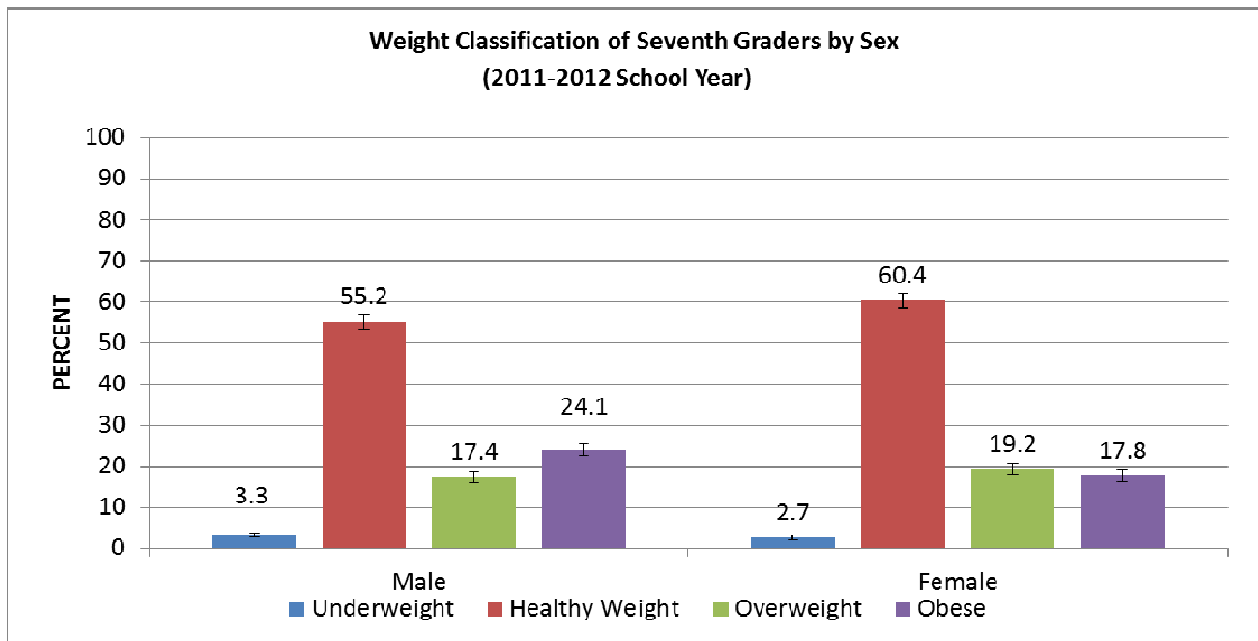


Figure 43: The percentage of seventh graders who are obese is highest in the Native American/Hawaiian and the Hispanic population, 34.7% and 27.2% respectively, and lowest among whites, 16.4%.



BMI Data by Sex

Figure 44: 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 10th Graders

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

BMI Data by District

Figure 45: The percentages of tenth graders who are underweight are low across all districts.

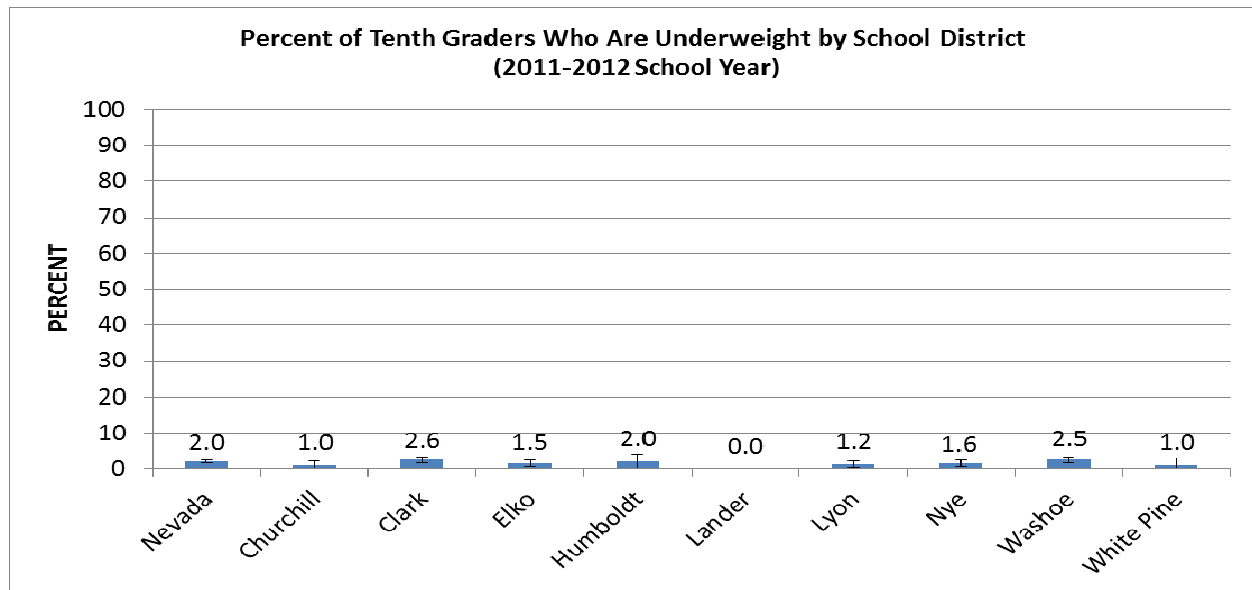


Figure 46: The percentage of seventh graders who are at a healthy weight range from 53.6% to 62.8% with a statewide average of 57.7%.

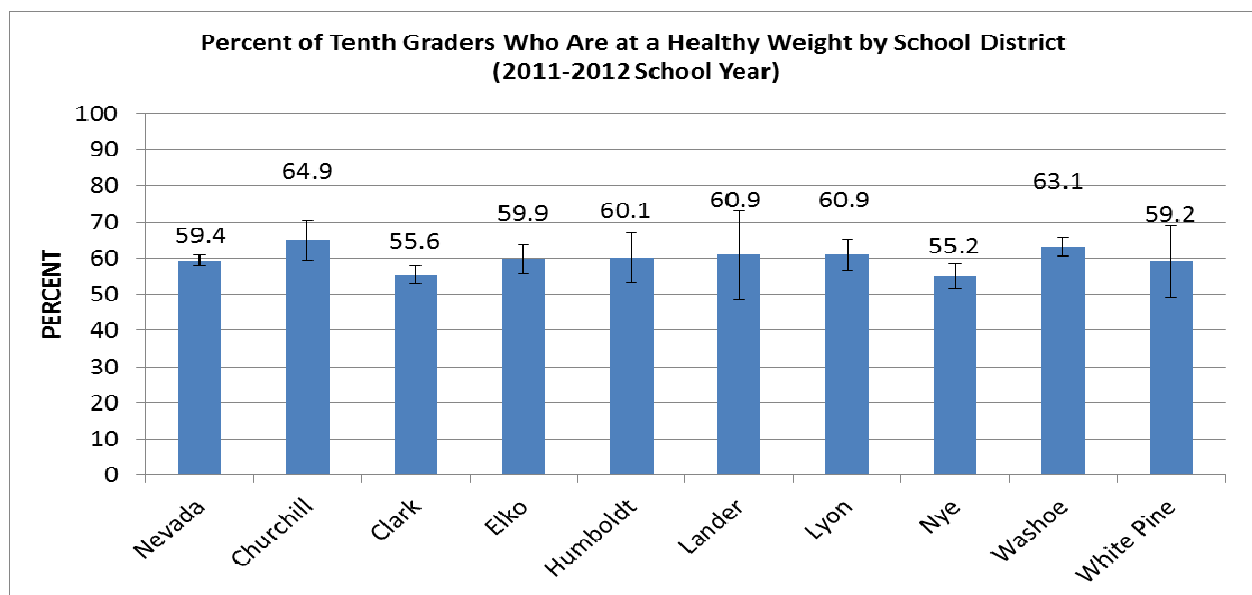


Figure 47: The percentages of seventh graders who are overweight are similar across districts ranging from 15.3 to 21.2%.

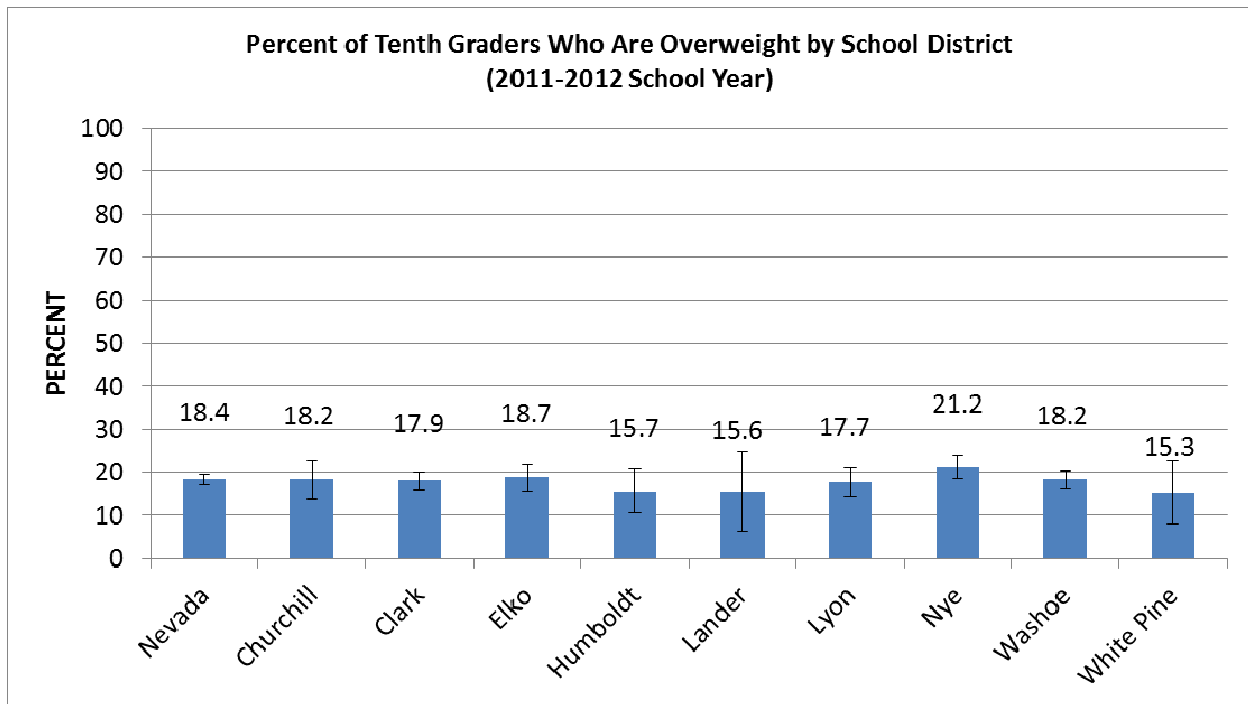
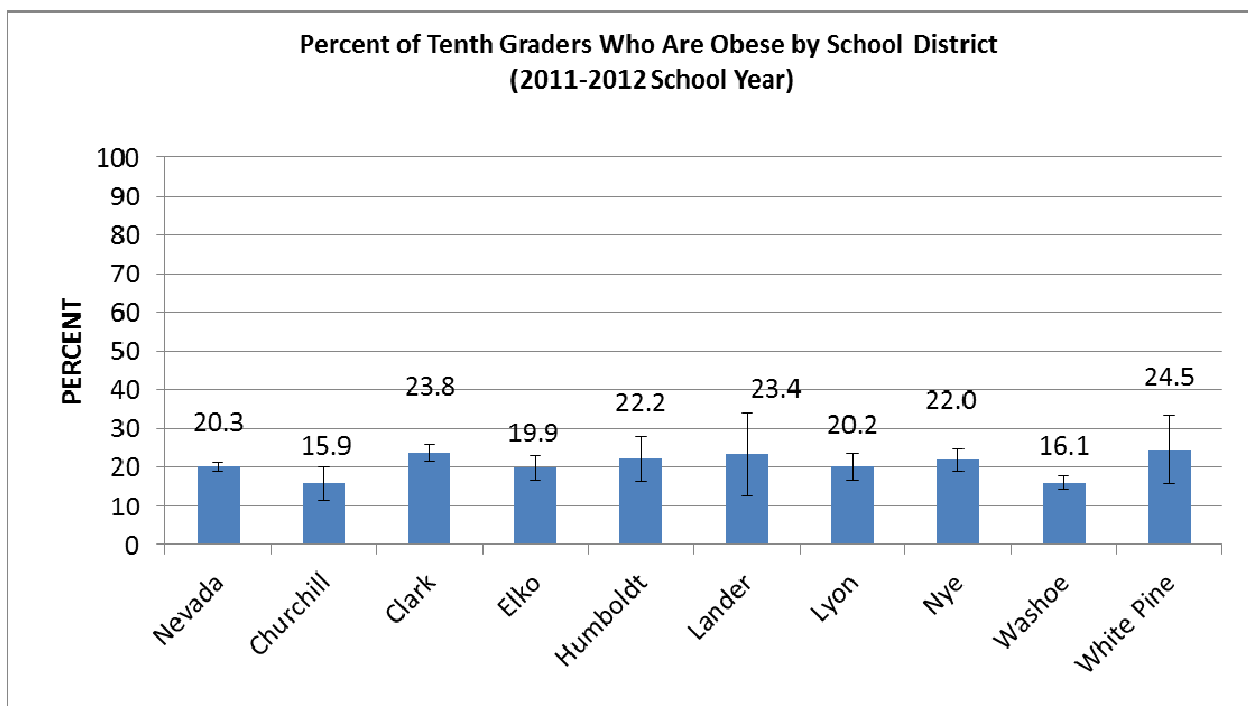


Figure 48: The obesity rate of tenth graders across districts range from 15.9% in Churchill County to 24.5% in White Pine County.



BMI Data by Race/Ethnicity

Figure 49: The percentage of tenth graders who are underweight is low for all race/ethnicity groups.

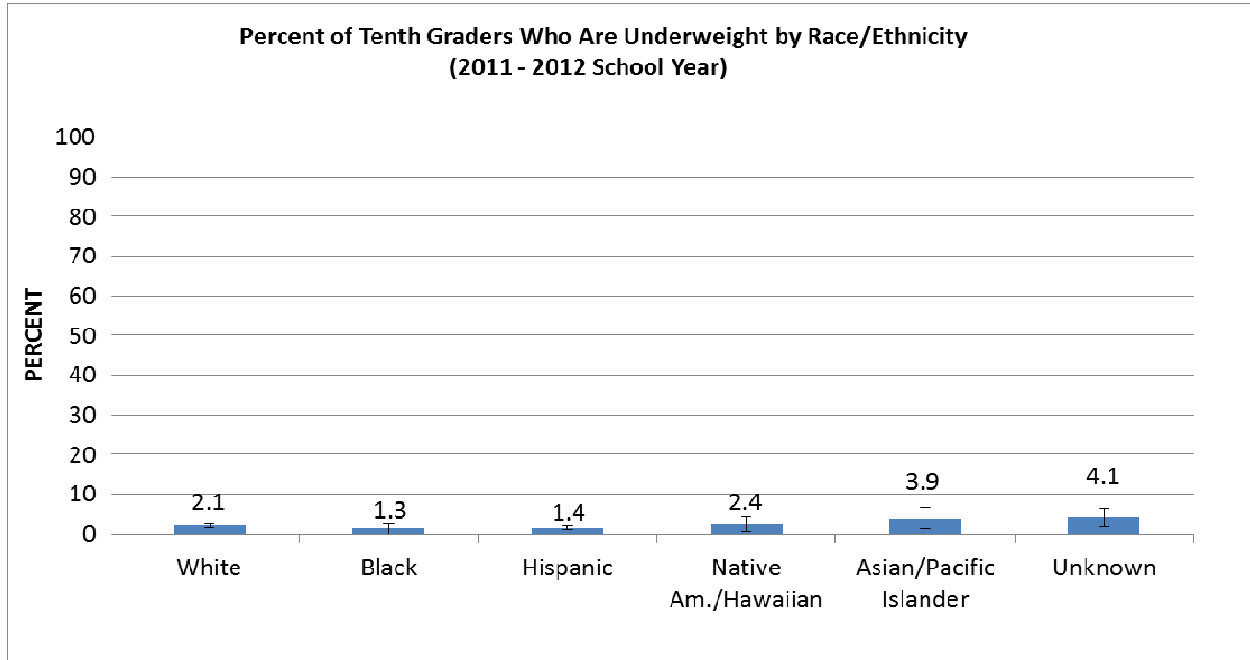


Figure 50: The percentage of tenth graders who are at a healthy weight is highest among Asian/Pacific Islanders and Whites at 62.8% and 62.6% respectively.

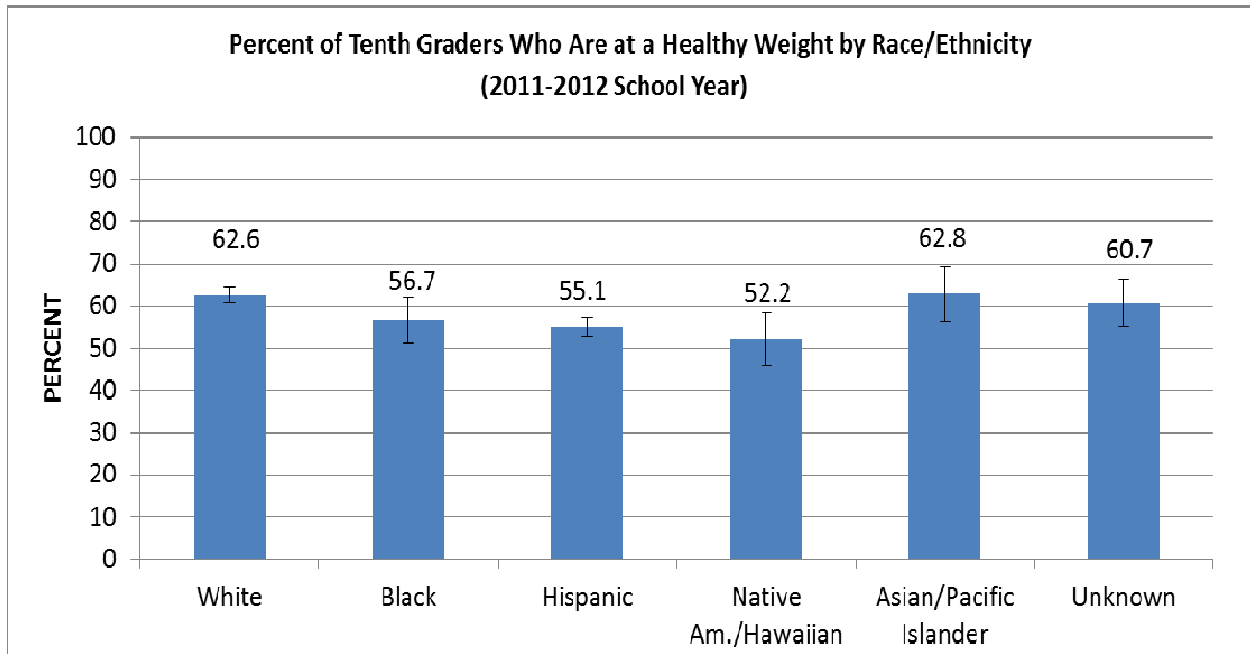


Figure 51: The percentage of tenth graders who are overweight is similar among all racial categories ranging from 16.2% to 20.3%

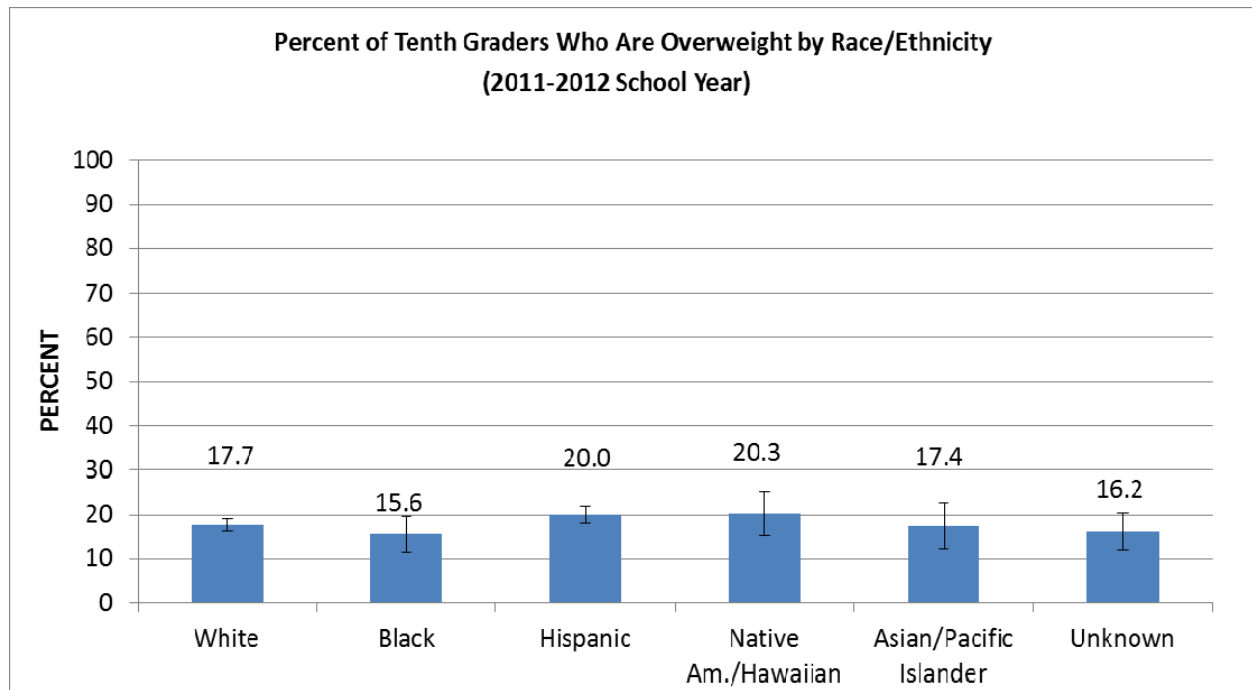
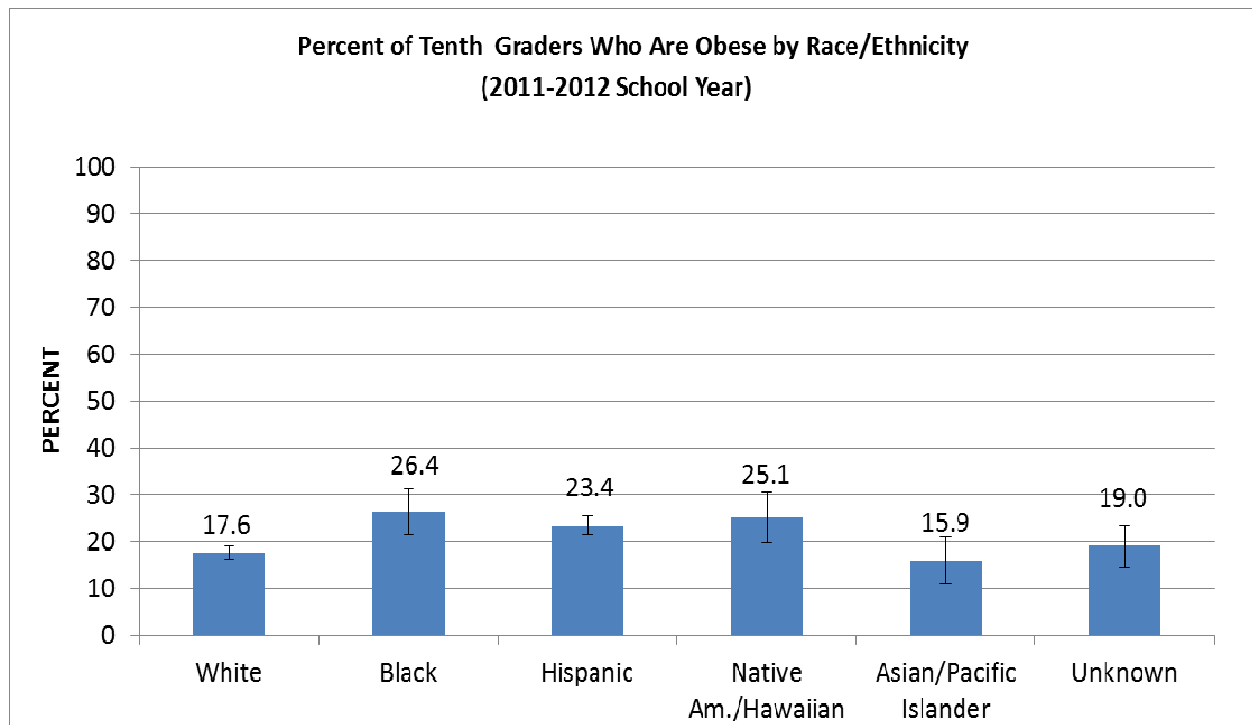
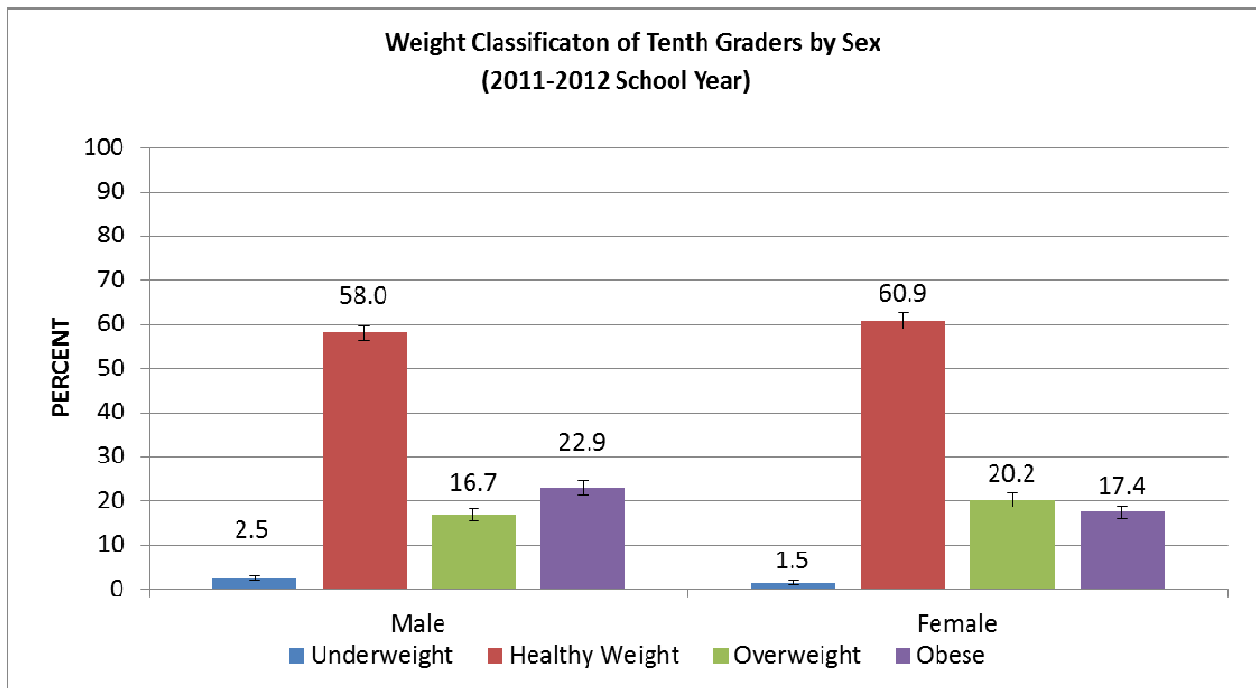


Figure 52: The percentage of tenth graders who are obese is highest in the Black population and lowest in the Asian/Pacific Islander population, 26.4% and 15.9% respectively.



BMI Data by Sex

Figure 53: 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

ⁱ Centers for Disease Control and Prevention, Overweight and Obesity, Data and Statistics, Obesity and Extreme Obesity Rates Decline Among Low-income preschool Children, January 11, 2013. (2013, February 26)

Retrieved from <http://www.cdc.gov/obesity/data/childhood.html>

ⁱⁱ Centers for Disease Control and Prevention, Overweight and Obesity, Childhood Overweight and Obesity, A Growing Problem – What Causes Childhood Obesity? April 27, 2012. (2013, February 26)

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ⁱⁱⁱ Centers for Disease Control and Prevention, Overweight and Obesity, Childhood Overweight and Obesity, Basics About Childhood Obesity – How is Childhood Overweight and Obesity Measured? April 27, 2012. (2013, February 26)

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^{iv} Centers for Disease Control and Prevention, Growth Chart Training, Other Growth Chart Resources, A SAS Program for the CDC Growth Charts, June 27, 2011. (2013, February 26)

Retrieved from <http://www.cdc.gov/nccdphp/dnpao/growthcharts/resources/sas.htm>

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