Body Mass Index of Nevada Students

School Year 2013-2014

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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 2013-2014

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.[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 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.[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:

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

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

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)

District	Total Number of Schools per District	Number of participating Schools	School Participation rate (Percent)
Clark	356	263	73.9
Washoe	103	22	21.4

Table 3: Total Enrollment, Participation (N), and Participation Rates (Percent) by County and Grade (School Year 20133-2014)

	Fourth Grade			Seventh Grade			Tenth Grade			Combined Grades		
State District	total	N	*Rate	total	N	*Rate	total	N	*Rate	total	N	**Rate
Clark & Washoe	28,888	3,341	11.6	29,786	3,423	11.5	28,952	2,832	9.8	87,626	9,596	11.0
Clark	24,003	1,978	8.2	24,839	1,937	7.8	24,016	1,503	6.3	72,858	5,418	7.4
Washoe	4,885	1,363	27.9	4,947	1,486	30.0	4,936	1,329	26.9	14,768	4,178	28.3

*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%.

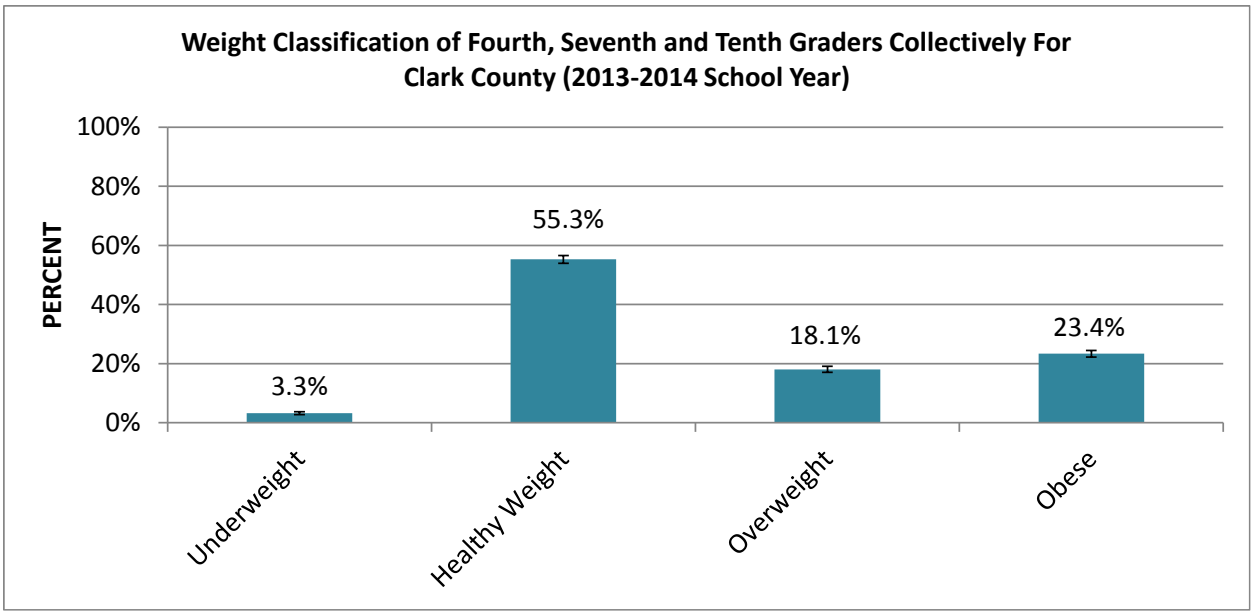


Figure 2: The percentages of Washoe County fourth, seventh, and tenth graders collectively who are at a healthy weight is around 62%.

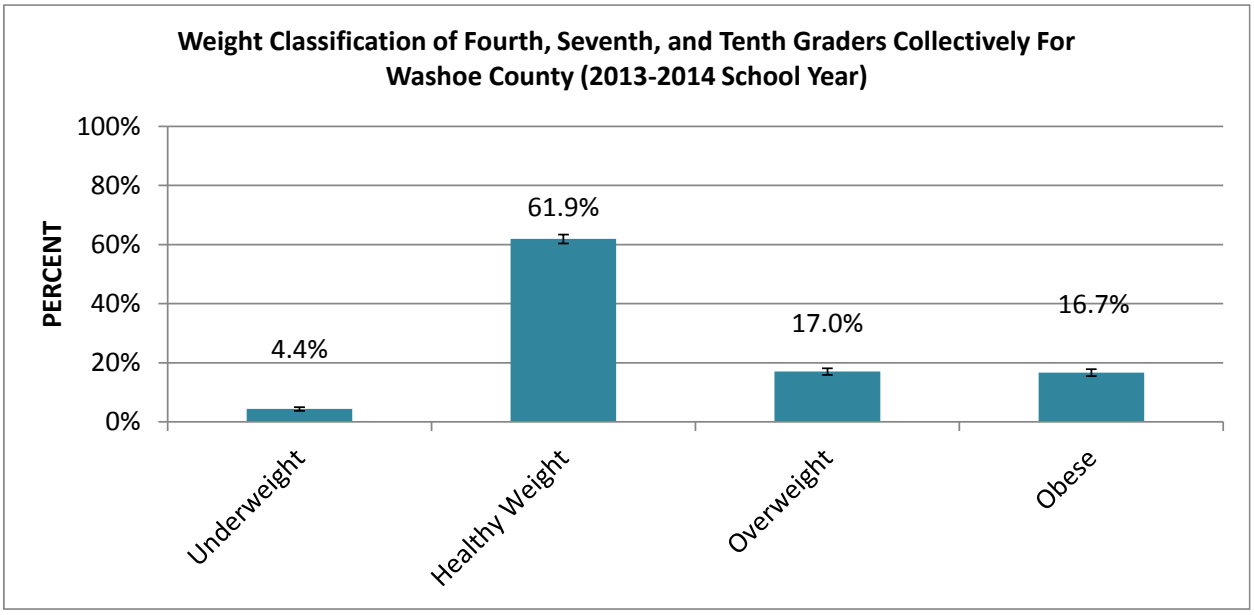
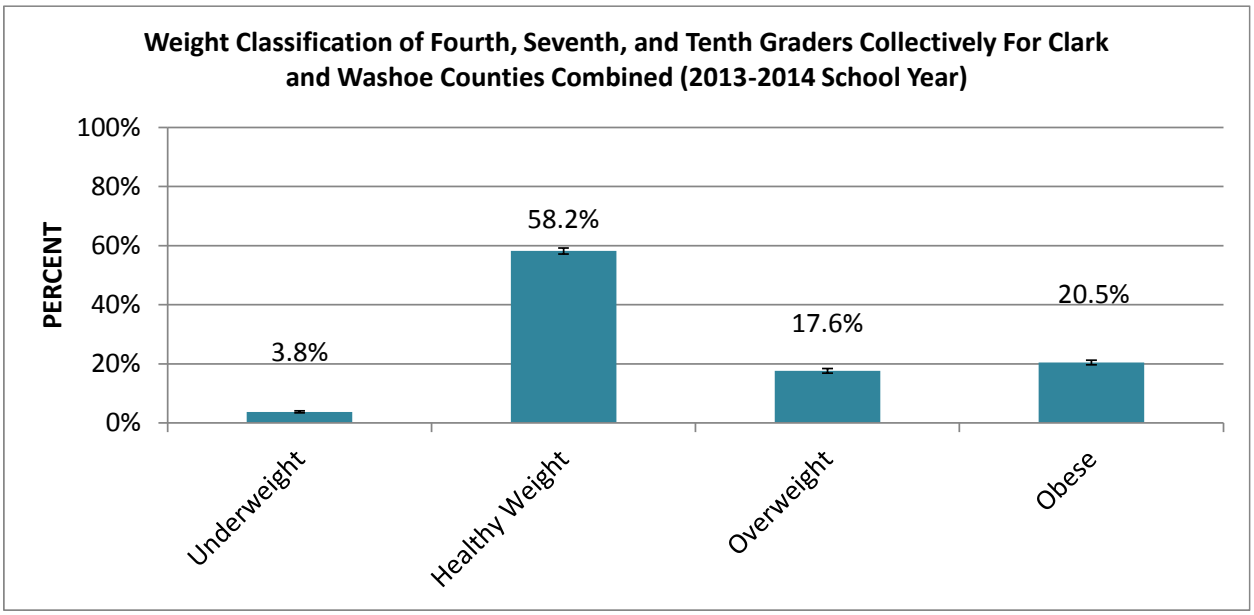


Figure 3: The percentages of Clark County and Washoe County combined for fourth, seventh, and tenth graders collectively who are at a healthy weight is around 58%.



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.

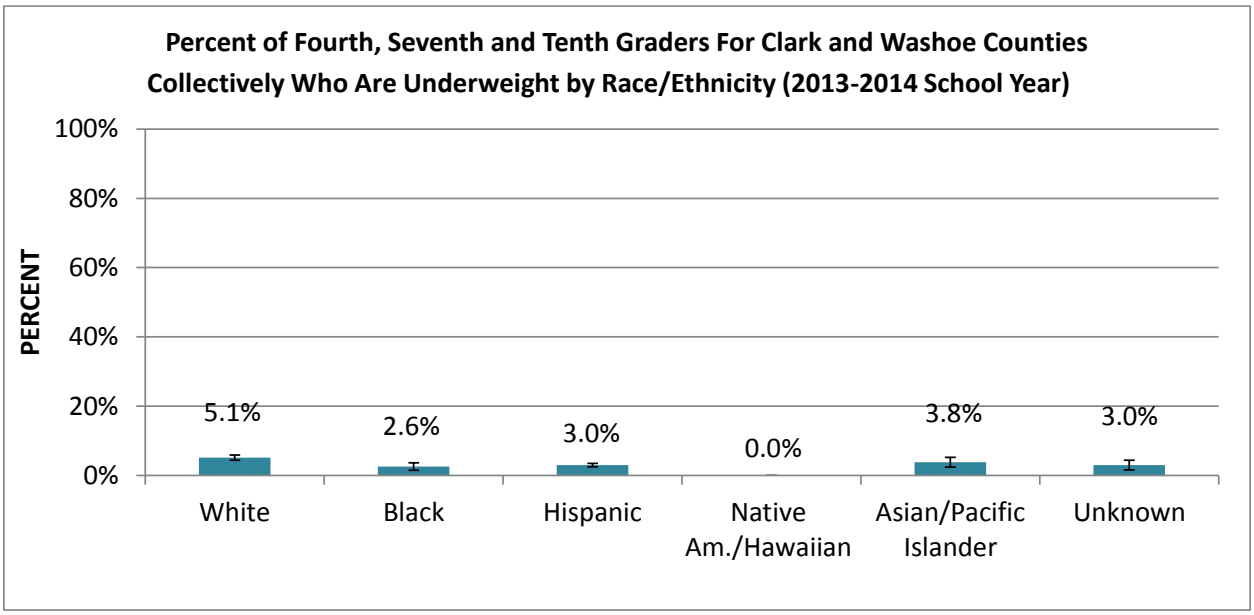


Figure 5: Among race/ethnicity groups, of fourth, seventh, and tenth graders collectively, Hispanics have a significantly lower rate of students with a healthy weight than other racial groups, with the exception of Native Americans/Hawaiians.

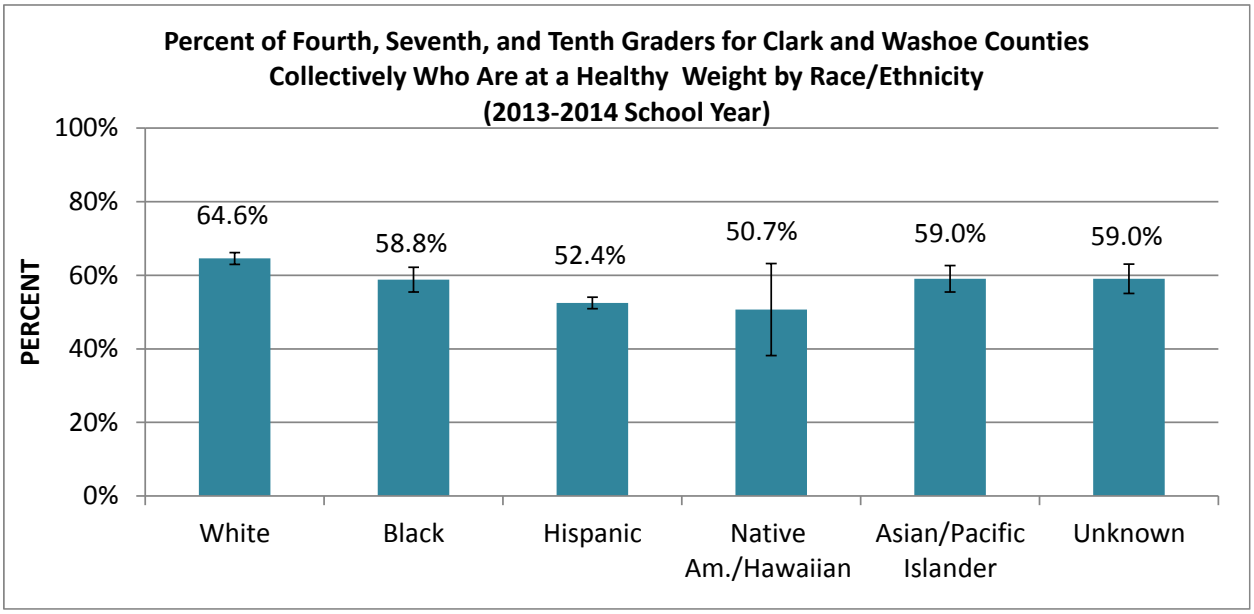


Figure 6: The percentage of fourth, seventh, and tenth graders collectively who are overweight range from 15.4% to 19.6% among race/ethnicity groups.

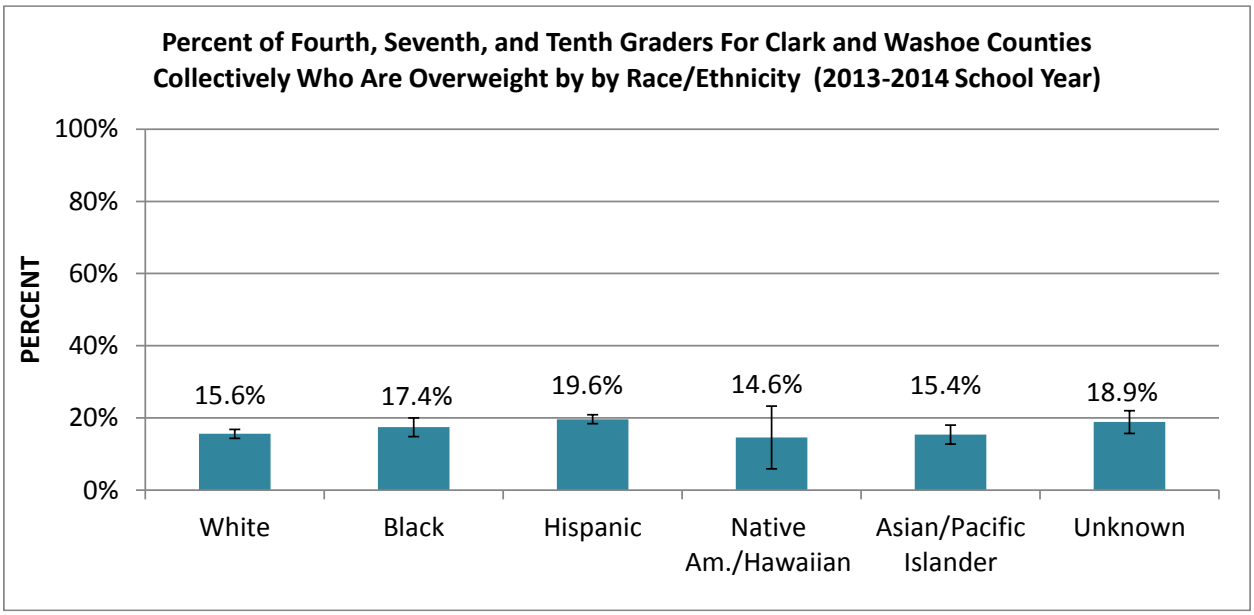
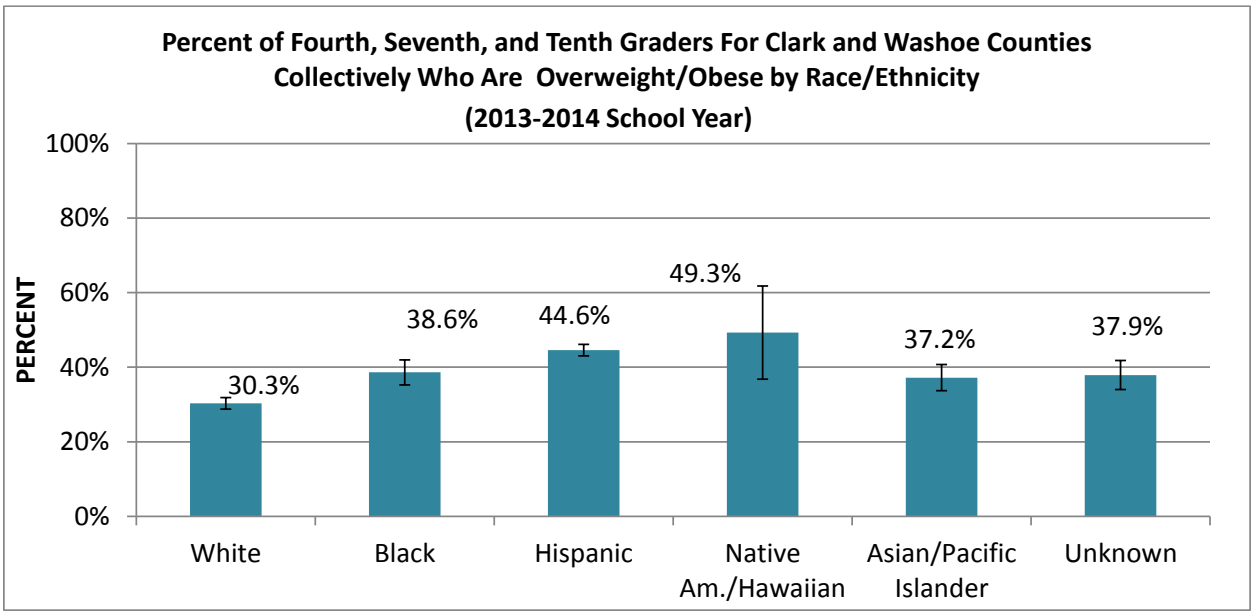


Figure 7: The percentage of fourth, seventh, and tenth graders collectively who are obese is significantly lower among Whites than other race/ethnicity groups.



BMI Data by Grade and Sex

Figure 8: The distribution of fourth, seventh, and tenth graders collectively among weight categories are similar.

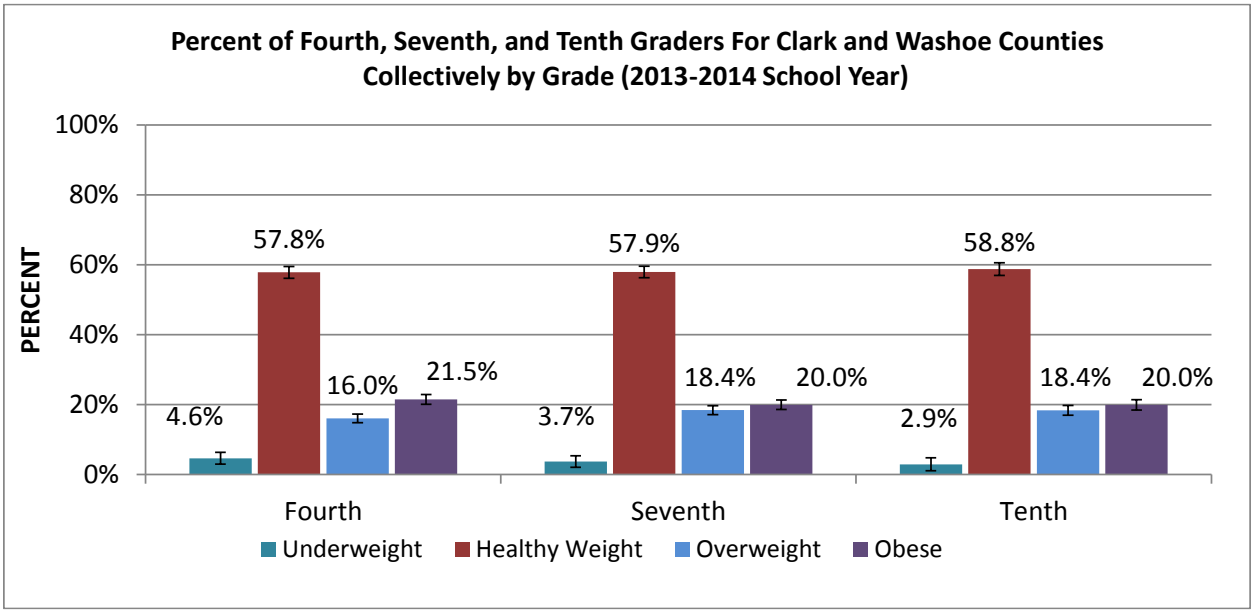
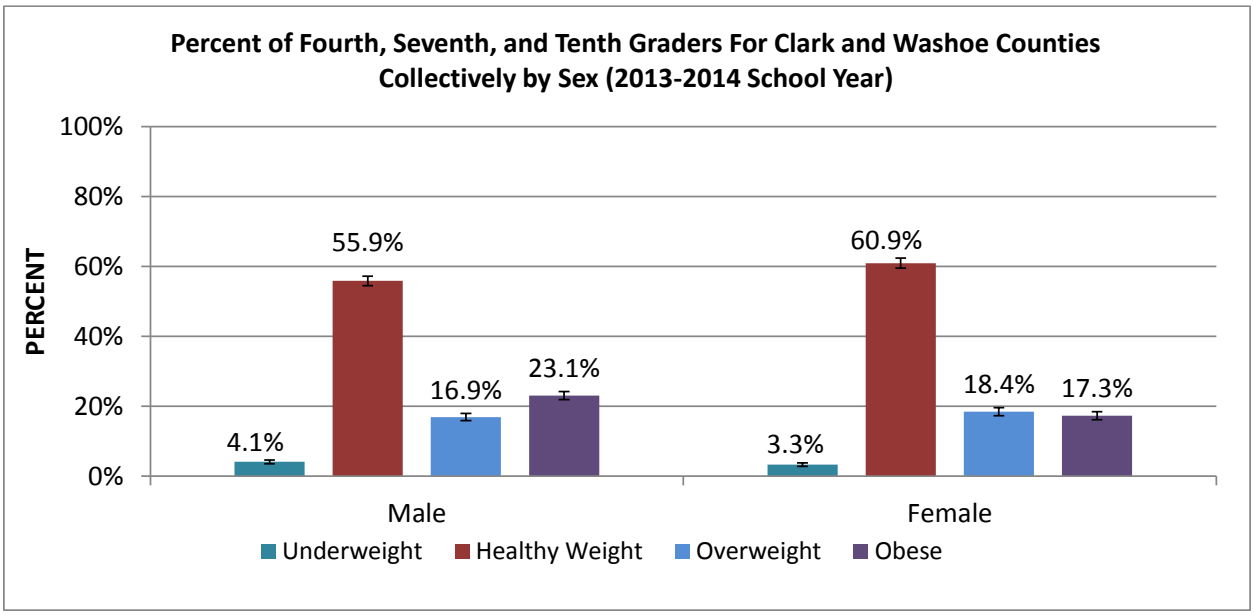


Figure 9: Clark and Washoe County females collectively have a significantly higher prevalence rate of healthy weight than males.



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

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

Clark and Washoe Counties Combined by Demographics

Figure 10: The percentages of Clark County and Washoe County fourth, seventh, and tenth graders collectively who are either underweight or at a healthy weight is significantly Higher in Whites than other race/ethnicities.

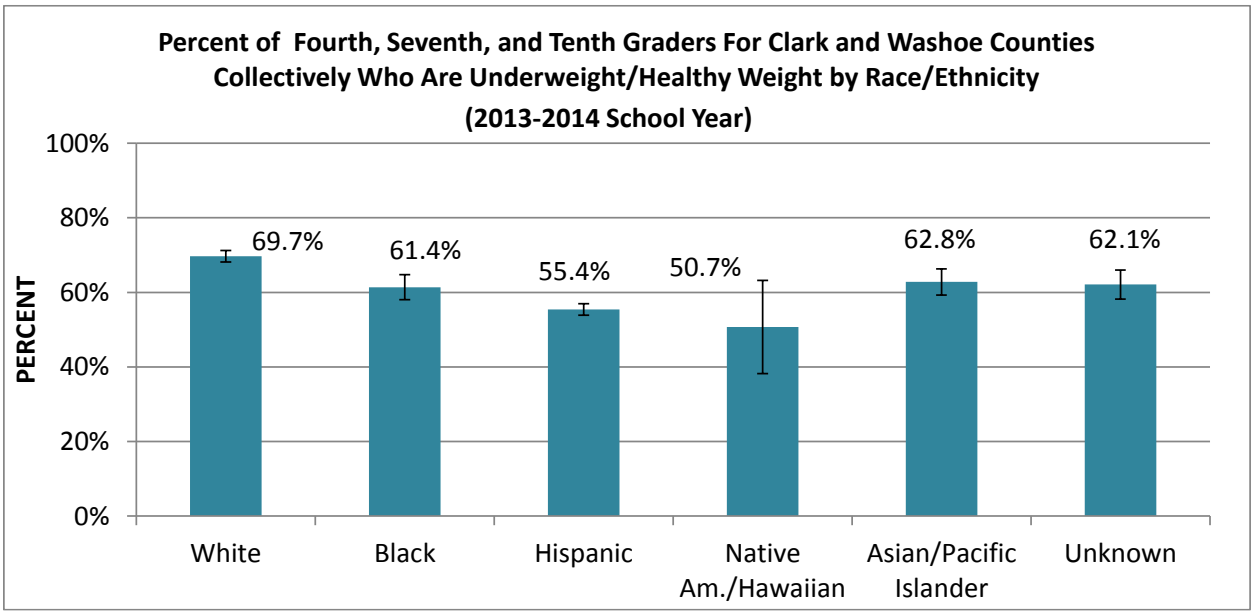


Figure 11: The percentage of Clark County and Washoe County fourth, seventh, and tenth graders collectively who are either overweight or obese among racial/ethnic groups is significantly lower among Whites.

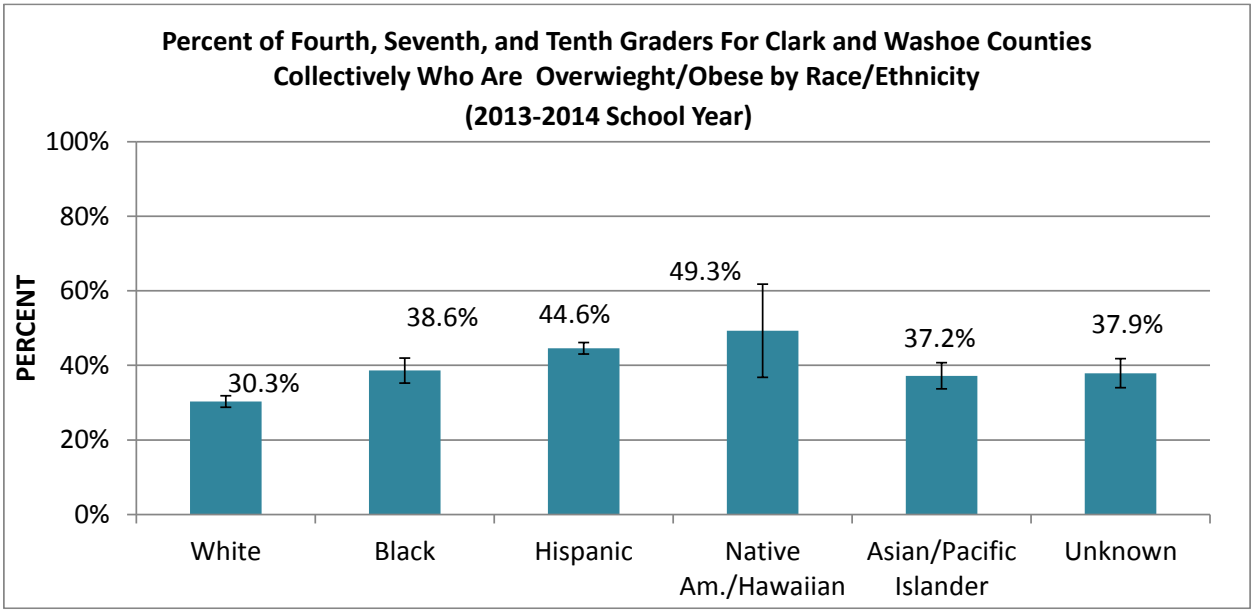


Figure 12: The percent of Clark County and Washoe County fourth, seventh, and tenth graders who are overweight or obese are essentially the same.

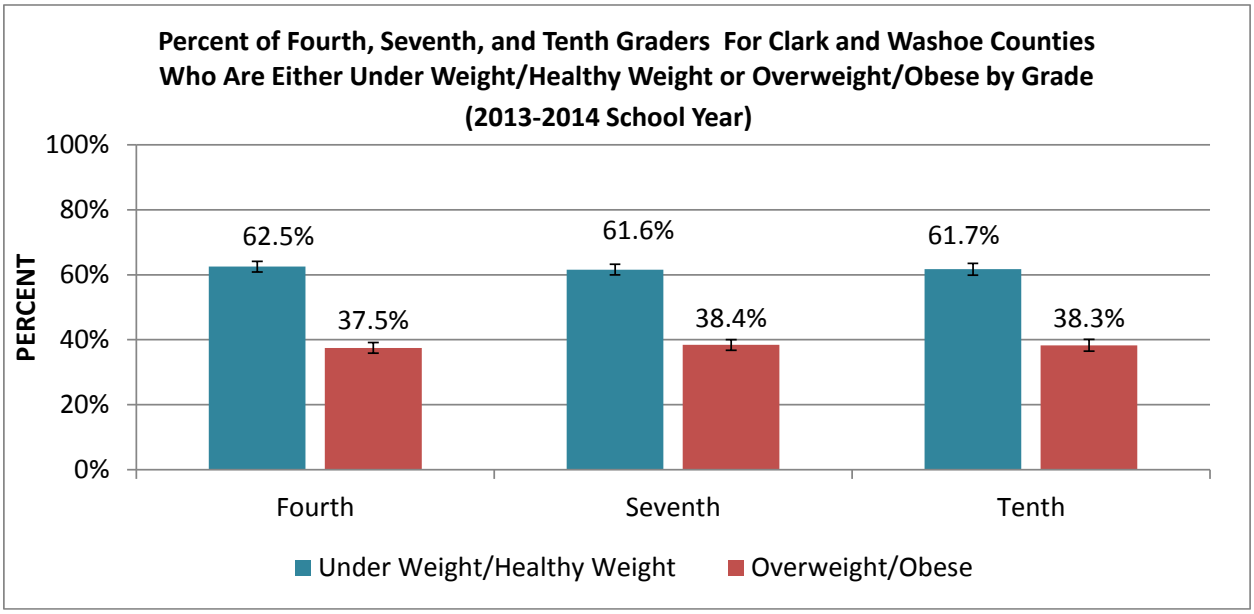
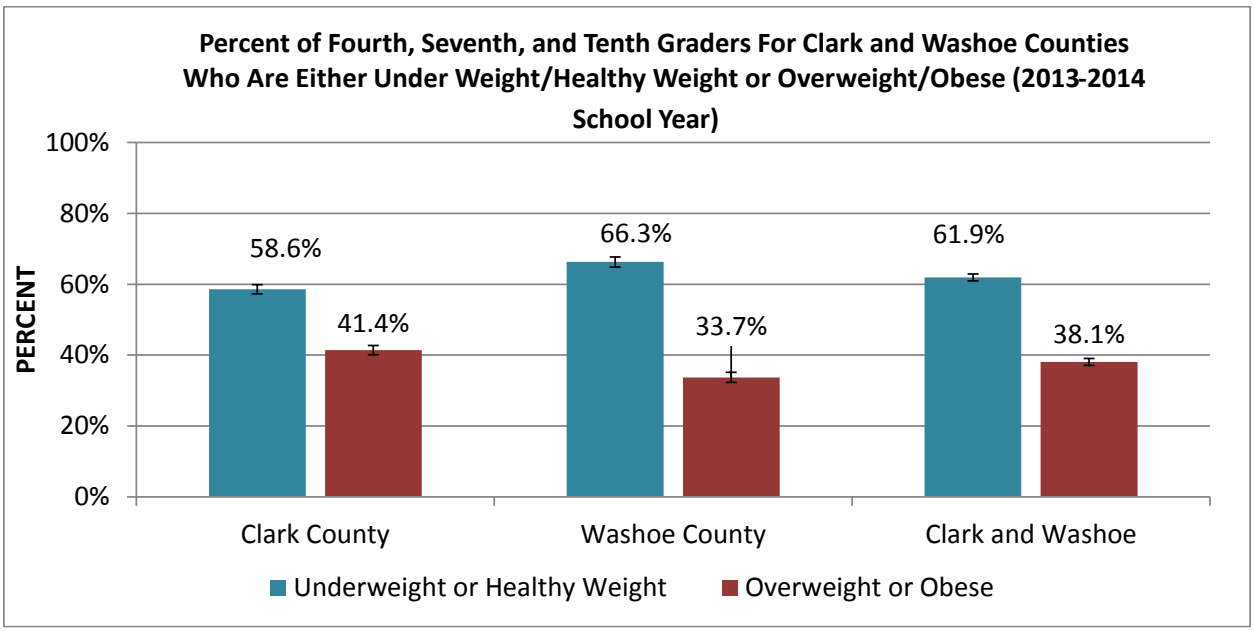


Figure 13: The percent of Clark County and Washoe County fourth, seventh, and tenth graders collectively who are overweight or obese is significantly higher among males.



Section III: Weight Classification of 4th Graders

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

BMI Data by District

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

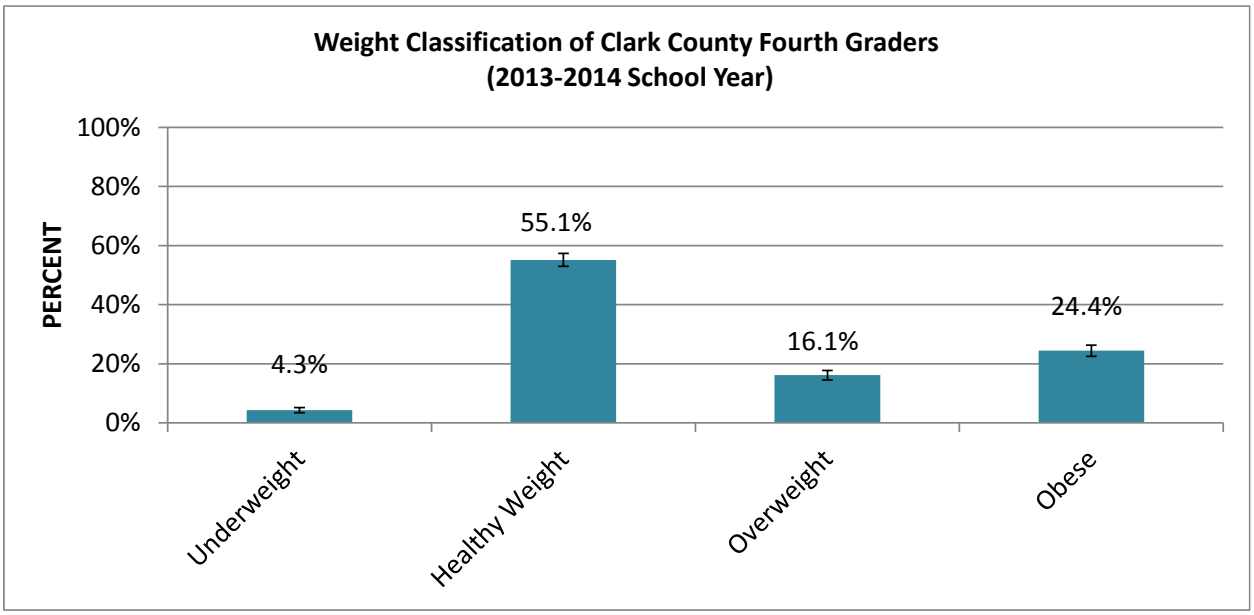


Figure 15: The percentages of Washoe County fourth graders who are at a healthy weight is 61.8%.

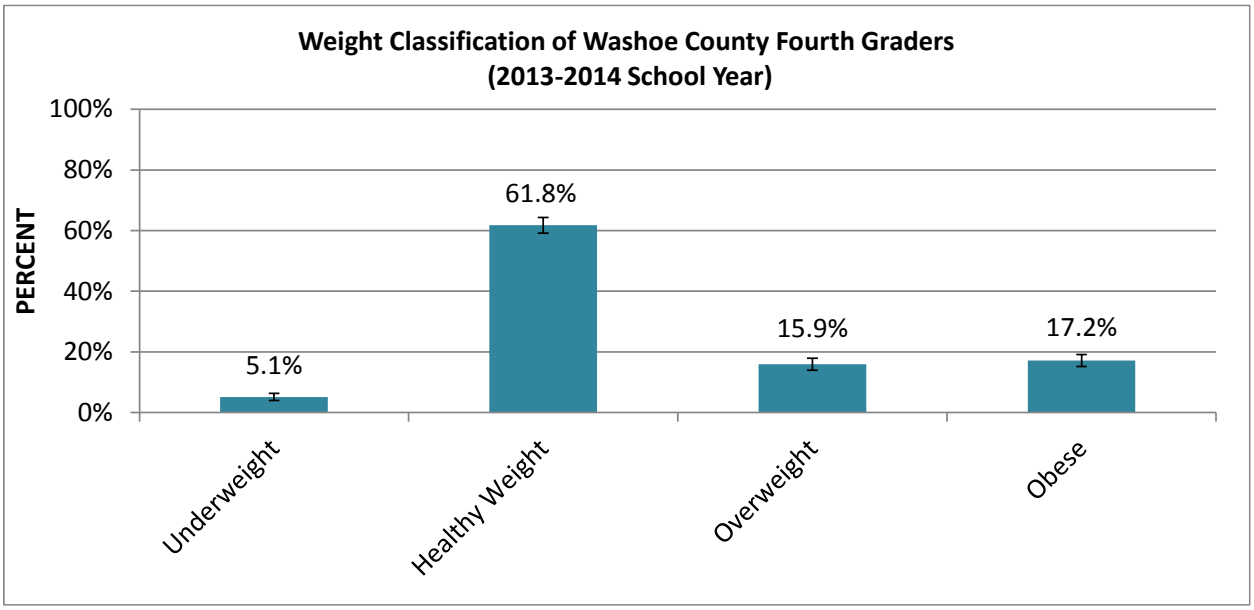
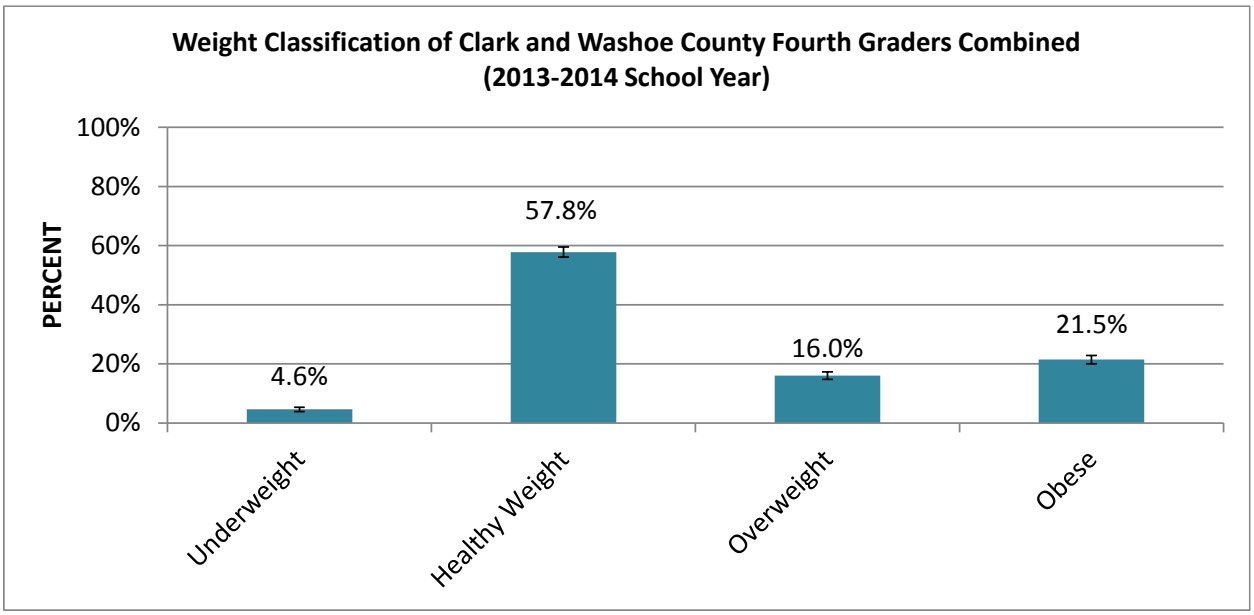


Figure 16: The percentage of fourth graders for Clark County and Washoe County combined who are obese is 21.5%.



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.

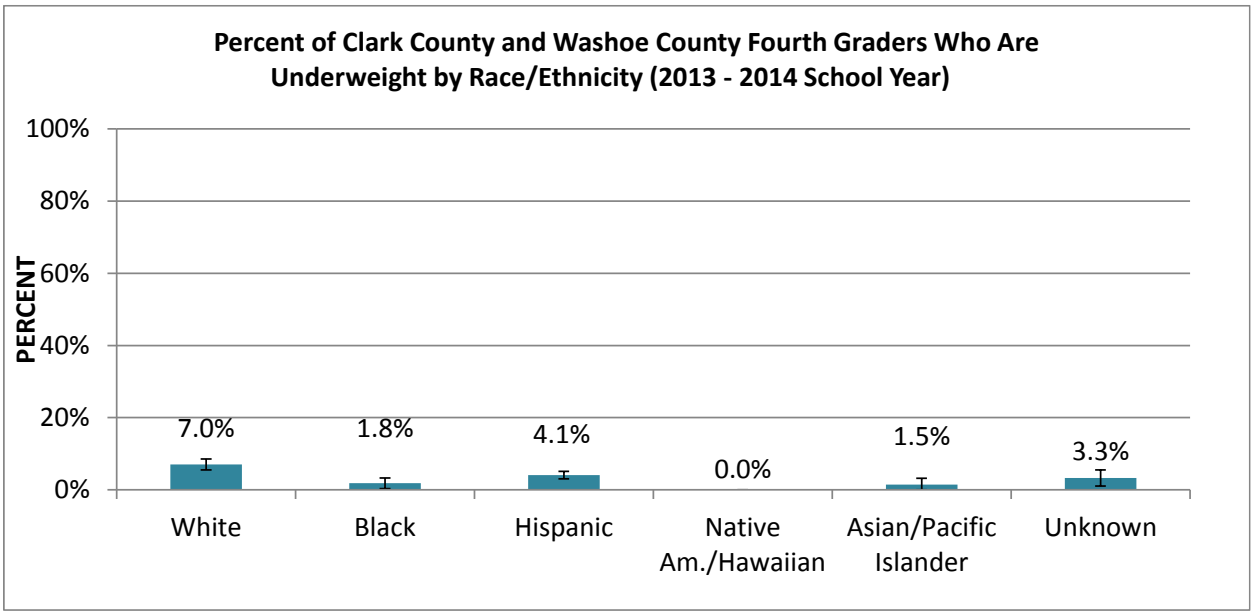


Figure 18: With the exception of Native Americans/Hawaiian, the percentage of Clark County and Washoe County fourth graders who are at a healthy weight is significantly lower in Hispanics than other race/ethnicity groups

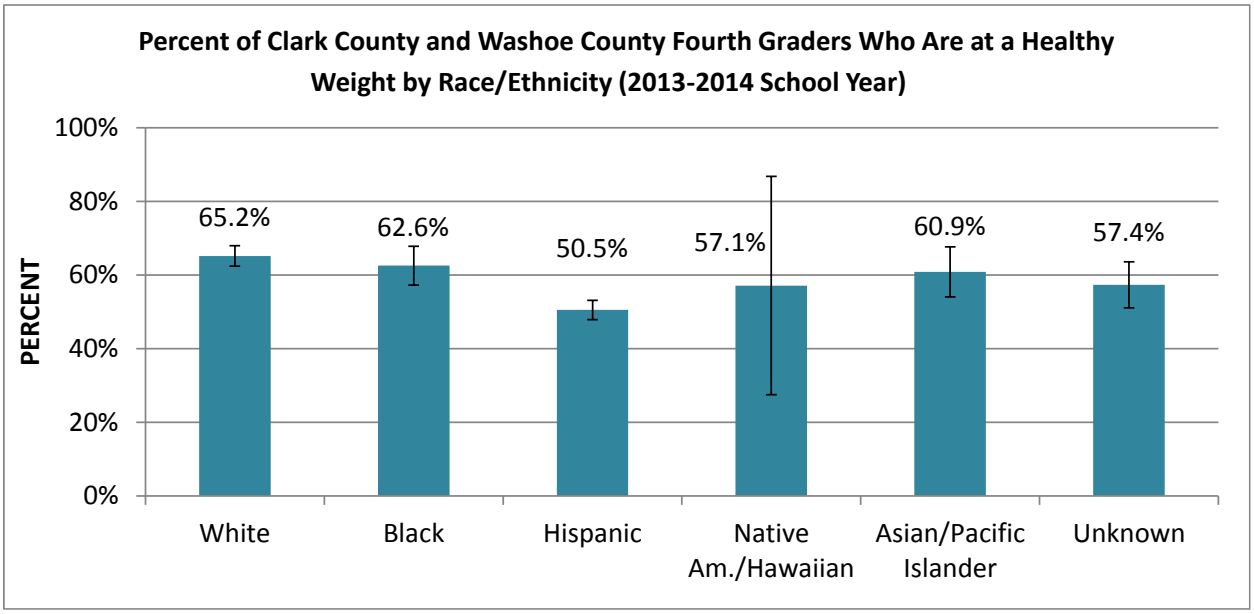


Figure 19: The percent of Clark County and Washoe County fourth graders who are overweight by race/ethnicity ranges from 13.8% to 18.0%.

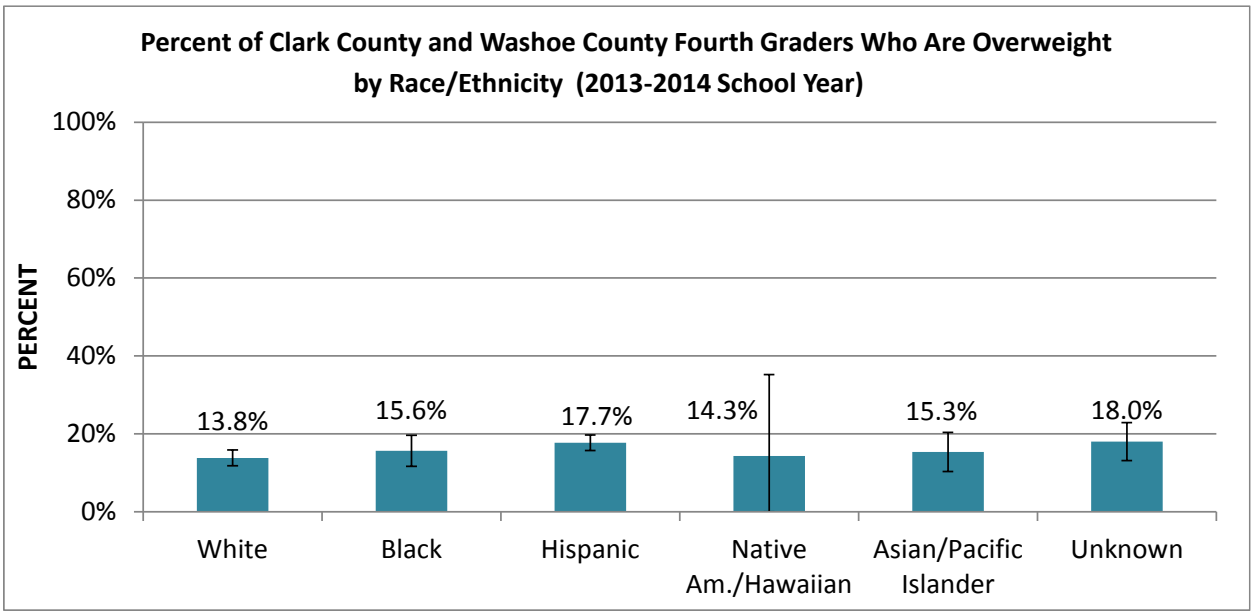
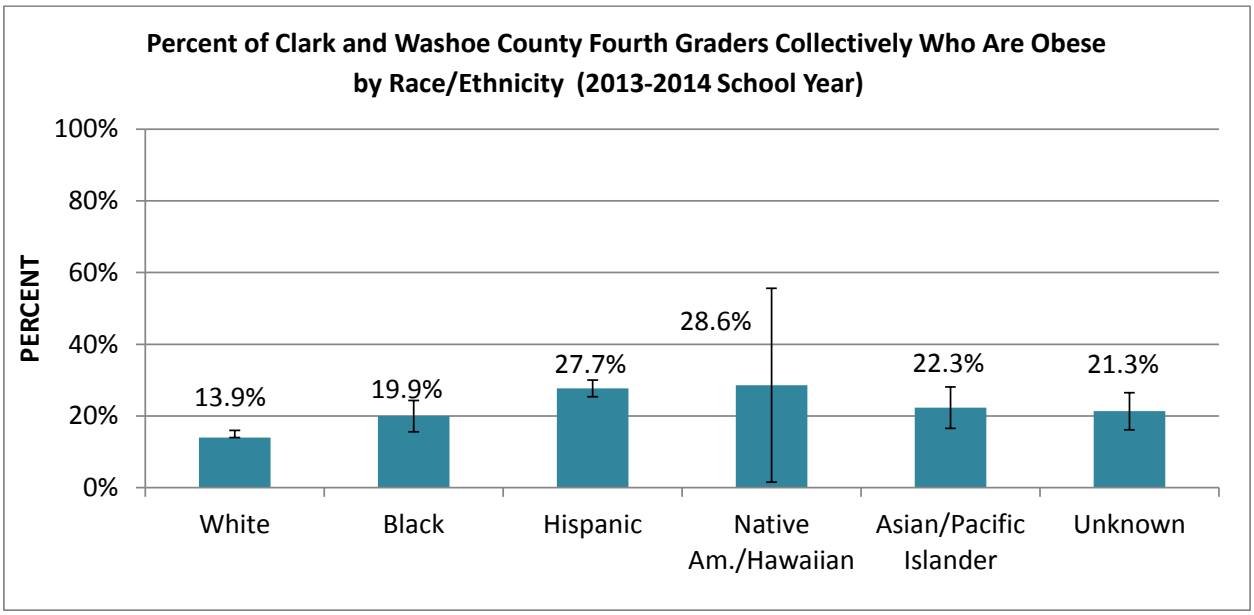
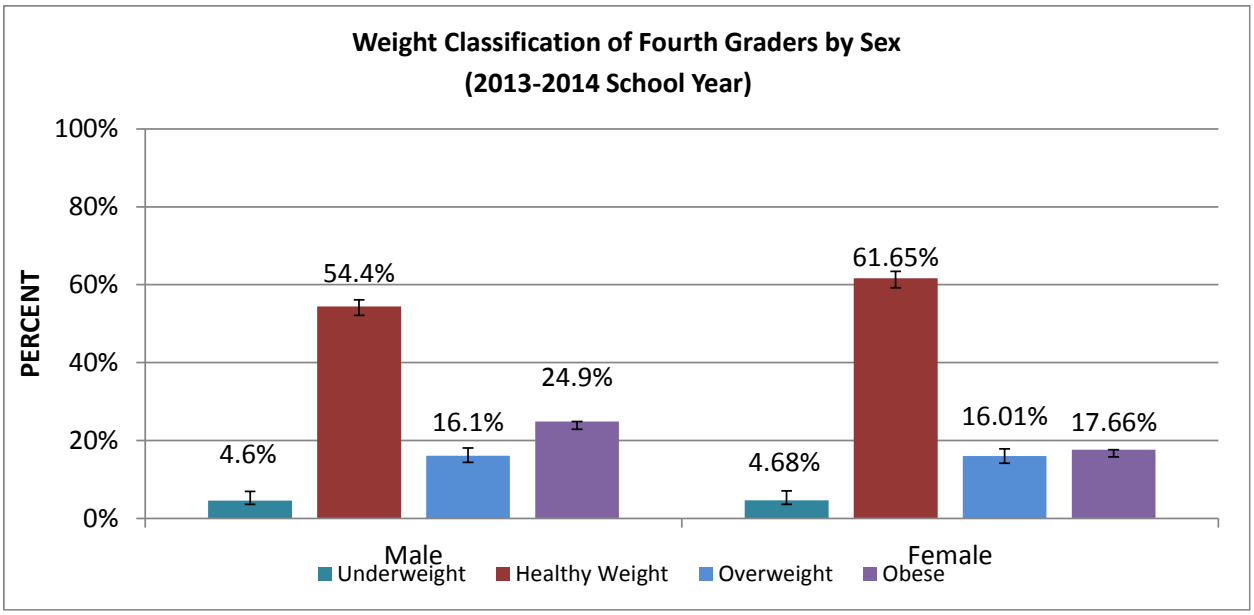


Figure 20: The percentage of Clark County and Washoe County fourth graders who are obese ranges from 13.9% to 28.6%.



BMI Data by Sex

Figure 21: 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; these differences are significant.



Section IV: Weight Classification of 7th Graders

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

BMI Data by District

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

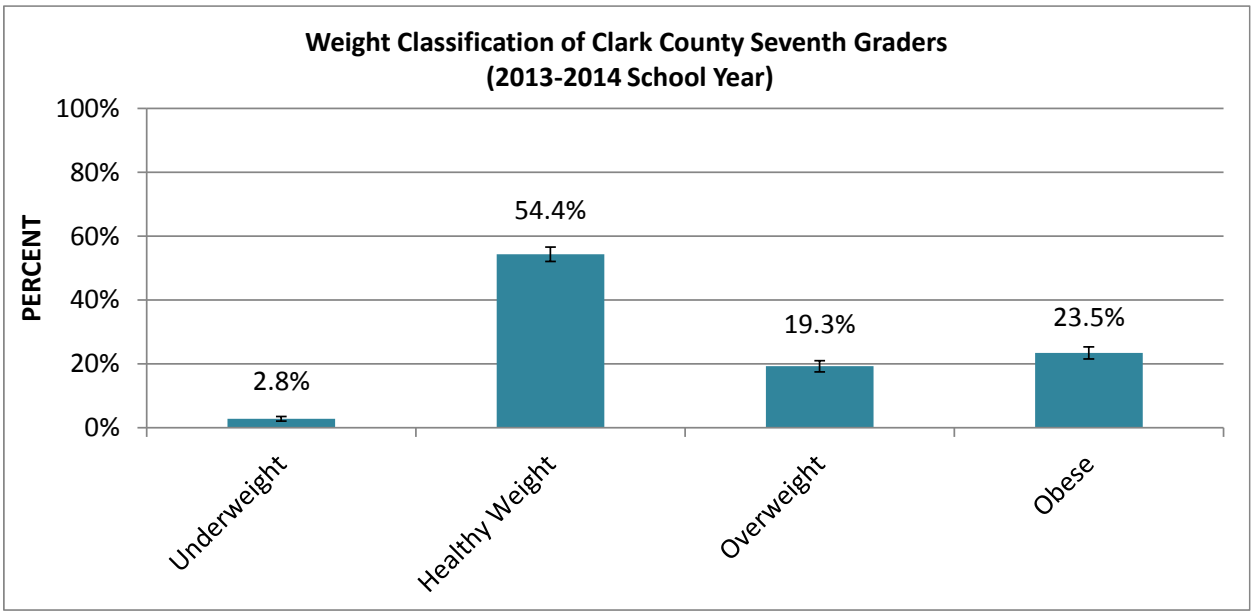


Figure 23: The percentage of Washoe County seventh graders who are at a healthy weight is 62.6%.

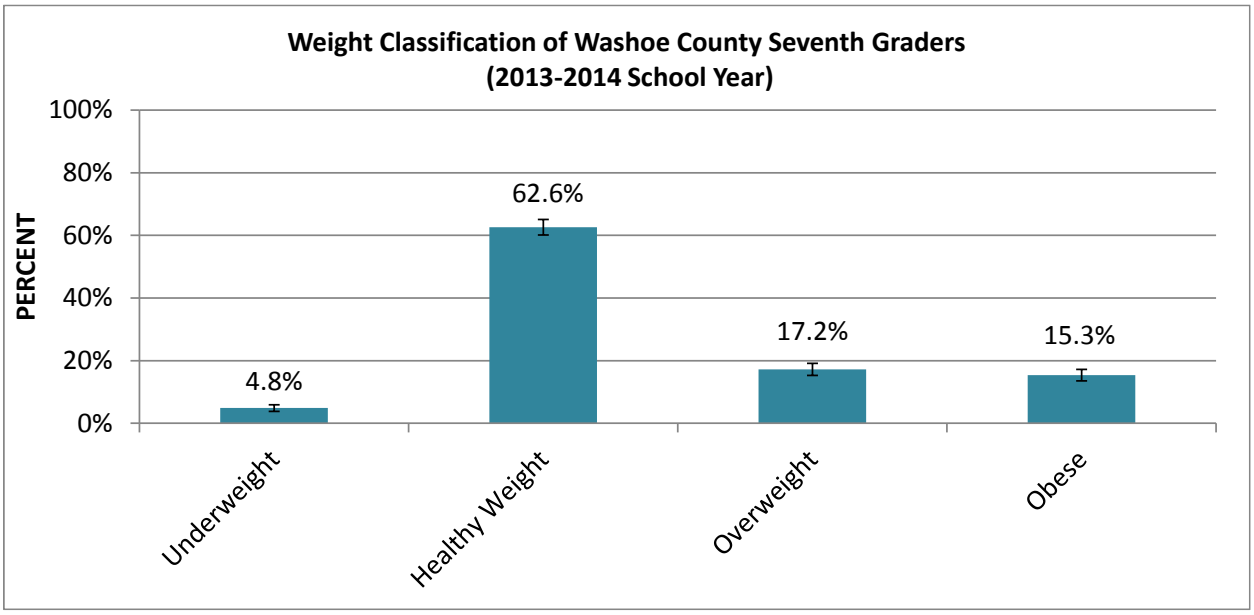
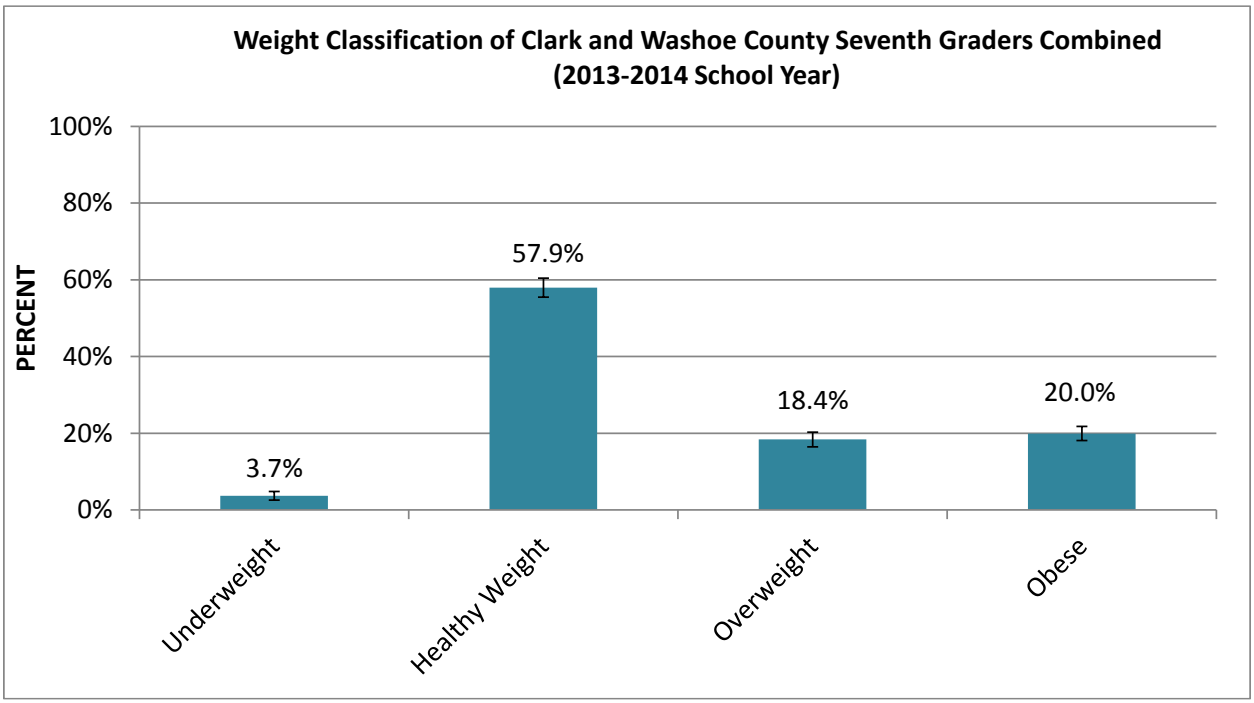


Figure 24: The percentage of Clark County and Washoe County seventh graders combined who are at a healthy weight is 57.9%.



BMI Data by Race/Ethnicity

Figure 25: The percentage of seventh graders who are underweight is low in all racial/ethnic categories.

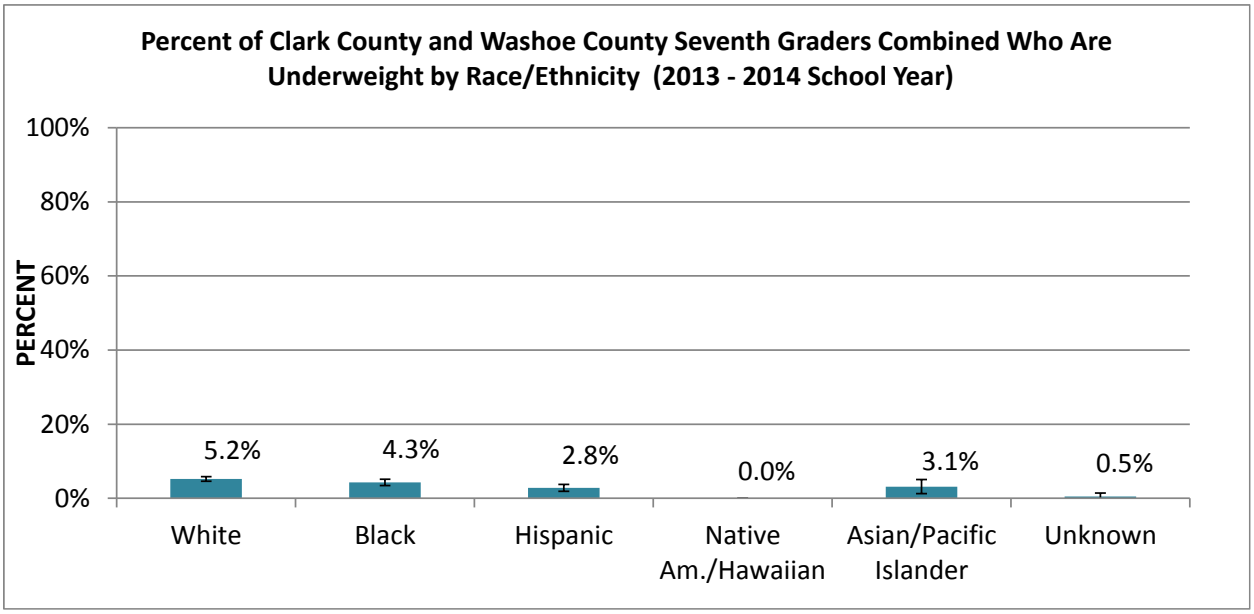


Figure 26: The percentage of Clark County and Washoe County seventh graders combined who are at a healthy weight is significantly higher among Whites than Blacks or Hispanics.

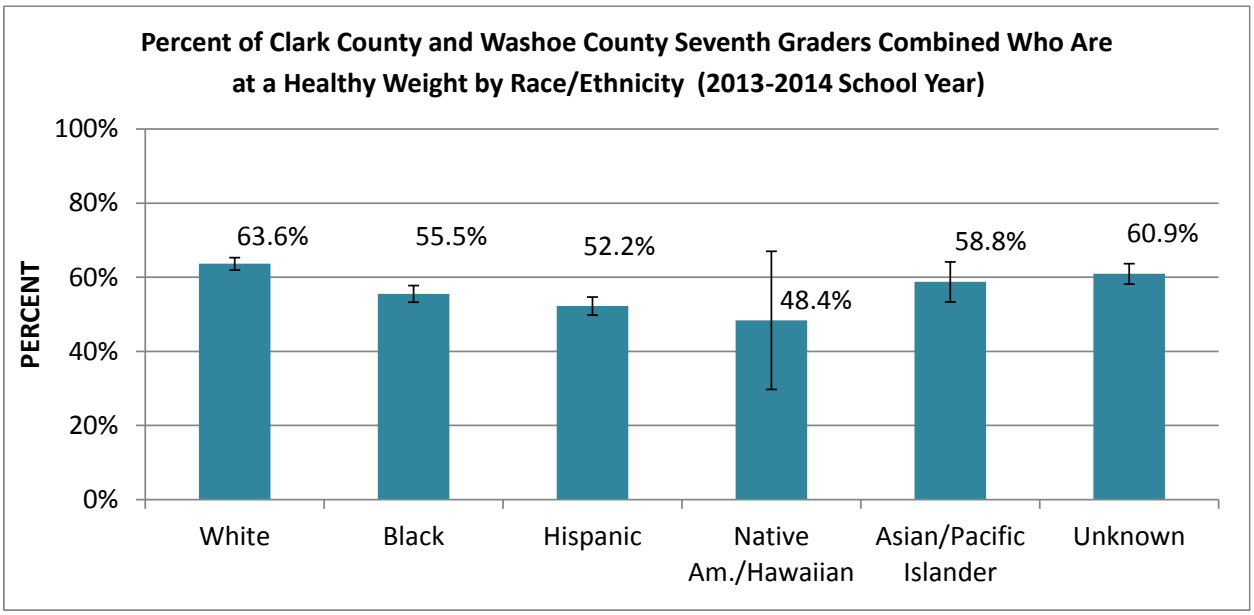


Figure 27: The percentage of Clark County and Washoe County seventh graders combined that are overweight ranges from 16.0% to 20.7% across race/ethnicity groups.

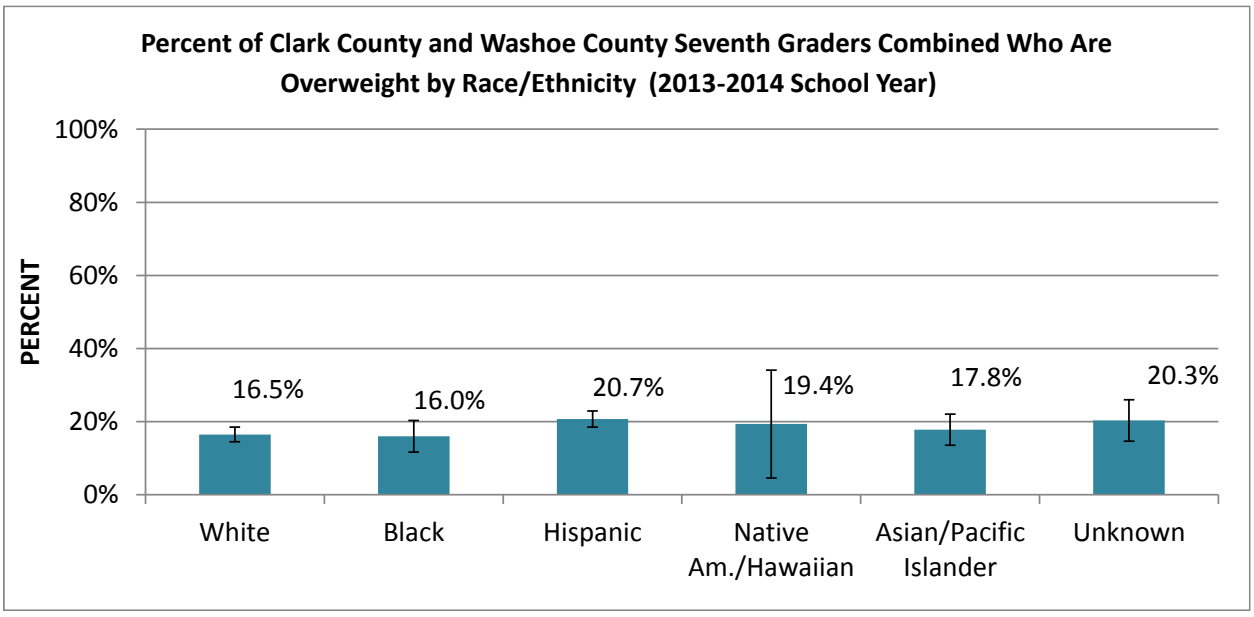
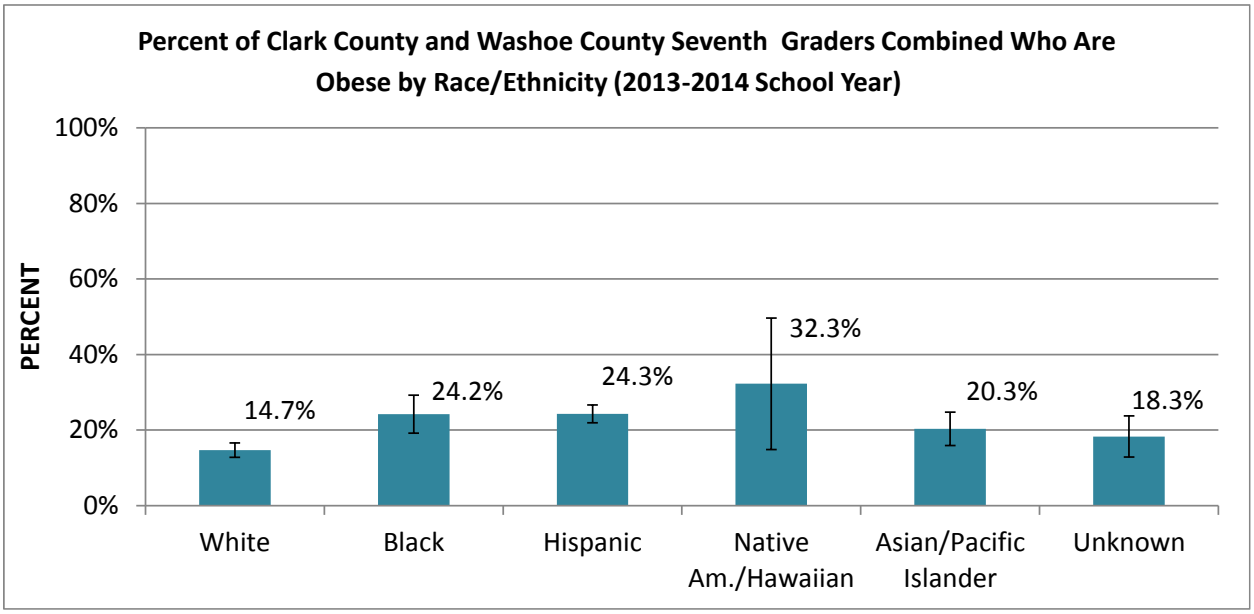
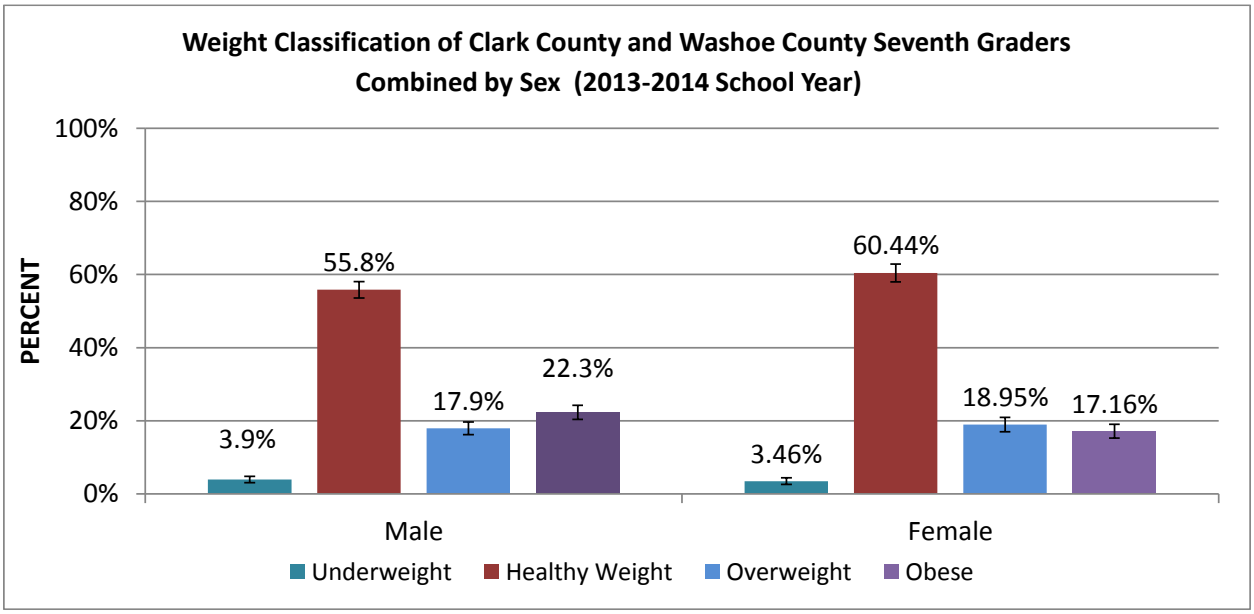


Figure 28: The percentage of Clark County and Washoe County seventh graders combined who are obese is highest in the Native American/Hawaiian and the Hispanic population; due to wide confidence intervals in the Native American/Hawaiian population this difference is not significant.



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.



Section V: Weight Classification of 10th Graders

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.

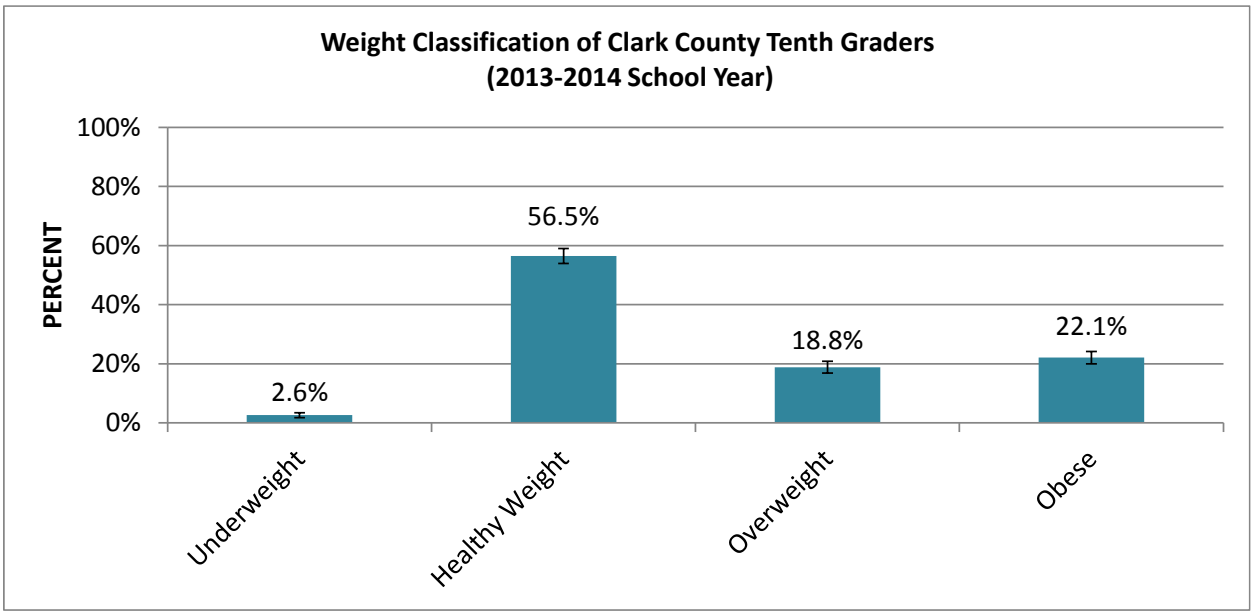
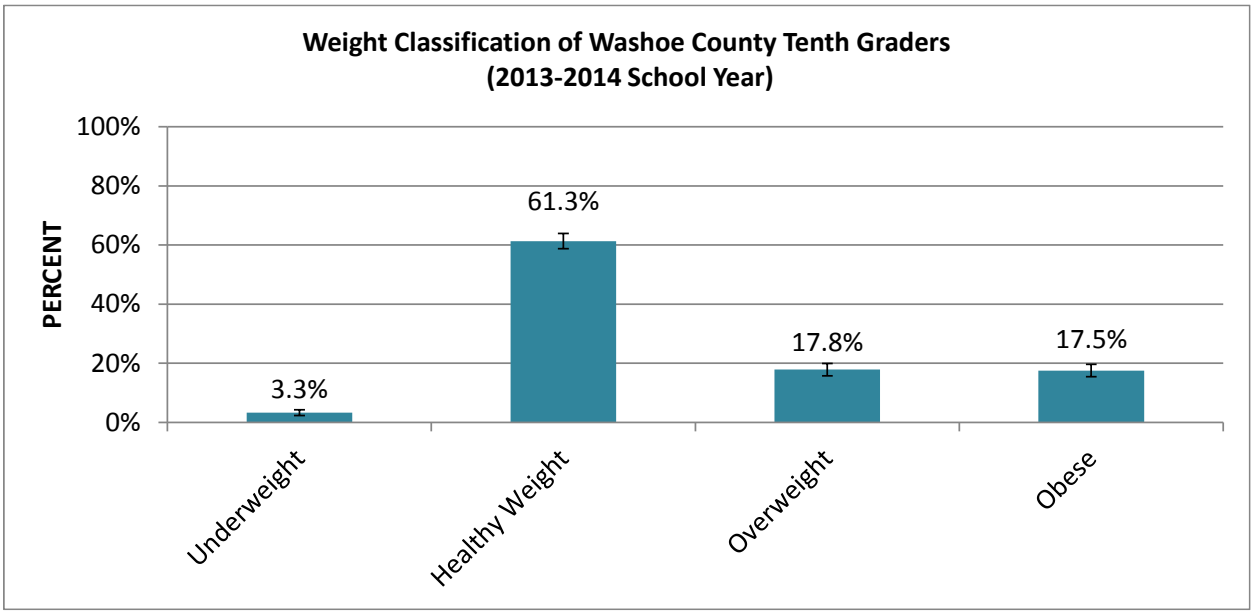


Figure 31: 61.3% of Washoe County tenth graders are at a healthy weight.



BMI Data by Race/Ethnicity

Figure 32: 58.8% of Clark County and Washoe county tenth graders combined are at a healthy weight.

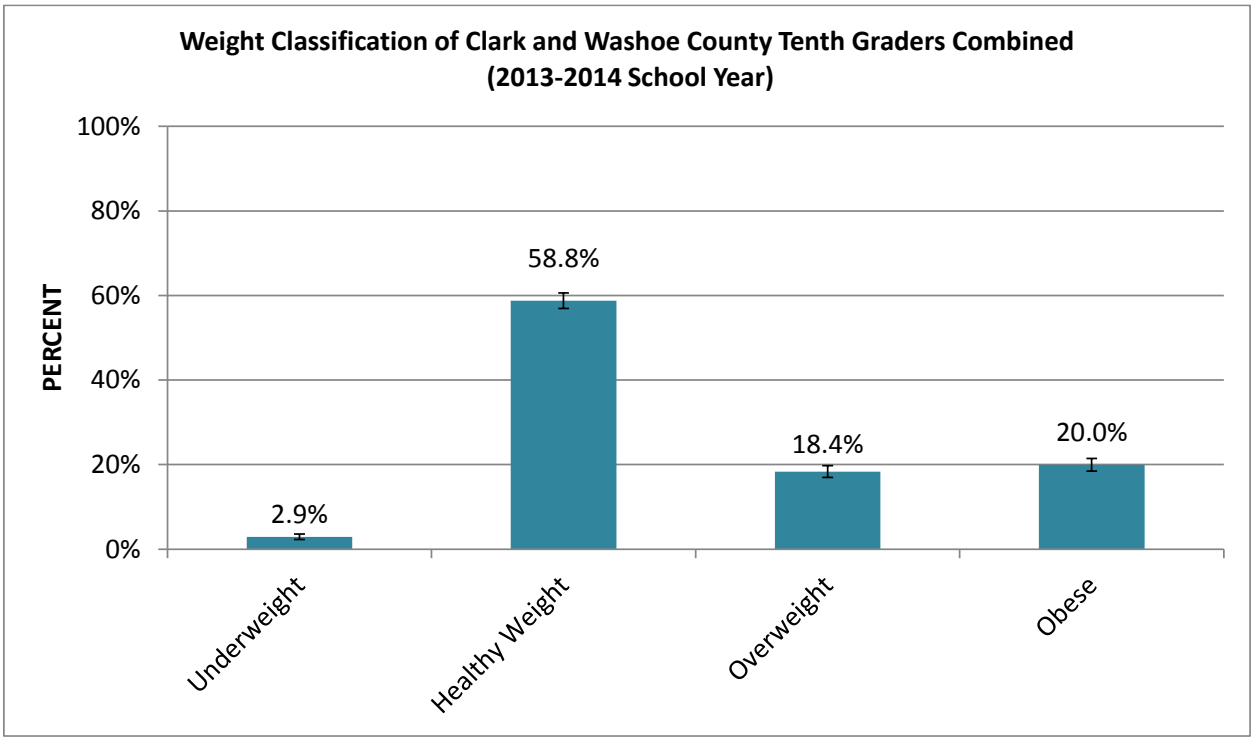


Figure 33: The percentage of tenth graders who are underweight is low for all race/ethnicity groups.

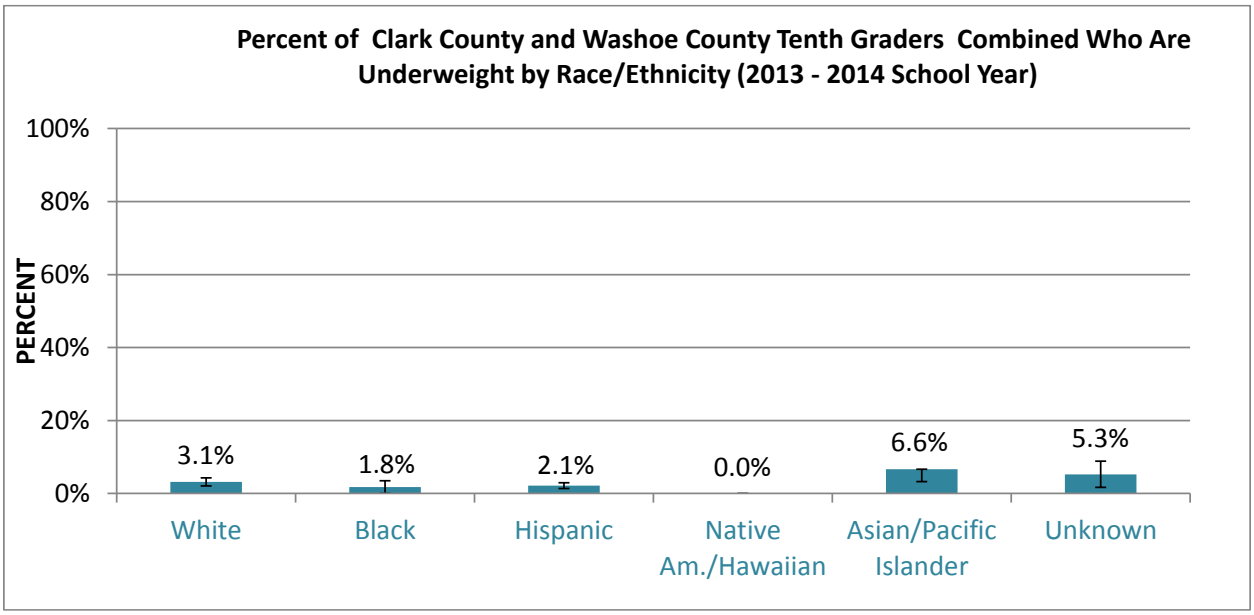


Figure 34: The percentage of Clark County and Washoe County tenth graders combined who are at a healthy weight is significantly higher among Whites than Hispanics.

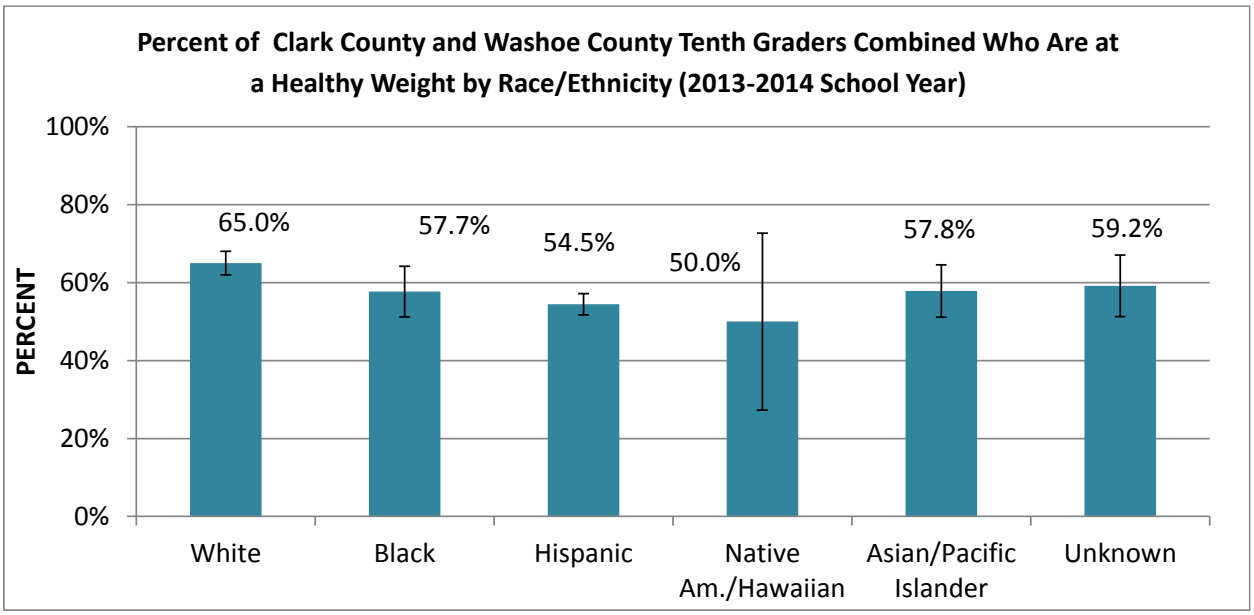


Figure 35: The percentage of Clark County and Washoe County tenth graders combined who are overweight ranges from 9.1% to 21.1% across race/ethnicity groups.

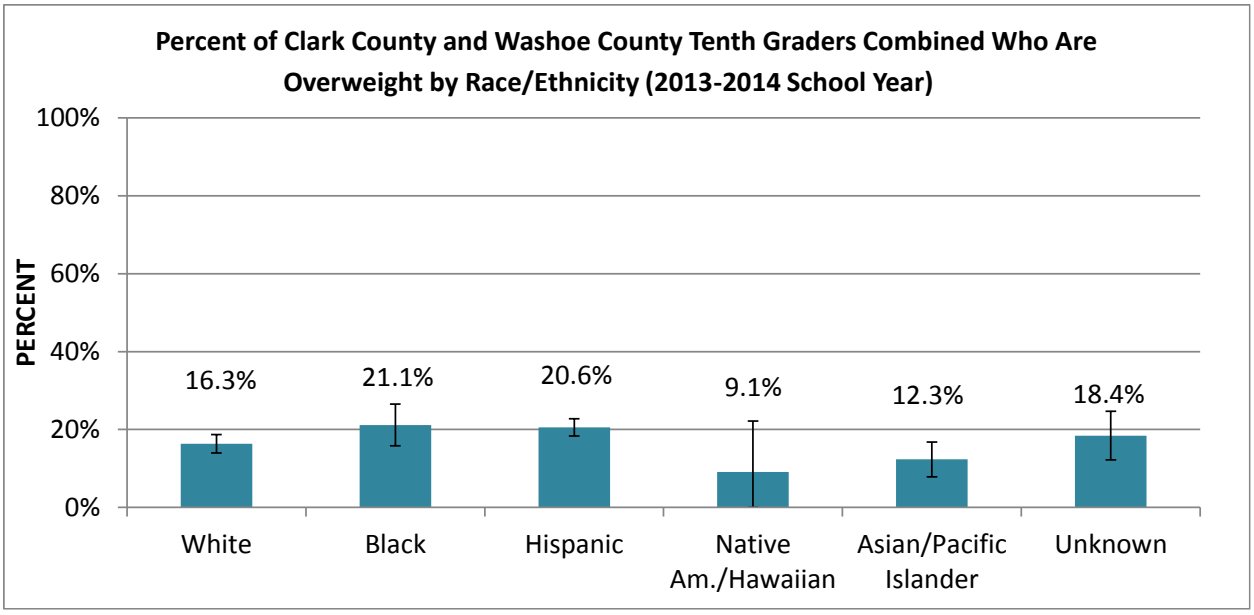
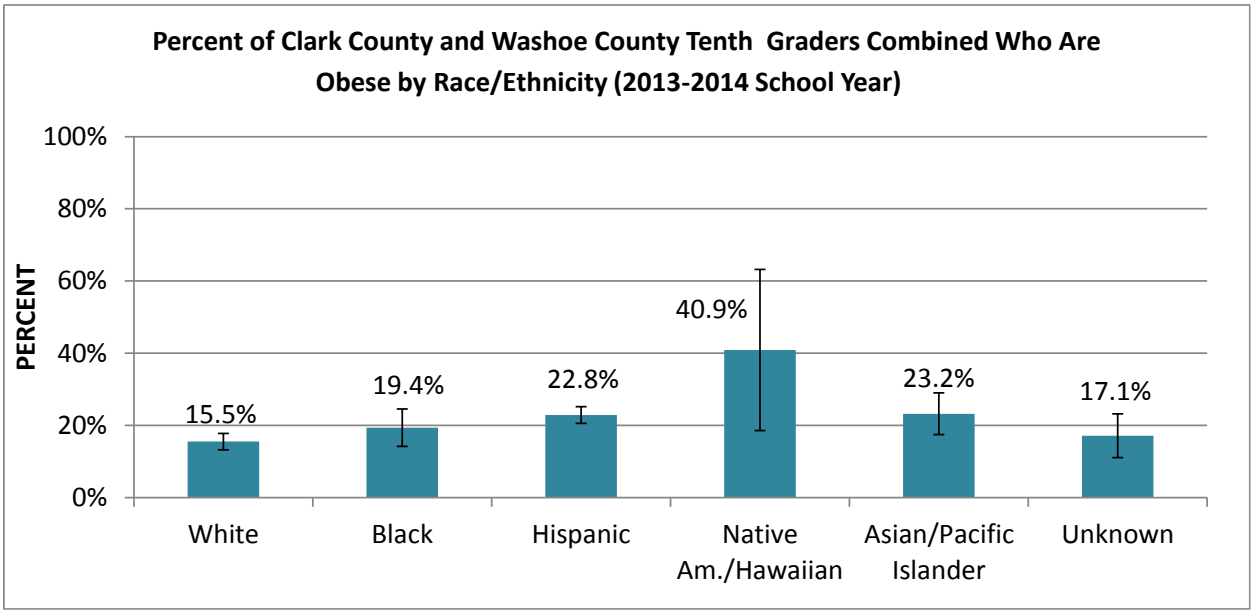
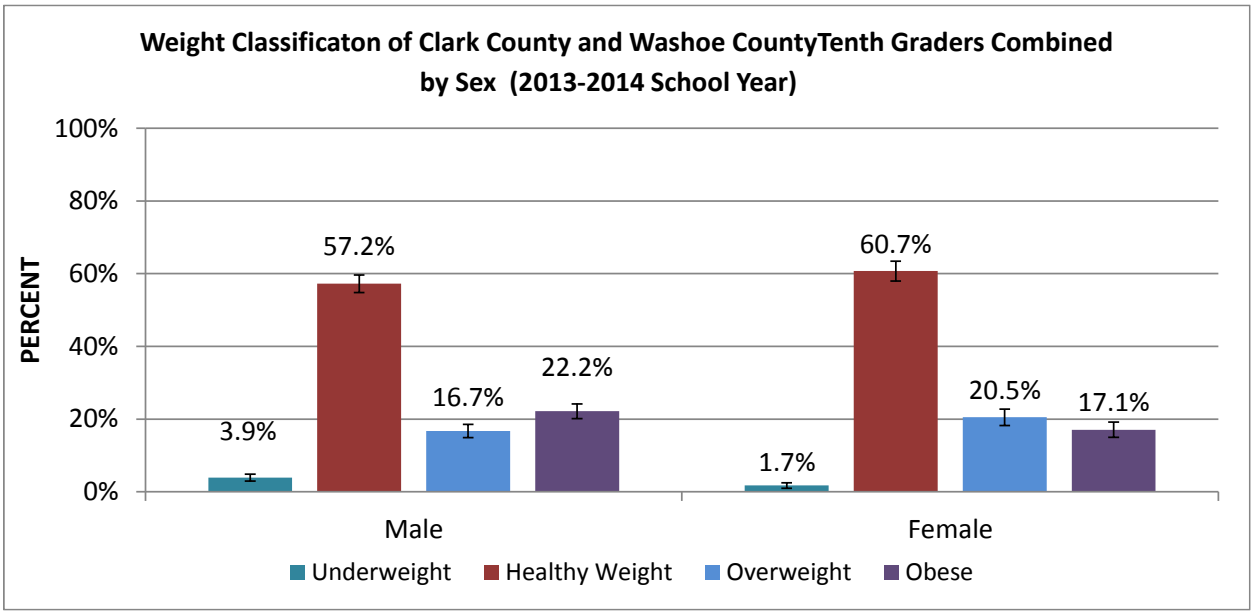


Figure 36: The percentage of Clark County and Washoe County tenth graders combined who are obese is highest in the Native American/Hawaiian population. Due to the wide confidence intervals this value is not significant.



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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