April 2023

Trends in Overweight and Obesity among K-8 Cambridge Public Schools Students from 2010-2019

Background

The City of Cambridge has a long history of focus on the health and wellbeing of its residents. Starting in the late 1990s, a diverse team of public health professionals, civic leaders, city staff, academics, parent activists, and the Cambridge Public Schools came together to develop innovative approaches to healthy eating and physical activity. Over the following decade, their collaborative efforts resulted in school cafeterias serving healthier and locally grown foods, parents of public-school students receiving annual health and fitness progress reports on their children, the establishment of school gardens in all elementary schools, and the adoption of model school nutrition policies.

Cambridge joined the national Let's Move! campaign in 2011 expanding the city's focus to create a healthy, sustainable, and equitable food and fitness environment in the entire city. This resulted in the establishment of the Cambridge Food and Fitness Policy Council in 2012; expansion of healthy food options in the public schools, including introduction of salad bars and cuisine from other cultures; annual nutrition and physical activity "mini-grants" to Cambridge organizations; an increase in the purchasing power of low-income residents at farmers markets through a SNAP (formerly food stamps) benefits matching program and incorporation of physical activity into the city's summer lunch program in local parks.

As of 2015, the impact of these efforts had begun to emerge. 31% of Cambridge public school students (grades K-8) were overweight or obese, down from 39% in 2004, according to data collected by the school department. Yet, racial disparities persisted as obesity disproportionately impacts Black and Latino children both locally and nationally. Among Cambridge school children (grades K-8), over 40% of Black and Latino students were overweight or obese compared to 27% of Asian children and 21% of White children, according to 2015 data.

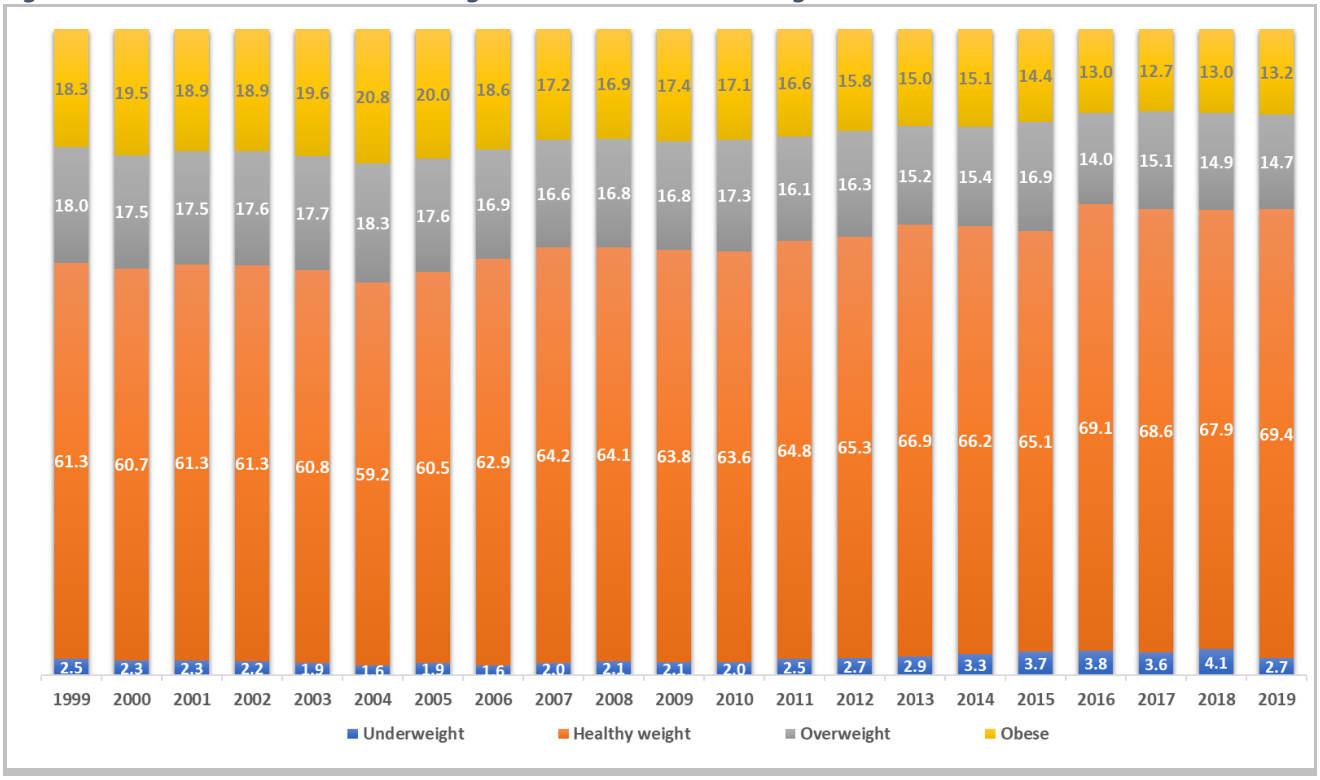
The purpose of this report is to provide an updated assessment of the trends in overweight/obesity among the K-8th grade population of public-school students in Cambridge, MA, and to determine whether the magnitude of disparities by race or ethnicity has changed. New analyses of data collected in 2016, 2017, 2018, and 2019 were conducted using methodologies set forth by the Centers for Disease Control and Prevention (CDC) for comparability to prior years of data. Trends in weight status between 2010 and 2019 were examined and reported and analyses included stratification by race/ethnicity, sex, age, and socioeconomic status whenever possible. This report was developed to highlight how the newly analyzed data (collected between 2016 and 2019) fit into the weight status trends that have been tracked in Cambridge since 2010. However, older data going back to 1999 has also been included as historic reference throughout the narrative to ensure the longer-term trends or differences can be more clearly understood.

The Cambridge Public Schools (CPS) and the Cambridge Public Health Department (CPHD) have monitored body mass index (BMI)and fitness annually since 1999. Individual weight status is assessed by BMI, which is calculated from height and weight measurements collected each spring by CPS physical education teachers and public health department staff. Staff follows a standard protocol using the same equipment. BMI percentiles are based on a child's height and weight, compared to other children of the same age and gender, and are calculated using

the methods provided by the CDC. Based on their BMI percentiles, students were classified as: underweight (BMI < 5th percentile), healthy weight (BMI ≥ 5th and < 85th percentile), overweight (BMI ≥ 85th and < 95th percentile), or obese (BMI ≥ 95th percentile).

Findings

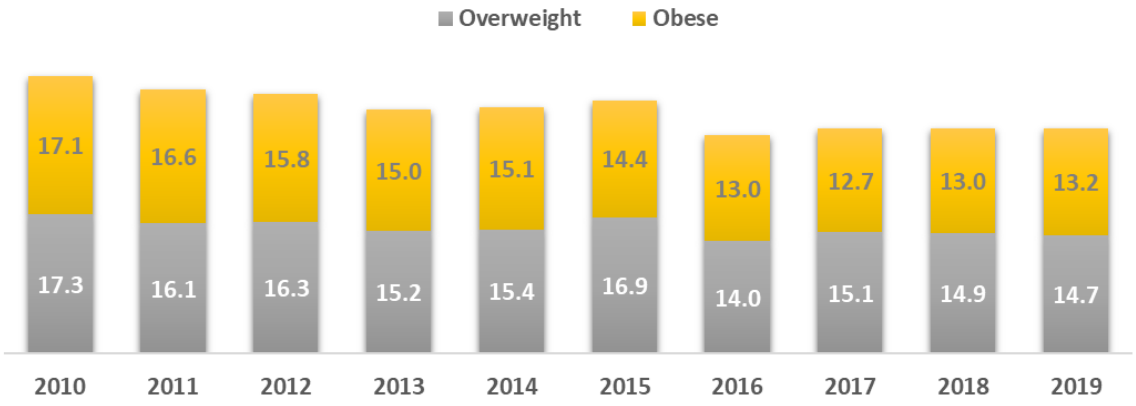
Figure 1. Historic Trend in Student Weight Status data 1999 through 2019



BMI data collection and monitoring by Cambridge Public Schools and the Cambridge Public Health Department has been extremely consistent over the years, which provides the opportunity to examine the long-term trend in student weight status over a full 20-year period. When examined in this way, the data suggest that slow and steady progress has taken place in Cambridge with an increasing proportion of students having a BMI percentile that falls within the healthy weight category. As detailed in **Figure 1**, 61.3% of students were categorized as 'healthy weight' in 1999 compared to 69.4% of students in 2019. This broader historic trend is a valuable reference when seeking to interpret findings that are based on narrower subsets of years because trends examined over shorter time periods often look like plateaus or even reversals of prior progress due to the natural variability in annual measurements.

Overall Trend in Overweight and Obesity

Figure 2. Prevalence of Overweight and Obesity 2010 through 2019: All Students, K-8th Grade



The percentages of Cambridge Public School students with BMI percentiles[1] in the overweight or obese categories are illustrated in ***Figure 2***. The data suggest a consistent downward trend in the prevalence of both overweight and obesity among students between 2010 and 2019.

In context of the full historical trend (i.e., data collected from 1999 to 2009), it appears that current data represent the continuation of a downward trend that began in those earlier years. The high point or peak in student obesity was reached in 2004, during which 20.8% of students were categorized as obese and 18.3% of students were categorized as overweight. Starting in 2005, Cambridge Public Schools and community partners launched the implementation phase of its efforts to promote healthy weight among Cambridge students (*Chomitz et al, Obesity, Feb 2010*).

During the most recent 2018/2019 school year, when 2,226 students were screened (approximately half of the enrolled student population in grades K-8), the percentage of students categorized as either overweight or obese was 27.9%, down from 34.4% in 2010. Furthermore, the percentage of students categorized as obese has declined since 2015, suggesting a more recent positive shift in weight status. Still, as of the most current screening year, one-quarter of students (27.9%) remain either overweight or obese, suggesting there is a continued need for healthy eating and active living programming within Cambridge Public Schools.

Exploring Overweight and Obesity by Sub-population

Monitoring overweight and obesity in the overall population of students provides a useful indicator of general prevalence within Cambridge. However, this does obscure very real differences between sub-groups of students. It is necessary to examine data disaggregated by race/ethnicity, sex, and socio-economic status, when possible, to understand which groups of students are most affected and where disparities may have persisted or widened. Such information is essential to advance health equity.

During the period that this report covers, two different variables related to school meal participation were used as a proxy for socio-economic status. Until 2014, the Massachusetts Department of Elementary and Secondary

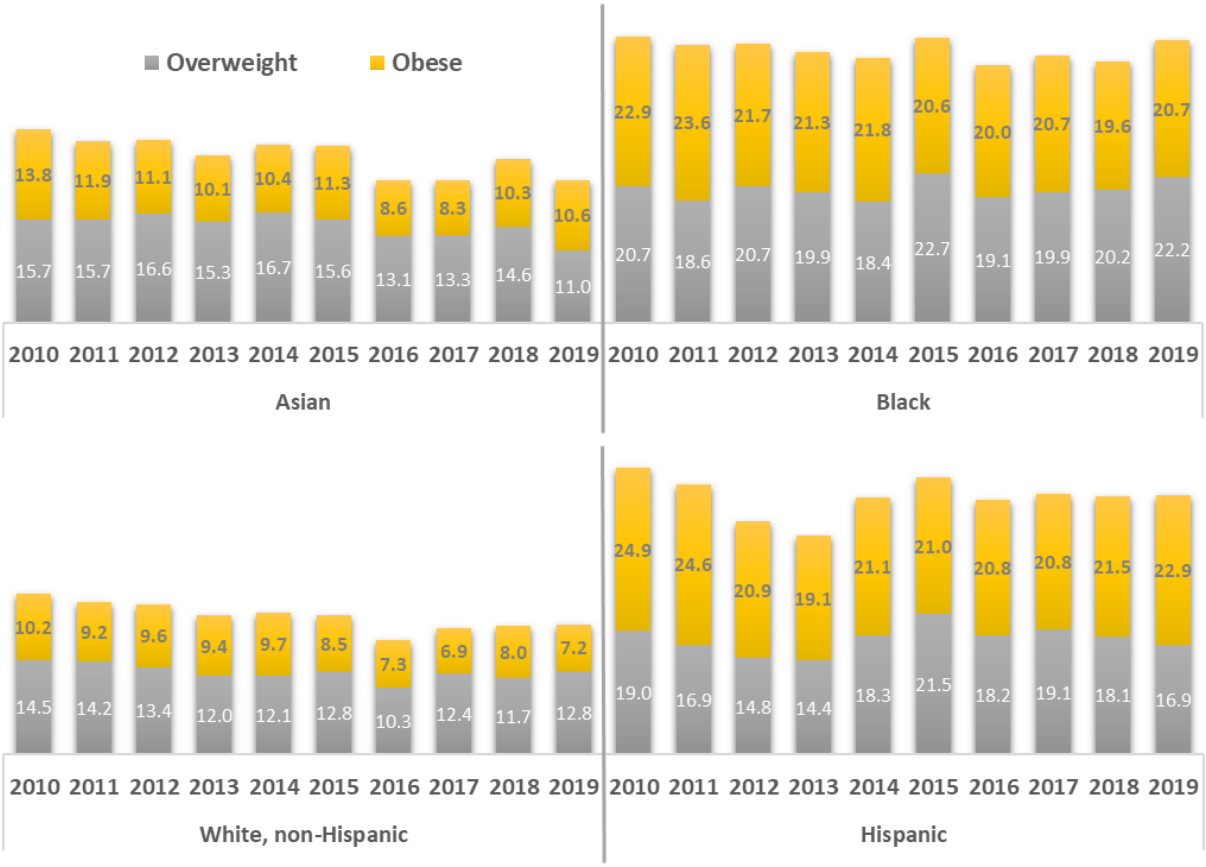
[1] Based on BMI percentiles students were classified as: underweight (BMI < 5th percentile), healthy weight (BMI ≥ 5th and < 85th percentile), overweight (BMI ≥ 85th and < 95th percentile) or obese (BMI ≥ 95th percentile)

Education (DESE) used the indicator “Eligibility for Free/Reduced School Lunch Status”, which includes all students who applied for and were deemed eligible to receive free or lower cost school meals. Starting in 2015, DESE started using “Economically Disadvantaged”. “Economically Disadvantaged” does not rely on active application by the family, but rather students whose families participate in one or more of certain state benefit programs are automatically enrolled. In most schools, including Cambridge, the number of “economically disadvantaged” students is lower than the number of "low income" students. For more detailed descriptions see Definitions Section at the end of this report.

This section presents the results of several different data stratifications and explorations of disparities in the outcomes of obesity and healthy weight. The results have been stratified and compared by race/ethnicity, sex, and school lunch/socio-economic status. Additionally, the magnitude of observed disparities has been calculated and compared between 2010 and 2019.

Race and Ethnicity

Figure 3. Prevalence of Overweight and Obesity: by Race/Ethnicity, K-8th Grade



The percentages of Cambridge Public School students with BMI percentiles in the overweight or obese categories, by race/ethnicity, are illustrated in ***Figure 3***. The prevalence did not increase for any group between 2010 and 2019. More specifically, the percentage of students who were either overweight or obese:

- Declined from 24.7% in 2010 to 20.0% in 2019 among White, non-Hispanic students
- Declined from 29.5% in 2010 to 21.6% in 2019 among Asian students

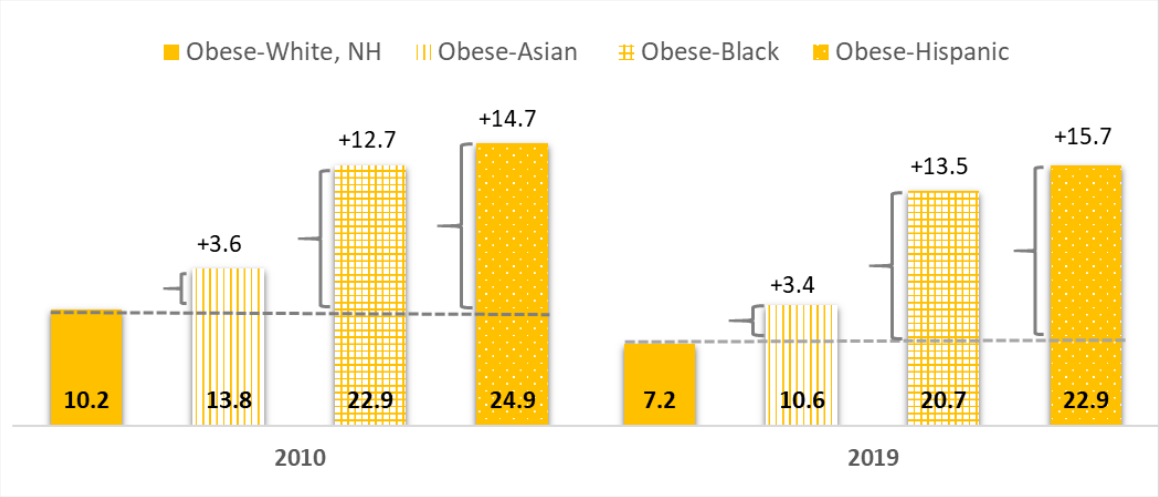
- Declined from 43.9% in 2010 to 39.8% in 2019 among Hispanic students
- Remained stable at 43.6% in 2010 and 42.9% in 2019 among Black students

The historic data, collected from 1999 onward, were only available as a single category of 'overweight or obese' when stratified by race/ethnicity. These data showed that the percentages of 'overweight or obese' were lower in 2019 than 1999 for Asian, Hispanic, and White students. Among Black students, the percentage of 'overweight or obese' has remained relatively consistent between 1999 and 2019.

However, like the overall trends noted previously, 2004 marked the peak in 'overweight and obesity'. When compared to this historic peak, the most recent data for 2019 suggest declines have occurred compared to 2004 among all race/ethnicity subgroups: White 32.3% to 20.0%; Asian 28.6% to 21.6%; Hispanic 47.8% to 39.8%; Black 45.8% to 42.9%.

Racial and Ethnic Disparities in Weight Status

Figure 4. Racial/Ethnic Disparities in Prevalence of Obesity: 2010 and 2019, K-8th Grade



While these trend data suggest positive improvement for all race/ethnicity groups, the observed differences in overweight and obesity between racial/ethnic groups remain striking and severe. As of 2019, the percentage of Black students who are overweight or obese is more than twice that of White, non-Hispanic students (42.9% vs. 20.0%), and the percentage of Hispanic students who are overweight or obese is nearly twice that of White non-Hispanic students (39.8% vs. 20.0%).

Figure 4 illustrates the magnitude of the observed racial/ethnic disparities in obesity, calculated for 2010 and 2019 using White, non-Hispanic students as the reference group. Disparities for Asian, Black, or Hispanic students persisted between the two time points. Importantly, while the prevalence of obesity was lower in 2019 than in 2010 for all groups, the size of the disparity narrowed only among Asian students. In contrast, disparities widened for Black and Hispanic students between 2010 and 2019.

- Asian students - the prevalence of obesity was 3.4 percentage points **higher** than for White, non-Hispanic students in 2019 compared to a difference of +3.6 percentage points in 2010
- Hispanic students - the prevalence of obesity was 15.7 percentage points **higher** than for White, non-Hispanic students in 2019 compared to a difference of +14.7 percentage points in 2010

- Black students - the prevalence of obesity was 13.5 percentage points **higher** than for White, non-Hispanic students in 2019 compared to a difference of +12.7 percentage points in 2010

Figure 5. Racial/Ethnic Disparities in Prevalence of Healthy Weight: 2010 vs. 2019, K-8th Grade

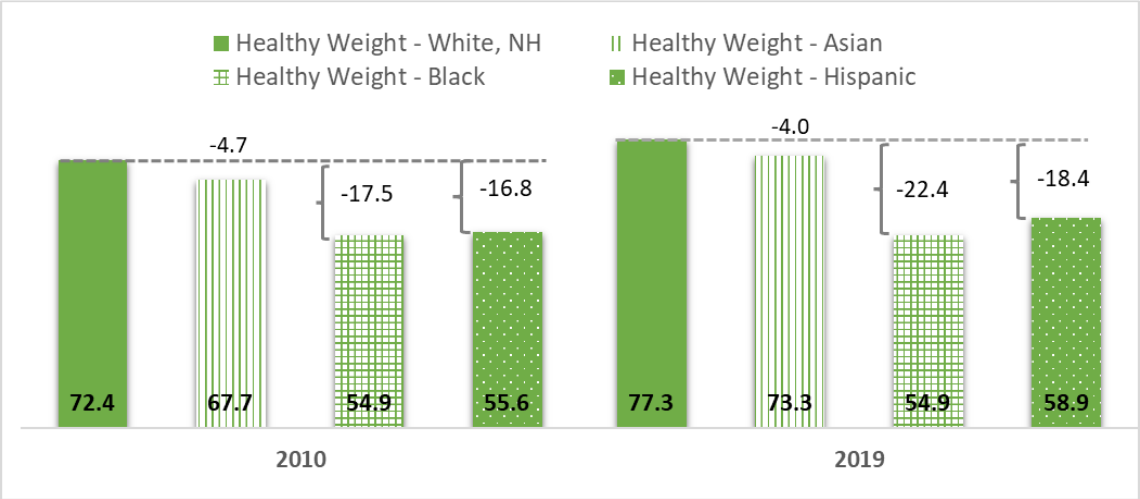
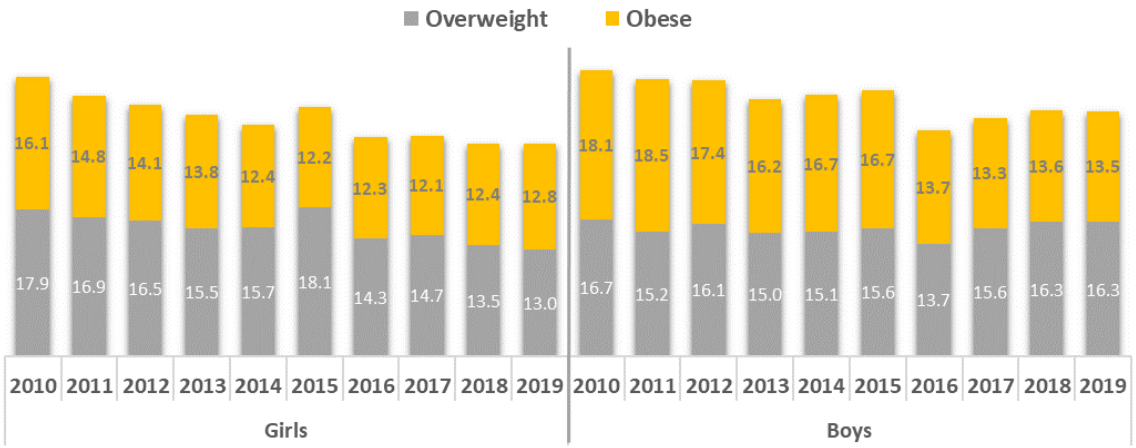


Figure 5 illustrates the magnitude of observed racial/ethnic disparities in healthy weight, calculated for 2010 and 2019 using White, non-Hispanic students as the reference group. The prevalence of healthy weight increased between 2010 and 2019 among White, non-Hispanic, Asian, and Hispanic students and it remained steady among Black students. The size of the observed disparity for Asian students was narrowed between 2010 and 2019, while the disparity widened for Black and Hispanic students.

- Asian students – the prevalence of healthy weight was 4.0 percentage points **lower** than for White, non-Hispanic students in 2019 compared to a difference of -4.7 percentage points in 2010
- Black students - the prevalence of healthy weight was 22.4 percentage points **lower** than for White, non-Hispanic students in 2019 compared to a difference of -17.5 percentage points in 2010
- Hispanic students - the prevalence of healthy weight was 18.4 percentage points **lower** than for White, non-Hispanic students in 2019 compared to a difference of -16.8 percentage points in 2010

Sex

Figure 6. Prevalence of Overweight and Obesity: by Sex, K-8th Grade



The percentages of Cambridge Public School students with BMI percentiles in the overweight or obese categories, by sex, are illustrated in ***Figure 6***. As of the 2018/2019 school year, the percentage of girls categorized as either overweight or obese was 25.8%, down from 34.0% in 2010. Similarly, the percentage of boys categorized as either overweight or obese was 29.8% in 2019, down from 34.8% in 2010.

Historic data, collected from 1999 onward, were available as a single category of 'overweight or obese' when stratified by sex. These data showed that the percentages of 'overweight or obese' were lower in 2019 than 1999 for both Boys and Girls. In 2004, the peak in student obesity, 38.2% of girls and 40.0% of boys were categorized as 'overweight or obese'. While trend data show notable and positive improvements for both girls and boys, the data do suggest that when compared to girls, boys have consistently had a slightly higher prevalence of overweight and obesity, which mirrors national trends.

Sex Disparities in Weight Status

Figure 7. Sex Disparity in Prevalence of Obesity: 2010 vs. 2019, K-8th Grade

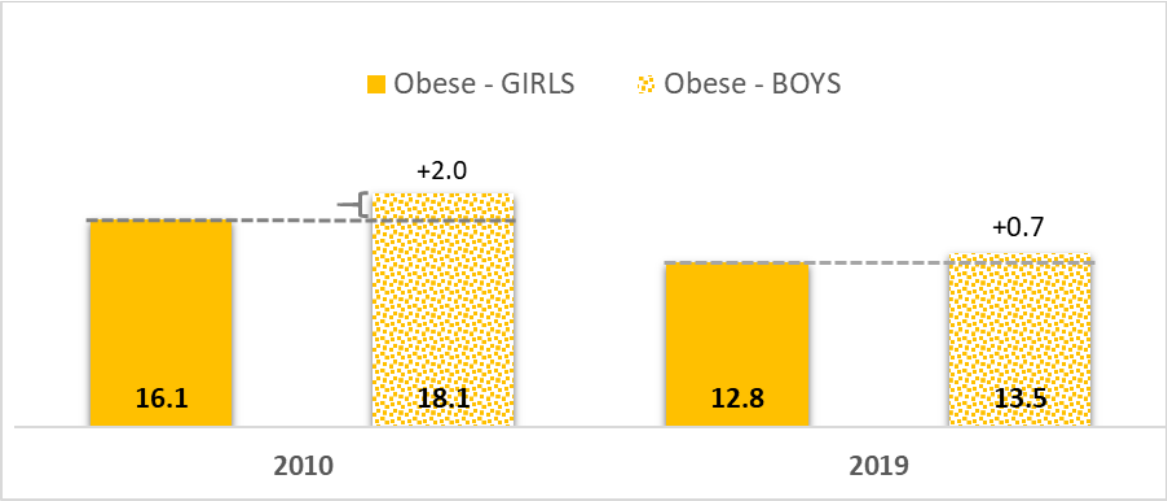


Figure 7 illustrates the magnitude of observed sex disparity in obesity prevalence calculated for 2010 and 2019 using girls as the reference group. The prevalence of obesity was lower in 2019 compared to 2010 for both girls and boys, and the magnitude of the disparity between the groups had narrowed.

- Boys – the prevalence of obesity was **0.7** percentage points **higher** than for girls in 2019 compared to a difference of +2.0 percentage points in 2010

Figure 8. Sex Disparity in Prevalence of Healthy Weight: 2010 vs. 2019, K-8th Grade

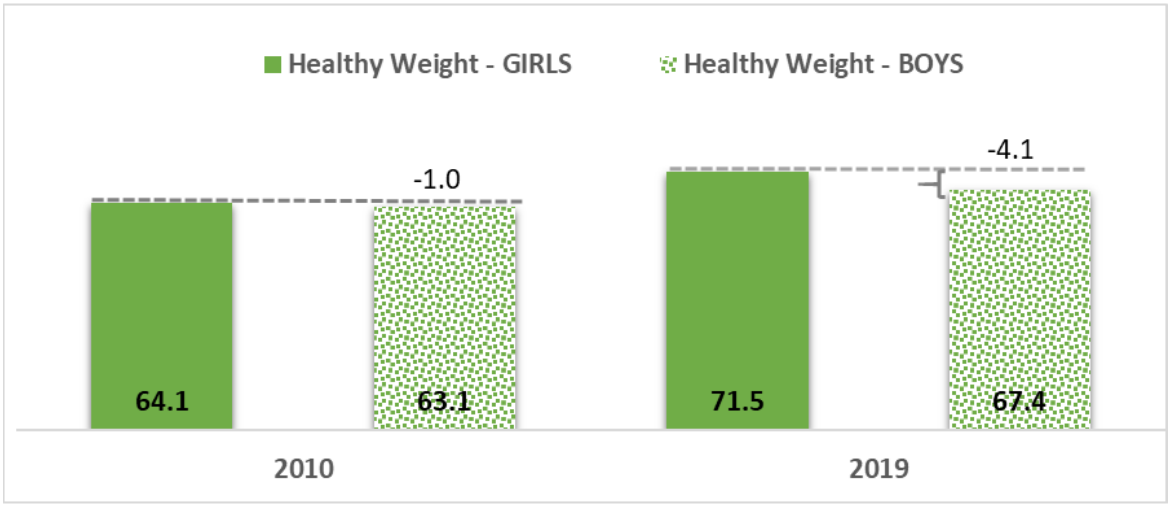
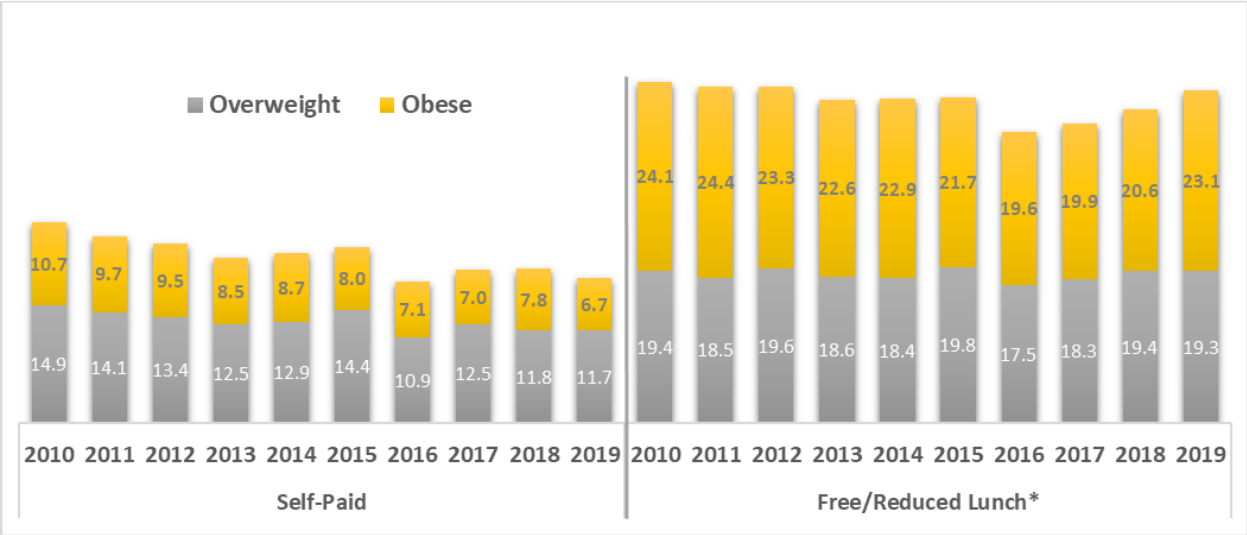


Figure 8 illustrates the magnitude of observed sex disparity in healthy weight prevalence calculated for 2010 and 2019 using girls as the reference group. The prevalence of healthy weight increased between 2010 and 2019 for both girls and boys. However, the disparity between the groups widened during the time period.

- Boys – the prevalence of healthy weight was 4.1 percentage points **lower** than for Girls in 2019 compared to a difference of -1.0 percentage points in 2010

School Lunch Status

Figure 9. Prevalence of Overweight and Obesity: by School Lunch Status, K-8th Grade



**Years 2010 through 2015 data reflect students on free lunch status only*

The percentages of Cambridge Public School students with BMI percentiles in the overweight or obese categories, by school lunch status, are illustrated in ***Figure 9***. The prevalence did not increase for either group between 2010 and 2019. More specifically, the proportion of students who were either overweight or obese:

- Declined from 25.6% in 2010 to 18.4% in 2019 among students who self-pay for lunch
- Remained stable at 43.5% in 2010 and 42.4% in 2019 among students who receive free or reduced lunch

Historic data, collected from 1999 onward, were available as a single category of 'overweight or obese' when stratified by school lunch status. These data showed that the percentages of 'overweight or obese' were lower in 2019 than 1999 for students who self-pay for lunch. Among students who receive free or reduced lunch, the percentage of 'overweight or obese' has remained relatively consistent between 1999 and 2019. However, like the overall trends noted previously, 2004 marked the peak overweight and obesity prevalence. When compared to this historic peak, the most recent data for 2019 suggest declines have occurred in both groups: Self-paid lunch 34.1% in 2004 to 18.4% in 2019; Free or reduced lunch 45.9% in 2004 to 42.4% in 2019.

A notably large and persistent disparity in overweight and obesity can be observed by school lunch status. As of 2019, the proportion of overweight and obesity among students who receive free or reduced lunch is over twice that of students who self-pay for lunch (42.4% vs. 18.4%).

Free/Reduced School Lunch Status Disparity in Weight Status

Figure 10. School Lunch Status Disparity in Prevalence of Obesity: 2010 vs. 2019, K-8th Grade

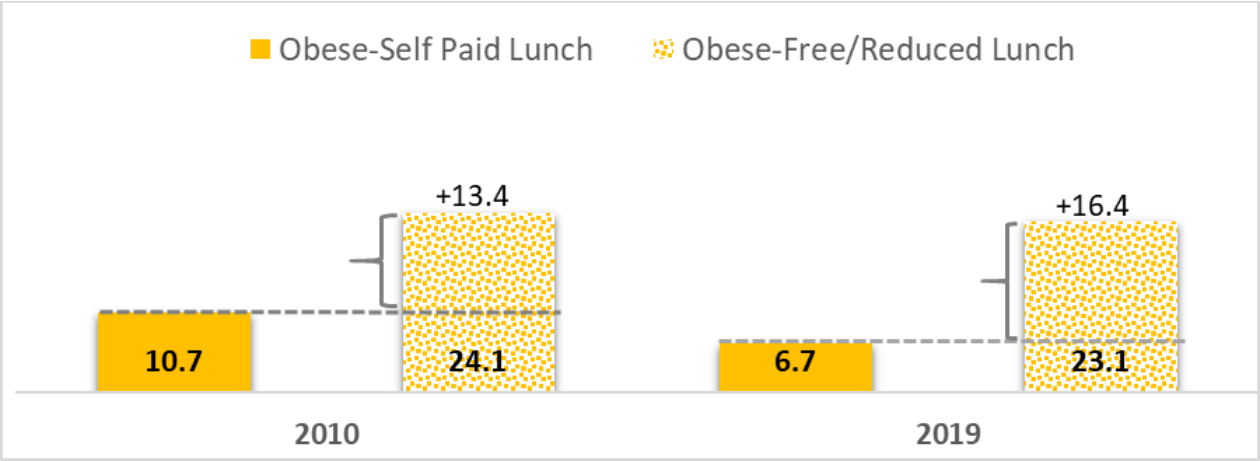


Figure 10 illustrates the magnitude of school lunch status disparity in obesity prevalence calculated for 2010 and 2019 using self-paid lunch as the reference group. While the prevalence of obesity was lower in 2019 compared to 2010 for both groups, the disparity between them had widened slightly.

- Students with free/reduced school lunch - the prevalence of obesity was 16.4 percentage points **higher** than students who self-pay for lunch in 2019 compared to a difference of +13.4 percentage points in 2010

Figure 11. School Lunch Status Disparity in Prevalence of Healthy Weight: 2010 vs. 2019, K-8th Grade

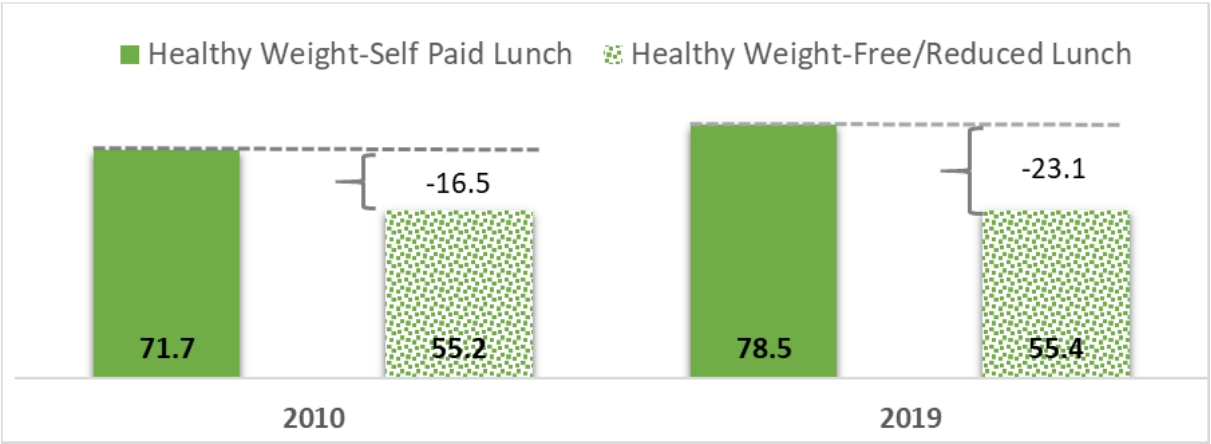
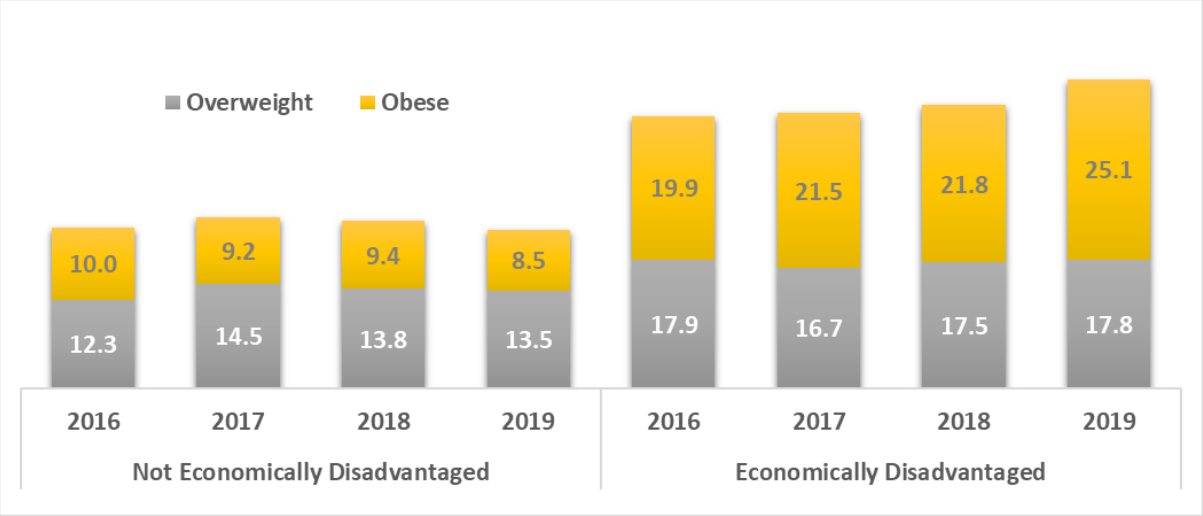


Figure 11 illustrates the size of the school lunch status disparity in healthy weight prevalence calculated for 2010 and 2019 using self-paid lunch as the reference group. The prevalence of healthy weight increased for students in the self-paid lunch group and remained steady for the free/reduced lunch group between 2010 and 2019. And during this time period, the disparity between the two groups widened.

- Students with free/reduced school lunch - the prevalence of healthy weight was 23.1 percentage points **lower** than for students who self-pay for lunch in 2019 compared to a difference of -16.5 percentage points in 2010

Economically Disadvantaged

Figure 12. Prevalence of Overweight and Obesity: by Socio-Economic Status, K-8th Grade



Analyses were also conducted based on the indicator 'economic disadvantage', which provides another proxy for low-income. The percentage of Cambridge Public School students with BMI percentiles in the overweight or obese categories, by economic disadvantage, are illustrated in ***Figure 12***. Based on these data from 2016 through 2019, the observed trends were distinct for each group. Specifically, the proportion of students who were either overweight or obese:

- Remained stable at 22.3% in 2016 and 22.0% in 2019 for students who were not economically disadvantaged
- Increased from 37.8% in 2016 to 42.9% in 2019 for students who were economically disadvantaged

These data further highlight a notably large disparity in overweight and obesity between the groups, similar to that observed for students' school lunch status. As of 2019, the proportion of overweight and obesity among students who met the definition of economically disadvantaged is nearly twice that of students who are not economically disadvantaged (42.9% vs. 22.0%).

Economic Disadvantage Disparity in Weight Status

Figure 13. Socio-Economic Status Differences in Prevalence of Obesity: 2016 vs. 2019, K-8th Grade

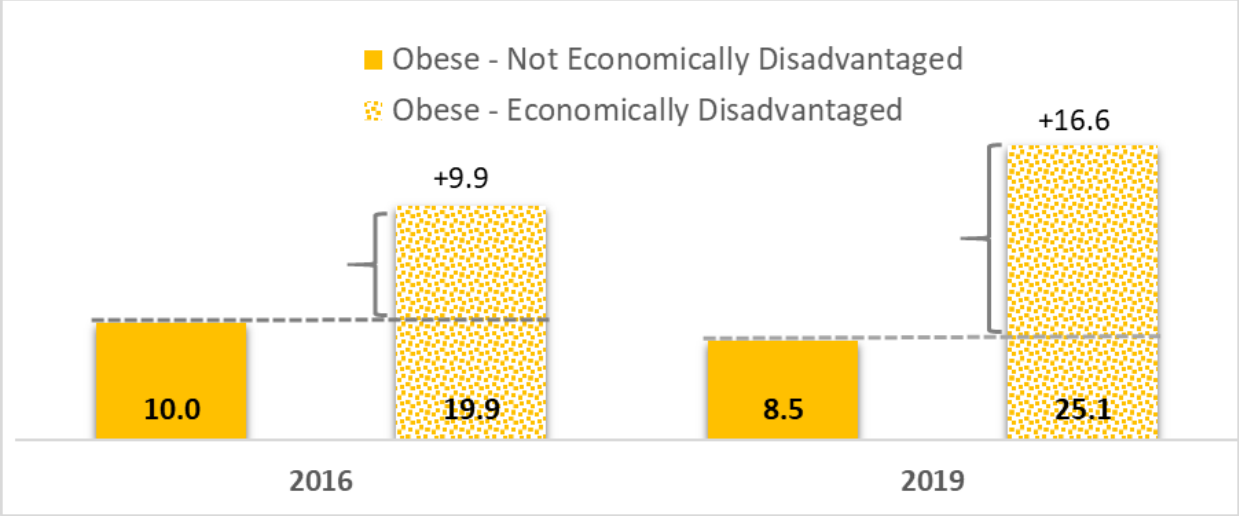


Figure 13 illustrates the size of the economic disadvantage disparity in obesity prevalence calculated for 2016 and 2019 using not economically disadvantaged as the reference group. The prevalence of obesity was lower in 2019 compared to 2010 for students who were not economically disadvantaged, but higher in 2019 than 2016 for students who were economically disadvantaged. In addition, the disparity between the two groups widened during the time period.

- Economically disadvantaged students - the prevalence of obesity was 16.6 percentage points **higher** than students who were not economically disadvantaged in 2019 compared to a difference of +9.9 percentage points in 2016

Figure 14. Socio-Economic Status Differences in Prevalence of Healthy Weight: 2016 vs. 2019, K-8th Grade

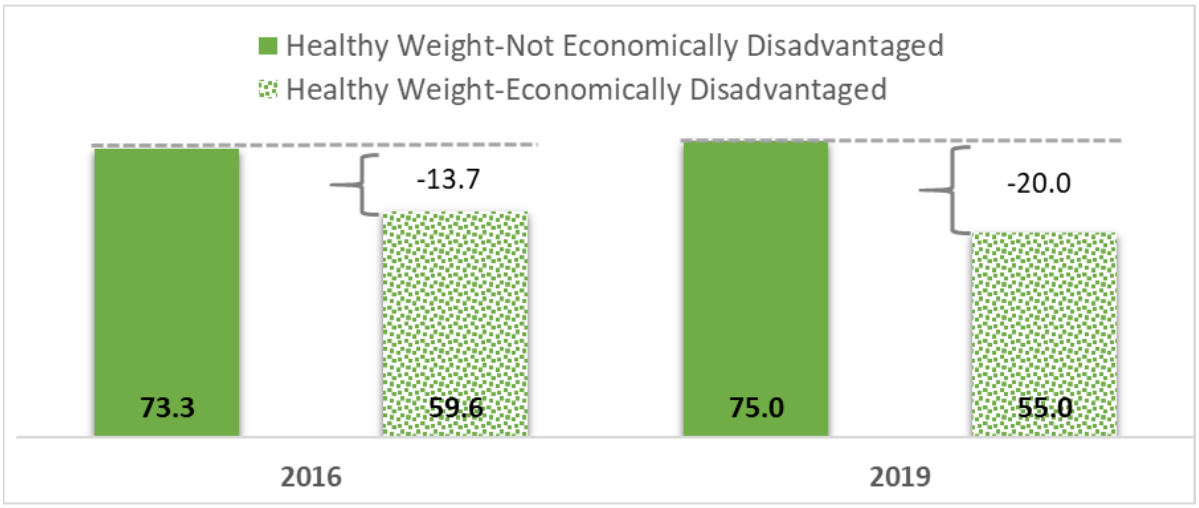


Figure 14 illustrates the magnitude of the economic disadvantage disparity in healthy weight prevalence calculated for 2016 and 2019 using not economically disadvantaged as the reference group. The prevalence of healthy weight was higher in 2019 compared to 2016 for students who were not economically disadvantaged, but lower in 2019 than 2016 for students who were economically disadvantaged. In addition, the disparity between the two groups widened during the time period.

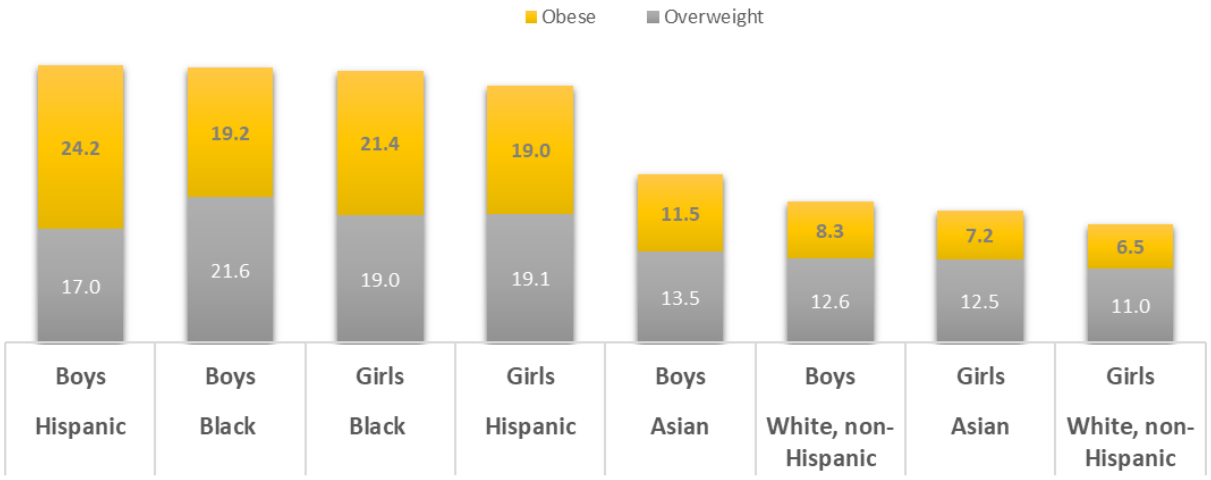
- Economically disadvantaged students - the prevalence of healthy weight was 20.0 percentage points **lower** than for students who were not economically disadvantaged in 2019 compared to a difference of -13.7 percentage points in 2016

Sex stratified by Race and Ethnicity

Rates of obesity are also known to differ based on race/ethnicity group AND the sex of the student. More specifically, obesity has been shown to be higher among non-Hispanic Black girls and Hispanic boys based on national data[2]. Similar observations have been made among Cambridge students over the years of data collection. Using the most recent years of data (2016 through 2019), this section begins to explore overweight and obesity by race/ethnicity and the sex of the student.

Because sample sizes become smaller with multi-level stratifications, greater year to year variability between measurements is observed and trends over time become unreliable and unstable. Therefore, to explore weight status by race and sex, annual trends were not examined. Instead, weight status prevalence is reported based on the average value across the four individual years. Explorations of disparities by race within sex categories were limited to this 4-year aggregated estimate.

Figure 15. Average Prevalence of Overweight and Obesity: 2016-2019 by Sex and Race/Ethnicity, K-8th Grade

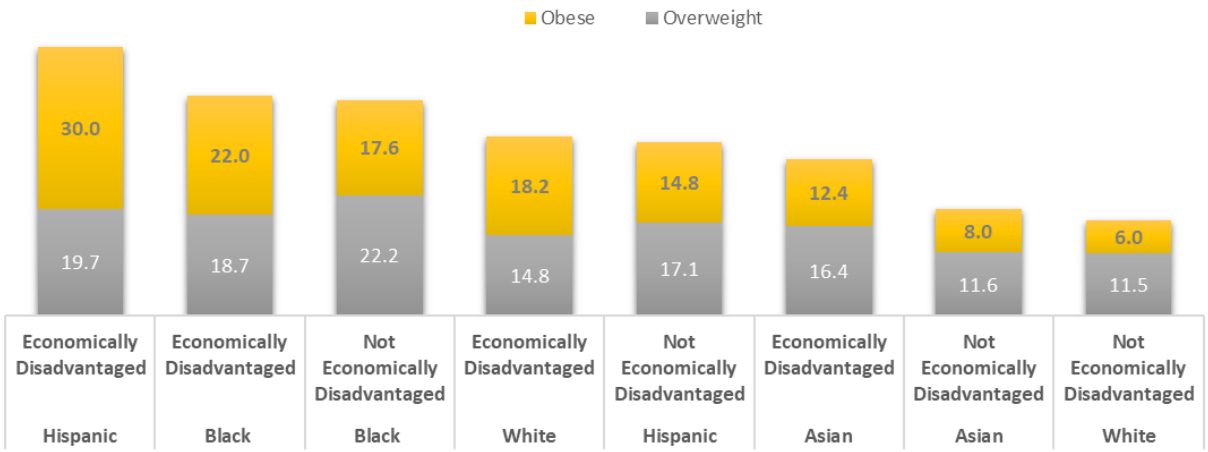


The percentages of Cambridge Public School students with BMI percentiles in the overweight or obese categories, by race/ethnicity and sex, are illustrated in **Figure 15**. Among both girls and boys, students who were Black or Hispanic had higher prevalence of overweight or obesity compared to Asian or white, non-Hispanic students. Looking specifically at the category of obesity, the group with the highest prevalence is Hispanic boys

[2] NCHS, National Health and Nutrition Examination Surveys, 1988–1994 and 1999–2018.

(24.2%) followed by Black girls (21.4%). In contrast, the group with the lowest prevalence of obesity is white, non-Hispanic girls (6.5%) followed by Asian girls (7.2%).

Figure 16. Average Prevalence of Overweight and Obesity: 2016-2019 by Economic Disadvantage and Race/Ethnicity, K-8th Grade



The percentages of Cambridge Public School students with BMI percentiles in the overweight or obese categories, by race/ethnicity and economic disadvantage, are illustrated in **Figure 16**. Among students of each race/ethnicity group, those who were economically disadvantaged had a higher prevalence of overweight or obesity compared to those who were not economically disadvantaged. However, the magnitude of the difference varied greatly by race/ethnicity.

Larger differences were observed among Hispanic students (17.7 percentage points **higher** if economically disadvantaged) and White students (15.5 percentage points **higher** if economically disadvantaged) while a smaller difference was observed among Asian students (9.2 percentage points **higher** if economically disadvantaged). Of note, prevalence of overweight/obesity was similar among Black students regardless of their economic status (0.9 percentage points **higher** if economically disadvantaged)). These findings begin to highlight that factors associated with higher prevalence of overweight and obesity do not impact all sub-populations in similar ways.

Summary and Discussion

BMI data collected by Cambridge Public Schools through 2015 showed a steady improvement in the weight status of the student population. The percentage categorized as overweight or obese had declined from its historic high of 39% in 2004 to 31% in 2015, while the percentage categorized as healthy weight increased from 59% to 65% in the same timeframe. With the addition of four more years of data, collected between 2016 and 2019, this overall trend continued with further improvements in the weight status of students in Cambridge. As of 2019, 28% of students were overweight or obese and 69% were at healthy weight.

Despite this important progress, disparities that have long been observed between sub-populations of students have persisted and, in some cases, widened over the past decade. The positive changes in weight status

observed for the aggregate student population does not necessarily represent trends for some groups. When comparing the magnitude of obesity disparities observed in 2010 to that observed in 2019, it was clear that some groups may not be benefiting equally from the environmental changes and health promotion efforts directed towards the Cambridge Public Schools student population during this time period or that it may not be sufficient to overcome the total effects of racism and marginalization.

Among Black and Hispanic students, the percentages who were categorized as obese declined between 2010 and 2019. However, the disparities compared to White, non-Hispanic students widened as obesity declined to a greater degree among the White, non-Hispanic students. As of 2019, the prevalence of obesity was 15.7 percentage points **higher** among Hispanic students and 13.5 percentage points **higher** among Black students compared to White, non-Hispanic students. Similarly, among students eligible for free/reduced school lunch, the percentage who were categorized as obese also declined between 2010 and 2019, yet the disparity when compared to those who self-pay for school lunch had widened. And in 2019, the prevalence of obesity was 16.4 percentage points **higher** among students eligible for free/reduced school lunch compared to students who self-pay for lunch.

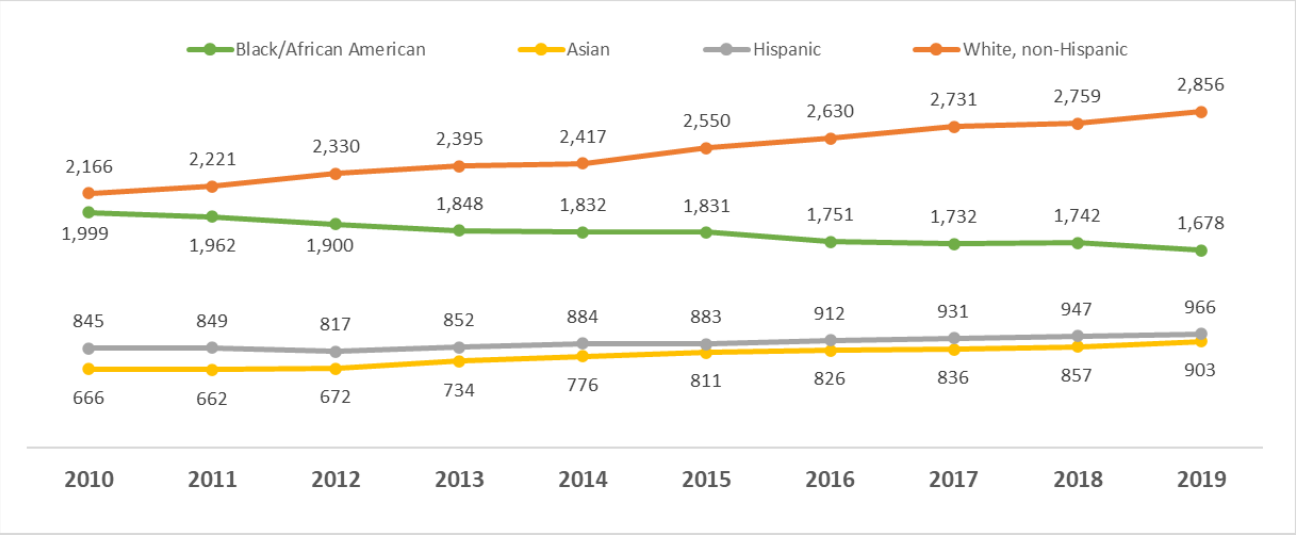
As observed in these Cambridge Public School data, childhood obesity has long been shown to be more prevalent among children who are socially disadvantaged.[3] Based on the new analyses of data collected between 2016 and 2019, some additional insights into the impact of economic status were observed. Using the newer indicator 'economic disadvantage', results showed the prevalence of overweight/ obesity actually increased among students who were identified as disadvantaged, from 38% in 2016 to 43% in 2019. This more recent indicator of student economic status may be identifying a group of students that are particularly vulnerable socially or economically, and thus at higher risk of overweight and obesity. The prior indicator of 'school lunch status' was unable to make this distinction. District level rates of 'economic disadvantage' as reported by MA DESE show that across all students in Cambridge Public Schools, the percentage who meet this definition has varied in the range of 27%-29% between 2015 and 2019. The percentages of students who are eligible for free/reduced school lunch has historically varied within the range of 43%-48%.

When examined by race/ethnicity group, the differences in the percentage of students who are categorized as overweight or obese by 'economic disadvantage' begin to show that socioeconomic factors do not impact all groups to the same extent or even in the same direction. This is most evident among Black students who regardless of economic disadvantage experience higher rates of overweight and obesity than economically disadvantaged White, non-Hispanic and Asian students.

There are some important limitations to the data that must be noted to ensure findings are interpreted with the appropriate level of caution. First, the more recent years of data appear to be reflecting a smaller proportion of the total student population in grades K-8. While student BMI monitoring has remained a priority of Cambridge Public Schools, the nearly universal screening rates observed in earlier years have declined to about 75% of students in 2016 and to about 50% of students in 2019. Thus, it is possible that weight status estimates for more recent years do not accurately reflect the broader student population. However, these declines appear to be happening similarly across grade levels and race/ethnicity groups and trends established many years prior appear to be continuing uninterrupted.

Figure 17. Cambridge Public Schools Student Enrollment Counts: 2010-2019, by Race/ethnicity

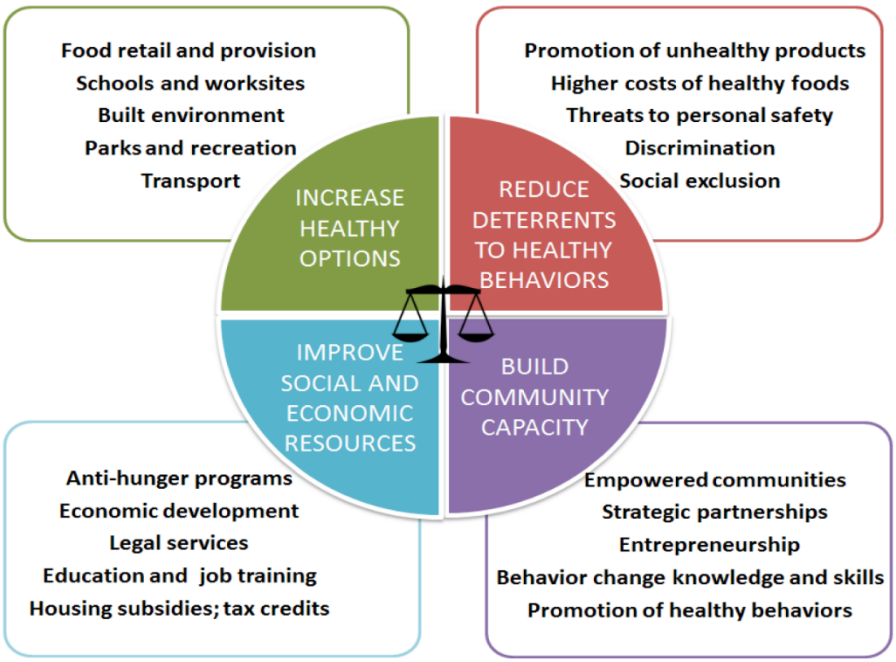
[3] Ogden CL, Carroll MD, Lawman HG, Fryar CD, Kroszon-Moran D, Kit BK, *et al*. Trends in obesity prevalence among children and adolescents in the United States, 1988–1994 through 2013–2014. *JAMA.* 2016;**315**(21):2292-9.



Additionally, it is important to consider the findings of this report in the context of the changing demographics of Cambridge. The total size of the student population in Cambridge Public Schools has increased steadily since 2010, however, when enrollment data are stratified by race/ethnicity (**Figure 17**) this trend applies only to Hispanic, Asian, and white, non-Hispanic students. In contrast, enrollment of Black students has declined since 2010. How these demographic shifts may be impacting the data presented in this report is unclear, but as weight status differs greatly by race/ethnicity and socio-economic status, a greater understanding of the families who are moving into versus out of Cambridge Public Schools may provide some insight.

Efforts taken to date by Cambridge Public Schools have been based on a socio-ecological model and designed using a universal approach. The aim has been to “make the healthy choice the easy choice” in order to lead to the adoption of health behaviors among all groups. Such policy and system and environmental (PSE) changes have included the promotion of healthy eating and physical activity in the Cambridge Public Schools and the community, such as school food service and menu improvements, a farm-to-school program, school gardens in all schools, a school wellness policy, vending machine guidelines and a Safe Routes to School effort. Most of these efforts were started between 2005 and 2007 and the majority have been sustained.

Figure 18. Framework for Equity in Obesity in Prevention



SOURCE: Kumanyika S. Getting to Equity in Obesity Prevention: A New Framework. Washington, DC: National Academy of Medicine; 2017. https://nam.edu/getting-to-equity-in-obesity-prevention-a-new-framework/

As Kumanyika describes (**Figure 18**) PSE approaches to increase healthy options and reduce deterrents to healthy choices, are key components of an equity-oriented obesity prevention framework. While the healthy weight promotion campaigns in Cambridge have addressed each of these areas and the improvements in student weight status observed since 2005 illustrate the positive impact of this approach, the widening gaps in overweight and obesity suggest past and current efforts have not sufficiently moved the needle for low-income students and students of color. Applying a more overt health equity lens to this work will likely require that universal strategies be tailored and/or targeted appropriately to increase the capacity of low-income students and students of color to adopt healthy behaviors and achieve the results seen among other students. It may also require gaining a greater understanding of the unique challenges that are faced by families in Cambridge.

The findings of this report provide an update on the weight status of Cambridge Public School students and increase our understanding of which groups are experiencing higher rates of obesity and overweight. The identification of the widening disparities by race/ethnicity and economic status is particularly informative and important as they provide direction for future programming and policy.

Finally, it should be noted that this is pre-pandemic data, and the impact locally on childhood weight is not yet known. A recent study showed significant weight gain during the pandemic, especially among 5-11 year old youth[4]

[4] Woolford SJ, Sidell M, Li X, et al. Changes in Body Mass Index Among Children and Adolescents During the COVID-19 Pandemic. JAMA. Published online August 27, 2021. doi:10.1001/jama.2021.15036

Definition of Terms

BMI - Body Mass Index is a person's weight in kilograms divided by the square of height in meters. For children and teens, BMI is age- and sex-specific and is often referred to as BMI-for-age. BMI is not a diagnostic tool, rather it is used to screen for potential weight and health-related issues. For more information see: CDC - About Child and Teen BMI

BMI Percentile – Unlike adults, children and teens are growing and developing, and so their BMI must be interpreted relative to other children of the same age and sex. After BMI is calculated for children and teens, it is then expressed as a percentile, based on CDC's standard BMI-for-age growth charts or percentile calculators.

Disparity – In the context of health, a disparity refers to a difference between groups in a given health outcome or indicator of health status. Healthy People 2030 more specifically defines a health disparity as "a particular type of health difference that is closely linked with social, economic, and/or environmental disadvantage. Health disparities adversely affect groups of people who have systematically experienced greater obstacles to health based on their racial or ethnic group; religion; socioeconomic status; gender; age; mental health; cognitive, sensory, or physical disability; sexual orientation or gender identity; geographic location; or other characteristics historically linked to discrimination or exclusion."

Free/Reduced School Lunch Status – MA Department of Elementary and Secondary Education (DESE) historically used students' eligibility for free or reduced cost school lunch as a proxy for low-income status. Children from families with incomes at or below 130 percent of the poverty level are eligible for free meals. Those between 130 percent and 185 percent of the poverty level are eligible for reduced-price meals. Federal income/poverty guidelines are updated annually. This statistic, which was used until 2015, consisted of the percentage of students within a given school district who applied for the program and were determined to be income eligible.

Economically Disadvantaged – In 2015, MA Department of Elementary and Secondary Education (DESE) started using the more specific measure "economically disadvantaged" as the proxy for low-income status. It is calculated based on family participation in one or more of the following state-administered programs: the Supplemental Nutrition Assistance Program (SNAP); the Transitional Assistance for Families with Dependent Children (TAFDC); the Department of Children and Families' (DCF) foster care program; and MassHealth (Medicaid). Students meeting these criteria now directly qualify for free/reduced school meals without having to fill out an application. Students from low-income families who don't qualify automatically through enrollment in state programs (for example undocumented immigrants) can still qualify for free/reduced school meals by filling out an application. Both "economically disadvantaged" and "low income" are valid measures, but there are methodological considerations that result from the change in proxy measure. In most schools, including Cambridge, the number of students categorized as "economically disadvantaged" is lower than the number of students categorized as "low income". Additionally, families who cannot participate in any of the programs (notably documented and undocumented immigrants) are no longer reflected by the more specific low income status proxy, "economic disadvantage".

Health Equity - Healthy People 2030 defines health equity as "the attainment of the highest level of health for all people. Achieving health equity requires valuing everyone equally with focused and ongoing societal efforts to address avoidable inequalities, historical and contemporary injustices, and the elimination of health and health

care disparities." Importantly, understanding and measuring health disparities is essential in order to advance health equity.

Healthy Weight – For children and teens, healthy weight refers to a BMI percentile that falls within the range of the 5th percentile to less than the 85th percentile.

Overweight – For children and teens, overweight refers to a BMI percentile that falls within the range of the 85th percentile to less than the 95th percentile.

Obesity – For children and teens, obesity refers to a BMI percentile that is equal to or greater than the 9th percentile.

Underweight – For children and teens, underweight refers to a BMI percentile that is less than the 5th percentile.

Prevalence – The proportion of a population who have a specific characteristic in a given time period. It is calculated and expressed in its most simple form as a percentage based on the number of people with the characteristic (numerator) divided by the total number of people who were measured (denominator).