Childhood Obesity and Asthma in the Consolidated School District of New Britain, Connecticut

2013-14

New Britain Health Department

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UCONN HEALTH

CENTER FOR PUBLIC HEALTH AND HEALTH POLICY

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Executive Summary

The Consolidated School District of New Britain extracted 2013/2014 data from the PowerSchool database for 2,493 students in grades PreK-3 and 4, Kindergarten, 6th, and 9th grade. New Britain Health Department nurses also extracted health data from Health Assessment Records for 880 children attending two large preschools that are not part of the PowerSchool database. Demographic data and weight and asthma status were available for all 3,373 students, while school performance and attendance information was also available for students in the PowerSchool database.

Key Findings:

Obesity

- Thirty-nine percent of students are overweight or obese. This is four times the expected rate according the Centers for Disease Control
- The rate of obesity increases as children get older
- The percentage of overweight/obese is highest among Hispanic/Latino students
- Weight alone is not related to school performance or attendance

Asthma

- The prevalence of asthma is very high among New Britain children and is related to childhood obesity as well as attendance and school performance
- Twenty-six percent of New Britain school children have physician-confirmed asthma
- Asthma prevalence increases with age and by 6th grade more than one-third of students have asthma
- Asthma prevalence is higher among Hispanic/Latino students, and highest among Hispanic/Latino students whose primary language is Spanish
- Overweight/obese students are more likely to have asthma
- Students with asthma are more likely to be chronically absent and have lower test scores

Demographics

- Sixty percent of students are Hispanic/Latino ethnicity
- English is the primary language for sixty-five percent of students
- Seventy-five percent of students are eligible for free/reduced cost lunch
- The chronic absentee rate is twenty-four percent

Recommendations:

Asthma control should be addressed to decrease chronic absenteeism and increase test performance among children with asthma. The data in this report should be a call to action for New Britain schools and parents.

Obesity is a national problem, but the prevalence of childhood obesity in New Britain is four times what is expected. Children who are overweight or obese are more likely to have asthma. This problem needs to be addressed both at home and in school beginning with preschool-age children.

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Background

Children born in the United States at the beginning of the 21st century may be the first generation since U.S. Census data have been recorded not to have a longer life expectancy than their parents[1]. The decrease in life expectancy is entirely attributable to prevalence of obesity in this generation[1]. The escalating costs of obesity will bankrupt cities with high rates of obesity. 2009 data reported an estimated cost of over $50 million per 100,000 residents. Children are entering into obesity early on, which translates into an often unchangeable life course of chronic disease, with "adult" conditions such as type 2 diabetes and hypertension starting in childhood. Obesity has started to outpace cigarette smoking, another risk factor commonly beginning in adolescence, as the greatest risk factor for death and illness.

Besides decreasing life expectancy, childhood overweight or obesity may severely affect a child's physical and psychological development. Hospital costs attributed to childhood overweight have increased three-fold in the last 20 years [3, 4]. From 1979 to 1999, the occurrence of type 2 diabetes, previously called adult onset diabetes doubled in adolescents, particularly among minority children [5]. In the same time period, diagnoses for sleep apnea and gall bladder disease, not usual pediatric problems, have tripled. A majority of overweight children (61%) have problems such as asthma, orthopedic problems resulting from excess weight, hypertension, dyslipidemia, and greater susceptibility to infectious disease [5]. These problems follow into adulthood where obesity is the direct antecedent to diabetes, heart disease, and many types of cancer, kidney failure, respiratory disease, and infertility. In many cultures, overweight stigmatizes the school age child[6]. This discrimination contributes to depression, low self-esteem, poor school performance, and interference with family functioning [7].

Unlike quitting smoking, achieving and maintaining a healthy weight and reversing the course of obesity often remains out of reach even for determined individuals. Adult weight loss treatments require long-term interventions. Most adults regain the lost weight, thus negating the time, financial and emotional investment, and health benefits. Sadly, there are no effective interventions for achieving the amount of sustained weight loss necessary for obese children to reach a healthy weight[8]. To decrease the number of obese adults in the future, prevention strategies must focus on points in the life cycle when genes that program energy conservation are expressed, and appetite regulation, physical activity patterns, and food preferences are developed. That window of opportunity is almost entirely during pregnancy through pre-adolescence.

Indicators show no decrease in the high rates (two-thirds) of adults who are overweight or obese [9], particularly since the prevalence of overweight in children 6 to 12 years of age quadrupled from four to 15% in the last 20 years [10]. Among children ages 2 to 5, 23% are overweight or obese [10]. Rates of overweight for adults and children are even higher for low-income families and minorities. Compared to 21% of non-Hispanic white children ages 2 to 5, 27% of non-Hispanic blacks, and 32% of Hispanic, mostly Mexican-American children are overweight or obese[10]. Of three-year-olds participating in the Fragile Families and Child Wellbeing Survey from 1999-2003, 18% were obese with an additional 17% overweight [11]. Black and Hispanic children were more likely to be overweight (17% and 24% respectively) than their white peers (14%) [11].

Children living in New Britain are at high risk for becoming obese. These children are predominantly Latinos from low-resource families and they experience a high rate of excess weight and obesity-related chronic diseases. According to the 2012/2013 report, 32% of children three years of age and 38% of kindergarten children in New Britain were overweight/obese [12]. The children in New Britain,

especially pre-adolescent children, warrant additional attention above and beyond the general population. Interventions for newborns to age five have been found more effective than those for older children when it comes to promoting sustained moderate caloric intake, fostering weight loss or prevention of weight gain [13]. As a greater percentage of the preschool population becomes obese, both parents and teachers lose perspective on what is a normal weight child.

During this pivotal point in life for setting a path towards healthy behaviors and away from obesity, children spend a substantial amount of time in center-based care. The caregivers in these settings are positioned to play a role, whether they intend to or not, in the development of food habits and physical activity routines. Especially within low-income communities, child care settings often have the added responsibility of preparing and supervising meal(s) and snack(s) under the federal Child and Adult Care Food Program (CACFP). Calls for action to promote health and prevent obesity are now geared towards child care centers. First Lady, Michelle Obama's, *Let's Move* Child Care Initiative, and the Institute of Medicine report on Early Childhood Obesity Prevention Policies, are among the calls to take action within the early care and education center setting to prevent and reverse the obesity trend.

Recognizing this importance, the New Britain Health Department asked the Center for Public Health and Health Policy at the University of Connecticut to analyze data on child weight status in their city schools and preschools that would describe the extent of childhood obesity, and its relationship to demographics including neighborhood, chronic disease, standardized test scores, and chronic absenteeism in the school population, as well as to provide a statistically sound base on which to evaluate the effectiveness of planned programs.

Methods

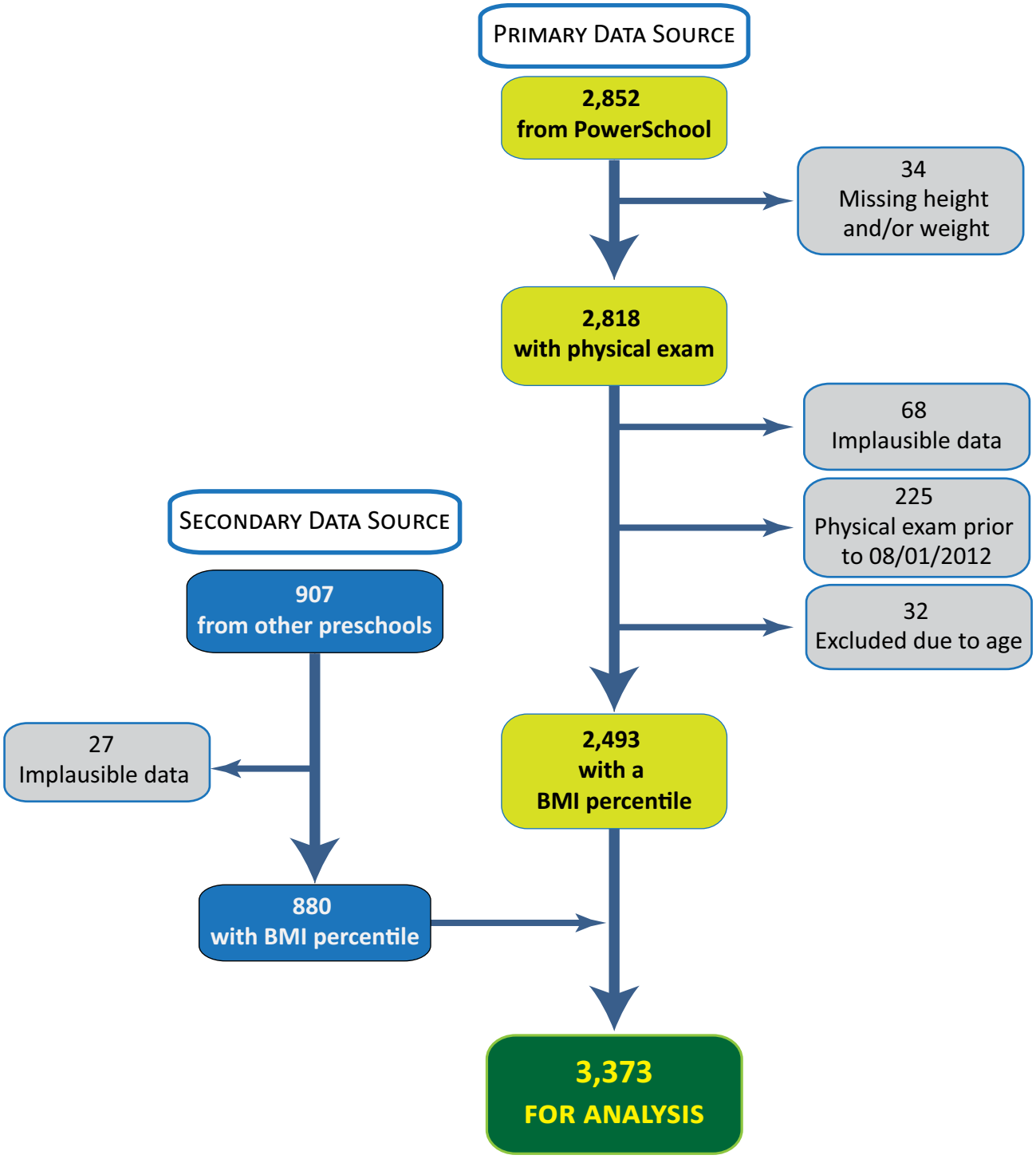
Data for the 2013/14 school year were extracted from the PowerSchool database for all students in pre-kindergarten 3 (PreK-3), and pre-kindergarten 4 (PreK-4), kindergarten (K), 6th and 9th grade students in the Consolidated School District of New Britain. PowerSchool is a web-based information system created by Pearson Education, Inc. Data were de-identified and included age, gender, race/ethnicity, height, weight, age (months) at time of height/weight measurement, free lunch status (as a proxy for SES), number of children in the family, primary language, special Individualized Education Program (IEP), school attendance, testing results (reading, language, math percentiles), chronic diseases (asthma, allergy, diabetes, seizures). A census tract of each home address was also provided.

Additionally, New Britain Health Department nurses extracted information from the Health Assessment Records of pre-kindergarten students who attended two large preschools, the Human Resource Agency's Head Start and the YWCA's preschool program. These preschools are not part of the Consolidated School District of New Britain. The data extracted were: date of birth, sex, grade, race/ethnicity, health insurance status, dental insurance status, asthma status, diabetes status, height, and weight. These data were provided for school years 2012/13 and 2013/14 for 3 and 4 year olds.

Body mass index (BMI) and BMI percentiles were calculated for each student using SAS programs downloaded from the Centers for Disease Control and Prevention (CDC) website. BMI percentiles are obtained by plotting BMI on the CDC BMI-for-age growth charts. The BMI percentile indicates the relative position of the child's BMI number among children of the same sex and age. Students were classified obese, overweight, healthy weight, or underweight as indicated by the CDC.

Data for 2,852 children with a BMI date was provided. Reasons for exclusion were: missing necessary information for calculation of the BMI percentile (age in months at physical exam, sex, height, weight), 'Biologically Implausible Values' as determined by the CDC software, date of the physical exam was prior to August 1, 2012, and age. Following CDC guidelines, BMI was not calculated for children younger than two years of age. In addition, values were excluded for children whose age was more than a year different from normal age for children in that grade. For example, the normal age for a child in kindergarten is 5 years old, and one 7 year old and ten 3 year olds were excluded. The final analytic sample from PowerSchool consisted of 2,493 children. Another 880 preschool children were included from the 2013/2014 data provided by the nurses, resulting in a combined sample size of 3,373 school children with BMI percentiles. A consort diagram is shown in Figure 1. Analyses of BMI and asthma data used the combined datasets, while all other analyses are based on the 2,493 children from the PowerSchool database.

Figure 1. Consort diagram



Demographics

Table 1 describes the demographics of the combined sample of 3,373 children overall and by grade. Average ages for each grade are as expected given the inclusion criteria stated above. Males represent more than half of the sample, overall and within each grade. Hispanic/Latino children account for almost 60% of the children, with very similar percentages of white (18%) and black (17%) students in the system. Ethnicity proportions were similar in each grade level.

Table 1. Demographic data by grade from the combined data sources

	Overall	PreK-3	PreK-4	Kindergarten	6th Grade	9th Grade
Sample Size, n (%)	3,373	581 (17.2)	816 (24.2)	897 (26.6)	620 (18.4)	459 (13.6)
Age in Years, mean (SD)	6.9 (4.0)	3.3 (0.6)	4.4 (0.5)	4.8 (0.5)	11.2 (0.6)	14.4 (0.7)
Gender, n (%)						
Female	1,571 (46.6)	260 (44.8)	408 (50.0)	417 (46.5)	268 (43.2)	218 (47.5)
Male	1,802 (53.4)	321 (55.2)	408 (50.0)	480 (53.5)	352 (56.8)	241 (52.5)
Ethnicity, n (%)						
Asian/Pacific Islander	140 (4.2)	22 (3.8)	60 (7.4)	29 (3.2)	23 (3.7)	6 (1.3)
Black, non-Hispanic	569 (16.9)	91 (15.7)	123 (15.1)	168 (18.7)	113 (18.2)	74 (16.1)
Hispanic/Latino	1,987 (58.9)	343 (59.0)	479 (58.7)	512 (57.1)	367 (59.2)	286 (62.3)
Other	58 (1.7)	20 (3.4)	31 (3.8)	3 (0.3)	3 (0.5)	1 (0.2)
White, non-Hispanic	604 (17.9)	101 (17.4)	119 (14.6)	181 (20.2)	113 (18.2)	90 (19.6)
Missing	15 (0.4)	4 (0.7)	4 (0.5)	4 (0.4)	1 (0.2)	2 (0.4)
BMI Percentile, mean (SD)	66.9 (29.6)	62.7 (31.0)	65.1 (30.5)	67.2 (29.0)	69.7 (29.3)	71.3 (26.8)

Table 2 shows a summary of the data for the 2,493 students in the PowerSchool database overall and by grade. The data represent approximately 90% of all students in the grades studied. A majority (65%) of the children spoke English as their primary language, 25% spoke primarily Spanish, and 10% spoke neither English nor Spanish as their primary language. Sixty percent of the children were the only child listed at their address, with 34% of households listing 2 to 3 children, and 6% listing 4 or more children. Three quarters of the students were eligible for free or reduced-cost lunch. Additionally, 878 (26%) students had physician-confirmed asthma (Table 6, Appendix), 71 (3%) had an allergy, 21 (0.8%) had seizures, and 5 (0.2%) had diabetes.

Table 2. Demographic data from the PowerSchool database

	Overall	PreK-3	PreK-4	Kindergarten	6th Grade	9th Grade
Sample Size, n (%)	2,493	184 (7.4)	333 (13.4)	897 (36.0)	620 (24.9)	459 (18.4)
Primary Language, n (%)						
English	1,630 (65.4)	115 (62.5)	219 (65.8)	698 (77.8)	360 (58.1)	238 (51.9)
Spanish	628 (25.2)	46 (25.0)	74 (22.2)	128 (14.3)	196 (31.6)	184 (40.1)
Other	235 (9.4)	12 (12.5)	40 (12.0)	71 (7.9)	64 (10.3)	37 (8.1)
Allergy, n (%)						
Yes	71 (2.9)	3 (1.6)	8 (2.4)	25 (2.8)	24 (3.9)	11 (2.4)
No	2,422 (97.1)	181 (98.4)	325 (97.6)	872 (97.2)	596 (96.1)	448 (97.6)
Lunch, n (%)						
Free	1,687 (67.7)	89 (48.4)	196 (58.9)	635 (70.8)	450 (72.6)	317 (69.1)
Reduced	197 (7.9)	7 (3.8)	28 (8.4)	70 (7.8)	60 (9.7)	32 (7.0)
Full	609 (24.4)	88 (47.8)	109 (32.7)	192 (21.4)	110 (17.7)	110 (24.0)
Number of children in school system at address, n (%)						
1	1,493 (59.9)	128 (69.6)	202 (60.7)	565 (63.0)	326 (52.6)	272 (59.3)
2 to 3	857 (34.4)	49 (26.6)	111 (33.3)	294 (32.8)	243 (39.2)	160 (34.9)
4 or more	143 (5.7)	7 (3.8)	20 (6.0)	38 (4.2)	51 (8.2)	27 (5.9)

Educational Services, Testing, and Attendance

Table 3 describes the educational services received, test scores, and school attendance data from the PowerSchool database overall and by grade. Of the 2,493 students, 382 (19%) kindergarten, 6th and 9th grade students received English Language Learner (ELL) services, while 499 (20%) students from all of the grades (including PreK) received Special Education. Standardized reading and math test scores/percentiles were available for children in kindergarten, 6th and 9th grade. Language scores were available for 6th and 9th grade students only. Average percentiles for each grade are shown in Table 3. Scores were also classified as above or below the 50th percentile. One would expect half of the students to be above and half below the 50th percentile; however, only 27%, 21%, and 25% of children were above the 50th percentile in the reading, math, and language scores, respectively. School attendance of 90% or lower is considered chronic absenteeism. Compared to the statewide chronic absentee rate of 11% [14], the rate among New Britain students was 24% —more than double the statewide rate. The highest rate of chronic absenteeism was among preschoolers and 9th graders. New Britain 9th graders had a rate of 40% chronic absenteeism, whereas the statewide rate for high school students is 17%. In contrast, 17% of kindergarteners and 12% of 6th graders were chronically absent. Although the chronic absentee rate was markedly lower among New Britain kindergarteners and 6th graders, the statewide rates were 8.9% and 9%, respectively, for those grades.

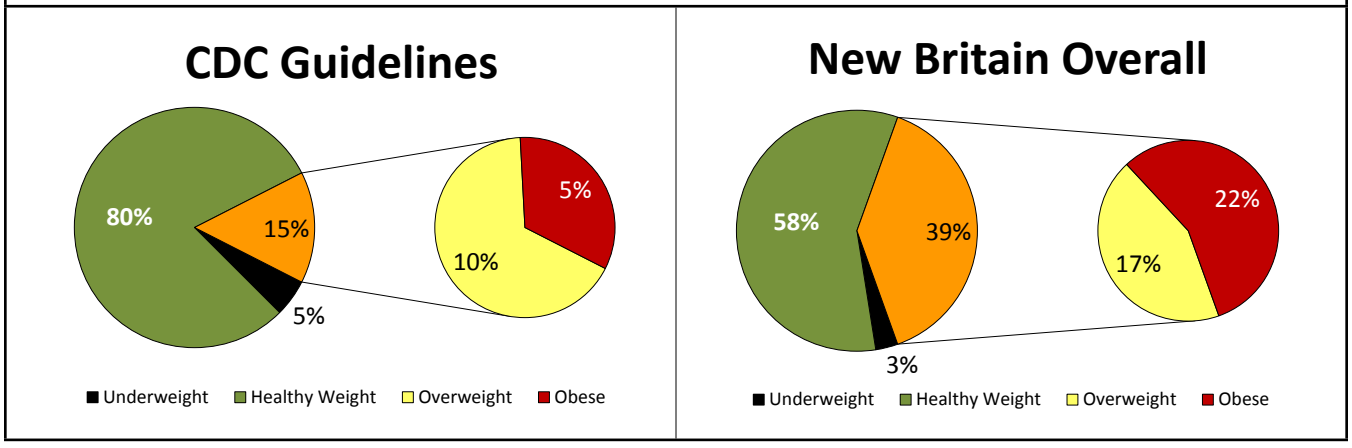
Table 3. School-related information from the PowerSchool database

	Overall	PreK-3	PreK-4	Kindergarten	6th Grade	9th Grade
Sample Size, n (%)	2,493	184 (7.4)	333 (13.4)	897 (36.0)	620 (24.9)	459 (18.4)
ELL Services, n (%)						
Yes	382 (15.3)	n/a	n/a	139 (15.5)	133 (21.5)	110 (24.0)
No	2,111 (84.7)	n/a	n/a	758 (84.5)	487 (78.6)	349 (76.0)
Special Education, n (%)						
Yes	499 (20.0)	74 (40.2)	99 (29.7)	148 (16.5)	116 (18.7)	62 (13.5)
No	1,994 (80.0)	110 (59.8)	234 (70.3)	749 (83.5)	504 (81.3)	397 (86.5)
Reading Percentile, mean (SD)		n/a	n/a	n=871 37.6 (27.0)	n=600 31.2 (26.2)	n=370 34.0 (26.1)
Math Percentile, mean (SD)		n/a	n/a	n=867 34.4 (27.1)	n=591 22.6 (21.4)	n=374 27.8 (24.3)
Language Percentile, mean (SD)		n/a	n/a	n/a	31.3 (26.1)	32.1 (25.4)
Chronic Absenteeism (<=90% attendance), n (%)						
Yes	597 (24.0)	70 (38.0)	120 (36.0)	148 (16.5)	76 (12.3)	183 (39.9)
No	1,895 (76.0)	114 (62.0)	213 (64.0)	749 (83.5)	544 (87.7)	276 (60.1)

Body Mass Index and Weight Classifications

BMI percentile indicates the relative position of the child's BMI adjusted for sex and age. The average BMI percentile among all 3,397 students was 67.1. Average BMI percentiles showed a steady increase of 2 percentile points with each grade (Table 1). The CDC has defined weight categories: Underweight (< 5th percentile), Healthy Weight (5th to < 85th percentile), Overweight (85th to < 95th percentile), and Obese (95th percentile and above). By definition of these categories, one would expect that 5% of children to be Underweight, 80% Healthy Weight, 10% Overweight, and 5% Obese.

Figure 2. Overall weight classification of New Britain children compared to CDC guidelines

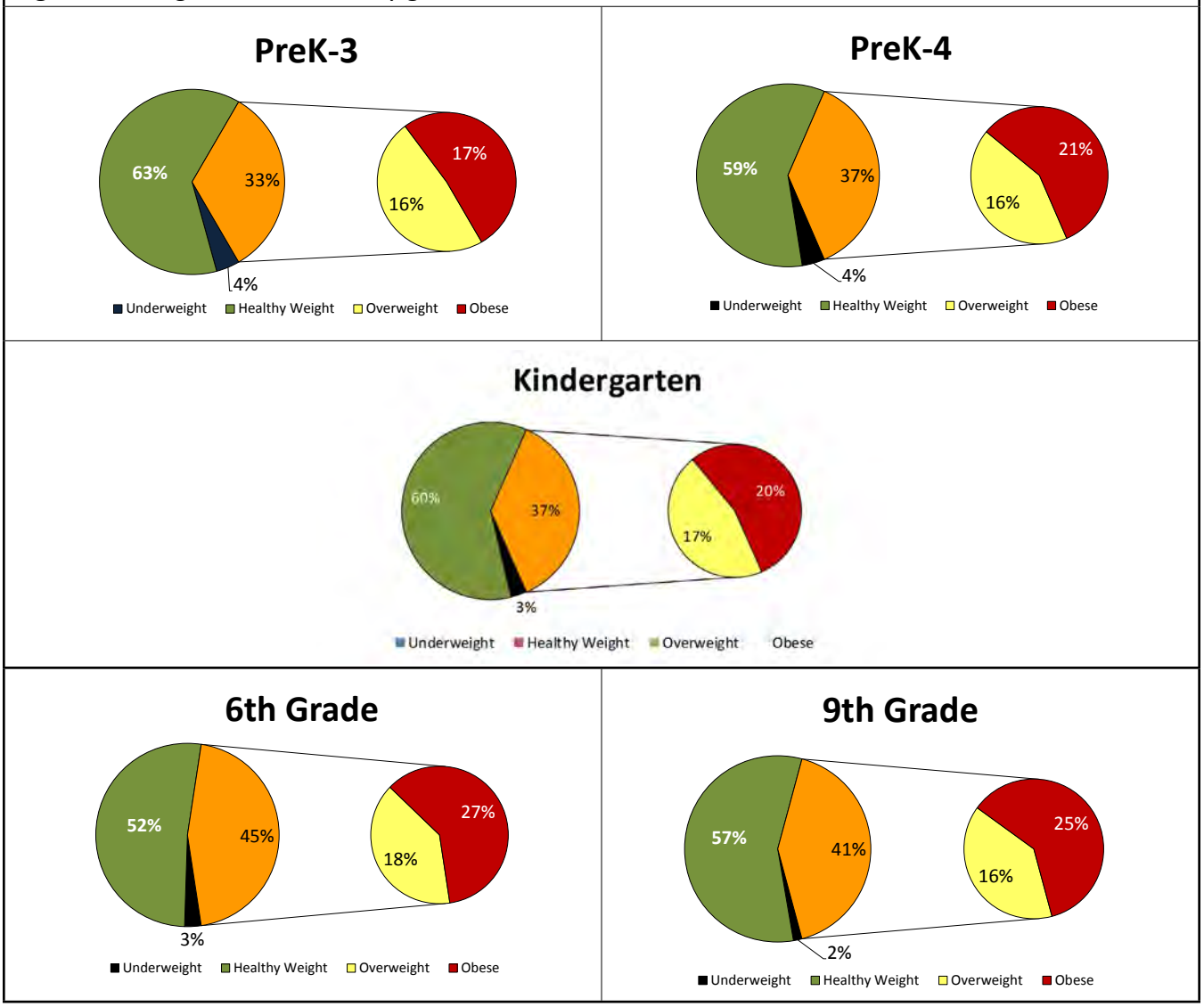


The weight distribution among the New Britain school children (Table 5, Appendix) is very different compared to the CDC recommendations. Thirty-nine percent of New Britain children are overweight or obese (Figure 2), which is in sharp contrast to the 15% CDC guidelines for overweight or obese. There are almost twice (17% versus 10%) as many overweight and more than four times (22% versus 5%) as many obese children as the CDC guidelines suggest. Boys were just as likely to be overweight as girls. Children from large families with four or more school-age children were less likely to be obese.

Weight by Grade

Figure 3 shows the percent of students in each weight category by grade. In every grade, there were fewer children at a healthy weight than recommended by CDC guidelines (Figure 2), and more children who were overweight and obese. Although the proportion of overweight students was similar in all grades (16% to 18%), the proportion of obese children increased from 17% to 27% as the children got older. This translates to 45% of 6th graders and 42% of 9th graders either overweight or obese.

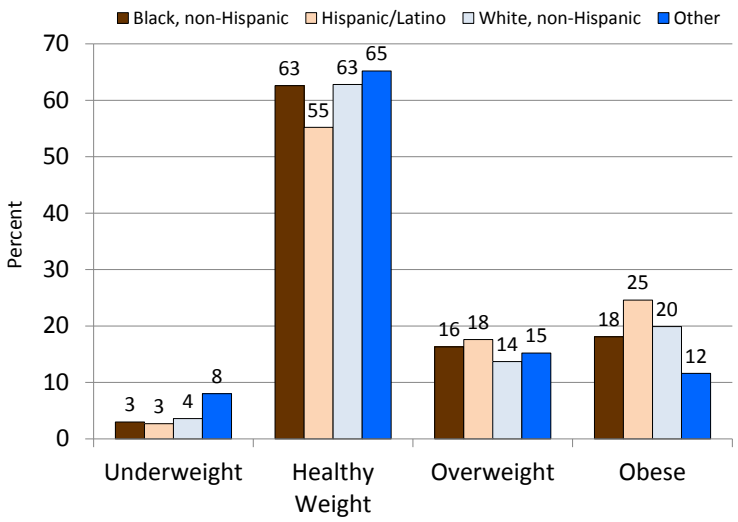
Figure 3. Weight classification by grade



Ethnic Differences in Weight Classification

Significantly more Hispanic/Latino children (43%) were overweight/obese when compared to black and white children (34%) and other ethnicities (27%) (Figure 4). Among Hispanic/Latino students, those whose primary language was Spanish were just as likely to be overweight as those whose primary language was English.

Figure 4. Weight classification by ethnicity



Weight and School Performance

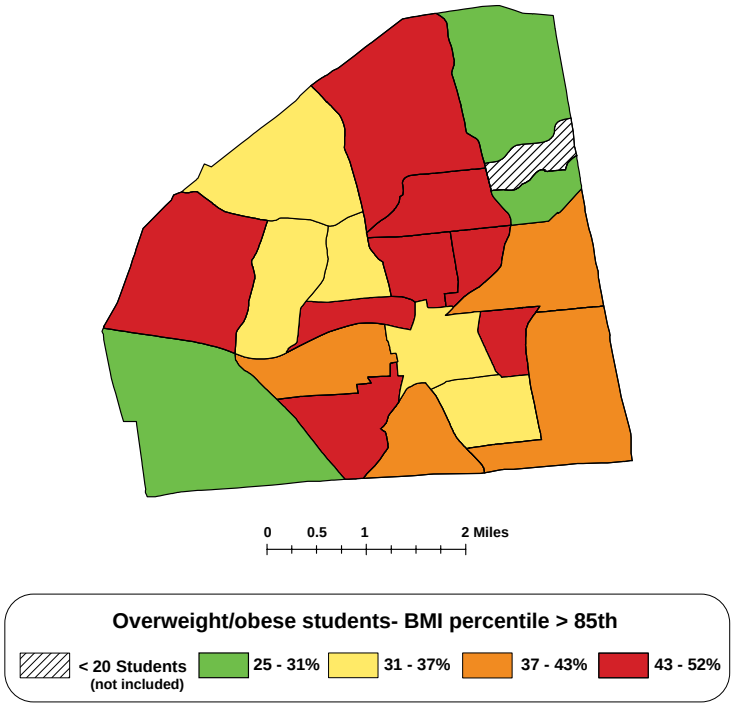
Reading, math, and language test scores did not differ by weight category. Similarly, there was no difference in the proportion of children scoring above the 50th percentile in the testing scores by weight. ELL Services, special education programs, chronic absenteeism, and free/reduced lunch were not associated with weight classification.

The Geography of Childhood Obesity

The relationship between rates of overweight/obesity and neighborhood has been well-documented [15]. Using the data provided from the PowerSchool database, we mapped rates of overweight and obesity by census tract.

Figure 5 shows the percent of children who were overweight/obese by census tract. Tracts shown in red have more than 43% of children overweight/obese, while orange tracts have between 37% and 43% overweight/obese.

Figure 5. Percent of overweight/obese students by census tract, 2013-14



Similarly, Figure 6 shows the percent of obese children by census tract. Red tracts have rates of obesity between 29% and 34%.

Figure 6. Percent of obese students by census tract, 2013-14

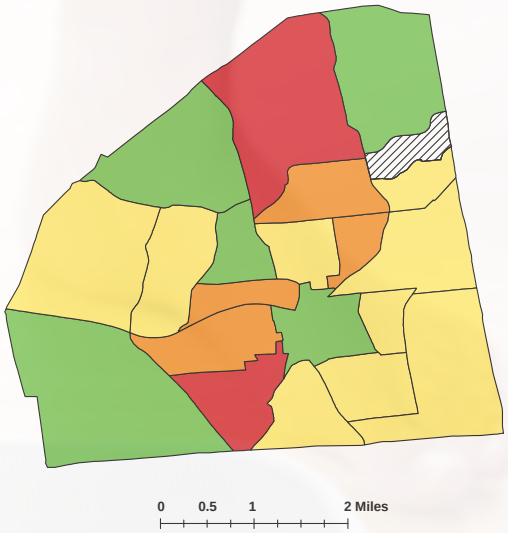
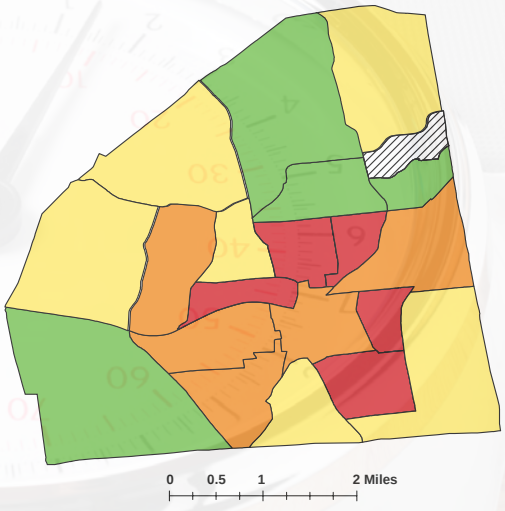


Figure 7 shows the percent of children under 18 years old who are below the poverty level by census tract. There was a significant correlation ($r = 0.47$, $p = 0.03$) between the percent below poverty level and the percent overweight/obese students.

Figure 7. Percent of children below poverty level by census tract - 2008-2012 census data



Longitudinal Analysis

The data from the preschool Health Assessment Records provide a unique opportunity to track weight changes from a cohort of children first measured in 2012 at age 3 and then again in 2013 (Table 4). Healthy weight status decreased from 65% to 55%, overweight increased from 15% to 17% and obesity from 16% to 24%.

Table 4. Longitudinal data from health assessment records

Grade	Year	n	Underweight	Healthy Weight	Overweight	Obese
PreK-3	2012/2013	532	4.5%	64.5%	15.2%	15.8%
PreK-4	2013/2014	502	4.6%	55.2%	16.7%	23.5%

The change in the proportion of obese students during this one year time period suggests that weight gain between the ages of 3 and 4 should be examined more closely. This analysis should be repeated on more cohorts of preschoolers to confirm that age 3 to 4 is a critical period for intervention. As data continues to be collected in the PowerSchool database, there will be more opportunities to follow children's weight change over time. This will enable school systems to develop and evaluate the effectiveness of interventions and prevention programs, as well as policy changes.

Asthma

Physician-confirmed asthma had been diagnosed in 26% of New Britain students. This is two times as many as the statewide proportion of school-aged children with asthma [16]. Figures 8, 9, and 10 show the distribution of asthma by grade, weight classification, and ethnicity and gender.

The proportion of children with asthma increased from 19% in PreK-3 to a high of 36% in 6th grade. Although there was a significant drop in asthma prevalence in the 9th grade students, the reason is unknown. A decrease among 9th grade students was also seen in both the 2011/2012 and 2012/2013 New Britain report. In contrast, the 2012 National Survey of Children's Health shows the prevalence of asthma among Connecticut children is not different among 6 to 11 year olds and 12 to 17 year olds. [16]

Figure 8. Percent of children with asthma by grade

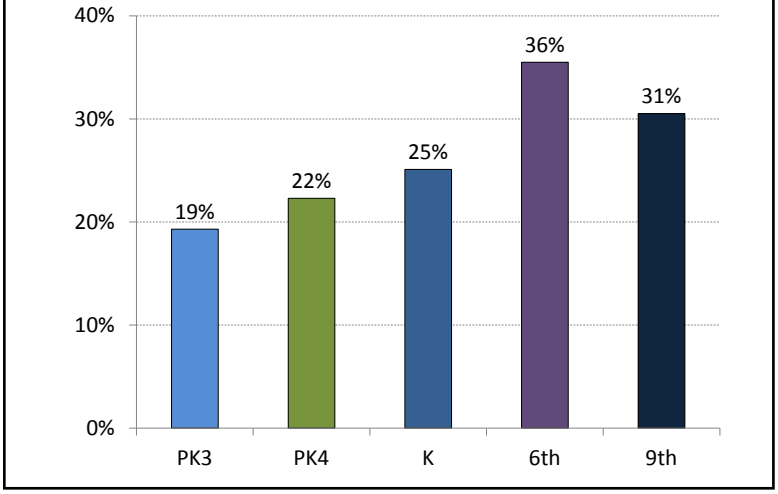


Figure 9 shows significantly more children with asthma were overweight (19% versus 16%) and obese (27% versus 21%) than children without asthma.

Figure 10 shows the percent of students with asthma by ethnicity and gender.

More boys than girls had asthma (28% versus 24%), and the proportion of children with asthma was highest among Hispanic/Latino children (31%). Hispanic/Latino children whose primary language was Spanish were more likely to have asthma (35% versus 28%) than those whose primary language was English.

Figure 9. Asthma by weight classification

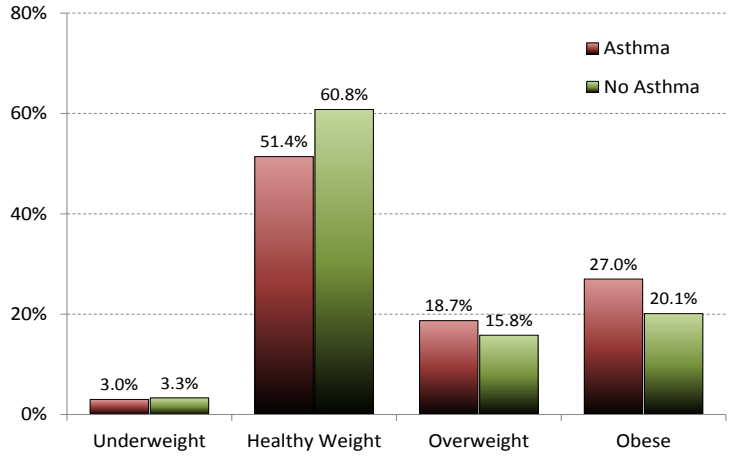
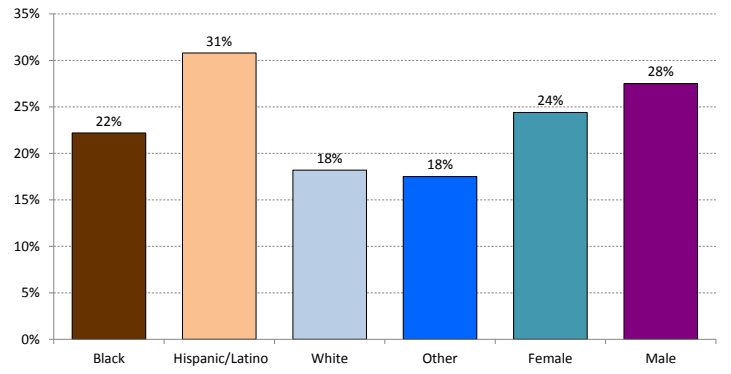


Figure 10. Asthma by ethnicity and gender



Asthma and School Performance

Figures 11 and 12 show the impact that asthma has on school performance and attendance.

Average test scores for all three subjects (reading, math, language) were significantly lower among children with asthma, with fewer children scoring above the 50th percentiles. In multivariate models which controlled for gender, primary language and ethnicity, children with asthma still scored lower than children without asthma on reading and math tests. Black and Hispanic ethnicities, male gender, and non-English as primary language were all significantly associated with lower test scores. Rates of asthma were significantly higher among children who received ELL services, were eligible for free lunch, or had allergies.

Figure 11. Skill percentiles by asthma

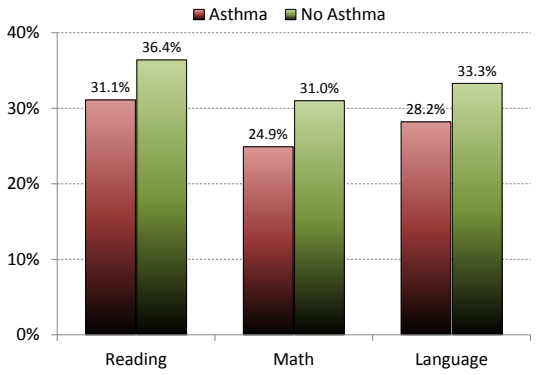
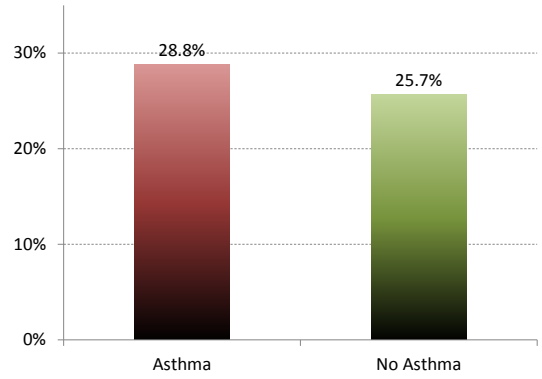


Figure 12. Chronic absenteeism by asthma

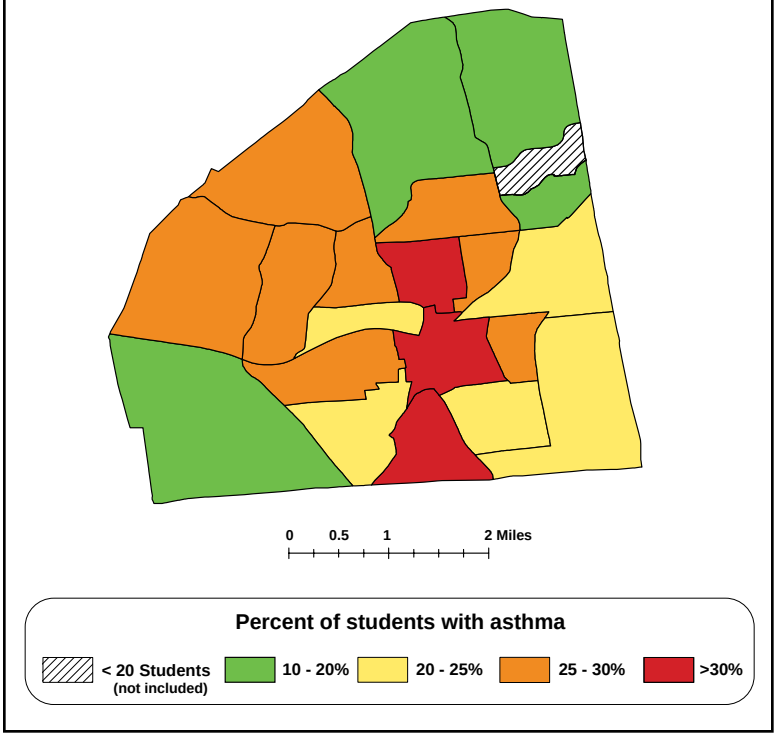


Children with asthma had similar rates (29% versus 26%) of chronic absenteeism as those with no asthma. However, in multivariate models which controlled for gender, ethnicity, primary language and grade, children with asthma were 1.3 times as likely to be chronically absent as children without asthma. Asian/Pacific Islanders and Hispanic/Latinos were twice as likely as white children to be chronically absent. Further, females were 1.2 times as likely as males. Kindergarteners and 6th graders were less likely than 9th graders to be chronically absent.

The Geography of Asthma

Figure 13 shows the percent of New Britain school children with asthma by census tract. Red tracts have an asthma prevalence of more than 30%. A significant correlation (r=0.55, p=.01) exists between the % below poverty level and the % students with asthma – areas with more poverty also have higher rates of asthma. This relationship is evident when comparing Figure 13 to Figure 7, which shows poverty level by census tract.

Figure 13. Asthma prevalence: Percent of New Britain children with asthma by census tract, 2013-2014



Conclusions

Childhood obesity and asthma prevalence among New Britain students are challenging issues for both schools and parents. The proportion of obese children in New Britain is four times as many as expected according to CDC guidelines, and is highest among Hispanic/Latino children. Asthma prevalence is very high among New Britain children, and is related to childhood obesity as well as school performance and attendance. Both obesity and asthma are related to poverty level in New Britain. Asthma control should be addressed to decrease chronic absenteeism and increase test performance among children with asthma. Obesity is a national problem and a local New Britain issue that needs to be addressed both at home and in school beginning with preschool age children.

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Appendix

Maps for the test scores (Figures 14 and 15) show the percent of children below the 50th percentile for reading and math. Tracts in red indicate that more than 75% of children scored below the 50th percentile of reading scores (Figure 14) and more than 85% below the 50th percentile of math scores (Figure 15). Figure 16 shows the percent of children who are chronically absent by census tract. Children who reside in the red tracts have the highest rates of absenteeism. There are significant correlations between the percent below poverty level and the percent below 50th percentile on math and reading tests, and chronic absenteeism.

Figure 14. Percent of students scoring below the 50th percentile on reading test by census tract, 2013-14

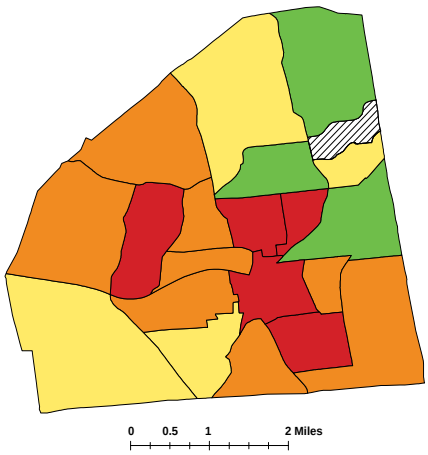

Figure 15. Percent of students scoring below 50th percentile on math test by census tract, 2013-2014

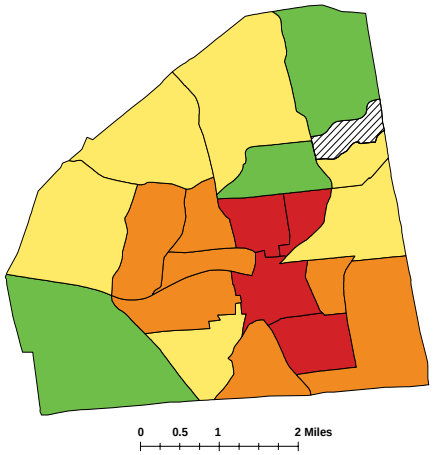

Figure 16. Percent of students chronically absent by census tract, 2013-2014

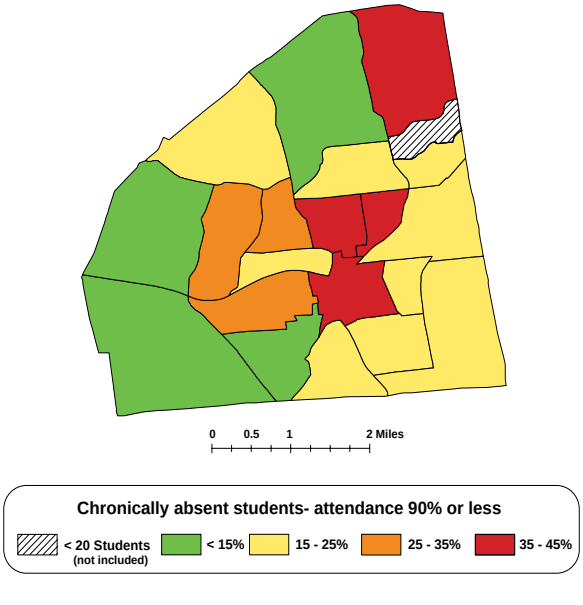

Table 5. Demographic data by weight classification

	Sample Size	Underweight	Healthy Weight	Overweight	Obese	P-Value
Overall, n (%)	3373	108 (3.2)	1969 (58.4)	558 (16.5)	738 (21.9)	
Grade, n (%)						0.0006
PreK-3	581 (17.2)	24 (4.1)	364 (62.7)	93 (16.0)	100 (17.2)	
PreK-4	816 (24.2)	33 (4.0)	481 (59.0)	128 (15.7)	174 (21.3)	
Kindergarten	897 (26.6)	26 (2.9)	541 (60.3)	151 (16.8)	179 (20.0)	
6th Grade	620 (18.4)	18 (2.9)	322 (51.9)	111 (17.9)	169 (27.3)	
9th Grade	459 (13.6)	7 (1.5)	261 (56.9)	75 (16.3)	116 (25.3)	
Gender, n (%)						
Female	1,571 (46.6)	46 (2.9)	921 (58.6)	258 (16.4)	346 (22.0)	0.78
Male	1,802 (53.4)	62 (3.4)	1,048 (58.2)	300 (16.7)	392 (21.8)	
Ethnicity, n (%)						<0.0001
Asian/Pacific Islander	140 (4.2)	13 (9.3)	87 (62.1)	20 (14.3)	20 (14.3)	
Black, non-Hispanic	569 (16.9)	17 (3.0)	356 (62.6)	93 (16.3)	103 (18.1)	
Hispanic/Latino	1,987 (58.9)	53 (2.7)	1,097 (55.2)	349 (17.6)	488 (24.6)	
Other	58 (1.7)	3 (5.2)	42 (72.4)	10 (17.2)	3 (5.2)	
White, non-Hispanic	604 (17.9)	22 (3.6)	379 (62.8)	83 (13.7)	120 (19.9)	
Asthma, n (%)						<0.0001
Yes	878 (26.1)	26 (3.0)	451 (51.4)	164 (18.7)	237 (27.0)	
No	2,490 (73.9)	82 (3.3)	1,514 (60.8)	394 (15.8)	500 (20.1)	

Table 6. Asthma data

	Asthma		
	Yes	**No**	p value
Overall, n (%)	878 (26.1)	2,490 (73.9)	
Ethnicity, n (%)			<0.0001
Asian/Pacific Islander	19 (13.6)	121 (86.4)	
Black, non-Hispanic	126 (22.2)	442 (77.8)	
Hispanic/Latino	612 (30.8)	1,374 (69.2)	
Other	10 (18.2)	45 (81.8)	
White, non-Hispanic	110 (18.2)	494 (81.1)	
Gender, n (%)			0.04
Female	383 (24.4)	1,184 (75.6)	
Male	495 (27.5)	1,306 (72.5)	
Grade, n (%)			<.0001
PreK-3	112 (19.3)	468 (80.7)	
PreK-4	181 (22.3)	631 (77.7)	
Kindergarten	225 (25.1)	672 (74.9)	
6th Grade	220 (35.5)	400 (64.5)	
9th Grade	140 (30.5	319 (69.5)	
Primary Language, n (%)			<.0001
English	412 (25.3)	1,218 (74.7)	
Spanish	215 (34.2)	413 (65.8)	
Other	32 (13.6)	203 (86.4)	
ELL Services, n (%)			0.03
Yes	118 (30.9)	264 (69.1)	
No	541 (25.6)	1,570 (74.4)	
Allergy, n (%)			0.005
Yes	29 (40.8)	42 (59.2)	
No	630 (26.0)	1,792 (74.0)	
Lunch, n (%)			<.0001
Free	517 (30.7)	1,170 (69.4)	
Reduced	38 (19.3)	159 (80.7)	
Full	104 (17.1)	505 (82.9)	
Reading RIT Percentile, mean (SD)	31.1 (25.4)	36.4 (27.1)	<.0001
Math RIT Percentile, mean (SD)	24.9 (22.9)	31.0 (26.1)	<.0001
Language RIT Percentile, mean (SD)	28.2 (24.0)	33.3 (26.5)	0.006
Chronic Absenteeism (<=90% attendance), n (%)			0.13
Yes	172 (28.8)	425 (71.2)	
No	487 (25.7)	1,408 (74.3)	

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