

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

2015-16



CITY OF NEW BRITAIN
HEALTH DEPARTMENT

UCONN
HEALTH

CENTER FOR PUBLIC HEALTH
AND HEALTH POLICY

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Summary of Key Findings

The Consolidated School District of New Britain extracted 2015/2016 data from the PowerSchool database for 3,454 students in grades Pre-K 3 and 4, kindergarten, and 3rd, 6th and 9th grade. New Britain Health Department also extracted health data from Health Assessment Records for 583 children attending 2 large preschools that are not part of the PowerSchool database. Demographic data and weight and asthma status were available for 3,848 students, while school performance and attendance information was available for the 3,277 students in the PowerSchool database. Analyses of these data found:

Demographics

- 64% of students are Hispanic/Latino ethnicity
- English is the primary language for 68% of students
- Chronic absentee rate is 20%, but as high as 38% among 9th graders
- Chronic absenteeism among 9th graders decreased significantly compared to 46% in 2014/15

Obesity

- 37% of students are overweight or obese
- Percent of overweight/obesity is highest among Hispanic/Latino and White students
- The percent of obese students increases with age
- Weight is not related to school attendance
- Longitudinal data for 2011/12 to 2015/16 suggests a downward trend in overweight/obesity among children in preschool
- Children typically remain in the same weight category (overweight/obese or healthy/underweight) as they age from 4 to 8 (77%) and 11 to 14 (84%)
- Successful movement out of the overweight/obese category may be more likely among young children between the ages of 4 and 8 (30%) than children between the ages 11 and 14 (21%)
- Young children overweight/obese at age 4 were 10 times as likely to be overweight/obese at age 8 when compared to healthy/underweight children

Asthma

- 28% of New Britain school children have physician-confirmed asthma
- Asthma prevalence increases with age and in 6th grade 35% of students have asthma
- Asthma prevalence is highest among Hispanic/Latino, non-Hispanic Black students, and boys
- Overweight and obese students are more likely to have asthma
- Children with asthma have higher rates of chronic absenteeism
- Students with asthma have lower test scores
- Asthma rates for 6th grade and 9th grade students appear to trend upward over the past 4 years

Obesity and asthma are among the most serious chronic conditions faced by children in the United States. New Britain surpasses national averages for both. The proportion of obese children in New Britain is almost five times as many as expected according to CDC guidelines, and is highest among Hispanic/Latino children. Asthma prevalence is also very high among New Britain children, and is related to childhood obesity as well as school performance and attendance. Incorporating additional case management and air quality improvement initiatives within school, childcare and home settings may improve the health, attendance and test performance among children with asthma.

Background

Obesity in America has increased considerably over the past three decades. Today more than a third of Americans are obese [1], compared with only 15 percent in 1976-1980 [2]. Obesity, particularly childhood obesity, has been characterized as an “epidemic” and identified as one of the leading health problems of the early 21st century [3]. Even the youngest of children appear to be affected. A recent national survey showed that eight percent of infants have unusually high weight [1]. Seventeen percent of children 2-19 years old are obese [1]. Being obese, and even overweight, is a risk factor for a number of chronic diseases among adults. Obesity in childhood often leads to obesity in adulthood; in some cases, it may cause health problems during childhood itself, including “adult” diseases, such as type 2 diabetes [4]. (Complications and social costs associated with obesity and overweight are detailed more thoroughly in the 2013-2014 version of this report [5]).

Asthma is another chronic health condition suffered by many children and that often continues into adulthood [6]. Asthma and obesity have long been associated, though a direct link has not been found. There is evidence, however, that obesity may be a risk factor for developing asthma [6]. Obesity may also make children more susceptible to air pollutants that trigger some episodes of existing asthma [7]. Further, asthma symptoms are often more difficult to treat in obese children than in children with a healthier body weight [6].

Obesity and asthma may interfere with a child’s educational performance. Children with asthma have been noted to be absent more often than their non-asthmatic peers and students with persistent asthma may perform lower on standardized tests than other students [8]. The evidence for obesity and educational performance is less clear, but one researcher found that obese students are judged by teachers as being less capable even when their standardized test scores are comparable to their peers [9].

Recognizing the importance of obesity and asthma as serious public health risks to its children, the New Britain Health Department asked the Center for Public Health and Health Policy at UConn Health to analyze data on child weight status in city schools and preschools. The report describes the extent of childhood obesity, and its relationship to demographics and asthma, standardized test scores, and chronic absenteeism in the school population. It provides a statistically sound base on which to design and evaluate the effectiveness of programs.

Methods

Data Sources

Data from two sources were used for this report: New Britain’s PowerSchool database and the Health Department’s MS Access databases. All data were de-identified. PowerSchool is a web-based information system created by Pearson Education, Inc. Extracted data from the PowerSchool database included age, gender, race/ethnicity, height, weight, age in months at time of height and weight measurement, total children at the same address, primary language, Individualized Education Program (IEP) participation, school attendance, standardized testing results (reading, language, math percentiles), and chronic diseases (asthma, allergy, diabetes, seizures). For the cross-sectional analyses in this report, data for the most recent school year, 2015/16, were extracted for all Pre-K 3 and 4, kindergarten, and 3rd, 6th and 9th grade students in the Consolidated School District of New Britain.

The PowerSchool data was supplemented with the New Britain Health Department's MS Access database which included Health Assessment Records for two large preschools only: the Human Resource Agency's Head Start and the YWCA's preschool program, both of which are outside of the Consolidated School District of New Britain. The data extracted for this report from the Health Department's databases included: date of birth, sex, grade, race, ethnicity, health insurance status, dental insurance status, asthma status, diabetes status, height, and weight.

For the time trend analyses, previously extracted data was combined with the 2015/16 data. This included PowerSchool data for the 2013/14, 2014/15 school years, as well as data from the MS Access databases for school years 2011/12, 2012/13, and 2014/15.

A second de-identified dataset was extracted from the PowerSchool database this year. It was a longitudinal dataset that included only children with more than one height and weight measurement in the PowerSchool database. Extracted data included gender, race/ethnicity, height, weight, age in months at time of height and weight measurement, primary language, Individualized Education Program (IEP) participation, and asthma status. The purpose of the dataset was to examine trends in BMI using changes by child. For this analysis, each child's change in BMI over time was examined. This is different than looking at BMI change by cohort. In the cohort analysis, the children included in the analysis may or may not be the same, due to new enrollments and attrition.

Analyses

Cross-sectional analyses of the 2015/16 data

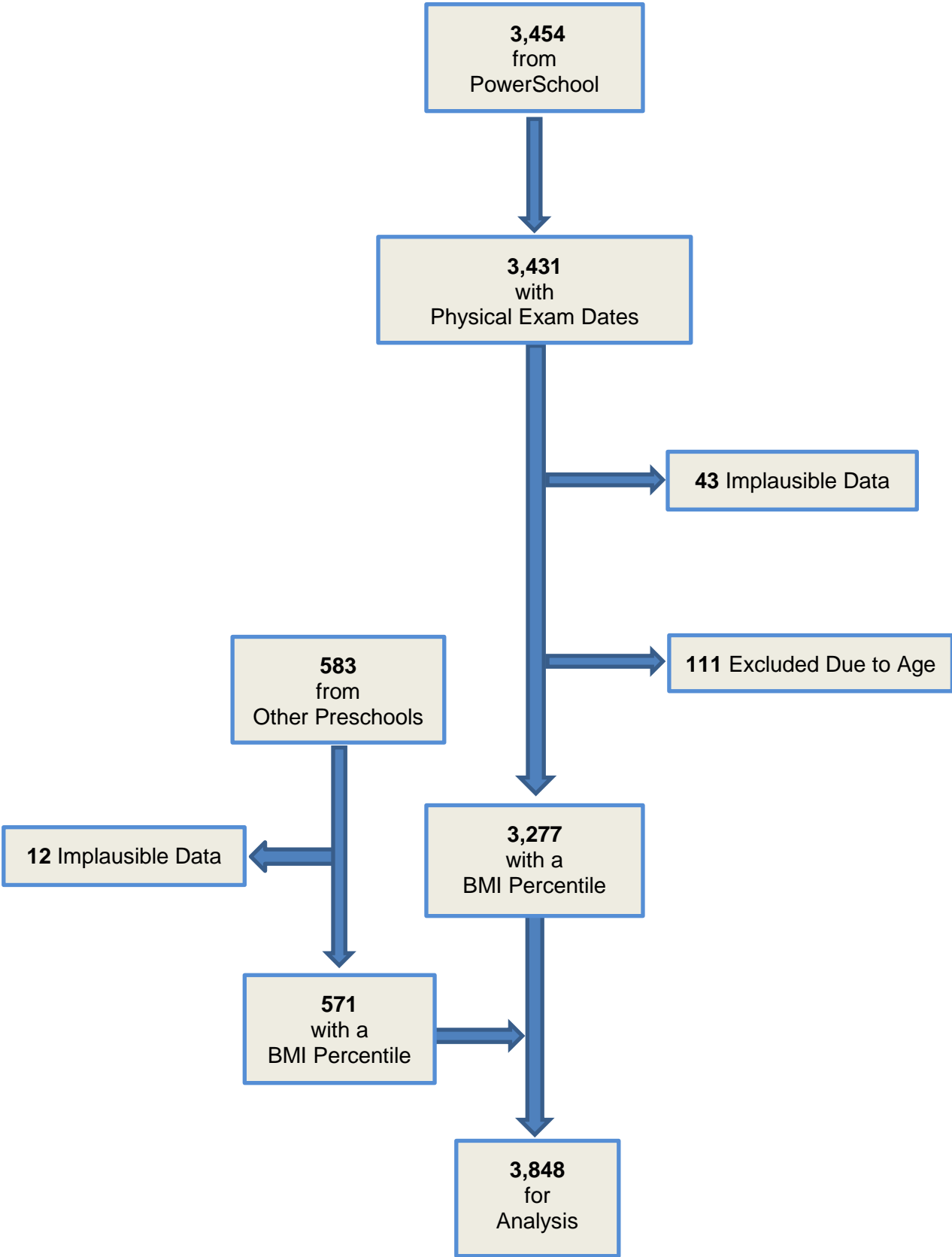
Using data from the combined sources, the 2015/16 school year demographics, weight status, and chronic conditions, primarily asthma and allergies, were examined. Data is summarized by grade and by weight category. Body mass index (BMI) and BMI percentiles were calculated for each student using SAS programs 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.

The analyses that incorporate 2015/16 school year data from the PowerSchool database and the Health Department's MS Access database included a combined sample size of 3,848 children with BMI percentiles. This includes the final analytic sample from PowerSchool consisting of 3,277 children and another 571 preschool children from the 2015/16 data provided by the Health Department as shown in Figure 1. PowerSchool data for 3,454 children was provided, but 177 were excluded from the analyses (n=3,277). 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 7/1/2015, and for several reasons related to 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 typical age for children in that grade. For example, the typical age for a child in kindergarten is 5 years old, so ages older than 6 or less than 4 were excluded. Analyses of BMI and asthma data used the combined datasets (3,848 children), while all other analyses are based on the 3,277 children from the PowerSchool database. The PowerSchool data represent between 68% and 96% of all students in the Consolidated School District of New Britain in the grades studied (Table 1).

Table 1. 2015-16 Consolidated School District of New Britain Child Data Sample

	Overall	Pre-K 3	Pre-K 4	Kindergarten	3rd Grade	6th Grade	9th Grade
Official Enrollment	3,891	277	329	925	831	716	813
Sample Size	3,277	188	288	817	794	623	567
Percent of enrollment	84.2	67.9	87.5	88.3	95.5	87.0	69.7

Figure 1. 2015-16 School Year Data and Analytic Sample



Longitudinal Analyses of Weight Status

Longitudinal data was analyzed three ways to identify possible changes in overweight/obesity among New Britain children over time. In addition to the 2015/16 data used above, school year data was available from four previous school years (2011/12, 2012/13, 2013/14, 2014/15) as well as the individual BMI data over time which was provided for this year's report.

Individual Child BMI Analysis

This approach used data for children who had two or more BMI measurements in the PowerSchool database. Data was available for 2,856 de-identified children who had more than one BMI measurement in the PowerSchool database. Age at measurement varied between 2 and 18 years old. However, upon close inspection, most children had 2 or 3 measurements within a time span of 5 years. Because of this, we divided the data into 2 time frames for analysis – ages 3 to 8 and 9-16. To be included in a time frame, a child needed at least 2 measurements during the period. For example, in time frame 3 – 8 years old, a child needed to have 1 measurement at age 3, 4, or 5 and a second measurement at age 6, 7, or 8. Most children had measurements at age 4 and 8. This time frame had 709 children with at least 2 weight measurements. In time frame 9 – 16 years old, a child needed to have 1 measurement at age 9, 10, 11 or 12 and a second measurement at age 13, 14, 15 or 16. Most children had measurements at age 11 and 14. This time frame had 585 children with at least 2 weight measurements. We then classified the children in the CDC weight categories at each time point using their ages at time of the measurement. Using two final categories of healthy/underweight and overweight/obese, we examined the change in category from beginning to end of time frame, overall and by ethnicity. Chi-square tests were used to detect significant changes in weight classification.

Historical Analysis

This approach looked at whether the rate of overweight/obesity for a given grade-level changed significantly across school years. For this analysis, the data used did not follow individual students over time. The percent of overweight/obese children in Pre-K 3, Pre-K 4, kindergarten, and 6th and 9th grade were calculated for each school year using available data from 2011/2012 through 2015/16. Analyses included five years of weight status data for kindergarten, 6th and 9th graders (2011/12 – 2015/16) and four years of data for children in Pre-K 3 and 4 (no preschool data was available for 2011/12). Statistical analyses included the Cochran-Armitage Trend Test to detect whether the prevalence of overweight/obesity changed significantly over time. Table 2 shows the number of children with available data by grade for grade-level historical comparisons of overweight/obesity prevalence. A total of 16,986 records were available from the New Britain databases.

Table 2. Historical Data: Number of Children in Data Files by Grade and Year

Year	Total # of children	Pre-K 3	Pre-K 4	Kindergarten	2nd Grade	3rd Grade	6th Grade	9th Grade
2011/12	2,036	n/a	n/a	827	n/a	n/a	669	540
2012/13	3,204	523	599	908	n/a	n/a	589	585
2013/14	3,389	584	818	902	n/a	n/a	620	465
2014/15	4,509	479	538	800	776	700	573	643
2015/16	3,848	460	587	817	n/a	794	623	567
Total	16,986	2,046	2,542	4,254	776	1,494	3,074	2,800

Cohort Analysis

Change in weight status over time was also explored using ‘cohorts’ of children and following them over time. The de-identified data used makes it impossible to know how many of the same children appear in each year of data; however, it is expected that many of the children are in all three years of the data. This report focuses on two cohorts with data beginning in Pre-K 3. Cohort 1 consists of all children (for whom there was BMI data) who were in Pre-K 3 in 2012/13 while Cohort 2 includes children who were in Pre-K 3 in 2013/14. Both cohorts were then examined for the next two consecutive years first using the data for Pre-K 4 children and then the data for children in kindergarten. Table 3 shows the school year and number of children in the data files for both cohorts of children. For example, the weight status of Cohort 1 is assessed using available data for children in Pre-K 3 during the 2012/13 school year, Pre-K 4 during the 2013/14 school year and kindergarten during the 2014/15 school year. Statistical analyses included chi-square tests to detect significant differences in overweight/obesity prevalence between the two cohorts at each grade level and Cochran-Mantel-Haenszel test to detect differences in the distribution of weight classifications over time.

Table 3. Pre-Kindergarten Cohort Analyses: Number of Children in Data Files by Cohort and School Year

Cohort	Year Pre-K 3	Year Pre-K 4	Year Kindergarten
1	2012/13 523	2013/14 81	2014/15 800
2	2013/14 584	2014/15 538	2015/16 817

Demographics 2015-2016

Age, gender, race and ethnicity of the full sample of 3,848 children overall and by grade are shown in Table 4. Average ages for each grade are as expected given the inclusion criteria stated above. Males and females are fairly evenly split in the sample, overall and within each grade. Hispanic/Latino students account for 64% of the children. Far fewer students in the district were White (18%) or Black (14%).

Table 4. Demographics Data for New Britain Students in the Combined Databases 2015/16

	Overall	Pre-K 3	Pre-K 4	Kindergarten	3rd Grade	6th Grade	9th Grade
Sample Size, n (%)	3,848	460 (12.0)	587 (15.3)	817 (21.2)	794 (20.6)	623 (16.2)	567 (14.7)
Age Years, mean (SD)	7.8 (3.8)	3.4 (0.4)	4.5 (0.3)	4.8 (0.5)	8.7 (0.4)	11.0 (0.5)	14.3 (0.7)
Gender, n (%)							
Female	1,870 (48.6)	228 (49.6)	298 (50.8)	390 (47.7)	402 (50.6)	287 (46.1)	265 (46.7)
Male	1,978 (51.4)	232 (50.4)	289 (49.2)	427 (52.3)	392 (49.4)	336 (53.9)	302 (53.3)
Ethnicity, n (%)							
Asian/Pacific Islander	145 (3.8)	21 (4.6)	31 (5.3)	23 (2.8)	30 (3.8)	28 (4.5)	12 (2.1)
Black, non-Hispanic	520 (13.5)	81 (17.6)	86 (14.7)	99 (12.1)	94 (11.8)	78 (12.5)	82 (14.5)
Hispanic/Latino	2,478 (64.4)	290 (63.0)	346 (58.9)	540 (66.1)	519 (65.4)	397 (63.7)	386 (68.1)
Other	20 (0.5)	5 (1.1)	10 (1.7)	1 (0.1)	1 (0.1)	2 (0.3)	1 (0.2)
White, non-Hispanic	678 (17.6)	61 (13.3)	110 (18.7)	154 (18.9)	150 (18.9)	117 (18.8)	86 (15.2)
Missing	7 (0.2)	2 (0.4)	4 (0.7)	0 (0.0)	0 (0.0)	1 (0.2)	0 (0.0)

Additional demographics in Table 5 show that two-thirds of the 3,277 children in the PowerSchool database speak English as their primary language. Primary language varies significantly by grade level. Almost one-third of students in grades 6 and 9 spoke Spanish as their primary language compared to 20% or fewer students in the other grades.

Table 5. Additional Demographics for Students in PowerSchool Database 2015/2016

	Overall	Pre-K 3	Pre-K 4	Kindergarten	3rd Grade	6th Grade	9th Grade	<i>p</i>
Sample Size, n (%)	3,277	188 (5.7)	288 (8.8)	817 (24.9)	794 (24.2)	623 (19.0)	567 (17.3)	
Primary Language, n (%)								<.0001
English	2,224 (67.9)	139 (73.9)	188 (65.3)	622 (76.1)	586 (73.8)	356 (57.1)	333 (58.7)	
Spanish	756 (23.1)	34 (18.1)	60 (20.8)	121 (14.8)	142 (17.9)	205 (32.9)	194 (34.2)	
Other	297 (9.1)	15 (8.0)	40 (13.9)	74 (9.1)	66 (8.3)	62 (10.0)	40 (7.1)	
Number of children in school system at address, n (%)								<.0001
1	1,507 (46.0)	101 (53.7)	128 (44.4)	412 (50.4)	333 (41.9)	249 (40.0)	284 (50.1)	
2 - 3	1,343 (41.0)	59 (31.4)	105 (36.5)	303 (37.1)	366 (46.1)	294 (47.2)	216 (38.1)	
4 or more	427 (13.0)	28 (14.9)	55 (19.1)	102 (12.5)	95 (12.0)	80 (12.8)	67 (11.8)	

Educational Services, Testing, and Attendance

Table 6 describes the educational services received, test scores, and school attendance data from the PowerSchool database overall and by grade. 593 students (18%) from preschool, kindergarten, 3rd, 6th and 9th grade received special education and 17% of students in kindergarten, 3rd, 6th and 9th grade (n=553) received English Language Learner (ELL) services. Students in kindergarten were less likely to receive ELL services than older students in 3rd, 6th or 9th grade.

Standardized reading and math test scores/percentiles were available for children in kindergarten, and 3rd, 6th and 9th grade. Language scores were unavailable for kindergarten students, but available for all other grades. As shown in Table 6, scores were 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 32%, 27%, and 37% of children were above the 50th percentile in the reading, math, and language scores, respectively.

Table 6. School-related Data for Students in PowerSchool Database 2015/16, n (%)

	Overall	Pre-K 3	Pre-K 4	Kindergarten	3rd Grade	6th Grade	9th Grade
Sample Size	3,277	188 (5.7)	288 (8.8)	817 (24.9)	794 (24.2)	623 (1 9.0)	567 (17.3)
ELL Services							
Yes	553 (16.9)	n/a	n/a	101 (12.4)	185 (23.3)	146 (23.4)	121 (21.3)
No	2724 (83.1)	n/a	n/a	716 (87.6)	609 (76.7)	477 (76.6)	446 (78.7)
Special Education							
Yes	593 (18.1)	81 (43.1)	102 (35.4)	97 (11.9)	93 (11.7)	105 (16.9)	115 (20.3)
No	2,684 (81.9)	107 (56.9)	186 (64.6)	720 (88.1)	701 (88.3)	518 (83.1)	452 (79.7)
Reading RIT, 50th percentile							
Above	853 (32.1)	n/a	n/a	232 (29.1)	305 (39.1)	179 (29.4)	137 (29.2)
Below	1,803 (67.9)	n/a	n/a	566 (70.9)	475 (60.9)	430 (70.6)	332 (70.8)
Math RIT, 50th percentile							
Above	703 (26.5)	n/a	n/a	257 (32.4)	222 (28.5)	119 (19.6)	105 (22.3)
Below	1,947 (73.5)	n/a	n/a	537 (67.6)	558 (71.5)	487 (80.4)	365 (77.7)
Language RIT, 50th percentile							
Above	688 (37.2)	n/a	n/a	n/a	333 (43.0)	204 (33.3)	151 (32.6)
Below	1,162 (62.8)	n/a	n/a	n/a	442 (57.0)	408 (66.7)	312 (67.4)
Chronic Absenteeism, ≤ 90% attendance							
Yes	662 (20.2)	63 (33.5)	103 (35.8)	133 (16.3)	57 (7.2)	91 (14.6)	215 (38.0)
No	2,614 (79.8)	125 (66.5)	185 (64.2)	684 (83.7)	737 (92.8)	532 (85.4)	351 (62.0)

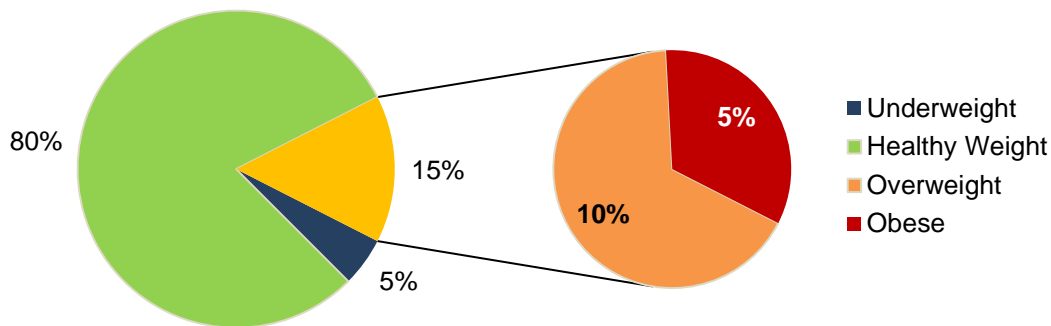
School attendance of 90% or lower is considered chronic absenteeism. The chronic absenteeism rate among New Britain students was 20%, with the lowest rate of absenteeism among the 3rd graders (7%) and the highest rates among preschoolers and 9th graders. The chronic absenteeism rate among 9th grade students was 38%—nearly 2.5 times the statewide rate for high school students [10]. However, this was a significant decrease when compared to last year’s 46% absenteeism among 9th graders ($p < 0.01$).

Body Mass Index and Weight Classifications

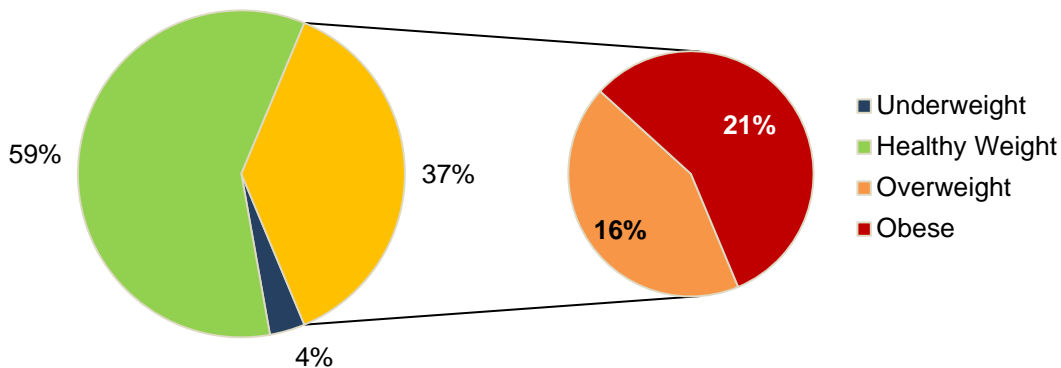
BMI percentile indicates the relative position of the child's BMI adjusted for sex and age. The CDC has defined weight categories based on percentiles: Underweight (< 5th percentile), Healthy Weight (5th to < 85th percentile), Overweight (85th to < 95th percentile), and Obese (95th percentile and above). 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

CDC Guidelines

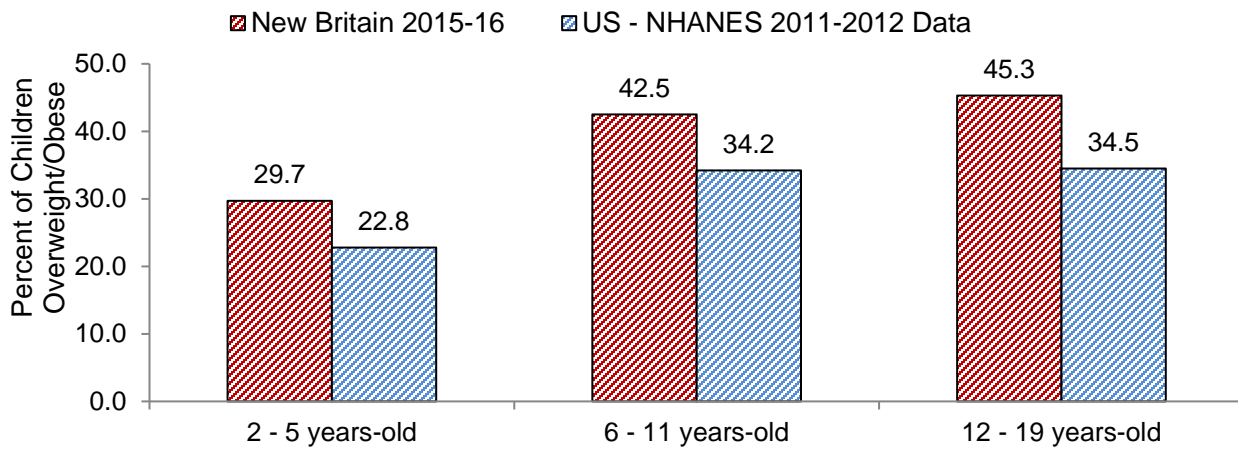


New Britain Overall



The weight distribution among New Britain school children is very different compared to the CDC recommendations (Figure 2). In sharp contrast to the 15% expected according to CDC guidelines, 37% of New Britain children are overweight or obese. There are 1.5 times (16% versus 10%) as many overweight and four times (21% versus 5%) as many obese children as CDC guidelines suggest. When compared to US rates of overweight and obesity for children of preschool age (2 to 5 years old), elementary age (6 to 11 years old), and adolescent age (12 to 19 years old), a higher proportion of New Britain children were overweight/obese (Figure 3).

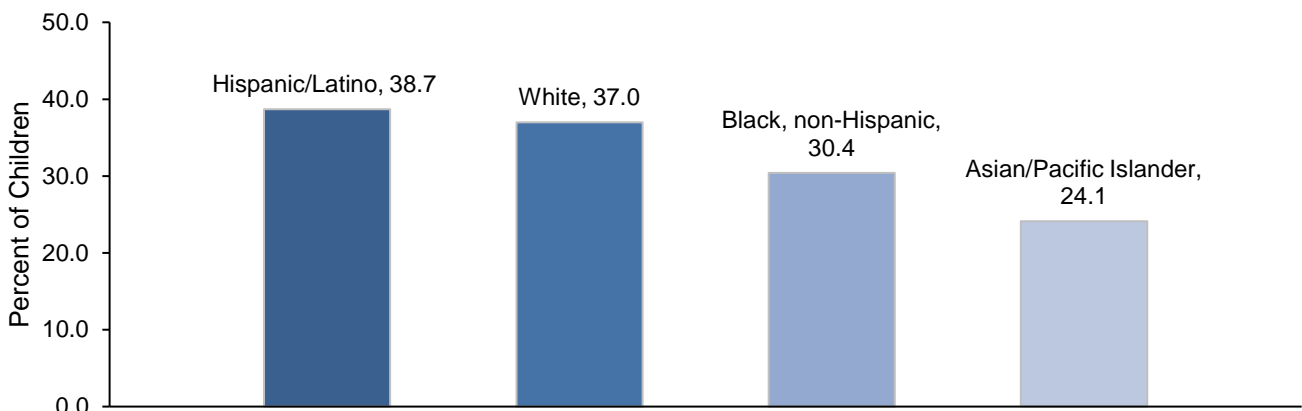
Figure 3. Percent New Britain Children Overweight/Obese Compared to United States Population



Weight Classification by Gender and Race/Ethnicity

Table A1 in the Appendix shows the distribution of weight classifications by different demographic groups. New Britain's rates of overweight/obesity by demographic groups are consistent with findings from national data [1]. Overall rates of overweight/obesity were similar for male (36%) and female (37%) students in the district. Significant differences between racial/ethnic groups existed, however. Hispanic/Latino children (39%) and White (37%) children were more likely to be overweight/obese than children of Black (30%) and Asian/Pacific Islander (24%) heritage (Figure 4). Neither the differences between Hispanic/Latino and White children or Black and Asian/Pacific Islander were statistically significant. Among Hispanic/Latino students, those whose primary language was Spanish were significantly more likely to be overweight/obese than students whose primary language was English (44% versus 38%, $p < .01$).

Figure 4. Percentage of Children who are Overweight/Obese by Race/Ethnicity



Weight Classification by Grade

Figure 5 shows the percent of students in each weight category by grade alongside the CDC guidelines. In every grade, there were far fewer students at a healthy weight than recommended by CDC guidelines, and more students who were overweight and obese. The district's youngest children had the highest proportion of healthy weights (68%), while almost half (45-48%) of the students in 6th and 9th grade were overweight or obese. The rate of overweight/obesity was significantly higher in kindergarten, 3rd and 6th grade than all lower grades (Figure 6). For example, the rate of overweight/obesity in 6th grade was higher than in Pre-K, kindergarten, and 3rd grade students.

Figure 5. Weight Classification of New Britain Students by Grade

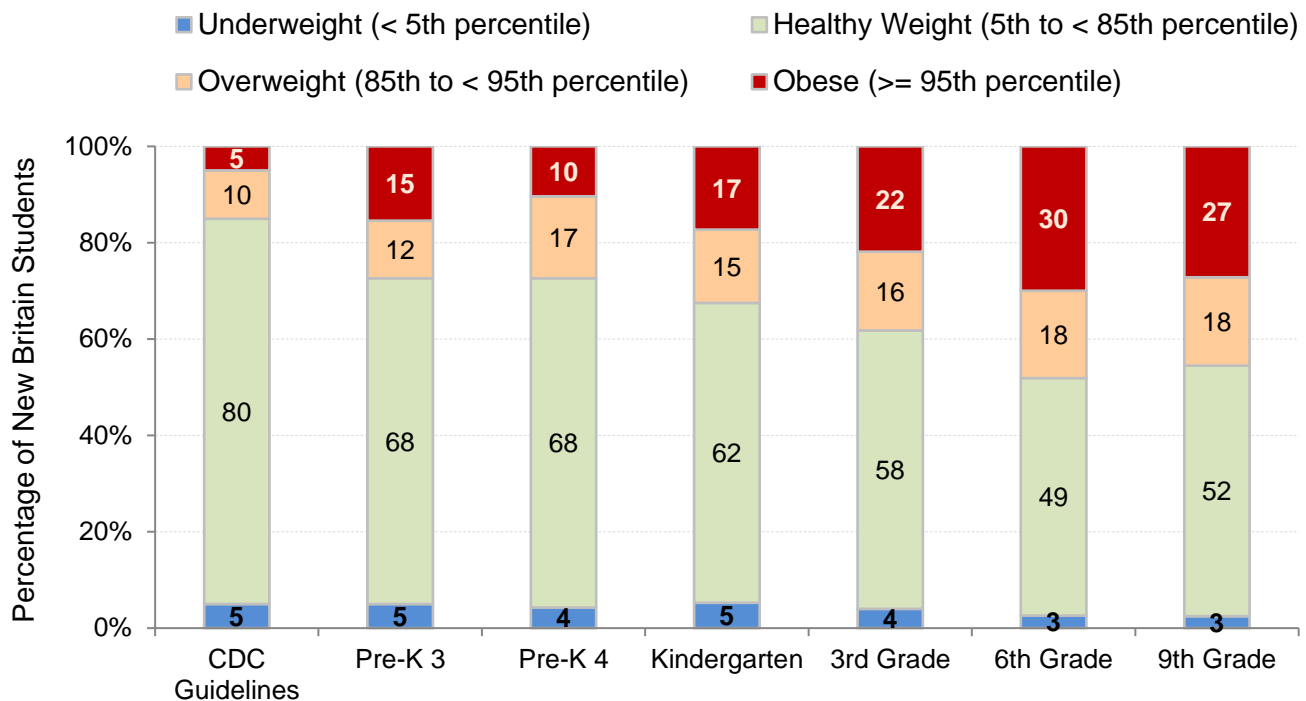
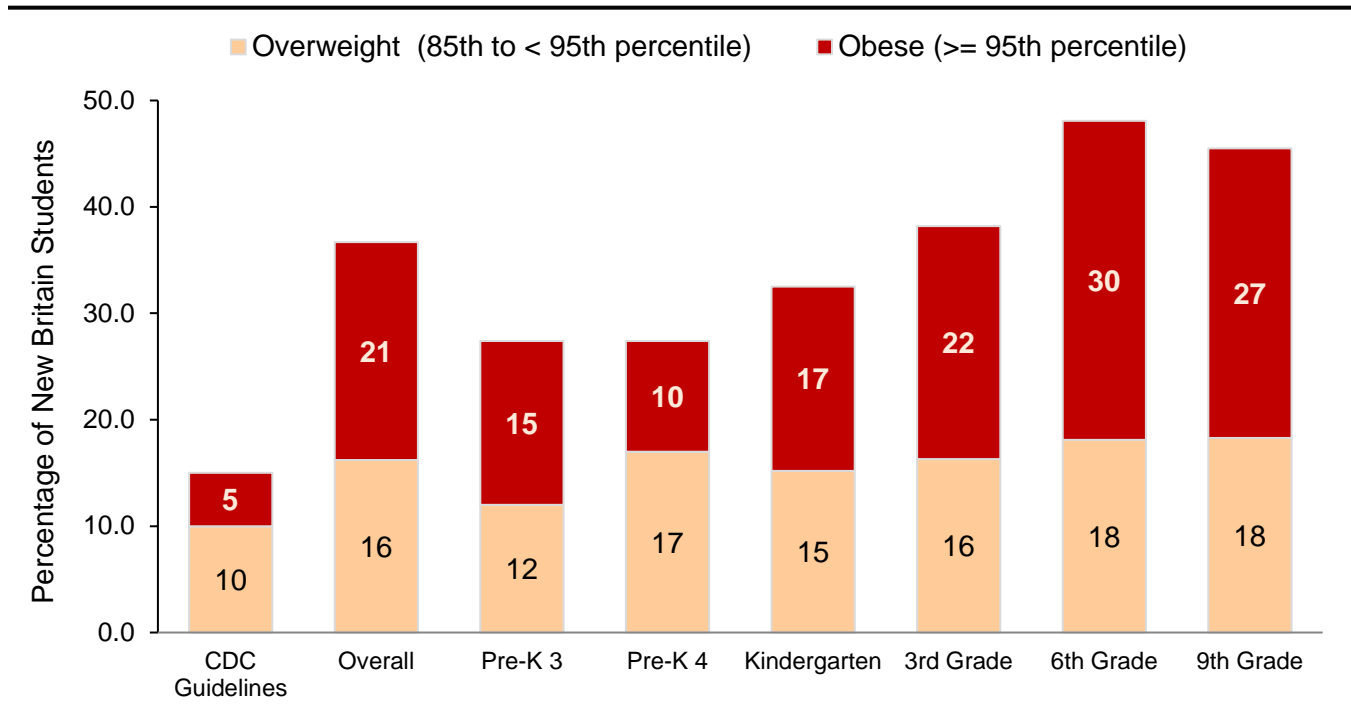


Figure 6. Percent of New Britain Students Overweight and Obese by Grade



A data summary with the complete weight distribution for each school is provided in the Appendix (Table A2).

Weight Classification and School Performance

Table 7 shows test results by weight category. Average reading, math and language test scores did not differ significantly by weight category. Although not statistically significant, differences in average language scores by weight category approached significance, with obese children (average percentile, 37) scoring lower than underweight (average percentile, 40), healthy weight (average percentile, 40), and overweight (average percentile, 43) children. The proportion of children scoring above the 50th percentile on the reading test and language test varied significantly by weight classification, with fewer obese children and more overweight children above the 50th percentile. However, once child demographics (race/ethnicity, primary language, gender), asthma status and absenteeism were accounted for, weight status was no longer associated with test scores. This is because overweight/obese children are more likely to have asthma, and children with asthma are less likely to score above the 50th percentile of test scores. The relationship between weight status, asthma, and test scores is further described in the asthma section below.

Table 7. School Performance by Weight Classification 2015/16

	Sample Size	Underweight (< 5 th percentile)	Healthy Weight (5 th to < 85 th percentile)	Overweight (85 th to < 95 th percentile)	Obese (>= 95 th percentile)	<i>p</i>
Reading RIT						
Percentile, mean (SD)	2,656	37.2 (27.0)	37.9 (27.3)	40.8 (28.0)	37.1 (26.7)	0.19
Percent above 50 th percentile	2,656	31.7	31.8	37.9	28.8	0.02
Math RIT						
Percentile, mean (SD)	2,650	32.4 (26.0)	32.7 (26.3)	35.0 (27.2)	31.5 (24.8)	0.36
Percent above 50 th percentile	2,650	27.7	26.7	28.2	24.7	0.63
Language RIT						
Percentile, mean (SD)	1,850	40.2 (28.1)	39.6 (28.5)	42.9 (29.5)	37.0 (27.5)	0.06
Percent above 50 th percentile	1,850	36.8	37.1	43.1	33.4	0.05

Longitudinal Analysis of Overweight/Obesity

The combined data from the Health Assessment Records and PowerSchool database provide an opportunity to track weight changes in children over time. Results for BMI trajectories, historical data, and cohort data are presented.

Individual Child BMI Trajectories

Ages 4 and 8

At age 4, 38% of the children were already in the overweight/obese category. These children were 10 times as likely to be overweight/obese at age 8 compared to the other children. Seventy-seven percent of children remained in the same weight category during this age range. Thus, there was some movement between categories. The shifting of categories is most likely due to children who are very near the 85th percentile of BMI at each age. Twenty-nine percent of the children who were overweight/obese at age 4, moved to the healthy/underweight category at age 8. Additionally, 19% of the children who were healthy weight/underweight at age 4 were in the overweight/obese category at age 8. At age 8, there were still 38% of the children in the overweight/obese category. These patterns of change were similar among White, Black, and Hispanic children.

Ages 11 and 14

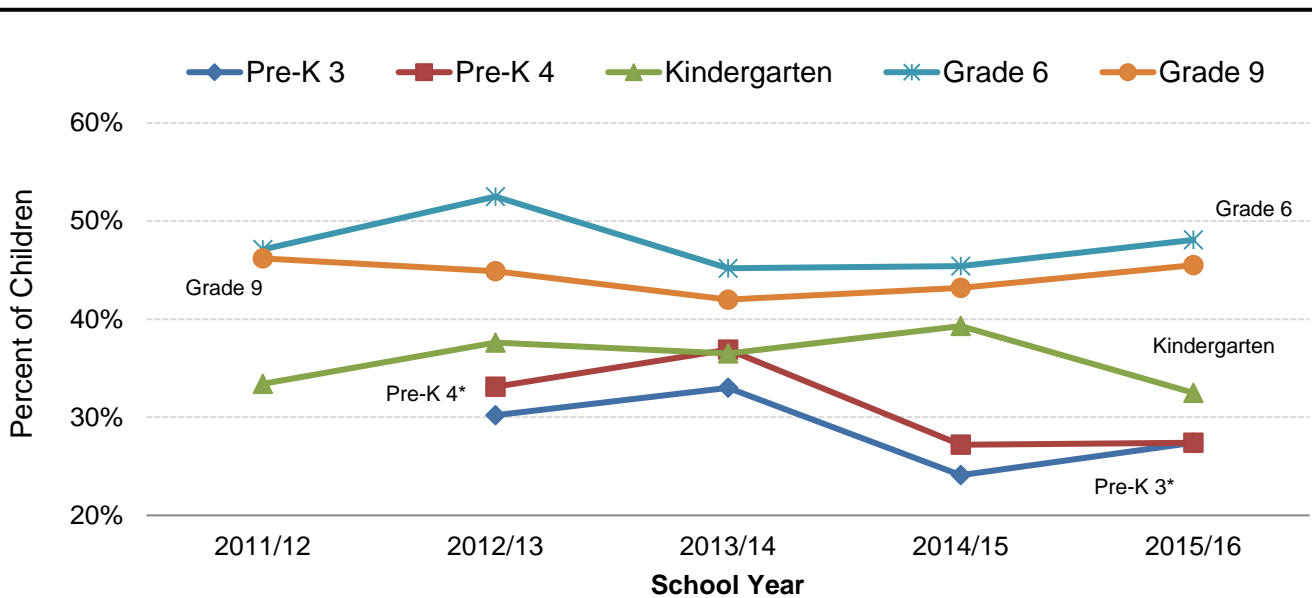
At age 11, 48% of the children were in the overweight/obese category. These children were 27 times as likely to be overweight/obese at age 14 compared to the other children. In fact, 84% of children

remain in the same weight category during these ages. However, there was some movement between categories – though less movement than at the younger ages. Twenty-one percent of the children who were overweight/obese at age 11, moved to the healthy/underweight category at age 14. Additionally, 12% of the children who were healthy weight/underweight at age 11 were in the overweight/obese category at age 14. By age 14, the overall percent of overweight/obese children had decreased to 44%. These patterns of change were similar among White, Black, and Hispanic children.

Historical Data

The historical data analyzed represents different groups of children for each year and shows the rate of overweight/obesity year by year. Figure 7 shows the proportion of overweight/obese children by grade during each school year with available data. In the four school years from 2011/12 to 2015/16, the rate of overweight/obese children in preschool appears to trend downward ($p < .05$). The rates for children in kindergarten, 6th grade and 9th grade fluctuated from year to year during the years studied but did not change significantly overall and no significant differences were found when comparing boys and girls. More years of data will be needed to determine if these are true trends or simply random variation in the groups of children. (In the Appendix, detailed information on student weight classifications by grade level for each available school year can be found in Table A3 and comparisons by gender can be found in Table A4).

Figure 7. Historical Analyses of Overweight/Obesity Prevalence among Children in Select Grades



*Pre-K 3 and Pre-K 4 showed significant decreases over time. The statistical test used was the Cochran-Armitage Trend Test.

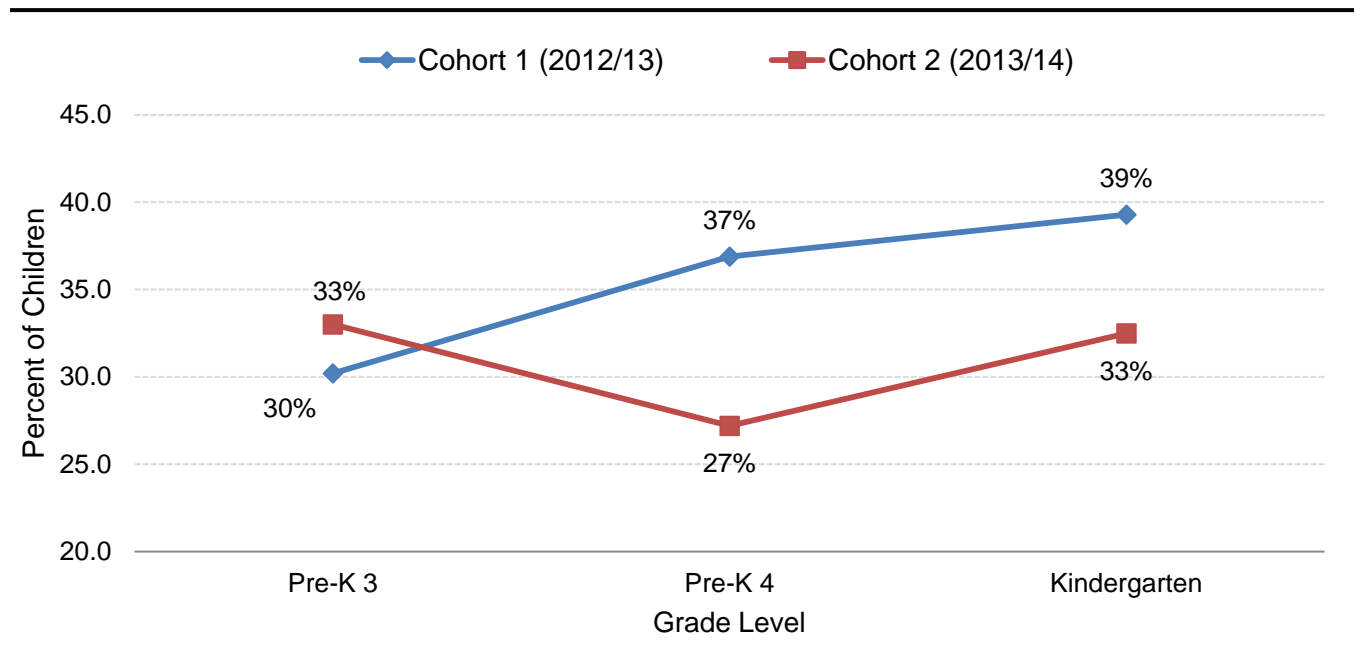
Cohort Data

The cohort analyses for this report focus on changes in weight status for two cohorts with data beginning in Pre-K 3. For discussion purposes, Cohort 1 consists of all children (for whom there was BMI data) who were in Pre-K 3 in 2012/13 and Cohort 2 includes children who were in Pre-K 3 in 2013/14. Each cohort was examined for the next two consecutive years using Pre-K 4 and then kindergarten data. The prevalence of overweight/obesity increased significantly during the preschool to kindergarten years for the Cohort 1 but not Cohort 2. Much of the observed increase for the Cohort 1

was due to the increase in the number of obese children, whereas the number of overweight children remained fairly constant. As shown in Figure 8, the Cohort 2 appears to show a drop in the number of overweight and obese children from 33% in Pre-K 3 to 27% in Pre-K 4. However, the number returns to the original 33% in kindergarten. It is possible that these fluctuations are due to having different children in the samples from year to year.

Of note, Cohort 2 had a significantly lower rate of overweight/obesity when compared to Cohort 1. Although the rate of overweight/obesity did not differ when the cohorts of children were in Pre-K 3, the rate of overweight/obesity in both Pre-K 4 (27% versus 37%, $p < .001$) and kindergarten (32% versus 39%, $p < .01$) was significantly lower for the group of children who entered Pre-K 3 in 2013/14 (Cohort 2).

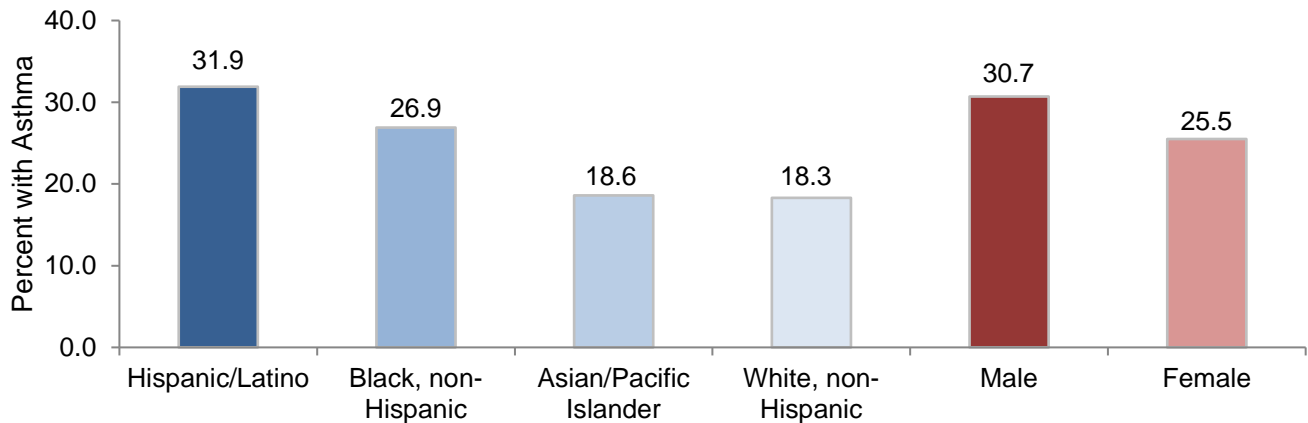
Figure 8. Cohort Analyses of Overweight/Obesity Prevalence in Early Childhood



Asthma

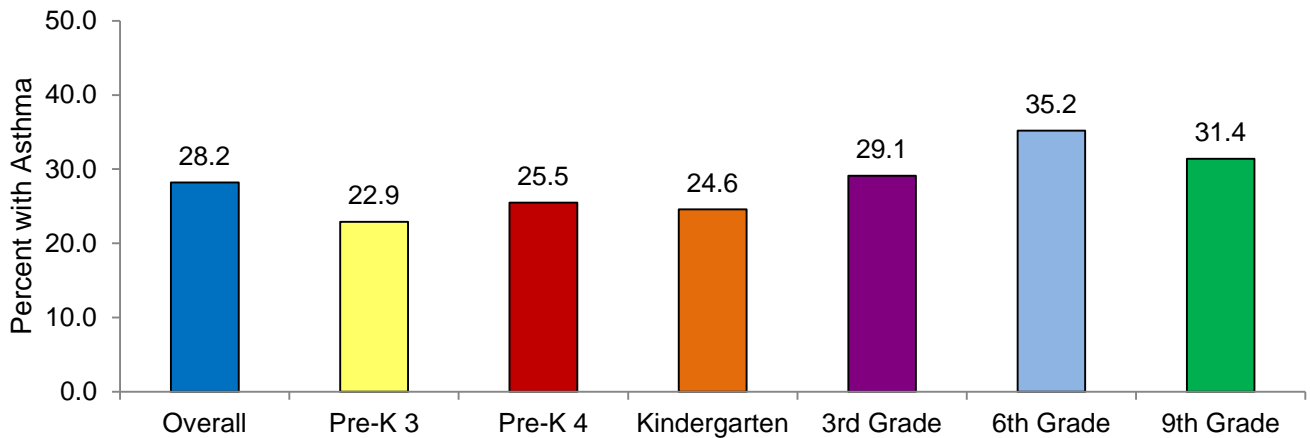
The physician-confirmed asthma prevalence rates are presented for New Britain students in preschool, kindergarten, 3rd grade, 6th grade and 9th grade. Table A5, located in the Appendix, summarizes asthma rates by demographics, grade, school services received, attendance and standardized test scores. Overall, 28% of New Britain students had physician-confirmed asthma during the 2015/16 school year. Prevalence of asthma was significantly higher among boys than girls (31% versus 26%) and Hispanic/Latino students compared to non-Hispanic students (Figure 9). Asthma prevalence was highest among Hispanic/Latino (32%) and non-Hispanic Black students (27%) whereas significantly fewer non-Hispanic white and Asian students (18%) had physician confirmed asthma. These demographic differences in asthma prevalence found for New Britain students are similar to differences reported for students in Connecticut public schools by the Department of Public Health. The Connecticut School-based Asthma Surveillance Report found significantly higher rates of asthma among boys and a higher prevalence of asthma among Hispanic students and non-Hispanic black students when compared to non-Hispanic white or Asian students [11].

Figure 9. Percent of Students with Asthma by Gender and Race/Ethnicity



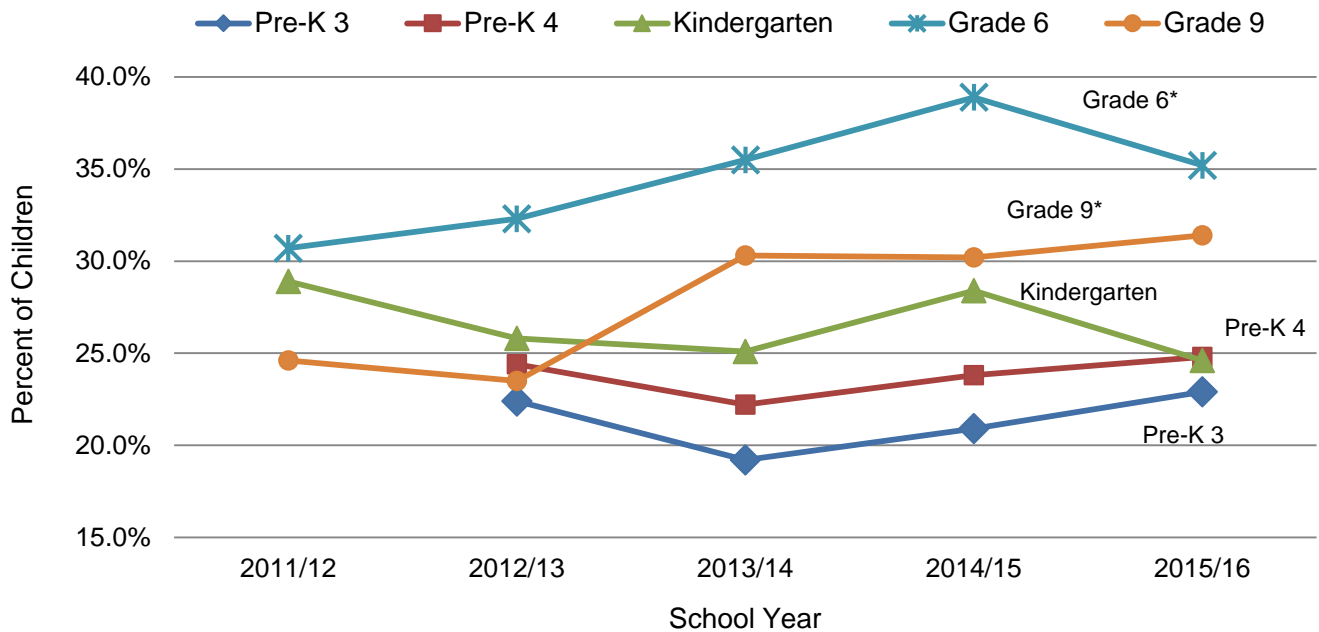
Physician-confirmed asthma prevalence also varied by grade (Figure 10). Students in Pre-K 3 had the lowest asthma rate (23%). Rates were significantly higher among older children in 3rd grade (29%) and 6th grade (35%) when compared to students in Pre-K 3 and kindergarten (25%). Among the grades studied, asthma rates appear the highest among the 6th grade students. Although 4% lower, the asthma prevalence among 9th grade students is not statistically different from the asthma prevalence among 6th grade students. The reason for this leveling off or decrease in asthma rates is unknown, but it is generally consistent with other observations of asthma rates in adolescence [12]. A lower rate among 9th grade students was also seen in previous New Britain surveillance reports (2011/12, 2012/13, 2013/14, 2014/15). Asthma rates for many of New Britain's public schools are shown in Table A6 located in the Appendix.

Figure 10. Percent of Children with Asthma Overall and by Grade Level



Historical data on the asthma prevalence among students in Pre-K 3, Pre-K 4, kindergarten, 3rd grade, 6th grade and 9th grade is shown in Figure 11. The data shows the year by year asthma prevalence at the grade level. In the four school years from 2011/12 to 2015/16, the rate of asthma in both 6th grade and 9th grade students appears to have trended upward ($p < .01$) whereas asthma rates for preschool, kindergarten and 3rd grade did not change significantly overall. More years of data will be needed to determine if these are true trends or simply random variation in the groups of children.

Figure 11. Historical Trends: Percent of Children with Asthma by Grade Level



*Grade 6 ($p = .01$) and Grade 9 ($p < .01$) showed significant increases over time. The statistical test used was the Cochran-Armitage trend test.

Asthma by Weight Classification

Figure 12. Asthma by Weight Classification

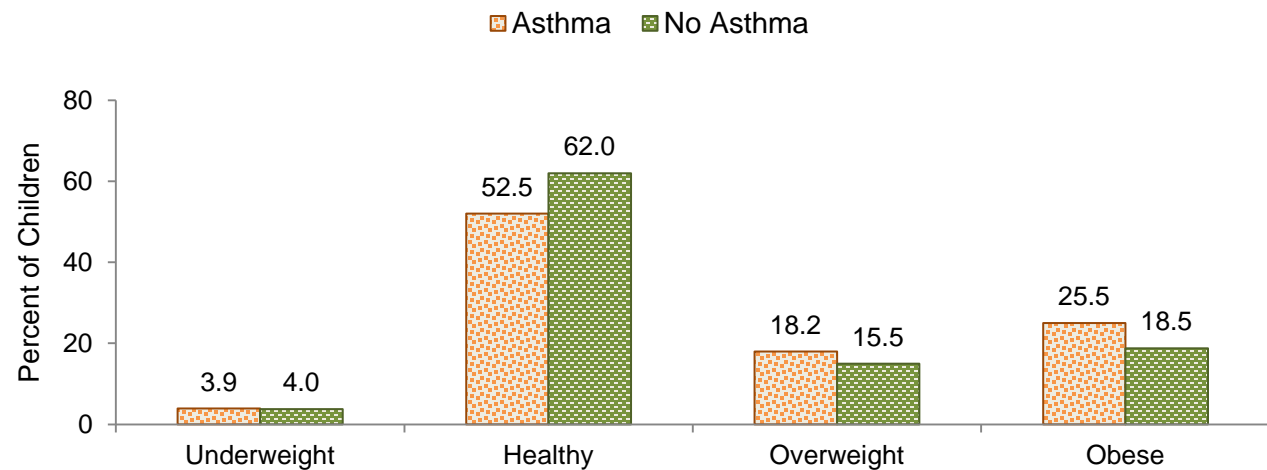
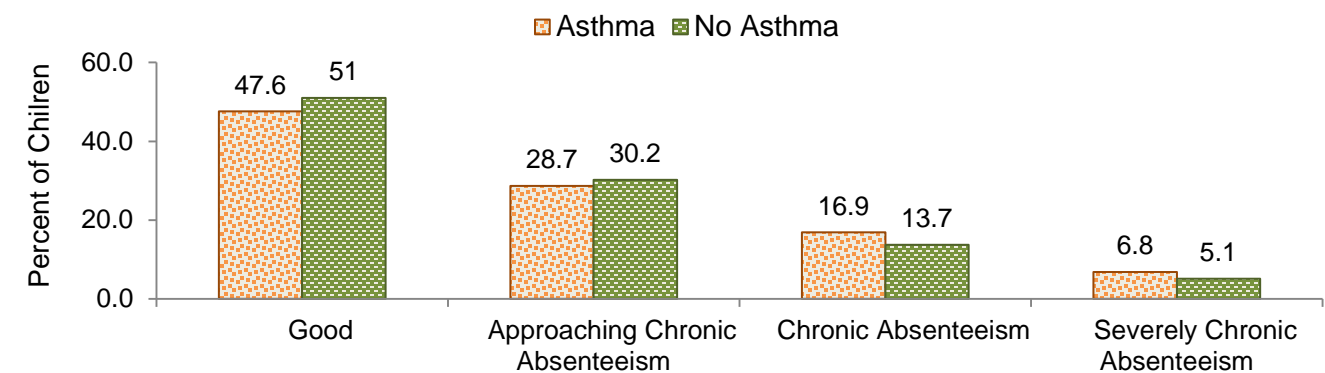


Figure 12 compares the weight classification of children with asthma to children without asthma. The rate of being overweight or obese was 44% for children with asthma compared to 34% among children without asthma ($p < .01$). More children with asthma were overweight (18% versus 16%, $p < .05$) and obese (26% versus 19%, $p < .01$) than children without asthma.

Asthma, Attendance and School Performance

Children with asthma may be at risk for missing more school days. Figure 13 compares attendance status for children with and without asthma. Significantly higher rates of chronic and severely chronic absenteeism were found among children with asthma when compared to children without asthma (24% versus 19%, $p < .01$). At the same time, children with asthma scored significantly lower on standardized test in reading, math, and language and were more likely than children without asthma to score below the 50th percentile (Appendix, Table A5).

Figure 13. Attendance Status by Asthma Diagnosis

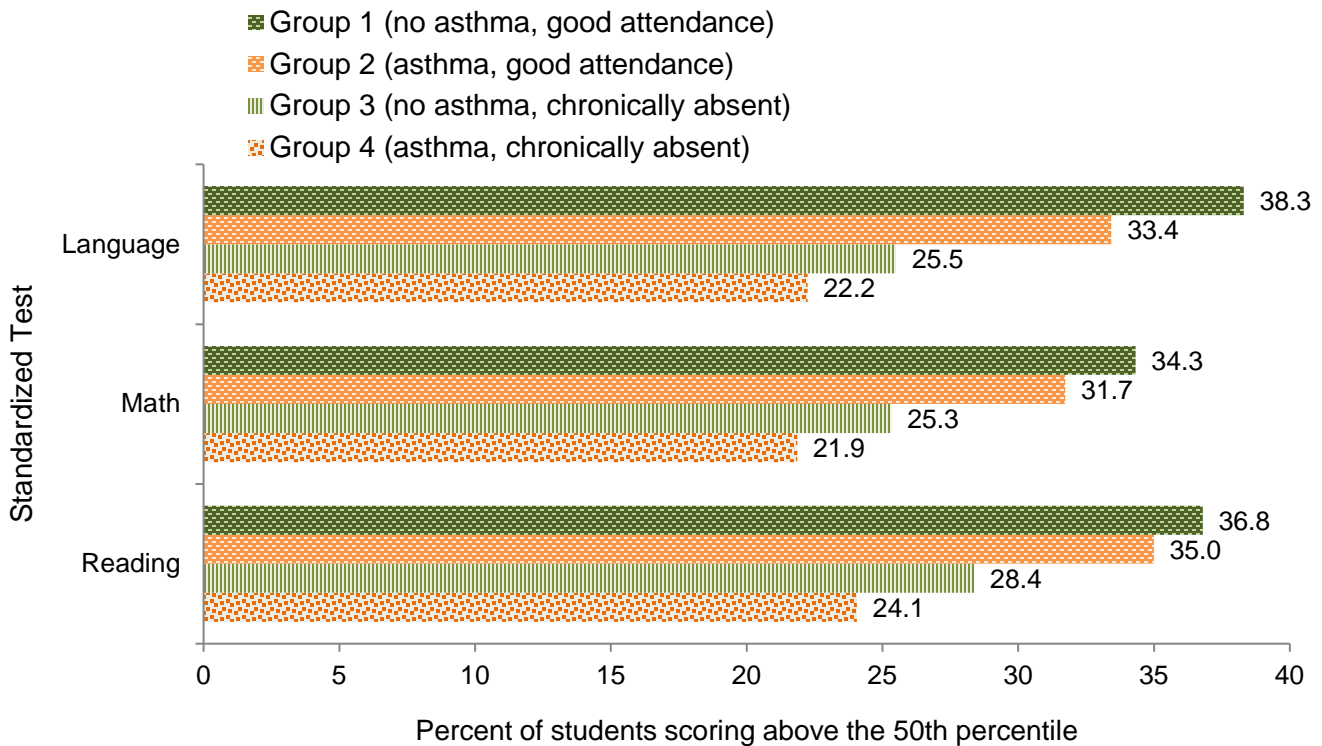


The association between standardized test scores, chronic absenteeism and asthma status was further examined using multivariate models. These models showed that both asthma and chronic absenteeism were associated with lower school performance. To separate the effects of asthma and absenteeism, 4 groups were created:

1. No asthma, good attendance
2. Asthma, good attendance
3. No asthma, chronically absent
4. Asthma, chronically absent

In models controlling for gender, primary language, and race/ethnicity, the proportion of children scoring above the 50th percentile was highest among children with no asthma and good attendance (Group 1) when compared to all other groups (Figure 14). However, even among children who were chronically absent, those with asthma were 29-47% less likely to score above the 50th percentile than those without asthma (odds ratios for Group 3 versus Group 4). Children with asthma who were chronically absent were 29-71% less likely to be above the 50th percentile on reading, math, and language tests than all three of the other groups (odds ratios for Group 4 versus Groups 1, 2, 3).

Figure 14. Student Test Scores by Asthma and Chronic Absenteeism*



*Holding race/ethnicity, primary language and gender constant.

Conclusions

Obesity and asthma are among the most serious chronic conditions faced by children in the United States [13]. This surveillance data for 2015-16 suggests disproportionately high rates of obesity and asthma among children in New Britain when compared to national statistics. The proportion of obese children was almost five times as many as expected according to CDC guidelines and the asthma prevalence was triple the national average [14]. Prevalence varied by race and ethnicity. New Britain children who were Hispanic or Latino had higher rates of being overweight/obese than Black or Asian children and higher rates of asthma than White or Asian children. Children who were Black also had significantly higher rates of asthma than White or Asian children.

Among New Britain children, asthma was related to childhood obesity as well as chronic absenteeism and lower scores on school performance assessments. Significantly fewer children with asthma scored above the 50th percentile on standardized reading, language or math tests. Even among children who were chronically absent, those with asthma were significantly less likely to score above the 50th percentile than those without asthma. Incorporating additional case management and air quality improvement initiatives within school, childcare and home settings may improve the health, attendance and test performance among children with asthma.

Longitudinal data suggest that rates of overweight/obesity may be decreasing among pre-school age children while rates of asthma have increased among older children in 6th and 9th grade. Community-based efforts are underway in New Britain to decrease obesity rates and improve asthma management for city children by 2019. The city-wide strategies for reducing obesity include school and early child care environmental approaches such as assessing preschool wellness policies and healthy food options at New Britain restaurants, and banning sugary drinks from school sporting events. Strategies also include increasing opportunities for physical activity by launching citywide bike paths, promoting after school program and sport participation, and adopting approaches recommended in “Step it Up! The Surgeon General’s Call to Action to Promote Walking and Walkable Communities.”

Strategies proposed to address asthma focus on encouraging pediatric providers to develop asthma action plans for children as recommended by the CDC, increasing awareness of asthma management programs available in the community, and offering school-based programs using the American Lung Association’s Open Airways for Schools curriculum to educate and empower children to self-manage their asthma. Planned strategies also include using the Environmental Protection Agency’s Indoor Air Quality Tools for Schools to prevent, diagnose and resolve indoor air problems. In addition to collaborating with local organizations on this multi-pronged approach to reduce the prevalence of obesity and improve asthma management, the City of New Britain is also committed to ongoing surveillance activities to monitor the success of these efforts.

References

1. Ogden CL, Carroll MD, Kit BK, Flegal KM (2014). Prevalence of childhood and adult obesity in the United States, 2011-2012. *Journal of the American Medical Association*, 311(8):806-814.
2. Ogden CL, and Carroll MD (2010). Prevalence of overweight, obesity, and extreme obesity among adults: United States, trends 1960-1962 through 2007-2008. National Center for Health Statistics, Centers for Disease Control and Prevention, Department of Health and Human Services, available at: www.cdc.gov/nchs/data/hestat/obesity_adult_07_08/obesity_adult_07_08.htm (accessed July 28, 2016).
3. World Health Organization (no date). Child overweight and obesity, global strategy on diet, physical activity and health, available at: www.who.int/dietphysicalactivity/childhood/en/ (accessed July 20, 2015).
4. Hannon TS, Goutham R, Arslanian SA (2005). Childhood obesity and type 2 diabetes mellitus. *Pediatrics*, 116(2): 473-480.
5. Center for Public Health and Health Policy (2015). Childhood obesity and asthma in the Consolidated School District of New Britain, Connecticut 2014-2015. University of Connecticut. (Prepared for the New Britain Health Department), available at: http://www.publichealth.uconn.edu/assets/newbritainreport_15.pdf (accessed July 28, 2016).
6. Hampton T (2014). Studies probe links between childhood asthma and obesity. *Journal of the American Medical Association*, 311(17): 1718-19.
7. Lu KD, Breyse PN, Diette GB, Curtin-Brosnan J, Aloe C, Williams DL, Peng RD, McCormack MC, Matsui EC (2013). Being overweight increases susceptibility to indoor pollutants among urban children with asthma. *Journal of Allergy and Clinical Immunology*, 131(4):1017-23.
8. Moonie S, Sterling DA, Figgs LW, Castro M (2008). The relationship between school absence, academic performance, and asthma status. *Journal of School Health*, 78(3):140-48.
9. Zavodny M (2013). Does weight affect children's test scores and teacher assessments differently? *Economics of Education Review*, 34:135-145.
10. Public School Information System, June 2014 Collection, (www.sde.ct.gov/sde/lib/sde/pdf/deps/chronicabsenteeism/learningfromthedata_statepresentation.pdf) (accessed July 21, 2015).
11. Peng, J, Nepaul A, Kloter, A, and Hargrove, S (2014). Connecticut School-based Asthma Surveillance Report 2014, School Years: Fall 2009-Spring 2012. Connecticut Department of Public Health, Community Health and Prevention Section, Hartford, CT. www.ct.gov/dph/lib/dph/hems/asthma/pdf/sbasr2014.pdf (accessed July 20, 2016).
12. Andersson M, Hedman L, Bjerg A, Forsberg B, Lundback B, Ronmark E (2013). Remission and persistence of asthma followed from 7 to 19 years of age. *Pediatrics*, 132(2):e435-e442.
13. Environmental Protection Agency (2015). Asthma Facts. EPA-402-F-04-019. https://www.epa.gov/sites/production/files/2015-10/documents/asthma_fact_sheet_eng_july_30_2015_v2.pdf
14. Centers for Disease Control and Prevention. Most Recent Asthma Data. 2014 National Health Interview Survey (NHIS) Data. Table 3-1 and Table 4-1. Webpage last updated: March 2016. http://www.cdc.gov/asthma/most_recent_data.htm (accessed July 28, 2016).

Appendix

Table A1. Demographics by Weight Classification 2015/16

	Sample Size	Underweight ($< 5^{\text{th}}$ percentile)	Healthy Weight (5^{th} to $< 85^{\text{th}}$ percentile)	Overweight (85^{th} to $< 95^{\text{th}}$ percentile)	Obese ($\geq 95^{\text{th}}$ percentile)	<i>p</i>
Overall, n (%)	3848	153 (4.0)	2282 (59.3)	625 (16.2)	788 (20.5)	
Grade, n (%)						<0.001
Pre-K 3	460 (12.0)	23 (5.0)	311 (67.6)	55 (12.0)	71 (15.4)	
Pre-K 4	587 (15.3)	25 (4.3)	401(68.3)	100 (17.0)	61 (10.4)	
Kindergarten	817 (21.2)	43 (5.3)	509 (62.3)	124 (15.2)	141 (17.3)	
3 rd Grade	794 (20.6)	32 (4.0)	459 (57.8)	129 (16.3)	174 (21.9)	
6 th Grade	623 (16.2)	16 (2.6)	307 (49.3)	113 (18.1)	187 (30.0)	
9 th Grade	567 (14.7)	14 (2.5)	295 (52.0)	104 (18.3)	154 (27.2)	
Gender, n (%)						0.46
Female	1870 (48.6)	68 (3.6)	1108 (59.3)	318 (17.0)	376 (20.1)	
Male	1978 (51.4)	85 (4.3)	1174 (59.4)	307 (15.5)	412 (20.8)	
Ethnicity, n (%)*						0.001
Asian/Pacific Islander	145 (3.8)	7 (4.8)	103 (71.0)	19 (13.1)	16 (11.0)	
Black, non-Hispanic	520 (13.5)	25 (4.8)	337 (64.8)	77 (14.8)	81 (15.6)	
Hispanic /Latino	2478 (64.4)	88 (3.6)	1430 (57.7)	395 (15.9)	565 (22.8)	
Other	20 (0.5)	0 (0)	13 (65.0)	5 (25.0)	2 (10.0)	
White, non-Hispanic	678 (17.6)	33 (4.9)	394 (58.1)	127 (18.7)	124 (18.3)	
Asthma, n (%)						<0.001
Yes	1083 (28.2)	42 (3.9)	568 (52.5)	197 (18.2)	276 (25.5)	
No	2762 (71.8)	111 (4.0)	1713 (62.0)	427 (15.5)	511 (18.5)	
Allergy, n (%)**						0.15
Yes	137 (4.2)	7 (5.1)	68 (49.6)	31 (22.6)	31 (22.6)	
No	3140 (95.8)	124 (4.0)	1814 (57.8)	509 (16.2)	693 (22.1)	

* 7 children not included due to missing ethnicity

** Data from PowerSchool database only

Table A2. Weight Classification by School 2015/16, n (%)

School	# of Students	Underweight	Healthy	Overweight	Obese
Chamberlain Elementary School	156	9 (5.8)	85 (54.5)	25 (16)	37 (23.7)
Frank J. DiLoreto School	299	7 (2.3)	168 (56.2)	55 (18.4)	69 (23.1)
Gaffney Elementary School	332	22 (6.6)	212 (63.9)	49 (14.8)	49 (14.8)
HALS Academy	48	0 (0)	28 (58.3)	14 (29.2)	6 (12.5)
Human Resources Agency Head Start	391	17 (4.3)	266 (68)	60 (15.3)	48 (12.3)
Holmes Elementary School	170	9 (5.3)	106 (62.4)	22 (12.9)	33 (19.4)
Jefferson Elementary School	152	8 (5.3)	91 (59.9)	24 (15.8)	29 (19.1)
Lincoln Elementary School	286	13 (4.5)	185 (64.7)	41 (14.3)	47 (16.4)
New Britain High School	543	14 (2.6)	279 (51.4)	100 (18.4)	150 (27.6)
Northend Elementary School	82	4 (4.9)	44 (53.7)	16 (19.5)	18 (22)
Preschool at Roosevelt	145	6 (4.1)	97 (66.9)	23 (15.9)	19 (13.1)
Pulaski Middle School	257	9 (3.5)	130 (50.6)	40 (15.6)	78 (30.4)
Slade Middle School	241	6 (2.5)	111 (46.1)	45 (18.7)	79 (32.8)
Smalley Academy	207	10 (4.8)	123 (59.4)	25 (12.1)	49 (23.7)
Smith Elementary School	164	6 (3.7)	99 (60.4)	30 (18.3)	29 (17.7)
Vance Village School	166	8 (4.8)	105 (63.3)	25 (15.1)	28 (16.9)
YWCA	179	5 (2.8)	133 (74.3)	25 (14)	16 (8.9)

Alternative Center School and New Britain Transitional Center not shown due to small population size.

Table A3. Weight Classifications by Grade: Historical Data

Grade	Year	# of Children	Underweight	Healthy	Overweight	Obese	<i>p</i> *
Pre-K 3	2012/13	523	4.2%	65.6%	15.5%	14.7%	0.09
	2013/14	584	4.1%	62.8%	15.9%	17.1%	
	2014/15	479	6.1%	69.9%	13.4%	10.7%	
	2015/16	460	5.0%	67.6%	12.0%	15.4%	
Pre-K 4	2012/13	599	4.7%	62.3%	16.4%	16.7%	<0.001
	2013/14	818	4.0%	59.0%	15.6%	21.3%	
	2014/15	538	5.2%	67.7%	12.1%	15.1%	
	2015/16	587	4.3%	68.3%	17.0%	10.4%	
Kindergarten	2011/12	827	3.8%	62.9%	16.0%	17.4%	0.99
	2012/13	908	3.2%	59.1%	17.7%	19.9%	
	2013/14	902	2.9%	60.5%	16.7%	19.8%	
	2014/15	800	3.1%	57.6%	15.5%	23.8%	
	2015/16	817	5.3%	62.3%	15.2%	17.3%	
3 rd Grade	2014/15	700	3.1%	59.4%	15.4%	22.0%	0.96
	2015/16	794	4.0%	57.8%	16.3%	21.9%	
6 th Grade	2011/12	669	1.5%	51.4%	18.7%	28.4%	0.39
	2012/13	589	2.4%	45.2%	20.4%	32.1%	
	2013/14	620	2.9%	51.9%	17.9%	27.3%	
	2014/15	573	3.5%	51.1%	19.2%	26.2%	
	2015/16	623	2.6%	49.3%	18.1%	30.0%	
9 th Grade	2011/12	540	1.9%	52.0%	20.6%	25.6%	0.87
	2012/13	585	2.1%	53.0%	20.3%	24.6%	
	2013/14	465	1.5%	56.6%	16.6%	25.4%	
	2014/15	643	1.9%	54.9%	19.6%	23.6%	
	2015/16	567	2.5%	52.0%	18.3%	27.2%	

*Cochran-Mantel Haenszel test was used to detect differences in the distribution of weight classification over time.

Table A4. Historical Prevalence of Overweight/Obese by Gender and Grade

Grade	Gender	2011/12	2012/13	2013/14	2014/15	2015/16	<i>p</i>
Pre-K 3	F	--	28.5	32.3	25.8	26.8	0.68
Pre-K 3	M	--	32.2	33.6	22.4	28.0	
Pre-K 4	F	--	31.6	37.7	28.2	28.9	0.58
Pre-K 4	M	--	34.3	36.1	26.2	26.0	
Kindergarten	F	--	33.9	37.5	35.6	43.4	0.13
Kindergarten	M	--	32.9	37.8	37.5	34.9	
3 rd Grade	F	--	--	--	39.4	39.1	0.28
3 rd Grade	M	--	--	--	35.6	37.2	
6 th Grade	F	49.3	50.3	46.3	45.5	44.6	0.67
6 th Grade	M	44.9	54.6	44.3	45.3	51.2	
9 th Grade	F	44.7	44.9	42.8	47.3	47.5	0.22
9 th Grade	M	47.5	45.0	41.2	39.3	43.7	

Table A5. Demographics and School Performance by Asthma 2015/16

Demographic and School Performance	Asthma		<i>p</i>
	Yes	No	
Demographic and School Performance	1083 (28.2)	2762 (71.8)	
Ethnicity, n (%)*			<0.001
Asian/Pacific Islander	27 (18.6)		
Black, non-Hispanic	140 (26.9)		
Hispanic/Latino	790 (31.9)		
Other	2 (11.1)		
White, non-Hispanic	124 (18.3)		
Gender, n (%)			<0.001
Female	477 (25.5)		
Male	606 (30.7)		
Grade			<0.001
PreK-3	105 (22.9)		
PreK-4	149 (25.5)		
Kindergarten	201 (24.6)		
3rd Grade	231 (29.1)		
6th Grade	219 (35.2)		
9th Grade	178 (31.4)		
Primary Language, n (%)			<0.001
English	636 (28.6)		
Spanish	250 (33.1)		
Other	197 (22.8)		
Special Education, n (%)			<0.001
Yes	210 (35.4)		
No	723 (26.9)		
ELL Services n (%)			0.574
Yes	152 (27.5)		
No	781 (28.7)		
Allergy**			<0.001
Yes	69 (50.4)		
No	864 (27.5)		
Reading RIT Percentile, mean (SD)	35.3 (26.8)	39.4 (27.4)	<0.001
Math RIT Percentile, mean (SD)	29.5 (24.7)	34.1 (26.6)	<0.001
Language RIT Percentile, mean (SD)	35.8 (27.9)	41.2 (28.6)	<0.001
Reading RIT, % above 50th percentile, n (%)	219 (27.9)		<0.01
Math RIT, % above 50th percentile, n (%)	173 (22.0)		<0.001
Language RIT, % above 50th percentile, n (%)	186 (31.9)		0.001

Table A5. Demographics and School Performance by Asthma 2015/16 (continued)

Demographic and School Performance	Asthma		p
	Yes	No	
Chronic Absenteeism (<=90% attendance), n (%)			0.002
Yes	221 (23.7)	441 (18.8)	
No	712 (76.3)	1902 (81.2)	
Attendance Status			0.01
Good	47.6	51.0	
Approaching Chronic Absenteeism	28.7	30.2	
Chronic Absenteeism	16.9	13.7	
Severely Chronic Absenteeism	6.8	5.1	

* 7 children not included due to missing ethnicity

** Data from PowerSchool database only

Table A6. Asthma Rates by School 2015/16

SCHOOL	Asthma n (%)
Alternative Center School	8 (42.1)
Chamberlain Elementary School	44 (28.2)
Frank J. DiLoreto School	91 (30.4)
Gaffney Elementary School	75 (22.6)
HALS Academy	16 (33.3)
HRA	104 (26.6)
Holmes Elementary School	37 (21.8)
Jefferson Elementary School	37 (24.3)
Lincoln Elementary School	71 (24.8)
New Britain High School	168 (30.9)
New Britain Transitional Center	4 (36.4)
Northend Elementary School	29 (35.4)
Preschool at Roosevelt	35 (24.1)
Pulaski Middle School	94 (36.6)
Slade Middle School	81 (33.6)
Smalley Academy	62 (30.0)
Smith Elementary School	35 (21.3)
Vance Village School	46 (27.7)
YWCA	46 (26.1)

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