Obesity Prevalence and Incidence through Elementary School in the United States

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ABSTRACT

While the prevalence of obesity has been well-described, little is known about the incidence of obesity among contemporary elementary school aged children in the United States. The nationally representative Early Childhood Longitudinal Study, Kindergarten Class of 2010 – 2011 (ECLS-K: 2011, analytic sample = 7019) included measured anthropometric data at eight time points between kindergarten and fourth grade. Using ECLS-K:2011 data, we examined the prevalence of obesity at each wave and the cumulative incidence of obesity by the end of fourth grade. Sex, race/ethnic, socioeconomic, and birth weight differences in obesity prevalence were observed at baseline and grew over time. Cumulative incidence of obesity was highest among boys, non-Hispanic black and Hispanic children, and children in households of lower socioeconomic status. The cumulative incidence of obesity by the end of fourth grade was 5.9 times higher among those who were overweight at kindergarten entry compared to those who were of normal BMI.

INTRODUCTION

Childhood obesity is recognized as one of the greatest contemporary public health challenges in the United States (Dentzer 2010). Obesity among children, commonly defined as a body mass index (BMI) z-score $\geq 95^{th}$ percentile for age and sex, has increased at all ages over the past several decades (Jolliffe 2004). In 2016, 35% of Americans aged two to nineteen years were classified as overweight and an additional 26% as obese (Skinner et al. 2018). Childhood obesity is linked with serious complications throughout life, including a higher propensity of obesity in adulthood, various cardiometabolic conditions (diabetes, most prominently), and higher mortality (Serdula 1993; Power, Lake, and Cole 1997; Dietz 1998; Must 2003; Reilly and Kelly 2011).

While there are reliable national estimates of obesity prevalence, less is known about obesity incidence in the U.S., which is arguably more important for prevention and treatment. Cunningham, Kramer, and Narayan (2014) used an earlier cohort of the Early Childhood Longitudinal Study, Kindergarten Class of 1998 – 1999 (ECLS-K) to investigate obesity incidence between ages five and fourteen for children who were in these age groups between 1998 and 2007. The investigators found that obesity incidence tended to occur early in childhood and that children who were overweight by entry into kindergarten had higher risks of obesity within the next 9 years. Another study explored obesity incidence in the transition from adolescence to adulthood using the National Longitudinal Study of Adolescent Health, and advocated for effective strategies to reduce the likelihood of transitioning to obesity, with emphasis on vulnerable population segments (Gordon-Larsen, The, and Adair 2012).

We examined national prevalence and incidence of obesity during elementary school among today's children, the cohort that entered kindergarten in 2010 using the Early Childhood

Longitudinal Study, Kindergarten Class of 2010 – 2011 (ECLS-K:2011). We examined patterns of obesity prevalence and incidence among children across sociodemographic sub-groups, such as sex, race, ethnicity, and socioeconomic status. To understand the importance of early weight, we also looked at differences by birth weight and initial BMI status in kindergarten.

DATA AND METHODS

The ECLS-K:2011 cohort was designed and conducted by the National Center for Education Statistics (NCES) of the Department of Education. A nationally representative cohort was selected using a multistage sampling design with a three-stage process – the first-, second-, and third-stage units were counties or groups of counties, schools, and students respectively. Our analytic sample consisted of 7019 observations who were interviewed in fall and spring of their kindergarten academic year (2010 – 2011), fall and spring of first grade (2011 – 2012), fall and spring of second grade (2012 – 2013), and spring of third (2014), fourth (2015), and fifth (2016) grades (Tourangeau 2018).[1]

Physical measurements were taken by trained assessors. A Shorr board was used to measure height (to the nearest quarter-inch) and a digital scale was used to measure weight (to the nearest half-pound). We calculated BMI z-scores by age and sex and cut-offs were set for normal, overweight, and obesity using the Centers for Disease Control and Prevention's growth charts developed from national survey data (Vidmar, Carlin, and Hesketh 2004). We defined normal BMI as BMI z-score $< 85^{th}$ percentile, overweight as 85^{th} percentile $\leq$ BMI z-score $< 95^{th}$ percentile, and obese as BMI z-score $\geq 95^{th}$ percentile (CDC 2016).

[1] Spring fifth grade data for the 2010 – 2011 cohort will be released in October of 2018, and will be included as the endpoint when available.

Obesity prevalence at each wave was defined as the proportion of all children with BMI z-score $\geq 95^{th}$ percentile. Obesity incidence measured the likelihood of a previously normal or overweight child becoming obese, and was determined using two metrics. Cumulative obesity incidence demonstrated the risk of obesity over the course of elementary school by dividing the number of newly-obese children in spring of fourth grade by the number of children who were not obese in fall of kindergarten. Annual obesity incidence exhibited the risk between waves by dividing the number of newly-obese children in a wave by the number of children who were not obese in the previous wave, taking into consideration the length of the interval between waves. Prevalence and incidence estimates were stratified by sex (boys or girls), race (non-Hispanic white, non-Hispanic black, Hispanic, or other race), household socioeconomic status at baseline (quintiles 1 through 5, with 1 representing the poorest and 5 representing the richest). To consider the impact of early weight, we also stratified by birth weight (low: < 2500 grams, normal: 2500 to 3999 grams, or high: ≥ 4000 grams) for all measures and BMI status in the first wave (normal or overweight) for incidence estimates.

We used logistic regression to determine the marginal predicted probabilities of obesity in spring of fourth grade as a function of BMI percentile/BMI z-score at younger ages. This is a measure of the likelihood of obesity by the end of fourth grade and the clinically relevant predictive risks at each wave of the survey.

For all analyses, we used variance estimates for constructing 95% confidence intervals with Taylor series linearization to account for the complex sample design. We used longitudinal weights and survey adjustments constructed by the NCES to make nationally representative inferences. All analyses were performed with the use of SUDAAN software, version 10.1 (Research Triangle Institute).

PRELIMINARY RESULTS

Prevalence of Obesity:

Figure 1 shows the trend in obesity prevalence from fall of kindergarten (mean age 5.6 years) in 2010 to spring of fourth grade (mean age 10.1 years) in 2016. During fall of kindergarten, 14.7% of children were obese (Table 1). Over the duration of the study, the prevalence of obesity generally increased and reached 20.1% by spring of fourth grade. During the follow-up period, the greatest increase in the prevalence of obesity occurred between fall of kindergarten and fall of second grade (mean age 7.6 years), when obesity prevalence increased from 14.7% to 18.0%; from third grade to fourth grade obesity prevalence only increased from 19.8% to 20.1%.

Across all ages, obesity prevalence was higher among boys compared to girls, though the largest difference by sex was observed at spring of fourth grade (21.7% and 18.2% for boys and girls, respectively). Obesity prevalence was higher among non-Hispanic black and Hispanic children compared to white children at all ages. However, between fall of kindergarten and spring of fourth grade, the prevalence of obesity increased similarly for all race/ethnic groups – 38% for non-Hispanic white children, 35% for non-Hispanic black children, 33% for Hispanic children, and 40% for children of other race/ethnicities (Asian, Pacific Islanders, Native American, and multiracial children). Children from the wealthiest 20% of families had a lower prevalence of obesity at baseline compared with those in all other socioeconomic quintiles (6.6% for the wealthiest quintile compared to 19.5% for the poorest quintile, respectively). This socioeconomic difference was observed across all ages, with obesity prevalence consistently being highest in the two poorest socioeconomic quintiles. Across all waves, obesity prevalence

was highest among those who were born with high birth weight compared to those born with normal or low birth weight.

Incidence of Obesity:

Between fall of kindergarten (mean age 5.6 years) and spring of fourth grade (mean age 10.1 years), 9.7% of non-obese children at baseline became obese (Table 2). The cumulative incidence was significantly higher for boys (10.9%) compared to girls (8.4%), and significantly higher for non-Hispanic black (13.9%) and Hispanic (11.7%) children compared to non-Hispanic white (8.2%) children. Among those not obese at baseline, almost 12% of those in the three poorest socioeconomic quintiles became obese by the end of fourth grade compared to 7.1% of those in the wealthiest quintile. The cumulative incidence of obesity was also higher among those with low (12.5%) or high (12.0%) birth weight compared to those with normal (8.9%) birth weight, although these differences were not statistically significant at an alpha < 0.05.

At baseline, approximately 80% of non-obese children had a normal BMI. By spring of fourth grade, 5.2% of those who were classified as normal BMI at baseline had become obese, compared with 30.5% for those who had been overweight at fall of kindergarten. Among each sex, race/ethnic, socioeconomic, and birth weight group, the cumulative incidence of obesity was much higher among those who were overweight at baseline compared to those who had normal BMI. Overall, those who were overweight in fall of kindergarten had 5.9 times the risk of becoming obese by spring of fourth grade compared to those who had a normal BMI at baseline. The risk ratio of obesity among those entering kindergarten overweight, compared with those entering with normal BMI, were highest among children from the second-highest socioeconomic quintile (7.46), non-Hispanic whites (7.01), and those with low birth weights (7.04).

(Annual incidence in progress.)

Quantifying Weight Trajectories:

Children at the 50th percentile of BMI during fall of kindergarten (mean age 5.6 years) had a 2% chance of becoming obese by spring of fourth grade (mean age 10.1 years) (Table 3). This likelihood increased to 21% among those at the 85th percentile at kindergarten entry and to 52% among those at the 95th percentile. Among children who were at the 99th percentile at baseline, 85% could expect to still be obese as they finished the fourth grade.

DISCUSSION

In this contemporary and nationally representative study, we described the prevalence and incidence of obesity during the elementary school years over the last decade. By the end of fourth grade (mean age 10.1 years), 20% of children had already developed obesity, stressing the importance of identifying ages and sub-populations at high susceptibility of obesity at young ages. Development of obesity by fourth grade was particularly common among those who were overweight in kindergarten and more likely among boys, non-Hispanic black and Hispanic children, and children from households of lower socioeconomic status.

We found differences among children in the prevalence and incidence of obesity across race and ethnic groups as early as kindergarten entry and these were sustained throughout elementary school. Higher cumulative incidences of obesity by spring of fourth grade among non-Hispanic black and Hispanic children contributes to the emerging evidence that suggests minority populations transition away from normal and overweight states at earlier ages than do non-Hispanic white populations (Avery et al. 2016). With U.S. minorities already disproportionately burdened by obesity-associated chronic diseases, early increases in the

prevalence and incidence of obesity could increase the duration of obesity among minority populations and exasperate chronic disease disparities.

A major strength of this study is the ability to compare obesity prevalence and incidence between two kindergarten cohorts a decade apart. Compared with children entering kindergarten in the late 1990s (Cunningham, Kramer, and Narayan 2014), children entering kindergarten in 2010 had a higher prevalence of obesity (12.4% and 14.7% for the older and newer cohorts, respectively). Thus, preschool-aged children during the last decade were having higher incidence of obesity before even entering school. This finding of increased obesity at young ages is consistent with recent National Health and Nutritional Examination Survey (NHANES) studies that identified notable increases in obesity for preschoolers between the ages of two and five from 2014 to 2016 (Skinner et al. 2018). At the same time, incidence of obesity by the end of elementary school was lower in the recent cohort compared with incidence a decade earlier, meaning that similar proportions of children were leaving elementary school obese. This may entail that school-based prevention programs or home-based awareness of the risks of obesity incidence during the elementary school years may be working. Limited studies examining the implications of early onset of obesity have shown an increased risk of metabolic syndrome by adolescents, although more evidence is needed (Pacheco et al. 2017). A focus on obesity prevention during the preschool years may also facilitate reductions in obesity for the years to come.

(In progress.) Several limitations of this study should be noted. First, we classified Asian, Pacific Islander, Native American, and multiracial children into an "Other" race category, to maintain sufficient sample size for stratification despite heterogeneity among these groups. Second, we contextualized obesity incidence as the likelihood of becoming obese among those

who were previously either normal or overweight. As a result, those who were obese at baseline were eligible to become incidence cases, even if the participant lost weight before the end of the period of interest.

While obesity prevalence at kindergarten entry was higher in the ECLS-K:2011 cohort compared to the 1998 – 1999 cohort, prevalence by the end of fourth grade was comparable. However, with approximately 20% of children having obesity by spring of fourth grade (mean age 10.1 years) much work is needed to preempt the development of childhood obesity. Furthermore, the heterogeneity in both prevalence and incidence suggests that sex-, race/ethnic-, and socioeconomic-specific tailoring of evidence-based programs to promote healthy weight, in addition to population-wide prevention efforts, is likely warranted. Identifying determinants of sex-, race/ethnic-, and socioeconomic difference among elementary school aged children is necessary to effectively target sustainable obesity prevention programs, especially among vulnerable and minority populations.

REFERENCES

Avery C.L., Holliday K.M., Chakladar S., Engeda J.C., Hardy S.T., et al. (2016) Disparities in Early Transitions to Obesity in Contemporary Multi-Ethnic U.S. Populations. PLOS ONE 11(6): e0158025. https://doi.org/10.1371/journal.pone.0158025

Centers for Disease Control and Prevention. 2016. "Defining Adult Overweight and Obesity." https://www.cdc.gov/obesity/adult/defining.html.

Cunningham, Solveig A., Michael R. Kramer, and K. M. Venkat Narayan. 2014. "Incidence of Childhood Obesity in the United States." New England Journal of Medicine 370: 403 – 411.

Dentzer, Susan. 2010. "The Child Abuse We Inflict Through Child Obesity." Health Affairs: 29 (3): 342.

Dietz, W. H. 1998. "Health consequences of obesity in youth: childhood predictors of adult disease." Pediatrics 101 (3 Pt. 2): 518 – 525.

Gordon-Larsen, Penny, Natalie S. The, and Linda S. Adair. 2012. "Longitudinal Trends in Obesity in the United States From Adolescence to the Third Decade of Life." Obesity 18 (9): 1801 – 1804.

Jolliffe, D. 2004. "Extent of overweight among US children and adolescents from 1971 to 2000." International Journal of Obesity 28: 4 – 9.

Must, A. and S. E. Anderson. 2003. "Effects of Obesity on Morbidity in Children and Adolescents." Nutrition in Clinical Care 6 (1): 4 – 12.

Pacheco L.S., Blanco E., Burrows R., Reyes M., Lozoff B., Gahagan S. Early Onset Obesity and Risk of Metabolic Syndrome Among Chilean Adolescents. Prev Chronic Dis 2017;14:170132.

Power, C., J. K. Lake, and T. J. Cole. 1997. "Review: Measurement and long-term health risks of child and adolescent fatness." International Journal of Obesity 21: 507 – 526.

Reilly, J. J. and J. Kelly. 2011. "Long-term impact of overweight and obesity in childhood and adolescence on morbidity and premature mortality in adulthood: systematic review." International Journal of Obesity 35: 891 – 898.

Serdula, M. K. et al. 1993. "Do Obese Children Become Obese Adults? A Review of the Literature." Preventive Medicine 22 (2): 167 – 177.

Skinner A. C., et al. 2018. "Prevalence of Obesity and Severe Obesity in US Children, 1999–2016." Pediatrics: 141 (3): e20173459.

Tourangeau, Karen et al. 2018. "Early Childhood Longitudinal Study, Kindergarten Class of 2010–11 (ECLS-K:2011): User's Manual for the ECLS-K:2011 Kindergarten–Fourth Grade Data File and Electronic Codebook, Public Version (NCES 2018–032)." Washington, D.C.: National Center for Education Statistics, Institute of Education Sciences.

Vidmar, Suzanna, John Carlin, and Kylie Hesketh. 2004. "Standardizing anthropometric measures in children and adolescents with new functions for egen." The Stata Journal 4 (1): 50 – 55.

Figure 1: Trend in Obesity Prevalence (%) among U.S. Children from Kindergarten to Fourth Grade

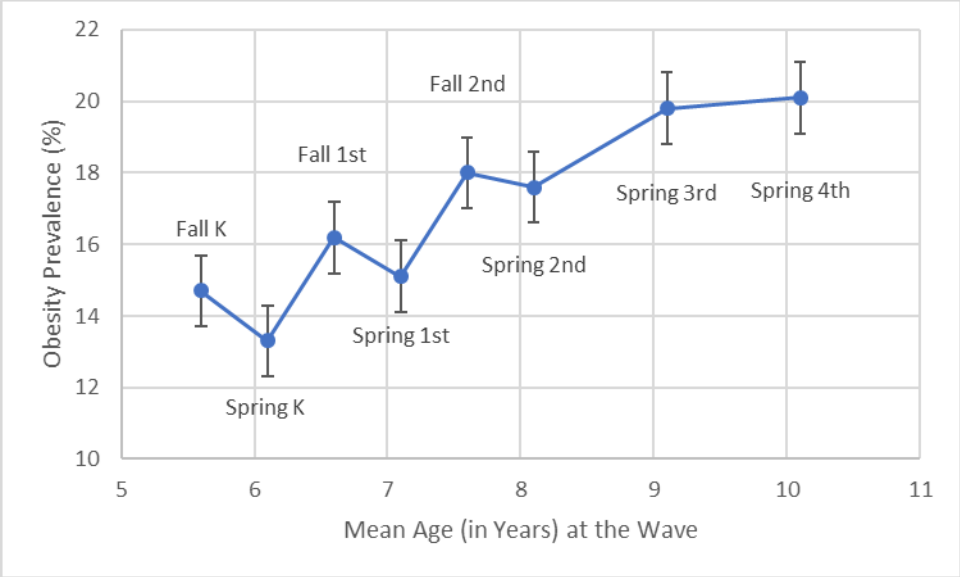

Table 1: Prevalence of Obesity (%) among U.S. Children from Kindergarten to Fourth Grade

		Prevalence of Obesity (95% CI*)							
		Kindergarten		First Grade		Second Grade		Third Grade	Fourth Grade
Variables	N	Fall (Mean Age = 5.6 Years)	Spring (Mean Age = 6.1 Years)	Fall (Mean Age = 6.6 Years)	Spring (Mean Age = 7.1 Years)	Fall (Mean Age = 7.6 Years)	Spring (Mean Age = 8.1 Years)	Spring (Mean Age = 9.1 Years)	Spring (Mean Age = 10.1 Years)
All Children	7019	14.7 (13.3-16.2)	13.3 (12.1-14.7)	16.2 (14.4-18.2)	15.1 (13.7-16.6)	18.0 (15.8-20.5)	17.6 (16.1-19.2)	19.8 (18.3-21.4)	20.1 (18.4-21.8)
Sex									
Boys	3564	15.7 (13.9-17.6)	14.2 (12.7-15.9)	16.8 (14.0-19.9)	15.5 (13.9-17.4)	18.8 (15.6-22.5)	18.5 (16.7-20.5)	21.2 (19.3-23.2)	21.7 (19.8-23.8)
Girls	3455	13.7 (11.9-15.6)	12.4 (10.9-14.0)	15.7 (12.9-18.9)	14.7 (12.9-16.7)	17.2 (14.3-20.5)	16.6 (14.7-18.7)	18.3 (16.4-20.5)	18.2 (16.1-20.7)
Race/Ethnicity									
Non-Hispanic White	3946	12.5 (10.5-14.8)	11.1 (9.3-13.1)	12.0 (10.0-14.3)	12.4 (10.6-14.5)	13.2 (10.7-16.3)	15.0 (13.0-17.2)	16.4 (14.5-18.7)	17.3 (15.2-19.5)
Non-Hispanic Black	618	19.3 (15.8-23.4)	17.9 (14.7-21.7)	19.3 (13.9-26.3)	20.4 (17.0-24.3)	21.4 (15.4-29.1)	23.4 (20.0-27.2)	27.3 (23.2-31.9)	26.5 (21.6-32.1)
Hispanic	1586	17.8 (15.7-20.6)	16.3 (14.3-18.6)	21.2 (18.3-24.5)	18.7 (16.6-21.0)	23.5 (20.1-27.3)	21.0 (18.5-23.6)	23.8 (21.4-26.5)	23.7 (20.8-26.7)
Other	869	12.9 (10.5-15.8)	12.1 (9.7-15.0)	15.3 (11.0-20.8)	14.0 (10.8-18.0)	17.4 (12.6-23.6)	15.7 (12.7-19.4)	17.9 (14.4-22.2)	18.0 (14.6-22.0)
Socioeconomic Quintiles									
1 (Poorest)	1075	19.5 (16.5-22.8)	17.2 (14.9-19.8)	18.0 (14.0-22.8)	19.3 (13.7-21.8)	20.2 (15.6-25.6)	20.6 (18.1-23.3)	24.4 (21.5-27.6)	25.0 (21.6-28.8)
2	1133	18.2 (15.8-20.9)	17.5 (15.0-20.3)	22.2 (17.6-27.6)	19.7 (17.0-22.7)	24.5 (19.8-29.8)	23.3 (20.3-26.6)	26.3 (23.0-29.9)	25.9 (22.7-29.3)
3	1346	16.2 (13.5-19.3)	13.8 (11.6-16.2)	17.2 (13.9-21.3)	16.8 (14.0-19.9)	20.0 (15.6-25.2)	19.4 (16.7-22.5)	22.0 (19.0-25.3)	22.8 (19.7-26.3)
4	1634	12.1 (10.4-14.1)	11.1 (9.2-13.4)	12.3 (10.0-15.1)	11.2 (9.5-13.2)	13.1 (10.5-16.2)	14.5 (12.5-16.6)	15.1 (13.0-17.4)	14.3 (12.1-16.9)
5 (Richest)	1831	6.6 (5.6-7.9)	6.4 (5.3-7.9)	9.6 (7.2-12.6)	7.5 (6.1-9.3)	10.3 (7.4-14.1)	8.7 (7.0-10.9)	9.5 (7.8-11.6)	10.7 (8.6-12.9)
Birth Weight (grams)									
< 2500	623	10.7 (7.9-14.4)	10.5 (7.7-14.2)	12.3 (8.1-18.4)	13.4 (10.0-17.7)	18.8 (13.2-26.0)	15.4 (11.9-19.8)	20.0 (16.1-24.4)	19.5 (15.8-23.9)
2500-3999	5110	13.9 (12.3-15.7)	12.4 (11.0-13.9)	14.6 (12.7-16.6)	14.1 (12.5-15.9)	15.9 (13.7-18.4)	16.4 (14.7-18.4)	18.2 (16.5-20.1)	18.9 (17.1-20.8)
≥ 4000	627	21.0 (16.8-25.9)	20.0 (15.5-25.4)	27.8 (21.6-35.0)	20.3 (16.2-25.2)	27.5 (21.2-34.8)	23.5 (19.3-28.4)	26.7 (22.3-31.6)	26.3 (21.6-31.5)

*CI: Confidence Interval

Table 2: Cumulative Incidence of Obesity (%) from Kindergarten through Fourth Grade, by BMI Categories in Fall Kindergarten, and Risk Ratios for Obesity among Overweight versus Normal Children in Fall Kindergarten

	Not Obese at Baseline (N = 6064)		Normal at Baseline (N = 4993)		Overweight at Baseline (N = 1071)		
Variable	Cumulative Incidence (95% CI *)	P-Value	Cumulative Incidence (95% CI *)	P-Value	Cumulative Incidence (95% CI *)	P-Value	Risk Ratio for Overweight vs. Normal (95% CI *)
All Children	9.7 (8.7-10.7)		5.2 (4.3-6.0)		30.5 (26.8-34.2)		5.90 (4.83-7.20)
Sex							
Boys	10.9 (9.4-12.5)	Ref	5.8 (4.5-7.1)	Ref	32.8 (26.8-38.8)	Ref	5.67 (4.21-7.62)
Girls	8.4 (7.0-9.8)	0.02	4.6 (3.5-5.6)	0.13	27.8 (23.1-32.4)	0.22	6.09 (4.80-7.73)
Race/Ethnicity							
NH White*	8.2 (7.0-9.4)	Ref	4.0 (3.2-4.9)	Ref	28.3 (23.8-32.8)	Ref	7.01 (5.51-8.92)
NH Black*	13.9 (9.9-17.9)	0.009	7.9 (4.8-10.9)	0.02	37.5 (23.6-51.4)	0.20	4.76 (2.80-8.08)
Hispanic	11.7 (9.7-13.7)	0.002	6.6 (4.6-8.6)	0.02	34.3 (27.2-41.4)	0.13	5.21 (3.53-7.69)
Other	8.3 (5.4-11.3)	0.91	5.1 (2.7-7.5)	0.35	23.4 (13.2-33.6)	0.40	4.59 (2.67-7.90)
Socioeconomic Quintiles							
1 (Poorest)	11.9 (9.7-14.1)	0.0004	7.3 (4.9-9.6)	0.02	32.8 (25.6-40.1)	0.08	4.52 (2.92-7.00)
2	11.9 (9.2-14.5)	0.001	6.5 (4.2-8.7)	0.06	31.6 (22.8-40.5)	0.14	4.90 (3.06-7.83)
3	11.5 (9.0-13.9)	0.003	5.4 (3.6-7.2)	0.18	36.6 (28.1-45.1)	0.01	6.77 (4.68-9.80)
4	6.1 (4.5-7.7)	0.37	3.1 (1.9-4.2)	0.31	23.1 (15.2-30.9)	0.82	7.46 (4.57-12.17)
5 (Richest)	7.1 (5.4-8.8)	Ref	4.0 (2.6-5.5)	Ref	24.2 (18.0-30.3)	Ref	6.01 (3.96-9.13)
Birth Weight (grams)							
< 2500	12.5 (8.9-16.2)	0.07	6.5 (3.2-9.7)	0.33	45.5 (29.5-61.4)	0.05	7.04 (3.68-13.48)
2500-3999	8.9 (7.9-10.0)	Ref	4.8 (4.0-5.6)	Ref	28.7 (24.5-32.8)	Ref	5.95 (4.82-7.35)
≥ 4000	12.0 (8.3-15.7)	0.09	4.9 (2.3-7.4)	0.97	31.3 (20.9-41.7)	0.62	6.43 (3.36-12.30)

*CI: Confidence Interval; NH: Non-Hispanic

Table 3: Likelihood of Obesity (%) in Spring Semester of Fourth Grade (Mean Age = 10.1 Years), by Z-Score and Percentile of BMI at Earlier Ages

	Kindergarten		First Grade		Second Grade		Third Grade
Percentile of BMI	Fall (Mean Age = 5.6 Years)	Spring (Mean Age = 6.1 Years)	Fall (Mean Age = 6.6 Years)	Spring (Mean Age = 7.1 Years)	Fall (Mean Age = 7.6 Years)	Spring (Mean Age = 8.1 Years)	Spring (Mean Age = 9.1 Years)
Normal							
50	2	2	1	1	< 1	< 1	< 1
60	4	4	2	2	1	1	< 1
70	7	7	5	5	3	1	< 1
80	14	15	11	12	7	5	1
Overweight							
85	21	22	17	19	13	11	4
90	32	34	30	33	26	24	13
Obese							
95	52	56	55	60	54	58	51
99	85	88	90	92	92	96	98