Shape NC Evaluation Report: Final Report

shapeNC
Healthy Starts for Young Children
an initiative of

BlueCross BlueShield of North Carolina Foundation
Smart Start

Westat

Shape NC Evaluation Report: Final Report

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Executive Summary

Background and Introduction

Shape NC is a technical assistance (TA) model used in childcare settings to improve health and nutrition practices, increase physical activity, and engage children and childcare providers in healthy lifestyle activities. Through the model, Shape NC coaches partner with subgrantees (TA providers) to serve childcare sites in four counties in central North Carolina (Randolph, Durham, Wake, and Wilson). Shape NC coaches integrate three programs to increase the use of wellness best practices in childcare sites: 1) Be Active Kids® (to increase indoor and outdoor physical activity), 2) Nutrition and Physical Activity Self-Assessment for Child Care (tools to measure best practices), and 3) the Natural Learning Initiative (promotes the design of children's natural outdoor learning environments to increase opportunities for physical activity). Coaches also provide implementation support for Farm to Early Care and Education and Carolina Global Breastfeeding Institute programs; however, these programs were not included in the evaluation.

This report describes results of Westat's evaluation of Shape NC TA using data collected from participating childcare sites and children in fall 2017, spring 2018, fall 2018, and spring 2019.

Problem Definition

Obesity rates and poverty are serious issues in North Carolina. Statewide, 29.7 percent of children age 2–4 are overweight or obese and rates of adult obesity almost tripled rising to 30.1 percent in 2015 from 12.3 percent in 1990 (Trust for America's Health and the Robert Wood Johnson Foundation, 2016). Poverty, too, is higher among the state's young children at 16.4 percent, compared to the national average of 13.5 percent (Census Bureau, 2015). Also illustrating the magnitude of the problem in North Carolina is that 61 of the state's 100 counties have obesity rates among low income 2–4 year olds that exceed the state average.

Evaluation Methods and Measures

To examine the effect of Shape NC TA on treatment sites and children enrolled in the sites, the evaluation team collected a variety of data at the site level (e.g., site director surveys and interviews) and the child level (e.g., height and weight). Westat recruited two cohorts of childcare sites for participation in the study. Baseline data were collected during the fall following recruitment (fall 2017 for cohort 1, fall 2018 for cohort 2), and follow up data were collected during the subsequent spring for both cohorts (spring 2018 for cohort 1, spring 2019 for cohorts 1 and 2) and again the following fall for cohort 1 (fall 2018).

Spring data collection was conducted as close to the end of the school year as possible. The evaluation team used the same procedures and timeline to collect data from sites and children with parental consent in the treatment and comparison groups.

Baseline Equivalence of Treatment and Comparison Groups

Since the impacts of the program are estimated by comparing the treatment and comparison groups after the program was implemented, it is important for the two groups to be comparable at baseline. Westat conducted statistical tests to identify mean differences between the treatment group and the comparison group and confirm that sites had similar wellness policies and practices, and body mass index (BMI) measurements.

Director survey results indicated that sites in each group were statistically similar regarding baseline wellness policies and practices. The evaluation team also compared baseline child-level outcomes and found no significant differences between children in the treatment and comparison groups.

Despite efforts to limit recruitment to sites with no prior exposure to Shape NC resources (i.e., Be Active Kids® [BAK®], Go Nutrition and Physician Activity Self-Assessment for Child Care [NAPSACC], Natural Learning Initiative [NLI]), data indicate sites in each group had prior program exposure. Approximately half of directors in both treatment and comparison sites indicated at baseline they were currently implementing or had previously implemented a Shape NC resource or similar program targeting similar outcomes. Prior exposure to Shape NC resources or initiatives targeting similar outcomes is a nontrivial potential source of bias for the comparison group. It is important to acknowledge that comparison sites had prior experience implementing wellness initiatives when interpreting results about the impact of Shape NC TA.

Impacts After 1 and 2 Years of Shape NC Shape NC Technical Assistance

The evaluation team examined the impact of Shape NC TA on (1) childcare site policies and practices, (2) indoor physical activities, (3) outdoor physical activities, and (4) children's BMI.

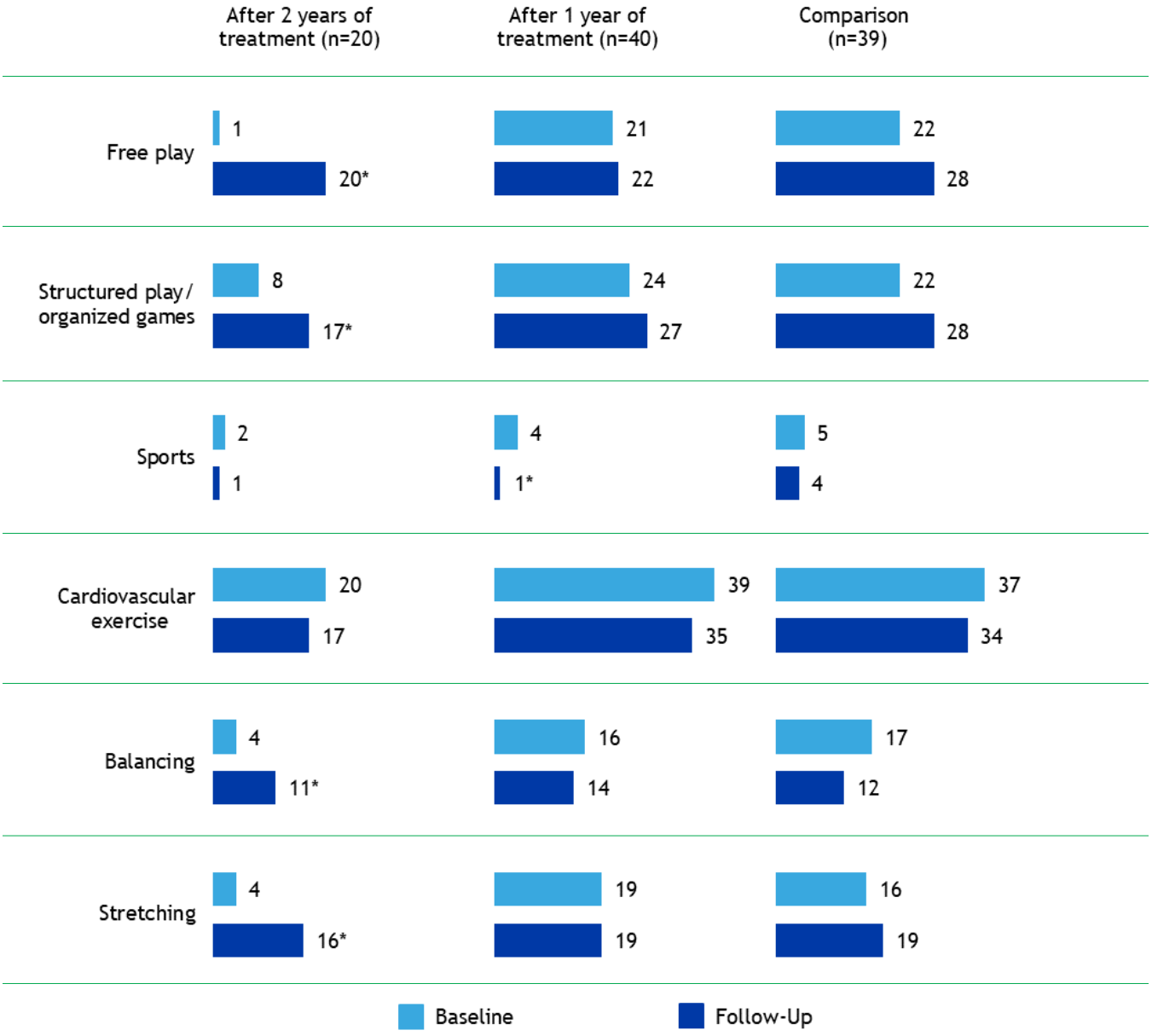
There was no significant impact of Shape NC TA on the number of nutrition polices and best practices after 1 or 2 years of implementation. Aligned with licensing requirements, most treatment and comparison sites had informal or written policies related to food brought from home and staff consumption in front of children.

Shape NC TA had a significant positive impact on the number and types of indoor physical activities available to children at treatment sites, especially after 2 years. There were significant increases in sites offering indoor free play, structured play/organized games, balancing, and stretching (Figure E-1).

There were statistically significant increases in the number of treatment sites that offered children opportunities for outdoor physical activities, using grant funds to partially offset the cost of implementing their natural learning environment design plan. These increases were significant after 1 and 2 years (Figure E-2). For example, after 2 years of treatment, the number of sites in which children participated in outdoor structured play/organized games increased to 17 from four at baseline ($p < 0.01$).

More than two-thirds of children in both treatment and comparison groups were in the healthy weight category at baseline and most stayed in the healthy weight category after 1 or 2 years of treatment. Data also suggested that comparison sites, on average, had a significantly higher proportion of children at a healthy weight ($p=0.04$) (Figure E-3).

Figure E-1. Changes in types of indoor physical activities between baseline and follow-up

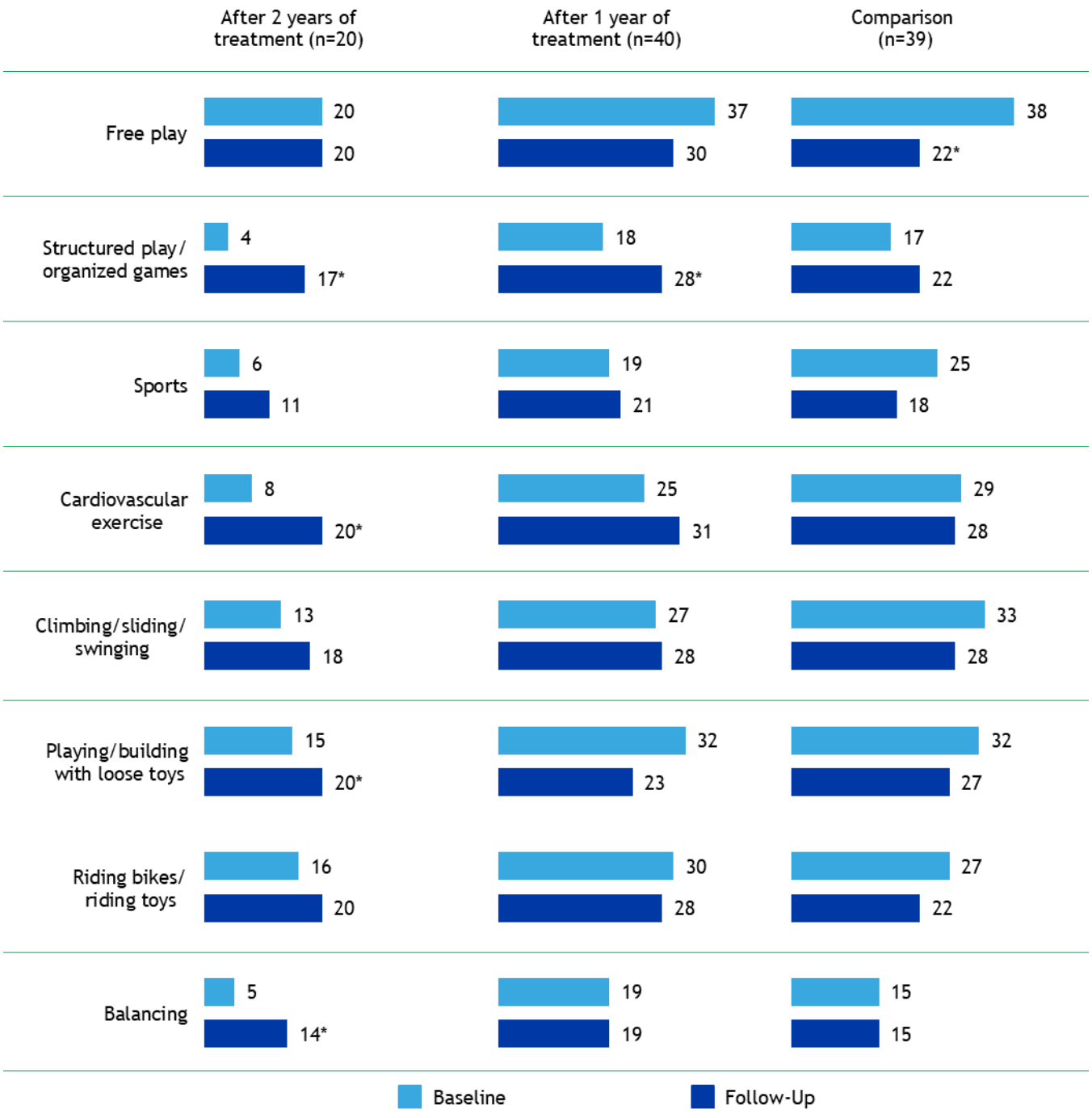


* The percentage of sites at follow-up is statistically different from the percentage of sites at baseline ($p < .05$).

NOTE: Findings for sites after two years of treatment include data from cohort 1 sites that received treatment in both years (Year 1 and Year 2). Findings for sites after one year of treatment include data from treatment sites in Year 1 (cohort 1) and Year 2 (cohort 2). Findings for comparison sites include data from the comparison group in Year 1 (cohort 2) and Year 2 (cohort 3).

SOURCES: Director interview, fall 2017 and spring 2018; Director survey, fall 2018, and spring 2019.

Figure E-2. Changes in types of outdoor physical activities between baseline and follow-up

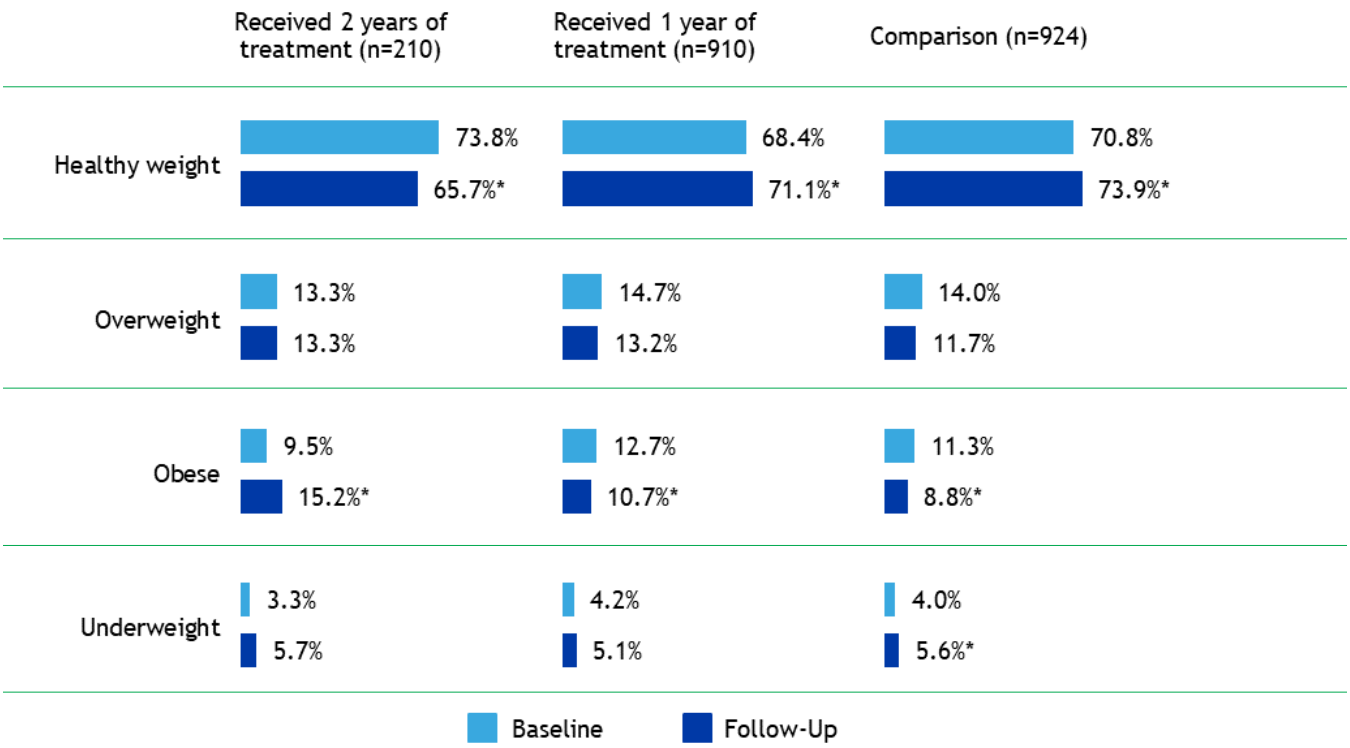


* The percentage of sites at follow-up is statistically different from the percentage of sites at baseline ($p < .05$).

NOTE: Findings for sites after two years of treatment include data from cohort 1 sites that received treatment in both years (Year 1 and Year 2). Findings for sites after one year of treatment include data from treatment sites in Year 1 (cohort 1) and Year 2 (cohort 2). Findings for comparison sites include data from the comparison group in Year 1 (cohort 2) and Year 2 (cohort 3).

SOURCES: Director interview, fall 2017 and spring 2018; Director survey, fall 2018, and spring 2019.

Figure E-3. Percentage of children in BMI weight categories between baseline and follow-up



* The percentage of children at follow-up is statistically different from the percentage of children at baseline ($p < .05$).

NOTE: Findings for children that received two years of treatment include data from children in cohort 1 that received treatment in Year 1 and Year 2. Findings for children that received one year of treatment include data from children at the treatment sites in Year 1 (cohort 1) and Year 2 (cohort 2). Findings for children in the comparison group include data from children at the comparison sites in Year 1 (cohort 2) and Year 2 (cohort 3).

SOURCE: Child height and weight measurement, fall 2017, spring 2018, fall 2018, and spring 2019.

Conclusions and Study Limitations

The evaluation team planned to collect child height and weight data for 3 consecutive years from children enrolled at participating childcare sites. Due to COVID-19 guidelines and restrictions, spring 2020 data collection was cancelled and Westat used data collected during the first 2 years of the program to evaluate the child-level program outcomes. In addition to disruptions caused by COVID-19, ceiling and testing effects led Westat to discontinue interviews with 2-year-old children about their food and activity preferences. This change left the less sensitive BMI outcome as the sole child-level outcome measure.

Shape NC TA had a statistically significant positive impact on the number and types of opportunities for indoor and outdoor physical activity offered to children at participating sites. There was no evidence to suggest Shape NC TA affects the percentage of participating children at a healthy weight. Over two-thirds of children in both groups were at a healthy weight throughout the study.

1 Background and Introduction

This section provides an overview of research related to childhood obesity nationally and in North Carolina, the effects of not being at a healthy weight, and the role of childcare sites in obesity prevention. It also includes a description of the goals of Shape NC technical assistance (TA).

National Prevalence of Childhood Obesity and Related Effects

Obesity rates of children and adolescents in the United States have generally risen over the past 25 years (Ogden et al., 2016) and remain high despite attempts to counter them. National data from 2015–16 indicate that the prevalence of obesity was 13.9 percent among young children aged 2–5 years and 18.4 percent among children aged 6–11 years (Hales, Carroll, Fryar & Ogden, 2017). Observed disparities in obesity rates among children of different races (Hales et al., 2017) and income levels (Lee, Andrew, Gebremariam, Lumeng, & Lee, 2014) are also a cause of concern. Obesity rates are higher among poor children and evidence suggests the magnitude of this disparity is increasing (Datar & Chung, 2015), with differences beginning as early as kindergarten (Singh, Siahpush, & Kogan, 2010). Studies have shown that obesity rates tend to decline as children age, leading researchers to underscore the importance of obesity prevention during early childhood, before children become obese (Cheung, Cunningham, Naryan, & Kramer, 2016). Promoting young children's healthy nutrition and physical activity is particularly important given the prevalence and risks of overweight and obesity.

Children who are obese are at risk for negative outcomes during childhood that last into adulthood. Obese children and adolescents face significant health risks (Ebbeling, Pawlak, & Ludwig, 2002) and are about five times more likely to be obese as adults than their counterparts who are not obese (Simmonds, Llewellyn, Owen, & Woolacott, 2016). These findings underscore the need for obesity prevention efforts to reduce the likelihood of obesity-related health risks that begin in childhood from continuing into adulthood. For example, adults who are obese are at risk for serious diseases including cardiovascular disease, kidney disease, diabetes, and cancer (Lauby-Secretan et al., 2016; Singh et al., 2013). In addition to adverse health effects, overweight or obesity in childhood is associated with negative school outcomes such as: reduced math and reading skills; decreased executive functioning skills; increased detention, absenteeism, and tardiness; and negative social-behavioral outcomes, including increased internalizing and externalizing behavior problems and ADHD (Datar & Sturm, 2006; Davis & Cooper, 2011; Pulgaron, 2013; Shore et al., 2008). In addition, children who are obese or overweight experience negative outcomes as adults, including fewer years of education, lower marriage rates and household income, and higher poverty rates (Dietz, 1998; Gortmaker, Must, Perrin, Sobol, & Dietz, 1993). Of critical importance is that children are exposed to healthy nutrition and physical activity from an early age.

Childhood Obesity in North Carolina

Obesity rates and poverty are serious issues in North Carolina. Among all states, North Carolina is among the top half of states reporting the highest obesity rates among children 10–17 years old (Trust for America's Health and the Robert Wood Johnson Foundation, 2016). Statewide, almost a third (30%) of children age 2–4 are overweight or obese (Trust for America's Health and the Robert Wood Johnson Foundation, 2016). Additionally, North Carolina was one of only three states in which there were statistically significant increases in obesity over a 6-year period, according to results from Pan et al.'s (2019) study of state-level obesity rates among WIC-enrolled children between 2 and 4 years of age. Research has also shown a negative relationship between socioeconomic status and obesity (Cheung et al., 2016). Poverty, too, is higher among North Carolina's residents at 14.0 percent, compared to the national average of 11.8 percent (United States Census Bureau, 2019). Childcare providers are uniquely positioned to cultivate habits during early childhood that are likely to lead to a healthy weight among the infants and toddlers in their care.

Role of Early Education in Preventing Childhood Obesity

Links between children's physical health and academic achievement have been well-researched over the past decade. Numerous studies and meta-analyses demonstrate the importance of nutrition and fitness to academic achievement (Asigbee, Whitney, & Peterson, 2018; Centers for Disease Control and Prevention, 2010; Fedewa & Ahn, 2011; Rampersaud, Pereira, Girard, Adams, & Metzl, 2005). Combined with an understanding of the relation between children's physical health and adult health outcomes, these findings have prompted calls for integrating wellness initiatives within educational settings.

In response, several recently developed frameworks integrate wellness policies and practices that promote child health within educational contexts. In 2005, the National Governors Association Task Force on School Readiness released Building the Foundations for Bright Futures, a framework emphasizing the importance of early motor development and physical well-being as key development domains. A related framework developed by the Early Childhood Systems Workgroup includes "health, mental health, and nutrition" as one of the four core components of an early childhood system designed to promote school readiness (Bruner, 2011). The Whole School, Whole Community, Whole Child (Lewallen, Hunt, Potts-Datema, Zaza, & Giles, 2015) model emphasizes relationships between learning and health, and includes health education, nutrition environment and services, physical education and physical activity, and community supports among its core components (Chiang, Meagher, & Slade, 2015; Lewallen et al., 2015). Additionally, a review of obesity prevention interventions targeting young children indicated that most interventions reviewed were implemented in early education centers with children from economically disadvantaged families and varied racial and ethnic backgrounds (Volger, Radler, & Rothpletz-Puglia, 2018).

In North Carolina,

30%

of children ages 2-4
are overweight or obese

(Trust for America's Health and the
Robert Wood Johnson Foundation, 2016)

In North Carolina, about 40 percent of children aged 0–4 years are served by over 4,600 childcare centers. More than a quarter of these children (26%) are living in poverty, as indicated by data about the proportion of children in care who are eligible to receive subsidies (North Carolina Department of Health and Human Services, 2017). Staff in childcare sites are able to influence the nutrition and physical activity of the children in their care, which is especially important to children living in poverty who are at higher risk for obesity. Research indicates that early exposure to healthy food and physical activity can lead to a lifetime of healthy choices (Moore et al., 1991; Skinner, Carruth, Bounds, & Ziegler, 2002), providing further support for interventions implemented in

childcare settings that target young children living in poverty. By focusing on children's early experiences, childcare sites are uniquely positioned to promote healthy habits that can last a lifetime. Although previous evaluations of Shape NC TA suggest it can have positive effects on childcare sites' nutrition and physical health policies and practices (De Marco & De Marco, 2016; Vaughn, 2013), the present study is the first rigorous evaluation of the program to be conducted.

Overview of Shape NC TA

Shape NC began in 2011 as a partnership between the North Carolina Partnership for Children (NCPC) and the Blue Cross Blue Shield of North Carolina Foundation (BCBSNCF) as a preventive approach to promote children's healthy weight. Shape NC is a TA model used in childcare settings to improve health and nutrition practices, increase physical activity, and engage children and childcare providers in healthy lifestyle activities. Taken together, Shape NC programs provide young children with early exposure to healthy foods and physical activity to cultivate habits and preferences leading to a lifetime of healthy choices. Through the program, site directors (and the teachers they select) receive training and monthly TA to support Shape NC implementation, a design plan for expanding the outdoor learning environment, and funds to offset costs of implementing the program (average spending is $10,423 for each treatment site in year 3). By targeting sites that serve high percentages of children living in poverty, the Shape NC TA aims to maximize positive outcomes among sites that serve children with the greatest need for support.

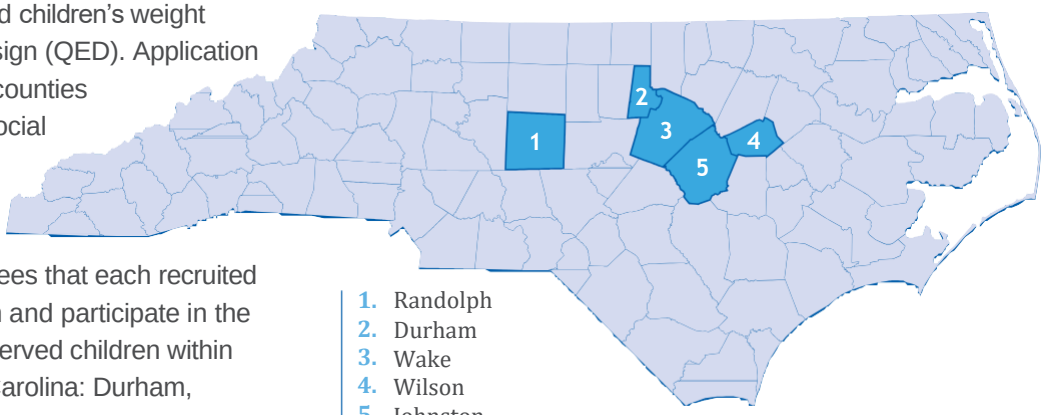
The North Carolina Partnership for Children and the Blue Cross Blue Shield of North Carolina Foundation partnered to offer Shape NC, an obesity prevention approach that promotes children's healthy weight, to childcare providers.

Shape NC integrates three programs to increase sites' use of wellness policies and best practices:

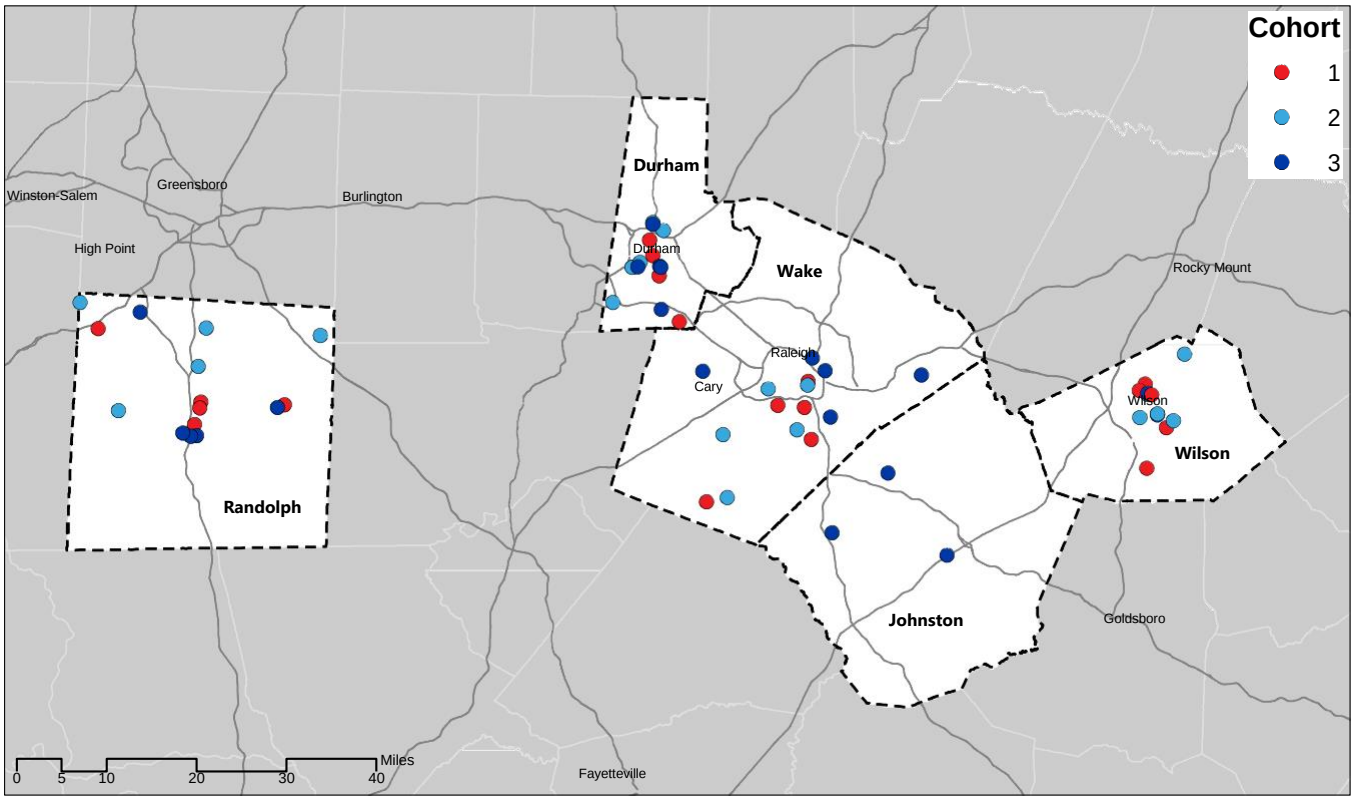
- **Be Active Kids®** (BAK®): A signature health program of BCBSNCF designed to increase indoor and outdoor physical activity of children and adults in early care and education settings.
- **Nutrition and Physical Activity Self-Assessment for Child Care** (Go NAP SACC): Online tools developed by the University of North Carolina at Chapel Hill (UNC-Chapel Hill) researchers to measure best practices in early care and education programs, policies, and environments in five content areas: Breastfeeding and Infant Feeding, Child Nutrition, Infant and Child Physical Activity, Outdoor Play and Learning, and Screen Time.
- **The Natural Learning Initiative** (NLI): A project developed at North Carolina State University that promotes the design of natural outdoor learning environments to enhance children's daily experiences and wellness.

Previous research shows that Shape NC TA can have positive effects on childcare sites' nutrition and physical health policies and practices (De Marco & De Marco, 2016; Vaughn, 2013). Westat's evaluation extends on the two prior evaluations of Shape NC TA by estimating cross-cohort and multiyear impacts of Shape NC on site practices and children's weight using a quasi-experimental design (QED). Application of a QED across participating counties yielded results that meet the Social Innovation Fund's definition of moderate evidence. For the current study, Shape NC TA staff worked with four subgrantees that each recruited sites to implement the program and participate in the evaluation. Participating sites served children within four counties in central North Carolina: Durham, Randolph, Wake, and Wilson.[1]

The remaining sections of this report provide an overview of the evaluation and methodology, as well as descriptions of the evaluation measures, data collection activities, baseline equivalence of treatment and comparison sites and children, and impacts of the program.



1. Randolph
2. Durham
3. Wake
4. Wilson
5. Johnston



1 Sites were recruited from neighboring Johnston County during the 2018-2019 school year. Data from this county were combined with data from Wilson County as there were too few childcare sites in Wilson County that met the eligibility criteria for an adequately powered study.

2 Evaluation Methods and Measures

This section summarizes Westat's methods for evaluating Shape NC TA and the measures used for the study. It also includes information on cohorts of participating childcare sites and the timeline for data collection.

To examine the effect of Shape NC Technical Assistance (TA) on outcomes after 2 years and answer the research questions, Westat collected a variety of data at the site level and child level. Westat collected baseline data in fall 2017 (Cohort 1 treatment group and Cohort 2 comparison group) and fall 2018 (Cohort 2 treatment group and Cohort 3 comparison group), and followup data in spring 2018 (Cohort 1 treatment group and Cohort 2 comparison group) and spring 2019 (treatment group composed of Cohorts 1 and 2 and Cohort 3 comparison group). The evaluation team followed the same procedures and used the same data collection timeline for the treatment and comparison groups. Additional information on the program theory and evaluation methodology are in Appendices A and B, respectively.

Research Questions

The evaluation estimates program effects after 1 and 2 years and focuses on site- and child-level outcomes. The impact evaluation contributes evidence of Shape NC's influence on childcare site practices and child outcomes and was designed to answer these research questions:

1. What is the impact of Shape NC TA on the number of health and nutrition best practices implemented in participating childcare sites receiving 1 or 2 years of treatment relative to comparison sites?
2. What is the impact of Shape NC TA on attitudes of participating children toward healthy eating and physical activity relative to children in comparison sites?
3. What is the impact of Shape NC TA on the percentage of participating children at a healthy weight as measured by child body mass index (BMI) status relative to children in comparison sites?

Study Modifications

There were two modifications to the SIF Evaluation Plan (SEP) since approval of the original plan.

NCPC, in consultation with Westat, eliminated cohort 4, which was meant to serve as the comparison group for cohort 3. Cohort 4 was never intended to receive services under the grant so there is no difference in breadth of service delivery. It was determined that impact would be minimal while still allowing the study to isolate program effect for one and two years of service dosage.

NCPC also decided to eliminate the following series of questions on social-emotional development:

- What is the impact of Shape NC on the physical and social-emotional development of participating children relative to children in comparison sites?

How does this effect vary over time? What is the impact on physical and social-emotional development at the time the child is ready to enter kindergarten?

NC Pre K requires classrooms to measure developmental progression among participating students. Shape NC had planned to use secondary data on children's developmental progress collected in participating NC Pre K classrooms to measure this outcome. However, the program team concluded that a small number of NC Pre K classrooms participating in Shape NC were not using the same measurement tools to measure social-emotional health. As a result, there would not be sufficient data to measure outcomes, thus, the evaluation no longer addressed this research question.

It is also important to note that in year 1 the evaluation team collected and analyzed data on children's food and physical activity preferences to examine children's attitudes toward healthy eating and physical activities. These data were intended to answer the second research question. Based on four rounds of interviews with children enrolled in participating childcare sites (fall 2017, spring 2018, fall 2018, and spring 2019) and discussions with NCPC, Westat concluded interview data were not sufficiently sensitive or informative as a child-level outcome measure and discontinued the collection of these data after spring 2019. Although levels of child and parent agreement suggested young children can respond reliably, baseline responses were near the top of the response scale, limiting opportunities to detect significant changes in attitudes. As such, this report does not address the original question. Instead, the evaluation team investigated the impact of Shape NC TA on children's physical activity at the site-level after 1 or 2 years of treatment and answered this question using site-level outcome data:

New Question 2: What is the impact of Shape NC TA on the physical activity of children in participating childcare sites receiving 1 or 2 years of treatment relative to children in comparison sites?

Westat compared outcomes among sites and among children enrolled in sites receiving Shape NC TA (treatment group) with outcomes among sites and children enrolled at matched comparison sites that had not yet received Shape NC TA (comparison group).

Measures

Site Level

Site director survey. To measure site-level outcomes, Westat adapted a subset of items from the Child Care Nutrition and Physical Activity Assessment Survey (Rudd Center for Food Policy and Obesity, 2008) to measure sites' physical activity and nutrition policies and practices. This self-report survey has been used in modified form to describe nutrition environments in childcare sites (Gerritsen, Wall, & Morton, 2016) and has established psychometric properties, as required by request for proposals. Westat included items from each of the four areas covered by the measure: Nutrition (15 items); Physical Activity Environment (10 items); Nutrition and Physical Activity Policies (6 items); and Barriers to Promoting a Healthy Child Care Environment (15 items). Items were scored using multipoint scales and checklists. Henderson et al. (2011) conducted a validation study that compared survey items to interview or observation data, and the agreement of the items used for the evaluation ranged from 54.5 to 96.9. For items with low agreement (less than .70), Westat included interview questions to corroborate survey data. Due to the time required to collect fall 2017 baseline data, instead of administering a second survey just a few months

later, Westat collected year 1 outcome data using responses to relevant questions incorporated as part of the spring 2018 site director interview.

Site director interview. During fall 2017 and spring 2018 data collection periods, site directors answered questions about implementing Shape NC programs (e.g., changes to food and activity policies, and indoor and outdoor environments and equipment; challenges to promoting health and nutrition). To reduce respondent burden, Instead of conducting site director interviews in years 2 and 3, selected interview questions were included in the site director survey administered each spring.

Child Level

Parent survey. Westat used baseline survey responses to obtain child demographic data (race, ethnicity, gender, date of birth) and to corroborate children's food preferences and activity habits. Due to low response rates, Westat discontinued parent surveys after year 1. Instead, Westat asked parents to provide demographic data when requesting consent for their child to participate in the evaluation.

Child Height and Weight. Westat used children's height and weight measurements to calculate each child's BMI. BMI is a measure of body fat in relation to height and is frequently used to measure healthy weight in children (Henderson et al., 2011; Ogden, Carroll, Fryar, & Flegal, 2015). We used standardized charts developed by the National Center for Health Statistics to determine the percentage of children in different weight categories by comparing children's BMI by age to commonly used national norms.
Weight categories provided by this measure are underweight, healthy weight, overweight, and obese.

Response Rates

Table 1 contains information on the response rate for each data source.

Table 1. Instruments and response rates

Data source	Respondents – Fall 2017		Respondents – Spring 2018		Respondents – Fall 2018		Respondents – Spring 2019	
	Total number eligible	Percent with complete data	Total number eligible	Percent with complete data	Total number eligible	Percent with complete data	Total number eligible	Percent with complete data
Height and weight	1,209	94	1,086	95	836	96	980	98
Site director survey	40	100	40	100	60	100	60	100
Site director interview	40	100	40	100	N/A	N/A	N/A	N/A
Parent survey	1,209	63	376	20	N/A	N/A	N/A	N/A

NOTE: The total number of eligible respondents represents the total number of children ages 2-4 whose parents returned a signed consent form and were enrolled at the site when data were collected, directors from participating sites, technical assistance providers, and parents of children who were eligible for participation. Parents who did not complete a parent survey were asked to complete the parent demographic survey.

3 Baseline Equivalence of Treatment and Comparison Groups

This section provides an overview of how Westat established that treatment and comparison groups were comparable when baseline data were collected. This ensures that differences in outcomes are more likely due to the intervention than to site or child characteristics.

Since the impacts of the program are estimated by comparing the treatment and comparison groups after the program was implemented, it is important for the two groups to be comparable at baseline. Westat ran statistical tests for mean differences between the treatment group and the comparison group in their wellness policies and practices (e.g., food provided, physical activities promoted), and body mass index (BMI) measurements. It is important to keep in mind that the study uses a quasi-experimental delayed treatment design to examine site- and child-level impacts of Shape NC Technical Assistance (TA) after 1 and 2 years of treatment. Through this design, each year Westat examined baseline equivalence between the 20 sites assigned to the treatment group and the 20 sites assigned to the comparison group.

Baseline equivalence was examined at the domain level. That is, the evaluation team established site-level equivalence by examining index scores that were used for site recruitment and site directors' pooled responses related to a range of policy and practice outcomes that may or may not be targeted for improvement by Shape NC TA. To establish child level equivalence, the evaluation team examined BMI percentiles. First the evaluation team presents results of site-level equivalence tests followed by results of child-level equivalence tests followed by descriptive information for key characteristics of sites and children in both groups. Appendix D provides additional details about site-level and child-level baseline equivalence testing.

Site Level Equivalence

Sites in each group were statistically similar regarding baseline wellness outcomes (Y1: $t = 1.435$, $p > 0.05$, Y2: $t = 0.38$, $p > 0.05$).[2] This finding indicates that Westat's strategy of creating blocks of similar sites and providing subgrantees with recruitment instructions resulted in creating equivalent groups. For supplemental details about baseline equivalence testing, see Appendix D.

In the section below, the evaluation team summarized additional descriptive information about key policies, practices, and site characteristics at baseline to provide a clearer picture of existing wellness policies and practices in place at participating sites before implementing the program.

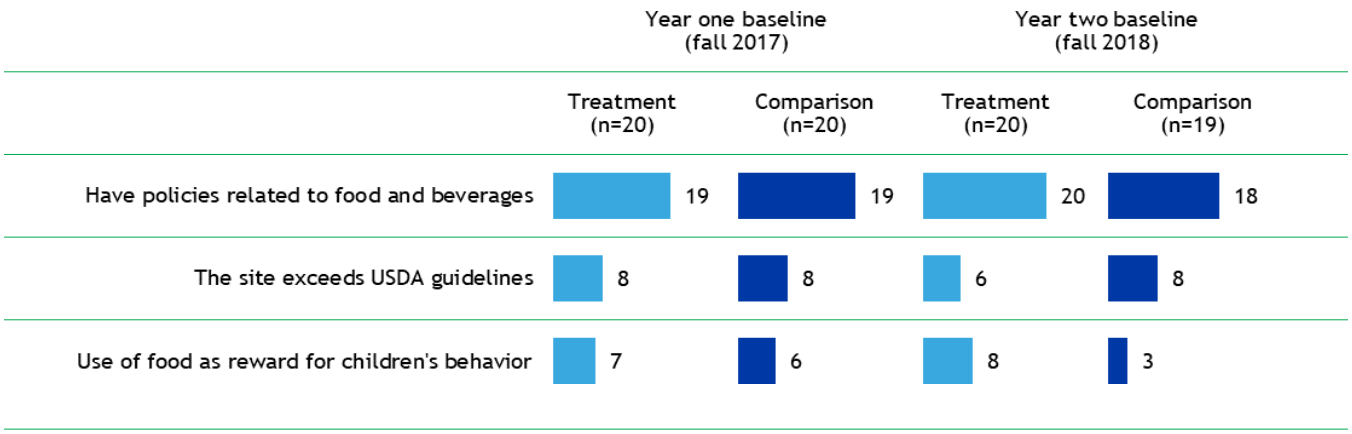
2 Please note Westat pooled 17 survey items regarding wellness policies and practices.

Food and Beverage Policies

Baseline director surveys provided information about sites' policies related to food and beverages prior to receiving Shape NC TA. At the time baseline data were collected, most sites in both groups had policies related to food and beverages (19 of 20 comparison sites and 19 of 20 treatment sites in year 1; and 18 of 19 comparison sites and 20 of 20 treatment sites in year 2). Further, fewer than half of directors in each group indicated that their site's policies exceeded USDA guidelines.

Some sites (6 of 20 comparison and 7 of 20 comparison sites in year 1, and 3 of 19 comparison and 8 of 20 treatment sites in year 2) had policies regarding use of food as a reward for children's behavior (e.g., getting a treat when children are quiet).

Figure 1. Number of sites with food and beverage policies



NOTE: Year one baseline results include cohort 1 treatment sites (n=20) and cohort 2 comparison sites (n=20). Year two baseline results include cohort 2 treatment sites (n=20) and cohort 3 comparison sites (n=19).

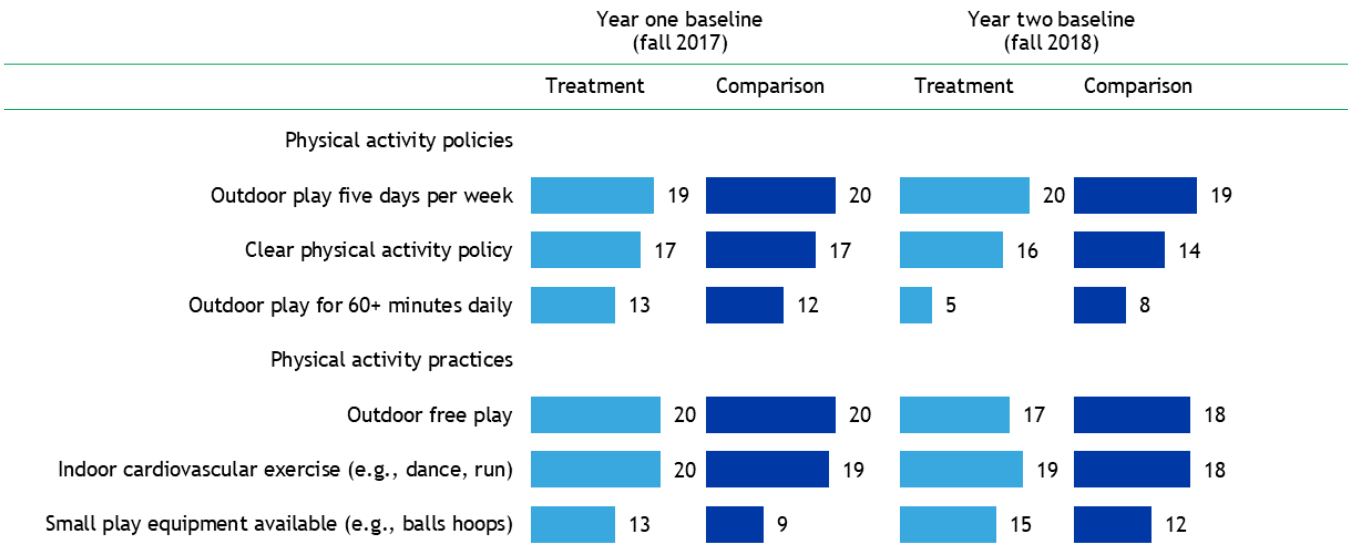
SOURCE: Director survey, fall 2017 (n=40) and fall 2018 (n=39).

Physical Activity Policies

Most sites in the treatment and comparison groups had similar baseline policies related to physical activity at the beginning of years 1 and 2. At baseline at almost all sites in both groups across both years, children had opportunities to play outdoors 5 days per week (among year 1 sites, 19 of 20 treatment sites and all 20 comparison sites; among year 2 sites, all 20 treatment sites and all 19 comparison sites). Similarly, the vast majority of sites in both groups had clear policies regarding physical activity at baseline (among year 1 sites, 17 treatment and comparison sites; among year 2 sites, 16 treatment sites and 14 comparison sites). Among year 1 sites, directors from 12 comparison sites (60%) and 13 treatment sites (65%) reported that children usually play outdoors for more than 60 minutes per day. Director survey results indicated that among year 2 sites, children at five treatment and eight comparison sites usually play outdoors for more than 60 minutes per day.

In terms of physical activity practices, treatment and comparison sites were equivalent at baseline. Almost all site directors in both groups reported offering free play as an outdoor activity and frequently providing children with opportunities to dance, run, or jump to increase indoor physical activity. Slightly more treatment sites than comparison sites have small play equipment such as balls, hoops, or ropes that are accessible to children (among year 1 sites, 13 treatment and 9 comparison sites; among year 2 sites, 15 treatment and 12 comparison sites) (Figure 2).

Figure 2. Number of sites with physical activity policies



NOTE: Year one baseline results include cohort 1 treatment sites (n=20) and cohort 2 comparison sites (n=20). Year two baseline results include cohort 2 treatment sites (n=20) and cohort 3 comparison sites (n=19).

SOURCE: Director interview, fall 2017 (n=40), director survey, fall 2018 (n=39).

Site Characteristics Used to Create Indices

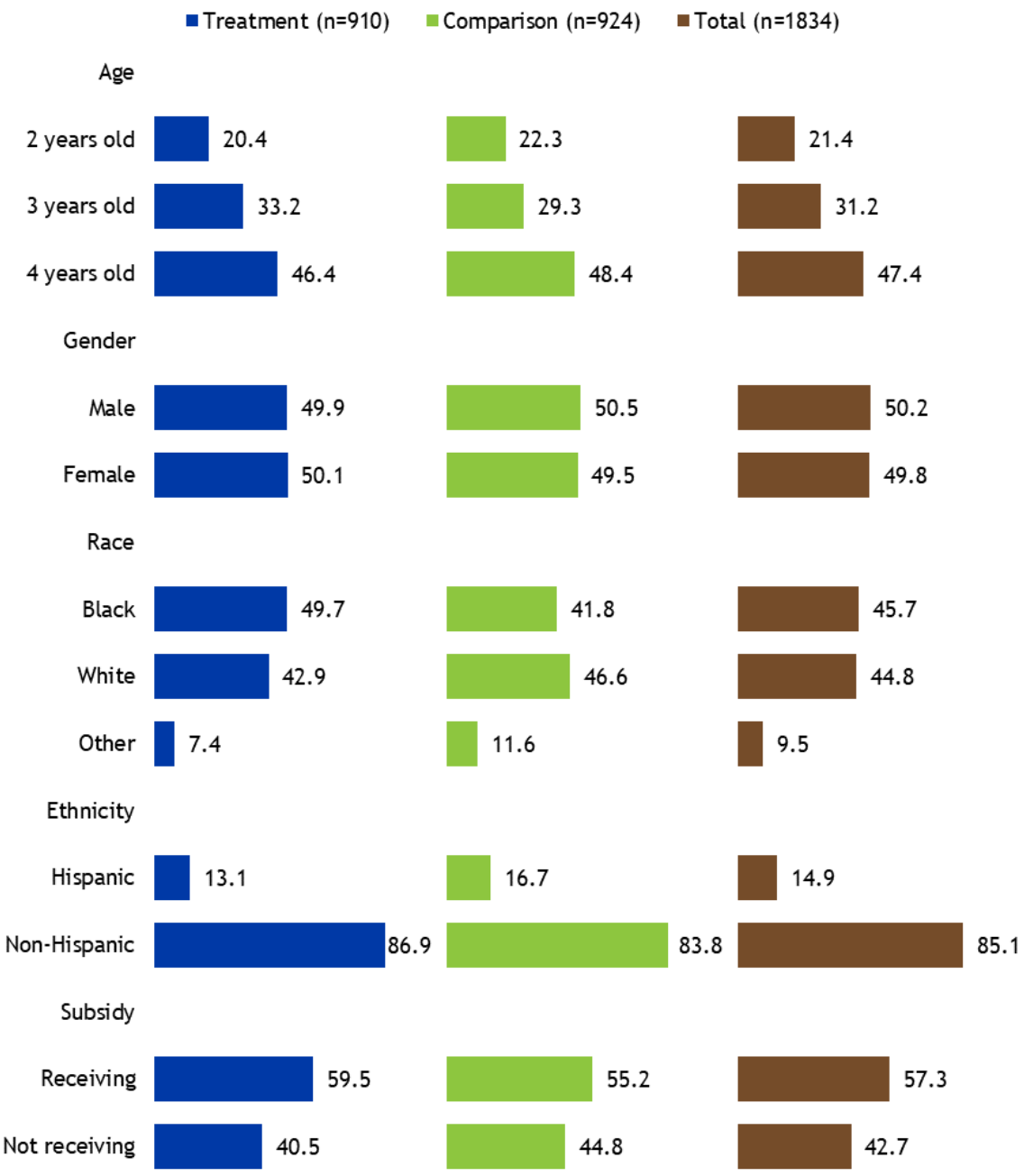
The evaluation team calculated a site index score to create blocks of similar sites. There were no significant differences between the sites in the treatment and comparison groups in the index score used for the recruitment (Y1, $p > 0.05$; Y2, $p > 0.05$).

Child-level Equivalence

Westat compared baseline differences in child-level outcomes and found no significant differences between children in the treatment and comparison groups (see Appendix D). **Children in each group were statistically similar regarding baseline wellness outcomes (Y1: $t = 0.82$, $p > 0.05$, Y2: $t = 0.73$, $p > 0.05$).**

Descriptive child-level demographic data provided by sites for children's age, gender, and race/ethnicity are provided in Figure 3. As the figure shows, children in the treatment and comparison groups share similar characteristics. A slightly larger proportion of children enrolled in treatment sites than comparison sites were Black (49.7% and 41.8%, respectively).

Figure 3. Percentages of children in each group with key characteristics



NOTE: Percentages may not add to 100 percent due to parent responses indicating their child is a member of more than one race/ethnicity category. Percentages are based on the imputed data.

SOURCE: Parent survey, fall 2017, and administrative data from sites, fall 2018

Prior Exposure to Shape NC TA or Other Similar Programs

Despite efforts to limit recruitment to sites with no prior exposure to Shape NC resources (i.e., Be Active Kids® [BAK®], Nutrition and Physical Activity Self-Assessment for Child Care [Go NAPSACC], Natural Learning Initiative [NLI]), data indicate sites in each group had prior program exposure (Table 2). Based on director interviews, about half of directors in both treatment and comparison sites indicated at baseline (in fall 2017 and fall 2018) they were currently implementing or had previously implemented a Shape NC resource or program targeting similar outcomes. Some directors reported the exposure occurred 3 or more years prior to the study. Sites with prior exposure to NAPSACC (the predecessor to the online Go NAPSACC) implemented it between 2011 and 2014. The comparison site that previously implemented BAK® did so in 2014. One treatment site director reported prior experience with BAK® in 2017, before beginning implementation in the fall of that year.

Examples of other programs sites implemented that focused on increasing physical activity or improving children's nutrition prior to the start of this study include the Childcare Health Consultant Program (CCHC), Color Me Healthy, Kindermusik, Imagination Yoga, Wellness Works Wonders, and the Child and Adult Care Food Program (CACFP). Prior exposure to Shape NC resources or initiatives targeting similar outcomes is a nontrivial source of potential comparison group contamination. It is important to acknowledge that comparison sites had prior experience implementing wellness initiatives when interpreting results about the impact of Shape NC TA.

Table 2. Percentages of sites with previous health-related program experience

Previous health-related program experience	Year one baseline (fall 2017)		Year two baseline (fall 2018)	
	Treatment (n=20)	Comparison (n=20)	Treatment (n=20)	Comparison (n=19)
Previous health-related program experience				
Currently participating in any health-related programs	7	10	10	13
Not participating in any health-related programs	11	9	9	6
Previous exposure to Shape NC partner providers				
NAPSACC or Go NAPSACC	2	2	2	1
Be Active Kids® (BAK®)	1	1	1	6
Preventing Obesity by Design (also known as NLI)	0	1	1	6
Engagement with other similar programs				
Childcare Health Consultant Program (CCHC)	2	3	3	6
Kindermusik	1	1	1	0
Imagination Yoga	1	1	1	0
Wellness Works Wonders	0	1	1	0
Color Me Healthy	0	2	2	0

NOTE: Some sites had experience with multiple health-related programs, so numbers are not summed. Year one baseline results include cohort 1 treatment sites (n=20) and cohort 2 comparison sites (n=20). Year two baseline results include cohort 2 treatment sites (n=20) and cohort 3 comparison sites (n=19).

SOURCE: Director interview, fall 2017 and fall 2018.

4 Impacts After 1 and 2 Years of Shape NC Implementation

This section includes a description of the analytic approach and a summary of site- and child-level impacts after 1 and 2 years of program implementation. The impacts described relate to best practices, some targeted by Shape NC TA for improvement and others that were not.

Analysis Approach

An overview of the questions, analytic approach and measures guiding the evaluation are provided in Table 3. Given the small number of treatment and comparison sites (i.e., less than 60), the evaluation team calculated the relationship between Shape NC Technical Assistance (TA) exposure and changes in site-level wellness policies and practices using Fisher's exact test (questions 1 and 2, Table 3). As mentioned earlier, the original question about children's food and physical activity preferences was replaced with a question about physical activity at the site level instead. To highlight Shape NC TA impacts, the evaluation team described the findings in terms of statistically significant changes in childcare site policies and practices.

To assess impact of Shape NC TA on children's body mass index (BMI) (question 3), the evaluation team conducted repeated measures of analysis of covariance, coupled with paired t-tests. This Difference-in-Difference (DID) approach enabled the evaluation team to examine differences in outcomes between groups, and simultaneously observe changes in outcomes over time within each dosage group (e.g., treatment group for 2 years, treatment group for 1 year, and comparison group).

To determine under which conditions Shape NC TA showed the most impact on children's BMI, the evaluation team used three-level nested hierarchical linear models (HLM), where level 1 = time, level 2 = child, and level 3 = site to examine relationships among child outcomes, child demographic characteristics, and site characteristics.

Table 3. Impact questions, outcome measures, and analytic approach

Question	Outcome Measure	Analytic Approach
1. What is the impact of Shape NC on the number of health and nutrition best practices implemented in participating child care sites receiving one or two years of treatment relative to comparison sites?	• Site Director Survey Fall 2017 • Site Director Interview Fall 2017 • Site Director Interview Spring 2018 • Site Director Survey Fall 2018 • Site Director Survey Spring 2019	Fisher's exact test Two years of treatment (Cohort 1 only): N=20 One year of treatment (Year 1 Cohort 1 and Year 2 Cohort 2 combined): N=40 Comparison (Year 1 Cohort 2 and Year 2 Cohort 3 combined): N=39
2. What is the impact of Shape NC on the physical activity of children in participating child care sites receiving one or two years of treatment relative to children in comparison sites?		
3. What is the impact of Shape NC on the percentage of participating children at a healthy weight as measured by child body mass index (BMI) status relative to children in comparison sites?	• Change in child's BMI percentile • Change in child's BMI weight category (i.e., underweight, healthy weight, overweight, or obese)	Repeated measures ANCOVA Paired t-tests HLM1[1] (Two years of treatment: N=210, One year of treatment: N=910, Comparison: N=924)

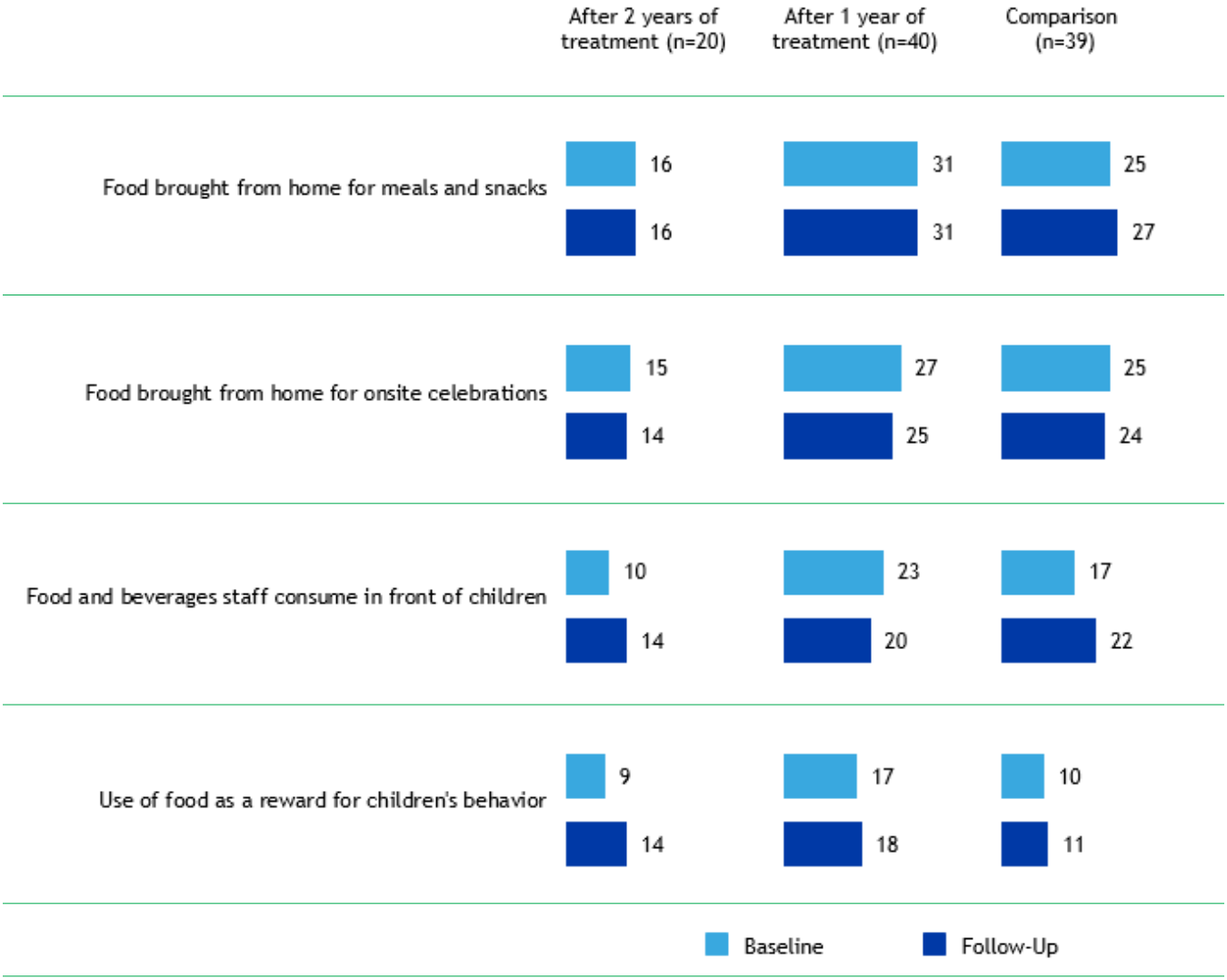
[1]NOTE: Westat ran two separate HLM models – one with the child-level propensity score weights combined into a single 'super covariate' and another with child demographic data entered as separate covariates. The super covariate was not significantly related to outcomes and did not provide interpretable information. In this report, the evaluation team focused on the findings from the latter model since it provided more interpretable information regarding child-level variables associated with changes in outcomes. Tables with HLM results (both models) are presented in Appendix E.

Impacts After 1 and 2 Years

Research Question 1: What is the impact of Shape NC technical assistance on the number of health and nutrition best practices implemented in participating childcare sites receiving 1 or 2 years of treatment relative to comparison sites?

There was no significant impact of Shape NC TA on the number of health and nutrition policies and best practices after 1 or 2 years of implementation. Most treatment and comparison sites had written policies related to food brought from home and staff consumption in front of children (Figure 4). However, of the 23 physical activity policies and practices examined for this study, 46 of them were already in state child care licensing regulations. Other policies didn't align with the Shape NC implementation model; thus, it is not surprising that there were no statistically significant changes between baseline and followup.

Figure 4. Changes to food and beverage policies from baseline to follow-up



NOTE: Findings for sites after two years of treatment include data from cohort 1 sites that received treatment in both years (Year 1 and Year 2). Findings for sites after one year of treatment include data from treatment sites in Year 1 (cohort 1) and Year 2 (cohort 2). Findings for comparison sites include data from the comparison group in Year 1 (cohort 2) and Year 2 (cohort 3).

SOURCE: Director survey, fall 2017, fall 2018, and spring 2019; Director interview, spring 2018.

Research Question 2: What is the impact of Shape NC technical assistance on the physical activity of children in participating childcare sites receiving 1 or 2 years of treatment relative to physical activity of children in comparison sites?

Shape NC TA had a significant positive impact on the number and types of indoor and outdoor physical activities available to children at treatment sites. The impacts were more evident among the sites receiving 2 years of treatment.

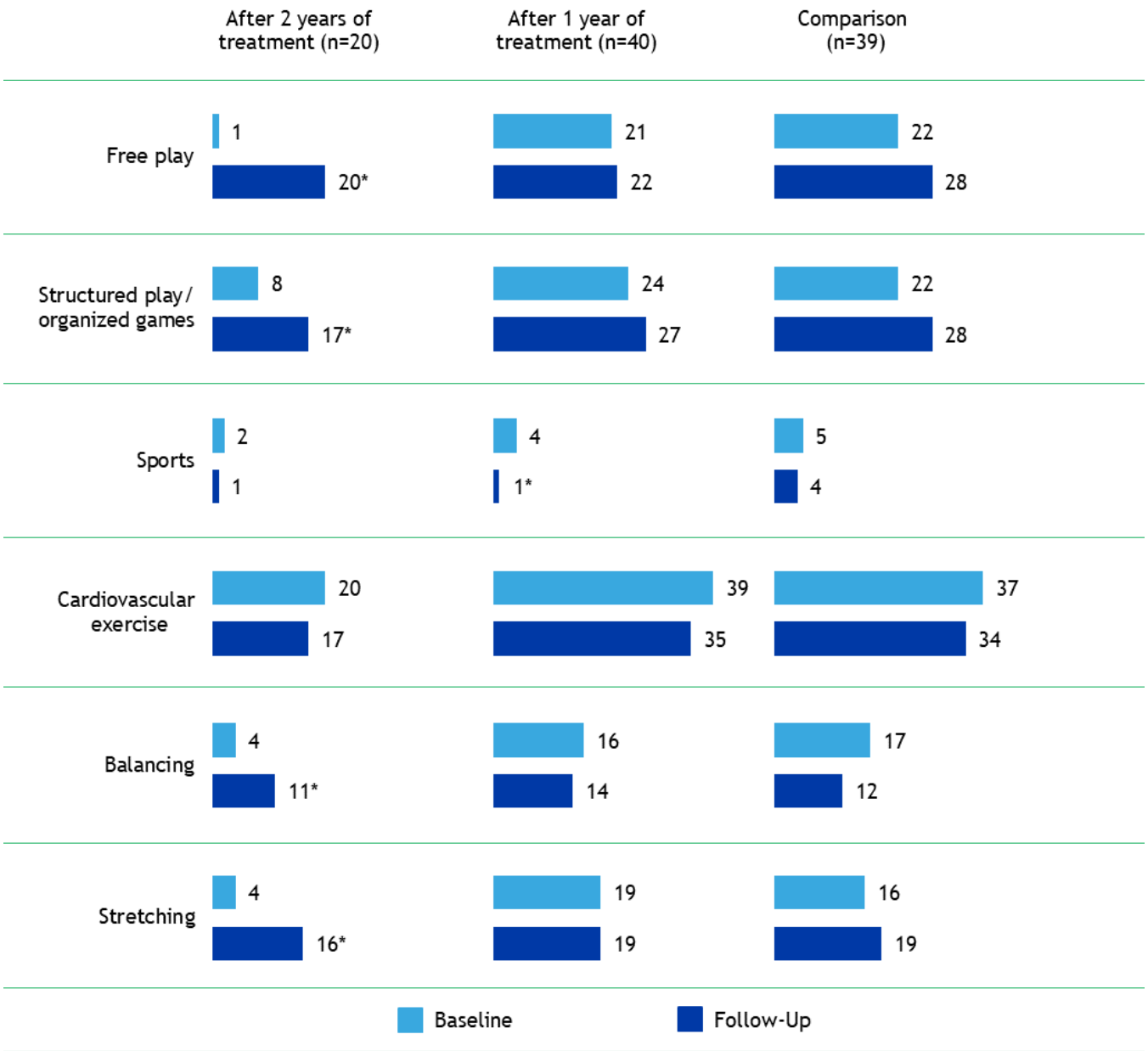
Indoor activities

Data showed there were significant increases in sites offering indoor free play, structured play/organized games, balancing, and stretching (Figure 5).

- After 2 years, children at all 20 treatment sites (100%) engaged in indoor free play, an increase from one site (5%) at baseline ($p < 0.01$).

- After 2 years, the number of sites in which children engaged in structured indoor play/organized games increased to 17 sites (85%) from 8 sites (40%) at baseline (p=0.01).
- After 2 years of treatment, the number of sites in which children engaged in indoor stretching increased to 16 (80%) from 4 (20%) at baseline (p < 0.01).

Figure 5. Changes in types of indoor physical activities between baseline and follow-up



* The percentage of sites at follow-up is statistically different from the percentage of sites at baseline (p < .05).

NOTE: Findings for sites after two years of treatment include data from cohort 1 sites that received treatment in both years (Year 1and Year 2). Findings for sites after one year of treatment include data from treatment sites in Year 1 (cohort 1) and Year 2 (cohort 2). Findings for comparison sites include data from the comparison group in Year 1 (cohort 2) and Year 2 (cohort 3).

SOURCES: Director interview, fall 2017 and spring 2018; Director survey, fall 2018, and spring 2019.

Outdoor activities

After 2 years, there were statistically significant increases in the number of sites in which outdoor structured play/organized games, cardiovascular exercise, play with loose toys, and balancing activities were available (Figure 6).

- After 2 years of treatment, the number of sites in which children participated in outdoor structured play/organized games increased from four (20%) at baseline to 17 (85%) ($p < 0.01$).
- The number of sites in which children engaged in outdoor cardiovascular exercise increased from 25 (63%) at baseline to 31 (78%) after 1 year of treatment ($p > 0.05$), and from 8 (40%) at baseline to all 20 sites after 2 years of treatment ($p < 0.01$).
- Among sites that received 2 years of treatment, the number in which children played/built with loose toys outdoors increased from 15 at baseline to all 20 sites ($p=0.05$).

After 2 years of treatment

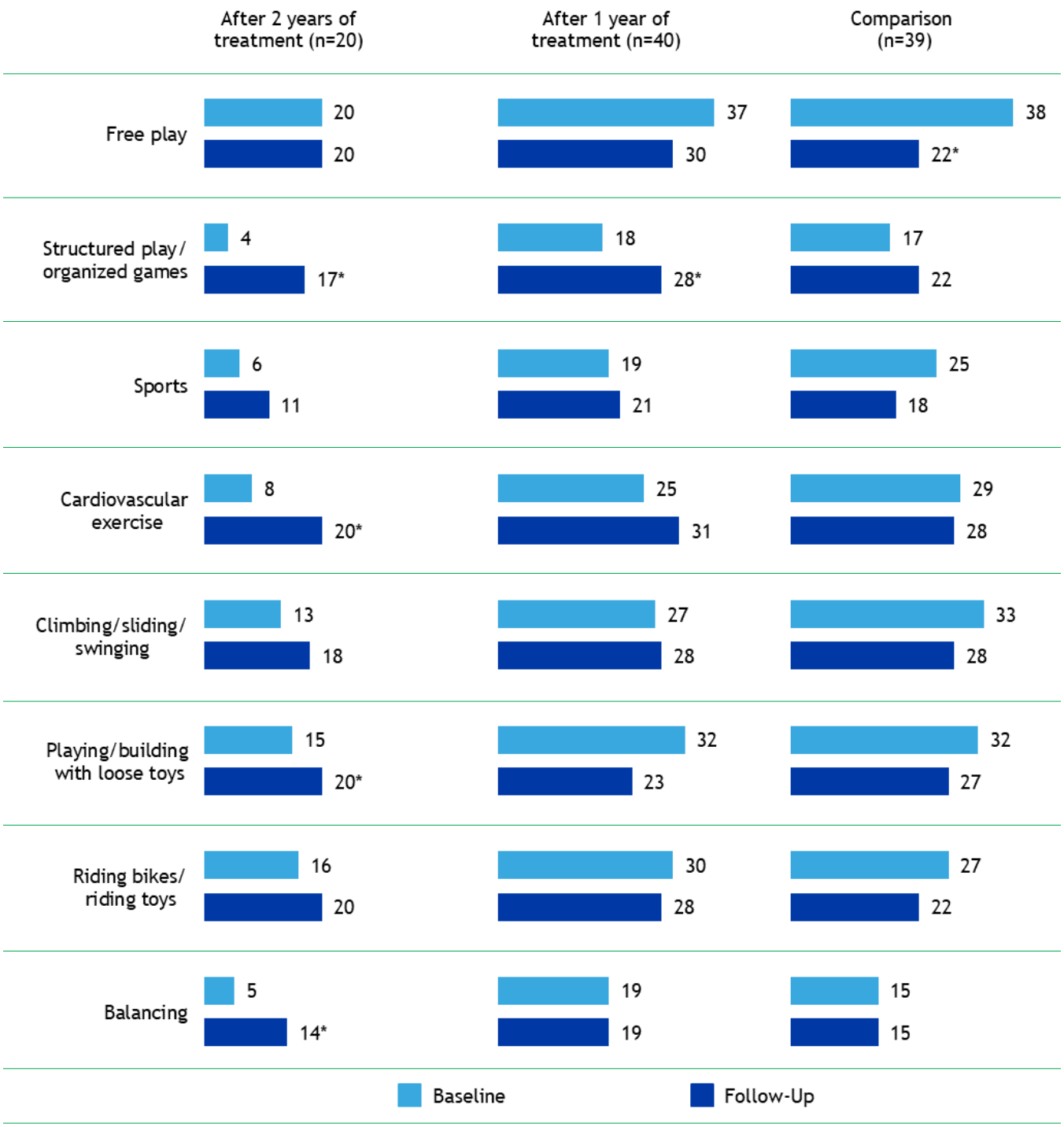
the percentage of sites in which children participated in outdoor structured play/ organized games increased to

85% from **20%**

at baseline.

- Among sites that received 2 years of treatment, the number of sites in which children engaged in outdoor balancing activities increased from five sites at baseline to 14 ($p=0.01$). The number of sites in which children engaged in outdoor balancing activities among sites that received 1 year of treatment (n=19, 48%) remained unchanged, as did the number of comparison group sites in which children engaged in these types of activities (n=15, 38%).

Figure 6. Changes in types of outdoor physical activities between baseline and follow-up



* The percentage of sites at follow-up is statistically different from the percentage of sites at baseline ($p < .05$).

NOTE: Findings for sites after two years of treatment include data from cohort 1 sites that received treatment in both years (Year 1and Year 2). Findings for sites after one year of treatment include data from treatment sites in Year 1 (cohort 1) and Year 2 (cohort 2). Findings for comparison sites include data from the comparison group in Year 1 (cohort 2) and Year 2 (cohort 3).

SOURCES: Director interview, fall 2017 and spring 2018; Director survey, fall 2018, and spring 2019.

After one year of treatment, the average BMI percentile decreased significantly for children who were in the obese and overweight categories at baseline.

Research Question 3: What is the impact of Shape NC technical assistance on the percentage of participating children at a healthy weight as measured by child body mass index (BMI) status relative to children in comparison sites?

Difference between treatment and comparison groups

Shape NC TA did not have a significant impact on the percentage of participating children at a healthy weight. More than two-thirds of children in both treatment and comparison groups were in the healthy weight category at baseline and most children in both groups stayed in the healthy weight category after 1 or 2 years of treatment. Additionally, comparison sites, on average, had a significantly higher proportion of children at a healthy weight (p=0.04) (Figure 7).

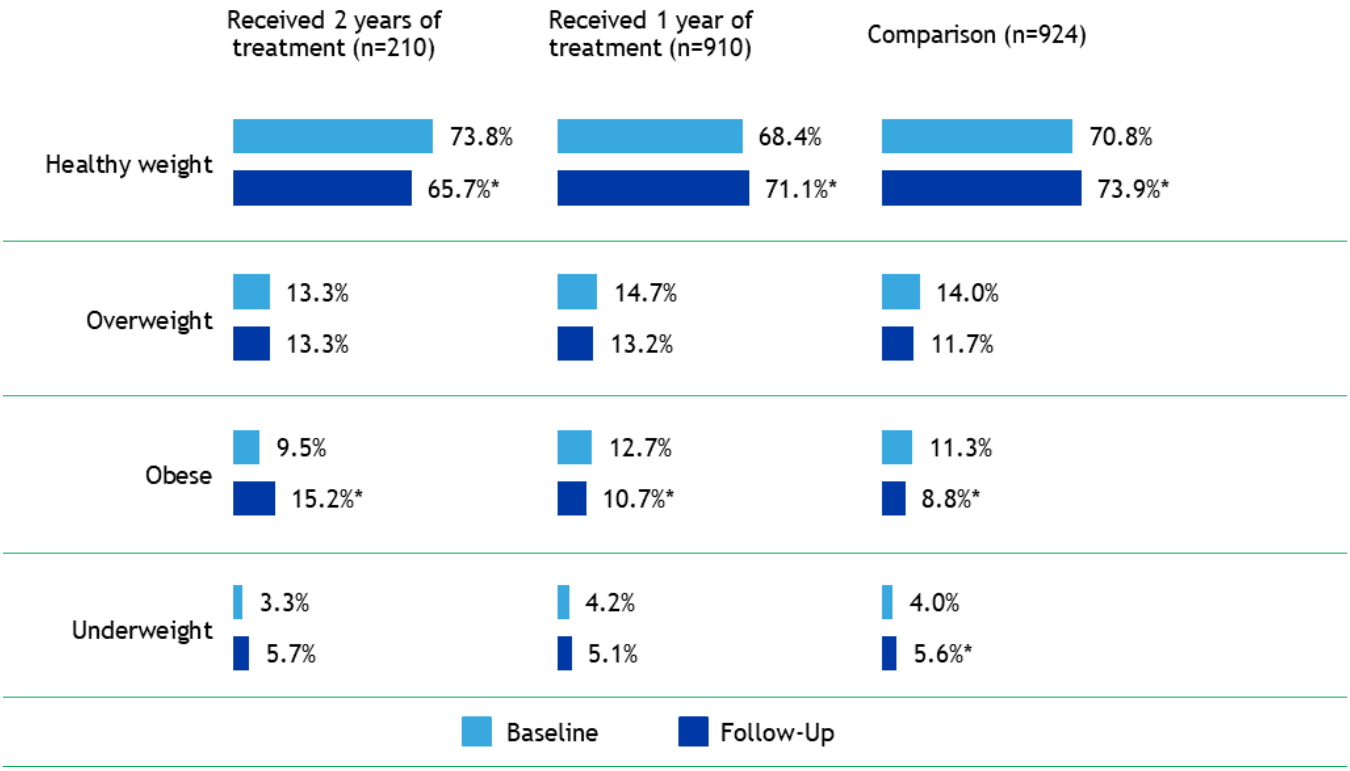
Changes within each dosage group

The section below provides the noteworthy changes between baseline and follow up within each dosage group (e.g., received treatment for 2 years compared to baseline, received treatment for 1 year and compared to a separate comparison group). Findings from HLM analysis are provided where applicable to highlight statistically significant relationships between the treatment and child demographic variables.

- Younger children, on average, were significantly more likely than older children to maintain a healthy weight ($p < 0.01$).[3]
- After 2 years of treatment, the percentage of children in the healthy weight category decreased significantly from 73.8 percent at baseline to 65.7 percent (p=0.02) while the percentage of children in the obese category increased significantly from 9.5 percent at baseline to 15.2 percent (p=0.02).
- After 1 year of treatment
  - the percentage of children in the healthy weight category increased significantly from 68.4 percent at baseline to 71.1 percent (p=0.03). However, children in the comparison group, had similar gains, among the percentage of children in the healthy weight category, which increased from 70.8 percent to 73.9 percent (p=0.02) after 1 year.
  - the percentage of children in the obese category decreased significantly from 12.7 percent at baseline to 10.7 percent (p=0.02). However, comparison group sites had similar decreases in the percentage of children in the obese category, which declined from 11.3 percent to 8.8 percent (p=0.03).

3 To avoid overfitting the model with the binary outcome, the relationships were examined with two-level HLM including child-level covariates.

Figure 7. Percentage of children in BMI weight categories between baseline and follow-up



* The percentage of children at follow-up is statistically different from the percentage of children at baseline ($p < .05$).

NOTE: Findings for children that received two years of treatment include data from children in cohort 1 that received treatment in Year 1 and Year 2. Findings for children that received one year of treatment include data from children at the treatment sites in Year 1 (cohort 1) and Year 2 (cohort 2). Findings for children in the comparison group include data from children at the comparison sites in Year 1 (cohort 2) and Year 2 (cohort 3).

SOURCE: Child height and weight measurement, fall 2017, spring 2018, fall 2018, and spring 2019.

The evaluation team also examined children's BMI percentile changes in each of the four weight categories (i.e., obese, overweight, healthy weight, and underweight), as determined by children's baseline BMI. To interpret whether a BMI change is positive or negative, the relative direction of the change must be considered (e.g., children who move from underweight category at baseline and to the healthy weight category at followup vs. children who move from the overweight category at baseline to the obese category at followup).[4] Table 4 presents the number of children in each weight category by number of years of program exposure.

4 The relationships were examined with three-level HLM with both site-level and child-level covariates.

Table 4. Number of children in each weight category

Weight category	Received 2 years of treatment (n=210)	Received 1 year of treatment (n=910)	Comparison (n=924)
Obese	20	116	104
Overweight	28	134	129
Healthy weight	155	622	654
Underweight	7	38	37

NOTE: Data for children that received 2 years of treatment includes cohort 1 only. Data for children that received 1 year of treatment includes cohorts 1 and 2 combined. Data for children in the comparison group includes Year 1 cohort 2 and Year 2 cohort 3.

SOURCE: Child height and weight measurement, fall 2017, spring 2018, fall 2018, and spring 2019.

There was no statistically significant difference in the rate of change between children in treatment and comparison groups (beta = 0.00, p > 0.05). Although children in each group did change weight categories, rates were similar for children in both groups. In examining each weight category, most changes were positive (i.e., movement from obese to overweight or healthy weight, from overweight to healthy weight, or from underweight to healthy weight).

The section below summarizes noteworthy changes in BMI percentile between baseline and follow up within each dosage group (e.g., received treatment for 2 years, received treatment for 1 year, or comparison group). Additional descriptive data highlight movement between weight categories (Table 5).

Key findings for children in the **obese** category at baseline:

- **After 1 year of treatment, the average BMI percentile decreased significantly (from 20.0 at baseline to 19.3) (p < 0.01).** Among children in this dosage group (n=116), 27 percent (31 children) moved to the overweight category and 7 percent (9 children) moved to the healthy weight category.
- **After 2 years of treatment, the average BMI percentile decreased among the 20 children who were obese at baseline (from 20.3 at baseline to 19.6).** However, the decline was not statistically significant (p > 0.05). Additionally, 15 percent (3 children) moved to the overweight category and 25 percent (5 children) moved to the healthy weight category.
- Among the 104 children in the obese category in the comparison group, the average BMI percentile decreased significantly at follow up (from 20.1 at baseline to 19.4) (p < 0.01). Data showed that 26 percent (27 children) moved to the overweight category and 8 percent (8 children) moved to the healthy weight category.

Key findings for children in the **overweight** category at baseline:

- **After 1 year of treatment, there were statistically significant decreases in the average BMI percentile (from 17.7 at baseline to 17.3) (p < 0.01).** That is, among the 134 children in the overweight category at baseline, 40 percent (54 children) moved to the healthy weight category.
- **After 2 years of treatment, the average BMI percentile among children in this dosage group (28 children) decreased significantly from 18.1 to 17.5 (p=0.04).** Three percent (9 children) moved to the healthy weight category.

- **Among the 129 children in the comparison group, the average BMI percentile decreased significantly from 17.7 at baseline to 17.2 at followup (p < 0.01).** Data showed that 49 percent (64 children) moved to the healthy weight category at followup.

Key findings for children in **underweight** category at baseline:

- **After 1 year of treatment, there were significant increases in the average BMI percentile for 38 children in this category from 13.5 at baseline to 13.9 (p < 0.01).** Among the 38 children in the underweight category at baseline, 39 percent (17 children) moved to the healthy weight category at followup.
- **Among the 7 children that received 2 years of treatment, the average BMI decreased from 14.0 at baseline to 14.1 after 2 years of treatment.** However, the change was not statistically significant (p > 0.05). Additionally, three children moved to the healthy weight category.
- **Among the 37 children in the comparison group, the average BMI percentile increased statistically significantly from 13.5 at baseline to 14.3 at followup (p < 0.01).** Data showed that 46 percent (17 children) moved to the healthy weight category.

Table 5. Children's movement between BMI categories from baseline to follow-up

Children who received 2 years of treatment (n=210)

		Weight Category at Baseline			
		Underweight (n=7)	Healthy Weight (n=155)	Overweight (n=28)	Obese (n=20)
Weight Category at Follow-up	Underweight	4	8	0	0
	Healthy weight	3	121	9	5
	Overweight	0	17	8	3
	Obese	0	9	11	12

Children who received 1 year of treatment (n=910)

		Weight Category at Baseline			
		Underweight (n=38)	Healthy Weight (n=622)	Overweight (n=134)	Obese (n=116)
Weight Category at Follow-up	Underweight	23	21	0	0
	Healthy weight	15	549	54	9
	Overweight	0	35	60	31
	Obese	0	17	20	76

Comparison group children (n=924)

		Weight Category at Baseline			
		Underweight (n=37)	Healthy Weight (n=654)	Overweight (n=129)	Obese (n=104)
Weight Category at Follow-up	Underweight	20	32	0	0
	Healthy weight	17	594	64	8
	Overweight	0	26	55	27
	Obese	0	2	10	69

SOURCE: Child height and weight measurement, fall 2017, spring 2018, fall 2018, and spring 2019.

5 Conclusions and Lessons Learned

This section summarizes key findings relevant to the multi-year impact study of Shape NC TA on participating childcare sites and children. It also includes a discussion of study limitations and lessons learned.

The evaluation team planned to collect child height and weight data for 3 consecutive years from children enrolled at participating childcare sites. Due to COVID-19 physical distance guidelines, in-person data collection restrictions, and childcare site closures, spring 2020 data collection was cancelled. Although Westat was unable to estimate the impact of Shape NC Technical Assistance (TA) after 3 years of support, it used data collected during the first 2 years of the program to evaluate the child-level outcomes of Shape NC TA after 2 years (instead of 3). However, because of the large amount of missing implementation data in year 2, especially Nutrition and Physical Activity Self-Assessment for Child Care (Go NAP SACC) data, Westat was not able to conduct planned implementation analysis or generate evidence about that program's contributions to results summarized in this report.

In addition to disruptions caused by COVID-19, a combination of ceiling and testing effects led Westat to discontinue direct collection with 2-year-old children on their food and activity preferences using the interview protocol. This change eliminated the opportunity to examine whether evidence indicated Shape NC TA produced short-term outcomes (attitude changes) at the child-level, leaving the less sensitive body mass index (BMI) outcome as the sole child-level outcome measure. Finally, given the relatively small number of sites in the sample, the evaluation lacks the power to detect small program effects.

The evaluation did not find evidence suggesting Shape NC TA affects the percentage of participating children at a healthy weight as measured by BMI. However, the evaluation generated rigorous evidence that Shape NC TA had a statistically significant positive impact on the number and types of opportunities for indoor and outdoor physical activity offered to children at participating sites, especially after 2 years. Findings suggest both the Be Active Kids® (BAK®) and Natural Learning Initiative (NLI) are powerful and effective interventions for increasing opportunities for children to engage in physical activity both indoors and outdoors while receiving site-based care. Despite prior exposure to programs with similar goals among sites in both groups, evidence indicates Shape NC TA produced large and significant improvements in opportunities for indoor and outdoor physical activity among children at participating childcare sites.

Lessons Learned

NCPC learned two key lessons from this last phase of Shape NC. Participants learned the importance of community engagement to support the project such as donation of materials, time and funding. Center directors learned how to make the "ask" to secure needed resources. This skill will be utilized in the future to sustain the progress and support continued growth at Shape NC centers. Another important lesson learned is that Shape NC is a model better suited to achieve promising outcomes at the center-level. The crux of the Shape NC model is information dissemination through intensive learning opportunities: the Provider and Technical Assistance Collaboratives, the Shape NC Summit, and the Shape NC track at the National Smart Start Conference. All training opportunities are supported by coaching and technical assistance to embed learned best practices.

With Shape NC sunsetting in 2021, NCPC will scale coaching and TA across the Smart Start network through a project called Beyond Shape: Coaching for Technical Assistants. The goal of Beyond Shape is to support the 150 technical assistants in the Smart Start network via coaching toward new and enhanced policies, collaborations, and environments that will influence a wide range of child and family outcomes. NCPC will facilitate individual professional growth and convene professional learning communities and will curate and create content that expands competencies for mentoring, coaching, and consultation in child care.

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Appendix A. Imputation

This appendix provides the theory of change and logic model for Shape NC Technical Assistance (TA), and outlines data collection methods and instruments used to address questions guiding the study.

Program Theory and Logic Model

The program theory supporting Shape NC TA is that TA, coaching and training, and the combined use of best practices related to infant and child nutrition, physical activity, and outdoor play and learning (i.e., Nutrition and Physical Activity Self-Assessment for Child Care [Go NAP SACC], Be Active Kids® [BAK®], and Natural Learning Initiative [NLI]) lead to increased use of site-level best practices and improvements in children's attitudes toward healthy nutrition and physical activity. Ultimately, these changes lead to increases the proportion of children at a healthy weight. The Shape NC TA logic model (Exhibit A-1) shows the program relies on funding from the Corporation for National Community Service (CNCS) and the Blue Cross Blue Shield of North Carolina Foundation (BCBSNCF). Other inputs include dedicated time from key NCPC staff, materials and expertise from partner providers (Go NAPSACC, BAK®, and NLI), and support from Shape NC mentor sites that demonstrate and share with new sites what they learned from receiving Shape NC TA previously.[5]

In addition to findings from past evaluations of Shape NC TA, research supports use of specific program components. For example, the Go NAPSACC program has been shown to improve provider and parent knowledge of nutrition and physical activity and site health policies, as well as improve children's body mass index (BMI) (Alkon et al., 2014; Battista et al., 2014; Benjamin et al., 2007). The BAK® program has been shown to improve children's nutrition, increase children's knowledge of the importance of proper nutrition and physical activity, increase physical activity, and decrease screen time (e.g., time spent watching videos and playing video games) (DeMarco, Zeisel, & Odom, 2014; Dunn, Thomas, Smith, & Pegram, 2001; Smith et al., 2014). Research supports the effectiveness of NLI's outdoor designs for increasing physical activity (Cosco, Moore, & Islam, 2010). Taken together, evidence suggests using these programs, which support Shape NC programs, can improve the health environment in childcare settings and related child-level outcomes. However, this is the first time a rigorous evaluation of the combined effects of using these programs has been conducted.

As shown in the logic model (Exhibit A-1), staff from North Carolina Partnership for Children (NCPC) provide coaching and TA to subgrantee staff who support implementation and completion of Go NAP SACC at participating childcare sites and provide training on using the BAK® curriculum. Staff from NLI work directly with subgrantees and with sites to design and implement site-specific improvements. In the short term, these activities are expected to improve site staff knowledge and use of best practices related to young children's nutrition and physical activity, and improve children's attitudes toward nutritious foods and being active. After 3 to 5 years, sites are expected to increase their use of best practices to support healthy nutrition and physical activity with the ultimate long-term outcome of more children at a healthy weight, as indicated by children's BMI scores.

Table A-1 shows the research questions and data sources we used to answer the questions guiding the impact evaluation.

5 Although Carolina Global Breastfeeding Institute's breastfeeding program is included in the Shape NC logic model, it is not part of Westat's evaluation.

Exhibit A-1. Shape NC logic model

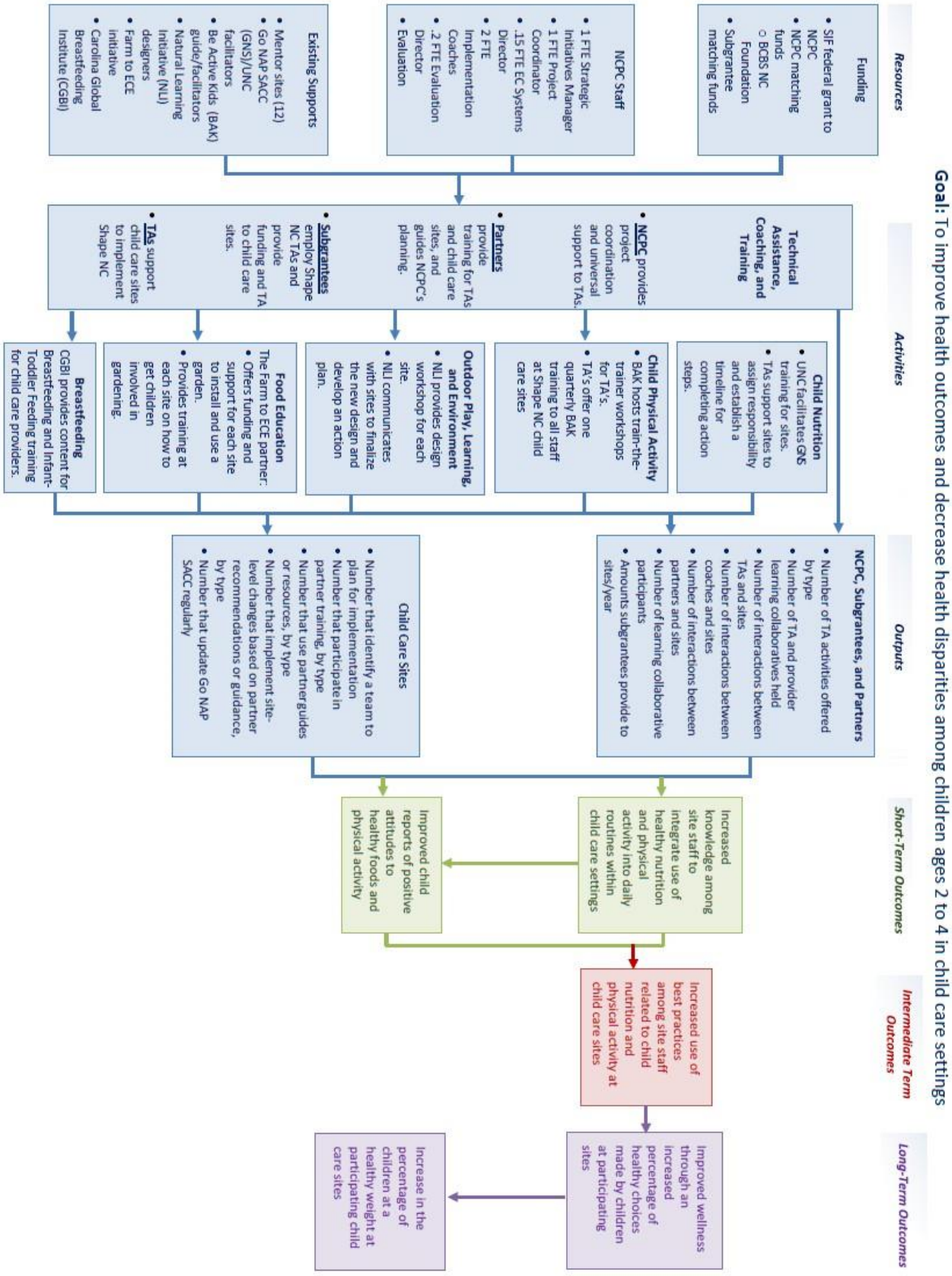


Table A-1. Data sources used to address impact questions

Questions	Site director survey	Site director interview	Child height and weight
	Years 1-2	Years 1	Years 1-2
What is the impact of Shape NC on the number of health and nutrition best practices implemented in participating child care sites receiving one or two years of treatment relative to comparison sites?	✓	✓	
What is the impact of Shape NC on the physical activity of children in participating child care sites receiving one or two years of treatment relative to children in comparison sites?	✓	✓	
What is the impact of Shape NC on the percentage of participating children at a healthy weight as measured by child body mass index (BMI) status relative to children in comparison sites?			✓

NOTE: Site director interviews were conducted in year 1 only (fall 2017 and spring 2018).

Appendix B. Methodology

This appendix describes key elements of the impact study design and the process the evaluation team used to create comparable groups of treatment and comparison sites over time, and key analytic details.

Impact Study

Study Design

Westat conducted a mixed methods evaluation using a quasi-experimental delayed treatment design to examine site- and child-level impacts of Shape NC TA after 1 and 2 years of exposure.[6] Westat compared outcomes among sites and among children enrolled in sites receiving Shape NC TA (treatment group) with outcomes among sites and children enrolled at matched comparison sites that did not receive Shape NC TA (comparison group).

Matching of Treatment and Comparison Groups

Site-Level. There were 709 childcare sites located across the four participating counties at the start of the study. To ensure that treatment and comparison sites are comparable across all years, the evaluation team grouped sites within each county into three blocks based on characteristics subgrantees (with lived experience) believed to be associated with site readiness to implement the program. Then, to ensure subgrantees did not select all the most prepared sites to receive Shape NC TA in the early years, leaving only the less prepared sites for the comparison group in later years, Westat provided subgrantees with detailed instructions regarding how many pairs of sites to recruit from each block in year 1. Once pairs of sites were recruited, subgrantees designated which site within each pair would receive Shape NC TA services and which site would be part of the year 1 comparison group. In year 2, subgrantees recruited new sites to participate in the study as the new comparison group, replacing year 1 comparison sites that started receiving treatment. Westat used this approach to allow subgrantees the freedom to recruit and assign sites based on their deep knowledge of sites within their county while reducing the chances that treatment and comparison groups would not be equivalent, especially in year 2. Westat created blocks by calculating an index score for each site using the following five measures from the North Carolina Department of Health and Human Services' Division of Child Development and Early Education (2017), and our discussions with NCPC and each subgrantee regarding which characteristics they thought were most associated with site readiness to participate fully in the program:

1. Quality license level (teacher education level),
2. Instructional program quality (e.g., space, materials, cleanliness, staff-to-child ratio, and interactions between adults and children and among children),
3. Days in operation (number of days since the site opened),
4. Site size (number of children the site can serve), and
5. Subsidy status (percent of children receiving a subsidy).

To create the index, the evaluation team calculated a normalized value (between 0 and 1) for each of the five measures for each site, so that each site had a total of five normalized values. The team then calculated a weighted index score by summing the normalized values for each site. Using the weighted

6 Due to state-mandated restrictions resulting from COVID-19, the evaluation team could not collect outcome data from children (height and weight) in year 3, as planned. Instead, the analysis reported here includes outcomes after 1 and 2 years.

index score, Westat identified sites that were similar with regard to key characteristics and formed three blocks of sites within each county. For example, within the first block, if Site A is recruited and assigned to the treatment group, it can be matched to comparison group Site B with a similar index score. Site B then serves as a proxy for what Site A would have experienced if Site A had not received the treatment.

This method offered two advantages. First, using index scores to match treatment and comparison sites prevents large differences between the two groups in the variables used to construct these scores. Second, because the evaluation team used index scores as a "super" covariate in the regression model, carrying information from all the covariates (e.g., child demographic variables) and their interaction terms, the approach used only one degree of freedom. Used this way, index scores increased statistical power compared to power when individual covariates are adjusted. Furthermore, combined use of index scores is more efficient and robust than when each score is used alone (Shadish, Cook, & Campbell, 2002).

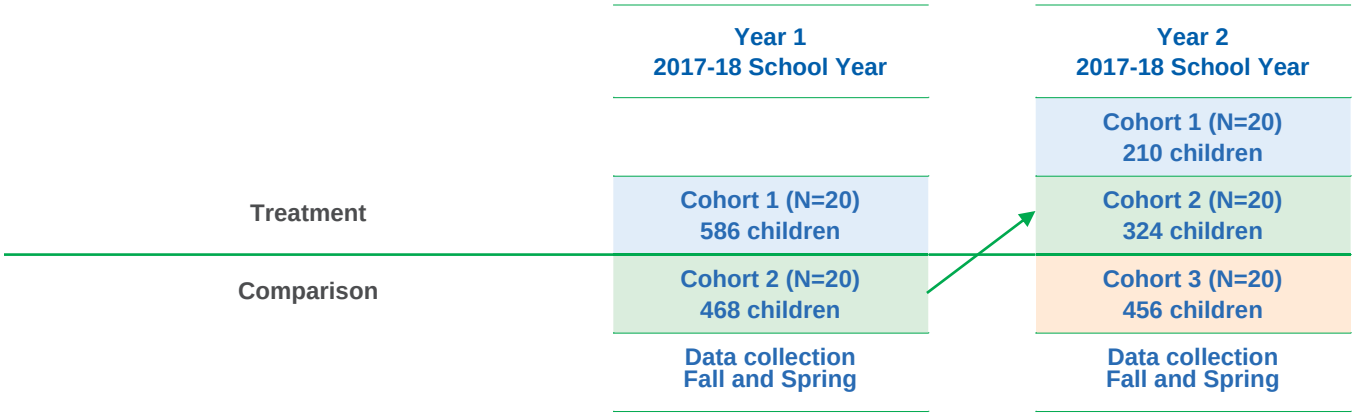
Using this approach, Westat created blocks of sites within each county that had not previously implemented Shape NC programs and had similar index scores. Prior to the recruitment of year 1 sites, subgrantees reviewed the lists of sites within each block and confirmed that lists reflected distinct differences among groups' regarding their readiness to receive Shape NC TA. In year 1, subgrantees recruited five pairs of sites (N=10) across blocks, per Westat guidance,[7] and assigned one site within each pair to receive Shape NC TA and the other site to be part of the year 1 comparison group (comparison sites received Shape NC TA in year 2). In year 2, subgrantees recruited additional sites, in a similar manner, per Westat guidance.[8] This method of identifying blocks of similar sites increased the odds that treatment and comparison groups would be comparable each year. Sites flowed from the comparison to the treatment group between school years as illustrated in Exhibit B-1. It is important to note that Westat based its construction of blocks on available data and subgrantees' deep knowledge of sites within their counties, and not on assessment data (e.g., needs or readiness assessments, or other tools identified through research).

Recruitment. To support subgrantee recruitment efforts, Westat created a brochure explaining the study and the benefits of participating for distribution to eligible sites. Directors of eligible sites who were interested in participating in the study returned a signed Memorandum of Understanding (MOU) indicating their agreement to participate. Westat also prepared information and consent forms for directors at participating sites to distribute to parents of children between 2 and 4 years old. Parent materials were available in English and Spanish. Parents returned signed consent forms indicating their permission for their child(ren) to be interviewed, weighed, and measured by Westat field staff. A toll-free number and study email address were included in the written materials provided to site staff and parents, who were encouraged to contact Westat with any questions or concerns, throughout the life of the study.

7 The number of sites in each block varies based on the size of the county and the number of children each site serves.

8 Due to state-mandated restrictions regarding face-to-face contact resulting from COVID-19, spring 2020 data collection was cancelled. Although subgrantees recruited new comparison sites prior to the 2019-20 school year, Westat was unable to collect the data necessary to include year 3 sites in this report.

Exhibit B-1. Impact Study: Quasi-experimental delayed treatment design



NOTE: A total of 910 children received 1 year of treatment (Westat pooled data for the 586 children in Cohort 1/year 1 and the 324 children in Cohort 2/year 2). A total of 210 children received 2 years of treatment (Cohort 1). The comparison group included 468 children in Cohort 2/year 1 and 456 children in Cohort 3/year 2. Child attrition between years 1 and 2 was due to factors such as children no longer being enrolled at a site, for example.

Table B-1. Group Assignments, by year

Group	Number of sites	2017-18	2018-19
A	20	Treatment	Treatment
B	20	Comparison	Treatment
C	20	Out of study	Comparison
Impact		A vs. B	A and B vs. C

Child-Level

In addition to calculating index scores at the site level, Westat calculated similar scores based on a set of key demographic variables used to adjust for differences among children in the treatment and comparison groups – in particular, age, gender, socioeconomic status (SES; subsidy eligibility information serves as a proxy for SES), and race/ethnicity.

Westat calculated child-level BMIs based on each child's height and weight as follows: [weight (kilograms)/height (centimeters)]*10,000. However, it is important to note that a decreasing BMI percentile is not always a positive finding. For instance, a change from a BMI percentile in the healthy range to a percentile in the underweight range can be negative. Similarly, an increase in BMI percentile is not always a negative finding (e.g., moving from a percentile in the underweight range to a percentile in the healthy range can be positive). Therefore, the evaluation team examined changes in BMI percentiles in two ways. The team:

1. created a dichotomous variable based on BMI percentile (1=healthy weight, 0=not healthy weight) for use as an outcome, since the goal of Shape NC TA is to support childcare sites in increasing implementation of best practices to help all children achieve and maintain a healthy weight.
2. calculated changes in the BMI percentile within each of the four weight categories (i.e., obese, overweight, healthy weight, and underweight), based on recent research suggesting differential effects of obesity prevention interventions on weight (Lumeng et al., 2015; Wang et al., 2013).

To estimate impact of Shape NC on children's BMI, food preferences, and activity habits, Westat calculated a score for each child and used it as a super covariate, and then used nested hierarchical linear modeling (HLM) to estimate child-level impacts.

Preparation of Analytic Sample. Westat collected height and weight data from children in the fall and spring of years 1 and 2.[9] [10] The section below describes the approach used to prepare the analytic sample, steps used to clean data, followed by steps used to impute missing data. The evaluation team also provides the minimum detectable effect size (MDE) the study can estimate, given the size of the analytic samples.

Cleaning Steps

Year 1

To calculate each child's Body Mass Index and classify them into the correct weight category (i.e., underweight, healthy weight, overweight, obese), the evaluation team examined child-level demographic data (age and gender) and excluded cases with missing age or gender data, or that had an "out of scope" age (an age other than 2, 3, or 4 years old).

The evaluation team then identified cases with unusually large differences (growth of 7 or more centimeters in height or weight changes of 4 or more kilograms over six months) based on CDC guidelines for expected growth over a six-month time period for 2-, 3-, and 4-year-olds, by gender. The evaluation team made three types of adjustments:

- For cases where the height measurement was lower in spring 2018 than in fall 2017, calculate an average of the two measurements and use the result as a replacement for both data points.
- For cases where the height difference was greater than two standard deviations from CDC's average growth rates based on age and gender, calculate an average of the two measurements and use the result as a replacement for both data collection points.

9 In year 1, the evaluation team collected and analyzed children's food and physical activity preference data. NCPC and Westat agreed that preference data are not reliable for younger children, so data were not collected from 2-year-old children in year 2 (height and weight data were collected from all children in years 1 and 2).

10 The evaluation plan outlines a strategy to collect data from incoming 2-year-old children in cohort 1 sites in year 2. These children would be new to the program but the sites would be in the second year of implementation, so the experiences of these children would be different than the experiences of the other 2-year-old children. Therefore, new 2-year-old children were not recruited at cohort 1 sites in year 2.

- For cases where the weight difference was greater or less than two standard deviations from CDC's average weight gain based on age and gender, calculate an average of the two measurements and use the result as a replacement for both data points.

Year 2

In year 2, the evaluation team had to do a minimal data cleaning, mainly, it corrected measurement errors. For example, Westat corrected children's weight when it was recorded in pounds instead of kilograms or adjusted height measurements[11] that were recorded in fractions of a centimeter instead of full centimeters.

Imputation of missing data.

After making adjustments for measurement errors, Westat identified cases with missing data on child race, ethnicity, height, or weight. As specified in the evaluation plan, the evaluation team imputed missing data using a statistical model. The imputation approach was the same for year 1 and year 2 and consisted of the following steps to prevent the impact estimate from introducing biases:

- **Step 1: Examine the patterns of missing data**. The imputation is based on the predictive model and needs a set of predictors to estimate the values for the missing data. For this evaluation, they can be demographic data – i.e., demographic data are used to predict missing outcome data, or outcome data – i.e., outcome data are used to predict missing demographic data.
- **Step 2: Identify potential cause of missing data.** The level of missing data can be categorized as Missing Completely At Random (MCAR), Missing at Random (MAR), or Not Missing At Random (NMAR). Implementation of any imputation method is based on the assumption that there is at least some missing data. This step is important in ensuring that the reason for missing data is not related to site- or child-level outcome measurement and covariates. If data are NMAR, estimates of treatment effects could be biased.
- **Step 3: If missing data meet the MAR assumption, determine the imputation method.** In this study, the classification and regression tree (CART) statistical model was used. CART utilizes the sequential regression model, in which all variables in the model are used as predictors to estimate the missing data for one variable. This method is a widely used Machine Learning Algorithm and performs well with both categorical and continuous data, such as the data collected for Shape NC TA, and is flexible to fit non-linear relationships. There are several studies showing the successful use of this method (van Buuren, 2018).

Following the steps above, the evaluation team retained 88 percent of data collected in year 1 and 97 percent of data collected in year 2. Table B-2 shows the number of sites and children that received the treatment, and the MDE this study is likely to produce for different doses of the treatment. In calculation of the MDE, the evaluation team set the power parameter to .08, $p < 0.05$, intraclass correlation to 0.10, and R2 to 0.50. (See Appendix C for the number of children in the treatment and comparison groups by key categories, before and after imputation for years 1 and 2.)

11 Due to children's hairstyle, shoes, etc., the adjusted height was collected from some children.

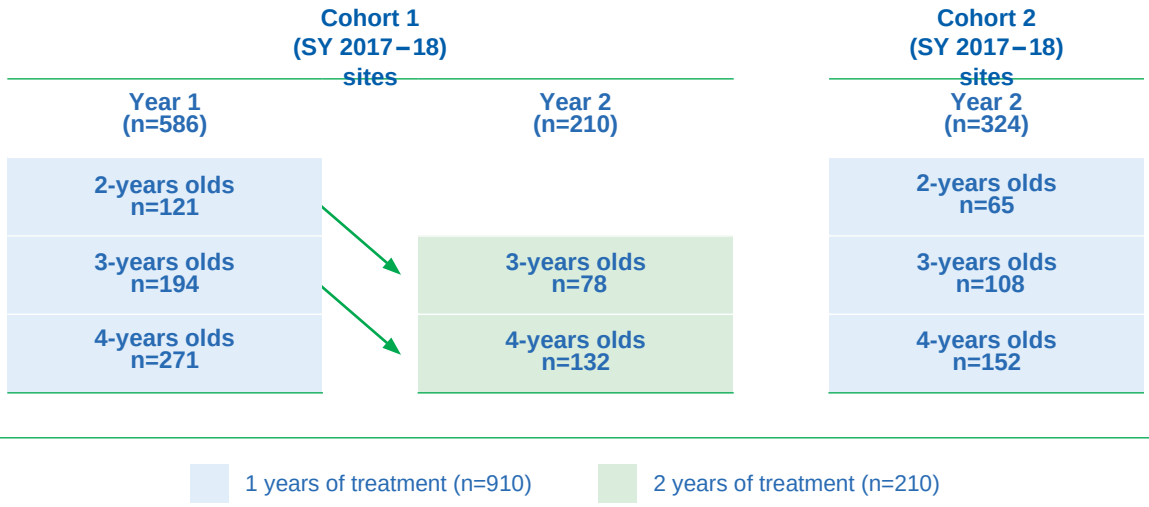
Table B-2. Number of sites, children included in the analysis, and MDE, by number of years of treatment

Number of years of treatment	Number of sites	Number of children	MDE
One year of treatment (Cohorts 1 and 2 combined)	40	910	0.2
Two years of treatment (Cohort 1 only)	20	210	0.4

NOTE: The study includes 924 children in 39 comparison sites.

Exhibit B-2 shows how cohorts of sites and children flowed through the evaluation across the 2 study years.[12]

Exhibit B-2. Number of children in each cohort receiving the treatment, by age



12 In year 1, the evaluation team collected and analyzed children's food and physical activity preference data. NCPC and Westat agreed that preference data are not reliable for younger children, so Westat did not collect data from 2-year-old children after spring 2018.

Appendix C. Imputation

Table C-1. Data collected in fall 2017 and spring 2018

	Before Imputation			After Imputation		
	n	mean	sd	n	mean	sd
Treatment Group (Cohort 1)						
Gender	585	1.51	0.50	586	1.52	0.50
Race	391	4.05	1.20	586	3.98	1.16
Ethnicity	395	1.83	0.37	586	1.85	0.36
Y1 Age	586	3.26	0.78	586	3.26	0.78
Y1 Subsidy	586	1.38	0.49	586	1.38	0.49
Fall 2017 weight	559	17.62	3.83	586	17.52	3.82
Fall 2017 Height	567	102.35	8.01	586	102.10	8.15
Spring 2018 weight	555	18.34	3.73	586	18.27	3.72
Spring 2018 height	555	105.56	7.94	586	105.42	7.96
Fall 2017 BMI	558	16.69	2.02	586	16.67	2.05
Spring 2018 BMI	555	16.34	1.77	586	16.31	1.79
Comparison Group (Cohort 2)						
Gender	467	1.49	0.50	468	1.50	0.50
Race	341	3.55	0.69	468	3.54	0.73
Ethnicity	354	1.81	0.39	468	1.81	0.39
Y1 Age	468	3.31	0.76	468	3.31	0.76
Y1 Subsidy	468	1.45	0.50	468	1.45	0.50
Fall 2017 weight	455	17.49	3.16	468	17.44	3.16
Fall 2017 Height	454	102.40	7.38	468	102.24	7.43
Spring 2018 weight	440	18.29	3.13	468	18.21	3.09
Spring 2018 height	440	105.66	7.29	468	105.53	7.23
Fall 2017 BMI	454	16.59	1.74	468	16.60	1.75
Spring 2018 BMI	440	15.31	1.52	468	16.27	1.51

Table C-2. Data collected in fall 2018 and spring 2019

	Before Imputation			After Imputation		
	n	mean	sd	n	mean	sd
Treatment Group						
Cohort 1						
Gender	210	1.52	0.50	210	1.52	0.50
Race	210	3.52	0.69	210	3.52	0.69
Ethnicity	210	1.91	0.29	210	1.91	0.29
Y2 Age	210	3.63	0.48	210	3.63	0.48
Y2 Subsidy	210	1.32	0.47	210	1.32	0.47
Fall 2017 weight	210	15.76	2.73	210	15.76	2.73
Fall 2017 Height	210	96.95	6.62	210	96.95	6.62
Spring 2018 weight	210	16.53	2.74	210	16.53	2.74
Spring 2018 height	210	100.44	6.42	210	100.44	6.42
Spring 2019 weight	199	19.15	3.66	210	19.22	3.73
Spring 2019 height	199	108.05	6.36	210	108.09	6.66
Spring 2019 BMI	199	16.29	1.94	210	16.33	1.92
Cohort 2						
Gender	322	1.48	0.50	324	1.48	0.50
Race	292	3.48	0.60	324	3.49	0.60
Ethnicity	279	1.91	0.29	324	1.91	0.29
Y2 Age	324	3.27	0.77	324	3.27	0.77
Y2 Subsidy	324	1.45	0.50	324	1.45	0.50
Spring 2018 weight	313	17.10	3.14	324	17.10	3.14
Spring 2018 height	313	101.72	7.85	324	101.65	7.83
Spring 2019 weight	294	18.35	3.54	324	18.38	3.53
Spring 2019 height	294	105.51	7.89	324	105.49	7.84
Spring 2018 BMI	313	16.43	1.55	324	16.45	1.54
Spring 2019 BMI	294	16.37	1.67	324	16.41	1.75
Comparison Group (Cohort 3)						
Gender	453	1.49	0.50	456	1.49	0.50
Race	422	3.63	0.72	456	3.63	0.71
Ethnicity	411	1.86	0.35	456	1.85	0.35
Y2 Age	456	3.21	0.83	456	3.21	0.83
Y2 Subsidy	456	1.45	0.50	456	1.45	0.50
Spring 2018 weight	444	16.91	3.77	456	16.87	3.76
Spring 2018 height	444	100.98	8.25	456	100.78	8.35
Spring 2019 weight	419	18.09	4.14	456	18.07	4.14
Spring 2019 height	419	104.71	7.97	456	104.67	8.06
Spring 2018 BMI	444	16.45	1.97	456	16.47	1.96
Spring 2019 BMI	416	16.34	1.95	456	13.33	1.93

Appendix D.
Supplemental Baseline Equivalence Data

Baseline Equivalence

Year 1 Treatment vs Year 1 Comparison

Table D-1. Percentage of sites with key characteristics at baseline

Characteristic	Year 1 Treatment (n=20)	Year 1 Comparison (n=20)	Total (n=40)
Children eligible for subsidies	95.0%	90.0%	92.5%
Quality star rating of 5	85.0	80.0	82.5
Program standards points of 5 or higher	80.0	80.0	80.0
Category of operation as independent	75.0	75.0	75.0
7 Lead teacher education points	60.0	70.0	65.0
In operation for 2 or more years	40.0	50.0	45.0
Enrollment capacity of 90 or more children	45.0	40.0	42.5
Average weighted index score	2.39	2.38	2.38

SOURCE: North Carolina Department of Health and Human Services, Division of Child Development and Early Education, Fall 2017.

Table D-2. Food and physical activity policies

Practice/policy on food and physical activity	Year 1 Treatment (n=20)		Year 1 Comparison (n=20)		Absolute difference between groups		
	Percent	SD	Percent	SD	Percent	ES	p-value
Nutrition practices exceed USDA's CACFP nutrition standards	40.0%	0.50	40.0%	0.50	0.0%	0.00	1.00
Written policy in the parent handbook about:							
Foods brought from home for meals and snacks	75.0	0.44	60.0	0.50	15.0	0.16	0.32
Food brought from home for onsite celebrations that include children	70.0	0.47	60.0	0.50	10.0	0.10	0.51
Food and beverages staff consume in front of children	10.0	0.31	20.0	0.41	10.0	0.18	0.38
Use of food as a reward for children's behavior	35.0	0.49	30.0	0.47	5.0	0.05	0.74
Physical education and/or physical activity	60.0	0.50	45.0	0.51	15.0	0.14	0.34

SOURCE: Director survey, Fall 2017.

Table D-3. Child-level outcomes

Outcomes	Year 1 Treatment (n=523)		Year 1 Comparison (n=416)		Absolute difference between groups		
	Mean	SD	Mean	SD	Mean	ES	p-value
Body Mass Index (BMI)	16.70	2.04	16.60	2.04	0.10	0.01	0.60
2-year-olds	16.81	1.69	16.97	1.45	0.15	0.04	0.56
3-year-olds	16.61	1.80	16.52	1.77	0.09	0.02	0.66
4-year-olds	16.72	2.31	16.60	1.78	0.12	0.02	0.53
Food and activity preferences	13.30	2.24	13.30	2.26	0.00	0.00	0.99
2-year-olds	13.54	2.41	13.70	2.35	0.16	0.03	0.15
3-year-olds	13.54	2.21	13.48	2.12	0.06	0.01	0.85
4-year-olds	13.07	2.19	13.02	2.30	0.05	0.01	0.82

SOURCES: Child interview and child height and weight measurement, Fall 2017.

Baseline Equivalence

Year 2 Treatment vs Year 2 Comparison

Table D-4. Percentage of sites with key characteristics at baseline

Characteristic	Year 2 Treatment (n=20)	Year 2 Comparison (n=19)	Total (n=39)
Children eligible for subsidies	85.0	94.7	89.7
Quality star rating of 5	80.0	52.6	66.7
Program standards points of 5 or higher	90.0	73.7	82.1
Category of operation as independent	75.0	84.2	79.5
7 Lead teacher education points	75.0	63.2	69.2
In operation for 2 or more years	50.0	21.1	35.9
Enrollment capacity of 90 or more children	45.0	47.4	46.2
Average weighted index score	2.38	2.19	2.29

SOURCE: North Carolina Department of Health and Human Services, Division of Child Development and Early Education, Fall 2018.
NOTE: Data from one year 2 comparison site are excluded from the analysis. This site was included at the request of the subgrantee, even though it did not meet the program quality rating requirement.

Table D-5. Food and physical activity policies

Practice/policy on food and physical activity	Year 2 Treatment (n=20)		Year 2 Comparison (n=19)		Absolute difference between groups		
	Percent	SD	Percent	SD	Percent	ES	p-value
Nutrition practices exceed USDA's CACFP nutrition standards	31.6%	0.48	42.1%	0.51	10.5%	0.10	0.51
Written policy in the parent handbook about:							
Foods brought from home for meals and snacks	83.3	0.38	57.9	0.51	25.4	0.27	0.09
Food brought from home for onsite celebrations that include children	63.2	0.50	52.6	0.51	10.5	0.10	0.52
Food and beverages staff consume in front of children	31.6	0.48	10.5	0.32	21.1	0.29	0.12
Use of food as a reward for children's behavior	40.0	0.50	15.8	0.37	24.2	0.27	0.10
Physical education and/or physical activity	50.0	0.51	42.1	0.51	7.9	0.08	0.63

SOURCE: Director survey, Fall 2018.

NOTE: Data from one year 2 comparison site are excluded from the analysis. This site was included at the request of the subgrantee, even though it did not meet the program quality rating requirement.

Table D-6. Child-level outcomes

Outcomes	Year 2 Treatment (n=255)		Year 2 Comparison (n=374)		Absolute difference between groups		
	Mean	SD	Mean	SD	Mean	ES	p-value
BMI	16.41	1.45	16.40	1.83	0.01	0.00	0.96
2-year-olds	16.88	1.54	16.79	1.42	0.10	0.03	0.69
3-year-olds	16.36	1.31	16.22	1.95	0.14	0.03	0.60
4-year-olds	16.23	1.46	16.28	1.94	0.04	0.01	0.84
Food and activity preferences	13.57	1.92	13.24	2.20	0.33	0.06	0.09
3-year-olds	13.93	1.70	13.66	2.33	0.27	0.05	0.40
4-year-olds	13.36	2.01	13.03	2.11	0.33	0.06	0.17

SOURCES: Child interview and child height and weight measurement, fall 2018.

NOTE: Data from one year 2 comparison site are excluded from the analysis. This site was included at the request of the subgrantee, even though it did not meet the program quality rating requirement.

Table D-7. Number and percentage of sites with previous health-related program experience (at baseline)

Previous Health-Related Program Experience	Year 1 Treatment Sites (n = 20)		Year 2 Treatment Sites (n = 20)		Year 2 Comparison Sites (n = 19)	
	Number	Percent	Number	Percent	Number	Percent
Experience participating in physical activity or nutrition programs						
Prior participation	7	35.0%	10	50.0%	13	68.4%
No prior participation	11	55.0	9	45.0	6	31.6
Don't know	2	10.0	1	5.0	0	0.0
Shape NC programs previously implemented						
NAP SACC or GO NAP SACC	2	10.0	2	10.0	1	5.3
Be Active Kids® (BAK®)	1	5.0	1	5.0	6	31.6
Preventing Obesity by Design (POD or NLI)	0	0.0	1	5.0	6	31.6
Other similar programs previously implemented						
Childcare Health Consultant Program (CCHC)	2	10.0	3	15.0	6	31.6
Kindermusik	1	5.0	1	5.0	0	0.0
Imagination Yoga	1	5.0	1	5.0	0	0.0
Wellness Works Wonders	0	0.0	1	5.0	0	0.0
Color Me Healthy	0	0.0	2	10.0	0	0.0
Fresh Fruit & Vegetable Grant	0	0.0	0	0.0	1	5.3
Healthy Me, Healthy We	0	0.0	0	0.0	1	5.3

SOURCES: Director interview (year 1 treatment sites and year 2 treatment sites), fall 2017, and site intake form (year 2 comparison sites), fall 2018.

NOTE: Data from one year 2 comparison site that did not meet the program quality rating requirement but was included at the request of the subgrantee are excluded from the analysis.

Table D-8. Number and percentage of sites with nutrition practices aligned with USDA's Child and Adult Care Food Program (CACFP) standards

Do site nutrition practices exceed USDA's CACFP standards?	Year 1 Treatment Sites (n = 20)		Year 2 Treatment Sites (n = 20)		Year 2 Comparison Sites (n = 19)	
	Number	Percent	Number	Percent	Number	Percent
Yes, site practices exceed CACFP nutrition standards	12	60.0%	6	30.0%	9	47.4%
No, but site practices align with CACFP standards	6	30.0	12	60.0	9	47.4
No, site practices do not meet CACFP standards	1	5.0	1	5.0	0	0.0
Not familiar with CACFP standards	1	5.0	1	5.0	1	5.3

SOURCES: Director survey, fall 2017 and fall 2018.

NOTE: Data from one year 2 comparison site that did not meet the program quality rating requirement but was included at the request of the subgrantee are excluded from the analysis.

Appendix E.
HLM Tables

Table E-1. Examining Healthy weight categories>

Model specification	Estimate	Std. error	z-value	P-value
Model 1: With propensity score				
Group assignment (Treatment)	-0.71	0.23	-3.14	0.00
Child propensity	1.89	1.37	1.38	0.17
Time 1	0.55	0.15	3.79	0.00
Time 2	-0.82	0.31	-2.66	0.00
Model 2: With child demographic				
Group assignment (Treatment)	-0.48	0.24	-2.02	0.04
Gender (Girl)	-0.71	0.18	-3.86	0.00
Age	-0.19	0.31	-0.62	0.53
Race 1 (Black)	-0.32	0.55	-0.59	0.56
Race 2 (White)	-0.06	0.54	-0.11	0.91
Ethnicity (Hispanic)	0.52	0.45	1.15	0.25
Subsidy (Received)	-0.35	0.31	-1.12	0.26
Time 1	0.54	0.14	3.75	0.00
Time 2	-0.24	0.34	-0.71	0.47

Table E-2. Examining BMI percentile>

Model specification	Estimate	Std. error	t-value	P-value
Model 1: With propensity score				
Group assignment (treatment)	0.04	0.06	0.64	0.52
Site level covariates				
Children eligible for subsidies	0.09	0.22	0.43	0.67
Category of operation as independent	-0.03	0.14	-0.24	0.81
Quality star rating of 5	0.20	0.21	0.97	0.34
7 Lead teacher education points	-0.04	0.13	-0.28	0.78
Program standards points of 5 or higher	-0.06	0.23	-0.25	0.78
Enrollment capacity of 90 or more children	-0.02	0.12	-0.15	0.88
In operation for 2 or more years	-0.22	0.11	-1.94	0.06
Child level covariate				
Propensity score	0.73	0.38	1.93	0.05
Time 1	-0.24	0.02	-11.05	0.00
Time 2	-0.29	0.06	-5.11	0.00
Model 2: With child demographic				
Group assignment (treatment)	-0.00	0.06	-0.00	1.00
Site level covariates				
Children eligible for subsidies	0.07	0.22	0.34	0.74
Category of operation as independent	-0.13	0.14	-0.95	0.35
Quality star rating of 5	0.26	0.21	1.25	0.21
7 Lead teacher education points	-0.11	0.13	-0.80	0.43
Program standards points of 5 or higher	-0.06	0.22	-0.27	0.78
Enrollment capacity of 90 or more children	0.01	0.11	0.11	0.91
In operation for 2 or more years	-0.18	0.11	-1.60	0.11
Child level covariate				
Age	-0.06	0.05	-1.12	0.26
Gender (Girl)	-0.04	0.09	-0.49	0.62
Race 1 (Black)	0.28	0.16	1.82	0.07
Race 2 (White)	0.16	0.15	1.11	0.27
Ethnicity (Hispanic)	-0.14	0.12	-1.15	0.25
Subsidy (Received)	0.05	0.08	0.67	0.50
Time 1	-0.24	0.02	-11.02	0.00
Time 2	-0.23	0.07	-3.15	0.00

Appendix F.
Outcome Data Disaggregated by County

Durham County

Site Level Results - Nutrition

Table F-1. Food and physical activity policies

Policy on food and physical activity	Treatment 2 years (n = 5)				Treatment 1 year (n = 10)				Comparison (n = 10)			
	Baseline		Follow-Up		Baseline		Follow-Up		Baseline		Follow-Up	
	N	%	N	%	N	%	N	%	N	%	N	%
Foods brought from home for meals and snacks												
No policy	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Informal policy	1	20.0	2	40.0	2	20.0	3	30.0	2	20.0	3	30.0
Written policy	3	60.0	3	60.0	7	70.0	6	60.0	7	70.0	7	70.0
Food brought from home for onsite celebrations that include children												
No policy	0	0.0	0	0.0	0	0.0	1	10.0	0	0.0	0	0.0
Informal policy	2	40.0	2	40.0	3	30.0	3	30.0	2	20.0	3	30.0
Written policy	3	60.0	3	60.0	7	70.0	5	50.0	7	70.0	7	70.0
Food and beverages staff consume in front of children												
No policy	1	20.0	0	0.0	1	10.0	0	0.0	2	20.0	1	10.0
Informal policy	1	20.0	1	20.0	2	20.0	3	30.0	4	40.0	3	30.0
Written policy	3	60.0	4	80.0	7	70.0	6	60.0	3	30.0	6	60.0
Use of food as a reward for children's behavior												
No policy	2	40.0	1	20.0	4	40.0	5	50.0	3	30.0	3	30.0
Informal policy	2	40.0	0	0.0	4	40.0	1	10.0	4	40.0	3	30.0
Written policy	1	20.0	4	80.0	2	20.0	3	30.0	2	20.0	4	40.0
Physical education and/or physical activity												
No policy	2	40.0	1	20.0	4	40.0	2	20.0	1	10.0	1	10.0
Informal policy	0	0.0	0	0.0	1	10.0	3	30.0	2	20.0	2	20.0
Written policy	3	60.0	4	80.0	5	50.0	330.0		6	60.0	7	70.0
Children's use of computers												
No policy	0	0.0	1	20.0	1	10.0	3	30.0	3	30.0	2	20.0
Informal policy	3	60.0	1	20.0	5	50.0	2	20.0	2	20.0	2	20.0
Written policy	2	40.0	3	60.0	4	40.0	4	40.0	4	40.0	6	60.0

NOTE: Percentages in the comparison column are based on data for sites that were in the comparison group in year 1 (cohort 2) and year 2 (cohort 3). Findings for sites after one year of treatment includes data from treatment sites in years 1 and 2. Findings for sites receiving two years of treatment includes cohort 1 treatment sites that received treatment in both years (year 1 and year 2). There were no statistically significant differences between baseline and follow-up for any of the groups.

SOURCES: Director survey, fall 2017, fall 2018, and spring 2019; Director interview, spring 2018.

Table F-2. Challenges reported by sites to promote healthy eating

Challenges to healthy eating	Treatment 2 years (n = 5)				Treatment 1 year (n = 10)				Comparison (n = 10)			
	Baseline		Follow-Up		Baseline		Follow-Up		Baseline		Follow-Up	
	N	%	N	%	N	%	N	%	N	%	N	%
Lack of staff training	1	20.0%	1	20.0%	4	40.0%	2	20.0%	6	60.0%	5	50.0%
Lack of nutrition education resources	2	40.0	0	0.0	5	50.0	3	30.0	6	60.0	5	50.0
Limited time to teach nutrition	1	20.0	1	20.0	5	50.0	5	50.0	7	70.0	6	60.0
Lack of access to fresh fruits and vegetables	0	0.0	0	0.0	0	0.0	1	10.0	0	0.0	0	0.0
Lack of funding to purchase healthy foods	1	20.0	1	20.0	4	40.0	5	50.0	1	10.0	3	30.0

NOTE: Percentages in the comparison column are based on data for sites that were in the comparison group in year 1 (cohort 2) and year 2 (cohort 3). Findings for sites after one year of treatment includes data from treatment sites in years 1 and 2. Findings for sites receiving two years of treatment includes cohort 1 treatment sites that received treatment in both years (year 1 and year 2).

SOURCES: Director interview, fall 2017 and spring 2018; Director survey, fall 2018, and spring 2019.

Site Level Results - Physical Activity

Table F-3. Key features of the site's physical education/physical activity policy

Physical activity policy	Treatment 2 years (n = 5)				Treatment 1 year (n = 10)				Comparison (n = 10)			
	Baseline		Follow-Up		Baseline		Follow-Up		Baseline		Follow-Up	
	N	%	N	%	N	%	N	%	N	%	N	%
No policy for physical activity	1	20.0%	1	20.0%	3	30.0%	2	20.0%	1	10.0%	1	10.0%
At least one hour of outdoor play daily	3	60.0	2	40.0	3	30.0	6	60.0	6	60.0	6	70.0
Less than one hour of outdoor play daily	0	0.0	2	40.0	3	30.0	2	20.0	2	20.0	2	20.0
Outdoor play daily (amount of time unspecified)	1	20.0	0	0.0	1	10.0	0	0.0	1	10.0	1	0.0

NOTE: Percentages in the comparison column are based on data for sites that were in the comparison group in year 1 (cohort 2) and year 2 (cohort 3). Findings for sites after one year of treatment includes data from treatment sites in years 1 and 2. Findings for sites receiving two years of treatment includes cohort 1 treatment sites that received treatment in both years (year 1 and year 2).
SOURCES: Director interview, fall 2017 and spring 2018; Director survey, fall 2018, and spring 2019.

Table F-4. Type of indoor and outdoor physical activity

Types of physical activities | children are involved in	Treatment 2 years (n = 5)				Treatment 1 year (n = 10)				Comparison (n = 10)			
	Baseline		Follow-Up		Baseline		Follow-Up		Baseline		Follow-Up	
	N	%	N	%	N	%	N	%	N	%	N	%
Indoor activity												
Free play	0	0.0%	5	100.0%	5	50.0%	7	70.0%	5	50.0%	7	70.0%
Structured play/organized games	2	40.0	5	100.0	5	50.0	7	70.0	5	50.0	6	60.0
Sports	1	20.0	0	0.0	2	20.0	0	0.0	2	20.0	2	20.0
Cardiovascular exercise	5	100.0	5	100.0	10	100.0	8	80.0	9	90.0	9	90.0
Balancing	2	40.0	3	60.0	6	60.0	4	40.0	7	70.0	4	40.0
Stretching	1	20.0	5	100.0	5	50.0	6	60.0	4	40.0	5	50.0
Outdoor activity												
Free play	5	100.0	5	100.0	10	100.0	5	50.0	10	100.0	5	50.0
Structured play/organized games	0	0.0	3	60.0	3	30.0	7	70.0	3	30.0	5	50.0
Sports	2	40.0	3	60.0	6	60.0	6	60.0	7	70.0	7	70.0
Cardiovascular exercise	1	20.0	5	100.0	6	60.0	7	70.0	8	80.0	7	70.0
Climbing/sliding/swinging	3	60.0	5	100.0	7	70.0	8	80.0	8	80.0	7	70.0
Playing/building with loose toys	4	80.0	5	100.0	9	90.0	5	50.0	9	90.0	6	60.0
Riding bikes/riding toys	5	100.0	5	100.0	9	90.0	8	80.0	7	70.0	6	60.0
Balancing	3	60.0	4	80.0	6	60.0	5	50.0	5	50.0	6	60.0

NOTE: Percentages in the comparison column are based on data for sites that were in the comparison group in year 1 (cohort 2) and year 2 (cohort 3). Findings for sites after one year of treatment includes data from treatment sites in years 1 and 2. Findings for sites receiving two years of treatment includes cohort 1 treatment sites that received treatment in both years (year 1 and year 2).
SOURCES: Director interview, fall 2017 and spring 2018; Director survey, fall 2018, and spring 2019.

Table F-5. Challenges reported by sites to promote physical activity

Challenges to physical activity	Treatment 2 years (n = 5)				Treatment 1 year (n = 10)				Comparison (n = 10)			
	Baseline		Follow-Up		Baseline		Follow-Up		Baseline		Follow-Up	
	N	%	N	%	N	%	N	%	N	%	N	%
Lack of staff training	3	60.0%	1	20.0%		70.0%	3	30.0%	6	60.0%	6	60.0%
Lack of appropriate physical education resources	1	20.0	1	20.0	4	40.0	4	40.0	3	30.0	7	70.0
Lack of funding to purchase equipment	1	20.0	1	20.0	4	40.0	4	40.0	3	30.0	4	40.0

NOTE: Percentages in the comparison column are based on data for sites that were in the comparison group in year 1 (cohort 2) and year 2 (cohort 3). Findings for sites after one year of treatment includes data from treatment sites in years 1 and 2. Findings for sites receiving two years of treatment includes cohort 1 treatment sites that received treatment in both years (year 1 and year 2). There were no statistically significant differences between baseline and follow-up for any of the groups.

SOURCES: Director interview, fall 2017 and spring 2018; Director survey, fall 2018, and spring 2019.

Child Level Results

Table F-6. Average child BMI

BMI category	Treatment 2 years (n = 46)		Treatment 1 year (n = 144)		Comparison (n = 199)	
	Baseline	Follow-Up	Baseline	Follow-Up	Baseline	Follow-Up
Overall	16.88	16.59	16.57	16.31	16.43	16.28
Healthy weight	16.05	15.71	15.94	15.69	16.03	15.86
Overweight	18.26	18.10	17.85	17.66	17.75	17.45
Obese	20.53	20.53	19.92	19.27	20.48	19.65
Underweight	n/a	n/a	13.44	13.62	13.41	14.56

NOTE: Findings for sites after one year of treatment includes data from treatment sites in years 1 and 2. Findings for sites receiving two years of treatment includes cohort 1 treatment sites that received treatment in both years (year 1 and year 2).
SOURCE: Child height and weight measurement, fall 2017, spring 2018, fall 2018, and spring 2019.

Table F-7. Percent of children in BMI weight category

BMI category	Treatment 2 years (n = 46)		Treatment 1 year (n = 144)		Comparison (n= 199)	
	Baseline	Follow-Up	Baseline	Follow-Up	Baseline	Follow-Up
Healthy weight	71.7%	50.0%	70.8%	73.6%	72.4%	77.9%
Overweight	19.6	19.6	16.7	12.5	13.6	10.6
Obese	8.7	21.7	9.7	7.6	7.5	6.0
Underweight	0.0	8.7	2.8	6.3	6.5	5.5

NOTE: Percentages in the comparison column are based on data for sites that were in the comparison group in year 1 (cohort 2) and year 2 (cohort 3). Findings for sites after one year of treatment includes data from treatment sites in years 1 and 2. Findings for sites receiving two years of treatment includes cohort 1 treatment sites that received treatment in both years (year 1 and year 2).
SOURCE: Child height and weight measurement, fall 2017, spring 2018, fall 2018, and spring 2019.

Randolph County

Site Level Results - Nutrition

Table F-8. Food and physical activity policies

Policy on food and physical activity	Treatment 2 years (n = 5)				Treatment 1 year (n = 10)				Comparison (n = 9)			
	Baseline		Follow-Up		Baseline		Follow-Up		Baseline		Follow-Up	
	N	%	N	%	N	%	N	%	N	%	N	%
Foods brought from home for meals and snacks												
No policy	1	20.0%	0	0.0	1	10.0%	0	0.0%	2	22.2%	0	0.0%
Informal policy	0	0.0	0	0.0	0	0.0	0	0.0	1	11.1	0	0.0
Written policy	4	80.0	5	100.0	8	80.0	10	100.0	6	66.7	9	100.0
Food brought from home for onsite celebrations that include children												
No policy	0	0.0	1	20.0	1	10.0	1	10.0	2	22.2	3	33.3
Informal policy	0	0.0	0	0.0	0	0.0	1	10.0	0	0.0	0	0.0
Written policy	5	100.0	4	80.0	8	80.0	8	80.0	7	77.8	6	66.7
Food and beverages staff consume in front of children												
No policy	0	0.0	0	0.0	0	0.0	0	0.0	2	22.2	0	0.0
Informal policy	2	40.0	1	20.0	2	20.0	5	50.0	2	22.2	2	22.2
Written policy	2	40.0	4	80.0	6	60.0	4	40.0	5	55.6	7	77.8
Use of food as a reward for children's behavior												
No policy	0	0.0	0	0.0	1	10.0	1	10.0	4	44.4	5	55.6
Informal policy	2	40.0	1	20.0	3	30.0	3	30.0	2	22.2	2	22.2
Written policy	3	60.0	4	80.0	6	60.0	6	60.0	3	33.3	2	22.2
Physical education and/or physical activity												
No policy	0	0.0	0	0.0	0	0.0	0	0.0	1	11.1	0	0.0
Informal policy	1	20.0	0	0.0	1	10.0	2	20.0	0	0.0	1	11.1
Written policy	4	80.0	5	100.0	9	90.0	8	80.0	8	88.9	8	88.9
Children's use of computers												
No policy	0	0.0	1	20.0	1	10.0	1	10.0	1	11.1	1	11.1
Informal policy	3	60.0	1	20.0	4	40.0	4	40.0	2	22.2	3	33.3
Written policy	2	40.0	3	60.0	5	50.0	5	50.0	6	66.7	5	55.6

NOTE: Data from one year 2 comparison site are excluded from the analysis. This site was included at the request of the subgrantee, even though it did not meet the program quality rating requirement. Percentages in the comparison column are based on data for sites that were in the comparison group in year 1 (cohort 2) and year 2 (cohort 3). Findings for sites after one year of treatment includes data from treatment sites in years 1 and 2. Findings for sites receiving two years of treatment includes cohort 1 treatment sites that received treatment in both years (year 1 and year 2). There were no statistically significant differences between baseline and follow-up for any of the groups.
SOURCES: Director survey, fall 2017, fall 2018, and spring 2019; Director interview, spring 2018.

Table F-9. Challenges reported by sites to promote healthy eating

Challenges to healthy eating	Treatment 2 years (n = 5)				Treatment 1 year (n = 10)				Comparison (n = 9)			
	Baseline		Follow-Up		Baseline		Follow-Up		Baseline		Follow-Up	
	N	%	N	%	N	%	N	%	N	%	N	%
Lack of staff training	2	40.0%	0	0.0%	2	20.0%	1	10.0%	0	0.0%	2	22.2%
Lack of nutrition education resources	1	20.0	0	0.0	1	10.0	0	0.0	2	22.2	1	11.1
Limited time to teach nutrition	1	20.0	0	0.0	2	20.0	4	40.0	2	22.2	1	11.1
Lack of access to fresh fruits and vegetables	0	0.0	1	20.0	2	20.0	3	30.0	0	0.0	2	22.2
Lack of funding to purchase healthy foods	0	0.0	1	20.0	0	0.0	5	50.0	2	22.2	1	11.1

NOTE: Data from one year 2 comparison site are excluded from the analysis. This site was included at the request of the subgrantee, even though it did not meet the program quality rating requirement. Percentages in the comparison column are based on data for sites that were in the comparison group in year 1 (cohort 2) and year 2 (cohort 3). Findings for sites after one year of treatment includes data from treatment sites in years 1 and 2. Findings for sites receiving two years of treatment includes cohort 1 treatment sites that received treatment in both years (year 1 and year 2).

SOURCES: Director interview, fall 2017 and spring 2018; Director survey, fall 2018 and spring 2019.

Site Level Results - Physical Activity

Table F-10. Key features of the site's physical education/physical activity policy

Physical activity policy	Treatment 2 years (n = 5)				Treatment 1 year (n = 10)				Comparison (n = 9)			
	Baseline		Follow-Up		Baseline		Follow-Up		Baseline		Follow-Up	
	N	%	N	%	N	%	N	%	N	%	N	%
No policy for physical activity	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	11.1%	0	0.0%
At least one hour of outdoor play daily	5	100.0	3	60.0	6	60.0	6	60.0	7	77.8	6	66.7
Less than one hour of outdoor play daily	0	0.0	2	40.0	4	40.0	4	40.0	1	11.1	3	33.3
Outdoor play daily (amount of time unspecified)	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

NOTE: Data from one year 2 comparison site are excluded from the analysis. This site was included at the request of the subgrantee, even though it did not meet the program quality rating requirement. Percentages in the comparison column are based on data for sites that were in the comparison group in year 1 (cohort 2) and Year 2 (cohort 3). Findings for sites after one year of treatment includes data from treatment sites in years 1 and 2. Findings for sites receiving two years of treatment includes cohort 1 treatment sites that received treatment in both years (year 1 and year 2).
SOURCES: Director interview, fall 2017 and spring 2018; Director survey, fall 2018 and spring 2019.

TableF-11. Type of indoor and outdoor physical activity

Types of physical activities | children are involved in	Treatment 2 years (n = 5)				Treatment 1 year (n = 10)				Comparison (n = 9)			
	Baseline		Follow-Up		Baseline		Follow-Up		Baseline		Follow-Up	
	N	%	N	%	N	%	N	%	N	%	N	%
Indoor activity												
Free play	0	0.0%	5	100.0%	5	50.0%	5	50.0%	6	66.7%	6	66.7%
Structured play/organized games	1	20.0	4	80.0	5	50.0	5	50.0	4	44.4	7	77.8
Sports	0	0.0	1	20.0	0	0.0	0	0.0	0	0.0	0	0.0
Cardiovascular exercise	5	100.0	3	60.0	10	100.0	10	100.0	9	100.0	7	77.8
Balancing	0	0.0	2	40.0	3	30.0	5	50.0	3	33.3	1	11.1
Stretching	1	20.0	3	60.0	5	50.0	4	40.0	5	55.6	5	55.6
Outdoor activity												
Free play	5	100.0	5	100.0	9	90.0	9	90.0	9	100.0	6	66.7
Structured play/organized games	0	0.0	5	100.0	4	40.0	7	70.0	5	55.6	6	66.7
Sports	1	20.0	2	40.0	3	30.0	4	40.0	6	66.7	3	33.3
Cardiovascular exercise	4	80.0	5	100.0	8	80.0	8	80.0	7	77.8	7	77.8
Climbing/sliding/swinging	4	80.0	5	100.0	7	70.0	5	50.0	9	100.0	7	77.8
Playing/building with loose toys	4	80.0	5	100.0	8	80.0	7	70.0	7	77.8	8	88.9
Riding bikes/riding toys	4	80.0	5	100.0	8	80.0	5	50.0	6	66.7	5	55.6
Balancing	1	20.0	3	60.0	5	50.0	5	50.0	3	33.3	3	33.3

NOTE: Data from one year 2 comparison site are excluded from the analysis. This site was included at the request of the subgrantee, even though it did not meet the program quality rating requirement. Percentages in the comparison column are based on data for sites that were in the comparison group in year 1 (cohort 2) and year 2 (cohort 3). Findings for sites after one year of treatment includes data from treatment sites in years 1 and 2. Findings for sites receiving two years of treatment includes cohort 1 treatment sites that received treatment in both years (year 1 and year 2).
SOURCES: Director interview, fall 2017 and spring 2018; Director survey, fall 2018 and spring 2019.

Table F-12. Challenges reported by sites to promote physical activity

Challenges to physical activity	Treatment 2 years (n = 5)				Treatment 1 year (n = 10)				Comparison (n = 9)			
	Baseline		Follow-Up		Baseline		Follow-Up		Baseline		Follow-Up	
	N	%	N	%	N	%	N	%	N	%	N	%
Lack of staff training	1	20.0%	0	0.0%	1	10.0%	1	10.0%	0	0.0%	2	22.2%
Lack of appropriate physical education resources	1	20.0	0	0.0	2	20.0	0	0.0	5	55.6	1	11.1
Lack of funding to purchase equipment	1	20.0	0	0.0	2	20.0	2	20.0	1	11.1	2	22.2

SOURCES: Director interview, fall 2017and spring 2018; Director survey, fall 2018 and spring 2019.

NOTE: Data from one year 2 comparison site are excluded from the analysis. This site was included at the request of the subgrantee, even though it did not meet the program quality rating requirement. Percentages in the comparison column are based on data for sites that were in the comparison group in year 1 (cohort 2) and year 2 (cohort 3). Findings for sites after one year of treatment includes data from treatment sites in years 1 and 2. Findings for sites receiving two years of treatment includes cohort 1 treatment sites that received treatment in both years (year 1 and year 2). There were no statistically significant differences between baseline and follow-up for any of the groups.

Child Level Results

Table F-13. Average child BMI

BMI category	Treatment 2 years (n = 38)		Treatment 1 year (n =169)		Comparison (n = 197)	
	Baseline	Follow-Up	Baseline	Follow-Up	Baseline	Follow-Up
Overall	16.52	16.20	16.69	16.41	16.63	16.34
Healthy weight	16.13	15.83	15.74	15.62	15.89	15.73
Overweight	18.09	17.77	17.72	17.44	17.60	17.10
Obese	18.44	17.83	19.57	18.59	20.14	19.24
Underweight	14.18	14.05	13.95	14.27	14.60	14.83

NOTE: Data from one year 2 comparison site are excluded from the analysis. This site was included at the request of the subgrantee, even though it did not meet the program quality rating requirement. Findings for sites after one year of treatment includes data from treatment sites in years 1 and 2. Findings for sites receiving two years of treatment includes cohort 1 treatment sites that received treatment in both years (year 1 and year 2).
SOURCE: Child height and weight measurement, fall 2017, spring 2018, fall 2018, and spring 2019.

Table F-14. Percent of children in BMI weight category

BMI category	Treatment 2 years (n = 38)		Treatment 1 year (n = 169)		Comparison (n = 197)	
	Baseline	Follow-Up	Baseline	Follow-Up	Baseline	Follow-Up
Healthy weight	71.1%	73.7%	63.9%	69.2%	71.1%	77.7%
Overweight	15.8	13.2	17.8	19.5	18.3	11.7
Obese	7.9	10.5	16.6	9.5	10.2	9.1
Underweight	5.3	2.6	1.8	1.8	0.5	1.5

NOTE: Data from one year 2 comparison site are excluded from the analysis. This site was included at the request of the subgrantee, even though it did not meet the program quality rating requirement. Percentages in the comparison column are based on data for sites that were in the comparison group in year 1 (cohort 2) and year 2 (cohort 3). Findings for sites after one year of treatment includes data from treatment sites in years 1 and 2. Findings for sites receiving two years of treatment includes cohort 1 treatment sites that received treatment in both years (year 1 and year 2).
SOURCE: Child height and weight measurement, fall 2017, spring 2018, fall 2018, and spring 2019.

Wake County

Site Level Results - Nutrition

Table F-15. Food and physical activity policies

	Treatment 2 years (n = 5)				Treatment 1 year (n = 10)				Comparison (n = 10)			
	Baseline		Follow-Up		Baseline		Follow-Up		Baseline		Follow-Up	
	N	%	N	%	N	%	N	%	N	%	N	%
Foods brought from home for meals and snacks												
No policy	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Informal policy	0	0.0	0	0.0	1	10.0	2	20.0	3	30.0	3	30.0
Written policy	5	100.0	5	100.0	8	80.0	8	80.0	7	70.0	7	70.0
Food brought from home for onsite celebrations that include children												
No policy	0	0.0	0	0.0	0	0.0	1	10.0	0	0.0	0	0.0
Informal policy	0	0.0	1	20.0	3	30.0	2	20.0	3	30.0	2	20.0
Written policy	4	80.0	4	80.0	6	60.0	6	60.0	7	70.0	8	80.0
Food and beverages staff consume in front of children												
No policy	0	0.0	0	0.0	1	10.0	0	0.0	1	10.0	1	10.0
Informal policy	2	40.0	1	20.0	4	40.0	4	40.0	3	30.0	3	30.0
Written policy	3	60.0	4	80.0	5	50.0	6	60.0	5	50.0	5	50.0
Use of food as a reward for children's behavior												
No policy	0	0.0	1	20.0	1	10.0	2	20.0	2	20.0	3	30.0
Informal policy	1	20.0	0	0.0	3	30.0	2	20.0	2	20.0	1	10.0
Written policy	4	80.0	4	80.0	6	60.0	6	60.0	5	50.0	5	50.0
Physical education and/or physical activity												
No policy	0	0.0	1	20.0	0	0.0	1	10.0	0	0.0	0	0.0
Informal policy	1	20.0	0	0.0	3	30.0	3	30.0	3	30.0	3	30.0
Written policy	4	80.0	4	80.0	7	70.0	6	60.0	7	70.0	7	70.0
Children's use of computers												
No policy	0	0.0	0	0.0	0	0.0	2	20.0	1	10.0	1	10.0
Informal policy	1	20.0	1	20.0	3	30.0	2	20.0	4	40.0	5	50.0
Written policy	4	80.0	3	60.0	7	70.0	6	60.0	5	50.0	4	40.0

NOTE: Percentages in the comparison column are based on data for sites that were in the comparison group in year 1 (cohort 2) and year 2 (cohort 3). Findings for sites after one year of treatment includes data from treatment sites in years 1 and 2. Findings for sites receiving two years of treatment includes cohort 1 treatment sites that received treatment in both years (year 1 and year 2). There were no statistically significant differences between baseline and follow-up for any of the groups.

SOURCES: Director survey, fall 2017, fall 2018, and spring 2019; Director interview, spring 2018.

Table F-16. Challenges reported by sites to promote healthy eating

Challenges to healthy eating	Treatment 2 years (n = 5)				Treatment 1 year (n = 10)				Comparison (n = 10)			
	Baseline		Follow-Up		Baseline		Follow-Up		Baseline		Follow-Up	
	N	%	N	%	N	%	N	%	N	%	N	%
Lack of staff training	1	20.0%	1	20.0%	4	40.0%	3	30.0%	3	30.0%	5	50.0%
Lack of nutrition education resources	0	0.0	2	40.0	2	20.0	4	40.0	2	20.0	4	40.0
Limited time to teach nutrition	1	20.0	0	0.0	4	40.0	2	20.0	2	20.0	4	40.0
Lack of access to fresh fruits and vegetables	1	20.0	0	0.0	1	10.0	3	30.0	2	20.0	3	30.0
Lack of funding to purchase healthy foods	1	20.0	1	20.0	1	10.0	3	30.0	5	50.0	5	50.0

NOTE: Percentages in the comparison column are based on data for sites that were in the comparison group in year 1 (cohort 2) and year 2 (cohort 3). Findings for sites after one year of treatment includes data from treatment sites in years 1 and 2. Findings for sites receiving two years of treatment includes cohort 1 treatment sites that received treatment in both years (year 1 and year 2).

SOURCES: Director interview, fall 2017 and spring 2018; Director survey, fall 2018and spring 2019.

Site Level Results - Physical Activity

Table F-17. Key features of the site's physical education/physical activity policy

Physical activity policy	Treatment 2 years (n = 5)				Treatment 1 year (n = 10)				Comparison (n = 10)			
	Baseline		Follow-Up		Baseline		Follow-Up		Baseline		Follow-Up	
	N	%	N	%	N	%	N	%	N	%	N	%
No policy for physical activity	0	0.0%	1	20.0%	0	0.0%	1	10.0%	0	0.0%	0	0.0%
At least one hour of outdoor play daily	4	80.0	3	60.0	7	70.0	6	60.0	5	50.0	6	60.0
Less than one hour of outdoor play daily	1	20.0	1	20.0	3	30.0	3	30.0	4	40.0	3	30.0
Outdoor play daily (amount of time unspecified)	0	0.0	0	0.0	0	0.0	0	0.0	1	10.0	1	10.0

NOTE: Percentages in the comparison column are based on data for sites that were in the comparison group in year 1 (cohort 2) and year 2 (cohort 3). Findings for sites after one year of treatment includes data from treatment sites in years 1 and 2. Findings for sites receiving two years of treatment includes cohort 1 treatment sites that received treatment in both years (year 1 and year 2).
SOURCES: Director interview, fall 2017 and spring 2018; Director survey, fall 2018 and spring 2019.

Table F-18. Type of indoor and outdoor physical activity

Types of physical activities | children are involved in	Treatment 2 years (n = 5)				Treatment 1 year (n = 10)				Comparison (n = 10)			
	Baseline		Follow-Up		Baseline		Follow-Up		Baseline		Follow-Up	
	N	%	N	%	N	%	N	%	N	%	N	%
Indoor activity												
Free play	1	20.0%	5	100.0%	6	60.0%	7	70.0%	5	50.0%	7	70.0%
Structured play/organized games	2	40.0	5	100.0	6	60.0	6	60.0	8	80.0	7	70.0
Sports	1	20.0	0	0.0	2	20.0	1	10.0	2	20.0	2	20.0
Cardiovascular exercise	5	100.0	5	100.0	9	90.0	7	70.0	10	100.0	9	90.0
Balancing	0	0.0	4	80.0	2	40.0	2	40.0	6	60.0	4	40.0
Stretching	0	0.0	5	100.0	3	30.0	4	40.0	6	60.0	6	60.0
Outdoor activity												
Free play	5	100.0	5	100.0	8	80.0	7	70.0	9	90.0	5	50.0
Structured play/organized games	10	20.	4	80.0	3	30.0	7	70.0	5	50.0	5	50.0
Sports	2	40.0	3	60.0	5	50.0	6	60.0	6	60.0	6	60.0
Cardiovascular exercise	1	20.0	5	100.0	4	40.0	8	80.0	9	90.0	8	80.0
Climbing/sliding/swinging	2	40.0	4	80.0	5	50.0	7	70.0	7	70.0	5	50.0
Playing/building with loose toys	3	60.0	5	100.0	6	60.0	5	50.0	8	80.0	6	60.0
Riding bikes/riding toys	4	80.0	5	100.0	6	60.0	8	80.0	8	80.0	6	60.0
Balancing	1	20.0	5	100.0	4	40.0	5	50.0	4	40.0	4	40.0

NOTE: Percentages in the comparison column are based on data for sites that were in the comparison group in year 1 (cohort 2) and year 2 (cohort 3). Findings for sites after one year of treatment includes data from treatment sites in years 1 and 2. Findings for sites receiving two years of treatment includes cohort 1 treatment sites that received treatment in both years (year 1 and year 2).

SOURCES: Director interview, fall 2017 and spring 2018; Director survey, fall 2018 and spring 2019.

Table F-19. Challenges reported by sites to promote physical activity

Challenges to physical activity	Treatment 2 years (n = 5)				Treatment 1 year (n = 10)				Comparison (n = 10)			
	Baseline		Follow-Up		Baseline		Follow-Up		Baseline		Follow-Up	
	N	%	N	%	N	%	N	%	N	%	N	%
Lack of staff training	2	40.0%	2	40.0%	6	60.0%	3	30.0%	5	50.0%	4	40.0%
Lack of appropriate physical education resources	0	0.0	1	20.0	2	20.0	3	30.0	2	20.0	7	70.0
Lack of funding to purchase equipment	2	40.0	0	0.0	3	30.0	5	50.0	3	30.0	5	50.0

NOTE: Percentages in the comparison column are based on data for sites that were in the comparison group in year 1 (cohort 2) and year 2 (cohort 3). Findings for sites after one year of treatment includes data from treatment sites in years 1 and 2. Findings for sites receiving two years of treatment includes cohort 1 treatment sites that received treatment in both years (year 1 and year 2). There were no statistically significant differences between baseline and follow-up for any of the groups.

SOURCES: Director interview, fall 2017 and spring 2018; Director survey, fall 2018 and spring 2019.

Child Level Results

Table F-20. Average child BMI

BMI category	Treatment 2 years (n = 15)		Treatment 1 year (n = 150)		Comparison (n = 205)	
	Baseline	Follow-Up	Baseline	Follow-Up	Baseline	Follow-Up
Overall	16.66	16.21	16.44	16.27	16.34	16.17
Healthy weight	16.47	16.13	15.95	15.80	15.78	15.65
Overweight	19.31	17.32	17.75	17.50	17.83	17.24
Obese	n/a	n/a	19.58	19.12	19.25	18.99
Underweight	n/a	n/a	13.43	13.88	13.50	14.18

NOTE: Findings for sites after one year of treatment includes data from treatment sites in years 1 and 2. Findings for sites receiving two years of treatment includes cohort 1 treatment sites that received treatment in both years (year 1 and year 2).
SOURCE: Child height and weight measurement, fall 2017, spring 2018, fall 2018, and spring 2019.

Table F-21. Percent of children in BMI weight category

BMI category	Treatment 2 years (n = 15)		Treatment 1 year (n = 150)		Comparison (n = 205)	
	Baseline	Follow-Up	Baseline	Follow-Up	Baseline	Follow-Up
Healthy weight	93.3%	80.0%	72.7%	73.3%	71.1%	73.2%
Overweight	6.7	13.3	12.0	11.3	12.2	11.7
Obese	0.0	6.7	10.7	10.7	11.7	9.3
Underweight	0.0	0.0	4.7	4.7	4.4	5.9

NOTE: Percentages in the comparison column are based on data for sites that were in the comparison group in Year 1 (cohort 2) and Year 2 (cohort 3). Findings for sites after one year of treatment includes data from treatment sites in Years 1 and 2. Findings for sites receiving two years of treatment includes cohort 1 treatment sites that received treatment in both years (Year 1 and Year 2).
SOURCE: Child height and weight measurement, fall 2017, spring 2018, fall 2018, and spring 2019.

Wilson County

Site Level Results - Nutrition

Table F-22. Food and physical activity policies

Policy on food and physical activity	Treatment 2 years (n = 5)				Treatment 1 year (n = 10)				Comparison (n = 10)			
	Baseline		Follow-Up		Baseline		Follow-Up		Baseline		Follow-Up	
	N	%	N	%	N	%	N	%	N	%	N	%
Foods brought from home for meals and snacks												
No policy	0	0.0%	0	0.0%	0	0.0%	1	10.0%	2	20.0%	1	10.0%
Informal policy	1	20.0	2	40.0	2	20.0	2	20.0	3	30.0	5	50.0
Written policy	4	80.0	3	60.0	8	80.0	7	70.0	5	50.0	4	40.0
Food brought from home for onsite celebrations that include children												
No policy	1	20.0	1	20.0	2	20.0	3	30.0	1	10.0	0	0.0
Informal policy	1	20.0	1	20.0	2	20.0	1	10.0	5	50.0	7	70.0
Written policy	3	60.0	3	60.0	6	60.0	6	60.0	4	40.0	3	30.0
Food and beverages staff consume in front of children												
No policy	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Informal policy	3	60.0	3	60.0	5	50.0	6	60.0	6	60.0	6	60.0
Written policy	2	40.0	2	40.0	5	50.0	4	40.0	4	40.0	4	40.0
Use of food as a reward for children's behavior												
No policy	2	40.0	2	40.0	3	30.0	4	40.0	7	70.0	7	70.0
Informal policy	2	40.0	1	20.0	4	40.0	3	30.0	3	30.0	3	30.0
Written policy	1	20.0	2	40.0	3	30.0	3	30.0	0	0.0	0	0.0
Physical education and/or physical activity												
No policy	1	20.0	1	20.0	3	30.0	4	40.0	4	40.0	4	40.0
Informal policy	0	0.0	2	40.0	1	10.0	1	10.0	2	20.0	4	40.0
Written policy	3	60.0	2	40.0	5	50.0	5	50.0	4	40.0	2	20.0
Children's use of computers												
No policy	1	20.0	0	0.0	2	20.0	1	10.0	2	20.0	2	20.0
Informal policy	3	60.0	3	60.0	5	50.0	6	60.0	4	40.0	5	50.0
Written policy	1	20.0	2	40.0	3	30.0	3	30.0	4	40.0	3	30.0

NOTE: Percentages in the comparison column are based on data for sites that were in the comparison group in year 1 (cohort 2) and year 2 (cohort 3). Findings for sites after one year of treatment includes data from treatment sites in Years 1 and 2. Findings for sites receiving two years of treatment includes cohort 1 treatment sites that received treatment in both years (year 1 and year 2). There were no statistically significant differences between baseline and follow-up for any of the groups.

SOURCES: Director survey, fall 2017, fall 2018, and spring 2019; Director interview, spring 2018.

Table F-23. Challenges reported by sites to promote healthy eating

Challenges to healthy eating	Treatment 2 years (n = 5)				Treatment 1 year (n = 10)				Comparison (n = 10)			
	Baseline		Follow-Up		Baseline		Follow-Up		Baseline		Follow-Up	
	N	%	N	%	N	%	N	%	N	%	N	%
Lack of staff training	3	60.0%	2	40.0%	7	70.0%	5	50.0%	6	60.0%	6	60.0%
Lack of nutrition education resources	1	20.0	0	0.0	4	40.0	4	40.0	4	40.0	5	50.0
Limited time to teach nutrition	2	40.0	0	0.0	5	50.0	4	40.0	3	30.0	3	30.0
Lack of access to fresh fruits and vegetables	0	0.0	1	20.0	0	0.0	5	50.0	3	30.0	3	30.0
Lack of funding to purchase healthy foods	2	40.0	3	60.0	5	50.0	6	60.0	3	30.0	5	50.0

NOTE: Percentages in the comparison column are based on data for sites that were in the comparison group in year 1 (cohort 2) and year 2 (cohort 3). Findings for sites after one year of treatment includes data from treatment sites in years 1 and 2. Findings for sites receiving two years of treatment includes cohort 1 treatment sites that received treatment in both years (year 1 and year 2).

SOURCES: Director interview, fall 2017 and spring 2018; Director survey, fall 2018, and spring 2019.

Site Level Results - Physical Activity

Table F-24. Key features of the site's physical education/physical activity policy

Physical activity policy	Treatment 2 years (n = 5)				Treatment 1 year (n = 10)				Comparison (n = 10)			
	Baseline		Follow-Up		Baseline		Follow-Up		Baseline		Follow-Up	
	N	%	N	%	N	%	N	%	N	%	N	%
No policy for physical activity	2	40.0%	1	20.0%	4	40.0%	4	40.0%	3	30.0%	3	30.0%
At least one hour of outdoor play daily	3	60.0	2	40.0	3	30.0	4	40.0	4	40.0	7	70.0
Less than one hour of outdoor play daily	0	0.0	2	40.0	2	20.0	1	10.0	2	20.0	0	0.0
Outdoor play daily (amount of time unspecified)	0	0.0	0	0.0	1	10.0	1	10.0	1	10.0	0	0.0

NOTE: Percentages in the comparison column are based on data for sites that were in the comparison group in year 1 (cohort 2) and year 2 (cohort 3). Findings for sites after one year of treatment includes data from treatment sites in years 1 and 2. Findings for sites receiving two years of treatment includes cohort 1 treatment sites that received treatment in both years (year 1 and year 2).
SOURCES: Director interview, fall 2017 and spring 2018; Director survey, fall 2018 and spring 2019.

Table F-25. Type of indoor and outdoor physical activity

Types of physical activities | children are involved in	Treatment 2 years (n = 5)				Treatment 1 year (n = 10)				Comparison (n = 10)			
	Baseline		Follow-Up		Baseline		Follow-Up		Baseline		Follow-Up	
	N	%	N	%	N	%	N	%	N	%	N	%
Indoor activity												
Free play	0	0.0%	5	100.0%	5	50.0%	6	60.0%	6	60.0%	8	80.0%
Structured play/organized games	3	60.0	3	60.0	8	80.0	9	90.0	5	50.0	8	80.0
Sports	0	0.0	0	0.0	0	0.0	0	0.0	1	10.0	0	0.0
Cardiovascular exercise	5	100.0	4	80.0	10	100.0	10	100.0	9	90.0	9	90.0
Balancing	2	40.0	2	40.0	5	50.0	3	30.0	1	10.0	3	30.0
Stretching	2	40.0	3	60.0	6	60.0	5	50.0	1	10.0	3	30.0
Outdoor activity												
Free play	5	100.0	5	100.0	10	100.0	9	90.0	10	100.0	6	60.0
Structured play/organized games	3	60.0	5	100.0	8	80.0	7	70.0	4	40.0	6	60.0
Sports	1	20.0	3	60.0	5	50.0	5	50.0	6	60.0	2	20.0
Cardiovascular exercise	2	40.0	5	100.0	7	70.0	8	80.0	5	50.0	6	60.0
Climbing/sliding/swinging	4	80.0	4	80.0	8	80.0	8	80.0	9	90.0	9	90.0
Playing/building with loose toys	4	80.0	5	100.0	9	90.0	6	60.0	8	80.0	7	70.0
Riding bikes/riding toys	3	60.0	5	100.0	7	70.0	7	70.0	6	60.0	5	50.0
Balancing	0	0.0	2	40.0	4	40.0	4	40.0	3	30.0	2	20.0

NOTE: Percentages in the comparison column are based on data for sites that were in the comparison group in year 1 (cohort 2) and year 2 (cohort 3). Findings for sites after one year of treatment includes data from treatment sites in years 1 and 2. Findings for sites receiving two years of treatment includes cohort 1 treatment sites that received treatment in both years (year 1 and year 2).
SOURCES: Director interview, fall 2017 and spring 2018; Director survey, fall 2018 and spring 2019.

Table F-26. Challenges reported by sites to promote physical activity

Challenges to physical activity	Treatment 2 years (n = 5)				Treatment 1 year (n = 10)				Comparison (n = 10)			
	Baseline		Follow-Up		Baseline		Follow-Up		Baseline		Follow-Up	
	N	%	N	%	N	%	N	%	N	%	N	%
Lack of staff training	4	80.0%	1	20.0%	8	80.0%	6	60.0%	4	40.0%	7	70.0%
Lack of appropriate physical education resources	4	80.0	2	40.0	8	80.0	6	60.0	7	70.0	8	80.0
Lack of funding to purchase equipment	3	60.0	2	40.0	7	70.0	5	50.0	4	40.0	7	70.0

NOTE: Percentages in the comparison column are based on data for sites that were in the comparison group in year 1 (cohort 2) and year 2 (cohort 3). Findings for sites after one year of treatment includes data from treatment sites in years 1 and 2. Findings for sites receiving two years of treatment includes cohort 1 treatment sites that received treatment in both years (year 1 and year 2). There were no statistically significant differences between baseline and follow-up for any of the groups.

SOURCES: Director interview, fall 2017 and spring 2018; Director survey, fall 2018 and spring 2019.

Child Level Results

Table F-27. Average child BMI

BMI category	Treatment 2 years (n = 111)		Treatment 1 year (n = 447)		Comparison (n = 323)	
	Baseline	Follow-Up	Baseline	Follow-Up	Baseline	Follow-Up
Overall	16.68	16.29	16.62	16.36	16.67	16.37
Healthy weight	16.03	15.78	15.95	15.79	15.92	15.72
Overweight	17.95	17.00	17.59	17.10	17.78	17.14
Obese	20.63	19.65	20.38	19.60	20.36	19.64
Underweight	13.89	14.11	13.45	13.90	13.59	14.00

NOTE: Findings for sites after one year of treatment includes data from treatment sites in years 1 and 2. Findings for sites receiving two years of treatment includes cohort 1 treatment sites that received treatment in both years (year 1 and year 2).
SOURCE: Child height and weight measurement, fall 2017, spring 2018, fall 2018, and spring 2019.

Table F-28. Percent of children in BMI weight category

BMI category	Treatment 2 years (n = 111)		Treatment 1 year (n = 447)		Comparison (n = 323)	
	Baseline	Follow-Up	Baseline	Follow-Up	Baseline	Follow-Up
Healthy weight	73.0%	67.6%	67.8%	70.3%	69.0%	69.7%
Overweight	10.8	10.8	13.9	11.6	12.7	12.4
Obese	11.7	15.3	13.0	12.1	13.9	9.9
Underweight	4.5	6.3	5.4	6.0	4.3	8.1

NOTE: Percentages in the comparison column are based on data for sites that were in the comparison group in year 1 (cohort 2) and year 2 (cohort 3). Findings for sites after one year of treatment includes data from treatment sites in years 1 and 2. Findings for sites receiving two years of treatment includes cohort 1 treatment sites that received treatment in both years (year 1 and year 2).
SOURCE: Child height and weight measurement, fall 2017, spring 2018, fall 2018, and spring 2019.