Community and Environment Strategies **Chapter 4**

This chapter focuses on strategies that can be implemented at the community and environment levels to promote healthy weight among young children ages 0-5 years. North Carolina has many evidence-based and evidence-informed initiatives underway; however, most are primarily aimed at older children and adults in the population. Some of these initiatives such as Eat Smart, Move More North Carolina (ESMM) have a broad population reach through various channels, while others have a more narrow reach and focus on very specific segments of the population. For example, the North Carolina Council of Churches' Partners in Health and Wholeness reaches individuals connected within the faith community, and the Appalachian Sustainable Agriculture Project reaches individuals residing in the Western region in the state. While broad reaching efforts are needed, such efforts are more effective when combined with similarly aligned efforts that are tailored to reach specific segments of the population.

In North Carolina, there are a few initiatives that specifically focus on promoting healthy weight among young children ages 0-5 years.

In North Carolina, there are a few initiatives that specifically focus on promoting healthy weight among young children ages 0-5 years. The Blue Cross and Blue Shield of North Carolina Foundation (BCBSNC Foundation) has funded different initiatives including Shape NC, Be Active Kids®, and Preventing Obesity by Design (POD) to improve nutrition, increase physical activity, and promote the outdoor learning environment in child care programs. Many of these initiatives have been implemented in collaboration with the North Carolina Partnership for Children (NCPC) and local Smart Start partnerships. Another effort to reach very young children comes from North Carolina's Race to the Top — Early Learning Challenge (RTT-ELC) grant. In December 2011, the state received a four-year RTT-ELC federal grant totaling $70 million, for which the North Carolina Early Childhood Advisory Council is the lead agency. The purpose of this grant is to help ensure that all young children entering kindergarten are ready to succeed. RTT-ELC is designed to address the school readiness gap that exists between children with high needs and their peers at the time they enter kindergarten. The grant aims to improve early learning and development programs for young children by increasing the number and percentage of low-income and disadvantaged infants, toddlers, and preschoolers who are enrolled in high-quality early learning programs. The grant also aims to implement an integrated system of high-quality early learning programs and services including high-quality health care, positive social and emotional development, and support for strong family development. In addition to the statewide efforts geared toward improving the quality of child care programs and other priorities, grant funding will be used to provide intensive technical assistance to build capacity and develop comprehensive approaches in a "Transformation Zone" comprised of four counties in Northeastern North Carolina, including Beaufort, Bertie, Chowan, and Hyde. In coordination with these efforts, Bertie County will participate in Shape NC, a health-promoting obesity prevention initiative for young children (discussed in Community/

Environment Strategy 1). Funding from the RTT-ELC grant will be used to enhance child care health consultant services as a means of improving school success. The lessons learned in the Transformation Zone will be shared and used to inform efforts statewide.[a,1,2]

The NCIOM Task Force on Early Childhood Obesity Prevention (ECOP) reviewed many of the current initiatives in the state, such as those mentioned above. It also identified barriers that prevent community organizations, child care programs, families, and others from implementing the recommendations of the previous task forces and expert committees that were discussed in Chapter 2. Ultimately, the ECOP Task Force identified 20 community and environment strategies (Appendix E)—5 of which were identified as priority strategies—that could help support implementation of these recommendations. The ECOP Task Force identified priority strategies as those strategies with the potential to reach the greatest number of children and have the greatest effect.

The ECOP Task Force identified priority strategies as those strategies with the potential to reach the greatest number of children and have the greatest effect.

The Community/Environment section of the ECOP Task Force's blueprint focuses on five strategies:

Community/Environment Strategy 1: Expand the use of evidence-based and evidence-informed strategies for physical activity and nutrition in pilot child care centers.

Community/Environment Strategy 2: Provide pre-service and in-service education for child care providers on evidence-based and evidence-informed strategies for physical activity and nutrition.

Community/Environment Strategy 3: Cross train all child care consultants and other support personnel on evidence-based and evidence-informed strategies for physical activity and nutrition.

Community/Environment Strategy 4: Increase Eat Smart, Move More North Carolina's focus on young children and their families.

Community/Environment Strategy 5: Form an ECOP Communications Committee to develop a communications campaign to support policy and behavior changes to reduce early childhood obesity.

The other Community/Environment strategies are included in Appendix E.

Three of the five priority Community/Environment strategies focus on child care programs since most children ages 0-5 years spend part of their early childhood in child care programs. In fact, at any point in time, one in four children in this age group are in a licensed, regulated child care program (see

a Bryan A. Early Childhood Advisory Council, NC Race to the Top-Early Learning Challenge. Oral Communication. March 19, 2013.

Table 4.1). Throughout the year, many more children spend time in child care programs, as many families enroll and disenroll throughout the year. This turnover results in more children experiencing some time in early education settings. According to the Early Childhood Longitudinal Study (ECLS-B), 83% of children were in non-parental early care and education arrangements, and 63.8% of these children spent some time in formal early care and education settings the year prior to entering kindergarten. Formal settings include early learning centers, preschools, nurseries, and Head Start programs.[3] Programs like NC Pre-K (formerly More at Four) and before and after-school care for older children are often licensed as child care centers. Because some of these programs operate in school settings, and/or serve older children, these child care strategies aimed at promoting health weight can also have an impact on older children. In addition, some five year olds are already in kindergarten. The Task Force recognized that it was important to continue similar strategies for school-aged children (partnering with the North Carolina Department of Public Instruction), but focused on child care for ages 0-5 because there has not been as much focus historically on this age group.

At any point in time, one in four children ages 0-5 years are in a licensed, regulated child care program.

As of January 2013, there were 7,572 licensed, regulated child care facilities in North Carolina. Of these, 4,809 were child care centers and 2,763 were family child care homes.[4] Collectively, child care centers and child care homes are referred to as *child care programs* in this report. One strategy identified by the ECOP Task Force addresses child care centers only, while others geared toward the child care setting address child care programs (i.e. both child care centers and family child care homes).

Table 4.1
Number of Children in Licensed, Regulated Care, by Age (July 2011)

Age	<1	1	2	3	4	5	Total
Number of Children in Care[a]	13,422	23,751	31,505	39,374	52,660	25,994	186,706
Population, July 2011[b]	120,929	123,009	125,015	127,545	128,959	128,233	753,690
Percentage of Population in Child Care	11.1%	19.3%	25.2%	30.9%	40.8%	20.3%	24.8%

Sources: [a]North Carolina Partnership for Children (NCPC). NCPC 2013 data analysis of North Carolina Department of Child Development and Early Education data for July 2011.
[b]North Carolina Office of State Budget and Management. July 1, 2011 Country total – single year ages. North Carolina Office of the Governor website. http://www.osbm.state.nc.us/demog/countytotals_singleage_2011.html. Accessed October 15, 2012.

It should be noted that there has already been considerable effort to implement evidence-based and evidence-informed physical activity and nutrition strategies in child care programs (see Community/Environment Strategy 1). The ECOP Task Force members believed it was both important and practical to support the progress made in improving health and wellness in pilot child care centers, and

to then spread the innovations to other child care programs across the state. Although efforts to spread these strategies target licensed child care centers directly, non-licensed programs also benefit. Many of the non-licensed child care programs, including part-day programs such as preschools, follow North Carolina licensure standards even though they are not required to do so (as meeting the standards assists them with qualifying for insurance coverage). Often these types of programs also hire trained child care professionals. Thus, strategies to train child care professionals, to improve the nutritional quality of foods and beverages, and to increase the amount of age appropriate physical activity in child care programs will inure to the benefit of children in non-licensed child care programs.

While interventions aimed at licensed, regulated child care programs can reach many young children in the state and their families, they cannot reach all young children. Thus, the ECOP Task Force also included community and environment strategies aimed at reaching broader audiences, including one that involves the existing Eat Smart, Move More North Carolina initiative and another regarding a broad communications campaign.

Community/Environment Strategy 1: Expand the use of evidence-based and evidence-informed strategies for physical activity and nutrition in pilot child care centers

Over the years, the Blue Cross and Blue Shield of North Carolina Foundation (BCBSNC Foundation) has invested in various initiatives to prevent and reduce obesity in child care programs. One such initiative is Shape NC, a $3 million, three-year grant to the North Carolina Partnership for Children (NCPC), to promote healthy weight and combat early childhood obesity by enhancing nutrition and physical activity in select Smart Start partnerships across the state. Shape NC unites three initiatives in child care programs that have proven to be effective: 1) Nutrition and Physical Activity Self-Assessment in Child Care (NAP SACC), to assess nutrition and physical activity policy and practice, 2) POD, to focus on the built environment and outdoor play and learning, and 3) Be Active Kids®, to focus on programming and training.[5,6] More information about each of these programs follows.

NAP SACC is a research-tested program developed by the UNC Center for Health Promotion and Disease Prevention at the University of North Carolina at Chapel Hill (UNC-Chapel Hill). The goal of NAP SACC is to enhance policies, practices, and the child care environment to improve nutrition, the amount and quality of physical activity, and staff-child interactions. An organizational assessment of the child care program is an integral component of NAP SACC. This assessment identifies strengths and weaknesses by assessing

14 areas of nutrition and physical activity policy, practices, and environments. A NAP SACC consultant then uses this assessment and works with child care program staff on goal setting and action planning for change, and also provides the child care staff with continuing education, skills-building opportunities, technical assistance, and follow-up.[7] More than 400 programs in the state have participated in NAP SACC through Smart Start support.[8]

Preventing Obesity by Design (POD) is a program of the Natural Learning Initiative at North Carolina State University. The POD program has been supported through partnerships with the BCBSNC Foundation (POD, POD-2, and POD[3]), the John Rex Endowment (POD-Wake), and NCPC. The goal of POD is to address the obesity epidemic in young children by improving child care outdoor environments and transforming them into naturalized, active, and productive sites (that include fruits and vegetables).[9] Research has shown that diverse, natural environments are associated with gross motor development and diverse play activities.[10-13] In addition, there is generally a higher level of physical activity associated with outdoor learning environments than with indoor environments.[14-16] Physical activity and skills development is enhanced with balls, portable equipment, and manipulative objects.[14,17-19] Vegetable and fruit gardening is associated with children's acceptance of diverse vegetable and fruit tastes, with increased frequency of vegetable consumption, and is regarded as a positive strategy to support healthy eating.[20-25] Best practice indicators include aspects such as shade; curvy, broad pathways; diversity of trees and shrubs; grassy areas that are big enough for a group of children to play; designated vegetable gardens; natural materials; outdoor toys; and settings for a variety of gross motor activities.[26]

Shape NC promotes healthy weight and combats early childhood obesity by enhancing nutrition and physical activity in select Smart Start partnerships across the state.

The BCBSNC Foundation's involvement with POD has changed over time. The Foundation's first involvement with the Natural Learning Initiative was in 2007. Initial funding was used to test the feasibility of implementing POD in three pilot child care centers (POD-1). Due to the success of the pilots, the BCBSNC Foundation partnered with NCPC in 2008 and invested additional funds to expand POD to 30 local Smart Start partnerships across the state (POD-2). The results of POD-2 include the following: 27 child care centers redesigned their outdoor play environments, more than 1,800 children (at the POD sites) increased physical activity/active play during outdoor time, more than 20 independent POD sites impacting at least 600 children developed as an offshoot of this work, 68% of the POD site teachers reported positive behavior changes from children as a result of improved outdoor engagement, and 40% of centers installed gardens and reported increased access to and consumption of fresh produce for their children during their time in care.[b] In addition, the North Carolina Division of Child Development and Early Education (NC DCDEE) supported the training of 250 licensing consultants and assessors

b Hansen, P. Project Manager, Shape NC, The North Carolina Partnership for Children, Inc. Written (email) communication. January 18, 2013.

to support the development of naturalized outdoor play spaces in child care. POD's ability to change the built environment and increase physical activity and active play has led to further growth of the program and investment from the BCBSNC Foundation in 2012. POD[3]'s goal is to make the tenets of POD common practice among early childhood educators, providers, regulators, and landscape designers. A regional approach to expanding POD will include training institutes, workshops, education modules, and web-based technical assistance. Anticipated outcomes include, but are not limited to, creating 100 new POD sites, training 900 child care providers, and 90 Smart Start/Child Care Resource and Referral technical assistance consultants.

To date, only 1.2% (60 of 4,809) of child care centers in the state have implemented the POD program.[c] In 2011, the NC DCDEE surveyed child care licensing consultants and environmental rating assessors to determine the quality of the outdoor learning environment in regulated child care centers. Nine out of 10 respondents reported that the outdoor learning environment was either "poor" (36%) or "average" (54%). Only 7.5% rated the outdoor learning environment as "good" and 1.2% as "very good." None ranked the outdoor learning environment as "excellent." [26] Thus, more work is still needed to increase the quality of outdoor learning environments in child care centers throughout the state.

Children who master motor skills such as running, jumping, leaping, and hopping are more likely to be physically active.

Be Active Kids® is a signature program of the BCBSNC Foundation. Originally developed in 1998 to promote physical activity, nutrition, and food safety for preschoolers ages 4 and 5 years, Be Active Kids® staff trained approximately 6,000 child care providers in 1,300 child care programs across the state.[8] As evidence evolved related to movement and active play in the early childhood setting, Be Active Kids® staff noted the need to change the content of the program to address physical inactivity in child care. Studies have shown that preschool children are largely sedentary for the majority of the preschool day.[27,28] Further, while children are more active outside than they are inside, they still do not engage in moderate to vigorous physical activity when outside and are more sedentary than not.[28] Research has also shown that children who master motor skills such as running, jumping, leaping, and hopping are more likely to be physically active.[29] Thus, in 2011 the BCBSNC Foundation provided a grant to the Frank Porter Graham Child Development Institute (FPG) at UNC-Chapel Hill to revamp Be Active Kids®, to focus on physical activity movement and active play, and to create curricula for age appropriate physical activity for younger children in child care settings (starting at birth). With this grant, staff at FPG developed teacher training, a physical activity curriculum, and a set of inexpensive materials to use in lesson plans to encourage age appropriate physical activity. The lesson plans encourage teacher and child participation in fun activities that help children learn skills, and build strength, stamina, and

c Cosco N. The Natural Learning Initiative, College of Design, North Carolina State University. Written (email) communication. April 24, 2013.

flexibility. The lesson plans also include academic content and social skills along with physical activity. These lessons were piloted in three child care programs, with the goal of offering these new resources statewide, as well as incorporating the model into Shape NC.[d]

Shape NC combines these three effective programs (NAP SACC, POD, and Be Active Kids®) for implementation in child care centers. It is using its funding in multiple ways to meet the goal of improved health for North Carolina's youngest people, including:

- Identifying 86 best practices in nutrition, physical activity, and outdoor learning environments.
- Supporting up to 100 early childhood professionals working with child care professionals in four Smart Start regional hubs covering Alamance, Alexander, Anson, Bertie, Buncombe, Carteret, Chatham, Cherokee, Clay, Edgecombe, Graham, Guilford, Haywood, Iredell, Jackson, Macon, McDowell, Mecklenburg, Mitchell, Nash, New Hanover, Onslow, Orange, Polk, Randolph, Rutherford, Swain, Wayne, and Yancey counties.[30]
- Augmenting the existing NAP SACC assessment tool to create an integrated tool that incorporates more than 30 new indicators around physical activity (building on Be Active Kids®) and the outdoor learning environment (e.g. POD).
- Supporting training and technical assistance of up to 2,000 child care teachers and directors and giving them the education and curricula needed to support enhanced inside and outside physical activity practices, improved nutrition, and healthier outdoor learning environments.
- Supporting community partnerships and action plans to reduce early childhood obesity in 19 communities and child care programs.
- Creating up to 19 model child care centers, reaching over 750 children, where best practices in nutrition, physical activity, and outdoor learning environments will be implemented. Ultimately these centers will serve as resources for other centers in their communities.

Shape NC combines these three effective programs to meet the goal of improved health for North Carolina's youngest people.

The ECOP Task Force wanted to build on the success of Shape NC by expanding this effort to include other child care centers. As noted earlier, Shape NC is being piloted in 19 child care centers across the state. Early results of the impact of Shape NC on the first 18 child care centers are impressive. The first cohort (Cohort 1) of eight participating child care centers enrolled in March 2011. These early adopters were generally higher achievers at the start; having adopted, on average, 42 of the 86 best practices before participating in Shape

d MacDougall J. Healthy Active Communities, Blue Cross and Blue Shield of North Carolina Foundation. Written (email) communication. March 28, 2013.

NC. After participating in Shape NC for 18 months, these centers had adopted 64 of the 86 recommended best practices.[31] The second cohort of 10 child care centers (Cohort 2) began in September 2011. These centers experienced more dramatic improvements. These centers had implemented, on average, 27 best practices before participating in Shape NC. This increased to 54 best practices after one year of participation.

Hub specialists measured heights and weights, and calculated BMI percentiles for the 4-year-old children in each of the participating child care centers. Height and weight were measured, and BMI was calculated on three occasions: September 2011, June 2012, and September 2012. The evaluation of Shape NC did not show a statistically significant change in the percentage of children at a healthy weight. This may be due, in part, to child turnover in these centers. Among the children enrolled in child care centers for six months or longer, there was a slight decrease in BMI between September 2011 and June 2012; but a very slight increase between June 2012 and September 2012. Neither of these changes was statistically significant. However, significant changes in BMI likely take longer than one year to develop. Therefore, continued monitoring is needed to determine if these interventions are having a positive impact on increasing the number of young children at a healthy weight.

After participating in Shape NC for 18 months, these centers had adopted 64 of the 86 recommended best practices.

While the data did not show a statistically significant change in the proportion of children at healthy weight, Shape NC did have a strong positive impact on the number of child care centers that have adopted best practices for physical activity and nutrition; participating child care centers increased the level of physical activity among children and the percentage of healthy foods served (see Table 4.2).

Table 4.2
Shape NC Child Care Centers Increased Physical Activity and Healthy Foods Offered

	Cohort 1 (percentage increase from baseline to evaluation)	Cohort 2 (percentage increase from baseline to evaluation)
Provided 90 minutes or more of physical activity daily	87% to 100%	14% to 72%
Served fruit two or more times per day	57% to 100%	9% to 54%
Served nutrient-dense vegetables daily	40% to 85%	16% to 61%
Served beans or lean meats one or more times per day	17% to 68%	0% to 38%

The increase in the number of child care centers that adopted best practices for physical activity and nutrition within an 18-month period is impressive. However Shape NC has only reached 19 centers and, as noted earlier, there are more than 4,809 child care programs in North Carolina. Thus, more work

is needed to expand this effort to additional child care centers across the state. The ECOP Task Force recommended that North Carolina funders and others disseminate Shape NC to other child care centers in the four Shape NC hubs, one of which covers northeastern North Carolina (the Transformation Zone that is part of North Carolina's Race to the Top — Early Learning Challenge grant).

Community/Environment Strategy 1: Expand the use of evidence-based and evidence-informed strategies for physical activity and nutrition in pilot child care centers

a) The BCBSNC Foundation, along with other funders and state agencies with shared missions and goals, should develop incentives to incorporate evidence-based and evidence-informed obesity prevention strategies into programs and policies in child care centers located in counties with high obesity rates among children. This effort should be coordinated with, and expand the ongoing efforts of, the four Shape NC hubs including the obesity prevention work that will occur in Bertie County as part of the Transformation Zone.

b) As part of this initiative, child care teachers and directors should be educated and coached about obesity trends, healthy food preparation, best nutrition practices, age appropriate physical activity strategies, the outdoor learning environment, limited or no screen time, and the importance of breastfeeding and infant feeding.

Lead organizations and partners: The BCBSNC Foundation, along with other interested funders, should continue its partnership with NCPC to expand the existing Shape NC effort aimed at promoting healthy weight and reducing the risk of overweight and obesity among infants and young children. These two organizations should collaborate with a broader coalition of groups at the state and local level, which includes, but is not limited to, local Smart Start partnerships, NC DCDEE, DPH, the Early Childhood Advisory Council (which oversees the Race to the Top — Early Learning Challenge Grant), the North Carolina Department of Public Instruction, State Board of Education, local health departments working on the Community Transformation Grant effort, the Center for Health Promotion and Disease Prevention at UNC-Chapel Hill (which helped develop NAP SACC), the Natural Learning Initiative at North Carolina State University (which helped develop POD), Be Active Kids®, Carolina Global Breastfeeding Initiative, North Carolina Center for Health and Wellness at the University of North Carolina at Asheville, child care programs, Head Start, North Carolina Child Care Health Consultants Association, North

Carolina Child Care Resource and Referral Council, North Carolina funders convergence, and the broader faith community.

Funding and new resources required: BCBSNC Foundation's current grant helps to fund the Shape NC activities for four regional Smart Start partnerships. The funding also supports Shape NC services in the Transformation Zone, but that funding will end in 2013. Additional planning is needed to determine how to further expand this effort into additional counties.

Performance measures and evaluation: Contingent upon funding, by 2018 at least 500 child care programs should have increased the quality of nutrition and physical activity available to young children (including healthier meals and snacks, reduced screen time, enhanced outdoor learning environments, increased physical activity, and breastfeeding support) as measured by an appropriate tool such as the Shape NC Assessment.[e]

Community/Environment Strategy 2: Provide pre-service and in-service education for child care providers on evidence-based and evidence-informed strategies for physical activity and nutrition

Just as there is a need to enhance training for health professionals about strategies to promote healthy weight and reduce early childhood overweight and obesity, there is a similar need to do this for child care professionals. The intention of this strategy is to enhance the training offered and required for students enrolled in early childhood education and child care education programs at the university, college, and community college levels.

Child care professionals need to have a broad understanding of healthy weight again, as well as unhealthy weight gain and its precipitating factors (such as poor nutrition and lack of physical activity) in the young child population. Their knowledge should include an understanding of obesity trends among infants and young children and that this condition can lead to significant health problems in the short-term (e.g. type 2 diabetes in childhood) and in the long-term (e.g. heart disease in adulthood). They should also know how to improve the nutritional profile of the foods and beverages served in child care settings, which includes the purchasing and preparing of such items. Child care professionals need to understand effective strategies to enhance the amount of time children spend engaged in age appropriate physical activity. Last but not least, child care providers are role models and, as such, should know how to reach and maintain their own optimal body weight through healthy behaviors.

e Shape NC is currently being implemented in child care centers, but may be in child care programs within the next five years; therefore the performance measure unit is child care programs. (Child care programs includes child care centers.)

The education level of child care program staff is varied. Lead teachers within a facility must have, at a minimum, a high school diploma or GED and a North Carolina Early Childhood Credential, which is offered by all 58 campuses in the community college system. Assistant teachers must have, at a minimum, a high school diploma or GED, while program administrators must have at least a Level 1 North Carolina Early Childhood Administration Credential. North Carolina Pre-K (formerly More at Four) teachers must have a bachelor's degree and have—or be working toward—the Birth-to-Kindergarten (BK) licensure. North Carolina Pre-K assistant teachers must hold a high school diploma or GED and be working toward an associate's degree. Head Start teachers must have an associate degree at a minimum; as of September 2013, 50% of Head Start teachers will be required to have a bachelor's or advanced degree.[1] All 58 colleges in the community college system have a statewide degree program that is based on a common course catalog. In addition, many of the private and public four-year colleges and universities offer degree programs for early childhood education.[32,33]

Child care professionals need to have a broad understanding of healthy weight and unhealthy weight gain in the young child population.

The ECOP Task Force agreed that incorporating this information into the existing education system is paramount to preventing and reducing childhood obesity among very young children. Therefore, the ECOP Task Force agreed that a better understanding of how physical activity and nutrition education are (or are not) included in the various curricula offered through North Carolina's two- and four-year education programs is needed. Once that initial assessment is complete, steps can be taken as outlined below to ensure this type of information is included in curricula offered across the state. In addition, there are opportunities for professional development during which child care program staff of all education levels can learn more about health, wellness, and obesity. Therefore, the educational content developed through this process should also be used to develop an in-service continuing education course, awarding at least 0.5 CEUs (5 hours), which can be offered through organizations such as the North Carolina Child Care Resource and Referral Council, Smart Start partnerships, child care health consultants' networks, and the Child Care Health and Safety Resource Center.

Community/Environment Strategy 2: Provide pre-service and in-service education for child care providers on evidence-based and evidence-informed strategies for physical activity and nutrition

a) To expand the availability of pre-service education for child care providers on evidence-based and evidence-informed strategies to promote healthy weight for young children, the North Carolina Center for Health and Wellness (NCCHW), in partnership with Eat Smart, Move More North Carolina, should survey administrators in North Carolina's public and private two- and four-year colleges and universities that offer child care

and early education degree programs about the existing curricula used to teach upcoming child care and early education professionals about early childhood health and obesity prevention strategies.

1) **The survey should seek information about whether the current curricula conveys information on topics such as, but not necessarily limited to, the following:**

   i) **Obesity trends among infants and young children**

   ii) **The impact of obesity on health**

   iii) **Infant feeding and signs of satiety**

   iv) **Healthy food and beverage procurement and preparation and best nutrition practices**

   v) **Strategies to promote healthy and appropriate sleep duration**

   vi) **The importance of reducing screen time**

   vii) **Age appropriate movement and physical activity**

   viii) **Outdoor learning environments and edible landscapes**

   ix) **Breastfeeding support**

   x) **Staff wellness to support role modeling**

   xi) **Effective strategies to educate parents and other caregivers about best practices to implement at home in order to promote healthy weight**

2) **The survey should seek information both on the content, the amount of time spent on the topics, teaching methods, whether information is integrated throughout the curricula (both in classroom and in-service learning), and whether the students are tested to ensure competency in the content area. In addition, the survey should collect information on the curricula used to teach prospective child care and early education professionals about educating parents about early childhood obesity prevention practices. NCCHW should evaluate the existing curricula to identify best practices and, if necessary, seek curricula from other colleges and universities outside of North Carolina.**

b) NCCHW should host a summit for North Carolina child care and early education professionals to identify strategies to enhance the curricula offered at community colleges, colleges, and universities for prospective early childhood professionals about health and wellness for young children ages 0-5 years, and obesity prevention strategies such as those listed earlier.

c) Using the findings from the survey and the summit, the North Carolina Institute for Child Development Professionals, in collaboration with NCCHW, the North Carolina Child Care Health and Safety Resource Center, the North Carolina Child Care Resource and Referral Council, North Carolina Pediatric Society, and two and four-year college and university representatives, should lead the development of education modules and materials that can be incorporated into existing curricula. The education materials should be pilot-tested in select higher education institutions. If they are successful in enhancing workforce and student knowledge about obesity in this age group and skills using evidence-based and evidence-informed strategies to reduce early childhood overweight and obesity, the curricula should be disseminated across the state.

d) To expand the availability of evidence-based and evidence-informed training for existing child care professionals, these education modules and materials should also be used for continuing education credits offered through the North Carolina Child Care Resource and Referral Council, Smart Start partnerships, child care health consultants' networks, and the North Carolina Child Care Health and Safety Resource Center to certified early educators.

Lead organizations and partners: NCCHW, in collaboration with Eat Smart, Move More North Carolina, along with a planning group comprised of representatives from college, university, and community college programs; the North Carolina Division of Child Development and Education; North Carolina Institute for Child Development Professionals; North Carolina Department of Public Instruction; Johnson and Wales University; North Carolina Child Care Health and Safety Resource Center; and the National Association for the Education of Young Children should take the lead in collecting the data on existing curricula, and in developing the one-day symposium. The North Carolina Institute for Child Development Professionals should take the lead in developing the educational materials and modules for use in pre-service and in-service education of child care professionals.

Funding and new resources required: NCCHW would need an estimated one-time funding amount of $50,000 to implement strategies 2a and 2b, above. This funding would cover the cost of survey instrument development, administration,

and analysis, as well as the cost of the one-time summit. The North Carolina Institute for Child Development Professionals estimates a one-time funding amount of $20,000 would be needed for 2c above, in order to develop and pilot-test the modules in select colleges and universities. The initiative should be funded by the North Carolina or national funders.

Performance measures and evaluation: The study by NCCHW would provide baseline information about the availability of coursework on early childhood health and wellness, including obesity prevention strategies. The data collection, identification of best practices, and summit should be completed within two years of initial funding. Within two years after completion of the summit (a maximum of four years past initial funding), at least 10% of two- and four-year colleges and universities should use the model curricula.

Community/Environment Strategy 3: Cross train all child care consultants and other support personnel on evidence-based and evidence-informed strategies for physical activity and nutrition

The goal is to help the state reach the "tipping point" in the number of child care facilities that are incorporating evidence-based and evidence-informed strategies to improve health outcomes.

The goal of this effort is to fortify the existing consultant infrastructure to help the state reach the "tipping point" in the number of child care facilities that are incorporating evidence-based and evidence-informed strategies to enhance physical activity and nutrition to ultimately improve health outcomes. Among the nutrition and physical activity topics that consultants should be knowledgeable of are nutrition basics, obesity trends, healthy food preparation, infant feeding/ breastfeeding basics, movement/physical activity basics, screen time consequences/considerations, and outdoor learning environments.

A variety of consultants regularly work with child care programs. Various agencies in North Carolina provide funding and training for these consultants. Each type of consultant fills a particular need in the child care setting infrastructure of North Carolina, some of which are described here. For example, child care health consultants from the North Carolina Child Care Health and Safety Resource Center focus on promoting health and safety in the child care environment, while licensing consultants from the North Carolina Division of Child Development and Early Education (NC DCDEE) assist programs with meeting licensure requirements. NC DCDEE also funds other consultants including infant/toddler specialists who specialize in the best quality of care for this age group, as well as social-emotional consultants (behavioral specialists). The Child and Adult Care Food Program (CACFP) of the Nutrition Services Branch within DPH provides consultants to assist programs in complying with CACFP standards and guidelines. Head Start provides consultants to assist Head Start programs in meeting requirements for its program, and local Smart Start partnerships (through NCPC) fund quality improvement staff consultants who

work with the facility on various quality improvement measures that go beyond licensure. In addition, there are Child Care Resource and Referral technical assistance specialists and professional development providers who help programs start up, improve their practice, provide professional development opportunities, and maintain compliance with licensing standards.

Many consultants hold specific degrees or certifications. For example, child care health consultants are certified and many are also registered nurses. Each type of consultant has job training and ongoing education, which presents an opportunity to ensure all consultants—regardless of type and primary purpose—are knowledgeable about overweight and obesity, nutrition, and physical activity. The ECOP Task Force recognized that the responsibilities of these consultants are great, but also recognized that they all have the potential opportunity to emphasize nutrition and physical activity in the work they do with child care programs.

Each consultant has a specific task within the child care system; however, ensuring that all consultants have a basic understanding and knowledge about childhood overweight and obesity and prevention strategies means child care staff members have regular contact with reliable sources of information about these topics. Educating the existing consultants will lead to the repetition and consistency of health information and messages and will also provide constant support and access to resources. This cross training increases the likelihood of successfully changing child care program environments and practices, as well as health outcomes for young children. Collaboration among existing agencies that currently influence child care programs will need to occur in order for this to come to fruition.

Community/Environment Strategy 3: Cross train all child care consultants and other support personnel on evidence-based and evidence-informed strategies for physical activity and nutrition

All child care consultants and other support personnel who provide training and technical assistance to child care and early education programs should be cross trained in evidence-based and evidence-informed strategies to support early educators in promoting healthy weight among young children. Using the education modules and materials developed in Community/Environment Strategy 2 as a starting point, the North Carolina Child Care Health and Safety Resource Center should take the lead in developing the cross training curricula and promoting it among the different child care consultants including, but not limited to, child care health consultants, Shape NC consultants, Smart Start quality enhancement specialists, Child Care Resource and Referral technical assistance specialists, Head Start consultants, Child and Adult Care Food Program consultants, infant/toddler specialists, and the staff at NC DCDEE who provide training and technical assistance to licensed child care programs.

a) Training should cover, but not be limited to, the following topics:

1) Obesity trends among infants and young children

2) The impact of obesity on health

3) Infant feeding and signs of satiety

4) Healthy food and beverage procurement and preparation and best nutrition practices

5) Strategies to promote healthy and appropriate sleep duration

6) The importance of reducing screen time

7) Age appropriate movement and physical activity

8) Outdoor learning environments and edible landscapes

9) Breastfeeding support

10) Staff wellness to support role modeling

11) Effective strategies to educate parents and other caregivers about best practices to implement at home to promote healthy weight

b) The modules and materials for this cross training should be developed and/or modified if need be such that they can be delivered through multiple mediums, including but not limited to computer-based webinars, training curricula that can be included as part of ongoing trainings and packaged learning modules. The training should be incorporated into existing trainings and updated as new information and evidence become available.

c) Organizations that employ consultants and other support personnel should require this cross training as part of their professional training requirements.

Lead organizations and partners: The North Carolina Child Care Health and Safety Resource Center should take the lead working with the North Carolina Institute for Child Development Professionals, Child and Adult Care Food Program in the Nutrition Services Branch, Women and Children's Health Section, and the Environmental Health Section in DPH, as well as NC DCDEE,

NCPC, North Carolina Child Care Health Consultant Association, North Carolina Child Care Resource and Referral Council, North Carolina Cooperative Extension, the Natural Learning Initiative at North Carolina State University, and the North Carolina Pediatric Society in developing the cross-training teaching modules and seeking to implement it into existing training and professional development requirements.

Funding and new resources required: The modules and materials discussed in Community/Environment Strategy 2 can be modified for use in consultant training. The total cost would be approximately $125,000 to develop, pilot, train, and deliver the cross-training of the consultants, specialists, and technical assistance providers in the first year including associated travel and materials. This funding would come from state or national funders.

Cross training consultants increases the likelihood of successfully changing child care program environments and practices, as well as health outcomes for young children.

In subsequent years, the training could be delivered quarterly for new providers entering the child care system. The information compiled as part of Clinical Strategy 4 about state and community resources that support healthy eating and physical activity should also be shared with child care professionals and consultants.

Performance measures and evaluation: As part of this process, the North Carolina Child Care Health and Safety Resource Center should conduct a pre- and post-intervention survey to assess the changes in the knowledge and skills of child care consultants and technical assistance staff about obesity trends, obesity prevention strategies, and effective parent engagement strategies. The survey should also capture actual practice in child care programs. As a result of the training, underlying knowledge about obesity trends, evidence-based or evidence-informed obesity prevention strategies, and effective parent/caretaker engagement strategies should be enhanced for all participants. In addition, within five years of initial funding, training should be included in all training programs for technical assistance staff on an annual basis. This strategy should contribute to the goal identified in Community/Environment Strategy 1, which is to implement evidence-based and evidence-informed strategies in at least 500 child care programs by the end of five years.

Community/Environment Strategy 4: Increase the focus of Eat Smart, Move More North Carolina on young children and their families

Many of the ECOP Task Force's strategies focused on implementing strategies in child care programs because, as noted earlier in this chapter, at least one in four children ages 0-5 years in North Carolina is, at any given time, in licensed, regulated care. However not all children from ages 0-5 years can be reached

through child care or early education settings. Thus, the ECOP Task Force was interested in exploring other options to reach young children and their families.

Eat Smart, Move More North Carolina is a coalition of more than 80 organizations working to promote "increased opportunities for healthy eating and physical activity wherever people live, learn, earn, play, and pray.

Eat Smart, Move More North Carolina (ESMM) is a coalition of more than 80 organizations working to promote opportunities for healthy eating and physical activity in the community in order to help people achieve a healthy weight.[34] ESMM provides evidence-based or evidence-informed nutrition and physical activity strategies, programs, and information for communities, child care settings, schools, after-school programs, policymakers, the faith community, worksites, families, and health care professionals. The overall goal of ESMM is to promote "increased opportunities for healthy eating and physical activity wherever people live, learn, earn, play, and pray."[35]

In addition to the 80-plus organizations that are part of the statewide leadership team, there are community coalitions in 78 counties across the state. Of these, virtually all have some focus on healthy weight among children, youth, and young adults. Recently, ESMM conducted a survey of the local coalitions to identify their policy focus and priority areas. The survey sought to obtain information about youth programs or initiatives, but little information was collected about activities in local communities targeting young children (ages 0-5 years) and their families.

ESMM already has significant partnerships with community groups across the state, including the faith community, child care providers, schools, families, policymakers, and other community-based organizations. However, to date, most ESMM coalitions have not focused on reducing obesity among young children and their families. As noted in Chapter 1, the evidence shows that obese children are more likely to become obese adults. Thus, early intervention is important if the state is to reverse its growing obesity trend. Prevention is also critical to stemming associated comorbidities that can occur even in childhood, such as elevated blood pressure, high cholesterol, and bone and joint problems, just to name a few.

Community/Environment Strategy 4: Increase the focus of Eat Smart, Move More North Carolina on young children and their families

a) Eat Smart, Move More North Carolina (ESMM) should increase the focus of its community engagement efforts to implement evidence-based and evidence-informed strategies to promote healthy weight among young children and their families.

1) ESMM should survey member organizations to collect information on existing early childhood initiatives and programs.

2) **ESMM should also work with other appropriate organizations, including but not limited to, the Physical Activity and Nutrition Branch, Women and Children's Health Section, and Nutrition Services Branch within the North Carolina Division of Public Health; as well as local health departments, Center for Training and Research Translation at the University of North Carolina at Chapel Hill, Shape NC, the Carolina Global Breastfeeding Institute, and the Natural Learning Initiative at North Carolina State University, to identify and create an inventory of evidence-based and evidence-informed tools, policies, programs, and practices to improve healthy nutrition and physical activity for young children.**

b) **ESMM should educate member organizations about the importance of intervening to improve nutrition and physical activity among young children ages 0-5 years and their families, and should promote the availability of evidence-based and evidence-informed tools, policies, programs, and practices across the state. Specifically, ESMM should help connect member organizations and others who use their resources with additional information on:**

1) **Obesity trends among infants and young children**

2) **The impact of obesity on health**

3) **Infant feeding and signs of satiety**

4) **Healthy food preparation and best nutrition practices**

5) **Strategies to promote healthy sleep**

6) **The importance of reducing screen time**

7) **Age appropriate movement and physical activity**

8) **Outdoor learning environments and edible landscapes**

9) **Effective strategies to educate parents and other caregivers about best practices to implement at home in order to promote healthy weight**

10) **Breastfeeding support**

Lead organizations and partners: Eat Smart, Move More North Carolina should take the lead, but also work with other coalition partners, including but not

limited to, the North Carolina Partnership for Children, state and local public health agencies, the broader faith community (including Faithful Families and Partners in Health and Wholeness), parks and recreation, Head Start Body Start, El Pueblo, National Association for the Advancement of Colored People, North Carolina Commission on Indian Affairs, North Carolina American Indian Health Board, North Carolina Child Care Resource and Referral Council, and the North Carolina Cooperative Extension, and other groups interested in promoting healthy weight among young children.

Funding and new resources required: An estimated one-time $100,000 would be needed to implement this strategy from North Carolina and national funders. This would cover the costs of a member survey; inventory and compilation of evidence-based tools, policies, and programs; implementation of an education initiative using the ESMM website; materials and communications; and evaluation. The information about state and community resources that support healthy eating and physical activity, compiled as part of Clinical Strategy 4, should also be shared with Eat Smart, Move More North Carolina and other community members.

Performance measures and evaluation: Within two years of initial funding, ESMM should have developed a resource of evidence-based and evidence-informed tools, policies, programs, and practices that have been shown to promote healthy weight and prevent obesity among young children and their families. The materials should be available on the ESMM website and should be promoted among local ESMM coalitions. Traffic on the website should be monitored to assess whether the materials are being used and, to the extent possible, to determine if they are being broadly distributed across the state. Within two years after these materials are developed, ESMM should survey local ESMM coalitions to determine if the materials have been used, and conduct a similar survey of health care, child care, and other providers to determine if the materials have been used.

Community/Environment Strategy 5: Form an ECOP Communications Committee to develop a communications campaign to support policy and behavior change to reduce early childhood obesity

In addition to the education and outreach to pediatricians, families, and child care program staff and consultants described in other strategies within this plan, the ECOP Task Force recognized the value of using an additional strategy such as a communications campaign to reach individuals and entities who have an impact on the weight of very young children. The intention of this strategy is to use the power of a well-crafted communications campaign to extend and enhance the collective impact of the other strategies contained in this plan.

This strategy, Community/Environment Strategy 5, is similar to a strategy used in North Carolina's strategic plan to prevent and reduce tobacco use. The North Carolina tobacco use prevention and cessation campaign, TRU (Tobacco. Reality. Unfiltered.), is a mass media campaign launched in 2004. A 2011 independent evaluation called the TRU campaign "an integral and successful component of North Carolina's teen tobacco prevention initiative."[36] This evaluation found that the campaign raised awareness about the consequences of tobacco use, reached youth at higher risk for tobacco use, and inspired conversation among youth and between young people and family members who smoked. The evaluation also showed that the campaign has increased the percentage of youth who believe cigarettes are addictive and who believe that regular use is likely to damage health.[36] This campaign, combined with other initiatives such as the smoke-free schools and tobacco tax increases, have helped reduce tobacco use in North Carolina.

Health communications campaigns, whether written or verbal, are designed to influence the behavior of a large number of people and can be combined with other efforts to enhance them.[37] They can be effective in changing behavior although the effects are small.[38] However, the impact of such campaigns can be important as part of a concerted effort or larger strategic plan. Large numbers of people can be reached through mass communications, so even though effect size may be small, the sheer number of people affected can be quite large.[38] An example of a campaign designed to reach a large target audience through mass media is the TRU campaign mentioned above. Health communications campaigns may use multiple communications channels, such as posters, handouts, and presentations to reach influential individuals, build individual capacity to change, and to increase exposure to the campaign in general. Greater exposure is associated with greater behavior change.[f]

Obesity-related social marketing and communications campaigns have demonstrated small but positive effects on health behavior that can translate into large population impacts.

Obesity-related social marketing and communications campaigns have demonstrated small but positive effects on health behavior that can translate into large population impacts.[39] Snyder (2007) showed a positive impact of campaigns on influencing the purchase of fruits and vegetables[40]; Reger and colleagues (1999) and Maddock and colleagues (2007) demonstrated success in campaigns encouraging individuals to switch to lower fat milk;[41,42] Huhman and colleagues (2010) showed the VERB campaign was successful in increasing physical activity behaviors among tweens[43]; and Noar and colleagues (2007, 2011) have shown that other computer-tailored materials can be effective in reducing fat intake and possibly increasing fruit and vegetable intake.[44,45]

Developing a successful communications campaign requires multiple steps:

1. conducting formative research,
2. using theory to inform the campaign,

f http://www.sciencedirect.com/science/article/pii/S1499404606006543

3. segmenting the audience,
4. designing the message to the target audience,
5. identifying the channels and message placement,
6. evaluating the process, including media exposure, and
7. evaluating outcomes.

These steps are critical and, to ensure success, should be followed in the development and execution of any campaign.[39]

Experts in communications, health, obesity, and very young children, as well as other partners should come together to determine an optimal communications campaign to build upon the momentum of early childhood obesity prevention strategies being implemented throughout the state. One example of a partner is the Alliance of YMCAs that has funding from the Robert Wood Johnson Foundation to advocate at the state level on behalf of childhood obesity prevention.[g]

Community/Environment Strategy 5: Form an ECOP Communications Committee to develop a communications campaign to support policy and behavior change to reduce early childhood obesity

a) The North Carolina Institute of Medicine (NCIOM) should convene an ECOP Communications Committee comprising North Carolina funders; communications professionals; the North Carolina Division of Public Health; Eat Smart, Move More North Carolina; representatives from North Carolina colleges and universities with expertise in communications, obesity, and/or young children; and other appropriate groups such as grocery stores, hospitals, and others to develop a carefully crafted communications campaign to promote healthy weight in very young children. This group should specifically examine opportunities for communications activities that would best support the ECOP Task Force's blueprint.

1) Once these activities have been determined, North Carolina health funders should provide support to the School of Journalism and Mass Communication at the University of North Carolina at Chapel Hill to conduct an analysis of the relevant peer-reviewed and "gray" literature to determine what messages have been effective in influencing individuals, organizations, or policymakers to make changes needed to

g Vodicka, S. Executive Director, North Carolina State Alliance of YMCAs. Oral communication. May 30, 2012.

reduce the risk of overweight and obesity among very young children. Other states' efforts that are similar should be reviewed as well.

2) **The ECOP Communications Committee's campaign development process should follow the seven steps to developing a successful communications campaign and should specifically consider audience segmentation, channel selection, and opportunities for partnering with existing efforts (e.g. farmers markets accepting EBT cards, existing school efforts) to boost overall campaign effectiveness, minimize costs, and ensure that the campaign is culturally and linguistically appropriate.**

Lead organizations and partners: The NCIOM will take the lead on convening the ECOP Communications Committee for the initial conversation. If funding is provided for development of the plan, the NCIOM, or another group chosen by the participating organizations, will reconvene the group.

Funding and new resources required: There is no cost to initially convene the group for the purposes of holding the preliminary discussion. If there is interest in pursuing this further, resources would be needed to develop the plan. Additional resources, which would be contingent on the communications campaign that is developed, would be needed to implement the campaign.

Performance measures and evaluation: Evaluation metrics should be determined as the plan is developed. Potential metrics include an increase in public awareness of campaign messages and community response or action following the release of certain stages of the campaign.

Partners should come together to determine an optimal communications campaign to build upon the momentum of early childhood obesity prevention strategies being implemented throughout the state.

References

1. North Carolina Institute of Medicine. Growing Up Well: Young Children's Social-Emotional Development Mental Health in North Carolina. Morrisville, NC. http://www.nciom.org/wp-content/uploads/2012/08/Early-Childhood.pdf. Published 2012. Accessed April 5, 2013.

2. The National Implementation Research Network, FPG Child Development Institute, University of North Carolina. Portfolio Updates: North Carolina Early Learning Challenge Transformation Zone. http://nirn.fpg.unc.edu/news/portfolio-updates-north-carolina-early-learning-challenge-transformation-zone. Published November 1, 2012.

3. US Department of Education. The Children Born in 2001 at Kindergarten Entry: First Findings From the Kindergarten Data Collections of the Early Childhood Longitudinal Study, Birth Cohort (ECLS-B). http://nces.ed.gov/pubs2010/2010005.pdf. Published October 2009.

4. Division of Child Development and Early Education. Division of Child Development and Early Education Monthly Statistical Summary: Information About Child Care Facilities Regulated by the Division. http://ncchildcare.dhhs.state.nc.us/pdf_forms/January_2013_Statistical_Report.pdf. Published January 2013. Accessed April 25, 2013.

5. Smart Start and The North Carolina Partnership for Children, Inc. SHAPE NC: Healthy Starts for Young Children. Blue Cross and Blue Shield of North Carolina Foundation website. http://www.bcbsncfoundation.org/shapenc. Accessed April 5, 2013.

6. Hansen P. Overview of shape NC. Presented to: Task Force on Early Childhood Obesity Prevention - Community Meeting; January 20, 2012; Morrisville, NC. http://www.nciom.org/wp-content/uploads/2011/11/ECOP_Hansen_2012-1-20.pdf. Accessed April 5, 2013.

7. Center for Training and Research Translation (Center TRT). UNC Center for Health Promotion and Disease Prevention. Nutrition and Physical Activity Self-Assessment for Child-Care (NAP SACC): Implementation. http://centertrt.org/?p=intervention&id=1091&section=6. Published 2013. Accessed April 13, 2013.

8. Hansen P. Obesity prevention in child care: Overview of intervention points, barriers and gaps. Presented to: Task Force on Early Childhood Obesity Prevention - Community Meeting; February 17, 2012; Morrisville, NC. http://www.nciom.org/wp-content/uploads/2011/11/Overview-of-Intervention-Points.pdf. Accessed April 5, 2013.

9. Natural Learning Initiative. Preventing Obesity by Design (POD-2). NC State University website. http://www.naturalearning.org/content/preventing-obesity-design-pod-2. Published February 2009. Accessed April 5, 2013.

10. Kuo F. National Recreation and Park Association. Parks and Other Green Environments: Essential Components of a Healthy Human Habitat. http://www.nrpa.org/uploadedFiles/nrpa.org/Publications_and_Research/Research/Papers/MingKuo-Summary.PDF. Published 2010. Accessed April 10, 2013.

11. Boldemann C, Blennow M, Dal H, et al. Impact of preschool environment upon children's physical activity and sun exposure. *Prev. Med.* 2006;42(4):301-308.

12. Fjørtoft I. Landscape as playscape: The effects of natural environments on children's play and motor development. *Children Youth and Environments.* 2004;14(2):21-44.

13. Taylor AF, Kuo FE, Sullivan WC. Coping with ADD the surprising connection to green play settings. *Environ. Behav.* 2001;33(1):54-77.

14. Boldemann C, Dal H, Mårtensson F, et al. Preschool outdoor play environment may combine promotion of children's physical activity and sun protection. further evidence from southern sweden and north carolina. *Science & sports.* 2011;26(2):72-82.

15. Brown WH, Pfeiffer KA, McIver KL, Dowda M, Addy CL, Pate RR. Social and environmental factors associated with preschoolers' nonsedentary physical activity. *Child Dev.* 2009;80(1):45-58.

16. Benham-Deal T. Preschool children's accumulated and sustained physical activity. *Percept. Mot. Skills.* 2005;100(2):443-450.

17. Nicaise V, Kahan D, Sallis JF. Correlates of moderate-to-vigorous physical activity among preschoolers during unstructured outdoor play periods. *Prev. Med.* 2011;53(4-5):309-315.

18. Ward DS. Physical activity in young children: The role of child care. *Med. Sci. Sports Exerc.* 2010;42(3):499-501.

19. Hinkley T, Crawford D, Salmon J, Okely AD, Hesketh K. Preschool children and physical activity: A review of correlates. *Am. J. Prev. Med.* 2008;34(5):435-441.

20. Cabalda AB, Rayco-Solon P, Solon JA, Solon FS. Home gardening is associated with filipino preschool children's dietary diversity. *J. Am. Diet. Assoc.* 2011;111(5):711-715.

21. Kalich KA, Bauer D, McPartlin D. Early sprouts. *Establishing Healthy Food Choices for Young Children. Young Children.* 2009;64(4):49-55.

22. Neelon S, Evans K. Brief 4: Farm to preschool and preschool garden strategies to combat early childhood obesity. In: Owen J, Rosch J, Smith S, eds. *Preventing Childhood Obesity: Policy and Practice Strategies for North Carolina.* 2011.

23. Meinen A, Friese B, Wright W, Carrel A. Youth gardens increase healthy behaviors in young children. *Journal of Hunger & Environmental Nutrition.* 2012;7(2-3):192-204.

24. Story M, Kaphingst KM, Robinson-O'Brien R, Glanz K. Creating healthy food and eating environments: Policy and environmental approaches. *Annu. Rev. Public Health.* 2008;29:253-272.

25. Kos M, Jerman J. Preschool children learning about the origin of food, on local farms and in the preschool garden. *Nutr. Food Sci.* 2012;42(5):324-331.

26. Cosco,N, Bieber,B, Little,S, et al. Shape NC intervention component – outdoor learning environment (OLE). Presented to: North Carolina Institute of Medicine Task Force on Early Childhood Obesity Prevention; January 20, 2011; Morrisville, NC. http://www.nciom.org/wp-content/uploads/2011/11/NCIOM_ShapeNC_MOORE_012012_A.pdf. Accessed April 13, 2013.

27. Oliver M, Schofield GM, Kolt GS. Physical activity in preschoolers: Understanding prevalence and measurement issues. *Sports Med.* 2007;37(12):1045-1070.

28. Brown WH, Pfeiffer KA, McIver KL, Dowda M, Addy CL, Pate RR. Social and environmental factors associated with preschoolers' nonsedentary physical activity. *Child Dev.* 2009;80(1):45-58.

29. Williams HG, Pfeiffer KA, O'Neill JR, et al. Motor skill performance and physical activity in preschool children. *Obesity (Silver Spring).* 2008;16(6):1421-1426.

30. Smart Start and The North Carolina Partnership for Children, Inc. The Blue Cross and Blue Shield of North Carolina Foundation. SHAPE NC: Healthy Starts for Young Children. http://www.smartstart.org/wp-content/uploads/2010/10/ShapeNC_FactSheet_1_6_2012.pdf. Accessed April 15, 2013.

31. Vaughn A, Murphy K, Hales S. UNC Center for Health Promotion and Disease Prevention. Shape NC Annual Report. http://www.smartstart.org/wp-content/uploads/2012/08/Shape-NC-2012-Annual-Reporl.pdf. Published November 2011. Accessed April 15, 2013.

32. NC Division of Child Development, NC Department of Health and Human Services. NC Colleges & Universities Approved Birth-Kindergarten Teacher Education & Licensure Programs. http://ncchildcare.dhhs.state.nc.us/pdf_forms/NCPre-K_ApprovedBKProgramsNC.pdf. Published March 12, 2012. Accessed May 2, 2013.

33. Child Care Services Association (CCSA). Provider Services | North Carolina Community Colleges. http://www.childcareservices.org/schools/index.php. Accessed May 2, 2013.

34. Eat Smart, Move More NC. Leadership Team. http://www.eatsmartmovemorenc.com/ESMMLeadership/ESMMLeadership.html. Published April 15, 2013.

35. Eat Smart, Move More NC. The Movement. http://www.eatsmartmovemorenc.com/AboutUs/TheMovement.html. Published April 15, 2013.

36. Tobacco Prevention and Evaluation Program, University of North Carolina at Chapel Hill, School of Medicine. 2011 Evaluation of the North Carolina TRU Media Campaign: Preliminary Report. http://www.tpep.unc.edu/reports/2011%20TRU%20Report%20Final%20Prelim%20Report%206%2030%2011.pdf. Published June 30, 2011. Accessed April 15, 2013.

37. The Guide to Community Preventive Services. Health Communication & Social Marketing: Health Communication Campaigns That Include Mass Media & Health-Related Product Distribution. http://www.thecommunityguide.org/healthcommunication/campaigns.html. Published December 15 2011. Accessed April 15, 2013.

38. Snyder LB, Hamilton MA, Mitchell EW, Kiwanuka-Tondo J, Fleming-Milici F, Proctor D. A meta-analysis of the effect of mediated health communication campaigns on behavior change in the united states. *J. Health Commun.* 2004;9 Suppl 1:71-96.

39. Noar,S. Health communication campaigns to promote healthy behaviors: A primer. Presented to: Task Force on Early Childhood Obesity Prevention; June 15, 2013; Morrisville, NC. http://www.nciom.org/wp-content/uploads/2011/11/Noar-NCIOM.pdf. Accessed April 15, 2013.

40. Snyder L. Health communication campaigns and their impact on behavior. *Journal of Nutrition Education and Behavior.* 2007;39(2):S32-S40.

41. Reger B, Wootan MG, Booth-Butterfield S. Using mass media to promote healthy eating: A community-based demonstration project. *Prev. Med.* 1999;29(5):414.

42. Maddock J, Maglione C, Barnett JD, Cabot C, Jackson S, Reger-Nash B. Statewide implementation of the 1% or less campaign. *Health Education & Behavior.* 2007;34(6):953-963.

43. Huhman ME, Potter LD, Nolin MJ, et al. The influence of the VERB campaign on children's physical activity in 2002 to 2006. *Journal Information.* 2010;100(4).

44. Noar SM, Benac CN, Harris MS. Does tailoring matter? meta-analytic review of tailored print health behavior change interventions. *Psychol. Bull.* 2007;133(4):673-693.

45. Noar SM, Harrington NG, Van Stee SK, Aldrich RS. Tailored health communication to change lifestyle behaviors. *American Journal of Lifestyle Medicine.* 2011;5(2):112-122.