Implementation of the North Carolina Child Care Health Consultant (CCHC) System Logic Model

By

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ABSTRACT

This paper examines the benefits and barriers for implementing a logic model with a specific focus on the logic model for a system of child care health consultants (CCHCs) in North Carolina developed by the NC Child Care Health Collaborative in late 2007. These stakeholders thoroughly investigated the current network of CCHCs and determined that the groundwork has been laid and North Carolina has the capacity to build a sustainable system of CCHCs in the public health infrastructure. The logic model provides a strategic plan for strengthening the system of CCHCs in North Carolina, which will result in the establishment of linkages among child care providers, child care health consultants, child care licensing consultants, children’s primary health care providers, and other important entities for the purpose of improving children’s health and safety in early care and education environments. Logic models have gained widespread acceptance and use by public health professionals as a program planning and evaluation tool. They provide a simple construct or roadmap of the relationship between program goals, activities, and expected outcomes. They help identify outcomes anticipated by the program or system, indicators of success, and evaluation instruments and methods to measure success toward intended outcomes.

Through a review of the literature on logic models, I plan to clarify the process of implementation, looking at benefits of system-wide program planning and outcomes and the barriers that may impede successful implementation in North Carolina. This will lay the foundation for offering recommendations for successful implementation of the NC System of CCHCs Logic Model. I will use two major research strategies to gather results: (1) a review of the literature on logic model development and implementation and (2) interviews with members of the NC Child Care Health Collaborative and other key stakeholders.
INTRODUCTION

In May, 2007 state-level leaders in the public health and early childhood education arena met to begin a discussion regarding the joint exploration of a statewide system of child care health consultants (CCHCs) in North Carolina, one that would be a more integral part of the public health infrastructure established in the state. These stakeholders established much of the groundwork and there is now capacity for the network of CCHCs to become a sustainable system in the public health infrastructure. Development of statewide systems of CCHCs as part of the public health and early childhood infrastructure aligns with one of the primary goals of the Healthy Child Care America (HCCA) Campaign (2004) launched in 1995 by the US Department of Health and Human Services in partnership with the American Academy of Pediatrics (AAP, 2004, p. 1). The objective of this paper is to explore the benefits and barriers of implementing a logic model, specifically the North Carolina Child Care Health Consultant System Logic Model (see Appendix A) developed by a group of key stakeholders during the fall of 2007 and winter of 2008.

Program structure and the process of child care health consultation in North Carolina currently vary, depending on the county or region offering the service and on the funding source. The majority of consultants in North Carolina are funded by their local Smart Start Partnership for Children who have the autonomy to determine the needs in their community. Local Partnerships frequently subcontract the CCHC project to the local health department. This has resulted in multi-agency supervision for the CCHCs, often with differing expectations for the job requirements. Steps taken in recent years toward the development of the statewide system of CCHCs include:
• The establishment of a Scope of Practice and Code of Ethical Conduct Statement (NC CCHCA, 2007) that outlines the services performed by CCHCs in the state

• The integration of the NC Child Care Health Consultant Training Course into the baccalaureate nursing program at North Carolina Central University (NCCU)

• The development of common health and safety forms for use by consultants in the state

In the fall of 2007 the North Carolina Child Care Health Collaborative Group was formed to continue the work started in May. Under the leadership of the State Child Care Nurse Consultant, it was decided that the first step in strengthening the system and building an infrastructure for child care health consultation should be the development of a logic model to guide the process. A logic model is a planning and evaluation tool required by the NC Division of Public Health and a part of the State Child Care Nurse Consultant’s workplan. The North Carolina Child Care Health Consultant System Logic Model is the result of the two collaborative meetings held in the fall. The NC CCHC logic model was based upon the infrastructure “pillars” of the Statewide CCHC System template developed by the Healthy Child Care Consultant Network Support Center Education Development Center (2006) and presented during the May, 2007 meeting (Fahey, 2007). The pillars are: Qualified Workforce, Funding, Regulatory Environment, Tracking and Evaluation, and Deployment Strategies (Fahey, 2007).

The Centers for Disease Control and Prevention (CDC) Evaluation Research Team (2006) recommends that when a “logic model becomes too complex; consider creating nested logic models where each separate model captures a different level of detail or scope” (CDC, 2006, p. 1). Due to the complexity of the NC model, a nested logic model was chosen. Each
pillar comprises a single logic model in the “nested” structure and includes its own goal statement, short term process outcomes, outputs, activities and resources (inputs). A single impact statement, Healthy Children, Healthy Child Care, and Healthy Communities, provides an overarching vision for the whole system logic model.

BACKGROUND

A famous quote by Yogi Berra says, “If you don’t know where you are going, how are you going to know when you get there?” Logic models are a visual representation or road map showing the sequence of related events and connecting the need for a planned program with the program’s desired results or outcomes. As defined in the W.K. Kellogg Foundation Logic Model Development Guide (2004), a logic model is a “systematic and visual way to present and share your understanding of the relationships among the resources you have to operate your program, the activities you plan, and the changes or results you hope to achieve” (WK Kellogg Foundation, 2004, p. 1). Logical or causal relationships are defined through displaying each of these components in individual cells. The text in the cells is read from left to right. For example if certain resources (inputs) are accessible, then particular activities can be planned and implemented. If the planned activities are implemented, then defined outputs are expected, and if achieved successfully they should lead to expected outcomes (Research Utilization Support and Help (RUSH) Project, 2008).

Although the text in the cells is read from left to right, when developing a logic model it is helpful to start from the right and work toward the left. This method, also called “reverse logic” (CDC, 2006, p. 2), starts with desired outcomes and requires planners to work backwards to develop activities and inputs. This method better ensures that program activities logically lead to specified outcomes, if the connections are well thought out (CDC,
2006). Logic models can be helpful tools for public health professionals to utilize in all phases of a program or project, including: planning, implementing, monitoring and evaluating (Research Utilization Support and Help (RUSH) Project, 2008). According to the Kansas University (KU) Work Group for Community Health and Development (KU Work Group, 2007), in their Community Tool Box, use of a logic model forces planners to think about evaluation and identify key components of a project evaluation design. The “goal is to use a logic model as a feedback and learning tool—with the model initially informing the data and then the data ultimately informing the model” (Coffman, 1999, “Learning from Logic Models”). This can be done by making sure that all logic model outcome statements provide descriptions of data and data sources that will be used to indicate progress toward outcome goals (RUSH, 2008). The flexibility of the logic modeling process allows for expanding their use beyond program or project planning and evaluation and to use them in systems development. This was the goal of the North Carolina Child Care Health Collaborative in developing the NC Child Care Health Consultant System Logic Model.

Statewide program planning and the development of health systems in child care require the expertise of health professionals with knowledge of and connection to the child care community. Child care health consultants (CCHCs) are asked to be responsible members of both the health care community and the child care community. In many ways North Carolina has lead the nation in building a quality system of child care health consultation, with the mission to ensure safe and healthy environments for children in out-of-home child care. The North Carolina Division of Public Health (DPH) has partnered with the North Carolina Partnership for Children (Smart Start), the NC Division of Child
Development (DCD) and the University of North Carolina in Chapel Hill to establish the current system of CCHCs in North Carolina.

The DPH employs the State Child Care Nurse Consultant to oversee public health efforts in child care and to collaborate with the North Carolina Child Care Health and Safety Resource Center, the agency DPH contracts with to provide training to prepare and qualify CCHCs for their work in the state. Smart Start provides technical assistance for and funds local Partnerships for Children, which have the autonomy to decide on which activities will support their vision of having all children in North Carolina enter kindergarten healthy and ready to succeed (Smart Start, 2008). Because CCHCs are deemed integral to meeting this goal, 48 out of 78 local Smart Start Partnerships currently fund CCHC activities (Smart Start, 2008). North Carolina is one of three states with its own professional association of CCHCs, the NC Child Care Health Consultant Association (NC CCHCA). The State Child Care Nurse Consultant and the NC CCHCA established a Scope of Practice and Code of Ethics to guide the work of North Carolina’s CCHCs, an organization that is the health link between child care and the health care system. These efforts have resulted in a firmly established network of CCHCs across the state. The goal of the NC Child Care Health Collaborative Group is to establish a formal and sustainable system that is incorporated into the public health infrastructure, similar to those established for public school health nurses.

When considering establishing a sustainable system of CCHCs in North Carolina and looking at what recommendations to offer, Sanjeev Sridharan and colleagues (2007) in their research outline some critical elements to consider. Sridharan (as cited in Mancini and Marek, 2004) proposes a “framework of sustainability that contains seven major elements: leadership competence, effective collaboration, understanding the community, demonstrating
program results, strategic funding, staff involvement and integration, and program responsivity” (Sridharan, Go, Zinzow, Gray & Barrett, 2007, p. 106). The *NC CCHC System Logic Model* incorporates or addresses many of these seven elements. Collaboration of key stakeholders and broad-base community support will continue to be especially critical as the NC Collaboration Group moves forward in implementing components of the *NC CCHC System Logic Model*. Collaboration is heightened when partners understand and believe in the benefits of establishing a system of CCHCs. In addition a workforce in the field is needed that is sufficient to improve the quality of the care provided in out-of-home child care settings. Collaboration among service providers reduces the risk of duplication, overlap of services, and encourages coordination of service delivery.

**LITERATURE REVIEW**

When planning for implementing components of the *North Carolina Child Care Health Consultant System Logic Model*, a review of the literature on logic models and their use in community initiatives provide insight into strategies that could be recommended to the NC Child Care Health Collaborative Group. A review of the literature regarding infrastructure development offer guidance on building sustainable state systems of child care health consultants (CCHCs) and will also be valuable to the Collaborative Group and key stakeholders as the process of implementing the logic model continues.

*Logic Models*

There are many benefits for developing and implementing logic models. The Centers for Disease Control and Prevention (CDC, 2007) outlines a number that health professionals should consider, including:

- Logic models can clarify the program or project strategy and justify benefits.
Logic models have the potential to enhance efforts to build consensus among community partners and stakeholders.

Logic models allow for the identification of realistic outcome targets.

Logic models assist planners in setting priorities for allocation resources.

Logic models enhance the ability to incorporate findings from research, which encourages evidence-based practice.

Logic models allow for monitoring and making adjustments and improvements to programs or projects.

Logic models provide a framework for evaluation and encourage stakeholders to be accountable for program processes and outcomes (CDC, 2007, “Logic Model”).

Developing and implementing a logic model has benefits for both new and existing programs. Through a process of clearly defining logical connections between activities and their effects, a new program is more likely to start off successfully. The potential for success is enhanced when the methods to reach specific outcomes have been thoroughly examined and when evaluation tools are established ahead of time and implemented throughout the process (KU Work Group, 2007, sec. 2 “Developing a Logic Model or Theory of Change”).

The flexibility of using a logic model allows a new program to modify the model as outputs are achieved or barriers arise. For the already existing program or system it allows the opportunity to evaluate the process periodically, to document successful strategies and to adjust the model as new information is gleaned, thereby reducing or avoiding unintended consequences. Priorities for allocating resources may need to be adjusted, which might require modifying the details in the logic model (KU Work Group, 2007, sec. 2 “Developing a Logic Model or Theory of Change”). Collaboration between people and organizations is
enhanced as responsibilities for activities can be more clearly outlined, lessening the potential for missed opportunities and/or action. According to the KU Work Group *Community Tool Box (2007)*,

Logic models define a shared language and shared vision for community change. The terms used in a model help to standardize the way people think and how they speak about community change. It gets everyone rowing in the same direction, and enhances communication with external audiences, such as the media or potential funders (KU Work Group, 2007, sec. 2 “Developing a Logic Model or Theory of Change”).

A logic model for a collaborative effort among multiple human services delivery systems allows each organization to have input and delineates each organization’s roles and responsibilities for implementation. Another significant benefit of using a logic model is that stakeholders are forced to focus on identified outcomes, which in turn has the potential to enhance accountability (KU Work Group, 2007, sec. 2 “Developing a Logic Model or Theory of Change”).

The KU Work Group (2007) advises that the only way to determine a logic model’s effectiveness is to see if the intended users followed through on activities and how they proceeded with the activities. This can be viewed as user “buy in.” To enhance user “buy in”, an effective logic model must be visually appealing. This requires creating a balance between detail and accessibility. The model must provide sufficient detail to serve its purpose and must present the information in a simple and easy to access format. They recommend that successful implementation and reaching intended outcomes is enhanced by a more complete
and well thought out model (KU Work Group, 2007, sec. 2 “Developing a Logic Model or Theory of Change”).

For those that are in the implementation phase of their projects, the logic modeling process offers guidance about organization and management. In their Logic Model Development Guide the W. K. Kellogg Foundation (2004) stresses that logic models should be considered a central method for providing management of a program, as well as identifying and collecting data that can be used for the process of monitoring and implementing improvement strategies (WK Kellogg Foundation, 2004, p. 5). If thoughtfully developed, use of a logic model for implementation provides the means to focus and prioritize those efforts that are most critical to success. The KU Work Group Community Tool Box (KU Work Group, 2007) points out that the logic modeling process is a collaborative one based on consensus-building. This sets the stage to allow stakeholders to make any needed changes and refine the model during the implementation phase (KU Work Group, 2007, sec. 2 “Developing a Logic Model or Theory of Change”).

In an article that discusses utilizing a logic model as a system level planning tool, David A. Julian (1997) moves beyond the idea of using logic models just in program planning. The author, a Program Director with the College of Education and Human Ecology at Ohio State University, compares the relationships between “short term outcomes produced by programs, intermediate system impacts, and long term community goals” (Julian, 1997, p. 251). He holds that logic models have a place in system level planning and can depict the operation of a program or “multiple human services delivery systems” (Julian, 1997, p. 251). He defines this term as a group of separate and distinct elements that come together to work toward a specific goal (Julian, 1997, p. 251). For example in North Carolina, a local Smart
Start Partnership for Children would be defined as a multiple human services delivery system. A Partnership provides multiple services, including but not limited to: child care subsidy assistance to parents, salary supplements to child care providers for increase educational level, health and safety consultation in early childhood settings, and family literacy programs. These services are provided with the specific goal to “ensure that young children enter school healthy and ready to succeed” (Smart Start, 2008). The system of child care health consultants working in North Carolina could also be seen as a human services delivery system.

When looking at impact made through community efforts, in an article on evaluation the United Way (2007) differentiates between program activities and outcomes that benefit individual program clients and those that benefit populations within the community. Program activities and changes impact only the clients served by the program, with the potential to have a more immediate effect upon individuals. Community outcomes, on the other hand, result in shifts within the community such as changes to community networks, neighborhoods, organizations and systems. They have the potential to affect large numbers of people over a long period of time (United Way, 2007, “Program Outcomes and Community Outcomes: What Are the Differences?”). The United Way (2007) defines those logic models used for efforts to bring about community change as “theories of change” logic models, and differentiates them from program level logic models.

When planning for community level change, planners must understand that program activities can not be strung together to create a community-based change. Julian (1997) holds that though the use of logic models for system level planning and evaluation has largely been limited, their use is beneficial when considering coordination of services that target
community or state level system goals and impact (Julian, 1997, p. 252). Coordination of services is seen as a critical element for an effective human services delivery system. Collaborators can successfully use a logic model to narrow the focus on the likely impact of services on a specific problem such as child health and safety. Julian (1997) posits that there are a number of factors to consider in order for logic models to be useful at the system level. They include:

- Providing an exact definition of impacts that will guide the program design and resource allocation decisions;
- Defining measurable indicators that will be used in order to assess progress in achieving objectives;
- Narrowing the problems to address those of highest priority so that sufficient resources can be allocated effectively; and
- Utilizing a variety of intervention strategies that will focus on organization, systems and community changes (Julian, 1997, p. 257).

While there are many benefits to be found in implementing logic models, there are also challenges or barriers that may be anticipated and/or those that arise unexpectedly. Employing a logic model requires strong leadership and commitment from key stakeholders, as the process most often calls for a high degree of exactness and participation. It requires concentration to detail in the development stage and continued attention when implemented, which can be a slow and time consuming process (KU Work Group, 2007, sec. 2 “Developing a Logic Model or Theory of Change”). A logic model is a living document that continues to inform the work of the partners involved and so needs to be revisited during the implementation period, requiring more time from key stakeholders. There is a need to stay
with the process long enough to complete the evaluation or to provide regular evaluation of progress. Coordination of effort must be clearly thought through at the beginning of the process. Lack of available community funds and resources often presents a barrier to implementing planned activities in a logic model, thus impacting the ability to meet outputs which then effect outcomes. Resistance from the community and obtaining community “buy-in” may delay implementing aspects of a logic model. Identifying potential challenges or barriers during the development phase will help the planners determine how to minimize the negative effect on the outcomes (KU Work Group, 2007, sec. 2 “Developing a Logic Model or Theory of Change”). Although the challenges may be many, a carefully developed and implemented logic model will yield many benefits for a program or multiple human services delivery systems.

There are challenges or barriers that are to be expected as North Carolina moves ahead to implement components of the Child Care Health Consultant System Logic Model. Fahey (2007), in a report shared with state-level planners in North Carolina, outlined some that have been common nationwide and some she believed were likely to manifest in this state. She included: lack or insufficient funding on a permanent basis; unmanageable caseloads for CCHCs located in some counties or regions with high need and an insufficient number of qualified CCHCs to meet the need; need for common continuous evaluation plan, variation in consultation services from county to county (region to region) due to the voluntary nature of the child care health consultation service at this time; lack of established CCHC service in some counties/regions; and lack of common health forms used in child care (Fahey, 2007). These challenges are enhanced by the fact that funding for the Early Childhood Comprehensive Systems Initiative (ECCS), a component of the Maternal and
Child Health Bureau (MCHB) *Strategic Plan for Early Childhood Health* (2008), is in the third year of a 5-year cycle.

Abrahams and Knaack (2006), in a study of the child care health consultation system in North Carolina, identified lack of funding as the number one barrier to expanding child care health consultation. Sanjeev Sridharan and colleagues (2007) also discuss that planning for sustainability of community initiatives are challenged for a variety of reasons, including lack of funds. They point out that programs often need to provide evidence of effectiveness to prove there is value in making them sustainable. This could be a challenge or barrier for the North Carolina system, due to a lack of a common continuous evaluation plan and method of data collection. Sridharan and colleagues (2007) also suggest that lack of funds can stimulate communication among collaborating partners to build capacity to solve problems (Sridharan, Go, Zinzow, Gray & Barrett, 2007, p. 110).

A review of the literature also outlined some common limitations of using logic models in implementing systems-level changes. In *Developing a Logic Model: Teaching and Training Guide*, Ellen Taylor-Powell and Ellen Henert (2008) emphasize that logic models represent the intentions of those involved in their development, but do not always capture unintended consequences or outcomes, whether they are positive or negative (Taylor-Powell & Henert, 2008, p. 6). Logic models generally focus on positive change, and usually do not sufficiently consider or take into account negative change. Implementing components of a logic model may be quite prescribed, leaving little room for creativity, spontaneity, or thinking “outside the box” (Taylor-Powell & Henert, 2008, p.6). The use of a logic model for system-wide planning, particularly when systems are complex, might limit or over simplify the causal nature of a system in which a variety of factors influence process and outcomes.
Finally, Taylor-Powell and Henert (2008) find that it is possible for those developing and implementing a logic model to lose sight both of the ultimate goal, or impact of the program or system, and of whether or not the program is the right thing to do (Taylor-Powell & Henert, 2008, p.6). In the Community Tool Box, the KU Work Group (2007) finds similar limitations in describing that the "logical" nature of a logic model does not always mean that it is accurate or correct. As Taylor-Powell (2008) described, effects of interventions or activities and their outcomes can be quite different than those anticipated in a logic model (Taylor-Powell & Henert, 2008, p.6). Changes may be negative and actions might make problems worse. A logic model provides a template to follow and sometimes the temptation is to implement the model blindly without regard for the need for ongoing evaluation of the implementation process. Through periodic evaluation the model can be refined or modified for the purpose of affecting positive change.

Building Sustainable CCHC Systems

When planning for implementing components of the North Carolina Child Care Health Consultant System Logic Model, it was helpful to review the literature on building sustainable systems of child care health consultation and establishing them within state public health and early childhood infrastructure. A study by Sanjeev Sridharan and colleagues (2007) that looked at comprehensive community initiatives suggests that planning for sustainability is challenging and often not accounted for during the planning phase (Sridharan, Go, Zinzow, Gray & Barrett, 2007, p. 109). The study (2007) emphasized the critical role planning for sustainability plays in the achieving intended impact. In a report prepared by Jennifer McGrady Heath for the Child Health and Development Institute (CHDI, 2005) that looked at the structure and sustainability of state consultation systems, the
recommendation was made that a state-level entity should oversee the system in order to ensure a consistent framework. The structure recommended by Heath (2005) is a multi-disciplinary consultation system (i.e. public health, early childhood, early intervention, etc.) that is integrated into all state-level plans with a state-level entity that ensures that the consultation system is not fragmented, but is coordinated across systems.

A Healthy Child Care Consultant Network Support Center Education Development Center publication (2006), outlining the influence of child care health consultants (CCHCs) in promoting children’s health and well-being, refers to study by Abby Alkon and colleagues which describes characteristics supportive of the development of community child care health consultation systems. Characteristics seen as facilitating this process include: establishment of linkages between community agencies and early childhood programs; strong commitment or “buy-in” for child care health consultation by a lead agency (e.g. state public health agency); sufficient community health resources; and effective communication and personal relationships (Healthy Child Care Consultant Network Support Center, 2006, p. 21). Factors that Alkon and colleagues identified as presenting barriers to this process include: lack of available community health and safety resources; early childhood programs unfamiliar with child care health consultation or unable/unwilling to participate; and geographic barriers that prevent access to resources (e.g. rural programs) (Healthy Child Care Consultant Network Support Center, 2006, p. 21). Farrer, Alkon, and To (2007) describe some similar barriers in their study including child care health consultants, such as program management, child care culture, geography, and available community services. The barrier most frequently mentioned in this study was “multi-agency involvement” (Farrer, Alkon & To, 2007, p.116) or having more than one agency involved in a supervisory role. As child
care health consultation is seen as a still emerging field recognizing and understanding these barriers described in the study can facilitate those developing or strengthening statewide systems of child care health consultants, as well facilitate the process of implementing the NC CCHC System Logic Model.

In order to develop and enhance CCHC infrastructures, it is critical to know key components that contribute to successful and sustainable state CCHC initiatives. A Healthy Child Care Consultant Network Support Center publication (2007) identifies some key components or factors, with those most commonly identified by leaders as: continuity, partnerships, and community support for early childhood priorities (Healthy Child Care Consultant Network Support Center, 2007, p. 7). Continuity requires committed stakeholders or partners to be persistent in working toward long-term goals, with a willingness to accept progress in small steps. Committed partnerships and continuity are most likely to flourish in environments that are receptive and supportive. Political support is critical. For example, North Carolina’s Smart Start early childhood initiative to ensure all children enter school healthy and ready to succeed, is supported legislatively and is possible in an environment that supports an early childhood agenda.

METHODS

During the first quarter of 2008, self-administered interview questions were distributed to approximately twenty-five individuals in order to collect information on use of logic models and perceived strengths and barriers to their use, as well as questions specific to the North Carolina Child Care Health Consultant System Logic Model developed in the fall.
Because this assessment was not a conventional research project, it was determined to be exempt from Institutional Review Board (IRB) governance by The Public Health Institutional Review Board (IRB) at the University of North Carolina at Chapel Hill.

An interview was requested by the author from representatives from the NC Child Care Health Collaborative Group, including the following organizations: NC Central University Department of Nursing; UNC, Department of Maternal and Child Health; School of Public Health; NC Division of Child Development; NC DHHS, Division of Public Health, Women’s and Children’s Health, Early Intervention Branch and Children and Youth Branch; Office of School Readiness; NC Child Care Resource and Referral’s Healthy Social Behaviors Initiative; NC Child Care Health and Safety Resource Center; NC Partnership for Children/Smart Start; UNC, School of Social Work; as well as health department based child care health consultants from the Buncombe County and the Madison County Health Departments.

Twenty-five interviews were disseminated to participants via email or in-person. Interviews took place through email, in person or over the phone, and took between 0.5 – 1 hour to complete. Fifteen interviews were completed.

The interview questions, developed by the author, were designed to collect information specific to each subject’s experience in developing and working with logic models, perceived benefits of developing and implementing a logic model, barriers encountered during the development and implementation process, and perceived benefits for using a logic model to develop a sustainable system such as the system of child care health consultants in North Carolina. The respondents were also asked to detail barriers that they anticipate as the Collaborative Group begins the implementation of the logic model. While
scripted interview questions were prepared for each interview, participant comments offered on any aspect of the child care health consultant system were noted.

This non-random sample of participants was an expert or judgment sampling and the study was exploratory. Those interviewed were considered by the author to be a panel of individuals known to be expert in the field of child care health consultation and in the use of logic models. Their expertise was judged as special knowledge, not necessarily formal training. An advantage of judgment sampling is the reduced cost and time involved in acquiring the sample participants (Statistics Canada, 2008). There were limitations to this type of study. The sample size was small. In order to draw any meaningful conclusions from the results of the interviews it is recommended that a sample be at a minimum thirty participants (North Carolina State University, 2008). The sample was not random, so the likelihood of bias is high. Random samples are always strongly preferred as only random samples permit statistical inference and there is no way to assess the validity of results of non-random samples. There may be a need to develop a random sample at some point, in order to extend the current results of the interview/survey and provide more in-depth statistical data analysis.

RESULTS

Summary of Results

Interviewing the NC Child Care Health Collaborative Group and other key stakeholders provided the author insight and information on perceived benefits of developing and implementing a logic model. A number of common themes emerged about the implementation of logic models.
Benefits of developing and implementing a logic model. There was a general agreement that the logic model tool itself is helpful in providing a visual for seeing connections between inputs, activities, outputs and outcomes or a plan made up of predetermined stages. The logic modeling process was seen to enhance the collaborative process, forcing key players at the table to think through steps necessary to achieve outcomes, and then move toward a consensus on methods to achieve outcomes. When implementing a logic model, barriers may block progress or barriers may suggest another avenue to explore. The plan may even be easy to implement. It was pointed out that a real benefit of the logic model is that it can be adapted to incorporate new information or understanding.

Of the fourteen responses to this interview question, thirteen participants (93%) described the benefits of developing and implementing logic models in terms of logic models serving as a map or framework. Creating the map requires that the partners involved create a shared perspective of the “lay of the land,” even though each individual sees it from different vantage points (i.e. different disciplines or job positions, different personal agendas, different levels in a hierarchy, etc). This is a benefit of developing the model. The boundaries of the project, which requires group consensus, serve to unite the project. The logic model also maps the project over time in a single “view”. The beginning (goals, objectives, etc) middle (activities, actions, documentation) and end (outcomes, publications, next-steps, sustainability, evaluation, etc) are all visible in a single document. A map that covers the entire project timeline is beneficial because it can be used to insure that no matter when an activity takes place, it fits within the project as a whole, and complements all the other parts of the project. Logic models are good for presenting a project to someone “outside” the
project, because they are a good summary. That is if the person viewing the model understands how to read a logic model.

Barriers encountered during development and implementation process. People often have the false conception that logic models are difficult to comprehend and difficult to use. They prefer to focus on their “part” of the project, instead of approaching the project as a whole or people can make the project that they imagine as highly complex look overly-simplified. It’s important to stress that logic models are just a summary and a tool. Once created, the logic models are more likely to sit in a file cabinet than to serve as a guide for each step of the project. The hierarchical state employment system contributes to this problem. As a consequence, sometimes projects stray from their intended purpose.

General resistance to change was also mentioned as a barrier. Inter-agency competition for resources and influence, as well as multiple funding sources that are tied to multiple and varied expectations, were seen as potential barriers. Attitude was seen as either a barrier or a support in the process. Those with a “we’re working from a deficit position” could stymie the process. Maintaining interest and enthusiasm of the participants over time could certainly present a challenge. Leadership was seen as instrumental to the implementation process and ensuring that collaborators are moving in the same direction. Moving forward on all components of the logic model will require careful coordination by a person or team members with vision and strong leadership skills.

Benefits for using the logic model to develop a sustainable system of CCHCs in NC. When considering the benefits specific to using a logic model to develop a sustainable system such as the system of child care health consultants in North Carolina, those interviewed saw the logic model as a crucial step in moving forward in setting the stage or
generating "buy in" for the CCHC system to be established in the public health infrastructure. The benefits of the nested logic model design chosen by the group were mentioned in terms of the frequency of connections and interdependency of each separate model in relationship to the other models. This allowed for a broader discussion of what would be required to establish and sustain a system of CCHCs from the point of funding to qualified workforce, policy development, evaluation and how to deploy qualified CCHCs into the work force.

It became evident that if all areas of the logic model were being developed at the same time the CCHC system would have a stronger foundation. This would enhance the likelihood of achieving its goals. This approach helped identify key organizations to include and the kind of tasks the group might start with. A broad based support lends credibility to the effort, strengthens collaboration and gives a powerful voice to the future work of policy development.

To create a sustainable system the *NC CCHC Logic Model* codifies the project, outlines both the vision and methods that will be used to carry it out, and insures that no single individual has responsibility for the entire project. When personnel changes occur, a new person could continue the project by using the logic model as a guide. As the project unfolds, multiple parts of the system are carried out simultaneously. The logic model is a good tool to use because it represents the entire project timeline, and can be used to view the project as a dynamic system, and to see how each step relates to other steps, even if they are taken out of order.

*Barriers anticipated in implementing NC Child Care Health Consultant System Logic Model.* Group members were consistent in seeing funding and lack of resources to be barriers
or challenges to implementing system-level logic models in general, and noted that financial concerns should be an anticipated barrier as the process of implementing the NC Child Care Health Consultant System Logic Model begins. Of the fourteen responses to this interview question, fourteen participants (100%) mentioned funding and access to resources as a potential barrier. Resources may dry up or need to be channeled in a different direction. This may require that the group explore other funding possibilities. Proceeding or getting around barriers calls for partnering and being creative in searching for alternate sources of funds. Building strong relationships with partners can leverage dollars and strong partners can be helpful in finding outside funding. Time is a resource that can be pivotal. Being sensitive to timing can make the difference in being able to accomplish a step quickly and with relatively little resistance or having to start again to generate enthusiasm and garner support for following through with expected tasks. Additionally, a number of respondents mentioned that a potential barrier to be cognizant of is changes in the state legislature or the political environment. These types of exterior barriers potentially require creativity of partners and the ability to revise portions of the logic model in order to meet the demands of a new “climate”.

Creating and implementing a logic model can become a project in and of itself. A few respondents to the interview questions offered words of caution that the group should not become enmeshed in the details of the model and thus make the model less accessible. With the goal of adopting the logic model, it will be important to make sure that all partners understand how the model will work as a tool to make the CCHC system stronger and to help people understand the importance of their role and contributions. If not, then the model is not worth the time and effort required to understand and use it.
Experience working with logic models. The participants in the study described their experience in working with logic models all along the continuum. Some participants described their experience as limited in terms of working with logic models in a group or collaborative process. Many noted that use of logic models is a job or workplan requirement at their agencies, and that they must be updated annually.

There were a number of major themes that emerged from the personal interviews, or comments that were made by a majority of the participants. They include:

- Logic models give clarity to a process. A group can see the benefits and meaning of their individual contributions to the big picture or overall desired outcome. If the model is followed through, it is a step-by-step guideline from beginning to end which helps keep people on task. People stay focused, thereby providing a more efficient use of time.

- Logic models are good tools to use because it represents the entire “project” timeline, and can be used to view the project as a dynamic system, and to see how each step relates to other steps, even if they are taken out of order. By using a logic model, how each activity relates to the others and to the project as a whole is seen.

- A time commitment for development and implementation of the logic model is required of all stakeholders in order to successfully meet outcomes.

- Strong relationships and partners can leverage dollars and can be helpful in finding outside funding.

- Logic modeling and building a system of child care health consultants (CCHCs) as part of the public health infrastructure calls for flexibility. Being confronted with
barriers and challenges requires creativity and the ability to revise or modify initial plans.

• The communication of the model will have to be handled effectively: verbally or with a written narrative. The communication of the whole model gives clarity to the vision, but then each individual or group needs a good explanation of their deliverables. The success will be dependent on the abilities of the individuals being asked to do the implementation. It will be important to identify the need to strengthen certain areas before the desired outcomes can be achieved.

• There should be a person designated to track the evaluation and outcome portion of each pillar of the model. Without a person or group designated to this part, it is often the forgotten piece and one of the most important for the sustainability of the model. It would be ideal to have a steward whose job was the sustainability of the model.

CONCLUSION AND RECOMMENDATIONS

According to Angela Crowley (2000), Associate Professor at the Yale School of Nursing in Pediatric Nurse Practitioner Specialty Masters Program, “health and safety top the list of quality indicators for child care and strategies to improve quality in child care include meeting health and safety standards and providing additional child care staff training through the use of child care health consultants (CCHCs)” (Crowley, 2000, p. 73). The establishment and sustainability of a state-wide system of CCHCs in North Carolina, is critical for meeting the needs of the uniquely vulnerable population, children ages 0-5 in out-of-home child care settings. The period of infancy and early childhood is characterized by rapid organ development and biological immaturity, which increase this population’s risk from exposure to infectious diseases and environmental toxins and at risk for injury. Research (Kotch, 2002)
has found CCHCs to be effective in accomplishing the goals set forth for the profession: to improve the health, safety, and nutrition of children in early care and education settings.

Unlike public schools, where children are mandated to attend and school nurse services are mandated services, neither child attendance nor provision of child care health consultation services in early childhood settings (child care) are mandated. Health services in public schools have the potential of reaching nearly all families, while health consultation in child care at this time only has the potential to reach those who choose to utilize and pay for the service. These factors lead the NC Child Care Health Collaborative Group and other key state-level stakeholders to align the **North Carolina Child Care Health Consultant System Logic Model** with recommendations outlined by the National Healthy Child Care Consultant Network Support Center (2007) regarding sustainability of CCHC systems. They advise that “states increase their chances for CCHC sustainability by including as many of the following pillars as possible in their designs:

- Sustained training programs;
- Innovative funding strategies;
- Infrastructures to deploy and sustain consultants’ clear role descriptions;
- Evaluation/tracking systems;
- Linkage to state child care quality improvement efforts; and
- Marketing, outreach and education efforts” (Healthy Child Care Consultant Network Support Center, 2007, p.7).

As plans are made to move ahead with implementation of the **NC Child Care Health Consultant System Logic Model** it will be important to remember that “a logic model is a work in progress, a working draft that can be refined as the develops” (WK Kellogg
Foundation, 2004, p. 7). Strong leadership is required; leaders with an eye on the vision, ability to motivate others and a willingness to say the course. Achieving long term community goals and making system-level changes is a process that unfolds over years. Based upon a review of the literature and the responses by NC Child Care Health Collaborative Group members to interview questions, a number of recommendations emerged that could facilitate the process of implementing the NC CCHC System Logic Model.

Recommendation 1: Maintain State-Level Leadership

Leadership, at the state-level, is needed to ensure that the successful implementation of the NC CCHC System Logic Model comes to fruition. Public health leadership is a process of influencing vision for the future and directing the performance of team members towards the achievement of public health goals (i.e. core functions of public health and its essential services). This involves a process of reflection upon personal leadership strengths and weaknesses, and then leading by example. Public health leaders need the ability to share their vision and motivate others to follow. This is best done through clear and effective communication, ethical practice, as well as fostering an environment that encourages risk taking, recognition and rewards, and empowerment, thus allowing other leaders to emerge. Public health leaders must be able initiate, coordinate and direct collaborative actions within the complex system of public health.

Recommendation 2: Implementation Process

Use the logic model as a roadmap or framework to guide the work of the group and its partners. Collaborators can easily lose sight of common goals and the document can aid in providing focus as key players do the hard work of achieving outcomes. In order for the logic
model to be implemented, and not sit on a shelf or become a document developed just to meet agency requirements, a follow-up meeting to the Fall 2007/Winter 2008 meetings should be scheduled by May 2008. The NC Child Care Collaborative Group should revisit and revise the document as needed and be aware of any emerging activities, effects or system-wide trends that are unexpected and unplanned for. This would provide the perfect opportunity to add the additional “pillar” recommended by the Healthy Child Care Consultant Network Support Center: Marketing, outreach and education efforts (Healthy Child Care Consultant Network Support Center, 2007, p.7). Collaboration is heightened when partners understand and believe in the benefits of establishing a system of CCHCs. This is critical to the process and can be insured by the addition of the marketing and outreach “pillar”.

Recommendation 3: Strategic Planning in Developing Measurable Outcomes

Revise the logic model’s long-term outcome and impact statements and add specificity that will ensure that measurable results are achievable. Address each “pillar” — Workforce, Funding, Regulatory Environment, Tracking and Evaluation, and Deployment Strategies. The new “pillar” logic model, Marketing, Outreach and Education Efforts, should be developed with the same care to specificity and measurable results.

Recommendation 4: Establish Priorities and a Timeline

Establish clear priorities for implementation and start with one or two activities to address first, in order to achieve demonstrable impacts. The issue of available resources makes this critical. Implementation of the nested logic model for ensuring a qualified workforce has been initiated with two activities. The NC Child Care Health Consultation Course has been expanded and is now one of the options for a community
rotation in the baccalaureate program at the School of Nursing at Western Carolina University, replicating the community rotation in the School of Nursing at North Carolina Central University. The Head Start State Collaboration Office and East Coast Migrant Head Start Project are collaborating with the state child care nurse consultant and the NC Child Care Health and Safety Resource Center to establish and offer child care health advocacy training to their health coordinators by 2009. Priorities and timelines for continuing the implementation process should address a component from each of the other areas: funding, regulatory environment, tracking and evaluation, and deployment strategies.
REFERENCES


Kansas University (KU) Work Group for Community Health and Development. (2007). *The Community Tool Box.* Chapter 2, Section 1: Developing a Logic Model or Theory of


_Evaluation and Program Planning_, 30(1), 105-113.


APPENDICES

Appendix A - North Carolina Child Care Health Consultant System Logic Model

North Carolina Child Care Health Consultant System Logic Model

Impact: Healthy Children, Healthy Child Care, Healthy Communities

Qualified Workforce
Funding
Regulatory Environment
Tracking and Evaluation
Deployment Strategies

Modified PPT slide from Developing a Child Care Health Consultation Infrastructure, Pat Fahey, May, 2007
Healthy Child Care Health Consultant Network Support Center. Education Development Center
## Qualified Workforce

**Goal:** A renewable, steady, qualified CCHC workforce

<table>
<thead>
<tr>
<th>Resources (Inputs)</th>
<th>Activities</th>
<th>Outputs</th>
<th>Process Outcomes Short Term (5 years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>In order to accomplish our set of activities we will need the following:</td>
<td>In order to address our problem or asset we will accomplish the following activities:</td>
<td>We expect that once accomplished these activities will produce the following evidence or service delivery:</td>
<td>We expect that if accomplished those activities will lead to the following changes in 1-3 then 4-6 years:</td>
</tr>
<tr>
<td><strong>Staff, funding, materials</strong>&lt;br&gt;NC Central University (NCCU), Head Start, Western Carolina University&lt;br&gt;Identified credentialing agency</td>
<td>Determine how many CCHCs needed&lt;br&gt;Establish statewide job expectations&lt;br&gt;Determine training needs&lt;br&gt;*issues addressed in course: cultural components of care, political nature&lt;br&gt;Expand training of CCHCs (i.e. more cohorts, multiple sources of training)&lt;br&gt;Expand pool exposed to training&lt;br&gt;Determine the turnover rate/time on the job. This will help define how many CCHCs are needed.&lt;br&gt;Define: work of and the workload of a CCHC.&lt;br&gt;Define the priority areas of work for a CCHC (infant/toddlers; children with special needs, unserved or underserved areas in the state etc)</td>
<td>Public recognition of CCHC as a profession through certification/credentialed CCHCs&lt;br&gt;Career ladder or lattice for CCHCs (levels of professionals, including CCHC mentors)&lt;br&gt;Educational requirements required for CCHCs:&lt;br&gt;• specialty area or nursing degree at AA or BS level&lt;br&gt;• CCHC training&lt;br&gt;• continuing education</td>
<td>Renewable, steady, qualified CCHC workforce&lt;br&gt;Every child care facility will have access to a qualified CCHC&lt;br&gt;Sufficient number of CCHCs to meet the need&lt;br&gt;Professional registry established for CCHCs where credentials are maintained and recorded; training completed, etc.</td>
</tr>
</tbody>
</table>
## Funding

**Goal:** Steady, reliable source of funding for CCHC system

<table>
<thead>
<tr>
<th>Resources (Inputs)</th>
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</tr>
<tr>
<td>Staff, materials</td>
<td>Expand the number of child care health consultants (CCHCs) providing consultation services in NC</td>
<td>Increased number of CCHCs working in the field</td>
<td>Healthy children attending out-of-home child care in NC</td>
</tr>
<tr>
<td>Medicaid</td>
<td>Securing Medicaid funding of CCHC positions</td>
<td>Multiple sources of funding for CCHCs in place</td>
<td><em>Healthy children as defined by measurement/evaluation tool to be determined TBD</em></td>
</tr>
<tr>
<td>DHHS, DPH</td>
<td>Shift in oversight of CCHCs to Division of Public Health (DPH)</td>
<td>CCHCs overseen by DPH</td>
<td>Sustainable system of child care health consultants (CCHCs) in NC</td>
</tr>
<tr>
<td>Smart Start</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Head Start</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Funding needs to be roughed out...Who is doing this (behind the scenes)?</em></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Regulatory Environment

**Goal:** Policy change with CCHCs included in requirements

<table>
<thead>
<tr>
<th>Resources (Inputs)</th>
<th>Activities</th>
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</tr>
<tr>
<td>Staff, funding, materials</td>
<td>Identify stakeholders for buy in to CCHC system</td>
<td>Each child in out-of-home care required to obtain a yearly health assessment (base standard).</td>
<td>Healthy out-of-home care/child care</td>
</tr>
<tr>
<td>Sanitation (Env. Health)</td>
<td>Create uniform health assessment form.</td>
<td>Child care facilities required to use a uniform health assessment form and assist in collecting data (base standard)</td>
<td><em>Healthy out-of-home care/child care as defined by measurement/evaluation tool to be determined (e.g. Environmental Rating Scale) TBD</em></td>
</tr>
<tr>
<td>Office of Education Services (OES)</td>
<td>Require cc facilities to have access to CCHC services</td>
<td>Specialized training in voluntary standards required.</td>
<td></td>
</tr>
<tr>
<td>Early Intervention – DPH</td>
<td>Rule changes presented to the NC Child Care Commission</td>
<td>Consultation through qualified/credentialed CCHC required</td>
<td></td>
</tr>
<tr>
<td>Office of School Readiness (OSR)</td>
<td>Health assessment done annually</td>
<td></td>
<td></td>
</tr>
<tr>
<td>buy in Head Start/Early HS/Migrant Head Start</td>
<td>Support medication training and policy development</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Division of Child Development (DCD)/Child Care Commission</td>
<td>Support emergency preparation training and policy development</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCR&amp;Rs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NCPC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child care providers/admin</td>
<td></td>
<td></td>
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</tbody>
</table>

*The Regulatory Group has not submitted changes to this section of the logic model as of 2/15/08.*
## Tracking and Evaluation

**Goal:** Tracking and Evaluation system that provides evidence of impact of CCHC services

<table>
<thead>
<tr>
<th>Resources (Inputs)</th>
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</tr>
<tr>
<td><strong>Staff, funding, materials</strong></td>
<td>Training CCHC in tracking and evaluation</td>
<td>Accessible, user friendly data</td>
<td>Statewide, universal tracking and evaluation system</td>
</tr>
<tr>
<td>Technical capability - hardware/software</td>
<td>Development of tracking/evaluation system (definitions)</td>
<td>* CCHC level data ~ how many, what they do, # of facilities</td>
<td>Use the data to advocate for improved services or modify existing services</td>
</tr>
<tr>
<td>Human - information management, statistical, instructional technology</td>
<td>Data entry, management, analysis</td>
<td>*Center/home level -policies, star level, quality, practices</td>
<td>Use the date to attract more support for child care health consultation</td>
</tr>
<tr>
<td>Existing systems</td>
<td>Determine organization</td>
<td>*Child level -access to health care, health status/disparities</td>
<td>Use the date to expand CCHC services to all caregivers</td>
</tr>
<tr>
<td>Laptops for every CCHC (&amp; printers)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organization requiring t/e (umbrella org)</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
### Deployment Strategies

**Goal:** All children in child care have access to CCHC services.

<table>
<thead>
<tr>
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</tr>
<tr>
<td><strong>Staff, funding, materials</strong>&lt;br&gt;A agencies (OSR, Head Start, MAF, EC, Even Start), DPH, DCD, DPI, Smart Start, DSS, CCR&amp;R, Early Intervention (DPH), Military &amp; Faith Based cc&lt;br&gt;Medically Fragile/Chronic Health Care Needs Clinical Group&lt;br&gt;Tracking and evaluation tools in place&lt;br&gt;Qualified CCHC workforce in place (funding, training, tracking, scope of practice)</td>
<td>Conduct a needs assessment&lt;br&gt;• Gather data on unregulated child care/children not in care.&lt;br&gt;• Gather data on regulated care (pull numbers).&lt;br&gt;• Determine baseline of “where we are now”.&lt;br&gt;See what other states are doing (e.g. kith and kin).&lt;br&gt;Bring agencies together to develop an Interagency Memorandum of Agreement (IMOAs).&lt;br&gt;Compile info on efficacy of program to share with agencies/legislators.&lt;br&gt;Establish CCHC representation on Interagency Coordinating Committee (ICC)</td>
<td>Increased ratio of CCHCs to facilities or children.&lt;br&gt;[1: 25 (ratio of CCHCs to child care facilities) or 1: 75 (ratio of CCHCs to number of children in cc)]&lt;br&gt;System of CCHCs (i.e. supervisory, where housed, etc.)&lt;br&gt;IMOAs established, identifying who employs CCHCs, defining common job expectations, job descriptions, training&lt;br&gt;ICC includes CCHCs</td>
<td>Common job descriptions: general and RN&lt;br&gt;2 models of employment: RN working alone or RN working with a team of CCHCs&lt;br&gt;Common expectation for all models, verified by common tracking system&lt;br&gt;ICC/IMOAs&lt;br&gt;• All agencies serving children in child care are employing/accessing CCHC services for their target population.&lt;br&gt;• All agencies that contribute to CCHC engaged in the process.</td>
</tr>
</tbody>
</table>
Appendix B – Interview Questions

1. What do you see as the benefits of developing and implementing a logic model?

2. What barriers have you encountered during the development and implementation process?

3. What do you see as the benefits for using a logic model to develop a sustainable system such as the system of child care health consultants in North Carolina?

4. What barriers do you anticipate as we begin the implementation of this NC Child Care Health Consultant System Logic Model?

5. Describe your experience working with logic models.