Logic Model Use for Breast Health in Rural Communities

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Purpose/Objectives: To describe the use of a logic model methodology in the development, implementation, and evaluation of a regionally based cancer health network.

Data Sources: Published articles; online references; published reports from government, state, and private organizations; and regional breast health project results.

Data Synthesis: Through the use of the logic model, the program objectives and outcomes were identified and actualized.

Conclusions: The logic model served as a framework for developing the key components of the program: infrastructure, implementation, and sustainability. Supportive structures, such as the timeline, process evaluation, and outcome evaluation plan, enhanced the use of the logic model by adding clarity to program development and program evaluation.

Implications for Nursing: Nurses, particularly advanced practice nurses and nurse managers, play a key role in leading program development. A logic model can be used to guide program development, implementation, and evaluation. It serves as an excellent framework for developing a program that integrates service, practice, and research.

Key Points . . .

- A logic model is a systematic and visual way to present and share an understanding of the relationships among the resources necessary to operate a program, the activities needed to run a program, and the changes or outcomes to be achieved through the program.
- A logic model can provide a format for developing a comprehensive program, identifying a service need, or outlining a trajectory for related research.
- The addition of supportive structures, such as a timeline, process evaluation, and outcome evaluation plan, enhances the use of a logic model.

A logic model is a useful guide to nurses for program planning and development. Nurses, particularly advanced practice nurses (APNs) and managers, often have program planning as a component of their role. The program planning process can take on a variety of facets, ranging from conceptualization through evaluation. Although use of a logic model is not unfamiliar to community and public health practitioners, its use by nurses has been somewhat limited. The authors chose to use a logic model to guide their planning as they created a regionally based cancer health network.

Background

A logic model is a systematic and visual way to present and share an understanding of the relationships among the resources necessary to operate a program, the activities needed to run a program, and the changes or outcomes to be achieved through the program. A logic model is a conceptual map. It is useful in clearly outlining the necessary components of a program, including the relationships among the program goals, objectives, activities, and measurable outcomes. The model clearly shows how a program is structured and is an easy tool to use for communicating to stakeholders. By using a logic model, a program planner can develop the "big picture" and then systematically add specific details.

Logic models have been used widely in public health, health promotion, and educational program development. Examples include smoking cessation programs, weight loss programs, managed community health clinics, cardiovascular health promotion programs, and women's clinics (Dykeman, MacIntosh, Seaman, & Davidson, 2003; Letts & Dunal, 1995; Moyer, Verhovsek, & Wilson, 1997). One benefit of a logic model is that it easily serves as a framework for monitoring program implementation and program evaluation (Dykeman et al.). A logic model depicts the key components of a program, including desired outcomes. Therefore, evaluation can be linked directly to each aspect of the program. Other benefits of such a model include providing a format for developing a comprehensive program, identifying a service need, or outlining a trajectory for research related to either the program or service activity.

A common schemata for a logic model is depicted in Figure 1. Note that the model is displayed in a flowchart format and that the key components include

- Define the problem.
- Identify the intervention.
- State the goal.
- Outline key objectives.
- Determine desired outcomes.

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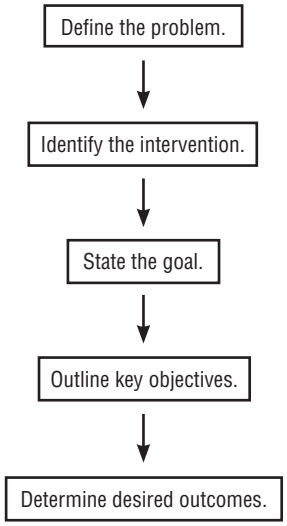

Figure 1. Schemata for a Logic Model

Logic Model Use

Three APNs, who also were nursing faculty at a large, urban, midwestern university, recognized that they all resided in rural communities that were not medically served by the urban medical center and other urban facilities. They believed that in their four-county rural area, underinsured and uninsured women were not receiving cancer screening opportunities, particularly mammograms, at the same frequency as their urban counterparts. To complicate the situation, the rural communities at the focus of the dilemma were located near an urban area but in another state. Thus, urban funding and many of the available urban resources were not accessible to out-of-state residents. This led the APNs to investigate how to better meet the cancer screening needs of the underserved rural women. To guide and structure their thinking in a purposeful manner, they chose to use a logic model (see Figure 2).

Step 1: Define the Problem

The first step was to define the problem clearly. What really was the problem? What was the basic health need? Was it limited to women? Was it limited to breast cancer? Was it limited to a geographic area? What resources needed to be assessed to help define the problem? Who were the stakeholders who should have input into the problem identification? The APNs completed a needs assessment that included a comprehensive review of public documents, interviews with community stakeholders, and a community provider assessment. Based on the assessment, the authors determined the core problem: Some rural women in their region lack knowledge about and access to malignancy screening techniques. Data from the State Department of Health and the national database for the Women's Initiative supported that malignancy screening for women in that geographic area was much lower than the national and state screening averages.

Step 2: Identify the Intervention

As the APNs reviewed the core problem, many ideas surfaced regarding how best to intervene. They determined that they needed to assess what intervention resources were available. They sought answers for many questions. What was the desired intervention? Did a "best practice" exist? What were the necessary components for an intervention? What type of and how many diagnostic facilities served the rural area? Was money available to support the intervention? Did the targeted group of women have money to pay for an intervention? Would women be interested in taking advantage of an intervention? Who were the stakeholders related to provision of an intervention? Who would provide the intervention? How would the intervention be developed so that it would continue over time? In searching for answers to these questions, the

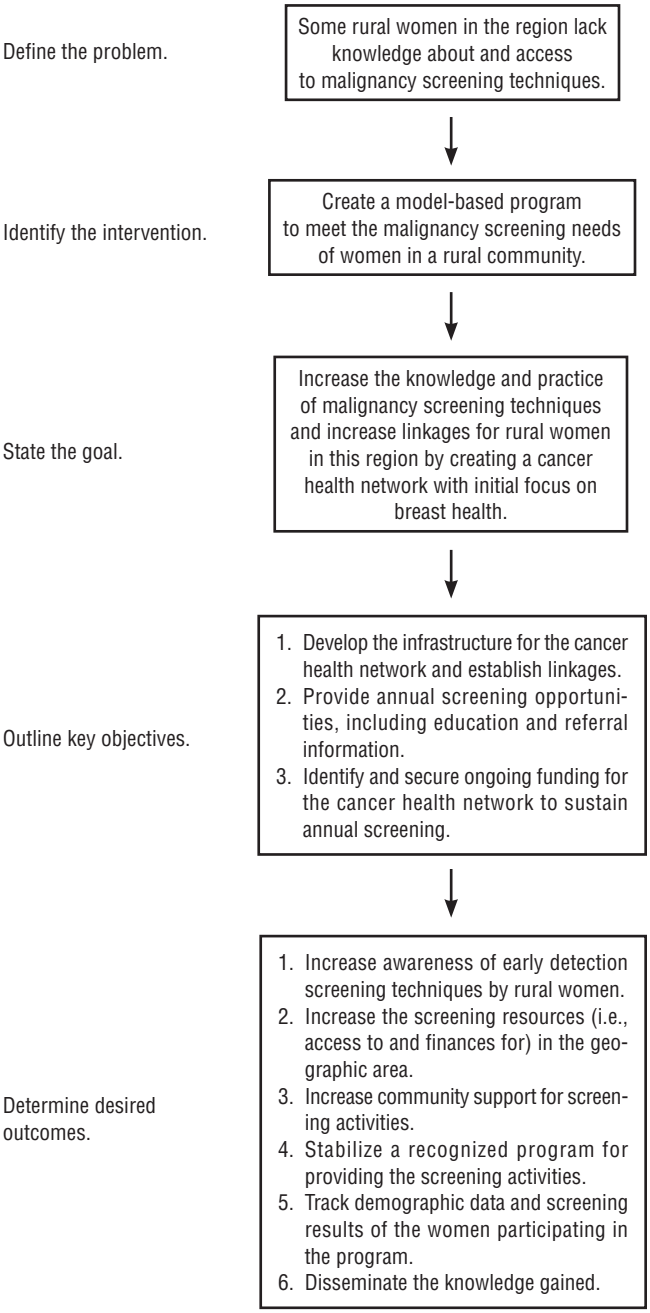

Figure 2. Schemata for a Completed Logic Model

APNs identified the intervention: to create a model-based program to meet the malignancy screening needs of women in a rural community. They recognized the need to develop a program that addressed the problem that some rural women lack knowledge about and access to malignancy screening techniques. A single activity or lone endeavor would not truly meet the needs of these women. The intervention that best fit the problem was the development of a program that would address the women's current and future malignancy screening needs.

Step 3: State the Goal

The next step in working through the logic model flow chart was to state the goal. The APNs reviewed the core problem to ensure that it was linked clearly to the stated intervention. Given both component statements (the problem and the intervention), they asked, "What is the true and actual goal?" Specifically linking each step of the logic model was crucial. By clearly assessing each link, the goal became clearer. The goal included "to" and "by" statements. The "to" referred to what the team hoped to accomplish. The "by" referred to the intervention that would be implemented. If the problem was that the women lacked knowledge and access, the goal needed to reflect that concern directly. The APNs determined that the project goal was to increase knowledge and practice of malignancy screening techniques and to increase linkages for rural women in the region by creating a cancer health network with an initial focus on breast health. The initial focus was chosen because of the prevalence rate for mammography in the region. The goal was that women would be knowledgeable about malignancy screening techniques and also practice those techniques. Initially, the project was aimed at teaching rural women breast self-examination and the need for mammography based on nationally recognized screening guidelines, then it focused on providing linkages for such services.

Step 4: Outline Key Objectives

The next step was to identify what key actions or key objectives were necessary to accomplish the goal. When possible, the number of key objectives should be limited. If the number exceeds four or five, determine whether an opportunity exists for combining objectives. In limiting the number of objectives, consider as a guideline that objectives should reflect the three program components of infrastructure, implementation, and sustainability (Health Foundation of Greater Cincinnati, 2001).

Step 4 was an appropriate time to revisit pertinent questions related to each previous step. Through a critical review of the questions and related answers, the APNs were able to articulate the key objectives of the program. The key objectives were to

- Develop the necessary infrastructure for the regional cancer health network and establish community linkages.
- Provide annual screening opportunities, including education and referral information.
- Identify and secure ongoing funding for the regional cancer health network to sustain the annual screening activities.

The APNs determined that by operationalizing each objective, the problem would be addressed, the intervention realized, and the goal met. Each step was linked directly and reflective of all other steps. The key objectives included the development of a program, the provision of a service, and the seeking of ongoing funding. The ability to clearly link the program objectives to nursing practice, nursing service, and nursing research contributed to the overall scope of the program.

Step 5: Determine Desired Outcomes

Program evaluation was planned to measure program effectiveness. Effectiveness was defined as doing the right thing for the right people at the right time. To effectively implement the program and plan for its future, the APNs developed a comprehensive evaluation plan. The desired outcomes of the program were the key components of the evaluation plan. Evaluation included an assessment of the process and the outcomes of the program (Fitzpatrick, Sanders, & Worthen, 2004). Evaluation was the critical component in identifying not only where the program had been, but also where the program needed to go in the future. The APNs reviewed the problem, the intervention, the overall goal, and each objective. Then they asked what measures had to be assessed to determine whether the program was working and how the program might work better. The following were identified as desired outcomes related to the key objectives of the program.

1. Increase awareness of early detection screening techniques by rural women.
2. Increase the screening resources (i.e., access to and finances for) in the geographic area.
3. Increase community support for screening activities.
4. Stabilize a recognized program for providing the screening activities.
5. Track demographic data and screening results of the women participating in the program.
6. Disseminate the knowledge gained.

When using a logic model, the links among the objectives and the desired outcomes should be assessed for congruence. Were the desired outcomes accomplished through addressing the key objectives of the program? Were any gaps apparent? If an outcome did not have a direct link to an objective, was another objective written or was the outcome dropped? Did the outcomes make a difference? To whom did the outcomes make a difference? Were any outcomes related to process? Were any outcomes related to impact? A critical analysis of the desired outcomes should be conducted to ensure that the outcomes provided a comprehensive foundation for evaluation, including both process and impact.

Implementing the Logic Model

As the APNs began to operationalize the logic model, they chose to prioritize the key objectives. Which objective was most important to the target group? Which objective was accomplishable with current resources? What resources were needed immediately? What was the timeline for the three objectives? A key driver for the entire project was that the APNs had received funding from a state women's health group to provide breast health education and screening to underserved women. Having received the one-time funding, the team was eager to establish a program that could be sustained. Through prioritization of the objectives, the authors determined that the underserved women in the target area first needed to receive information about breast self-examination and be offered mammography at a low cost or no cost in their communities. They also considered how communities could continue this

service. They identified that collaborating with local health department nurses could be an opportunity to provide sustainability and enlist community buy-in for the program. The APNs contacted the health department nurses in each of the counties and investigated the opportunity to collaborate. They further offered the nurses a free continuing education program about breast health, breast cancer, breast self-examination, and breast screening, plus provided free breast screening materials and equipment to each local health department as part of the collaboration agreement. The health department nurses readily agreed to collaborate and participate. The first linkage was secured.

After providing the educational program to the health department nurses and giving local health departments breast health materials, the APNs worked with the nurses to plan programs to offer a breast health program with mobile mammography opportunities to local women. In the first year, four programs were offered. One hundred and forty-one women were taught how to perform breast self-examination, and each received free or low-cost mammogram via a mobile unit brought into their communities.

During the first year, the authors gathered data regarding the call-back rate for mammography: The rate was 21%. With the national follow-up rate being 5%–10%, the APNs recognized that the screening efforts must continue, and they began work on securing grant funding for the next calendar year (Bassett et al., 1994). The APNs were aware that the objectives to provide annual screening and educational opportunities as well as to identify and secure ongoing funding to sustain the annual screening and education were not only crucial but also consistent with community need.

The authors created a list of grant opportunities with accompanying grant deadline dates. Several grants were written for future funding. Simultaneously, a breast health program calendar was developed for the upcoming year. The APNs recognized that activities needed to begin that focused on creating and maintaining linkages and establishing an infrastructure for the cancer health network. An important linkage had been made with the local health departments, but this needed to be nurtured, and additional linkages and support needed to be sought. Furthermore, the APNs needed to establish a timeline-driven structure. Such a structure would focus activity and avoid running from key objective to key objective. To sustain the program, a detailed work and service calendar needed to be developed.

Problems During Implementation

Although a review of the first year demonstrated true success, opportunities always exist for improvement. A critical review of the implementation yielded several problems that could have been avoided with better planning.

Pitfall 1: Lack of a Timeline: Even though the key objectives provided a guide for actions, a timeline was not created for undertaking the actions. The APN team identified timeframes in which they would act, but an overall work calendar was not developed until the end of the year. A work calendar that included dates for grant writing, grant submissions, breast health programs, team meetings, community planning, and all related activities would have been useful in the overall coordination and implementation of the program. In addition to an overall calendar, individual calendars specific to grants, breast health programs, and program operations may have been helpful. Such calendars (i.e., timelines) would have been beneficial in effective implementation as well as evaluation.

Pitfall 2: Lack of Identified Key Actions: Although the APN team had specifically identified the key objectives, they did not wholly outline the necessary actions to meet the objectives. Even though they identified the need to outline actions related to objectives, they determined that the time necessary to accomplish that function was not available. This was a stumbling block. As the APN team worked through the logic model, they were held back by their need to identify and agree on the best actions to be taken. Although the model was meant to be dynamic and not static, an outline of key actions was necessary for smooth implementation. Such an outline would have provided an overall team feeling of harmony rather than uncertainty.

Pitfall 3: Lack of an Overall Coordinating Process: Related to pitfall 2, during the first year of implementation, periods of time existed when the APN team asked the following questions. Where were we? Were we funded for next year? What was our infrastructure? Where and when were we providing services for the next year? Were we clicking with our linkages? On which activity were we currently focusing? Who needed to be on our team? Who actively participated on our team? How could we better delegate some of the work of our team? How were we ensuring that we were accomplishing the necessary work? How did all of this relate to our key objectives?

An effective team was a necessary component for an effective program. An effective team would have consisted of contributing players with a clear process by which to get work done. A clear vision needed to be communicated. Values needed to be shared. Ground rules needed to be set on how the team functioned. Such actions would have gone far in assisting the team to function more effectively and work in a more coordinated fashion toward the overall goals.

Pitfall 4: Lack of a Defined Infrastructure: The infrastructure was the foundation necessary to bind the program together. An entity was needed to house the program effects (e.g., files, data, correspondence, grants). This entity was a component of the program infrastructure. The team needed to identify what comprised the infrastructure and what actions had to be taken to develop the infrastructure. The APNs determined that the formation of a not-for-profit organization (501c3) was a key step in the development of an infrastructure for the cancer health network. Other key components of the infrastructure included, but were not limited to, a data repository, file space, program address, business cards, and letterhead. The lack of a defined infrastructure limited the marketing of the program and the potential for linkages throughout the healthcare and political communities.

Key Supporting Structures

To avoid potential pitfalls and other stumbling blocks during subsequent years, the APNs incorporated a number of key supporting structures into the use of the logic model. The logic model provided an excellent framework or schemata for program development, implementation, and evaluation. Adding the supporting structures strengthened the model. Examples of such supporting structures included a timeline, process evaluation, and outcome evaluation plan.

Timeline

A minimum of a monthly timeline had to be created (e.g., key activities that needed to be accomplished in January, February, etc.). Examples for a particular month included which grant(s) were to be submitted, which grant writing was to be started, which stakeholders should be visited and when, what service programs were to be performed, what reports had to be written, what abstracts were to be submitted, which presentations were to be made, and what investigations and assessments were to be started. The more specific and detailed the timeline was, the more useful. Timelines should be flexible and allow for adjustment. The timeline provided a roadmap for accomplishing the key program components in an organized fashion without losing track of incidental details.

Process Evaluation

The process evaluation served as the framework for listing actions relevant to each key objective. The key objectives provided the overall direction, whereas the actions provided the details. The process evaluation included four components specific to each key objective. The five components were (a) performance target, (b) data source, (c) method for data collection, (d) author responsible, and (e) target date. The performance targets were the actions and subactions. The data sources were the listing of documents, people, places, and resources from which the data would be collected. The method for data collection included the type of actions that would be taken to gather the data. The target date was the detailed timeline.

The process evaluation, or the list of key actions, included incorporating the cancer health network; identifying community resources that provided cancer screening activities; identifying stakeholders (e.g., politicians, churches, social clubs) for securing ongoing resources and funding; creating a database of contacts, resources, and activities; creating an information repository; establishing cancer health network brand for communications; and developing a Web site. The process evaluation also included subactions specific to each action. An example of subactions related to the key action of incorporating the cancer health network included applying for not-for-profit status 501c3, writing and adopting articles of incorporation, and establishing a board of directors and bylaws.

A listing of possible data sources related to the first key action of incorporating the cancer health network might have included the state bar association, legal aid, friends, local lawyers, the Internal Revenue Service, the state revenue service, and so on. The method of data collection included activities such as an Internet search, phone calls, person-to-person contact, and networking. The responsible person component actually listed the person in charge of completing the activity. The target date was specific to month, day, and year. By using a detailed process evaluation, the team was able to identify actions that needed to be taken to accomplish each key objective. A grid (see Table 1) was useful in outlining the process evaluation.

Outcome Evaluation

The outcome evaluation focused on the desired outcomes developed in step 5. The outcome evaluation was critical in determining the success, future path, and sustainability of the program. For each identified outcome, measurement indicators were developed. The assessment of each measurement revealed the status of the outcome. The outcome evaluation plan included the identified outcome, measurement indicator, data source or data-collection instrument, comparison or benchmark, responsible person, and target date for evaluation. The development of the outcome evaluation plan was useful in clarifying the program outcomes. In writing the evaluation plan, the team recognized that some of the initially listed outcomes were neither measurable nor key. This tool then became critical in determining which of the outcomes were related specifically to the program objectives. Each outcome needed to be linked to one or more of the key objectives. This link then was noted on the outcome evaluation plan. The grid provided in Table 2 was a useful tool in developing the plan.

Reflection: Use of the Model

The APNs periodically revisited the logic model throughout the first year to reacquaint themselves with the goal and key objectives. The logic model served as a guide for activities throughout the year. The outcomes section of the model also served as a guide for the data that were collected from each breast health program participant. Furthermore, as the team evaluated the first year of the program, the outcomes listed

Table 1. Process Evaluation Grid

Key objective: Develop the necessary infrastructure for the regional cancer healthcare network and establish community linkages.

Performance Target	Data Source	Method for Data Collection	Author Responsible	Target Date
Incorporate the cancer health network.	Bar association Legal aid Friends	Internet Person to person Telephone	Lane Martin Lane and Martin	March 20, 2003
Create an information repository.	File cabinet Correspondence Grants Annual reports	Ask Search and collect Organize Filing originals and copies	Lane Martin	June 30, 2001
Establish cancer health network brand for communications.	Brochures Letterhead	Person to person Samples of brochures Internet Computer program Graphic designer	Lane Martin Lane and Martin	April 30, 2003

Table 2. Outcome Evaluation Grid

Outcome: Increase the screening resources in the geographic area.
Related key objective: Provide annual screening opportunities, including education and referral information.

Measurement Indicator	Data Source/Instrument	Comparison	Author Responsible	Target Date
Number of screening programs scheduled	Actual dates scheduled	Number of community programs provided from other sources	Lane	November 1, 2003
Number of community agencies participating	Actual agencies committed	Number of agencies interested	Lane	November 1, 2003
Number of women participating in programs	Mammogram roster Education sign-in sheet Follow-up phone calls	Year to year	Lane and Martin	March 3, 2003 May 21, 2003 June 1, 2003

provided the basis for the review. For example, the evaluation focused on the number of programs provided, number of women served, progress of infrastructure development, number of grants written and funded, resources available for the upcoming year, and participant outcomes related to their learning and breast health.

At the conclusion of the first year of the program and the end of the first grant, the authors prepared a final report that was reflective of the logic model outcomes. The APNs developed a list of key stakeholders, including local and state politicians, healthcare providers, church and civic leaders, breast health colleagues, and others. A synopsis of the final report was made into an attractive newsletter and mailed to each stakeholder. The newsletter mailing, as well as completion of the final grant report, contributed to dissemination of the knowledge gained. Additionally, the newsletter served to stimulate additional linkages and market the program.

The logic model was most useful in outlining the program, guiding the first year, and identifying needed direction for the future of the program. It was at the heart of the program development and served as the visual schemata. The team members could take a quick glance and refresh themselves with their overall goal, objectives, and desired outcomes. The model served as a framework for focusing on and developing each of the key components of the program: infrastructure, implementation, and sustainability. The model further served as a compass to revisit for determining the future path of the program. The model was an easy and effective tool for visually and clearly communicating to stakeholders. The incorporation of supportive structures, such as the timeline, process evaluation, and outcome evaluation plan, enhanced the use of the logic model. These structures added clarity to program development and evaluation. By using the logic model and the supportive structures, the program planner developed the "big picture" and then added the specific details necessary for program success.

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