

## LOGIC MODELS IN PRIMARY CARE REFORM: NAVIGATING THE EVALUATION

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**Abstract:** Primary care is under the microscope in Canada and worldwide. Governments are spending millions of dollars on reform initiatives to see whether innovative approaches will make any difference to the quality and cost of delivering primary care. The question of where to start in planning the evaluation of a reform is a common concern. This article considers the strengths and weaknesses of logic models in helping to evaluate reforms and highlights the model for the Nova Scotia Primary Care Demonstration Project evaluation. Lessons learned from the development of a logic model for this project are also discussed.

**Résumé:** Les soins médicaux primaires sont en train d'être examinés de près au Canada et au monde entier. Les gouvernements dépensent des millions de dollars pour les initiatives réformatrices à fin de voir si les approches nouvelles feront aucune différence à la qualité et le coût de livraison des soins médicaux primaires. On se demande où commencer à planifier pour évaluer les réformes. Cet article s'adresse aux avantages et aux faiblesses des modèles logiques à évaluer des réformes et souligne le modèle pour l'évaluation du Projet de démonstration des soins médicaux primaires de la Nouvelle Écosse. Les leçons apprises du développement du modèle logique pour ce projet sont aussi traitées.

■ Reforming our health care system is a top priority for governments in Canada. There are many pressures on our system to reform, including economic restrictions on the health care system, the aging population, advances in medical and information technology, and the rise of consumer needs and demands. Through reform initiatives, people are experimenting with innovative approaches such as delivering patient care in multidisciplinary teams, trying new payment mechanisms, and using new information technologies. The challenge is how to decide whether to continue, revise, or stop a reform through evidence-based evaluations.

There have been several studies published on primary care reform evaluation in Canada and elsewhere (Gross et al., 1996; Jones, West, & Lester, 1997; Kates, Craven, Crustolo, Nikolaou, & Allen, 1997; Kukulka, Christianson, Moscovice, & DeVries, 1994; Mass & Whyte, 1997; Morais & England, 1999; Paterson & Peacock, 1995). In their review of the international literature on primary health care delivery models, Abelson and Hutchison (1994) found that evaluations of reform models varied greatly in study design, rigour, and focus. Designs included meta-analysis, randomized control trials, historical and prospective cohort studies, case studies, and impact assessments. The focus of these studies ranged from examining entire programs to individual provider preference to the effects of given interventions on service utilization and costs. They conclude that there is a paucity of evaluation literature on primary care delivery models and argue for rigorous evaluations of primary health care to inform policy decisions.

## HOW LOGIC MODELS CAN HELP TO EVALUATE REFORMS

One of the first steps in planning a sound evaluation of a reform is to develop a program logic model. These models are navigational aids to pictorially describe how a program will be implemented and what results are expected. They come in a variety of forms and have been used by evaluators over the past 35 years to guide program planning and evaluation (McLaughlin & Jordon, 1999; Suchman, 1962; Weiss, 1972; Wholey, 1983; Wholey, Hatry, & Newcomer, 1994). Increasingly they are of interest to health planners (Dwyer & Makin, 1997; Jarvis, 1997; Letts & Dunal, 1995; Mercer & Goel, 1994; Moyer, Verhovsek, & Wilson, 1997; Ogborne & Rush, 1994; Rush & Ogborne, 1991; Wong-Rieger & David, 1995) and are well-suited for planning evaluations of primary care reforms (Canadian Medical Association [CMA], 1998).

A variety of logic models can be used to describe the plans for implementation and expected outcomes of reform. There is no right or wrong way of developing a logic model, although it is preferable to use models that can be referenced to a sound source from the literature. There are many models that exist with different levels of specificity, complexity, and type of pictorial displays (CMA, 1998; Dwyer & Makin, 1997; Hatry, van Houten, Plantz, & Greenway, 1996; Jarvis, 1997; Letts & Dunal, 1995; McLaughlin & Jordan, 1999; Mercer & Goel, 1994; Moyer, Verhovsek, & Wilson, 1997; Ogborne & Rush, 1994; Wong-Reiger & David, 1995). Generally there are

two major approaches to logic model development: bottom up and top down (Ogborne & Rush, 1994). The bottom-up approach begins with considering the kind of effects you would like the reform strategy to have on participants or the health care system and then designing the program and activities around these desired results. In contrast, the top-down approach starts by selecting the reform components first and then considering how these components will lead to certain goals and effects.

There are several benefits of using logic models to help evaluate primary care reforms. If developed at an early stage of program planning, logic models can help to ensure that long-term outcomes or impacts drive program activities. These outcomes are linked through a series of mini-steps in the path to intermediate and initial outcomes, outputs, implementation objectives, and components. Knowing the path toward outcomes strengthens the validity of a program by revealing its proposed theory of change (Weiss, 1997). If some of the expected steps are not borne out by the evidence, then the evaluation can reveal where the expected sequence of steps broke down. Then the question of why things did not go as planned needs to be considered.

These models make explicit the underlying logic of reform as they link process and impact evaluation elements and show the connection between the planned reform activities and the intended changes to be seen. Making explicit what is often left implicit can help to ensure that evaluators have a clear understanding of the program and that evaluators, program planners, and other relevant stakeholders have a common view of how the program is intended to achieve its results (Wholey, Hatry, & Newcomer, 1994). This is particularly important for primary care reform pilot or demonstration projects to eliminate unrealistic claims about their intended outcomes or effectiveness (Ogborne & Rush, 1994).

Which components of a reform to track and measure is something that needs to be decided quite early in the evaluation. Through the process of developing a logic model, stakeholders are required to identify the main components to be measured and to set priorities for what effects to examine under a reform. Furthermore, a logic model can assist in determining the differences and similarities among sites. A common set of data-collection methods and instruments could be developed if sites are considering similar outcomes as described in their logic model. This can save money and time evaluating a reform.

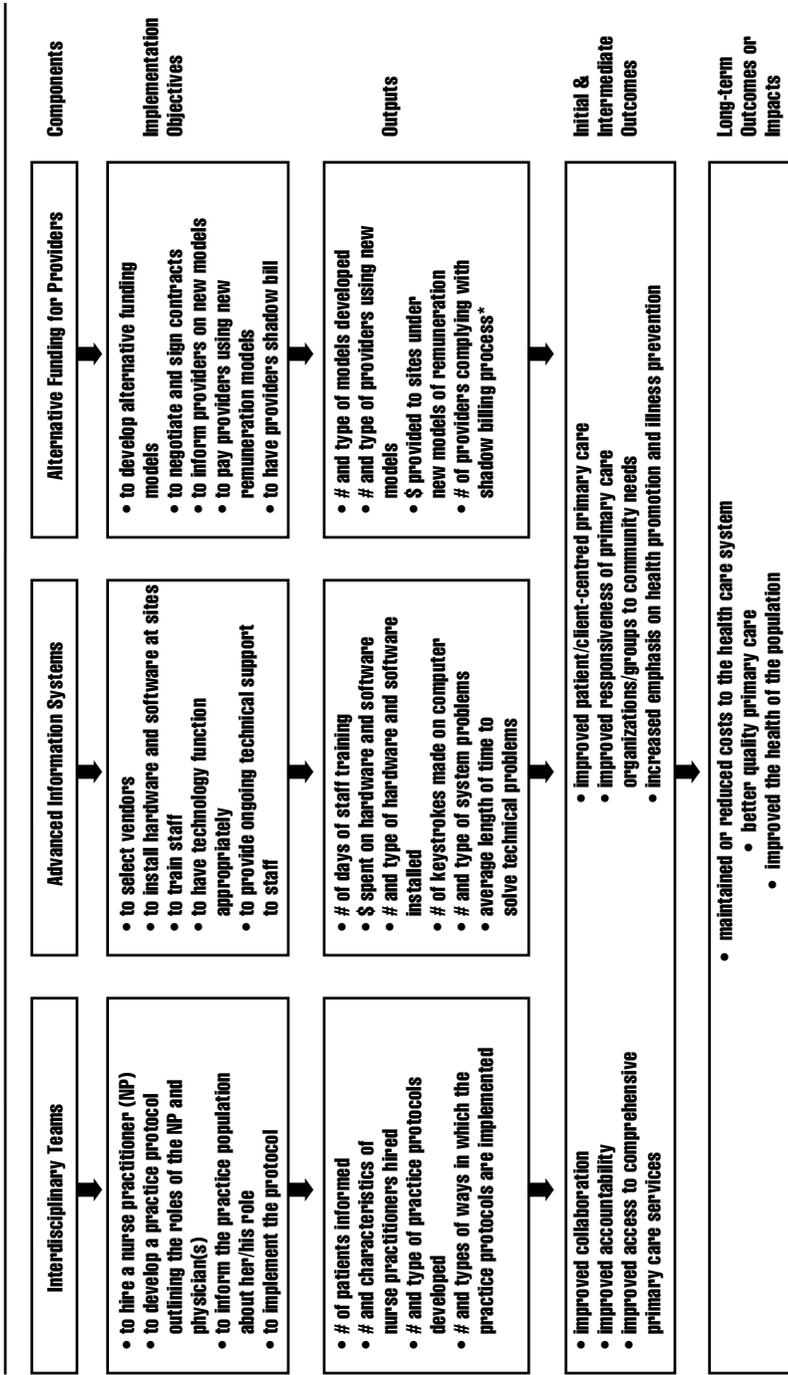
Although there are many positive aspects of logic models, there are some limitations. They require quite a bit of time and patience to develop, extending from weeks to several months of iterations if not longer. Logic models do not illustrate every aspect of a reform. For example, they are not intended to include details about costs for different components. Nor do they include information about the measurement process, including process and outcome indicators. For the most part, logic models emphasize the information contained in the boxes rather than clarifying the meaning of the arrows or the logical reasoning behind why the boxes are connected.

Finally, the question of whether logic models can or should comprehensively lay out a program's theory of change needs some discussion. Perhaps logic models are more appropriate to outline the "implementation theory" of a program rather than its "programmatic theory." According to Weiss (1997), implementation theory focuses on how a program will be carried out and tests the assumption of it reaching its desired results based on how well it matches its implementation plan. Programmatic theory examines the "mechanisms that intervene" between implementing the program and reaching its outcomes. These mechanisms are the responses or changes in participants because of the program. For example, increased early detection of breast cancers might be due to improved knowledge of self-breast examination because of an educational program. Programmatic theory is more detailed and rests on a known scientific basis or, in the case of clinical programs, clinical experience about, for example, the influence of client characteristics on the response to an intervention (Sidani & Braden, 1998). However, in the government policy world where programs are developed based on a combination of scientific knowledge, public opinion, and world trends, it is far more feasible to develop logic models to address implementation theory than programmatic theory.

#### THE LOGIC MODEL FOR THE NOVA SCOTIA PRIMARY CARE DEMONSTRATION PROJECT

The Nova Scotia Department of Health received funding from Canada's Health Transition Fund to implement a demonstration project exploring different ways of delivering, managing, and funding primary care (Nova Scotia Department of Health, 1999a). Four sites were selected throughout the province, with one site per health region and a mix of rural and urban areas. The logic model for the overall demonstration project is shown in Figure 1. The structure

**Figure 1**  
**Logic Model for the Nova Scotia Primary Care Demonstration Project**



\* assumes that the shadow billing process is assessed to be accurate

for this model is based on the work of Hatry, van Houten, Plantz, and Greenway (1996) and Ogborne and Rush (1994). The three main implementation components, interdisciplinary teams, advanced information systems, and alternative funding for providers, were initially conceived through consultation with communities in Nova Scotia (Nova Scotia Department of Health, 1999b), past government reports (Nova Scotia Department of Health, 1996, 1999c), and a workshop with key stakeholders in primary care reform and evaluation from across Canada (Nova Scotia Department of Health, 1997). These components were approved by the project steering committee.

The evaluation working group took the first stab at developing the implementation objectives, outputs, and outcomes. This occurred over several meetings in which the group was divided into three subgroups, each dealing with one implementation component. Subgroups brainstormed the initial, intermediate, and long-term outcomes along with implementation objectives and outputs. Refinements were made by senior project management team members including the chairs of the information systems, funding, and evaluation working groups and individuals leading the collaborative practice component. The next logical progression was the development of a series of measurement grids stemming from the logic model itself. An example from the impact evaluation matrix is seen in Figure 2 and outlines the outcomes, objectives, and evaluation questions, indicators or measurements, data collection methods/design/sample, and comments. The process and impact evaluation matrices went through several review iterations by a variety of stakeholders including the evaluation working group and the demonstration-site participants.

## LESSONS LEARNED

- 1) Before developing a reform logic model, program planners need to define and articulate what is to be implemented, including the goals and objectives.

In Nova Scotia, clarity about the goals and objectives of the demonstration was achieved through several methods. Meetings were held very early in the project with the project steering committee to define the main components of the demonstration and to decide whether, in fact, all sites needed to implement all three components at once. These discussions were challenging at times particularly since there was no “common view” on whether a nurse practitioner needed to be introduced at every site. In the interest of following

**Figure 2**  
**Impact Evaluation Matrix**

Outcomes, Objectives, and Evaluation Questions	Indicators or Measurements	Data Collection Methods/Design/Sample	Comments
<b>Outcome 1.0 To Improve Collaboration (C)</b>			
<b>Objective 1.1 Facilitating collaborative practice</b>			
C1. Did an interdisciplinary team that practised collaboratively provide primary care services? What health professions provided services at the site to support the interdisciplinary team?	<ul style="list-style-type: none"> <li>• type and amount of services provided by provider</li> <li>• describe mechanisms for supporting collaboration between providers (e.g., case conferencing, joint assessment, casual contact, formal consultation)</li> <li>• provider perception of shared decision making</li> <li>• formal statements (e.g., mission, collaborative practice statement)</li> <li>• describe method of selecting most appropriate care providers, practice agreement, definition of care provided by provider type</li> </ul>	<ul style="list-style-type: none"> <li>• site Electronic Medical Record (EMR) data</li> <li>• scheduler (Info Systems reports on provider work activities and time spent)</li> <li>• focus groups at each site with providers (e.g., physicians, nurses, and nurse practitioners)</li> <li>• interviews with providers at sites</li> <li>• focus groups at each site with providers (e.g. physicians, nurses, and nurse practitioners)</li> <li>• file reviews of site</li> <li>• interviews with providers at sites</li> <li>• focus groups at each site with providers (e.g., physicians, nurses, and nurse practitioners)</li> </ul>	<ul style="list-style-type: none"> <li>• also addressed by the process evaluation which considers activities of providers, number and type of providers, turnover</li> <li>• for patient preferences see results of patient survey</li> </ul>
<b>Objective 1.2 Shared decision making</b>			
C2. Did the site promote a climate of respect, trust, and support for shared decision making?			
<b>Objective 1.3 Appropriate provider</b>			
C3. Were decisions regarding the most appropriate provider to deliver the most service made within the context of patient preference, provider competence, and other considerations?			

government policies and having consistency in the way the demonstration was implemented, a consensus was reached on implementing the same components at all four sites.

Also early in the project, Department of Health staff developed, refined, and redefined the overall goals and objectives of the project, which helped to shape the project outcomes. These were very productive sessions leading to clarification on uncertain points. For example, there were discussions about whether one of the main project components included multidisciplinary or interdisciplinary teams. The multidisciplinary team consisted of a broader set of professionals, whereas the interdisciplinary team focussed on the relationship between the physician(s) and the nurse practitioner(s). In the end, it was decided to focus on interdisciplinary teams because of the priority need to understand the relationship of that dyad while also considering, to a lesser degree, other professionals who interact with that team.

- 2) There are other ways to develop reform logic models, not just bottom up or top down.

We applied neither a top-down nor a bottom-up approach to develop the Nova Scotia logic model. Rather, we used a “mixed approach” in which elements of the logic model were developed in parallel. The implementation objectives, outputs, and project outcomes were developed by the evaluation working group based on proposed, yet hypothetical, implementation components. Decisions about what to implement were made simultaneously by the project steering committee. This method of constructing a logic model was not seen in the literature. The real challenge was to ensure that decisions and information flowed rapidly and freely to and from each committee or group so that any needed adjustments to the overall logic model could be made. Fortunately the proposed components ended up being selected for implementation.

- 3) A reform logic model is likely to change over time.

It is likely that a reform logic model will change over time as the model is implemented in the field. In fact, in Nova Scotia, there is now justification for developing separate models for each site, so that they can be portrayed accurately. For example, two of the sites will not be changing their system of physician remuneration because

they are already on alternative fee-for-service payments. Consequently, these sites' implementation objectives and outputs for the alternative funding for providers component will need to be revised to reflect the lack of change in this area. At another site, the nurse practitioner will work in the physician's office 60% of the time and will be off-site out in the community 40% of the time. The implementation objectives and outputs for this site will likely differ from sites where the nurse practitioner is stationed in the office 100% of the time. Variations to the overall logic model such as these were anticipated from the beginning of the project and viewed by the project steering committee and evaluation working group as vital to representing the individual perspectives of each participating community site.

## CONCLUSIONS

Primary care reform planners no doubt have a rationale for their program, but the logic behind what they intend to do may be implicit. Taking the time to organize and diagrammatically integrate information about program activities and desired results will prove useful when planning reform evaluation. In the future, it may be possible to use logic models to set out a framework to help make broad comparisons of similarities and differences among reform sites across Canada.

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