

## USING A LOGIC MODEL TO FOCUS HEALTH SERVICES ON POPULATION HEALTH GOALS

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**Abstract:** This article describes an application of program logic models to help regional health authorities focus attention and efforts on health outcome goals in British Columbia. The article emphasizes the value of graphic modeling techniques such as logic models in identifying the presumed contribution to regional health status of health services and other health determinants. It argues that logic models facilitate overall governance of health care services by creating performance-monitoring frameworks for both short-term and long-term outcome objectives.

**Résumé:** Ce rapport décrit une application de modèles logiques pour aider les autorités de la santé régionale à concentrer leurs efforts pour atteindre les buts en termes de résultats de santé en Colombie Britannique. La valeur des techniques de modélisation graphique tels que les modèles logiques pour identifier la contribution présumée des services de santé et d'autres déterminants de santé vis-à-vis le statut de la santé de la population régionale est soulignée. On propose que ces modèles aident les dirigeants des services de santé en développant un encadrement du rendement pour les résultats à court et à long terme.

■ There is a tendency in health service systems to lose sight of ultimate outcome goals and to become preoccupied with short-term outcomes, outputs, processes, or inputs. Even when the focus is on outcomes, those outcomes tend to be short term rather than involving the purposes for which the health system exists. Governors, administrators, and providers in the health care system tend to direct their attention to the things they can control, achieve, and measure.

Population health goals are not exclusively controlled or achieved by health services per se. The health of the population is also affected by genetic, social, economic, and environmental determinants (Mustard & Frank, 1994). Health services interact with these other factors in very complicated ways and, further, the ultimate outcomes often lag far behind the health intervention. Consequently, population health outcomes are frequently not considered in the ongoing governance, management, and delivery of service. This disjunction between the purposes of a health system and the objectives to which it is actually managed has been referred to as “mission creep” and “outcome displacement” (Dyal, 1990).

Insufficient attention to long-term population health outcomes at every level in the health system, from point-of-service to governance, attenuates accountability and manageability of health care services. Examples include focusing on detection of high blood pressure through community screening programs while not attending to the incidence of heart disease and stroke in the general population, focusing on the successful completion of alcohol and drug counselling episodes while not attending to the reduction of auto accidents due to impaired driving; and focusing on reaching high school students with a tobacco warning while not attending to morbidity and mortality due to tobacco use. In these examples of outcome displacement, health care programs become entrenched, rather than being subjected to a strategic planning and performance review process in the light of their logical relationship to achievement of population health goals. In each case, there are programs in operation that do not serve the population health purpose for which they are created and funded.

## THE TOPIC

As British Columbia began to regionalize, an opportunity to increase attention to population health outcomes was created. We developed a document entitled *Framework for Regional Outcome Monitoring and Reporting* for the Province of British Columbia, in which our primary purpose was to keep the whole system, particularly regional health authorities, focused on the long-term population health outcomes that provincially funded health services were designed to address. (This was not intended to supplant or preclude other evaluation, such as short-term agency outcome assessment, quality assurance, or utilization review/management.) In this article we describe our use of a logic model to assist governance structures to establish and maintain a focus on population health outcomes.

## THEORETICAL FORMULATION/FUNCTIONS OF LOGIC MODELS

Logic models serve three functions: effective communication, clarification of logical connections, and identification of performance measures.

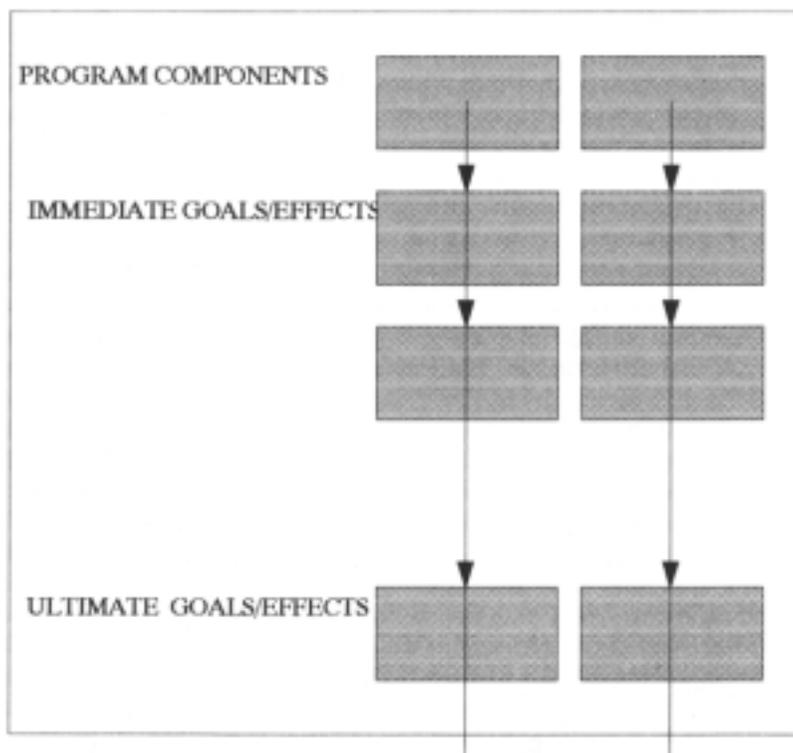
*Communication.* How can we systematically convey the complicated relationships among services and other causative factors, and how can we keep the whole health care system committed to the ultimate population health status outcome goals? We believe that graphic modeling tools, such as logic models, help establish and maintain commitment to population health outcomes despite the distraction of other causative factors and significant time lags between service and ultimate outcome. Certainly in the absence of such tools, we experienced limited success in getting beyond input, process, output, and short-term outcome goals (and rarely even the latter).

Graphical techniques and logic models are useful for *reducing* an overwhelming body of information to the critical bits of information necessary for a particular purpose. Logic models emphasize a critical path, more (e.g., Rush & Ogborne, 1991) or less (e.g., Wholey, 1983) inclusively. Rush and Ogborne set out good reasons for choosing a more inclusive logic model: evaluators find proxy measures, administrators monitor program delivery, and program managers use the more inclusive logic model as a guide for improving program design, and for performance reviews. The richness of the more inclusive logic model, however, is not required in system-wide applications. Wholey reduces the amount of information further in order to facilitate the work of governance. Governance makes a valuable contribution by focusing on the big picture (and becomes less useful when it becomes preoccupied with administrative and operational matters).

For the purpose of focusing the attention of governors, for example, regional health authorities, on the ultimate population health outcomes, we chose the less inclusive model (see Figure 1). In our application, the model identifies health services intended to lead to the attainment of immediate service outcomes objectives and then to the attainment of ultimate population health outcomes goals. Outputs and inputs are intentionally minimized in this window, although still very much in the view of administrators and providers.

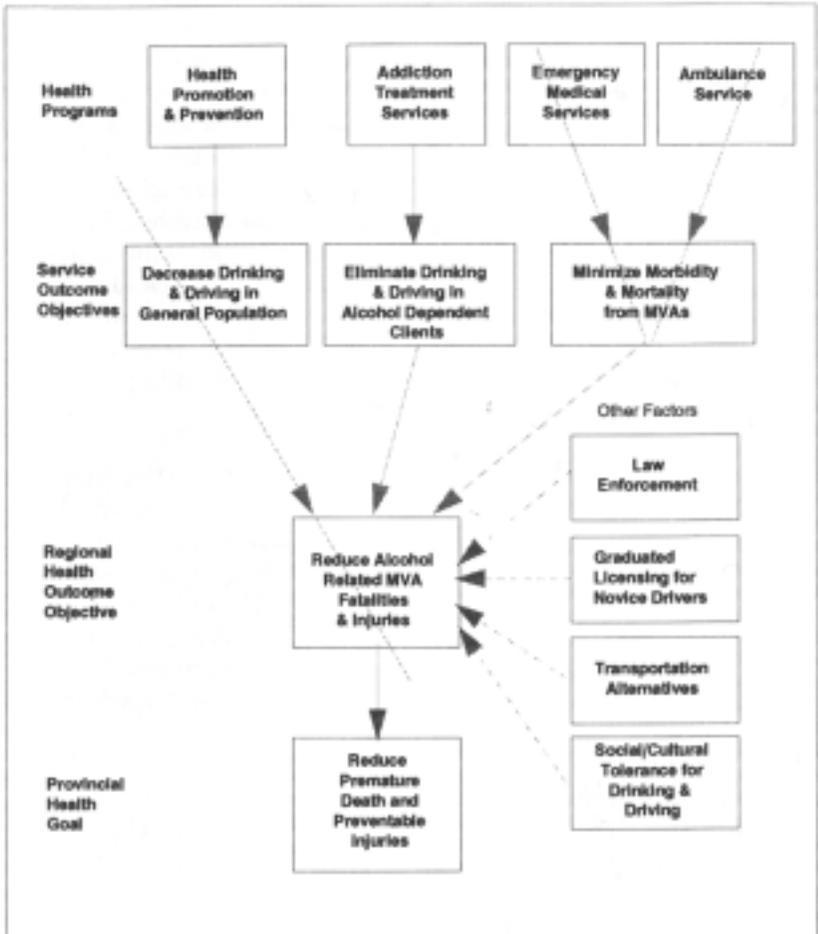
A concrete example of our use of Wholey's logic model is shown in Figure 2. Outcomes of several health services (cessation of drinking

**Figure 1**  
**Basic Structure of Wholey's Program Model for Evaluability Assessment**



and driving among enrolled clients of treatment services) achieves (in combination with law enforcement and transportation alternatives) the regional population health objective (*reduced fatalities due to drinking and driving*), which ultimately achieves the provincial population health objective (*reduction of premature deaths and preventable injuries*). Thus, all participants in the health system using this model keep one eye on their own immediate achievements and the other eye on the ultimate goals; the regional health authorities keep both eyes on the overall goals. In addition to health service interventions, we depict the influence of other factors, thus reflecting the multiple determinants of this particular health outcome. Inclusion of other causative factors also serves to identify possible partnerships with other sectors to achieve better health outcomes. Again, this larger-than-health services view is crucial to the role of system governors.

**Figure 2**  
**Logic Model for Reducing Alcohol-Related Motor Vehicle Accident Injuries and Deaths**



Ultimate health goals vary from region to region but are related through a province-wide framework. A series of broad provincial health outcome goals have been established to guide efforts of the regional health authorities (Office of the Provincial Health Officer, 1996). The broadly framed provincial health goals establish what is important, but the regional goals are stated as specific, measurable population health outcome objectives of particular importance in that region. Hence, the objective to reduce alcohol-related motor vehicle

accident fatalities and injuries may be derived from the provincial health goal to reduce premature death, preventable injury, and illness in a health region where alcohol-related traffic accidents are high. Other examples exist for regions with high rates of low-birthweight infants, suicides, sexually transmitted diseases, and seniors with hip fractures.

*Clarifying logical connections.* The utility of the logic model begins with planning. Regional health authorities must look at the relationship between outcomes of services with known efficacy and the population health status of the region. Through this process, regional health authorities may determine whether each service under their jurisdiction makes sense in relation to the broader regional health goals. As the same time, the authorities identify potential contributing factors outside of the health services arena. Then they may reasonably plan changes in population health status through health services, considered in relation to the other, specified causative factors.

The use of “known efficacy” is very important (but frequently overlooked) in planning. Despite the lack of efficacy information on some health services (Mosteller, 1993), a considerable body of scientific literature is now amassing on the efficacy of many other procedures and practices (e.g., Bunker, Frazier, & Mosteller, 1994; Miller & Hester, 1995). Planners should use the efficacy literature to choose programs that are evidence based. The logic model draws the attention of regional health authorities to the question whether program components are efficacious.

Assessing whether an efficacious service has been effective in achieving the population health goal requires population health status data applied in a suitable analytic framework. That brings us back to the use of the logic model in evaluation.

*Identifying performance measures.* Logic models assist by imposing logical constraints on the desired outcomes, and thereby helping to select appropriate measures for performance reviews. Fortunately, collecting and reporting population health status data is quite straightforward in most provinces. A relatively simple logic model that puts forth generic population health status as its goals, and easily available measures, provide health system governors with a doable task and an opportunity to make meaningful contributions to health care systems.

## CONCLUSION

Simple schematics such as logic models that depict relevant health services, immediate service outcomes, long-term impacts on population health, and related health determinants have proven helpful to us in building a consensual framework for planning and evaluating the whole health system at the macro level. These schematics enhance accountability efforts by identifying outcomes that will serve as performance indicators for the spectrum of activities designed to improve population health. Regional health authorities in British Columbia have been encouraged to construct logic models for each major regional health outcome objective (British Columbia Ministry of Health, 1996) in order to ensure that these objectives contribute to the ultimate population health goals of the provincial system.

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