



Centre for
HEALTH SERVICES AND POLICY RESEARCH

A Results-Based Logic Model for Primary Health Care

Laying an
Evidence-Based
Foundation to
Guide Performance
Measurement,
Monitoring and
Evaluation

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Table of Contents

ABOUT CHSPR

ACKNOWLEDGEMENTS

EXECUTIVE SUMMARY i

INTRODUCTION 1

Treasury Board Approach to Designing Results-Based Logic Models 2

Efficiency and effectiveness of the PHC sector 3

METHODS 5

Defining PHC 5

Terminology 5

Policy analysis and literature review 5

Stakeholder consultations 5

RESULTS-BASED LOGIC MODEL FOR PHC 7

PHC Contexts 7

Population characteristics and public participation 7

Contextual factors 7

PHC Inputs 8

Fiscal resources 8

Material resources 8

Health human resources 8

PHC Activities 8

Policy- and governance-level activities and decisions 8

Health care management-level activities and decisions 9

Clinical-level activities and decisions 10

PHC Outputs 10

PHC Outputs — Type and Volume 10

PHC Outputs — Qualities 10

PHC Immediate Outcomes 12

Increased knowledge about health and health care among the population	12
Reduced risk, duration and effects of acute and episodic health conditions	12
Reduced risk and effects of continuing health conditions	12
Maintain or improve the work life of the PHC workforce	12
PHC Intermediate Outcomes	13
Appropriateness of place and provider	13
Health care system efficiency	13
Health care system equity	14
Acceptability	14
PHC Final Outcomes	14
Sustainable health care system	14
Improve or maintain functioning, resilience and health for individuals (including wellness and longevity)	14
Improved level and distribution of population health and wellness	15
PHC Results-based Logic Chain	15
Contexts, inputs and activities	15
Outputs and outcomes	16
 USING THE LOGIC MODEL TO PLAN, MONITOR, EVALUATE AND REPORT ON PHC RENEWAL STRATEGIES	 17
 DISCUSSION	 19
 REFERENCES	 21



About CHSPR

The Centre for Health Services and Policy Research (CHSPR) is an independent research centre based at the University of British Columbia. CHSPR's mission is to stimulate scientific enquiry into issues of health in population groups, and ways in which health services can best be organized, funded and delivered. Our researchers carry out a diverse program of applied health services and population health research under this agenda.

CHSPR aims to contribute to the improvement of population health by ensuring our research is relevant to contemporary health policy concerns and by working closely with decision makers to actively translate research findings into policy options. Our researchers are active participants in many policy-making forums and provide advice and assistance to both government and non-government organizations in British Columbia (BC), Canada and abroad.

CHSPR receives core funding from the BC Ministry of Health Services to support research with a direct role in informing policy decision-making and evaluating health reform, and to enable the ongoing development of the BC Linked Health Database. Our researchers are also funded by competitive external grants from provincial, national and international funding agencies.

Much of CHSPR's research is made possible through the BC Linked Health Database, a valuable resource of data relating to the encounters of BC residents with various health care and other systems in the province. These data are used in an anonymized form for applied health services and population health research deemed to be in the public interest.

CHSPR has developed strict policies and procedures to protect the confidentiality and security of these data holdings and fully complies with all legislative acts governing the protection and use of sensitive information. CHSPR has over 30 years of experience in handling data from the BC Ministry of Health and other professional bodies, and acts as the access point for researchers wishing to use these data for research in the public interest.

For more information about CHSPR, please visit www.chspr.ubc.ca.

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Members of British Columbia's primary health care evaluation working group provided expert feedback on numerous drafts of this logic model. Many other academics have influenced the conceptual foundation of the logic model and their work is referenced throughout this report. Barbara Starfield is acknowledged for the tremendous influence she has had on our understanding of and vision for primary health care.

Between 2003 and 2004, we made presentations to roughly 250 primary health care stakeholders at meetings hosted by the Interior Health Authority, Northern Health Authority, Vancouver Coastal Health Authority, Vancouver Island Health Authority and the Ministry of Health Services in British Columbia. In January 2004, a draft version of the logic model was presented to the Federal/Provincial/Territorial Advisory Group on the Primary Health Care Transition Fund. In May 2004, a draft version was presented to approximately 350 people who attended the National Primary Health Care Conference in Winnipeg, Manitoba.

These presentations were participatory to allow an array of stakeholders the opportunity to voice assumptions and expectations of primary health care and renewal efforts, to test the robustness and validity of the logic model in describing the activities and intended outcomes of various reform strategies, and to create a shared understanding of expectations of this health services sector. We thank the many people who provided us with valuable feedback during and after these events, particularly Ted Bruce (British Columbia), Trevor Hancock (British Columbia), Jan Horton (Yukon), Robert James (Manitoba), Betty Newson (Prince Edward Island) and Marc Pelletier (British Columbia).

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All analysis and interpretation, and any errors, are the sole responsibility of the authors.



Executive Summary

Primary health care (PHC) is the foundation of Canada's health care system. For most people, PHC is their first point of contact with the health care system, often through a family physician. It is where short-term health issues are resolved and the majority of chronic health conditions are managed. It is also where health promotion and education efforts are undertaken, and where patients in need of more specialized services are connected with secondary care.

The last few years have seen increasing concern about access to and the quality of PHC in Canada. When asked to deliberate about the various options to sustain their health care system, many Canadians suggest reform to PHC.

People are ready for new models of service delivery that will improve or sustain the level of care already provided.

Between 1997 and 2008, substantial federal and provincial investments are dedicated to improving the delivery of PHC in Canada. All of these financial investments have, to varying degrees, required evaluation to ensure that the policy, administrative and practice community monitor, guide and report on PHC renewal.

Yet, despite these investments, a common performance measurement and evaluation framework for understanding the PHC system, and the impact of renewal efforts, is lacking. In response, we have developed a results-based logic model for PHC using the Treasury Board of Canada results-based management accountability framework (RMAF), policy analysis, research evidence, and broad consultation.

The Treasury Board approach focuses on implementing performance measurement to guide quality improvement and public reporting. The first step in this process is the creation of a logic model. Results-based logic models linearly link resource inputs to activities performed, services delivered, and outcomes achieved. In doing so, they identify the domains requiring monitoring, evaluation and reporting. The results-based logic model for PHC described in this report is intended to reflect the aims and functions of the PHC system in Canada by describing the

chain of inputs, activities, outputs, and expected outcomes of this sector, and the contexts that influence PHC services.

PHC inputs include fiscal, material and human resources. PHC activities are the work processes intended to produce specific outputs (e.g. products and services), and are the primary link in the chain through which outcomes are achieved. PHC activities are categorized into three types: policy/governance, health care management and clinical. Together these elements form the structure or foundation of a PHC system.

PHC outputs are direct products or services delivered as a result of PHC activities. PHC services include health promotion and disease prevention, and curative, rehabilitative, palliative and supportive services to targeted individuals or populations. These outputs can also be described in terms of responsiveness (e.g. whether they are timely, culturally appropriate and convenient), as well as the degree to which they are patient-focused, effective, comprehensive, continuous, coordinated and community-oriented.

PHC outcomes can be immediate, intermediate or final. Collectively, PHC outcomes represent “results for Canadians.” Immediate outcomes are those most attributable to outputs, and for which the PHC workforce of policy-makers, administrators and practitioners can reasonably assume control, responsibility and accountability. Three immediate outcomes are, for the most part, unique to PHC—increased knowledge about health and health care among the population; reduced risk, duration and effects of acute and episodic conditions; and, reduced risk and effects of continuing health conditions. A fourth immediate outcome is the maintenance or improvement of the work life of the PHC workforce.

Intermediate outcomes include areas in which PHC stakeholders have a lesser degree of control, but for which PHC services are still expected to have an impact. These outcomes include appropriateness of provider and place; health care system efficiency; acceptability or satisfaction;

and health care system equity. Final outcomes include a sustainable and accountable health care system; improvement and/or maintenance of function, resilience and health for individuals; and improved population-level health and wellness. It is recognized that external forces (social, cultural, legal/regulatory, physical and economic contexts, as well as population characteristics and participation in PHC) influence inputs, activities, outputs and outcomes.

In accordance with the Treasury Board of Canada approach, the efficiency of the PHC system is seen as a function of inputs, activities and outputs. By comparison, effectiveness of the PHC system is a function of outputs and outcomes. Since external factors affect immediate, intermediate and final outcomes, sophisticated analyses are required to attribute health and health system outcomes to PHC.

This logic model should focus and unify evaluative efforts by enabling diverse stakeholders to work from a shared conceptual foundation (and lexicon) of the main inputs, activities, outputs and outcomes of the PHC sector. Moreover, it establishes a common theory about the logic links among these different dimensions, and a shared set of assumptions about these dependencies. It defines the areas in which information, evaluation and evidence are needed for policy, administrative and practice communities to plan, implement and report on PHC renewal.

This logic model for PHC illuminates the array of activities that are potential levers for change; recognizes the unique and distinguishing features of PHC and outcomes attributable to this sector; and identifies the way in which PHC and other health sectors converge to affect health system-level performance and the health of the population. It also

helps identify the potential trade-offs that various renewal efforts may have. It has been designed to be useful to PHC policy-makers, planners, managers, evaluators and practitioners as they plan and monitor system renewal efforts, report on achievements, and account for results.

For a logic model to be useful, it must be designed in consultation with stakeholders (eventual users), and robust enough to enable use for a broad range of purposes. To date, approximately 650 researchers, policy-makers, administrators and health care providers have been involved in developing and/or providing feedback to the logic model described here. In 2004/05, we will be conducting broad consultations with members of the public to identify the features and outcomes of PHC that are important to them. We will also participate in a range of evaluative activities guided by this logic model, which will contribute to efforts to validate and improve it. Over time we expect to publish findings about the robustness of this logic model for planning, implementing and evaluating PHC renewal.



Introduction

Primary health care (PHC) is the foundation of Canada's health care system. For most people, PHC is their first point of contact with the health care system, often through a family physician. It is where short-term health issues are resolved and the majority of chronic health conditions are managed. It is also where health promotion and education efforts are undertaken, and where patients in need of more specialized services are connected with secondary care. Dietitians, nurses, occupational therapists, physiotherapists, pharmacists, psychologists, social workers and other health care workers also deliver PHC services.

Over the last decade, there has been a significant focus on transforming the delivery of PHC in Canada and abroad. Recent evidence suggests that a strong PHC system improves health and reduces inequities in health across populations,^{1,2} and may also contribute more to the health of the population than specialized health services.^{3,4} A strong PHC system is needed to address the challenges of an aging population, and to meet the needs of the increasing proportion of people who experience chronic disease, complex co-morbidity, and/or functional disability.

But there is growing concern about access to and the quality of PHC in Canada. While most Canadians (86%) have a family physician, some (16%) report difficulty accessing first contact care, and others (13%) accessing routine care.⁵ Roughly half of Canadians are satisfied with access to care in the community (48%) and the timeliness of access (43%).⁶ Over time, Canadians have increasingly become concerned about quality of care. Access and quality are now viewed as equally important by Canadians.⁷ When asked to deliberate about the various options to sustain their health care system, Canadians suggested reforms to PHC.⁸

Between 1997 and 2008, substantial federal investments are dedicated to improving the delivery of PHC in Canada. The Health Transition Fund (HTF), PHC Transition Fund (PHCTF), and First Ministers' Accord on Health Care Renewal (FMA) all include financial commitments to support PHC projects designed to inform (HTF), catalyze

(PHCTF), and sustain (FMA) renewal efforts. All of these financial investments have, to varying degrees, required evaluation.

Yet despite these investments, there has been no specific aim to develop a common performance measurement and evaluation framework for understanding the overall PHC sector, and the impact of renewal efforts. A common framework affords stakeholders the opportunity to more clearly consider and communicate expected associations and links between goals/objectives, alternative courses of action, and the attainment of results. It defines the areas in which information, evaluation and evidence are needed for policy, administrative and practice communities to plan, monitor, guide and report on PHC renewal.

In recognition of the potential benefits of common evaluation frameworks, the Treasury Board of Canada requires government departments, agencies, and programs to use a results-based management accountability framework (RMAF) for quality improvement and reporting purposes. The RMAF approach is a multi-stage process that begins with the creation of a results-based logic model that links resources expended to activities performed, services delivered, and outcomes achieved.

In May 2003, the Auditor General of British Columbia reviewed performance agreements between the British Columbia Ministry of Health Services and health authorities and recommended that these parties "consider using logic models as part of the process of selecting measures of outcomes for the British Columbia health care system."⁹ Moreover, the Auditor General endorsed the use of the RMAF approach to designing logic models.

The purposes of this report are to: describe a results-based logic model for PHC developed using the Treasury Board of Canada framework, policy analysis, research evidence, and broad consultation; and, illustrate how it can be used to inform the implementation and evaluation of PHC renewal.

The results-based logic model described in this report is intended to reflect the aims and functions of the PHC system in Canada by describing the chain of inputs, activities, outputs, and expected outcomes of this sector. It should focus and unify implementation and evaluative efforts by enabling diverse stakeholders to work from a shared conceptual foundation (and lexicon) of the main inputs, activities, outputs and outcomes of this sector. It will lay the foundation for the development of performance indicators and PHC information systems, as well as evaluative and reporting agendas. In essence, it has been designed to be useful to policy-makers, planners, managers, evaluators and practitioners as they plan and monitor PHC system renewal efforts, report on achievements, and account for results.

Treasury Board Approach to Designing Results-Based Logic Models

In 2000, the Treasury Board of Canada developed a “modern management agenda” that is outlined in *Results for Canadians: A Management Framework for the Government of Canada*.¹⁰ In articulating expectations about the way departments and agencies manage and deliver publicly funded programs and services, this agenda “recognize[s] that the federal government exists to serve Canadians and that a ‘citizen focus’ must therefore be built into all government activities programs and services.”¹⁰ Another key element of this agenda is a focus on the achievement of results for Canadians. A results-based approach that can distinguish program strengths and weaknesses is put forward as key to establishing “a more productive cycle of planning, measuring, evaluating and reporting of results to citizens.”¹⁰

The RMAF approach was established by the Treasury Board to assist in achieving some of the changes envisioned in *Results for Canadians*. It focuses on measuring and reporting on outcomes throughout the life cycle of a policy, program or initiative, and more specifically, is intended to help stakeholders:

- describe clear roles and responsibilities for the main partners involved in delivering the policy, program or initiative ... ;
- ensure clear and logical design that ties resources to expected outcomes ... ;
- determine appropriate performance measures and a sound performance measurement strategy that allows managers to track progress, measure outcomes, support subsequent evaluation work, learn and, make adjustments to improve on an ongoing basis;
- set out any evaluation work that is expected to be done over the lifecycle of a policy, program or initiative; and
- ensure adequate reporting on outcomes.¹¹

The design and use of a RMAF is intended to guide the process of integrating strategy, people, processes and measurements to improve decision-making and drive change, and focuses on implementing performance measurement, learning and changing, and reporting performance. The RMAF approach begins with the creation of a results-based logic model.

A logic model is a picture that describes how a system, organization or project expects to produce benefits or results for Canadians—essentially, the theory, evidence and assumptions underlying a service.¹² The model reflects a series of “if/then” statements. For example, if people involved in delivering PHC engage in activity X, then the result is output Y. If a PHC activity produces output Y, then this will cause immediate outcome Z, and so on. A results-based logic model “... identifies the linkages between the activities of a policy, program or initiative and the achievement of its outcomes,”¹¹ or results for Canadians.



The Treasury Board has published a template for designing results-based logic models (Figure 1). In this illustration, **inputs** are the human, material or financial resources used to carry out activities, produce outputs and/or accomplish results. **Activities** are the primary link in the chain through which outcomes are achieved, and are the operations of an organization intended to produce specific outputs. **Outputs** are the direct products or services from the activities of a policy, program or initiative, and are delivered to a target group or population. **Outcomes** are significant external consequences attributed to an organization, policy, program or initiative, and can be described as immediate, intermediate or final; direct or indirect; and intended or unintended.¹¹

Efficiency and effectiveness of the PHC sector

An important aspect of the results-based logic model is the differentiation between areas of control and areas of influence, as well as the concepts of efficiency and effectiveness. Inputs, activities and outputs are areas in which a program, organization, or sector have some degree of control, while outcomes are areas of influence (see Figure 1).

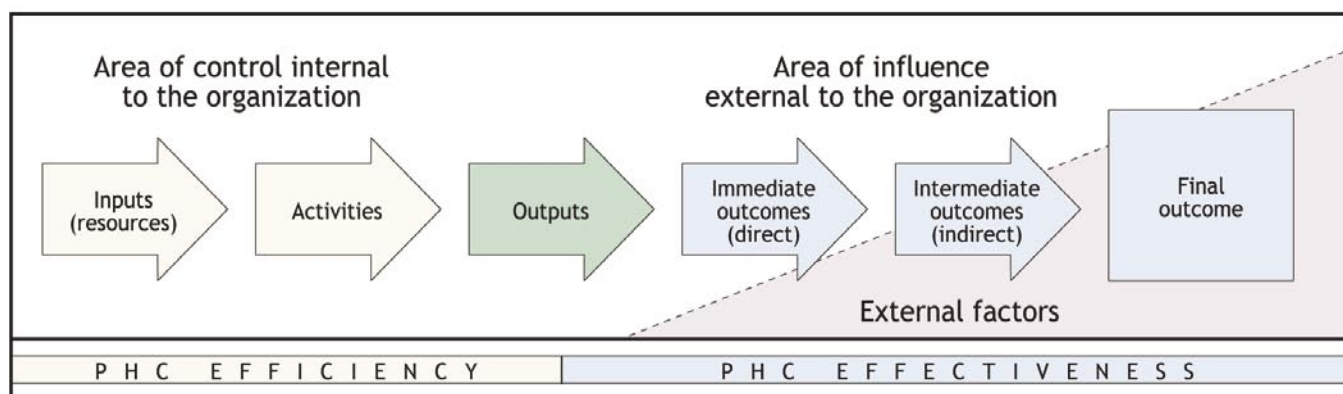
Efficiency, the extent to which an organization, policy, program or initiative is producing its planned outputs in relation to expenditure on resources, is a function of

inputs, activities and outputs. Inputs and activities occur prior to and in preparation for outputs; outputs represent the interface between PHC products (e.g. web-based health guide) and services (e.g. telephone triage, visits with health providers) and Canadians. Information about inputs, activities and outputs is needed to measure and monitor the efficiency of the PHC system.

Effectiveness, the extent to which an organization, policy, program or initiative is meeting its planned results, is a function of outputs and outcomes. Effectiveness can be measured at a system level and at a service or clinical level. The effectiveness of the PHC system is a function of all product and service outputs as illustrated on the left side of the logic model for PHC. By comparison, the effectiveness of a single product or service delivered by a provider is a function of that output and the outcome attained by the individual who received it. Effectiveness at this clinical level is described in [Interpersonal communication and technical effectiveness](#).

As one moves along the PHC system outcome continuum from immediate to final outcomes, the degree of influence of this health sector diminishes. In the context of PHC, immediate (or direct) outcomes are those for which this sector is most (but not solely) responsible and accountable.

Figure 1: Treasury Board of Canada Results-based Logic Model



Reproduced from: Treasury Board of Canada. Guide to the development of results-based management and accountability frameworks [monograph on the Internet]. Ottawa: Treasury Board of Canada Secretariat; 2001 [cited 2004 Jan 20].

But even these outcomes can be influenced by external factors. Intermediate and final outcomes are more strongly influenced by factors beyond the control of PHC, but it is important to include them in the model to ensure that people who work in PHC continually focus on results for Canadians.

Logic models clarify the linkages between inputs, activities, outputs and immediate outcomes, as well as the impact of immediate outcomes on more downstream results for Canadians (i.e. intermediate and final outcomes). By staggering the order of outcomes by the degree of influence, PHC stakeholders should more readily be able to identify areas in which they should be held more (i.e. immediate outcomes) or less (i.e. intermediate and final outcomes) accountable.

The Treasury Board approach to results-based logic models acknowledges that many factors influence PHC outcomes. Evaluations of the effectiveness of the PHC system on immediate, intermediate and final outcomes must therefore account for these externalities through sophisticated (e.g. multivariate) analyses.¹³ Evaluations of the efficiency of the PHC system also require elaborate analysis, as do economic evaluations of PHC renewal strategies, since information regarding efficiency and effectiveness is combined.



Methods

Defining PHC

An operational definition of PHC was necessary to define the breadth and boundaries of the results-based logic model, and the unique and distinguishing¹⁴ activities, outputs, and expected outcomes of the PHC sector. Many definitions of primary care and primary health care exist, causing considerable confusion in defining this sector. Therefore, definitions proposed by provincial governments in Canada, health care professional organizations, the World Health Organization, the Institute of Medicine, and internationally recognized academics were reviewed for recurring themes.¹⁵

For our purposes, PHC is defined as products or services designed to address acute and episodic health conditions and to manage chronic health conditions. It is also where health promotion and education efforts are undertaken, patients receive first care and where those in need of more specialized services are connected with other parts of the health care system. PHC can be described in terms of the degree to which it is responsive to the needs of patients and populations, and in terms of the unique and distinguishing features as described in [PHC Outputs](#).

Terminology

The language used to describe the features, processes and outcomes of PHC is far from uniform. Recent efforts have aimed to “defuse the confusion” around the concept of continuity of care,¹⁶ but much remains to be done to standardize the PHC lexicon. This report relies on Treasury Board definitions of effectiveness and efficiency, and conceptual definitions relevant to describing PHC that have been proposed by academics. Researchers in Quebec¹⁷ have begun national consultations with experts in Canada to seek agreement on operational definitions of the most important dimensions of PHC. The terminology used to describe the results-based logic model in this report has been informed by, and will continue to evolve through national dialogue and emerging consensus.

Policy analysis and literature review

To identify the goals and objectives relevant to PHC renewal in Canada, we conducted an analysis of the prominent and recurring themes in federal and provincial policy documents.¹⁸⁻²¹ Existing conceptual models of health/illness, health care, and PHC that have been informed by (or inform) health services and policy research were reviewed.²²⁻²⁶ Existing performance measurement and accountability frameworks were reviewed,²⁷ with particular focus on those used in other countries.^{28,29} A literature review was also conducted to identify PHC inputs, activities, outputs and outcomes, as well as to substantiate the relations between them. Illustrative examples of the literature are cited throughout this report.

Stakeholder consultations

A multi-stage iterative feedback and revision process was used for stakeholder consultations. We developed the first draft of the results-based logic model following the policy analysis and literature review. Stakeholder consultations were undertaken for a period of nine months, and the model was continually revised in response to feedback. The following stakeholder groups received formal requests for comment, participated in small focus groups, and/or attended presentations to solicit feedback on draft versions of the model:

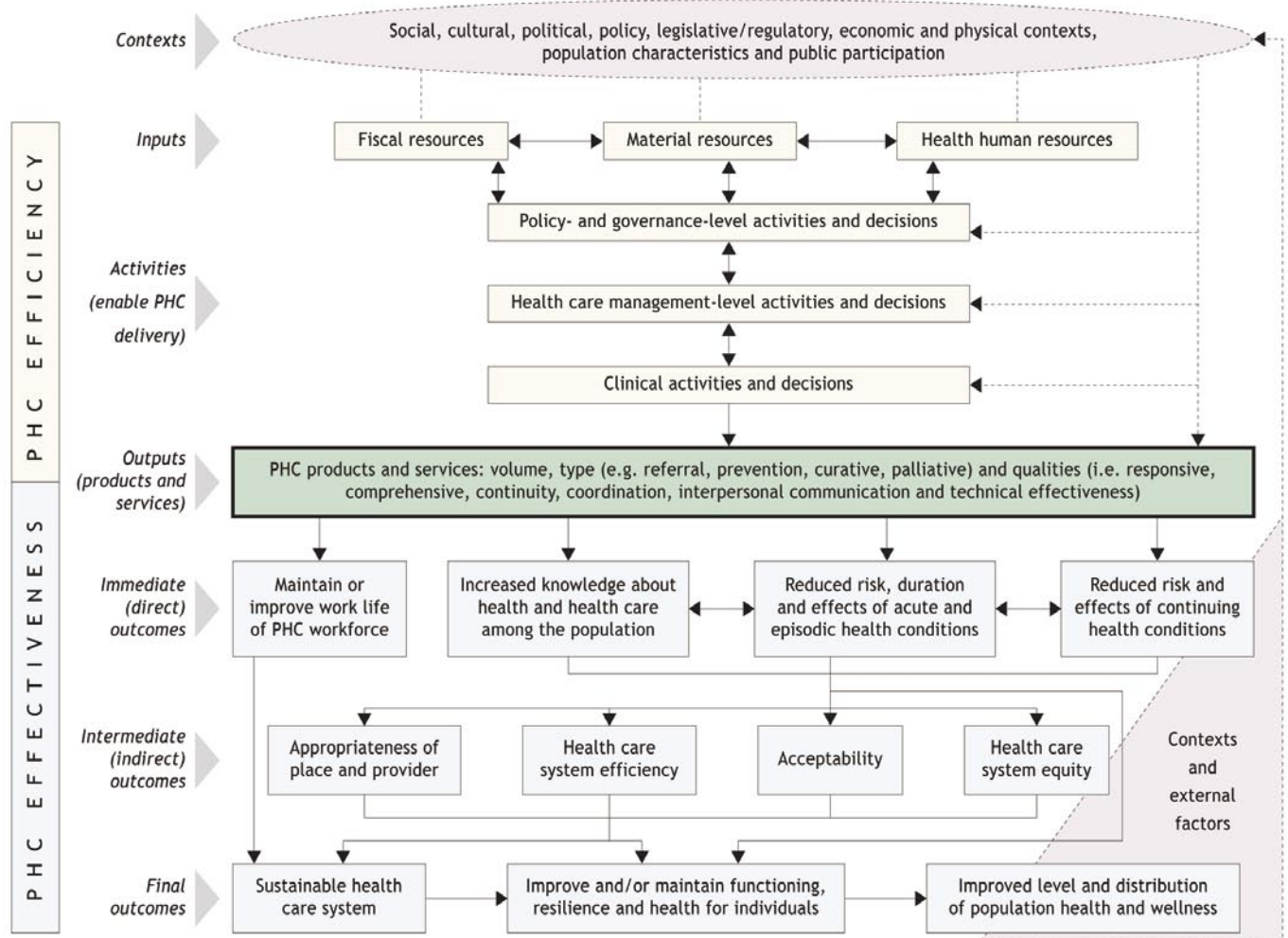
- PHC practitioners from various health regions in British Columbia responsible for delivering PHC and/or implementing or evaluating PHC renewal (approx. 200 people).
- Individuals from university departments or professional associations/colleges representing medicine, family medicine, nursing and pharmacy (approx. 40 people).
- Senior academic researchers and consultants in Canada who specialize in PHC research and evaluation (approx. 10 people).
- PHC leaders and evaluation specialists who work

for provincial and territorial ministries of health across Canada (approx. 50 people).

- Participants who attended a session hosted at a national conference for PHC in May 2004 (approx. 350 people).

To date, the Canadian public has not been routinely consulted about the features and outcomes of PHC important to them.³⁰ CHSPR will be conducting this work in British Columbia in 2004-05.

Figure 2: A Results-based Logic Model for Primary Health Care (PHC)





Results-Based Logic Model for PHC

The results-based logic model for PHC is described here and illustrated in Figure 2.

PHC Contexts

Many stakeholders identified the need to understand variation in population characteristics and contexts, since these external factors influence inputs, activities, outputs and outcomes. Others have also recognized the importance of understanding and accounting for these factors to understand and shape variation in practice (e.g. clinical-level activities) and to standardize rates and indicators for comparative analyses.³¹

The recipients and contexts of a public program or initiative are not typically included in Treasury Board logic models; we have therefore represented these dimensions with dotted lines in Figure 2.

Population characteristics and public participation

The role and contribution of individual members of the population in initiating first contact with the health care system, and participating in PHC activities and decisions, requires that the population be specifically identified.

Canadians support the PHC system as investors and workers (i.e. fiscal and human resource inputs), and contribute to governance-, health care management- and clinical-level activities and decisions. For instance, citizens participate in policy processes by communicating a values framework that should be used to guide policy and practice.⁸ They participate in governance and health care management activities by holding positions on boards, councils and committees; and clinical activities through shared decision-making.

Population characteristics important to planning, monitoring and evaluating health care include predisposing (e.g. demographics, values), enabling (e.g. literacy³²) and need (e.g. acute self-limiting illnesses, pregnancy, chronic

health conditions, cognitive functioning) factors.^{23,33,34} Moreover, population patterns of health beliefs, lifestyles (e.g. smoking, diet and exercise) and health-related attitudes and preferences are important determinants of need, demand and use of health care, and PHC in particular.³⁵

Contextual factors

Since there is tremendous variability across and within Canadian communities in the context in which health care operates, PHC inputs, activities and outputs will not be uniform across jurisdictions. Importantly, improvements in immediate, intermediate and final outcomes will not be uniform across or within different communities, since (by definition) these impacts are heavily influenced by factors outside the PHC system.

Contextual factors influencing the population and the PHC system include social, cultural, political, policy, legislative/regulatory, economic and physical environments. The following examples illustrate the influence of these factors:

- Physical environments influence geographic distribution and accessibility of PHC services.
- Social contexts, including family context, influence the availability of informal/voluntary care and, indirectly, the level of need for formal care.³⁶
- Social and cultural priorities influence the relative importance of different activities, outputs and outcomes.
- Social and economic contexts influence health—and vice versa—as well as the patterns of delivery and use of PHC.^{37,38}
- Economic and cultural contexts influence the degree to which a population (or provider) uses technology to understand health issues.³⁹
- Political and cultural contexts influence the degree to which regulations enable or thwart, for example, direct-to-consumer advertising from the pharmaceutical industry, which affects the nature of demand for care.⁴⁰

PHC Inputs

The Treasury Board approach defines inputs as the resources (human, material, financial) used to carry out activities, produce outputs and/or accomplish results. The importance of acknowledging and monitoring health system inputs is demonstrated in the 2003 First Ministers' Accord on Health Care, which identified “sustainability” performance indicators in the areas of, for example, health human resources (e.g. age distribution and turnover rates of practicing providers), equipment (e.g. number and types of equipment installed), and information systems (e.g. degree of standardization of information collected and shared for evidence-based decision-making).

The following inputs collectively provide structure for the provision and receipt of PHC products and services:

Fiscal resources

Fiscal resources from all sources, public and private.

Material resources

The following are examples of material resources relevant to PHC:

- Physical facilities and equipment used to support and deliver care.
- Nature and number of educational and training resources to prepare health care providers, managers, policy-makers and governors.
- Extent and availability of research evidence about the effectiveness of interventions, technologies and approaches.
- Information systems and technological resources to support clinical, management, policy and governance activities.

Health human resources

Human resources include the number, mix and characteristics of the clinical, management, policy and governance workforces. The following characteristics have been suggested as important:

- Level of knowledge and degree of competence.⁴¹
- Orientation toward teams and interdisciplinary practice.⁴²
- Degree of innovation.

PHC Activities

The next link in the logic chain after inputs is activities, which are the operations or work processes intended to produce specific outputs. Activities are the primary link in the chain through which outcomes are achieved. Work processes internal to the PHC sector include policy/governance, health care management and clinical activities intended to produce specific products and services. Importantly, the actual act of service delivery is classified as an output according to the Treasury Board approach. Outputs represent the direct products or services delivered—essentially, the interface between PHC and Canadians.

The following activities collectively reflect the processes involved in preparing for the delivery of PHC:

Policy- and governance-level activities and decisions

Activities and decisions at this level relate to policy, planning, governance and oversight processes. Policy-makers, board members, administrators, regulators, managers, professional organizations (e.g. through codes of conduct, standards of practice, fee negotiations), the public and interest groups are involved. Examples include:

- Governance, fiscal stewardship and accountability policies and procedures.
- Decisions about financing and funding for capital investments and operations.
- Decisions about benefit coverage and cost-sharing (i.e. public and private financing) for health services, drugs, and medical devices.
- Decisions about methods of funding organizations and remunerating providers (i.e. capitation, fee-for-service, salary, blended funding).



- Methods of rostering or enrolling people in PHC organizations, networks or groups.
- The identification and implementation of health human resource supply management strategies.
- Legal and regulatory activities for health professions (e.g. scope of practice, provisions for malpractice insurance).
- Professional and clinical governance.
- Financing and design principles of clinical health information systems.
- Enactment or implementation of privacy legislation affecting health information.

The health policy contexts in which PHC systems operate are critically important to the impact PHC has on a population's level of health. For example, international comparisons suggest that better health outcomes result when PHC systems regulate the distribution of resources so that areas in need are amply supplied with resources, financial access is assured by publicly accountable bodies such as governments, and there is little to no cost-sharing for service use.⁴

Health care management-level activities and decisions

Activities and decisions relating to management and operations are important determinants of the organization of PHC. Administrators, managers and clinical providers may be involved. Examples include:

- Determination of the size, location and types of group practices or networks formed to deliver care (e.g. groups with single health professional disciplines, groups that rely on interdisciplinary collaboration).
- Decisions about the temporal availability of services (e.g. office hours and after-hours coverage).
- Decisions about the range and comprehensiveness of services provided by a health care organization (e.g. counselling services, sports medicine, walk-in urgent care clinics, full service practice).

- Type and availability of clinical, management and/or financial information systems.
- Quality improvement initiatives such as provider profiling or program evaluation, including the establishment of quality improvement initiatives.
- Type and availability of decision-support tools for providers (e.g. reminder systems, evidence-based decision tools) and/or decision aids for patients.⁴³

Together, policy-, governance- and health care management-level activities and decisions establish and support the degree to which PHC organizations endorse and facilitate (through operational planning and orientation) a patient, family and/or community focus among practitioners. A PHC system is patient-focused rather than disease-focused when it represents the primary point of entry for all of an individual's needs and problems, offers care over time, provides care for all but the most uncommon conditions, and coordinates and integrates services provided by others.⁴⁴ Family-centred approaches to policies, services and care recognize the vital role that families play in ensuring health and well-being, and support them in their care-giving and decision-making roles.⁴⁵ PHC organizations that have a community focus or orientation use information about the health needs of the community, engage practitioners in community affairs and involve the community in practice-level and governance issues.⁴⁴

Together, policy-, governance- and health care management-level activities and decisions also establish and support the degree to which PHC organizations have a professional or community-oriented vision. Professional models are designed to deliver services to patients who seek them (clients) or to people who register to obtain them (subscribers). By comparison, community models are designed to meet the health care needs and improve the health of a population, to promote community development, and to provide all medical, health, social, and community services.²⁵

Clinical-level activities and decisions

These activities and decisions relate to patient-focused, family-centred or community-oriented clinical care and include:

- Extent of use of evidence and orientation toward evidence-based decision-making.
- Engaging in continuing education to support evidence-based practice.
- Determining the degree to which one will specialize in specific types of clientele (e.g. geriatrics).
- Determining the degree to which a health care provider personally elects to deliver certain types of services (e.g. counselling, house calls, obstetrics, community focus).
- Preferences for and engagement in different models of team-based service delivery—multidisciplinary or interdisciplinary.
- Workload preferences⁴⁶ and practice styles (e.g. preferences for recalling patients).⁴⁷

PHC Outputs

The Treasury Board approach defines outputs as direct products (e.g. web site for health education) or services (e.g. visits with health care providers) delivered as a result of the activities of a policy, program or initiative. Outputs represent the interface between providers and Canadians—this interface has been popularized under the notion of access to health care. Access has been described as having different dimensions, which we consider as adjectives that describe the process of obtaining and receiving care. PHC outputs can be described in terms of type, volume and qualities.

PHC Outputs—Type and Volume

PHC providers are responsible for delivering health promotion, disease/disability prevention, curative, rehabilitative, palliative and supportive services to target groups or populations. They also deliver services that can be described as patient-focused, family-centred and/or community-focused. PHC providers also match people with services provided by community-based organizations or agencies, and

refer individuals with unusual or complex needs to more specialized health care service sectors. Indeed, referrals represent the formal mechanism of interaction between primary and secondary or tertiary care. These outputs are all predicated on identifying, diagnosing and understanding an individual's or population's health conditions and risk for future health issues.

The volume of PHC outputs is influenced by contexts and determined by inputs (e.g. fiscal and human resources used), as well as governance-, health care management-, and clinical-level activities and decisions.

PHC Outputs—Qualities

The delivery of PHC products and services can be described in terms of the degree to which they are responsive to the needs of patients and populations, and in terms of the unique and distinguishing features of PHC:

Responsiveness

The responsiveness of PHC reflects the degree to which it aligns with and is sensitive to the expectations and preferences of patients and providers. PHC should meet the expectations of patients in terms of timeliness, convenience, and geographic availability, and should be structured to be, for example, culturally and socially appropriate.

Comprehensive services and whole-person care

Because PHC is the first point of contact with the health system and is responsible for longitudinal dimensions of care, providers in this sector are expected to address (through direct services or referrals to others) a full array of health states and engage in delivering a broad or comprehensive spectrum of services.⁴⁴ PHC systems that offer a comprehensive array of services attain better health outcomes.⁴

PHC providers are also expected to deliver services directed towards acute, recurring and chronic health conditions, and risky health behaviours, while taking into consideration the changing life circumstances, social



circumstances, and environmental contexts of individuals and populations (i.e. whole person care).

Continuous care/longitudinality

Continuity of care has been defined as “the degree to which a series of discrete healthcare events are experienced as coherent and connected and consistent with the patient’s medical needs and personal context.”⁴⁸ Continuity of PHC has been associated with improved technical effectiveness, responsiveness, acceptability and health system efficiency.^{49,50,51} There are three types of continuity,⁴⁸ all of which are measurable at the individual patient level and all of which recognize the longitudinal⁵² or chronological⁵³ dimension of the relationship between patients and providers.

1. Relational continuity refers to the ongoing therapeutic relationship between a patient and one or more providers. Ongoing, longitudinal relationships between practitioners and patients result in better problem recognition, and appropriate use of “wait-and-see” strategies. Having a regular source of care has been associated with more appropriate use of specialized services (including emergency rooms), more appropriate use of clinical preventive services, improved medication compliance, fewer physician visits and lower costs among the general population.^{54,55}
2. Informational continuity is the use of information on past events and personal circumstances to make current care appropriate for the individual. It includes the provision of information to patients and family members to support their role in decision-making and ongoing care.
3. Management continuity is a consistent and coherent approach to the management of a health condition that is responsive to a patient’s changing needs. Management continuity is particularly important when a number of PHC providers are involved in the delivery of a patient’s services.

Coordination of care (integration)

Coordination of care reflects the degree to which there is integration of services across providers within the PHC sector, as well as between PHC providers and other health and social services sectors. In essence, coordination of care describes the degree to which providers coordinate care and the nature and extent to which there is horizontal or vertical integration of services. While continuity of care is a dimension of service quality that is experienced by patients, the experience of management continuity is dependent on the degree to which services are coordinated and integrated.

Interpersonal communication and technical effectiveness

At the level of the PHC system, the Treasury Board approach defines effectiveness as a function of system-level outputs and outcomes. But at the program, practice or provider level it is important to gauge and monitor the effectiveness of each product or service (unit of output) delivered to Canadians. In this instance, the effectiveness of a PHC output refers to the degree to which a specific product or service has an effect or influence on an individual or population.

In order to focus evaluative efforts, academics have distinguished between two types of effectiveness with respect to the utility of a health service product or service.^{56,57} Interpersonal effectiveness (referred to here as interpersonal communication) includes communication, decision-making, and interpersonal style. Interpersonal communication also includes appreciation of the patient’s experience of illness and encompasses the degree to which providers are oriented toward offering patient-centred care.⁵⁸ Providers who adopt a patient-centred approach to care account for the patient’s desire for information and shared decision-making by exploring the patient’s concerns and needs for information; seeking to understand the patient as a whole person with emotional needs and life issues; and trying to find common ground with the patient about what the problem is and how it should be managed.⁵⁹

By comparison, technical effectiveness refers to provider competence in selection and use of effective counselling techniques, tests, procedures, treatments and/or interventions for particular patients, such that services are consistent with professional knowledge. This concept has also been popularized as evidence-based care⁶⁰ and includes care otherwise considered valid by contemporary professional standards.

Recent research has shed light on the technical effectiveness of PHC^{61,62} and the potential for health care providers to do harm.⁶³ Patient safety is a function of policy and health care management activities and decisions at the system level, as well as interpersonal communication and technical effectiveness at the provider level.

PHC Immediate Outcomes

As illustrated in Figure 1, immediate outcomes are those most attributable to outputs and for which a program can reasonably assume control and responsibility. Since external factors affect immediate, intermediate and final outcomes, sophisticated analyses are required to attribute health and health care system outcomes to PHC.

In the context of PHC, we describe two types of immediate outcomes. The first type relates to patients and populations—increased knowledge about health and health care among the population; reduced risk, duration and effects of acute and episodic health conditions; and reduced risk and effects of continuing health conditions. The second type of outcome includes results for Canadians that could be expected of any health sector—maintaining or improving the work life of the PHC workforce.

Increased knowledge about health and health care among the population

One of the primary outcomes (and responsibilities) of the PHC sector is to enhance the knowledge, skills and abilities of individuals so that they may maintain or improve their own health, as well as the health and well-being of others. Health literacy enables people to understand the

determinants of health and illness and how to appropriately self-manage risky behaviours, impairments and disabilities. Health care literacy enables people to understand how and when to use different types of health and social services.

Reduced risk, duration and effects of acute and episodic health conditions

Another primary outcome of PHC is to reduce a population's risk of experiencing (prevalence and incidence) acute, episodic and recurrent conditions that reduce functional health and well-being. When people experience reductions in health status, PHC limits the duration and effects of impairments so as to minimize risk of complication, curtail disability and optimize health. "Inherent in the organization of health services by level of care (primary, secondary, tertiary) is the idea that there is a point of entry each new time care is needed for a health problem."⁴⁴

Reduced risk and effects of continuing health conditions

A third primary outcome of PHC is to reduce a population's risk of experiencing continuing health conditions that result in prolonged impairment or disability. Impairments are problems in body function (i.e. physiological) and structure (i.e. anatomical) that result in significant deviation or loss; disability is an umbrella term for impairments, activity limitations, and participation restrictions. Activity limitations are difficulties an individual may have in executing a task, and participation restrictions are problems an individual experiences in life situations.⁶⁴ In situations where individuals have an impairment that is not transient, PHC services are directed toward minimization of disability in order to optimize health status.

Maintain or improve the work life of the PHC workforce

A second immediate outcome of the sector is to maintain or improve the health of the PHC workforce of providers, managers, administrators, policy-makers and governors. Recent research suggests that there is much to be concerned about, as health care providers are, for example,



more likely to miss work because of illness and disability, and have lower levels of workplace satisfaction than those who work in non-health sectors.⁶⁵

Clearly, the health, satisfaction and productivity of the health care workforce are outcomes of all health service delivery sectors, including PHC. Until recently, this area has received little attention in health system performance monitoring and surveillance efforts. However, professional associations and others have begun to identify, assess and report on these factors for the health care workforce.

Though there is little evidence to substantiate a link between the health of providers and high quality care,⁶⁶ the work life of health care workers is important because human resources are a key health system input. One in ten employed Canadians work in health and social services.⁶⁵

PHC Intermediate Outcomes

PHC is expected to have a relatively high degree of control or influence (and therefore responsibility) over immediate outcomes, though these are still influenced by external factors. By comparison, PHC is expected to have a lower degree of control over intermediate outcomes due to stronger influences from external factors. In PHC, intermediate outcomes include:

Appropriateness of place and provider

The concept of appropriateness has been summarized as delivering the right service to the right person by the right provider in the right place at the right time. In September 2000, the First Ministers agreed that improvements to PHC are crucial to the renewal of health services, and committed to ensuring that Canadians receive the most appropriate care, by the most appropriate providers, in the most appropriate settings.⁴²

An appropriate service is one that is expected to do more good than harm to a patient,⁶⁷ and involves issues of efficacious treatment (right service), necessity (right person) and safety (right application of the right treatment at the

right time). In relation to the PHC logic model, the appropriateness of “right service to the right person at the right time” is subsumed as an output (i.e. interpersonal communication, technical effectiveness and responsiveness with respect to time).

The appropriateness of place and provider, however, has been defined as an intermediate outcome to recognize the contribution of PHC to this feature of health care systems. It is recognized that the PHC system has less direct control of this outcome, because appropriateness of place and provider are heavily influenced by inputs, activities and outputs of other health care sectors. Appropriateness of place is measured by whether the patient’s condition and the services required for care match the setting in which care is provided.⁶⁷

In comparison, the appropriateness of provider is determined by whether patients are best matched with providers who can deliver desired levels and types of care, and by whether providers are best matched with patients for whom they can deliver desired levels and types of care. PHC has indirect influence over this outcome through, for example, its control over policy decisions about funding and availability of an array of different types of providers, management decisions regarding the mix of providers delivering PHC, and clinical preferences to treat patients or refer them to specialists.

Health care system efficiency

This intermediate outcome refers to health care system efficiency, as distinct from the efficiency of PHC system. Health care system efficiency is a function of the inputs, activities and outputs of all health care sectors, of which PHC is only one. An efficient health care system uses resources to the point at which the marginal benefit is equal to the marginal cost—the consumption of resources beyond this point results in provision of ineffective treatment and the diversion of resources away from other societal needs. Efficiency entails achieving the desired results with optimal use of resources.⁶⁸

The PHC system contributes to the efficiency of a health care system directly through its own efficiency as a sector, and indirectly by influencing the use of resources in other health care sectors. For example, geographic areas with more family and general practitioners per population have lower hospital admission rates for conditions that should be preventable with good PHC.⁶⁹ Moreover, individual patients who have a PHC physician rather than a specialist as their regular source of care have lower annual health care costs.⁷⁰

A review of Canadian policy documents supports the notion that the community expects an association between PHC and health care system efficiency. For example, the Commission on the Future of Health Care in Canada indicated one benefit of PHC to be better use of health care resources through more appropriate use of emergency room services and reduced need for expensive hospital treatment or re-admission.¹⁸

Health care system equity

This intermediate outcome refers to equity of the health care system, including the degree of equity of PHC. An equitable health care system and PHC system distributes care to the population on the basis of relative need rather than, for example, ability to pay. The principle of equity is espoused in the Canada Health Act, and continues to be endorsed by Canadians.^{6,71}

PHC contributes to health care system equity directly through its control (and responsibility) for equity within this sector. PHC also indirectly influences the equity of other sectors through control over prescriptions, referrals and admissions. Research suggests that family physician services in Canada, for example, appear to be related to the relative need for care.³⁸ But the association between need and use of specialist services is not as strong and may relate to bias in PHC referral patterns^{72,73} and availability of specialty care.⁷⁴

If health care is intended to be provided to Canadians on the basis of need, there should be activities within PHC to

ensure that individuals who demand and receive care are those most in need (vertical equity) and individuals with similar needs receive similar levels of care (horizontal equity). It is also important to ensure that those who don't seek or receive care are not in need. Thus, health system performance monitoring requires an understanding of the characteristics of individuals who use care, as well as the profiles of those with unmet needs.

Acceptability

Acceptability includes both satisfaction with services received and, more broadly, public confidence in services. Acceptability is when the care or service provided meets the expectations of the patient, community, providers and paying organizations. It is recognized that there may be competing interests between stakeholders, but the needs of the populations are paramount.

PHC Final Outcomes

Final outcomes are expected to take a long time to realize. Furthermore, immediate and intermediate PHC outcomes, as well as external factors, are expected to influence the ultimate impacts or final outcomes of PHC. Final outcomes include:

Sustainable health care system

A recent analysis of Canadian policy statements suggests that many jurisdictions view PHC as a key lever to attaining a sustainable, affordable health care system. There is some evidence to support this—research suggests that health care systems that promote PHC achieve lower overall system costs than those who do not.^{1-4,75}

Improve or maintain functioning, resilience and health for individuals (including wellness and longevity)

PHC is expected to improve or maintain the health and well-being, or impede a decline in health, of individuals who receive services. In circumstances where individuals are experiencing expected declines in health status due to terminal illness, for example, the population expects



that PHC services would continue to meet their evolving needs.

Improved level and distribution of population health and wellness

Two-thirds of Canadians indicate that the most important goal of the health care system should be to enhance the quality of life, promote health and wellness, reduce disability and increase the ability to function.⁷⁶ Only one-third of Canadians identify the provision of life-extending treatments as important, suggesting that the population places higher priority on population health and wellness than longevity. While PHC services are directed toward individuals, a strong PHC system that appropriately complements other health care sectors should contribute to the average level and distribution of health among populations.

Research suggests that PHC-oriented health care systems are associated with lower population-based rates of mortality¹ and buffer at least some of the health-damaging effects of income inequity.^{75,77,78}

PHC Results-based Logic Chain

A results-based logic model:

“ ... identifies the linkages between the activities of a policy, program or initiative and the achievement of its outcomes. It succinctly clarifies the set of activities that make up a policy, program or initiative and the sequence of outcomes that are expected to flow from these activities. As such, a logic model serves as a ‘roadmap’, showing the chain of results connecting activities to the final outcomes and, thus, identifying the steps that would demonstrate progress toward their achievement.”¹¹

This section is intended to describe some of the more explicit links between inputs, activities, outputs and outcomes of the PHC sector. Arrows on the logic model illustrated in Figure 2 graphically represent these links. In the following section, illustrative examples show how the

constructs and links in the logic model can be used to inform planning, monitoring, evaluating and reporting on PHC.

Contexts, inputs and activities

- Policy/governance, health care management and clinical activities and decisions influence consumption and use of fiscal, material and human resource inputs. The availability of these PHC inputs also influences these PHC activities.
- Policy/governance decisions and activities set the stage upon which health care management and clinical activities occur, and vice versa.
- Social, cultural, political, policy, legislative/regulatory, economic and physical contexts directly influence PHC inputs (fiscal, material, and human resources), as well as PHC activities (policy, management and clinical).
- Characteristics of the population (e.g. values, needs, demands) influence policy/governance, health care management and clinical activities and decisions.
- The public contributes financial resources for PHC and participates in the PHC workforce. They also participate, directly and indirectly, in governance-, policy-, health care management- and clinical-level activities and decisions.
- Finally, environmental and social contexts, in combination with characteristics of the population, influence immediate, intermediate and final outcomes.

Outputs and outcomes

- Three of the four immediate outcomes of PHC are closely related. Increased knowledge about health and its determinants among the population may reduce the risk of acute or continuing health conditions. Reductions in the risk, duration or effects of acute impairments may reduce the risk of continuing health conditions among the population. Furthermore, reductions in the prevalence of continuing health conditions may reduce the risk and duration of acute or episodic impairments.
- These three immediate outcomes capture health-related effects that directly improve and/or maintain functioning, resilience and health for individuals—one of the final outcomes. There is also a direct link between these three immediate outcomes and all the intermediate outcomes. For example, when the duration and effects of acute and/or chronic health conditions are minimized (immediate outcome), it is likely that services will be acceptable (intermediate outcome).
- The fourth immediate outcome, maintenance or improvement of the work life of the PHC workforce, contributes directly to a sustainable health care system—one of the final outcomes. However, this final outcome is also influenced by intermediate outcomes, as well as external forces.
- The intermediate outcome of appropriateness of place and provider is the result of PHC activities (e.g. management decisions regarding mix of PHC providers) and outputs (e.g. referral patterns), as well as other external factors. Indeed, this and other intermediate outcomes are indirectly the results of PHC inputs, activities, outputs and external factors.
- The intermediate outcome of appropriateness of place and provider also contributes to health system efficiency—another intermediate outcome.
- The intermediate outcomes of health care system efficiency and equity contribute to acceptability of PHC—another intermediate outcome.
- All four intermediate outcomes contribute to a sustainable health care system, which, in turn, contributes to improvement or maintenance of the health of individuals and the level and distribution of population health.
- Finally, immediate outcomes directly influence functioning, resilience and health for individuals (final outcome) and, when targeted to those most in need of care, indirectly influence the distribution and level of population health (final outcome).



Using the Logic Model to Plan, Monitor, Evaluate and Report on PHC Renewal Strategies

In this section we describe, using an illustrative example, how the logic model for PHC can be used to plan, monitor, evaluate and report on strategies implemented to strengthen the PHC system in Canada.

The logic model can be used at the earliest stages of planning PHC renewal because it provides a common lexicon for communication among stakeholders. It facilitates decisions about the goals and objectives of any renewal strategy because it identifies the complete array of PHC outputs and outcomes. Review of the logic model affords stakeholders the opportunity to more clearly consider and communicate expected associations and links between declared goals and objectives, and alternative courses of action.

The logic model helps evaluators and researchers contribute to PHC renewal planning and reporting efforts by defining the areas where information and evidence are important. Information about contexts, inputs, activities and outputs is necessary to understand the current and evolving state of the PHC system. Evidence on interventions that alter outputs and outcomes in the desired ways enhances knowledge about expected outcomes associated with alternative courses of action.

There are numerous initiatives to renew PHC underway in Canada. One popular one is the creation of interdisciplinary collaborative teams that will support timely access to comprehensive, coordinated PHC services, enabling Canadians to receive necessary services from the most appropriate provider. The logic model can focus the attention of planners, implementers and evaluators on the inputs required to support this type of renewal effort and the broad array of activities that must be aligned to stimulate and support change. It can be used to monitor and evaluate renewal as it identifies the relevant inputs, activities, outputs and outcomes where change is expected.

In terms of creating interdisciplinary collaborative teams, those responsible for planning and implementing change

must first consider the current state of PHC inputs, activities and outputs in their jurisdiction. At the PHC input level, things to consider include the degree to which fiscal resource inputs support or constrain changes in the number or mix of providers from different disciplines. Consideration should be given to the degree to which educational resources and information systems (material resources) support or constrain interdisciplinary collaboration within teams, and the degree to which health human resources are available or prepared to work in collaborative teams.

At the policy or governance level, activities or decisions considered as supports or constraints to interdisciplinary collaboration include the method by which PHC organizations are funded and providers remunerated, and the legal and regulatory contexts.⁷⁹ At the health care management and clinical levels, decisions by PHC leaders and practitioners will ultimately determine the size, location and types of group practices or networks, and how they work together as a team to deliver care. Moreover, decisions regarding the availability and use of clinical information systems will influence the nature and extent of communications between team members.

Throughout this process, close observation is essential to detect whether activities are being undertaken as planned and whether these interventions are having the intended effects on outputs. Monitoring is required to ensure that leaders of PHC organizations or networks hire or otherwise engage providers from an array of disciplines. If monitoring activities indicate that practitioners are not collaborating as a team, evaluation is necessary to determine the clinical-level activities or decisions that influence the decision not to collaborate. If monitoring activities indicate that collaborative teams have formed, evaluators assess for intended and unintended effects on outputs. The logic model identifies the outputs (volume, type and qualities of these products and services) to be assessed.

Early monitoring and evaluative efforts form an important part of what experts call formative evaluations. These evaluations provide information to those responsible for PHC renewal so that they can respond quickly to emerging threats and opportunities for lasting change. The logic model frames the activities, outputs and outcomes to be monitored. When evaluators undertake assessments to determine whether outputs and outcomes are attributable to renewal interventions, such as interdisciplinary collaborative teams, the logic model identifies the outputs and outcomes of importance, as well as the external forces to be considered.

Just as important, however, is that the logic model identifies other outputs and outcomes of this sector that should be monitored for the unintended effects of an intervention. Measuring intended and unintended activities, outputs and outcomes, as well as accounting for contextual and population effects, can provide valuable insights for those responsible for PHC renewal, and enables them to understand and act on the consequences of their actions, and report to Canadians on progress attained and outcomes achieved.

The logic model can be used during planning, monitoring and evaluation to identify performance indicators and the most important evaluation questions, as well as to plan PHC information systems to support this work. Indicators can be established to describe and monitor PHC inputs, activities, outputs and immediate outcomes, as well as the efficiency of the PHC system. When indicators are constructed to enable comparisons between interventions or regions, sophisticated analysis is required to account for differences in external contexts and populations. It is not appropriate to use indicators to measure the effectiveness of PHC renewal strategies on immediate, intermediate and final outcomes. More sophisticated evaluations are necessary to account for externalities that simultaneously influence these outcomes.



Discussion

Canadians are increasingly concerned about access to and the quality of health care and many are open to new models of PHC service delivery. There have been and will continue to be substantial public investments in PHC renewal and Canadians have clearly indicated their desire for better public reporting in this area. The results-based logic model described here is intended to support efforts to renew the organization, financing and delivery of PHC in Canada.

The following quote by the Treasury Board of Canada, seems relevant for all PHC policy-makers, administrators and practitioners:

“Accountability for results or outcomes asks if you have done everything possible with your authorities and resources to effect the achievement of the intended results and if you have learned from past experience what works and doesn’t work. Accounting for results of this kind means demonstrating that you have made a difference; that through your actions and efforts you have contributed to the results achieved.”¹³

If policy-makers, administrators and providers are to implement, monitor, evaluate and guide initiatives designed to facilitate PHC renewal, a multi-stage process is necessary.

1. A results-based logic model is required to identify the main inputs, activities, outputs and outcomes of this health care sector.
2. Indicators of performance are required to meet the information needs of those responsible for planning, monitoring and reporting on PHC renewal.
3. A PHC information system is necessary to provide timely, valid and reliable performance indicators, and to test hypotheses of the linkages between inputs, activities, outputs and outcomes.
4. Information about the results of PHC renewal activities need to inform future policy, health care management and clinical plans, decisions, actions and evaluations.⁸⁰

This report focuses on the first stage. Subsequent work and reports to be published by CHSPR will focus on the remaining three stages.

Our logic model for PHC should focus and unify evaluative efforts by enabling diverse stakeholders to work from a shared conceptual foundation (and lexicon) of the main inputs, activities, outputs and outcomes of PHC. It establishes a common theory of the logic links among these dimensions, and a shared set of assumptions about these dependencies.

This logic model also illuminates the array of activities that are potential levers for change; recognizes the unique and distinguishing features of PHC and outcomes attributable to this sector; and identifies the way in which PHC and other health sectors converge to affect health care system-level performance and the health of the population. It also helps identify the potential trade-offs that various renewal efforts may have.

For a logic model to be useful in planning, implementation, analysis and evaluation of PHC at a system and service level, it must be designed in consultation with stakeholders (eventual users), and robust enough to enable customization for use in program evaluation and intervention research. To date, approximately 650 people have been involved in developing and/or providing feedback for this logic model. In 2004/05, we will be conducting broad consultations with members of the public to identify the features and outcomes of PHC that are important to them. We will also participate in PHC renewal evaluative activities guided by this logic model. Over time we expect to publish findings about the robustness of this logic model for planning, monitoring, evaluating and reporting on PHC renewal. We look forward to learning from you—the users of this logic model—about its usefulness.



References

- ¹ Macinko J, Starfield B, Shi L. The contribution of primary care systems to health outcomes within Organisation for Economic Cooperation and Development (OECD) countries, 1970-1998. *Health Serv Res* 2003;38(3):831-865.
- ² Shi L. Health care spending, delivery, and outcome in developed countries: a cross-national comparison. *Am J Med Qual* 1997;12:83-93.
- ³ Baicker K, Chandra A. Medicare spending, the physician workforce, and beneficiaries' quality of care. *Health Aff* 2004 Apr 7;W4:184-197.
- ⁴ Starfield B, Shi L. Policy relevant determinants of health: an international perspective. *Health Policy* 2002;60(3): 201-218.
- ⁵ Sanmartin C, Gendron F, Berthelot JM, Murphy K. Access to health care services in Canada, 2003. Ottawa: Statistics Canada; 2004. Catalogue No.: 82-575-XIE.
- ⁶ Pollara Research. Health care in Canada survey: retrospective 1998-2003 [monograph on the Internet]. Toronto: Pollara Inc.; 2003 [cited 2004 Aug 10]. Available from: http://www.mediresource.com/e/pages/hcc_survey/pdf/HCiC_1998-2003_retro.pdf
- ⁷ Ekos Research Associates. Health Issues Tracking Survey. In: Mendelsohn M. Canadians' thoughts on their health care system: preserving the Canadian model through innovation. Saskatoon (SK): Commission on the Future of Health Care in Canada; 2002.
- ⁸ Maxwell J, Jackson K, Legowski B, Rosell S, Yankelovich D, Forest PG, Lozowchuk L. Report on citizens' dialogue on the future of health care in Canada. Saskatoon (SK): Commission on the Future of Health Care in Canada; 2002.
- ⁹ Auditor General of British Columbia. A Review of performance agreements between the Ministry of Health Services and the health authorities. Victoria (BC): Office of the Auditor General of British Columbia; 2003.
- ¹⁰ Treasury Board of Canada. Results for Canadians: a management framework for the government of Canada [monograph on the Internet]. Ottawa: Treasury Board of Canada Secretariat; c2000 [cited 2004 Jan 20]. Available from: http://www.tbs-sct.gc.ca/res_can/dwnld/rc_e_pdf.pdf
- ¹¹ Treasury Board of Canada. Guide to the development of results-based management and accountability frameworks [monograph on the Internet]. Ottawa: Treasury Board of Canada Secretariat; 2001 [cited 2004 Jan 20]. Available from: http://www.tbs-sct.gc.ca/eval/pubs/RMAF-CGRR/RMAF_Guide_e.pdf
- ¹² WK Kellogg Foundation. Logic model development guide. Battle Creek(MI): WK Kellogg Foundation; 2001.
- ¹³ Auditor General of Canada. Addressing attribution through contribution analysis: using performance measures sensibly [monograph on the Internet]. Ottawa: Office of the Auditor General of Canada; 1999 [cited 2004 Feb 20]. Available from: [http://www.oag-bvg.gc.ca/domino/other.nsf/html/99dp1_e.html/\\$file/99dp1_e.pdf](http://www.oag-bvg.gc.ca/domino/other.nsf/html/99dp1_e.html/$file/99dp1_e.pdf)
- ¹⁴ We are grateful to Dr. Barbara Starfield for coining the term 'unique and distinguishing features' when describing her notions of the most salient characteristics of primary care.
- ¹⁵ CHSPR intends to produce a paper outlining the result of this narrative analysis.
- ¹⁶ Reid R, Haggerty J, McKendry R. Defusing the confusion: concepts and measures of continuity of health care. Final Report. Ottawa: Canadian Health Services Research Foundation; 2002.
- ¹⁷ Personal communication, J. Haggerty, August 13, 2004.
- ¹⁸ Commission on the Future of Health Care in Canada, Romanow RJ. Building on values: the future of health care in Canada – final report. Saskatoon (SK): Commission on the Future of Health Care in Canada; 2002.
- ¹⁹ Commission on Medicare, Fyke KJ. Caring for medicare: sustaining a quality system. Regina (SK): The Commission on Medicare, Saskatchewan Health; 2001.
- ²⁰ Premier's Advisory Council on Health for Alberta, Mazankowski D. A framework for reform: report of the Premier's Advisory Council on Health. Edmonton (AB): Premier's Advisory Council on Health for Alberta; 2001.
- ²¹ Standing Senate Committee on Social Affairs, Science and Technology, Kirby MJL. The health of Canadians – the federal role. Volume six: recommendations for reform. Ottawa: Standing Senate Committee on Social Affairs, Science and Technology; 2002.
- ²² Aday LA. Establishment of a conceptual base for health services research. *J Health Serv Res Policy* 2001;6(3): 183-185.
- ²³ Andersen R, Newman JF. Societal and individual determinants of medical care utilization in the United States. *The Milbank Memorial Fund Quarterly - Health & Society* 1973;51(1):95-124.
- ²⁴ Donabedian A. Evaluating the quality of medical care. *The Milbank Memorial Fund Quarterly - Health & Society* 1966;44(3 Suppl):166-206.
- ²⁵ Lamarche P, Beaulieu M, Pineault R, Contandriopoulos A, Denis J, Haggerty J. Choices for change: the path for restructuring primary healthcare services in Canada. Ottawa: Canadian Health Services Research Foundation; 2003.
- ²⁶ Starfield, B. Primary care: concept, evaluation and policy. New York: Oxford University Press; 1992.

- ²⁷ Statistics Canada, Canadian Institute for Health Information (CIHI). About health indicators. Health indicators [serial on the Internet] 2004 Jun [cited 2004 Sep 15];2004(1). Catalogue No.: 82-221-XIE. Available from: http://secure.cihi.ca/indicators/en/pdf/About_Health_Indicators.pdf
- ²⁸ Centre for Development and Innovation in Health. Evaluation of the primary care partnership strategy: Baseline report [monograph on the Internet]. Victoria, Australia: Australian Institute for Primary Care, La Trobe University; 2002 Jul [cited 2004 Sep 15]. Available from: http://www.latrobe.edu.au/aipc/cdih/evaluation_pcp/Baseline%20PCP%20Evaluation%20Report%202002.pdf
- ²⁹ Department of Health. The NHS Performance Assessment Framework. London: National Health Service; 1999.
- ³⁰ We do know, however, from consultations that occurred with Canadians in 2002⁸ that they recommend health system renewal focus on interdisciplinary PHC teams that provide more coordinated primary care supported by a central information system.
- ³¹ Rosen AK, Reid R, Broemeling AM, Rakovski CC. Applying a risk-adjustment framework to primary care: can we improve on existing measures? *Ann Fam Med* 2003;1(1): 44-51.
- ³² Smith JL, Haggerty J. Literacy in primary care populations: is it a problem? *Can J Public Health* 2003;94:408-412.
- ³³ Aday LA, Andersen R. A framework for the study of access to medical care. *Health Serv Res* 1974;9(3):208-220.
- ³⁴ Phillips KA, Morrison KR, Andersen R, Aday LA. Understanding the contexts of health care utilization: assessing environmental and provider-related variables in the Behavioural Model of Utilization. *Health Serv Res* 1998;33(3):571-596.
- ³⁵ Van der Kar A, Knottnerus A, Meertens R, Dubois V, Kog G. Why do patients consult the general practitioner? Determinants of their decision. *Br J Gen Pract* 1992;42(361):313-316.
- ³⁶ Oakley A. Who cares for health? Social relations, gender, and the public health. Duncan Memorial Lecture. *J Epidemiol Community Health* 1994;48(5):427-434.
- ³⁷ Ross NA, Wolfson MC, Dunn JR, Berthelot JM, Kaplan GA, Lynch JW. Relation between income inequality and mortality in Canada and in the United States: cross sectional assessment using census data and vital statistics. *BMJ* 2000;320(7239):898-902.
- ³⁸ Watson DE, Bogdanovic B, Heppner P, Katz A, Reid R, Roos N. Supply, availability and use of family physicians in Winnipeg [monograph on the Internet]. Winnipeg (MB): Manitoba Centre for Health Policy, University of Manitoba; 2003 [cited 2004 May 7]. Available from: <http://www.umanitoba.ca/centres/mchp/reports/pdfs/famphys.pdf>
- ³⁹ Two-thirds of Canadians have looked for online health information, and more Canadians have gone online to seek this information than for any other online activity. (Ipsos-Reid. Searching for online health information: the number one online activity in Canada [news release]. Toronto: Ipsos-Reid; 2002 Dec 17 [cited 2004 Sep 2]. Available from: <http://www.ipsos-na.com/news/pressrelease.cfm?id=1696>)
- ⁴⁰ Mintzes B, Barer ML, Kravitz RL, Kazanjian A, Bassett K, Lexchin J, Evans RG, Pan R, Marion SA. Influence of direct to consumer pharmaceutical advertising and patients' requests on prescribing decisions: two site cross sectional survey. *BMJ* 2002;324:278-279.
- ⁴¹ Statistics Canada, Canadian Institute for Health Information (CIHI). About health indicators: health indicators framework. Health indicators [serial on the Internet] 2004 Jun [cited 2004 Sep 15];2004(1). Catalogue No.: 82-221-XIE. Available from: <http://secure.cihi.ca/indicators/en/pdf/Framework-english.pdf>
- ⁴² First Ministers (Canadian). Communiqué on health [news release]. First Ministers' Meeting; 2000 Sep 11; Ottawa ON. Ottawa: Canadian Intergovernmental Conference Secretariat; 2000. Ref. No.: 800-038-004.
- ⁴³ Estabrooks C, Goel V, Thiel P, Pinfold P, Sawka C, Williams I. Decision aids: Are they worth it? A systematic review. *J Health Serv Res Policy* 2001;6(3):170-182.
- ⁴⁴ Starfield B. Primary care: balancing health needs, services and technology. New York: Oxford University Press; 1998.
- ⁴⁵ American Academy of Pediatrics. Policy Statement: family-centered care and the pediatricians role. *Pediatrics* 2003;112(3):691-696.
- ⁴⁶ Watson DE, Katz A, Reid RJ, Bogdanovic B, Roos NP, Heppner P. Family physician workloads and access to care in Winnipeg: 1991 to 2001. *CMAJ* 2004;171(4):339-342.
- ⁴⁷ Roos NP, Carriere KC, Friesen D. Factors influencing the frequency of visits by hypertensive patients to primary care physicians in Winnipeg. *CMAJ* 1998;159(7):777-783.
- ⁴⁸ Haggerty JL, Reid RJ, Freeman GK, Starfield B, Adair CE, McKendry R. Continuity of care: a multidisciplinary review. *BMJ* 2003;327(7425):1219-1221.
- ⁴⁹ Christakis DA, Mell L, Koepsell TD, Zummerman FJ, Connell FA. Association of lower continuity of care with greater risk of emergency department use and hospitalization in children. *Pediatrics* 2001;107(3):524-529.



- ⁵⁰ Hjortdahl P, Laerum E. Continuity of care in general practice: effect on patient satisfaction. *BMJ* 1992;304(6837):1287-1290.
- ⁵¹ Parchman ML, Pugh JA, Noel PH, Larme AC. Continuity of care, self-management behaviours, and glucose control in patients with type 2 diabetes. *Med Care* 2002;40(2):137-144.
- ⁵² "Longitudinality, in the context of primary care, is a long-term personal relationship between practitioners and patients in their practice. Continuity is not necessary for this relationship to be present; interruptions in the continuity of care for whatever reason need not disrupt this relationship. Therefore, the term 'longitudinality'...provides a much better sense of the characteristic that is a critical part of primary care."⁴⁴
- ⁵³ Hennen BK. Continuity of care in family practice. Part 1: dimensions of continuity. *J Fam Pract* 1975;2(5):371-372.
- ⁵⁴ Ettner SL. The timing of preventative services for women and children: the effect of regular source of care. *Am J Public Health* 1996;86(12):1748-1754.
- ⁵⁵ Lambrew JM, DeFries GH, Carey TS, Ricketts TC, Biddle AK. The effects of having a regular doctor on access to primary care. *Med Care* 1996;34(2):138-151.
- ⁵⁶ Cleary PD, McNeil BJ. Patient satisfaction as an indicator of quality care. *Inquiry* 1988;Spring;25(1):25-36.
- ⁵⁷ Campbell SM, Roland MO, Buetow SA. Defining quality of care. *Soc Sci Med* 2000;51(11):1611-1625.
- ⁵⁸ Stewart M, Brown JB, Weston WW, McWhinney IR, McWilliam CL, Freeman TR. Patient-centred medicine transforming the clinical method. Thousand Oaks (CA): Sage Publications; 1995.
- ⁵⁹ Stewart M. Towards a global definition of patient centred care [editorial]. *BMJ* 2001;322(7284):444-445.
- ⁶⁰ Sackett DL, Rosenberg WM, Gray JA, Haynes RB, Richardson WS. Evidence based medicine: What it is and what it isn't [editorial]. *BMJ* 1996;312(7023):71-72.
- ⁶¹ McGlynn EA, Asch SM, Adams J, Keesey J, Hicks J, DeCristofaro A, Kerr EA. The quality of health care delivered to adults in the United States. *N Engl J Med* 2003;348(26):2635-2645.
- ⁶² Katz A, De Coster C, Bogdanovic B, Soodeen R, Chateau D. Using administrative data to develop indicators of quality in family practice. Winnipeg (MB): Manitoba Centre for Health Policy, University of Manitoba; 2004.
- ⁶³ Forster AJ, Asmis TR, Clark HD, Al Saied G, Code CC, Caughey SC, Baker K, Watters J, Worthington J, van Walraven C. Ottawa Hospital Patient Safety Study: incidence and timing of adverse events in patients admitted to a Canadian teaching hospital. *CMAJ* 2004;170(8):1235-1240.
- ⁶⁴ World Health Organization. International classification of functioning, disability, and health. Geneva: World Health Organization; 2001.
- ⁶⁵ Canadian Institute for Health Information (CIHI). Canada's health care providers. Ottawa: Canadian Institute for Health Information; 2001.
- ⁶⁶ Eisenberg JM, Bowman CC, Foster NE. Does a healthy health care workforce produce higher quality care. *Jt Comm J Qual Improvement* 2001;27(9):444-457.
- ⁶⁷ Lavis JN, Anderson GM. Appropriateness in health care delivery: definitions, measurement and policy implications. *CMAJ* 1996;154(3):321-328.
- ⁶⁸ Pulchins I. Health indicators conceptual framework technical specifications [conference presentation]. At: Partnership for Health Information Standards Fall 2000 Conference; 2000 Oct 2-3; Toronto ON. Ottawa: Canadian Institute for Health Information; c2000 [cited 2004 Jan 21]. Available from: http://secure.cihi.ca/cihiweb/en/downloads/partner_conf_oct2000_e_IPulchins.pdf
- ⁶⁹ Parchman ML, Culler S. Primary care physicians and avoidable hospitalizations. *J Fam Pract* 1994;39(2):123-128.
- ⁷⁰ Franks P, Fiscella K. Primary care physicians and specialists as personal physicians. Health care expenditures and mortality experience. *J Fam Pract* 1998;47(2):105-109.
- ⁷¹ Survey by Berger Health Monitor 1991, 1994, 1995, 1999, 2000. In: Mendelsohn M. Canadians' thoughts on their health care system: preserving the Canadian model through innovation. Saskatoon (SK): Commission on the Future of Health Care in Canada; 2002.
- ⁷² Dunlop S, Coyte PC, McIsaac W. Socio-economic status and the utilisation of physicians' services: results from the Canadian National Population Health Survey. *Soc Sci Med* 2000;51(1):123-133.
- ⁷³ Frohlich N, Fransoo R, Roos N. Health services use in the Winnipeg Regional Health Authority: variations across areas in relation to health and socioeconomic status. *Health Care Manage Forum* 2000;51(1 Winter Suppl):9-14.
- ⁷⁴ Forrest CB, Reid RJ. Prevalence of health problems and primary care physicians' specialty referral decisions. *J Fam Pract* 2001 May;50(5):427-432.
- ⁷⁵ Starfield B. Is primary care essential? *Lancet* 1994;344(8930):1129-1133.
- ⁷⁶ Merck Frost/Pollara, 1999. In: Mendelsohn M. Canadians' thoughts on their health care system: preserving the Canadian model through innovation. Saskatoon (SK): Commission on the Future of Health Care in Canada; 2002.
- ⁷⁷ Shi L, Macinko J, Starfield B, Wulu J, Regan J, Politzer R. The relationship between primary care, income inequality, and mortality in the US states, 1980-1995. *J Am Board Fam Pract* 2003;16:412-422.

- ⁷⁸ Shi L, Starfield B, Kennedy B, Kawachi I. Income in equality, primary care, and health indicators. *J Fam Pract* 1999;48(4):275-284.
- ⁷⁹ Martin-Misener R, McNab J, Sketris IS, Edwards L. Collaborative practice in health systems change: the Nova Scotia experience with the Strengthening Primary Care Initiative. *Can J Nurs Leadership* 2004 May;17(2): 33-45.
- ⁸⁰ Institute of Medicine. Crossing the quality chasm: a new health system for the 21st century. Washington; The National Academies Press: 2001.

