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How Do Health Human Resources Policies and Practices Inhibit Change? A Plan for the Future

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Contents

Highlights	iv
Executive Summary	vi
Acknowledgements	ix
Preamble	1
Introduction	2
Question 1	5
Education in Primary Health Care Initiatives	7
Educating for Teamwork	8
Certification, Licensure and Scope of Practice	9
Question 2	11
New Directions	13
Certification, Licensure and Scope of Practice	15
Redesigning Current Work Environments	15
Question 3	17
High Quality Data Acquisition	20
Modeling and Simulation	21
Networking, Knowledge Transfer and Uptake	22
References	24

Highlights

- To ensure health care system efficiency and effectiveness, health human resource planning activities should be needs based, responsive to a changing system, and outcome directed.
- Policy-makers need to focus their immediate attention on why it remains the case that all health providers are underutilized, and why forms of health care delivery, which are known to enhance their capacity to impact population health (i.e., primary care), are being resisted. Nurse Practitioners need to be more widely utilized in primary health care.
- Educational programs for all health care personnel need to do a better job emphasizing and developing the skills, attributes and, most importantly, the dispositions that are required for working effectively on complex teams.
- HHR educational programs must be planned and delivered based on the health needs of the population. Health, social, political, economic, and technological advances must be considered in the planning, implementation, and evaluation phases of educational programs. Meeting the needs of populations requires an integrated approach to educational programming for health professionals.
- Care must be taken to ensure that public safety is maintained without having the quality of care diminished through the misappropriation of professional structures by factions more concerned with self-promotion and gain.
- Human resource planning needs to be placed within the broader system in which health care services are provided and it must take into account the impact of several important related factors. These include: social, political, geographical, technological, and economic factors, and how these influence the efficient and effective mix of both human and non-human resources.
- We need to redesign current work environments for all health professionals to make them valued places to work where each professional works to his/her fullest scope of practice.
- HHRP must consider the relative needs of communities rather than simply the demand for services as expressed as a function of service utilization.
- Key stakeholders must join together to identify common research needs, existing resources for meeting those needs, available opportunities, and obstacles to overcome in building a truly effective approach to HHRP for Canada.
- Until further development of models occurs, sensitivity analysis will allow policy-makers and planners to have different estimates of required resources from which to plan their service needs and HHRP. The importance of continuously updating estimates cannot be overstated.

- There needs to be a significant investment in creating and maintaining readily accessible databases that allow us to compare differences between and across jurisdictions, to understand the needs, and to determine whether the system is working in effective and efficient ways to meet those needs.
- Health human resource planning should be broad in nature, incorporating the entire health workforce. Key stakeholders including health providers, planners, and government policy-makers must be involved in the entire planning process to facilitate acceptance of the HHRP recommendations made.
- Solid relationships and links between the research and policy communities need to be in place to move HHRP policy-relevant research forward and enhance the use of findings in policy decision-making. There needs to be effective and ongoing coordination of the interaction among government, research and administrative stakeholders through advisory, research, and communication infrastructures.
- Serious consideration, therefore, should be given to the establishment of several standing HHRP research/policy institutes linked nationally through a permanent virtual institute. This, together with an enhanced commitment to ongoing HHRP research/policy infrastructure support, will help forge the links necessary to ensure optimal HHR planning for the future.

Executive Summary

There is no unambiguous “right” number and mix of health professionals. Instead, health provider requirements will be determined by broad societal decisions about the level of commitment of resources to health care, organization of the delivery and funding of health care programs, and the level and mix of health care services provided. Although there may always be more that could be done to meet the health needs of the population, whether more should be done will depend on what other benefits may have to be forgone in order to provide the required resources. That said, health human resource allocation decisions must be based on the best possible evidence. Health human resource planning models attempt to provide such evidence by approximating future planning requirements based on a variety of factors specific to the model being employed. It is critical that we further develop, test, and employ methods that 1) are based on population health needs, 2) reflect the dynamic nature of the health care system, 3) account for the complexity of the relationships between and among a variety of factors, and 4) are outcome directed.

The majority of HHR planning in Canada continues to rely on outdated approaches. Most jurisdictions employ methods based on supply. In other cases, rates of service utilization are also used. Policy/decision-makers have quite understandably come to rely on these methods primarily because data acquisition is relatively easy (i.e., it simply involves counting heads). We believe that the capacity of the system is influenced by broad economic cycles, i.e. the money available for education and health will influence the decisions about HHRP. As a result, we have witnessed the boom and bust of the 70s and the layoffs and reduction in educational enrolments in the early 1990s. Relatively little attention has been paid to demand factors and the health needs of the population. Furthermore, current HHRP practices tend to be intermittent, based on faulty assumptions, reflect one-time-only estimates focusing on single disciplines, and are often in violation of even the most basic measurement principles. These approaches have led to repeated cycles of shortage and surplus of providers. A continued focus on shortages and surpluses, however well these are measured, is unlikely to help determine the efficiency of health human resource levels. The main limitation of current approaches is the failure to reflect the complex nature of the processes underlying the needs for services (population health) and the delivery of services (health care provision), as well as the effects of HHRP on population, provider, and system outcomes.

In contrast to supply/utilization driven approaches, models based on population health needs provide more meaningful information about how to deploy human resources effectively. To build a workforce that is designed to meet the health needs of our communities, HHRP must be based on comprehensive information that promotes sufficient numbers of relevant health providers who can work together in ways that maximize health outcomes. To be optimally effective, needs-based models of health human resource planning require high quality data from a wide variety of sources. Although much of immediate relevance can be accomplished by careful analysis of existing data within the framework of a well defined needs-based HHRP model, there is little doubt that research, policy, and planning initiatives continue to be significantly hampered by a lack of good quality data that are both comparable and comprehensive.

There is a clear need for new forms of knowledge-creation between research and policy sectors. This can be facilitated through the development of partnerships among consumers, researchers and policy-makers that involve regular direct interaction at each step of the research, implementation and assessment phases of HHRP. Building solid relationships and strengthening the links between the research and policy communities will move HHRP policy-relevant research forward and enhance the use of findings in policy decision-making. There needs to be effective and ongoing coordination of the interaction among government, research and administrative stakeholders through advisory, research, and communication infrastructures. Therefore, serious consideration should be given to establishing several standing HHRP research/policy institutes linked nationally through a permanent virtual institute. This, together with an enhanced commitment to ongoing HHRP research/policy infrastructure support, will help forge the links necessary to ensure optimal HHR planning for the future.

In regard to questions about current policies and practices dealing with education, certification, licensure, regulation, and scope of practice, the Commission is cautioned to avoid the temptation of making recommendations that would radically alter the status quo. While there may be positive gains as a result of enhanced flexibility in establishing a wider range of shared competencies among various professions, there is nothing in the form of empirical evidence to support claims that improvements in HHRP could be better served by dissolving existing structures and replacing them with jurisdictional regulation and bureaucratically mandated scopes of practice. In the absence of clear empirical evidence showing that current educational, competency or certification requirements create a real barrier to meeting the health needs of the population, strategies that involve change to current policies and practices need to be introduced only as the outcome of widespread consensus among relevant stakeholders, in the context of open and respectful dialogue.

Dismantling processes that have proven effective in promoting public safety and public trust on the basis of ill-founded claims that, at best, would result in short-lived gains in the number of providers, would at the same time risk creating further frictions between professional groups and governments and serve to undermine public confidence in the system. Furthermore, such approaches are unlikely to create lasting change precisely because they perpetuate the problematic focus on shortages and supply. Educational programs must be planned and delivered based on the health needs of the population. There must be an increased focus on educating for teamwork and education in primary care initiatives. Beyond this, we need to redesign current work environments for all health professionals in order to make them valued places to work where each professional works to his/her fullest scope of practice.

As the World Health Organization has recently stated, now is the time to embark on health human resource planning using an approach that is policy-relevant, integrated, health needs-based, consumer focused, goal and capacity driven, adequately resourced, evidence based, accountable and reflective of the unique and shared competencies of all stakeholders. To begin such an enterprise it is critical for key stakeholders to join together in identifying common research needs, existing resources for meeting those needs, available opportunities, and obstacles to overcome in building a truly effective approach to health human resource planning for Canada and its jurisdictions.

Our key message is this: Health human resource planning needs to be placed within the broader system in which health care services are provided, and it must take into account the impact of several important related factors. These factors (outlined in our Conceptual Model) include social, political, geographical, technological and economic factors, and how these influence the efficient and effective mix of both human and non-human resources. HHRP cannot be performed effectively in isolation of broader health care policy processes. Therefore, we urge the Commission to consider recommendations that promote and support models, practices and strategies for HHRP that are needs based, outcome directed, and explicitly recognize and embrace the complex and dynamic nature of the factors that impact health human resource planning decisions and allocations. Moreover, building solid relationships and strengthening the links between the research and policy communities will move HHRP policy-relevant research forward and enhance the use of findings in policy decision-making. There needs to be effective and ongoing coordination of the interaction among government, research and administrative stakeholders through advisory, research, and communication infrastructures. Therefore, serious consideration should be given to establishing several standing HHRP research/policy institutes linked nationally through a permanent virtual institute. This, together with an enhanced commitment to ongoing HHRP research/policy infrastructure support, will help forge the links necessary to ensure optimal HHR planning for the future.

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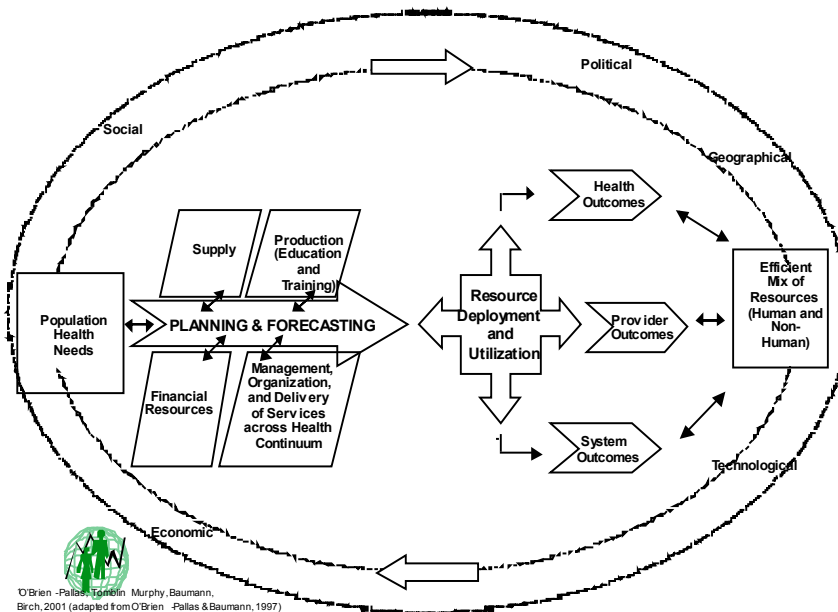
Preamble

Canada's health care system has undergone enormous change over the past few years through reform and economic rationalization. These initiatives have created new challenges for Health Human Resource Planning (HHRP). Every health profession has been affected in terms of levels of demand for their services, roles played, and skills required. Positions have been downsized, restructured, and in some cases eliminated. The nature and scope of practice within and among health professions have been altered, often dramatically. Effective health human resource planning has become critically important in this environment of change. However, current work in this area is intermittent and there is little evidence that current planning practices consider trends in society, determinants of health, needs of consumers, and the unique and shared knowledge and skills of providers. Typically, planning has been based on health care system utilization patterns and/or current fiscal commitment. There is growing consensus in the literature that the continuous cycles of over and under supply of health human resources world-wide reflects the inadequate projection methods used to estimate future requirements for expanding health systems and/or the failure to consider the evidence supplied by ongoing labour market trends. Health human resource planning in most countries has been poorly conceptualized, intermittent, varying in quality, profession-specific, and without adequate vision or data upon which to base sound decisions. In Canada, the growing recognition of the serious consequences of poor HHRP practices has led the Canadian Institutes for Health Research (CIHR) and the Canadian Health Services Research Foundation (CHSRF) to identify health human resource planning as the dominant health policy issue for the next five years (Birch, O'Brien-Pallas, Alksnis et al. 2002). To ensure system efficiency and effectiveness, planning activities should be needs based, responsive to a changing system, and outcome directed (O'Brien-Pallas 2002).

Introduction

The three specific questions posed by the Commission regarding Health Human Resource Planning (HHRP) can be seen to intersect around a single common theme, *viz*: that health human resources must be matched as closely as possible to the health needs of the population. It is, however, precisely in this regard that historical approaches to HHRP have failed. The recurrent cycles of over and under supply that continue to plague Canada and other OECD countries can in part be traced to the fact that while the stated goal of HHRP is to match human resources to *needs*, the theoretical models and empirical tools used to inform HHR allocation decisions have concentrated primarily on measuring *demand* for services (as measured by utilization rates), thus making them poorly suited to the creation of a useful predictive framework. It is being increasingly recognized that factors which affect the matching of supply to needs (rather than simply matching supply to demand) are many and varied. Recognition of this fact suggests the need for the development, testing and utilization by decision-makers of a dynamic model that adequately accounts for both the number of influencing factors and how each factor is likely to influence others. It is for this reason that we structure this Discussion Paper around a Health Human Resources Conceptual Framework developed by the authors and colleagues, and that has been adopted recently for use by the Canadian Institute for Health Information (CIHI) and adapted for the World Health Organization (WHO). Our purpose in employing this conceptual framework here is not to promote the framework *per se*, but rather to use it as a reference point in our discussion of the Commission's questions and to show how the various factors that influence HHR planning cohere.

Health Human Resources Conceptual Framework



As with any other journey, unless we have a road map to provide direction and indicate the overall terrain leading to our destination, the odds are small that we will take the most direct route. According to Hall (1993), the human resource process comprises three inter-related steps: planning, production, and management. The focus on one component at the expense of the others does little to ensure an effective and efficient health care system (O'Brien-Pallas, Baumann, Birch et al. 2000). Yet, a review of HHRP work done to date reveals that these conceptual linkages have not been made. Our dynamic, open-system-based framework considers these linkages by defining the key elements of human resource planning (O'Brien-Pallas 2002). We have found the framework to be an invaluable aid in navigating our way through the varied and rapidly changing terrain of our own HHRP research and modeling activities; therefore, it seems quite natural that we should adopt it as the road map to guide us in responding to the important questions posed by the Commission.

Although we will touch on various aspects of the model throughout the paper, it will be helpful at this point to define briefly some of the key elements of the framework in order to orient the reader to the complexity and dynamic nature of HHRP and to indicate to which questions particular elements of the framework are most relevant.

- **Population health needs** reflect the multivariate characteristics of individuals in the population that create the demand for curative as well as preventive health services; addressing the health needs of the population provides the motive, context, and justification for HHRP practices. [Questions #1, #2 and #3]
- The **production** element of the framework highlights that in order to ensure future capacity to meet population health needs, these needs must be considered in setting production targets for health education and training programs. [Question #1]
- The **supply** element reflects the actual number, type and geographic distribution of regulated and unregulated providers; it also recognizes that supply is fluid and is related to production elements as well as to factors such as recruitment/retention, licensing, regulation, and scope of practice. [Questions #1 and #2]
- **Planning and forecasting** reflect the varieties of available HHRP practices and models, their assumptions, methods, data requirements, and limitations. [Question #3]
- **Health, provider and system outcomes** refer to establishing the effectiveness and quality of health human resource practices by examining their effect on population health, provider health, job satisfaction, etc., and system costs and efficiencies. [Question #2]
- **Efficient mix of human and non-human resources (e.g. fiscal resources, physical plant, space, supplies, equipment and technology)** reflects the number and type of resources that must be developed in order to achieve the best population, provider, and system outcomes.
- **Context** elements (represented in the outer band of the framework) speak to the need to recognize factors outside the health care system that influence population health, the health system and the health human resource planning process. [Questions #1, #2 and #3]

Using this conceptual framework as a heuristic device will allow us to more precisely locate and better articulate the strengths and limitations of various candidate approaches to HHR planning. Employing the framework will also force us to keep in mind the subtle interplay of variables in a way that will help us predict the direct and indirect consequences of proposed or anticipated change in any one factor.

We will proceed by drawing on the existing academic literature, the grey literature, and the experiences of jurisdictions in Canada and the OECD countries to describe, analyze, evaluate and provide our opinion (i.e., recommendations) concerning HHRP practices.

Specifically, for each question we will:

- describe the current state of practice and knowledge about HHRP
- compare and contrast the common approaches to HHRP
- discuss the relationships among the various factors affecting HHRP [with emphasis on those factors that relate directly to the Commission's questions]
- articulate the strengths and limitations of the various approaches to HHRP as these relate to the issues and choices facing the Commission
- suggest ways that knowledge acquisition, dissemination and uptake can be enhanced
- suggest steps that can be taken in both the short and long term to enhance HHR research and planning
- urge the Commission to make recommendations that promote and support HHRP models, practices and strategies that are needs based and explicitly recognize and embrace the complexity and dynamic nature of health human resource allocations.

Question 1

Do current HHR educational programs produce a workforce with the capacities and perspectives to meet the needs of the population in an environment of a rapidly changing and increasingly integrated health care system? If not, what changes should be made? Are policies and practices governing scope of practice, certification, and licensure of health care occupational groups up-to-date and consistent with contemporary health system goals and directions? If not, how might they be changed to promote desirable innovation and change while at the same time preserving quality and protecting the public interest?

This question relates directly to both the *production* and *supply* elements of HHRP. Recall from the HHR Conceptual Framework that in order to meet population health needs, these needs must be considered in setting production targets for health education and training programs. Typically, however, production targets have been established simply on the basis of employer projections, which are in turn typically based on historical utilization rates together with the number of workers historically designated to service those rates. Although, in some cases, demographic change has been used to inform these projections, in most cases this has not gone beyond consideration of simple age and sex distribution. Furthermore, the actual health needs of the population have not been likewise accounted for. While it is clear that both demographic and epidemiological data are useful in determining the number of learners required to create an adequate future workforce, these factors, together with the *context* elements associated with changes in the funding, values and delivery of health care, also have a role to play in the way the future workforce is educated. Specifically, the political and geographical factors of the HHR Conceptual Framework are key components that influence all aspects of HHRP. Decisions about HHR are not always rationally based. To the contrary, decisions regarding health professions education and recruitment are often taken in order to quell community outrage and/or to politically support particular communities.

Recall further that the supply element of HHRP reflects the actual number, type and geographic distribution of regulated and unregulated providers; it also recognizes that supply is fluid and related to production elements as well as to factors such as recruitment/retention, licensing, regulation, and scope of practice. Again, it must be emphasized that the supply element, like the production element, is both influenced by and has an influence on population health needs. Much like the production element, the supply element is also greatly influenced by a variety of contextual factors. It is critical to have the right providers working with Canadians to meet their health needs. We need to consistently ask ourselves if we have the right (appropriately educated and trained) health care providers working in the right location to meet the health needs of the population. While there is no unambiguous right number and mix of health professionals, all health care professionals need to practice to their fullest capacity, within their scope of practice.

In a paper recently published by the Commission on the Future of the Health Care in Canada (2002), it is pointed out that there are more than 30 “regulated” health professions in Canada and that their roles, while said to be unique, often overlap. Changing scopes of practice based on the

needs of the population is a challenge as there are tensions between and among health professions that are complicated by union contracts and issues of self-regulation. However, the evidence is mounting regarding positive health, system, and provider outcomes associated with multi-skilled workers, higher ratios of registered nurses (RN), nurses working in advanced practice roles, and baccalaureate preparation (Horrocks, Anderson, and Salisbury 2002; Needleman, Buerhaus, Mattke, et al. 2002).

There is currently a great deal of debate (more so in political circles and hospital corridors than in the literature) about the increasing length of educational programs and the growing number of health occupations now requiring a four-year university degree for entry to practice. The common perception is that this lengthens the time it takes to get new providers into the workforce and that this is counterproductive in meeting the demands of a human resource-starved sector. A common solution being proposed is to shorten educational programs, make them more task-specific, and introduce locally determined competency requirements and certification processes that would be under substantial control of jurisdictional governments and local health care facilities. While it is easy to understand why such an approach has gained political cachet, there is no evidence to suggest that it would provide anything more than an extremely short-term fix for long-standing problems of episodic over and under supply that are known to be associated with poor planning. Furthermore, such approaches fail to recognize that human resources differ in kind from non-human resources. Human resources are unique insofar as people have preferences and exercise these preferences in ways that make them less predictable, and therefore less amenable to distribution than non-human resources. Human resources are likely to actively resist and undermine distribution schemes that do not accord well with their preferences or that they find otherwise unacceptable (Hubert 2002). We know for example that a sense of autonomy and control over decisions that affect individuals and their work lead to enhanced job satisfaction, which in turn has a positive impact on retention (as well as on a number of work-performance indicators).

What is clear, however, is that given the rapid rate of change in the way health care is delivered, preparing graduates only for present conditions is in fact preparing them for the past. The focus of health professions' education must be on preparing graduates for a future that remains largely unknown. This means providing them with knowledge and skills that are easily transferable and that will allow them to manage uncertainty and adapt readily to change. According to the American Council of Medical Colleges (2001), a well rounded health professional demonstrates the following attributes: literacy, clinical competence, lifelong learning skills, evidence-based practice, interdisciplinary teamwork, balance between health care and disease prevention/health promotion, inculcation of professional values and ethical behaviour in practice, optimal use of resources and consciousness of well-being of self and colleagues.

The answer to whether providers with these attributes are in fact being educated in the current system will depend to a significant degree on which professional group we are talking about. Since various health occupational groups typically have different roles within the system, their education and training is likely to vary accordingly. Furthermore, while task-specific learning (i.e., training) can be accomplished equally well for most health occupations in a variety of settings and via a number of program delivery models (e.g., colleges, hospitals, technical

schools, universities, etc.), others among the above-described attributes are best learned within the academy (i.e., universities). We have learned from the experience of nursing that one of the advantages of a broad based health professions education is that it tends to better prepare graduates for change. Role expansion, changes in practice venue, and additional task-specific learning are easier to introduce and to adapt to if built on a strong platform of undergraduate education. According to O'Brien-Pallas, Doran, Murray et al. (2002), clients cared for by degree-prepared nurses in the community demonstrated improved knowledge and behaviour scores. Similarly, visits performed by degree-prepared nurses resulted in fewer total visits and improved RN perceptions of visit adequacy (O'Brien-Pallas, Doran, Murray et al. 2001).

Education in Primary Health Care Initiatives

Consider as an example that primary health care delivery is continually touted as being a high priority for policy-makers and health care leaders in every jurisdiction throughout the country. While significant efficiencies and gains in population health have been reported in OECD countries that have moved toward a primary health care model, there is little evidence in Canada that current strategies to redesign care settings have incorporated the principles of primary health care. This is due to a number of factors. First, there is a lack of understanding about what primary health care actually means; there continues to be a misperception that it should be physician centred. Second, the requisite shift in policy as well as a change in thinking among health care workers, bureaucrats, politicians and the public has not yet taken hold. For example, while university schools of nursing across the country have for several years now been structuring their curricula around a focus on primary health care, medical faculties have been slow to do likewise. We believe that the tardiness to respond to the need for change in educational programs based on the principles of primary health and the needs of people speaks to the continued domination of the medical model of health care.

Much of the resistance to adopting a primary health care model has to do with the continued limitations placed on the scope of practice of other health professionals by medicine—this, despite the fact that we know outcomes for people have been positively associated with nurses working in advanced practice roles. For instance, nurses have proven to be efficient and effective care providers who need to be utilized according to evidence that shows where they can have the greatest impact on population health. Numerous studies have demonstrated the effectiveness and efficiency of utilizing registered nurses in a variety of settings and roles supportive of direct clinical services and population-based approaches (Prescott 1993; Brown 1994; Shamian and Chalmers 1996). Nursing interventions have been associated with positive health outcomes involving personal health knowledge, treatment adherence, health maintenance, follow-up return, accessibility of care, and patient satisfaction (Brown, 1994; Shamian and Chalmers 1996). Nursing actions have also been associated with increased capacity to function well in daily life (Prescott 1993; Doran, McGillis Hall, Sidani et al. 2001). Data show that advanced practice nurses facilitate continuity of care, access to care in rural and other settings, and the provision of care to underserved populations (Shamian and Chalmers 1996). Advanced practice nursing results in enhanced health outcomes such as reduced rates of smoking and alcohol use (Green and Simons-Morton 1984), shorter hospital stays (Brooten, Jumar, Brown et al. 1989; Cohen 1991; Ethridge 1991; Ethridge and Lamb 1989; Lamb and Huggins 1990; Marchette and

Holloman 1986; McKenzie, Torkelson, and Holt 1989; Naylor 1990), decreased hospital admissions, and more appropriate office visits (Prescott 1993; Shamian and Chalmers 1996). It has also been shown that better health outcomes occur when the advanced practice nurse and physician work together (Schultz, McGlone, Kinderknecht et al. 1977). Such nursing interventions enable patients to maintain their health and thus reduce the costs associated with more expensive medical and emergency services (Brown 1994; Denton, Gafni, Spencer et al. 1983). More recently, a systematic review of whether nurse practitioners working in primary health care can provide equivalent care to doctors concluded that increasing the availability of nurse practitioners in primary health care is likely to lead to high levels of patient satisfaction and high quality care (Horrocks, Anderson, and Salisbury 2002). Studies designed to determine the impact of the role of other health professionals on health outcomes are not apparent in the literature.

It appears clear that, at least in the case of nursing, the current system of education has served the population well and prepared nurses for changing roles within the health care system. This is not to say that alterations in the way that we educate nurses (i.e. movement towards baccalaureate education) are not required as health systems and population health needs are better understood. However, policy-makers need to focus their immediate attention on why it remains the case that nurses are underutilized, and why forms of health care delivery that are known to enhance their capacity to impact population health (i.e., primary health care) are being resisted. Mr. Romanow will recall that when, during a recent public consultation, he asked a group of Ontario nurses why they had not had a greater impact on making primary health care a reality, the powerful one-word answer given by a single nurse was “power.”

Educating for Teamwork

Health human resources do not provide care in isolation; instead they use their knowledge and skills in combination with other human and non-human resources (e.g., fiscal resources, physical plant, space, supplies, equipment and technology) to provide services to meet the needs of the population (Birch, O’Brien-Pallas, Alksnis et al. 2002). It has long been recognized that both institutional health care and primary health care require a high degree of teamwork. Educational programs for all health care personnel need to do a better job emphasizing and developing the skills, attributes and, most importantly, the dispositions required for working effectively on complex teams. This is important since we know that teamwork: 1) reflects the reality of much of modern health care, 2) is associated with increased efficiencies and effectiveness, 3) enhances inter-professional cooperation and decreases turf wars, 4) reduces errors and increases patient safety, and 5) has a positive impact on working relationships and job satisfaction. However, other than within a few progressive HHR education programs (and in even fewer workplaces), there is little in the way of meaningful opportunities to create well-functioning health care teams. The way health care professionals combine knowledge and skills for the shared benefit of patients has direct implications for the health care production function (i.e., the relationship between the levels and mix of resources used to produce health care services and the quantity and quality of services produced). The challenges in providing team-oriented educational programs are particularly daunting in rural areas. However, with the advent of technologies (e.g. Web Course Tool, other distance delivery innovations), creative

teaching strategies may facilitate ongoing dialogue between and among the health professions during their participation in educational programs. It is also essential that team teaching and learning experiences are carried through to, and made available in, the clinical setting.

It is important to re-emphasize that all HHR educational programs must be planned and delivered based on the health needs of the population. Health, social, political, economic and technological advances must be considered in the planning, implementation and evaluation phases of educational programs. Meeting the needs of populations requires an integrated approach to educational programming for health professionals.

Certification, Licensure and Scope of Practice

A common theme appears to be surfacing in many health care jurisdictions that existing policies and practices related to certification, licensure and regulation (particularly self-regulation) present unreasonable obstacles to positive change, innovation and better health care. There appears to be a growing consensus among bureaucrats and health care CEOs that they would be better able to improve health care and ensure adequate supplies of the right type and mix of health care workers if only the traditional professional boundaries could be dissolved and replaced with jurisdictional regulation and bureaucratically mandated scopes of practice. There is nothing in the form of empirical evidence to support this claim. It is, however, easy to see why policy-makers interested in finding a quick fix for pressing HHR shortages would be attracted to the notion of cutting the length of educational programs and putting scope of practice under their own control. However, in the absence of clear empirical evidence that current educational, competency or certification requirements create a real barrier to meeting the health needs of the population, strategies that involve wholesale change to current policies and practices need to be introduced only as the outcome of widespread consensus among relevant stakeholders in the context of open and respectful dialogue. Given that there are a variety of higher priority (and less politically troublesome) issues at hand, we suggest that the discussion of such strategies is premature. Furthermore, there has not yet been reasonable expert or public/political consensus reached about what one has in mind when speaking of the “desirable innovation and change” that current policies and practices are ostensibly blocking.

This is not to say, however, that significant positive change may not come about as a result of alterations in the scope of practice and flexibility in establishing a wider range of shared competencies among various health professions. In fact, the philosophy of primary health care to which we subscribe depends on just such a willingness to be flexible about the boundaries of each profession. Whether primary health care is a success will, in large part, be a function of the degree to which medicine is willing to relinquish authority and blur scope of practice boundaries. This, however, does not require abandoning professional self-regulation, particularly if this is done in favour of centralized bureaucratic regulation. Such a move would likely diminish rather than enhance public confidence and trust in the health care system. Health care professionals (especially nurses) have higher public trust ratings than other occupations (including the clergy) and certainly higher than politicians and bureaucratic mechanisms (Pollara 2000). In addition, the costs involved in replacing existing licensing and regulatory structures for all health disciplines that currently regulate their own activities at their own expense, would add an

additional financial burden to the health care system, with the possible consequence that health services would be further jeopardized.

We want to make a further point about the role of self-regulation, certification and licensure. Messages from a variety of stakeholders suggest that the collective bargaining voice of health occupations is drowning out other reasoned voices and has, to some degree, marginalized the voices of those who have as their mandate public safety (i.e., professional bodies). In the case of nursing, for example, the media captures messages about labour strife and demands for higher pay, and the rhetoric of those who have an interest in preserving the status quo soon becomes that if nurses are allowed to provide services historically provided by physicians, they will soon be demanding similar levels of compensation, with the consequence that any intended savings to the health care system will be lost to new wage demands. What the media and others typically do not capture is how the scope of practice of all professionals could be realigned to better meet the health needs of the population.

Unlike the development of labour unions, which are unapologetically intended to serve first the interests of the group, professional associations and similar governing bodies are ostensibly designed to protect the public and enhance service through mechanisms that promote and enforce a commitment to standards and values. The downside of professionalization is that exclusive territories are created in which a particular group is allowed to operate without undue interference from governments or the encroachment of other professions. While created in the name of public protection, the line between public interest and professional self-interest is, by its nature, an extremely thin one. Care must be taken to ensure that public safety is maintained without having the quality of care diminished through the misappropriation of professional structures by factions more concerned with self-promotion and gain.

Question 2

What are the main strengths and weaknesses of current approaches to HHRP nationally and provincially/territorially? What changes should be made in the approach to HHR planning to ensure an adequate supply of qualified personnel to meet the needs of the population? What impact would alterations in current policies and practices governing scope of practice, certification, and licensure of health care occupational groups have on the future health care workforce? How will we balance the losses in this regard with the gains?

The majority of HHR planning in Canada and its jurisdictions continues to rely on outdated approaches. Most jurisdictions employ approaches based on supply, given that in most cases these data are readily available and, in some cases, are the *only* ones available. In other cases, rates of service utilization are also used; however, such data are not generally available, and when they are available they are typically confined to physician utilization. Furthermore, current approaches to HHRP tend to be intermittent, based on faulty assumptions, one-time-only estimates focusing on single disciplines, and often in violation of even the most basic measurement principles. These approaches have led to repeated cycles of shortage and surplus of providers. Simplistic approaches which ignore the complexity of the health care system have avoided consideration of why we provide health services and the impact of these services. It is critical that we improve our ability to plan health human resource requirements (Birch, O'Brien-Pallas, Alksnis et al. 2002).

Birch first described what has become the standard distinction among the three methods of HHRP: (*utilization based* [how many health professionals are required to serve the population in the same way as the current population?]; *needs based* [how many health professionals are required to meet the needs of the population?]; and *effective-demand based* [how many health professionals are required to support society's commitment to health care?]) and their related assumptions, questions, and methods (Lavis and Birch 1997; O'Brien-Pallas, Baumann, Birch et al. 2000). Many approaches have been developed and tested to estimate the health human resources required. Birch emphasizes that HHRP has largely been an exercise in demography based on implicit assumptions that population structure determines the service needs of the population, and that the age of providers determines the quantity of care provided (Birch, O'Brien-Pallas, Alksnis et al. 2002)). The main limitation of such approaches is their failure to reflect the complex nature of the processes underlying the needs for services (population health) and the delivery of services (health care provision), as well as the effects of HHRP on population, provider and system outcomes (Birch, O'Brien-Pallas, Alksnis et al. 2002).

Several reports have highlighted the limitations of these approaches, and recommendations have been made for improving the related processes (Lomas, Stoddart, and Barer 1985; Barer and Stoddart 1991; Birch, O'Brien-Pallas, Alksnis et al. 2002). A focus on shortages and surpluses has not assisted in the determination of the efficiency of health human resource levels. In fact, shortages may actually reflect problems of management such as work and care delivery models. Changing roles and demographics of a younger generation workforce seem to influence work participation. The changing work commitments among younger male and female

physicians are thought by many physicians to be one of the root causes of the current shortage (e.g. choosing to work 40-hour instead of 70-hour weeks) (Standing Senate Committee on Social Affairs, Science and Technology 2002).

Over the last decade major changes have occurred in the delivery of health care services. For example, there has been a major shift in the balance of care away from inpatient and institutional settings toward outpatient and community and home settings. Because these different approaches to service delivery involve different levels and mixes of resources, the changing balance of care will have implications on health human resources requirements (Birch, O'Brien-Pallas, Alksnis et al. (2002).

Birch, O'Brien-Pallas, Alksnis et al. (2002) argue that health human resource requirements should be considered along with the relationship between the levels and mix of resources used to produce health care services and the quantity and quality of services produced. The efficient and effective mix of human resources is determined by the interaction of the several elements of the HHR Conceptual Framework. This provides an evidence-base for exploring the implications of health care policies for planning future health human resources. This includes policies associated with education, certification, licensure and scope of practice.

Human resource planning needs to be placed within the broader system in which health care services are provided, and it must take into account the impact of several important related factors. These include: social, political, geographical, technological and economic factors, and how these influence the efficient and effective mix of both human and non-human resources. Political and geographical factors cannot be overlooked in responsible HHRP. The issue of political will is an important one. The human resource challenges we are facing today have evolved slowly over the last 50 years. Past mistakes cannot be overcome within the timeframe of a single or even a second political mandate. There needs to be sustained HR planning efforts by policy-makers and key stakeholders, which is very difficult when faced by changing governments and political agendas. Policy-makers and researchers must work in concert to keep the health policy issues relevant, easily understood, and practical. Geographical factors (urban and rural) must be considered in HHRP. With the appropriate data availability, the HHR Conceptual Framework can be applied to both urban and rural areas. However, ecological (i.e., transferring results from aggregates to individuals) and atomistic fallacy (i.e., researching exclusively at the individual level, thus failing to account for the context in which the individual action occurs) must be considered in understanding and planning for the geographical variations in needs. The issues of recruitment and retention of health providers are unique in rural Canada.

HHRP cannot be performed effectively in isolation of broader health care policy processes (O'Brien-Pallas, Birch, and Murphy 2001; CIHI 2001). In nursing, for example, care requirements associated with decreased lengths of stays have been the result of new care delivery methods such as same-day procedures. This change in technology involves changes in the nurses' role in the delivery of care, which often includes an increase in work intensity. According to Birch, O'Brien-Pallas, and Alksnis et al. (2002), while planners can react to this by allocating fewer nurses to work with a patient population that we assume will pass through the hospital more quickly, this form of planning will perpetuate nursing shortages, if adequate consideration is not given to the concomitant increase in the level of work intensity. As a case in

point, the decision made in the 1990s to reduce the number of hospital beds in Ontario had major implications for human resource requirements. In the absence of equiproportional reductions in the number of episodes of all levels of severity, additional nursing inputs per episode were needed to support the technological innovations that were required to reduce hospital lengths of stay (Birch, O'Brien-Pallas, Alksnis et al. 2002).

New Directions

The approach we are advocating begins by examining the dynamic nature of population health needs. Population characteristics related to health levels and risk reflect the varied characteristics of individuals in the population that create the demand for curative and preventative health services. Consideration must be given to people's responses to their environment, the economy, and the accessibility and quality of their health care system. Outcomes must drive the HHRP process. The outcomes of interest are related to the system, providers, and the health of Canadians (O'Brien-Pallas et al. 2002).

HHR has been supply driven with very little attention paid to demand factors and needs of the population. Demand factors are varied and may impact on the future demand for health resources. A comprehensive HHR model needs to address as many of these factors as possible. These demand factors may include: population demographics, innovations or technology, availability of treatment and options, patient attributes, waiting lists, access to services, service utilization, incidence of disease (medical diagnosis) which drives utilization, and health professionals' work patterns. At the most general level, demand factors interact with the supply of health personnel to create future requirements. The concept of "demand" is a critical one in HHRP. There is, however, little consistency in the meaning and use of related terminology. Demand factors are really utilization factors. Research, policy and practice in HHRP will need to go beyond demography to avoid endlessly replicating the cycles of boom and bust in the availability of health human resources (Birch, O'Brien-Pallas, Alksnis et al. 2002).

HHRP also needs to be integrated. Integrated health human resource planning involves determining the number, mix and distribution of health providers that will be required to meet population health needs at an identified future point in time. This requires integrating HHRP with service planning. HHRP should occur over a longer planning horizon than has been the practice to date. Short-term planning is aimed at ensuring that resources for health are allocated and managed in an efficient and effective manner. Service planning activities are concerned with how many and what type of health resources will be allocated among different sectors and among human and physical capital such as technology, drugs, human resources, and renewing existing or planning for new infrastructure. The same basic principles that underpin good HHRP practice also underpin good service planning. If done properly, service planning and HHRP activities should be mutually supportive. Both should be seen as part of a continuous quality improvement process which is updated at least bi-annually and where each activity informs the other. Both sets of activities should be based on evidence of best practice and current research. Where available, labour market analysis is a useful tool for understanding the shortfalls of previous planning decisions, gaining insight into the current HHRP and planning context, and for providing clues for future corrective action to be taken along the planning horizons

(O'Brien-Pallas 2002). It is important, however, to emphasize that data and the management of data is not enough. A vision of the health care system is needed to guide and frame practices and research. This vision must be sensitive to the multiplicity of factors outlined in the HHR Conceptual Framework and provide simulation modeling opportunities to test new health care delivery strategies before implementation (e.g. to study the impact of program management on health, system, and provider outcomes prior to implementation would have been an important lesson learned).

Because HHRP must determine how many health professionals are needed to meet population health needs, it must examine questions such as substitution and skill level within and between professional groups. In addition, the WHO has suggested that the relative price of different skill categories should be used to help guide decisions about the most efficient mix of workers in jurisdictions where labour markets are functioning. As suggested in response to Question #1, consideration of the skill level of providers must be made judiciously and based on the evidence from ongoing research. For example, some jurisdictions have used the ratio of other providers to the number of physicians in determining future requirements for integrated workforces. However, as health restructuring moves out of the hospital or clinical setting to non-traditional service venues, the number of other personnel might need to be unbundled from the ratio of physicians to ensure that full scopes of practice as defined in legislation and, in practice, work to the advantage of the population. Failure to do so could create inefficient substitutions which would lead to wasteful duplication of services. Focusing on the number of physicians as the starting point obfuscates the contribution of all other health team members and leaves us functioning in a medical model of health care. Furthermore, there is a direct correlation between the ratio of nurses to patients and the health outcomes of the patients (Canadian Nursing Advisory Committee 2002). Higher ratios of RNs have been linked to increased patient satisfaction, enhanced quality of life, fewer in-hospital complications, shorter hospital stays, reduced costs (California Nurse 1999), lower rates of urinary tract infections and upper gastrointestinal bleeding, lower rates of pneumonia, shock, and cardiac arrest (Needleman, Buerhaus, Mattke et al. 2002). Higher proportions of Registered Nurses and Licensed Practical Nurses in the staff mix are associated with better patient satisfaction and health outcomes including lower rates of medication errors and wound infections (McGillis Hall, Irvine Doran, Baker et al. 2001). However, we do not advocate standardized nurse-to-patient ratios until further research is available to inform this process.

A report on the roles and utilization of Licensed Practical Nurses (LPN) and Care Aides (2000) confirms that British Columbia has the lowest LPN-to-RN ratio in Canada, and that LPNs here are not utilized to the full scope of their competencies. Other factors identified for the low utilization of LPNs were jurisdictional conflict with RNs and the inability to recruit qualified LPNs.

Little evidence regarding the impact of ratios of other health professionals to patients and the staff mix outcomes beyond nursing and medicine are available. To move us into the 21st century, we need to make a concerted effort to move away from old and safe approaches and embrace conceptual and analytical complexity. This includes a focus on outcomes and integrated planning in order to provide efficient and effective health services for future generations.

Certification, Licensure and Scope of Practice

Although breaking down inter-professional borders and allowing for greater overlap in scopes of practice are likely to enhance equity in the division of health care labour, create the conditions necessary for the exploration of more flexible/efficient delivery models, and contribute positively to patient outcomes, decision-makers need to take caution in selecting the appropriate mechanisms and processes for working toward this goal. Historically, professional spheres of responsibility and influence have been closely guarded and vehemently defended. Certification, licensure and self-regulation have been the traditional weapons with which professional territories have been defended and new territories captured. Although medicine is arguably the most sophisticated and successful defender of its territory, other professions such as nursing have also used legal and political mechanisms, ostensibly designed to protect the public, as instruments of self-interest by which to gain professional advantage. Calls for self-regulation by other health occupational groups and the move from diploma training to baccalaureate entry-to-practice requirements are interpreted by many as simply a status-enhancing exercise unlikely to contribute positively to health outcomes. Employers, however, are increasingly demanding greater employee preparation in areas such as: communication skills, workplace management, coping skills, and general knowledge of the health system. These topics are not components of traditional diploma programs, but are visible in university-based delivery models.

However, as suggested in Question #1, since public protection is the mandate of licensing/professional bodies, careful consideration needs to be taken to understand where these points of view both converge and diverge from that of the labour unions. Furthermore, it is doubtful that public support could be garnered for initiatives that would usurp the authority and scope of existing professional bodies, which are, with good reason, perceived to be performing well in their public protection mandate. Attention does need to be directed toward issues of recruitment and retention and the role of work environments in the production function.

Redesigning Current Work Environments

We need to redesign current work environments for all health professionals in order to make them valued places to work, where each professional works to his/her fullest scope of practice. Work environments vary across jurisdictions and especially between rural and urban Canada. Numerous reports outline the problem. Fewer reports set directions for the future. In July 2002, the report of the Canadian Nursing Advisory Committee was released to the Deputy Ministers of Health. The recommendations address the main issues identified as barriers to a quality workplace for Canadian nurses including: the need to increase the number of nurses; the need to improve education and maximize the scope of practice of nurses; and the need to improve the working conditions of nurses. Furthermore, factors influencing nursing job satisfaction and retention are highlighted with a clear message that “the more important variable ... is the political will (at all levels) to implement the changes and strategies we know are central to creating high quality workplaces (Canadian Nursing Advisory Committee 2002, 28). This report not only identifies evidence-based strategies, but also is presently determining the costs associated with implementation of these strategies across Canada. While focused on nursing, it is likely that the report will also inform decision-making in regard to other health professions. Given that more

than half of nurses and some other providers in this country will be eligible to retire in the next five to ten years, time is of the essence.

In a report prepared by the Canadian Medical Association (CMA, 2002), physician workforce issues are identified as being of paramount importance to the Canadian Medical Association (CMA). The CMA has been involved in a number of physician workforce related initiatives resulting in a series of formal policies addressing physician resource planning, rural and remote practice issues, physician health and well-being and physician compensation. Similar to nurses and physicians, allied health care providers report difficulty in recruiting students, aging workforces, high levels of fatigue and burnout. In addition, they are predicting nation-wide shortages in the next five to fifteen years (Standing Senate Committee on Social Affairs, Science and Technology 2002). According to the WHO (2001) integrated, multidisciplinary, collaborative and cooperative models are required for workforce planning. Governments are establishing action plans to deal with workforce issues. Common features include: better utilization and distribution of health professionals, increased cooperation between providers, enhanced education for health professionals, and the development of guidelines for safe staffing.

Human resource planning processes need to focus not only on how many and what type of providers we need, but also on creating incentives to keep our current supply in the workforce for as long as possible and to ensure each practitioner is able to make their full contribution (O'Brien-Pallas 2002).

Question 3

What are the assumptions associated with different approaches to HHRP and what are their related strengths and limitations? What is the best approach to ensure that we develop a plan with meaningful numbers, types, and mix of professionals to best meet the needs of the population?

Nursing, physician, and other health professional shortages are being experienced in Canada and other OECD countries. Policy-makers, health care leaders and researchers are interested in developing a meaningful, long-term approach to health human resource planning. This will require collaborative efforts to develop effective mechanisms and policies for establishing, monitoring, and predicting health professional requirements to meet the health needs of the population (Sechrist, Lewis, and Rutledge 1999). It is critical that resource allocations be based on the best possible evidence. Health human resource planning models attempt to provide such evidence in the context of determining requirements for health care workers by approximating future planning requirements based on a variety of factors specific to the model being employed. Regardless of which model is used, however, sound methods of study design and data analysis must be used if the evidence is to be meaningful. To complicate matters, HHRP research is a nascent discipline for which a firm scientific basis has not yet been fully worked out and tested. Methods for predicting human resource requirements are few in number and those available for use continue to be plagued with methodological and conceptual difficulties (O'Brien-Pallas, Birch, Baumann et al. 2001).

In order to move beyond current practice, it is important at the outset to gain some familiarity with the three available approaches to HHRP (utilization based, needs based, and effective demand based) and their related assumptions, questions and methods. Proceeding in this fashion will help make clear that the needs-based approach we are advocating has evolved from the experience gained working with utilization-based frameworks. The table below presents the basic assumptions, questions and methods of each approach in a way that is designed to highlight the evolution toward a needs-based approach. It is a supplement to the text descriptions that follow. It must be stressed that factors such as supply and utilization rates are important pieces of the HHRP puzzle; therefore, these data play an important role in the overall structure of a needs-based model. The intent is not to jettison what is valuable in current practice, but rather to build an approach that better reflects the complexity and dynamic nature of the health care system.

In utilization-based models the quantity, mix and population distribution of current health care resources are adopted as a baseline for estimates of future requirements. As shifts are predicted in the basic (i.e., age and sex) demographic characteristics of the population, these are compared to current baseline factors in order to derive predictions about future requirements. This approach, however, is limited by the fact that utilization rates are dramatically affected by factors other than the population characteristics typically included in utilization-based models (Lavis and Birch 1997; O'Brien-Pallas, Baumann, Birch et al. 2000).

*How Do Health Human Resources Policies and Practices Inhibit Change?
A Plan for the Future*

Approach	Assumptions	Question	Method
Utilization based	<ul style="list-style-type: none"> - Current level, mix, distribution of services is appropriate. - Appropriate level, mix and distribution remain constant. - Estimated future demographic profile is accurate. 	How many health professionals are required to serve the future population in the same way as the current population?	<ul style="list-style-type: none"> - Uses population-based utilization rates as a baseline. - Applies rates to demographic profile of future population.
Needs based	<ul style="list-style-type: none"> - (All) health needs can and should be met. - Cost-effective methods can be identified and implemented. - Unmet needs are caused (only) by inadequate supply. - Non-needs/non cost-effective use of resources can be eliminated. 	How many health professionals are required to meet the health care needs of the population?	<ul style="list-style-type: none"> - Population-based rates of health problems replace population-based use of services. - Identifies human resource requirements for solving population's health problems. - Applies rates to demographic profile of future population.
Effective demand based	<ul style="list-style-type: none"> - Health needs are only one of a set of social priorities. - Definitions of need are less than precise. - There are clear possibilities for resource trade-offs. 	How many health professionals are required to support society's commitment to health care?	<ul style="list-style-type: none"> - Estimates the size of the economy supporting health care. - Estimates the proportion of the economy devoted to health care. - Estimates the proportion of health care expenditures allocated to health services. - Estimates the number of health professionals that could be employed using these resources. - Provides a fiscal resource context for needs (or utilization) based methods.

Common Methodological Frameworks for HHRP (p. 54-55, Tomblin Murphy 2002, Birch 2001).
The table presents a general overview of the three methods. Alternative approaches address different questions that arise from the basic assumptions of each model and which ultimately determine the methods. Each approach is informed by experience gained with the previous one.

As the name suggests, needs-based planning models attempt to approximate future human resource requirements based on an empirical assessment of the levels of health need in the relevant population. Unlike utilization-based approaches, however, needs-based planning begins from the premise that the current distribution of health professionals and health services are not necessarily optimal for addressing population health needs, and that health human resources must be redistributed if health needs are to be met (Markham and Birch 1997; Roos, Black, Frohlich et al. 1995; Evans and Mustard 1995). According to Eyles, Birch, and Newbold (1995) there are two broad approaches to needs-based planning: 1) the absolute needs approach and 2) the relative needs approach. The absolute needs approach attempts to quantify the health care resources required to produce a target level of health status in the general population. The relative needs approach considers the variation in health status among communities together with available resources in order to meet the needs of communities. The downside of the former approach is the risk that resources will be allocated based on the demand for services (rather than actual needs), thus placing too great a claim on social resources. It is primarily because of this concern that the relative needs approach is preferable. Data obtained through the relative needs approach can better serve to plan for the distribution of the HR workforce in which the overall cost of increasing supply is explicitly acknowledged. Health human resource planning must therefore consider the relative needs of communities rather than simply the demand for services as expressed as a function of the utilization of services. Otherwise, the use of resources will in

fact be based on demands rather than needs, with the consequence that HHRP will hopelessly continue endeavouring to provide a forever-escalating number of workers. Both approaches, however, require an assessment of the health needs of populations and variations among communities in order to better match resource allocations to the later (Tomblin Murphy 2002).

It is critical that in a needs-based approach geographic variation in needs are considered in HHR planning. For instance, the health needs of Canadians living in rural areas are different from those living in urban centres. The Canadian Medical Association (1999) surveyed 7000 health care professionals, including 2000 rural physicians, pharmacists and a range of nursing professionals (registered nurses, licensed practical nurses, and nurse practitioners) who practice in rural or remote areas of Canada. Findings from the survey inform the national “framework of rurality” regarding a variety of factors including: the most important characteristics in defining rural practice; the characteristics of health care communities in rural Canada; and nurses’, pharmacists’ and physicians’ satisfaction levels with their personal and professional lives in rural and remote communities.

The type of needs-based model we are advocating treats health human resource requirements as independent of current service utilization, while at the same time recognizing they are interdependent with the requirements for other health human resources and various other factors. Moreover, to the degree that current needs are not all met, unmet needs will be included in the estimation process. Thus, the main virtue of this approach lies in its ability to avoid perpetuating existing inequities and inefficiencies in the deployment of services (O’Brien-Pallas 2002).

Effective demand-based approaches to HHRP attempt to incorporate economic considerations into the principles of the needs-based approach. The starting point is to estimate the future size of the economy from which the particular health human resource and competing services will be funded. This allows an estimation of the proportion of total resources that might be allocated to health care and the estimated share that will be devoted to health human resources.

Notwithstanding the welcome inclusion of general economic considerations brought to the mix by effective demand-based approaches, it remains clear that information about the level and distribution of needs in the population, and the role health human resources play in meeting those needs, will continue to be at the heart of any model of HHR planning. Furthermore, measuring population health needs will help identify when these needs can reasonably be satisfied through the distribution of health care resources and when health needs may best be met through various other social mechanisms. Although the health care system may not have the resources to directly impact all the determinants of health, it is nonetheless important to understand that the health care system itself is just one of the determinants of health and that it is often left to deal with the consequences of more general social failures to address these needs. It is therefore imperative that the measurement and understanding of population health needs be an integral part of HHRP.

In contrast to traditional supply driven approaches, models based on population health needs provide more meaningful information about how to deploy human resources effectively. Consequently, they generate opportunity for more relevant decisions about legislation, policy development and the production and utilization of health care providers. To build a workforce

designed to meet the health needs of our community, it must be based on comprehensive information that promotes sufficient numbers of relevant health providers who can work in ways that maximize health outcomes. To be optimally effective, needs-based models of human resource planning must rely on data from varied sources. From health care consumers, data are needed about the changing demographics of society, changing health and illness patterns, changing determinants of health, and changing behaviour of consumers. From the health system, it is essential to have knowledge about factors such as those that influence the effectiveness and efficiency of the organization, management and delivery of services, and the capacity to achieve enhanced health outcomes. From governments, data are needed about the known/anticipated effects of existing or proposed policies. From universities, it is critical to have knowledge pertaining to factors that influence the effectiveness, efficiency, productivity and relevance of educational programs.

Given the massive restructuring underway as part of health reform, other types of information are needed as well. For example, data regarding shifts from institutional to community-based care and the integration of community services, primary health care and institutional care must be monitored. It is essential to track changes in governance (e.g., devolution to regional health boards, mergers, etc.), methods of funding services and reimbursing professional services, cost-shifting, and changes in burden sharing. Trends in the redefinition and reconfiguration of professional roles are also critical to follow. Tracking the effects of these reforms, however, will require a significant shift away from historical database practices. As the World Health Organization (1978, 2000) argues, now is the time to embark on human resource planning using an approach that is policy-relevant, integrated, health needs based, consumer focused, goal and capacity driven, adequately resourced, evidence based, accountable, and reflective of the unique and shared competencies of all stakeholders. To begin this enterprise it is critical for key stakeholders to join together in identifying common research needs, existing resources for meeting those needs, available opportunities and obstacles to overcome in building a truly effective approach to health human resource planning for Canada.

High Quality Data Acquisition

To accomplish this vision, we need good quality data that is comparable, comprehensive and available to researchers in a timely fashion. There is a pressing need for the development of mechanisms which enable meaningful and efficient partnerships to develop between researchers and data gathering/holding facilities (e.g., Statistics Canada). To ensure system efficiency and effectiveness, HHR planning activities should be both needs based and outcome directed. Furthermore, planning at all levels requires good quality data. In describing the approaches to modeling or service planning, we make the assumption that the data that form the basis of resource planning are currently available and of good quality; that is, they are consistently reported (reliable) and they actually measure the key variables to estimate human resource requirements (valid). This is an assumption that, regrettably, does not reflect current reality (O'Brien-Pallas 2002; O'Brien-Pallas and Tomblin Murphy 2002). Needs-based approaches, in which resource requirements are based on estimated populations' health needs, create greater data demands than those required for supply/utilization-based planning. The requirement to link to outcomes will initially create greater data challenges. To plan services and/or to model human

resources requirements without high quality data will only lead to unreliable estimates of future human resource needs and erroneous service planning models. Planning should be conducted when planners are confident that the data that underpins the estimates are of good quality (Tomblin Murphy 2002)

Modeling and Simulation

Our conceptual model is a dynamic system-based framework which considers: 1) population characteristics related to health levels and risks (needs-based factors); 2) service utilization patterns, nurse deployment patterns, and others who provide similar or identical services (utilization based); 3) the economic, social, contextual, and political factors that can influence health spending (effective demand based); and 4) the population clinical and health status, provider, and system outcomes resulting from the different types of nurse and other health provider utilization. This model incorporates each of the three methodological approaches outlined earlier but places these approaches in the context of an assessment of needs and outcomes of service provision. Simulations of the health system are used to provide needs-based estimates that are aimed at optimizing outcomes. The practical applications of this model are currently being tested by members of our research team, which, as a result of our work on the framework has expanded to include philosophers, political scientists, labour economists, demographers, geographers, epidemiologists, physicians, health economists, and psychologists.

Simulation is a powerful technique. Hall (2000) suggests that it allows planners to explore consequences of alternative policies, facilitates input and output sensitivity analysis, and makes it easier to involve stakeholders throughout the process. Simulations are a means to assist planners to make decisions; they are not an end in themselves, nor a substitute for careful planning. The extent to which simulation provides useful scenarios for consideration is dependent upon the quality of the data used in the model and the extent to which the variables modeled reflect the system as a whole. Simulation probably offers the most useful tools for assessing substitution across and within professions and for addressing issues such as geographic distribution of health personnel. Whatever method used, O'Brien-Pallas, Baumann, Donner et al. (1998), Song and Rathwell (1994), and Eyles, Birch, and Newbold (1993) suggest that estimates for requirements will not be exact numbers but instead a range of numbers. Until further development of models occurs, sensitivity analysis will allow policy-makers and planners to have different estimates of required resources from which to plan their service needs and HHRP. The importance of continuously updating estimates cannot be overstated.

Networking, Knowledge Transfer and Uptake

We need to plan HHR in an integrated way. Planning for nurses, doctors, physiotherapists, pharmacists and others must be done at the same time, each being driven by the health needs of Canadians. To do this, there needs to be a significant investment in creating and maintaining databases for planning: databases that allow us to compare differences between and across jurisdictions and databases that allow us to understand the needs and to determine whether the system is working in effective and efficient ways to meet those needs. The Canadian Institute of Health Information (CIHI) is the logical partner for development, storage, and upkeep of databases. The other partners are researchers and policy-makers who are committed to needs-based and outcome-driven analysis that embrace the complexity of the health care system.

We need to establish a standing committee on integrated Health Human Resources composed of consumers, expert researchers and policy-makers. This standing committee should be charged with the responsibility of creating next generation approaches to forecast and plan human resources, conducting the actual analyses, and working with both management and policy-makers in implementing the results of these activities. Furthermore, a virtual national and international network of HHR key stakeholders (consumers, policy-makers, managers, researchers) must be developed to facilitate a more comprehensive understanding of HHR, to foster interdisciplinary mentorship and to help build a critical mass of expertise in HHRP.

There is a clear need for increased knowledge transfer and uptake between the research and policy sectors. This can be facilitated through the development of partnerships among consumers, researchers and policy-makers that involve direct regular interaction at each step of the research, implementation and assessment phases of HHRP. Building solid relationships and strengthening the links between both the research and policy communities will move HHRP policy-relevant research forward and enhance the use of findings in policy decision-making. There needs to be effective and ongoing coordination of the interaction among government, research and administrative stakeholders through advisory, research, and communication infrastructures. *Serious consideration, therefore, should be given to the establishment of several standing HHRP research/policy institutes linked nationally through a permanent virtual institute. This, together with an enhanced commitment to ongoing HHRP research/policy infrastructure support, will help forge the links necessary to ensure optimal HHR planning for the future.*

Health human resource planning has become a priority for Canadian researchers, policy-makers and decision-makers. As social, economic, and technological developments propel health care into the information age, Web-based access to HHRP related information is rapidly assuming greater significance. Convenient access to HHRP related information is important for current and future HHRP and will continue to be a priority as the area develops and responds to new challenges (Tomblin Murphy and Barrath 2002). Evidence for decision-makers comes in a variety of forms. Policy institutes, research units, governments and their agencies, professional associations and unions, think tanks, universities, and not-for-profit organizations release a variety of reports that are seldom integrated into conventional literature vehicles (such as journals or bibliographic databases). The Web sites of these organizations frequently provide access to this unpublished or “grey” literature. The grey literature must be accessible to

Canadian consumers, policy-makers and researchers. It includes academic papers, scientific protocols, white papers, preprints, committee reports, proceedings, conference papers, research reports, standards, discussion papers, technical reports, dissertations, theses, government reports, journals, newsletters, working papers, essays, and electronic columns. Grey publications are valued as sources of comprehensive, concrete and up-to-date information on research findings and investigations (System for Information on Grey Literature 2002). They provide valuable and often unique information that can rapidly inform specific scientific communities, funding bodies and policy-makers about the results of research projects and other initiatives.

As users gain confidence in searching and accessing Web-based grey literature, the demand for more sophisticated and user-friendly sites will continue to grow. Technical innovations such as these promise to expand knowledge transfer and uptake in a way that will ultimately enhance research productivity and greatly impact on HHRP internationally.

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