



CANADIAN NURSE PRACTITIONER INITIATIVE TECHNICAL REPORT *HEALTH HUMAN RESOURCES CHAPTER*

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1. Introduction

Health human resources (HHR) are recognized to be the foundation of the Canadian health system. Timely access to health services is dependant on the appropriate mix and number of qualified health professionals. More and more, governments are recognizing that the effective delivery of health services requires an interdisciplinary approach to care. The *2003 First Ministers' Accord on Health Care Renewal* and the *2004 10-Year Plan to Strengthen Health Care* identified the need for collaboration and health services delivered by teams of health-care providers. They also committed governments to enhance HHR planning (HHRP) and management.

The HHR planning process involves three major and interrelated steps that include planning, production and management (Hall in O'Brien-Pallas et al. 2001). Planners have used various approaches to determine the current and future supply and demand of health professionals. To date, HHR planning in Canada has been primarily supply-based in silos with little or no attention to the demand side of the equation or to the interrelationship between providers. Factors such as population demographics, technology, health needs, wait lists and collaboration have not been taken into consideration.

HHR planning has been difficult for well-established health professions, let alone for new roles for registered nurses (RNs) such as the nurse practitioner (NP). HHR planning for NPs in most Canadian jurisdictions and countries is limited by data availability, data quality and timeliness of data collection (Tomblin Murphy Consulting Incorporated 2005a). This has limited their effective utilization in the health system to resolve some of the most prevalent health system issues including access, wait times, efficiency and effectiveness.

The objectives of the HHRP component of the Canadian Nurse Practitioner Initiative (CNPI) were to:

1. Develop national NP data to support HHRP;
2. Develop models that provinces and territories can use to determine the current and future requirements for nurse practitioners in the context of Canada's renewed primary health-care system; and
3. Develop NP recruitment, retention and deployment recommendations.

In order to achieve these objectives, an extensive environmental scan was conducted. That scan included initial consultations, literature reviews and round table consultations. This chapter presents the work completed on the objectives and concludes with a summary of the findings and recommendations arising from the HHRP component.

2. Environmental Scan

2.1. Initial Stakeholder Consultations

From September 2004 to January 2005 the manager of the HHRP component of the CNPI held initial consultations with approximately 100 representatives of different stakeholder groups across Canada. The purpose of these consultations was to determine how various federal, provincial and territorial stakeholders perceived various factors that shape the integration of the NP role in the health system and their importance for HHR planning. The participating stakeholders included provincial/territorial governments (departments of health and education), unions, employers, regulatory bodies, NPs, regional health authorities, etc. An interview guide developed by experts in HHR planning research was used to collect data. This guide was revised as necessary throughout the initial consultation phase. Individual consultation notes were then entered into a database and analyzed for thematic areas.

Overall, the consultation participants agreed there are obstacles impeding meaningful planning for and successful integration of the NP role in the Canadian health system. Despite these obstacles, the participants also agreed that strategic interventions of various kinds could remove these obstacles. What follows is a brief summary of the five key thematic areas identified from the consultation notes.

The first important theme that the consultation participants raised was the inconsistent educational and competency standards for NPs across Canada. Mobility problems surface due to the absence of equal standards for educating NPs in different provinces or territories. This situation not only places restrictions on NPs' ability to seek employment in other provinces or territories but also employers' ability to recruit qualified NPs to meet service needs. This lack of uniformity has had negative effects on the supply of NPs and the demand for their services, as well as their effective utilization and deployment in primary health care. Many stakeholder groups in different provinces and territories seemed to support the development of national standards to promote greater consistency in NP education, expected competencies and scope of practice parameters.

The second theme that the stakeholders identified was the legislative/regulatory suggestion that NPs work closely with physicians in some type of collaborative practice. If this requirement is too restrictive, then serious limitations are imposed on NPs employability and, ultimately, their effective utilization and deployment in primary health care.

The third theme relates to the management, organization and delivery of health services. Stakeholder comments revealed a wide variation in collaborative practice models and the level of NP role integration in different provinces and territories. Despite the presence of innovative collaborative models in primary health care, there is incomplete understanding and acceptance of the concept of overlapping roles and collaborative relations, especially by physicians. Furthermore, restrictions imposed upon NP scope of practice by legislation/regulatory bodies, employers and related legislation and policy also limit

meaningful role integration. This situation is exacerbated by the absence of a consultative framework to encourage discussion among key stakeholders, by physician fee-for-service remuneration, and by a general lack of public understanding and support of the NP role.

A fourth theme that the consultation participants identified was financial resources and unionization. The stakeholders cited the absence of a dedicated budget in most provinces and territories to fund the NP role in primary health care as an important barrier to effective HHR planning. The fee-for-service payment structure for physicians was again identified as a major barrier. Stakeholders stressed the importance of having strong nursing leadership, greater clarification of the NP role, and supportive others (e.g., CEOs, physicians, etc.) at local and provincial levels to facilitate role acceptance and implementation. Although some stakeholders noted union benefits such as fair and equitable salaries and workloads, there was general opposition to the unionization of NPs.

The final theme, population health and provider outcomes, has received scant attention in most provinces and territories. Many stakeholders acknowledged that there was insufficient empirical data to support evidence-based decision-making on the numbers and qualifications of NPs required for the realization of optimal population health outcomes at an affordable cost to the health system. In addition, all stakeholders were interested in evaluating the impact of collaborative practice arrangements in primary health care on provider outcomes.

For more information see Appendix A, *CNPI Health Human Resources Planning Initial Consultation Report*.

2.2. Literature Reviews

As part of its environmental scan, the HHRP component of the CNPI commissioned two separate but extensive literature reviews. The first review analyses literature on HHR planning/modeling as it affects the role and utilization of NPs in primary health care, as well as HHR planning specific to NPs. The second review appraises literature on the recruitment and retention of NPs in primary health care. The methodology for both of these literature reviews included a review of peer-reviewed published literature from both national and international sources through major health databases including CINAHL, PubMed and Cochrane Library. In addition, relevant grey literature was reviewed and analysed. The literature reviews were completed by Tomblin Murphy Consulting Incorporated (2005a and 2005b) and highlights are presented below.

2.2.1. HHR Planning/Modeling: Literature Review Findings Summary

The literature review of HHR planning reveals an abundance of quality evidence beginning in 1970 that proves the positive impact of NPs on both system and health outcomes. Research consistently shows that NPs can provide care that is safe, effective and comparable to physicians in a wide range of situations and circumstances. Overall, the appraised literature emphasizes both the commitment and notion that NPs may be part

of the solution to resolve prevalent current health-care delivery issues such as access, wait times, system efficiency and effectiveness, as well as costs.

Unfortunately, the literature also demonstrates that current health human resources planning practices suffer from many deficiencies. They tend to be intermittent, based on incorrect assumptions, focusing on single disciplines, and are often not linked to appropriate analytical models. The reliance on supply and utilization approaches and lack of conceptual frameworks and analytical models has led to the continual cycle of HHR shortages and surpluses in Canada and other countries. In addition, HHR planning for NPs around the world is limited by data availability, data quality and timeliness of data collection.

HHRP is sometimes based on crude health-care provider to population ratios. This methodology does not address the unique needs of people living in rural and under-serviced communities or the unique practice of providers in these areas. Specific HHR planning for primary health care nurse practitioners (PHCNPs) for rural, remote or under-serviced areas of the country needs to be undertaken, as well as the development of plans to increase the number of aboriginal nurses practising in Canada.

HHR planning models based on the health needs of the population provide more meaningful information regarding the effective deployment of all human resources. To build a workforce that is designed to meet Canadian health-care needs means that HHR planning must be based on comprehensive information. Such information promotes sufficient numbers of relevant health providers who can work together in ways that maximize health outcomes.

For more information see Appendix B, *Health Human Resource Component Literature Review Report – Health Human Resource Planning/Modeling Activities for Primary Health Care Nurse Practitioners*.

2.2.2. Recruitment and Retention: Literature Review Findings Summary

The review of the literature on NP recruitment and retention shows there is a lack of coordinated action in Canada. A number of recent provincial, territorial and federal documents demonstrate a committed effort toward the integration of NPs into the delivery of primary health care. However, efforts are not consistent across the country nor are efforts comprehensive enough to fully address current issues for NP practice.

Recruiting and retaining NPs in rural/remote/isolated and aboriginal communities remains a challenge due to numerous factors including: isolation, lack of resources such as professional support and/or continuing education opportunities, and lack of communication technology supports. Some argue that these strategies do not appear to address the unique work life issues faced by health-care providers practising in under-serviced areas (Pong 2000). Several jurisdictions have suggested that providing tuition assistance or bursaries for NP students in exchange for return-to-service agreements

and/or willingness to relocate to remote or rural areas are effective strategies to recruit and retain NPs for under-serviced areas. Others have suggested that ongoing formal relationships with communities -- especially those in under-serviced, rural or remote areas -- need to be developed to support the recruitment and education of PHCNPs (Gregory, Wasekeesikaw, Macrae, Wood & Amaral 2002).

It is clear that autonomy, support, role clarity, collaboration and practising at full scope are necessary for workplace satisfaction. Strategies that lead to the successful development of a positive, challenging work environment will enhance the retention of NPs in existing positions, and may facilitate recruitment of other nurses into this advanced nursing role. Recruitment and retention strategies for NPs in primary health care need to be aimed at sustainable funding for formal education, continuing education, information technology support and appropriate compensation.

Recruitment and retention efforts must be aimed at a variety of initiatives to improve NP integration into the delivery of primary health-care services in order to maximize health care for Canadians. According to the literature such efforts must include:

- the development of appropriate remuneration and funding models that are independent of physician funding;
- national legislative and regulatory frameworks that provide a clear definition of the NP role;
- consistent policies which support and educate NPs to practise in environments based on interprofessional and intraprofessional collaboration;
- the redesign of current practice environments so that all health providers (including NPs) feel valued and able to practise to their fullest scope;
- the provision of sustainable funding to provide formal education, continuing education, information technology support and appropriate compensation for NPs;
- the development of continuing and formal education programs for NPs that are interdisciplinary, flexible and innovative as well as delivered by a variety of methods;
- the recruitment and retention of NPs to rural and remote communities;
- the garnering of community support for the NP role by way of marketing and recruitment campaigns; and
- the integration of foreign-educated NPs into Canadian health care by means such as the development of clearly defined criteria for practice based on relevant education and experience, support for the provision of language training to overcome communication barriers and assistance with integration into a new culture.

For more information see Appendix C, *Health Human Resource Component – Literature Review Report – Recruitment and Retention of Primary Health Care Nurse Practitioners in Canada*.

2.3. Round Table Consultations

Following in the wake of the initial stakeholder consultations and literature reviews described above, the CNPI staged eight round table consultations in cities across Canada during April and May 2005. The purpose of these consultations was to obtain further input and direction from a broad range of knowledgeable individuals on how to resolve HHR planning issues as they affect NPs. A total of 182 individuals representing national/provincial professional organizations, employers, educators, NPs, physicians, other health professionals and government stakeholder groups from every Canadian province and territory participated in the round table consultations. Participants were invited to discuss issues outlined in a workbook that provided highlights of the literature reviews and initial consultations. Specific questions for the HHRP component focused on key factors that should be considered in determining the number of NPs needed across Canada and principles that should be applied to funding models (fee-for-service, salary, contract, etc.) that would best support the sustainability of NP positions within interdisciplinary teams.

Foremost, round table consultation participants identified the need for a clear definition of the NP role in order to help establish HHR planning for the profession. In addition, given that NPs usually work in teams, participants discussed the need to consider NP human resource needs in light of other HHR needs. This idea builds on other participant comments such as ensuring that NPs are not physician replacements and that Canadians should be able to see the appropriate health-care professional when needed.

Several common factors in determining the number of NPs needed were identified:

- Wait times;
- Access to care;
- Current and future population demands;
- Funding models;
- Workload;
- NPs' development (research and continuing education); and
- Isolation for those working in rural/remote/isolated areas.

In terms of guiding principles for funding models, the participants' responses show that many different perspectives exist on funding. Overall, the idea of NPs working in teams was at the forefront of most funding discussions. Most round table consultation participants did not think there is a 'one size fits all' funding model for NPs.

Nevertheless, they raised three recurring elements in their funding model discussions:

1. NPs should receive salaries and/or be on contract, but they should not be paid under a fee-for-service model;
2. NPs should receive incentive pay and benefits for working in rural, remote or isolated locales; and
3. NPs should be compensated for continuing their education.

(For more information, see Section 2: Legislation and Regulatory Framework, Appendix C, *Report on National Roundtable Consultations*).

3. National Nurse Practitioner Data

3.1. Nurse Practitioner Education Statistics

One of the deliverables of the HHRP component of the CNPI is to develop national NP education data to support HHR planning. However, in the past that goal has proven elusive because no single data source fulfilled the ongoing requirements of NP supply projection. To tackle this issue, a NP education data workshop was convened on January 21, 2005. This workshop provided a forum where data providers (i.e., the schools of nursing) and data users such as researchers, governments and associations discussed what data is still required to support educational programming and HHR planning.

For the short-term, workshop participants agreed that future Canadian Nurses Association (CNA)/Canadian Association of Schools of Nursing (CASN) National Student and Faculty Survey results should include three new data elements: program focus (e.g., primary health care, acute care/speciality), program duration and program delivery mode. The collection of these new elements will lead to database changes, including some re-design, additional programming and the creation of new report layouts. In addition, the CASN and the CNA are exploring the possibility of a more detailed, follow-up survey with schools delivering nurse practitioner programs.

During the workshop the CASN agreed to look at possible funding sources to support an annual survey modelled on a nurse practitioner survey previously conducted by their Database Taskforce. If funding is secured, the survey will be expanded to include data on clinical supervision and program funding, as well as more detailed faculty data.

As a result of the workshop the CNA reworked the survey tool and redesigned the student and faculty database to accommodate new data requirements. In addition, the CNA designed and constructed additional nurse practitioner reports. As a result, when the CNA/CASN National Student and Faculty Survey results are released in spring 2006, these results will be added to the nurse practitioner program reports.

(For more information see Appendix D, *Nurse Practitioner Education Data Workshop – January 21, 2005*).

3.2. Nurse Practitioner Workforce Data

The inclusion of NPs in provincial, territorial and national HHR planning has been limited by the availability of current and reliable data. Therefore, in order to assess the number and location of NPs and make recommendations about their strategic deployment, the CNPI has as one of its deliverables the development of national NP workforce data. Given the Canadian Institute for Health Information (CIHI) houses other national health provider databases, the CNPI began discussions with the CIHI. To this

end the CNA, through the CNPI, and the CIHI have started to work with provincial and territorial regulatory authorities for registered nurses to begin collecting NP information beyond the existing self-reported nurse practitioner position data collected for the Registered Nurses Database (RNDB).

In April 2005 the registrars of the provincial/territorial regulatory authorities met with the CNA and the CIHI to discuss the RNDB. At this annual meeting the participants discussed the importance of collecting and reporting standardized regulated NP data. The regulatory authorities committed to collecting and providing the CIHI with regulated NP data. Four new NP-specific data elements were proposed by the CIHI to be collected by the regulatory authorities: nurse practitioner type, education leading to NP recognition/licensure, graduation year for NP education and location of graduation for NP education.

In the spring of 2005 the CNPI and the CIHI also began collaborating to produce a report highlighting what is currently known about the licensed NP workforce in Canada (i.e., those RNs meeting education, training and/or experience requirements necessary for NP licensure in their province/territory of registration). Entitled *The Regulation and Supply of Nurse Practitioners in Canada*, the report provides the first pan-Canadian profile of demographics, employment characteristics (i.e., employment status, position, place of work, area of responsibility) and education characteristics for the licensed NP workforce.

The CIHI has committed to collecting data on the licensed NP workforce with the goal of including this data in the 2007 RNDB annual report. In the interim, an update to the supply and distribution data for the licensed NP workforce may potentially be published in 2006. The CNA and the CIHI will continue to work with provincial and territorial regulatory authorities for registered nursing to elaborate common NP-specific data elements and definitions needed to provide more comprehensive practice information for the licensed NP workforce.

For more information see Appendix E, *The Regulation and Supply of Nurse Practitioners in Canada*.

4. Development of Health Human Resources Planning Simulation Model for Nurse Practitioners in Primary Health Care

4.1. Introduction

One of the key deliverables of this initiative is the development of models that provinces and territories can use to determine the current and future requirements for nurse practitioners in the context of Canada's renewed primary health-care system. This was achieved by developing a needs-based health human resources (HHR) planning simulation model, applicable for primary health-care nurse practitioners (PHCNPs) across all jurisdictions in Canada. This simulation model is based on the HHR conceptual framework developed by O'Brien-Pallas, Tomblin Murphy, Birch and Bauman (O'Brien-Pallas et al. 2001), as well as the analytical framework developed by Birch, Kephart, O'Brien-Pallas, Tomblin Murphy et al (Birch et al. 2005). The final product is a simulation model that goes beyond the traditional HHR planning models based on supply and projected population-to-provider ratios to consider population health needs and the level of services required to meet those needs. It also integrates key drivers such as training programs and equivalency reviews, in- and out-migration, retirements, and deaths as well as levels of provider activity and productivity. This model incorporates national planning assumptions in order to estimate the supply of NPs required to meet primary health care needs from 2005 to 2015.

An expert team of HHR researchers under the management of Med-Emerg Inc. was commissioned to lead the development of the model in collaboration with federal/provincial/territorial governments and the CNPI HHRP Taskforce. An integral part of the process of simulation model development and refinement was the staging of three stakeholder workshops from March to October 2005 involving data and policy representatives of various federal, provincial and territorial governments, as well as members of the CNPI HHRP Taskforce. Through these workshops, the model development was a product of collaboration and consensus. A final training workshop was held in December 2005.

A secondary outcome of the model development workshops was the knowledge that was acquired by participants. They came to understand and appreciate the challenges inherent in HHRP in Canada. It was important to capture their wisdom and fold this into the final recommendations of the HHRP component of the CNPI. Thus, one of the objectives of the third workshop was for participants to discuss draft recommendations related to the development of the model. The draft recommendations were offered by the Med-Emerg Inc. team in several broad areas, including: simulations, partnerships, needs-based and context-based planning and data investment. Discussion and input from all the stakeholders were captured on flip charts. Those recommendations were presented to the CNPI HHRP Taskforce for review and ultimately helped to inform the recruitment, retention and deployment recommendations.

The information presented below is highlights from the full report written by Med-Emerg Inc. titled *Development of Health Human Resources Planning Simulation Model for Nurse Practitioners in Primary Health Care* (see Appendix F).

4.2. Guiding Principles

The guiding principles in this project were derived from a variety of factors including: direction from the Canadian Nurse Practitioner Initiative (CNPI), past work of the research team, review of the empirical evidence and grey literature, as well as ongoing modeling work at the federal and jurisdictional government levels. The HHR model developed and applied in this project was based on the following criteria, that:

1. An NP will work to her/his full scope of practice;
2. An NP's scope of practice will be focused on those unique competencies that distinguish an NP from an RN;
3. The need for primary health care (PHC) services will be based on scientific evidence about the prevailing level and distribution of health in populations;
4. The requirements for NPs are derived from the need for PHC services that NPs produce;
5. PHC services are produced from the use of a range of health-care inputs that include PHCNPs as well as other human and non-human resources; noting that the impact of other human (e.g., RNs, administrative or clerical staff) and non-human resources (e.g., new technologies) can be modeled by way of changing the PHCNPs' productivity in accordance with evidence;
6. The production of PHC services and the use of NPs in the production of those services will occur in prevailing social, cultural, economic and political contexts;
7. The HHR Model will:
 - build upon and further test the relationships of variables of the Health Human Resources Conceptual Framework (O'Brien-Pallas, Tomblin Murphy, Birch & Baumann 2001);
 - be based on the needs of people and incorporate evidence-based approaches to needs assessment;
 - forecast needs based on population health indicators;
 - respect the legislated scopes of practice of the PHCNP;
 - incorporate evidence on recruitment and retention of nurse practitioners;
 - recognize the various health services delivery models in place across the country;
 - address both urban and rural/remote/isolated scenarios;
 - recognize interprofessional collaboration;
 - offer a range of policy levers available to NP policy-makers aiming to respond to estimated gaps between future NP requirements and supply; and
 - incorporate feedback from federal, provincial and territorial government policy and data stakeholders who participated through the workshops held during the project and the outcomes of consultations the CNPI HHR Taskforce members held with various NPs, employers and unions prior to the outset of the work.

4.3. Planning Assumptions

Planning assumptions were necessary because the role of the PHCNP is evolving. These assumptions were essentially the stated vision of service delivery by PHCNPs which the model would simulate. The development of the planning assumptions evolved over a series of initial consultations with broad key stakeholders (noted above), the CNPI HHRP Taskforce and participants in the workshop discussed above. The assumptions were also informed by relevant literature (including grey literature).

The scope of this study was to include only PHCNPs who are licensed by the jurisdiction in which they practise. Based on current and emerging policy directions for NPs, it was agreed that PHCNPs work in three main sectors: community health services (CHS), long-term care (LTC) and emergency departments (ED). In the community, the PHCNPs will provide PHC services in family physician offices, community health centres (clinics, etc.), independent offices, schools and public health. It was also determined that long-term care clients are well-suited to receive their primary care by an NP. The stakeholders agreed that it was not ideal to have clients receive their primary care in the ER, but recognized it was a reality in the short- to mid-term given the large number of Canadians without access to a primary care provider. The complete planning assumptions are available in the report titled *Development of Health Human Resources Planning Simulation Model for Nurse Practitioners in Primary Health Care* (see Appendix F).

4.4. Simulation Model

The simulation model specifies the mathematical relationships for the components of the analytical framework. The model is based on estimating and comparing PHCNP supply with PHCNP requirements. The difference between the two is termed the gap which may be positive or negative, indicating a surplus or shortfall. Each of the supply and requirement elements of the model is based on two main modules: *training and supply modules* for NP supply, and *productivity and needs modules* for PHCNP requirements. The supply module incorporates the equivalency review (prior learning assessment and review) and migration factors. See Diagram 1 for the simulation model.

4.5. Applicability of the Model

One of the requirements of this project was to demonstrate the applicability of the developed model in various jurisdictions. In determining the jurisdictions to be modeled, a set of criteria was established and approved by the CNPI HHRP Task Force. The criteria were expressed as follows:

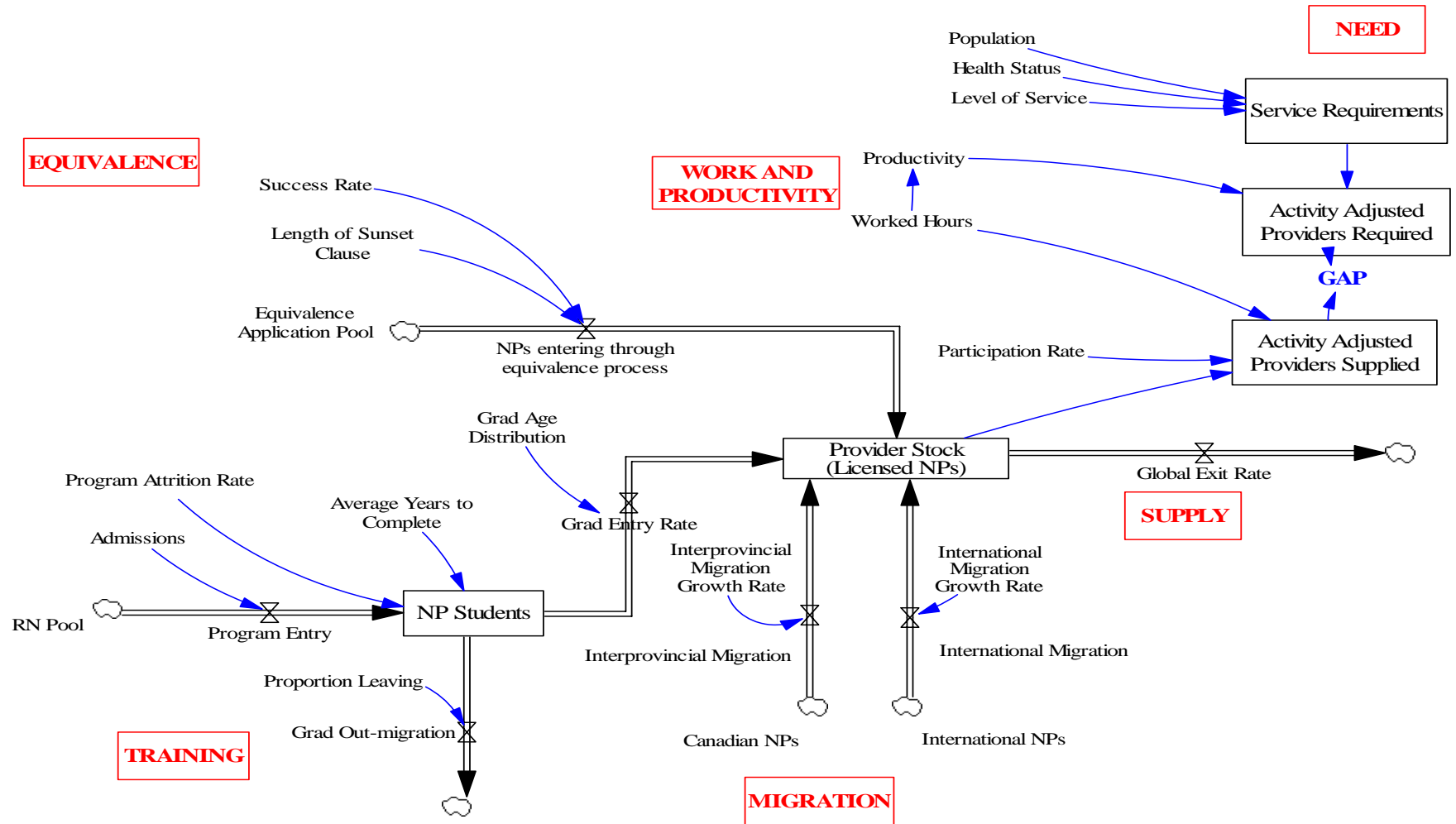
- Data availability;
- Sufficient number of licensed NPs (confidentiality issue);
- Expressed interest from jurisdiction; and
- Minimum of two jurisdictions.

The criteria reflect the realities as well as the complexities of HHR modeling. Without sufficient data, meaningful results cannot be produced. A small stock will also produce results with less reliability. Finally, if available data are not easily accessible the effectiveness of the model could be severely hampered. Based on the criteria, Alberta, Ontario and Newfoundland and Labrador were selected as pilots for the model. Thus, the developed model was demonstrated in jurisdictions that included one of the smallest, the largest, and one in between. This included one in the east, the west and central Canada. The Task Force approved this jurisdictional selection.

This simulation model was implemented using Vensim software (2002). Vensim allows planners to conceptualize, build, and run dynamic simulation models. It is based on an underlying mathematical model that expresses levels (e.g., the number of providers) as a function of rates that change levels over time (e.g., retirement rates) and other variables that determine changes in the values of the rates (e.g., retirement policies). These are expressed as a series of mathematical equations that are solved to run the simulation. Vensim was selected because of its programming flexibility, ability to handle complexity, graphical interface, and extendibility. Graphical tools enhance the ability to communicate model results, as well as support the engagement of multiple stakeholders and policy makers in the simulation process.

Diagram 1

Modified from Birch S, Kephart G, Tomblin Murphy G, O'Brien Pallas L et al. for the *Atlantic Health Education Training Planning Study*, Med-Emerg Inc. 2005



4.6. Simulation Model Application Results

In each case, health status data observed in 1996 and 2003 indicate that the population needs for health care are not constant. Three scenarios of population health needs were examined: needs remain unchanged ('constant'), needs continue along the trends observed over the 1996-2003 period ('continue'); and needs change at half the rate observed in the 1996-2003 period ('half rate'). However, for brevity in data presentation, the conservative change scenario was used; i.e. half the rate of change observed ('half rate'). As a result, the following overview of the simulation modeling results focus on the 'half rate' of observed data change. Based on this 'half rate' assumption, the model's application shows that current plans for the education and training of NPs will not be sufficient to meet the requirements arising from the proposed role for NPs in the delivery of primary health care as reflected in the model's planning assumptions. All three test models indicate a substantial shortfall between future supply in relation to future NP requirements for primary health care:

- For Alberta, the simulation model estimates a requirement of 604 PHCNPs in 2004, resulting in a shortfall of 542. With an estimated NP need of 1,284 in 2014, the shortfall increases to 1,064 if the trends in health status of the population continue at half the rate of change recently observed. Therefore, according to the simulation model the shortfall in the NP supply for primary health care in Alberta could nearly double over the next decade. These numbers are a conservative estimate of the shortfall since the number for the provider stock in 2004 includes NPs who work in both primary health care and acute care, as they are not licensed separately in Alberta.
- Running the simulation model for Newfoundland and Labrador shows that in 2004 that province would have required 205 activity-adjusted NPs in total in order to have met the primary health care needs as designed in the planning assumptions. By comparison, the province had 62 licensed NPs including both primary health care and acute care sectors in 2004, resulting in a gap of 143. The estimated gap between the supply of and requirements for NPs in primary health care is expected to be reduced slightly to 126 in 2014 if the trend in health status continues at half the observed rate of change. Given that the projected increase in the required number of activity-adjusted PHCNPs is less than the projected increase in the number supplied, the shortfall in the supply of PHCNPs is lessening over the planning period. Note, however, that since the CIHI data provided for this project did not distinguish PHCNPs from acute care nurse practitioners (ACNPs), the supply of PHCNPs is overestimated in this analysis, meaning that the shortfall is likely underestimated.
- According to the simulation model, Ontario required 1,692 NPs to provide primary health care in 2004. This is five times the 337 NPs who were available in the labour market that year. If the trend in population health status continues but at half the observed rate of change, the number of NPs required will increase nearly threefold to 4,883 in 2014, leading to a shortfall that the model estimates will increase to 3,655.

4.7. Policy Scenarios

The simulation model allows government planners to simulate gaps in the supply of and requirements for PHCNPs, and to test the effectiveness of policy initiatives in dealing with HHR gaps prior to actual implementation of the policy intervention. Such policy scenarios might include a 10 per cent increase in NP enrollment, or increased funding for more full-time NP positions to increase the NP participation rate in the workforce by 10 per cent. The flexibility of the Vensim software allows one to test a variety of policy scenarios in this simulated HHR planning model. Scenarios involving modest changes in enrollment, NP participation, full-time employment, and productivity were tested and compared for their effectiveness in reducing the shortfall of PHCNPs while maintaining the planning assumptions. All of the scenarios, including the baseline, were run using half the rate of change in health needs observed in the past few years. These policy scenario results are available in the full report titled *Development of Health Human Resources Planning Simulation Model for Nurse Practitioners in Primary Health Care* (see Appendix F).

4.8. Limitations

The study did face a number of limitations and the findings should be considered in the context of these. First, the PHCNP is a relatively new role and the role and contribution in the delivery of PHC is changing. Hence it is difficult to identify a clear and consistent role both within and across jurisdictions. As a result, the study relied upon a set of planning assumptions based on consultations (as outlined under ‘Planning Assumptions’) about the role and contribution of PHCNPs for which we should plan for the future. However, the validity of these assumptions will depend upon a range of other policies being in place to support these roles and contributions (e.g., funding, licensure, etc). Second, little if any systematically collected data were available on some of these roles and contributions. Hence the planning assumptions extended beyond what the PHCNP role will be to also include assumptions about the proportions of client populations that will be served and the levels of productivity in these roles. Third, because the total size of the PHCNP stock remains relatively low, data on the current use of PHCNPs are not easy to find. They are often employed in small numbers and in different settings meaning that centralized data are not easily available on factors such as the rates of net migration, participation, activity and productivity. Fourth, because the PHCNP is a relatively new role the profession has a relatively young age distribution with few NPs being in age groups approaching retirement. As a result, insufficient data are available to consider retirement patterns among PHCNPs in a systematic way. Such data will only become available once a substantial number of PHCNPs have ‘aged’ through the later years of working life and retirement. As a result, the estimates presented in this report should be considered indicative of broad trends in, as opposed to confirming precise numbers for, supply and requirements.

For more information on the simulation model see Appendix F, *Development of Health Human Resources Planning Simulation Model for Nurse Practitioners in Primary Health Care*.

5. Synthesis of Findings

A synthesis of the literature reviews and consultations conducted as part of the environmental scan, the review of the national NP data and the development of the HHRP simulation model for NPs in primary health care culminated in six major theme areas. These include: health human resources planning, interprofessional collaboration, funding, remuneration, resource deployment and utilization, and healthy workplace environments. These themes served to shape the recruitment, retention and deployment recommendations.

5.1. Health Human Resource Planning

The HHR planning process involves three major and interrelated steps: planning, production and management. Much HHR planning has tended to consider these factors separately, which has led to incomplete solutions (e.g. concentrating on production of practitioners when the management system was not permitting practitioners to utilize their full scope of practice).

A further complication has been that HHR planning has tended to consider each health profession separately, rather than taking an integrated approach (as an example, community requirements for PHC have usually been defined in terms of the number of family practitioners required per population, rather than the combination of family physicians, NPs and nurses required to adequately serve that community).

Finally, much HHR planning has been dominated by supply-side thinking and historical patterns of use, which has meant that the resources produced bear little relation to actual needs in the community. HHR planning needs to be more closely linked to population health outcomes if it is going to produce the desired impact. Linked to this is the need for valid, reliable and timely data to populate both the supply and requirement sides of HHRP.

The specific situation of aboriginal communities is unique, given the health and social issues faced by these communities and the general shortage of health providers. The need for strategies to train and support more aboriginal RNs and NPs is critical. This was recognized in the national recruitment plan for aboriginal nurses developed in 1999 by Health Canada's First Nations and Inuit Health Branch.

Recommendation 1:

Conduct needs-based HHRP for NPs using a pan-Canadian, interprofessional approach that is based on a conceptual framework. To support this planning, use the HHRP Simulation Model for Nurse Practitioners in Primary Health Care.

5.1.1. Interprofessional Collaboration

Many of the issues associated with education and deployment of NPs are related to the lack of clarity that currently exists with respect to the role, and particularly the overlap between the NP role and the medical role. NP roles and other advanced practice nurse (APN) roles evolved in some areas as a response to a specific health care issue – shortages of physicians – rather than in

response to well-defined goals developed from needs assessments and a clear understanding of the NP role. Many aspects of their role are misunderstood or negated if NPs are considered only as ‘physician replacements’. NP ‘value-added’ skills in communication and coordination, as examples, have been found to contribute to patient satisfaction and quality of care. The role needs to be defined in terms that complement – rather than replace – the work of other providers.

Bryant-Lukosius, DiCenso, Browne & Pinelli (2004) discuss the general situation for APNs, which is directly applicable to NPs, “In the absence of clearly-defined goals, APN roles become shaped by the expectations of stakeholders such as managers, health care providers, and nurses in the role, resulting in wide variations in how APN roles are interpreted and used. Inexperience with APNs by those involved can lead to misinterpretation, under-use of the role and inconsistencies among APN roles related to purpose, titling, scope of practice, education funding and reporting mechanisms” (p. 523).

This lack of role clarity affects the profession negatively in a number of ways resulting in unclear relationship with other health-care practitioners, particularly physicians; lack of clear legislative and regulatory framework to support NPs; funding and organizational structures which do not support the optimal use of NP skills and experiences; lack of clear educational and core competency standards, and consequently a lack of credibility with other health-care practitioners, policy-makers and the general public. As a result, NPs spend considerable time and energy defending their roles and searching for the support they need to do their work effectively.

The role of NPs, however, needs to be defined within a larger context. Governments in Canada need to provide clear policy direction with respect to the development of models for the delivery of PHC, and how NPs fit in this larger direction.

The degree of understanding of – and support for – the NP role is an extremely important factor influencing the full integration of NPs into different practice models. True collaborative relations are perceived to be only possible when physicians and other health professionals value NPs for their unique contributions to health care and respect them as autonomous practitioners who do not require their supervision. NP-physician and other health professional collaboration needs to be based on cooperation, assertiveness, responsibility, communication, autonomy, coordination, and mutual trust and respect, with joint decision-making recognizing the overlapping and unique abilities of each health-care provider. It is important that we understand and value every health profession’s role and scope of practice and the uniqueness of that role.

NPs in Canada have liability coverage under a number of different plans, depending on where they practise and the type of practice in which they work. The issue of liability has received much attention as a barrier to collaboration between NPs and physicians, but there are differences of opinion as to which risks are real and which are perceived. Physicians are particularly concerned with the issue of vicarious liability where they are in the position of supervising NPs. In addition, the notion of team-based health care is new to the justice system. The historical approach has been focused on individual provision of care. Communication between the health and justice system will be important as we move forward with primary health care reform.

Recommendation 2:

Develop and implement clear policy direction for models of interprofessional PHC service delivery and a supportive change management strategy.

5.1.2. Funding

There is a lack of consistent public policy in Canada regarding the long-term funding of NPs. Four funding models have been suggested for the NP practice, based on the varied responsibilities and legal liabilities of the role: 1) budget/request-based funding (based on costs of services); 2) utilization-based funding (based on allocation of resources dependant on past use); 3) capitation/population-based funding (based on population demographics); and 4) needs-based funding (based on health status and outcomes of populations). Fee-for-service is an option which has not been recommended, as it provides incentives for the frequency of interactions rather than the comprehensiveness of care, and as it can promote competition, rather than collaboration, among providers.

Funding for the NP role is generally sporadic across the country, with no defined budget for this level of service. Regional Health Authorities (RHAs) have the mandate in most parts of the country to identify population health needs in their areas, and to determine the requisite number, mix and distribution of health-care providers for service delivery. Thus funding for health services could be driven by the health needs of the community as opposed to being tied to any one provider. Such a model exists in the United Kingdom.

Some NP associations support committed Ministry funding for communities with limited access to primary health care. The model of providing Ministry funding through a not-for-profit transfer agency which bypasses the need for fiscal employee-employer relationships between NPs and physicians, communities or organizations is also supported by some. This model supports NPs working at their full scope of practice. NPs would have to arrange for their own liability insurance through their respective licensing bodies, and negotiate funds for start-up, capital, etc. Some advantages of this type of approach include: support for NP autonomous practice, recognition of NPs' unique contribution to health care; encouragement of recruitment of NPs to roles independent of physician practice (possibly to geographical areas where physicians are not located and collaboration occurs by distance); and by facilitating the collection of appropriate data for HHR planning.

Recommendation 3:

Adopt funding models for primary health care services that reflect a needs-based system (including health status) that supports interprofessional practice and incorporates population health outcomes.

5.1.3. Remuneration

Remuneration has been related to the perceived role of the NP. The most dominant consideration has been whether the NP is considered as a physician replacement or a complementary health provider. As a result, salaries, benefits and working conditions vary considerably within provinces and from province to province, leading to some competition for scarce resources between and within provinces/territories. NPs are not physician replacements and thus should be remunerated appropriately.

A variety of employment models are used across the country to remunerate NPs. Stakeholders agreed that no one model of remuneration will fit all situations. Four employment models have been recommended by IBM (2003) for this purpose in Ontario: 1) remuneration via an organizational employer; 2) remuneration directly from the Ministry; 3) remuneration directly from Medicare; or 4) remuneration directly from a physician employer. Tying NPs to physician billing has been shown to reinforce physician's supervisory, hierarchical role as opposed to supporting a collaborative model of care, and has often resulted in NPs being unable to realize their full scope of practice.

Recommendation 4:

Remunerate NPs to reflect their scope of practice, responsibility and accountability, and standardize the remuneration to address:

- Salary/benefit discrepancies (within provinces and territories);
- Yearly cost-of-living expenses;
- Incentives and supports to recruit NPs to difficult-to-recruit areas; and
- Additional overhead/operating/infrastructure expenses.

5.1.4. Resource Deployment and Utilization

The ability of NPs to fully implement their scope of practice has been defined much more by the practice situation than by planning. The priority, in general, has been to ensure that the population has access to health services, rather than on the quality and comprehensiveness of that access. NPs working in rural/remote/isolated practices have been functioning as physician substitutes and therefore may have been exceeding their scope with respect to medical functions. Some working in other areas have not been able to achieve their full scope because of overly restrictive collaborative arrangements. NPs will be able to make optimal use of their skills when they can work autonomously (within their scope of practice) within a collaborative practice model. The full role of the NP includes direct clinical care as well as population health and other advanced nursing practice activities.

Autonomy is one of the most important factors associated with job satisfaction for NPs, and is also essential to enable NPs to work to their full scope of practice. Autonomy is strongly related to the legislative/regulatory environment governing the profession, as well as the type of practice model in which the practitioner is working.

Numerous studies have evaluated the work of the NP in a variety of health-care settings. A classic Canadian study by Spitzer et al. in 1974 (as cited in *Canadian Health Services Research Foundation* 2002) and a meta-analysis by a number of researchers including the latest in 2002 by Horrocks et al. that included 11 randomized control trials and 23 observational studies demonstrated that NPs provided care of a similar standard to physicians, using a variety of measures. The role has traditionally been implemented in community-based settings, but has expanded to other settings such as long-term care, emergency departments, hospitals and others.

Recommendation 5:

Utilize NPs across all health-care settings in urban, and rural/remote/isolated areas. NP practice should be a blend of individual and family visits, population health activities, and other advanced practice activities (research, leadership, collaboration and change agent).

5.1.5. Healthy Workplace Environments

Several studies and the consultations have identified that important elements associated with job satisfaction among NPs include: autonomy, opportunities for professional development, flexible work hours, participation in decision-making and opportunities for career advancement. Other important factors include a supportive organizational and practice environment (e.g., clear role for NPs in the organization, support for this role at all levels in the organization, professional support and mentoring, and reasonable workload). Appropriate infrastructure support, as well as information, communications and computer technologies and their related development and education are also essential components of a healthy, professional work environment.

Recommendation 6:

Create healthy work environments for NPs that support positive client, provider and system outcomes.

6. Summary of Recruitment, Retention and Deployment Recommendations

1. Conduct needs based HHRP for NPs using a pan-Canadian, interprofessional approach that is based on a conceptual framework. To support this planning, use the Health Human Resources Planning Simulation Model for Nurse Practitioners in Primary Health Care™.
2. Develop and implement clear policy direction for models of interprofessional PHC service delivery and a supportive change management strategy.
3. Adopt funding models for primary health-care services that reflect a needs-based system (including health status) that supports interprofessional practice and incorporates population health outcomes.
4. Remunerate NPs to reflect their scope of practice, responsibility and accountability, and standardize the remuneration to address:
 - Salary/benefit discrepancies (within provinces and territories);
 - Yearly cost-of-living expenses;
 - Incentives and supports to recruit NPs to difficult-to-recruit areas; and
 - Additional overhead/operating/infrastructure expenses.
5. Utilize NPs across all health-care settings in urban, and rural/remote/isolated areas. NP practice should be a blend of individual and family visits, population health activities, and other advanced practice activities (research, leadership, collaboration and change agent).
6. Create healthy work environments for NPs that support positive client, provider and system outcomes.

7. Conclusion

Despite an apparent policy commitment to the integration of NPs into the health system, the research and the consultations conducted as part of the project environmental scan paint an unfavourable picture of HHRP for NPs in Canada. It is characterized by a lack of coordination based on incorrect assumptions, profession-specific planning, and a dearth of valid, reliable and timely data often not linked to appropriate conceptual and/or analytical models. NP recruitment and retention strategies are not consistent across the country, nor are they sufficient enough to address issues such as autonomy, support, role clarity, collaboration and practising at full scope which are all linked to job satisfaction. Strategies that lead to the successful development of a positive, challenging work environment will enhance the retention of NPs in existing positions, and may facilitate recruitment of other nurses into this advanced nursing role.

The HHRP simulation model for NPs in primary health care presents a unique opportunity for governments to base their planning on health needs using a common conceptual and analytical framework yet flexible enough to support planning assumptions that reflect the unique reality of each jurisdiction. It allows planners to test various policy scenarios before they are implemented in the real environment. The development of national NP data will help to populate this model and enhance HHRP.

The six recruitment, retention and deployment recommendations cover a range of themes from broad HHRP to healthy work environments, remuneration, funding, interprofessional collaboration, and resource deployment and utilization. These recommendations will support planners as they look for means to effectively integrate the NP role within a health-care team to meet the health-care needs of Canadians. What is clear is that none of these recommendations can be successfully implemented by one organization. HHRP for NPs must be a collaborative and integrated effort that is situated within the broader HHRP agenda for all health professionals. It must also be an iterative process that constantly updates data and assumptions as we garner more information and evidence about the HHRP of NPs and other health professionals.

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