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Utilization of Primary Health Care Nurse Practitioners in rural northern communities to alleviate the physician shortages and retention issues

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Abstract

The purpose of this research project is to critically examine primary health care services and analyze alternative solutions to the physician recruitment and retention issue in rural, northern, and remote communities in Ontario. Primary health care nurse practitioners, (PHCNPs) are a safe, cost-effective solution to alleviate this dilemma in these communities.

The needs assessment, conceptual framework and literature review demonstrated that populations living in rural, northern and remote communities have decreased access to Health Care Providers, show that PHCNPs are a cost-effective and safe alternative to physicians, and demonstrate that recruiting nurses from rural and remote communities to become PHCNPs is beneficial to the communities. The Population Health Model validated that the health care needs of individuals in rural, northern and remote communities are not being met

To alleviate the physician shortage and retention issue in Ontario and particularly rural, northern and remote communities in Ontario the Ministry of Health and Long Term Care (MOHLTC) could:

Provide funding to Registered Nurses in northern, rural and remote communities to become PHCNPs.

Increase the number of PHCNP run clinics.

Continue to support and increase the number of Family Health Teams in Ontario.

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Statement of the Problem

To examine primary health care (PHC) services for populations of rural, northern and remote communities in Ontario.

Objectives of the Research Project

1. Provide evidence of PHC service shortages in rural, northern and remote communities in Ontario.
2. Demonstrate that Primary Health Care Nurse Practitioners (PHCNPs) are as cost effective, safe, and efficient as physicians in providing services.
3. Support the contention that recruiting nurses from rural and remote communities to become PHCNPs is one solution to this health care issue.

Background Information

Ontarians living in rural, northern and remote geographic areas do not have adequate access to consistent health care services to meet their unique health care needs because of physician shortages and retention issues. According to the Canadian Institute for Health Information (CIHI, 2006), only 16% of family physicians and 2.4% of specialists reside in smaller, more isolated communities in Canada. One solution to this paucity of physicians is to hire PHCNPs to provide services in these communities.

According to the Nurse Practitioners' Association of Ontario (NPAO, 2002), a PHCNP

> A nurse with advanced knowledge and decision-making skills in assessment, diagnosis, and health care management. The PHCNP is a community-based practitioner with a scope of practice to provide services to individuals of all developmental stages, and to families and communities. He or she provides comprehensive health services

encompassing health promotion and accessibility, prevention of diseases and injuries, cure, rehabilitation, and support services. (n.p.)

The Canadian Nurses Association (CNA, 2002) reported that PHCNPs could provide care to 82.6% of patients currently seen by doctors. The MOHLTC could allocate funding to cover the education and salary costs of rural, northern and remote nurses who have been accepted into PHCNP programs. The Ontario Liberal party in their election campaign stated that they would commit to 50 Family Health Teams and 25 PHCNP run clinics in Ontario (Ontario Liberal Party, 2007). The MOHLTC could then provide these PHCNPs positions in their communities. The MOHLTC should increase PHCNP run clinics and Family Health Teams in Ontario to alleviate physician shortages.

In order to further validate the utilization of PHCNPs and the relevance of Family Health Teams, data from a recently established Family Health Team in North Western Ontario will be included in this project. Since April 2005, 150 Family Health Teams have been approved in both rural and urban centers (MOHLTC, 2007a). It is predicted that by 2008 more than 2.5 million Ontarians will have improved access to primary health care through the implementation of family health teams. In the budget released by the Government of Ontario on March 25, 2008, the government has committed to create 50 more Family Health Teams (Ministry of Finance, 2008). Family Health Teams consist of physicians, nurse practitioners, nurses, dietitians and mental health workers who provide collaborative primary health care to their clients. Family Health Teams were developed to ensure that health care services are delivered to keep Ontarians healthy, reduce wait times and provide primary health care (MOHLTC, 2007a). Family Health Teams are mandated by the MOHLTC to provide programs that focus on health promotion and

illness prevention as well as chronic disease management. In North Western Ontario 12 Family Health Teams have been approved by the MOHLTC.

PHCNP run clinics are another solution to alleviating the health care needs of residents in northern rural and remote communities. On August 31, 2007, the MOHLTC announced the opening of the first PHCNP clinic in Sudbury, Ontario to provide primary health care to the residents of this northern community (Mulligan, C., 2007). This clinic was spearheaded by two PHCNPs due to the thousands of patients without a doctor and to provide employment to local PHCNPs who were presently unemployed.

Needs Assessment

In order to validate that Ontarians living in rural, northern and remote communities do not have adequate access to primary health care services a needs assessment was done. A needs assessment is the process of gathering and analyzing information to determine the current status and service needs of a defined population and/geographical area (Beadle de Palomo, F. & Luna, E., 2000). The needs assessment of rural, northern and remote Ontario communities must incorporate the determinants of health, specifically: environmental forces, social forces, political forces, and regulatory forces.

Environmental Forces

Rural, northern, and remote communities in Ontario have unique health care needs. The geographical make up is unique to other areas of Ontario due to the rugged terrain, sparse population and vast distance between communities. In these northern communities it should be noted that some are only accessible by air or railway services. Romanow (2002) recognized these rural and remote communities have unique health needs. He recommended utilizing the "Rural and Remote Access Fund" to support the recruitment and retention of medical staff in

isolated communities. Romanow recommended that Telehealth services be expanded to increase access to health care and education for patients and medical staff. Increasing Telehealth services can reduce the travel costs for residents in rural and remote communities who may have to travel long distances to access care from general practitioners or specialists. Travel grants from the MOHLTC are inadequate to cover these costs.

Romanow (2002) recommended that the " Rural and Remote Access Fund" should also be used to support innovative ways of delivering health care services to smaller communities to improve the health of the people in these communities. He noted that one solution for one community might not be suitable for another community due to their unique health care needs. Romanow believed that a unified approach would ensure that all Canadians' health care needs are met. This approach requires the involvement of community members, as well as federal, provincial, territorial, and municipal representatives, to develop solutions.

Social Forces

Our government recognizes that Ontarians' want a sustainable health care system that ensures timely access to health care services. The First Ministers' Accord was a plan developed for health care reform that reflects all governments working collaboratively with other providers to reshape the health care system (Health Canada, 2003).

Trends in health care delivery as outlined by Health Canada (2003) are based on the five principles of public health insurance: universality, accessibility, portability, comprehensiveness and public administration. The ultimate purpose of the Accord was to ensure that residents receive the following:

1. Access to a health care provider 24 hours a day, 7 days a week;
2. Timely access to diagnostic procedures and treatments;

3. Elimination of repetitive testing and health history;
4. Access to quality community and home care services;
5. Access to medications that are required;
6. Access to quality care regardless of place of residence;
7. Participation in a health care system that is responsive, adaptive, efficient, and recognizes their unique individual needs presently and in the future.

All governments' have made significant investments in health care since the development of the Accord. Public health care requires increased financial investments but money alone will not fix the system. All governments' agree that reforms are needed to improve access to quality health care services (Health Canada, 2003).

Romanow (2002) further determined that health care for rural, and remote communities should be supported by the following principles:

1. Rural health initiatives should be designed to provide equity in both access to health care and outcomes;
2. No single strategy is appropriate for all communities;
3. Both short-term, immediate issues (such as access to health care providers) and long-term, more fundamental issues (such as economic and living conditions) must be addressed;
4. Health strategies must focus on an outcome;
5. Policies, strategies and programs need to be evidence based;
6. Strategies developed for urban centers may not be appropriate for rural, and remote communities;
7. A national approach is needed to find solutions and take the necessary action.

Government collaboration, Romanow's (2002) "Rural and Remote Access Fund" and the implementation of more Family Health Teams and PHCNP run clinics by the MOHLTC are plausible solutions to improve access to PHC for rural, northern and remote communities. However, until these initiatives are fully established and evaluated communities are not receiving adequate primary health care services.

Historically health care has primarily focused on acute care issues and a small proportion on preventive activities. However, chronic conditions place a high burden on the health care system and reduce the quality of life for those who suffer the conditions. In the North West Local Health Integration Network (LHIN) chronic conditions account for:

- 2 out 3 deaths;
- 1 out 4 inpatient hospital separations;
- 1 in 10 emergency department visits;
- 1 in 4 visits to general practitioners or family physicians. (North West LHIN, 2008).

Those with chronic conditions also utilize ambulatory care clinics, rehabilitation services, physician specialists and medications (North West LHIN, 2008). Both Health Canada and the Centers for Disease Control and Prevention have described chronic diseases as those that have a prolonged course, do not resolve spontaneously and for which complete cure is rarely achieved (Choi, B., Wright, E. & Auguste, U., 2005). The Chronic Disease Prevention Alliance of Canada (2006), cite that chronic conditions are the leading causes of avoidable illness, death, and disability worldwide, and account for a substantial portion of health care system utilization. Given that our population is living longer and that treatment and management of chronic diseases is very costly to the health care system it is evident that prevention is another important key in managing our health care effectively.

Preventive health care programs can lead to early detection of disease, which will ultimately result in reduced mortality and morbidity. Provincial preventive programs such as, the influenza vaccine, mammogram and pap screening tests are services utilized equally by residents North Western Ontario and the province of Ontario (MOHLTC, 2007h).

Opportunities and challenges

Availability and access to services is a challenge for residents living in rural, northern and remote communities. Romanow (2002) identified that recruiting, training, and retaining more nurses and doctors over the next decade is crucial, especially for remote, rural and northern communities. Financial incentives and tuition reimbursement programs by the MOHLTC (2007a) to physicians to relocate to remote, rural and northern communities are effective and need to be continued. Tuition reimbursement programs to nurses willing to practice in remote, rural and northern communities by the MOHLTC (2007j) need to continue but financial incentives similar to physicians need to be considered as well.

Telehealth services provide videoconferencing services to residents in northern, rural and remote communities. Residents can have assessments done through Telehealth and are not required to drive long distances for face-to-face appointments with specialists or physicians. Telehealth services have improved access to specialists for residents living in rural, northern and remote communities for initial and follow-up appointments. Unfortunately in order to receive treatment from a specialist these residents must continue to endure separation from their families, travel costs, loss of income, and increased wait times.

Access to specialists in Northern centers such, as Thunder Bay is limited due to the decreased number of providers and limited availability of beds at Thunder Bay Regional Health Science Center. It is not uncommon for treatment to be delayed due the hospital being "closed to

the region." Residents must then be transferred even further away from their families and upon discharge are to incur travel costs at their own expense to return to their community.

Education of health care providers is a challenge when living in rural, northern and remote communities. The implementation of Telehealth services and the availability of distance education courses have helped to alleviate this barrier. However, lack of networking with other providers and face-to-face education is a barrier. The MOHLTC identified the need to work with universities to accommodate applicants of the PHCNP program due to geographical issues related to access (MOHLTC, 2007f). Distance, cost and travel time to attend educational courses is a barrier to health care providers working in rural, northern and remote communities.

Education and training of PHC providers in rural, northern and remote communities on cultural and social needs is a challenge. Social and cultural backgrounds influence residents' perception and reception to health care services and providers. Wesley, (2001) identified unique challenges in providing care to Aboriginals given the fact that their belief system is based on holistic concepts. They believe that physical, mental, spiritual, and emotional elements are all connected and must not be identified as separate issues (Wesley, 2001). Health care providers must incorporate and be sensitive to the unique cultural practices of the First Nations' people.

Education about the role and services provided by PHCNPs is a challenge in rural, northern and remote communities. The MOHLTC must continue to educate the public on the expanded role of PHCNPs and the vital contribution that they can make to PHC. Romanow (2002) also identified that one of the challenges is educating physicians and nurses on the expanded scope of practice of PHCNPs. Reluctance by physicians to relinquish patient care and allow PHCNPs to provide health care has also been identified by Romanow (2002) as a challenge. Romanow (2002) suggested that interprofessional education of physicians, nurses and

allied health care providers is needed to better prepare these professionals to work as teams instead of independent practitioners. HealthForceOntario (2007) further supported interprofessional education of physicians and PHCNPs. It identified that educating and preparing present health professionals to work interprofessionally will lead to multiple benefits such as, improved access to health care for patients, improved management of chronic diseases, decreased tension among care health professionals, improved recruitment of health professionals and decreased rate of staff turnover. Decreased utilization of PHCNP scope of practice was found to be due to lack of interdisciplinary education and lack of familiarity with the NP role (Way, D., Jones, L., Baskerville, B., & Busing, N., 2001). Recent legislation has clarified the scope of practice of PHCNPs as only nurses in the Extended Class can use the title of NP. (College of Nurses of Ontario, 2007).

Population Trends

Life expectancy among males and females in North Western Ontario is significantly lower than life expectancy for Ontario overall. In North Western Ontario life expectancy is 79.5% female and 74.7% male compared to 82.10% and 77.5% for Ontario (MOHLTC, 2007h). The incidence of low birth weight, an important determinant of infant morbidity and mortality is lower than the provincial average in North Western Ontario. Low birth weight in North Western Ontario equals 3.7% compared to the provincial rate of 5.6% (MOHLTC, 2007h). Infant mortality is a long-established measure, not only of child health, but also of the well being of a society. Infant mortality per 1000 births in North Western Ontario is 5.1%, which is higher than the provincial rate of 5.4% (MOHLTC, 2007h).

Self-reported health, a known indicator of overall health status is lower than the provincial average in North Western Ontario (MOHLTC, 2007h). Self-reported health can reflect

aspects of health not captured in other measures, such as disease severity, aspects of positive health status, physiological and psychological reserves and social and mental function (MOHLTC, 2007h).

Poor health practices are related to increased risk of chronic disease, mortality and disability. A number of selected health practices in North Western Ontario are different from the province as a whole, and include smoking, alcohol consumption, physical inactivity, obesity, and life stress (MOHLTC, 2007h).

In North Western Ontario the point of access for most medical care is through a primary care physician. Medical doctors play a key role in coordinating care and managing chronic conditions. However, PHCNPs can also manage stable chronic conditions and coordinate care with community partners. The majority of people in North Western Ontario (74.6%) had a least one contact, either in person or by phone with a medical doctor in the past year. This percentage is significantly lower than the provincial rate of 81.4%

TABLE 1: Population Trends

	North Western Ontario	**Province of Ontario**
Female Life Expectancy	79.50%	82.10%
Male Life Expectancy at Birth	74.7%	77.5%
Low Birth Weight Babies	3.7%	5.6%
Infant Mortality Rate per 1000 live Births	5.1%	5.4%
Rate of Self Health as Excellent or Very Good	51.0%	57.4%
Population with an Activity	29.4%	24.6%

Limitation		
Daily Smokers	21.5%	16.8%
Nonsmokers exposed to ETS at home	10.7%	9.3%
Heavy Drinkers	28.8%	21.2%
Physically Inactive	37.8%	47.1%
Obese or Overweight	55.2%	48.5%
Mammogram in past 2 years	77.2%	70.6%
Pap smear test in past 3 years	68.4%	69.2%

(MOHLTC, 2007h)

Health Professionals

Prior to the implementation of the North Shore Family Health Team, three physicians provided primary health care to the residents of Schreiber, Terrace Bay and the surrounding catchment areas of Pays Plat First Nation, Jackfish and Rossport. Although each community has been allocated 2 full time physician complements they have been unable to recruit a fourth physician. Primary health care nursing services are provided through the District Health Unit, Community Care Access Centre and the McCausland Hospital Diabetes Program. Acute care nursing services are provided by the McCausland Hospital in Terrace Bay. Nursing staff consists have 8 full time Registered Nurses (RNs), 3 part time RNs, and 5 casual RNs. The hospital also employs 4 full time Registered Practical Nurses (RPNs), 5 part time RPNs, and 2 casual RPNs The hospital employs two full time physiotherapists who also provide service to residents in their homes. Unfortunately it is difficult to entice nurses to the area for part time work only. Since the implementation of the Family Health Team primary health care services are also provided by a

PHCNP, Mental health worker, part time RN and part time Dietitian. The PHCNP is an RN from the community who completed the PHCNP program. In regards to increased access to primary health care, 2,773 clients were assessed by the PHCNP in the last twelve months (North Shore Family Health Team, 2007). Prior to the implementation of the PHCNP services residents had a four to six week waiting period for appointments with the physicians in the communities. Since the implementation of the PHCNP services residents can obtain an appointment with the PHCNP the same day or within one week and within one to four weeks with the physicians.

In regards to data related to practicing PHCNPs in Ontario, there are 800 PHCNPs licensed by the College of Nurses of Ontario of which 765 are employed as PHCNPs (College of Nurses, 2007). The survey indicated that 25 PHCNPs are not employed; eight are employed in non-nursing careers and two were not specified. The report indicates that there are 45 practicing PHCNPs in the North West LHIN and 100 PHCNPs in the North East LHIN. It is also important to note that of those 45 PHCNPs the majority of them were former RNs living in North Western Ontario, thus supporting the recruitment and retention issue.

Demographics and Health Trends

Relative to the province, North Western Ontario has a higher:

- Percentage of the population who self identify as Aboriginal;
- Unemployment rate;
- Proportion of the population who smoke daily;
- Proportion of the population who are heavy drinkers;
- Percentage of the population who are overweight or obese;
- Prevalence of activity limitations and arthritis or rheumatism;

But lower:

- Rate of population growth;
- Percentage of the population with post-secondary education;
- Percentage of the population of immigrants and visible minorities;
- Proportion of pre-middle-age adults.

(MOHLTC, 2007h)

During the 1994-2004 time period the population of North Western Ontario decreased, on average, by 0.4% each year, and statistics support that males and females within the age group of 25 to 39 were a definitive proportion of the out –migration statistics. It is also important to note that the population of Ontario increased by 1.5% annually during this same time (MOHLTC, 2007h).

North Western Morbidity and Mortality

In North Western Ontario, 24.9% of deaths occur before the age of 65, and 44.5% occur before the age of 75 (the Ontario percentages are 21.3% and 41.2% respectively) (MOHLTC, 2007h). All causes of mortality, potential life years lost and hospitalization rates in North Western Ontario are higher than the provincial rates (MOHLTC, 2007h). This increase appears to be primarily due to higher rates of cardiovascular disease and cancer, which are the two leading causes of mortality and morbidity (MOHLTC, 2007h). In North Western Ontario, external causes (injuries) contribute to more years of potential life lost than any other cause, followed by cardiovascular disease and cancer (MOHLTC, 2007h).

Chronic Conditions

Chronic conditions place a high burden on the health care system and decrease the quality of life of those who suffer from the condition (North West LHIN, 2008). Table 2 shows the prevalence of selected chronic conditions in the North West LHIN compared to the overall

population of Ontario. Arthritis, hypertension, heart disease, chronic obstructive pulmonary disease (COPD), and diabetes are more prevalent in the North West LHIN compared to the population of Ontario (North West LHIN, 2008). Prevalence of asthma, cancer and stroke are relatively equal between the residents of the North West LHIN and the Ontario population (North West LHIN, 2008). The incidence of depression is lower in the North West LHIN compared to the Ontario population (North West LHIN, 2008).

TABLE 2: Chronic Conditions

	North Western Ontario	**Province of Ontario**
Arthritis/Rheumatism	21.4%	17.2%
Hypertension	18.5%	15.4%
Asthma	8.0%	8.0%
Diabetes	6.1%	4.8%
Chronic Bronchitis	5.2%	4.1%
Heart Disease	6.5%	4.8%
Depression	4.4%	4.8%
Cancer	1.9%	1.5%
Stroke	1.5%	1.1%

(North West LHIN, 2008).

Political Forces

Our governments recognize the need for a sustainable health care system that provides timely access to health care. All levels of government should collaborate and continue to support alternative health care providers to improve access to primary health care.

Romanow (2002) made several recommendations to sustain the Canadian health care system. They were developed on the premise that Medicare should remain the responsibility of the provincial and federal governments. Romanow suggested that reorganization is the key to keeping the publicly funded health care system intact. Services must be prompt, accessible, and relevant to the growing needs of Canadians, no matter where they reside. Romanow noted that the retention and recruitment of physicians in rural and remote communities is likely caused by maldistribution rather than a physician shortage. Romanow stated that nurses and NPs could provide a solution to this problem. However, a barrier to this solution is that different professions tend to protect their scope of practice. They are willing to increase their responsibilities, but they are reluctant to cede some of their duties to other professions (Romanow). Collaborative practice agreements and models may help alleviate this issue of jurisdiction.

The MOHLTC support and recognize the value of utilizing PHCNPs as alternative health care providers. In August 2007, the McGuinty government announced that the government is committed to investing 5 million for a 50-seat expansion of the Nurse Practitioner Education program and 5 million in salary and benefits to recruit and retain PHCNPs (MOHLTC, 2007f). Unfortunately in order to fill the seats in the Nurse Practitioner program there must be an increase in seats in the nursing programs in this province. A recent study by the Canadian Institute for Health Information (CIHI) revealed that within Ontario alone it is estimated that 15,000 nurses will retire in two years and the potential graduating nurses are 8,400. Research suggests that 12,000 graduates per year are needed to address the projected nursing shortage (CIHI, 2007). Solutions proposed to the nursing shortage are that the province allocates more spaces in nursing programs and fast track nursing programs so that more nurses can graduate in a shorter period of time (Canadian Institute for Health Information, 2007). Canada is also facing an

education shortage of qualified teachers to educate future nurses and PHCNPs. A recent report in the Canadian Nurse cited several factors that are contributing to the current critical shortage of nursing faculty (Bartfay, W., & Howse, E., 2007). The nursing shortage can be attributed to the fact that Canada lacks qualified faculty candidates; increased age and retention of faculty; workload issues; inadequate training and inadequate salary compensation (Bartfay, W., & Howse, E., 2007). Universities are offering part time masters and doctoral programs on campus and through distance education but more nurses need to pursue graduate education. The MOHLTC is currently offering tuition reimbursement for northern remote nursing students and thus needs to offer graduate and doctoral tuition reimbursement as well as incentives for more nurses to consider graduate education. Further recommendations to help alleviate the faculty shortage are to develop recruitment strategies to retain qualified staff; offer mentorship programs to train new faculty; ensure workloads are tolerable; and lobby all levels of government to reinforce that there is a national shortage of nurses and educators to address this critical issue (Bartfay, W., & Howse, E., 2007).

The Minister of Health and Long Term Care has also lobbied the Health Professional Regulatory Advisory Council (HPRAC) to make changes to improve interprofessional collaboration. The Minister of Health and Long Term Care proposed with the support of the College of Nurses of Ontario, (CNO) that the CNO independently govern the PHCNPs. The CNO would establish competencies for PHCNPs practice; review their scope of practice legislated by the Nursing Act of 1991, and include the recent proposals with respect to controlled acts (MOHLTC, 2007e). The report and recommendations by the HPRAC will be submitted to the Minister in March 2008.

Regulatory Forces

The Nurse Practitioner Association of Ontario (NPAO), (2002) suggested that the MOHLTC play a key role in the development and implementation of NP positions. The NPAO identified the need for funding for NP positions in communities that are under serviced or have high rates of closed family practices.

The NPAO, (2007) has also identified that the present physician compensation model has negative implications for successful implementation of interprofessional models of health care delivery and threaten integration of PHCNPs within the team. The current OMA and MOHLTC agreement allows physicians to include the work of PHCNPs in achieving targets for incentive based activities. Incentive payments include activities such as smoking cessation counseling, influenza vaccines, immunizations, PAP tests, mammograms and colorectal screening. This current model interferes with team development as it devalues the work of the PHCNP. This current model has also been applied to the Family Health Teams in the province and thus physicians are continuing to receive credit for the work of the PHCNP. Unfortunately without changes to this current model the work of the PHCNP is devalued, trust and respect between providers is undermined, the PHCNPs scope of practice is impeded, and accurate data on the impact of PHCNPs on Ontario's health care system. NPAO supports an interprofessional approach to patient care but in order to fully achieve the objectives of interprofessional care, funding for teams and compensation for all providers must recognize individual contributions of each profession (NPAO, 2007).

The Registered Nurses Association of Ontario (RNAO) has also lobbied the HPRAC to make legislative changes to improve interprofessional collaboration and expand PHCNPs scope of practice. RNAO acknowledged that the current restrictions prevent PHCNPs from prescribing medications, ordering certain tests and decrease patient access to care. The proposed legislative

changes will allow PHCNPs to enjoy greater autonomy that has already been implemented in other provinces such as British Columbia, Saskatchewan, New Brunswick, Newfoundland & Labrador and the North West Territories (Registered Nursing Journal, Nov/Dec 2007).

Thus, as identified by Romanow (2002), the NPAO, and RNAO, nurses and NPs play a vital role in the reorganization of our health care system so that all individuals have equal access to health care services.

Conceptual Framework

The Population Health Model

The Population Health Model (PHM; Health Canada, 2001) validated that the health care needs of individuals living in rural, northern and remote Ontario communities are not being met. The model supports the concept that health is complex and is not merely the absence of disease. It is appropriate as the framework of this proposal because it integrates activities across a wide range of interventions, ranging from health care to prevention, protection, health promotion, and action on the determinants of health including the core goals of PHC and PHCNPs (Health Canada).

In January 1997, the Federal, Provincial and Territorial Advisory Committee on Population Health (Health Canada, 2001) defined population health as:

> [The] health of the population as measured by health status indicators and as influenced by social, economic and physical environments, personal health practices, and individual capacity, and coping skills, human biology, early childhood development, health services, gender and culture.

The PHM utilized quantitative and qualitative data based on the determinants of health to identify priorities and strategies to improve health (Health Canada). This approach focuses on

improving not only the health status of the individual but also that of the whole population. Focusing on population health reduces inequalities in the health status of social groups (Health Canada). In this next section, the key determinants of social environment, health care services, gender, and culture will be addressed.

Social Environment

The social environment is an important determinant of health to Ontario populations living in rural, northern and remote communities. Individuals who have to leave the community to access health care are denied the vital support of family, friends, and community. Health Canada (2001) concluded that the health effect of a supportive social network might be as important as the established risk factors of smoking, lack of physical activity, obesity, and high blood pressure. If PHCNPs who reside in the communities can provide the necessary services, residents can then remain in their communities and continue to receive support from their social relationships.

Health Care Services

Health care services are an important determinant of health to residents of Ontario living in rural, northern and remote communities. Access to physicians for health care services in rural and remote Ontario communities is lower than that in urban Ontario communities. Currently Ontario is short over 2,000 physicians, which impacts more than one million adults and 130,000 children (CIHI, 2006b). Demographic trends indicate that our population is growing and the baby boom generation is getting older. Ontario's physician population is also aging, approximately 2500 physicians are older than 65 (CIHI, 2006b). Although the number physicians practicing in Ontario increased to 22, 141, the population of Ontario increased by 4.6% which decreased the physician to population ratio from 179 to 174 per 100,000 (CIHI, 2006b). Access

to nurses for health care services in rural and remote Ontario is lower than that in urban Ontario communities. In Ontario there are 800 PHCNPs, 45 are employed in North Western Ontario (CON, 2007). In Ontario there are 95,877 Registered Nurses, 2.6 per cent are employed in North Western Ontario and of the 26, 338 Registered Practical Nurses, 3.9 per cent are employed in North Western Ontario. Thus access to health care services in North Western Ontario communities is decreased compared to the rest of the province.

Health care services that focus on prevention activities such as immunization and mammography have shown positive results (Health Canada, 2001). NPs assess health habits, stressors, genetics, and health risk factors to identify health promotion and disease prevention strategies (Hamric, Spross, & Hanson, 2000). PHCNPs can provide and endorse illness-prevention health services in rural, northern and remote communities, thereby improving the health of the population.

Gender

Females living in rural, northern and remote communities in Ontario have decreased access to female health care providers. This decreased access is a barrier to care. Females as a group are more vulnerable than males to poor health because of poverty, ethnic origin, race, social class, language, sexual orientation, or disability (Women's Health Clinic, 2005). Female PHCNPs can help to alleviate this barrier to care. Health Canada (2001) reinforced the relevance of gender differences in health outcomes by reporting that although females often live longer than males, they are more likely to suffer depression, stress overload, and chronic diseases. Health Canada (2001) concluded that if smoking rates for females continue to increase, particularly in the adolescent population, lung cancer rates for females would continue to rise. Clearly, gender is an important determinant of health for rural and remote Ontario.

Culture

Culture is an important determinant of health to First Nations people living in rural, northern and remote areas of Ontario. Infant mortality rates in the First Nations population were twice as high as those of the Canadian population in general; the same held true for the prevalence of diabetes, heart disease, hypertension, and arthritis (Health Canada, 2001). Given the prevalence of chronic diseases and high rates of infant mortality in the First Nations population, it is vital that consistent, ongoing, and diverse PHC services be provided in these communities. PHCNPs who live and work in these communities could provide these services and eliminate barriers to care.

Literature Review

Research studies were reviewed in areas that are relevant to Ontario residents living in rural, northern and remote communities. The initial focus was on the experience with PHCNPs in Ontario. However, in order to accurately represent the true experience with PHCNPs, studies were included from across Canada as well as the United States, United Kingdom and Australia. The studies were obtained from the Cochrane database, nursing and medical journals, RNAO, NPAO, OMA, MOHLTC, Canadian Health Research Foundation and CIHI. In reviewing the studies the following themes emerged: access to health care services; PHCNPs as alternative, cost-effective, and safe service providers; barriers to implementation of PHCNPs; and recruitment strategies to entice community-based nurses to become PHCNPs.

Access to Health Care Services

The literature review supported that access to physicians for health care services in rural and remote Ontario communities is lower than that in urban Ontario communities. Access to physicians may not be due to lack of physicians but a geographic maldistribution of physicians.

The literature reviewed indicates that although Ontario is in a physician shortage crisis, redistributing physicians from urban to rural communities may alleviate this crisis. Another solution and perhaps more preferable is utilizing alternative health care providers to deliver primary health care.

The Ontario Medical Association's (2005) Human Resources Committee (OHRC) has argued that reductions in health care services are the result of physician shortages. Despite significant increases in medical school enrollment and improvements in easing international graduate licensing, Ontario is in a physician resource crisis. Approximately 1.2 million Ontario residents do not have family physicians, and the current provincial shortage exceeds 2,100 doctors (OMA, 2005). The OHRC has proposed several recommendations to alleviate this physician shortage: increase medical school enrollment, decrease tuition costs, integrate use of nurse practitioners, and encourage Canadian-trained physicians to relocate in Ontario.

A review of the literature on the availability of physicians in Canada confirms that the decrease is more likely due to a geographic maldistribution of physicians. The CIHI (2006a) defined maldistribution as "the mismatch between the spatial distributions of inhabitants to health care providers [HCPs]" (Executive Summary section). The CIHI compiled data comparing urban-rural differences indicating that only 9.4% of physicians, compared to 21.1% of Canadians, live in rural areas. Ng, Wilkins, Pole, and Adams (1999) reported that residents in rural communities may be more than 100 km away from the nearest specialist physicians, including obstetricians, pediatricians, and general surgeons.

Barer and Stoddart (1999) reiterated the fact that the apparent physician shortage is due to a maldistribution of physicians. They referred to several solutions, which had been unsuccessful in alleviating this problem: trying to "direct" where physicians can practice, offering financial

incentives, and recruiting foreign medical graduates. Two promising solutions to relieve the problem were recruitment of future physicians from rural and remote communities, and integration of NPs as alternative care providers (Barer & Stoddart).

Tesson, Curran, Pong, and Strasser (2005) studied rural medical education as one way of helping to recruit and retain physicians in remote rural communities. These medical schools focus on admitting students from rural communities and giving them opportunities to experience the benefits of practicing in rural and remote communities (Tesson et al.). Although the results of the study appear to be positive, the long-term impact has yet to be demonstrated.

In summary, the literature review supported that more research needs to be done to improve access to health care services in rural and remote communities in Canada. However, two solutions may be plausible: recruit potential medical students from rural communities and utilize PHCNPs as alternative care providers.

Alternative, Cost Effective and Safe Health Care Providers

The following studies were included in the literature review as they support PHCNPs as alternative, cost effective and safe health care providers.

Myers, Lenci, and Sheldon (1997) reviewed the validity of having PHCNPs serve as alternative care providers. They analyzed 1,000 consultations on repeat consultations, prescription rates, referrals, patient satisfaction, dysfunctional consultations, and misdiagnoses. The findings indicated that patients were very satisfied with the services provided by NPs and that no medical problems arose because of misdiagnoses or mismanagement. Patients seeing physicians were more likely to receive prescriptions; repeat consultations were equal for NPs and physicians (Myers et al.).

Mundinger et al. (2000) compared the primary care outcomes of patients who were randomly assigned to either NPs (n_1 = 806) or physicians (n_2 = 510). The randomized trial was evaluated from August 1995 to October 1997. Four community-based clinics were utilized, with 17 physicians and 7 NPs participating in the study. Initially, 3,397 patients were screened, but 1,316 patients were included in the trial following the initial consultation. The analyzed outcome measures were health status, satisfaction, test results 6 months later, and service utilization one-year post initial appointment. The researchers reported no differences in outcome measures between the two groups.

To validate their previous data, Lenz, Mundinger, Kane, Hopkins, and Lin (2004) completed a 2-year follow-up randomized study comparing patient outcomes when assigned to an NP or a physician. The sample size consisted of 406 adults from the previous study. The results validated that there were no differences between the two groups in health status; disease-specific physiologic measures; satisfaction; and use of specialists, ER, or in-patient services.

Horrocks, Anderson, and Salisbury (2002) confirmed that NPs provide equivalent health care to patients as doctors. The objective of their study was to determine if NPs can provide care at first point of contact equivalent to doctors. The design of their study was a systematic review of randomized controlled trials and prospective observational studies. Included in the study were 11 trials and 23 observational studies. The results indicated that patients are more satisfied with care by NPs. They noted that NP consultations are longer and that NPs initiate more investigations than doctors. They found no differences in health status, prescription rate, return consultations, or referrals. These researchers concluded that increasing the number of NPs to deliver PHC would increase levels of patient satisfaction and quality care.

The Canadian Health Services Research Foundation (CHSRF, 2002) compiled several research studies on the safety and effectiveness of PHCNPs. The CHSRF analysis confirmed that Canadians living in remote or rural communities are more likely to receive care from NPs that is just as safe and effective as that provided by doctors. PHCNPs are effective because of their increased educational preparation, which allows them to expand their scope of practice and effectively manage their patients (CHSRF).

Laurent et al. (2006) conducted a meta analysis on the results of replacing doctors with primary care nurses (i.e., practice nurses, NPs, clinical nurse specialists, and advanced practice nurses) to evaluate patient outcomes in morbidity, mortality, satisfaction, compliance, and preference. Patient health outcomes were similar for nurses and doctors, but patient satisfaction with the nurses' care was higher (Laurent et al.). The researchers concluded that nurses with higher educational preparation and skills could provide high-quality care and positive patient outcomes.

A randomized, controlled trial by Kinnersly, Anderson, Parry, and Rogers (2000) evaluated any differences in care from NPs and physicians. In this study, 1,368 patients were surveyed on patient satisfaction, resolution of symptoms and concerns, number of prescriptions issued, investigations, referrals, recalls, and amount of detailed information provided to patients. The results showed that the patients who consulted with NPs were quite satisfied with their care. There were no differences between the two groups in resolution of symptoms, concerns, number of prescriptions, investigations, and recalls. However, the length of time that NPs spent providing information to their patients' was significantly longer. The researchers supported the utilization of NPs in the clinic practice setting as alternative PHC providers.

A randomized control trial in England and Wales compared the cost effectiveness of general practitioners to NPs (Venning, Durie, Roland, & Leese, 2000). The main outcomes measured were consultation process, patient satisfaction, health status, return to clinic, visits over 2 weeks, and costs. These researchers concluded that the clinical and health service costs of NPs and general practitioners were similar. They also suggested that if NPs could decrease their consultation times and follow-up visits, they could be more cost effective than general practitioners.

There was a paucity of studies specific to Ontario comparing the cost effectiveness of PHCNPs to physicians; it remains evident therefore, that more research needs to be done in this area. The MOHLTC (2007b) announced that PHCNPs in Ontario receive a 6.65% wage increase effective April 1, 2007 which equates to an annual salary of $85,320 which is approximately 50% of what salaried physicians earn, not including "on call" fees. Based on salary alone, PHCNPs in Ontario are more cost effective than physicians. Research needs to be done to determine if recruiting and retaining PHCNPs by "Growing your own NP" is successful.

Although more research needs to be done in this area, the studies presented conclude that PHCNPs are alternative, cost effective and safe health care providers. Patients were equally satisfied with the care that they received from a PHCNP compared to a physician. The studies confirmed that increasing the number of PHCNPs to deliver PHC increases patient satisfaction and quality of care. Educational preparation and increased scope of practice are attributed to PHCNPs ability to provide quality and effective PHC.

Barriers to implementation of PHCNPs

Arising from the literature it was evident that barriers exist in implementing PHCNPs. The research supports that utilization of collaborative practice models developed by all providers

decreased workplace barriers. The literature also supported that clarification of the PHCNP role and responsibilities decreased barriers.

The MOHLTC (2007i) conducted a study to determine how best to integrate PHCNPs in Ontario's health care system. Data was collected through a literature review, surveys, site visits and an analytical framework. The key positive issues which emerged from the synthesis of the data were: collaborative practice models; shared vision for NP role and role alignment; role definition and clarity at the practice level; team dynamics; adequate resources; scope of practice issues; facilitators and barriers to integration of PHCNPs into the Ontario health care system. The study concluded that integration of PHCNPs is best achieved when collaborative practice models are developed with health care providers working together. Integration can also be achieved with clarification of the PHCNP role; improved salary and benefits; and referral process for specialists. Removal of barriers to ordering drugs and lab tests; access to acute care patient information and hospital admission privileges; and orientation of PHCNP will also improve integration.

Research by Way, D., et al (2000) promotes the utilization of collaborative practice models in the implementation of multidisciplinary primary health care teams. Their research involved the development and evaluation of case studies that focused on collaborative nurse practitioner/family physician practice models and postgraduate education for student nurse practitioners and family medicine residents. A framework was developed for successful collaboration and consisted of the following seven essential elements:

1. Responsibility and Accountability. Includes independent and shared accountability. Shared accountability involves active participation of partners in decision-making and acceptance of equal responsibilities.

2. Coordination. Organization of treatment plans effectively and efficiently. Services are not duplicated and care is not fragmented.
3. Communication. Content and relationships need to be communicated. Each professional must disclose to partners any information regarding patient issues. Information exchanged needs to be relevant and concise.
4. Co-operation. Acknowledging and respecting each other's opinions and viewpoints. Each provider needs to be willing to examine and alter his or her own views and perspectives.
5. Assertiveness. Individual providers supporting their own views and perspectives and valuing their contributions. Each partner agrees to support the decisions and integrative plan.
6. Autonomy. The ability of the individual providers to work independently, make decisions and develop the treatment plan.
7. Mutual Trust and Respect. Each provider depends on the integrity of the other as the foundation for his or her professional relationship (Way, D., et. al 2000).

The model that Way, D., et al (2000) promote in their research supports a successful collaborative practice. The establishment of a successful collaborative practice must incorporate the seven essential structural elements and reflect equality of partners. Employer-employee models do not support successful implementation of PHCNPs. Concerns regarding liability can be minimized by utilizing a collaborative practice model that clearly identifies the role and functions of the PHCNP.

Further research by Way, D., et al (2001) on collaborative practice was undertaken to help clarify what services were delivered by family physicians (FPs) and NPs. Data was

collected from 2 rural Ontario primary care practices that had participated in a pilot study to improve collaborative practice between NPs and FPs. A total of 2 NPs and 4 FPs participated in data collection for 400 patient encounters over a 2-month period; data included reason for visit, services provided and recommendations for further care. Data was analyzed from 122 encounters with NPs and 278 encounters with FPs. Health exams were the most frequent reason for visiting an NP and cardiovascular disease was the most frequent reason for visiting an FP. Health promotion services were equal for both providers whereas curative and rehabilitative services were higher for FPs compared to NPs. NPs provided more services related to disease prevention and supportive services. Interpretation of the data concluded that NPs were underutilized for curative and rehabilitative care. Explanations for the findings included medical issues related to sharing responsibility, lack of interdisciplinary education and familiarity with NP scope of practice.

A randomized controlled study called Anticipatory and Preventive Team Care (APTCare) explored the role of nurse practitioners within a multidisciplinary team (Humbert, J., Legault, F., Dahrouge, S., Halabisky, B., Boyce, G., Hogg, W., & Amos, S., 2007). Two hundred and forty-one patients were enrolled in the study – 120 in the intervention arm and 121 in the control group. The intervention group received services from three half time nurse practitioners for 18 months and a full time pharmacist for 15 months. The control group received physician care only and had no contact with the nurse practitioners or pharmacist. The study was to evaluate whether integrating nurse practitioners and a pharmacist was an effective solution to managing patients with multiple chronic illnesses. The study revealed that coordination of patient care could be challenging when nurse practitioners and physicians share patients but clarification of roles and responsibilities will alleviate these challenges. The study concluded that a shared collaborative

approach was needed to best meet the needs of these patients. The study also provided valuable information on how best to incorporate nurse practitioners within a team of health care providers.

In summary, the literature reviewed supported that PHCNPs can be better implemented if barriers such as the process of ordering drug, and lab tests are reviewed; collaborative practice models implemented; and a process for referral to specialists is developed. Education of the PHCNP role and responsibilities can further alleviate these barriers.

Recruitment and Retention Strategies

The following studies were included in the literature review as they support solutions and identify the difficulty in recruiting and retaining nurses and PHCNPs in rural, northern and remote communities.

The Registered Nurses Association of Ontario (RNAO, 2000) gathered data on nurses and PHCNPs in Ontario to determine what the ministry needs to do to recruit and retain nurses and PHCNPs. The RNAO offered 10 recommendations to recruit and retain nurses and PHCNPs. One recommendation was that nurses living in rural and northern communities be given support. Evidence from the data collected indicated that most nurses want to continue to live in their home communities. Nurses and PHCNPs in rural northern and under serviced areas need support to gain fair employment and the specialized knowledge to best serve their communities (RNAO, 2000).

The (1999) nursing task force (MOHLTC, 2007c) also investigated possible solutions to recruiting and retaining nurses in Ontario. This committee collected data through audits, surveys, College of Nurses of Ontario registration statistics and statistical reports to the MOHLTC. Their data analysis led to the development of eight recommendations to the MOHLTC. In regard to initiatives to support the employment of PHCNPs in rural and remote communities that have

difficulty recruiting PHCNPs, the task force recommended that the MOHLTC should approve funding to allow registered nurses to upgrade to PHCNPs (MOHLTC, 2007c). The task force also recommended that funding be allocated to PHCNP positions for MOHLTC's under serviced area Program (MOHLTC, 2007c).

Michel and Pong's (2005) study of PHCNPs from 1995 to 2001 led to the emergence of some interesting statistics. Students were surveyed upon entry, exit, one year, and 3 years post graduation to assess their education needs and employment rate. Results from the 3-year follow-up survey found that 93% of the graduates found work as PHCNPs, but only 28% were working in rural areas. The barriers to employment-included lack of PHCNP positions, fee-for-service (OHIP) as a deterrent, inability to relocate, lack of compensation, and employment conditions. Unique northern issues identified by the researchers were that 21% of PHCNP students were from Northern Ontario and 22% of the students studied in Northern Ontario. Three years after graduation, only 24% of nurses reported working in Northern Ontario. More research needs to be completed to assess if recruiting nurses from rural and remote communities, as PHCNPs will alleviate the PHC issue in these communities. What changes might there be in these statistics if the barriers to employment were removed for these PHCNPs? Would more PHCNPs locate in rural and remote communities?

Grow Your Own NP Program

Future research data could be provided by new initiatives by the MOHLTC. In February 2006 the MOHTLC (MOHTLC, 2007d) initiated the "Grow your own NP program" to help fill vacant PHCNP positions in communities that had been allocated PHCNP funding. The Provincial government recognizes the benefit of utilizing PHCNPs as providers of primary health care to the residents of Ontario. The MOHLTC are recruiting potential candidates from RNs

residing in the communities that have vacant PHCNP positions. The MOHLTC will provide funding for education costs and 1 years salary for the potential PHCNP to alleviate a significant barrier for RNs becoming PHCNPs. The candidate must provide services back to the community for 3 years. Since the potential candidate must be from that community it is far more likely that he/she will reside in that community. The goals of this initiative are to create new opportunities for communities to recruit PHCNPs, promote NP retention, reduce NP vacancies in ministry-funded positions throughout the province, and increase the supply of NPs employed in the province (MOHLTC, 2007d). Thus primary health care services are guaranteed for three years. The government is spending significantly less money to educate a PHCNP than it would cost to educate a physician. An RN can become a PHCNP in 1 year, but to become a physician she/he will have to complete six more years of education.

Nurse Practitioner Demonstration Project

The second initiative established by the MOHLTC (2007g) is the "Nurse Practitioner Demonstration Project," which places PHCNPs in communities in southern Ontario where there are no or too few family physicians. This project provides $3 million annually to establish demonstration projects that have placed PHCNPs in under serviced communities. The goal of this project is to enhance access to service and better integrate PHCNPs into Ontario's health care system.

Family Health Teams

The third initiative established by the MOHLTC (2007b) is the implementation of Family Health Teams in Ontario. As stated previously 150 Family Health Teams have been approved in Ontario and it is hoped that by 2008 more than 2.5 million Ontarians will have improved access to primary health care. Family Health Teams provide funding for PHCNP positions. Family

Health Teams will provide data on collaborative partnerships and alternative providers of primary health care such as PHCNPs. Unfortunately the process of approval and implementation of a Family Health Team requires significant work and commitment. The North Shore Family Health Team took eighteen months to become established and approved. The Ministry of Health and Long Term Care considered this faster than normal. Unfortunately in the province of Ontario this is the present format for PHCNPs to obtain employment unless there is a physician who wishes to hire them. As previously stated the Liberal party promised to implement 50 more Family Health Teams and 25 PHCNP run clinics but the process of obtaining approval and implementation takes too much time (Ontario Liberal Party, 2007). It is a slow process. Recently a local hospital applied for approval as a Family Health Team and was advised that they were denied at this time due to the overwhelming number of applications in the system. This in itself sounds positive, but the process of approval is delaying the implementation of more Family Health Teams.

PHCNP Clinics

A fourth initiative from the MOHLTC is the opening of the first PHCNP clinic in Ontario. The first PHCNP clinic opened its' doors to residents of the district of Sudbury on August 31, 2007(Mulligan, C., 2007). This clinic was spearheaded by two PHCNPs to provide health care services to the thousands of orphan patients in the Sudbury region and to provide employment to local PHCNPs. The Sudbury district nurse practitioner clinics consist of PHC nurse practitioner run clinics operating in the communities of Sudbury, Chapleau and Dowling, Ontario. It is anticipated that the clinics will treat 4500 patients who presently do not have a family physician. Four PHCNPs, support staff and physician partners staff the clinic. The clinic will also be recruiting a dietitian and social worker within a year. PHCNP clinics can provide

jobs to present PHCNPs unemployed in Ontario. The government has promised to implement another 25 PHCNP clinics in Ontario (Ontario Liberal Party, 2007).

Although more research needs to be done on whether recruiting nurses to become PHCNPs in rural, northern and remote communities is effective, the initial findings appear positive. The studies support that providing nurses with fair employment, adequate salary and skills can improve retention of nurses in rural, northern and remote communities. Strategies such as the "Grow your own NP" project, Nurse Practitioner Demonstration Project, Family Health Teams, and NP run clinics appear to be positive solutions to the recruitment and retention issue but unfortunately the process to implement these strategies is slow.

It is evident from the literature review, that there are two potential solutions to address the health care needs of communities in rural, northern and remote regions of Ontario. One is to recruit and provide funding to medical students from rural, northern and remote communities in the hope that they will return to their communities as PHC providers. The other, perhaps more preferable, solution is to provide funding to nurses from rural, northern and remote communities to become PHCNPs and provide PHC. The rationale for this solution is that it costs considerably less in terms of time and money to educate PHCNPs than physicians.

Discussion

The Kellogg Foundation Logic Model (Kellogg, 1998) was incorporated to analyze the process of implementing programs that allow nurses from rural and remote communities to train as PHCNPs and then provide PHC services to their communities. Utilizing a logic model provides direction to a program and describes how the desired outcomes will be achieved. The initial step is to identify the resources and potential barriers to implementing such a training

program. Potential solutions have also been provided to provide direction as to how best implement such a program.

Resources

In order to utilize nurses from rural, northern and remote communities to become PHCNPs and increase PHC services the following resources should be implemented and utilized.

The MOHLTC should allocate funding to nurses in rural and remote communities to become PHCNPs in their home communities. The MOHLTC could provide salary replacement and additional funding for educational needs while nurses attend school. Collaborative practice agreements need to be established in communities with physicians, PHCNPs, or other HCPs to ensure a positive and functional work environment. Collaborative practice models developed with health care providers working together ensures a positive integration of PHCNPs (MOHLTC, 2007i).

Telehealth services should be implemented, if they are not already available from the MOHLTC. Romanow (2002) recommended that Telehealth services be expanded to increase access to health care and education. Telehealth services can be utilized to access physicians, specialists, and meet the educational needs of community members and medical staff. Educational requirements should be provided through Internet distance education services or Telehealth so that PHCNP candidates can remain within their communities as much as possible. Communities should endeavour to provide preceptors for PHCNP candidates.

Barriers

PHC services can be better integrated and implemented in rural, northern and remote communities if the following barriers are removed.

Communities may not utilize PHCNP services because they don't know about their role or scope of practice. They do not know what PHCNPs can do. They have not been educated about their scope of practice. Nurses in the communities may also be reluctant to work with PHCNPs because they too do not know their scope of practice or role. The MOHLTC (2007i) support that implementation of PHCNPs can be best achieved when the role and scope of practice has been clarified.

Physicians may be reluctant to work with PHCNPs because they are concerned about safety or liability issues. They may not want to relinquish duties or skills to PHCNPs. The MOHLTC (2007h) identified potential barriers that may impede physicians' promoting implementation of PHCNPs. PHCNPs could have a negative impact on fee-for-service physicians and recruitment and retention (MOHLTC, 2007h). The present OMA and MOHLTC agreement for incentive payments is also a barrier to interprofessional collaboration between physicians and PHCNPs (NPAO, 2007).

The impending nursing and faculty shortage may impact the future of PHNCPs in Ontario. Decreased faculty to educate nursing or PHCNP students will have a negative impact on the availability of nurses to become PHCNPs (Bartfay, W., & Howse, E., 2007). Decreased availability of nurses to become PHCNPs will also have a negative impact on the future of PHCNPs in Ontario (CIHI, 2007).

Solutions

The following solutions proposed can improve and expedite PHC services in rural, northern and remote communities.

Legislative changes should be implemented to expand the PHCNP role in Ontario. Under the current legislation in Ontario, PHCNPs scope of practice is restricted compared to nurse practitioners in other provinces (Registered Nursing Journal, Nov/Dec 2007).

The MOHLTC should increase Telehealth services to rural and remote communities. Romanow (2002) validated that Telehealth can help overcome the obstacles of distance and improve access to health care in rural communities. Telehealth can provide the link so that family physicians or specialists can diagnose, treat, and provide consultations at a distance. Telehealth can also provide distance education to physicians and health care providers. Romanow supported the use of Telehealth technology. The result will be cost savings and improved health care for residents in rural and remote communities.

Role clarity, interprofessional education and collaborative practice models can decrease potential barriers between physicians, communities and health professionals. Research by Humbert, J., (2007) revealed that coordination of patient care could be challenging when nurse practitioners and physicians share patients but clarification of roles and responsibilities will alleviate these challenges. The study concluded that a shared collaborative approach was needed to best meet the needs of these patients. Opportunities need to be explored and initiated for communities and HCPs to be exposed to the benefits of utilizing PHCNPs.

Research should be conducted to support the allocation of funding for nurses to become PHCNPs. Potential students may require assistance in the application process, and linkages with PHCNPs in the community should be established. PHCNPs who are already established in rural or remote communities could preceptor NP students. This relationship is beneficial in that NP students can see the full potential of the NP role, and future-networking resources will be

established. PHCNPs in the community should educate physicians, health care providers and community organizations on their role.

Funding for clinic space should be obtained from the MOHLTC, municipalities, or Band Councils. The clinic should be large enough to accommodate all medical and support staff so that care is not fragmented. Amalgamating all health disciplines in one centre will facilitate access to services.

Partnerships could be established with other health professionals, Band members, or schools within the community to assess community needs and develop health promotion and prevention programs. These partnerships can focus on preventive programs such as prenatal care; immunization; newborn screening; and screening for diabetes, hypertension, and cholesterol. Assessments of high-risk behaviours and lifestyle needs may lead to the development of health promotion and prevention programs.

The potential benefit of educating an RN to become a PHCNP is that an alternative PHC provider could be available to the community in less than 2 years. The time required to be become a family physician is potentially 6 to 10 years. Considering that the Canadian Nurses Association (2002) determined that PHCNPs could provide care to 82.6% of patients seen by doctors, recruiting and training PHCNPs is a more economical and timely solution.

The potential benefits of having PHCNPs offer PHC services in rural and remote communities could be evident in such outcomes as increased patient satisfaction, patient compliance and access to primary health care. The potential outcome of this project is that PHCNPs could remain in their remote or rural communities to provide PHC services. Retention rates could be improved. Given PHCNPs advanced scope of practice and skills, in less than 3 years, the prenatal and newborn care for the community could increase; immunization of

children and adults could be current; high-risk behaviours could be identified; and counselling services could be available to children, adolescents, and adults. Screening programs for diabetes, hypertension, and cholesterol could be offered quarterly to the community residents.

The potential long-term outcomes that could be evident in 7 to 10 years are that HCPs have chosen to live and work in their own rural and remote communities. Better management of chronic diseases from increased access to PHC services should demonstrated a decrease in complications associated with such chronic conditions as diabetes, asthma, chronic obstructive lung disease, and heart disease. Statistical evidence from the increased PHC services in the communities will be supported by the decrease in the rates of depression, suicide, and infant mortality.

Communities could benefit because they could have access to PHC providers who recognize the unique needs of rural and remote communities. The potential outcomes of this project are: more of the population being cared for, improved health of the population, increased patient satisfaction and more utilization of health care services and programs. The long-term effects are decreased rates and complications of chronic diseases, decreased use of emergency services and out-of-community hospitalization of residents, and increased savings to the government for health services.

In summary, utilizing the resources proposed and eliminating barriers can improve PHC services in rural, northern and remote communities. Integration and implementation of the solutions proposed will improve PHC services for these above said communities. It is evident that PHCNPs can offer PHC services that are safe, and cost effective. Access, recruitment and retention of PHC services would be improved by promoting nurses to become PHCNPs in these rural, northern and remote communities.

Recommendations

The needs assessment and literature review validate that PHCNPs are a cost effective solution to the physician recruitment and retention issue in rural, northern and remote communities in Ontario. The MOHLTC could provide funding to RNs in rural, northern and remote communities to become PHCNPs and alleviate the physician shortage in these communities. Although recruiting RNs to become PHCNPs will reduce the number of RNs in these communities alternative strategies for recruiting nurses should be funded by the MOHLTC. The MOHLTC should provide the additional 50 Family Health Teams and 25 PHCNP run clinics in Ontario to further alleviate the physician shortage in northern remote rural communities.

Conclusion

The purpose of this project was to examine primary health care services for residents of rural, northern and remote communities in Ontario. Ontarians' living in rural, northern and remote communities do not have adequate or consistent health care services to meet their unique health needs. Potential solutions were offered. The MOHLTC should allocate funding to recruit and train nurses from rural, northern and remote communities to become PHCNPs; increase the number of Family Health Teams and PHCNP run clinics to deliver PHC services to these communities. The objectives of this project were to provide evidence that populations living in rural, northern and remote communities have decreased access to HCPs, show that PHCNPs are a cost-effective and safe alternative to physicians, and suggest that recruiting nurses from rural and remote communities to become PHCNPs is beneficial to the communities.

The needs assessment incorporated environmental forces, social forces, political forces, and regulatory forces. Political and regulatory forces suggest that the recruitment and retention of physicians is a maldistribution rather than a shortage, and Nurses and NPs can provide a solution

to this problem. There are many duties and skill currently performed by physicians, which nurses and PHCNPs can do effectively. This will make better use of limited resources and allow nurses and PHCNPs to practice to their level of education and training. The MOHLTC should allocate more funding for PHCNP positions. Education of physicians, nurses, allied health providers and clients on the role and services that PHCNPs provide could alleviate barriers in utilization of PHCNP services. Environmental issues include the need to expand Telehealth services and increase funding for medical services. Social forces revealed that residents in rural, northern and remote communities do not have access to health care services 24 hours a day, 7 days a week. Access to specialists is limited to urban centers only and the number of specialists practicing is decreased in North Western Ontario.

The Population Health Model demonstrated that many of the health care needs of individuals in rural, northern and remote communities are not being met. The key determinants discussed were social environment, health services, gender, and culture. The literature reviewed indicated that there is decreased access to health services in rural and remote Ontario communities and that PHCNPs are safe and cost effective service providers. More research needs to be done on the process of recruiting and training nurses to become PHCNPs in rural and remote communities. The literature review revealed plausible solutions for these rural and remote communities: recruit "home grown" potential medical students and utilize PHCNPs as alternative PHC providers.

The Kellogg Foundation logic model (Kellogg, 1998) was incorporated to analyze the process of implementing programs that allow nurses from northern, remote and rural communities to become PHCNPs and provide PHC services. Resources and potential barriers

were identified, as were activities to reduce or eliminate these barriers. Short-term and long-term outcomes, and benefits of having PHCNPs in rural and remote communities were identified.

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Appendix A

Budget

This is a possible budget outlining the cost for a nurse from a rural, northern and remote community to become a PHCNP. The salary requirement is based on the current annual salary of $72,000 for a full-time Level 8 hospital nurse in Ontario (Ontario Nurses' Association, 2006). The funding information for an NP's salary is from the MOHLTC.

Salary for one year = $72,000

Education expenses = $ 5,000 ($3,000 tuition, $2,000 books)

Salary & Benefits once completed PHCNP and passed RN (EC) exam:

Salary = $80,000 - 85,000 (Supported by NPAO, 2002)

Benefits = $15,000 annually (includes short- and long-term disability, pension, and annual vacation entitlement).

NPs need a minimum of $1500 annually and up to 10 professional development days to maintain standards and development of professional practice for the College of Nurses of Ontario.

Overhead = $15,000 (to be dispersed for clerical expenses and office equipment).

Appendix B

Community Partners

CONTACT	AGENCY	DESIGNATION
Ms. Brenda Asmussen 415 Scotia Street, Schreiber, ON Phone: 807-824-2413	Thunder Bay District Health Unit	Public Health Nurse - preventive programs focusing on health promotion and disease prevention
Ms. Melanie McKenna, RD Ms Jane Chasse, RN 20B Cartier Drive, Terrace Bay, ON Phone: 807-825-3273	McCausland Hospital Diabetes Program	Diabetes Education – preventive and maintenance programs.
Ms. Kathy Weller 26 Pennisula Road, Marathon, ON Phone: 807- 229-8627	Community Care Access Center	Provides nursing, homemaking, speech, physiotherapy and OT services
Ms. Sandra Jordan (Nursing) Ms. Crystal Ray (Children) 177 Railway St, Nipigon, ON Phone: 807 – 887-2514	DILICO Ojibway Child and Family Services	Health Nurse- Pays Plat First Nation preventive programs focusing on health promotion and disease prevention. Early child screening
Mr. Adam Presenger 211 Walker St, Schreiber, ON Phone: 807-824-2867	North of Superior Programs	Mental Health counseling, Telepsychiatry services
Ms. Sheryl O'Riley 211 Walker St, Schreiber, ON Phone: 807-824-2867	Integrated Services for Northern Children (ISNC)	Pschometry, OT, Teacher Dx, Physical therapy, Speech Therapy, Psychologist, Psychiatry services

Ms. Debbie Bouchard Pays Plat First Nations Phone: 824-1112	Pays Plat First Nations	Community Resource Worker – coordinates services for residents of Pays Plat – appointments with NP
Ms. Evelyn Leblanc 313 Scotia St, Schreiber, ON Phone: 807-824-1362	Mental Illness Support Network (MISN)	Offers group and individual support and provides referrals to appropriate agencies.
Ms. Karen Figliomeni 315 Scotia Street, Schreiber, ON Phone: 807-824-1304	Superior Speech Services	Speech language services to clients of all ages with identified speech disorders. Provides home, school and hospital services.
Mr. Frank Costa 52 Pennisula Rd, Marathon, ON Phone: 807-229-0580	Children's Aid Society of the District of Thunder Bay	Evaluate and identify children at risk and ensure children's needs are addressed.
Ms. Sharon MacKenzie Hudson Drive, Terrace Bay, ON Phone: 807-825-3271	Lake Superior High School	Partnerships for education presentations and allows school clinic for NP.