# PUBLIC HEALTH CORE AND NURSING COMPETENCIES AMONG PUBLIC HEALTH NURSES IN ONTARIO: A PILOT STUDY TO ASSESS AWARENESS AND UTILIZATION

by

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Public Health Core and Nursing Competencies Among Public Health Nurses in Ontario:

A Pilot Study to Assess Awareness and Utilization

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Abstract

Purpose: This study describes influencing factors that public health core and public health nursing competency sets have had on public health nursing workforce development since their release in 2007 and 2009 respectively.

Methods: A descriptive, non-experimental pilot study was conducted using Rogers Diffusion of Innovation Theory as a framework to explore awareness and utilization of public health core and nursing competencies among a sample of 221 public health nurses (PHNs) working in Ontario health units.

Results: Findings suggest substantial awareness and moderate use of both competency sets among PHNs, with a statistically significant difference between management and front-line staff in level of awareness of core competencies only. Barrier/facilitator themes influencing competency set utilization frequently represented organizational factors, and were slightly different between competency sets.

Implications: Results have implications for knowledge translation efforts of competencies integration into practice and addressing barriers to precluding competency-based public health nursing workforce policy and planning.

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Finally, I would also like to give a heartfelt thanks to my family, friends and colleagues who provided the ongoing support, time and assistance to make this degree and thesis possible.

## Dedication

This thesis is dedicated to my husband Rob, my voice of reason and ‘rock’ who truly deserves joint recognition on the degree. Thank you for pulling me along when I got too tired of chasing after this goal. It is your love, support, and constant encouragement that got me to the finish line.

I would also like to dedicate this work to my children Lochlan and Rowan. I am grateful to have you both and thank you for understanding the many times ‘mummy had to do homework’. I love you and I look forward to spending time with you and giving you all the attention in the world.

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# CHAPTER I - INTRODUCTION TO COMPETENCY SETS IN PUBLIC HEALTH

## Background to the Problem

Over the last decade, significant public health emergencies have led to the critical examination of the Ontario public health system and its capacity to effectively manage emerging public health events (Frank & Di Ruggerio, 2003). The Escherichia coli (e-coli) contamination of drinking water in May 2000 and the Severe Acute Respiratory Syndrome (SARS) outbreak in spring of 2003 resulted in significant preventable morbidity and mortality among many people and affected the health and safety of local populations in Ontario. Both the e-coli and SARS outbreaks prompted the initiation of several commissions to examine and identify gaps in the public health system that resulted in delayed responses at all levels of government. These commissions also provided recommendations aimed at rebuilding neglected and poorly resourced public health services and supported efforts to strengthen the sector and its ability to respond to emerging public health issues and mitigate risks to the population's health (Campbell, 2006; Kirby, 2003; Naylor, 2003; Walker, 2004). The commissions led to the identification of deficiencies in health human resource (HHR) capacities that contributed to the rapid spread of these outbreaks. Naylor (2003) provided examples of gaps such as surge capacity issues, and limited availability of specific disciplines and expertise to implement basic functions of public health services such as outbreak investigation, management and control.

Public health human resources (PHHR) consist of a mix of regulated and non-regulated health professionals and disciplines with varying degrees of formal and informal training and education in the specialty field of public health (Tilson & Berkowitz, 2006). The diversity of skills-mix found in public health contributes to PHHR inconsistencies across jurisdictions; leading to potential workforce imbalances and poor human resource distribution across many public health organizations (Moore, 2009). These imbalances and resource differences can

influence a public health organization's ability to implement effective public health interventions and respond to critical public health events (Frank & Di Ruggerio, 2003).

From the various post-SARS commissions, several recommendations focused on efforts to support an investment in PHHR (Kirby, 2003; Naylor, 2003). A number of countries, including Canada, acknowledged the need to develop core competencies to support educating and training a knowledgeable and skilled public health workforce with the ability to execute core public health functions such as surveillance, health promotion, disease and injury prevention, health protection and population health assessments, in order to effectively address emerging public health issues and emergencies (Provincial Public Health Research, Education and Development [PHRED] Operations Committee, 2006). The United States (U.S.) Centers for Disease Control and Prevention (CDC) have developed a model illustrating that core public health functions underpinning program and service delivery cannot be implemented without the support of a public health infrastructure that includes: (a) a competent workforce, (b) organizational capacity, and (c) information and communication capability (Cioffi, Litchfeld & Tilson, 2004). Therefore, a competent workforce is a foundational element to the public health system. The requisite of an adequate and competent workforce to support and strengthen the public health sector was captured in the review of the National Advisory Committee on SARS and Public Health Commission (Naylor, 2003), where "no attempt to improve public health will succeed that does not recognize the fundamental importance of providing and maintaining in every public health agency across Canada an adequate staff of highly skilled and motivated public health professionals" (p.136). A government response was required to address questions raised and gaps identified in public health workforce capacity, as well as mechanisms to fill the identified expertise void.

In response, a task group of the Federal/Provincial/Territorial (F/P/T) Advisory Committee on Population Health and Health Security (2005) released a report with key recommendations focused on the development of a sufficient and competent public health workforce. The recommendations supported a national public health workforce strategy and the identification and application of public health competencies for professionals in the sector. Through the recommendations of national advisory committees and task groups for public health, the Joint Task Group on Public Health Human Resources (JTGPHHR) was formed to address long-term planning, education, research, training, enumeration, and forecasting requirements for PHHR (Joint Task Group on Public Health Human Resources [JTGPHHR], 2005). It was through this group that a national framework for PHHR planning was developed (JTGPHHR, 2005). A key goal articulated in this framework was the creation of an "interprofessional public health workforce with the skills and competencies" (JTGPHHR, 2005, p.10) required to conduct public health activities that addressed population health needs across provincial jurisdictions within Canada.

Specifically, a skills and competencies-based approach to workforce development was put forth as a possible strategy to address these challenges. This required defining and creating national core competencies for public health practice. Through an extensive consultation process, a set of essential core competencies for all public health professionals was developed that summarized the general knowledge, skills and attitudes required for public health practice in Canada across public health disciplines (Public Health Agency of Canada [PHAC], 2007a). Where there were competencies specific to disciplines and their related scope of practice, discipline-specific competencies were then developed by various national professional

organizations, including public health nursing competencies released by the Community Health Nurses of Canada [CHNC] (2009).

Numerous advantages of core and discipline-specific competencies for practice within the public health sector are evident in literature. Competency sets establish parameters for expected skills, knowledge and abilities to practice public health and public health nursing (Emerson, 2005; Kulbok & Reed, 2006; Underwood, 2007), and can be measured and applied to set standards of practice in the field. In academic and pedagogical settings, competency sets outline the basis for, and priorities within public health education, training, practice and research (Gotway Crawford et al., 2009; King & Erickson, 2006; Underwood, 2007). As public health is an inter-disciplinary field with an extensive cross-over of functions, balanced by distinct discipline-specific activities, a core competency set articulates generic competencies expected of all practitioners in the field of public health (PHAC, 2007a), while discipline-specific scopes of practice are important within discipline-specific competency sets (King & Erikson, 2006). In terms of performance appraisal, established core and discipline-specific competencies support the ability of organizations to develop performance measurement tools for ongoing skills assessment and enhancement, and professional development among employees (King & Erikson, 2006). Finally, competency development among staff can have a positive impact on program and service delivery which can contribute to the health of individuals and populations served by the public health sector (Cioffi, Litchtveld, & Tilson, 2004). Individuals and organizations that utilize nationally established competency sets to guide and support professional development activities and workforce capacity building are essentially using the knowledge benchmarks established within the sector that are informed by evidence and expert consensus. These national competency requirements also contribute to a harmonized approach to skills and knowledge

development among a public health workforce and support some of the national goals and objectives set out by the JTGPHHR (2005) in their Pan-Canadian public health workforce plan.

Potential and suggested applications and utility of competency sets in workforce development include: establishing consistent role expectations; standards for assessment within the performance appraisal processes; determining organizational skills-mix or discipline requirements; facilitation of PHHR planning and implementation; and curriculum development (Emerson, 2005; Underwood, 2007). While some of the suggested utility of competency sets in public health workforce development has been proposed in grey literature, empirical support for the use of competency sets in public health is limited. Little is known about the levels of awareness of competency sets between groups of public health professionals within organizations (i.e. staff, management, academia, etc.). Information on the barriers and facilitators that influence the level of awareness or uptake of competency sets is also limited.

## Problem Statement

Information available on competency set application in public health is typically more prevalent in grey literature in the form of opinion pieces; case studies of the development of core and discipline-specific competencies in the sector; organizational evaluation or reports of competency set use; policy papers; conference presentations and measurement tools to assess core and discipline-specific competencies attainment in public health. Empirical studies assessing the level of awareness of competency set documents among public health professionals or their utility in guiding PHHR development with individuals and within organizations in practice settings are limited in availability and quality. Significant resources are required to develop public health core and discipline-specific nursing competencies that are intended to guide professional development activities and influence practice for outcomes that positively

impact the health of populations (Oppewal, Lammana, & Glenn, 2006). However, with limited available empirical literature on awareness of public health core and nursing competency sets, as well as factors influencing their utilization, effective strategies to promote and facilitate their use for competency-based workforce development may be poorly executed and waste valuable and limited resources (Oppewal, et al., 2006).

## Statement of Purpose

The purpose of this study was to identify and describe the extent of influence that public health core and public health nursing competency sets have had on public health nursing workforce development in Ontario since their release in 2007 and 2009 respectively. Specifically, this study a) assessed Ontario public health nurses' (PHNs) level of awareness of both Canadian public health core competencies and discipline-specific public health nursing competencies; b) identified Ontario PHNs' use of competency sets, c) described the barriers and facilitators associated with the use of competencies in supporting professional development and PHHR capacity building within the public health units where PHNs were employed; and d) attempted to determine differences between front-line nursing staff and management regarding the level of awareness and utilization of competency sets. A comparison of specific study variables, either between the two competency sets, or between front-line staff and management results within the context of their respective public health organizations were also explored and discussed.

## Significance of Problem to Nursing Practice

Public health nurses in Ontario represent approximately 50% of the public health workforce (Capacity Review Committee [CRC], 2005). With such a large component of the public health workforce responsible for implementation of mandated public health functions, a

skilled and knowledgeable public health nursing workforce is a key component to public health program and service delivery that also contributes to population health (Kulbok & Reed, 2006). However, being the largest segment of the public health workforce will also pose challenges in the near future given the changing demographics of the current workforce.

In Canada, nursing workforce demographics indicate an aging community health nurse population, with nurses being slightly older in community health than in other healthcare sectors (Underwood et al., 2009). According to the Canadian Institute for Health Information (CIHI) data base, in 2007, 28% of nurses working in community health nursing were 55 years or older versus 21% found in the overall nursing workforce in Canada (Underwood et al., 2009). An aging community health nursing workforce will eventually result in the exodus of nurses through retirement, creating a sector capacity gap. As competency-based training and education is the nationally recommended strategic direction for PHHR development (JTGPHHR, 2005), future nurses choosing to enter public health will likely be exposed to and need to acquire both public health core and nursing competencies to practice in the sector.

Despite the dissemination and promotion of public health core and nursing competencies sets by national organizations several years ago, little empirical evidence exists regarding the widespread knowledge of these key practice documents, or the impacts of competency sets on workforce development in nursing or the sector as a whole. Much has been written about the perceived value, benefits and contributions of competency sets on workforce capacity building in public health in the grey literature or journal commentaries/editorials reviewed. Discussions of competency set use often focus on anticipated outcomes such as competency-based education and training opportunities to support the development of a public health sector that could be responsive to emerging public health needs and emergencies (CRC, 2006; Emerson, 2005;

Gotway Crawford et al., 2009; JTGPHHR, 2005; King & Erickson, 2006; Mowat & Moloughney, 2004). This point has implications for the discipline of public health nursing. If PHNs are to be effective and responsive to evolving public health issues, especially among ever increasing public health emergencies and emerging chronic disease epidemics, PHNs will need to be prepared to meet these population health needs. The use of competency sets to support competency-based workforce development is one strategy to support achievement of this goal.

While some literature is available promoting the merits of public health core competencies, empirical research is limited and narrow in scope regarding the assessment of awareness levels, or competency set use in PHHR development among individuals, organizations, or academia. If informed decisions are to be made on PHHR capacity building and policy making at all levels of government to address identified workforce gaps, evidence is required to justify resource investment and allocation, as well as articulate anticipated returns on this investment with limited public dollars. Evidence informed PHHR policy is crucial for public health nursing given that nurses represent a sizeable proportion of the public health workforce, and therefore, will likely require a considerable amount of training and professional development, as well as fiscal resource commitments within public health organizations in order to meet requirements in competency and practice standards.

Recently, the Ontario Ministry of Health and Long-Term Care (MOHLTC) released a provincial strategic plan for public health. The sector's plan identified capacity building as one of five priority areas that included PHHR development (Ministry of Health and Long-Term Care [MOHLTC], 2013). The strategic plan noted that a workforce plan was required inclusive of "core competencies for the full range of public health disciplines" (MOHLTC, 2013, p.23). Ontario Boards of Health are also "required to ensure that the administration develops a

workforce development plan which…encourages opportunities for the development of core competencies" (MOHLTC, 2011, p.23). The value of competencies has been recognized as a contributing factor to building a competent public health workforce in Ontario from a policy perspective. This explicit acknowledgement of core competencies in the provincial strategic plan may influence other parts of the sector such as schools of public health in the planning of education programs for future public health practitioners, and establishing administrative functions in public health organizations supporting professional development and practice standards. However, without knowing the extent of awareness or uptake of competency sets among public health units or disciplines, it is difficult to gauge their current and potential impact on strategic goals and current mandated practices. This pilot study attempted to address this evidence gap and present results could support evidence-informed PHHR policy making.

## Summary

In conclusion, the evolution and relevance of competency set development for public health in Canada has been introduced and the argument made for the need to document current knowledge and application of core and discipline-specific competencies in public health nursing specifically. While there is considerable acknowledgement of the value of competency sets to PHHR capacity building within grey literature, documented empirical outcomes and impacts of their contributions towards competency-based public health workforce development is limited. Such evidence is crucial to support evidence-informed policies and decision making at various levels of government and execute public health workforce development strategies using a competency-based approach. This study aimed to explore the level of knowledge and utility of public health core and nursing competencies among PHNs in Ontario, as well as barriers and facilitators influencing their uptake in public health organizations on workforce development.

# CHAPTER II – REVIEW OF LITERATURE

## Literature Search Strategy

In order to identify the level of awareness and application of core and discipline-specific competencies, a literature review was conducted on the following: the development of competencies, their use in public health workforce development, level of awareness and utilization of other similar evidence-based resources to guide practice such as best practice guidelines (BPGs) or clinical practice guidelines (CPGs), as well as the barriers and facilitators to their use. A search for literature was performed using the following data bases: The Cumulative Index of Nursing and Allied Health Literature (CINAHL), ProQuest Health and Medicine, ProQuest Nursing and Allied Health Services, Education Resource Information Centre (ERIC), and MedLine. Established search limits within data bases included peer reviewed journals, with available abstracts and full-text, content written in English, and published from the years 2000 to present. In the case of both ProQuest data bases, to limit the first round of results to a manageable number of articles for review, an additional limitation was applied during the search (the limitation used in these data bases is identified as 'Field Code: Anywhere except full text'). Both quantitative and qualitative research papers were reviewed. Search strategies and key terms were suggested by a Ryerson University health sciences librarian as well as noted in various initial articles reviewed. Reference lists of articles of interest were reviewed for additional literature sources. Key seminal articles pre-dating the literature search limits were obtained from reference lists of readings and doctoral dissertations recommended for review by subject matter experts.

The following key search terms were used: competency, competencies, core competencies, public health, diffusion of innovation, Best Practice Guidelines (BPGs), Clinical

Practice Guidelines (CPGs), and knowledge translation. A number of ancillary terms were used in various combinations with key terms to narrow down topics of interest and identify key articles for further review. These ancillary terms included: public health, public health nursing, public health workforce, theory, barriers and facilitators, nursing, utilization, and concept analysis. As noted in Table 1.0, the results of the literature review have been summarized and include data bases searched, successful combinations of key and ancillary search terms (note: key and ancillary terms were almost always used with the search function 'AND' to narrow results) along with the number of results, number of articles initially selected through a preliminary scan and the number of articles reviewed in depth (of which there is some overlap and duplication of selected articles due to saturation of search strategy).

Articles were selected for relevance to the pilot study using the following selection criteria: a) relevant key and/or ancillary terms, b) exemplified measurement, evaluation or exploration/assessment of defined concepts or similar concepts of interests for this pilot study, c) defined theoretical concepts of interests, d) provided historical background or contextual information, e) presented case studies of concepts explored, f) exemplified utility or application of concepts studied, g) written by key subject matter experts, h) content focus was in the context of the public health sector where possible, and i) opinion pieces, commentaries and editorials for the purpose of providing historical and contextual references. Exclusion criteria included clinically oriented/technical healthcare competencies, competencies applied to disciplines as a whole (e.g. nursing versus public health nursing), the detailed process of developing specific competency statements and documents, and jurisdictions dissimilar to Canadian context (e.g. articles from developing nations).

Table 1.0

*Summary of Literature Search and Review Outcomes*

| Data Base | Key Term | Ancillary Term | Number of Articles Found[1] | Number of Articles Selected for Initial Review | Number of Articles Selected for in Depth Review |
|---|---|---|---|---|---|
| CINAHL | Core Competencies | Public Health | 104 | 17 | 10 |
| CINAHL | Competency | Public Health Nursing | 28 | 18 | 13 |
| CINAHL | Competency | Public Health | 267 | 35 | 20 |
| CINAHL | Competency | Public Health Workforce | 34 | 12 | 5 |
| CINAHL | Competency | Concept Analysis | 11 | 2 | 2 |
| CINAHL | Public Health | Workforce | 130 | 18 | 10 |
| CINAHL | Diffusion of Innovation | Theory | 448 | 47 | 26 |
| CINAHL | Diffusion of Innovation | Barriers AND Facilitators | 18 | 8 | 8 |
| CINAHL | Knowledge Translation | Theory | 62 | 5 | 5 |
| CINAHL | BPGs OR CPGs | Nursing | 426 | 9 | 4 |
| CINAHL | BPGs | - | 316 | 9 | 9 |
| CINAHL | CPGs | Utilization | 227 | 10 | 5 |
| ERIC | Competence | Work AND Learning | 440 | 10 | 6 |
| ProQuest Health and Medicine | Core Competencies | Public Health | 398 | 12 | 5 |
| ProQuest Health and Medicine | Core Competencies | Public Health Nursing | 14 | 6 | 6 |
| ProQuest Health and Medicine | Core Competencies | Public Health Workforce | 125 | 4 | 4 |
| ProQuest Nursing and Allied Health | Knowledge Translation | Public Health | 224 | 7 | 6 |
| ProQuest Nursing and Allied Health | Knowledge Translation | Theory | 134 | 5 | 5 |
| ProQuest Nursing and Allied Health | BPGs | Nursing AND Barriers OR Facilitators | 188 | 4 | 4 |
| MedLine | Knowledge Translation | Public Health | 56 | 7 | 7 |
| MedLine | Knowledge Translation | Barriers AND Facilitators | 33 | 4 | 4 |
| MedLine | Diffusion of Innovation | Barriers AND Facilitators | 112 | 9 | 9 |
| MedLine | Diffusion of Innovation | BPGs | 12 | 3 | 3 |
| MedLine | Diffusion of Innovation | CPGs | 90 | 8 | 8 |
| MedLine | BPGs | Barriers AND Facilitators | 12 | 3 | 3 |

[1] Please note that the search yield may include duplicates.

Grey literature was also included in the search and review of documents. This literature was obtained from federal and provincial government/government agency websites, public health and nursing organizations, key word or title searches on general search engines (e.g. Google) and recommended readings from subject matter experts. Included in the review were key government commissions, reports and policy documents, organizational reports and evaluations, administrative documents, and opinion pieces and organization documentation for contextual/historical references. A scan of grey literature reference lists helped identify additional sources of key literature.

## Concepts of Core Competencies and Discipline-Specific Competencies

The term *competency* is widely used in healthcare literature with respect to appropriate actions or knowledge acquisition for practice by healthcare professionals; however, consensus for a specific and consistent definition is elusive (Axeley, 2008; Scott Tilley, 2008). In a concept analysis of the term 'competency', Axeley (2008) provides numerous definitions with common repetitive themes. These themes include the possession of knowledge, skills, judgment, and expertise; display of behaviours, abilities or actions to perform specific tasks/activities correctly; and that competencies can be observed, measured or assessed in some manner. Axeley (2008) also notes that a degree of self-regulation is required when acknowledging one's own competency in the form of "attitudes, motives, personal insightfulness, interpretive ability, receptivity, maturity and self assessment" (p.218). Competencies can be categorized as generic, situation-specific or core (Irwin, 2008). These categories are significant given that the focus of this pilot study is on two distinct types of professional competency sets that are core and discipline-specific in nature.

The term *core competencies* has its roots in the business sector, where a collective set of skills or expertise possessed by all in an organization are used to produce an array of products or outcomes (Prahalad & Hamel, 1990). Underwood (2007) provides a definition that attempts to distinguish between the two concepts of competency versus core competency; "competency refers to the human capability for performing certain functions. Core competency refers to capability required within an industry that is essential for a person to be accepted to work in that industry" (Underwood, 2007, p.1). This latter point is salient as core competencies for public health are relevant for all those employed in this sector of the healthcare system.

Both the *Core Competencies for Public Health in Canada Release 1.0* (PHAC, 2007a) and the *Public Health Nursing Discipline Specific Competencies Version 1.0* (CHNC, 2009) have similar key elements in their respective definition of competencies such as knowledge and skill set. The Public Health Agency of Canada's (PHAC) definition reads:

> Core competencies are the essential knowledge, skills and attitudes necessary for the practice of public health. They transcend the boundaries of specific disciplines and are independent of program or topic. They provide the building blocks for effective public health practice and use of an overall public health approach. Generic core competencies provide a baseline for what is required to fulfill public health system core functions. These include population health assessment, surveillance, disease and injury prevention, health promotion and health protection. (PHAC, 2007a, p. 1)

The Community Health Nurses of Canada [CHNC] (2009) define the discipline-specific competencies for public health nursing as "the integrated knowledge, skills, judgment and attributes required of a public health nurse to practice safely and ethically. Attributes include, but

are not limited to attitudes, values and beliefs" (p.2). CHNC's public health nursing competencies are considered *discipline-specific;* this term is defined as "the breadth and depth of core and technical competencies that are used to define a particular discipline" (Emerson, 2005, p. ix). Therefore, not only do the public health nursing discipline-specific competencies consist of public health core competencies such as those outlined in the *Core Competencies for Public Health in Canada Release 1.0* (PHAC 2007a), they also consist of *technical competencies* bound by the discipline of nursing and possibly other disciplines (e.g. medicine). Technical competencies within the context of public health are defined as "the special knowledge, skills and abilities that are not possessed by all public health practitioners and are required for a particular aspect of public health practice" (Emerson, 2005, p.ix).

Within a discipline, attainment of competencies is shaped by behaviours and attitudes; acquisition of competencies is linked to performance outcomes in practice, and ideally supports meeting requirements for set standards of practice (Irwin, 2008). Such competencies might be considered specialist competencies, "theoretical knowledge and practical know how associated with specific professional practice" (Nilson, 2010, p.257), creating a sphere of exclusive knowledge to practice within a given field or context. For example, in the case of the Canadian discipline-specific public health nursing competencies (CHNC, 2009), this competency set outlines the knowledge, skills and attributes required by PHNs in order to meet standards of practice in community health nursing (CHNC, 2011).

To demonstrate the relationship between the two competency sets and their influence on expected scope of nursing practice in public health, the CHNC has developed a model outlined in the *Canadian Community Health Nursing Professional Practice Model and Standards of Practice* (CHNC, 2011). This modified model in Figure 1.0 (CHNC, 2011) illustrates where

various competency sets intersect to support nurses in meeting set standards of nursing practice defined by regulatory bodies and in the specialty area of community health nursing, as well as sub-specialty of public health nursing.

Figure 1.0 Relationship Between Community Health Nursing Standards and Competency Sets

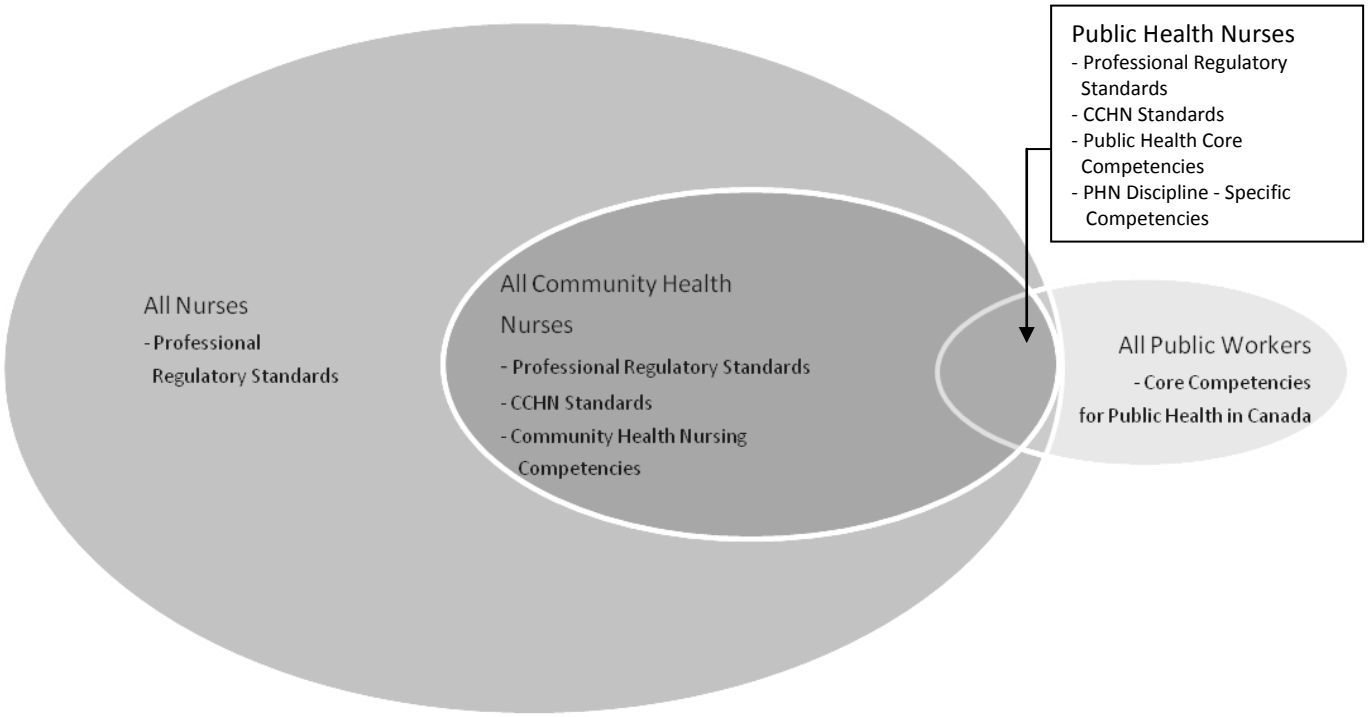


*Figure 1.0* Diagram from the Canadian Community Health Nurses Professional Practice Model and Standards, published by the Community Health Nurses of Canada. (2011).

A subset of nurses work in the field of community health nursing and must practice to the standards set out by nursing colleges as well as standards set out by the CHNC; they should also attain defined community health nursing competencies. A further subset represents all public health practitioners, where all disciplines in the sector should attain the PHAC defined core competencies for public health to practice public health in Canada. Finally where the subsets of

community health nurses and public health workers intersect, is the domain of public health nursing. In this domain, PHNs are required to have the numerous competencies, including public health nursing competencies outlined in the diagram; as well as meet the various discipline and sector standards of practice required. This diagram reflects the multiple areas of knowledge and skills essential in the specialized field of public health nursing, and demonstrates why highly-skilled and knowledgeable workers are required to implement public health core functions necessary to promote and protect population health.

Competency development can be based on policy or strategic priorities, and/or planning (Estrom & Koch, 2008). Such was the case for the development of the *Core Competencies for Public Health in Canada Release 1.0* (PHAC, 2007a). Born from task group policy recommendations to a federal/provincial/territorial government committee (Federal/Provincial/ Territorial Advisory Committee on Population Health and Health Security, 2005) and the development of a Pan-Canadian framework for strengthening the capacity of the public health sector (JTGPHHR, 2005), the establishment of a set of public health core competencies was proposed as a foundational element required for a skilled and knowledgeable public health workforce. Building on core competencies work initiated by the Ontario Public Health Association (OPHA), and an international jurisdictional review and compilation of public health workforce development initiatives and public health core competencies, the JTGPHHR drafted an initial set of draft core competencies (Emerson, 2005). Australia, the United Kingdom (U.K.) and the United States (U.S.) had already developed their own version of public health core competencies, with an extensive review and contributions from thousands of public health practitioners and experts (Emerson, 2005). The JTGPHHR determined that rather than developing a new set of public health core competencies, a rational starting point was the

evaluation of existing core competencies from the noted jurisdictions and utilizing those that fit best within a Canadian context (Emerson, 2005).

An extensive national consultation process was undertaken by PHAC to review the first and following drafts of the core competencies. Feedback was obtained from regional meetings, a Pan-Canadian survey, pilot implementation projects, and engagement with specific disciplines and professional organizations (PHAC, 2007a). The work resulted in a final set of core competencies for public health released by PHAC in 2007. The competency set contained seven domains (i.e. a domain refers to a common theme in which a set number of outlined competencies are clustered and organized), and a total of 36 competencies throughout the document (see Appendix J for a summarized version of the PHAC core competencies).

An anticipated outcome of developing a final set of general public health core competencies was "the creation of a common framework upon which other competency sets" could be developed (Emerson, 2005, p.ix). To build on this work, the Community Health Nurses of Canada (CHNC) with the support of PHAC initiated the development of public health nursing discipline-specific competencies through an extensive consultation process with public health nursing experts and stakeholders (Underwood & Associates, 2009). This process resulted in the development of the *Public Health Nursing Discipline Specific Competencies Version 1.0* (CHNC, 2009). The public health nursing competencies outlined eight domains of knowledge, skills and attributes mirroring those listed in the public health core competencies, with the exception of an additional 'Professional Responsibility and Accountability' domain (see Appendix K for excerpts from the CHNC PHN competencies), and included 66 competencies made explicit within those competency domains (CHNC, 2009; Underwood & Associates, 2009).

### Level of Awareness of Public Health Core and Nursing Competency Sets

One study and two evaluations reports were identified addressing the level of awareness of public health competency sets in the literature review. Oppewal et al. (2006) assessed the level of awareness of American public health core and nursing competencies among PHNs working in health departments and academia in the U.S. This study examined diffusion of competency sets and found that knowledge of both competency sets among PHNs were similar, with approximately one third of the sample being familiar with the competency documents, one third having some but less familiarity with the competencies, and the remainder having no knowledge of either competency set document.

The pilot study conducted for this thesis is an approximate replication of the Oppewal et al. (2006) study. The key differences between the original study and this pilot study is the population of interest (i.e. the pilot study sampled PHNs in Ontario health departments only and not academics), and the competency sets examined (i.e. Canadian versus American public health core and nursing competency sets). By conducting this pilot study, the research adds to the limited body of knowledge on competency set dissemination and application among the discipline of public health nursing and within a Canadian context that could be used to inform future policy decisions and practice within the public health sector.

The review of grey literature included of two evaluation reports produced for PHAC, where the variable 'level of awareness' of Canadian public health core competencies was assessed among staff. In a Pan-Canadian scan of the integration of core competencies in public health organizations conducted by the City of Hamilton, Public Health Services (2010), key staff informants were asked about general staff level of awareness of the core competencies. Only 35% of respondents thought most staff would be aware of the core competencies, while 52%

responded only some staff would be aware. Only 5% thought no staff would be aware of the document. In an evaluation conducted at a health department in Nova Scotia, the awareness of core competencies also varied among staff, from very low among administrative staff to very high among staff and management involved in competency set implementation activities, strategic planning, etc. (Rush & Furlong, 2012). Variability was also dependent on types of activities staff were exposed to with respect to core competency use and implementation. Assuming that the level of awareness of competency sets among a given population is an indicator of diffusion and dissemination of this type of resource, it is surprising that there is little information available regarding the assessment of knowledge and awareness of these documents in the broader public health and discipline-specific public health nursing sectors.

## Utility of Core and Discipline-Specific Competencies in Public Health

The bulk of the literature available on competency sets in public health seems to be within public health education and professional development; that is, how they are being used within academia and organizations. However the use of competency sets is not without its challenges and translation of competencies into practice can be too abstract or complex for professionals (City of Hamilton, Public Health Services, 2010; Oppewal et al., 2006). It has been suggested that in order for the competency sets to be meaningful, useful and applicable to front line public health staff, competencies should be written in clear and simple language (Gebbie, et al., 2002; PHAC, 2007b) and presented in condensed formats such as subsets of competencies for easier interpretation and application (Gebbie, et al., 2002). To facilitate public health professionals' grasp of competency sets and how they might be useful, competency sets should offer concrete examples of how they can be translated into practice; articulate content in the context that people work within; link to actual public health activities; and define the relevance

and advantages of the competencies (PHAC, 2007b). Cross et al. (2006) argue that core competency sets can be "complex and multidimensional… and difficult to measure"; for public health nursing in particular, their structure may not align with the "sequencing of activities consistent with the nursing process" (p.109).

There is some evidence to support that some domains of competency sets may be utilized to greater or lesser degrees depending on the discipline and the type of work conducted within a specific position; resulting in variability of utility among the different domains of competencies in a competency set (Bartee, Winnail, Olsen, Diaz, & Blevens, 2003; Gebbie, et al., 2002). Also important to note in competency assessment is the varying degrees of competency attainment by individuals, where novices to public health and public health nursing will be far less skilled and knowledgeable in specific competencies than individuals who have practiced for many years. Therefore, any work assessing competency levels and competency attainment should take proficiency level based on experience into account (Patell, Powell, & Woolard, 2008). It can be assumed that it would take a novice practitioner time to attain some level of self-efficacy with respect to competency sets, where proficient and expert practitioners will have attained a greater number of competencies at more advanced levels of knowledge and skill based on various factors (e.g. years of experience, breadth of professional experiences, exposure to varied practice, etc.) (Patell et al., 2008).

Competency sets in public health have been applied in different ways to support professional development and human resource processes. Competency sets have been used for various organizational human resource functions including conducting performance appraisal evaluations, preparing job descriptions, creating job interview questions or defining job roles (Rush & Furlong, 2012; Wright Eichelberger & O'Neill Hewlett, 1999). The use of competency

sets have also supported professional development activities such as planning education and training programs within organizations (Stewart, Halverston, Rose, & Walker, 2010; Wright Eichelberger & O'Neill Hewlett, 1999); assessing learning needs; defining job functions; and used to advocate for resources for professional development (Rush & Furlong, 2012). Literature reviewed also suggests that competency sets have supported workforce capacity assessments. For example, they have been used to obtain baseline measures of professional practice competencies among a public health workforce (Patel et al., 2008; Wright et al., 2000); and mapped against organizational performance measures to assess staff ability to implement core public health functions expected within the sector (Mayer, 2003). Competency sets have also informed the development of performance appraisal tools both in organizational and academic settings (Kalb, et al., 2006; Lin, Hsu, Mathers, & Huang, 2010; Rush & Furlong, 2012).

**Use of Competency Sets in Academic Settings**

Competency sets have been used in academic settings to support the development and evaluation of educational program curricula (Boulton, Montgomery, & Beck, 2008; Poulton & McCammon, 2007; Wright et al., 2000). In a case study presented by Boulton, Montgomery, and Beck (2008), the authors outlined how the U.S. CDC competencies for epidemiologists were used to map the discipline-specific competencies against the epidemiology component of a university preventative medicine residency program. The 38 competencies were mapped to course content and syllabi, allowing the authors to identify strengths and weaknesses in the program, determine where gaps existed in the curriculum and where competency requirements were not being met. The authors were able to determine that most of the program content met requirements for competencies and enabled consideration of program modification to address identified gaps. This case study provides a clear example of how competency sets can be

leveraged as the baseline expectation of academic performance outcomes and the assessment of processes within academic educational programs to attain those outcomes.

In another study, Stewart, Halverston, Rose, and Walker (2010), presented how American public health core competencies were used as a framework to guide the development of an inter-disciplinary public health training program for staff of a state health department, in collaboration with the University of North Carolina. A self-assessment measurement tool was developed and applied pre and post training of perceived core competency levels among state health department staff. The tool outlined 68 core competency statements mapped to a scale, where staff rated their perceived competency level of each competency statement. Post training, self-perceived increase in attainment of most core competency domains occurred among the majority of program participants across disciplines.

A similar study by Poulton and McCammon (2007) examined self-perceived attainment of public health nursing competencies before and after academic undergraduate education in a university public health nursing program in the U.K. The students were asked to measure their self-perceived level of competency using a 5-point Likert Scale mapped to competency statements that were based on national public health and public health nursing standards. The tool was useful in identifying students' perceived levels of competencies attained, where there were gaps in various domains, and where further work was required for the public health nursing education program in order to meet established competency standards for the sector.

**Assessment of Workforce Competency Levels and Training Requirements**

Two studies were identified that used public health core and discipline-specific competency sets for competency level assessments among the public health workforce and to identify further training requirements. In one study, core competencies were used to obtain a

baseline of workforce knowledge and skill set to determine gaps in specific workforce expertise and, to also identify training and education needs among public health disciplines (Bartee et al., 2003). In this study conducted at a U.S. state health department, a large scale public health training needs assessment of a cross-section of public health front-line disciplines were asked to complete a survey tool used to capture self-assessments of perceived competency level of each public health core competency statement. The main outcome of the study indicated that certain disciplines were either stronger or weaker in specific domains of the core competencies. For example, public health nurses and mental health workers were proficient in communication and cultural competency domains but had perceived lower competency levels in financial management and program planning/policy development domains. The authors of the study concluded that any future training and education programs for workforce development could not be a "one size fits all training approach"; however, greater benefit might be elicited from discipline-specific and targeted strategies (Bartee et al., 2003, p. 468). The planned training should then be gauged to strengths and gaps of core competencies among staff.

In a similar study assessing a baseline of workforce competencies, Patell, Powell, and Woolard (2008) used discipline-specific competencies developed for epidemiologists to measure self-perceived competency levels of staff at a state health department. Participants were asked to rate the "frequency and confidence in performing" each competency listed in the Competencies for Applied Epidemiologists in Government Public Health Agencies (AECs) as well as "the need for training" using a 5-point Likert Scale (Patell et al., 2008, p.119). The authors were able to determine that the state health department had a well rounded epidemiological workforce with varying levels of experience among staff. Confidence in competency acquisition was dependant on the designated tier level of practice which was based on education and form of training, years

of experience, functions and responsibilities, and position held (i.e. staff/management). Authors found utility in the AECs as they provided a framework to assess a baseline in skills and knowledge required of staff, potential training and education requirements to fill gaps, and provided guidance on job functions within specific epidemiology roles.

**Performance Measurement**

Discipline-specific competencies in public health nursing have also been used to develop job performance appraisal tools. Kalb et al. (2006) presented a case study of the development of such a tool and positive outcomes of pilot testing at a state health department in the U.S. The tool was developed to assess competencies and performance requirements of nurses working in the public health department, accounting for different nursing roles within the organization and the competencies associated with those roles (e.g. registered nurses, public health nurses, nurse practitioners, clinical nurse specialists, etc.). Lin, Hsu, Li, Mathers, and Huang (2010) developed a similar competency-based performance appraisal tool in the context of Taiwanese public health nursing and conducted testing of the tool's dimensions including validity and reliability to produce a trustworthy competency assessment scale for public health nursing practice in Taiwan.

A goal of competency statements is to guide initiatives that contribute to workforce capacity building through the attainment of knowledge, skills, judgment and attributes to support practice. Improvements to practice should translate into improvements in the delivery of programs and services and overall organizational performance. Mayer (2003) explored this assumption in a cross-sectional study related to core competency domains and their potential influence on public health service performance measures of 10 essential services. The study was conducted among 420 employees at a state health department in the U.S. The level of staff confidence in four domains of core competencies (i.e. analytical, program development, cultural

and communication) was assessed along with job performance measures included in the CDC 10 Essential Services for Public Health Framework. Results were mixed depending on the essential service; a given core competency accounted for 2-20% of the variance of the provision of the specific essential service. For eight of the10 essential services, one of four core competency domains assessed was significant to the delivery of an essential service. For the remainder two essential services, two of four competency domains were identified as significant to the delivery of an essential service. The study demonstrated that some core competencies had varying degrees of importance for job functions associated with the performance of 10 essential public health services, and that there could also be other contributing factors (e.g. individual, organizational, contextual) that affected the delivery of essential public health services. Therefore, core competencies did have a role to play in contributing to a skilled public health workforce that could influence organizational performance of public health functions (Mayer, 2003).

Literature reviewed suggested that in academia, competency sets are used for curriculum assessment, development and evaluation. Within public health organizations, competency sets are used to gauge or assess level or acquisition of specific competencies; to assess training and education needs among a workforce; and staff performance appraisal measurement activities. What appears to be a strong theme in the literature was that the use of such competency sets is driven by organizations. Competency sets are applied broadly by organizations to cohorts of students or the workforce. However, it was difficult to ascertain from the literature if participants knew what the competency sets were and if they were aware that these competencies are the expectations of knowledge, skills and attitudes/attributes within their respective sectors of practice. There was also limited information on the barriers and facilitators to the use of competency sets either at the individual or organizational level.

## Barriers and Facilitators to Adoption or Rejection of Competency Sets

Empirical evidence on what influences the decision to adopt/reject or implement competency sets was limited. Only one study by Oppewal et al. (2006) discussed some of the barriers and facilitators that support or hinder the decision to use or implement competency sets in public health for professional development in nursing. As a result, a wider search of literature was conducted on 'knowledge-to-practice tools' such as best practice guidelines (BPGs) or clinical practice guidelines (CPGs) to identify barriers and facilitators to using such knowledge-translation oriented documents. There are common elements of BPGs and CPGs to competency sets; they are a) often evidence-based, b) articulate knowledge that has been synthesized and simplified in language to influence practice, and c) can be translated further into meaningful actions of best and expected practice. Therefore, evidence on the use of BPGs and CPGs was also incorporated with the literature reviewed on competency sets. These documents (i.e. BPGs, CPGs, etc.) will be referred to as knowledge-to-practice tools in this section.

There are a number of factors that can influence the decision to adopt or reject the use and implementation of knowledge-to-practice tools. Barriers and facilitators affecting their use have been broken down into various categories including characteristics of these tools themselves, and factors related to individual, organizational and environmental influences.

### Characteristics of Knowledge-to-Practice Documents

In the only empirical study identified that examined level of awareness of public health core and nursing competency sets among PHNs in the U.S., a number of factors were identified that contributed to the use and ongoing implementation of these documents within academic and public health organizational contexts (Oppewal et al., 2006). In this study, the barriers identified related to the characteristics of the competency sets themselves, i.e. they were too complex to use

by individuals; they were a ‘poor-fit’ with existing nursing curricula, and competing competency sets were being used by respondents. The theme of complexity of competency set documents was echoed in an evaluation of the implementation of Canadian core competencies for public health at a health department in Nova Scotia. Staff identified the need to gain an understanding of the ‘language’ of the competency document and the implications of the document for public health practice (Rush & Furlong, 2012).

A number of BPG/CPG studies have also highlighted barriers to the use of such resources with respect to characteristics of the knowledge-to-practice tools themselves. These barriers related to the complexity and ease of understanding of BPGs/CPGs (Lia-Hoagberg, Schaffer, & Strohschein, 1999; Spallek et al., 2010). Few resources were available providing instructions in the use of these documents; nor did the guidelines align with the work of study participants or populations being cared for (Lia-Hoagber et al., 1999). However, there are also facilitators related to BPGs/CPGs themselves that enabled their uptake such as acting as a mechanism to bridge the gap between evidence and practice (Lia-Hoagber et al., 1999); articulating baseline levels of practice that are the expected standard (Lia-Hoagber et al., 1999); developing the statements into printed resources that can be disseminated widely (Stergiou-Kita, 2010); and developing measures linked to guidelines that can support quality assurance and monitoring mechanisms (Stergiou-Kita, 2010).

**Characteristics of Individuals as an Influence of Knowledge-to-Practice Document Use**

At times, the adoption, rejection or implementation of knowledge-to-practice tools such as BPGs or CPGs may be influenced by the individual making the decision to use such tools. These individual characteristics can sometimes act as barriers or facilitators, or both depending on the document or context (Ploeg, Davies, Edwards, Gifford, & Miller, 2007). Individual-level

barriers or facilitators can include attitudes and beliefs about knowledge-to-practice tools (Ploeg et al., 2007; Stergiou-Kita, 2010); a level of awareness of the tools (Koh, Manias, Hutchinson, Donath, & Johnston, 2008; Stergiou-Kita, 2010) and amount of time available to learn or understand these tools (Lia-Hoagberg et al., 1999; Spallek, et al., 2010). Professionals also reported peer pressure (e.g. resistance to change traditional practice and adoption of new knowledge) (Lia-Hoagberg et al., 1999; Spallek et al., 2010), and a lack of knowledge/skills to translate guidelines into practice (Koh et al., 2008; Lia-Hoagberg et al., 1999; Spallek et al., 2010; Stergiou-Kita, 2010) as specific barriers to using this information to shape behaviours and practice. Other factors identified that encourage the uptake of knowledge-to-practice tools included a belief that the documents had a positive influence on practice (Lia-Hoagberg et al., 1999; Stergiou-Kita, 2010); the type of career of the professional (e.g. academic); their position within the organizational hierarchy (e.g. manager), or level of education (Koh et al., 2008; Lia-Hoagberg et al., 1999).

**Organizational Factors**

A number of studies also cited organizational factors that presented as barriers or facilitators influencing the use of knowledge-to-practice tools. Some of the factors within organizations may be structural in nature (e.g. organizational capacity, resources, communication channels, etc.), philosophical (e.g. organizational culture), or related to change agents within the system (e.g. leadership, management, champions) (Dearing, 2008). Some structural factors identified in empirical literature included available time/resources or associated costs (Lia-Hoegberg et al., 1999; Oppewal et al., 2006; Ploeg et al., 2007); mechanisms and processes for communication about documents (Gifford, Davies, Edwards, & Graham, 2006; Oppewal et al., 2006; Stergiou-Kita, 2010); training required to educate staff on how to apply new tools (Lia-

Hoagberg et al., 1999; Spallek et al. 2010); and the need to build knowledge-to-practice document use into organizational structures/processes (e.g. protocols, policies, quality assurance programs, etc.) (Gifford et al., 2006; Ploeg et al., 2007; Stergiou-Kita, 2010).

Change agents also have an influence on the uptake of knowledge-to-practice tools. Similar positive or negative influences to using knowledge-to-practice tools were also found in the literature. Some of these factors include level of support from senior management and decision makers to implement such tools (Lia-Hoagber et al., 1999; Oppewal et al., 2006; Ploeg et al., 2007; Stergiou-Kita, 2010); and available support staff such as champions or clinical practice specialists to assist staff in translating documents into practice (Koh et al., 2008; Lia-Hoagberg et al., 1999; Ploeg et al., 2007).

Organizational culture may have an impact as a barrier or facilitator to the use of knowledge-to-practice tools. Examples presented in the literature included an organizational culture that embraced the use of evidence into practice (Morago, 2010; Gifford et al., 2006; Stergiou-Kita, 2010; Solomons & Spross, 2011); alignment of knowledge-to-practice documents with vision/goals/mandate of the organization (Ploeg et al., 2007; Gifford et al., 2006); and other competing priorities within the organization taking precedence (Lia-Hoagberg et al., 1999).

**Environmental Barriers/Facilitators**

There may also be a number of environmental factors in play that influence the decision to use knowledge-to-practice documents. These factors included: regulatory bodies or professional organizations and their requirements for practice standards (Stergiou-Kita, 2010); professional organizations' support to disseminate and implement documents (Ploeg et al., 2007); inter-organizational networks and collaboration across organizations/agencies/sectors to promote and support the development/use of such documents (Oppewal et al., 2006; Ploeg et al.,

2007); and various communication mechanisms used to promote the documents (Oppewal et al., 2006). These factors are external to the control of individuals or organizations and occur at a systems level of influence and operation.

## Critique of Limitations and Strengths of Literature

There were several limitations and strengths identified from the reviewed literature. The primary limitation was the scarcity of literature on level of awareness of, and barriers/facilitators supporting adoption of competency sets in public health; this resulted in the need to examine literature on BPGs/CPGs in place of competency sets. Contextual factors and sample sizes also limit the conclusions that could be drawn. A strength of the studies was the comparison made between sub-groups on key study variables and outcomes related to knowledge-to-practice tools, in particular, front-line staff versus management results. Outcome results were often linked to organizational influences such as management support, where inferences were made on the uptake and utilization of knowledge-to-practice documents through top-down implementation in organizational contexts. Many of the studies reviewed used a common theoretical framework that will be discussed in greater detail in the following chapter.

### Limitations

As discussed earlier, only one empirical study by Oppewal et al. (2006) was identified that discussed the level of awareness, utilization and barriers/facilitators to the utilization of competency sets in the public health sector. In this particular study, the population of focus was PHNs working in academia and public health departments in the U.S. Also, only two PHAC commissioned evaluations were identified that examined similar variables among staff working in the public health sector using the Canadian core competencies for public health (City of Hamilton, Public Health Services, 2010; Rush & Furlong, 2012). Given that evaluation was the

purpose of these PHAC commissioned documents, it is assumed that rigorous research methods were not necessarily applied that would be expected in a formal empirical study where statistical significance of results could be determined. However, these evaluations provided some invaluable background information to support the development of this pilot study and further interpret the results. The bulk of literature available on public health competency sets focused on how they were being used by organizations. As a result, much of the literature on level of awareness, and factors influencing adoption/rejection or implementation of the competencies documents (including barriers and facilitators) was drawn from literature on BPGs/CPGs.

Despite similar characteristics between competency sets and BPGs/CPGs, these resources have different purposes. As a result, it is unknown how much the literature on BPGs/CPGs can be transferred or applied to the level of knowledge of, and barriers and facilitators influencing the adoption and implementation of competency sets. There were also a number of contextual issues noted to the literature reviewed. BPGs/CPGs are often used in more clinically oriented settings. Clinically oriented contexts such as hospitals, independent practices or other clinical practice settings, may not necessarily be applicable to work conducted in the public health sector. Also, the literature revealed nothing on context with respect to size of the organization or location. Smaller or remotely located organizations may lack the capacity or the resources to support adoption of knowledge translation innovations such as competency sets, BPGs or CPGs. This contextual factor was a consideration in the pilot study. Some of the studies reviewed also had very small sample sizes as they were pilot studies or had difficulty to recruiting participants in busy clinical settings. Small sample sizes may impact the outcomes and generalizability of the results to larger populations.

### Strengths

One of the strengths of the literature reviewed was the recognition that responses between front-line staff, management or academics were different. A few of the studies sought to ensure that perspectives from different sample groups were obtained from various organizations. These perspectives provided insight into both individual and organizational influences on the adoption of knowledge-to-practice tools such as competency sets, BPGs or CPGs. This comparison among different groups was applied in the pilot study.

While limited literature was available on various public health competency sets, most of the studies identified for review outlined the application of competency sets within the public health sector. The utility of these resources for education, professional development and organizational operations that support public health workforce capacity building was well documented for a baseline understanding of their current application. The broad use of competency sets can also be interpreted as a potential indicator of dissemination efforts and levels of awareness of these resources to a select group of individuals (e.g. academics, organization management, etc.).

## Summary

Based on the literature available, the suggested utility of public health competency sets and application of these resources is evident in various educational and organizational settings and contexts. However, what is less apparent is level of awareness of competency sets among public health professionals, in particular PHNs, and some of the potential barriers and facilitators influencing competency set uptake. From the literature reviewed, it is difficult to gauge the extent of the diffusion of this innovation among different nursing groups in the public health sector. Questions remain on how competency set information is disseminated among PHNs; how

the competency sets are being used as professional development resources and for PHN workforce capacity building specifically within organizations, as well as what barriers and facilitators exist precluding/supporting their adoption and ongoing use. The pilot study conducted attempted to explore questions related to these gaps in the literature.

# CHAPTER III – THEORETICAL FRAMEWORK

## Theoretical Framework Selected

The utilization of Rogers' *Diffusion of Innovations (DOI)* theory as a framework for research in healthcare studies is well established. This theory works well with the concept of dissemination of knowledge-building innovations such as knowledge-to-practice tools within healthcare contexts. The frequency of the use of this theory over several decades, and its longevity and breadth of use in healthcare research supported the rational to select this theory in guiding this pilot study.

There are many factors that contribute to the integration or rejection of new ideas and practice into the activities of individual health practitioners, or a healthcare organization's functions or operations. DOI theory attempts to deconstruct and explain why some concepts are adopted and others are not among groups or social systems (Rogers, 2003); this theory also describes various factors and processes that influence how a new concept or idea is disseminated among people. The theory was born from Rogers' agricultural/rural sociology research in the 1950's to explain how new agricultural ideas spread in farming communities. The theory has evolved since that time and been used extensively in research over the last half century in many other sectors and fields of study (Rogers, 2003). DOI theory-based research has been applied to different types of innovations such as those that are technological, administrative, educational, etc. in nature (Baldridge & Burnham, 1975; Kimberly & Evanisko, 1981). Elements of DOI theory are used as a theoretical framework for this pilot study, aimed at describing the dissemination of public health core and public health nursing competency sets (i.e. the innovations) among PHNs in Ontario.

Rogers' (2003) defines *diffusion* as "the process in which an innovation is communicated through certain channels over time among the members of a social system" (p. 5). The fundamental basis for diffusion is the action of 'communication of *new* concepts'; "the newness of the idea in the message content gives diffusion its special character" (Rogers, 2003, p.6). There are four key elements to DOI theory that affect the dissemination of a new concept; these are the 1) *innovation,* 2) *communication channels,* 3) *time* and 4) *social system.* In the context of this pilot study, the main concepts under DOI theory would be the competency sets (the innovation); mechanisms by which people learn about competency sets (communication channels); time that has passed since the launch of the competency sets (time); and PHNs working in Ontario public health units (the social system).

Individuals or organizations that contemplate the use of an innovation move through a five stage process when considering the adoption of a new concept; these stages are *knowledge, persuasion, decision, implementation, confirmation*. This process of contemplation and potential uptake of a new concept is called the *Innovation-Decision Process* (Rogers, 2003). In DOI theory, the Innovation-Decision Process is embedded in the key element of 'time'; depending on various influencing factors, each innovation will require different amounts of time to disseminate through the social system it is intended for (Rogers, 2003). In order to understand how innovative concepts such as public health core and nursing competency sets have disseminated within the specific social system of PHNs working in Ontario public health units since their respective launches in 2007 and 2009, the pilot study applied aspects of the Innovation-Decision Process and key elements of the DOI theory to gain a better understanding of the diffusion of these competency sets in the context of Ontario's public health units.

A modified version of the Innovation-Decision Process model outlined in Figure 2.0 was used to guide the development of the pilot study, the literature review, the modification of a pre-existing study questionnaire and the analysis of the results. This model proposes the process in which an individual (i.e. PHN) or other decision-making unit (i.e. local public health unit) move from a stage of knowing about an innovation (i.e. *awareness*); to developing an opinion about an innovation and determining whether to adopt or reject an innovation (i.e. *decision*); and finally the actual utilization of the innovation (i.e. *implementation*). This modified model of the Innovation-Decision Process has been used in a knowledge translation study conducted by Leeman, Jackson & Sandelowski (2006) and aligns with variables explored in this pilot study. Added to the Leeman et al. (2006) model is the variable of *communication channels* as outlined in Rogers' (2003) original Innovation-Decision Process model. Communication channels represent mechanisms by which PHNs learn about competency sets throughout the Innovation-Decision Process. The element of time in DOI theory has been made explicit in Figure 2.0 and represents the period from which the innovation was made available to the point at which the study was conducted.

Figure 2.0 Modified Version of the Stages in the Innovation-Decision Process Model

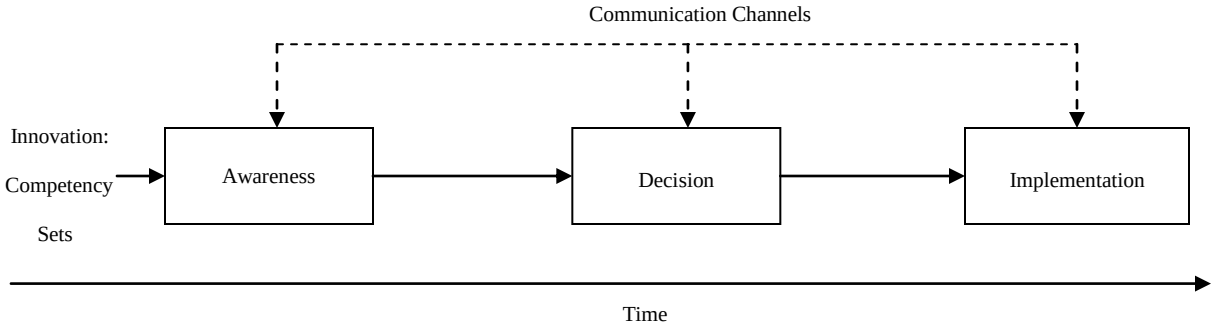


*Figure 2.0* The following diagram is a modified model of Rogers (2003) Innovation-Innovation Decision Process adapted from "An evaluation of how well research reports facilitate the use of findings in practice" by Leeman, Jackson & Sandelowski, 2006. *Journal of Nursing Scholarship*, 38(2), 171-177.

Dobbins, Ciliska, Cockerill, Barnsley, and DiCenso (2002) have identified Rogers' DOI theory as influential in its contributions to comprehending innovation utilization such as health research and evidence in shaping health care policy making and professional practice. While the DOI theory has evolved, it has been used as the foundation for other theories on dissemination of information, particularly in knowledge translation theories and it is considered the 'gold standard' of theories of this nature given its longevity and extensive of use across research fields (Colquhuan, Letts, Law, & Missiuna, 2010; Estabrooks, Thompson, Lovely, & Hofmeyer, 2006). Innovation diffusion may be considered a type of knowledge translation process; DOI theory shares similar characteristics with knowledge translation in how knowledge of a novel concept is adapted and utilized to influence practice (Estabrooks et al., 2006).

Competency sets highlight specific knowledge, skills and attitudes/attributes required to practice within a defined sector, and can be used as a relatively new tool to articulate knowledge requirements, and a resource to bridge the knowledge-to-practice gap in public health. As such, core and discipline-specific competencies can be an innovation examined using Rogers' DOI theory. The theory has also been used in other studies and evaluations regarding competency sets (City of Hamilton, Public Health Services, 2010; Oppewal et al., 2006; Rush & Furlong, 2012). In order to support some of the concepts proposed in the modified Innovation-Decision Process model and choice of variables explored in the pilot study, DOI theory and knowledge translation theory-based literature was used to provide rationale for the modified model outlined in Figure 2.0, and selected variables for investigation and exploration.

## Study Variables

There are two distinct innovations in this pilot study where specific study variables are explored. These innovations are the *Core Competencies for Public Health in Canada Release 1.0*

(PHAC, 2007a) and the *Public Health Nursing Discipline Specific Competencies Version 1.0* (CHNC, 2009); these documents also represent the innovations identified in the Innovation-Decision Process Model reflected in Figure 2.0. *Innovation* is one of the four key elements of DOI theory; it can be an "idea, practice, or object that is perceived as new by an individual" or a group (Rogers, 2003, p.12). The perceived novelty of an innovation is reflected in one's level of knowledge of the innovation, its promotion, adoption or utilization (Rogers, 2003). For this pilot study, innovation is defined as "any idea, practice, or material artifact perceived to be new by the relevant unit of adoption" (Zaltman, Duncan, & Holbeck, 1973, p.10).

Key variables examined in this pilot study reflected the stages of the Innovation-Decision Process, as noted in Figure 2.0. The Innovation-Decision Process usually has 5 stages under DOI theory (Rogers, 2003): knowledge, persuasion, decision, implementation and confirmation. The modified model proposed by Leeman et al. (2006) was selected as the reduced scale was suitable for the design of this pilot study, the proposed research questions, and the variables examined. In the case of the modified version of the Innovation-Decision Process by Leeman et al. (2006), the study variables explored are awareness, decision and implementation of an innovation. The stages of 'Persuasion' and 'Confirmation' in Rogers' original model were removed in the modified version of this model as this pilot study does not attempt to explore detailed contemplation processes of potential innovation adopters, nor does the study evaluate long-term continued adoption and utilization of the innovations.

Another variable explored in this pilot study which is a factor linking various stages of the Innovation-Decision Process was the key element of 'communication channels' in DOI theory. Communication channels are the mechanisms and means by which information about an innovation is disseminated throughout the Innovation-Decision Process.

The Innovation-Decision Process model is a process that occurs over a period of time. Time enables one to gauge the extent of dissemination of an innovation since its availability within a social system. In the case of this pilot study, the release date was 2007 for the public health core competencies and 2009 for the public health nursing competencies (i.e. the innovations), and the dissemination variables studied occurred during the Spring of 2013 when the pilot study was conducted. While time is not an explicit variable examined, it is an important contextual factor to note as it has been six and four years respectively since the launch of the competency sets. It was therefore assumed that these innovations were no longer novel at the point of study implementation, and if diffusion had occurred, it should be measurable to some degree.

As this was a pilot study that was descriptive in nature, the study included variables to be explored and relationships between the variables noted without proposed or hypothesized outcomes. Conceptual and operational definitions of the study variables are discussed in the following section.

## Conceptual and Operational Definitions

### Channels of Communication

One of the research questions posed in this study examined how individuals learned of competency sets. This mechanism of information exchange is called a 'communication channel' and is a key element of DOI theory. Rogers (2003) defines communication channel as "the means by which messages get from one individual to another" (p.18); it connects a unit of adoption (e.g. a person or organization) that has knowledge/experience with an innovation to a unit of adoption with no or little awareness or familiarity with the same innovation. Communication channels generally have a 'source', which is "an individual or institution that

originates the message" (Rogers, 2003, p.204), and a 'channel', "a means by which a message gets from a source to a receiver" (p.204).

There are various types of communication channels and each type may have different levels of influence on each stage of the Innovation-Decision Process model. In DOI theory, Rogers (2003) identifies four distinct categories of communication channels; these are interpersonal, mass media, cosmopolite and localite channels. Some channels such as mass media and cosmopolite channels create knowledge of an innovation; some channels such as interpersonal and localite, are more useful for persuasion about an innovation. Mass media channels involve the use of a communication medium (e.g. web based tools, radio, promotional material, etc.). This channel has the ability to spread information to large numbers of people relatively quickly (Rogers, 2003). Interpersonal channels are exchanges of information between people (usually face-to-face). Cosmopolite channels link the "individual with sources outside the social system under study" (Rogers, 2003, p.207). Localite channels occur within structures and between people within a social system.

Shirey (2006) uses DOI theory to outline how nursing leaders can facilitate the uptake of evidence-based nursing practice (EBNP) in healthcare organizations; in particular, she uses the Innovation-Decision Process Model to support the knowledge broker role and the relevance of communication and knowledge dissemination strategies at each stage of the process (i.e. awareness, persuasion, decision, implementation and confirmation). During each stage, information is obtained by individuals through various communication channels that answer specific questions about the innovation (i.e. EBNP) before moving on to the next stage of the decision making process. For example, in the awareness stage, Shirey (2006) proposes that nurses may ask questions about an innovation such as "(1) What is the innovation? (2) How does

it work? and (3) Why does it work?" (p.254). Nursing leaders may use mass media mechanisms (e.g. e-mail, bulletins, etc.) to inform nurses about an innovation like EBNP. In the following stage of the process called 'persuasion', nurses will contemplate use EBNP and ask questions about the advantages and disadvantages, or other characteristics of the innovation that make it worthy of consideration. At this stage, interpersonal channels of communication and peer networks are successful methods of disseminating information about an innovation. People seek and value personal information about innovations and the experience had by others. This communication and shared information influence movement into the next stage of the process, the decision making stage. At the decision making stage, the nurse will choose to adopt or reject the innovation. Information receipt and processing continue on through the remainder two stages of the Innovation-Decision Process and facilitate movement of individuals through each of its' stages. In this particular article, various communication strategies are offered at each stage of the Innovation-Decision Process that nurse leaders may use to influence uptake of EBNP and address potential barriers and consequences arising through the process. Other communication channels identified in literature on knowledge-to-practice resources such as competency sets or evidence based practice are leadership opinion, social networks, use of knowledge brokers and change agents, literature, educational opportunities (e.g. conferences, presentations, webinars, etc.), modes of media, professional organizations, and organizational processes/functions where innovations are embedded (Brown, 1981; Oppewal et al., 2006; Rush & Furlong, 2012; Shirley, 2006).

Using a modified questionnaire developed by Oppewal et al. (2006) (which from this point forward will be called the Competency Set Questionnaire or [CSQ]), measurements of communication channels were obtained through multiple options questions on the CSQ for this

pilot study. Specifically, the CSQ question asked participants how they learned about each competency set. Participants were able to answer this research question through multiple pre-populated answers, or open-ended responses under the category of 'other'.

**Awareness**

From various communication channels, individuals become aware of an innovation. In the proposed modified Innovation-Decision Process model for this pilot study, the stage of innovation knowledge has been identified as *awareness*. As suggested in the literature review, the level of awareness of an innovation such as core competencies or BPGs can influence the diffusion of such innovations (Cabana et al., 1999; Koh et al., 2008; Oppewal et al., 2006; Stergiou-Kita, 2010). While this pilot study uses the term 'awareness', the concept is meant to be interchangeable with the term 'knowledge' used by Rogers in DOI theory. As such, a conceptual definition of knowledge according to Rogers will be used to articulate the meaning of awareness for this pilot study. 'Knowledge' "communicates when an individual or (other decision making unit) is exposed to an innovation's existence and gain an understanding of how it functions" (Rogers, 2003, p.171).

Rogers has suggested that there are two opposing views on knowledge/level of awareness early on in the Innovation-Decision Process regarding an innovation, i.e. individuals either play a) a passive role, or b) an active role, in learning about an innovation. In the passive role, the level of awareness may occur by happenstance. Conversely, in the active role, "predispositions of individuals influence their behavior toward communication messages about an innovation and the effects that such messages are likely to have"; hence, some individuals will purposely seek out information on new ideas that align with their interests, needs, philosophies, etc. (Rogers, 2003, p.171). Either way, Rogers suggests that the individual must have a 'need' for an

innovation in order to proceed through the Innovation-Decision Process model and actively seek and consider more information about the innovation which occurs through various communication channels at each stage of the model.

The concept of 'need' is defined as "a state of dissatisfaction or frustration that occurs when an individual's desires outweigh the individual's actuality" (Rogers, 2003, p.172). Hassinger suggests that people do not expose themselves to messages about an innovation unless a) there is a need, and b) exposure to the message will only be effective if the innovation aligns with one's attitudes and beliefs (as cited in Rogers, p.171). Rogers call this 'selective perception', that is when one chooses to interpret information in terms of their values, perceptions, attitudes, and beliefs. Rogers (2003) asserts that knowledge of an innovation may motivate individuals to learn more about the innovation (e.g. how to use it or understanding the theoretical principles behind an innovation). This influences the familiarity or level of awareness with an innovation.

In Rogers' (2003) Innovation-Decision Process model, characteristics of the decision making unit (e.g. an individual or an organization) are postulated as factors influencing the level of awareness of an innovation. Some of these factors include socio-economic characteristics, personality traits or communication behaviours of units of adoption. Characteristics of an individual familiar with an innovation early on, "are generally similar to the characteristics of innovators or early adopters [of an innovation]" (Rogers, 2003, p.174). Therefore, early 'knowers' of an innovation, tend to be similar to early adopters in that they are often more resourced (e.g. educated, wealthy, influential, connected, etc.) (Brown, 1981; Rogers, 2003). For example, using DOI theory, Becker (1970a) examined factors that facilitated and inhibited the adoption of new programs by health department medical officers. Becker (1970a) identified that

the rate at which innovative public health programs were adopted by the medical officer was dependent on whether the medical officer was considered one of the earliest of adopters. This was represented by their placement within the communication network of their social group (i.e. degree of opinion leadership); their cosmopolitanism (e.g. the degree to which the adopter looked for new information outside the social system); level of use of most current scientific information, and certain factors related to their training and education (e.g. degree of specialty training and education, greater levels of education). In this case, medical officers who were innovators deliberately sought information on new programs or research early on, thereby increasing their knowledge and level of awareness of current information on new public health programs.

In contrast, Baldridge and Burnham, (1975) argue that conducting DOI research within organizational contexts and strong considerations of environmental factors versus focus on the individual as the unit of adoption, may be more appropriate for measurements of the impact of diffusion. Organizational characteristics may produce more meaningful indicators of dissemination of an innovation. If characteristics of individuals are to be examined to explain the level of awareness and diffusion of an innovation, the authors recommend it should be characteristics of administrators and leaders within organizations as they are in positions of power and have access to resources to influence the process of innovation diffusion including knowledge of the innovation. Balrdrige and Burnham (1975) consider organizational attributes stronger predictors of diffusion of innovations rather than individual characteristics. These authors suggest that organizational structural elements (e.g. size as represented by number of employees, administrative complexity as represented by hierarchical levels, etc.) play a part in the learning of, consideration, adoption and implementation of an innovation. Organizations over

individuals in general have more resources to implement innovations (Dearing, 2008), and larger, more complex organizations may have greater numbers of staff, resources and specialization that facilitate knowledge, adoption and sustainability of innovations (Baldridge & Burnham, 1975).

As awareness plays a role as a precursor of an innovation's diffusion through a social system, awareness is an important variable for assessment in this pilot study. Awareness was measured as an ordinal level, multiple choice question on the self-perceived knowledge (or degree of awareness) of the innovations on the CSQ. This question was based on a similar one drawn from the original survey developed by Oppewal et al. (2006).

**Decision**

The *decision stage* of the modified Innovation-Decision Process model involves steps and actions required by an adoption unit (e.g. an individual or organization) to determine whether the innovation will be used. At this stage of the Innovation-Decision Process, information is sought by individuals to evaluate the innovation; reduce the unknowns; determine consequences of using the innovation; and assess its benefits and disadvantages (Rogers, 2003). Rogers goes on to suggest that while scientific evidence may be available to support the use of an innovation, individuals may seek the feedback of peers on their experience with the innovation to form an opinion or make a decision on its utility (Rogers, 2003). Opinion leaders, particularly individuals that have knowledge of, or experience with an innovation may be influential through interpersonal/localite communication channels in supporting a unit of adoption through the decision phase of the Innovation-Decision Process (Shirey, 2006).

'Decision' about innovation use "takes place when an individual (or other unit of adoption) engages in activities that lead to a choice to *adopt* or *reject* an innovation" (Rogers,

2003, 177). Rogers' (2003) conceptually defines *adoption* as "a decision to use an innovation as the best course of action available" and *rejection* as "a decision not to adopt an innovation" (p.171). However, DOI theory also acknowledges that most individuals need to use an innovation on a trial basis to assess its usefulness within a specific context before a commitment to adopt or reject an innovation can be made (Rogers, 2003). The decision to adopt or reject an innovation can be dependent on a number of factors. These factors might include characteristics of the innovation, factors related to the unit of adoption (Rogers, 2003), or environmental factors (Baldridge & Burnham, 1975; Zaltman, Duncan, & Holbek, 1973).

In DOI theory, various innovation characteristics have been suggested as factors influencing the decision making stage. These characteristics or attributes include the innovation's *advantage* and perceived benefits over the status quo; its *compatibility* with established norms of practice; the *complexity* of the innovation and its implementation; its *trialability* (i.e. can it be implemented on a trial basis) and how *observable* the outcomes of the innovation are (Rogers, 2003). For example, in a study using a DOI framework, Lia-Hoagberg et al. (1999) found that issues of complexity and compatibility prohibited the use of nursing practice guidelines among front-line and management nursing staff at a health department. In their literature review, Cabana et al. (1999) also identified these same characteristics describing ease of use and experience in previous practice as influential factors on the decision to use CPGs among physicians.

Zaltman, Duncan and Holbek (1973) suggested a detailed list of attributes of an innovation that are considered within an organizational context. These attributes include an innovation's cost, social costs, return on investment, risk and uncertainty, communicability, social-psychological level of adoption, scientific status, and point of origin. To illustrate some of these characteristics using DOI theory, Kaluzny and Veney (1973) examined attributes of health

services implemented by hospitals and health departments that influenced program implementation. Both hospitals and health departments had different patterns of services implementation. The study found that health units were more likely to implement services a) that could be done on a trial basis such as low risk services (i.e. *trialability*); b) maintain consistency with existing services in place (i.e. *compatibility*); and c) maintain the degree to which the new service did not impact other service delivery negatively (i.e. *cost*). Hospitals were more likely to implement health care services that had high impact on quality and comprehensiveness of the service (i.e. *returns on investment or advantage*); however, hospitals would likely not implement a service where returns on initial costs were small or where there was a lack of social recognition for the service (i.e. *status*). The authors conclude that health departments were far more conservative in their approach of implementation of new programs and services than hospitals.

Along with innovation characteristics, Kaluzny and Veney (1973) note this conservatism in adoption of new programs within health departments may also be the result of external influences related to government policy and funding mechanisms, adding to the complexity of decision making required in the health department. This latter point suggests that there are influencing factors other than attributes of the innovation in the diffusion of innovations. Factors external to the organization suggested in this study speak to environmental/situational circumstances that may influence the decision to adopt or reject an innovation, a broad theme also noted by other authors in theoretical literature on DOI (Baldridge & Burnham, 1975; Zaltman, Duncan, & Holbek, 1973).

Evidence suggests organizational attributes or structural features such as size or administrative complexity may influence the adoption or rejection of innovations (Baldridge & Burnham, 1975). A study by Mohr (1969) illustrates this point where the author examined health

departments in the U.S. and Canada and organizational factors that influenced the adoption of innovative and progressive public health programs. Factors correlated to adoption of such programs included health unit size (measured by population size) and expenditures for service delivery of the organization. This latter factor was linked to population size as more money is required and available for the implementation of services within highly populated jurisdictions. Greater resources also enabled the health department's ability to adopt non-traditional programs. Size of an organization as a key characteristic was also identified in a study by Kimberley and Evanesko (1981) that explored individual, organizational and contextual factors influencing the adoption of technical and administrative innovations in hospitals. In this case, the size of the hospital (measured by number of beds), was a major predictor of innovation adoption within the study.

The choice to adopt may not be a full commitment. An innovation may be implemented on a trial basis or on a small-scale; it may also be implemented, but rejected at a later date or modified to suit the needs of the unit of adoption. In this case, the decision to use an innovation proceeds before the contemplation of its utility (Rogers, 2003). Therefore, even at the decision stage, the Innovation-Decision Process is not static or linear. Graham et al. (2006) also acknowledge that information must be customized to suit the context and circumstances in which the information is being applied or implemented.

In order to assess and measure the variable of decision to use the public health core and nursing competencies, the outcomes of adoption or rejection of both competency sets were assessed. This concept was operationalized through ordinal-scale, multiple-choice questions on the CSQ which asked respondents to reflect on their degree of use of both competency sets

within their organizational contexts. Questions from the original Oppewal et al. (2006) study questionnaire required a slight modification to suit the context of this pilot study.

**Implementation**

Once an individual or other unit of adoption has made the decision to adopt an innovation, the next step in the Innovation-Decision Process model outlined in this pilot study is *implementation*. Implementation of an innovation "occurs when an individual (or other decision making unit) puts an innovation into use"; it "involves overt behavior change as the new idea is actually put into practice" (Rogers, 2003, p.179). Within organizations, "implementation is the constellation of processes intended to get an intervention into use…; it is the means by which an intervention is assimilated into an organization" (Damschroder et al., 2009). Information is often actively sought during the implementation process to answer questions that will support the operationalization of an innovation to obtain its full utility and benefits (Rogers, 2003). It is during this stage, change agents are often used to support implementation efforts as they act as knowledge translators or provide technical expertise (Rogers, 2003; Shirey, 2006).

In some cases, modified implementation of an innovation occurs to accommodate the needs of a unit of adoption. Rogers calls this *re-invention*. Re-invention is defined as "the degree to which an innovation is changed or modified by a user in the process of its adoption and implementation" from its original intended use or design (Rogers, 2003, p.180).

As mentioned in Rogers (2003) definition of implementation, the use and application of an innovation is a relevant component of its operationalization into practice. The literature review conducted on public health core and nursing competency sets provide some insight into how these innovations are being used among specific disciplines and organizations. For example, in academic settings, competency sets have been used for curriculum assessment and course

content mapping exercises (Boulton et al., 2008), and self-efficacy assessments of the public health competencies among students (Poulton & McCammon, 2007). Competency sets have also been utilized for health human resource support and functions such as writing job descriptions or conducting job evaluations (Rush & Furlong, 2012); general or discipline-specific workforce competency assessment (Bartee et al., 2003; Patell et al., 2008); learning needs assessment for public health staff (Rush & Furlong, 2012); planned education and training of staff within public health organizations (Wright Eichelberger & O'Neill Hewlett, 1999) and the development of performance measurement tools/assessments in the workplace (Kalb et al., 2006; Lin et al., 2010; Mayer, 2003).

To gain insight into the utility of public health core and nursing competency sets in a public health context as well as the continued use of these innovations over time, the concept of *implementation* was operationalized and measured by two questions in the CSQ. Binomial and multiple option questions asked participants how both the public health core and nursing competency sets were being utilized (i.e. for what purposes) to support activities of professional development within the organizational context of their public health units. The original questions from the Oppewal et al. (2006) study questionnaire were slightly modified to suit the context and study population of this pilot study.

Chaudoir, Dugan and Hl Barr (2013) suggest that "implementation of evidence-based health innovations is a complex process" related to multiple, broad, micro, meso, and macro level factors (p.2). In their systematic review of factors that affect the implementation of health innovations, Chaudoir et al. (2013) propose a model of factors considered as barriers or facilitators influencing the implementation of health innovations. Factors in this model that could be applied to this pilot study include those that were: structural level (e.g. external factors -

physical environment, political, social, policies, economic); organizational level (e.g. internal factors - leadership, organizational culture or work environment); provider-level (e.g. aspects of individual user of innovation); and the innovation itself (e.g. innovation characteristics - advantage, quality, efficacy).

At the implementation stage of the Innovation-Decision Process, potential barriers and facilitators may influence the utilization of an innovation. In this pilot study, factors that act as a barrier or facilitator influencing the utilization of innovations are also explored as an aspect of the concept of implementation. Sometimes, similar factors that occur at various system levels, as described in the Chaudoir et al.'s (2013) systematic review, can be both facilitators and/or barriers, depending on the context and circumstances in which an innovation is adopted. Damschroder et al. (2009) acknowledge the importance of context with respect to implementation of an innovation and identified context as not just as a "setting" or "backdrop for implementation", but also a "set of circumstances or unique factors that surround a particular implementation effort" (p. 3). A *barrier* may be considered a factor (e.g. physical, social, economic, environmental) that precludes the adoption or implementation of an innovation. In contrast, *facilitators* are factors that support or promote innovation adoption or implementation. Barriers and facilitators represent an important subset of the concept of implementation explored in this pilot study.

With respect to characteristics of innovations such as competency sets, BPGs or CPGs, issues of complexity of the documents, or poor fit with current practice or populations the documents were intended for, can be barriers (Lia-Hoagberg et al., 1999; Oppewal et al. 2006). An incentive for their use is standardization of current practice among professionals or within organizations (Lia-Hoagberg et al. 1999). Although not an exhaustive list, some key

characteristics of individuals that influence uptake of knowledge-to-practice documents included attitudes and beliefs of professionals; level of awareness of such documents; lack of time to learn about the innovation; lack of knowledge translation skills; job category; level of position within organizations; level of education, and belief of effect on practice (Lia-Hoagber et al., 1999; Koh et al., 2008; Oppewal et al., 2006; Ploeg et al., 2007; Spallek et al., 2010; Stergiou-Kita, 2010). Rogers (2003) suggests that implementation challenges are more likely among organizations rather than individuals as there are more "individuals involved in innovation-decision process, and the implementers are often a different set of people from the decision makers" (p.179). Dearing (2008) identified that structural, cultural and change agent factors within organizations can influence the implementation of innovations. With respect to organizational factors, barriers and facilitators identified in the literature review included lack of time or fiscal resources; information dissemination channels; support from senior management; presence of champions or change agents; innovative culture within the organization; alignment with organizational mandate and competing priorities (Gifford et al., 2006; Koh et al., 2008; Lia-Hoagberg et al., 1999; Morago, 2010; Oppewal et al., 2006; Ploeg et al., 2007; Solomons & Spross, 2011; Spallek et al., 2010; Stergiou-Kita, 2010).

To further explore the variable of barriers and facilitators influencing the implementation of competency sets among PHNs in Ontario public health units, these variables were examined as a subset of qualitative questions in the CSQ. The questions on barriers and facilitators within the CSQ were open-ended and had been slightly modified from the original Oppewal et al. (2006) study questionnaire to fit the context and study population of this pilot study. Open-ended questions asked respondents about perceived barriers and facilitators to the use of public health core and nursing competency sets.

## Research Questions

Research questions were modeled after questions proposed in the U.S. study by Oppewal et al. (2006) on the familiarity and use of American public health core and nursing competencies among practicing PHNs and academics. As the study is descriptive in nature, the proposed questions were designed with the objective of identifying and describing the level of awareness of public health core and nursing competency sets and factors influencing their utilization among the sample. Each question explores and is aligned with concepts in the Innovation-Decision Process model outlined in Figure 2.0. The pilot study research questions were as follows:

1) Are PHNs in Ontario health units aware of the Canadian public health core and nursing competency sets (i.e. awareness)?
2) If PHNs are aware of public health core and nursing competency sets, how did they learn of them (i.e. communication channels)?
3) To what degree are the public health core and nursing competency sets being used by PHNs working in Ontario public health units (i.e. decision)?
4) For what purposes are competency sets being used in the public health units (i.e. implementation)?
5) Are there differences among front-line public health nursing staff and management regarding the a) level of awareness of public health core and nursing competency sets (i.e. awareness), and b) level of utilization of the same competency sets, in the public health units (i.e. decision)?
6) What are the barriers preventing the use of competency set documents among PHNs and within health units (i.e. implementation)?

7) What are the facilitators promoting and supporting the use of competency set documents among PHNs and within health units (i.e. implementation)?

## Summary

The key elements defined within Rogers (2003) DOI theory and discussed in this chapter offer a framework to explore variables identified in this pilot study and ground study concepts in a well established theory on innovation dissemination. This theory attempts to articulate how new ideas spread via communication channels, in the knowledge and use of an innovation, through a given social system over a period of time. As applied to this pilot study, the innovation would represent the public health core and nursing competency sets, the social system - PHNs working in Ontario health units, communication channels – mechanisms of knowledge dissemination, and time passed since the release of the competencies documents. In particular, the Innovation-Decision Process model embedded in DOI theory as adapted by Leeman et al. (2006) presents a three-stage process (i.e. awareness, decision, and implementation), in which people/organizations engage as they contemplate adoption or rejection of knowledge-to-practice resources (i.e. competency sets), and factors that may influence this process at various system levels (i.e. communication channels, and other barriers/facilitators). In this pilot study, key concepts of study (i.e. competency set awareness, utilization, and barriers and facilitators influencing use) were aligned with the modified Innovation-Decision Process model to support the research questions, the design of the pilot study, and the analysis and interpretation of results, as presented in the following chapters.

# CHAPTER IV - METHODS AND PROCEDURES

## Design of Study

A descriptive, non-experimental design was used for the pilot study, with the intent to test the feasibility for a future expanded study (i.e. national or broader study population of PHNs). As previously stated, this study was modeled on Oppewal et al.'s (2006) study that assessed the level of awareness, utilization of, and barriers and facilitators to the use of American public health core and nursing competency sets among PHNs in the U.S. The aim of this pilot study was to identify and describe the overall awareness and utilization of public health core and nursing competencies within public health nursing in Ontario after their release in 2007 and 2009 respectively. In particular, research questions focused on level of awareness of competency sets among this population; how competency sets were used; barriers and facilitators to the uptake of competency sets; and if there was a difference between public health front-line nursing staff and nursing management with respect to responses provided. Since literature on the dissemination, uptake and factors influencing the use of public health core and nursing competency sets among PHNs is limited, a non-experimental, descriptive pilot study was appropriate (Burns & Grove, 2009).

This pilot study was an approximate replication of the Oppewal et al. (2006) study; however, key differences exist. First, this study examines responses between PHN front-line staff compared to management in Ontario public health units; whereas the original study examines responses between PHNs working in health departments in the U.S. (both front-line and management combined) versus academics. Second, in this pilot study, the same set of questions in the questionnaire were applied to gain information regarding two distinct competency sets; whereas the U.S. study focused predominantly, but not exclusively, on the American public

health nursing competency set. Finally, this study was applied to a provincial context only; whereas, the Oppewal et al. (2006) study was a national study conducted in the U.S.

This study builds on the limited research available on public health core and nursing competency sets used among the discipline of public health nursing. Results were intended to add depth to the existing but small body of knowledge on this subject matter; establish ground work for future research on competency sets in public health; and provide evidence to inform public health workforce planning and development, and decision making. The pilot study also attempted to verify if original outcomes from the Oppewal et al. (2006) study are consistent with the new findings in this study. Consistency between results of the two studies, where there are commonalities in elements explored, adds credibility to the methods and design of this pilot study and encourages generalizability of some study outcomes across international jurisdictions (Burns & Grove, 2009).

## Recruitment Strategy

### Recruitment Source and Methods

In order to facilitate recruitment of PHNs to participate in the pilot study, a number of public health nursing interest groups/organizations/networks were approached to promote the study to their PHN members including two public health nursing organizations, i.e. The Community Health Nursing Interest Group (CHNIG) and the Association of Nursing Directors and Supervisors in Official Ontario Health Agencies (ANDSOOHA). Once support for promoting the pilot study was obtained from CHNIG and ANDSOOHA, recruitment notices were provided to both organizations. The recruitment notice contained information on the study, the on-line link to the survey, and researcher contact information. This became the main method of participant recruitment. Organizations were asked to distribute an electronic introduction letter

and reminder notices to their membership via e-mail recruitment (refer to Appendix B, C, D and E). CHNIG promoted the pilot study by posting information on the organization's website. ANDSOOHA had promoted the study extensively through multiple e-mail blasts to its membership and to key public health nursing leaders in the province. As the PHN community is relatively small and quite interconnected, it was hoped that this strategy would prove successful in achieving the desired participant number. In addition to this recruitment strategy, other personal networking and conference opportunities were used to distribute information/invitation letters to PHNs. 'Word of mouth' strategies were also pursued to promote participation in the pilot study which will be discussed in the following section. To maximize the opportunity to recruit an adequate number of participants for statistical analysis, the on-line questionnaire remained open for four months.

To increase the response rate, a cash prize incentive was offered to participants in the form of a random draw. The draw consisted of two cash prizes valued at $100.00. Information regarding the details of the prize draw were outlined in the 'thank you for participating' section of the questionnaire (see Appendix F) and the lottery draw form (see Appendix G).

**Sample Selection Criteria**

Both front-line staff and management were included in the sample to enable comparative analysis for potential differences between these two sub-groups in the knowledge and use of similar knowledge-to-practice documents (e.g. BPGs, CPGs) (Lia-Hoagberg et al., 1999; Ploeg et al., 2007). It has been suggested that obtaining responses from management reflects organizational decisions while front-line staff responses reflect decision making at the individual level (Baldridge & Burnham, 1975). Managers/directors are also in positions of authority and are

likely change agents facilitating adoption and implementation of innovations at an organizational level (Baldridge & Burnham, 1975).

To represent the varying public health practice contexts; PHNs were drawn from as many of Ontario's 36 public health units as possible. Inclusion of PHNs from across the sector ensured that participants represented diverse practice setting contexts to increase the heterogeneity of the sample and generalizability of the results to the broader population in the absence of a random sampling procedure (Burns & Grove, 2009). Also, the reviewed literature suggested smaller and less resourced organizations (e.g. smaller populations, less staff, less administrative complexity, etc.) may have challenges implementing innovations such as competency sets (Baldridge & Burnham, 1975; Mohr, 1969). Information regarding the 36 public health units of employment were aggregated into one of six 'peer group clusters' of health units. Health unit peer group clusters are defined by Statistics Canada (2013) as regions representing similar social, demographic and economic characteristics (e.g. urban-rural mix, urban centres, rural-northern regions, etc.). Peer group clusters were used as a proxy for assessing the diversity of public health practice settings where PHNs worked (see Appendix I for peer group clusters).

PHNs included in the study were those holding educational criteria requisite for PHNs in Ontario as outlined in the Health Protection and Promotion Act (HPPA) (1990). Only PHNs as defined in the HPPA were included in this study (i.e. member of the College of Nurses of Ontario, obtained public health nursing education from degree granting institution in Canada or degree granting institution equivalent outside Canada accepted by institutions within Canada, and additional qualifications as outlined in regulations of the Act). This criterion was assessed through demographic questions on level of education attained. Registered practical nurses and some registered nurses (e.g. diploma prepared nurses) were excluded as they do not meet PHN

qualifications as defined by legislation. Nurse practitioners (NPs) were also excluded as few NPs practice in public health (College of Nurses of Ontario [CNO], 2010) and those that are employed in public health units often have a clinical focus in practice versus performance of broader public health functions in their respective organizations.

Inclusion criteria also required PHNs to be employed either full or part-time in order to elicit current knowledge of, and practice related to competency sets. An assumption was made that employed PHNs would have more opportunity for competency set exposure than those not working. Therefore, unemployed, casual and retired PHNs were excluded from the study. There were no exclusion criteria based on age, sex or race.

## Population and Sample Size Calculation

### Population

The population of interest in this pilot study is practicing PHNs employed in Ontario public health units. The sample drawn was limited to Ontario boundaries for feasibility of study implementation. To gain a grasp of the PHN demographics in Ontario, a preliminary search of the accessible population was conducted using the College of Nurses of Ontario's (CNO) Data Query Tool on the organization's website (CNO, 2010). The data query tool allows individuals to publically access basic characteristics of the registered nursing population currently holding licensure with the CNO. Using the selected variables of working status (i.e. full/part time) and employment place (i.e. public health unit/department) on the data query tool, the number of nurses registered under these categories was generated. From the preliminary data base retrieval of CNO 2010 statistics, there were approximately 3700 full-time and part-time, general class registered nurses working in the public health sector in Ontario (CNO, 2010). Selection and

exclusion criteria were created and applied to this accessible population and assessed through demographic information collected.

**Sample Size Calculation**

The general size of the accessible population of PHNs in Ontario is a relatively small population to draw a sample from with approximately 3700 registered as full-time and part-time employed general class nurses with the CNO. While the number of nurses required for the study could be calculated, the rate of response could not be gauged with the data collection method selected. Recommendations from Cohen (1992) were used to calculate a potential sample size for this pilot study. According to Cohen (1992), to reduce risk of Type II errors, a power of 0.8 is recommended as a convention for general use along with an α or significance criterion of 0.05. This criterion, along with a medium effect size (ES), were selected to determine a sample size required from Cohen's (1992) tables of recommended sample size for a t-test of independent means, the main test used for statistical analysis of results. With these proposed parameters, a sample size of 64 is recommended for each group in the sample, totaling a requirement of 128 participants for two groups in the sample (i.e. front-line staff and management). The sample number was rounded up to 130 participants for ease of counts.

Since response rates to survey questionnaires can be as low as 25-30% (Burns & Grove, 2009), and that this pilot study had not been attempted before, it was unclear if a sample size of 130 participants was attainable. In order to recruit an adequate sample to support statistical analysis, sample size requirements for pilot studies as recommended by Hertzog (2008) were also considered. Hertzog (2008) recommended that if Cohen's method of sample size selection was used, and a medium-large effect size using an α of .05 and a power of .8 for a two-group, cross-sectional study were applied, a sample size of 130 participants could be reduced to 80 (or

two groups of 40 participants) for a pilot study, enabling a sample size robust enough for statistical analysis. While a minimum of 80 participants was required, endeavours to recruit more participants (ideally up to 130 participants) to strengthen analysis were attempted as described in the 'Recruitment Source and Methods' section of this chapter.

## Setting

As the questionnaire was accessed on-line by study participants across Ontario, the setting in which the questionnaire was completed was at the discretion of the study participant. Data was collected from PHNs working in any of the 36 Ontario health units. The public health units range in size (e.g. based on population served, or geographic boundaries/jurisdiction); operate across varied geographical settings (e.g. rural, sub-urban, urban, northern, small versus large geographical areas, etc.), and provide services to diverse populations (e.g. multi-cultural, francophone, aboriginal, etc.).

## Ethical Considerations and Protection of Participants

Approval to conduct the study was obtained through the Research Ethics Board (REB) of Ryerson University. Revisions were required to the original REB submission. These requested revisions included: principle investigator contact information; sample size estimates for a pilot study; changes to recruitment methods; explicit voluntary participation information included on multiple study information and recruitment resources, and explicit selection criteria details on additional study resources. Approval was obtained from the Ryerson University REB and can be reviewed in Appendix A.

The pilot study was considered low-risk to participants and had no anticipated physical, psychological, social or economic impact to subjects. However, a small risk was noted with potential identification of participants from information obtained in questionnaires where

collated frequency counts per health unit were likely to be low (e.g. < 5). For example, a senior level management position at a health unit such as the Chief Nursing Officer would elicit a low response rate as only person could be designated in this position within an organization. In such cases as small cell counts, data was presented in aggregated form to the fullest possible extent (to maintain the anonymity of the participants).

Participants were asked to identify which health unit they were employed at as part of demographic information collected, to gain insight into the geographical context or the size of the health unit in which they worked. To preserve the anonymity of participants where small frequency counts (<5) could have contributed to potential participant identification, especially in public health units with overall small numbers of practicing PHNs, 'place of employment' was presented as aggregated data using health unit 'peer group clusters' as defined by Statistics Canada (Statistics Canada, 2013). Peer group clusters represent health units with similar geographic, social and economic characteristics (Statistics Canada, 2013) (See Appendix I).

For full disclosure of data handling methods and meeting the requested revisions of REB, the study invitation letter outlined the purpose and details of the study; how the information collected in the study would be used; how anonymity of participants would be maintained; and that participation in the study was voluntary. Reminder notices also contained the provision that participation in the study was voluntary. Participants were informed that they were not obliged to answer questions they were not comfortable providing a response for.

Contact information of the principle student investigator and thesis advisor were provided both in the invitation letter/preamble of the electronic questionnaire (see Appendix B) and other recruitment material (see Appendix C, D and E). REB contact information was also provided to participants for information on the ethics review process or ethical concerns regarding the study.

Within the questionnaire's introduction letter, it was noted that a returned survey would be taken as implied consent for participation; therefore no formal consent forms were distributed.

As previously discussed, participants were provided the opportunity to participate in a random draw for one of two cash gifts valued at $100.00 each as an incentive to complete the questionnaire. At the end of the on-line questionnaire on the 'thank you page', information was provided to participants about the draw. A link was created for the purpose of the draw on a separate website; the link provided the participant with access to a blank form for the draw (see Appendix G). The link was completely separate from the on-line survey to maintain the anonymity of the participants and in no way was connected to survey responses. Participants were informed of how their privacy would be maintained and separated from study responses in the introduction letter (see Appendix B).

Participants were advised that personal information in the draw form would be used for the purpose of the draw alone and that all forms submitted by participants would be destroyed and disposed of in confidential waste after the draw was completed. Forms were submitted via e-mail to the student researcher's Ryerson e-mail account, or mailed to the thesis advisor at Ryerson University's School of Nursing (instructions for submission were also provided on the draw form as well in Appendix G). E-mails submitted by participants were also deleted once the lottery draw was completed.

## Data Collection

### Instrument/Measurement Tools

A written request was made to Dr. Oppewal for the original study questionnaire which was used in this pilot study (see Appendix H). While some questions in the original Oppewal et al. (2006) study were appropriate for this pilot study, it was necessary to modify the original

study questionnaire to answer the specific research questions and to address the different context of this study (i.e. Ontario versus the U.S.). Changes included additions/modifications to demographics (i.e. addition of employment status, changes/additions to educational status, addition to years of practice in public health nursing, removal of memberships to American nursing organizations, and additions of community health nursing certification and public health unit of employment). Alterations also included changes to main body of survey questions (i.e. framing of questions to a Canadian context and in public health unit settings; more explicit references to each competency set in questions/responses; additional categories of Likert-Scale response options to facilitate odd number of responses ; addition of skip logic responses where applicable; removal of questions with reference to academic settings; changes in applications of competency sets to align with context and literature; addition of questions on facilitators supporting level of utilization of competencies, and same questions applied to both core and nursing competencies).

Some content for this pilot study questionnaire was drawn from the literature review conducted. Each study variable was explored by one or more quantitative questions; however some questions were qualitative and open-ended to obtain greater detail and description of the variable explored. Scale-based multiple choice, binomial, multiple options, and open-ended questions were included. The level of measurement varied depending on the proposed question within the questionnaire, with most data reported at the nominal level and interval level, and a few demographics at the ratio level. Once the study questionnaire was modified and reviewed by the thesis committee, three content experts reviewed the questionnaire for face validity. Only slight modifications were required to address noted minor concerns.

To obtain information on the original questionnaire's psychometric testing, Dr. Oppewal and Dr. Glenn of the Oppewal et al. (2006) study were contacted to obtain further details on validity and reliability of the questionnaire. The response provided through correspondence with the authors lacked detail and thus, information on the actual testing of this original tool is a limitation of this study. To address this gap, a Cronbach's alpha test was conducted with the current sample on the modified questionnaire for this pilot study.

Demographic information was included on the questionnaire to describe the sample's general characteristics (Burns & Grove, 2009). The demographics included age, number of years practicing in nursing and public health nursing specifically, highest level of education obtained, position held within the health unit, and the health unit at which the public health nurse was employed. Specific demographic factors may have influenced the level of awareness, adoption and utilization of public health core and nursing competency sets for professional development. For example, being in a position of management may influence support or securing resources for the use of an innovation (e.g. competency sets) within an organization (Rogers, 2003). In the Oppewal et al. (2006) study, the researchers reflected on various outcomes such as rationale for higher response rates from managers versus front-line nursing staff in public health departments, as well as greater utilization of public health competency documents among nursing academics versus public health practitioners. Collection of specific demographic variables outlined in the questionnaire allowed for comparisons among the sample groups (Burns & Gove, 2009).

## Procedure for Data Collection and Storage

The principle method of data collection used in the pilot study was through electronic, anonymous questionnaires accessed on-line. As the study allowed for the anonymity of participants, there was no personal information collected, or linked as codes to survey responses.

Survey Monkey® was used as the data collection tool for the electronic survey. This was a password protected site, with knowledge of the passwords held by the student investigator alone. Individual survey responses were downloaded on a password protected computer used for the purpose of data storage and analysis. Data was also stored on a password protected and encrypted USB key to maintain security of information. No identifiers were stored on the laptop where data was entered and analyzed.

The university's research ethics board was contacted to determine the university policy on retaining study materials. As per the recommended REB policy, data and other relevant study materials will be retained for a minimum of one year post study. Material related to the study will be housed at the Daphne Cockwell School of Nursing, Ryerson University on a password protected USB key.

The on-line questionnaire remained open for a period of four months. Study participants were able to complete the questionnaire on their own time; at their own pace; and in their setting of choice. As such, no opportunity to monitor data collection processes was available to address arising issues. However, participants were advised that should questions or concerns arise regarding the study or questionnaire, to contact the student researcher or the thesis advisor via e-mail.

While it was possible that a PHN could submit more than one electronic questionnaire for this pilot study (as there are no personal identifiers linked to responses submitted), there were a couple of deterrents for this. First, one would expect that nurses would adhere to the ethics of their profession, which would not condone the interference or manipulation of nursing research being conducted. Second, PHNs would require additional time to fill out the questionnaire more than once, and it is doubtful that study participants would be inclined to invest more time than

needed to respond to research questions. To attempt to track duplicate responses, Internet Protocol (IP) numbers were used. Internet protocol numbers are unique computer network identifiers. Data collection tools can be set to collect these unique identifiers with questionnaires submitted, without collecting names and e-mail addresses, and maintaining some level of participant anonymity. The limitation of this risk mitigation strategy is that the IP number could be duplicated itself when multiple responders are using the same network (i.e. more than one PHN working at the same health unit and using the same network to submit the electronic survey). Although this mitigation strategy is not 100% effective , it seemed the most viable option for scanning of duplicate questionnaire submissions when using an anonymous survey format and non-probability sampling methods, to reduce risk of multiple submissions by one participant. Identified duplicates are discussed in following chapter outlining the results of the pilot study.

## Data Analysis

IBM SPSS Statistics© (21) software was used to organize and analyze the quantitative data collected. Data was reviewed for discrepancies such as duplicate questionnaire submissions or decisions on handling missing data prior to entry to reduce risk of error. As survey responses were anonymous, no coding of data was required. Notes were made with respect to data entry choices (e.g. handling incomplete questionnaires or unclear answers, etc). Five percent of surveys were reviewed for data entry errors. Microsoft® Office Word 2007 software was also used to organize and analyze qualitative data obtained from the pilot study responses.

As this pilot study was non-experimental and descriptive in nature, and most data collected was nominal with the exception of two demographic variables, analysis of data collected included descriptive statistical analysis (e.g. frequency counts, percentages, measures

of central tendency and variance). Since the difference in responses between PHN front-line staff and management was sought, a t-test for independent sample means was selected for comparison results where the denominator measured was interval level data. A two-tailed test at a $p < .05$ level of significance was used for measures of comparison (Burns & Grove, 2009).

To obtain descriptive qualitative information on some quantitative responses elicited from the questionnaire, selected quantitative questions were followed by open-ended questions. Content analysis methodology was selected to explore and describe findings from the qualitative data, as a low level of data interpretation was required for this study. Vaismoradi, Turunen, and Bondas (2013) describe content analysis as "a systematic coding and categorization approach used for exploring large amounts of textual information unobtrusively to determine trends, patterns and words used, their frequency, their relationships and the structures and discourses of communication" (p. 400). In content analysis, coding for broader themes is descriptive and codes are quantified in frequency counts (Kondracki, Wellman, & Amundson, 2002). Manifest content analysis was initially conducted; this required coding of sub-themes or key words in the qualitative content reviewed and tallied for frequency (Kondracki et al., 2002; Hsieh & Shannon, 2005). The sub-themes were then clustered into broader themes or categories, most of which were identified in the literature (referred to as directed content analysis), with the exception of a few new themes that emerged during analysis (Hsieh & Shannon, 2005). Where responses to open-ended questions were very low, minimum frequency counts tallied for a common theme were limited at two counts or more. Where responses to open-ended questions were high in number, frequency counts of sub-themes/key words tallied for a common theme were cut off at a higher count (count = minimum of five). Responses were organized in a Microsoft® Office Word document for analysis and coding. Memos were kept to identify codes/sub-themes selected

and categorization into broader themes that were linked to those identified in the literature on barriers and facilitators to the use of knowledge-to-practice documents.

Due to required skip logic of the data collection tool, non-response to some survey questions could not be avoided. However, as most of the data presented was descriptive, statistics for non-responders were included in the results section (see Chapter 5) and the implications of this missing data discussed in the 'Limitations' section of Chapter 6. El-Masri and Fox-Wasylyshyn (2005) suggest that a range of 10-40% of missing data for a given variable is acceptable before consideration of variable elimination is required; however, noting patterns of missing data is also relevant. Where a t-test for independent sample means was applied on study variable in the pilot study data set, a pair-wise deletion of data was selected for non-responses on ordinal level data. This approach eliminates specific variable results; however, maintains sample size and power (El-Masri & Fox-Wasylyshyn, 2005).

## Summary

The identified gaps in the empirical body of knowledge available on competency set awareness and utilization among PHNs, and factors influencing the uptake of these knowledge-to-practice documents, prompted the selection of a descriptive, non-experimental study design to explore these variables and DOI theory concepts. To strengthen the study methodology as per Burns and Grove (2009), an approximate replication of the Oppewal et al. (2006) study on core and PHN competency set awareness and utilization was applied to this pilot study. Recruitment of a sample from the PHN population working in Ontario's 36 public health units was supported mainly by promotion of the pilot study through two Ontario public/community health nursing organizations to their respective membership. This recruitment approach aimed to maximize heterogeneity of the sample to strengthen generalizability of results and maximize the sample

size to detect statistically significant results and reduce the risk of Type II errors. Data was collected through an on-line, anonymous questionnaire based on the work of Oppewal et al. (2006), to elicit both quantitative and qualitative responses on the variables studied related competency sets. To support the exploration of concepts examined, analysis of the data included both descriptive statistics and parametric tests for quantitative data, and content analysis of the qualitative responses provided. A summary of findings from data analyzed is presented in the following chapter.

# CHAPTER V - RESULTS

## Description of Sample

### Survey Response

The questionnaire was posted on Survey Monkey from March 1, 2013 to July 1, 2013. A total of 244 electronic surveys were returned. From this number, 18 (7.4%) surveys were removed from the sample as eligibility criteria had not been met. Excluded respondents were primarily self-identified as non-PHNs (e.g. diploma prepared RNs or RPNs), or working in a capacity less than full or part-time (e.g. casual staff). After reviewing the returned surveys for eligibility criteria, 226 surveys remained for further review and data entry. During data entry, it was noted that five surveys appeared to be duplicate entries. Duplicate entries were assumed to be the result of on-line survey access issues identified by a few participants (less than five) and communicated to the principle researcher via e-mail (e.g. workplace firewalls, etc.). Once access issues were resolved, participants likely made second attempts to complete the survey. Duplicate submissions were determined on proximity of time between submission of both surveys (usually within one hour), same internet provider codes, identical responses to a number of demographic and research questions, and notification of incomplete survey response from Survey Monkey tracking functions. The decision was made to remove the lesser of the completed two responses from the sample where surveys clearly appeared to be duplicates. Of the remaining 226 surveys, the five identified duplicate surveys were removed from the sample leaving a remainder 221 surveys as the final sample size for data analysis. From the 221 surveys, a total number of 194 (87.8%) surveys were identified as completed through Survey Monkey tracking functions, 27 (12.2%) were incomplete. However, a decision was made to analyze data where possible

irrespective of level of completion of the submitted surveys. Missing data has been noted where possible in data results presented.

An accurate response rate could not be calculated as the number of individuals that received the survey link is unknown. Survey invitations were distributed to two provincial professional public/community health nursing organizations for multiple e-mail distributions to their respective members, or posting pilot study recruitment notices on the organizations' websites. While the actual number of PHNs that received recruitment invitations is unknown, a proxy response rate can be estimated. An estimate of registered nurses general-class working in public health units was retrieved from the College of Nurses of Ontario on-line Data Query Tool (CNO, 2010). A total of 3735 full and part-time nurses reported working at Ontario public health units. This is a large and conservative estimate that likely includes RNs that do not fit the PHN legislative definition (i.e. demographic of diploma prepared, registered nurses general-class, which were excluded from the pilot study). If this estimate was used as a proxy denominator, an estimated response rate is 8.1% of the PHN population working in Ontario public health units.

**Demographic Characteristics of Sample**

Of the 221 individuals included in this pilot study, most (91.4%) were employed on a full-time basis, predominantly as front-line PHNs (66.1%), practicing in the public health sector on average for 13.4 years, and in nursing in general for 19.5 years. Most of the PHNs had a baccalaureate degree in nursing studies (67.4%) as the highest level of education attained, which is not surprising as this is a legislative requirement to practice under the title of a PHN in the public health sector (Health Protection and Promotion Act, 1990). However a significant number of masters' prepared PHNs participated in this study (26.3%). While most of the respondents did not have certification in the specialty of community health nursing (82.8%), a higher proportion

than anticipated (13.6%) did report having certification from the Canadian Nurses Association. Almost all peer groups of health units were represented in this sample, with the highest proportion of responses drawn from regions of an urban/rural mix with varying degrees of population density (75.5%). Table 2 provides a detailed summary of the demographic descriptive statistical results, and Table 3 outlines measures of central tendency and variation on years of practice in nursing and public health nursing specifically.

## Study Instrument

The original survey from the Oppewal et al. (2006) study was obtained for this pilot study. Authors of the original study confirmed that the extent for reliability testing of this instrument was a Cronbach's alpha coefficient for internal consistency on one dimension of the tool (i.e. level of familiarity with the competency sets). Full reliability testing of the tool could not be assumed. In keeping with attempts to conduct an approximate replication of the Oppewal et al. (2006) study, a Cronbach's alpha coefficient was calculated for determining internal consistency on the construct of 'familiarity with competency sets' for this pilot study's questionnaire, the same variables used in the original study (as confirmed through correspondence with the authors). The computed Cronbach's alpha coefficient was $\alpha = 0.799$, a score considered within acceptable range for social studies (Burns & Grove, 2009).

Table 2

*Demographic Profile of Sample*

| Demographic Variable | Category | (n = 221) | |
|---|---|---|---|
| | | Frequency | Percentage |
| Employment Status | Full-time | 201 | 91.4% |
| | Part-time | 18 | 7.7% |
| | Other | 2 | 0.9% |
| Nursing Position Held | PHN | 146 | 66.1% |
| | PHN Specialist | 14 | 6.3% |
| | Manager | 35 | 15.8% |
| | Director | 2 | 0.9% |
| | Chief Nursing Officer | 6 | 2.7% |
| | PHN Other | 14 | 6.3% |
| | Other | 1 | 0.5% |
| | No response* | 3 | 1.4% |
| Category of Nursing Position | Front-line staff | 172 | 77.8% |
| | Management | 45 | 20.4% |
| | No response* | 4 | 1.8% |
| Highest Level of Education | Baccalaureate nursing | 149 | 67.4% |
| | Bachelor other | 1 | 0.5% |
| | Master nursing | 24 | 10.9% |
| | Master other | 34 | 15.4% |
| | PhD nursing | 1 | 0.5% |
| | PhD other | 0 | - |
| | Associate degree (US) | 0 | - |
| | Other discipline/ Specialized degree | 5 | 2.3% |
| | No response* | 7 | 3.2% |
| Canadian Nurses Association Community Health Nursing Certification | Yes | 30 | 13.6% |
| | No | 183 | 82.8% |
| | Working on it | 1 | 0.5% |
| | No response* | 7 | 3.2% |

*Note. 'No response' represents system missing data, where no responses were provided in the survey to enter as part of data set.

Table 2

*Demographic Profile of Sample*

| Demographic Variable | Category | (n = 221) | |
|---|---|---|---|
| | | Frequency | Percentage |
| Peer Grouping of Public Health Unit | Group A-Urban/rural mix | 84 | 38.0% |
| | Group B-Mainly urban, moderate population density | 38 | 17.2% |
| | Group C-Sparsely populated, urban/rural | 36 | 16.3% |
| | Group D-Mainly rural | 12 | 5.4% |
| | Group G-Large metro centers | 18 | 8.1% |
| | Group J-Mainly urban, high population density | 19 | 8.6% |
| | No response* | 14 | 6.3% |

*Note. 'No response' represents system missing data, where no responses were provided in the survey to enter as part of data set.

Table 3

*Demographic Profile – Years of Practice in Nursing*

| Number of Years in Practice | Mean (Years) | Median (Years) | Mode (Years) | Standard Deviation (SD) | Range Min | Range Max |
|---|---|---|---|---|---|---|
| Years as a registered nurse | 19.48 | 20 | 30 | 11.56 | 0.5 | 42 |
| Years as a public health nurse | 13.43 | 12 | 13 | 9.31 | 0.0 | 37 |

## Exploratory Data Analysis of Competency Sets

### Level of Awareness of Competency Sets

One of the principle aims of this pilot study was to assess the level of awareness of both Canadian public health core and nursing competency sets among PHNs in Ontario. As a sub-component of exploring this concept, identification of 'communication channels', or methods of

knowledge dissemination/dispersion by which PHNs learned of both competency sets was also examined.

In response to Research Question 1 regarding the level of PHN awareness of competency sets, descriptive statistics of frequencies were tabulated to assess various levels of familiarity for each of the competency sets among the study group (refer to Table 4). Each response was mapped to a Likert-Scale score from '0' for the response 'Not familiar with them' to '4' for the response 'Very familiar with them' (Likert-Scale score noted beside each response option in Table 4). The scores facilitate calculations for t-tests for independent means calculated between managers and front-line staff on level of awareness outlined later in this chapter.

Almost two-thirds of all PHNs (62.4%) reported a minimum to moderate level of familiarity with the public health core competencies (i.e. minimum to moderate defined as response categories of 'read parts of them' = 28.5% [minimum] and 'somewhat familiar with them' = 33.9% [moderate] combined). Over half of the sample (50.2%) also had a minimum to moderate level of familiarity with the public health nursing competencies (i.e. response categories of 'read parts of them' [26.7%] and 'somewhat familiar with them [23.5%] combined). Approximately one-fifth of the sample indicated being 'very familiar' with both competency sets (public health core competencies = 22.6% and public health nursing competencies = 20.8%). Therefore, knowledge transfer of competency sets and awareness of their existence seems to have occurred in a substantial proportion of the PHN sample, although to a slightly lesser degree with the public health nursing competencies.

Table 4

*Competency Set Level of Awareness Among PHNs in Public Health Units*

| Level of Awareness | Public Health Core Competencies (n = 221) | (%) | PHN Competencies (n = 221) | (%) |
|---|---|---|---|---|
| Not familiar with them (0) | 9 | 4.1% | 23 | 10.4% |
| Heard about them (1) | 13 | 5.9% | 19 | 8.6% |
| Read parts of them (2) | 63 | 28.5% | 59 | 26.7% |
| Somewhat familiar with them (3) | 75 | 33.9% | 52 | 23.5% |
| Very familiar with them (4) | 50 | 22.6% | 46 | 20.8% |
| Skipped question* | 1 | 0.5% | 0 | 0.0% |
| Total number of responses | 211 | 95.5% | 199 | 90.0% |
| No response** | 10 | 4.5% | 22 | 10.0% |
| Total | 221 | 100.0% | 221 | 100.0% |

Note. *Skipped question was a response on the electronic survey format to allow for skip logic programming to function as survey responses were entered. This option also fulfilled a Research Ethics Board requirement to allow respondents the option of a voluntary response to a specific question.
**'No response' represents system missing data, where no responses were provided in the survey to enter as part of data set.

Research Question 2 regarding the method of communication by which the PHNs learned of both competency sets is summarized in Table 5. This is followed by Table 6, where a more detailed analysis is presented on knowledge dissemination methods for the category of 'Other' (i.e. responses other than those identified in pre-populated response options to the survey questions on communication channels).

The five most frequent modes of communication by which PHNs learned of both competency sets were similar. Those common responses for the public health core competencies and public health nursing competencies (respectively) were as follows: work colleagues/activities (46.6%, 38.5%); received a copy of the document (29.0%, 28.1%); national public health /community health nursing organizations that released the competency sets (22.2%, 20.4%); management/employer (27.1%, 19.9%); and the launch campaigns of the competency sets/workshops (16.7%, 17.2%).

Table 5

*Communication Method Which PHNs Learned of Competency Sets*

| Communication Method | Public Health Core Competencies (n = 221) | (%) | PHN Competencies (n = 221) | (%) |
|---|---|---|---|---|
| Work colleagues/work activities | 103 | 46.6% | 85 | 38.5% |
| Launch of competencies/workshops | 37 | 16.7% | 38 | 17.2% |
| Interview preparation/job descriptions | 36 | 16.3% | 23 | 10.4% |
| Management/employer | 60 | 27.1% | 44 | 19.9% |
| Orientation within health unit | 36 | 16.3% | 27 | 12.2% |
| Undergraduate/graduate studies | 29 | 13.1% | 25 | 11.3% |
| Received copy of document | 64 | 29.0% | 62 | 28.1% |
| Heard about it during development | 36 | 16.3% | 30 | 13.6% |
| Public Health Agency of Canada | 49 | 22.2% | 23 | 10.4% |
| Ontario Public Health Association | 28 | 12.7% | 17 | 7.7% |
| Community Health Nurses of Canada | 29 | 13.1% | 45 | 20.4% |
| Other | 22 | 10.0% | 20 | 9.0% |
| Total number of survey responses | 201 | 91.0% | 174 | 78.7% |
| No response | 20 | 9.0% | 47 | 21.7% |
| Total | 221 | 100.0% | 221 | 100.0% |

Table 6

*Thematic Analysis of Communication Methods on Competency Sets – 'Other' Category*

| Theme | Examples of Key Terms | Frequency of Themes Identified | Example |
|---|---|---|---|
| Q. 9 How did you learn about the Core Competencies for Public Health? ('Other' category)* | | | |
| Performance development | Performance, appraisal, tool, systems | 4 | "Used annually for our performance review" |
| Knowledge part of job requirement | Job, requirement | 2 | "It is part of my job to build core competencies" |
| Found them on own | Found, self, myself | 2 | "Found it myself while looking for documents" |
| Student placements | Student, preceptor, program, placement | 2 | "I had nursing students I wanted to educate on the competencies" |

Table 6

*Thematic Analysis of Communication Methods on Competency Sets – 'Other' Category*

| Theme | Examples of Key Terms | Frequency Count of Themes Identified | Example |
|---|---|---|---|
| Q. 18 How did you learn about the Public Health Nursing Competencies? ('Other' category)* | | | |
| Found them on own | Found, self, myself | 2 | "Found them myself" |
| Student placements | Student, preceptor, program, placement | 2 | "Used with nursing students as a preceptor" |
| Other organizations | Other organizations (e.g. CHNIG, ANDSOOHA) | 2 | "Transition to public nursing program" |

*Note. Where few responses were submitted for a survey question, frequency counts were limited to a minimum of two counts to define a theme.

**Utilization of Competency Sets**

Public health nurses reporting a 'level of awareness' of either the public health core competency set (n = 201, 91.0%), or the public health nursing competency set (n = 173, 78.3%), were then forwarded to additional questions regarding the 'utilization' of those competency sets in the context of working in public health units. To gain some understanding about the utilization of competency sets among PHNs familiar with the competency documents, the following research question was posed: To what degree are the public health core and nursing competency sets being used by PHNs working in Ontario public health units (Research question 3)? Response options to this question were mapped against a Likert-Scale score from '0' for the response 'Not using them to '6' for the response 'Extensive use of them' (noted in Table 7 beside each response). Scoring of responses facilitated calculating the results of a t-test for independent sample means on level of utilization of competency sets between managers and front-line staff, discussed later in this chapter.

Table 7 provides a summary of frequencies calculated for responses on 'level of utilization' of competency sets. Respondents who answered "Not using them" or "No longer using them" were forwarded to open-ended questions on barriers and facilitators influencing use of each competency set; those responses are presented later in this chapter. The bulk of responses fell under the categories of 'limited'(29.0%) to 'moderate' (25.3%) level of use combined of the documents, where over half (54.3%) of PHNs reported having used the public health core competencies, and less than half (limited [26.7%] + moderate [19.5%] = 46.2%) responded similarly for the use of public health nursing competencies. Overall, there is a fair degree of utilization of both competency sets among PHNs in Ontario public health units, although adoption of the public health nursing competency set seems to occur to a lesser degree than the core competencies. This is not an unexpected outcome due to the broader applicability of the core competencies across various public health disciplines within organizations.

Table 7

*Competency Set Level of Utilization Among PHNs in Public Health Units*

| Level of Utilization | Public Health Core Competencies (n = 221) | (%) | PHN Competencies (n = 221) | (%) |
|---|---|---|---|---|
| Not using them (0) | 16 | 7.2% | 20 | 9.0% |
| No longer using them (1) | 1 | 0.5% | 3 | 1.4% |
| Thinking about using them (2) | 8 | 3.6% | 11 | 5.0% |
| Making plans to use them (3) | 9 | 4.1% | 5 | 2.3% |
| Limited use of them (4) | 64 | 29.0% | 59 | 26.7% |
| Moderate use of them (5) | 56 | 25.3% | 43 | 19.5% |
| Extensive use of them (6) | 18 | 8.1% | 11 | 5.0% |
| Skipped question* | 29 | 13.1% | 21 | 9.5% |
| Total number of survey responses | 201 | 91.0% | 173 | 78.3% |
| No response | 20 | 9.0% | 48 | 21.7% |
| Total number of surveys | 221 | 100.0% | 221 | 100.0% |

Note. * 'Skipped question' was a response on the electronic survey format to allow for skip logic programming to function as survey responses were entered. This option also fulfilled a Research Ethics Board requirement to allow respondents the option of a voluntary response to a specific question.

In addition to exploring the level of utilization of both competency sets among PHNs, information was sought on how these competencies were being applied in practice within public health unit organizational settings. Those that responded some level of use of each competency set were then forwarded on to the following questions in examining application of competency sets by PHNs. Table 8 summarizes the frequencies of responses to Research Question 4 on different applications/use for each competency set. Table 9 highlights the most frequent thematic responses for both competency sets that fall into the category of 'Other', where pre-populated responses were insufficient to answer the survey question on applied use. A total of 196 (88.7%) participants responded to this question related to the core competencies for public health, and less for the public health nursing competency set question (n = 167, 75.6%).

Table 8

*Reported Use of Competency Sets Among PHNs in Public Health Units*

| Application of Competency Sets | Public Health Core Competencies (n = 221) | (%)* | PHN Competencies (n = 221) | (%)* |
|---|---|---|---|---|
| General public health functions | 52 | 23.5% | 33 | 14.9% |
| Orientation purposes | 73 | 33.0% | 53 | 24.0% |
| Human resource processes | 55 | 24.9% | 44 | 19.9% |
| Professional development resource | 80 | 36.2% | 61 | 27.6% |
| Educational needs | 80 | 36.2% | 57 | 25.8% |
| Performance evaluations | 73 | 33.0% | 61 | 27.6% |
| Competency based testing for training | 7 | 3.2% | 8 | 3.6% |
| Development of training sessions | 29 | 13.1% | 28 | 12.7% |
| Program planning, implementation, and evaluation | 53 | 24.0% | 35 | 15.8% |
| For nursing practice council work | 36 | 16.3% | 37 | 16.7% |
| Used in presentations | 17 | 7.7% | 17 | 7.7% |
| Cited in other work resources | 26 | 11.8% | 18 | 8.1% |
| Other | 20 | 9.0% | 21 | 9.5% |
| Total number of survey responses | 196 | 88.7% | 167 | 100.0% |
| No response** | 25 | 11.3% | 54 | 24.4% |
| Total number of surveys | 221 | 100.0% | 221 | 100.0% |

Note. *Proportion of responses calculated out of 221 surveys.
**'No response' represents system missing data, where no responses were provided in the survey to enter as part of data set.

The five most frequent themes reported on applications of both competency sets (see Table 8), were similar between the public health core and nursing competencies. Among these identified applied uses for the public health core and nursing competency sets (in this respective order) were professional development (36.2%, 27.6%), educational needs (36.2%, 25.8%), performance evaluations (33.0%, 27.6%), orientation purposes (33.0%, 24. 0%), and human resource processes (24.9%, 19.9%). From the thematic analysis of responses to the category of 'Other' regarding competency set applications (see Table 9), the most frequent thematic response for both competency sets was 'Not sure if/how they are used.' This theme may account for non-responders.

Table 9

*Common Themes Related to How Competency Sets are Used – Responses from 'Other' Category*

| Theme | Examples of Key Terms | Frequency Count of Themes Identified - Core Competencies | Frequency Count of Themes Identified - PHN Competencies |
|---|---|---|---|
| Q. 11 If the Core Competencies for Public Health are being used in your organization, how are they being used? (Responses to 'Other' category)* | | | |
| Q. 20 If the Public Health Nursing Competencies are being used in your organization, how are they being used? (Responses to 'Other' category)* | | | |
| Not sure if/ how they are used | Not sure, not aware, unsure, used | 10 | 7 |
| Work underway to incorporate into organizational functions | Plans, work, progress, rolled out | 3 | 5 |

*Note. Where few responses were submitted for a survey question, frequency counts were limited to a minimum of two counts to define a theme.

## Differences in Responses Between Front-Line Staff and Management

Literature reviewed for this pilot study and discussed earlier in this thesis posits differences between front-line staff and management in level of awareness and utilization of knowledge-to-practice documents such as competency sets. To explore this position further, differences between front-line public health nursing staff and management regarding the a) level of awareness, and b) level of utilization of both competency sets were examined by conducting a t-test for independent sample means. Responses were divided between the sub-groups of 'managers' and 'front-line staff' and each response was mapped to a Likert Scale score (See Table 4 and 7). A summary of the t-test results (including group statistics for sample size [n], mean and standard deviation) answering Research Question 5 on noted differences between these sub-groups for level of awareness and utilization of competency sets is presented in Table 10.

### Significant Differences in Level of Awareness Between Front-Line Staff and Management

A significant difference was detected in the level of awareness of the public health core competencies between front-line staff and managers where ($t(82.7) = -3.057$, $p = .003$). However, a difference in level of awareness of the public health nursing competencies between front-line staff and management fell short of statistical significance ($t(69.0) = -1.784$, $p = .079$).

### Significant Differences in Level of Utilization Between Front-Line Staff and Management

In assessing the significance of differences in level of utilization between front-line staff and management of both competency sets, no statistically significant differences were noted ($p > .05$). Results of the t-test were not statistically significant for the public health core competencies ($t(76.6) = -.129$, $p>.05$), and for the public health nursing competencies ($t(65.4) = .177$, $p>.05$).

Table 10

*Reported T-test Results of Comparisons Between PHN Front-Line Staff and Management*

Group Statistics for Level of Awareness Between Competency Sets

| | (n) | | Mean | | Standard Deviation | |
|---|---|---|---|---|---|---|
| | Staff | Managers | Staff | Managers | Staff | Managers |
| Public Health Core Competencies | 168 | 42 | 2.60 | 3.05 | 1.074 | .795 |
| PHN Competencies | 157 | 42 | 2.32 | 2.69 | 1.276 | 1.179 |

Level of Awareness T-test Results

| Competency Set | t | df | Sig. (two-tailed) | Mean Difference | Std. Error Difference |
|---|---|---|---|---|---|
| Public Health Core Competencies | -3.057 | 82.7 | .003 | -.452 | .148 |
| PHN Competencies | -1.784 | 69.0 | .079 | -.372 | .208 |

Group Statistics for Level of Utilization Between Competency Sets

| | (n) | | Mean | | Standard Deviation | |
|---|---|---|---|---|---|---|
| | Staff | Managers | Staff | Managers | Staff | Managers |
| Public Health Core Competencies | 133 | 39 | 3.99 | 4.03 | 1.667 | 1.328 |
| PHN Competencies | 115 | 37 | 3.68 | 3.62 | 1.794 | 1.656 |

Level of Utilization T-test Results

| Competency Set | t | df | Sig. (two-tailed) | Mean Difference | Std. Error Difference |
|---|---|---|---|---|---|
| Public Health Core Competencies | -.129 | 76.6 | .898 | -.033 | .257 |
| PHN Competencies | .177 | 65.4 | .860 | -.057 | .320 |

## Content Analysis of Barriers and Facilitators to the Use of Competency Sets

To gain a better understanding of the responses provided on level of awareness and utilization of competency sets among PHNs working in Ontario health units, a number of open-ended questions were posed in the questionnaire to explore factors that were perceived barriers and facilitators to the uptake of competency sets within the organizational settings of public health units. The following section provides a summary of common themes identified related to barriers and facilitators using manifest and directed content analysis methodology (Kondracki et al., 2002; Hsieh & Shannon, 2005).

### Barriers to the Use of Competency Sets

Research Question 6 queried what factors might preclude the uptake of competency sets in organizational settings such as public health units. With both theoretical and empirical literature suggesting that barriers could be at the individual, organizational or environmental level, several open-ended survey questions were posed to explore the concept of 'barriers'. A content analysis was conducted to identify frequency of common themes on factors that prohibited or limited the uptake and utilization of competency sets. Table 11 outlines common barrier themes to survey questions related to the public health core competencies, while Table 12 summarizes common barrier themes identified on the public health nursing competencies.

Table 11

*Thematic Categories of Barriers Precluding Use of Public Health Core Competencies*

| Theme | Examples of Key Terms | Frequency Count of Themes Identified | Example |
|---|---|---|---|
| Q. 14 If you are not using the Core Competencies for Public Health, what influencing factors (e.g. individual/organizational) have been barriers preventing their use?* | | | |
| Competing/other competency documents used | Organizational, discipline specific competencies, standards | 4 | "Developed organizational competencies before PH competencies released" |
| No training/education on core competencies | Orientation, learning, information, support | 4 | "A formal orientation in the department did not really exist" |
| Not an organizational priority/not part of processes | Organizational, structure, priority, planning, activities, not | 4 | "Core competencies not part of operational planning…" |
| Organizational leadership to influence uptake | Senior, management, leadership, lack, barrier | 3 | "Management does not encourage their use" |
| Unsure of use | Unsure, not aware | 3 | "I am not aware if we are using them" |
| Q. 13 [If your organization is using the Core Competencies to some degree] What influencing factors (e.g. individual/organizational) have precluded or acted as barriers to the adoption and utilization of the Core Competencies for Public Health at your health unit?** | | | |
| Lack of organizational promotion/staff awareness | Lack, awareness, education promotion, training, information, staff | 27 | "No learning sessions on them" |
| Time | Time, lack, limited, workload, staff | 26 | "Lack of time to do the work necessary to adopt the core competencies" |
| Organizational leadership to influence uptake | Medical officer of health (MOH), directors, Chief Nursing Officers (CNOs) managers, management, direction, approval | 16 | "Senior management is reluctant to incorporate them into practice" |
| Competing priorities | Priority, adjust, conflicting, workload, focus, staff | 16 | "Other policies and work …have greater priority" |

Table 11

*Thematic Categories of Barriers Precluding Use of Public Health Core Competencies*

| Theme | Examples of Key Terms | Frequency Count of Themes Identified | Example |
|---|---|---|---|
| Organizational structures/ processes | Lack, human resources (HR), organization, structure, difficult, process | 13 | "Takes time to change process in a large organization" |
| No organizational supports (resources/tools/people) | Money, staff, resources, support, lack | 12 | "No implementation framework and/or tools" |
| Competing competencies used | Other, competencies different, confusing competing | 10 | "Challenging to navigate the interface between different competencies |
| Inter-disciplinary issues | Non-nurses, other, disciplines, management | 10 | "Non-nursing management have indicated that CCPH reflect what health |
| Difficult to interpret the competency set/confusing to use | Difficult, translate, interpret, practice, apply, understand, fit, integrate | 9 | "Barriers include… adapting and applying core competencies" |
| No known barriers | None | 8 | - |
| Unsure of use | Not sure, unsure | 8 | - |
| Competencies perceived as not important/relevant | Lack, not, interest, relevant | 6 | "Not seeing link between competencies and work" |
| Inconsistency in application across organization | Not, consistent, used, different | 5 | "Not utilized consistently" |
| Not aligned with current performance appraisal tool | Performance, appraisal, not, include, HR, support | 5 | "Not supported by HR for performance appraisal tool" |
| Organizational change underway | Reorganization, changes, review, restructure | 5 | - |

*Note. Where few responses were submitted for a survey question, frequency counts were limited to a minimum of two counts to define a theme.
**Note. Where many responses were submitted for a survey question, frequency counts were limited to a minimum of five counts to define a theme.

Table 12

*Thematic Categories of Barriers Precluding Use of Public Health Nursing Competencies*

| Theme | Examples of Key Terms | Frequency Count of Themes Identified | Example |
|---|---|---|---|
| Q. 23 If you are not using the Public Health Nursing Competencies, what influencing factors (e.g. individual/organizational) have been barriers preventing their use? | | | |
| Competing competencies used | Organizational, discipline, specific, competencies, standards, use, priority, decision, staff, core competencies | 7 | "We decided…to switch to the Public Health Core Competencies because they were applicable to all staff" |
| Lack of organizational promotion/staff awareness | Lack, awareness, education, promotion, training, staff | 7 | " I was not aware of PHN competency development" |
| Inter-disciplinary issues | Discipline, interdisciplinary, scope, practice, non-nurses | 6 | "…practice tools for specific disciplines do not get implemented to their fullest capacity…" |
| No organizational supports (resources, tools, people) | Time, human resources, allocate, resources | 3 | "We do not have time or resources to…ensure we are meeting new competencies" |
| Unsure of use | Unsure, not aware | 3 | "I am not sure" |
| Q. 22 [If your organization is using the PHN Competencies to some degree] What influencing factors (e.g. individual/organizational) have precluded or acted as barriers to the adoption and utilization of the Public Health Nursing Competencies at your health unit? | | | |
| Time | Time, lack, limited, workload, staff | 21 | "Lack of time for front line nurses" |
| No organizational supports (resources/tools/people) | Money, staff, resources, support, lack | 14 | "A tool kit to go with them …make full Implementation happen" |
| Lack of organizational promotion/staff awareness | Lack, awareness, education, promotion, training, staff | 12 | "Not much promotion of competencies…" |
| Competing priorities | Priority, adjust, conflicting, workload, focus, staff | 9 | "Other competing priorities" |

Table 12

*Thematic Categories of Barriers Precluding Use of Public Health Nursing Competencies*

| Theme | Examples of Key Terms | Frequency Count of Themes Identified | Example |
|---|---|---|---|
| Organizational leadership to influence uptake | MOH, CNO, directors, managers, management, lack, leadership, not, use, approval | 8 | "Manager does not cite or use them" |
| Organizational structures/ processes | Lack, HR, organization structure, process, difficult | 7 | "HR requiring certain elements in performance appraisal" |
| Inter-disciplinary issues | Non-nurses, discipline, inter-disciplinary, scope, practice | 7 | "…in an interdisciplinary environment, it may be perceived exclusionary to have discipline-specific competencies" |
| No known barriers | None | 6 | - |
| Unsure of use | Not sure, unsure | 6 | - |
| Staff resistance to change | Staff, buy-in, change, resistance | 6 | "Staff resistance/ reluctance to use and apply tools" |
| Competing competencies used | Other, competencies, different, confusing, competing | 5 | "Competing competencies especially for managers …[of] more than one discipline" |
| Difficult to interpret the competency set/confusing to use | Difficult, translate, interpret, practice, apply, understand, fit, integrate | 5 | "…how to integrate into practice or how to use the document (make relevant to practice)" |
| Non-nursing managers | Non-nursing, managers, not, using, reference | 5 | "My managers are not nurses…not that attached to using them" |

*Note. Where few responses were submitted for a survey question, frequency counts were limited to a minimum of two counts to define a theme.
**Note. Where many responses were submitted for a survey question, frequency counts were limited to a minimum of five counts to define a theme.

Common themes regarding the barriers associated with using competency sets were similar between the public health core and nursing competencies. Barriers themes among those health units not using the competency sets were limited in scope and frequency with a focus on other competency sets in use; lack of training/staff awareness of the documents; low organizational priority; inter-disciplinary issues; or not being aware of the competency set. However, the five most frequent barrier themes among those using both competency sets were similar and reflect resource commitments made by decision makers within an organization. These include lack of organizational promotion/staff awareness, time to for training and education, commitment from organizational leadership, and competing priorities. The final barrier was different for each competency set where lack of organizational structure and processes were a barrier for core competency uptake and no organizational supports (resources/tools/people) precluded the full implementation of public health nursing competencies.

**Facilitators to the Use of Competency Sets**

Research Question 7 asked what facilitators promoted and supported the use of competency sets among PHNs and within public health units. A number of open-ended questions asked participants about perceived facilitators supporting the uptake and utilization of competency sets. A thematic analysis was conducted of the responses to ascertain a frequency count of common identified 'facilitator' themes for both the public health core and public health nursing competency sets. Table 13 outlines common facilitator themes related to the core competencies for public health, while Table 14 summarizes similar facilitator themes on public health nursing competency set use.

For health units not using either competency set, responses were few and the common potential facilitator identified included management support for the core competencies (count = 5), and organizational communications and training for the public health nursing competencies (count = 4). The three most frequent 'facilitator' themes identified among PHNs working in health units using the core competencies for public health were organizational leadership to influence uptake (count = 56); integration into other organizational processes/functions/ structures (count = 25) and integration into performance appraisal tools/processes (count = 21). These themes speak to broader organizational functions or influence of decision making authority for changes in policy, practice, procedure and processes. For the public health nursing competency set, the three most frequent themes to have emerged on 'facilitators' supporting utilization of the public health nursing competency set are organizational leadership to influence uptake (count = 53); integration into work of professional practice team/council (count = 21), and dedicated staff person for professional development (count = 20). In contrast to the core competencies, the two themes that emerged were nursing leadership (e.g. CNOs, middle management) in the context of decision making to use the competency set and nursing-specific human resources to support knowledge translation and implementation of competency sets as resources.

Table 13

*Thematic Categories of Facilitators Supporting Public Health Core Competencies Use*

| Theme | Examples of Key Terms | Frequency Count of Themes Identified | Example |
|---|---|---|---|
| Q. 15 If you are not using the Core Competencies for Public Health, what supports would be helpful to facilitate the adoption and utilization of the Core Competencies (e.g. into your public health practice or in your organization)?* | | | |
| Support from senior management | Support, direction, management, CNO | 5 | "…direction from upper management" |
| Organizational training | Not, aware, know | 3 | "If a formal, universal orientation were adopted for…each health unit" |
| Integration into organizational processes/ functions/structures | Incorporate, strategic planning, policies, HR | 2 | "Incorporation into strategic planning" |
| Orientation program | Orientation, new staff | 2 | "Add them to orientation of new staff" |
| Incorporation into performance appraisals | Incorporate, embed, performance, appraisal | 2 | "Ensure that they are embedded into our performance appraisals" |
| Unsure of use | Unsure, not sure | 2 | - |
| Q. 12 [If your organization is using the Core Competencies for Public Health to some degree] What influencing factors (e.g. individual/organizational) have facilitated/supported the adoption and utilization of the Core Competencies for Public Health at your health unit?** | | | |
| Organizational leadership to influence uptake | Senior, management, leadership, MOH, CNO | 56 | "Support from senior management team" |
| Integrated into organizational processes/ functions/structures | Job descriptions, strategic planning, operational plans, HR | 25 | "...utilizing these competencies in strategic planning and service review" |
| Integration into performance appraisal | Performance, appraisal, tool, reviews, measures, work, development | 21 | "...easy to embed jointly in nursing performance measurement tool..." |
| Integration into work of professional practice team/council | Nursing, practice, team, council, advocate, use | 18 | "...Nursing practice council agreeing to go forward" |

Table 13

*Thematic Categories of Facilitators Supporting Public Health Core Competencies Use*

| Theme | Examples of Key Terms | Frequency Count of Themes Identified | Example |
|---|---|---|---|
| Dedicated staff person for professional development | Practice lead, coordinator, professional development, staff, nursing specialist | 15 | "New positions created... working to integrate core competencies into organization" |
| Professional obligation, personal motivation | Professional, practice, guide responsibility, PHN, I, myself | 11 | "...I use the core competencies as a guide to learning about what is expected of me" |
| Organizational training | Organization, in service, training, education, professional development | 9 | "Formal presentations were made to staff" |
| Unsure of use | Not sure, don't know | 8 | - |
| Work groups, team discussion to incorporate competencies into organizational functions | Team meetings, work groups, committees, discussions, activities, planning | 8 | "...were introduced at office team meetings, then reintroduced regularly after that..." |
| On-line training, resources | On-line, website, modules, course | 6 | "Online training offered" |
| Nursing organizations | RNAO, CHNIG CHNC, ANDSOOHA | 5 | "Transition to Public Professional Resource Group at health unit" |

*Note. Where few responses were submitted for a survey question, frequency counts were limited to a minimum of two counts to define a theme.
**Note. Where many responses were submitted for a survey question, frequency counts were limited to a minimum of five counts to define a theme.

Table 14

*Thematic Categories of Facilitators Supporting Public Health Nursing Competencies Use*

| Theme | Examples of Key Terms | Frequency Count of Themes Identified | Example |
|---|---|---|---|
| Q. 24 If you are not using the Public Health Nursing Competencies, what supports would be helpful to facilitate the adoption and utilization of the Public Health Nursing Competencies (e.g. into your public health practice or in your organization)?* | | | |
| Organizational communication | Communication, meetings, information | 4 | "Bring it up at PHN meetings" |
| Organizational training | Education, presentations, tutorials, learning | 4 | "Have a mandatory tutorial to complete" |
| Unsure of use | Not sure | 3 | - |
| Organizational leadership to facilitate uptake | Management, CNO, director, commitment | 3 | "...CNO level there could discussion about their use" |
| Integration into organizational processes/ functions/structures | Organization, policies, plans, include, competencies | 2 | "...referring to the competencies in organizational policies" |
| Orientation program | Orientation, nurses, staff | 2 | "Having this document included in orientation" |
| Resources/tools to help apply competency set | Tools, application, Z-cards, posters | 2 | "Have it in poster version and Z-cards" |
| Q. 21 [If your organization is using the PHN Competencies to some degree] What influencing factors (e.g. individual/organizational) have facilitated/supported the adoption and utilization of the Public Health Nursing Competencies at your health unit? ** | | | |
| Organizational leadership to influence uptake | Senior, management, leadership, MOH, CNO | 53 | "CNO facilitated the adoption of them" |
| Integration into work of professional practice team/council | Nursing, practice, team, council, committee, use, support, champion | 21 | "Our Nursing Practice Council has helped disseminate information" |
| Dedicated staff person for professional development | Practice lead, coordinator professional development, staff, nursing, specialist | 20 | "The practice coordinator position" |

Table 14

*Thematic Categories of Facilitators Supporting Public Health Nursing Competencies Use*

| Theme | Examples of Key Terms | Frequency Count of Themes Identified | Example |
|---|---|---|---|
| Integration into performance appraisal | Performance, appraisal, tool, reviews, measures, work, integrate, incorporate | 9 | "Incorporation into our performance review process" |
| Professional obligation, personal motivation | Practice, practice, guide expectation, PHN, I, informed | 9 | "Personal growth and as a tool for self-regulation" |
| Organizational training | Nursing, in-service, presentation, education | 7 | "Presentations and workshops were offered" |
| Orientation program | Orientation, nurses, staff | 6 | "Orientation for nurses coming to public health" |
| Nursing organizations | Nursing, organizations, CHNC, ANDSOOHA | 5 | "Nursing organizations" |
| Resources/tools to help apply competency set | Received, copy, competencies | 5 | "Everyone received copy" |

*Note. Where few responses were submitted for a survey question, frequency counts were limited to a minimum of two counts to define a theme.
**Note. Where many responses were submitted for a survey question, frequency counts were limited to a minimum of five counts to define a theme.

## Summary

Key findings of this pilot study were highlighted in this chapter. The pilot study response rate was higher than anticipated and met the minimum estimated pilot study sample size calculations. Study population characteristics were well represented in the sample, with the exception of specific educational and training qualifications achieved by PHNs suggesting a relatively high degree of specialization among this group. The level of awareness reported for both competency sets among PHNs was relatively high and level of utilization moderate; confirming diffusion of these innovations among the sample. However, varying degrees of

diffusion were reported, where level of awareness and utilization for PHN competencies lagged behind the core competencies. Differences between PHN management and front-line staff on competency set awareness and utilization were not statistically significant with the exception of level of awareness for the public health core competencies. PHNs also confirmed numerous communication channels contributing to their awareness of these documents, some of which highlighted effective knowledge dissemination strategies. Finally numerous barriers and facilitators have been identified influencing the adoption of competency sets with most of these factors falling at the organizational level. Potential rationales for some of the findings based on reviewed literature are discussed in the following chapter.

# CHAPTER VI - DISCUSSION

## Representation of the Sample to the Population

The sample was reflective of most of the demographic characteristics of the PHN population with the exception of a few variables. First, the level of education and degree of specialization were slightly higher among the sample than the population. Also the proportion of PHNs in management positions among study participants was higher than that in the population; however, recruitment of this group was deliberate to support statistical analysis requirements. Finally, most responses came from PHNs employed in the health unit peer groupings of 'urban/rural' and 'mainly urban (densely populated)'; far fewer responses came from smaller rural or northern health units, possibly reflecting over representation from certain peer groupings of health units. The variables that deviated from the population may have implications which are highlighted in the discussion section of this chapter.

The majority of respondents identified themselves as a PHN (66.1%), followed by middle managers (15.5%). Out of a total of 4152 registered nurses (all general-class) working in Ontario public health units on the CNO registry data base, 3308 (79.7%) self- identify as public health nurses and 298 (7.2%) as middle managers (CNO, 2010). The discrepancy between pilot study PHN response rate and the population may be explained by limits in the CNO Data Query Tool data retrieval parameters available to the public for data retrieval, where selection criteria applied to the pilot study could not be set as limits on the data query tool. The excess number of middle managers participating in the study compared to proportional representation in the population is likely due to the aggressive recruitment efforts made to equalize the numbers of front-line and management staff.

The highest level of education reported by PHNs was a baccalaureate degree in nursing (67.4%), followed by a master's degree in a field of study other than nursing (15.4%) and a master of nursing degree (10.9%). A baccalaureate degree in nursing is a legislative requirement defining a PHN; therefore, a high number of baccalaureate prepared nurses practicing in the sector was anticipated. The high proportion of graduate prepared PHNs in the pilot could be a reflection of management response rate, where graduate preparation among nursing management would be more likely (Duffield et al., 2001).

Specialization is also reflected by the number of nurses in the pilot study with community health nursing (CHN) certification. The Canadian Nurses Association reported that as of July, 2013, a total of 288 nurses had received their CHN certification in Ontario (Canadian Nurses Association, 2013). This total would be inclusive of nurses from other community health sectors. Lack of sub-sector data limited the ability to make comparisons between population and pilot study results. In the pilot study results, 13.6% (n = 30) of participants reported CHN certification. This appears to be a relatively high proportion and represents 10.4% of all those that hold CHN certification in the province. In an evaluation of CHN certification, pursuit of certification was found to be promoted where CHNC standards and competencies were championed within an organization (Robison-Vollman, Martin-Misener & Rowe, 2010). High participation of PHNs in this pilot study with CHN certification may have been influenced by their knowledge of the competency sets as part of their certification studies. However, the high number of managers and specialized staff in this pilot compared to the population was also reflected in an evaluation conducted by the City of Hamilton, Public Health Services (2010), where a Pan-Canadian scan was conducted of the integration of the public health core competencies into public health settings.

Statistics Canada organizes public health unit/regions in Canada by 10 peer groups, using 24 variables to cluster regions with similar social, economic and geographic characteristics (Statistics Canada, 2013). In Ontario there are a total of seven peer groups. All but one peer group was represented from among the responses. Therefore, heterogeneity in regions of practice and settings was reflected in most of the sample. The highest proportion of respondents (38.0%), were employed in health units from Peer Group A – Urban/Rural Mix. This is not unexpected as the majority of the health units (15 out of 36, or 41.7%) fall under this peer group, where moderate numbers of PHNs work (MOHLTC, 2009). This was followed by 17.2% of responses from Peer Group B – Mainly Urban with moderately high population density. While Peer Group B only represents 16.7% (n = 6) of the public health units in Ontario, data reviewed from these health units indicate they serve larger populations and have more PHN nursing staff than their rural or less densely populated counterparts (MOHLTC, 2009). Peer Group H-Rural Northern had no responses and Peer Group D – Mainly Rural had a response rate of 11.1%. Rural health units generally serve smaller populations; therefore have fewer PHNs on staff (MOHLTC, 2009) that could have potentially responded to the survey. What is important to note about peer groups is that larger, more complex organizations such as those in Peer Groups A and B may have more resources or greater numbers of staff to justify investments in training and education on innovations and the ability to incorporate the innovation into organizational structures and processes (Baldridge & Burnham, 1975). Therefore, it is important to identify the impact this variable may have on study results.

## Discussion of Key Findings

### Summary of Key Findings

There were eight key findings identified in this pilot study in response to the research questions posed. First, there was a substantial awareness of the public health core and nursing competency sets among PHNs, although familiarity with the documents varied in degree among the sample. Most PHNs reported reading parts of (core competencies = 28.5%, PHN competencies 26.7%), or being somewhat familiar with (core competencies = 33.9%, PHN competencies = 23.5%) both competency sets, and approximately one-fifth of the sample were very familiar with the competency sets. Second, the five most frequent communication channels by which PHNs learned of the competency sets were: work colleagues/activities; received a copy of the competency document(s); obtained competency set information from national organizations that developed the documents (i.e. PHAC, CHNC); information obtained from managers/employers; and information obtained during competency set launch campaign/workshops. Third, most PHNs reported limited (29.0%, 26.7%) to moderate (25.3%, 19.5%) use of the public health core and public health nursing competency sets respectively within their organizational contexts of public health units. Fourth, the top five applications of competency sets reported by PHNs included: professional development purposes; educational needs; orientation purposes; performance evaluations; and human resource processes. Fifth, the difference in level of awareness between PHN front-line staff and managers of the public health core competencies was statistically significant, however not statistically significant for the public health nursing competency set. Sixth, differences in level of utilization of both competency sets between front-line PHN staff and management were not statistically significant. Seventh, a variety of organizational barriers precluding adoption of competency sets were identified. These

barriers were slightly different and dependent on a) if the public health unit used, or did not use the competency sets, and b) which competency set was considered (i.e. core versus discipline-specific). Finally, the identified facilitators that supported the adoption of competency sets were similar to those themes that emerged for barriers precluding use of the core competencies (e.g. organizational leadership, organization processes and functions, and resources/tools, etc.). However, the facilitators for the public health nursing competencies were also aligned with nursing leadership, professional development support networks and subject matter experts within the organization.

## Level of Awareness of Competency Sets

### Level of Awareness

There is a considerable level of awareness of both competency sets among PHNs in Ontario, with the majority of the sample reporting a mid-range level of awareness with both competency sets (i.e. 'read parts of' or 'being somewhat familiar' with the competencies). Therefore, exposure to both competency sets and gained innovation knowledge has occurred among a large proportion of the sample. The Oppewal et al. (2006) study also found a broad level of awareness of the American public health competency sets, although with slightly different proportional results among the various categories of level of familiarity with the competency sets. In the Oppewal et al. (2006) study, levels of awareness of the American public health core and nursing competency sets were equally distributed by one third of the sample being 'unfamiliar' with the documents; one third being 'somewhat familiar', and the remainder one third being 'very familiar' with the competency sets. In contrast, this pilot study's results indicated approximately two-thirds of respondents combined having 'read parts of' (28.5%) or being 'somewhat familiar' (33.9%) with the public health core competencies, while half

responded to this level of awareness combined for the public health nursing competencies (i.e. 'read parts'= 26.7% and 'somewhat familiar' = 23.5%). Approximately 20% of the respondents in the pilot study reported being 'very familiar' with both competency sets. In the City of Hamilton, Public Health Services (2010) Pan-Canadian evaluation of the core competencies for public health, staff level of awareness perceived by management or key knowledge brokers within organizations indicated similar results to this pilot study; however, the extensive level of knowledge perceived by respondents among staff was slightly higher in the Pan-Canadian evaluation than this pilot study's results. Knowledge of an innovation such as competency sets is a precursor to contemplating adoption of the innovation which is the first stage in the Innovation-Decision Process (Rogers, 2003), where information is gathered to assess the need and utility of an innovation. Therefore, the results indicated that the first-step in the Innovation Decision-Process was achieved for both competency sets.

It is important to understand factors influencing the level of awareness of competency sets. According to Rogers (2003), 'early knowers' tend to be more educated, have a higher social status, experience greater exposure to mass media channels, have more contacts with change agents, are engaged in social participation more frequently, and tend to be cosmopolite (i.e. seek information outside of social one's social network/system) more so than late knowers. Becker (1970a) examined factors that influenced diffusion of innovative public health programs in public health departments among health officers. Personal attributes of health officers that positively correlated with knowledge and diffusion of innovative programs included the level of education and extent of professional specialization; cosmopolitanism; location within their peer group communication network; and utilization of external information sources for evidence.

In this pilot study, personal characteristics of the sample discussed included a higher proportion of highly educated nursing professionals. There was also a considerable number of subject matter experts with CHN certification (13.6%) or 'specialists' (6.3%) that may have a role in brokering knowledge within organizations regarding the competency sets along side of managers. Individuals in such roles, with appropriate organizational support, can be effective champions facilitating knowledge dissemination and translation within organizations to diffuse information about such knowledge-to-practice tools (e.g. BPGs and evidence based practice) (Kitson et al., 2011). Those organizations with higher degrees of specialization among their resources, including human, are more likely to adopt innovations (Baldridge & Burnham, 1975). It might be assumed a greater proportion of highly educated and specialized nurses within public health units could increase awareness or use innovations like competency sets. Rogers (2003) identified the role of opinion leaders and champions in accelerating diffusion of innovations. This point will be discussed further in the 'facilitators' discussion of this chapter.

Considerable time and resources were invested, and sector consultation sought in the development of both competency sets (Emerson, 2005; Underwood and Associates, 2009). Given the level of consultation and discussion in the field prior to the launch of the public health core and nursing competencies, and the promotion of competency-based human resource development as best practice (JTGPHHR, 2005), a degree of prestige may have been associated with knowledge and uptake of these novel and highly promoted innovations. Mohr (1969) and Becker (1970b) noted perceived prestige associated with innovative public health programs as an influential factor and motivator to learning more about an innovation and its eventual adoption.

In addition to individual factors of early adopters and innovation prestige, 'time' may have also influenced level of awareness. This pilot study was conducted six years post release of

the core competencies for public health, and four years after the public health nursing competencies. Rogers (2003) identifies time in the diffusion process as a key element of influence as it requires various periods of time for an innovation to be discovered and investigated for its benefits before it can be considered for adoption. As a comparator, in the Oppewal et al. (2006) study several years post release of the American public health core and nursing competency sets, considerable knowledge diffusion of these documents had occurred among study participants within a two to five year period. Similar results were identified in the Pan-Canadian evaluation on core competencies organizational integration three years post release of this document (City of Hamilton, Public Health Services, 2010).

Finally, it is important note the difference in level of awareness between the two competency sets among the sample of this pilot study, where the level of awareness was greater among PHNs for the core competencies than the public health nursing competencies. These results were different from the Oppewal et al. (2006) study, where there were relatively equal proportions of responses for each level of awareness for each competency set. An obvious consideration for this difference would be that the core competencies for public health were released two years prior to public health nursing competencies and would therefore have more time to diffuse through the public health nursing sector in Canada. However, this did not appear to be an influencing factor in the Oppewal et al. (2006) study.

The differences may be explained by the study populations. The sample for this pilot study consisted of front-line PHNs and management working in Ontario public health units, and comparisons were made between these sub-populations. The Oppewal et al. (2006) study included public health nursing academics and made comparisons between public health department staff and academics. There may be greater familiarity with public health nursing

competencies in the Oppewal et al. (2006) study as public health nursing academics may use competency sets to greater degrees to guide nursing curricula. This seemed to be evident in the number of studies identified where various discipline-specific competency sets were applied to public health pedagogical studies with students (Boulton, Montgomery, and Beck, 2008; Poulton and McCammon, 2006; Maltby, 2006).

**Communication Channels**

How participants learned of the competency sets may have also affected awareness levels. Multiple communication channels, as well as type of channel, may have an influence on level of awareness and adoption of innovations. The five most frequently reported methods and mechanisms of knowledge transfer/exchange, of which Rogers' (2003) referred to as 'communication channels', fit into the four distinct categories: interpersonal, cosmopolite, and localite communication channels, and mass media strategies. Of the interpersonal/localite channels reported, 'work colleagues/activities' and 'management/ employer' were most frequently identified in the study results. A cosmopolite channel included 'national organizations that developed the competency sets (i.e. PHAC and CHNC)'. Finally, mass media strategies came in the form of 'receipt of copy of the document', and 'launch campaigns/workshops'. Rogers' (2003) discussed the application of The Bass Model for Forecasting the Rate of Adoption of a New Product by Mahajan, Muller and Bass, and applied this model to DOI theory. This forecasting model postulates that the number of new innovation adopters often result from mass media channel exposure at first, and later to a greater extent by interpersonal communication channels. Generally, earlier adopters and innovators find mass media channels more important as an influencing factor, while later adopters tend to put greater weight on

interpersonal networks, especially from peers (Rogers, 2003). The communication channels most frequently identified in the pilot align with the forecasting model's factors of influence.

Many of the respondents reported multiple communications channels by which they learned of the competency sets. There is evidence to suggest that a single intervention to disseminate information about innovations and promote their implementation (e.g. such as clinical guidelines), have been met with little success and that multiple strategies are often required (e.g. communication channels might include resource materials, meetings, workshops, buy-in from opinion leaders) (Kitson, 2009; Marchionni & Ritchie, 2008; Shirey, 2006). The studies and evaluations reviewed on competency sets used in public health suggest that individuals learned of these innovations from multiple sources (City of Hamilton, Public Health Services, 2010; Oppewal et al., 2006; Rush & Furlong, 2012). Oppewal et al. (2006) specifically noted that one-fifth of respondents aware of the American public health core and nursing competency sets had learned of them through two or more communication channels.

At their respective launches, a considerable amount of information on the new competency sets was made available to public health professionals. Numerous presentations made at past national conferences are available on the websites of the Canadian Public Health Association (CPHA) or the CHNC, or listed in national conference program agendas (Canadian Public Health Association [CPHA], 2007; CPHA 2009; CHNC, 2010) and webinars. Both the public health core and nursing competencies were easily accessible on websites and were available in hard copies from PHAC or the CHNC. Receiving a copy of the public health core competencies was the primary communication channel by which people learned of the document in the Pan-Canadian evaluation on core competencies, where employers played a key role in disseminating this resource to staff (City of Hamilton, Public Health Services, 2010). In a

systematic review of the effect of print education material (PEMs) on professional practice, Giguère et al. (2009) found that such resources can have a small effect on professional practice outcomes when used on their own; however it was noted that often, PEMs are add-ons to other interventions.

Access to on-line copies of the document also appears to be a relevant communication (mass media) channel noted (City of Hamilton, Public Health Services, 2010; Oppewal et al., 2006; Rush & Furlong, 2012). When reviewing the websites of professional organizations such as the Ontario Public Health Association (OPHA), the CPHA, the Registered Nurses Association of Ontario (RNAO) - Community Health Nurses' Interest Group (CHNIG), the CHNC and PHAC, one can find links directly to the public health core competencies, the public health nursing competencies, or both. There appears to be significant promotion of the competency sets across public health organizations in Ontario and Canada. These partnerships for knowledge dissemination among public health organizations have been effective for knowledge exchange and translation strategies supporting awareness building of the public health core competencies noted in other grey literature (City of Hamilton, Public Health Services, 2010).

In addition to the conferences and early launch activities, workshops were also conducted by various organizations on the competency sets. Evaluations on the public health core competencies identified 'workshops' as a key communication channel by which people learned of the core competencies (City of Hamilton, Public Health Services, 2010; Rush & Furlong, 2012). Workshops may have been noted as a relevant communication channel because they provide a mechanism to disseminate information and implement knowledge translation activities, where individuals learn of the core competencies, and how to apply them. In a systematic review by Forsetlund et al. (2009), the authors found that educational meetings and workshops where

interactive approaches alone or a mixed combination of interactive approaches and didactic methods had effects on professional practice.

'Work colleagues/activities' was the most frequently cited communication channel in the pilot study results. 'Managers/employers' also came in the top five rankings. Both of these communications channels might be identified as interpersonal. This is congruent with the Rush and Furlong (2012) evaluation, where participants cited learning of the PHAC core competencies most often "in team meetings, work activities, and staff conversations" (p.21) as well as from management/employer. However, this latter interpersonal channel was less frequently reported in the Oppewal et al. (2006) study; this difference may be explained by the sample make up, where the vast majority of respondents in the Oppewal et al. study self identified as public health department management (40%), or faculty members in academic institutions (41%), and far fewer responses from front-line staff (8%). The PHN sample of the Oppewal et al. (2006) study was quite different than that of this pilot study, where front-line staff contributed to the bulk of the sample.

The interpersonal communication channel theme of management or practice leads as opinion leaders was also identified as mechanism of information dissemination of BPG development by the Registered Nurses Association of Ontario (RNAO) (Gifford et al., 2006; Ploeg, et al., 2007), where organizational leaders could use their relative position within healthcare organizations to influence BPG communications. Baldridge and Burnham (1975) refer to such organizational positions and roles of authority as the "factors that bridge the individual level and the organizational level" (p.168). Organizational leaders themselves may be better situated to learn of, disseminate and communicate information on innovations as key opinion leaders, champions, decision makers and influencers (Gifford et al., 2006; Shirey, 2006). As

previously mentioned, demographics of pilot study participants suggest a substantial number of PHNs that might support this role in knowledge diffusion as nursing leaders, champions or subject matter experts.

**Difference in Level of Awareness Between Front-Line Staff and Management**

While there was a statistically significant difference noted on level of awareness of the core competencies; there was no statistically significant difference between groups regarding awareness of the public health nursing competencies. The significant result for the core competencies may be explained by supporting literature on 'early knowers' and their characteristics including leadership roles. Alternatively, the non-significant result may be explained by speculated limitations of the measurement tool, participant error, timing of the study, and/or sample size. Results of the Oppewal et al. (2006) study on this variable may not be comparable to this pilot study's results. Comparisons of level of awareness were made between PHNs (both front-line and management) to PHN academics in the Oppewal et al. study (2006); differences noted between sample groups were significant ($p<.0005$) on level of awareness for both competency sets.

A number of studies/evaluations using DOI theory or adoption of knowledge-based innovations have targeted management, professional practice leaders or human resource specialists in their samples (City of Hamilton, Public Health Services 2010; Gifford et al., 2006; Kitson et al., 2011). The assumption is that some 'early knowers' of innovations (e.g. leadership, and professional practice leaders/specialists) may be more socially connected into information networks (e.g. professional organizations, attendance to conferences) or interpersonal channels (e.g. communities of practice, professional groups) that enable them to learn of innovations and their attributes in greater detail (Rogers, 2003). Baldridge and Burnham (1975) noted the

importance of leadership roles and relative position within organizations as a factor of influence on diffusion of an innovation. Becker (1970a) also noted the relevance of opinion leaders and positions within social networks as an influence on knowing and adopting innovations. It is then plausible to consider that position and social influence found among leadership and change agents may predispose some individuals to greater levels of awareness about an innovation such as competency sets.

However, this does not explain the contrary result found for the public health nursing competency set. The statistically insignificant result might be explained by a number of factors. First, there was a slightly lower response to public health nursing competency set questions than the core competency set questions. The sample size may have been too small to detect any statistical significance. Second, there appeared to be some confusion among a small number of respondents answering questions on the public health nursing competency set. From their responses, it appeared these PHNs answered questions about the public health nursing competencies found in the third section of the survey exactly how they answered questions on the public health core competencies in the second section of the questionnaire, essentially with respondents repeating responses and commenting on being asked the same questions twice in the questionnaire. Respondents may not have read instructions carefully, or failed to note that each section of the questionnaire corresponded to a different competency set. Beyond a few obvious comments made about respondent confusion on how to answer the survey, it is unclear how wide spread this problem was among respondents. It is also unknown what impact this may have had on the statistical tests related to the public health nursing competency set, if the confusion was a result of a flaw in the design of the questionnaire, or if lack of attention on the part of the respondent when reading the questions caused respondent error.

Finally, time as an element of DOI theory may be an influencing factor, where time influences rate of diffusion of an innovation (Rogers, 2003). Public health nursing competencies were publically released two years after the core competencies. Therefore, the core competencies may have had more time to diffuse through the Ontario public health nursing social network than the public health nursing competencies, hence the statistically insignificant result of the latter competency set.

Among all these communication channels, it was quite evident that one mechanism alone is not responsible for learning about competency sets, but multiple mechanisms have been used to learn of these documents. There were a number of communication channels identified in addition to the top five reported in this pilot study, and multiple communication channels were often listed among respondents. Individuals will obtain various types of information at different stages of the Innovation-Decision Process before they make the decision to adopt or reject an innovation (Rogers, 2003; Shirey, 2006).

## Utilization of Competency Sets

### Level of Utilization of Competency Sets

Those that reported some 'level of awareness' of either competency set were later asked to comment on the degree of utilization of those competency sets within their respective organizations. Among those respondents in the pilot study that reported some level of awareness of the competency sets, approximately half reported limited to moderate use of the documents combined, within their organizational contexts. Far fewer reported extensive adoption of the competency sets (< 10%). For all categories of adoption, the PHN competencies were less utilized than the public health core competencies. While there appears to be widespread

knowledge of the competency sets among the sample group, uptake of competency sets has been at a much slower pace in organizational contexts.

In the Pan-Canadian evaluation on core competencies, 57% of respondents indicated "that their organizations were actively adopting or adapting the Core Competencies for use in existing or emerging competency-based human resources tools and/or process" (City of Hamilton, Public Health Service, 2010, p.13). However, this evaluation does not indicate the extent to which the core competencies were applied (i.e. number of applications, details of tools or processes, etc.). In the Oppewal et al. (2006) study, 56% indicated current use of the competency sets, but again, no detailed level of application was discussed.

Level of utilization is an important element to consider, as it is a proxy for determining adoption of an innovation. Utilization of an innovation is an aspect of the Innovation-Decision Process Model under the stage of 'Decision' making (Rogers, 2003). Rogers (2003) suggests that adopters can be plotted on a continuum of their innovativeness against a normal frequency distribution curve. The first 50 % of the population up to the mid-point of the curve represents 'innovators' (2.5%), 'early adopters'(13.5%), and 'early majority' (34%). The latter half of the curve represents the 'late majority' (34%) and the 'laggards' (16%). If the levels of utilization of both competency sets found in the results of this pilot study are plotted against this curve, then this sample was represented by innovators, early adopters and the early majority of users and adoption is at the half way mark of diffusion of this innovation. There remains another 50% of the population (the late majority and the laggards) to adopt competency sets, if they are adopted at all. Even among this group, the degree of adoption may vary from partial uptake to full implementation; this premise of adoption variation was also acknowledged by Rogers (2003) in DOI theory.

As discussed with the variable 'level of awareness', factors influencing familiarity with an innovation are similar to factors that influence their adoption (Rogers, 2003). Literature reviewed on competency set utilization and application had a tendency to be within organizational contexts such as academic settings or public health departments. Therefore, survey questions on these variables were also framed within an organizational context.

Baldridge and Burnham (1975) identify complex organizations as the adopters of major social innovations, and that two main characteristics of organizations influencing innovation uptake are the size of the organization and administrative complexity. The size of an organization is correlated to the administrative complexity of the organization represented by levels of hierarchy, number of management positions, and management to staff ratios (Blau, 1970).

In a study conducted by Baldridge and Burnham (1975) on the adoption of innovative education programs among schools and school districts, the authors found that as school and district size increased, so did the number of adopted education innovations. Schools with higher rates of adoption were larger and had greater structural complexity including more students served, and greater numbers of management positions. Mohr (1969) also noted that larger, more resourced health departments also had greater adoption of innovative public health programs, where population size being serviced by the organization and the expenditures on health department programs were positively correlated to adoption of non-traditional public health programs. Health departments serving larger populations would have a greater tax-base to generate revenue, and therefore have more resources to implement programs. Mohr (1969) suggests that greater resources are required for diversification of programs and capacity may be unavailable within smaller public health organizations.

This information is relevant to the pilot study as a high proportion of staff that participated in this study came from 'Urban-Rural' mix and 'Mainly Urban' public health units. These health units have greater numbers of nursing staff employed (MOHLTC, 2009) and may have the human resource capacity to help implement innovations like competency sets into organizational processes and functions. Larger organizations often have greater capacity for specialization and more staff to support adoption of an innovation (Baldridge and Burnham, 1975). The larger health units could justify fiscal and human resource investment in competency set implementation as there are a more staff that would benefit from integration of competency sets in professional development resources and opportunities, and the organization's size enable economies of scale. Therefore, greater returns on investment in competency set implementation may be perceived in larger public health units.

As noted earlier in the discussion on level of awareness, characteristics of 'early knowers' tend to be the same as early adopters (Rogers, 2003). These characteristics included the influence of level of education, social status, contacts with change agents and cosmopolitanism (Rogers, 2003). The work of Becker (1970a) discussed earlier highlighted level of education, degree of specialization, degree of being 'cosmopolite', and placement in peer group communication networks as factors found to be positively correlated with awareness and adoption of public health innovations among health officers. Many of these personal characteristics were similar to the pilot study findings on demographics; this may explain degree of the adoption of competency sets.

However, Baldridge and Burnham (1975) suggest that individual characteristics may not play as important a role in adoption of innovations as much as the influence of organizational leaders, who are the bridge between the individual and the organization. These individuals often

have the authoritative power, influence and resources to implement innovations. In a pilot study assessing organizational factors supporting implementation of nursing best practice guidelines in two in-patient settings of a metropolitan healthcare center, transformational leadership and a culture of organizational learning were factors identified that supported partial implementation of RNAO best practice guidelines (BPGs) (Marchionni & Ritchie, 2008). This study acknowledged that an organizational culture supporting professional development, learning and change in practice could not be achieved without the influence and support of leadership. Building on this evidence, another study on RNAO BPGs examining factors that contributed to sustained use of these documents involved three broad leadership themes (Gifford et al., 2006). These themes included supporting staff to use the BPGs; creating a positive organizational culture of best practice; and influencing required changes to organizational processes and structures. Other types of leadership support identified in BPG implementation included providing staffing and resources, embedding guidelines in policies and documentation (Ploeg et al., 2007), and building necessary infrastructure to support innovation uptake (Gifford et al., 2006; Shirey, 2006). Many of these factors are beyond the control of front-line staff; however, they are well within the management and organizational leadership spheres of influence.

**Differences in Level of Utilization**

A key finding in this pilot study was that there was no statistical significant difference in the level of utilization of both the public health core and public health nursing competency sets between front-line staff and nursing management ($p>.05$). An explanation for this may be linked with the discussion in the previous section on leadership influence. If one assumes that leadership does have influence on level of awareness and adoption of competency sets, and the adoption of this innovation occurs within organizational contexts where implementation and

integration into organization processes and functions occur, it is likely any application of the competency sets would affect both management and front-line staff. Hence, the level of utilization may not be different between the two groups where adoption of competency sets have or have not occurred.

In the Pan-Canadian evaluation on core competencies implementation, by design, the predominant responders to the questionnaire were management, leadership and staff involved in professional development or human resources (City of Hamilton, Public Health Services, 2010). A question was posed in this same evaluation on strategies used to integrate core competencies into public health organizations. Most of the strategies listed to integrate core competencies into organizational resources, processes and functions, as well as increase staff familiarity with the document and its utility, would have required some level of management approval and commitment of various organizational resources. Therefore, utilization of the core competencies among staff could not have occurred without first being utilized by management, leaders and subject matter experts within the organization.

In the Oppewal et al. (2006) study, there was a statistically significant difference in level of utilization of competency sets between public health department PHNs and PHN academics ($p<.001$). However, no further information was provided on the results in the study. Comparisons are difficult to make between the Oppewal et al. (2006) study and this pilot study given the difference in study populations between the two studies.

**Application of Competency Sets**

Within the pilot study, the most frequent applications reported for both competency sets were: educational needs, professional development, orientation purposes, performance evaluations, and human resource processes. Many of these applications are reflective of the other

competency set literature reviewed with emphasis on human resource development and capacity building (Bartee et al., 2003; City of Hamilton, Public Health Services, 2010; Kalb et al., 2006; Lin et al. 2010; Oppewal et al., 2006; Patell et al., 2008; Rush & Furlong, 2012). Therefore, results from the pilot study on common competency set applications are consistent with the available literature.

These applications are also congruent with the goals of PHAC and what this agency had hoped to achieve with the release of the core competencies. These primary aims of making core competencies available included: supporting the development of public health practitioners; assessment of training and professional development requirements; performance assessment; job descriptions; identifying skills and competency needs in organizations to fulfill public health functions within organizations and across programs; and identify mix of public health professionals required in organizations (Public Health Agency of Canada [PHAC], 2010).

The frequency of competency set application in healthcare organizations for public health human resources (PHHR) processes and professional development requirements would align with obligations to governments and regulatory bodies to meet quality assurance standards and contribute to continuous quality improvement enhancing program and service delivery to populations. Public health units might be considered ‘professional bureaucracies’ (Scott, 1990), with an interdisciplinary mix of healthcare providers, public health specialists and support staff tasked to protect and promote the health of local populations they serve. Some of these disciplines are influenced and guided in their practice by professional practice models and standards, as well as regulatory and legislative frameworks. Competencies are therefore required, and need development and

maintenance to fulfill these various professional requirements often implemented through the contexts in which people work with oversight by their places of employment.

Conversely, healthcare organizations such as public health units are required to make investments in professional development as part of quality assurance programs and continuous quality improvement (Ministry of Health and Long-Term Care [MOHLTC] & Ministry of Health Promotion and Sport [MHPS], 2011). In Ontario, the MOHLTC has tracked expenditures of total budget on professional development and training needs in the public health sector as an indicator of investment in PHHR capacity building (MOHLTC, 2009). In the *Initial Report on Public Health in Ontario*, the MOHLTC articulated the need for investment in training and professional development resource commitments by boards of health that could "support staff in their ongoing skill enhancement and maintenance for effective public health practice…enhance their knowledge" and provide "information on new methods of practice [contributing] to improvements in the delivery of public health programs and services" (MOHLTC, 2009, p.56). Competency sets clearly have an important role to play in local public health unit professional and human resource development. Their utility for this purpose has been demonstrated in this pilot study and other studies. These documents can also provide a frame of reference for the required PHHR investments to be made at the local level.

**Barriers and Facilitators to Utilizing Competency Sets**

It has been noted that at times, factors identified as barriers to adoption of knowledge can also be facilitators (Harrison, Légaré, Graham and Fervers, 2010). The results of this pilot study exploring barriers and facilitators influencing competency set uptake among PHNs working in Ontario public health unit reflects this position.

### Barriers

Participants were asked about barriers to full adoption of competency sets in two different contexts, those that were not using the competency sets at the time of the study, and those that were using the competency sets in their respective organizations. The responses were slightly different between those organizations using and not using the competency sets, and also different between the two competency sets explored in this pilot study. These differences required further consideration and discussion.

For those health units not using the competency sets, there were differences noted between the adoption of the core and discipline-specific competency sets. Barriers to core competency set adoption were related to organizational processes, structures, resources and priority setting. For example, the lack of training, the use of corporate competencies for health human resource (HHR) purposes, and the low priority of competency set integration within the organization were noted. Some of these themes were similar to other studies and evaluations reviewed (City of Hamilton, Public Health Services, 2010; Oppewal et al., 2006; Rush & Furlong, 2012). Some of these barriers may be related to a lack of organizational resources, and centralization (i.e. locus of decision making within the organization) (Scott, 1990).

Public health units are extensions of municipal governments in Ontario. Therefore, the ability to implement innovations may be associated with allocated fiscal resources approved by municipal government boards of health, or human resource (HR) departments applying corporate policies within departments of the municipal government. For example, in a study by Kimberly and Evanisko (1981) on the adoption of administrative and technical innovations in a hospital, hospital leadership was more likely to have an influence on technical innovation adoption, rather than administrative innovation implementation. Dual authority and structures within hospitals

created conflict on resource allocation for broader organizational innovation investment such as those tied to administrative innovations, where technical innovation uptake would be determined within specialty units of the hospital (e.g. various medical/surgical departments). Public health units may not be dissimilar in that certain innovations require top tier system level approval and resource allocation prior to implementation.

More interesting and less expected, were the barriers to public health nursing competency set use in organizations that were not using this competency set. This included the use of other competency sets (i.e. focus on organizational use of public health core competencies or corporate competencies). Barriers also included inter-disciplinary issues, where non-nursing management were unfamiliar with discipline-specific competencies and lacked the knowledge translation skills to incorporate them into professional development activities for PHNs, or that the focus on discipline-specific competency development might be perceived as exclusionary to other disciplines.

These barriers are interesting as the public health sector prides itself on ‘inter-disciplinary practice’, where cross-over of functions and activities often occur between disciplines. However, specific skills and knowledge also fall into the domain of each discipline working within the sector. If these barriers to discipline-specific competencies adoption are accurate, this has implications not only for public health nursing, but for other public health disciplines with their own specific competency sets. More unsettling is the all or nothing approach that has been adopted by some health units, that organizations may be choosing the core competencies to guide PHHR development as they are applicable to all staff regardless of discipline; rather than equally valuing and acknowledging balance with discipline-specific competency development. This unbalanced choice appears to be in contradiction to the intent of PHAC and the development of

the core competencies for public health, where the core competencies would be the building block for the development discipline-specific competency sets (JTGPHHR, 2005; PHAC, 2010). The competency sets are meant to complement each other, not compete.

The lack of discipline-specific competency set integration into organizational processes may be the result of several issues. First, public health units, particularly smaller and less resourced ones, may not have the fiscal or human resource capacity to invest, and what few resources are available to these organizations, must be applied to support competency development among all staff regardless of discipline. 'Lack of resources' is often cited as a barrier to uptake of BPGs (Lia-Hoagburg et al., 1999; Ploeg et al., 2007; Stergiou-Kita, 2010). Second, there may be issues of inter-disciplinary conflict or role confusion. Each discipline is bound by its own culture, language, practice, etc., that may be obscure to other disciplines (Hall, 2005). Conflict might occur as a result of role boundary issues, scope of practice, accountability, time and workload, and hierarchy (Brown et al., 2011). Minimal support for discipline-specific competency set implementation may be a result of lack of management understanding or recognition of the discipline-specific roles among staff and their respective obligations within the discipline to meet standards, regulations, etc. (Mandy, 1996). Nonetheless, this was an interesting finding that would be worthy of further exploration. There are public health organizations that have found strategies to implement all types of competency sets into professional development work that could be models of best practice (Marchuk, Dilworth & Kreick, 2011).

For those individuals reporting some level of competency set use of in their organization, common barriers identified for both competency sets included: limited promotion within organizations; competing priorities; lack of dedicated staff time to learn and incorporate

competencies due to workload; no commitment from organizational leadership and management; lack of integration into organizational structures and processes; and minimal organizational supports such as resources, tools and people. These barrier themes were less surprising and often found within literature related to knowledge translation documents such as BPGs or adopting evidence-based practice.

The lack of leadership as an organizational barrier was common theme in a number of studies on BPG implementation or competency sets (Lia-Hoagberg et al., 1999; Oppewal et al., 2006; Rush & Furlong, 2012). As previously discussed, organizational leaders hold positions of authority, possess decision making abilities, and have access to resources required for innovation implementation (Baldridge & Burnham, 1975). It is leadership that may have an impact on other barriers identified in this pilot study and literature reviewed. For example, the lack of competency set integration into organizational structures and processes was identified as a barrier to adoption in this pilot study; this barrier was also noted in other studies and evaluations (Ploeg, et al., 2007; Rush & Furlong, 2012). It has been suggested that nursing leadership can play a key role in developing the infrastructure and processes necessary to support innovation adoption (Shirey, 2006).

The absence of competency set promotion and dedicated staff time to learn about the competency sets were themes found in this pilot study as well as other studies (City of Hamilton, Public Health Services, 2010; Lia-Hoagberg et al., 1999; Oppewal et al., 2006; Ploeg, et al., 2007). Once again, these themes are within the span of leadership control within organizations and may be considered organizational level barriers (Chaurdoir et al., 2013), where leaders have the ability to remove such barriers to create a culture of learning (Marchionni & Ritchie, 2008). Lack of time may be influenced by workload issues (Lia-Hoagberg et al., 1999) or available

resources to free staff time (City of Hamilton, Public Health Services, 2010; Ploeg et al., 2007). Limited competency set promotion may also be influenced by available resources; not only fiscal, but specialized human resources to interpret and provide technical expertise to translate the resource into practice (Shirey, 2006). Hands on tools and resources to learn how to put the competencies into practice and unpack the complexity of these tools seems to be an ongoing concern, not only identified in this pilot study, but also in other literature (City of Hamilton, Public Health Services, 2010; Lia-Hoagberg et al., 1999; Oppewal et al., 2006). Complexity of the competency sets was a theme less frequently reported in the pilot, but presented the need for knowledge translation resources required in the field. Rogers (2003) and Chaudoir et al. (2013) also discuss complexity of an innovation as a potential barrier to implementation.

Finally competing organizational priorities was an additional theme identified that is congruent with literature on uptake of knowledge-to-practice documents (City of Hamilton, Public Health Services, 2010; Rush & Furlong, 2012). Limited adoption of competency sets in public health units may not be from a lack of desire or interest, but an issue of competing priorities. As public sector organizations currently face considerable fiscal constraint, and where budgets are waning, organizations are expected 'to do more with less'. Resources and time may be redistributed to other priorities such as mandatory requirements dictated by funding agencies and government funding sources. Kaluzny and Veney (1973) recognized the constraint on health departments by legislative bodies and funding authorities as an influence to conservative approach when adopting innovations in health department contexts. Such structural level barriers have been acknowledged in other theoretical literature (Chaudoir et al., 2013). However, many of these barriers can also be facilitators, as noted in the pilot study results.

**Facilitators**

Where competency sets were not being used by PHNs in public health units, very few suggested facilitators influencing their uptake were provided. However, there were a considerable number of responses on facilitators from PHNs working in health units where competency sets were utilized. Facilitators were slightly different for the two competency sets.

Among the facilitator responses supporting core competency set uptake, two out of three of the top themes (i.e. leadership, and integration into organizational processes, structures and functions) were also identified as barriers in the previous section. In addition, the third most frequent facilitator was the integration of core competencies into performance evaluations. This latter facilitator might be considered a sub-set of 'organizational function or process' as a key theme, as it is an example of a human resource processes; however, 'performance evaluation' was a relatively strong enough theme to stand on its own compared to other organization functions and processes identified and clustered under this broader theme.

As previously discussed, leadership is a strong theme as an influential factor to support uptake of knowledge-to-practice documents in literature (Gifford et al., 2006; Lia-Hoagberg et al., 1999; Ploeg et al., 2007; Stergiou-Kita, 2010). For similar reasons cited in the barriers discussion, leadership is the gatekeeper to organizational resources and change in organizational processes and structures to accommodate innovation adoption (Gifford, et al., 2006; Ploeg et al., 2007). Therefore, it should be no surprise that it also emerged as a strong facilitator theme.

The third most frequent theme identified was integration of competency sets into performance appraisal tools/evaluations. This also was a theme supported in literature as a facilitator (City of Hamilton, Public Health Services, 2010; Cross et al., 2006). Performance appraisals with key competencies for attainment, and strategies to develop those competencies

may be perceived as a tangible, practical example of a tool/resource where competency set content has been applied. It is also a tool/resource that directly affects and is utilized by front-line staff. This resource may also be more visible than other human resource processes that are implemented by specialized staff or departments such human resources or professional practice leads (e.g. change agents) involved in broader organizational processes and operations. Respondents of the pilot study were aware of change agents involved directly in the development of tools, resources, policies and changing organizational processes based on the core competency set. Some work was underway in the organization at a distance from the respondents, although this was a less frequent theme to have emerged. This may support the argument that some positions within the organization are more influential than others at promoting the adoption of the core competencies.

The more interesting facilitator themes to have emerged were enablers for implementing the public health nursing competency sets as these themes were distinctly related to champions and opinion leaders in nursing. The top three themes to emerge as facilitators for public health nursing competency sets included organizational leadership (most frequently related to nursing such as the Chief Nursing Officer, and nursing directors and managers), integration into the work of professional/nursing practice teams or councils, and a dedicated staff person for professional development (i.e. professional/nursing practice lead or consultant).

As previously noted, literature reviewed suggested the importance of leadership influence on uptake of competency sets; however, the pilot study responses specifically focused on nursing leadership. Where non-nursing management was perceived as a barrier, nursing leadership and management were perceived as a facilitators. Gifford et al. (2006) had noted in their study on BPG implementation this affinity to nursing leadership as a facilitator, where

nursing management made efforts to understand front-line staff practice issues in order to minimize identified barriers and support staff nurses' BPG content integration into practice.

The theme of practice-councils and practice leaders are similar in that they represent champions to support the uptake of competency sets; they transfer knowledge to front-line staff about the documents, and assist in the translation of these resources to implement in practice. The establishment of these professional development resource persons is at the discretion of leadership; however, they are the subject matter experts accessible to both leadership and front-line staff. Professional practice councils and professional practice leaders as key agents of change can support implementation and integration of nursing knowledge into practice and process (Gifford et al., 2006; Ploeg et al., 2007; Shirey, 2006).

This may also be a time of transition in public health nursing in Ontario. As of 2013, Ontario boards of health were required to designate a Chief Nursing Officer (CNO) in every public health unit with the responsibility of nursing practice quality assurance and leadership within their respective organizations (Ministry of Health and Long-Term Care & Ministry of Health Promotion and Sport, 2011; Ministry of Health and Long-Term Care, 2011). Since that time, a considerable amount of work has been undertaken by CNOs and nursing practice leads in the province on public health nursing professional development, quality assurance in practice and the development of competencies (Peroff-Johnston, Tober, & Bajnok, 2012). The pilot study responses of nursing leadership and change agent facilitators supporting uptake of the public health nursing competencies may be the result of timing of the pilot study and noted effects of the provincially mandated policy and government investment in public health nursing leadership. The importance of this is relevant in that change agents among other professional groups and

disciplines working in public health may have similar impacts on practice and uptake of respective discipline-specific competency sets.

## Limitations

There are a number of limitations to be considered in this pilot study. These limitations include issues with the survey design and implementation, sample selection methods used to draw from the population of study, and potential types of error encountered. These limitations are discussed, and where possible, future considerations to address these limitations are suggested.

There are a number of limitations with the survey tool used for this pilot study. While the original survey tool used for the Oppewal et al. (2006) study was obtained for this pilot study and modified to address the Ontario public health context, the extent of instrument testing of Oppewal et al.'s survey tool for construct and content validity, and reliability is unclear. Internal consistency had been confirmed with the authors of the Oppewal et al. (2006) study on one variable only (i.e. familiarity with competency sets) with a Cronbach's α of 0.84., and face validity had been documented in the published article. Face and content validity was established by the review of literature for the tool and the review of the questionnaire by two content experts in public health nursing. Given the limited information on instrument testing, one must assume that full testing had not been conducted with the original study survey. Therefore, results should be interpreted with this limitation in mind. As the original survey instrument had been adapted to fit the context of this pilot study, any original testing conducted by Oppewal et al. (2006) may no longer be applicable to the survey instrument used for this pilot study. To address changes made to the original survey tool, the adapted survey was assessed by three content experts for face validity. However, time limitations prohibited psychometric testing of the instrument and future testing would likely be required if this pilot study were to be expanded. Reliability and validity

testing of the modified questionnaire for this pilot study may be possible as a secondary analysis at a later time.

Respondent error is also a concern in this pilot study arising through misunderstanding or misreading of a question (Kirwood & Sterne, 2003). A small number of qualitative responses in surveys received (< 5 observable responses) seemed to indicate some confusion between sets of questions posed for the public health core competencies (Part B of the questionnaire) and the public health nursing competencies (Part C of the questionnaire). Respondents indicated they believed they were answering the same set of questions repeatedly with the public health nursing competencies after completing core competency set questions. It is unclear if this confusion between the questions on the two sets of competencies related to the questionnaire design and clarity of the questions (e.g. misreading questions), situational contaminants, or lack of knowledge and distinction between the two types of competency sets. As a result, this confusion may have had several impacts on responses. First, this may have affected the completion of a survey, creating a non-response bias (Loiselle, Profetto-McGrath, Polit, & Beck, 2007). Surveys submitted partially completed during this study could have been the result of individuals assuming they were responding to the same set of questions twice and only completing the first half of the survey. Second, the non-completion of the on-line questionnaire could have impacted sample size (Loiselle et al., 2007), as the PHN competency set responses were fewer than those for the core competency set questions. This lower response rate could have altered statistical conclusion validity, where the public health nursing competency questions resulted in inadequate power to detect statistically significant differences in results and created a greater risk of type II error (Burns & Grove, 2009). Therefore, results should be interpreted with caution, particularly for the public health nursing competency set outcomes. For future consideration, pilot testing the

survey for alternative formatting to correct the potential for this error may be helpful. It may also be advantageous to separate questions into two separate surveys, one for each competency set implemented at two different times, although this may increase the risk of non-response rates with each consecutive survey.

Non-response bias could have also resulted from issues with technology and use of an on-line questionnaire format. There were a few e-mails to the principal investigator regarding issues with accessing the on-line questionnaire (< 5 reports). As a result, participants may not have been able to complete the on-line questionnaire. The other concern is the number of duplicates that were identified and pulled from the original data set due to participant double entry, also likely from challenges identified in accessing the on-line format. This too may have implications for data entry error, impacts on actual sample size and statistical conclusion validity (Burns & Grove, 2009). In addition to this, the need to create skip logic within the on-line questionnaire format posed survey design challenges. Skip logic items were required to meet opt out and voluntary participation requirements by the REB; these skip logic/opt out items resulted in lower response rates for certain questions impacting sample size.

Sampling bias is also a concern. A non-probability sampling method was utilized to recruit participants in the pilot study. A large proportion of the sample reported some level of awareness of the competency sets. There may be systematic over representation of a cohort of the public health nursing population where organizations that chose to participate in the study were those that used the competency sets versus those that did not use the competency sets. Self-selection bias might also have occurred on an individual level, where participants in the study may inherently be different than those that chose not to participate (i.e. participants are aware of the competency sets, motivated to participate in research as part of professional interest and

development, etc.) (Burns & Grove, 2009; Loiselle et al., 2003). Time available to conduct the study prohibited original intentions to obtain a more random sample of study participants. The random sample originally planned was to be obtained through an application to the College of Nurses of Ontario registry of RNs volunteering to engage in nursing research. However, a number of issues precluded this approach and a different strategy was applied to meet REB requirements and timelines.

Other sample selection issues that may have created bias include excluded PHNs and jurisdictional issues. There are a number of PHNs that work in a variety of other settings than public health units in Ontario (e.g. non-profit organizations, agencies, government, academia, etc.); these nurses may also be using the competency sets in their respective public health practice. However, these additional groups were excluded from this pilot study sample selection criteria. Also, public health service in Ontario is very different from public health service organization in other Canadian jurisdictions in that it is quite decentralized. PHNs working in this context may have different experiences than those in other parts of the country working with competency sets; therefore, there may be some concern with cross-jurisdictional application of the results.

Finally, a power analysis was conducted to calculate an estimated adequate sample size for a pilot study as defined by Hertzog (2008) and was achieved (a minimum of 40 subjects per group). However, Cohen's (1992) sample size estimates for a full study (64 subjects per group) were only partially fulfilled; the two comparison groups were not equal in size, and the number of PHN managers recruited was less than Cohen's recommended estimate. With fewer managers in the sample than required based on Cohen's (1992) estimates for a full study, there is some concern with inadequate power to note statistically significant differences in results between the

two groups for the t-tests run in this study, therefore increasing the risk of type II errors and impacting statistical conclusion validity.

## Implications

While a number of limitations have been noted in this pilot study, the results were informative in gauging the dissemination and implementation of key resources influencing public health human resource development to build capacity in the sector. The findings provide new results on some variables and confirm other results found in similar studies and evaluations. These results have implications on nursing practice and policy, theoretical contributions and potential future research.

### Implications for Practice and Policy

The results of this pilot study seem to confirm that at least among the discipline of public health nursing in Ontario, knowledge of the public health core and public health nursing competency sets is quite widespread, although to varying degrees. While the difference in the level of knowledge on the core competencies for public health between management and front-line staff was statistically significant; this was not the case for the public health nursing competency set and may be the result of a later release of these competencies with less time to diffuse through the social system. Regardless, significant progress has been made in the promotion of the competency sets, and awareness building may be at a point of saturation of the 'public health market'. However, their utilization and application within organizations appears to be lagging in comparison, and perhaps efforts should be shifting from building awareness to knowledge translation strategies and infrastructure supports to continue the momentum of competency set adoption and integration. This is relevant as competencies are considered a

foundational element and building block of public health workforce development in Canada (JTGPHHR, 2005).

Rogers (2003) has noted in DOI theory that knowledge of an innovation does not necessarily equate to adoption and often individuals or organizations may shift back and forth between adopting and discontinuing use of innovation. Movement from contemplation to adoption of an innovation in the Innovation-Decision Process may not be linear, where vacillation occurs back and forth between stages of this process. Also, the innovation may not be fully adopted or integrated into the system. There may be elements of the innovation that provide more utility and benefit, or better fit organizational needs than other aspects of the innovation.

Regardless of degree of competency set implementation in public health units reported by PHNs in this pilot study, the utility of these documents has been articulated, especially with respect to professional development opportunities and organizational human resource processes and functions. Competency-based workforce development to build the required knowledge and skills required to practice in public health and public health nursing clearly has a place within the sector. This was demonstrated in some of the results of the pilot study where frequent applications of the competencies included human resources processes (e.g. development of job postings and descriptions, human resource needs assessments and planning, orientation of new staff, performance appraisals/evaluations, etc.), and professional development opportunities (e.g. staff educational needs assessment, planning for training and educational opportunities, development of learning tools and resources, professional quality assurance programs and meeting standards of practice, etc.).

The promotion of a competency-based workforce in public health is not only offered in public health human resource frameworks (JTGPHHR, 2005), it is integrated into broader system

policies. In the recently released strategic plan for the Ontario public health sector, identification of key competencies for all disciplines and collaborative partnerships with organizations that provide education and support to the public health workforce (e.g. Public Health Ontario) was listed under a collective area of focus – building a 'Highly Competent Workforce' (MOHLTC, 2013). National competency sets establish the minimal requirements of knowledge, skills and attitudes/attributes outlined that will contribute to the development of a responsive public health workforce when applied appropriately, and ideally aide in meeting the strategic priorities of the sector in this province.

However, having competency set documents in existence does not guarantee that they will be used and translated into practice and application. What has been evident in research reviewed and what has emerged in this pilot study to reinforce previous findings is that multiple factors are required to facilitate the uptake and integration of competency sets into nursing practice, and the practice of disciplines across the sector. Shirey (2006) offers a helpful framework to consider strategies when implementing evidence into nursing practice; the model uses Rogers' DOI theory and the Innovation Decision Process as a basis for organizing strategies at each stage of consideration and application of the innovation. The strategies offered to nursing leaders from first acquiring knowledge of the evidence, to confirming the use of that knowledge are easily applicable to competency sets. Some of those strategies were identified in other literature discussed in this thesis and facilitators identified in this pilot study supporting uptake of competency sets.

First and foremost, leadership persuasion and involvement to use competency sets to support professional development in nursing within public health organizations is a crucial facilitator (Gifford et al., 2007; Marchionni & Ritchie, 2008; Ploeg et al., 2007; Shirey, 2006).

Organizational leadership, including nursing leadership can allocate resources, create organizational structures and processes, establish policies, facilitate institutional acceptance and monitor implementation and evaluation of innovations (Gifford et al., 2007; Ploeg et al., 2007; Shirey, 2006). All of these activities can be applied to the implementation and integration of competency sets into organizational functions and processes. Organizational leaders are the gatekeepers to effective strategies to learn and apply competency sets beyond the individual practitioner trying to meet professional obligations. As it applies to public health nursing in Ontario, it is anticipated that the mandated designation of Chief Nursing Officers in every Ontario board of health can broker this support within public health organizations as they are responsible for nursing quality assurance and nursing practice leadership within their respective organizations (MOHLTC & MHPS, 2011; MOHLTC, 2011).

Other facilitators noted in the pilot study to support uptake of competency sets are once again within the purview of leadership. In particular, the responses to the public health nursing competencies highlighted the important role of nursing/professional practice councils and a dedicated staff person such as a nursing/professional practice leader as important contributors to the adoption of competency sets. The relevance of such supports has also been noted in literature (Gifford et al., 2006; Ploeg et al.; 2007). The use of such models/individuals for professional development among regulated and non-regulated staff are an organizational standard for quality assurance and continuous quality improvement, and a recommendation of the provincial government to Ontario boards of health to implement within local health units (MOHLTC & MHPS, 2011). Professional practice councils/leaders might be considered champions of such resources as competency sets; become subject matter experts on their application; translate the information into practical tools and resources that can be applied in practice; and use them for

the basis learning needs assessment and interactive educational opportunities (City of Hamilton, Public Health Services, 2010; Gifford, et al., 2006; Kitson et al., 2011; Ploeg et al., 2007).

Where work is clearly required within organizations is the reconciliation of tensions between development of core competencies and discipline-specific competencies and the selected use of the competency sets in some organizations. Bartee et al. (2003) identified in their study on the assessment of competencies among public health department staff, that particular staff will have stronger competencies in some domains as the nature of their work and practice might dictate that profession/discipline to be proficient in some areas and have a working knowledge of others. Therefore a 'once size fits all approach' to staff training and professional development will not be effective, nor an efficient use of resources. While the pilot study highlighted tensions and resource allocation issues to professional development and human resource functions between core competency development and public health nursing competency development; these results have implications for all disciplines working within health units that might have their own discipline-specific competencies and standards of practice to meet. Further work is required to explore issues that might be contributing to these tensions and identified examples of where such tensions have been resolved successfully could be useful.

If DOI theory is to be the lens through which the pilot study results are viewed, and competency set uptake is at the half way mark of diffusion among the population, we can speculate late adopters and laggards have yet to adopt these resources within Ontario public health units. National organizations that initially promoted the competency set documents to build awareness may want to shift their focus on efforts to inform and persuade late adopters and laggards. Leadership within public health organizations highlighted the importance of partnerships with professional and national organizations to learn more about the competency

sets, as well as how to interpret and use these documents (City of Hamilton, Public Health Services, 2010; Oppewal et al., 2006). If the level of use is to continue on an upward trajectory, organizations both large and small have a part to play in documenting and demonstrating the utility of these documents and their impacts on public health and nursing practice, including the dissemination of information on successful knowledge translation activities facilitating the implementation of these documents within public health units. The dissemination of information seems to have been prolific at the launch of the competency sets during key national and provincial public health and community health nursing conferences, but promotion has waned considerably since that time with the occasional presentation/webinar found on on-line training sites. Opportunities and mechanisms to disseminate information, and share resources/tools/methods (such as conferences or communities of practice) should shift towards practical application of competency sets going forward.

## Implications for Theory

This pilot study was exploratory in nature and hypotheses were not postulated; however, specific results of the study aligned with propositions on key concepts made by Rogers' (2003) in DOI theory. The propositions in DOI theory have developed as a result of findings collated from various studies, completed across fields of research over the past 50 years where DOI theory has been applied. In the following discussion, results of this pilot study are compared to selected general propositions made in DOI theory to contribute to further empirical support for the theoretical concepts.

### Early Knowers and Adopters

Rogers (2003) makes the following common propositions of early knowers: they have more years of formal education; have more exposure to mass media channels; have more

exposure to interpersonal channels and tend to be cosmopolite. Early adopters have more years of formal education; have a higher degree of social status; work within larger sized units (i.e. schools; hospitals, companies, etc.); are highly interconnected with interpersonal networks; have more contacts with change agents; and have more exposure to interpersonal and mass media channels of communication (Rogers, 2003).

These propositions could be found in some of the results of this pilot study. All the study participants had formal education in nursing where most responded having a baccalaureate in nursing as their highest level of education. Many were graduate prepared and/or had attained specialization certification. Most of the PHNs came from health units that might be considered 'cosmopolite', that is, from urban or urban/rural mixed settings. Their settings of practice tended to be mid-large sized health units. Many of the PHNs reported learning about the competency sets through various communication channels, mostly through marketing and promotion from national/professional organizations, or though interpersonal channels. Change agents also played a key role in the uptake of competency sets in the form of nursing organizational leadership, practice councils, or professional practice leads as part of interpersonal channels.

Rogers (2003) also discusses characteristics of an innovation as an influencing factor for adoption. Two propositions made about innovations can be noted in the results of the content analysis and adoption results that contribute to Rogers' arguments. First is the notion of compatibility, or "the degree to which an innovation is perceived as consistent with existing values, past experiences, and needs of potential adopters" (Rogers, 2003, p.266). Compatibility is related to the rate of adoption. In the case of the competency sets, some health units rejected the use of the competency sets, particularly the public health nursing competency set, as these documents conflicted with other competency sets chosen or were not in sync with organizational

values or priorities (e.g. choice to use core competencies over discipline-specific competencies due to broader applicability across the organization's workforce). The second innovation characteristic proposition relates to the 'complexity' of the innovation. "The complexity of an innovation…is negatively related to the rate of adoption" (Rogers, 2003, p.267). When examining the barriers and facilitators, although not in the top five responses, complexity of the document to translate into practice was noted. If the competency sets are perceived as too complex to understand, translate and utilize, then they may be rejected. If organizations require more resources than available to demystify the competency sets and make them applicable to public health and nursing practice, they may be rejected. The competency sets may also be rejected if they are too complex to integrate into existing structures and processes, and changing those processes is an unavailable option. A number of thematic responses that emerged from the pilot study seemed to contribute to DOI theory propositions made on innovation characteristics.

A number of key results from the pilot study seem to contribute to generalized statements within Rogers' (2003) DOI theory as discussed in this section. The modified Innovation-Decision Model from DOI theory applied in this pilot study also proved to be a useful framework for research questions posed and analysis of data. Barriers and facilitators identified in this pilot study confirmed that factors influencing healthcare innovation adoption occur at various system levels as proposed by Chaudoir et al. (2013). Given this theory's extensive use in healthcare research and other fields of study over five decades, and its applicability within this pilot study, DOI theory has proven to be a useful in explaining some of the outcomes identified in this research project.

The theory also has utility for practice settings more broadly. Within DOI theory, the Innovation-Decision Process model provides a framework for planning and implementation of

knowledge-to-practice resources such as competency sets in practice settings, where each stage of the model (i.e. knowledge, persuasion, decision, implementation and confirmation) can provide an opportunity to consider gaps and mitigation strategies to support transition through each stage of this process. As discussed earlier in this chapter, Shirey (2006) has presented a list of strategies embedded in each phase of the Innovation-Decision Process model that nursing management and leaders can use to communicate information about knowledge-to-practice resources and address potential problems that arise with the awareness building, adoption and implementation of this type of innovation among nursing staff.

**Implications for Research**

One of the limitations in the pilot study pointed to the original data collection tool and the limited information on the degree of reliability and validity testing of the instrument. The assumption was made that this tool was minimally tested, and to proceed with the study using a version of the tool modified for contextual purposes of the pilot study. Further validation of the instrument used would be beneficial, particularly on the constructs of level of awareness, and level of utilization, if this pilot is to expand into a larger or broader study to include PHNs from across jursidications or working in other parts of the public health sector.

The breakdown of demographic characteristics of the sample and the relationships of those characteristics to levels of awareness and levels of utilization might be a fruitful secondary analysis. Rogers (2003) highlighted numerous characteristics of early knowers and adopters of innovations. Although this was noted briefly in the discussion of this thesis, appropriate statistical analysis of data to assess such relationships was beyond the scope of this pilot study. Building on this line of thought, organizational characteristics (e.g. population size, health unit

peer groups, staff size, organizational complexity, etc.) and utilization of competency sets could also be potentially explored and tested for relationships.

An area for further exploration is the issue of inter-disciplinary tensions noted as barriers to the uptake of discipline-specific competency sets. Public health is an inter-disciplinary practice, where many public health functions cross disciplines. However, each discipline has its own domain of knowledge applicable to its practice where crossover does not occur, and the discipline-specific competencies within public health define that expected knowledge and skill. The cause of the underlying inter-disciplinary tensions and barriers was unclear in the pilot study. Therefore, facilitators and strategies to balancing the use core competencies and any discipline-specific competency set is worthy of further exploration if a competency-based approach to public health workforce development is to be successful and achievable.

From the pilot study results, it appears that there has been considerable work accomplished in the integration of competency sets among some Ontario public health settings, which has translated into professional development opportunities for PHNs and other disciplines. If late adopter and laggard organizations are to learn more about the successful competency set implementation strategies in supporting workforce capacity building, further work is required to document this information. Much of the literature reviewed for this pilot study was drawn from work on implementation of BPGs, CPGs or integration of evidence into practice under knowledge translation theories and frameworks. There were far fewer articles and evaluations on competency set application. Case studies of competency set implementation may provide an important avenue of knowledge dissemination on the applicability of these resources for PHHR development. Also, further examination of leadership and organizational factors and processes, would provide some insight into what is required to support adoption, integration and

sustainability of competency-based workforce development in public health. This latter point is salient as this appears to be a period of transition in the sector where there is a movement from enumerating professionals required in the workforce, to examining competencies and skills required among the mixed workforce to guide PHHR planning and development.

## Dissemination of Findings

The primary dissemination strategy will be through a publication of this thesis in appropriate peer reviewed journals. To further disseminate results, abstract submissions to various national and provincial public health and community health nursing conferences will be made for presentation (e.g. The Ontario Public Health Convention, Community Health Nurses of Canada Conference, Canadian Public Health Association Conference, etc.). Other opportunities will be sought to disseminate results (e.g. national and provincial webinars, dissemination of the pilot study to the nursing organizations that assisted with recruitment, etc.). Finally, a high level overview of the results will be prepared and disseminated as a slide deck and distributed upon request for those seeking additional information on the project.

## Conclusion

A descriptive, non-experimental pilot study was conducted to explore the dissemination and implementation of the Canadian Core Competencies for Public Health and the Public Health Nursing Discipline Specific Competencies among PHNs working in Ontario public health units. Rogers's Diffusion of Innovation Theory (2003) was used as a theoretical framework to examine level of awareness and utilization of these competency sets, including differences between PHN managers and front-line staff, as well as the barriers and facilitators influencing the uptake of these documents among PHNs. Study findings suggest that diffusion of competency sets has occurred among the sample of PHNs, with widespread knowledge across the province and

moderate use of the competency sets for nursing workforce capacity building and professional development. Various knowledge dissemination strategies have been utilized to build awareness of the public health core and nursing competencies; however, any further promotion of these resources may benefit from knowledge translation efforts to support further uptake of these documents among late adopting public health organizations. Barriers and facilitators influencing the adoption of competency sets were heavily influenced by organizational level factors such as leadership, processes and structures, and resources. These factors provided some insight into possible strategies to operationalize competency sets within organizations so that they can be utilized to their full potential.

The results of this study also contributed to the limited knowledge and empirical literature available on the awareness and application of competency sets within the public health sector. Some of these results support general postulates presented in Rogers' DOI theory, contributing to the literature where this theoretical framework is used. The evidence produced from this research project also demonstrates the utility of these resources for public health nursing workforce capacity building and professional development, and implications for future practice and policy decisions for PHHR in Ontario more broadly.

## APPENDIX A – Research Ethics Board Approval Letter

To: Nancy Peroff-Johnston
School of Nursing
Re: REB 2012-350: Public Health Core and Nursing Competencies Among Public Health Nurses in Ontario: A Pilot Study to Assess Awareness and Utilization
Date: February 11, 2013

Dear Nancy Peroff-Johnston,

The review of your protocol REB File REB 2012-350 is now complete. The project has been approved for a one year period. Please note that before proceeding with your project, compliance with other required University approvals/certifications, institutional requirements, or governmental authorizations may be required.

This approval may be extended after one year upon request. Please be advised that if the project is not renewed, approval will expire and no more research involving humans may take place. If this is a funded project, access to research funds may also be affected.

Please note that REB approval policies require that you adhere strictly to the protocol as last reviewed by the REB and that any modifications must be approved by the Board before they can be implemented. Adverse or unexpected events must be reported to the REB as soon as possible with an indication from the Principal Investigator as to how, in the view of the Principal Investigator, these events affect the continuation of the protocol.

Finally, if research subjects are in the care of a health facility, at a school, or other institution or community organization, it is the responsibility of the Principal Investigator to ensure that the ethical guidelines and approvals of those facilities or institutions are obtained and filed with the REB prior to the initiation of any research.

Please quote your REB file number (REB 2012-350) on future correspondence.

Congratulations and best of luck in conducting your research.

Nancy Walton, Ph.D.
Chair, Research Ethics Board

## APPENDIX B – Participant Letter of Information for Pilot Study Questionnaire

*(Preamble before starting the on-line questionnaire)*


DAPHNE COCKWELL SCHOOL OF NURSING | FACULTY OF COMMUNITY SERVICES
Accredited by the Canadian Association of Schools of Nursing

**Study Title: Public Health Core and Nursing Competencies among Public Health Nurses in Ontario: A Pilot Study to Assess Awareness and Utilization**

**Study Investigators:**

**Nancy Peroff-Johnston, RN, BScN, MSc, MN (student)**
Daphne Cockwell School of Nursing, Ryerson University
Toronto, Ontario
E-mail: NPeroff@ryerson.ca
*(Potential Ryerson voice mail box number here)*

**Dr. Cristina Catallo RN, PhD**
Associate Professor
Daphne Cockwell School of Nursing, Ryerson University
Toronto, Ontario
Phone: 416-979-5000 x2019
E-Mail: ccatallo@ryerson.ca

**Purpose of the pilot study:**

The purpose of this pilot study is to assist researchers gain insight into the level of awareness and utilization of the Core Competencies for Public Health in Canada Release 1.0 (Public Health Agency of Canada [PHAC], 2007) and the Public Health Nursing Discipline Specific Competencies Version 1.0 (Community Health Nurses of Canada [CHNC], 2009) among public health nurses in Ontario, as well as the barriers and facilitators that influence the utilization of these competency sets. You are invited to participate in this pilot study by Nancy Peroff-Johnston RN, BScN, MSc, a student completing her Masters of Nursing with the Daphne Cockwell School of Nursing, Ryerson University, Toronto, Ontario. Nancy is supervised by Dr. Cristina Catallo RN, PhD, Associate Professor, Daphne Cockwell School of Nursing, Ryerson University. It is the intent of the researchers to submit results from this study for publication.

**What is required if I agree to participate in this pilot study?**

If you agree to participate in this pilot study, you are asked to complete the following on-line questionnaire. The questionnaire will require approximately 15 minutes to complete.

**Will my responses be kept confidential?**

No personal information with identifiers is collected in this questionnaire; responses provided are anonymous. Information you provide will be kept confidential and data will be presented in aggregated form to maintain participant anonymity to the fullest possible extent. If this pilot study is published, information you provide will not be identifiable and confidentiality related to your contributions will be maintained.

Information collected from the questionnaire will be compiled by the researchers to review and analyze as part of this study and will be stored on a data base in which only the research team will have access to. The information will be securely stored on password protected and encrypted files.

**What are risks and benefits by participating in this pilot study?**

There are no known risks if you choose to participate in this pilot study. Benefits of participating in this pilot study include contributing to the evidence and limited available knowledge on the level of awareness of public health core and public health nursing competencies, as well as how competencies are currently being used to support public health nursing in Ontario public health units. Such information could support future evidence-informed decisions and actions related to competency-based activities strengthening public health nursing practice, and contributing to public health program and service delivery.

**Your participation in this pilot study is voluntary:**

Your participation in this pilot study is completely voluntary. You can refuse to participate and/or answer questions in the questionnaire at any point in time. You may choose not to answer specific questions of the questionnaire. You may be contacted more than once during the time that the on-line questionnaire is open for the pilot study to remind you to complete the questionnaire if you wish to participate, but have not already done so. You are under no obligation to complete the questionnaire at any of these points in time.

**By completing the questionnaire to the best of your knowledge and ability and submitting the questionnaire on-line, your consent to participating in this pilot study will be implied.**

**Compensation:**

As a token of appreciation for your participation in this pilot study, you will be offered an opportunity to participate in a draw for one of two prizes of $100.00. Once your questionnaire has been submitted on-line, you will be provided information on obtaining a form for the draw. Completed forms may be submitted to the investigators of the pilot study as per instructions provided on the form for the draw. This form does require your personal information for the draw; however, this information is completely separate from your questionnaire responses and there is no link between the personal information you provide for the draw and your responses

for the research project. Personal information you provide on the form will be used solely for the purpose of the draw and destroyed after completion of the draw. The forms will be kept separate from pilot study information collected. Two forms will be drawn randomly to select the two winners of the draw, who will then be contacted to receive the prizes of $100.00 each.

**Other information regarding the pilot study:**

If you have any questions regarding this pilot study or you require further information, please contact Nancy Peroff-Johnston at nperoff@ryerson.ca or *(insert Ryerson voice mail box number here if number obtained)*. You may also contact Dr. Cristina Catallo at 416-979-5000 ext. 2019 or e-mail at ccatallo@ryerson.ca. If you have any questions regarding the ethics review of this pilot study of research participant rights, please contact Research and Ethics Board coordinator, Toni Fletcher at toni.fletcher@ryerson.ca or 416-970-500, ext. 7112.

## APPENDIX C – Generic E-Mail Recruitment Notice for Pilot Study Distributed By Ontario Public Health Nursing Organizations/Networks/Groups

RYERSON UNIVERSITY

DAPHNE COCKWELL SCHOOL OF NURSING | FACULTY OF COMMUNITY SERVICES
Accredited by the Canadian Association of Schools of Nursing

**Subject Heading: Public Health Core and Public Health Nursing Competencies Among Public Health Nurses In Ontario: A Pilot Study Assessing Level of Awareness and Utilization.**

Dear Public Health Nursing Colleagues,

Public health nurses represent over half the sector's workforce in Ontario and provide key contributions to population health and reducing health inequities through nursing and public health practice and expertise. Core and nursing competencies for public health define the knowledge, skills and attitudes required to practice public health in Canada and help support activities aimed at strengthening the sector's workforce. We are asking for your assistance in understanding more about how the core competencies for public health and public health nursing competencies are used to support public health nursing in Ontario health units. Your contributions to this pilot study will provide information on competency sets and how they might best be used to strengthen public health nursing practice in this province.

You are invited to participate in this anonymous, voluntary pilot study by Nancy Peroff-Johnston RN, BScN, MSc (principle investigator), who is completing her Master of Nursing degree at the Daphne Cockwell School of Nursing, Ryerson University, Toronto, Ontario. Nancy is supervised by Dr. Cristina Catallo RN, PhD (co-investigator), Associate Professor, Daphne Cockwell School of Nursing, Ryerson University, Toronto, Ontario. Please feel free to forward this e-mail on to public health nursing colleagues that may be interested in participating in this pilot study.

The questionnaire should take no more than 15 minutes to complete. Once the questionnaire has been submitted, you will have the opportunity to participate in a draw for one of two prizes for $100.00 as a token of appreciation for participating in this research project. Personal information is collected for the sole purpose of the draw and is in no way linked to your responses. This information will be destroyed once the lottery draw has been completed.

If you would like to participate in this pilot study, please click the link listed below which will provide further information about the research project and the questionnaire to be completed.

Http:// **(Link to be determined)**

Should you require further information or have questions regarding this pilot study, please contact Nancy Peroff-Johnston at nperoff@ryerson.ca, or Dr. Cristina Catallo at ccatallo@ryerson.ca. Thank you in advance for your interest and participation in this research project.

Sincerely Yours

Nancy Peroff-Johnston RN, BScN, MSc Dr. Cristina Catallo RN, PhD

## APPENDIX D – E-Mail Recruitment Notice for Pilot Study Distributed By Ontario Public Health Nursing Organizations/Networks/Groups (Management Targeted)

RYERSON UNIVERSITY

DAPHNE COCKWELL SCHOOL OF NURSING | FACULTY OF COMMUNITY SERVICES
Accredited by the Canadian Association of Schools of Nursing

**RE: Pilot Study Invitation to Public Health Nursing Management in Ontario**

***Public Health Core and Public Health Nursing Competencies among Public Health Nurses in Ontario: A Pilot Study Assessing Level of Awareness and Utilization.***

Dear Public Health Nursing Colleagues,

Public health nurses represent over half the sector's workforce in Ontario and provide key contributions to population health and reducing health inequities through nursing and public health practice and expertise. Core and nursing competencies for public health define the knowledge, skills and attitudes required to practice public health in Canada and help support activities aimed at strengthening the sector's workforce. We are asking for your assistance in understanding more about how the core competencies for public health and public health nursing competencies are used to support public health nursing in Ontario health units. Your contributions as nursing management to this pilot study will provide information and a leadership perspective on competency sets and how they might best be used to strengthen public health nursing practice in this province.

You are invited to participate in this anonymous, voluntary pilot study by Nancy Peroff-Johnston RN, BScN, MSc (principle investigator), who is completing her Master of Nursing degree at the Daphne Cockwell School of Nursing, Ryerson University, Toronto, Ontario. Nancy is supervised by Dr. Cristina Catallo RN, PhD (co-investigator), Associate Professor, Daphne Cockwell School of Nursing, Ryerson University, Toronto, Ontario. Please feel free to forward this e-mail on to public health nursing colleagues in management or senior management roles that may be interested in participating in this pilot study.

The questionnaire should take no more than 15 minutes to complete. Once the questionnaire has been submitted, you will have the opportunity to participate in a draw for one of two prizes for $100.00 as a token of appreciation for participating in this research project. Personal information is collected for the sole purpose of the draw and is in no way linked to your responses. This information will be destroyed once the draw has been completed.

If you would like to participate in this pilot study, please click the link listed below which will provide further information about the research project and the questionnaire to be completed.

https://www.surveymonkey.com/s/RyersonCompetencySetStudy

Should you require further information or have questions regarding this pilot study, please contact Nancy Peroff-Johnston at nperoff@ryerson.ca, or Dr. Cristina Catallo at ccatallo@ryerson.ca. Thank you in advance for your interest and participation in this research project.

Sincerely Yours,

Nancy Peroff-Johnston RN, BScN, MSc Dr. Cristina Catallo RN, PhD

## APPENDIX E: Reminder Notice

RYERSON UNIVERSITY

DAPHNE COCKWELL SCHOOL OF NURSING | FACULTY OF COMMUNITY SERVICES

Accredited by the Canadian Association of Schools of Nursing

### Public Health Core and Nursing Competencies Among Public Health Nurses in Ontario

Invitation to participate in a pilot study – Reminder notice.

Dear Public Health Nursing Colleagues,

Recently, you were invited to participate in a pilot study to assess the level of awareness and utilization of Canadian public health core competencies and public health nursing competencies among public health nurses working in Ontario health units. This e-mail is a reminder that if you would like to participate in this pilot study, the on-line questionnaire remains open and is receiving responses from interested public health nurses in Ontario.

Participation in this pilot study is completely voluntary and anonymous. Your consent to participate in this research project is implied with the completion and submission of the on-line study questionnaire. By submitting the completed questionnaire, you will also have the opportunity to participate in a draw for one of two cash prizes of $100.00.

Your participation in this research project is greatly appreciated. Information you provide in this pilot study will contribute to the development of research and evidence on the use of competency sets in public health, which in turn may inform and support future public health nursing practice and capacity building in Ontario. Please feel free to forward this reminder on to public health nursing colleagues that may be interested in participating in this pilot study.

Please click on the link below to access the pilot study information letter and on-line questionnaire.

Link: Http://..... **(Link listed here)**

Should you require further information or have questions regarding the pilot study, please contact Nancy Peroff-Johnston at nperoff@ryerson.ca, or Dr. Cristina Catallo at ccatallo@ryerson.ca. Thank you in advance for your interest and participation in this research project.

Sincerely Yours,

Nancy Peroff-Johnston RN , BScN, MSc
Masters of Nursing Program (Student)
Daphne Cockwell School of Nursing
Ryerson University

Dr. Cristina Catallo, RN PhD
Associate Professor
Daphne Cockwell School of Nursing
Ryerson University

## APPENDIX F: Electronic Survey Questions

**Questionnaire Introduction:**

**Awareness and Utilization of Canadian Core Competencies for Public Health and Public Health Nursing Competencies**

The following questionnaire pertains to a pilot study to help researchers gain insight into the level of awareness and utilization of the Core Competencies for Public Health in Canada: Release 1.0 (Public Health Agency of Canada [PHAC], 2007) and the Public Health Nursing Discipline Specific Competencies Version 1.0 (Community Health Nurses of Canada [CHNC], 2009) among public health nurses in Ontario, as well as the barriers and facilitators that influence the utilization of these competency sets. This questionnaire should take approximately 15 minutes to complete.

The populations of interest in this pilot study are: public health nurses working as front-line staff in public health program and service delivery; staff with a background in public health nursing currently employed in other public health service delivery roles and practice-related roles; and public health nurses working in management (mangers/directors/nursing leader). As part of the inclusion criteria, individuals participating in this pilot study should be employed full or part-time at an Ontario public health unit. If you identify yourself as front-line public health nursing staff at your organization, please answer the questions to the best of your ability as an employee of your public health unit and within the context of your organization's activities and functions. If you identify yourself as a manager/director/nursing leader, please answer the questions to the best of your ability from an organizational perspective and position of influence.

This questionnaire is divided into three sections:

Part 1: Questions about demographic information.

Part 2: Questions related to the Core Competencies for Public Health in Canada: Release 1.0 (PHAC, 2007).

Part 3: Questions related to the Public Health Nursing Discipline Specific Competencies Version 1. (CHNC, 2009).

Please proceed to the next section to start the questionnaire.

**Part 1: Demographic Questions:**

1. * Please indicate the status of your employment. (Please select one response of best fit).
    a. Employed full-time
    b. Employed part-time
    c. Employed on a casual basis
    d. Unemployed
    e. Retired
    f. Other: _____

2. * I describe myself primarily as (please select one response of best fit):
    a. Registered Practical Nurse (RPN), Staff
    b. Registered Nurse (RN), Staff
    c. Public Health Nurse (PHN), Staff
    d. Public Health Nurse (PHN), Practice Leader/Clinical Nurse Specialist/Team Lead
    e. Public Health Nurse (PHN) working in another position (e.g. evaluation, health promotion, policy, etc.)
    f. Public Health Nurse (PHN), Manager
    g. Public Health Nurse (PHN), Director
    h. Chief Nursing Officer
    i. Other: _____

3. How many years in total have you practiced as a registered nurse? (Please indicate your response in text box below).

4. How many years in total have you practiced as a public health nurse? (Please indicate your response in text box below).

5. Educational background: Please select the options representing your initial and last diploma/degree completed.
    a. Diploma of nursing
    b. Baccalaureate of nursing
    c. Bachelor's degree in another field of study
    d. Masters of nursing
    e. Masters degree in another field of study
    f. PhD of nursing
    g. PhD in another field of study
    h. Associate degree (United States)
    i. Other discipline or specialized degree:_____

6. Have you obtained your Canadian Nurses Association Community Health Nursing Certification?

   Yes ____ No_____ Working Towards Certification_____

7. At which public health unit are you employed? (Please indicate your response in the text box below).

   _____

**Part 2: Questions related to Public Health Core Competencies:**

The following questions relate to the **Core Competencies for Public Health in Canada: Release 1.0** (herein referred to as the **Core Competencies for Public Health**), produced by the Public Health Agency of Canada (2007).

8. *How familiar are you with the document the Core Competencies for Public Health? (Please select one response).

   *Note : If you answer "I am not familiar with the Core Competencies for Public Health", you will be redirected to **Question 14** as part of skip logic of on-line survey tool.*

   a. I am not familiar with the Core Competencies for Public Health.
   b. I have heard about, but not seen the Core Competencies for Public Health.
   c. I have read parts of the Core Competencies for Public Health.
   d. I have read the entire Core Competencies for Public Health and I am somewhat/vaguely familiar with it.
   e. I have read the entire Core Competencies for Public Health and I am very familiar with it.
   f. I would like to skip this question

9. How did you learn about the Core Competencies for Public Health? (Please select all responses that apply).
    a. Colleague(s) at work, work activities, etc.
    b. Launch of competencies/workshops
    c. Used them to prepare for job interview
    d. Management, employer
    e. Orientation to public health
    f. Undergraduate or graduate studies/program
    g. Received a copy of the document
    h. Heard about them while they were being developed
    i. Public Health Agency of Canada website, communications, presentations, etc.
    j. Ontario Public Health Association website, communications, presentations, etc.
    k. Community Health Nurses of Canada website, communications, presentations, etc.
    l. Other _____

10. *What one statement best describes the **level of use** of the Core Competencies for Public Health in your organization? (E.g. Examples of "use" can include organizational planning, implement processes or policies, referenced within documents, defining roles/practice expectations, etc.). (Please select one response).

    *Note: If you respond that you are '**not** using' or '**no longer'** using the Core Competencies for Public Health, you will be redirected to question to **Question 14** as part of skip logic of on-line survey tool.*

    a. We are not using the Core Competencies for Public Health.
    b. We did use the Core Competencies for Public Health, but no longer use them.
    c. We are thinking about using the Core Competencies for Public Health.
    d. We are making plans to use the Core Competencies for Public Health.
    e. We are using the Core Competencies for Public Health in a limited manner (e.g. used/referenced in a couple of organizational activities/documents/policies/etc.).
    f. We are using the Core Competencies for Public Health to a moderate degree (e.g. used/referenced in several organizational activities/documents/policies/etc).
    g. We are using the Core Competencies for Public Health extensively (e.g. used/referenced in many organizational activities/documents/policies/etc.).
    h. I would like to skip this question.

11. If the Core Competencies for Public Health are being used in your organization, how are they being used? (Please select all responses that apply).
    a. They are applied to general public health functions/activities.
    b. For orientation purposes in the organization.
    c. For human resource processes (e.g. job descriptions, screening candidates, interview design).
    d. As a professional development tool/resource.
    e. For learning/education needs (e.g. assessments, developing annual learning plans).
    f. As part of annual performance evaluation.
    g. As competency-based testing for educational or practice purposes.
    h. Development of training sessions/programs (e.g. objectives of learning events, relevant competencies related to training).
    i. Program planning, implementation and evaluation.
    j. Integrated into work of professional practice councils.
    k. Used for presentations.
    l. Cited in other work/resources.
    m. Other (please specify) _____.

12. What influencing factors (e.g. individual/organization) have facilitated/supported the adoption and utilization of the Core Competencies for Public Health at your health unit? (Please indicate your response in the text box below).

_____
_____
_____

13. What influencing factors (e.g. individual/organization) have precluded or acted as barriers to the adoption and utilization of the Core Competencies for Public Health at your health unit? (Please indicate your response in the text box below).

    *Note: If you are using the Core Competencies for Public Health in your work setting, you will be redirected to* ***Question 17*** *as part of the skip-logic of the on-line survey tool.*

_____
_____
_____

14. If you are not using the Core Competencies for Public Health, what influencing factors (e.g. individual/organizational) have been barriers preventing their use? (Please indicate your response in the text box below).

_____
_____
_____

15. If you are not using the Core Competencies for Public Health, what supports would be helpful to facilitate the adoption and utilization of the Core Competencies (e.g. into your public health practice or in your organization)? (Please indicate your response in the text box below).

_____
_____
_____

16. *Would you consider using the Core Competencies for Public Health if there were different tools to support their use? (e.g. competency assessment tool, performance appraisal, job description template, practice exemplars). (Please select one response).

    Yes ____ No_____ Not Sure_____ I would like to skip_____

Please list suggested format options in the text box below:_____

**Part 3: Questions Related to Public Health Nursing Competencies:**

The following questions relate to the **Public Health Nursing Discipline Specific Competencies Version 1.0**, (herein referred to as the **Public Health Nursing Competencies**), produced by the Community Health Nurses of Canada (CHNC, 2009).

17. *How familiar are you with the document Public Health Nursing Competencies? (Please select one response).

    *Note: If you answer "I am not familiar with the Public Health Nursing Competencies", you will be redirected to **Question 23** as part of the skip logic of the on-line survey tool.*

    a) I am not familiar with the Public Health Nursing Competencies.
    b) I have heard about, but not seen the Public Health Nursing Competencies.
    c) I have read parts of the Public Health Nursing Competencies.
    d) I have read the entire Public Health Nursing Competencies and I am somewhat/vaguely familiar with it.
    e) I have read the entire Public Health Nursing Competencies and I am very familiar with it.
    f) I would like to skip this question.

18. How did you learn about the Public Health Nursing Competencies? (Please select all responses that apply).

    a. Colleague(s) at work, work activities, etc.
    b. Launch of competencies/workshops
    c. Used them to prepare for job interview
    d. Management, employer
    e. Orientation to public health
    f. Undergraduate or graduate studies/program
    g. Received a copy of the document
    h. Heard about them while they were being developed
    i. Public Health Agency of Canada website, communications, presentations, etc.
    j. Ontario Public Health Association website, communications, presentations, etc.
    k. Community Health Nurses of Canada website, communications, presentations, etc.
    l. Other _____

19. What one statement best describes the **level of use** of the Public Health Nursing Competencies in your organization? (e.g. examples of "use" can include organizational planning, implement processes or policies, referenced within documents, defining roles/practice expectations, etc.). (Please select one response).

    *Note: If you respond that you are '**not** using' or '**no longer'** using the Public Health Nursing Competencies, you will be redirected to **Question 23** as part of skip logic of on-line survey tool.*

    a. We are not using the Public Health Nursing Competencies.
    b. We did use the Public Health Nursing Competencies, but no longer use them.
    c. We are thinking about using the Public Health Nursing Competencies.
    d. We are making plans to use the Public Health Nursing Competencies.
    e. We are using the Public Health Nursing Competencies in a limited manner (e.g. used/referenced in a few organizational activities/documents/policies/etc.).
    f. We are using the Public Health Nursing Competencies to a moderate degree (e.g. used/referenced in several organizational activities/documents/policies/etc.).
    g. We are using the Public Health Nursing Competencies extensively (e.g. used/referenced in many organizational activities/documents/policies/etc.).
    h. I would like to skip this question.

20. If the Public Health Nursing Competencies are being used in your organization, how are they being used? (Please select all responses that apply).

    a. They are applied to general public health functions/activities.
    b. For orientation purposes in the organization.
    c. For human resource processes (e.g. job descriptions, screening candidates, interview design).
    d. As a professional development tool/resource.
    e. For learning/education needs (e.g. assessments, developing annual learning plans).
    f. As part of annual performance evaluation.
    g. As competency-based testing for educational or practice purposes.
    h. Development of training sessions/programs (e.g. objectives of learning events, relevant competencies related to training).
    i. Program planning, implementation and evaluation.
    j. Integrated into work of professional practice councils.
    k. Used for presentations.
    l. Cited in other work/resources.
    m. Other (please specify) _____.

21. What influencing factors (e.g. individual/organizational) have facilitated/supported the adoption and utilization of Public Health Nursing Competencies at your health unit? (Please indicate your response in the text box below).

_____
_____
_____

22. What influencing factors (e.g. individual/organizational) have precluded or acted as barriers to the adoption and utilization of the Public Health Nursing Competencies at your health unit? (Please indicate your response in the text below).

*Note : If you are using the Public Health Nursing Competencies in your work setting, you will be redirected to* ***Question 26*** *as part of the skip-logic of the on-line survey tool.*

_____
_____
_____

23. If you are not using the Public Health Nursing Competencies, what influencing factors (e.g. individual/organizational) have been barriers preventing their use? (Please indicate your response in the text box below).

_____
_____
_____

24. If you are not using the Public Health Nursing Competencies, what supports would be helpful to facilitate the adoption and utilization of the Nursing Competencies (e.g. into your public health practice or in your organization)? (Please indicate your response in the text box below.)

_____
_____
_____

25. *Would you consider using the Public Health Nursing Competencies if there were different tools to support their use? (e.g. competency assessment tool, performance appraisal, job description template, practice exemplars). (Please select one response).

Yes_____ No_____ Not Sure_____ Skip this question_____

Please list suggested format options in the text box below: _____

26. This is the end of the formal questionnaire; however, additional comments about the Core Competencies for Public Health and the Public Health Nursing Competencies are welcome in the text box below.

_____
_____
_____
_____

Thank you page:

**Thank You**

You have come to the end of this questionnaire. Thank you once again for participating in this pilot study. If you have any questions regarding this pilot study or the questionnaire, you may contact Nancy Peroff-Johnston at nperoff@ryerson.ca or Dr. Cristina Catallo at ccatallo@ryerson.ca, Daphne Cockwell School of Nursing, Ryerson University.

**Information on the Lottery Draw**

As previously mentioned in the introduction, as a gesture in kind we are offering you the opportunity to participate in a random draw for one of two gift prizes of $100.00. You will be required to provide personal contact information on the form for the draw and submit the form via e-mail or land mail to the researchers as per the instructions on the form.

Participation in this draw is voluntary and the personal information collected is for the sole purpose of the lottery draw. This information is kept separate from data collected in a secure file and will be destroyed once the random draw is completed. Please be advised that the personal information you provide for the draw is in no way linked to your responses; the responses you provide are anonymous and separate from this draw. Please submit this form as soon as possible after the completion and submission of the on-line questionnaire.

Please click on the following link which will allow you to access the form for the random draw.

**Http:// (link listed here).**

## APPENDIX G – Draw Entry Form

RYERSON UNIVERSITY

DAPHNE COCKWELL SCHOOL OF NURSING | FACULTY OF COMMUNITY SERVICES
Accredited by the Canadian Association of Schools of Nursing

**Public Health Core and Nursing Competencies among Public Health Nurses in Ontario**

Draw Entry Form for Study Participants

I have read the letter of information for this pilot study and agree to have my name entered into a draw for one of two prizes of a $100 (provided as a cheque).

Name: _____

Signature: _____

Address: Apt. No./Street _____ Town/City _____

Province _____ Postal Code _____

Date: _____

*All forms will be destroyed and discarded in confidential waste after completion of the pilot study and prizes are drawn. You will only be contacted by mail if you are a prize winner.*

---

Please return completed forms to Nancy Peroff-Johnston via e-mail at **nperoff@ryerson.ca**; all e-mail addresses will be deleted once the completed form for the draw is received. If you prefer to mail in your form for the draw, please mail to:

**Dr. Cristina Catallo, Associate Professor**
**Attn: Public Health Core and Nursing Competencies Pilot Study**
**Daphne Cockwell School of Nursing**
**Ryerson University**
**350 Victoria Street**
**4th Floor, POD 481**
**Toronto, ON, M5B 2K3**

Thank you once again for participating in this study.

## APPENDIX H – E-mail Exchange with Dr. S. Oppewal for Study Questionnaire

| | |
|---|---|
| From | "Oppewal, Sonda" <soppewal@email.unc.edu> |
| Sent | Thursday, July 7, 2011 2:23 pm |
| To | Nancy Peroff-Johnston <nperoff@ryerson.ca> |
| Subject | RE: RE: Request for study questionnaire |

Nancy,
You should have received two messages from me with attached scanned documents. I'm sorry I couldn't find this in a word document...but you can retype and hopefully use or modify.
Sonda

| | | |
|---|---|---|
| From | "Oppewal, Sonda" <soppewal@email.unc.edu> | |
| Sent | Thursday, July 7, 2011 2:00 pm | |
| To | Nancy Peroff-Johnston <nperoff@ryerson.ca> | |
| Subject | survey questions | |
| Attachments | 20110707133444565.pdf | 145K |

Nancy,

Here are the survey questions or pretty close to what we used.
I hope this will be of help. Good luck with your study!

Sonda

| | | |
|---|---|---|
| From | "Oppewal, Sonda" <soppewal@email.unc.edu> | |
| Sent | Thursday, July 7, 2011 1:59 pm | |
| To | Nancy Peroff-Johnston <nperoff@ryerson.ca> | |
| Subject | Survey analysis plan from Oppewal, Lamanna, Lee | |
| Attachments | 20110707133521095.pdf | 303K |

Hi Nancy,

Our building coordinator was able to take me up to the locked penthouse and I found this information in a box that I had stored there. Here is the analysis plan, and I'll send what I think was the last version of the survey to you via another email message. Because we used survey monkey it's possible there were some slight changes but this should help!

Sonda

## Appendix I – 2011 Statistics Canada Peer Group Definitions for Ontario

| Peer Group | Number of Health Units | Principal characteristics |
|---|---|---|
| **A** | 15 | • Urban-rural mix from coast to coast<br>• Average percentage of Aboriginal population<br>• Average percentage of immigrant population |
| **B** | 6 | • Mainly urban centres in Ontario and Alberta with moderately high population density<br>• Low percentage of Aboriginal population<br>• Very High employment rate<br>• Higher than average percentage of immigrant population |
| **C** | 7 | • Sparsely populated urban-rural mix in Eastern and Central provinces<br>• Average percentage of Aboriginal population<br>• Average employment rate<br>• Low percentage of immigrant population |
| **D** | 4 | • Mainly rural regions from Quebec to British Columbia<br>• Average percentage of Aboriginal population<br>• High employment rate |
| **G** | 1 | • Largest metro centres with an average population density of 4,065 people per square kilometre<br>• Very low proportion of Aboriginal population<br>• Average employment rate<br>• Very high proportion of immigrant population |
| **H** | 1 | 1. Rural northern regions from coast to coast<br>2. High proportion of Aboriginal population<br>• Low proportion of immigrants |
| **J** | 2 | • Mainly urban centers in Ontario and British Columbia with high population density<br>• Low proportion of Aboriginal population<br>• High proportion of immigrants |

(Statistics Canada, 2013)

## Appendix J – Excerpts of the Core Competencies for Public Health in Canada

The following sections are quoted excerpts taken from the Core Competencies for Public Health Release 1.0 (PHAC), 2007.

**Introduction**

Core Competencies are the essential knowledge, skills and attitudes necessary for the practice of public health. They transcend the boundaries of specific disciplines and are independent of program and topic. They provide the building blocks for effective public health practice, and the use of an overall public health approach.

**1.0 Public Health Sciences:**

This category includes key knowledge and critical thinking skills related to the public health sciences: behavioural and social sciences, biostatistics, epidemiology, environmental public health, demography, workplace health, and the prevention of chronic diseases, infectious diseases, psychosocial problems and injuries. Competency in this category requires the ability to apply knowledge in practice.

**2.0 Assessment and Analysis:**

This category describes the Core Competencies needed to collect, assess, analyze and apply information (including data, facts, concepts and theories). These competencies are required to make evidence-based decisions, prepare budgets and reports, conduct investigations and make recommendations for policy and program development.

**3.0 Policy and Program Planning, Implementation and Evaluation**

This category describes the Core Competencies needed to collect, assess, analyze and apply information (including data, facts, concepts and theories). These competencies are required to make evidence-based decisions, prepare budgets and reports, conduct investigations and make recommendations for policy and program development.

**4.0 Partnerships, Collaboration and Advocacy**

This category captures the competencies required to influence and work with others to improve the health and well-being of the public through the pursuit of a common goal. Partnership and collaboration optimizes performance through shared resources and responsibilities. Advocacy-speaking, writing or acting in favour of a particular cause, policy or group of people - often aims to reduce inequities in health status or access to health services.

**5.0 Diversity and Inclusiveness:**

This category identifies the socio-cultural competencies required to interact effectively with diverse individuals, groups and communities. It is the embodiment of attitudes and practices that result in inclusive behaviours, practices, programs and policies.

**6.0 Communication:**

Communication involves an interchange of ideas, opinions and information. This category addresses numerous dimensions of communication including internal and external exchanges; written, verbal, non-verbal and listening skills; computer literacy; providing appropriate information to different audiences; working with the media and social marketing techniques.

**7.0 Leadership:**

This category focuses on leadership competencies that build capacity, improve performance and enhance the quality of the working environment. They also enable organizations and communities to create, communicate and apply shared visions, missions and values.

## Appendix K – Excerpts from the Public Health Nursing Competencies

The following sections are quoted excerpts taken from the Public Health Nursing Discipline Specific Competencies Version 1.0 (CHNC), 2009.

| |
|---|
| **1.0 Public Health and Nursing Sciences**<br>This category includes key knowledge and critical thinking skills related to: the public health sciences (behavioural and social sciences, biostatistics, epidemiology, environmental public health, demography, workplace health, prevention of chronic diseases, infectious diseases, psychosocial problems and injuries) as well as nursing theory, change theory, economics, politics, public health administration, community assessment, management theory, program planning and evaluation, population health principles, community development theory, and the history of public health. Competency in this category requires the ability to apply knowledge in practice. |
| **2.0 Assessment and Analysis**<br>This category describes the core competencies needed to collect, assess, analyze and apply information (including data, facts, concepts and theories). These competencies are required to make evidence-based decisions, prepare budgets and reports, conduct investigations and make recommendations for policy and program development. Community members are involved in identifying and reinforcing those aspects of everyday life, culture and political activity that are conducive to health. |
| **3.0 Policy and Program Planning, Implementation and Evaluation:**<br>This category describes the core competencies needed to effectively choose options, and to plan, implement and evaluate policies and/or programs in public health. This includes the management of incidents such as outbreaks and emergencies. |
| **4.0 Partnership Collaboration and Advocacy:**<br>This category captures the competencies required to influence and work with others to improve the health and well-being of the public through the pursuit of a common goal. This includes the concepts of: social justice, which is the fair distribution of society's benefits and responsibilities and their consequences (Canadian Nurses Association, Code of Ethics, 2008); partnership and collaboration which is to optimize performance through shared resources and responsibilities; advocacy which is to speak, write or act in favour of a particular cause, policy or group of people and aims to reduce inequities in health status or access to health services. |
| **5.0 Diversity and Inclusiveness:**<br>This category identifies the competencies required to interact effectively with diverse individuals, families, groups and communities in relation to others in society as well to recognize the root causes of disparities and what can be done to eliminate them (Canadian Nurses Association, Code of Ethics, 2008). It is the embodiment of attitudes and actions that result in inclusive behaviours, practices, programs and policies. |
| **6.0 Communication:**<br>Communication involves an interchange of ideas, opinions and information. This category addresses numerous dimensions of communication including internal and external exchanges; written, verbal, non-verbal and listening skills; computer literacy; providing appropriate information to different audiences; working with the media and social marketing techniques. |
| **7.0 Leadership:**<br>This category focuses on leadership competencies that build capacity, improve performance and enhance the quality of the working environment. They also enable organizations and communities to create, communicate and apply shared visions, missions and values. |
| **8.0 Professional Responsibility and Accountability:**<br>This category addresses a number of dimensions including the recognition that nurses are accountable for their actions and are responsible for making sure they have the required knowledge and skills needed to ensure the delivery of safe, compassionate, competent and ethical care. It includes the competencies required to maintain quality work environments and relationships needed in a professional practice. Public Health nurses are responsible for initiating strategies that will address the determinants of health and generate a positive impact on people and systems. They are accountable to a variety of authorities and stakeholders as well as to the individual and community they serve. This range of accountabilities places them in a variety of situations with unique ethical dilemmas. (CHNC, 2009) |

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