Resource allocation in the public health sector:

Current status and future prospects

by

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A thesis
presented to the University of Waterloo
in fulfillment of the
thesis requirement for the degree of
Master of Science
in

Health Studies and Gerontology

Waterloo, Ontario, Canada, 2013

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Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

Background: Funding practices in Ontario's acute care sector have undergone a substantive shift away from 'lump-sum funding' towards a combination of population-needs and performance-based financing (MOHLTC, 2013). In contrast very little is known about how funds are distributed across the province's public health sector, specifically the 36 public health units (PHUs) that are mandated to deliver health promotion and disease prevention programs across the province. In fact the funding arrangement utilized by the public health sector has remained unchanged for several years, despite the growing burden of responsibilities on PHUs in terms of evolving population health needs and more expansive programmatic and performance expectations. Current literature on the processes, variables and overarching principles that govern the distribution of funds across PHUs remains considerably limited.

Objectives: The underlying objectives of this study were to develop a better understanding of how PHUs in Ontario are currently funded, and to examine what principles public health professionals believe should guide the distribution of resources across health units in Ontario. The study was not intended to critically evaluate the existing funding arrangement or propose an alternate funding model for the public health sector. Instead the project sought to identify the fundamental principles (and underlying social values) that public health professionals believe are important to consider in future thinking around public health funding policies and practices.

Methods: Given the dearth of comprehensive literature on the topic, the perspectives of public health professionals who have proximal links to the current public health funding process served as the basis of the data discovery component for this study. A total of 14 in-depth interviews were conducted with a number of public health professionals to gather their insights on the current funding arrangement, and explore what principles they believe should be used to guide allocation decisions in the public health sector. Interviews were followed by a web survey that was sent a wide range of public health professionals to examine how they rank principles and perceive trade-offs between competing principles.

Results: Public health professionals proposed a total of 12 fundamental principles to guide the distribution of resources across PHUs. These principles were grounded in three core social value judgments (need, equity, and transparency and accountability). The study provides important insights into the fundamental principles that public health professionals believe should guide allocation decisions in the public health sector and illustrates the complexity associated with distributing limited resources across health units, as well as possible directions for future research on this topic.

Acknowledgments

My sincerest gratitude goes out to the public health professionals who contributed their time and energy to various stages of this study. Your perspectives and thoughtful insights on this topic have served as the foundation and continued inspiration for this work.

To my supervisor, Dr. McKillop, you have been a truly exceptional mentor, teacher and friend in this journey. Your intellectual curiosity and openness to challenging your own ideas and assumptions, and constantly inspiring me to refine my academic and personal lenses is incomparable. I am truly grateful to have had your leadership and guidance supporting me over the course of this journey.

Dr. McDonald, the chance to be mentored by you led me to Waterloo two years ago. You have been an instrumental influence in shaping my thinking and motivations as a researcher, and have inspired me to ask the tough questions that need asking, and to always go after what I am passionate about.

Dr. Garcia, you have been a source of invaluable guidance and support through my time here at Waterloo. Thank you for your advice, honesty and commitment to this project and my growth as a researcher. Your insights and experience have been instrumental in shaping this project from the start all the way to the very end.

Dr. Perlman, thank you for offering your insights and experience to this project. Your constructive feedback and perspectives from the acute care sector have played an important role in helping to refine the final product.

To my peers at the School of Public Health and Health Systems, I feel privileged and honored to be considered an equal. Thank you for sharing this experience with me, I am inspired, humbled and grateful to have received such tremendous support from you all as we charted our paths through the program. I would like to thank my funding sources, the Canadian Institutes for Health Research (CIHR) and the CIHR Training Grant in Population Intervention for Chronic Disease Prevention.

To my parents, thank you for your unconditional love and support. Your values, persistence and courage keep me inspired and grounded at all times. To my sisters, thank you both for your patience, encouragement, and most importantly for helping me to keep the big picture in sight. I wouldn't have made it this far without you all. And finally sincerest thanks to my grandmother, your ability to approach every challenge with humility, strength and grace continues to inspire and motivate me to be all that I can be. Thank you for being such an exceptional role model for us all.

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CHAPTER ONE: INTRODUCTION

1.1 Overview

Health care is the Government of Ontario's single largest spending portfolio. In 2010-2011, 40.3% of Ontario's total spending portfolio) ($44.77 billion) was allocated to healthcare (Ministry of Finance, 2012). Much of that funding was dedicated to the acute care sector for the provision of medical care and individual patient level services. In contrast the province's public health sector, that is tasked with managing a wide range of health promotion and protection programs, including population health surveillance, chronic disease and injury prevention, and emergency preparedness, received only 1.5% ($7 billion) of the Ministry of Health and Long-term Care's (MOHLTC) total operating budget (Ministry of Finance, 2011).

A strong and adequately resourced public health component is considered to be an integral part of any effective health system (Canadian Public Health Association [CPHA], 2009). In the context of Ontario, the health promotion and protection aspects of public health are especially critical given that approximately 79% of deaths in Ontario are attributable to chronic illnesses, the vast majority of which are preventable (Ontario Agency for Health Protection and Promotion-Cancer Care Ontario, 2012, p 1). In addition to addressing growing burdens of mortality and morbidity from chronic illnesses, public health is also tasked with identifying and responding to episodic events that threaten population health, including monitoring and frontline management of infectious disease and outbreaks such as SARS, toxic waste spills, and influenza etc. (CPHA, 2009). Long-term investments in 'upstream' population-level health promotion and prevention efforts can generate significant cost-savings 'downstream' in terms of reductions in the utilization of emergency and acute care services (CPHA, 2009). Identifying the resource needs of the public health sector and guaranteeing that the limited funds currently allotted to the public health envelope are appropriately distributed across public health units (PHUs), will be critical to ensure that public health programs and services are effectively and efficiently delivered to communities across Ontario.

A majority of the existing research and policy dialogue around funding in Ontario's healthcare system has focused almost exclusively on the acute care sector. Funding policies and practices in the acute care sector have undergone a shift away from lump-sum funding, and towards a combination of population-needs and performance based funding via the Health-Based Allocation Model (HBAM) and quality-based procedures respectively (MOHLTC, 2013). In contrast, the public health sector has retained its reliance on 'historical allocation', i.e., PHU budgets are based on historical levels of spending, despite the growing burden of responsibilities on health units in terms of evolving population health needs and more expansive programmatic expectations. The provincial

government (specifically the MOHLTC) does not currently utilize a structured formula to distribute provincial funds for the provision of mandatory programs, instead a fixed percentage increase (or less if requested) is offered across all PHUs (Government of Ontario, 2013). Details around the fundamental principles and underlying variables or indicators, that guide the distribution of funds to individual PHUs, as well as the processes and stakeholders involved in informing allocation decisions, remain unclear in existing grey and peer-reviewed literature.

1.2 Research purpose

Public health services in Ontario are delivered through a total of 36 PHUs that are located across the province. PHUs are defined as "official health agencies, established by a group of urban and rural municipalities to provide a more efficient community health program carried out by full-time, specially qualified staff… Health units administer health promotion health promotion and disease prevention programs to inform the public about healthy lifestyles, and communicable disease control including education in sexually transmitted diseases/AIDS, immunization, food premises inspection… health education for all age groups and selected screening services" (MOHLTC, 2012a). The organization of public health services in Ontario is distinct from all other provinces where public health programs are delivered under regional health authorities that also include hospitals, homecare, ambulatory services and mental health services (Moloughney, 2007). The separation between public health and the rest of the healthcare system in Ontario, means that allocation decisions concerning the delivery of public health services are completely separate from the funding model utilized by the acute care and hospital system.

Unlike their peers in the acute care system, the public health sector has retained its reliance on historical funding - characterized by per capita budgets that are based on historical levels of spending (Government of Ontario, 2013). In light of growing fiscal pressures and competition for resources with other parts of the healthcare system, increases in PHU budgets have been capped at 2% per fiscal year (Government of Ontario, 2013). And while increments to PHU budgets are becoming increasingly limited, the resource needs of health units are continuing to grow. In 2012, 30 PHUs requested a funding increase greater than 2% (for mandatory programs), with an average requested increase of approximately 8%, with some requests ranging over 25% (Government of Ontario, 2013). The provincial government (specifically the MOHLTC) does not currently utilize a formula to distribute the provincial funding for the provision of mandatory programs (and unorganized territory funding), instead a fixed percentage increase (or less if requested) is offered across all PHUs (Government of Ontario, 2013).

More recently there has been some growing interest in examining alternate strategies to finance public health programs. The MOHLTC recently launched its own research inquiry process to examine alternate ways to finance public health, with establishment of its Funding Review Working Group (FRWG) in early 2010. The FRWG has been tasked with exploring alternative funding mechanisms to distribute funds from the provincial envelope to municipalities, for the delivery of mandated programs in both organized and unorganized territories (MOHTLC, 2010). The FRWG's recommendations were anticipated for release in 2011 (MOHTLC, 2010), although no final report or strategic directives have been released as yet.

Gaps in existing knowledge around the stakeholders, processes and variables involved in distributing resources across PHUs represent an opportunity to develop a better understanding of how PHUs are currently resourced, and to examine what overarching principles might be considered in guiding future allocation decisions. In the absence of comprehensive literature on the topic of public health funding especially in the context of Ontario, this study intends to connect with public health professionals via a series of in-depth interviews to develop a better understanding of the current funding arrangement and to examine their perspectives around what core decision-making principles should be used to inform the distribution of funds across PHUs. The scope of the project will be guided by the two research questions proposed below:

1. How are funds currently distributed across Ontario's 36 health units?
2. What overarching decision-making principles do public health professionals believe should be used to guide public health funding?

Identifying the resource needs of different PHUs and aligning resource requirements with allocation practices will be critical to ensure that funds are appropriately distributed across health units. For the purposes of this study, the term 'decision-making principles' or 'principles' refers to the overarching ideologies, moralities or philosophies that guide the distribution of resources in healthcare settings. This study is not designed to explore what the appropriate size of the public health sector's total budget should be, rather it seeks to better understand how funds from the public health envelope are currently distributed across the 36 PHUs, and examine what fundamental decision-making principles public health professionals believe should be used to guide the distribution of resources across health units in Ontario. Given the lack of comprehensive and accessible grey or peer-reviewed literature on the topic, the perspectives of public health professionals will drive the data discovery component of this study. A series of in-depth informant interviews and a web survey will serve as the primary methods for data collection. And while it is acknowledged that there are other

agencies and stakeholder groups involved in supporting the design and delivery of public health services at a federal level (Health Canada and the Public Health Agency of Canada) and provincial level (Public Health Ontario [PHO]), this study will focus exclusively on allocation mechanisms involving the 36 PHUs in Ontario. Results are intended to add to existing dialogue and debate around strategies to ensure that health units are sufficiently resourced to execute their mandated responsibilities, and address both current and emerging population health needs facing the province. An in-depth look at the current funding arrangement, alongside an examination of the key principles that public health professionals believe should guide funding practices in the public health sector would be an important first step in that process.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Existing grey and peer-reviewed literature on the topic of funding public health programs/services emphasizes the need to adopt multi-faceted lenses in establishing key priorities and allocating resources to promote and protect the health of communities or populations being served (CPHA, 2001; Gardner, 2008; McIntosh, Ducie, Burka-Charles, Church, Lavis, Pomney, Smith, and Tomlin, 2010). A wide range of factors can influence resource needs in public health settings, and these may range from more traditional technical judgments such as demographic or epidemiological indicators such as population growth or disease burdens (Birch and Chamber, 1993; Hurley and Rakita, 2006; Mcintosh et al., 2010), to less quantifiable factors such as the moral values and ethical beliefs of a given community or society (Clarke and Weale, 2012). Empirically-grounded 'scientific' criterion, i.e. clinical efficacy and cost-efficiency, that policymakers have traditionally relied upon to inform resource distribution are often thought to be inherently grounded in the perceived values, experiences and backgrounds of stakeholders, policymakers, and the organizational values of their host institutions (Littlejohns, Weale, Chalkidou, Faden, and Teerawattananon, 2012). The fundamental principles that guide the distribution of funds in healthcare settings extend beyond so-called 'technical' judgments i.e., cost-efficiency or clinical efficacy, stem from 'social value judgments' that inform the specific criterion and relative value assigned to different priorities that shape funding decisions (National Institute for Health and Clinical Excellence, 2008; Clarke and Weale, 2012; Littlejohns, et al., 2012).

2.2 The role of social value judgments in influencing allocation decisions

Social values serve as 'universal moral values' that are informed by the social, cultural, religious and institutional characteristics of a given community (Clarke and Weale, 2012). Social values may be operationalized in the form of 'decision-making principles' that guide priority-setting and allocation decisions in healthcare. Social value judgments and corresponding decision-making principles are often supplemented by additional features, i.e., policies, legislation or evidence that are intended to uphold social value judgments in informing decisions around rationing and resource allocation in healthcare settings (Menon, Stafinski, Martin, Windwick, Singer and Caulfield, 2002; Clarke and Weale, 2012). For instance, the idea of equity is an example of a social value, which may be operationalized as a decision-making principle that informs funding decisions. A commitment to equity can support the prioritization of service delivery to disadvantaged high-risk population sub-groups and/or promote targeted investments towards upstream determinants of health disparities

(Guindo, Wagner, Baltussen, Rindress, Til, Kind, and Goetghebeur, 2012). Therein equity serves as the underlying social value, that may be operationalized as a decision-making principle and thus support investments in health services to ensure that all population sub-groups have equal access to health services (Hoedemaekers and Dekkers, 2003; Clarke and Weale, 2012).

A number of different social value judgments have also been identified in grey and peer-reviewed literature as key influences on the underlying principles that govern funding policies and practices in healthcare settings. Clarke and Weale (2012) in their development of a conceptual framework that examines the role of social values in informing priority setting in healthcare, organized the social values discussed in literature around bioethics and social values, into two broad categories - content and process values. Process values are engaged in "determining when and how decisions on priority setting are justifiable", i.e. how decisions are made, whereas the content values inform the reasons used in priority-setting, i.e., what decisions are made and why (Clarke and Weale, 2012, p 294). Sections 2.2.1 and 2.2.2 provide a brief overview of the content and process values that may inform priority-setting and resource allocation decisions in public health settings. For content values, summaries of how each value could be operationalized in the form of decision-making principles that may influence resource allocation for health services are provided with specific examples where relevant. For process-values, potential applications in terms of the ways in which these values may inform the processes or procedures that inform funding decisions are also outlined.

2.2.1 Content values

Content values are associated with the 'substance of decision-making' (Clarke and Weale, 2012, p 295), specifically the reasoning and criterion upon which decisions are made. Some of the content values that Clarke and Weale (2012) have proposed include, 1) equity, 2) dignity, 3) solidarity, 4) need, and 5) autonomy. Each of these content values are discussed in more detail below:

1. *Equity:* A commitment to the idea that the most needy or disadvantaged members of society will receive the foremost priority (Hoedemaekers and Dekkers, 2003). This may also include a pledge to ensuring that all members of a particular society/community have equal access to a minimum set of health services, irrespective of extenuating characteristics, including their capacity to advocate for or pay for those basic services, lifestyle choices, ethnic background, location etc. (Oliver and Mossialos, 2004). As a social value, the idea of equity can be extended to ensuring that individuals with similar conditions are treated similarly, i.e., ensuring that extraneous variables, including gender, ethnicity, or

sexual orientation have no influence on the type, cost, or quality of treatment received (World Health Organization [WHO], 2000; Cappelen and Norheim, 2005).

→ Potential application in public health settings

- Directing additional resources to tackle upstream causes of health inequalities, particularly those that relate to socio-economic causes of health disparities. For instance, investments in multi-lingual programing and outreach, to target high-risk vulnerable sub-groups (e.g., immigrants or aboriginal communities) to ensure that their access and utilization of health services is comparable to the rest of the general population (and that specific barriers to access are systematically addressed).

2. *Solidarity:* A binding willingness among all members of society to share the financial risks of ill health (Hoedemaekers and Dekkers, 2003).

→ Potential application in public health settings

- Can manifest itself in the form of cost sharing of services (risk solidarity) as well as co-payments (income solidarity) i.e., distributing the costs of health service delivery among all members in society (Hoedemaekers and Dekkers, 2003; Oliver and Mossialos, 2004).

3. *Need*: Defined as the "gap or between a current and a desired state of being," and may be objective (quantifiable) or subjective (perceived) and physical or psychological in nature (Royal College of Physicians and Surgeons in Canada [RCPSC], 2012, p 3). Health needs assessments are often examined in light of multiple 'types' of need, including (Government of Ontario, 2006).

a. *Felt* needs (or wants) are defined as subjective experiences of need, i.e., a need that is seen as important by the individual concerned,

b. *Expressed* needs represent vocalized needs, i.e., demand for (or utilization of) health services, and

c. *Normative* needs refers to acceptable minimum and maximum population health status and/or related levels of service provision. Additional specific dimensions of health needs that may inform resource assessments in public health settings include the following (Government of Ontario, 2006):

⇒ Health need as burden of illness - how sick or incapacitated are we

⇒ Health need as medical necessity - severity of illness (as defied by an expert authority)

⇒ Health need as comparative health deficit - are we better or worse off than others?

⇒ Health need as capacity to benefit - how much health and wellbeing are we capable of gaining?

→ Potential application in public health settings

- Assessments around the level of resources required to fill different types of 'needs' within or across communities are seen as a function of information on the health status of the population, demographics and individual or communal perspectives on appropriate standards or levels of care (RCPSC, 2012). The health need of the population (which may vary based on the dimension of need being examined, i.e., burden of illness, capacity to benefit etc.) is characterized as 'demand', whereas the supply is the actual provision of health resources required to fulfill those demands. (Government of Ontario, 2006).

4. *Autonomy*: The ability of individuals to make independent decisions around the use of health services including the freedom to choose the type of healthcare one prefers and the responsibility of financing those particular choices with one's own resources (National Institute for Health and Clinical Excellence [NICE], 2008; Clarke and Weale, 2012). Autonomy in terms of decision-making may also relate to governance structures, and the degree of flexibility that different stakeholders may exercise in terms of investing in health services (i.e., variations in organizational mandates, health emergencies, and legislative obligations etc. (Bossert, 1998).

→ Potential application in public health settings

- Individuals may choose a particular health provider or utilize service that is not covered under a predetermined set of providers/services accepted under a government funded health plan (Clarke and Weale, 2012). The link between autonomy and responsibility for the consequences of an individual's independent choices can also impact whether public funds should be used to cover the costs of health services for those individuals who engage in risky health behaviors (i.e., smoking or nutritional choices) versus individual liability for subsequent health outcomes (Cappelen and Norheim, 2005). In the context of public health, individual freedoms may be absolved to promote population level benefit. For instance, in certain epidemics individuals are required to be in quarantine to limit further transmission of disease, or legislation is passed to influence (and enforce) certain types of behavior change, such as laws requiring individuals to wear seatbelts (Petrini and Gainotti, 2008), and fines for smoking in public places.

2.2.2 Process values

The process values explored in this section are typically associated with a commitment to upholding public reasoning and legitimacy in democratic decision-making, which in effect informs

the justifiability of the decisions made (Clarke and Weale, 2012). The three process values explored in greater detail include, 1) transparency, 2) accountability and 3) participation.

1. *Transparency*: In the context of public health, and more broadly within healthcare settings, a commitment to transparency can entail ensuring that decision-making processes are transparent and accessible such that external and internal stakeholders are able to determine who is involved, and on what specific criterion will decisions be made (Martin, Giacomini and Singer, 2001; Clarke and Weale, 2012).

→ Potential application in public health settings

- The adoption of transparency in funding assessments in public health settings may facilitate broader stakeholder engagement in the development of funding criterion, and the explicit disclosure of the specific variables and rationale that funding decisions are based upon (Clarke and Weale, 2012).

2. *Accountability*: Holding health services organizations (for example PHUs) accountable for the funds they receive. The adoption of accountability in priority setting processes and resource allocation decisions for public health programs/services can extend to the provision of justification(s) for decisions made around the distribution and utility of public funds in the health care system. The idea of accountability in public health operations can extend beyond individual departments/PHUs to include courts/legal systems and taxpayers in general (Clarke and Weale, 2012).

→ Potential application in public health settings

- A commitment to accountability may support explicit links between outputs and resource distribution in public health settings (i.e., PHUs) including the utilization of funds received from cost-shared and transfer agreements between the province and municipalities. It may also include greater public reporting around the utilization of funds across health units, through performance indicators and explicit links between funding allocation and PHU performance (Schwappach, 2002; Dolan, Shaw, Tsuchiya, and Williams, 2005).

3. *Participation*: Providing different stakeholders the opportunity to inform the design, delivery and evaluation of public health services (Clarke and Weale, 2012).

→ Potential application in public health settings

- The adoption of a democratic and participatory approach towards incorporating different perspectives and public preferences at a policy level helps to ensure that diverse stakeholder

perspectives and agendas are integrated into priority-setting and allocation decisions for healthcare organizations (Charles and DeMaio, 1993). In terms of population health, this may range from government officials and politicians to non-profits and community-based advocacy groups.

The context within which social values may inform resource allocation decisions is of critical significance when evaluating the effectiveness of resource distribution practices, examining alternative funding strategies, or drawing comparisons across health systems. An awareness of context (i.e., cultural and institutional settings, political influence and historical precedence etc.) is critical to understanding how different social values may be operationalized as decision-making principles, and how trade-offs between social values may influence allocation decisions (Clarke and Weale, 2012). For example, in a community where solidarity might be valued over another criterion such as equity or autonomy, allocation decisions may be weighted in favor of the social value that is held in higher regard by the public on a cultural and societal scale (Clarke and Weale, 2012). One example of such a 'trade-off' comes from the Swedish healthcare system, where in light of growing resource constraints there has been increasing pressure to integrate considerations around cost-efficiency into allocation decisions (Bernfort, 2003). Nonetheless, Swedish law dictates that decisions around the provision of funds and health service delivery must be guided primarily by the idea of solidarity and need, with cost-efficiency seen only as secondary considerations (Bernfort, 2003).

A community's underlying political ideologies and legislative mandates can also influence the organizational structure of stakeholder groups and the level of input they may have in shaping allocation decisions (Kieslich, 2012). For instance, Germany has a self-governing statutory health insurance (SHI) system, under which insurers and health care providers largely determine the level and quality of care that is mandated via legislation with very limited public input (Giaimo and Manow, 1999, in Kieslich, 2012). Overall, there is a significantly lower degree of transparency and accountability around resource allocation and agenda-setting in SHI systems, especially compared to tax-funded health systems where federal or provincial/state governments are both the funder and provider of health services (Giaimo and Manow, 1999, in Kieslich, 2012).

Some health systems have adopted a more structured and formal recognition of the role of social value judgments in influencing the principles that shape resource distribution, while others have acknowledged the need to incorporate social values judgments, but have not formally integrated social values into allocation mechanisms in healthcare settings. The National Institute for Health and Clinical Excellence (NICE) in the United Kingdom, and its eight-principle social values framework

represents a systemic integration of social values into the decision-making environment surrounding priority-setting and resource distribution in healthcare (Littlejohns, Sharma and Jeong, 2012). NICE has developed a series of value-driven guidelines, termed as 'Social Value Principles' in 2005, which were most recently revised in 2008 (NICE, 2008). NICE's framework of social values is intended to advise the United Kingdom's National Health Service on how to account for social value judgments in establishing strategic directions for health services planning and funding. The eight-principle framework acknowledges the role of social value judgments in terms of how traditional scientific criterion inherently reflect the social value judgments upheld by a particular community or society. The social value principles also emphasize the role of procedural values, i.e., inclusiveness, transparency, and autonomy, in how they may inform the processes by which priority-setting decisions are reached (NICE, 2008). Table 1 provides a brief summary of the complete framework of social value principles (and additional criterion) that guide NICE's recommendations for resource allocation and decision-making in terms of clinical and public health practice (NICE, 2008).

Table 1: National Institute for Health and Clinical Excellence social value judgments - Principles for the development of NICE guidance (NICE, 2008, p 16-28)

Social Value Principles	Description	Related criterion/ social values
Principle 1	NICE should not recommend an intervention (i.e., a treatment, procedure, action or program) if there is no evidence, or not enough evidence, upon which to make a clear decision.	• Clinical and public health effectiveness
Principle 2	Those developing clinical guidelines, technology appraisals, or public-health guidance must take into account the relative costs and benefits of interventions (including cost-effectiveness) in deciding whether or not to recommend them.	• Cost effectiveness
Principle 3	Decisions about whether to recommend interventions should not be based on evidence of their relative costs and benefits alone. NICE must consider other factors when developing its guidance, including the need to distribute health resources in the fairest way within society as a whole.	• Cost effectiveness
Principle 4	NICE should explain its reasons when it decides that an intervention with an incremental cost-effectiveness ratio (ICER) below £20,000 per QALY gained is not cost effective; and when an intervention with an ICER of more than £20,000 to £30,000 per QALY gained is cost effective.	• Cost effectiveness
Principle 5	Although NICE accepts that individual NHS users will expect to receive treatments to which their condition will respond, this should not impose a requirement on NICE's advisory bodies to recommend interventions that are not effective, or are not cost effective enough to provide the best value to all users of the NHS	• Autonomy
Principle 6	NICE should consider and respond to comments it receives about its draft guidance, and make changes where appropriate. But NICE and its advisory bodies must use their own judgment to ensure that what it recommends is cost effective and takes account of the need to distribute health resources in the fairest way within society as a whole.	• Inclusiveness • Transparency • Challenge • Review
Principle 7	NICE can recommend that the use of an intervention be restricted to a particular group of people within the population (for instance, people under or over a certain age, or for women only), but only in certain circumstances. There must be clear evidence about the increased effectiveness of the intervention in this subgroup, or other reasons relating to fairness for society as a whole, or a legal requirement for any such recommendations.	• Justice • Beneficence
Principle 8	When choosing guidance topics, developing guidance and supporting those who put its guidance into practice, NICE should actively consider reducing health inequalities including those associated with sex, age, race, disability and socioeconomic status	• Justice • Beneficence

2.3 Research context: An overview of the public health sector in Ontario

To help set the stage for data collection methods and analysis in the Chapter 4, Section 2.3 and 2.4 are aimed at providing background information pertaining to the structure of the public health sector in Ontario and the history of funding arrangements used to distribute funds across PHUs.

The 36 health units are often categorized into six 'peer groups' based on their demographic characteristics (MOHLTC, 2009). Categories range from 'Urban Centers' to 'Rural Northern Regions'. Appendix 1 provides an overview of the defining features of the six peer groups and the individual PHU's included in each peer group (MOHLTC, 2009). Each PHU is linked to a board of health that has a Medical Officer of Health, typically a health professional with advanced training in population health (i.e., Master's in Public Health or a specialist in Community Medicine). Boards of health are primarily comprised of elected representatives from local municipal councils (MOHLTC, 2012a), and operate under the statutes of the Health Protection and Promotion Act (HPPA). Membership on boards of health typically includes between three and thirteen municipal members, in addition to three-year appointments made by the Lieutenant Governor in Council[1] (Pasut, 2007). Boards of health can be organized in a variety of different governance formats, including autonomous, semi-autonomous/integrated, single-tier, and regional structures. Appendix 2 provides brief descriptions for each type of board of health, as well as an overview of the 36 PHUs organized by their governance format. Appendix 3 provides a list of PHUs organized by location. Each Medical Officer of Health (appointed by the MOHLTC) is responsible for the provision and management of public health programs and services offered at a PHU level, report directly to the board of health (Pasut, 2007).

At a provincial level, PHUs operate under the Chief Medical Officer of Health branch at the MOHLTC. Provincial agencies such as Public Health Ontario (PHO) and other branches of the provincial government including the Ministry of Health Promotion and Sport (recently amalgamated into the MOHLTC) and the Ministry of Children and Youth Services also provide vital assistance in terms of surveillance support, technical expertise, and cost-sharing of programmatic expenses (MOHTLC, 2005). Federal partners include the Public Health Agency of Canada (PHAC), the Canadian Food Inspection Agency (CFIA), and Health Canada (HC) that provide a wide range of technical and strategic support including the design and implementation of policies, research and evaluation etc. At the municipal level, PHUs are supported in varying degrees by municipal governments in terms of financial assistance for the provision of public health services, and through infrastructural partnerships, legal and technical assistance.

[1] The number of members appointed to the board of health by the Lieutenant Governor cannot equal or exceed the number

The specific programming responsibilities for health units are outlined under Statute 5 of the Health Protection and Promotion Act (HPPA). The HPPA stipulates that the provision of public health services in the following areas, i) community sanitation, ii) control of infectious diseases and reportable diseases, iii) health promotion, disease and injury prevention, iv) family health, and v) the collection and analysis of epidemiological data (Government of Ontario, 2011). The mandated program areas required of all health units as outlined in the HPPA are further guided by the Ontario Public Health Standards (OPHS) (and its 26 protocols) that serve as the operating mandate governing all PHU operations. A full listing of the 26 protocols and additional activities mandated under the OPHS can be found in Appendix 4. In addition to the OPHS, other important pieces of legislation that influence PHU operations include the Health Services Improvement Bill (2007) that transferred the responsibility for inspecting residential drinking water systems from the Ministry of Environment to PHUs (Pasut, 2007), and the Smoke-Free Ontario Act (2006) under which PHUs are responsible for enforcing limitations on the use, sale, display and distribution of tobacco products (Government of Ontario, 2008).

2.4 History of funding practices in Ontario's public health sector: A brief summary

Under the HPPA, the legal responsibility to fund boards of health rests entirely on municipalities, given that PHUs ultimately deliver programs at the local level. Section 76 of the HPPA does however state that the MOHLTC has the discretion to provide grants for the implementation of the HPPA as needed (MOHTLC, 2010). In fact the provincial government has historically provided the bulk of funding for public health programs (mandated under the joint statutes of the HPPA and the OPHS) through a 3:1 cost-sharing arrangement with municipalities (Pasut, 2007) as well as 100% funding for a number of other mandated programs.

Funding for public health programs offered across PHUs can be divided into three categories, 1) programs that are mandated and fully funded by the province, 2) programs that are mandated and partially funded by the province, and 3) jurisdiction-specific programs that are financed entirely by municipalities. Programs in the first category are fully funded by the provincial government, and include Healthy Smiles Ontario, Healthy Babies Healthy Children, Sexual Health Hotline and Resource Centre, and the Public Health Nurses Initiative (Association of Local Public Health Agencies [ALPHA], 2011; MOHLTC, 2012b). The second category is comprised of programs that are mandated under the OPHS, and are cost-shared at a ratio of 3:1 between the provincial government and individual municipalities (MOHTLC, 2010). The third category represents programs that are entirely funded by municipalities based on jurisdiction-specific population health needs and

municipal funding capacities. An overview of public health programs that are fully and partially funded by the province is available in Appendix 5. Overall, the existing funding formula that determines allocation for each PHU can be best described as historical funding, which is characterized by annual budgets that are based on historical levels of spending (MOHLTC, 2012c). PHU budgets are based on the level of historical support that municipalities have provided to public health issues. Appendix 6 provides an overview of the PHU/board of health expenditure estimates for the 36 health units serving Ontario.

The cost-sharing partnership between the provincial government and municipalities has undergone several adjustments in the past few years (Pasut, 2007). Up till 1997, the provincial government, financed 75% of public health expenditure, and municipalities were responsible for the remaining 25%, with the exception of the Toronto where the costs were split 60:40, between the six boroughs and the provincial government (MOHLTC, 2004). In addition a number of public health programs including Tobacco Use Prevention, Sexual Health, and AIDS programming were fully funded by the provincial government (MOHLTC 2004; Pasut, 2007). In 1997, public health in Ontario saw a complete 'downloading' of public health costs to the municipal governments under the Harris government, following the introduction of the Services Improvement Act in 1998, which involved a complete transfer of liability for funding public health programs (Pasut, 2007) to municipalities, with the province instead taking up full responsibility for the education portfolio (MOHLTC, 2004). The Healthy Babies Healthy Children program continued to be 100% funded by the provincial government (MOHLTC, 2004; Pasut, 2007), Despite the shift towards complete municipal funding, the legislation retained the provincial government's authority over developing and updating standards and expectations for public health programming (Pasut, 2007). The transfer of financial responsibility to municipal governments was maintained till early 1999, after which there was a transition to a 50-50 split for PHU funding between the provincial and municipal governments.

Following the Severe Acute Respiratory Syndrome (SARS) crisis in 2003, Operation Health Protection was launched in 2004, by the MOHLTC as part of a broader strategy to strengthen public health capacity in Ontario. Under Operation Health Protection, PHUs saw a steady and progressive growth in the province's contribution to the cost-sharing agreement, from 55% in 2005, 65% in 2006, and 75% in 2007, where it remains as the current standard (Pasut, 2007; ALPHA, 2010). The MOHLTC states that up to 5% increases in funding will be considered annually, while other mandatory programs, i.e., Healthy Babies Healthy Children and sexual health services continue to be fully funded by the province (Pasut 2007; ALPHA, 2010). For the 2008-2009 fiscal year for all mandatory programs increases of 5% were permitted, 3% across all boards of health, 1% to address

emerging resource needs due to population growth, and an additional 1% to support service provision for low income populations (MOHLTC, 2012c). For the 2011-2012 fiscal year in light of growing economic pressures and fiscal restraint, annual increments to PHU budgets have been limited to a maximum of 2% growth (for mandatory programs) over the previous year's allocation (Government of Ontario, 2013).

2.5 Existing research and policy dialogue surrounding public health funding in Ontario

The breadth of existing research around the decision-making principles and allocation mechanisms utilized in the context of public health services in Ontario is fairly limited. Existing peer-reviewed literature on public health funding in Ontario has predominantly focused on examining specific variables or indicators that influence resource needs in public health settings. Hurley and Rakita (2006) recently explored the relationship between the size of PHU budgets and various 'indicators of need' (i.e., population health characteristics, vital statistics, socio-economic characteristics, and certain health-related behaviors). They observed that need-based indicators explain between 50-70% of variation in PHU funding (Hurley and Rakita, 2006). The study stressed the challenges associated with quantifying the relationship between needs indicators and funding allocation for PHUs (Hurley and Rakita, 2006). Hurley and Rakita (2006) emphasized that verifying assumptions around the quantitative relationships between indicators of need and resource allocation in PHUs require further research to better understand the risks and opportunities associated with adopting needs-based funding approaches for public health services/organizations (Hurley and Rakita, 2006).

Hutchison, Torrance-Rynard, Hurley, Birch, Eyles, and Walter (2003) compared funding allocations based on relative population need (specifically age, sex and self-assessed health) with actual expenditures across regional, district (district health councils) and local (PHU) levels in Ontario. Hutchison et al., (2003) analyzed self-assessed health status and the utilization of healthcare services (via the Ontario Health Survey), along with data on health care expenditures from MOHLTC, and population level data from Statistics Canada, to contrast actual health care expenditures with allocations (at regional, district and local levels) based on relative population need as represented by age, sex and self-assessed health status. In their analysis they found that on average the gap between needs-based allocations and actual health care expenditures ranged from 4.2% at the health region level to 8.0% at the local/PHU level (Hutchison et al., 2003). Their analysis revealed that at the local level there was substantive variation across PHUs; needs-based allocations ranged

from 23.8% higher for Northwestern to 18.8% lower for Kingston, Frontenac, Lennox and Addington, with a mean absolute difference of 8% (Hutchison et al., 2003).

Overall, much of the current research around resource allocation practices and policies in the context of Ontario has focused on acute-care settings (hospitals and research centers) or specific health services (cancer and cardiac care etc.). Public and population health services have largely been excluded from research and dialogue around priority setting and funding reforms around resource distribution practices. But as the roles and responsibilities assigned to health units continue to evolve, it will be essential to ensure that public health professionals and PHUs across the province are sufficiently resourced to meet the programmatic and performance expectations they will face over the coming years.

2.6 Sensitizing concepts - Setting the stage for research inquiry

In qualitative research, sensitizing concepts are often intended to provide a "general sense of reference and guidance in approaching empirical instances… aimed at merely suggesting directions along which to look." (Bowen, 2006, p 2). They serve as 'foundations' in guiding data discovery and analyses, and are typically established by the researcher to "examine substantive codes with a view to developing thematic categories from the data" (Bowen, 2006, p 3). A number of sensitizing concepts were derived from key themes observed in a review of current peer-reviewed and grey literature on the topic of public health funding. For example, commonly identified variables that influence resource needs in public health service delivery, structural factors that are known to impact public health expenditures, or even certain best practices in resource distribution within public health settings. Table 2 provides a summary of each sensitizing concept along with a brief description.

Where possible literature relevant to Ontario's public health sector was reviewed, or examples specific to Ontario were extrapolated upon to develop broader sensitizing concepts, however literature that was not specific to Ontario or Canada was also reviewed. These sensitizing concepts helped to inform the design of data collection tools (specifically the interview guide), and support data analyses stages by providing a point of reference with which to explore the perspectives shared by public health professionals during data collection stages. In keeping with the project's acknowledgment of the role of multi-faceted dimensions of resource allocation practices, the underlying social value judgments that best embody the intent and/or intended outcomes of each sensitizing concept are also outlined.

Table 2: Detailed description of sensitizing concepts

Sensitizing concepts	Description	Associated social values
1. Funding public health services is a shared responsibility (i.e., the responsibility to finance public health programs should be shared across multiple levels of government)	Currently, the maintenance of a minimum set of public health services relies heavily on the provincial government, along with a portion of cost-shared funding between the provincial and municipal governments (Pasut, 2007). Placing the entire burden of public health funding on municipalities is not feasible or practical. Wide variations in tax bases, infrastructural capacities, and municipal priorities across jurisdictions, can severely compromise public health capacity if municipalities were solely responsible for financing PHUs (Deber et al., 2006; Levi, Juliano, and Richardson, 2007).	- Solidarity - Equity
2. High-risk vulnerable populations should receive special considerations in terms of funding for health services	Upholding equity in the delivery of public health services involves a commitment to improving access and utilization of health services for disadvantaged sub-groups (Whitehead, 1992; Braveman and Guskin, 2003). This may also include targeted investments to tackle upstream social determinants of health that may create and exacerbate health inequalities within and across jurisdictions (Braveman and Guskin, 2003; Raphael, 2003).	- Solidarity - Equity
3. Jurisdiction-specific needs across all PHUs should be funded entirely by municipalities	Given their interconnected roles as funders, receivers and administrators of public health programs, municipalities play a critical role in assessing and responding to local health needs and supporting strategic planning for investments in public health planning (Council of Ontario Medical Officers of Health [COMOH] 2005). Since public health services are delivered at the municipal level and municipally elected officials constitute a majority of the membership for boards of health, municipal governments are uniquely placed to directly identify and address the health needs of local communities within their respective jurisdictions.	- Autonomy - Solidarity
4. Rurally located PHUs require additional resources to fulfill their mandated responsibilities	PHUs that serve remote, sparsely populated-jurisdictions require expertise, resources and programming that vary considerably from what might be required in a densely populated urban area (Mays, McHugh, Shim, Perry, Lenawa, Halverson and Moonesinghe, 2006; Mays and Smith, 2009). Factors that may influence the resource requirements of rural PHUs include, limited public infrastructure, and the high cost of service delivery due to vast geographic distances and high population dispersion (ALPHA, 2004; Kilty, 2007).	- Need - Equity

Sensitizing Concepts	**Description**	**Associated social values**
5. Funding distribution across PHUs should be primarily population needs-based	Populations of equal size do not necessarily have equal health needs – population characteristics are what 'drive' both relative demand for health services and subsequent resource requirements (McIntosh et al., 2010). Indicators of 'population need' include epidemiological variables (prevalence of disease), risk behaviors (i.e. tobacco use and obesity etc.) as well as demographic features and related social determinants of health (e.g. race, educational attainment, and income status) (Stevens and Gillam, 1998; Bedard et al., 1999).	- Need - Equity
6. Funds should be distributed based on assessments of 'critical mass' across PHUs	Critical mass is defined as the "minimum amount of resources, expertise and capacity of PHUs required to fulfill expectations for performance" (Moloughney, 2005, p 1). The critical mass required by PHUs to effectively deliver a prescribed set of public health services includes factors such as staffing size/mix, population size, and informational infrastructure (Moloughney, 2005).	- Need
7. Variations in governance formats across PHUs should be incorporated into decisions around funding distribution	PHU governance formats range from decentralized autonomous boards of health to more centralized formats, i.e., regional PHUs. Decentralized governance facilitates resource decisions that are more responsive to community needs, and tend to be less vulnerable to spending reductions (Mays and Smith, 2009). Consolidated governance may facilitate a more efficient utilization of resources across jurisdictions but can also be less effective in equitably representing the needs of unique sub-populations (Mays et al., 2006).	- Autonomy - Accountability
8. Performance measures should be considered in the context of other external factors (i.e., geography and governance structure) if they are linked to funding decisions	Fourteen 'Accountability Agreement' indicators were released by the MOHLTC in 2011 (MOHLTC-MHPS 2011; see Appendix 7) as a first step towards the integration of performance reporting in public health operations. The relative importance assigned to performance measures as a factor in informing allocation decisions should be considered in relation to other variables such as geography, institutional context, economic determinants, governance formats that may impact PHU performance (Mays et al., 2006).	- Transparency - Accountability - Equity

Sensitizing Concepts	Description	Associated social values
9. Input from multiple levels/types of stakeholders should guide decisions around the distribution of funds across PHUs	The range of stakeholders involved in allocation decisions may influence the diversity of perspectives (i.e., political agendas and social values) that are factored into decision-making (Clarke and Weale, 2012). Multi-stakeholder involvement in budget development and priority setting facilitates the inclusion of multiple stakeholder agendas, and may promote greater awareness around the availability of health services, including increases in service uptake and acceptability/adherence (Frankish, Kwan, Higgins, Larsen, and Ratner, 2002).	- Participation -Transparency - Accountability
10. A transparent and systematic process should be established by involved funders to assess resource needs and discuss allocation decisions with PHUs	Currently very little is known about the specific stakeholders, processes, variables or criterion and underlying social value judgments that inform resource distribution practices/policies in public health. In keeping with strategic shifts towards greater transparency and accountability pursued by other parts of the healthcare system, public health may also benefit from formally integrating a greater degree of transparency in assessments of financial need and accountability in the distribution and utilization of resources by PHUs.	- Transparency - Accountability

The 10 sensitizing concepts presented in Table 2 served as key starting points to guide the development of data collection (specifically the interview guide) and support data analyses by helping to familiarize the researcher with core ideas around resource needs, funding mechanisms and allocation practices in public health settings. Given the dearth of existing literature on the topic further consultation with public health professionals was seen as a logical next step in learning more about the relevance of these sensitizing concepts that were developed a priori, as well as others that may not have been captured from a review of the literature. More details on the proposed methodological framework and specific data collection tools that were used to guide data discovery and analyses are presented in Chapter 3.

CHAPTER THREE: METHODS

3.1 Introduction

In light of the limited scope of existing literature on the stakeholders, processes, and principles that inform public health funding, understanding the current funding arrangement as well as the key resource needs of PHUs, will be critical to ensuring that health units are adequately resourced to fulfill their mandated programmatic and performance expectations in the years to come. The key objectives of this study were to develop a better understanding of the mechanisms, variables, and underlying social values that inform the existing funding arrangement, and identify what public health professionals believe are the fundamental principles that guide the distribution of resources across PHUs. The perspectives of public health professionals who have proximal links to current funding processes, served as the basis of the data discovery component for this study. The sampling frame and methods for data collection, as well as the specific analysis techniques that were used to process and analyze the data collected are described in more detail over the course of this chapter.

3.2 Understanding how funds are allocated in Ontario's public health sector

Given the dearth of comprehensive literature on the policies and practices that guide public health funding in Ontario, the perspectives of public health professionals who have proximal links to current funding processes served as the basis of the data discovery component for this study. Initial phases of the literature review revealed that public health professionals in Ontario influence the processes and mechanisms that inform public health funding at two levels, a) provincial government, i.e., MOHLTC and the Ministry of Children and Youth Services, and b) municipal partners, more specifically Medical Officers of Health at each PHU. A series of in-depth informant interviews with public health professionals directly connected to the public health funding, to comment on the topic, were proposed to examine how PHUs are currently funded, and to generate dialogue around what types of guiding principles should be used to guide funding allocation in the public health sector.

Through their current involvement with public health funding in a variety of capacities, it was anticipated that public health professionals would be well positioned to offer complex perspectives around what types of overarching principles should be used to guide resource distribution in public health based on their first-hand knowledge of broad resource needs, the stakeholder agendas and processes involved in budget development. The main objective of the informant interviews was to better understand the existing funding arrangement, and examine what types of guiding principles (and corresponding social values, variables and indicators) that public health professionals believe should guide the distribution of resources across health units in Ontario.

3.3 Sampling frame

The sampling frame for the study included public health professionals from both provincial and municipal levels of government within Ontario's public health sector. Much of the provincial government's support of public health programming in Ontario is directed through the MOHLTC, specifically through the Public Health Division under the Chief Medical Officer of Health branch. Key sub-branches under the Public Health Division include; i) Public Health Standards, Practice & Accountability, ii) Public Health Planning and Liaison, iii) Public Health Policy and Programs and iv) Emergency Management. At the municipal level, Medical Officers of Health at each PHU are responsible for ensuring that PHUs meet the expectations outlined by the OPHS, and are considered to have the most proximal link to understanding resource needs of individual PHUs. Efforts were made to interview a wide range of public health professionals to help develop a balanced understanding of the status quo, and ensure that multiple perspectives around future guiding principles for allocation decisions are solicited and captured over the course of the study.

3.3.1 Sampling and recruitment

Two types of sampling strategies were utilized to develop a representative sample of public health professionals for interview recruitment. At the provincial level, public health professionals (upper level staff, i.e., branch directors or managers of public-health related MOHLTC branches) were targeted for recruitment through purposeful/selective sampling. Purposeful/selective sampling involves a "calculated decision to include in one's sample certain informants or groups of informants based on a preconceived albeit 'reasonable' set of identified dimensions" that are specific to the research being conducted (Schatzman and Strauss, 1973 in Coyne, 1997, p 624; Cutcliffe, 2000). For this particular project, the application of purposeful/selective sampling involved connecting with a wide range of public health professionals based on their roles, institutional links and knowledge of the provincial level decision-making processes around the distribution of resources across the 36 PHUs. It was anticipated that public health professionals at the provincial level would in light of their experiences be able to share in-depth perspectives on the provincial government's historical involvement in PHU funding, and provide insights into provincially established strategic priorities and related guiding principles in public health funding.

At the municipal level, Medical Officers of Health, who are the senior-most public health professionals within each PHU, were recruited through random selection. Using a random number generator, a total of 12 PHUs were randomly selected from the 36 health units that currently serve the

province of Ontario. The rationale for the use of random selection was to ensure that public health professionals at the municipal level have an equal chance of being selected, such that there is no deliberate over or under representation of Medical Officers of Health from a particular type of PHU, i.e., board of health governance format, jurisdiction-type (e.g., rural, urban, and urban/rural mix etc.), or region (i.e., North West, North East, or South West etc.). A variety of features including location, size and population characteristics can influence the level of resources required by public health departments in designing and delivering population health services (Mays and Smith, 2009). Recruiting Medical Officers of Health from the full range of health units was intended to capture the role that different structural, organizational, and other jurisdiction-specific factors may have on resource needs and allocation decisions in public health settings.

It was anticipated that due to the sensitive nature of the topic, there would be some challenges with recruiting public health professionals, particularly those at the provincial level, given the MOHLTC's dominant role in agenda-setting and strategic oversight for the public health sector. If provincial level public health professionals do not respond to the initial recruitment email and follow-up request, the researcher identified an alternate upper-level manager/staff within the same branch (or in another public-health related branch) that shares similar levels of expertise and knowledge of public health funding policies and practices. At the municipal level, if a Medical Officer of Health from the randomly selected PHU does not respond to the initial recruitment email (as well as the follow-up request) or declines to participate entirely, they were replaced with another randomly selected PHU from the total pool of 36 health units.

It was hoped that the final municipal sample would be comprised of a total 12 PHUs, representing one-third of the 36 health units operating in the province, and that the provincial sample will consist of 3-4 upper level staff from across the various branches in MOHLTC's Public Health Division. In the event that challenges in the recruitment of public health professionals for the key informant interviews impedes the adequate representation of informants from each individual sub-group (i.e., provincial and municipal), data collected during the interviews and web survey will not be analyzed independently for each sub-group. Instead the data collected through the informant interviews and web survey would be analyzed collectively, i.e., as a single cohesive group of public health professionals.

A total of 14 public health professionals were recruited and interviewed during the first stage of data collection. Overall, the group was well represented by Medical Officers of Health, i.e., public health professionals at the municipal level. A wide range of PHU settings were represented by the Medical Officers of Health in the final sample. These included multiple jurisdiction types (rural,

urban, and rural-urban mix), governance formats (i.e., autonomous, regional and single-tiered etc.) as well as geographic location (i.e., North West, South West and Central West region etc.). There was significantly less representation from public health professionals at the provincial level. The sensitive nature of the topic and the MOHLTC's involvement (via the FRWG) were cited as reasons for why many provincial level public health professionals declined to participate. As noted in the proposed data collection plan in the event that recruitment challenges inhibit the adequate representation of informants from each individual sub-group (i.e., provincial and municipal levels), the data collected through the informant interviews was analyzed collectively. Therefore the opinions and perspectives shared by public health professionals from both the provincial and municipal levels of government were examined as a single cohesive group of public health professionals, and all findings and conclusions were portrayed as such.

All recruitment for the informant interviews was conducted via email, with follow-ups via phone if required. The recruitment email that was used for the informant interviews is available in Appendix 8. The recruitment information provided to participants described the topic area, project goals, and the type of information that the investigator was seeking, to ensure an appropriate alignment between participants' professional background/knowledge of the topic, and the project's data collection objectives and intended outcomes. All interviews were conducted and recorded using a teleconference recording line. Given the large number of interviews being conducted, an external transcription service (Audability Inc.) was utilized to transcribe the interviews.

The in-depth interviews with key informants ranged between 45-60 minutes, with the exception of one interview that lasted 30 minutes. Table 3 provides a detailed overview of the interviews conducted, including the total number of pages of data collected (374), average number of pages per interview (26.7), average words per transcript (9693.7 words) and average length of interview (61.3 minutes). To ensure maximum consistency in data collection procedures across participants, all interviews were conducted over the phone through a teleconference recording service.

Table 3: Description of interview timing and lengths of transcripts

Participant #	Transcript length (pages)	Number of words	Duration (minutes)
Participant 1	32	11552	59
Participant 2	23	9669	58
Participant 3	25	10351	61
Participant 4	25	8686	63
Participant 5	37	11083	69
Participant 6	29	7194	63
Participant 7	21	8968	54
Participant 8	19	7640	56
Participant 9	22	7527	49
Participant 10	12	4223	72
Participant 11	19	7514	44
Participant 12	27	10767	24
Participant 13	61	23502	145
Participant 14	22	7037	42
Minimum	**12**	**4223**	**24**
Maximum	**61**	**23502**	**145**
Average	**26.7**	**9693.7**	**61.3**
Total	**374**	**135713**	**859**

3.4 Interview format and questions

The informant interviews were designed to be semi-structured with open-ended questions to provide informants with the opportunity to share their understanding of the current funding framework, and describe in their own words what principles they believe should guide the distribution of funds across PHUs. The interview questions were prepared in consultation with members of the thesis committee, many of whom have experienced multiple roles within public health administration and management, to ensure that the proposed questions reflect the terminology used in public health settings, and that questions are phrased appropriately (i.e., are not loaded or leading) so as to allow informants to openly share their perspectives on the topic. The complete interview guide that was used to conduct the key informant interviews is present in Appendix 9. The first half of each interview focused on the current funding arrangement, and included questions such as:

1. How would you characterize the current funding framework for the public health sector?
2. Can you elaborate on cost sharing arrangement between municipalities and the province?

3. What types of fixed and variable costs do PHUs typically incur?
4. Which stakeholders are involved in making decisions around how to distribute resources to PHUs?
5. What variables are used to determine resource needs at a PHU level?

The second half of the interview focused exclusively on obtaining informant feedback on what principles public health professionals felt should be used to guide the distribution of resources across PHUs. Interviewees were asked to share their own principles as informed by their expertise and experience in the public health sector. After informants discussed their own principles, the 10 'sensitizing concepts' that were developed during the literature review (see Table 2) were also suggested as possible directions to reflect upon in order to stimulate further dialogue on fundamental principles to consider. Informants were asked to share any feedback or comments that they have on the validity or relevance of those sensitizing concepts in the context of public health funding in Ontario.

3.5 Web survey

In addition to the informant interviews, a web survey was developed to gather further insights into the interview findings, specifically the principles that were generated based on informant feedback over the course of the interviews. The purpose of the survey was to explore how public health professionals prioritize the different principles and examine how they conceive trade-offs between competing principles in terms of the relative importance in guiding allocation decisions. The principles developed via the interviews were organized into three distinct categories based on the relative importance assigned to them by interviewees in the preceding stage of data collection:

- *Category 1 - Critical to consider*
  This category consisted of principles that were suggested and strongly supported by interviewees as key ideas that would be extremely critical to consider in making allocation decisions. Almost every public health professional discussed these principles at several points over the course of the interviews.

- *Category 2 - Very important to consider*
  Category 2 was comprised of principles that were mentioned and supported by many (but not all) informants as important ideas to consider in making decisions around the distribution of resources across PHUs. The principles in this category were suggested by most but not every public health professional interviewed.

- *Category 3 - Important but not essential to consider*
  Principles placed in Category 3 were mentioned by a few informants and were deemed as pertinent but not crucial to consider in guiding resource allocation in the public health sector. These principles were brought up by a few informants and received mixed levels of support from public health professionals across interviews.

The purpose of dividing principles up into categories was to facilitate the ranking process. Dividing principles up into smaller groups (based informant perspectives gathered during the preceding interview stage) rather than presenting survey respondents with an exhaustive list was intended for survey completion to be more time-efficient for participants, and also make the ranking exercise more reflective of the relative importance assigned to principles, as highlighted in informant feedback.

The survey was sent to a wide subset of public health professionals from the original sampling frame including the Medical Officers of Health for all 36 PHUs in the province, as well as a number of upper-level staff from various public-related MOHLTC branches. Survey respondents were asked to rank the different principles in order of significance, i.e. (Most Significant, Significant, Somewhat Significant or Least Significant etc.), based on the relative value that public health professionals' felt each principle should hold as a potential determinant of resource distribution in the public health sector. A number of open-ended questions were also included to provide survey respondents with the opportunity to suggest or comment on the categorization of principles, and share principles that might not have been brought up during the interviews. The survey was administered electronically via Survey Monkey. All public health professionals identified within the anticipated sampling frame were individually sent an email with a link to the survey. The email invitation that was utilized to recruit public health professionals is available in Appendix 10, and the complete web survey is available in Appendix 11. Current research on the application of web-based surveys indicates that follow-up reminders can have a positive influence on response rates (Sheehan, 2001; Solomon, 2002). Therefore a follow-up email with a link to the survey was sent approximately one week after the initial invitation to help bolster response rates.

It was hoped that a wide range of public health professionals would complete the survey and that responses would provide detailed insights into what extent public health professionals felt that different principles should be integrated into a funding framework for the public health sector and how they conceived trade-offs between competing principles. The survey was completed by a total of 15 public health professionals. Survey responses were exported into Excel from the Survey Monkey database. Data collected from the web-survey was analyzed using Microsoft Excel software. Simple percentage scores were tabulated for all three categories to assess the level of support received by different principles. Variations in percentage responses for each category were used to determine what level of support/endorsement survey respondents assigned to different principles. Key patterns that emerged in rankings within and across categories were explored to determine how public health professionals envision trade-offs between competing principles in terms of their role in guiding

funding decisions in public health. For instance, whether public health professionals consistently rated a certain type of principle higher than others, or if certain types of principles were equally valued by all public health professionals who completed the survey. Respondent feedback from the open-ended questions was reviewed to determine if public health professionals had any insights on the categorization of principles shared in the survey, or had suggestions about additional principles, that had not emerged from the informant interviews. To protect and preserve the identity and confidentiality of participants no identifying information or professional affiliations was collected, and thus no distinctions could be made between the responses of different types of public health professionals in describing and discussing survey results.

3.6 Data analysis - General inductive approach

The general inductive approach towards qualitative data analysis is characterized as a "systematic procedure for analyzing qualitative data where the analysis is guided by specific objectives" (Thomas, 2003, p 2). The main purpose of the inductive approach is to "allow research findings to emerge from the frequent, dominant, or significant themes inherent in raw data, without the restraints imposed by structured methodologies" (Thomas, 2006). Inductive approaches are typically utilized in:

a. Summarizing raw data into more concise formats,

b. Examining and establishing links between the underlying research objectives and summarized findings from the raw data, and/or

c. Supporting the development of frameworks or theories regarding the phenomenon, themes or processes that emerge from the raw data (Thomas, 2006).

Data analysis in the application of the general inductive approach involves repeated extensive review of the raw data. The overarching research objectives provide a platform for data analyses; findings are intended to emerge directly from the data collected rather than through a priori preconceived expectations or an anticipated theory/model (Thomas, 2006). The following techniques are typically used to conduct an inductive analysis of qualitative data (Thomas, 2006).

1. **Data cleaning**: Preparation of raw data, i.e., organizing raw data into specific format.

2. **Close reading of text**: After the raw data has been appropriated formatted, the text is reviewed in detail so that the researcher is able to gain some familiarity with the content, and can begin to identify emerging themes, phenomenon, processes or events in the text.

3. **Creation of categories**: The researcher identifies and defines key categories or themes. Higher order categories tend to be based on the underlying research objectives/questions, whereas 'lower-level' categories are often more specific. For example, lower level categories may include codes that

are generated from phrases or meanings/interpretations of the text.

4. **Overlapping coding and uncoded text**: Inductive analyses allow for text to be coded under more than one node (or category). In addition, text that has no relevance to the underlying research may not be coded to any nodes(s) or categories.

5. **Revision and refinement of categories**: Within each category, sub-categories may be established to convey different dimensions within a particular theme, idea or concept.

Similar to other types of qualitative analysis the trustworthiness (characterized as credibility, transferability, dependability, and confirmability) of qualitative findings developed through inductive analysis may be examined through stakeholder checks (i.e., member checks) and/or consistency checks (i.e., inter-rater reliability assessments) to verify the validity and relevance of findings derived from the data. The specific stages utilized in the application of the general inductive approach for data analysis in this project are outlined below.

3.6.1 Open coding

To protect the identity and privacy of participants, any identifying details, i.e., participant names and professional affiliations were replaced with alternate identifiers. This first stage of data analysis involved a detailed review of transcripts to help the researcher develop an awareness and familiarization with the richness of the data in order to inform the coding process in later stages. Interview transcripts were reviewed concurrently with data collection since the interviews were conducted over a period of a few weeks based on the availability of informants. The idea of a detailed review of the text at this stage is comparable to 'open-coding' commonly discussed in the context of grounded theory approaches. Open-coding is defined by Strauss and Corbin (1990a) as an, "analytic process through which concepts are identified and their properties and dimensions are discovered in the data" (p 110). Each transcript was uploaded into Nvivo 10, and open-coding was employed to organize informant responses, capture the key ideas or concepts emerging across transcripts and draft potential nodes and categories for further consideration in later stages (Bazeley, 2007). As is expected in general inductive analyses, a predetermined coding structure was not utilized during data analysis. Instead the themes and patterns that emerged from the data during a close review of the text were used to guide the development of nodes and categories. The nodes generated in this first stage helped to inform more detailed coding in Stage 2.

3.6.2 Line by line coding - Linking text segments to research objectives

Following an initial review of the transcripts, more detailed line-by-line coding, (i.e., every phrase and segment of the data collected) was conducted to explore all possible meanings and dimensions of informant feedback. Individual nodes were developed within Nvivo 10 through the coding toolbar. Text segments were examined in the context of the underlying research questions. Line by line coding included both 'lumping' of data, which involves summarizing a particular set of ideas or concepts, as well as 'splitting' that entails identifying additional dimensions or interpretations of a particular phenomenon, social process or theme in the data (Saldana, 2009). Nodes that examined similar concepts were amalgamated if and where possible, to eliminate any redundancies. Moreover, if a certain portion of text was coded under more than one node, it was reviewed to guarantee the most appropriate 'fit' between the data and its respective coded location. Text search and coding queries in Nvivo 10 were used to identify keywords in the raw data, to ensure that all transcript data was appropriately coded, and that any additional dimensions that were emerging over the course of the review process were appropriately organized.

3.6.3 Development and elaboration of categories

This final stage of data analysis involved a more structured organization and refinement of codes into categories, and where applicable sub-categories. Where appropriate parent nodes and associated child nodes were organized into separate categories based on theme, and the specific dimensions/ideas grouped under each parent or child node. Individual nodes were reviewed to assess the fit between their coded content and overarching categories. Compound coding queries in Nvivo 10 were used to identify any overlap in coded data between categories to ensure that content coded under more than one node is an appropriate fit for its respective coded location(s). Since only one researcher conducted all coding, the validity of the data was verified through multiple reviews of transcripts and coded content.

In terms of developing and refining the codes some qualitative researchers have suggested the use of 'theoretical saturation' (which involves sampling and collecting data to a point that that no new knowledge is created) as the basis for guiding data analysis (Strauss and Corbin, 1990a). An alternate approach to the idea of 'theoretical saturation' has been proposed by Dey (1999), who suggests the use of 'theoretical sufficiency' - characterized as the stage at which the categories established by the researcher have been developed (and elaborated upon) to a 'sufficient extent', such that relationships between categories can be examined and conclusions may be drawn from the data collected (Dey, 1999). Dey states that theoretical saturation embodies an "inflexible expression because it has

connotations of completion [and] seems to imply that the process of generating categories (and their properties and relations) has been exhaustive" (Dey, 1999, p 116-117, in Andrade, 2009), and thus suggests that it may limit the researcher's flexibility and openness to exploring new ideas, concepts, and relationships in the data (Dey, 1999 in Andrade, 2009).

This study was guided by the idea of theoretical sufficiency in analyzing the interview data. A formal saturation analysis was not conducted; instead Nvivo 10's text search, compound coding, and matrix coding functions were used to examine the frequency with which new nodes were being developed. Reductions in the frequency with which additional nodes and categories were developed and existing nodes were being revised in Stages 2 and 3 were used as an indicator to represent theoretical sufficiency.

3.7 Establishing qualitative rigor

The 'trustworthiness' of qualitative research is assessed in the context of four key dimensions - credibility, transferability, dependability, and confirmability (Guba [1981] in Shenton (2004). Credibility refers to the researcher's efforts to demonstrate that an accurate representation of the issue or topic being examined has been presented. Credibility was ensured by soliciting and connecting with research participants, specifically public health professionals, who were well-positioned to make informed comments about the current funding arrangement and share detailed insights into what principles should be used to guide the distribution of resources across PHUs in Ontario. The combination of purposeful/selective sampling for provincial level public health professionals and random sampling for the Medical Officers of Health across PHUs (i.e., municipal level stakeholders) was used to ensure that a diverse range of perspectives were solicited and collected. Data analysis was conducted in view of a commitment to 'theoretical sufficiency', i.e., no new nodes or categories were emerging from the interview data to ensure that the full range of ideas and dimensions were captured during data analysis for the informant interviews.

A verification step was also utilized to support the credibility of findings; a summary of key findings from the key informant interviews was sent to all interviewees to allow them to share their insights or reflections on the key findings, and ensure that the researcher has adequately and appropriately captured the perspectives of the key informants interviewed. Sharing the researcher's interpretations of informant feedback and the results of data analysis with participants helps to ensure that the investigator has accurately and appropriately 'translated' the perspectives of research participants, therein minimizing the possibility of misrepresentation and/or misleading findings (Krefting, 1991). A brief two-page summary of the findings, specifically a list of the principles

developed over the course of the interviews, was shared with interviewees to collect their feedback and ensure that the researcher's assessment and analysis of interview transcripts adequately and accurately reflects the perspectives shared by key informants. Survey respondents also had a chance to provide feedback on the final set of principles (developed via the interviews) through several open-ended questions intended to allow respondents to comment on the content and categorization of the proposed principles, and offer any additional principles or insights on the topic.

Triangulation was another aspect of this study that was used to promote the credibility of findings. Multiple methods (i.e., the interviews and web survey) were utilized to collect data in an effort to compensate for the limitations of each individual data collection method (Shenton, 2004). Memos are another commonly used technique in qualitative inquiry, intended to promote the credibility of qualitative findings (Shenton, 2004). Memos serve as a form of 'reflective commentary' - they are used to support the researcher in making 'conceptual leaps' from data collected to fully identifying and understanding the themes that may emerge from the data (Birks, Francis, and Chapman, 2008). They are often developed as a way of 'auditing' decisions and events, more specifically to represent the perspective(s) of the researcher at a given stage and can often serve as points of critical review or confirmation across stages of data collection and analysis (Birks et al., 2008). For the purposes of this study, memos were utilized in tracking changes in the coding structure and the development of categories for interview data, as well as in comparing interviews findings with survey results. Constant comparison method was another technique used to promote the credibility of findings. It involves taking segments of data (i.e., broader themes or specific statements) and comparing it with other (similar or different) occurrences in the raw data to develop conceptualizations of potential relationships between various segments/themes in the data (Thorne, 2000). Strauss and Corbin (1990b) propose that constant comparison helps the researcher challenge their own preconceived notions and assessments of the data, to prevent researcher bias and support greater consistency and precision in coding and data analysis. For the purposes of this study, constant comparative analysis was applied both within and across various stages of data analysis involving the informant interviews. Specifically it was used to compare informant feedback with the 10 sensitizing concepts developed during the literature review stages. In addition during each stage of data analysis, a list of codes was printed and dated to record changes in the evolution of coding. Constantly comparing the coding structure with earlier stages of data analysis was intended to help draw more accurate conclusions around the point of 'theoretical sufficiency' and support a refinement of the categories established (Boeije, 2002), to ensure that findings were being drawn directly from the data collected rather than through the researcher's preconceived ideas/assumptions on the topic.

To allow for transferability in qualitative research, the researcher must provide enough detail around the overarching context of the fieldwork conducted to enable the reader to understand and determine whether the surrounding context within the study occurred is comparable to other situations/settings. A detailed description of the study context was provided to allow readers to determine if study findings are applicable to other research settings. An overview of Ontario's public health sector (structure, history and mandate) was provided to help readers contextualize findings and determine the degree of transferability of results to other settings. The dependability criterion refers to the extent to which a study may be replicated by other researchers. Clear descriptions of the sampling frame, specific data collection tools (i.e., interview guide and survey) and data analysis techniques utilized in the project have been provided to allow for other researchers to replicate the study.

To achieve confirmability, researchers must demonstrate that appropriate steps were taken over the course of the research process, to ensure that findings emerged directly from the data rather than through the preconceived notions or perspectives of the researcher themself (Shenton, 2004). A decision trail was completed to provide readers with an overview of the various steps taken by the researcher from the start of a research process to its completion and reporting of findings (Robert Wood Johnson Foundation, 2008). Decision trails in qualitative research provide insights into the rationale for a researcher's decisions, by helping to identify how and why certain patterns or themes in the data were observed and chosen by the researcher, and how those decisions lead to coding, the formation of categories and ultimately the development of conclusions based on the data (Malterud, 2001). The decision trail provided in Appendix 12 is intended to allow readers to examine the theoretical, methodological, and analytic choices made by the researcher to help frame key findings in light of the original research questions and underlying context for the study.

3.8 Ethics approval

Under the Government of Canada's Panel on Research Ethics, Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans (TCPS 2, Articles 6.1-6.12), an ethics review by a full Research Ethics Board is the minimal requirement for research involving human participants (University of Waterloo, 2012). Ethics approval (ORE 18826) from the University of Waterloo's Office of Research Ethics was received before any participants were recruited. Since the informant interviews were conducted via telephone, informed consent was obtained over the phone in the form of verbal consent. An information letter with details pertaining to the purpose of the study, informed consent, compensation for participants as well as contact information for the researcher was sent via email to participants in the initial recruitment email. The information letter also contained information

regarding audio recording of the interview, verbal consent and the use of anonymous quotations in the study (and any related publications), and brief details regarding the web survey that would be sent to participants after the first round of data collection is completed. The information letter used in participant recruitment for the in-depth informant interviews is available in Appendix 13. The personal identities and professional affiliations of key informants were protected to preserve the confidentiality of all informants. In the event that direct quotations are used, they were not be linked to the real identities of participants, and names were replaced with generic numeric codes.

The web survey was designed to be completely anonymous. Participants were individually sent an electronic link to the survey (hosted on Survey Monkey) by the researcher. No identifying information (names, processional designations/affiliations, or internet protocol [IP] addresses) was collected. And no identifying characteristics or direct informant feedback from the interviews or web survey was shared with other participants or the general public. Chapter 4 will provide a comprehensive discussion of the key findings in relation to the key research questions outlined at the start of the study.

CHAPTER FOUR: FINDINGS

4.1. Introduction

This study was intended to develop a better understanding of the current funding arrangement and to examine the perspectives of public health professionals on the core decision-making principles that should be used to guide the distribution of funds across PHUs. As outlined in the methods chapter, the data discovery component of this research project consisted of a series of open-ended key informant interviews with public health professionals. Following the completion of the interviews, a web survey was sent to a broad range of public health professionals to explore how different public health professionals rank the principles developed and perceive trade-offs between competing principles. This chapter will discuss the implementation of the specific stages (and techniques) for data analyses discussed in Chapter 3. Key findings will explored in light of the original research questions over the course of this chapter.

4.2 Data analysis - Key informant interviews

Once the interviews were completed, transcriptions of the interview recordings were uploaded to Nvivo 10. Since interviews were transcribed by a professional transcription service (Audability Inc.), transcripts were verified against the original recording by the researcher (i.e., the principal investigator) to detect any errors in the transcribed materials (i.e., cross-talking, unclear feedback, spellings etc.). Transcripts were then analyzed using the strategies described below.

4.2.1 Open coding

Following the formatting of raw data, the researcher engaged in a cursory review of the transcripts to get acquainted with interviewee feedback and identify potential nodes or categories that could be used to classify the interview data via ‘open coding’. Over time the researcher developed a strong sense of familiarity with the themes and key concepts that were being shared by interviewees. A number of initial nodes were established based on frequently occurring themes and common ideas that were emerging within and across interviews. Coding was initiated after the first few interviews were transcribed, and took place concurrently as interviews were being conducted. The nodes generated in this stage were intended to guide further detailed coding and categorization of data in the next stage and are presented in Table 4. Many of the initial nodes developed reflect some of the key themes outlined by the sensitizing concepts (see Table 2). Specifically, ideas around cost-sharing and the shared responsibility for funding public health programs (sensitizing concept 1), population needs-based resource assessment (sensitizing concept 5), as well as health inequalities and related resource

requirements at a PHU level (sensitizing concept 2) were among the key themes that were observed across the original sensitizing concepts and the core ideas that emerged during the initial review of transcripts.

Table 4: List of nodes generated during open coding

Node	Description
Historical allocation	Key feature of the current funding arrangement used to distribute funds across the 36 health units
Cost-sharing and solidarity in funding allocation	Shared financial responsibility between municipal and provincial governments for the provision of funds for PHU programming
Insufficiency of funds	Gaps in the existing resource needs of the public health sector
Population-needs based allocation	Public health's population level scope and the importance of aligning funding mechanisms with population health needs
Fixed costs	Types of fixed costs incurred annually by all health units
Political will and perceived value of public health	Stakeholder (provincial, municipal governments and boards of health) and public perceptions around the role and value of public health/PHUs, and resulting levels of strategic priority assigned to public health issues and related resource needs
Performance measurement	Current status and challenges associated with the use of performance measures in public health
Equity	Equity issues faced by health units as well as the challenges associated with integrating equity considerations into funding allocation practices
Critical mass and economies of scale	Restructuring health units (i.e., amalgamations) to develop more appropriate economies of scale and generate cost-efficiencies in the provision of public health services across PHUs
Cost-efficiency	Opportunities to develop more cost-effective ways to design and deliver public health programs
Transparency and accountability in public health	Transparency and accountability in terms of allocation mechanisms and the role of stakeholder influences in shaping allocation decisions
Autonomy/Participation	Level of autonomy that PHUs and other stakeholder groups have in influencing assessments of PHU resource needs and subsequent allocation decisions
Cost-drivers	Key variables that influence costs in the design and delivery of public health programs

4.2.2 Line by line coding - Linking text segments to research objectives

The second phase of data analysis involved a detailed review of transcripts. The initial nodes and associated content were closely reviewed in light of the original research questions. Additional nodes were developed to separate individual dimensions within a particular theme. For example, the ideas coded under 'Transparency and accountability in public health' in Stage 1 were reviewed and reorganized into separate nodes illustrating specific themes/aspects of transparency in public health funding, which included 'Feedback loops between funders and PHUs', 'Transparency in funding allocation' and 'Performance measurement in public health'. Nodes were refined using Nvivo 10's text search and compound coding query functions. Codes with fewer sources (and references) were continuously revisited (via constant comparative method) to assess whether they should be organized as a sub-set to an existing node or considered as an independent node. For instance, references that had initially been coded under 'Historical allocation' and 'Cost-sharing and solidarity in funding allocation' in Stage 1, were consolidated into 'Current funding arrangement' in Stage 2, since they both represented different components of the existing funding framework. Constant comparative method was used to compare the content coded under individual nodes in Stage 2 to determine whether additional nodes were needed to represent different dimensions/themes in the data. At several points over the course of data analysis a full list of nodes was printed and reviewed to assess potential consolidations, i.e., the lumping or splitting of data as needed (Saldana, 2009).

This process of reviewing and revising codes lasted several weeks, and by the end of Stage 2, a total of 31 nodes had been created. These are described briefly in Table 5. The second stage of coding underscored several other areas of overlap between public health professionals' feedback on the principles that should guide allocation decisions and the initial sensitizing concepts. Interviewees discussed at length the need to acknowledge the specific resource needs of rural PHUs (sensitizing concept 4) and strongly emphasized the importance of structural reform to achieve greater economies of scale in their feedback around funding PHUs based on critical mass (sensitizing concept 6). Some of the nodes developed in this stage were linked to actual principles shared by public health professionals, while others were linked to 'non-principle' related feedback/ideas for PHUs; conceptualized as important supporting aspects in the design and implementation of allocation practices in public health settings. The nodes that are linked to the specific principles proposed by public health professionals over the course of the interviews are marked by an asterisk (*) sign in Table 5.

Table 5: Detailed list of nodes, descriptions and associated sources

Node (n=31)	Description	Number of sources
1. Variables that influence PHU funding need	Refers to the individual variables that influence resource needs at a PHU level	12
2. Value of public health	The importance and priority given to the public health sector/PHUs at a both municipal and provincial level (compared to other municipal interests or at a provincial scale with other parts of the healthcare system)	8
3. Unmet PHU need	Describes the key gaps in existing PHU resource needs	10
4. Feedback loops between funders and PHUs	The lines of communication between different funding bodies (i.e., municipal and provincial governments) and PHUs	6
5. Transparency	Degree of transparency observed in the processes surrounding resource assessment and allocation for PHUs	8
6. Ontario Public Health Standards (OPHS)	The legal mandate of PHU roles and responsibilities that is designed and administered by the provincial government	6
7. Multi-stakeholder involvement-participation	Describes the roles of different stakeholders in influencing decisions around resource allocation for public health	11
8. Empirical guidance in funding allocation	Discusses the extent to which decisions round resource allocation are guided by empirical evidence	8
9. Performance measurement in public health	Refers to ideas around the role of performance measurement in the public health sector including notions around the development and application of valid performance indicators and the value of benchmarking	14
10. Integration and consolidation of resources for public health	Consolidating resources and expertise across PHUs to improve cost-efficiency/effectiveness in the delivery of public health services	11
11. Strategic and legislative changes	Ideas around potential improvements to the current funding arrangement (including structural and legislative changes to support alternative thinking around public health funding)	12
12. Equity*	Discusses the idea of equity in the context of resource distribution (within and across PHUs) and priority-setting with regard to equity challenges facing the public health sector	11
13. Current funding arrangement	Description of the current funding arrangement utilized in the distribution of resources across PHUs in Ontario, including changes in allocation mechanisms and funding policies over time	13
14. Cost-efficiency	Ideas on how to improve cost-effectiveness in the design and delivery of public health services	13

Node	Description	Number of sources
15. Economies of scale*	Examines the potential of restructuring health units to achieve greater economies of scale in the design and delivery of public health services	13
16. Budget development	Describes the processes, procedures, and stakeholders involved in the development of PHU budgets	7
17. PHU governance format	Refers to various organizational structures and governance formats of different PHUs and their influence on resource needs and allocation decisions	9
18. Base capita funding*	A minimum base per capita allocation granted to all PHUs to carry out mandated roles and responsibilities	8
19. Accountability*	Accountability in terms of allocation decisions, PHU spending and reporting relationships between different funders and PHUs	8
20. Special considerations for high-risk vulnerable populations*	Identifying and allocating funds to address the health needs of certain high risk/vulnerable populations	14
21. Retaining historical allocation	Retaining elements of the historical funding framework which is currently used to distribute resources to PHUs	10
22. Cost-sharing and shared responsibility	Cost-sharing of public health services between different funders/stakeholders under the assumption that the delivery of public health services is a shared responsibility that requires financial contributions from multiple levels of stakeholders	14
23. Jurisdiction-specific needs	Additional resources required to cater to unique jurisdiction-specific public health needs across PHUs	10
24. Resource allocation and critical mass*	Allocating funds to PHUs based on assessments of 'critical mass' (i.e., a minimum level of resources and infrastructure required to operate and maintain a PHU)	13
25. Performance measurement and funding allocation in public health*	Linking PHU performance to allocation decisions	14
26. Rural health needs*	Refers to the role of a PHUs location/jurisdiction-type (i.e., rural, urban, mixed etc.) in influencing resource needs	14
27. Population-needs based funding*	Allocation of resources to PHUs based on population level characteristics	14
28. Transparency in funding allocation*	Funding for PHUs should be allocated in a transparent manner such that allocation decisions are clear and understandable for all involved stakeholders	7

Node	Description	Number of sources
29. Cost-drivers in public health*	Key factors in the design and delivery of public health services that drive costs upwards	13
30. Emergency situations	Resource needs and funding protocols in emergency situations	6
31. Changes in funding allocation over time*	Changes in resource needs over time (such population growth and inflation) and processes to adjust for evolving resource needs	9

4.2.3 Development and elaboration of categories

Coding qualitative data is by its very nature a 'cyclical process' - the researcher compares and reflects on the relevance and fit of coded data and emerging patterns/themes across various stages of data analysis (Saldana, 2009, p 8). After a thorough refinement and review of the nodes generated, the final nodes were organized into broad categories based on their underlying themes. Nvivo 10's compound coding and text search function were used to ensure that individual categories contained relevant nodes. A total of 8 categories were established to represent the fundamental concepts that had emerged from across the key informant interviews, and are described briefly in Table 6.

Table 6: Summary of major categories

Category (n=8)	Description
1. Current funding arrangement	The funding format, stakeholders, political/municipal influences and mechanisms that influence the distribution of funds across the 36 PHUs in Ontario.
2. Need	The specific factors/variables that influence the level of resources required by health units to meet performance and programmatic expectations
3. Equity	Incorporating equity in allocation decisions for the public health sector
4. Transparency and accountability	Transparency in the agendas, variables, procedures and processes that inform funding allocation decisions, and accountability among stakeholders for resources distributed to the public health sector (i.e., PHUs)
5. Cost-Efficiency	Cost-effectiveness in the delivery and dissemination of public health programs
6. Solidarity and shared responsibility	Shared liability/responsibility for financing the delivery of public health programs across multiple stakeholders/funders
7. Multi-stakeholder involvement	The involvement of multiple levels/groups of stakeholders in influencing various stages of budget development and resource allocation for PHUs
8. Strategic changes and best practices	Key ideas around strategic policy and practice reform around public health funding, including best practices from other sectors.

4.3 Interview findings

The remainder of chapter will provide a detailed discussion of the findings from the key informant interviews. Findings are organized into four sub-sections described briefly below:

- Section 4.4, explores how informants described the current funding arrangement used to distribute funds across the 36 PHUs in the province.
- Section 4.5 examines key findings from the interviews in terms of the overarching principles that public health professionals believe should guide public health funding
- Section 4.6 explores process-based ideas, i.e., key supporting features in the design and implementation of allocation policies/practices in public health settings that were shared by public health professionals over the course of the interviews. The process-based ideas were oriented around which stakeholders should be involved in funding public health services and how services should be delivered, rather than how should be funded.
- Section 4.7 examines strategic changes and best practices from other sectors that public health professionals suggested for consideration in the context of Ontario's public health sector.

4.4 Examining how funds are currently distributed across Ontario's 36 PHUs

The first research question sought to examine how funds are currently distributed across the 36 health units that serve the province of Ontario. This line of inquiry was not intended to explore what the appropriate size of the public health sector's budget should be, rather it was intended to developed a better understanding of how the funds allotted to the public health envelope are distributed across the 36 PHUs. Category 1 - 'Current Funding Arrangement' included the key insights shared by public health professionals in their discussion of the current funding arrangement. Table 7 provides an overview of the key sub-categories alongside any additional dimensions pertaining to the core ideas shared by public health professionals during the interviews.

Table 7: Overview of key nodes in the 'Current Funding Arrangement' category

CATEGORY: CURRENT FUNDING ARRANGEMENT	
Sub-categories/nodes	**Additional dimensions**
1. Historical Allocation	1. Historical allocation mechanisms supplemented by additional forms of funding (i.e., policy, performance, jurisdiction-specific programming etc.)
2. Cost-sharing Arrangements	1. Cost-shared versus 100% provincially funded programs 2. Variations in municipal and provincial contributions to cost-sharing arrangements

Sub-categories/nodes	Additional dimensions
3. Budget development processes	1. Processes and stages involved in PHU budget development 2. Fixed versus variable costs at the PHU level
4. Unmet PHU needs	1. Changes in resource allocation over time 2. Gaps in existing resource needs
5. Politics and governance	1. Municipal commitments to public health 2. Influence of PHU governance format on allocation decisions 3. External factors that influence resource needs (i.e., municipal-provincial interactions, political priorities, strategic directions)

4.4.1 Historical allocation

Overall, informants characterized the current funding arrangement as predominantly historical allocation (PHU budgets are based on annual increments from the previous year's allocation) with supplementary funding offered to PHUs occasionally for specific strategic or policy-based programming, or for jurisdiction-specific requirements. Supplementary funding was provided to help PHUs implement specific policies based on strategic initiatives put forth by the provincial government. Additional one-time funding for programs to address unique jurisdiction-specific needs was also occasionally offered to PHUs through a grant proposal process that provides health units with the option to apply for a limited a one-time non-renewable grant. This one-time funding is drawn from a pool of collective unused PHU funds at the end of the fiscal year, thus its availability varies considerably from year to year. Commonly shared examples of specific strategic or policy-based supplementary funding included recent funding provided to all PHUs for the hiring of a chief nursing officer position and two public health nurse positions dedicated to addressing social determinants of health at the PHU level, as well as funds allotted to implementing the Smoke-free Ontario policy at a municipal level. Several informants commented specifically on this idea of 'combination' funding:

> If you had to pick one it's a combination but it is primarily historical… with a percentage added. A smaller amount from provincial envelope funding and from time to time, and smaller amounts still by competition… so, for example, the province will say usually in the area of community mobilization or disease prevention… we're interested in ideas, give us your [feedback]—put it in a grant proposal and we'll get back to you. But they're a very small percentage of our [overall] budget. (Participant 5)

> I would say that the major part of it is probably historical, so you would probably call it global funding, but historically there have also been some efforts to address population growth, and so in some ways it's a bit of a mix between population-needs based funding and global [i.e., historical] funding. Now, that having been said, there are certain areas that receive targeted funding from the Ministry. So, in that sense, those are policy-based funding. For example, the Ministry had wanted Health Units to have Chief Nursing Officers, so there was 100% funding associated with that... Those are the sort of policy-based funding

> [allocations], essentially the policies that the Ministry wishes to be implemented. (Participant 4)

Informant feedback suggested that there appears to be some population base in financing public health programs, particularly for the more policy-based (i.e., Smoke-free Ontario) programs. Some of the cost-shared programs may also receive small annual increments based on population growth, however there is a great deal of variability in terms of annual increments to PHU budgets. Overall public health professionals suggested that PHU budgets have been driven mostly by the historical precedence assigned to public health by the respective municipal governments within each PHU's jurisdiction. Municipalities were initially liable for funding public health in the late 1990s under the Services Improvement Act (1998) (Pasut, 2007). Municipal support for public health issues has historically set the precedence for the level of municipal funding provided to PHUs, which in turn informs the subsequent provincial match, so any changes in allocation decisions over time are built upon that original historical precedence.

In their discussion around the existing funding arrangement, almost all informants discussed at length the absence of clear empirical evidence behind the funding mechanisms that currently govern the distribution of resources across health units in the province. Some interviewees mentioned that board of health/municipal support for public health programming was the key determinant of historical allocation decisions for PHUs, but overall many public health professionals emphasized that there was not a great deal of clarity around the specific underlying factors that inform historical allocation decisions. Several informants commented in great detail on this issue:

> I just think that historically, you know, none of us can even really articulate how it was set, so that's not very meaningful. Maybe there is some kind of base funding that everybody should receive and then go from there. But to be basing it on some kind of history that we're not even sure how it was designed, that doesn't make a lot of sense to me. (Participant 7)

> I do not think it was ever population based. Public health used to be a municipal responsibility... I think the historical funding was almost based on what the municipality of the day was currently providing... And how each individual municipality came up with that, I mean I think that's why you have just this massive variation in the per capita funding for health units that exists now. (Participant 5)

> It's [current funding model] basically historic, and they have absolutely no idea as to how it was arrived at… It's very unclear as to how it was originated, and a lot of it probably was dependent upon who was at the table devising it at the time. (Participant 10)

> It's a multi-factorial allotment that is based primarily on historical factors that have been obscured by the myths of time. So, to say that this is a systematically applied funding formula would be incorrect. It's not. (Participant 6)

Several informants discussed the challenges associated with developing and implementing an alternative funding strategy that key stakeholders in the public health sector may agree upon. Competing stakeholder interests and the difficulties associated with transitioning to an alternate funding approach, especially one in which some PHUs might gain funds at the expense of others, was seen as a major deterrent to a shift away from the status quo. But despite the challenges associated with devising and implementing an alternate funding strategy for public health, most informants suggested that a transition to a more empirically-driven framework similar to what has been observed in the acute-care and the hospital systems funding frameworks (i.e., HBAM and quality-based procedures) is increasingly critical for the public health sector. There appeared to be a general consensus across public health professionals that the funding framework's reliance on historical precedence, and therein the absence of empirical evidence as the driving force behind historical allocation decisions has made it challenging for PHUs to effectively accomplish their mandated responsibilities, especially in light of increasingly resource-intensive population health needs (i.e., aging populations and growing burdens of chronic disease etc.), and pressure to limit PHU expenditures while also meeting stringent performance measures and performance expectations.

Citing limited alignment between historical funding and evidence-informed resource allocation, many respondents stressed to the need to consider alternative ways to finance public health services, particularly in light of evolving population health needs, growing pressure from stringent performance measurement, and the increasingly complex expectations of PHUs under the OPHS. All of the public health professionals interviewed heavily stressed the need to consider shifting towards an alternate funding arrangement, with many mentioning the FRWG as a possible source for new directives around public health funding in Ontario over the next few years.

4.4.2 Cost-Sharing

The current cost-sharing agreement utilized by the public health sector, involves a 75-25 split between municipalities and the provincial government (primarily the MOHLTC), for a fixed portfolio of programs under the OPHS. While the minimum 25% in municipal support is the mandated requirement, many municipalities cover more than their required share. In fact 19 of the 36 PHUs currently operating in Ontario, contribute more than the required 25% in municipal funding, with some municipalities contributing as high as 38% of the total (Participant 13). Aside from the 75-25 cost-shared programs, the province fully-finances a number of other mandatory programs including Health Babies Health Children, Healthy Smiles Ontario, Smoke-Free Ontario, and Sexual Health Hotline and Resource Centre (ALPHA, 2010). Within 100% provincially funded programs, a number

of initiatives are cost-shared with additional ministries at the provincial level, including the Ministry of Child and Youth Services (MOCYS) that jointly fund Health Babies Healthy Children with the MOHLTC, and the Ministry of Health Promotion and Sport (MHPS) (that has recently been amalgamated back into the MOHLTC) that was previously involved in financing Health Smiles Ontario (HSO), Children In Need of Treatment (CINOT) and the Healthy Communities Fund (HCF).

From a legislative perspective, the delivery of public health services at a municipal level is considered a municipal responsibility under Section 72 of the HPPA, which states that the legal liability to finance boards of health rests with the obligated municipalities within a PHU's given jurisdiction (Pasut, 2007; Government of Ontario, 2011, MOHLTC 2012c). And while ultimately municipalities are responsible for financing PHUs, the provincial government has and continues to serve as the majority funder for public health in Ontario. Many informants emphasized the significance of the HPPA's legislative power over municipal governments in terms of how it requires municipalities to commit to financing public health services, and thus hold a stake in prioritizing and promoting public health issues within the municipal agenda. As one informant commented:

> … [Under the HPPA] municipalities are obligated to pay in order for public health to do their job, so if the board [of health] says "We need you to pay 7% more than you're paying local municipalities because we can't meet the Ontario Public Health Standards", then the municipality is obligated to pay, and that's a very powerful piece of legislation. It gives the board of health a lot of clout over the municipality. (Participant 1)

Some interviewees discussed previous fluctuations in cost-sharing agreements between the municipal and provincial governments and the resulting challenges that changes in cost-shared contributions have had on the effective planning and delivery of public health services[2]. Many public health professionals felt that drastic transitions in cost-shared contributions created significant practical difficulties and uncertainty in terms of proactive planning and staffing for the delivery of public health programs. The general recommendations across informants for cost-shared contributions were to either retain the current 75-25 split or shift to 100% provincial funding. Several interviewees stressed that 'downloading' the responsibility for financing PHUs to municipal governments would not be feasible or sustainable, especially for those municipalities with smaller population bases because municipal funding for public health is linked to property tax assessments. Thus in the event

[2] Prior to 1998, a 3:1 cost sharing arrangement was used, with the provincial government covering 75% of the PHU costs. This was followed by a shift to 100% municipal funding in 1998, and then a 50-50 split between the province and municipalities in 1999 (Pasut, 2007). Operation Health Protection (OHP) was launched in 2004, by the MOHLTC. Under OHP, PHUs saw a steady and progressive growth in the province's contribution to the cost-sharing agreement, from 55% in 2005, 65% in 2006, and 75% in 2007, where it remains as the current standard (Pasut, 2007; ALPHA, 2010).

that funding was shifted entirely to municipalities, sparsely populated health units would be drastically under resourced to effectively implement the OPHS mandated for all PHUs.

Informants also mentioned that since the provincial government largely determines the public health sector's agenda (i.e., OPHS) that the province should be the majority funder, along with mandated support from the municipal governments since public health programs are ultimately delivered at the municipal level. Across interviews there was considerable support for retaining cost-sharing arrangements, and the idea of solidarity in financing PHUs across multiple levels of government was widely supported by many of the public health professionals that were interviewed.

4.4.3 Budget development processes

Typically the budget development process for health units begins towards the end of the year, and is initiated internally within PHUs. Under the historical allocation approach the previous year's budget is used as the basis for future planning, i.e., examining deficits, surpluses and areas of immediate resource need etc. The proposed budget is then put forth to each PHU's corresponding board of health, which reviews and approves the budget before it is sent across to the MOHLTC for provincial approval. As one interviewee discussed:

> The budget process begins in the fall, and it begins in the health unit with the managers of the various teams looking at their current year's funding, looking at any surpluses and deficits, and looking ahead to what they forecast for the next year… We put forth a budget that's based on guidelines that have been already put down from the local municipality. So, for example, if they say to us "We want a zero percent increase," then we try to stay very low. If they give us some indication that they are looking at 1% [in increased funding], then we use that to help us form our budget. The budget is usually heard in January by the Board of Health, and then whatever is passed at that level, goes on to the province for their consideration, and the timing of the provincial review is that we usually don't hear until July. (Participant 7)

Human resources (HR), i.e., staffing, salaries and benefits was cited a one of major fixed components of PHU budgets, given that between 75-90% of the average PHU's budget is composed entirely of staffing/HR costs and employee benefits. In addition to staffing and HR costs, another major component of PHU budgets mentioned by informants was office/building occupancy; while many PHUs own the buildings they are housed in, but many health units actually rent their premises. Other categories of fixed expenses included, staff training, staff travel, office equipment, expenses, printing, and postage etc., and board/volunteer training and recognition. Variable costs included changes in programmatic needs due to population growth, changes in burdens of illness and associated risk factors, emergencies and outbreaks etc., as well as evolving policy or strategic priorities and related programmatic and staffing expenditures.

4.4.4 Unmet PHU need

Interviewees discussed key gaps in resource needs within the public health sector, primarily in the context of limited changes in the level of resources allocated to the public health sector, compared to other parts of the health care system and in terms of limited adjustments to PHU budgets over time. Many informants also stressed that the funding received by the public health division of the provincial government dwarfs in comparison to the acute-care and hospital sector, and does not reflect the claims and political commitments to public health that are promoted in the public eye. And many interviewees commented on how this systemic underfunding is a testament to the low strategic priority assigned to the health promotion and prevention mandate:

> I think the provincial government, and the Ministry of Health needs to look at how they are allocating health funds, because we receive less than 3% of the budget... They keep talking about prevention, but they never put their money where their mouth is, so I think it needs to start there, and then maybe we could have a process where we [public health professionals] have input [in allocation decisions]… They've been talking about it for years but the never change anything. (Participant 2)

> [Funding commitments to public health] haven't changed over the years, it's always 2% to 3%. It's really not a lot of money when you're talking about primary prevention and trying to get a better handle on these public health issues, [to control] the healthcare costs that we have now. (Participant 2)

Changes in resource allocation at the PHU level have been restricted to very limited increases especially in the last few years. Several informants mentioned that the gap between allocation decisions and resource needs was observed across both cost-shared programs as well as 100% provincially funded programs. 100% provincially funded programs require operational overheads including additional costs from inflation that PHUs have to ultimately finance from their own budgets:

> That whole zero percent thing had started long ago in the 100% programs… So, in fact, if you look at a program like Healthy Babies Healthy Children, it's 100% funding, but the funding has not increased over the last four or five years, it's been zero, zero, zero, zero in terms of the increase. The implication for health units is that their costs are going up despite the fact that the funding is staying the same. (Participant 3)

> We did have a stretch there where we were having larger increases, but overall in my career in public health the funding has been quite restrained. Many of our 100% funded programs have not had increases for several years. Last year, a couple of them did receive very small increases, but many of them have stayed the same for many years, and haven't kept up with salary increases or inflation. (Participant 2)

Cost-sharing arrangements between municipalities and the provincial government further complicate annual resource increments, since any increases in the provincial governments

contribution have to be matched 3:1 by the municipal government. Municipalities are often reluctant to commit any more than their mandated minimum contribution of 25%, which presents a significant challenge for PHUs in terms of advocating for and receiving additional funds over budget years. PHUs that have historically received less support from their respective municipalities have by virtue of cost-sharing arrangements also received fewer cost-shared dollars from the provincial government. Under-resourced PHUs already face serious challenges in implementing the OPHS and responding to changing population health needs within limited budgets, systematic efforts to address these prominent gaps in resource needs were proposed as a critical component of future dialogue around funding allocation for the public health sector.

4.4.5 Politics and governance

Another common theme that emerged in informant feedback around the existing funding arrangement for public health funding was the role of political influences and governance formats in shaping municipal support for PHUs as well as strategic provincially driven system-level priorities for public health. Municipal politics play an important role in influencing municipal support for public health issues. PHU budgets are based on historical allocation decisions, essentially those jurisdictions that originally received larger municipal contributions have been able to exponentially grow their budgets over time, compared to those PHUs who received more limited municipal assistance when the current funding formula was initially established. The level of municipal support (based on historical precedence) that PHUs received from municipal governments continues to impact PHU budget sizes under the current funding framework. Municipal politics and the degree of importance that is assigned to public health issues on the municipal agenda, inadvertently also impacts the level of cost-shared funding PHUs receive from the provincial government. As one informant commented:

> The political agenda at the municipal level is also a factor... There are some cases when additional funding is provided to health units, but the municipality decides it does not want to provide additional funding to the public health unit, in which case then the Ministry's funding - the provincial government's funding, is withdrawn… So that's an example of where the municipality may have different objectives than the provincial government. (Participant 14)

Many public health professionals suggested that a board of health’s governance format (i.e., regional, autonomous, or single-tier etc.) could have an important influence on which specific stakeholders are involved in making allocation decisions. Informant feedback suggested that autonomous boards of health by and large appear to be the most successful advocates for PHUs, and due to their autonomous design exercise a prominent degree of independence in agenda setting, planning and oversight for their respective health unit. In comparison PHUs with a single tiered

format, where the municipal councils serves as the board of health, funding for public health issues/programs, must compete with other municipal priorities including policing, fire safety, and other infrastructural developments (i.e., roads, bridges etc.). Similarly within regional structures, public health resource needs have to be justified against other large-scale regional priorities i.e., public works, community and infrastructural development etc., which presents an added degree of competition in terms of PHUs being able to successfully advocate for their resource needs. Many informants criticized single tier and regional formats for the low priority that public health issues and the stiff competition that public health issues face against other municipal or regional priorities in those settings. Conversely autonomous boards of health were described as the most supportive environment to advocate for public health issues. Several informants commented at length on role of different governance formats and political influences on PHU budgets:

> One of the weaknesses of a regional authority structure is that you are directly competing for resources in front of everybody else – roads, sewers and libraries, right? And an autonomous board of health who's membership is composed of people from a municipality, as well as people from the province, they don't necessarily perceive the fight for resources in as direct a manner, and so you can really push for the fact that public health needs certain resources for specific things without drawing obvious comparisons to other municipal priorities. So, I think it can be easier to 'sell' the resource needs at the level of a board of health than in a regional authority. (Participant 3)
>
> In some single tiered municipalities, the municipal council is the board of health. And I think that's outrageous and shouldn't be permitted under the legislation that governs health boards… When the municipal council has to make the decisions about resource allocation for the police, fire, roads, bridges, in addition to public health - that's just terrible. It makes a mockery of the power that boards of health have to obligate their municipalities to contribute to public health issues. That decision-making power should not rest with the municipal council. (Participant 6)
>
> I personally would not like the entirety of [municipal] council to be the Board of Health. I don't think it allows for sufficient focus on important topics that are under consideration. Most major councils are dealing with everything from, you know, transportation to roads so having a special purpose body I think is incredibly important. If you want my honest opinion, the worst model is the regional model. (Participant 9)
>
> I've seen all types of Boards of health. I certainly think the autonomous boards of health work best… because then you have a board that is committed and dedicated only to looking at public health. So it has its own agenda and it allots the time that it decides on discussing matters of public health. When you're a part of regional government you are one agenda item on a busy day. (Participant 8)

Interviewees also discussed the relationship between municipalities and the provincial government, and the extent to which boards of health leverage that interaction to access additional resources, as an important determinant of funding decisions. Several informants revealed that some

PHUs (and corresponding boards of health) are more involved and active in terms of their links to the provincial government (specifically the MOHLTC), that allowed those PHUs to better advocate for jurisdiction-specific needs and impart a more prominent influence on future directions for public health funding reform.

Political priorities at the provincial level may also play an important role in influencing agenda-setting for the public health sector overall, including what system-level priorities are established and how those are linked to various resource distribution mechanisms. Two specific examples, the Health Kids Strategy (the MOHTLC's recent campaign to tackling childhood obesity), and the chief nursing officer and public health nursing positions were discussed as strategies where political strategic directives informed resource decisions in the public health sector. Many informants felt that constantly aligning resource distribution mechanisms with frequently evolving priorities set by the provincial government can be a significant challenge, especially when decisions on priority setting based on political agendas, that directly impact PHU budgets and operations, are made in a top-down format with limited consultation with PHUs:

> When the government decides that it wants to focus more on one area or public health issues, then PHUs may need to redistribute their funding amongst their various priorities, their local priorities, which may not align necessarily with the province's agenda. So I think sometimes there is a bit of a disconnect there. (Participant 14)

Interviewee feedback highlighted the variety of roles that political influences in the form of municipal support for public health issues, board of health governance formats, and external politically driven priorities can play in informing the value assigned to public health issues, and the level of competition faced by PHUs when competing for limited municipal funding. And while political influences and governance formats may not have as 'overt' of an impact on resource needs, compared with some of the more 'empirically-oriented' variables like population growth or disease prevalence, they were discussed by many interviewees as important influencing factors in terms of the stakeholder agendas and processes that influence resource assessments and ultimately allocation decisions in the public health sector.

4.5 Identifying what principles public health professionals believe should guide the distribution of funds across PHUs

The second research question sought to identify what core principles public health professionals believe should guide future directions around public health funding. For the purposes of this project, the term 'decision-making principle' or 'principle', refers to the overarching ideologies, moralities and philosophies that guide the distribution of resources in healthcare settings, i.e., the

premise upon which allocation decisions are or should be made. Principles may be grounded in the operationalization of empirical evidence or communally held social value judgments, or even a combination of both. Given the dearth of existing data on the topic, public health professionals who are directly involved in the processes and stages that inform allocation decisions were considered to be well-positioned to share informed perspectives on the topic in light of their professional experience and knowledge. The data discovery component of the project was driven by a series of informant interviews and a web survey targeted at public health professionals. The interviews were semi-structured with mostly open-ended questions. Informants were asked to share in their own words what principles they felt should the distribution of funds in public health. The 10 sensitizing concepts (Table 2) developed during a review of current grey and peer-reviewed literature on the topic were also shared with informants to stimulate dialogue during the in-depth interviews.

Informant feedback over the course of the interviews was organized into different 'nodes' based on theme/content. The full list of nodes developed is present in Table 5. Several of the nodes generated during the analysis of interview data were linked to specific principles (nodes that were linked to a specific principle is distinguished by an asterisk sign in Table 5). The number of sources linked to each node was used to determine whether a particular idea proposed by an informant was a valid 'universal' principle in the context of the feedback shared by public health professionals over the course of the interviews. The number of sources that each principle was linked to ranged from a minimum of 7 to a maximum of 14. A total of 12 principles emerged from the data collected during the informant interviews. These principles were linked to three distinct underlying themes/social values, i) need, ii) equity, and iii) transparency and accountability. A complete list of the principles proposed by public health professionals alongside brief descriptions is available in Table 8. In addition to the 12 guiding principles, informants also brought up a number of different 'process-based ideas'. The distinction between principles and the process-based ideas shared by informants is an important one. Process-based ideas were conceptualized as 'non-principle' related concepts or strategies that were suggested by public health professionals as important supporting features/aspects in the design and implementation of allocation policies/practices in public health settings. The process-based ideas proposed by informants were oriented around which stakeholders should be involved in funding public health services and how services should be delivered, rather than how public health programs/services should be funded (i.e., principles). For example, the suggestion that core public health services required by all PHUs should be delivered in a centralized format was characterized as a process-based idea, since it tackles how public health services should be delivered,

rather then how they should be funded. The process-based ideas shared by public health professionals across the interviews are discussed in Section 4.6.

Table 8: List of principles proposed by public health professionals to guide the distribution of resources across health units

CATEGORY/CORRESPONDING SOCIAL VALUE - NEED	
Principle	**Description**
1. Funding for PHUs should be based on characteristics of the population served, i.e., age distribution, incidence of TB, and prevalence of tobacco use, etc.	There are many different types of 'health need'. The health need of the population may vary based on the dimension of need being examined, i.e., burden of illness, capacity to benefit etc., and may be characterized as the 'demand' aspect, whereas the supply is the actual provision of health resources required to fulfill those demands. (Government of Ontario, 2006). Populations of equal size do not necessarily have equal health needs - population characteristics are what 'drive' the relative demand for health services and associated resource requirements (McIntosh et al., 2010). Indicators of 'population need' include epidemiological indicators, risk profiles (i.e. tobacco use and obesity etc.) as well as demographic features and related social determinants of health (e.g. race, educational attainment, and socio-economic status etc.) (Stevens and Gillam, 1998; Bedard et al., 1999)
2. Funding for PHUs should account for the cost of service delivery, i.e., a community's cultural and demographic makeup, number of languages spoken etc.	A number of different factors can inform the cost of design and delivering public health services. Cost-drivers in the provision of health services include primarily two categories, geography and population/demographic traits. Geographic features may include the, type of jurisdiction served (i.e., rural, urban, or mixed etc.) and associated dwelling rates and infrastructural capacity. Demographic characteristics typically involve additional expenditures incurred as a result of service delivery to vulnerable sub-groups such as ethnically diverse sub-populations due to language and cultural adaptations etc., i.e., immigrant communities with multi-lingual needs requiring services to be delivered in languages other than English (Conference Board of Canada [CBOC], 2004; Wilson-Stronks, Lee, Cordero, Kopp, and Galvez, 2008), and aging populations that are typically associated with greater service utilization and more complex health needs (Canadian Institutes of Health Information [CIHI], 2011)
3. Rural PHUs should receive additional funds to deliver the standard basket of public health services required of all health units	PHUs that serve remote, sparsely populated-jurisdictions require a set of skills, expertise, resources and programming that vary considerably from what might be required in a densely populated urban area (Mays, et al., 2006; Mays and Smith, 2009). Factors that may influence resource requirements of rurally located PHUs include; limited public infrastructure, and the high cost of service delivery due to vast geographic distances (i.e.s travel times, service delivery in multiple remote locations etc.) and low dwelling rates (Kilty, 2007; ALPHA, 2004).
4. Funding for PHUs should be based on characteristics of that particular PHU, such as geographic size, staffing size and mix, number of locations/offices, etc.	Critical mass is defined as the "minimum amount of resources, expertise and capacity of PHUs required to fulfill expectations for performance" (Moloughney, 2005, p 1). The critical mass of each individual PHU depends on a variety of factors including staff size/mix, jurisdiction size and informational infrastructure (Moloughney, 2005).

Principle	Description
5. PHUs should receive annual increases that at least cover the cost of inflation.	Price inflation is a critical contributor to rising healthcare expenditure on an annual basis (CIHI, 2011). Much of the growth in costs is a function of human resources, i.e., remuneration, compensation, benefits etc. (CIHI, 2011). While specific estimates around inflation trends are not available at the PHU level, expenditure estimates from the acute-care sector indicate that compared to the general economy inflation is significantly higher within the health sector (CIHI, 2011).
6. PHUs should receive a base level of funding, irrespective of geographic size or population served	Base capita funding approaches propose the allocation of a standard baseline figure to health facilities/providers based on programmatic needs and infrastructural/operating costs (Ogden, Sellers, Sammartino, Buehler, and Bernet, 2012). 'Base-plus allocations' are commonly employed to address competing pressures between jurisdiction-specific fiscal capacity, disease burdens, and unique population needs; wherein a proportion of total funds are distributed to all jurisdictions to support the provision of 'baseline capacities' that all jurisdictions are expected to establish, with additional or 'plus up' funding provided to jurisdictions on account for specific jurisdiction specific population health issues etc. (Ogden, et al., 2012).
7. Funding for PHUs should include explicit amounts for capital costs	Capital projects are not currently considered a separate 'line item' in PHU budgets (ALPHA, 2012). There has been a great deal of support for the establishment of a capital budget component in PHU budgets, to help support investments in public health capacity, maintain aging public health infrastructure and support planning efforts to upgrade health unit facilities and equipment (ALPHA, 2012)
CATEGORY/CORRESPONDING SOCIAL VALUE - EQUITY	
Principle	**Description**
8. The amount of funding a PHU receives should be sensitive to the presence of high-risk vulnerable populations in a PHU's designated service area	Upholding equity in the delivery of public health services involves a commitment to improving access to health services for disadvantaged sub-groups (Whitehead, 1992; Braveman and Guskin, 2003). It may also entail targeted investments to tackle upstream social determinants of health that may create and exacerbate health inequalities across different population sub-groups within PHUs given jurisdiction (Braveman and Guskin, 2003; Raphael, 2003)
9. Under-funded health units should be brought up to the level of the top health units, rather than bringing the top funded health units down	There is a great deal of disparity in PHU budget sizes across the province. The lowest and highest funded PHUs in Ontario range from a minimum of $5.7 million (Timiskaming Health Unit) to a maximum of $193.6 million (Toronto Public Health) (MOHLTC, 2009). Eliminating these disparities and working towards ensuring that PHUs with the lowest per capita budgets receive additional funds to address historically unmet needs, is required to ensure a more equitable distribution of funds across PHUs (Northwestern Health Unit, 2013).
10. Funding decisions should be based on measures of health outcomes and disparities in health outcomes across jurisdictions	Health outcomes have been used indicators in justifying changes in resource allocation in health care settings. Health outcome indicators (and gaps in outcomes across jurisdictions) illustrate are used to identify specific areas or population sub-groups that require additional health services. They may be used as a proxy measure to determine unmet health and service needs, and subsequent resource requirements at a PHU level, or may be used as an aspect of performance measurement as levers or incentives to tie performance to allocation decisions (James, 2012).

CATEGORY/CORRESPONDING SOCIAL VALUE - TRANSPARENCY AND ACCOUNTABILITY	
Principle	**Description**
11. Funding for PHUs should be determined via a process that is sufficiently transparent, such that a PHU can calculate or validate its funding allocation using available data	Formula-based allocations are often thought to be more transparent than other types of funding mechanisms, given the assumption that formulas are built around objective and evidence-based criterion (Buehler and Holtgrave, 2007). With the introduction of HBAM and quality-based procedures in the acute-care sector, there has been growing discussion around public health also shifting towards a transparent model/ process for resource distribution (including greater transparency around how allocation relates to performance) (Northwestern Health Unit, 2013).
12. Funding should be tied to meeting agreed performance targets	There has been a growing shift towards incorporating performance indicators into funding decisions in the acute-care and hospital sector to facilitate greater transparency and accountability in health system performance. Performance reporting has only recently been introduced to the public health's sector with the release of the 14 Accountability Agreement indicators. Moving towards performance based financing may incentivize PHUs to push for improvements in population health outcomes within their respective jurisdictions. Lower scores on performance indicators may reveal key resource gaps and improvements for improvement. Furthermore, the use of performance measures can promote greater accountability in terms of both allocation and utilization resources within and across PHUs.

4.5.1 Need-based principles

The 'Need' category was comprised of key ideas and concepts around the specific factors and associated variables that influence the level of resources required by PHUs to meet their required programmatic and performance expectations. A total of 7 from the 12 principles proposed by public health professionals over the course of the interviews were linked to this category. Table 9 provides an overview of the individual principles and corresponding dimensions that emerged across interviews. Each principle is discussed at length over the following paragraphs.

Table 9: List of need-based principles

NEED-BASED PRINCIPLES	
Sub-categories/nodes	**Additional dimensions**
Principle 1. Funding for PHUs should be based on characteristics of the population served	1. Population-level characteristics to consider in resource assessments 2. Establishing consensus on a set of fixed population characteristics 3. Supplementing population characteristics with additional variables 4. Balancing population level characteristics with unique jurisdiction-specific needs
Principle 2. Funding for PHUs should account for the cost of service delivery	1. Serving high-risk high need populations/communities 2. Geography 3. Cost-drivers versus needs indicators
Principle 3. Rurally located PHUs should be provided with additional resources to deliver the same standard set of public health services expected of all health units	1. Resource needs of rurally located PHUs 2. Geography/distance vs. density tradeoffs
Principle 4. PHUs should receive annual increases that at least cover the cost of inflation	1. Policies around annual changes in resource needs 2. Inflation and PHU budget planning
Principle 5. Funding health units should be based on a fixed set of PHU characteristics	1. Determinants of critical mass at a PHU level 2. Amalgamations and economies of scale
Principle 6. PHUs should receive a base per capita funding irrespective of geographic size or population served	1. Base funding and plus up allocation mechanisms 2. Aligning legislated expectations with resource distribution mechanisms
Principle 7. Funding for PHUs should include explicit amounts for capital costs	1. Limited resource availability for capital investments 2. Capital funding and cost-sharing arrangements

4.5.1.1 Principle 1: Funding for PHUs should be based on characteristics of the population served

Financing based on population-need, i.e., the idea that assessment of resources required (by individual health units) and subsequent funding decisions should be based on characteristics of the population served, was discussed by all informants as a core principle to consider in guiding the distribution of resources across PHUs. In light of the population level scope inherent to the public health sector's overarching mandate (i.e., the OPHS), informants proposed that mechanisms for resource distribution should align with that scope of practice. Employing a population-based lens grounded in identifying the distinct health needs of the population being served by a PHU, was supported by many informants as an 'empirically-driven approach' towards resource allocation. All of

the public health professionals interviewed suggested that population-based lenses should serve as the core of any funding strategy for the public health sector:

> You know, if I were doing the formula, I would weight population health needs to be probably 70%. It's a big portion. But it's not the only portion. (Participant 9)
>
> [Funding allocation] needs to be population-based, so what is the size of the population; what are the demographics; what is the housing status of the population; but definitely the need of the population should be driving the allocation to health units (Participant 8)

Public health professionals proposed a number of specific population features to consider in the allocating funds to PHUs based on population need. These features are broadly categorized in the following three groups:

i) *Demographic variables*

- Population demographics (size, age, gender distribution and ethnic diversity etc.)
- Vulnerable high-risk sub-groups (e.g., immigrants, low income, aboriginal, and pregnant women etc.)
- Social determinants of health, i.e., socio-demographic indicators (e.g., income, educational attainment/literacy, unemployment, and housing status etc.)

ii) *Epidemiological indicators*

- Burdens of illness within a jurisdiction's population disease-specific morbidity and mortality (i.e., Quality-Adjusted Life Years and Potential Years of Life Lost)

iii) *Population-level health behaviors*

- Predictors of disease burdens, such as smoking/tobacco use, alcohol use, nutritional habits, and measures of physical activity etc.

And while across interviews there appeared to be a sense of general consensus around the importance of integrating population size and characteristics into decisions around resource allocation, many public health professionals emphasized the challenges of establishing agreement between different stakeholders on a fixed set of population variables to use in assessing the level of resources required by PHUs to fulfill their mandated responsibilities:

> There's no agreement on that issue [the variables that should be used to guide funding decisions]… If you've got a group of people that, you know, are smoking, obese, sedentary, not eating their fruits and vegetables… Maybe you need more money for health promotion programs in those places. But, there's no broad agreement on this and people argue about it incessantly whenever it comes up as to what should be a valid variable and what level of resources [health units] deserve. (Participant 6)
>
> I think in any formula you use, you are going to have winners and losers… For example, do we put in seasonal population? You know, every individual health unit will agree on the basic demographic, and the basic epidemiological variables. And, where it breaks down are the unique circumstances that everyone's in, and that's where it ends up being positional. (Participant 9)

In addition to the difficulty associated with establishing adequate consensus around the mix of population-specific variables and weightage that should be assigned each population characteristic in guiding allocation decisions, informants also discussed the importance of balancing population needs with other factors that inform may influence resource needs at a PHU level such as geography and equity. Many interviewees proposed that weighing population characteristics appropriately and supplementing population-based assessments of a PHU's resource needs with other factors (such as geographic dispersion and land mass etc.) would be instrumental in pursuing a balanced and equitable approach towards resource distribution. As one informant commented:

> When you start looking at really what are the 'drivers' of [population health] need… You really have to look at all of those issues and try to put a basis of percentage on how they should be weighted. I think that the weighting of factors, like geography, language, different populations etc… There has to be some sort of evidence base in making the allocation of percentages to those areas… Proportionality is going to be really important, and in terms of the weighting… I think population and geography and unorganized territories should be high on there. (Participant 10)

Several interviewees advised that relying on population variables, as the sole determinants of financial need could disproportionately favor densely populated PHUs, and could potentially exacerbate unmet needs and widen gaps in health outcomes between urban and rural PHUs. They proposed instead that any funding mechanism driven by a population scope should also aim to provide health units with an opportunity to examine unique local needs across jurisdictions, instead of focusing exclusively on macro-level population characteristics as the sole determinants of resource allocation. As one interviewee stated:

> I think it [population-based funding] is a complex issue. When it comes to population, the small health units lose out… because they don't have the population density, and yet they have some unique needs that are difficult to fill. So I don't think it's as easy as just, per capita funding [based on population features alone]. (Participant 7)

By and large the adoption of a population-focused approach towards funding health units was widely supported across interviews. A series of 'adjustors' (specifically variables such as land mass/geography, health disparities, and local/jurisdiction-specific needs etc.) were identified as supplementary considerations to include in developing comprehensive assessments of PHU resource needs. Establishing consensus between different stakeholders on both the population-specific variables and their relative weightage in influencing funding need were identified as key challenges in the design and implementation of this particular principle.

4.5.1.2 Principle 2: Funding for PHUs should account for the cost of service delivery

Current literature on health services financing outlines a number of different factors that may serve as key cost-drivers in the design and delivery of public health services, including demographic features such as the presence of ethnically diverse sub-populations as well as infrastructural factors such as geographic spread and limited public transportation. The idea that funding for PHUs should account for the cost of service delivery as a key factor in guiding resource allocation in public health was suggested and supported by many interviewees. Informants revealed that under the current funding arrangement the cost of service delivery is not systematically incorporated under the existing historical allocation approach. Two categories of cost-drivers were suggested for consideration by interviewees, 1) high risk high need populations, and 2) geography (land mass and geographic dispersion).

Servicing vulnerable sub-populations, that tend to be both high-risk, i.e., higher prevalence of risky health behaviors, and high-need, i.e., distributions of illness and co-morbid/complex conditions etc., (compared to general population) were identified as key cost-drivers in the design, delivery and financing of public health services. Immigrant communities were specifically mentioned as key priority populations that require additional resources to service, primarily due to linguistic barriers and the costs associated with the translation of programs materials and staff language training. In addition, aboriginal communities, as well as refugees and migrant workers were also discussed as population sub-groups that require additional resources to serve, since they too require services in multiple languages and tend to have more complex health needs (i.e., predisposition to certain social determinants of health that prime them for lower health outcomes) compared to the general population. Many interviewees discussed at length the need to consider the costs associated with serving these priority sub-populations in assessing resource needs at a PHU level:

> Health units have unique things based on their population needs. So, for example, we have a unique migrant population that comes into our community from [redacted], that live in our community and work in agriculture. So those folks come in for five to six months of the year, and they have some unique health needs. They live in bunkhouses on our farmers' farms, which have to be inspected by our public health inspectors. So that's something that isn't even done in many health units, and yet we're trying to do that within the context of our existing funding… we never really have a chance to bring those issues forward to receive particular funds to cover that. (Participant 7)
>
> There are two aspects associated with language [as a cost-driver] in public health programs. One is the number of languages spoken, and the second is the number of languages within which service is expected to be delivered… All our phone services are available with multi-lingual [options]. Most of our materials are multi-lingual. So, it has a knock-on cost impact… it is a factor that impacts PHU costs but it's a 'non-negotiable' in terms of serving a multi-ethnic city. (Participant 9)

Geography or distance-related costs were another common factor brought up by informants in their discussion for why cost-drivers should be formally included as a principle to guide allocation decisions. The 36 PHUs in Ontario range from those located in densely populated metropolitan areas and urban centers (i.e., Toronto, Peel and York) to those that are based in sparsely populated parts of rural northern Ontario (i.e., Northwestern, Thunderbay, Timiskaming, and Porcupine etc.). PHUs covering a larger land area are faced with significantly higher travel costs due to limited transportation infrastructure and widespread population dispersion, compared to their counterparts in densely populated, urban/metro centers with extensive transit and infrastructural support. The role of geography, specifically the interplay between vast land mass and dispersed population settlement within a PHU's jurisdiction, was discussed as a key cost-driver, due to travel time and transportation costs associated with serving those communities. Some communities may be densely populated within a small proportion of a jurisdiction's landmass, whereas others are distributed sparsely over a larger land area, or may have very limited public transportation infrastructure, therefore requiring PHU staff (e.g., nurses and public health inspectors) to travel far distances to deliver programs. A number of public health professionals commented on the role of geography-related factors in driving PHU expenditures:

> Whether [a health unit] is predominantly urban or rural, that [has to be taken into account] when making these funding decisions… If you've got a North Ontario health unit that spans hundreds of thousands of square miles and you have to fly everywhere… that's going to be a lot more expensive to administer than having the same population in downtown Toronto. (Participant 6)

> If there are particular barriers or challenges that are faced [by a health unit in delivering services]… for example, the geography of a health unit - there are some health units that are vast in size, and it's going to cost a lot more to deliver programs and services to populations that are more remote, so the geography of the health unit needs to be taken into account [when making funding decisions]. (Participant 8)

Another key sub-theme that emerged from informant feedback around this principle was the challenge of distinguishing between cost-drivers and indicators of health need. Indicators of need were discussed as factors that inform what types of programs or services are required in a particular community, for instance high rates of teen pregnancy or sexually-transmitted illness may indicate that a PHU must provide maternal health and sexual health programming. Cost-drivers were viewed as variables that influence how much it costs to deliver those particular services/programs. For example in a rural health unit with a highly dispersed population, those maternal and sexual health programs may cost more to deliver than in a densely populated urban PHU due to the time and travel costs associated with program delivery in rural settings. A few informants brought up the issue of

inaccurate misrepresentations of 'need indicators' as cost-drivers in requesting or justifying additional resources at the PHU level. A community's ethnic makeup is an indicator of need, therefore a PHU servicing multi-ethnic communities may need to deliver programs in several languages and possible at multiple locations within a PHU's given jurisdiction. However ethnic diversity in a PHU's designated service area, does not affect *all* public health programs/operations, for instance, public health inspections and the time and resources required for PHU staff to inspect restaurants, swimming pools or drinking water systems are not impacted by the level of ethnic diversity within a given community. Informants pointed out that the mere presence of 'priority populations' should not be deemed as a sufficient justification for additional resources for all aspects of PHU operations. Interviewees suggested that this distinction between needs indicators and cost-drivers was critical in areas where needs indicators have no bearing on a PHU's resource requirements, to ensure that health units are fairly funded across the province:

> … We have [number redacted] small drinking water systems [to inspect under the OPHS] - their costs are nothing to do with the ethnic makeup, or aboriginal mix, or the poverty level of the people drinking the water from the system…they are dependent on how much time does it take our Public Health Inspector to get to that location and then do the inspection… From a public health point of view, if you look at all our environmental health programs - safe water, safe food, rabies, health hazard investigations, throw in emergency preparedness, none of them care about needs, ethnicity, or recent immigrants. (Participant 13)

Several public health professionals mentioned that some commonly considered 'priority-populations' may be portrayed as cost-drivers but do not always require additional resources to serve. Immigrant populations in particular were a point of contention for several interviewees who felt that the 'healthy migrant effect[3]' countered the legitimacy of immigrant communities as cost-drivers in public health service provision (particularly in the short term). A number of informants commented on the challenge of balancing the role of the 'healthy immigrant effect' with a rigorous identification of the level of resources required by PHUs to adequately meet the unique needs of immigrant communities:

> Certain factors drive delivery costs [upwards in health units] and those costs that sometimes can be counterbalanced by health status, so for example, you take a place like Peel Region, which has a very ethnically diverse population with a lot of new immigrants, so the delivery of public health services is more expensive because of the language issues. On the other hand, these are very healthy people. They are the beneficiaries of the 'healthy migrant effect',

[3] Several studies have shown that in the duration immediately following migration to the host country, the health of immigrants is substantially better than native-born counterparts in the host country, over time however the gap in health status among immigrants and native-born residents decreases significantly (McDonald and Kennedy, 2004; Ali, McDermott and Gravel, 2004; Ng, 2011). Self-selection, health screening prior to arrival and under-reporting have been identified as key factors in affecting the health immigrant effect (McDonald and Kennedy, 2004; Ali, McDermott and Gravel, 2004) that has been observed in many nations with large immigrants communities including Canada, Australia and the US. (McDonald and Kennedy, 2004).

> which tells you that recent immigrants tend to be very healthy, so why are we giving more money to health units with more recent immigrants?… In some ways, they're more expensive to service because of the language issues, on the other hand, they're healthier so they need fewer services. The two factors [ethnic diversity and immigrant status] would actually be pushing funding in opposite directions. I think that's the kind of balance you have to hit. (Participant 11)

Across interviews there appeared to be widespread support for identifying and integrating considerations around key cost-drivers into allocation decisions. The two types of cost-drivers that emerged across interviews were priority-populations (i.e., vulnerable high risk high need population sub-groups) and geography related factors such as landmass and population dispersion etc. Establishing consensus on which specific variables serve as cost-drivers, and distinguishing between needs-indicators and true cost-drivers were identified as important aspects to consider in implementing this particular principle.

4.5.1.3 Principle 3: Rural PHUs should receive additional funds to deliver the standard basket of public health services required of all health units

The idea that rural PHUs should be granted additional resources to fulfill the mandated programmatic and performance expectations required of all PHUs, was discussed and supported by many informants as an important principle to consider in informing future directions around public health funding. Several informants proposed that rural PHUs require additional resources to deliver the standard set of health services that are mandated for all health units under the OPHS. Services such as public health inspections and vaccination/immunization in schools were identified as the key activities that require extra resources to deliver in rural jurisdictions. Justifications for rural PHUs requiring additional resources to meet the program expectations outlined under the OPHS, were oriented around distance-related time and costs attributable to vast landmasses and sparsely distributed community settlements (a common feature in rural PHUs). The limited availability and access to public transportation/infrastructural links for both community members and PHU staff were also suggested as key reasons for additional resource needs at a PHU level. Several public health professionals commented on this issue:

> [Small rural health units] have no public transportation locally, so that affects staff and the public. Staff have larger distances to travel, so mileage rates are high. As well, they have to offer services in multiple sites, because [our] citizens can't easily get to one central location. [Staff in rural health units are] constantly going out to where [they] can - where we find people. So that's a challenge. (Participant 7)

> We have [immunization/vaccination programs for] schools in rural areas… [a nurse and a supporting staff member] are gone for basically the better part of the day and yet they only see 18 kids. Where the nurse team in Toronto can go to one of the large public schools and

> [complete all immunizations in one day] - and of course because of Ontario Nurses Association and labor costs, we still pay the same per hourly wage that the City of Toronto pays their nurses. We pay the same rate and yet, not only did it cost us more money… to see very few kids, we had to pay additional mileage on top of that and pay the nurse and her assistant lunch because they're away from her home office… So, it becomes a way more expensive proposition than leaving a central city site and you could actually even take the subway. (Participant 13)

The trade-off between density and distance was another aspect of the discussion around rural PHUs requiring additional funding to meet the OPHS. Some informants felt that several urban or urban-rural mixed PHUs face many of the same challenges in service design and delivery as rural PHUs. The difficulty associated with balancing additional resource demands attributable to geography and rural dwelling with the resource needs of PHUs serving dense, heavily populated jurisdictions emerged as a key theme across many interviews. Several informants advised against the idea of additional 'blanket-funding' for rurally located health units, emphasizing that not all aspects of a rural health unit's operations warrant additional resources:

> How do you balance considerations of distance with density? That's where you have something of a tradeoff. Toronto has the largest population of social housing of anywhere in the country, very high need. Now, the converse argument can be made in the far north, that the cost of delivery for remote [PHUs] where you might be carrying out, for example, inspections or outbreak investigations over an area the size of France… The appropriate balancing or weighting of distance and density related factors is extremely challenging and it's very, very hard to reach a consensus on it. (Participant 9)

> With respect to people that are isolated geographically or are residing in huge geographic areas, that doesn't necessarily mean it's a rural issue. I mean, you can go in the City of Toronto and you can find seniors there that are extremely isolated, just as socially isolated as people that live in rural areas. (Participant 14)

Simply awarding rural health units additional funding due to their jurisdiction type (i.e., rural, urban etc.) was cautioned against by some interviewees. Many public health professionals felt that striking a balance between providing rurally located health units with additional resources to deliver public health programs, and while encouraging rural PHUs to develop more cost-effective ways to deliver programs was identified as an important challenge in the practical application of this particular principle:

> I totally understand that there are health units with enormous geographic distances that they have to cover in order to deliver programs… and that they would propose that there is a need for excess money to address that transportation or distance issue... It comes back to the problem of incentives… if you give a health unit extra money to address a transportation issue, it has no incentive to innovate and address that issue more efficiently. There are so many ways that technology could be used to address that transportation barrier… You can set up a video station. Instead of doing a home visit, you can do a Healthy Babies Healthy Children visit at a clinic that is set up with video monitor and you can monitor the interaction

> between the parents and the child, so you haven't had to go out on a two hour drive to see them, right?... If you give them [rural health units] extra money… then they don't have to think about how they might get around the transportation issue. (Participant 3)

And while there is continued pressure on all health units to restrict expenditure and deliver services within allocated budgets, some informants also suggested that with reference to rurally located PHUs and their associated challenges (geographic dispersion, limited transportation/public infrastructure etc.) a certain degree of cost-efficiency is to be expected and accepted as part of servicing populations in rural locations:

> I think it's so tempting to get caught up in the numbers game, right? We talk about equity and cultural sensitivity in terms of language, heritage, or ethnic group, but there is a real 'rural culture' [in some jurisdictions] and in order to service that culture I think you need to be a little bit inefficient. I mean, I think we should still do a flu clinic even though only 200 people may show up. So in a rural area, there's a certain amount of built-in inefficiency just by virtue [of location] - if you're going to provide equitable service, you're going to be somewhat inefficient. (Participant 5)

Informants revealed a number of other factors that could lead to additional expenditures for rural health units. Costs incurred due to high staff turnover (i.e., hiring and training costs), fewer opportunities for collaborations with other municipal departments (e.g., social services) or other parts of the healthcare system i.e., primary care and family health teams etc. These types of collaborative (and often cost-shared) relationships (and potential cost-savings) were considered easier to establish and sustain in urban settings. In contrast PHUs in rural settings cannot rely on established healthcare networks/providers to share service delivery platforms and communication/media outreach etc.

Across interviews there appeared to be strong support for the provision of additional resources to rural PHUs for the delivery of the public health programs under the OPHS. Geography-related factors, i.e., low population density, high population dispersion and resulting travel costs were commonly mentioned as key justifications for the additional resource needs of rural PHUs. Some informants suggested that carefully examining the validity of density versus distance-related costs, and establishing appropriate incentives for rural PHUs to develop cost-effective methods for service delivery were key elements to address prior to integrating this principle into the distribution of resources across PHUs.

4.5.1.4 Principle 4: PHUs should receive annual increases that at least cover the cost of inflation

Currently, there does not appear to be a formal policy around incorporating inflation costs into the budget development process for PHUs on an annual basis. Every year PHUs create annual budgets that are presented to the board of health, the respective municipalities and ultimately the

province, but there appears to be a great deal of variation in the processes and the extent to which PHUs successfully advocate for and receive additional funds across budget years. Several participants reported that annual increments to PHU budgets have declined significantly in the past few years, and the gap between allocation and resource needs has widened as jurisdictions continue to experience population growth and increased pressure to adapt to changing burdens of illness. Several informants proposed that ensuring PHUs receive annual increases that at least cover the cost of inflation across budget years would be crucial to help health units maintain a minimum level of capacity in terms of operations and staffing. Based on the existing cost-sharing arrangement between the municipalities and the provincial government, if municipalities are not willing to increase their portion of the cost-share to account for additional funding needs due to inflation, the provincial match is also withdrawn, resulting in serious resource constraints. In addition, several public health professionals also revealed that even though the 100% provincially funded programs PHU portfolios are said to be 'fully-funded' by the province, these programs often have additional overhead costs that also grow with inflation over time, and are not accounted for by the provincial government across fiscal years. Several interviewees suggested that additional resource needs due to inflation should be accepted as a core component of budget development across fiscal years:

> [Annual increases to budgets] are separately considered by both the municipal funding body and the provincial government. And the provincial government's decision is a political decision… it may not even cover existing costs. So, I think what should be done is that they should fix the inflation rate. And then, all their increases should automatically be on top of that so that they are 'real' increases - otherwise it's an erosion. (Participant 6)

Advocating for annual adjustments to account for inflation in a proactive and timely manner under the current funding framework is further inhibited by prominent disconnects in the timelines for budgetary review for both funders (i.e., municipalities and the province). The municipal fiscal year starts in January (municipal budgets are developed between September and November each year). Whereas the provincial government operates on a fiscal year that runs from April 1st to March 30th and budgets are typically finalized in the summer (May-July). The gap in timelines makes it challenging for PHUs to integrated additional resource needs form inflation into the budget development processes. Informants placed a strong emphasis on ensuring that resource distribution practices in public health should at minimum account for inflation rates across fiscal years as an important next step to ensure that PHUs are adequately resourced to meet the expectations outlined under the OPHS.

4.5.1.5 Principle 5: Funding for PHUs should be based on characteristics of that particular PHU

The concept of financing PHUs based on a fixed set of health unit characteristics and funding based on a PHU's 'critical mass' was discussed by several public health professionals over the course of the interviews. Critical mass refers to the "minimum amount of resources, expertise and capacity of PHUs required to fulfill expectations for performance", and is influenced by factors such as staffing size/mix, jurisdiction size, program-related capacity (i.e., number of locations, offices, and satellite locations etc.), and the availability of informational infrastructure (Moloughney, 2005, p 1). Resourcing based on PHU characteristics involves incorporating a combination of core variables including jurisdiction type (rural, urban or mixed), number of locations, population size, staffing mix, and other operating costs that are required to run a PHU. These PHU specific features are independent of the characteristics of the population served by a PHU, and are oriented around the core operational/infrastructural elements required of all health units. Specific examples of PHU characteristics suggested by interviewees to consider in assessments of critical mass included:

a) *Number of premises and corresponding inspections* required (i.e., daycare centers/nurseries, swimming pools, beaches, small drinking water systems, school boards/schools [immunization etc.] and restaurants)

b) *Staffing size and mix* including management/leadership, (for instance some PHUs have more than one Medical Officer of Health, as well as other specialized positions based on jurisdiction-specific needs or governance format).

c) *Land mass* including the geographic distance covered by a PHU can affect the number of central offices, satellite offices and related fixed costs (i.e., staffing and building space/rent etc.).

d) *The governance/political structure* of a particular health unit. Some PHUs may host a single municipality, whereas other health units may be serving a large number of municipalities with varying levels of political clout/representation on the corresponding board of health (thus resources must be distributed across multiple political boundaries within a PHUs jurisdiction).

Informants felt that the governance features of different health units are not clearly identified or captured in the current funding arrangement, and require more attention in terms of how they inform the level of resources required by PHUs to complete their mandated responsibilities. For instance, a board of health's governance format can influence a PHU's 'critical mass', by the degree to which certain services (i.e., HR, Information Technology [IT] and legal services) may be shared between a PHU and other municipal branches (i.e., family and social services, housing etc.) or whether certain PHUs have to acquire and maintain those services independently, which could potentially drive costs upwards. Regional and single-tier PHUs tend to share certain services and expertise across various other municipal departments, whereas PHUs with autonomous boards of

health by virtue of their sovereign structure typically require in-house expertise in areas such as legal and HR etc. Informants suggested that pooling resources between various municipal departments may help to create significant cost-savings and greater consistency in operations as suggested by some public health professionals, but are not without their challenges, especially in terms of competition for certain services (e.g., IT and HR) that must be shared across multiple municipal departments.

Within the discussion of critical mass and PHU characteristics as a possible guiding principle for PHU funding, informants also shared detailed insights around potential restructuring of PHUs to achieve better economies of scale across the public health sector. Following the SARS crisis in 2003, the provincial government's Capacity Review Committee (CRC) in their final report suggested amalgamating the province's 36 PHUs to a total of 20-25 PHUs (ALPHA, 2004; CRC, 2006). And while amalgamations may generate cost-savings particularly in the long-term, the process of integrating health units is costly and often politically challenging (i.e., municipal resistance) (ALPHA, 2004). In their feedback around funding PHUs based on assessments of critical mass, many public health professionals discussed the possibility of resizing PHUs to optimize critical mass at a health unit level. Many informants suggested that amalgamations should be considered as part of broader dialogue around new directions for public health funding. Several interviewees commented on variations in critical mass across PHUs due to substantive variations in their sizes as a major challenge in effectively and equitably distributing resources across health units:

> Part of the problem is that we have health units of varying sizes. You're supporting 80,000 people so your core infrastructure in that situation will be much higher per capita than if you're supporting 400,000 or 600,000 people, so one of the things I think really needs to be done across the province is to make more equal-sized health units by mergers and amalgamations... some health units don't need to be so small and maybe some of the larger health units should not be quite so large… Certainly on the small side there is no economies of scale and it's very expensive to run a small health unit. (Participant 1)

> I actually support that we should be looking at amalgamations, because there is such disparity in PHU sizes. But, to me, there's just too much disparity, there's just too great a difference [in PHU sizes and budgets], and, again, you come back to the OPHS and what [level of resources] you need to fulfill those… So, I actually think they should be amalgamating health units, like ourselves, because we're just so small. We can't possibly have what others have, and yet we're supposed too. (Participant 2)

> I think one of the challenges has been the size of the health units… We have health units that are only about, 10,000, 20,000, 30,000 strong. So, I think it is really important to revisit the [idea of] 'critical mass' in terms of [the] population [a health unit] is supporting… and then from that you can sort of have a minimal application of resources to that population. (Participant 4)

In light of the expansive nature of the OPHS, many public health professionals also revealed that the growing list of roles and responsibilities being added to PHU agendas should be proactively incorporated into assessments of a PHU's critical mass. Staffing requirements including operating/infrastructural elements such as in-house HR, legal, communications, epidemiology and surveillance, as well as increases in PHU expenditures due to inflation have made it challenging for many PHUs to operate within their assigned budgets. Several interviewees recommended that a systematic review of PHU sizes to identify opportunities to achieve more appropriate economies of scale across health units, must precede any efforts to consider distributing resources based on PHU characteristics:

> I think if you really wanted to do it right, you would throw the whole system, including the structure of health units and the governance of health units under review. The existing structure is part of the problem - 36 health units of varying size, part urban, part rural, variance governance models etc. It's a bit of a dog's breakfast, right? So if you wanted to really do it right, you would start over again - what's the ideal structure, governance model, how big should a health unit be, what geographic size should it cover, what services should be amalgamated… everything would be up for grabs, not just tinkering with per capita allocations. (Participant 1)

Structural reform, especially mergers or amalgamations require a great deal of planning, investment and sustained oversight. The costs of amalgamating health units and the transition period following the amalgamation process can be costly and pragmatically challenging (due to issues in liability for infrastructural investments, staffing changes, and role refinement etc.). And while structural reforms may refine critical mass and generate better economies of scale across PHUs, ultimately the political, economic, and practical implications of amalgamations may drive costs upwards instead of creating cost-efficiencies, especially in the short-term. Overall, the idea of financing health units based on assessments of 'critical mass' received strong support from a majority of the public health professionals that were interviewed. Informants did caution that establishing agreement on what should be considered an appropriate size for a health unit, and developing consensus (across public health professionals) on the specific characteristics should be included in the assessments of critical mass would be key issues to consider in the implementation of this principle. Informants suggested that the discussion around potentially restructuring health units to achieve better economies of scale should be included in broader dialogue around public health funding, with several informants even proposing that a comprehensive resizing of health units to achieve better economies of scale should precede the design and implementation of any funding reforms for the public health sector.

4.5.1.6 Principle 6: PHUs should receive a base level of funding, irrespective of geographic size or population served

The idea of 'base funding' was proposed by several informants as one possible approach to consider in guiding the distribution of resources across PHUs. Under a base per capita funding approach all PHUs would receive a standard base per capita amount (also referred to as 'base-plus funding') that would be founded upon programmatic needs and infrastructural/operating costs. Interviewees described the underlying rationale for a base capita approach, as a strategy to systematically and equitably align resource needs with allocation decisions, by ensuring that all PHUs receive a minimum level of funding to deliver the OPHS. Under base capita financing legislated programming needs and not population characteristics are seen as the sole driving force behind PHU funding, given that the latter is thought to favor larger densely populated PHUs, at the expense of rural thinly populated PHUs. Informants suggested that a base capita strategy would allow for greater consistency in funding decisions and more even budget sizes across jurisdictions. Several interviewees proposed that base per capita allocations should be awarded to all PHUs, alongside 'adjustors' that would be applied to the base amount to finance additional jurisdiction-specific needs, i.e., local health disparities, public health emergencies, and population growth etc.

Many of the public health professionals interviewed also discussed the difficulty associated with accurately identifying an appropriate 'base per capita' amount, and the variables to consider in setting a base amount for all PHUs. Informants stressed that establishing a specific base capita amount that all 36 PHUs as well as other stakeholders (i.e., municipal and provincial governments) can agree upon would be a formidable challenge. Several interviewees stressed that a 'grant-based approach' involving base funding, supplemented by competitive funding for jurisdiction specific needs should be avoided. Interviewees cautioned that such an approach might inhibit PHU collaborations and partnerships, by invoking a 'divide and conquer' brand of politics that can adversely impact PHU operations and inhibit collaborations and cooperation (i.e., sharing of best practices etc.) between health units.

4.5.1.7 Principle 7: Funding for PHUs should include explicit amounts for capital projects

The idea that explicit funds should be allocated for capital projects at a PHU level emerged as a key principle from informant feedback around unmet needs at the PHU level. The provincial government does not currently finance capital projects (i.e., infrastructural needs, building space purchases, renovation and repairs etc.) (MOHLTC, 2011). Under the HPPA the legal obligation to fund capital projects rests on the municipal government. In cases where there are multiple

municipalities within a PHUs jurisdiction, a majority of the municipalities within a PHUs catchment area have to unanimously agree before any type of capital project/investment can be requested (City of Guelph 2011). The challenge of achieving unanimous consensus between different municipalities on committing to a capital investment may be further complicated by competition for limited resources between different capital projects on municipal agendas.

Several informants discussed the need for greater policy direction around capital investments specifically related to building space - emphasizing that PHUs should not be allowed to request capital funds to own their office spaces. Interviewees cited the high costs of maintenance and the issue of PHUs 'out-growing' their building spaces as they expand operations over time, as justifications for why PHUs should rent their facilities instead of purchasing them. The return on investment from owning property they suggested is negated by the time and costs required to acquire and maintain PHU building spaces over time. Informants also mentioned that based on municipal budgetary protocols, unspent funds cannot be put towards capital projects since they must be spent by December 31st which marks the end of the municipal fiscal year, whereas the provincial governments fiscal year ends on March 31st. Unspent funds are collected by the MOHLTC and individual PHUs may then make individual one-time requests for specific needs. However funds received under one-time requests must also be spent within the municipal budget year. Public health professionals felt that the disconnects in fiscal timelines between the two primary funders makes it challenging to commit to capital projects, especially since they tend to be long-term investments that require multiple years to plan and execute.

In addition to strong support for capital projects to be formally included as a line item on PHU budgets, interviewees also proposed that capital projects should be cost-shared between the provincial government and municipalities to ensure buy-in from both levels of stakeholders. Interviewees emphasized that concrete efforts should also be made to realign fiscal year timelines between the municipal and provincial levels of government to give PHUs a full 12-month period to request and initiate capital projects. Some even suggested that unspent funds should be cycled back into a 'reserve fund' that is comprised of funding that has already been allocated to PHUs but remains unused at end of the municipal budget year. A centrally managed review or audit process was suggested by some informants as a means to equitable and transparently prioritize capital investments across the 36 PHUs.

4.5.2 Equity-based principles

The third category, 'Equity' examines principles related to the incorporation of fairness and distributive justice in the distribution of resources for the provision of health services, and encompasses issues of health inequalities at a jurisdiction level, as well as equity in terms of resource distribution across PHUs as a whole. Three of the 12 principles proposed by public health professionals were linked to this category. Table 10 provides a brief overview of each of these principles. The individual principles are discussed at length over the following paragraphs.

Table 10: List of equity-based principles

CATEGORY: EQUITY	
Sub-categories/nodes	**Additional dimensions**
Principle 8. The amount of funding a PHU receives should be sensitive to the presence of high-risk vulnerable populations in a PHU's designated service area	1. Servicing priority populations 2. Balancing incentives and resource requirements for health equity issues across PHUs 3. Ontario Marginalization Index
Principle 9. Under-funded PHUs should be brought up to the level of the top PHUs, rather than bringing the top funded PHUs down	1. Current variations in budget sizes across PHUs 2. Shifting towards a more equitable distribution of resources across PHUs
Principle 10. Funding decisions should be based on measures of health outcomes and disparities in health outcomes across jurisdictions	1. Linking funding to health outcomes 2. Agreement on health outcome measures/indicators

4.5.2.1 Principle 8: PHU funding should be sensitive to the presence of high-risk vulnerable populations in a PHU's designated service area

Equity was discussed by all informants as a core tenet to uphold in the design, delivery and financing of public health services. Many interviewees stressed the importance of identifying and addressing the needs of high-risk vulnerable population sub-groups (including low-income, low education communities as well as diverse sub-groups such as immigrants and aboriginal communities) that may be predisposed to poorer health outcomes (compared to the general population) based on the links between social determinants of health and health status. Restricted access to health services, limited cultural competence and linguistic sensitivity in service delivery, as well as a general lack of awareness around the availability of public health services were cited by informants as key factors that may influence health disparities, and are critical to incorporate into assessments of resource needs to address health equity issues at a PHU level.

The challenge of balancing resource needs for health equity issues with incentivizing better performance at a health unit level also emerged as an important sub-theme in informant dialogue around this particular principle. Some public health professionals felt that if PHUs were simply granted additional resources to address equity issues within their jurisdictions, it could disincentive long-term efforts or investments in identifying the underlying causes of health inequalities within their designated service areas:

> My main concern with funding based on equity is that you create a disincentive to address inequity. So if a PHU gets extra money because it caters to a population that is significantly disadvantaged compared to the general population, that health unit has no incentive to actually change that inequality, because they get paid for it… Requests [for additional funds to service vulnerable populations] must be absolutely evidence based. [Health units] should go out into their communities, and figure out what the inequities are, and what the barriers to access might be, and put together a proposal to address a specific barrier in a specific population, rather than simply ask for extra money because their population as a whole is disadvantaged. (Participant 3)

Several informants emphasized that the provision of additional funds to service high-risk vulnerable sub-groups should be supported via a transparent, evidence-informed review of how funds that are granted to PHUs to service high risk vulnerable communities are being utilized to address health disparities. The Ontario Marginalization Index (ON-Marg) was brought up by a number of interviewees as a possible tool to consider in examining health inequalities to inform funding decisions. Developed by the Center for Research on Inner City Health (CRICH), ON-Marg is an index based on census and geographic data designed to identify and address various aspects of marginalization in both rural and urban Ontario (CRICH, 2006). This tool is specifically intended to be used in conducting needs assessment and health service planning, with respect to health inequalities and focuses on four specific dimensions of marginalization; residential instability, material deprivation, ethnic concentration and dependency (CRICH, 2006). In fact the ON-Marg tool was discussed by multiple informants as one of the potential components of alternate funding approaches under review by the FRWG. Across interviews, there was strong support for a systematic inclusion of health equity considerations into resource assessments and the distribution of funds across health units. Balancing the provision of additional resources with incentives to encourage PHUs to address the underlying causes of health disparities in their respective jurisdictions was suggested as another important feature to consider in the implementation of this particular principle.

4.5.2.2 Principle 9: Under-funded PHUs should be brought up to the level of the top PHUs, rather than bringing the top funded PHUs down

Another aspect of integrating equity lenses into public health funding suggested by informants was oriented around moving towards a more equitable distribution of resources across the 36 health units. There is a great deal of variation in per capita budget allocations across PHUs with the highest board of health expenditure estimated at $193.6 million (Toronto Public Health), and the lowest estimated at $5.7 million (Timiskaming Health Unit) (MOHLTC, 2009). This prominent variability in board of health expenditures across the 36 health units may be linked back to historical allocations based on municipal support for public health, rather than more empirically driven approaches towards the distribution of resources across PHUs. Political influences and the advocacy/lobbying power associated with different boards of health and historical variations in municipal buy-in were discussed as key factors that may have contributed to current variations in budgets sizes across health units. Some informants suggested that health units with stronger ties to policymakers and the provincial government tended to have a more prominent voice in advocating for and receiving additional funds:

> Invariably what happens with provincially-centered [PHUs]… is that as you get closer to the center, the bigger mass has the bigger voice, the bigger whine - and invariably the large central health units are resourced well, while the other health units continually end up getting the short end of the stick because there's less advocacy power. (Participant 12)

Many public health professionals suggested that any changes to the status quo should be preceded by a critical review of PHU budgets would help to identify both under-funded and over-funded health units, and establish a baseline understanding of where the greatest resource needs lie, and what levels of resources are required to address those immediate gaps:

> The place to start is to look at the historical gap and do an analysis to determine which boards of health are underfunded and need to be brought up to a standard; and then once you've leveled everyone up, then definitely population or needs-based funding makes sense. (Participant 8)

Another aspect of incorporating equity lenses into allocation mechanisms was discussed in light of transitioning to alternate funding approaches. Shifting to a different funding framework could cause drastic reductions in PHU budget sizes. For instance, over-funded health units may face serious budget cuts whereas underfunded PHUs could receive prominent increases. A 'red-circling approach' was suggested by many interviewees as a critical component to consider in broader efforts around equalizing PHU budget sizes. Under a red-circling strategy those PHUs who may be receiving more resources than empirically warranted would be allowed to retain their current allocation, i.e., existing budgets would be frozen at a 'holding level' (Treasury Board of Canada Secretariat, 2013), and any

new/additional funds would be directed towards underfunded PHUs to ensure over time an equalization of resource distribution across jurisdictions. Over time a gradual introduction of equalizing measures was emphasized by several interviewees, who suggested that a long-term lens should be applied to any transition towards equalization to ensure that PHUs are not decimated by drastic funding cuts:

> Also critically important is going to be, over what timeframe are you going to implement it? And, are you going to red-circle these health units? For instance, if you've got a health unit that, you determine with your new formula, was getting too much money, all of a sudden to cut them back 25% if that's what a new funding model shows that it should be, is going to be devastating for that health unit. And, what the alternative might be is that you leave them where they are but they don't get any increases for the next whatever number of years, until the have-nots, the ones that were below average, the money goes to them to get them up to where they need to get to. (Participant 10)

> An objective funding formula that most people can either agree with or live with would have to be applied over a long period of time to be able to avoid complete chaos. I mean, could you imagine a health unit saying: “As of this year you’re going to get a 40% drop”… So that, you’re going to have to start firing people, and move out of buildings - it’s going to be a disaster. And those that are getting a 40% increase… They wouldn’t even know what to do with it, this is more money then they can even imagine… I think a transition from the subjective formula that we supposedly have now into whatever objective formula is decided upon… will have to be a very gradual transition. (Participant 6)

> I think what you would have to do [if there was a shift towards equalizing health unit budgets], is you have to have a lot of notice. If you're going to implement a funding formula and there's going to be winners and losers, first of all, it has to be very transparent so people understand that what the decisions are based on. Two, you have to give boards of health lots of notice because 90% of your funds are labor costs and we want to be able to transition to a new funding formula without penalizing people so that you had a two or three year window, you could plan for a gradual decrease. So if you had to decrease your staffing, you could do that through retirements, for example, so you don't have to lay people off. I think you would want to minimize the harm being done to individuals as you transition over, and so this has to be done very gradually and with lots of notice. (Participant 8)

Informants suggested red-circling existing budgets would be essential to ensure that any significant changes in allocation practices do not decimate health units to the extent that PHUs have to make drastic cuts to staff or compromise programmatic capacities to fit within revised allocations. Some interviewees suggested that PHUs that are selected to receive additional resources should be provided with systematic guidance and support (from the provincial government, PHO or other PHUs) on how to best utilize new funds to maximize investment potential for improvements in population health. Many public health professionals felt this was an important guiding principle to consider in distributing resources across PHUs. An empirically supported review of existing budgets (and related disparities between jurisdictions) and a systematic but gradual approach toward

equalization were the main points stressed by informants in their feedback around the practical application of this particular principle.

4.5.2.3 Principle 10: Funding decisions should be based on measures of health outcomes and disparities in health outcomes across jurisdictions

Several public health professionals in their discussion around the integration of health equity lenses in allocation decisions mentioned the idea of health outcomes as determinants of health inequalities and demonstrated resource need at a PHU level. Health outcomes were discussed as empirically driven indicators of health disparities and associated resource needs. Life expectancy and standardized mortality ratios (SMR) were proposed as potential outcome measures to consider in developing comparisons of health status across jurisdictions to guide the distribution of resources across PHUs. Several informants suggested that health outcomes and resulting disparities across jurisdictions indicate where the greatest resource needs lie, and proposed that they should be used to guide resource distribution and drive improvements in health disparities:

> Health outcomes are not a proxy measure. They show actual disparity in health across the province. Life expectancy is an example of a health outcome measure that varies across the province… and serves as evidence for the need to increase funding to level up health units with lower health outcomes… How would cutting the budget [of those PHUs who are underperforming on health outcome measures] and giving more money to somebody who already has excellent health outcomes make any sense? If Peel Region has the lowest amount of funding, but they still actually have the healthiest population, then they don't need more money… (Participant 13)

Aligning the means to identify and address gaps in health outcomes with incentives to improve performance was another significant theme that emerged across interviews. Some informants felt that the provision of resources to PHUs simply on the basis of disparities in health outcomes across jurisdictions may create a climate of negative incentives for better performing PHUs, and could discourage health units from striving towards improvements in health outcomes and eliminating the underlying causes of health disparities within their respective jurisdictions:

> If you have a population for example that has high rates of cardiovascular disease, should that health unit be getting more money? Because it's like a double-edged sword. You're rewarding poor health, and yet they have a need to address that issue. But it's disincentive to make it better, because you get more money if it isn't. So, should health units be penalized for doing well? (Participant 10)

Overall, many informants felt that health units with poorer health outcomes should not simply be granted additional resources without a rigorous examination of the causes of poor health outcomes in a given jurisdiction/community, and the establishment of a clear plan to address the underlying causes of health disparities in their respective jurisdictions. Interviewees indicated that shifting

towards funding based on health outcomes requires a careful review of the extenuating circumstances and social conditions that influence gaps in health outcomes within and across PHU jurisdictions. Many public health professionals stressed that PHUs should be asked to provide a clear justification for any additional resource needs that they request to deliver specific plans or programs to improve health outcomes (and their underlying determinants). Establishing consensus around a core set of health outcomes as indicators of a PHU's resource needs, and the difficulty associated with balancing the provision of additional funds with demonstrable efforts to address the underlying determinants of health outcomes were discussed as potential challenges with the adoption of this particular principle.

4.5.3 Transparency-accountability-based principles

The fourth category 'Transparency and Accountability' included principles related to the integration of transparency in the procedures that inform budget development, and the adoption of greater accountability in linking performance indicators to resource needs at a PHU level. Two of the 12 principles proposed by public health professionals were linked to this particular category. Table 11 provides an overview of the two principles along with additional dimensions discussed by informants in terms of the design and implementation of each principle.

Table 11: List of transparency and accountability-based principles

CATEGORY: TRANSPARENCY AND ACCOUNTABILITY	
Sub-categories/nodes	**Additional dimensions**
Principle 11. Funding for PHUs should be determined via a process that is sufficiently transparent	1. Lack of transparency in the current funding framework 2. Limited feedback loops between funders and health units
Principle 12. Funding should be tied to meeting agreed performance targets	1. Accountability and performance measurement in public health 2. Linking performance measures to funding 3. External factors and PHU performance

4.5.3.1 Principle 11: Funding for PHUs should be determined via a process that is sufficiently transparent

In terms of the current funding arrangement, informants felt that the processes and variables that guide the distribution of resources across health units remain unclear. Many of the public health professionals that were interviewed expressed a strong interest in seeing a shift towards more transparency in the distribution of funds across health units. Several interviewees suggested the adoption of a formula-based approach (with specific justifiable criterion) to calculate or justify

allocation decisions as a transparent and objectively driven approach towards resource distribution. Under a formula-driven strategy, public health professionals suggested that PHUs would be able to determine what their resource needs might be, and develop a sense of the expected budget size they may receive. This type of an approach informants revealed would be a significant improvement in terms of the very limited degree of transparency observed under the current historical funding approach. Some interviewees also mentioned that shifting to a formula approach in the interest of greater transparency should be accompanied by a system of checks and balances to ensure that PHUs are not 'maneuvering' the formula to achieve the maximum allocation benefit and compromising transparency and fairness intended by the adoption of a formula-based approach to funding:

> I think we need to be transparent because we're accountable to the public. There should be ways that we can account for how we spend our money. When you get into systems like HBAM… it does allow some consistency across the board, but then it also allows for 'gaming' [the formula] and how to play the game 'right'. So here's a formula, [health units may say] if we do it this way it gets us more [money]… You want to encourage transparency, which means straight forwardness and openness rather than optics and positioning. (Participant 12)

Informants also discussed the need for a more transparent and systematic process to appeal or request additional funds. While there are currently opportunities for PHUs to request one-time funds for additional needs, the process is mostly internalized and occurs on a case-by-case basis with PHUs requesting those funds directly from the province or their respective municipalities. Informants mentioned that political connections and board of health lobbying power are among the key external factors that can influence the degree of success that PHUs may experience in advocating for additional funding. To ensure fairness and transparency in allocation decisions (including one-time funding), many public health professionals proposed a shift towards a formal process for budget appeals and one-time funding requests, so that the processes and reasoning behind PHUs requesting and acquiring resources is transparent and justifiable to taxpayers, other PHUs, and funders themselves.

Many informants also emphasized the role of organizational features in shaping the degree of transparency in resource assessments and allocation decisions in public health – specifically disconnects in timelines and budget development procedures between the province and municipalities. PHU budgets have to be approved by their respective board of health, after which they are passed on to the municipal government, and finally sent to the MOHLTC for provincial review. Municipal governments operate on a fiscal year that starts in January; so municipal budgets are set typically between September and November each year, whereas the provincial government operates on a fiscal year that runs from April 1st to March 30th, under which budgets are typically finalized in

the summer. Interviewees discussed at length how delays in budget development at the provincial level (i.e., Cabinet revisions, political agenda-setting, and evolving provincial priorities etc.) can often result in provincial approval being postponed for several months. In fact PHUs often do not receive final budgetary information till part way through the municipal budget year. Several informants commented on the difficulties presented by this misalignment of budget planning timelines, both in the context of openness and transparency between funders and PHUs, as well as on a more practical scale in terms of the limitations it imposes on proactive planning and program delivery at a PHU level. The resulting gap in timelines for budget development and limited feedback loops between funders and PHUs create significant challenges for PHUs, who in effect have to plan and design services based on assumptions of increases in budgetary changes. Several public health professionals discussed this misalignment in budgetary timelines and its implications for transparency in funding decisions for PHUs:

> There's a complete misalignment in terms of the scheduling and planning processes… Health units are constantly playing catch-up with spending based on expectations of what they think they are going to get, and those may change during the course of the year…. [This results in] a duplicated sort of effort… health units are having to plan based on expectation - instead of allocating according to what they know they are getting. (Participant 3)

More effective communication channels between PHUs, municipalities and the provincial government around anticipated increases were proposed by many informants, who emphasized that strategic efforts must be taken to align budget development timelines between different levels of funders to better support PHUs in proactive program planning and staff hiring and retention etc. Shifting to a formula-based approach with clearly defined criterion, similar to what has been observed in the acute-care sector with HBAM was suggested as a possible next step for the public health sector. Overall, the need for a stronger commitment to transparency and greater accountability in terms of the processes that govern funding allocations for PHUs was supported by all interviewees. Many informants also emphasized that the public health sector has a unique opportunity to advocate for some much-needed commitments towards integrating greater transparency into resourcing decisions, especially in light of emerging dialogue around the possibility of new directions for public health funding via the FRWG.

4.5.3.2 Principle 12: Funding should be tied to meeting agreed performance targets

Performance measurement and its link to funding decisions featured heavily in informant feedback around incorporating transparency and greater accountability into public health funding. Taking steps to measure the impact that PHUs have in terms of health improvements in the

communities they serve, was generally supported by all informants, but there was not as clear of a consensus around what specific indicators should be used, and how performance measures should ultimately be linked to funding decisions.

Interviewees emphasized that much of the work that health units are responsible for focuses on disease prevention, and that PHU mandates span across a wide range of health determinants and risk behaviors, many of which are beyond the direct influence of PHUs. And several public health professionals strongly emphasized that that lower rankings in performance measures may not necessarily be a direct reflection of how well a PHU is operating. By and large, public health professionals felt that the demonstrable impacts of preventative programming are often apparent in the long-term but funding decisions are not based on a multi-year design, which makes the development of appropriate indicators for public health a critical challenge in formalizing the link between performance and funding for PHUs. The lack of consensus around appropriate performance indicators also emerged as an important barrier to explicit linkages between performance measures and funding for PHUs. Several interviewees commented on the difficulties associated with implementing this principle:

> The idea of accountability, the idea of measuring what we do in public health and using that measurement to understand the value that public health generates in a community, or delivers to a community, I think most people are behind that concept… I think the practical application of that concept is what the whole field of public health is struggling with - How do we measure value of prevention?… How do we measure all of the diseases that we've prevented? It's hard. It's really easy to make the case for acute medical care… but it's really tough to make the case for, prevention - that if you spend a little bit more earlier on things like vaccination, then you don't have to deal with those things down the road. I think we're still, years later, making that case for public health. (Participant 3)
>
> I think what's difficult, particularly with respect to health promotion, is that these are long-term outcomes. We're trying to change people's behaviors. So, it's one thing to increase knowledge or awareness of the public around constitutes 'healthy eating', but actually getting the person to change their purchasing behavior at the grocery store - how and when and what they eat is a more complex process that is difficult to measure and more expensive to measure. It is more challenging to find performance indicators that aren't more 'societal' as proxies for that. (Participant 14)

The issue of sole attribution to performance was a major concern for many informants who felt that PHUs may be unfairly penalized for poor performance, for instance, social determinants that are beyond the influence of PHUs. Informants also mentioned that lower scores on performance indicators may not be necessarily be attributable to poor management or incompetency in terms of staff and program delivery, and instead might be a function of multiple variables such as under-staffing, incomplete surveillance due to land mass/geographic distances, or extenuating factors such

as historically low levels of educational attainment and income within a PHU's catchment area. Several informants expressed concern that an explicit link between PHU performance and funding could lead to a further reduction in resource provision for underperforming (and likely underfunded) health units, which may exacerbate existing health inequalities and gaps in service provision etc.:

> In linking performance to funding you take away money from the underperforming health units. That doesn't make sense to me at all. If a health unit is underperforming, then it needs to have a change in management. It doesn't need to have money taken away from it so it can underperform even more. (Participant 11)

Many public health professionals stressed that if performance measures were explicitly tied to funding, they would have to be taken into account in the greater context within with a PHU operates. Informants felt that in order to draw fair and legitimate comparisons of PHU performance across jurisdictions, the extenuating circumstances, i.e., social conditions, population demographics, and historical trends in disease burdens, public health emergencies etc. must be taken into consideration when assessing performance across PHUs:

> Performance indicators shouldn't be looked at out of context. They really need to be considered with more of a discussion about why they [PHUs] didn't meet those indicators - Was it because you had staff turnover that year? Was it because your base amount of staff is inadequate? There has to be some context. I think obviously if a health unit is just not doing the job, then some of the 'stick' I guess is important, but you have to understand the context first. (Participant 7)

Some interviewees suggested that better performing health units deserve the additional funds for the success that they have achieved, while others felt that linking performance to funding mechanisms may generate negative incentives for PHUs to commit to or invest in improving their performance. And several informants even commented on the challenge of balancing rewards for PHUs that are successfully meeting performance targets with incentives for under-performing health units as a key barrier to the full-scale adoption of this particular principle:

> If somebody is scoring highly in all of their indices, they don't need more money. If they are scoring low in all their indices, then they need more money, or more human resources, or more expertise. There's some reason why they're scoring so low in all their indices… the system's set up so that those who underperform are going to get increases in budgets… But still, how crazy is that? So, the health units that are doing their best get penalized for doing so by not getting as much money as the health units that are underperforming. It's nonsensical and it shouldn't be tied that way. (Participant 6)

Another theme that arose in the discussion around explicitly tying performance to funding for PHUs was the concern that PHUs would disproportionately focus their efforts on scoring well on predetermined indicators (potentially at the expense of other programs/services or aspects of PHU operations). Several interviewees also suggested that moving towards a performance-based funding

format could potentially create greater competition for limited funds that may inhibit collaborations and cooperation (i.e., sharing of best practices) between PHUs. Instead of moving towards collectively improving the health of populations across Ontario, and shifting the average health curve towards better health status for all Ontarians, health units would be more likely to focus solely on their own jurisdictions.

Some informants still felt that formalizing the link between funding and performance could potentially encourage health units to connect with other stakeholders in their respective municipal jurisdictions (i.e., social services, housing, and education etc.) to facilitate more coordinated efforts to identify and address the underlying determinants of health in their respective jurisdictions:

> The [accountability agreement] indicator on reducing the prevalence of smoking. Well, much of that is outside of the control of the board of health, but on the other hand, I personally don't have a problem with it, because I think we can sometimes leverage these indicators to get other partners to the table to work with us. (Participant 8)

If the link between performance measurement and public health funding is formalized in a future funding framework, many informants suggested a gradual shift towards implementing performance-based financing. In addition, several public health professionals also felt that there was an opportunity for PHUs to be more involved in the process of developing and validating indicators. The 14 Accountability Agreement indicators that are currently mandated for all PHUs were described as shortsighted and arbitrary in nature. And many interviewees criticized the recently released accountability agreement indicators for measuring aspects of population health that are beyond the direct or immediate influence of PHUs. Developing indicators that accurately capture jurisdiction specific variability/context across jurisdictions was a key concern that emerged across interviews. Some public health professionals suggested developing a fixed set of 'core indicators' alongside additional 'jurisdiction-specific measures' to capture certain local context. Several interviewees felt that if performance measures were to be integrated into funding decisions, the development of more appropriate reliable and valid indicators would be an important first step towards performance-based financing in public health:

> Some of the performance [accountability agreement] indicators like the immunization indicators are true performance indicators and some of them are what I would call 'aspirational'… So, we have a mixed bag of indicators right now. I think we certainly have a lot more to do in terms of developing the right performance indicators that will drive performance. I think it's very much a 'work in progress', and I am glad that funding is not tied to these indicators. (Participant 8)

Across interviews public health professionals widely emphasized the need for health units to adopt greater accountability in terms of their management, operations and overall performance in

improving population health outcomes. Informant feedback highlighted a mixed reaction to a direct link between performance measures and funding allocation for PHUs at this stage. The proactive involvement of health units in the development and verification of performance indicators and an acknowledgement of the wider context within which a PHU operates were seen as integral components of any transition towards linking performance measurements to funding decisions.

4.6 Process-based ideas

Over the course of the interviews conducted with public health professionals, in addition to the 12 guiding principles, informants also brought up a number of different 'process-based ideas'. Process-based ideas are conceptualized as 'non-principle' related ideas that were suggested by public health professionals as important supporting features/aspects in the design and implementation of allocation policies and practices in public health settings. The process-based ideas proposed by informants were oriented around which stakeholders should be involved in funding public health services and how services should be delivered, rather than how public health programs/services should be funded (i.e., principles). A complete list of the process-based ideas proposed by public health professionals over the course of the interviews is available in Table 12.

Table 12: List of process-based ideas

CATEGORY	PROCESS-BASED IDEAS
1. Cost-efficiency	1. Consolidation of PHU resources for centralized service delivery
2. Cost-sharing and shared responsibility	1. Shared financial responsibility for the provision of public health services
3. Multi-stakeholder involvement	1. Input from multiple levels/types of stakeholders should guide decisions around the distribution of funds across PHUs

4.6.1 Consolidation of PHU resources for centralized service delivery

Achieving greater cost-efficiency in the design and delivery of public health services emerged across interviews as a common theme in informant dialogue around future directions for resource distribution in public health. Interviewee feedback around establishing ideal 'critical mass' at a PHU level (Principle 5) illustrated strong support for restructuring PHUs through amalgamations to achieve greater economies of scale and improve the cost-effectiveness of public health operations. In addition, many interviewees also suggested a shift towards more centralized approaches towards public health program delivery as an important supporting feature of public health funding practices.

While not all public health services can be centrally delivered, there are a number of services that public health professionals felt were more cost-effective if delivered in a more centralized format, i.e., at a regional or provincial level rather than at the municipal level. The centralization of health services typically involves a regionalization of services, with the transfer of responsibility shifting from the municipal to a regional scale (Lewis and Kouri, 2004; Kodrzycki, 2013). Typically, technology and expertise-intensive services tend to be more cost-effective to deliver in a centralized format (Kodrzycki, 2013). A shift towards more centralized organization and delivery of public services has been observed in several public sectors including policing, fire safety, and education (Koh, Elqura, Judge, and Stoto, 2008).

Ontario that has retained a prominent distinction between public health and the acute-care and hospital system, whereas the rest of the Canadian provinces all deliver public health services in a more centralized format under 'regional health authorities' (McIntosh et al., 2010). Many interviewees felt that given the expansive range of responsibilities expected of all health units, PHUs are individually responsible for several costly operations including epidemiological surveillance, toxicology assessments, human resources, and communication/outreach activities. Since PHUs are mandated to deliver the same core set of programs/services under the OPHS and are subject to the same performance expectations (i.e., 14 Accountability Agreement indicators), many public health professionals felt that centralizing certain core services would help to prevent individual PHUs from having to 'reinvent the wheel' in their own jurisdictions. Potential cost-savings generated from a centralized approach could help to conserve resources (financial and staffing hours etc.) that can be redirected to other areas, i.e., local needs, capital projects, and emergency situations etc. Examples of successful centralization in public health that were mentioned by informants included library support and ethics review. PHO provides centralized support for ethics review for all PHUs as well as resource library assistance through 'regional librarians'.

The specific services suggested by interviewees to be delivered in a more centralized format included, epidemiological surveillance, toxicology assessments, and communications/media outreach. Informants proposed that since PHUs have to collect much of the same epidemiological data based on a core set of programs mandated under the OPHS, therefore centralizing epidemiological surveillance efforts could be a viable and practical strategy. As one public health professional commented:

> What can be done centrally and what must be done locally - I would think right now we have no provincial surveillance system for chronic diseases and risk factors, and you've got some health units who are paying to have the Rapid Risk Factor Surveillance System (RRFSS)[4]

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[4] RRFSS is an ongoing telephone survey used to gather surveillance data and monitor public opinion on key public health issues – specifically the risks for chronic diseases, infectious disease and injuries. The RRFFS is administered by the

> data, and it's extremely expensive and it's patch-work. I would think if that data were provided centrally, it would save health units a lot of time and money, so surveillance is a big piece. (Participant 8)

Communication/media outreach was also discussed as another potential opportunity for centralization, since all PHUs are required to provide the same mandatory programs, and implement similar provincially mandated policies (e.g., Smoke-free Ontario). Informants emphasized that the use of centralized communication campaigns (i.e., chronic disease, healthy/active living, and sexual health etc.) could not only help to cut costs across individual PHUs, but also allow for greater consistency in communication/outreach messaging (i.e., social marketing, advertisements, and electronic messaging etc.) across the province. Toxicology assessments were another commonly mentioned service that informants felt could be deployed centrally to prevent PHUs from having to hire and train an 'in-house' toxicologist, proposing instead that PHUs could acquire that service from a centralized platform such as PHO. But not all informants fully supported a systemic shift towards centralizing those specialized services that are required of health units. Some public health professionals felt that shifting core services to a central source, such as PHO is costly and administratively challenging, and the costs incurred could possibly negate any savings created (particularly in the short-term) due to the infrastructural and HR adjustments that would be involved in executing a centralization strategy. Retaining certain core services at the PHU level would allow health units to capture and integrate local nuances in programming, which may be overlooked if centralization was implemented across all health units. As one interviewee commented:

> I don't think that [epidemiological surveillance] could be run as effectively centrally through the MOHLTC or Public Health Ontario… It's that 'information loop' that works very well at the municipal level because it's the direct tie between the front line nurse and the epidemiologist at the back… I think you have to balance it… if you consolidate too much, you are actually flying people out to deal with an outbreak because you lack on the ground support… [with centralizing] legal [support] you enter into a quagmire because there would be a lot of caveats with it. Currently, the board of health is legally liable. So, every board will want its own legal counsel just to follow good governance practices. So, it's very hard to centralize it. Plus, legal issues could be between the health unit and the Ministry, or between the health unit and PHO too. So, very, very few councils would give up the right to have legal counsel. (Participant 9)

Informant feedback suggested strong support for the centralization of certain core public health operations to generate cost-savings across the public health sector. Epidemiological

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Institute for Social Research (ISR) at York University. Individual health units contract directly with ISR for each cycle of RRFSS. 12 out of the total 36 PHUs currently participate in the RRFSS (Rapid Risk Factor Surveillance System, 2013).

surveillance, toxicology assessments, and communication/outreach activities were the most commonly mentioned services, that informants felt could be offered via a centralized format. Public health professionals identified a number of challenges associated with centralizing public health services, including time, staffing hours and the operational costs required to establish and maintain centralized service delivery platforms.

4.6.2 Shared financial responsibility for the provision of public health services

Currently the maintenance of a minimum set of public health services across jurisdictions relies heavily on financial support from the provincial government through cost-sharing agreements between the MOHLTC and PHUs. The MOHLTC has supported PHUs through funding for several operational needs, including salaries, benefits, building occupancy, and information technology etc. (MOHLTC, 2011), for the provision of both mandatory and cost-shared programs under the OPHS. The idea of shared responsibility, i.e., that funding for the provision of public health services should be shared by multiple levels of government, was widely supported by a majority of the public health professionals interviewed. Interviewees felt that cost-sharing agreements help to ensure stakeholder buy-in from multiple funders. Several informants suggested that relying solely on one funder was a risky strategy, since funds could be drastically cut or reduced due to changes in political priorities or evolving stakeholder agendas. Cost-sharing arrangements help to 'protect' public health programs from a disproportionate reliance on a single funder. In terms of program content, having multiple funders can help to counter or balance the agenda of a particular funding partner. For instance, certain boards of health may not be as supportive of sexual health programming, but having the provincial government involved (through legislative [OPHS] and financial support) helps to protect sexual health programs from being eliminated by municipal governments. This idea of protective support for programs through shared responsibility for funding was discussed by many interviewees as a valuable aspect of cost-sharing:

> I am absolutely in favor of it… In any environment where your governance body can change every four years or does change every four years, health units would be vulnerable to losing programs that have political sensitivity. [For] programs like sexual health, the existence of the provincial funding and the provincial legislative requirements… its great protection for the public health piece. On the other hand, the existence of the municipal input provides municipalities with leverage, to say [to the province], "Yes, these are your priorities but because the municipality is putting in 25%, then we have the right to comment on some of that distribution [of resources]". So I think there's the protection [of certain programs], but cost sharing also gives you some local nimbleness and responsiveness. (Participant 5)

> Now, when it comes to money matters, we have found that if you were wholly dependent on the province, then the province can pull the plug at any time, right?... So shared responsibility

> with the municipality helps because the municipality is interested in protecting its share… The other thing is that the municipalities themselves may decide to pick up the slack… Public health services are better protected by a shared funding relationship. If there was completely 100% municipal funding, we are likely to see a complete pullout when the going gets tough. (Participant 4)

Informants suggested that having two sets of governments involved in financing can promote greater transparency, consistency and fairness in allocations across jurisdictions, and provide PHUs with a certain level of lobbying power to ensure that population health needs are retained as municipal and provincial priorities over time. The municipal buy-in through the 75-25 cost-shared programs helps to ensure that municipal governments are consistently providing PHUs with adequate levels of strategic and infrastructural support to plan and deliver public health programs. Municipal input also provides the municipal government with a certain degree of 'ownership' over how 'local' population health issues and health behaviors are addressed by PHUs. Some interviewees felt that a complete shift to 100% provincial funding may inhibit local responsiveness/flexibility, and community-specific needs would not be systematically integrated into funding decisions if financing for health units was handled centrally by the province:

> The advantage of the provincially run system is that there would be probably more consistent access to funds at certain times and [transparency through] formulas, etc. The disadvantage is that any local issues would probably have to be less important. [Funding would be] more centralized with less involvement around areas of community mobilization and health promotion, etc. While that is useful in areas where variability is not desired, such as in the health protection programs, how you respond to an outbreak in different jurisdictions would not be the same everywhere. To have inconsistency is, at best, problematic, and at worst both costly and confusing to the public. (Participant 12)

Shared responsibility for PHU financing was considered especially important for those municipalities with smaller economies facing restricted growth (i.e., agriculture, tourism etc.) and limited tax bases. Many interviewees emphasized that wide variations in the revenue generation capacity of municipal economies and tax bases (i.e., property taxes) across jurisdictions could create significant inconsistencies in the amount of funding PHUs would receive if municipalities were the sole funders of public health services. The resulting disparities in PHU budget sizes could adversely impact population health outcomes and health inequalities across the province. Across interviews, public health professionals strongly supported the idea of shared financial responsibility for the provision of public health program. The current 75-25 split between the province and municipalities was seen as an appropriate division of responsibility between the two levels of government. Interviewees cautioned against rapid shifts in cost-shared contributions similar to what was witnessed in the downloading of public health funding to municipalities under the Harris government in the

1990s (Deber, 2006) where the burden of responsibility to fund public health programs was shifted entirely to municipalities.

4.6.3 Multi-stakeholder representation in PHU budget development

The key groups that currently have an influence on allocation decisions include both municipal and provincial-level stakeholders. Municipal representation includes boards of health that are comprised primarily of municipally elected officials (COMOH, 2005) alongside a smaller number of provincially appointed representatives. Provincial influence is linked to the MOHTLC (specifically the Public Health Division) and its public health-related branches. The range of stakeholders involved in decision-making around the distribution of allocated funds can have an important influence on the diversity of perspectives (i.e., political agendas and social value judgments etc.) that are factored into decision-making (Clarke and Weale, 2012).

In addition to retaining the role of the provincial government and individual municipalities in budget development processes, several informants also suggested that the general public who currently do not have a prominent voice in shaping PHU agendas should be included in dialogue around public health funding. Proactively eliciting the public's feedback they suggested could help to expand the reach of public health services, specifically in terms of health promotion programs, i.e., healthy eating, active transportation, drug and alcohol abuse, and physical activity etc., and help to identify local needs and support program uptake at a local level. Other stakeholders that were suggested for inclusion in broader dialogue around priority-setting and resource distribution for PHUs included municipal partners, such as restaurant associations and school boards, given that these stakeholder groups are often at the receiving end of public health programs such as public health inspections and vaccinations/immunization initiatives.

Across interviews the role of the municipal government as a cost-sharing partner was widely supported as an important influence to retain in budget development stages. Interviewees felt that having municipalities involved in contributing to budget development and priority-setting at the local level helps to ensure that PHUs are aligning their program portfolios with community needs, and are being held accountable to the communities they serve. Informant feedback around multi-stakeholder involvement in allocation decision-making also revealed agenda setting at the provincial level appears to be rather top-down with PHUs being engaged in the latter stages rather than more upstream in during the initial priority-setting stages.

4.7 Strategic changes and best practices for public health

In addition to discussing what types of principles should be used to guide future directions for public health funding, informants also shared broader insights around strategic changes and possible adaptations of best practices from other parts of the healthcare system to the public health context. The ideas shared by public health professionals are described in more detail below.

4.7.1 Best practices from other sectors

Many informants provided detailed insights around ways to adapt best practices from other sectors (including other parts of the healthcare system) into the design, delivery and management of PHUs. Proactive, system-wide information exchange, and the establishment of 'communities of practice' at a local level, were identified as key opportunities for health units to collect information about the successes and challenges faced by their peers in designing and delivering programs in their respective jurisdictions. The adoption of a 'quality control review' process/committee that would be tasked with assessing PHU performance, i.e., facilitate internal reviews, identify in-house opportunities for cost-savings etc., was also identified as an important best practice utilized in many other government sectors that could support PHUs in achieving better population health outcomes and improving operational/organizational performance. As one interviewee commented:

> I would love for the Ministry to have kind of like an auditor – a continuous quality improvement-type officer or committee that goes to health units… and says, "Somebody else has the same system or problem, and they do it this way"… or "How can we do deliver this program more efficiently?… I think [we need to have a] review committee to come to health units in the spirit of quality improvement, and share best practices that other health units have done. So it's actually an information exchange. (Participant 13)

Similar to the idea of quality control reviews/audits, the idea of accreditation of health units also emerged across informant interviews. Many public health professionals expressed regret that accreditation under the Ontario Council on Community Health Accreditation (OCCHA) is no longer being financially supported by the MOHLTC (ALPHA, 2013). About a third of PHUs are accredited under the OCCHA, and many interviewees commented positively on the benefits that both planning for and undergoing an accreditation process could have for promoting continued quality improvement at a PHU level. Developing more effective approaches towards the negotiation of collective agreements (union agreements) similar to what has been adopted by the hospital system with the Ontario Hospital Association and the Hospital Employee Relations Services managing the central

bargaining process for a number of different unions[5] (Ontario Hospital Association, 2013) was also suggested as an additional best practice for the public health sector to consider incorporating into its operational and management framework in the future.

4.7.2 Building a brand for public health

One of the most common themes that emerged across interviews was informant feedback on the public's very limited understanding of the role and value of PHUs and public health programs/services. Many public health professionals felt that the public health sector was misunderstood and undervalued, especially compared its counterparts in the acute-care and hospital system. Several interviewees suggested that there is a critical need to craft and develop a 'brand' to promote the purpose and value of public health, since PHUs tend to receive media coverage only in the event of emergencies or outbreaks, and their role and on-going contributions to disease prevention and health promotion efforts at a societal level often go unnoticed:

> Even though we try, people don't really understand what public health does. We're always trying to improve that message, and certainly if people have used our services, I think they recognize our value better, but overall, we still get lost in the mix of healthcare. They don't really understand the concept of 'population health' – the idea that we don't actually 'see' people, except for the Sexual Health Program. So we don't tend to get a groundswell of, "Yes, we need more money for public health!"… People just want their acute health care… I don't recall any hospital ever having to advertise what they do… a hospital never has trouble raising funds or people donating money. (Participant 2)
>
> I think at the end of the day what's going to be the most convincing is not research… you could do a bunch of different studies that say, "Prevention is cost-effective, or that the prevention of chronic disease saved you this amount of money"... It's not going to be as effective as what I would consider compelling 'stories of prevention'. And we don't have them in public health. We have them for vaccines, but we're starting to lose them because people don't have the memory of seeing all of these terrible infectious diseases that were cured, essentially, prevented by vaccines… No one notices [public health] because they never knew what we did in the first place. (Participant 3)

Overall, there appeared to be an overwhelming consensus among public health professionals on the importance of building a more compelling brand/profile around the purpose and impact of the public health sector to promote greater public awareness around why public health should be an important priority for citizens as well as municipal and provincial governments. Interviewees emphasized that developing a brand for public health would be an important next step for PHUs to not only generate more momentum and awareness around public health activities and preventative

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[5] Including the Ontario Nurses Association, Ontario Public Sector Employees Union, and the Professional Association of Interns and Residents of Ontario (Ontario Hospital Association, 2013)

health services within their respective communities but also to be more visible and appropriately positioned to advocate for additional funds from policymakers across municipal and provincial levels of government.

4.7.3 Developing more integrated approaches towards public health programming

Improved coordination of program delivery between PHUs, as well as partnerships with other parts of the healthcare system through structured collaborations and integrated approaches towards public health programming were strongly suggested by multiple interviewees. Several informants advised that PHUs should actively engage with other partners in their respective municipalities, i.e., social services and education etc., to consolidate resources and create a more collaborative environment to improve the reach of public health programs and tackle underlying determinants of health. Some informants suggested that the broader acute-care system and the LHINs that PHUs are co-located in represent important often-untapped avenues for sharing expertise, resources and venues:

> It's not just the healthcare system; it's the health and social services system. I think that PHUs would say they don't just provide health services, they provide social services, so they should work within the broader settings of their communities… that's why I'm emphasizing partners… if [PHUs] are responsible for needs-based population health in their communities, then they should leading efforts on that basis. And they tend to, like many other areas of the healthcare system, operate in silos. (Participant 14)

The seven regional Tobacco Control Area Networks (TCANs) that are established and maintained by the Ministry of Health Promotion (now amalgamated into the MOHLTC) were discussed as an exemplar of integrated programming. TCANs play a vital role in supporting planning, training and media/communication efforts between local and regional levels, and internally within PHUs (Ministry of Health Promotion, 2010), to support more integrated design and delivery of public health services. Connecting with community-based organizations (schools, non-profits etc.) to support coordinated approaches towards public health programming was another suggestion offered by several interviewees.

4.8 Findings - Web survey

As outlined in Chapter 3, the completion of the key informant interviews was followed by the administration of a web survey. The main objectives of the web survey were to determine how a wider subset of public health professionals' prioritized the different principles developed during the informant interviews, and how they conceived trade-offs between competing principles (and associated social values), in terms of their perceived relative value/importance in guiding allocation decisions. The survey was targeted at capturing the perspectives of a broad sample of public health

professionals and was sent to a wide range of public health professionals (including those that were interviewed in the first stage of data collection), that included the Medical Officers of Health from all 36 PHUs as well as several upper-level staff across the MOHLTC's public health related branches.

A total of 15 respondents completed the web-survey via Survey Monkey. It was hoped that a larger number of public health professionals would complete the survey but the sensitive nature of the topic as well as the provincial government's involvement in the area via the FRWG served as key deterrents in recruitment for both interviews and web survey. And since personal/identifying characteristics and IP addresses were not collected to protect the privacy of participating public health professionals it was not possible to differentiate the responses of general survey respondents from those who also participated in the informant interviews in earlier stages of data collection. Simple percentage counts were used to assess the relative importance/priority assigned to each principle by survey respondents. Ultimately, due to the small sample size it was not possible to draw meaningful conclusions from the survey with regards to underlying trends in rankings or specific trade-offs between competing principles. Given the limited number of respondents it was not feasible to conduct complex statistical analysis on survey results or draw conclusions on key themes/patterns in survey results. The raw data for principles rankings by category is available in Appendix 14.

Overall there appeared to be prominent variations in the rankings assigned to each of the 12 principles that were generated during the key informant interviews. Respondent feedback strongly supported a shift towards a more adaptive funding approach, specifically that PHUs should receive annual increases that at least cover the cost of inflation (Principle 4). In contrast the proposition that funding should be tied to meeting agreed performance targets received substantive resistance from survey respondents (Principle 12). By and large, survey results indicated that public health professionals do not support the explicit link between performance and funding for PHUs at this time.

In addition to the ranking exercise, a number of open-ended questions were also included in the survey to provide respondents with the opportunity to propose any additional principles that should be considered in guiding allocation decisions for public health, and provide their feedback on the categorization of principles, and offer any other insights on the topic. Informant feedback was centered on ideas of structural/strategic reform, specifically that efforts should be made to resize health units to achieve better economies of scale through amalgamations, and that resources from acute-care should be diverted to the public health sector to finance preventative health programming. Flexibility and adaptation were also cited as key ideas to consider in distributing resources across PHUs, specifically that allocations to PHUs should be reexamined frequently to adjust to changing demographics (specifically population growth). Implementation challenges associated with

transitioning from one funding arrangement to another were also highlighted as important issues to proactively identify and address, specifically, the concept of ‘first do no harm’ was proposed as a critical tenet to uphold in examining potential changes in funding practices for public health. Chapter 5 will provide a brief discussion of the findings obtained from across the informant interviews. Interview findings will be compared and contrasted in light of the original research questions as well as relevant grey and peer-reviewed literature.

CHAPTER FIVE: DISCUSSION

5.1 Introduction

Health units in Ontario are increasingly being forced to balance complex population health needs and multidimensional programmatic expectations with growing pressure to restrict spending. The overarching principles, and associated social values, variables, and indicators that govern the distribution of resources across individual health units remains unclear in existing grey and peer-reviewed literature. Emerging literature on the topic of priority setting and resource allocation in health care settings suggests that there is a growing shift towards the incorporation of social values judgments as key factors alongside technical criterion (i.e., cost-effectiveness and clinical efficacy) in shaping decisions around resource allocation in the design and delivery of health services (Stafinski Menon, Marshal, and Caulfield, 2011; Clarke and Weale, 2012; Ahn, Kim, Suh, and Lee, 2012). The role of social value judgments (and associated principles) in influencing healthcare decision-making has recently been examined in the context of health technology assessments (Hofmann, 2005; Lehoux and Williams-Jones, 2007; Jonsson, 2009), but research around their application in the context of public health settings remains very limited. Existing research on the topic of public health funding specific to Ontario has been limited to a quantitative examination of the relationship between needs-based indicators and PHU budget sizes (Hutchison et al., 2003; Hurley and Rakita, 2006).

As the competition for funds intensifies across various sectors within the health system, ensuring that the resource requirements of PHUs are proactively accounted for will be especially important in light of evolving population health needs, stringent performance measures and pressure limiting spending. And since the public health sector receives a significantly smaller portion of total healthcare funding, systematically examining the resource needs of different health units will be critical to ensure that PHUs are adequately and appropriately resourced to fulfill their programmatic and performance expectations in the years to come.

This study was intended to answer two overarching research questions, 1) how are funds currently distributed across Ontario's 36 health units, and 2) what overarching decision-making principles do different public health professionals believe should guide the distribution of funds across PHUs. The findings presented in Chapter 4 are discussed in this final chapter with regard to the original research questions as well as relevant grey and peer-reviewed literature. The strengths and limitations of the study along with recommendations for future research on this topic have also been outlined.

5.2 Addressing the key research questions

The underlying objectives of this study were to develop a better understanding of how PHUs in Ontario are currently funded, and to examine what principles different public health professionals believe should guide allocation decisions in public health. The research project was not intended to critically evaluate the existing funding arrangement or propose an alternate funding model for public health. Instead the project sought to identify the fundamental social value judgements and guiding principles that public health professionals believe are important to consider in future debate around public health funding policies and practices.

Data discovery involved two rounds of data collection. The first stage involved a series of in-depth interviews that were conducted with a number of public health professionals to gather their insights on the current funding arrangement and explore what principles they believe should be used to guide the distribution of resources across PHUs. A total of 14 interviews were conduced with public health professionals from across the province, including professionals from the provincial level of government as well as Medical Officers of Health at individual PHUs (i.e., municipal level). The informant interviews were followed by a web survey that was administered to a wide range of public health professionals (including those involved in the informant interviews) from both provincial and municipal levels of government. The survey was intended to assess how public health professionals prioritize the different principles developed in the interview stages, and examine how they perceived trade-offs between competing principles in terms of their relative value/importance in guiding allocation decisions.

5.2.1 How are PHUs in Ontario currently funded?

This particular research question was examined through a series of in-depth informant interviews. Public health professionals were asked to provide a brief overview of how funds are currently distributed, which stakeholders are involved, and what types of underlying principles and processes inform resource distribution in the public health sector. Informants described the current funding format as historical budgeting, under which PHU budgets are based on annual increments from the previous year's allocation, alongside occasional supplementary funding (for programs linked to new policies/strategic initiatives introduced by the provincial government, or for unique jurisdiction-specific needs). The current funding framework also includes a cost-sharing agreement involving a 75-25 split between municipal and provincial governments, for a fixed portfolio of programs under the OPHS (including the small drinking water systems program and the vector-borne diseases program), alongside a core group of 100% provincially funded programs (that include

Healthy Babies, Healthy Children, Healthy Smiles Ontario and Smoke-free Ontario). Overall public health professionals emphasized that the existing funding arrangement was not entirely empirically driven or evidence informed. PHU budgets are based on historical precedence set by municipal commitments to public health issues. Moreover, the current funding framework has remained unchanged for several years, with only minor adjustments such as variations in cost-sharing proportions between the province and municipalities, and occasional one-time funding for specific programs or policies. The absence of clarity around the origins of historical funding, and limited adaptive potential of current funding framework emerged as key points of discussion across interviews. Many public health professionals felt that the absence of a transparent and systematic approach to resource distribution undermined the public health mandate, and limited the capacity of PHUs to adapt to changing demographic and epidemiological trends in delivering population health services.

Attempts to adjust PHU budgets to account for demographic changes have been introduced in the past few years, but public health has not seen the same level of adaptation to changing resource requirements, that has been observed in the acute-care and hospital system, where funding allocation mechanisms are linked to population characteristics through the HBAM (Government of Ontario, 2012). There appeared to be a sense that the public health sector's mandate and role were not particularly valued by political players and policymakers (at both provincial and municipal levels of government) and that most commitments to public health issues were merely window-dressing. Both policymakers' and the public's misunderstanding or lack of awareness around the role of public health, was mentioned as a likely cause for public health's lower priority on the agendas of key decision-makers. Sustained investments in public health and the prevention agenda were described as minimal and unpredictable, with PHUs increasingly being expected to 'do more with less'.

Public health professionals also revealed that political agendas/interests at the provincial level might influence the extent to which politically driven health system priorities are linked to resource distribution mechanisms. Interviewees also felt that the value assigned to public health by municipal governments affects the level of support that PHUs receive from other municipal partners in designing and delivering public health services. The board of health governance format across health units was seen as another politically oriented variable that can shape funding decisions. Decentralized autonomous boards of health were considered to be the most successful advocates for public health issues, and tended to facilitate allocation decisions that are more responsive to community needs. Interviewees also felt that PHUs operating within centralized governance formats, such as regional

governance structures, tend to face significant competition with other municipal priorities including policing, fire safety, and infrastructural development (i.e., roads, bridges etc.).

In terms of factors that influence PHU budgets, public health professionals revealed that staffing and HR costs constitute between 75-90% of PHU budgets. Other types of fixed costs mentioned by interviewees included, building occupancy, staff training, staff travel and mileage, and office expenses. Variable costs included changes in programmatic needs due to population growth, changes in burdens of illness (and associated risk factors), public health emergencies and outbreaks etc., as well as emerging policy/strategic priorities and related programmatic and staffing expenditures.

Across interviews there was strong support for the need to look towards alternate strategies to distribute funds across health units. In light of growing pressure to adapt to changing population health needs, as well as stringent performance and programmatic expectations, all informants suggested that adopting an evidence-informed approach towards allocation decisions would be critical to ensure that PHUs are adequately resourced to fulfill their mandated responsibilities. There was widespread acknowledgment of the challenges associated with shifting away from the current funding arrangement. And many public health professionals emphasized that any form of transition away from the current funding arrangement would be costly and challenging. Some PHUs would likely receive additional funds at the expense of others, which would be met with great resistance from health units and other stakeholders (i.e., municipalities and the provincial government etc.). Public health professionals proposed that a shift away from the status quo would have to be carefully planned and executed over a period of time, with provisions such as red-circling of PHU budgets to ensure that PHUs are not decimated by drastic reductions (or increases) in annual budget sizes.

5.2.2 What principles do public health professionals believe should guide the distribution of resources across health units?

Prior to the start of the informant interviews a series of sensitizing concepts were developed following a review of existing literature on public health funding and resource allocation in healthcare settings. These sensitizing concepts were derived from commonly identified factors that inform resource requirements in the provision of public health services, including structural features that are known to impact public health expenditures, as well as best practices in allocation practices in public health settings. The 10 sensitizing concepts developed in the literature review stages (see Table 2), helped to guide the development of data collection tools (specifically the interview guide), stimulate dialogue during interviews, support data analyses by helping to familiarize the researcher with key

ideas around resource needs in public health, and provide a point of reference with which to explore the perspectives shared by public health professionals.

The interviews provided rich detailed insights around the core decision-making principles (and associated social values) that public health professionals felt should guide allocation decisions. A total of 12 diverse principles emerged following the completion of data collection and analyses of the informant interviews. A complete list is available in Table 8. The principles shared by public health professionals were intrinsically linked to three core social values, 1) need, 2) equity and 3) transparency and accountability. Each of the final principles were linked to a single social value that best describes the premise of each principle based on how informants characterized its respective applications and potential impacts.

There was substantial overlap between the 10 original sensitizing concepts and the final set of principles derived over the course of interviews with public health professionals. For instance, ideas around population characteristics as the basis for future funding decisions (sensitizing concept 5) were reflected in both needs (Principle 1) and equity-based principles (Principle 8). A commitment to incorporating a more transparent funding approach towards PHU budget development (sensitizing concept 10) was also apparent in the transparency and accountability-based principles (Principle 11) proposed by interviewees. And the role of PHU characteristics (sensitizing concepts 4, 6 and 7), i.e., jurisdiction-type (urban, rural etc.) were also embodied in several need-based principles, including Principles 2, 3 and 4. Overall, approximately half of the sensitizing concepts were suggested or endorsed by public health professionals over the course of the informant interviews.

The remaining principles represented novel ideas that public health professionals proposed for future considerations in guiding public health funding, many of which had not been captured in the sensitizing concepts. These novel principles were linked to a diverse range of ideas including several principles oriented around a shift to funding practices that are more adaptive to changing resource requirements at the PHU level, for instance, informants suggested that funding decisions should proactively consider cost-drivers and account for inflation (Principles 2 and 5). Informants also suggested an additional dimension to the transparency and accountability aspect, proposing that a greater degree of transparency should be incorporated not only in terms of the processes and criterion that inform PHU funding, but also in terms of efforts to introduce greater accountability in PHU operations through the use of valid and reliable performance indicators (Principle 12). Other novel propositions included the idea that equity lenses should be applied not only to account for the needs of vulnerable groups at a jurisdiction level, but should be extended on a macro level to PHU budgets as a whole. Specifically several interviewees felt that systematic efforts should be made to equalize

PHU budgets, i.e., overfunded health units are red-circled in terms of budgetary changes, and new/additional funds are channeled directly to underfunded PHUs (Principle 9). Another aspect of equity that was not captured in the sensitizing concepts is the idea that variations in health outcomes (and subsequent disparities in health status across jurisdictions) should be used as a proxy measure for assessing health disparities and related areas of resource need at a PHU level (Principle 10).

Over half of the proposed decision-making principles were categorized as needs-based principle, but there was a considerable degree of diversity in the interpretations of 'need' across principles. Needs-principles ranged from more macro-level evidence-informed thinking (i.e., funding based on population characteristics, and cost of service delivery etc. (Principles 1 and 2) to more micro-level aspects such as the provision of funds for specific aspects of need, such as capital projects and adjustments to PHU budgets to account for inflation costs (Principles 7 and 5). Similarly in the equity category, both micro and macro-level perspectives on the integration of equity lenses into allocation decisions were observed in informant feedback. Micro-level perspectives included support for the equitable distribution of funds to deliver services to specific vulnerable sub-groups (Principle 8), and macro-level perspectives proposed that future considerations around equitable resource distribution for public health should include efforts to bring under-funded PHUs up to the level of the top funded health units, rather than bringing the top funded health units down (Principle 9). The principles in the 'Transparency and Accountability' category also represent two very different interpretations of the incorporation of transparency into public health funding. For example, Principle 11 proposes the adoption of greater transparency in public health funding at a macro level, specifically in terms of the procedures, criterion, and stakeholders involved in informing allocation decisions, i.e., having clearly defined criterion and an appeals process etc., such that allocations can be easily understood and justified. Whereas Principle 12 supports the link between transparency and public health funding in terms of performance measures on a more micro-level regarding individual PHU performance.

The wide range of social values represented in the principles shared by public health professionals during the informant interviews illustrate the variety of interpretations that social values may impart upon decision-making principles, and the complexity associated with developing a comprehensive and balanced approach towards resource distribution in public health. With a majority of principles being linked to the idea of 'Need', a commitment to aligning resource requirements with allocation mechanisms was seen as the foremost priority for public health professionals in terms of future considerations around the distribution of resources across PHUs. The absence of this alignment in the current funding framework was a key component of informant feedback in their criticism of the

status quo. In the context of funding PHUs based on 'need', one of the important sub-themes that emerged across interviews was the challenge of establishing consensus between public health professionals on the specific types of needs that should be used to guide resource assessments and ultimately allocation decisions. Subjective experiences of need (i.e., felt, expressed or normative) can be interpreted in a variety of ways (RCPSC, 2012). For instance, health needs may be characterized as differential burden of illness, i.e., how sick or incapacitated a specific population or community may be) or in terms of capacity to benefit, i.e., how much health and wellbeing is a particular population/community capable of gaining (Government of Ontario, 2006). Many informants discussed the difficulty associated with obtaining agreement from different public health professionals on the specific dimensions of need that should be used to inform resource requirements at the PHU level. Public health professionals specifically emphasized the challenges of balancing universal characteristics (i.e., demographic and epidemiological variables across PHUs) with jurisdiction-specific resource requirements, in their dialogue around funding based on population characteristics (Principle 1) and the integration of cost-drivers into allocation decisions (Principle 2).

Informant dialogue around integrating a greater degree of transparency and accountability in public health funding was centered on the idea that funding allocation for PHUs should be determined via a process that is sufficiently transparent, such that health units can calculate or validate its funding allocation using available data (Principle 11). This commitment to transparency could be seen as a push towards formal 'formula-based allocation', an increasingly common practice in many health systems (Rice and Smith, 2002; Buehler and Holtgrave, 2007). Formula-based allocations are typically considered to be empirically driven and more transparent than other types of funding mechanisms (Buehler and Holtgrave, 2007). Informant feedback suggested that one of the key motivations for a shift towards a formula-driven funding approach for public health was that formula-based approaches are associated with the use of clearly defined criterion and an evidence-informed lens towards resource assessments and allocation decisions. Growing commitments to transparency and accountability in the acute care system that has recently adopted a population-based formula driven approach in the form of HBAM as well as quality-based procedures to pursue greater accountability in hospital performance were also discussed as motivations for public health to consider a similar shift in management and operational practice. While most public health professionals supported the concept of integrating performance management into PHU funding, many interviewees also noted that the challenges associated with the development of appropriate indicators were a key deterrent to the formal integration of performance into PHU funding at this point.

In fact there was not a strong sense of consensus or agreement upon the specific indicators that should be used to guide performance measurement. This was further emphasized by a strong assertion by many public health professionals that performance measures, if they are to be tied to funding decisions must be considered within the broader context, i.e., social determinants of health, environmental factors, historical inequalities etc., within which a health unit operates. Many informants stressed that the adoption of performance-based financing, would have to be supported by systematic efforts to prevent health units from 'playing' to performance measures, i.e., investing disproportionate funds to meet performance measures potentially at the expense of other programmatic expectations. In terms of the current state of performance reporting in public health, the existing 14 Accountability Agreement indicators were described as shortsighted and arbitrary. Many public health professionals proposing that the current performance indicators were misaligned with the population scope and long-term prevention lens that guide the design and delivery of public health programs. The development of accurate performance measures that different stakeholders could agree upon was highlighted by many public health professionals as a critical first step in linking performance indicators to funding decisions. Interviewees also commented emphasized that any transition towards performance-based financing would have to be phased in over time.

The wide range of principles proposed over the course of the informant interviews also raised the issue of determining the relative value that should be assigned to each principle within a broader funding framework for the public health sector. Informant feedback suggested that an over or under-representation of a particular principle could compromise the validity and effectiveness of a funding arrangement/formula. Public health professionals emphasized that balancing different considerations, for instance, incorporating needs-based principles with equity considerations while also ensuring that the allocation process is transparent enough to hold all involved stakeholders accountable for their actions, presents an on-going challenge in the effective distribution of resources across PHUs.

Across interviews public health professionals also emphasized that multiple criterions and the wider context within which a health system is based in should be considered in incorporating various principles, social values, or variables/indicators into resource assessments and the subsequent distribution of funds across PHUs. This idea of multi-criteria decision-making has formally gained substantive support in literature surrounding current practices in healthcare funding in the form of multi-criteria decision-making analyses (MCDA) (Baltussen and Niessen, 2006; Department for Communities and Local Government, 2009). MCDA analyses combine multiple types of information (i.e. cost-effectiveness, equity considerations, and social values, and ethical beliefs etc.) to rank or establish preferences between various interventions or policy options, by using an explicit set of

objectives that a relevant decision-making body or stakeholder(s) has identified (Baltussen and Niessen, 2006). The resulting performance matrices can then be examined through qualitative analyses and/or quantitative assessments (linear additives and numerical weighting etc.) (Baltussen and Niessen, 2006). A majority of MCDA applications have occurred in the design, evaluation or rationing of services in the acute care sector (Orr, Woff and Morris, 2011), the ranking of interventions within a specific disease area (Tony, Goetghebeur, Wagner, Khoury, Rindress and Oh, 2010; Baltussen, Youngkong, Paolucci, and Niessen, 2010) or in the wider context of facilitating priority-setting at a health system level (Baltussen, Stolk, Chisholm, and Aikins, 2006; Defechereux, Paolucci, Mirelman, Youngkong, Botten, Hagen, and Niessen, 2012). But overall a critical review of the application of MCDA in guiding resource distribution for public health/population health services is still fairly limited. Findings from the interviews suggest both an opportunity as well as strong support for the application of MCDA-style approaches towards public health funding – with need, equity and transparency serving as the tenets of criterion development (and the resulting decision-making matrix) in future dialogue around funding reform for the public health sector in Ontario.

One of the most prominent themes that emerged from data collection and analyses stages was the idea of distinctions between principles and process-based ideas. During data analysis, the conceptualization of 'process-based ideas' emerged through constant comparative analysis between the initial sensitizing concepts and informant feedback around fundamental principles. Process-based ideas were conceived as 'non-principle' related ideas suggested by public health professionals over the course of the interviews. Process-based ideas are conceptualized as key supporting features in the design and execution of allocation policies and practices in public health settings. The process-based ideas proposed by informants were oriented around which stakeholders should be involved in funding public health services and how services should be delivered, rather than how public health programs/services should be funded (i.e., principles). The specific process-based ideas that shared by public health professionals included the following:

- System-wide essential public health services should be centralized to support cost-efficiencies across the public health sector
- Input from multiple levels/types of stakeholders should guide decisions around the distribution of funds across PHUs
- Funding public health services is a shared responsibility (i.e., the responsibility to provide resources for the provision of public health programming should be shared across multiple levels of government)

Informant feedback showcased strong support for the centralized provision of epidemiological surveillance, toxicology assessments and communications/media outreach to prevent PHUs from spending resources on 'reinventing the wheel' at the local level. Several public health

professionals also emphasized the need for structural reform, i.e., restructuring or amalgamating health units to achieve greater economies of scale, and generate cost-savings in the design and delivery of public health programs across the province. In fact, many public health professionals suggested that proactive structural reform should precede any changes in funding policies and practices to ensure that structural inefficiencies are identified and addressed prior to any changes in allocation policies and practices for the public health sector.

Some of the process-based ideas shared by informants were reflected in the original sensitizing concepts. Specifically the idea that the responsibility for financing public health services should be shared across multiple levels of government (sensitizing concept 1), and that multiple stakeholders should be involved in the budget development processes for PHUs (sensitizing concept 9). In addition to PHUs themselves, other stakeholders that were suggested for inclusion in budget development processes were community-based stakeholders such as restaurant associations, school boards, as well as the general public. While the primary focus of this study was to uncover the key principles that public health professionals believe should be considered in making allocation decisions, these 'process-based ideas' that emerged across interviews highlight the role that public health professionals believe external factors, such as structural/strategic reform and stakeholder engagement should play in broader dialogue around informing funding practices in the public health sector.

In addition to the interviews, a web survey was sent to a wide subset of public health professionals (including all 36 Medical Officers of Health and senior staff from the public-health related branches of the provincial government). The purpose of the survey was to examine how public health professionals prioritized the principles developed in the interviews, and explore how public health professionals envisioned trade-offs between competing principles (and associated social values) in their thinking around public health funding. The 12 principles that emerged from the interviews were organized into three distinct categories based on the relative value/importance assigned to each principle by the public health professionals in the preceding in-depth interview stage. Principles were organized into three distinct categories, 1) critical to consider, 2) very important to consider, and 3) important but not essential to consider, based on the level of significance, informants assigned to each principle in the preceding stage of data collection. The survey included a prioritization exercise that asked respondents to rank the principles within each category in order of significance - 1 being the 'Most Significant, 2 being 'Significant', 3 being 'Somewhat Significant' and 4 being the 'Least Significant' principle in terms of its perceived value in guiding future allocation decisions for public health.

Several open-ended questions were also included to allow public health professionals to suggest additional principles that they feel should be considered, and share any other feedback on the topic of public health funding. Survey results illustrate the complexity associated with establishing a firm consensus on the relative importance of each principle as a guiding factor for allocation decisions. Given the small sample size it was not possible to draw meaningful conclusions from the survey with regards to underlying trends in rankings or specific trade-offs between competing principles. Overall there were prominent variations in the rankings assigned to each of the 12 principles that were generated during the key informant interviews. Respondent feedback strongly supported a shift towards a more adaptive funding approach, specifically that PHUs should receive annual increases that at least cover the cost of inflation (Principle 4). In contrast the proposition that funding should be tied to meeting agreed performance targets (Principle 12) received strong resistance from survey respondents, with many public health professionals indicating that they do not support the explicit link between performance and funding for PHUs at this time.

In terms of additional principles to consider, suggestions included the adoption of structural reforms, specifically that PHU amalgamations should be considered to achieve better economies of scale, and that funds should be redirected from the acute-care sector towards population health programs to ensure long-term gains in population health improvements. Flexibility and adaptation were also cited as key ideas to consider in making allocation decisions, specifically that allocations to PHUs should be frequently reexamined to adjust for changing demographics (specifically population growth). Implementation challenges associated with transitioning from one funding arrangement to another were also mentioned by respondents as an important issue to proactively consider and uphold in future thinking around public health funding. Survey respondents also cautioned against creating competition for resources between health units, emphasizing that competitive funding inhibits cooperation and collaborative efforts between PHUs in terms of program design and delivery.

5.3 Strengths and limitations

Despite careful planning and the integration of various methodological considerations into study design, data discovery and analyses, every research project comes with its own unique set of strengths and limitations. In terms of study design, the layering of data collection through the use of in-depth interviews followed by the web survey administered to a broad group of public health professionals well positioned to comment on the topic was intended to ensure that informed opinions were collected to provide insights into the key research questions.

The use of a verification step to ensure that the investigator's interpretation of informant feedback accurately and adequately reflects their perspectives on the topic was another important strength in terms of methodological design and execution. A brief two page summary of findings from the key informant interviews was sent to all the public health professionals that were interviewed during the first stage of data collection. This verification step intended to support the credibility of findings, provided public health professionals with a chance to suggest additions or changes to the principles shared by the group over the course of the interviews, and served as an opportunity for the researcher to ensure that they had adequately captured the diversity of perspectives shared by public health professionals who were involved in the study.

With regards to methodological choices and specifically the use of informant interviews as the primary means for data discovery, the breadth and depth of data collected through informant interviews relies heavily on the line and style of questions utilized by the investigator as well as interviewee's own personal, cultural and institutional assumptions (Crabtree and Miller, 1999). It is acknowledged that the perspectives of the public health professionals who shared their opinions on the topic during the interviews and/or survey, are informed by their current and previous professional experiences and institutional affiliations, and have been analyzed and summarized as such. In some cases, specific feedback shared by participants during the interviews could not be disclosed in the findings due to the sensitive nature of the data, to prevent feedback from being ascribed to a particular informant (Marshall, 1996). Where possible any such identifying information was redacted to preserve the anonymity of participants without compromising the intent and quality of informant feedback.

In terms of scope, the study was focused on public health funding in the province of Ontario only. Unlike the other provinces, the public health sector in Ontario is not situated within regional health authorities along with several other components of the healthcare system (i.e., acute-care, long-term care etc.). Thus, the validity of comparisons or generalizability of findings to allocation principles or practices in other provinces or health systems outside of Canada is limited. However, the context within which the study was conducted has been described in extensive detail to allow for greater transferability of findings.

In the absence of grey and peer-reviewed literature on the topic, connecting with stakeholders that were well positioned to describe the status quo and provide detailed insights around new ways of thinking around public health funding, was seen as the most appropriate source of information to develop insights around the key research questions (given the scale and scope of the study). In terms of the web survey, given that the personal/identifying characteristics and IP addresses

were not collected to protect the privacy of public health professionals who participated, it was not possible to differentiate the responses of general survey respondents from those who also participated in the informant interviews in earlier stages of data collection. And while many of the public health professionals that were approached during recruitment stages agreed to participate in the study, it is possible that those who did not participate may have brought a different set of lenses and perspectives on the topic. Future research on the topic may benefit from engaging with a wider range of stakeholders (including health professionals in other parts of the healthcare system as well as agencies such as PHAC, HC and PHO) and collecting the perspectives of other groups (i.e., general public, municipal organizations, and boards of health etc.) to develop a more comprehensive sampling frame.

The sensitive nature of the topic relative to the timing of the study was another important limiting factor. Data collection stages overlapped with a period of renewed interest in the topic of public health funding. The provincial government's FRWG also recently reconvened after an extended hiatus, and could also have been a deterrent for involvement. Some public health professionals due to their professional affiliations may be bound by confidentiality agreements/clauses to not disclose any information on the topic (including details pertaining to the province's stance on public health funding) until the FRWG findings are made public. In fact several public health professionals who were initially contacted to participate, mentioned the FRWG and their hesitation with involvement in a topic that was being examined by the provincial government, as reasons for declining to participate in the project.

5.4 Recommendations for future research

Findings highlight the complex nature of the roles and responsibilities assigned to PHUs, and underscore the tensions between current allocation mechanisms and growing support for a shift towards more evidence-informed approaches in the distribution of resources in the public health sector. Results also indicate a more widespread recognition of the role of underlying social value judgments in influencing the fundamental principles that public health professionals believe should inform resource allocation in public health settings. Interviewee feedback reflected a strong emphasis by public health professionals on the need to use multiple dimensions to facilitate evidence-informed, equitable and transparent approaches towards resource distribution across PHUs. The feedback received from public health professionals across interviews also revealed the need for more proactive 'upstream' involvement of PHUs and municipal level stakeholders in the decision-making processes that influence resource distribution in public health. Specifically public health professionals suggested that efforts should be made to counter systemic disconnects between involved stakeholders, such as

gaps in fiscal timelines between the two primary funders (municipal and provincial), and limited feedback loops between PHUs, municipalities and the provincial government. Public health professionals also suggested a number of factors to consider in implementing or transitioning from one funding arrangement to another. Red-circling PHU budgets and phasing in alternate funding mechanisms over a prolonged period of time emerged across interviews as important aspects to examine in future research on this topic.

There are several opportunities for further research based on the findings obtained from this research. This study presents a cursory understanding of the current funding arrangement, and possible guiding principles to consider in future dialogue around public health funding. Further research may involve quantitative assessments of the variables linked to each principle. For instance statistical analyses to examine the extent to which cost-drivers discussed by public health professionals actually influence additional resource needs (Principle 2). Examining how different principles might be weighted within a formal funding framework, and exploring trade-offs between competing principles, resource needs, and social values, could be an important next step in widening the existing research base on funding strategies in public health settings. While the perspectives of the public health professionals who participated in this project may serve as valuable contributions to growing dialogue around the development of an alternate funding framework for public health, connecting with a broader range of public health professionals could be helpful in testing the validity of these findings.

In addition, the theoretical categories and relationships between different principles could be further examined to better understand trade-offs between competing principles, perhaps by engaging public health professionals in a simulated budgeting exercise to develop a sense of the practical implementation of the guiding principles developed in this study. The survey results also highlight the complexity associated with ranking competing principles, which was apparent in the absence of clear-cut consensus on the relative value/importance of principles across categories. One way to further delve into examining trade-offs, and determine stakeholder perspectives on the differential value that should be assigned to competing principles, could be through the use of discrete choice experiments (DCE). In terms of methodological design, DCEs are 'attribute-based measures of benefit' (Ryan 2004, p 360) that have been commonly utilized in exploring public or provider preferences (particularly value-based preferences) and examining trade-offs between competing attributes/interventions etc., (Ryan 2004). Typically DCEs are conducted in survey formats; hypothetical scenarios are developed and respondents must choose their preferred option from a series of given scenarios, each comprised of a set of attributes that describe that particular scenario

(Baltussen, Stolk, Chisholm, and Aikins, 2006; Lancsar and Louviere 2008). Much of the current research on the application of DCEs has centered around priority-setting at a health system level (Baltussen, Stolk, Chisholm, and Aikins, 2006) but DCE's are also increasingly being utilized in collecting and examining public preferences for resource allocation in healthcare (Watson, Carnon, Ryan and Cox, 2011; Lim et al., 2012). If applied towards examining the perspectives of public health professionals, policymakers, and the general public, on allocation practices in public health, they may provide a more definitive understanding of stakeholder perspectives on the practical integration of fundamental principles in guiding the distribution of funds across PHUs.

5.5 Summary

Public health professionals proposed a series of 12 fundamental principles to guide future thinking around public health funding. These principles were grounded in three core social value judgments (need, equity, and transparency and accountability) and showcase a significant degree of diversity in terms of how social values manifest themselves in the form of guiding principles to inform decision-making in public health settings. Needs-based principles ranged from macro-scale evidence-informed thinking (i.e., funding based on population characteristics, and cost of service delivery etc.) to more micro-level lenses around funding based on specific aspects of need (such as capital projects and inflation costs). Similarly the equity-based principles also represented both micro and macro-level perspectives on the promotion of equity in public health settings. They included support for the equitable distribution of funds to deliver services to specific vulnerable sub-groups, and the proposition that funds should be distributed more equitably across health units, i.e., under-funded PHUs should be brought up to the level of the top health units, rather than bringing the top funded PHUs down. The principles in the 'Transparency and Accountability' category, illustrated an emphasis on adopting a transparent funding process and incorporating valid and reliable performance indicators to support greater accountability in the distribution and utilization of funds by PHUs.

The wide range of social values represented in the principles shared by public health professionals reflect the variety of interpretations that social values can impart upon associated decision-making principles, and the complexity associated with developing a comprehensive strategy towards resource allocation in public health. In addition to principle-based thinking around public health funding, interview findings revealed a number of process-based ideas - conceptualized as supporting features in the design and execution of allocation policies/practices in healthcare settings. These included strong support for the centralized provision specifically epidemiological surveillance,

toxicology assessments, and communications/media outreach, and more upstream multi-stakeholder involvement in PHU budget planning.

Survey results illustrated the challenges associated with establishing consensus on a specific set of guiding principles. In terms of general themes from the percentage rankings across categories, respondent feedback strongly supported a shift towards a more adaptive funding approach, specifically that PHUs should receive annual increases that at least cover the cost of inflation (Principle 4). The proposition that funding should be tied to meeting agreed performance targets received strong resistance from survey respondents. By and large public health professionals did not support the explicit link between performance and funding for PHUs at this time. Overall, the varied distribution of principle rankings within and across categories illustrates the difficulty associated with making clear trade-offs between competing principles, and the complexity affiliated with establishing agreement on the differential value that should be assigned to different principles in ascertaining the role they should play in guiding allocation decisions for public health.

The study provides important insights into what fundamental principles public health professionals believe should guide allocation decisions in public health, and contributes to limited existing literature on the role of social values judgments, in informing resource distribution, specifically in the context of public health settings. Need, equity, transparency and accountability were identified by public health professionals as the central tenets of future thinking around resource allocation in the public health sector. Examining whether the principles shared by public health professionals are reflected in the perspectives of broader group of stakeholders and policymakers, along with quantitative exploration around the practical applications of these principles could be possible next steps in terms of further research.

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APPENDICES

Appendix 1:Overview of PHUs in Ontario

Table A: Ontario's Public Health Units Grouped by MOHLTC's Peer Groups (MOHLTC, 2009)

2007 Peer Groups	Health Unit
Peer Group A: Urban/Rural Mix	Brant County Health Unit City of Hamilton Health Unit Hastings and Prince Edward Counties Health Unit Chatham-Kent Health Unit Kingston, Frontenac and Lennox and Addington Health Unit Lambton Health Unit Middlesex-London Health Unit Niagara Regional Area Health Unit Peterborough County-City Health Unit
Peer Group B: Urban Center	Durham Regional Health Unit Halton Regional Health Unit City of Ottawa Health Unit Peel Regional Health Unit Waterloo Health Unit Wellington-Dufferin-Guelph Health Unit Windsor-Essex County Health Unit York Regional Health Unit
Peer Group C: Sparsely Populated Urban-Rural Mix	The District of Algoma Health Unit North Bay Parry Sound District Health Unit Sudbury and District Health Unit Thunder Bay District Health Unit Timiskaming Health Unit
Peer Group E: Mainly Rural	Elgin-St. Thomas Health Unit Grey Bruce Health Unit Haldimand-Norfolk Health Unit Haliburton, Kawartha, Pine Ridge District Health Unit Huron County Health Unit Leeds, Grenville and Lanark District Health Unit Oxford County Health Unit Perth District Health Unit Renfrew County and District Health Unit The Eastern Ontario Health Unit Simcoe Muskoka District Health Unit
Peer Group G: Metro Center	City of Toronto Health Unit
Peer Group H: Rural Northern Regions	Northwestern Health Unit Porcupine Health Unit

Table B: Key features of Ontario's 6 peer groups for public health (MOHLTC, 2009)

Peer group	Principal characteristics
A	Urban-rural mix from coast to coast Average percentage of Aboriginal population Low male population Slow population growth from 1996 to 2001
B	Mainly urban centres with moderately high population density Low percentage of government transfer income Rapid population growth from 1996 to 2001
C	Sparsely populated urban-rural mix from coast to coast Average percentage of Aboriginal population Negative population growth
E	Mainly rural regions in Quebec, Ontario and the Prairies High proportion of people recently moved to or within these regions since 1996 Average percentage of Aboriginal population Moderate population growth
G	Largest metro centers with an average population density of 3,934 people per square kilometer Low Aboriginal population Moderate percentage of government transfer income High female population
H	Rural northern regions High Aboriginal population High male population Negative population growth

Appendix 2:
PHU governance format
Table A: Description of board of health governance formats (MOHLTC, 2009)

Board of health type	Description
Autonomous	Distinct from any municipal organization but with multi-municipal representation (including citizen representatives appointed by municipalities and potential for provincial appointees.
Autonomous/Integrated	Operate within municipal administrative structure, and only one municipality appoints representatives (including citizen representatives) and potential for provincial appointees.
Regional	Boards are councils of the regional government (federations of local municipalities), and there are no citizen representatives or provincial appointees
Single-Tier	Boards are councils of single tier municipalities (jurisdictions with only one level of municipal government); there are no citizen representatives or provincial appointees
Semi-Autonomous	Single-tier council appoints members to a separate 'board of health' (including citizen representatives). Council approves budget and staffing, and there are no provincial appointees.

Table B: PHUs grouped by board of health governance structure (MOHLTC, 2009)

TYPE OF BOARD	PUBLIC HEALTH UNIT
I. Autonomous	1. Thunder Bay District 2. Haliburton, Kawartha, Pine Ridge District 3. Kingston, Frontenac and Lennox & Addington 4. Leeds, Grenville and Lanark District 5. North Bay Parry Sound District 6. Hastings and Prince Edward Counties 7. Simcoe Muskoka District 8. Sudbury District 9. Windsor-Essex County 10. Eastern Ontario 11. Elgin-St. Thomas 12. Timiskaming 13. Grey Bruce 14. Porcupine 15. Perth District 16. Peterborough County-City 17. Hastings and Prince Edward Counties 18. Middlesex-London Health Unit 19. Renfrew County & District 20. Algoma Public Health 21. Brant county 22. Northwestern
II. Autonomous/integrated	1. Huron 2. Lambton 3. Chatham-Kent
III. Single tier	1. Haldimand-Norfolk 2. Hamilton
IV. Regional	1. York 2. Durham 3. Peel 4. Halton 5. Niagara 6. Waterloo 7. Oxford county
V. Semi-autonomous	1. Ottawa 2. Toronto

Appendix 3:
List of PHUs by geographic location (ALPHA, 2010)

Region	Public Health Unit
1. North West Region	- Northwestern - Thunder Bay
2. North East Region	- Algoma - North Bay Parry Sound - Porcupine - Sudbury - Timiskaming
3. South West Region	- Chatham-kent - Elgin St Thomas - Grey Bruce - Huron - Lambton - Middlesex London - Oxford - Perth - Windsor-Essex
4. Central West Region	- Brant - Haldimand - Halton - Hamilton - Niagara - Waterloo Wellington Dufferin
5. Central East Region	- Durham - HKPR - Peel - Peterborough - Simcoe Muskoka - York Region
6. Toronto Region	- Toronto
7. Eastern Region	- Eastern - Hastings - Kingston - Leeds - Ottawa - Renfrew

Appendix 4:
Overview of Ontario Public Health Standards
Table A: OPHS Program Standards and corresponding programs and protocols (MOHTLC, 2008)

OPHS Program Standards	Activities/Programs
I. Chronic Diseases and Injuries (2 protocols)	1.Chronic disease prevention 2. Prevention of injury and substance misuse
II. Emergency Preparedness (1 protocol)	1. Public health emergency preparedness
III. Environmental Health (6 protocols)	1. Food safety 2. Safe water 3. Health hazard prevention and management
IV. Family Health (5 protocols)	1. Reproductive health 2. Child health
V. Infectious Diseases (11 protocols)	1. Infectious diseases prevention and control 2. Rabies prevention and control 3. Sexual health, sexually transmitted and blood-borne infections 5. Tuberculosis prevention and control 6. Vaccine preventable diseases

Table B: Ontario Public Health Standards – Topic Specific Protocols (MOHLTC, 2008)

OPHS'S 26 Topic-specific protocols	
1.	Beach Management Protocol, 2008
2.	Children in Need of Treatment (CINOT) Program Protocol, 2008
3.	Drinking Water Protocol, 2008
4.	Exposure of Emergency Service Workers to Infectious Diseases Protocol, 2008
5.	Food Safety Protocol, 2008
6.	Healthy Babies Healthy Children Protocol, 2008
7.	Identification, Investigation and Management of Health Hazards Protocol, 2008
8.	Immunization Management Protocol, 2008
9.	Infection Prevention and Control in Licensed Day Nurseries Protocol, 2008
10.	Infection Prevention and Control in Personal Services Settings Protocol, 2008
11.	Infection Prevention and Control Practices Complaint Protocol, 2008
12.	Infectious Diseases Protocol, 2009
13.	Institutional/Facility Outbreak Prevention and Control Protocol, 2008
14.	Nutritious Food Basket Protocol, 2008
15.	Oral Health Assessment and Surveillance Protocol, 2008
16.	Population Health Assessment and Surveillance Protocol, 2008
17.	Preventive Oral Health Services Protocol, 2008
18.	Protocol for the Monitoring of Community Water Fluoride Levels, 2008
19.	Public Health Emergency Preparedness Protocol, 2008
20.	Rabies Prevention and Control Protocol, 2009
21.	Recreational Water Protocol, 2008
22.	Risk Assessment and Inspection of Facilities Protocol, 2008
23.	Sexual Health and Sexually Transmitted Infections Prevention and Control Protocol, 2008
24.	Tobacco Compliance Protocol, 2008
25.	Tuberculosis Prevention and Control Protocol, 2008
26.	Vaccine Storage and Handling Protocol, 2010

Appendix 5:
Provincial Support for Public Health Programming (Pasut 2007; ALPHA, 2010; MOHLTC, 2012b)

Program Type:	**Program**
Fully Funded by Province	• Preschool Speech and Language Services • Healthy Babies, Healthy Children – partnership with Ministry of Children & Youth Services • Speech and Audiology • Genetics Counseling • Sexual Health Hotline and Resource Centre • Infection Control (introduced to the provincial envelope following the SARS epidemic) • Infection Control Nurse Position • Healthy Smiles Ontario • Smoke Free Ontario (SFO) - through the Ministry of Health Promotion and Sport • Vaccine development for immunization programs • Drugs to treat sexually transmitted diseases (STD's), tuberculosis (TB) and leprosy • Chief Nursing Officer Initiative • Public Health Nurses Initiative
Partially Funded by Province	• Small Drinking Water Systems Program (at 75%) • Vector-Borne Diseases Program (at 75%) • Public Health Research, Education & Development (PHRED); • West Nile Virus • Infection Control (180 FTEs) • Miscellaneous program-based grants (including one-time grants)

Appendix 6:
PHU Expenditure Estimates (2009) (MOHLTC, 2009)

Peer Group		Public Health Unit	Total BoH expenditures	BoH expenditure variance
			$M	percent
Rural Northern Regions	1	Northwestern Health Unit	13.0	4.0%
	2	Porcupine Health Unit	10.7	-6.2%
Mainly Rural	3	The Eastern Ontario Health Unit	14.1	-1.7%
	4	Elgin-St. Thomas Health Unit	6.4	-6.4%
	5	Grey Bruce Health Unit	10.8	-1.2%
	6	Haldimand-Norfolk Health Unit	7.0	-7.5%
	7	Haliburton, Kawartha, Pine Ridge District Health Unit	15.1	-1.6%
	8	Huron County Health Unit	6.2	-2.8%
	9	Leeds, Grenville and Lanark District Health Unit	10.5	-2.0%
	10	Oxford County Health Unit	6.8	-10.9%
	11	Perth District Health Unit	6.6	-2.3%
	12	Renfrew County and District Health Unit	6.2	-20.8%
	13	Simcoe Muskoka District Health Unit	28.8	-1.2%
Sparsely Populated Urban-Rural Mix	14	The District of Algoma Health Unit	16.6	0.0%
	15	North Bay Parry Sound District Health Unit	14.3	-4.5%
	16	Sudbury and District Health Unit	15.8	-1.9%
	17	Thunder Bay District Health Unit	15.7	-2.5%
	18	Timiskaming Health Unit	5.7	-1.8%

Peer Group		Public Health Unit	Total BoH expenditures	BoH expenditure variance
Urban/ Rural Mix	19	Brant County Health Unit	10.0	-0.2%
	20	Chatham-Kent Health Unit	8.9	1.6%
	21	City of Hamilton Health Unit	35.7	1.0%
	22	Hastings and Prince Edward Counties Health Unit	11.3	-0.8%
	23	Kingston, Frontenac and Lennox and Addington Health Unit	15.6	-10.2%
	24	Lambton Health Unit	8.6	6.3%
	25	Middlesex-London Health Unit	28.2	-7.0%
	26	Niagara Regional Area Health Unit	28.9	-0.2%
	27	Peterborough County-City Health Unit	10.3	0.4%
Urban Centres	28	Durham Regional Health Unit	33.8	-3.4%
	29	Halton Regional Health Unit	24.1	-3.0%
	30	City of Ottawa Health Unit	46.0	-4.9%
	31	Peel Regional Health Unit	61.7	-6.6%
	32	Waterloo Health Unit	28.8	-2.5%
	33	Wellington-Dufferin-Guelph Health Unit	17.0	0.0%
	34	Windsor-Essex County Health Unit	17.0	-8.2%
	35	York Regional Health Unit	47.7	-4.7%
Metro Centre	36	City of Toronto Health Unit	193.6	-4.9%
		Ontario Total	**837.7**	
		Ontario Minimum	**5.7**	**-20.8%**
		Ontario Maximum	**193.6**	**6.3%**

Appendix 7:
MOHLTC's Public Health Accountability Agreement indicators (MOHLTC-MHPS, 2011)

OPHS Foundational Standard	Program	Indicator
1. Environmental Health Program Standards	A. Food Safety	• % of high risk food premises inspected once every 4 months while in operation
	B. Safe Water	• Proportion of pools and public spas by class inspected while in operation • % of completed SDWS inspections, of those that are high risk, that are due for re-inspection
2. Infectious Diseases Program Standards	C. Sexual Health	• Time between health unit notification of Gonorrhea and initiation of follow up
	D. Infectious Disease Prevention and Control	• Time between health unit notification of an GAS case and initiation of follow up • % of known high risk personal service settings inspected annually
	E. Vaccine Preventable Disease	• % of vaccine wasted by vaccine type (HPV, influenza, pneumococcal, and DPT) that are stored/ administered by the PHU • % completion of reports related to vaccine wastage by vaccine type (HPV, influenza, pneumococcal, and DPT) that are stored/ administered by other healthcare practitioners • % of school-aged children who have completed immunizations for Hepatitis B, HPV and meningococcus
3. Chronic Diseases and Injuries Program Standards	F. Chronic Disease Prevention	• % of youth (ages 12 - 19) who have never smoked a whole cigarette • % tobacco vendor compliance with legislation by infraction type
	F. Prevention of Injury and Substance Misuse	• Fall-related emergency department visits by age group • % of population that exceeds Low-Risk Drinking Guidelines
4. Family Health Program Standards	G. Child Health and Reproductive Health	• Baby Friendly Initiative Status

Appendix 8:
Recruitment email for informant interviews

Dear [Insert name of Participant]

Improving the distribution of limited healthcare resources is one of the most prominent challenges facing Canada's health system. Recently there has been a growing interest in understanding how to efficiently allocate appropriate funding for public health activities in Ontario, a topic that I am also investigating as part of my M.Sc. thesis titled, *Resource Allocation in the Public Health Sector: Current Status and Future Prospects* at the University of Waterloo. Among the key objectives of this project is to collect the perspectives of a wide range of health units based on their location and structure. In your role as the MOH for North Bay Parry Sound Health Unit, I believe that your contribution as a leading expert and advocate for the public health sector will be invaluable in ensuring that diverse stakeholder perspectives are reflected in reports stemming from this study, which I hope will inform current dialogue around the funding policies and practices that should be utilized in the province's public health sector.

Participation involves an open-ended discussion on what principles you believe should be utilized in making decisions around resource allocation for public health units in Ontario. Phone interviews will be conducted, and are expected to last between 45-60 minutes. Following the interview a very brief survey will be sent to you (via email), asking you to rank a series of proposed decision-making principles based on your personal expertise and experience. Participants will receive a $50 Chapters gift card for their contributions to the project. If you are interested in participating, please review the attached recruitment document for more information on the study. This research has been granted ethics clearance from the University of Waterloo Office of Research Ethics. If you have any concerns about the conduct of this project, contact Dr. Maureen Nummelin, the Director, Office of Research Ethics, at 1-519-888-4567, Ext. 36005 or maureen.nummelin@uwaterloo.ca.

Thank you so much for taking the time to review this email, I know that you are very busy, and I really do appreciate you taking time to review this request. I look forward to hearing from you.

Sincerely,
Anum Irfan Khan

Appendix 9:
Interview Guide for key informant interviews

Interviewer: In the past few years there the topic of public health funding in Ontario has received a great deal of attention. Substantive expansions in the roles and responsibilities assigned to PHUs along with complex population health needs and performance expectations are among some of the key variables that are believed to influence PHU resource needs. This project looks to better understand the current funding arrangement, and collect the feedback of public health professionals - experts like yourself around what types of decision-making principles should be used to guide distribution of funding across Ontario's 36 public health units (PHUs). Your perspectives as a public health professional in Ontario will be valuable in informing both current and future prospects around the distribution funds within the province's public health sector.

-Obtain verbal consent before proceeding-

PART 1: Current Funding Practices

Q. Which stakeholders are involved in decisions around the distribution of allocated funds across PHUs?

Probe: 1) Provincial level, 2) Municipal level and 3) External groups (i.e., Ontario Public Health Association, Association of Municipalities etc.)

Q. Are there any additional stakeholders that you think should be involved in the decision-making process around the distribution of funds?

- Provincial level (i.e., other government departments or sub-branches within the MOHLTC?)
- Municipal level (i.e., BOH membership criterion, other municipal actors?)
- External groups?

Q. How can the current funding system be best characterized?

Probe: 1. Base budgeting/global funding, Population needs-based funding, Case-based/activity-based funding, Policy-based funding, Performance-based funding, Combination?

Q. Can you elaborate on the different stages involved in decision-making around the distribution of resources across the 36 PHUs?

Q. Can you elaborate on the cost-sharing arrangement between municipalities and the MOHLTC?

Probe: Are cost-sharing agreements based on historical trends, base budgeting?

Q. What variables are used to determine funding need at a PHU level?

Probes:
1. Epidemiological (i.e., prevalence/incidence of infectious and chronic illnesses such as STDs, AIDS, hypertension and diabetes, health-adjusted life expectancy, risk factors [physical activity and smoking etc.])
2. Demographic (i.e., population growth rate, morbidity, mortality, ethnic distribution, population density)
3. Equity (i.e., Gini-like indexes summarizing health inequality and/or jurisdiction-specific measures of equity)
4. Organizational or operational characteristics (i.e., regulatory enforcement, community mobilization, FT and PT staff, governance format, and staffing mix)
5. Other (i.e., political, jurisdiction-specific etc.)

Q. What indicators are used to determine the resource need/requirements of a particular PHU?

1. Epidemiological (i.e., changes in prevalence/incidence of disease and associated risk factors)
2. Program specific indicators
3. Equity (i.e., increased access to health services for vulnerable groups, provision of specialized services to vulnerable population sub-groups)
4. Organizational/operational characteristics
5. Performance measures (i.e., MOHLTC 14 accountability indicators, internal PHU-specific indicators)

Q. Can you elaborate on the types of fixed and variable costs that PHUs typically incur?

PART 2: Social values and Decision-Making principles
Interviewer: Higher-order social value judgments, i.e., communally held moral or ethical values may be operationalized in the form of decision-making principles to guide allocation decisions for PHUs. For example, the concept of equity or distributive justice can manifest itself as a decision-making principle in health care settings, such that investments are commissioned to ensure that vulnerable sub-groups have equitable access to health services.

Q. What types of decision-making principles do you believe are currently incorporated into the distribution of resources across PHUs?

Note interviewee principles and follow-up/clarify as needed.

Q. Thank you for sharing your list of principles. Current literature on the topic has suggested the following ideas or concepts as potential influencing factors in the distribution of funds. Do you think these are applicable in the context of resource allocation in the context of PHU's in Ontario?

Sensitizing concepts:
1. Funding public health services is a shared responsibility (i.e., the responsibility to provide resources for the provision of public health programming should be shared across multiple levels of government)

Probe: Cost-sharing is an important feature in PHU funding - should this be retained?

2. High-risk vulnerable populations should receive additional/special considerations in terms of health service provision (i.e., children, low-income youth, pregnant women, and ethnic minorities etc.) from both provincial and municipal levels of government

Probe: How should the health needs of vulnerable population be incorporated into decisions around resource allocation in PHUs?

3. Jurisdiction-specific needs across all PHUs should be funded entirely by municipalities

Probe: How are jurisdiction-specific needs identified?

4. Rurally-located PHUs require additional resources to fulfill their mandated responsibilities

Probe: In what ways might resource allocation be influenced by a PHU's location/jurisdiction type?

5. Funding distribution across PHUs should be primarily (population) needs-based

6. Funds should be distributed based on assessments of 'critical mass' across PHUs

Probe: What structural or organizational features influence the distribution of funds at a PHU level?

7. Variations in governance formats across PHUs should be incorporated into decisions around funding

distribution *Probe: How might different styles of governance influence the decision-making process, i.e., which stakeholders are involved or not involved based on the governance format of a PHU?* 8. Performance measures should be considered in the context of other external factors (i.e., geography, and governance structure) if/when integrated into decisions around funding distribution *Probe: The 14 Accountability Agreement Indicators have recently been released; what role should performance indicators play in informing allocation decisions for PHUs?* 9. Input from multiple levels/types of stakeholders should guide decisions around the distribution of funds across PHUs *Probe: Are there other stakeholders who are not adequately represented in the decision-making process? Is there a formal process of appeals or requests for the inclusion of certain stakeholders' interests into the decision-making process?* 10. A transparent and systematic process should be established by involved funders to assess resource needs and discuss allocation decisions with PHUs *Interviewer: I am especially interested in understanding how trade-offs between principles are made when limited resources must be distributed across multiple public health/healthcare facilities, and whether different public health professionals share similar ideas (underlying principles and associated social values) in their thinking around public health funding. And in particular how you think some of these decision-making principles should be prioritized. Would you be interested in ranking these proposed decision-making principles in order of significance via a web survey at a later date?*
Q. If a future restructuring of funding frameworks was considered/initiated what would be some principles to consider in the transition from one funding approach to another? Q. Are there any 'best practices' in terms of decision-making principles to guide funding allocation that can be drawn from other sectors and adapted for use in the public health sector?
Q. Do you have any other thoughts on this topic? Interviewer: Thanks for taking the time to participate in this interview.

Appendix 10:
Email invitation for web survey

Name of Participant Date
Title
Professional Affiliation
Address

Dear [Name of Participant]:

Priority-setting around resource allocation for the provision of public health is a topic that has recently gained significant attention in research and policy circles. In light of growing economic pressures to limit spending and address rapidly evolving population health needs, the province's healthcare system is facing intensified competition for limited financial resources.

As part of my MSc. thesis project at the University of Waterloo titled: **Resource Allocation in Public Health,** we are connecting with a wide range stakeholders in the public health sector to determine whether there is some consensus between public health professionals around a core set of principles that should be used to guide funding decisions for PHUs in the future. A short survey has been prepared to explore how public health professionals believe these principles should be prioritized and is available through the link below. It should take between **5-7 minutes** to complete.

ELECTRONIC LINK TO WEB SURVEY

Your feedback and insights will play a **critical** role in shaping future debate and dialogue around funding policies and practices governing the provision of public health sector in Ontario. **All responses will be kept confidential and completely anonymous - no personal characteristics will be shared in the thesis or any publications linked to the thesis project. No identifying information (i.e., IP addresses, professional designations etc.) will be collected to protect the privacy of participants. Survey responses are anonymous to ALL participants of this project, INCLUDING the principal investigator.**

Thank you for taking the time to review this email and our request for your perspectives on this important issue. Feel free to contact me via email or phone (647 886 8344) if you would like a copy of the final thesis.
This research has been granted ethics clearance from the University of Waterloo Office of Research Ethics. If you have any concerns about the conduct of this project, contact Dr. Maureen Nummelin, the Director, Office of Research Ethics, at 1-519-888-4567, Ext. 36005 or maureen.nummelin@uwaterloo.ca

Sincerely,
Anum Irfan Khan

Appendix 11:
Web survey
Public health professionals have been keen to examine what principles should direct funding for public health units (PHUs) in Ontario, particularly in light of rapid changes around funding practices in other parts of the healthcare system. We are interested in learning more about what principles public health professionals believe should be used to guide the distribution of funds across PHUs, and what trade-offs must be considered in light of intensifying resource constraints and competing health system priorities.

Following a series of in-depth interviews with a diverse range of public health professionals, a total of 12 principles to guide public health funding were established. Based on the feedback received from the interviews, those principles have been organized into three categories:

Category 1 - Critical to consider
Category 2 - Very Important to consider
Category 3 - Important but not essential to consider

This survey is intended to examine whether there is some consensus between public health stakeholders, around a core set of principles that should be integrated into decisions around resource allocation. We are interested in having experts like you rank the different principles to determine how to best allocate funds for PHUs, and identify trade-offs between different principles/priorities.

Your feedback and insights will play a critical role in shaping future debate and dialogue around the funding policies and practices governing the provision of funds for the public health sector in Ontario. All responses will be kept confidential and completely anonymous - no personal characteristics will be shared in the thesis or any publications linked to the thesis project. No identifying information (i.e., IP addresses, professional designations etc.) will be collected to protect the privacy of participants. Survey responses are anonymous to all participants of this project, including the principal investigator.

Q1. Please rank the principles in the category below on a scale of 1-4, with 1 representing the most significant and 4 being the least significant, in terms of how vital these principles are in guiding future directions around funding for PHUs.

Please note that each principle must have a unique rank.

CATEGORY 1: CRITICAL TO CONSIDER

Principle	Most Significant (1)	Significant (2)	Somewhat Significant (3)	Least Significant (4)
1. The amount of funding a PHU receives should be sensitive to the presence of high-risk vulnerable populations in a PHU's designated service area				
2. Rural PHUs should receive additional funds to deliver the standard basket of public health services required of all health units				
3 Funding should be based on characteristics of the population served, such as age distribution, incidence of TB, and prevalence of tobacco use, etc.				
4 Funding should account for the cost of service delivery, i.e., a community's cultural and demographic profile, number of languages spoken etc.				

Q2. Please rank the principles in the category below on a scale of 1-4, with 1 representing the most significant and 4 being the least significant, in terms of how vital these principles are in guiding future directions around funding for PHUs.

Category 2: VERY IMPORTANT TO CONSIDER

Principle	Most Significant (1)	Significant (2)	Somewhat Significant (3)	Least Significant (4)
1. PHUs should receive annual increases that at least cover the cost of inflation.				
2. Efforts should be made to bring under-funded PHUs up to the level of the top funded PHUs, rather than bringing the top funded health units down				
3. Funding for PHUs should be based on characteristics of that particular PHU, such as geographic size, staffing size and mix, number of locations/offices, etc.				
4. Funding decisions for PHUs should be based on measures of health outcomes and disparities in health outcomes across jurisdictions				

Q3. Please rank the principles in the category below on a scale of 1-4, with 1 representing the most significant and 4 being the least significant, in terms of how vital these principles are in guiding future directions around funding for PHUs.

Category 3: IMPORTANT BUT NOT ESSENTIAL TO CONSIDER

Principle	Most Significant (1)	Significant (2)	Somewhat Significant (3)	Least Significant (4)
1. Funding for PHUs should be determined via a process that is sufficiently transparent, such that a PHU can calculate or validate its funding allocation using available data				
2. PHUs should receive a base level of funding, irrespective of geographic size or population served				
3. Funding for PHUs should include explicit amounts for capital costs				
4. Funding for PHUs should be tied to meeting agreed performance targets				

Q 4. Are there any principles that you feel would be better suited to a different category than what has been proposed in this survey?

Q 5. Are there any other principles you feel should be considered in making decisions around the distribution of resources for public health units in Ontario?

Q 6. Feel free to share any other thoughts or comments that you may have:

Thank you for taking the time to complete this survey. Your responses and contributions will play a critical role in furthering the on-going debate around potential policy changes surrounding funding allocation practices for the public health sector in Ontario. We really do appreciate your time and contributions to this research project.

Please contact the principal investigator (Anum Irfan Khan) via email (anum.i.khan@uwaterloo.ca) or phone (647 886 8344) at any time if you have questions or concerns about this survey. This research has been granted ethics clearance from the University of Waterloo Office of Research Ethics. If you have any Nummelin, the Director, Office of Research Ethics, at 1-519-888-4567, Ext. 36005 or maureen.nummelin@uwaterloo.ca.

Appendix 12:
Methods and decision trail

1. Stage 1: Initiated study design

→ Developed and revised the project's key research questions (understanding how PHUs are currently funded and what principles public health professionals believe should be used to guide the distribution of resources in public health), sample frame (public health professionals in Ontario) and proposed methods (key informant interviews and a web survey) following proposal defense and committee feedback

2. Stage 2: Developed sensitizing concepts and interview guide
→ Developed a series of 'sensitizing concepts' via a review of literature on public health resource needs, social value judgments and resource distribution in public health settings, and obtained committee feedback on sensitizing principles and interview guide

3. Stage 3: Recruited and conducted informant interviews
→ Established sampling frame for key informant interviews and survey – public health professionals from across Ontario (provincial level Ministry officials and Medical officers of health from across PHUs)
→ Electronic/email invitations were sent out to members in the final sample for key informant interviews
→ Conducted the 14 key informant interviews

4. Stage 4: Data analyses
→ Conducted preliminary analyses of interview data based on techniques/stages described in the preceding section (initial coding, line by line coding and development of categories)
→ Memos used to track changes in coding and category development across stages in data analysis

5. Stage 5: Developed and administered web survey
→ Interview transcripts were reviewed and the key principles shared by informants were refined and organized into three distinct categories based on the significance assigned to each principle by public health professionals over the course of the interviews
→ Survey (electronic link) sent to a wider subset of original sampling frame (all 36 Medical Officers of Health and upper level management/staff in several public health related MOHLTC branches)
→ Survey completed by 15 public health professionals
→ Survey results tabulated

6. Stage 6: Verification of interview findings
→ A summary of key findings were shared with the public health professionals that were interviewed, and interviewees were asked to share any feedback they had on the results to ensure that the researcher had accurately captured and interpreted participant perspectives

7. Stage 7: Presentation of results
→ Final thesis report presented to thesis committee and shared with public health professionals who participated in the thesis project

Appendix 13:
Interview participant information letter and consent form

Name of Participant Date
Title
Professional Affiliation
Address

Dear [Name of Participant]:

Thank you very much for responding to my invitation to participate in a study I am conducting at the University of Waterloo titled, " ." This study is being undertaken as part of my M.Sc. degree in the School of Public Health And Health Systems under the supervision of Dr. Ian McKillop.

For the past decade or so much of the discussion about how funding should be allocated in Ontario's health care system has focused on the acute-care sector. The encouraging news is that there is a growing interest in understanding how best to deploy funds to support public health activities. This project seeks to contribute to that important discussion by identifying and examining the specific decision-making principles that experts feel currently do, and in the future should guide the distribution of provincial funds to Ontario's public health units. I believe that your contribution as a leading expert and advocate for the public health sector will be invaluable in ensuring that diverse stakeholder perspectives are reflected in reports stemming from this study, which I hope will inform current dialogue and debate around critically examining the funding policies and practices utilized in the province's public health sector.

Participation in this study is entirely voluntary. The time commitment is 45-60 minutes, during which I will invite you to talk with me via telephone at a time convenient for you to seek your opinion and input on a number of questions (that I will provide to you ahead of time). You may of course decline to answer any of the interview questions, and you may withdraw from this study at any time without any negative consequences by simply letting me know. With your permission, the interview will be audio recorded and later transcribed for analysis. In additional verbal consent will also be sought prior to the start of the phone interview. After the interview, I will send you via email a list of proposed decision-principles and ask you to rank them in order of significance based on your expertise and experiences in the field of public health. Following the completion of all interviews, I hope to send all participants a general summary of findings, and invite their feedback or reflections on the results obtained. All the information you provide is considered completely confidential. To protect and preserve the confidentiality of all participants, names will not appear in my thesis or any report resulting from this study. There are no known or anticipated risks to you as a participant in this study. No findings or opinions will be directly attributed to you or your professional affiliation(s) in my report, however, with your permission anonymous quotations may be used. Only researchers associated with this project will have access to the data collected.

As a token of my appreciation of the time and expertise you so kindly gave to this project, all participants will receive a $50 gift card from Chapters. The gift card and the thank you letter will be mail to you via post as soon as the interview is completed. The amount received is taxable. It is your responsibility to report the amount received for income tax purposes. In addition, if you would like, a final report can also be sent to you electronically once the project has been completed.

Since the interviews will be conducted over the phone, you will be asked the following 3 questions to attain verbal consent prior to the start of the interview: 1) Do you agree, of your own free will, to participate in this study, 2) Do you agree to have your interview audio recorded, and 3) Do you agree to the use of anonymous quotations in any thesis or publication that comes of this research. You can seek clarifications or ask any questions you may have prior to the start of the interview directly from the researcher during the phone interview, as well at any point over the course of the project via email (anum.i.khan@uwaterloo.ca) or phone (647-886-8344).

If you have any questions about participation in this study, or would like additional information to assist you in

reaching a decision about participation, please feel free to speak with my supervisor, Dr. Ian McKillop via phone at (519) 888-4567 ext. 37127 or via email at ian@uwaterloo.ca. This research has been granted ethics clearance from the University of Waterloo Office of Research Ethics, however, the final decision about participation is yours. I very much look forward to speaking with you and thank you in advance for your assistance in this project. Should you have any comments or concerns regarding the conduct of this research, please contact Dr. Maureen Nummelin, the Director, Office of Research Ethics, at 1-519-888-4567, Ext. 36005 or maureen.nummelin@uwaterloo.ca

Sincerely,
Anum Irfan Khan, B.A.
M.Sc Candidate & Project Lead
University of Waterloo - School of Public Health and Health Systems
Phone: 647 886 8344
Email: anum.i.khan@uwaterloo.ca

Appendix 14:
Principle rankings by category
Table A: Summary of principle rankings for Category 1

Category 1	Social Value	Most Significant	Significant	Somewhat Significant	Least Significant
1. The amount of funding a PHU receives should be sensitive to the presence of high-risk vulnerable populations in a PHU's designated service area	Equity	33.3%	13.3%	20.0%	**33.3%**[6]
2. Rural PHUs should receive additional funds to deliver the standard basket of public health services required of all health units	Need	13.3%	33.3%	**33.3%**	20.0%
3. Funding should be based on characteristics of the population served, such as age distribution, incidence of TB, and prevalence of tobacco use etc.	Need	**46.7%**	6.7%	26.7%	20.0%
4. Funding should account for the cost of service delivery, i.e., a community's cultural & demographic profile, languages spoken etc.	Need	6.7%	**46.7%**	20.0%	26.7%

Table B: Summary of principle rankings for Category 2

Category 2	Social Value	Most Significant	Significant	Somewhat Significant	Least Significant
1. PHUs should receive annual increases that at least cover the cost of inflation.	Need	**53.3%**	20.0%	20.0%	6.7%
2. Funding for PHUs should be based on characteristics of that particular PHU, i.e., geographic size, staffing size and mix etc.	Need	33.3%	20.0%	**26.7%**	20.0%
3. Efforts should be made to bring under-funded health units up to the level of the top health units, rather than bringing the top funded health units down	Equity	0.0%	**46.7%**	**26.7%**	26.7%
4. Funding should be based on measures of health outcomes and disparities in health outcomes across jurisdictions	Equity	13.3%	13.3%	**26.7%**	**46.7%**

[6] The bolded percentage values represent the highest rankings within that particular significance column

Table C: Summary of principle rankings for Category 3

Category 3	Social value	Most Significant	Significant	Somewhat Significant	Least Significant
3.1 Funding for PHUs should be determined via a process that is sufficiently transparent, such that a PHU can calculate or validate its funding allocation using available data	Transparency-Accountability	**46.7%**	13.3%	**33.3%**	6.7%
3.2 PHUs should receive a base level of funding, irrespective of geographic size or population served	Need	40.0%	26.7%	20.0%	13.3%
3.3 Funding for PHUs should include explicit amounts for capital costs	Need	6.7%	**46.7%**	26.7%	20.0%
3.4 Funding should be tied to meeting agreed performance targets	Transparency-Accountability	6.7%	13.3%	20.0%	**60.0%**