

Description of Post-PHRED Knowledge to Action (K2A) Model: Conceptual Description of Model Attributes

Final Report – July 2009

Tri-Partite Working Group:

- Ontario Agency for Health Protection and Promotion
- Public Health Division, Ministry of Health and Long-Term Care
- Public Health Research, Education and Development Program

Executive Summary

The Public Health Research, Education and Development (PHRED) Program was established in 1997 to contribute to the functioning of Ontario's public health system through key system support functions including: applied public health research and knowledge translation; skills enhancement of the existing workforce; program/policy development and its evaluation; and contribution to the development of future public health practitioners.

This vision for the PHRED Program was never fully realized due to the co-occurrence of major changes by the provincial government to the funding of public health. Since 1997, the PHRED Program has been funded 50/50 by the province and the health unit's municipality(ies), which is not consistent with the originally envisioned regional and provincial program perspectives. Despite the inherent limitation of the funding model over the past decade, the PHRED Program has made many contributions to strengthen public health in Ontario.

The mandate of the Ontario Agency for Health Protection and Promotion (Agency) is to provide scientific and technical advice for those working to protect and promote the health of Ontarians. The Agency Implementation Task Force (AITF) identified surveillance and epidemiology, research, knowledge exchange, and professional development among the Agency's core functions. Recognizing the alignment of PHRED functions and services with those of the planned Agency, the AITF recommended:

*"The Agency should, at minimum, draw upon the available provincial financial resources in the PHRED program. Furthermore, we recommend that the Agency assume direct oversight for the provincial budget component of the PHRED program (p.12)."*¹

A tri-partite working group involving representatives from the Public Health Division, Ministry of Health and Long-Term Care (PHD-MOHLTC), the PHRED Program, and the Agency, was struck in the fall of 2008 to discuss the transfer of provincial PHRED funding and functions from MOHLTC to the Agency. The purpose of this paper is to provide a conceptual description of a model to inform Agency and MOHLTC decision-making regarding a transfer of provincial PHRED funding and functions.

This paper builds upon a previous report, *Knowledge to Action – K2A: Building a Stronger System of Workforce Development, Applied Research and Knowledge Exchange for Public Health in Ontario*,² which recommended a blended model with regionally distributed hubs combining cross-cutting functions support to local health units with specific applied research and content expertise. The subsequent release of the Ontario Public Health Standards (OPHS), particularly the *Foundational Standard*, reinforces the need for cross-cutting supports to health units. The

main body of this report discusses in more detail the purpose, principles and design features of the K2A model.

Based on the analysis and discussion among working group participants, the following conclusions and recommendations are provided:

1. There is continued agreement that overall leadership for PHRED functions (i.e., work force development, applied research, knowledge exchange) are better aligned with the Agency. As such, transfer from MOHLTC to the Agency of the responsibility for provincial leadership and the provincial budget component for PHRED functions should be pursued.
2. Recognizing the central leadership, coordination and capacity of the Agency, and the mandated expectations for public health units described in the Ontario Public Health Standards (OPHS), the proposed K2A model includes a system of regional hubs to provide a mechanism for direct engagement with all public health units to build capacity and provide cross-cutting/foundationalⁱ support and expertise. Regional hubs would also support the Agency as a province-wide resource of specific applied research and content expertise. The current conceptual model for the regional K2A hubs is characterized by the following:
 - a. Purpose:
 - i. Conducting applied public health research of provincial and local relevance
 - ii. Increasing public health knowledge synthesis, dissemination and diffusion (knowledge exchange)
 - iii. Assisting in the development of public health programs and policies and their evaluation
 - iv. Providing skills development opportunities for public health practitioners
 - v. Contributing to the development of public health competencies in health science students and future public health practitioners
 - vi. Supporting public health units to meet the OPHS *Foundational Standard*.
 - b. Principles:
 - i. Grounded and relevant, characterized by:
 - Strong links to and understanding of public health and public health units
 - Strong academic links

ⁱ Foundational: includes the requirements in the OPHS *Foundational Standard* (assessment, surveillance, research, knowledge exchange, and evaluation) and the related “*Principles*” section (workforce development).

- Driven by provincial priorities set through a transparent process that includes mechanisms for local/regional input and is aligned with the overall strategic planning and priority setting process of the Agency
 - ii. Comprised of centres with one or more areas of specialized public health related expertise that are regionally distributed
 - iii. Part of an effective, high profile system for knowledge exchange
 - iv. Transparent and accountable with their funding based on results.
- c. Structural:
- i. 100% provincially funded
 - ii. Sufficient critical mass
 - iii. While in the longer-term there is potential for regionally-based Agency assets to be co-located, in the near term, it makes most sense to have regional hubs housed by a host organization. Since there is no strategic advantage for potential host organizations to actively seek this role, the Agency will need to actively engage host organizations and seek out hub directors and staff who would have formal paid engagement/employment with the Agency.
- d. Transition Planning/Management:
- i. Address funding uncertainty among current PHRED municipal partners during the transition period between models
 - ii. Prevent the loss of valuable public health system human resources currently housed within the PHRED program due to uncertainty, protracted timelines, etc.
 - iii. Explore mechanisms to retain existing municipal PHRED program funding to address other areas of health unit infrastructure needs (e.g., assistance to meet *Foundational Standard* requirements).
- e. Phased Implementation
- i. Allocation of existing provincial PHRED funding will support the initial establishment of 2-3 regional hubs
 - ii. Over time, the Agency will need to secure additional resources to achieve full implementation of the proposed model.
- f. Coordination:
- i. Have regional advisory committees to support local relationships, coordination and priority setting
 - ii. Agency ensures consistency and coordination among K2A hubs and alignment with Agency-wide directions and initiatives.

3. There are a number of areas requiring additional dialogue and analysis to further elucidate the K2A model:
 - a. Clarifying central and regional Agency roles for supporting the OPHS *Foundational Standard* and other cross-cutting responsibilities
 - b. Clarifying central and regional Agency roles for providing content specific knowledge exchange, training and technical assistance
 - c. Assessing the potential synergies of existing regional capacity (e.g., RICNs, RRFSS, tobacco training and consultation) with the envisioned network of regional K2A hubs.

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Description of Post-PHRED Knowledge to Action (K2A) Model: Conceptual Description of Model Attributes

Introduction

Evolving from the former Teaching Health Unit (THU) Program, the Public Health Research, Education and Development (PHRED) Program was established in 1997 to contribute to the functioning of Ontario's public health system through key system support functions including: applied public health research and knowledge translation; skills enhancement of the existing workforce; program/policy development and its evaluation; and contribution to the development of future public health practitioners. These PHRED Program functions correspond to the recommended functions of the new Ontario Agency for Health Protection and Promotion (Agency), which include: surveillance and epidemiology; research; knowledge exchange; and, professional development.¹ Recognizing better alignment of PHRED functions and services with the planned Agency, the Agency Implementation Task Force (AITF) recommended:

*"The Agency should, at minimum, draw upon the available provincial financial resources in the PHRED program. Furthermore, we recommend that the Agency assume direct oversight for the provincial budget component of the PHRED program (p.12)."*¹

Now established, the Agency released its *Strategic Planning Framework and Start-Up Operational Plan* in December 2008.³ With a mandate to "provide scientific and technical advice for those working to protect and promote the health of Ontarians", its two enabling goals are to increase the capacity and effectiveness of public health in Ontario; and, improve access to information and support. The *Plan* furthermore indicates that "we will actively explore how we can play a critical role in strengthening and aligning existing programs such as...the PHRED Program."³ To that end, a tri-partite working group involving representatives from the Public Health Division, Ministry of Health and Long-Term Care (PHD-MOHLTC), the PHRED Program, and the Agency, was struck in the fall of 2008 to discuss the transfer of provincial PHRED funding and functions from MOHLTC to the Agency. The purpose of this paper is to provide a conceptual description of a model to inform Agency and MOHLTC decision-making regarding a transfer of provincial PHRED funding and functions.

A Brief History of the PHRED Program

When conceptualized in 1997, the PHRED Program was intended as an evolutionary step from the pre-existing THU Program and its developers identified the need to address a number of issues that remain pertinent today:

- Be more of a province-wide resource
- Strengthen links with all boards of health
- Develop centres of excellence
- Enhance the program's role in applied and evaluative research, continuous education of public health professionals and program development
- Review role in undergraduate student education activities.⁴

A key feature of the intended PHRED Program was the establishment of regional governance structures to facilitate links with all local boards of health. In addition, each regional PHRED site was to be linked with one or more academic centres. Greater equity in funding levels of PHRED sites was envisioned, as was the designation of a portion of the overall budget for provincial special projects.

This vision for the PHRED Program was never fully realized due to the co-occurrence of major changes by the provincial government to the funding of public health. Since 1997, the PHRED Program has been funded 50/50 by the province and the health unit's municipality(ies). This dependence on local funding is not consistent with regional and provincial program perspectives. Therefore the regional governance model and expected linkages with area health units were not realized. The shift from a 100% provincially funded model to one cost-shared with municipalities resulted in Toronto Public Health (TPH), which had originally included three PHRED sites prior to amalgamation, withdrawing their participation.

At the time of the planning for the PHRED Program, the budget for the 100% provincially funded THU Program was \$6.6M. With a shift to 50/50 funding and the loss of the TPH PHRED site, the remaining budget was \$2.2M. Over the past decade, this has been reduced to approximately \$1.9M due to reduced funding requests from some PHRED sites, capped budgets in others, and uncertain long-term sustainability of the existing model.

Despite the inherent limitation of the funding model over the past decade, the PHRED Program has made many contributions to the strengthening of public health in Ontario. Examples include:

- Systematic reviews of the literature on public health-related topics (e.g., Effective Public Health Practice Project, supported development of health evidence.ca)
- Evaluations and evaluation support (e.g., CINOT, Ontario's Action Plan for Healthy Eating and Active Living; recent partnership with Cancer Care Ontario to support five evaluation initiatives in chronic disease prevention)
- Comprehensive evaluations of both the Ontario Rapid Risk Factor Surveillance System (RRFSS) and its website
- Toolkit development and training (e.g., program evaluation, benchmarking)
- Applied research (e.g., analysis of RRFSS postpartum mood disorders module for 8 health units; development and validation of a pre-school nutrition screening tool: NutriSTEP; Hamilton child blood lead prevalence study)
- Program and system development (e.g., community-based obesity prevention program; benchmarking projects; public health core competencies typologies development, public health accountability framework)
- Incubator for public health investigators (e.g., Margaret Black, Donna Ciliska, Maureen Dobbins, Nancy Edwards, Meizi He, Ian Johnson, Linda Levesque, Bruce Newbold, Helen Thomas, Ruta Valaitis).

Recognizing the inherent limitations and lack of sustainability of the status quo model, as well as the opportunity represented by the creation of the Agency, recommendations from the Capacity Review Committee (CRC) and AITF addressed the need for 100% provincial funding and having the Agency assume direct oversight of the PHRED Program, respectively.^{1,5} It is therefore timely to consider the appropriate next step in the evolution of PHRED functions and services in Ontario's public health system.

Envisioning a Post-PHRED Network of System Supports for Public Health in Ontario

In 2007, a working group under the leadership of the Sudbury & District and Middlesex-London Health Units built upon recommendations from the AITF and CRC reports and engaged in significant field consultations to develop a model to better address PHRED functions. The resulting report, *Knowledge to Action – K2A: Building a Stronger System of Workforce Development, Applied Research and Knowledge Exchange for Public Health in Ontario*, recommends a blended model with regionally distributed hubs combining cross-cutting foundational functions support to local health units with specific applied research and program content expertise.² The underlying premise is that fulfillment of system support functions requires a regional infrastructure and cannot be adequately addressed solely through a centralized approach.

Expectations for Health Unit Performance – The OPHS Foundational Standard

The release of the new Ontario Public Health Standards (OPHS)⁶ provides a key consideration for designing a system of supports for health units.

The OPHS establish the requirements for fundamental public health programs and services for which boards of health are responsible. Key principles by which boards of health are to be guided include the importance of using health data, including underlying health determinants, as well as the evidence for the effectiveness of interventions to inform decision making at the local level regarding program assessment, planning, delivery management and evaluation. Boards of health are expected to continuously tailor programs and services to address needs influenced by differences in the context of their local communities.

Foundational Standard Requirements

Population Health Assessment:

- Assess current health status, health behaviours, preventive health practices, health care utilization relevant to public health and demographic indicators
- Assess trends and changes in local population health
- Use population health, determinants of health and health inequities information to assess needs of local populations, including populations at risk, to determine priority populations for programs/services
- Tailor public health programs and services to meet local population health needs including priority populations
- Provide population health information including determinants of health and health inequities to the public, community partners and health care providers

Surveillance:

- Conduct surveillance including the ongoing collection, collation, analysis and periodic reporting of population health indicators
- Interpret and use surveillance data to communicate information on risks to relevant audiences

Research and Knowledge Exchange:

- Engage in knowledge exchange activities with public health practitioners, policy-makers, community partners, health care providers and the public regarding factors that determine health of the population
- Foster relationships with community researchers, academic partners, and others to support public health research and knowledge exchange
- Engage in public health research activities either alone or in partnership with others

Program Evaluation:

- Routinely monitor program activities and outcomes to assess and improve the implementation and effectiveness of programs and services including collection, analysis, and periodic reporting of indicators related to inputs, resources, implementation processes, reach, outputs and outcomes
- Conduct program evaluations when new interventions are developed or implemented or when there is evidence of unexpected operational issues or program results to understand the linkages between inputs, activities, outputs and outcomes
- Use a range of methods to facilitate public health practitioners' and policy-makers' awareness of the factors that contribute to program effectiveness

Source: Ontario Public Health Standards, 2008; pgs 15-17.

Reflecting these principles, the OPHS *Foundational Standard* identifies specific requirements for all health units in the areas of **population health assessment, surveillance, research and knowledge exchange**, and **evaluation**. An accompanying protocol provides additional details.⁷ The requirements are cross-cutting in nature since they underlie a health unit’s ability to optimally fulfill all of the program-specific requirements included in the OPHS. While the contents of the *Foundational Standard* are consistent with known best practices for public health organizations, the new OPHS have made these expectations explicit. The system challenge is that there is considerable heterogeneity in the intrinsic capacity of health units to fulfill these requirements. The design of system supports for public health in Ontario must explicitly address how health units will be assisted to meet the OPHS *Foundational Standard*.

While not included as a requirement in the *Foundational Standard*, workforce development, a critical support function for public health organizations and systems, is explicitly addressed in the “principles” section of the *Foundations* chapter of the OPHS.

Workforce Development Expectations – OPHS Principles

“Boards of health shall ensure a competent and diverse public health workforce by providing ongoing staff development and skill building related to public health competencies. This shall include quality improvement and life-long learning programs for staff members, as well as the provision of opportunities for formal and informal public health leadership development. Boards of health shall foster an interest in public health practice for future health professionals by supporting student placements.”

Source: Ontario Public Health Standards, 2008; pg 14.

Addressing Inequities in Health Unit Capacity

The establishment of the Agency represents a central source of expertise, leadership and coordination for the system support functions described in the OPHS *Foundational Standard*. The K2A working group envisioned a number of affiliate Agency sites or “nodes” possessing particular research and/or programmatic expertise that would support the Agency’s mandate. Examples of such nodes include the Centre for Public Health and Zoonoses at the University of Guelph, ICES, and the Health Communications Unit at the Centre for Health Promotion. Reflecting their mandate, each of these nodes would have their own network of research and/or practice partners including some public health units. These “dispersed” networks would be expected to be flexible and dynamic depending on the issues/projects being addressed with partners located anywhere in Ontario and beyond.

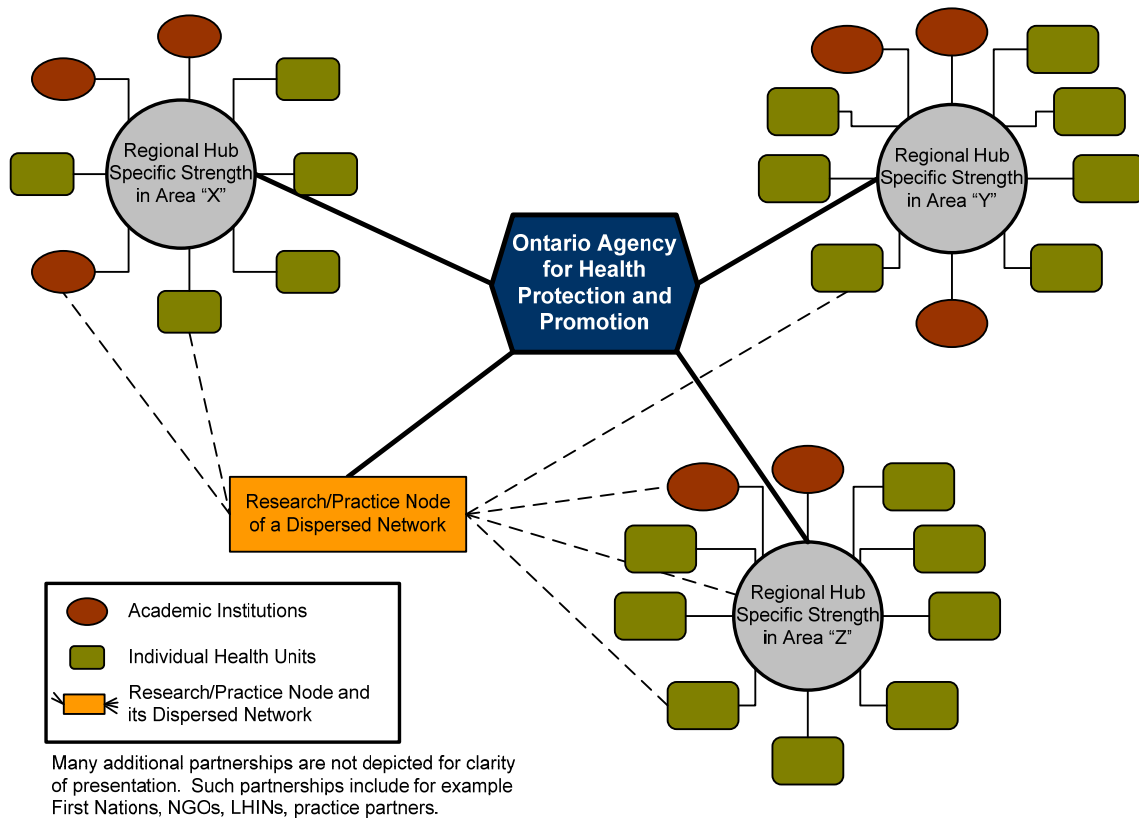
The Agency, combined with a series of affiliate nodes and their dispersed networks, is an extremely important province-wide resource, but will have limited ability to support all of the province’s health units. The fundamental challenge is that there are considerable differences in participative and receptor capacity among the 36 health units across the province. An approach

that relies on passive uptake and application of new knowledge or capacity to engage in innovative projects will favour health units with already well developed systems for knowledge exchange since these provide a cumulative advantage for repeated successful innovation diffusion.⁸ Such an approach risks *increasing* existing inequities among health units. The AITF spoke directly to this issue in noting the experience of Health Intelligence Units and PHREDS and recommended “promoting the establishment of coordinated regional approaches to increasing both the availability and relevance of research on a more equitable basis...[by]...supporting regional research and knowledge exchange network specific to public health.”²

The K2A Model – Blend of Region-Based Supports and Content Expertise

In addition to the presence of the Agency and affiliated research/practice nodes and their dispersed networks, the envisioned K2A model includes a series of regional hubs to engage and support individual health units for critical support functions and processes including OPHS *Foundational* requirements. Figure 1 depicts the inter-relationships among the K2A model components. In addition to providing cross-cutting/foundational support and assistance, the regional hubs are also envisioned to possess specific strength in a content area. In other words, hubs would also function as research/practice nodes.

Figure 1: Proposed K2A Model Blending Features of Research/Practice Nodes and Regional Hubs



Modified from: Sutcliffe P, Etches V, Michel I, et al. Knowledge to action – K2A: building a stronger system of workforce development, applied research and knowledge exchange for public health in Ontario: final report. Sudbury, ON: Sudbury & District Health Unit & Middlesex-London Health Unit, 2007.

Table 1 summarizes the primary roles for each of the model components.

Table 1: Roles of Model Components

Model Component	Primary Role
Agency	Central axis for the K2A system providing leadership, coordination, expertise and funding.
Node	Organization affiliated or contractually engaged with Agency and possessing specific research and/or practice expertise. (e.g., Centre for Public Health and Zoonoses at the University of Guelph, ICES, and the Health Communications Unit)
Dispersed Network	Flexible and dynamic relationships between Agency-affiliated “node” and various partners, including public health units, as part of node’s role in supporting and strengthening public health system.
Hub	Regionally-based capacity established by the Agency to contribute to fulfilment of K2A functions including providing support to client health units to fulfil <i>Foundational Standard</i> . Hubs are also envisioned to have particular areas of strength/expertise. Core services funded by Agency. Applied research carried out in partnership with others.

Viewed system-wide, the inherent flexibility of the K2A model is related to the blending of its two key components:

Nodes

- As a centre of expertise, can participate as a partner in a dispersed network
- Flexibility to establish groups of partners based on expertise and interest as required for particular projects/needs
- May be ongoing or time-limited
- Supports relationships of peer health units across regions

Regional Hubs

- Provides mechanism for engagement of all health units
- Supports development of ongoing relationship between the hub, client health units and regional academic partners
- Supports regional delivery of training and consultation services for cross-cutting foundational and organizational requirements (population health assessment, surveillance, research and knowledge exchange, program evaluation, workforce development, CQI)
- Mechanism to identify local innovation and disseminate to rest of system
- Identify local/regional research needs
- Potential to host regionally-based program-specific expertise/support

As a centre with particular research/practice expertise, each hub would be a province-wide resource with particular emphasis on applied research and knowledge exchange. To a large degree, these responsibilities would be similar to other Agency-affiliated centres of expertise (i.e., nodes) located across the province. The unique aspect of the K2A model is the regional hub component. It is a key mechanism by which all health units can be linked to regional knowledge exchange networks and a province-wide system to support *Foundational Standard* requirements including the provision of training and consultation services.

The remainder of this paper will provide a more explicit description of the envisioned K2A model.

Description of the K2A Model

Purpose of the K2A Hubs

The purpose of the K2A hubs is to support the Agency in building organizational capacity and improving access to information and support in the province's public health system by:

- Conducting applied public health research of provincial and local relevance
- Increasing public health knowledge synthesis, dissemination and diffusion (knowledge exchange)
- Assisting in the development of public health programs and policies and their evaluation
- Providing skills development opportunities for public health practitioners
- Contributing to the development of public health competencies in health science students and future public health practitioners
- Supporting public health units to meet the OPHS *Foundational Standard*.

Principles

The K2A hubs will fulfil their purpose as a system-wide resource ensuring that they are:

- Grounded and relevant, characterized by:
 - Strong links to and understanding of public health and public health units
 - Strong academic links
 - Being driven by provincial priorities set through a transparent process that includes mechanisms for local/regional input and is aligned with the overall strategic planning and priority setting process of the Agency
- Comprised of centres with one or more areas of specialized public health related expertise that are regionally distributed
- Part of an effective, high profile system for knowledge exchange
- Transparent and accountable with their funding based on results.

A Blend of Province-Wide and Regional Responsibilities

Defined Areas of Strength

The dispersed network component of the model is actively being built in Ontario as the Agency pursues affiliate arrangements with a number of selected universities and institutes (e.g., University of Guelph, University of Toronto, ICES). It would be expected that each K2A hub would have/develop particular strength(s) and function as an applied research/practice node for the benefit of the province. As such, one would anticipate that a portion of the hub's core funding/capacity would be directed to address priority applied research questions identified by

the Agency consistent with the hub's area of expertise. Close relationships with health units will foster practice-based research, which is critical to produce evidence that "more accurately and representatively reflects the 'program-context interactions' and circumstances in which the results of the research are expected to be applied."⁹

Regional Supports

The regional hub component of the K2A model provides a mechanism by which all health units can be linked to regional knowledge exchange networks and provides a province-wide approach to support health units in fulfilling the *Foundational Standard* of the OPHS. Supporting the *Standard's* requirements will require a balance of central and regional supports. For example, in order to support population health assessment responsibilities, the Agency might centrally prepare sets of area-specific health status information and associated tools for preparing a health status report. However, the ability to integrate multiple sources of data, including local ones, analyze and interpret the data to inform priority setting, and the tailoring of OPHS requirements to meet local needs, are tasks that need to closely consider the local context and are more appropriately delivered locally. Nevertheless, there are also central coordination and support roles.

Related tasks such as planning, including the development of program logic models and evaluation plans, are additional areas where technical assistance at the local level would be of value. While health units will have differing levels of needs, training and technical assistance in these foundational areas will likely be particularly beneficial for those health units with limited epidemiologic and other graduate level expertise. The intent of the K2A hubs is not to perform health unit core responsibilities, but rather to provide technical support and build capacity recognizing the intrinsic differences among health units.

Table 2 provides additional detail to distinguish the application of specific content versus cross-cutting foundational expertise to address core responsibilities.

Table 2: Specific Content and Cross-Cutting Expertise for Individual Hub Responsibilities

K2A Hub Responsibility	Specific Content Expertise	Cross-Cutting/Foundational Expertise
Conduct applied research	Consistent with area of strength/expertise – partner with academic centres and health units within and outside region as appropriate	Potential involvement with research questions associated with KE process
Knowledge exchange	Province-wide perspective related to area of expertise, consistent with Agency’s KE framework	Work with client health units to advise on incorporation of knowledge & best practices in organizational context (e.g., change agent) Act as broker to link client health units to information sources/expertise elsewhere in system.
Professional development & training (specific blend of centralized and regional development and delivery dependent on topic area, target population and training strategy)	May be involved in development of training program. Provide province-wide training where appropriate (e.g., distance education). Could employ train-the-trainer approach and support for regional on-site training	Provide region-based training. This may be supported by lead centre Provide support for application of training into practice
Contribution to the Ministries’ development of program-specific standards, protocols, performance measures	Contribute consistent with centre’s area of expertise	Provide input regarding applicability, feasibility, logistical issues. Assist integration within health units
Consultation to health units on assessment, surveillance, planning, evaluation, quality improvement, performance measurement and research	Take lead if area of expertise	Ongoing relationship and technical assistance with management and staff of client health units - organizational capacity building, institutionalization of learning/practices, tool development

While supporting many of the *Foundational* requirements might be considered a “generalist role”, this term is potentially misleading. The ability to support these cross-cutting requirements demands considerable specialized expertise and grounding in public health practice and would be facilitated by ongoing relationships with client health units. Interventions

to improve the use of data and information in decision making, planning and evaluation of programs are examples of organizational capacity building. Improvements in these key health unit activities are not merely providing knowledge and skills to individuals, but are essentially improving the intrinsic organizational processes within health units. Similarly, providing training to strengthen leadership and management competencies of senior and middle managers would be intended to strengthen the overall functioning of a public health unit with benefits to multiple programs. While some types of training could be developed and delivered centrally, such an approach may be insufficient where more intensive in-person interaction is required.

Examples of possible types of regionally-based supports include providing training and technical assistance to improve the use of surveillance information in the planning and implementation of programs, developing a collaborative report on social determinants of health and health inequities in the region, assisting with the development of evaluation frameworks for specific programs, developing mechanisms to tailor services to particular population groups (e.g., First Nations, Francophones), and assistance with preparing a research protocol for a regional research initiative.

An area for further analysis is clarifying central versus regional support roles for the cross-cutting/foundational areas. The earlier description of roles regarding assessment and surveillance data and its interpretation and application needs to be further elucidated and expanded to other areas of support.

Regional-Based Program Content Supports

Consistent with the previous K2A report,² the preceding discussion limited the provision of local support to health units to cross-cutting, foundational areas of practice. Following establishment of the desired number of hubs, each with defined areas of strength, one could consider providing regional content-specific support from these sites as well. In other words, in addition to providing training and technical assistance for foundational areas, the presence of the regional hubs could also be used to integrate region-based approaches to program content-specific training, consultation, and coordination. Such models already exist for tobacco and infection control. Consistent with the major areas of the OPHS, one might consider having capacity in each K2A hub for each major program area (i.e., chronic disease and injury prevention, infectious diseases, maternal/child health, and environmental health). Doing so would offer a range of possibilities with respect to building networks of practice and fostering knowledge exchange.

An argument for expanding regionally-based training and consultation to other content areas is that programs do not exist in isolation of their organizational context. Successful diffusion is characterized by adjustments both to the innovation, as well as to the work environment.⁸

Uptake of new knowledge/evidence into practice does not stop at adoption and implementation, but must reach the next steps of institutionalization and ultimately, maintenance.¹⁰ It has been suggested that continuous quality improvement (CQI) could be a key approach to facilitate the systematic integration of interventions since it “systematically addresses many of the barriers and issues described in the breakdown that occurs between the initial adoption and implementation of an intervention and the institutionalization of that intervention.”¹⁰ This perspective is also consistent with the CRC report, which states that there is a need to create a culture of continuous quality improvement in health units.⁵

Knowledge exchange is inherently bidirectional. Health units themselves are sources of innovations and practice-based learning needs to be “uploaded” for spread to other communities.^{8,9} The ongoing relationship of the K2A hub with local health units will provide an opportunity for innovations to be recognized and exchanged with the network of supports to other health units.

Further analysis is required regarding linking of pre-existing initiatives (i.e., tobacco, RICNs) to a future K2A model, as well as the potential expansion of the concept to other program content areas. There may also be opportunities for closer linkages with the current OHPRCs. In some instances, there may be considerable similarity or synergy in the expertise and functions of an OHPRC and K2A hub(s). The need for this analysis is included in the *Agency’s Strategic Planning Framework* that states: “we will actively explore how we can play a critical role in strengthening and aligning existing programs such as the Ontario Health Promotion Resource System (OHPRS), the Public Health Research and Education Development (PHRED) program, the Rapid Risk Factor Surveillance System (RRFSS), and the Provincial Infectious Diseases Advisory Committee (PIDAC).”³

Knowledge Broker

Even if regional hubs eventually possess a cross-section of content specific expertise, issues will arise in which more detailed expertise is required. For example, there are differences in aspects of surveillance, planning and other cross-cutting activities when applied to one particular program area versus another (e.g., chronic diseases, infectious diseases, child development, etc.). At some point, the level of required expertise may exceed that available within a regional hub. In such circumstances, the hub staff would fulfill a knowledge broker role facilitating contact with the expert resource for the client (e.g., OHPRC, academic centre, other regional hub, etc.) and would stay involved to the extent required by the circumstances. In some cases this would be limited to making the connection, while in others, ongoing involvement will be indicated. This “one stop shop” approach will help build sustainable relationships conducive to knowledge exchange while simplifying processes for local health units to access program

content or cross-cutting foundational expertise. A key point is that each hub is part of a bigger network of coordinated supports that includes the central Agency, various affiliated entities (i.e., nodes), as well as other hubs with particular areas of strength.

Regional Knowledge Exchange Network

Creating ongoing linkages between health units and researchers is a critical role of the K2A hubs.^{11,12} A regional hub model would provide a mechanism by which all health units would be linked with academic partners and applied public health researchers. It would facilitate access of local health units to this expertise and to involvement in applied research opportunities. The K2A hub's own ongoing research projects would also provide an opportunity for local health unit involvement, although would not be limited to regional-based health units since it would reflect the hub's particular area(s) of strength.

Range of Engagement Strategies

While a close working relationship between K2A hubs and individual health units is critical, including the provision of on-site consultation and training, for efficiency, regional staff will need to use a range of engagement strategies with client health units. The regional K2A hubs would be expected to have access to and utilize a range of technological approaches that the Agency will be using to foster communication province-wide.

Knowledge Exchange as an Object of Research

There is much to learn regarding the knowledge exchange process in public health systems, as well as from other sectors. Therefore, the knowledge exchange process itself should be considered as a subject of research inquiry to advance knowledge in this area for public health. While one could conduct research on the range of interventions that the K2A system will deploy, one might also assess impact on a system level since the network of K2A hubs could also be the subject of public health systems' research in assessing its ability to build organizational capacity and improve practice through improved access to information and support. This perspective is consistent with the Agency and MOHLTC's partnership with British Columbia's Ministry of Health to conduct research in the area of public health services renewal. Beyond adding to scientific understanding, these issues also have obvious organizational pertinence to the Agency.

Achieving Balance in Roles

The Agency's strategic planning framework speaks to the need for a balanced perspective.³ Such a perspective will be required in the implementation of the K2A model with respect to the

relative role of central and regional supports, hubs' cross-cutting/foundational support and centre of expertise roles, and the extent of support to individual health units with differing capacities. Active communication and coordination will be critically important.

Priority Setting

The applied research activities will be primarily driven by priorities identified by the Agency's priority setting process, which would incorporate regional perspectives from individual health units and K2A hubs, among other stakeholders. Hubs would also have the opportunity to attract additional external research funding for projects consistent with their mandate.

Priority setting will also need to occur for regional-focussed activities and closely involve regional partners and client health units, as well as alignment with province-wide initiatives (i.e., training, KE). In order to support flexibility and responsiveness, all of this capacity should not be allocated in advance to allow for issues as they arise during the year.

Coordination with Regional Client Health Units

As described earlier, the K2A hubs will have a number of regional responsibilities. Mechanisms to engage local partners and seek their input and feedback should be in place, (e.g., regional user group/advisory committee), yet will not require formal multi-stakeholder, region-based governance structures.

A challenge that will be faced by K2A hubs is that while one of their core roles/functions is to support individual health units in a number of areas, the receptor capacity among client health units will likely vary with implications for the amount and type of support needed. Those with less receptor capacity will likely have greater and differing needs for support, while those units with greater existing capacity could overwhelm the K2A hubs as they seek further improvement.

K2A Network Coordination

While each K2A hub is a specialized centre with its own collection of partnerships and relationships, it is part of a distributed network of Agency-affiliated hubs that have critical regional-focussed cross-cutting/foundational responsibilities. As illustrated in Figure 1, the Agency is the central hub and has a lead role in the development of a province-wide public health research and knowledge exchange agenda. The Agency's leadership and coordination of system development will be important to foster the necessary relationships and processes among the various components including the central Agency itself, regional hubs, the various affiliate nodes, RCINs, as well as additional sources of expertise from potential external

partners. Examples of the latter include the Public Health Agency of Canada and its network of National Collaborating Centres including the Centre for Methodologies and Tools located in Ontario, provincial public health agencies and other specialized centres.

K2A hub directors will meet regularly as a group with the Agency's lead representative to address issues of consistency, coordination and areas for collaboration across K2A hubs, and with other Agency initiatives. Each hub will possess an annual workplan that aligns with the Agency's strategic plan and clearly identifies the expected activities and deliverables of the hub and a time line of significant events/milestones for the funding period.

Relationship with Academic Partners

Development of knowledge and the application of existing and new knowledge to practice require close collaborative relationships with academic partners. The hubs' content and methodological expertise and rigour would be enhanced by academic partner involvement while these academic partners would benefit from the opportunity to address practice-based questions that impact the health of the public. Such an environment should not only provide a rich opportunity for applied research, but also for practice settings for research and professional practice students.

Structure

In the longer-term, there is potential for regionally-based Agency assets to be co-located. At this early stage of Agency development, it is unclear exactly what those components would be, and how they would be collectively configured, managed and coordinated. This situation will likely become clearer over the next few years. In the interim, there needs to be a short term approach to develop the regional hubs that has the potential to transform to a fully fledged regional Agency model.

The design parameters for a hub require some careful consideration. While a research/practice node could essentially be located anywhere in the province, by design, a hub needs to be regionally based, have considerable engagement with client health units, and its staff function collectively and proactively as a team. Ideally, team members would be co-located, but this may not always be feasible. In such circumstances, a variety of compensatory measures are required, such as periodic in-person meetings and use of communication technology, to foster team cohesion.

The Tri-Partite Working Group envisions an interim model in which the hub's staff are collectively located within a host organization and have formal paid engagement with the

Agency. A variety of engagement models may be required depending upon where individuals are being recruited from. While the hub staff may be physically located within a health unit, university or other organization, their direction and coordination is through the Agency. There needs to be clear delineation between the staff of the hub and the staff of the host organization. This clear delineation between hub staff and host organization has important functional reasons, but also presents a challenge for the establishment of the hub. Other than altruistic system building, there is not much obvious benefit to being a host organization. Therefore, a competitive proposal-based process is unlikely to be successful in establishing the hubs. The Agency will therefore have to take the lead in finding suitable space to house the hubs.

The lack of a sponsoring host organization also presents a challenge to staffing the hubs. Simply transferring existing PHRED staff to the new model is not an option for several reasons: i) this is not a continuation of the PHRED program – it is a new model; ii) need to provide the opportunity for involvement to all who wish to be part of the new model; iii) individual PHRED units have evolved in different directions; and, iv) without injection of new funds, available funding for the new model is considerably less than the jointly funded PHRED program.

The Agency will need to take the lead to staff each of the hubs through a competitive process. This is envisioned to occur in two stages with the hub lead/director chosen first, and then s/he can be involved in the recruitment of team members. Fostering a team perspective will be critical. A hub needs to be focused on engagement, building organizational capacity in health units and providing support in the application of information and knowledge. While involvement in research is expected, the expected roles of hubs differ considerably from entities that are primarily a collection of individual researchers, each with their own particular research agendas.

Planning the transition from the former PHRED model to the new regional hubs is important. A key consideration is retaining the expertise contained in current PHREDS within Ontario's public health system. Since the PHRED program has been cost-shared, consideration of the municipal budget cycle and adequate communication to municipal funding partners will be necessary to avoid premature, unilateral budgetary decisions. Intentions for how the transitional period will be supported should be communicated as soon as possible.

With a shift from a cost-shared program to a provincially funded model, the future of the previous local funding for PHREDS is unclear. There is therefore a risk that, in the absence of new provincial funds, there would be a net loss of system resources. Considering the more explicit expectations for individual health units described in the *Foundational Standard*, there is a clear option for PHRED-based health units to apply previous local PHRED funding to local

capacity building to meet this *Standard*. Since funding for public health programs is typically cost shared with the provincial level, discussions with MOHLTC will likely be necessary.

Areas of Focus

A key expected characteristic of the K2A hubs is for each to possess and apply one or more areas of specialized strength for the benefit of the province-wide public health system. This will be an area for further analysis and is dependent on other developments by the Agency. Considering the evolving system, the potential capacity to develop expertise in a required area should also be considered.

Minimum Capacity

K2A hubs will require a critical mass of expertise and capacity in order to fulfill core expectations. This applies overall, as well as to fulfill each of the expected functions. There needs to be a core set of identifiable staff that is dedicated to the centre. Sharing of some staff with the host organization or partners may be necessary, particularly in the early years. Clear expectations regarding expected responsibilities, time, and deliverables will be required in such circumstances.

Of interest, the 1997 PHRED discussion document had envisioned a base staff complement of 8 FTEs including: Director (1); Specialists (3); Librarian (1); Research assistant (1); Admin assistant/clerk (2).⁴

Identifying expectations for desired staff complements of the K2A hubs is dependent on several variables including:

- The expected scope of work (e.g., whether content-specific support across all OPHS requirements is envisioned)
- The expected balance of supports to be provided centrally versus regionally across multiple areas (e.g., population health assessment, surveillance, library sciences, etc.)
- The extent of phased implementation.

As such, it is not possible to provide definitive advice on staff complements of future K2A hubs. There will be a need to consider K2A hub functions, related competencies and roles for staffing. Table 3 provides a starting point for such analysis.

Table 3: Analysis of Hub Functions, Required Staff Competencies and Position Roles

Functions	Competencies*	Position Roles
<ul style="list-style-type: none"> • Conducting applied public health research • Increasing public health knowledge synthesis, dissemination and diffusion (knowledge exchange) • Assisting in the development of public health programs and policies and their evaluation • Providing skills development opportunities for public health practitioners • Contributing to the development of public health competencies in health science students and future public health practitioners. 	<ul style="list-style-type: none"> • Public health and academic experience & competencies (preferably combined) • Ability to systematically review literature – critical appraisal • Project management • Quantitative/qualitative methodology/analysis • Analysis of large data sets • Grantsmanship • Publishing track record • Interprofessional and collaborative practice • Team building • Adult learning approaches • Knowledge broker • Change agent 	<ul style="list-style-type: none"> • Unit leadership and management • Mix of content-research-practice specialists (e.g., PhD, MD-FRCPC, MPH) • Research support • Adult educator • Admin support

*Assumes presence of public health core competencies

Number of Hubs

There are several factors that require consideration regarding the number and distribution of K2A hubs:

- Regional engagement with a set of client health units:
 - Geographic proximity
 - Feasibility of supporting a pool of client health units
- Need for critical mass in each hub
- Range of public health issues to be addressed
- Number and distribution of academic centres
- Available funding.

An initial perspective might be to have a minimum of four K2A hubs (southwest, north, central and east), which would average 9 health unit clients per hub. This approach however, is overly simplistic since “central” could potentially include half of the province’s population. Considering Toronto Public Health’s size and complexity, and the presence in Toronto of the Dalla Lana School of Public Health, multiple other academic and research institutes, as well as the head office of the Agency, the Agency’s relationship with this health unit requires specific consideration. Nevertheless, this still leaves central Ontario as a very large span of health units to the west, north and east of Toronto. Ideally, these would be split into at least two parts (e.g., central west and central east). The result is a more realistic roster of five regional hubs (Southwest, Central West, Central East, East, and North) and Toronto. Further analysis regarding exact boundaries for these regions needs to consider LHIN boundaries, CRC’s proposed health unit amalgamations, and existing regional entities (i.e., RICNs, tobacco networks).

In the initial implementation, the availability of funding to support critical mass in each hub is an important consideration. The perspective of the working group is that 100% funding is a prerequisite and if necessary, to initially have fewer adequately funded hubs as an initial step than a larger number of hubs with limited resources. While a fully implemented model is the desired goal, in the absence of additional provincial funding beyond the existing provincial level PHRED budget, then only 2-3 hubs could initially be developed. This preliminary implementation phase provides an opportunity for demonstrating proof of concept while awaiting subsequent implementation phases. In addition, while the hubs are only one component of the Agency’s intended system of supports to public health units, the initial regional hubs will contribute to province-wide system strengthening both as centres of expertise, as well as in developing and identifying knowledge and innovation that can be disseminated across the system by the Agency.

Core Funding

Funding of K2A hubs will include:

- Core staff
- Travel (Agency-associated; interaction with client health units and partners)
- Project funds
 - Research project development seed money
 - Funded research projects
 - Evaluation projects
 - KE costs
 - Training costs

- Interaction costs (bringing researchers together, interaction with regional partners/clients)
- Staff development
- IT/Communication
- Overhead.

As per previous sections, considering the challenges experienced with a mixed funding model of the PHRED program over the past decade, 100% provincial funding is a required element of the model.

External Funding

Over time, hubs are expected to leverage their core funding/capacity to attract additional projects, including peer-reviewed grants, which are consistent with the core purpose of the hub. Mature research institutes frequently double their base research funding with external funding. Multi-year external funding targets for the K2A hubs should be based on the portion of their core funding for applied research instead of the overall amount.

Regional Advisory Committees

Each K2A hub will have a regional advisory committee comprised of representatives of client health units and regional academic partners. The purpose of these committees includes the following:

- Conduit for input regarding provincial priorities (research, training, supports)
- Advise on regional priorities in establishing K2A hub workplans
- Provide feedback on extent K2A hub is meeting expectations
- Knowledge exchange channel with health units and academic partners.

Agreements

Creation and Approval of Annual Workplan

In conjunction with Agency priority-setting, an annual workplan would be negotiated between each K2A hub and the Agency. The workplan should identify how the K2A hub will contribute to Agency priorities and provide support to client health units. The approved workplan will be the basis of the funding agreement with the host organization. The workplan for individual K2A hubs will reflect a blend of province-wide priorities and regional hub & spoke needs.

Accountability – Deliverables

The workplan and associated funding agreement will stipulate the expected deliverables of the K2A hub and the manner in which expectations will be assessed. Productivity with respect to applied research, evaluation, knowledge exchange, training and consultative services will be included and tracked on annually and over several years. More frequent periodic updates could also be utilized. Future funding/investment in K2A hubs will depend on demonstrated productivity of hubs. Expectations and their tracking will evolve over time. Table 4 provides examples of the types of performance measures that could be considered.

Table 4: Examples of Possible Performance Measures for Hubs

Function	Performance Measure
Applied public health research	Lead/participate in priority projects
	Open competition grants (proposals/awarded)
	Lead/participate in externally funded projects
KE	Scientific publications
	Citations of unit's publications in literature
	Grey literature publications
	Invited presentations to national or international conferences
	Consultation to health unit staff to incorporate knowledge into practice
	Evidence of uptake of new knowledge into practice
Program, tool, resource development	Projects to develop/enhance programs or policies
Program Evaluation & Consultation	Consultation to health unit staff on program evaluation, CQI
Education/Training	Practicum/research placements for undergraduate and graduate students
	Training to existing workforce

Support from the Agency

As a funded hub of the Agency, the K2A hub will benefit from developing capacity, processes and strategic relationships developed by the Agency. The funding agreement with hubs will identify expectations for support from the Agency (e.g., access to data, centralized ethics review process, KE processes, library services, etc.).

Support from Host Organization

Expectations for support from host organizations will be specified.

Identity and Intellectual Property

There will need to be transparency and clarity in any future agreements undertaken with the Agency related to intellectual property, prepublication notification, external grant administration which is consistent with the Agency's research, academic and communication policies.

Conclusions and Recommendations

Based on the analysis and discussion among working group participants, the following conclusions and recommendations are provided:

1. There is continued agreement that overall leadership for PHRED functions (i.e., work force development, applied research, knowledge exchange) are better aligned with the Agency. As such, transfer from MOHLTC to the Agency of the responsibility for provincial leadership and the provincial budget component for PHRED functions should be pursued.
2. Recognizing the central leadership, coordination and capacity of the Agency, and the mandated expectations for public health units described in the Ontario Public Health Standards (OPHS), the proposed K2A model includes a system of regional hubs to provide a mechanism for direct engagement with all public health units to build capacity and provide cross-cutting/foundationalⁱⁱ support and expertise. Regional hubs would also support the Agency as a province-wide resource of specific applied research and content expertise. The current conceptual model for the regional K2A hubs is characterized by the following:
 - a. Purpose:
 - i. Conducting applied public health research of provincial and local relevance
 - ii. Increasing public health knowledge synthesis, dissemination and diffusion (knowledge exchange)
 - iii. Assisting in the development of public health programs and policies and their evaluation
 - iv. Providing skills development opportunities for public health practitioners
 - v. Contributing to the development of public health competencies in health science students and future public health practitioners
 - vi. Supporting public health units to meet the OPHS *Foundational Standard*.
 - b. Principles:
 - i. Grounded and relevant, characterized by:
 - Strong links to and understanding of public health and public health units
 - Strong academic links
 - Driven by provincial priorities set through a transparent process that includes mechanisms for local/regional input and is aligned

ⁱⁱ Foundational: includes the requirements in the OPHS *Foundational Standard* (assessment, surveillance, research, knowledge exchange, and evaluation) and the related “*Principles*” section (workforce development).

with the overall strategic planning and priority setting process of the Agency

- ii. Comprised of centres with one or more areas of specialized public health related expertise that are regionally distributed
 - iii. Part of an effective, high profile system for knowledge exchange
 - iv. Transparent and accountable with their funding based on results.
- c. Structural:
- i. 100% provincially funded
 - ii. Sufficient critical mass
 - iii. While in the longer-term there is potential for regionally-based Agency assets to be co-located, in the near term, it makes most sense to have regional hubs housed by a host organization. Since there is no strategic advantage for potential host organizations to actively seek this role, the Agency will need to actively engage host organizations and seek out hub directors and staff who would have formal paid engagement/employment with the Agency.
- d. Transition Planning/Management:
- i. Address funding uncertainty among current PHRED municipal partners during the transition period between models
 - ii. Prevent the loss of valuable public health system human resources currently housed within the PHRED program due to uncertainty, protracted timelines, etc.
 - iii. Explore mechanisms to retain existing municipal PHRED program funding to address other areas of health unit infrastructure needs (E.g., assistance to meet *Foundational Standard* requirements).
- e. Phased Implementation
- i. Allocation of existing provincial PHRED funding will support the initial establishment of 2-3 regional hubs
 - ii. Over time, the Agency will need to secure additional resources to achieve full implementation of the proposed model.
- f. Coordination:
- i. Have regional advisory committees to support local relationships, coordination and priority setting
 - ii. Agency ensures consistency and coordination among K2A hubs and alignment with Agency-wide directions and initiatives.

3. There are a number of areas requiring additional dialogue and analysis to further elucidate the K2A model:
 - a. Clarifying central and regional Agency roles for supporting the OPHS *Foundational Standard* and other cross-cutting responsibilities
 - b. Clarifying central and regional Agency roles for providing content specific knowledge exchange, training and technical assistance
 - c. Assessing the potential synergies of existing regional capacity (e.g., RICNs, RRFSS, tobacco training and consultation) with the envisioned network of regional K2A hubs.

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