

Core Competencies for Public Health Epidemiologists in Ontario

Background and technical material:

A framework to guide the consultation process (Interim report #1, November, 2005)

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1. Rationale

With the arrival of SARS, there were many more reports about the lack of capacity in public health. Naylor³, and Frank⁴ both released reports calling for more funding and support for public health. Among the multiple initiatives has been one to create “core competencies” in public health. Similar processes have been occurring in Australia and the USA with the development of core competencies for public health⁸ and epidemiology^{9,10}. To date, the majority of the work in Canada has been done by the Public Health Agency of Canada and the Ontario Public Health Association. Papers and reports have been written by Moloughney⁵, Sullivan⁶, and the Ontario Public Health Association⁷.

The overall goal of competency work is to clearly define the base and common competencies that span all public health workers. Such definition should help clearly define the field of public health and assist with the training and upgrading of public health practitioners. The main reason for creating core competencies is to promote adequate staffing and functioning of public health units and agencies. Development of core competencies also has implications for practice in that the necessary knowledge, attitude & skills for performance of particular functions or particular disciplines.

Discipline-specific public health competencies in epidemiology should define the key elements of the job for a public health epidemiologist as well as separate a public health epidemiologist from a non-public health epidemiologist. An initial literature review and has been conducted (Burns, 2005). The discipline specific competencies should indirectly specify the required elements for the training programs for public health epidemiologists and inform appropriate continuing education programs. Jointly such efforts should ensuring that public health units in Ontario are staffed with well-trained, competent epidemiologists who contribute to the effective delivery of public health programs to their respective populations.

2. Defining terms

The area of “core competencies” in public health is fraught with imprecise language. Some academic reflection has occurred among adult educators in attempts to clarify use of words e.g. Knowles 1980, Anderson et al., 2001. In order to be clear about the interpretations in this document, a selection of key terms are defined below and the approach to each discussed briefly. The terms are grouped for ease of understanding.

Knowledge, Attitudes & Skills

- Knowledge refers to “theoretical and practical understanding of a subject”.¹ It refers to the information that is learned and can be used to complete a task or resolve an issue. For example, working in public health requires knowledge of the principles of prevention.
- Attitudes refers to a “way of thinking or settled opinion”¹ on a topic. In many cases, attitudes affect the way we perceive and act on information that we

receive.

- Skill refers to the “practiced ability”.¹ It refers to the ability to complete a complex set of actions that are necessary to complete a task. The greater the skill, the easier, better and/or faster the work is done.

Competencies

- Competency- a competency is an ability to perform a task. Unlike a performance which corresponds to an ability to demonstrate the accomplishment of an outcome, a competency is the ability to do the task or job if necessary. The Oxford dictionary defines it as “adequately qualified or capable”.¹ In public health, this means that staff with competencies to do a particular task, could do it if called upon to do so. Competencies are usually associated with the appropriate mix of knowledge, skills and attitudes.
- “Core competency” is the notion of a competency that is common to all members of a team or agency, irrespective of discipline. Specifically for public health, the concept of “core competencies” means that all public health workers have these competencies, not matter what job they have or position in the hierarchy of the organization.
- “Common competency” appears to be similar to the meaning of core above, but is less commonly used (Maloughney, personal communication at session on human resource development at CPHA, Ottawa, September 2005).

Levels of competencies

- Three main levels of competencies in a public health unit can be roughly categorized as:
 - Awareness.
 - Able to do.
 - Able to teach.
- A parallel set of levels is that of the USA Council on Linkages between Academia and Public Health Practice assigns levels of skill to each competency:
 - Aware - Basic level of mastery of the competency. Individuals may be able to *identify* the concept or skill but have limited ability to perform the skill.
 - Knowledgeable - Intermediate level of mastery of the competency. Individuals are able to *apply* and describe the skill.
 - Proficient - Advanced level of mastery of the competency. Individuals are able to *synthesize*, critique or teach the skill.

For epidemiologists in Ontario, there may be some competencies that are in the awareness level and some in the “ability to teach”. However, it is anticipated that the main focus in this work will be on the “ability to do” components of the competencies.

- Other cuts on levels have to do with specific vs. general, and management vs. staff. Such levels add additional complexity which may be explored with a wider range of epidemiologists in a February 2006 workshop. However, the main focus of the current study will be on the practicing generalist, staff public health epidemiologist in Ontario.

Disciplines and functions

- Disciplines refer to formal health professional entities. For example, the disciplines in public health include inspection, medicine, nursing, nutrition, and others. The disciplines are usually but not always defined in provincial regulations such as the Regulated Health Services Act in Ontario. These discipline groups define themselves by the acts that they are allowed to perform and members are regulated by professional associations.
- Functions refers “a mode of action or activity by which a thing fulfils its purpose”.¹ Hence in public health, the agency has to conduct certain programs (e.g. contact tracing) so as to fulfil its purpose of communicable disease control.
- “Core functions” refer to the main set of functions that all public health persons are able to complete (see public health functions below in section 3).
- “Function specific” versus “discipline specific” posit two ways to define the core-competencies for epidemiologists working in public health units. The former focuses on epidemiologists’ function within a health unit.
- “Function specific” competencies would be most appropriately used to define the unique competencies that are associated with the job of a public health epidemiologist. These competencies are related to the role of the epidemiologist in a public health unit and thus describe their contribution to the overall function of the public health unit. An implication is that a person filling this job may not have a specific degree in epidemiology but has the appropriate abilities to do the job in the health unit. The focus on “function specific” core competencies would highlight the unique functional contributions of the epidemiologist position.
- “Discipline specific” competencies implies that there is a unique discipline of epidemiology and competencies define the special skills needed by those persons with this training who work successfully in a public health unit. The recognition is that epidemiology is a very broad field and the use of the term, epidemiology specific public health competencies, implies that there is a subset of epidemiology competencies that are of special importance to working in a health unit. Hence the discipline specific competencies will help define the required competencies of an epidemiologist who works in a health unit in contrast to those who work in other sectors of the health care system.
- Both elements (function specific and discipline specific) are required to specify the competencies of a public health epidemiologist. Since the term “discipline specific” is more commonly used and does help clarify the unique roles of public health epidemiologists versus other epidemiologists, this term

will be used in this paper. However, readers should note that the goal of the work here will be to define both the unique contributions of epidemiologists versus other public health staff and the competencies required for working as an epidemiologist in a public health setting.

3. Public Health Functions and Competency Domains

According to Spasoff ², the concept of core functions of public health was first articulated in January 2001 in the Survey of Public Health Capacity in Canada. This report was written for the provincial and territorial deputy ministers of health and recommended 5 main functions. These have never been officially recognized but have been widely accepted as the main public health functions:

- Population health assessment,
- Health surveillance
- Health promotion
- Disease and injury prevention, and
- Health protection.

“Core” competencies for all public health practitioners have been defined by Moloughney and the Ontario Public Health Association. Moloughney proposed that the competencies to perform these core functions be disaggregated into “core elements” that can then be re-combined into seven domains of core competencies (see Appendix 1 for the list of core elements within domains). The seven major domains are as follows:

- Core public health sciences
- Analysis and assessment
- Policy development and program planning
- Partnership and collaboration
- Communication
- Socio-cultural competencies
- Leadership and systems approaches

Interestingly, this framework is similar to that recommended by the Task Force looking at the Educating Future Physicians for Ontario (EFPO) document which recommended 7 major areas: Clinical (technical) expert, Manager, Advocate, Collaborator, Communicator, Learner, Scholar, and Person. This latter framework has been modified (Learner and Person were combined to create a new category called “Professional”) and is now being used in the training programs in medicine. We would hope for similar effects for epidemiologists, as per the American College of Epidemiology’s work on competencies in epidemiology (Armenian et al., 2001) and our efforts to define competencies for UofT MHS graduate in public health in general and epidemiology specifically (CHE MHS development group, 2004).

4. Proposed Competency & Function Framework

We have created a two dimensional table which sets out the seven core public health competency domains listed vertically down the side and the five core public health functions listed horizontally across the top, recognizing that for any function one or more competencies are going to be important to varying extents. For each public health staff member, one could imagine that they would have a different emphasis profile across the 35 cells. We might express the emphasis as the size of a column coming out of the cell in a third dimension, with the height being proportional to the number of core elements mastered by the public health professional in that competency domain and applied to that function.

In terms of competencies, we would expect that epidemiologists might master most of the core elements in the Analysis & Assessment domain, giving rise to tall columns coming out of the table surface across that row. In contrast, a health promoter might have larger columns in the socio-cultural competencies domain. In such a way, we should be able to more clearly define the relative emphasis on different competency domains across different disciplines working in public health.

In terms of functions, we might also expect variation in the size of columns such that for epidemiologists higher columns occurred for the Analysis & assessment domain in the Population health assessment and Health surveillance functions than in the Health promotion function. In this way, we should be able to demonstrate the relative importance of different competency domains for completion of particular public health functions.

In our work over the coming months, we hope to better describe what practicing epidemiologists see as the different core elements in the competency domains that they have to perform their functions. Our initial semi-structured interview questions start with a broad sense of knowledge, skills, abilities and competencies for epidemiologists in public health units before focusing on the specific competencies that epidemiologists report as necessary for them to carry out the different public health functions.

Table 1. Competencies for Functions

<i>Functions</i>	<i>Population health assessment</i>	<i>Health surveillance</i>	<i>Health promotion</i>	<i>Disease and injury prevention</i>	<i>Health protection.</i>
Competence domains					
Core PH sciences					
Analysis & assessment					
Policy development & program planning					
Collaboration & partnership					
Communication					
Socio-cultural competencies					
Leadership and systems approaches					

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US core competencies for public health USA Council on Linkages between Academia and Public Health Practice www.trainingfinder.org/competencies/background.htm

and epidemiology ^{9,10}

Appendix I.

1 - Core Public Health Sciences Domain

A public health practitioner is able to...

- 1.1. Understand the historical development, structure, and interaction of public health and health care systems at the local, provincial/territorial, national, and international levels
- 1.2. Understand the concepts of health status of populations, determinants of health and illness, factors contributing to health promotion and disease prevention, and factors influencing the use of, and decision making about, health services
- 1.3. Apply the basic public health sciences including behavioural and social sciences, biostatistics, epidemiology, environmental public health, and prevention of chronic and infectious diseases and injuries
- 1.4. Identify and apply basic research methods used in public health
- 1.5. Develop a lifelong commitment to rigorous critical thinking
- 1.6. Identify and retrieve current relevant scientific evidence
- 1.7. Review and critically appraise the evidence for public health interventions
- 1.8. Identify the role of evidence in developing health policies and programs and appropriately apply evidence

2 - Analysis and Assessment Domain

A public health practitioner is able to...

- 2.1. Define a problem
- 2.2. Identify relevant and appropriate data and information sources
- 2.3. Collect accurate quantitative and qualitative primary data when secondary data is unavailable
- 2.4. Identify community assets and available resources
- 2.5. Determine appropriate uses and limitations of both quantitative and qualitative data
- 2.6. Evaluate the integrity and comparability of data and identify gaps in data sources
- 2.7. Obtain and interpret information regarding risks and benefits to the community
- 2.8. Partner with communities to validate and attach meaning to collected quantitative and qualitative data
- 2.9. Make relevant inferences from quantitative and qualitative data
- 2.10. Recognize how the data illuminates ethical, political, scientific, economic, and overall public health issues
- 2.11. Identify relationships, trends, and patterns in health assessment information and make appropriate recommendations on further investigations or actions that should be taken
- 2.12. Understand cost-effectiveness, cost-benefit, and cost-utility analyses
- 2.13. Apply ethical principles to the collection, maintenance, use, and dissemination of data and information
- 2.14. Apply data collection processes, information technology applications, and computer systems storage/retrieval strategies

3 - Policy Development and Program Planning Domain

A public health practitioner is able to...

- 3.1. State policy options and write clear and concise policy statements
- 3.2. Articulate the health, economic, administrative, legal, social, and political implications of each policy option
- 3.3. State the feasibility and expected outcomes of each policy option
- 3.4. Utilize current techniques in decision analysis and health planning
- 3.5. Decide on the appropriate course of action
- 3.6. Develop a plan to implement policy, including goals, outcome and process objectives, and implementation steps
- 3.7. Monitor and evaluate implementation of interventions for their intended and unintended effects, costs, quality, and acceptability
- 3.8. Develop and present a budget
- 3.9. Develop strategies for determining budget priorities
- 3.10. Identify, interpret, implement, and understand the limitations and uses of public health laws, regulations, and policies
- 3.11. Prepare for and contribute to the management of incidents, outbreaks and emergencies

4 - Partnership and Collaboration Domain

A public health practitioner is able to...

- 4.1. Describe the role of governments and community partners in the delivery of public health services
- 4.2. Identify how public bodies and private organizations and practitioners operate within a community
- 4.3. Establish and maintain linkages with community leaders and other key stakeholders
- 4.4. Solicit input from individuals and organizations
- 4.5. Support governments and community partners in their efforts to improve community quality of life
- 4.6. Utilize leadership, team building, negotiation, and conflict resolution skills to build community partnerships
- 4.7. Collaborate with governments and community partners in common and coordinated efforts
- 4.8. Advocate for individuals and communities on aspects which will improve their health and wellbeing
- 4.9. Facilitate a dialog among governments and community partners about strategies to attain and sustain healthier communities

5 - Communication Domain

A public health practitioner is able to...

- 5.1. Communicate clearly and concisely
- 5.2. Listen to others in an unbiased manner, respect points of view of others, and promote the expression of diverse opinions and perspectives
- 5.3. Provide health status, demographic, statistical, programmatic, and scientific information tailored to professional and lay audiences
- 5.4. Understand social marketing principles and consumer behaviour
- 5.5. Use the media, advanced technologies, and community networks to receive and communicate information
- 5.6. Advocate for public health programs and resources

6 - Socio-Cultural Competencies Domain

A public health practitioner is able to...

- 6.1. Utilize appropriate methods for interacting sensitively, effectively, and professionally with persons with diverse cultural, socioeconomic, educational, racial, ethnic and professional backgrounds, and persons of all ages, gender, health status, and lifestyle preferences
- 6.2. Identify the role of diverse population characteristics in determining the delivery of public health services
- 6.3. Develop and adapt policies and program delivery that responds to diversity in population characteristics
- 6.4. Understand the importance of a diverse public health workforce

7 - Leadership and Systems Approaches Domain

A public health practitioner is able to...

- 7.1. Know public health organization mission and priorities
- 7.2. Operationalize the mission of the organization within personal or unit scope of work.
- 7.3. Identify internal and external issues that may impact delivery of essential public health services (i.e., strategic planning)
- 7.4. Ethically manage self, people and resources
- 7.5. Help create key values and shared vision and use these principles to guide action
- 7.6. Understand and support the contribution of other government and community partner programs relative to achieving the public health vision and mission
- 7.7. Understand and incorporate international best practices
- 7.8. Contribute to team and organizational learning
- 7.9. Contribute to improvements in the workplace environment (improve work activities, recommend improvements to plans)
- 7.10. Contribute to development, implementation, and monitoring of organizational performance standards