**CORE PUBLIC HEALTH COMPETENCIES**

2.6.a Identification of core public health competencies that all MPH or equivalent professional masters degree students are expected to achieve through their courses of study.

The Core Competencies developed for the Master’s Degree in Public Health programs in the Faculty of Health Sciences refer to the essential knowledge and skills required for the successful application and practice of public health. In most cases the competencies transcend the boundaries of specific disciplines. They provide the building blocks for effective public health practice, and, for undergraduates, constitute the fundamentals of a public health approach or perspective.

We have organized our core competencies into four broad categories: basic population and public health sciences; fundamentals of public health practice; the population and public health perspective; and the organization of population and public health systems and services. The definitions of these categories are as follows:

**Basic Population Health Sciences:** Students will acquire the required foundation level knowledge, thinking skills and perspectives necessary for competent entry-level public health practice. This includes knowledge about the health status of populations, inequities in health, the determinants of health and illness, strategies for health promotion, disease and injury prevention, and health protection. The basic population health sciences include epidemiology, biostatistics, the social and health policy sciences, and environmental public health.

[Core competencies 1-5]

**Fundamentals of Public Health Practice:** Students will integrate the core concepts and evidence generated by the basic population health sciences to inform decision-making regarding health policies and programs. Effective practice entails the ability to identify and justify program and policy options, design public health programs, identify and work with institutional and community partners, and to communicate effectively with diverse stakeholders.

[Core competencies 6-8]

**The Population Health Perspective:** Students will know and apply the fundamentals of a population health approach. The population health approach aims to improve the health of the entire population and to reduce health inequities among population groups by examining, studying, and acting upon the broad range of factors and conditions that have a strong influence on health. The population health perspective has two important characteristics: an ability to assess critically how various aspects or markers of social location affect health outcomes, access to health care, and program design and implementation; and an ability to think critically at a systems level, recognizing the interrelationships among and between factors that affect the health of populations.

[Core competencies 9-11]

**The Organization of Population and Public Health Systems and Services:** Students will be able to identify and explain the organization of the population and public health system, both in Canada, as well as in a more global context. This involves understanding the interdependencies of health systems, ranging from the tertiary services characteristic of health care to institutions that promote and protect health through policy, regulation, surveillance, and community-level programming.

[Core competencies 9 & 12]

**Concentrations:** All students will gain additional knowledge and expertise afforded by in depth study in one of the following four areas of concentration:

- **Environmental and Occupational Health:** Protecting communities and workers from environmental factors that adversely impact human health and to maintaining the ecological balances essential to long-term human health and environmental quality.

- **Global Health:** Adapts and applies the skills and knowledge of population and public health to work in resource-challenged contexts, with a commitment to promoting better and more equitable health worldwide.
• **Population Health**: Health policy and planning for health care delivery, health promotion and disease prevention, and applied methods for assessing population health.

• **Social Inequities and Health**: Critical and reflexive research and practice that addresses health inequities related to poverty, racism, colonialism, sexism and other forms of structural inequality.

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<thead>
<tr>
<th>Table 2.6.a. – Core Competencies – All Concentrations</th>
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<tbody>
<tr>
<td><strong>Basic Population Health Sciences</strong>: Students will acquire the required foundation level knowledge, thinking skills and perspectives necessary for competent entry-level public health practice. This includes knowledge about the health status of populations, inequities in health, the determinants of health and illness, strategies for health promotion, disease and injury prevention, and health protection. The basic population health sciences include epidemiology, biostatistics, the social and health policy sciences, and environmental public health.</td>
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**CC1: Epidemiology**: Explain and apply the theories, concepts and methods of descriptive and analytic epidemiologic approaches for improving population and public health and reducing health inequalities from local to global levels.

**Course-level learning objectives include the following:**

• Explain the role of epidemiology in improving population health and reducing health inequities.
• Display and explain graphical and tabular representations of epidemiological data to inform understanding of population health status and health inequalities.
• Use traditional public health and health equity perspectives to generate descriptive and analytic research questions and hypotheses.
• Identify sources and limitations of provincial, national and international surveillance data on population health status and health inequalities.
• Use basic methods for investigating outbreaks of health problems in communities using concepts of disease variation by time, person and place.
• Explain the strengths, limitations and appropriate uses of major epidemiological study designs for understanding upstream and downstream causes of disease.
• Calculate and interpret basic epidemiology measures of disease occurrence, disease association, and public health screening program effectiveness.
• Define and interpret the roles of chance, bias, confounding, effect modification and criteria for causal inference in the critical evaluation of quantitative population and public health literature.
• Synthesize epidemiological data to provide a rationale for population health programs, policy decisions, and advocacy.

**CC2. Biostatistics**: Apply statistical reasoning and methods in addressing, analyzing, and solving problems of population and public health.

**Course-level Learning Objectives:**

• Describe basic concepts of probability, random variation, and commonly used statistical probability distributions.
• Describe preferred methodological alternatives to commonly used statistical methods when assumptions are not met.
• Distinguish among the different measurement scales, data types, and study designs and determine the implications for the selection of statistical methods to be used based on these distinctions.
• Apply descriptive techniques commonly used to summarize population and public health data.
• Apply common statistical methods for inference, including hypothesis-testing and estimation.
- Apply basic informatics techniques with vital statistics and population and public health records in the description of population health characteristics and in population health research and evaluation.
- Interpret results of statistical analyses found in population and public health literature.
- Perform common statistical analyses with a computer software package and interpret the results.

**CC3. Methods of Population and Public Health Assessment, Diagnosis, and Analysis:** Determine population and public health concerns through analysis and diagnosis of communities and populations using a variety of quantitative and qualitative methodologies.

**Course-level Learning Objectives:**
- Describe the components and methods of effective disease surveillance systems and existing disease reporting networks.
- Describe the components of effective infectious disease emergency preparedness response systems.
- Distinguish high-risk, population-based, and other approaches to improve population health and health equity.
- Be able to conduct a population or community health assessment through the use of relevant/appropriate data/information sources.
- Critically assess different approaches to prevent and control disease taking into account contextual factors.
- Differentiate between qualitative and quantitative methods of data collection in relation to their strengths, limitations, and appropriate uses, and emphases on reliability and validity.
- Recognize how data both elucidate and are constrained by ethical, political, scientific, economic, and overall public health issues.
- Be able to apply evidence in recommending policies and programs that promote population health and health equity.

**CC4. Environmental and Occupational Health:** Identify the main environmental factors that affect the health of workers and communities, and explain common methods of risk reduction and mitigation.

**Course-Level Learning Objectives:**
- Identify the main environmental factors that affect the health of a community.
- Describe the direct and indirect human, ecological, and safety effects of major environmental /occupational agents and challenges.
- Describe governmental regulatory programs, guidelines, and authorities that control environmental and occupational health issues, both domestically and internationally.
- Specify approaches for assessing, preventing, and controlling environmental hazards that pose risks to human health and safety.
- Be able to define and apply the concepts of risk, susceptibility, and resilience to environmental agents, changes and/or stressors.
- Identify the workplace-based determinants of health.
CC5. **Social Sciences:** Explain the basic theories, concepts and models from a range of social and policy sciences that are used in population and public health research and practice.

**Course-Level Learning Objectives:**
- Explain and be able to apply the basic theories, concepts and models from a range of social and behavioral sciences disciplines that are used in population and public health research and practice.
- Identify the characteristics of social systems that affect population and public health and be able to explain how these become embodied in the production of health inequities.
- Describe the role of political, economic, social, and community factors in both the onset and solution of population and public health problems.
- Identify and apply strategies for positive changes to improve population and public health and reduce health inequities at macro-, meso-, and micro-levels.
- Describe the ethical principles that are applied to population and public health program planning, implementation, and evaluation.
- Explain and apply methods of social and policy analysis towards healthy public policy.
- Explain the interconnections between social policies and population and public health policies and outcomes.

**Fundamentals of Public Health Practice:** Students will integrate the core concepts and evidence generated by the basic population health sciences to inform decision-making regarding health policies and programs. Effective practice entails the ability to identify and justify program and policy options, design public health programs, identify and work with institutional and community partners, and to communicate effectively with diverse stakeholders.

CC6. **Partnerships, Professionalism, Collaboration and Advocacy:** Identify appropriate partners in addressing population and public health issues; identify and analyze ethical considerations in public health programs; and devise appropriate strategies for mobilizing communities around a public health issue.

**Course-Level Learning Objectives:**
- Describe the role of community development, policy advocacy, and communication strategies to promote public health.
- Distinguish between population and individual ethical considerations in relation to the benefits, costs, and burdens of population and public health programs.
- Describe the importance of working collaboratively with diverse communities and constituencies.

CC7. **Communication:** Demonstrate effective communication with and mobilization of individuals, families, groups, communities, and colleagues to improve population and public health.

**Course-Level Learning Objectives:**
- Describe how the population and public health infrastructure is used to collect, process, maintain, and disseminate data.
- Describe how social, organizational, and individual factors influence and are influenced by public health communications.
- Use information technology to access, evaluate, and interpret public health data.
- Critically assess the role of communication in education and advocacy for change in population and public health, from individual, to community, to population levels.
- Demonstrate effective written and oral skills for communicating with difference audiences in the context of population and public health activities.
**CC8. Policy and Program Planning, Implementation, and Evaluation:** Identify program and policy options relevant to population and public health issues, design and implement population and public health programs, and develop appropriate methods of monitoring and evaluation.

**Course-Level Learning Objectives:**
- Use a population health perspective in assessing health issues and in planning, implementing and evaluating prevention and control programs.
- Develop a population health program plan and logic model, including goals, outcomes, process objectives, and implementation steps.
- Be able to monitor and evaluate the implementation of programs, policies, and interventions.
- Be able to develop and conduct a population health needs assessment.

**The Population Health Perspective:** Students will know and apply the fundamentals of a population health approach. The population health approach aims to improve the health of the entire population and to reduce health inequities among population groups by examining, studying, and acting upon the broad range of factors and conditions that have a strong influence on health. The population health perspective has two important characteristics: an ability to assess critically how various aspects or markers of social location affect health outcomes, access to health care, and program design and implementation; and an ability to think critically at a systems level, recognizing the interrelationships among and between factors that affect the health of populations.

**CC9: Core Concepts in Population and Public Health:** Explain the history, paradigms, basic theories, concepts, frameworks, and models of population and public health, and as pertinent from local to global levels.

**Course-Level Learning Objectives:**
- Explain the historical development, structure, and interaction of population and public health and health care systems from local to global levels.
- Explain and apply the concepts of the health status of populations; determinants of health and illness; health promotion and disease prevention; and factors influencing the use of and decisions about health services.
- Identify, analyze, and be prepared to challenge structures that produce poverty, inequity, and disease.
- Describe primary, secondary and tertiary prevention activities and apply them to public health problems.

**CC10. Systems Thinking:** Recognize system level properties that result from dynamic interactions among human and social systems, from local to global, and from cell to society.

**Course-Level Learning Objectives Include:**
- Identify unintended consequences produced by changes made to a population and public health system.
- Analyze interrelationships among systems, from local to global, that influence the quality of life of people in their communities.
- Explain the effects of political, social and economic policies on population and public health systems at the local, state, national, and international levels.
CC11. *Gender, Culture, and Social Location:* Explain how gender, culture and diverse markers of social location are related to health outcomes; access to and delivery of health services; and program planning.

**Course-Level Learning Objectives:**
- Recognize how gender, ethnicity, race, class and other markers of social location are related to health outcomes.
- Apply the basic concepts, skills, and strategies required for community engagement and empowerment among diverse communities.
- Develop and adapt policies and program delivery that are responsive to diverse populations and groups.

The Organization of Population and Public Health Systems and Services: Students will be able to identify and explain the organization of the population and public health system, both in Canada, as well as in a more global context. This involves understanding the interdependencies of health systems, ranging from the tertiary services characteristic of health care to institutions that promote and protect health through policy, regulation, surveillance, and community-level programming.

CC12. *Health Systems:* identify the factors that determine the quality, accessibility, organization, performance, costs, and outcomes of health services for individuals, communities and populations.

**Course-Level Learning Objectives:**
- Identify and analyze contemporary problems in Canadian and/or global health care systems and policy.
- Explain the role of the health care system in contributing to population and public health.
- Explain how methods of financing, provider payment regulation, historical, and social/cultural factors affect the accessibility, quality, organization, performance, and outcomes of the health care system.
- Identify the roles played by both contemporary and historic political and economic factors on the accessibility, quality, organization, performance and outcomes of the health care system.
- Describe how ethical values relate to and inform the organization and reform of health care systems.
- Be able to apply methods for health care system design, improvement, and evaluation.
### SPECIALTY AREA COMPETENCIES

**Table 2.6.c.i – Core Competencies Specific to the MPH Concentration in Environmental and Occupational Health (Stream will not be offered until 2010)**

<table>
<thead>
<tr>
<th>Competency</th>
<th>Description</th>
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<tbody>
<tr>
<td>EOHC1</td>
<td>Identify route(s) of and factors that influence exposure of humans to environmental toxicants and apply to formulating appropriate exposure reduction strategies.</td>
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<tr>
<td>EOHC2</td>
<td>Demonstrate the ability to provide an overview of the molecular and genetic mechanisms involved in response to environmental contaminants with the use of examples from modern primary sources.</td>
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<tr>
<td>EOHC3</td>
<td>Describe the advantages and disadvantages of measurements and models for assessing exposure in epidemiology and risk assessment and, based on this assessment, design appropriate exposure assessment strategies for various pollutants, routes of exposure, and exposure scenarios.</td>
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<tr>
<td>EOHC4</td>
<td>Describe the main steps in environmental risk assessment, be able to apply these steps to a number of risk situations, and identify the strengths and weaknesses of current approaches to risk assessment.</td>
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<tr>
<td>EOHC5</td>
<td>Be able to present and defend findings with the support of external or internal evidence and to assess validity and quality of experimental endpoints.</td>
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**Table 2.6.c.ii – Core Competencies Specific to the MPH Concentration in Global Health (Stream has been offered since 2007)**

<table>
<thead>
<tr>
<th>Competency</th>
<th>Description</th>
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<tr>
<td>GH1</td>
<td>Identify, define, and critically analyze historical, current and emerging issues in global health; identify the major stakeholders and policymakers in global health; the key areas of interest and attributes of the major governmental and nongovernmental organizations involved in global health; and the role that Canada plays in global health.</td>
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<tr>
<td>GH2</td>
<td>Identify how global political economic processes have shaped the international public health agenda.</td>
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<td>GH3</td>
<td>Analyze the role of public and private sectors in promoting public health and providing health services in comparative, global context. Outline the impact of privatization and government restructuring on health outcomes.</td>
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<tr>
<td>GH4</td>
<td>Explain theories of development in historical and political-economic context and identify the means by which development policies and programs have affected global health inequities.</td>
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<td>GH5</td>
<td>Comprehend and be able to apply formal and informal ethics, including principles of justice, in global health.</td>
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<td>GH6</td>
<td>Identify and explain the theories underlying population health promotion as relevant to global contexts, including measures enabling people and communities to increase control over their health and its determinants.</td>
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<td>GH7</td>
<td>Analyze, critique and problem-solve for links between global health and international finance institutions, multilaterals, international trade organizations, militarization, and humanitarian aid.</td>
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<td>GH8</td>
<td>Analyze and explain the role of transnational networks and global institutions in the adoption and enforcement of international laws, conventions, agreements, and standards that affect health and safety, including the domains of security, trade, labor, food supply, the environment, pharmaceuticals, international development aid, human rights and conflict.</td>
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<tr>
<td>GH9</td>
<td>From an international comparative perspective, explain how methods of financing, provider payment, organization, regulation, historical, and social/cultural factors affect the performance and accessibility of the health system. Evaluate Canada’s role with respect to foreign aid, international trade agreements and overseas investment promotion.</td>
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<tr>
<td>GH10</td>
<td>Identify the roles played by global political and economic factors, including international/regional trade...</td>
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policies, structural adjustment programs and the role of international institutions such as the World Bank, International Monetary Fund, and the World Trade Organization on the performance and accessibility of health systems.

Table 2.6.c.iii – Core Competencies Specific to the MPH Concentration in Population Health (Stream has been offered since 2005)

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<td>PH1.</td>
<td>Develop additional expertise in methods of population health data collection and analysis, including one or more of the following: demographic methods for public health, epidemiological methods, intermediate biostatistics, and other areas as identified.</td>
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<tr>
<td>PH2.</td>
<td>Develop additional expertise in areas of population and public health applications, including one or more of the following: health promotion, program planning and evaluation, advocacy and communication, and population health policy.</td>
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<tr>
<td>PH3.</td>
<td>Develop a broad approach to population and public health practice by taking additional specialization courses offered in the Faculty.</td>
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Table 2.6.c.iv – Core Competencies Specific to the MPH Concentration in Social Inequities and Health (Stream will not be offered until 2010)

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<tr>
<td>SIH1.</td>
<td>Critically assess theories that explain constructions of gender and sex, race and ethnicity, social class, and other markers of social location with attention to their intersections, historical and contemporary contexts, and relationships to health equity.</td>
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<tr>
<td>SIH2.</td>
<td>Identify frameworks and theories that shape the conceptualization and implementation of research and practice addressing health inequities.</td>
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<tr>
<td>SIH3.</td>
<td>Engage in self-reflection about one’s own social position relative to others and discuss implications of one’s positionality for research and practice addressing health inequities.</td>
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<tr>
<td>SIH4.</td>
<td>Critically assess the strengths, limitations and issues pertinent to the application of study designs, methods and approaches used in research on health inequities.</td>
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<tr>
<td>SIH5.</td>
<td>Discuss ethical issues pertinent to research on health inequities in diverse populations including the politics of research and how study findings represent and impact the populations studied.</td>
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<tr>
<td>SIH6.</td>
<td>Compare and contrast a range of policy, intervention and practice approaches, strategies and techniques for addressing social and structural change to promote health equity.</td>
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<tr>
<td>SIH7.</td>
<td>Discuss strategies for addressing the politics of practice aimed at promoting health equity.</td>
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<tr>
<td>SIH8.</td>
<td>Critically apply evidence to inform policy and practice initiatives aimed at promoting health equity.</td>
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