Environmental Health Competency Framework for Public Health in Québec

Québec ✚✚

Environmental Health Competency Framework for Public Health in Québec

Direction de la santé environnementale
et de la toxicologie

July 2012

AUTHORS

Claire Laliberté, M.A., M.Sc.
Direction de la santé environnementale et de la toxicologie
Institut national de santé publique du Québec

Cora Brahimi, Ph.D.
Vice-présidence aux affaires scientifiques
Institut national de santé publique du Québec

CONTRIBUTORS

Lise Laplante, M.D., M.Sc.
Direction de la santé environnementale et de la toxicologie
Institut national de santé publique du Québec

Michel Savard, M.D., M.Sc.
Agence de la santé et des services sociaux des Laurentides/Direction de santé publique

Leylâ Deger, M.Sc.
Direction de la santé environnementale et de la toxicologie
Institut national de santé publique du Québec

Josée Chartrand, M.Sc.
Table nationale de concertation en santé environnementale
Agence de la santé et des services sociaux de la Mauricie et Centre-du-Québec/Direction de santé
publique

Marie-Johanne Nadeau, M.A.P.
Agence de la santé et des services sociaux de la Montérégie/Direction de santé publique

Christiane Thibault, M.Sc.
Direction de la santé environnementale et de la toxicologie
Institut national de santé publique du Québec

Véronique Lapaige, M.D., M.A., Ph.D.
Université de Montréal
Centre de recherche de l'Institut de santé mentale de l'Université de Montréal

TRANSLATION

The translation of this publication was made possible with funding from the Public Health Agency of
Canada.

SECRETARIAT

Julie Colas
Direction de la santé environnementale et de la toxicologie
Institut national de santé publique du Québec

ACKNOWLEDGEMENTS

EXECUTIVE SUMMARY

Environmental health is a rapidly evolving field, and people working in this field have to deal with increasingly complex situations. Many environmental health practitioners need to develop new professional practices and update their competencies continuously in order to adapt to the new realities in the field. A group of public health experts set out to develop this environmental health competency framework in order to give practitioners an opportunity to engage in a process of continuing education.

To provide a common language and approach that will optimize the success of interventions, all of the professionals in a multidisciplinary team are expected to develop certain competencies related to public health as well as environmental health. That, moreover, is the raison d'être of this competency framework, which is intended for all members of the multidisciplinary team, whether their specialization is in health or a complementary field.

The framework is composed of four competencies:

- Provide expertise for the management of health risks stemming from biological, chemical or physical threats, contaminants or hazards in the environment;

- Make recommendations on all public health issues related to environmental impacts, including policies, large-scale environmental projects, acts, regulations, standards, programs and land-use plans;

- Support the environmental health network and its intersectoral partners during the decision-making process in a constantly evolving context;

- Respond to environmental emergencies or disasters with a view to protecting public health.

In the framework, each competency is linked to a set of internal (knowledge, know-how and soft skills) and external (resources in the work environment) resources required for competency development.

The methodology that was used allowed a large number of stakeholders to participate in the collection of information and validation of the results, thereby ensuring that the framework reflects the realities of the field. Their involvement also strengthened collaboration and permitted the gradual introduction of a new paradigm for competency development.

The description of the tool reveals the complex nature of environmental health and indicates areas in which it can be used: development of continuing education plans, succession training and collaboration with Québec universities with a view to training environmental health specialists for public health work.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS

ASE	Environmental health workshop
ASSS	Agence de la santé et des services sociaux [Québec health and social services agency]
BAPE	Bureau d'audiences publiques en environnement [Québec Bureau of public hearings on the environment]
CanMeds	Competency framework for medical information of the Royal College of Physicians and Surgeons of Canada
CANUTEC	Canadian Transport Emergency Centre
CBRNE	Chemical, biological, radiological, nuclear and explosive
CDC	Centers for Disease Control (United States)
CHEMM	Chemical Hazards Emergency Medical Management
CRAIM	Conseil pour la réduction des accidents industriels majeurs [Council for the reduction of major industrial accidents]
CSSS	Centre de santé et de services sociaux [Health and social services centre]
DGASP	Direction générale adjointe de la santé publique [Assistant public health branch]
DSP	Direction de santé publique [Department of Public Health]
FNEP	Federal Nuclear Emergency Plan
FRAISE	Fiche de réception de l'appel initial – santé environnementale
HIA	Health impact assessment
HPA	Health Protection Agency
HSDB	Hazardous Substances Data Bank
IAQ	Indoor air quality
INSPQ	Institut national de santé publique du Québec [Québec public health institute]
IRIS	Integrated Risk Information System (USEPA)
JASP	Journées annuelles de santé publique [Annual public health days]
MADO	Québec acronym for notifiable diseases

MAPAQ	Ministère de l'Agriculture, des Pêcheries et de l'Alimentation [Québec Department of Agriculture, Fisheries and Food]
MDDEP	Ministère du Développement Durable, de l'Environnement et des Parcs [Québec Department of Sustainable Development, Environment and Parks]
MSSS	Ministère de la Santé et des Services sociaux [Québec Department of Health and Social Services]
NCCEH	National Collaborating Centre for Environmental Health
NCCHPP	National Collaborating Centre for Healthy Public Policy
NCCMT	National Collaborating Centre for Methods and Tools
NGT	Nominal group technique
PAR	Regional action plan
PHAC	Public Health Agency of Canada
PNSC	Plan national de sécurité civile du ministère de la Sécurité publique [Emergency management plan of the Department of Public Security]
PNSP	Programme national de santé publique [Québec Public Health Program]
PRSC-MS	Plan régional de sécurité civile – Mission santé [Regional emergency management plan – Health Mission]
REMM	Radiation Emergency Medical Management
SECOURS	Santé Environnementale Comité sur les Urgences et Sinistres [Québec committee on environmental health emergencies and disasters]
TNCSE	Table nationale de concertation en santé environnementale [Québec environmental health liaison table]
WHO	World Health Organization
WISER	Wireless Information System for Emergency Responders

INTRODUCTION

This document presents the foundations of the approach that was used to develop the environmental health competency framework and is intended as a companion to the framework itself. It was written for managers, professionals, physicians, researchers and experts in the Health and Social Services network, which is the context in which environmental health services are provided.

The report is divided into three sections. The first section describes the context of environmental health within Québec's public health system and aims to provide an understanding of its characteristics. The second part describes the approach that was adopted, namely the competency-based approach. The methodology used for data collection and analysis with a view to developing the environmental health competency framework is described in the third section. The third section also contains the framework itself, which is the cornerstone of this document.

1 BACKGROUND

In Québec, the mandates under which public health professionals work derive from the *Public Health Act* (amended November 1, 2011). The purpose of the Act is to protect citizens' health and provide conditions favourable for maintaining and improving population health. The protection component of this Act falls under the responsibility of the public health authorities, that is, the Minister of Health and Social Services, the Québec public health director and the public health directors of the different health regions. The position of director of public health at the provincial level is reserved for physicians with a background in community medicine and the same function at the regional level is reserved for physicians with training in community health or the equivalent.

A number of partners have roles to play in relation to the health promotion and disease prevention component, including the CSSSs on account of their responsibility for population health, as well as municipalities and other government organizations.

Public health encompasses a multitude of activities, with environmental health as one of the core areas.

1.1 THE ENVIRONMENTAL HEALTH FIELD

According to the Public Health and Environment Department of the World Health Organization (WHO), the field of environmental health involves promoting a healthier environment, intensifying primary prevention and influencing public policies in all sectors so as to address the root causes of environmental threats to health. The main focus is on:

- assessing and managing human health risks (air pollution, chemicals, drinking water, climate change, etc.) and developing standards and guidelines based on factual data related to environmental hazards that can affect health;

- developing recommendations and tools and implementing initiatives to facilitate the development of health policies and their implementation (WHO 2011).

In Québec, more specifically, the practice of environmental health relates to health protection and prevention of health problems associated with chemical, biological or physical threats present in the different environmental compartments (water, air, soil, etc.). It is a complex field. Since a common approach and language are needed to optimize the success of interventions, all the professionals in a multidisciplinary team are required to develop or maintain certain competencies related to public health and the environmental health field. That is, moreover, the main objective of this competency framework, which is intended for all members of a multidisciplinary team, whether their training is in the field of health or in a complementary area.

Québec's Public Health Program (PNSP, revised 2008) sets priorities for public health measures which are required in order protect health and prevent threats to health. To fulfill its mandates, the environmental health network must work with various partners at the federal, provincial and municipal levels which have legal responsibilities related to the quality of the

natural and built environment, which include monitoring, control, security and remediation. An intersectoral strategy is essential in a context of this type.[1]

It should be noted that changes in the field of environmental health are strongly influenced by the ubiquitous nature of emerging environmental issues[2] which are a source of concern for the general population and often spark public debates sometimes characterized by a high degree of political sensitivity. This shows that health is a fundamental concern. Environmental health practitioners may be asked to prepare a state of knowledge report on the potential health impacts and to share this information with the general public or with decision makers. Some of the requests that environmental health professionals receive are unusual and present a major challenge. For example, they might be asked to prepare prevention messages for the general public or to prepare a response plan. In this demanding context, environmental health practitioners find themselves grappling with increasingly complex professional situations, which require a considerable ability to adapt and learn new skills.

1.2 ENVIRONMENTAL HEALTH IN QUÉBEC AND CANADA

In Québec, the public health system has three main pillars which have complementary expertise and work together to share knowledge and harmonize practices. In this regard, the Table nationale de concertation en santé environnementale [Québec environmental health liaison table], which brings together the decision-making authorities of the MSSS, the DSPs, the health and social service agencies and the INSPQ, plays an essential integrating role.

The Direction de la santé publique of the MSSS has several mandates to fulfill, such as implementing various government action plans, establishing directions and representing the MSSS on various committees. One of the MSSS's primary mandates involves participating in the review and evaluation of projects that have environmental impacts. In addition, as part of the application of section 54 of Québec's *Public Health Act*, the MSSS has a mandate to provide opinions on the potential population health repercussions of regulations, acts and policies proposed by other departments.

Within the health and social service agencies (ASSSs), as specified in the *Public Health Act*,[3] environmental health units in the DSPs are expected to play a second-line role in relation to health issues linked to the regional environment. However, given the limited number of employees with environmental health training at the local level (in CSSSs), "routine requests" are handled by the environmental health team with the requisite mandate. These requests have a population health component. They may, for example, come from public or private establishments in the community (schools, daycare centres, seniors' residences) or from community groups. In fact, requests that are not directed at a specific group of people may be handled, because first-line resources may not have the requisite knowledge of

---

[1] Referred to as complex collaboration, based on the present trend (Lapaige 2010).

[2] For example, the development of the energy system/technologies and the development of large-scale environmental projects.

[3] Section 5 of the *Public Health Act* states that public health actions must be directed at protecting, maintaining or enhancing the health status and well-being of the general population and must not focus on individuals, except insofar as such actions are taken for the benefit of the community as a whole or a group of individuals.

environmental health risks. There are major regional disparities in terms of staffing. In general, regions located far from large urban centres have the most limited resources.

The mandate of the Direction de la santé environnementale et de la toxicologie of the INSPQ consists in ensuring the ongoing availability and quality of technical and scientific expertise in environmental health and human toxicology in order to meet the needs of the MSSS, the public health network and the health care system (laboratory, clinical toxicology).

The intensity of the research activities undertaken in the environmental health network as a whole varies with the availability of trained resources. Most of the research activities are carried out at the INSPQ in keeping with its third-line mandate. However, a number of professionals and physicians in DSPs collaborate with the INSPQ or participate in research niches specific to their area. These activities consist of applied research (e.g., evaluation of responses), systematic reviews or knowledge syntheses. Much of this research is aimed at guiding decision making. The university affiliation of the professionals and physicians concerned helps to promote the conduct of original research studies.

In Canada, environmental health roles and mandates differ from one province to the next. The most patent example is that of municipal environmental health inspectors who are involved in health protection (food safety, drinking water quality, wastewater treatment and discharges, etc.). To perform this function for a province, municipality or the federal government, inspectors must obtain and maintain a certificate in public health inspection through a continuing education program managed by the Canadian Institute of Public Health Inspectors. For historical reasons, these protection mandates are allocated to various authorities in Québec (MAPAQ, MDDEP, municipalities, etc.).

In keeping with their specific mandates, Health Canada professionals also participate in the evaluation and management of chemicals, as well as in the development of regulations pertaining to food, consumer goods and toxic substances. The National Collaborating Centre for Environmental Health, which was established by the Public Health Agency of Canada, prepares knowledge syntheses and training material related to scientific issues.

1.3 ACADEMIC PATHWAYS

Unlike the situation in several Canadian provinces where training in environmental health is offered at the bachelor's level,[4] in Québec, most environmental health professionals have a master's or a Ph.D. degree in various disciplines. Often, environmental health teams include many professionals with degrees in fields such as environmental sciences, epidemiology and toxicology, as well as physicians and nurses with training in community health.

---

[4] Ryerson University (Ontario), Concordia University College of Alberta (Alberta), Cape Breton University (Nova Scotia), British Columbia Institute of Technology (British Columbia), First Nations University of Canada (Saskatchewan). The graduates of these establishments work for different levels of government (municipal, provincial, federal, within Aboriginal communities, etc.).

Owing to the context, there has been an increase in the amount of work done in multidisciplinary teams, which has resulted in a broadening of the areas of expertise involved. It is therefore not unusual nowadays to find geographers, urban planners, anthropologists, etc. serving on such teams. Consequently, it appears that the involvement of professionals with training in complementary fields is important "[TRANSLATION] in order to address the impact of environmental factors on health and to better control them in order to protect the general population" (Gérin et al. 2003). In general, aside from physicians and nurses, few professionals have basic training in public health and vice versa.

1.4 CONTINUING EDUCATION

At present, the supply of environmental health training courses consists of a number of diverse activities that are available to everyone. They include environmental health workshops (ASEs), which are held every two years, online conferences (webinars) organized by the Réseau d'échange sur les enjeux en santé environnementale [Exchange Network on Environmental Health Issues] and a few training sessions on specific topics related to the acquisition of knowledge of methods, tools and regulations. For example, two training sessions on chemical emergencies have been given to professionals and physicians involved in emergency response. In spite of this array of activities, the available training does not meet all of the existing needs. Indeed, most of the training is aimed at updating knowledge in various disciplines and it barely touches on the complex know-how and knowing to act specific to the field of environmental health. In addition, although the available training meets the quality criteria for the accreditation of training courses, comprehensive and systematic efforts have not been devoted to course development in spite of the increasing complexity of the field and the evidence of a shift to interdisciplinarity.

Coherent, realistic strategies need to be implemented in order to provide all environmental health practitioners with the opportunity to develop their professional competencies continuously through courses tailored to their needs. A comprehensive strategy reflecting a shared vision of public health is required. From this perspective, the competency framework is an indispensible tool which is especially useful in a competency-based approach when it is developed with the help of practitioners. It can be used to identify all the competencies required in order to work in a given field and can also serve as the basis for implementing a competency development plan designed to meet specific requirements.

In this regard, the assistant public health branch (DGASP) of the MSSS has established an action plan for implementing the province's Public Health Plan (PNSP). It comprises four action areas, including the adaptation of professional and management practices to the new implementation context associated with the PNSP. One of the essential activities of this component centres on designing public health competency frameworks to promote the development, sustainability and evolution of the competencies of public health professionals and to implement high quality responses. In this context, the environmental health competency framework is considered a priority and has been funded accordingly.

2 COMPETENCIES AND COMPETENCY FRAMEWORK

In recent years, a few public health competency frameworks covering a variety of areas (Brahimi 2011) have been developed in Canada and around the world. An analysis of these frameworks reveals the diversity of perspectives related to the competency framework concept. Such frameworks are designed for the use of various groups such as professionals (NCEH et al. 2001, CIPHI 2010) and physicians (Royal College of Physicians and Surgeons of Canada 2001; Medical Officers of Health Competencies Working Group 2009), managers and students. In addition, competencies are often identified based on the roles associated with the organization of public health in different institutions or based on broad areas of activity. With regard to environmental health, the existing frameworks do not reflect the specific characteristics of Québec.

In Canada, the Public Health Agency of Canada carried out a vast pan-Canadian survey (federal, provincial, territorial and regional) to identify the core competencies for public health (PHAC 2007). This project, which was aimed at developing effective public health practices, sought the collaboration of numerous professionals in various institutions (government, universities, professional associations, etc.). The document is intended as a reference tool, since it provides public health practitioners with an overview of the public health system core functions: population health assessment, surveillance/monitoring, disease and injury prevention, health promotion and health protection.

A competency framework is an indispensable tool for any organization that wants to implement a competency development policy. However, this tool must not be designed, as Le Boterf (2006) stated, as a simple job description or as an exhaustive list of the tasks to be performed. It must be viewed as a dynamic, updatable tool that meets current needs of a given field, function or trade. That is why the **competency-based approach,** in which a competency is viewed as a **complex knowing to act**, was taken as the basis for the development of this environmental health competency framework.

2.1 DEVELOPMENT OF A COMPETENCY FRAMEWORK

In *L'approche par compétences, un levier de changement des pratiques en santé publique au Québec*, Brahimi (2011) draws on the ideas of a number of authors in setting out an approach for developing competency frameworks (Figure 1). The approach is based on a dynamic definition of a competency as described by several authors (Le Boterf 2006; Tardif 2006; Joannert 2009). In particular, Tardif defines a competency as "[TRANSLATION] a complex knowing to act which involves mobilizing and combining a variety of internal and external resources in a range of situations."

Since the concept of a **professional situation** is central to the definition, it is important to identify the current realities in the field. Therefore, the information that is used in developing the framework is gathered in the field (data collection) by having professionals reflect on their own professional practices in relation to situations they encounter. The situations are then analyzed (data processing) in order to classify them in general categories of situations. Each general category corresponds to the source of the competency to be developed. Since each competency is evidenced by a person's ability to mobilize and combine a variety of internal

resources (knowledge, know-how, attitudes, qualities, experience, etc.) and external resources that are present in the environment (experts, peers, references, software, information and communication technologies, etc.), these resources are identified and presented in the competency framework.

In order to carefully formulate competencies, an effort is made to identify their integrative, combinatory, developmental, contextual and evolving character as defined by Tardif (2006):

- each competency integrates a multitude of resources of differing types: **integrative** character;
- each competency involves mobilizing a variety of resources: **combinatory** character;
- each competency is developed over a person's lifetime: **developmental** character;
- each competency is used in a context that guides action: **contextual** character;
- each competency is designed to permit the integration of new resources and new situations without being compromised: **evolving** character.

Clarify the purpose of the framework

Adopt a definition of competency

Specify the format of the framework

Gather data

Process the data

Submit the data for validation

Organize appropriation of the framework

Ensure the sustainability of the framework
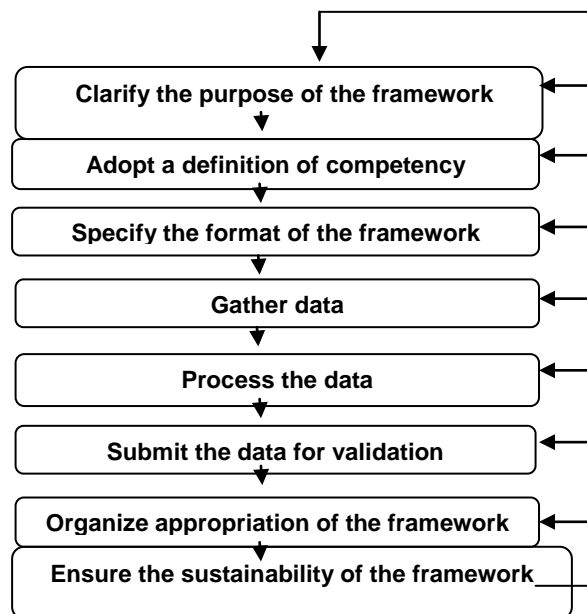
Figure 1   Competency framework development process, based on Jouvenot and Parlier, 2005

The competency framework provides a portrait of changes in management and professional practices. Based on the professional situations that are identified, it can be used to develop continuing education plans, support succession and promote the transfer of expertise between generations. An analysis of needs must first be undertaken (Figure 2) in order to address individuals' training expectations and needs as well as the reality within the organization.

Figure 2   **From competency framework to training plan**

The competency framework thus provides an opportunity to work in collaboration with human resource departments (recruitment, internal mobility, personnel appraisal, etc.).

In conclusion, the competency framework is a dynamic tool which can be updated regularly.

3 METHODOLOGY AND RESULTS

This section describes the procedure followed in developing the framework, including the methodology used, as well as the main results obtained. As mentioned earlier, the approach is iterative rather than linear. To facilitate understanding, however, the steps are presented sequentially.

3.1 STEERING COMMITTEE

At the beginning of the project, an interdisciplinary committee was established which was coordinated and presided over by a project leader. This group, representing the diversity of environmental health professionals, was composed of two physicians, three professionals, a researcher and three managers (representing a regional Department of Public Health, the MSSS or the INSPQ). An educational engineering specialist provided the group with methodology- and education-related assistance throughout the project.

The team members' involvement in the entire process (choice of places, groups and individuals to meet, documents to consult, personal reflection, discussion, validation, etc.) was very beneficial, because their experience in the environmental health field enabled them to ground the project in reality.

The goal of the first meeting was to outline the Committee's mandate and introduce the members to the process of designing a competency framework. The meeting included a discussion concerning the members' viewpoints, vision and expectations, which led to a reframing of the initiative, a common understanding of the project and an initial effort to standardize the terminology. This meeting also addressed the first three steps in the process (described in Figure 1), as explained below.

3.2 THE FIRST THREE STEPS IN THE PROCESS

3.2.1 Clarify the purpose of the framework

Given the increasing complexity of environmental health work, the difficulty of providing an integrated continuing education program that meets current requirements as well as learning and organizational needs (see Background), the implementation of a comprehensive competency development plan is the primary purpose of the framework. This vision is shared by the TNCSE and by the MSSS, which, moreover, emphasizes competency development in the Public Health Program.

3.2.2 Adopt a definition of competency and specify the format of the framework

As mentioned earlier, a competency has been defined as "[TRANSLATION] a complex knowing to act which involves mobilizing and combining internal and external resources in a range of situations." According to this vision, the framework presents all the professional situations linked to each competency, along with the associated internal and external resources.

The framework is generic and interdisciplinary in that it does not describe the competencies required for each profession in the environmental health network or the associated responsibilities. It provides a descriptive portrait of all the competencies and resources required to fulfill the environmental health mandate at the different levels (DSP, MSSS and INSPQ). Accordingly, emphasis is placed on interdisciplinary work because the situations involved often call for collaborative approaches and teamwork. Nonetheless, specific data can be extracted for each of the different professions involved during the analysis of training needs.

3.3   DATA COLLECTION AND PROCESSING

This section describes the data collection and processing procedures.

3.3.1   Compiling a list of professional situations

With a view to compiling a list of professional situations[5] to serve as a basis for identifying the environmental health competencies to be developed, four focus groups were organized between December 2010 and February 2011 with professionals, physicians and executives from the following organizations:

- INSPQ (10 people);
- DSPs in Bas-St-Laurent, Québec City, Trois-Rivières, Chaudière-Appalaches (7 people);
- DSPs in Montréal, Laval, Laurentides, Lanaudière, Montérégie (7 people);
- Steering Committee (8 people).

In addition, to obtain complementary information, semi-directed one-on-one interviews were held at the MSSS and the INSPQ. Note that all of these interviews were recorded for subsequent use. The list of all the people who participated in the group meetings or in one-on-one interviews is presented in Appendix 1.

The list of professional situations was compiled using the nominal group technique (NGT), which involved three steps:

- individually, each participant selected at least three professional situations encountered in his/her day-to-day work;

- following several round-table discussions, all the situations were recorded on flipcharts so they could be presented to all participants;

- in the plenary, each situation was analyzed to determine its relevance to the practice of environmental health and reformulated if necessary, and links were established to identify possible overlaps. Note that 130 statements were compiled.

---

5   A professional situation is a situation a person encounters and has to deal with effectively in his or her work (Joannert 2009). The situation is problematic in that it requires an action or intervention entailing a certain degree of complexity. It must also be a representative situation, that is, one that arises fairly often, in different forms (Perrenoud 2001).

A group of individuals (experts, professionals, physicians, etc.) carried out a series of validations of professional situations, which involved consulting relevant documents related to the roles and responsibilities of all environmental health professionals. The documentation included the updated Québec Public Health Program document (2003–2012), internal documents related to the roles of the players in relation to regional teams, recent studies of training needs and a directory of the requests allocated within the network of professionals and physicians. This process made it possible to enhance the formulation of each situation (specific context, appropriate action verbs, etc.) and to expand the list of situations. This work resulted in a list of 46 situations which are classified in broad categories of situations.

3.4 THE RESULTS OBTAINED: THE COMPETENCY FRAMEWORK

This section presents the competencies and the associated resources derived through the analysis of situations.

3.4.1 The four categories of situations

After several meetings of the Steering Committee, the situations were classified into four broad categories corresponding to the following classification:

- risk assessment and management;
- formulation of recommendations;
- support for the network and its partners;
- emergency response.

3.4.1.1 Risk assessment and management

The *risk assessment and management* category comprises all the professional situations related to managing environmental hazards in order to protect population health and ensure disease and injury prevention.

Table 1   "Risk assessment and management" category of situations

- Analyze a simple or complex situation in response to a request from the network or community, or an emerging issue that poses a potential risk for the population (physical health or concerns).

- Receive and analyze a notifiable disease (MADO) report.

- Receive a report of an environmental situation that could present a human health risk (e.g., drinking water).

- Investigate an outbreak.

- Estimate contaminant exposure for specific or vulnerable groups and quantify the risk (it could be a hazard).

- Evaluate the health impacts associated with exceedances of standards and guideline levels in one-off and chronic situations and make recommendations.

- Conduct an epidemiological investigation within the meaning of the *Public Health Act*.

- Conduct an epidemiological study.

- Take appropriate action in response to an environmental problem or situation that presents a risk taking into account the actual or perceived seriousness of the situation.

- Help to define and implement measures to protect population health.

- Develop a prevention strategy.

- Collect and interpret environmental quality monitoring data (water, air, soil, etc.).

- Monitor and interpret health indicators.

- Set priorities for public health based on health and environmental indicators.

- Carry out health monitoring.

- Define indicators and use them in a monitoring plan or an information system.

- Develop an exposure biomonitoring program.

- Prepare a public health advisory or recommendation in connection with a risk assessment.

- Conduct or help develop an information campaign for the general public or for community partners in order to eliminate or minimize exposure risks or promote the adoption of safe and healthy behaviours.

- Evaluate an awareness campaign or communication tools.

3.4.1.2 *Formulation of recommendations*

The *formulation of recommendations* category of situations comprises all the professional situations associated with communicating with various authorities concerning the state of scientific knowledge of the real or potential health risks associated with environmental hazards.

Table 2   "Formulation of recommendations" category of situations

- Participate in the process of reviewing land-use plans and interim control bylaws.

- Participate in the process of reviewing land-use plans of the Montréal Metropolitan Community and the Québec Metropolitan Community.

- Evaluate the impacts of development projects by identifying the psychosocial and health issues when the projects are subjected or not to the impact procedure.

- Follow up on impact studies and other recommendations.

- Answer questions posed by the BAPE (on behalf of the MSSS or the DSP).

- Participate in public hearings held by the BAPE in keeping with the assigned mandate.

- Validate the reference values, standards and criteria for various chemical, physical, microbiological and radiological contaminants.

- Establish reference values, standards and criteria for various chemical, physical, microbiological and radiological contaminants.

- Draft or assist in drafting a scientific opinion in accordance with section 54 of the *Public Health Act,* an environmental health bill or the amendment process for a set of regulations.

3.4.1.3 Support for network and its partners

The *support for network and its partners* category consists of all professional situations related to the implementation of strategies designed to support the public health network, its intersectoral partners and the general public in making the necessary changes in response to emerging issues.

Table 3   "Support for network and its partners" category of situations

- Raise the awareness of partners, decision-makers and the general public regarding environmental health risks and encourage the creation of healthy environments.

- Influence decision-makers and partners involved in the development of public policy related to environmental health.

- Develop the professional competencies of the environmental health network and its intersectoral partners.

- Develop decision support, risk management, information and communication tools.

3.4.1.4 Emergency preparedness and response

The *emergency preparedness and response* category comprises all professional situations involving a variety of potential threats to population health. A number of stages (before, during and after) are involved in this type of intervention.

Table 4 "Emergency preparedness response" category of situations

- Collaborate in identifying, eliminating or reducing risks that can result in a biological, chemical or physical emergency or disaster that is likely to adversely affect population health.

- Monitor the emergence of new health threats that can potentially lead to an emergency or a disaster that could affect population health.

- Prepare the public health response to emergencies and disasters according to the potential health threats and in collaboration with partners:

  - Develop or update environmental health activities in the public health component of the DSP's or the ASSS's emergency response plan, the resource mobilization plan for the public health regional action plan and the organization's communication plan;
  - Contribute to the development, testing and updating of emergency response plans, mobilization plans and communication plans;
  - Develop tools to support public health emergency preparedness and response;
  - Develop and see to the implementation of a continuing education plan (including simulation exercises) for environmental health professionals and, if applicable, for partners;
  - Participate in activities aimed at mitigating the health impacts of emergencies or disasters;
  - Provide support for the public health and emergency management network (ORSC, OSCQ) and partners involved in emergency management with a focus on environmental emergencies and disasters.

- Respond at any time in keeping with the mandate of public health during environmental emergencies or disasters:

  - Conduct an epidemiological investigation, relevant health monitoring activities and the analysis of real or anticipated health risks;
  - Ensure that health protection measures are put in place and, if applicable, call on partners so they exercise their authority;
  - Inform the public, first responders and decision-makers about health risks and the measures to be taken to protect themselves, in collaboration with partners;
  - Interpret the response context in order to link public health responses with partners' responses during environmental emergencies or disasters in an emergency management context.

- Implement monitoring activities deemed necessary following an emergency or disaster:

  - Monitor the long-term health effects, if necessary;
  - Collaborate, depending on the situation, on activities aimed at preventing the health impacts associated with living conditions or environmental conditions affected by the disaster;
  - Implement public health programs, as appropriate.

- Carry out feedback activities aimed at improving emergency response planning:

  - Conduct an evaluation of public health interventions;
  - Participate in an evaluation of the response with the partners involved.

3.4.2 The four competencies

As you recall, a competency can be defined as a complex knowing to act which involves mobilizing and combining a variety of internal and external resources in a range of situations. Under this definition, a competency is associated with each category of situations described above.

An individual will, for example, develop a competency in an emergency situation if that person successfully mobilizes certain resources (knowledge, know-how, experience, attitudes, network, etc.) to master situations found in the *emergency response* category of situations.

In order to correctly formulate each competency associated with a given category of situations, the main characteristics that should appear in the descriptive statement are the integrative, developmental, contextual and evolutive nature of the competency as mentioned in the previous section.

The Steering Committee was tasked with formulating the competencies. The definitive version (below) is the result of a series of validations carried out with experts and stakeholders in the environmental health network.

- Provide expertise for the management of health risks stemming from biological, chemical or physical threats, contaminants or hazards in the environment;

- Make recommendations on all public health issues related to environmental impacts, including policies, large-scale environmental projects, acts, regulations, standards, programs and land-use plans;

- Support the environmental health network and its intersectoral partners during the decision-making process in a constantly evolving context;

- Respond to environmental emergencies or disasters with a view to protecting public health.

The competencies can be defined as follows:

Competency 1

On a regular basis, professionals and physicians working in environmental health receive requests from partners, health organizations and educational establishments to address questions related to the population health effects of exposure or suspected exposure to chemical, microbiological or physical contaminants. Evaluating these risks entails mobilizing available knowledge and tools that can be used to provide an expert opinion, identifying potential or real health impacts.

Competency 2

Professionals and physicians working in environmental health receive requests on a regular basis from other health stakeholders or partners in other sectors to provide support for decision making related to land-use planning and the development of large-scale projects, as well as policies and standards governing the creation of environments supportive of health. In such situations, the goal is to identify emerging health issues before it is too late to implement preventive measures.

Competency 3

The changes occurring in the environmental health field, new government directions and knowledge development all lead to changes in professional practices. Practitioners are encouraged to implement the changes and to promote them within the community, notably by adopting innovative strategies for mobilizing and influencing others.

Competency 4

Professionals and physicians working in environmental health are required to deal with emergency situations (emergency, disaster, crisis) involving chemical, biological or physical agents which pose a real or potential threat to population health. These situations may differ considerably and they may occur suddenly and necessitate immediate action, including measures to protect the general public. In order to prevent and prepare for such situations, it is necessary for stakeholders to collaborate on identifying, eliminating and reducing environmental hazards with the potential to affect population health, and to plan appropriate public health measures. Depending on the situation, emergency response actions involve collaboration between the main partners in the public health network, including emergency management officials.

3.4.3   Internal and external resources

Based on the reference definition, individuals select, mobilize and combine a series of resources in order to deal with situations. These resources are the **internal resources** peculiar to an individual, referred to as knowledge, know-how and attitudes in this document (which can also be designated as procedural and declarative knowledge[6]) and **external resources** are the resources made available in our work environment (e.g., reference documents, peers, material resources.).

An initial portrait of resources was prepared by the project leader from her extensive experience in environmental health. Each competency was analyzed in depth in order to identify the internal and external resources that needed to be mobilized to develop the competency in question. The results of this work were then submitted to the brainstorming group for an initial validation. Several other validations were required; they were carried out by different groups and different persons (experts) (see Appendix 2). In addition, some pertinent elements were integrated following the consultation of numerous documents. The competencies were the subject of a complementary validation involving environmental health coordinators at a meeting of the TNCSE. Some of the coordinators had consulted their team members beforehand to obtain their comments. Finally, thanks to their experience, the authors of the framework supported the validation process by submitting additional examples of professional situations, as well as contributing to the internal and external resources.

The competency related to emergency response was addressed by taking account of the specific characteristics associated with this area. A working group was established to validate and add to the list of professional situations and to identify the associated resources. The INSPQ's science team in charge of emergency response and the SECOURS committee were also consulted in this regard. Their emergency response expertise related to public health emergencies involving environmental hazards was a major asset in terms of validating this competency.

---

[6] **Declarative knowledge** is knowledge about objects and facts. Concepts, proposals, sets of interrelated proposals, images and metacognitive knowledge are all forms of declarative knowledge.

[6] **Procedural knowledge** is knowledge that enables a person to take action on a concrete matter using operators or operations. Rules of action, procedures, and cognitive and metacognitive strategies are procedural knowledge.

3.5   PORTRAIT OF ENVIRONMENTAL HEALTH COMPETENCIES

This section presents the competency framework (Table 5), which contains all the competencies and the associated internal and external resources. As you will note, there is some overlap of certain internal and external resources between the competencies, which is characteristic of their cross-cutting nature.

Table 5   Competency Framework

COMPETENCY 1: PROVIDE EXPERTISE FOR THE MANAGEMENT OF HEALTH RISKS STEMMING FROM BIOLOGICAL, CHEMICAL OR PHYSICAL THREATS, CONTAMINANTS OR HAZARDS IN THE ENVIRONMENT			
	Internal Resources		
Professional situation	**Knowledge** **Declarative Knowledge**	**Know-How** **Procedural Knowledge**	**Soft Skills** **Attitudes**
DOCUMENTATION OF CONTEXT Analyze a simple or complex situation in response to a request from the network or community, or an emerging issue that poses a potential risk for the population (physical health or concerns). **RISK ASSESSMENT** Receive and analyze a notifiable disease (MADO) report. Receive a report of an environmental situation that could represent a human health risk (e.g., drinking water). Investigate an outbreak. Estimate contaminant exposure for specific or vulnerable groups and quantify the risk (it could be anuisance). Evaluate the health impacts associated with exceedances of standards and guideline levels in one-time and chronic situations and make recommendations. Conduct an epidemiological investigation within the meaning of the *Public Health Act*. Conduct an epidemiological study.	• Knowledge of communities and their specific characteristics (e.g., Aboriginal communities) • General knowledge of environmental health* • General epidemiology* • Biostatistics* • Field epidemiology • Social research • Communication of risks • Process of investigating an outbreak that occurs in the community • Conducting an epidemiological investigation within the meaning of the *Public Health Act* • Risk assessment methodology • Bibliographical research • Environmental quality regulations and criteria • Roles and responsibilities of public health workers in relation to the legal mandate* • Roles and responsibilities of the key partners in relation to the legal mandate *	• Search for information about health and sociodemographic components. • Assess the scientific value of the available literature.** • Produce a status report. • Plan and prioritize actions. • Detect the presence of an outbreak. • Conduct a preliminary study of the cases. • Characterize the toxicological risk or other types of risk. • Develop a toxicological database. • Use data processing software. • Draw up a research protocol. • Draft a research or response report. • Propose appropriate protection measures. • Follow up on the steps required. • Carry out qualitative analyses. • Take an interdisciplinary approach to work.** • Take an intersectoral approach to work.**	• Ethics • Professionalism • Scientific rigour • Leadership • Analytical skills and ability to synthesize • Collaborative spirit • Open-mindedness • Listening skills • Tact • Self-control • Independence • Initiative • Empathy

*   Common declarative knowledge.

** Common procedural knowledge.

Table 5   Competency Framework (cont'd)

Professional situation	Internal Resources		
	Knowledge **Declarative Knowledge**	**Know-How** **Procedural Knowledge**	**Soft Skills** **Attitudes**
RESPONSE intervention Take appropriate action in response to an environmental problem or situation that presents a risk according to the actual or anticipated seriousness of the situation. Collaborate to define and implement measures to protect population health. Develop a prevention strategy.	• Planning and priority-setting models • Health prevention and promotion strategies* • Public health protection strategy • Scope of standards and the steps to take in case of an exceedance • Methods of evaluating responses • Theoretical foundation of the population-based approach in public health* • Social factors affecting risk management	• Plan and prioritize actions. • Propose appropriate prevention and protection measures.	
MONITORING Monitor and interpret environmental quality monitoring data (water, air, soil, etc.). Monitor and interpret health indicators. Set priorities for public health based on health and environmental indicators. Carry out health monitoring. Define indicators and use them in a monitoring plan or for an information system. Develop an exposure biomonitoring program.	*NB: All of the preceding knowledge elements are valid for these situations.* • Purpose and objectives of monitoring • Appropriate databases (e.g., toxicology, environmental) • Limitations of data sources • Feasibility criteria • Criteria of an effective monitoring system	• Analyze and interpret health and environmental data. • Draft operational definitions. • Identify relevant data sources. • Assess the sensitivity and specificity of the monitoring system. • Identify monitoring indicators.	

COMPETENCY 1: PROVIDE EXPERTISE FOR THE MANAGEMENT OF HEALTH RISKS STEMMING FROM BIOLOGICAL, CHEMICAL OR PHYSICAL THREATS, CONTAMINANTS OR HAZARDS IN THE ENVIRONMENT

* Common declarative knowledge.

** Common procedural knowledge.

Table 5 Competency Framework (cont'd)

COMPETENCY 1: PROVIDE EXPERTISE FOR THE MANAGEMENT OF HEALTH RISKS STEMMING FROM BIOLOGICAL, CHEMICAL OR PHYSICAL THREATS, CONTAMINANTS OR HAZARDS IN THE ENVIRONMENT			
	Internal Resources		
Professional situation	**Knowledge** **Declarative Knowledge**	**Know-How** **Procedural Knowledge**	**Soft Skills** **Attitudes**
COMMUNICATION AND ASSESSMENT Prepare a public health advisory or recommendation consistent with the risk assessment. Conduct or help develop an information campaign for the public or for community partners with the goal of eliminating or minimizing exposure risks or promoting the adoption of safe and healthy behaviours. Evaluate an awareness campaign or communication tools.	• Communication of risks • Assessment strategies • Social marketing • Knowledge of communities and their specific characteristics • Perception of risk • Drafting of scientific documents	• Use communication strategies tailored to various audiences.** • Document demographic, health and psychosocial characteristics of target populations. • Assess the scientific value of the available literature.** • Draft a scientific advisory.	
External Resources			
Guidelines, directions, agreements, policies • Lignes directrices pour la réalisation des évaluations du risque toxicologique pour la santé humaine (2002) [Guidelines for conducting toxicological risk assessments for human health] • Agreements signed with partners (MSSS, MDDEP, federal government, etc.) *Tools and databases* • MADO and MADO chimique databases [notifiable diseases and notifiable diseases of chemical origin] • Nosological definitions • Drinking water sheets (INSPQ) • Toxicology data sheets • Data analysis software (SAS, SPSS, etc.) • TNCSE [Québec environmental health liaison table] directory • Plan commun de surveillance [Joint monitoring plan] • Infocentre de santé publique [Public health infocentre] • Fiches indicateurs [Indicator sheets] (Infocentre) • Computer tools • National and international databases • Scientific watch and documentation tools • Media watch			

* Common declarative knowledge.

** Common procedural knowledge.

Table 5   Competency Framework (cont'd)

COMPETENCY 1: PROVIDE EXPERTISE FOR THE MANAGEMENT OF HEALTH RISKS STEMMING FROM BIOLOGICAL, CHEMICAL OR PHYSICAL THREATS, CONTAMINANTS OR HAZARDS IN THE ENVIRONMENT
External resources

External resources

Bibliographical references
- Principes directeurs d'évaluation du risque toxicologique pour la santé humaine de nature environnementale (MSSS 2002) [Guiding principles for assessing environmental toxicological risks for human health]
- Cadre de référence en gestion des risques pour la santé dans le réseau québécois de la santé publique (2003) [Risk management framework for health in the Québec public health system]
- La détermination des priorités [Establishing priorities] in Planification de la santé : concepts, méthodes, stratégies [Setting priorities in health planning: concepts, methods, strategies] (1986)
- Portrait de santé de la population [Population health profile]
- Guides méthodologiques Infocentre (Methodological guides)
- La surveillance épidémiologique, Principes, méthodes et applications en santé publique [Epidemiological surveillance, principles, methods and public health applications] (2011)
- Cadre conceptuel de la santé et de ses déterminants [Conceptual framework of health and determinants of health] (MSSS)
- Pour mieux réussir vos communications médiatiques en promotion de la santé [How to produce more successful health promotion media communications] (2002)
- Guide Animer un processus de transfert des connaissances [Facilitating a knowledge translation process], INSPQ 2009
- Planifier pour mieux agir [Planning for better action] (1999)

Training
- Skills Enhancement for Public Health (INSPQ and PHAC)
- Field Epidemiology (PHAC)
- Methodological workshops offered (e.g., social marketing, writing clearly and concisely). For information: http://www.inspq.qc.ca/

*   Common declarative knowledge.

** Common procedural knowledge.

Table 5   Competency Framework (cont'd)

COMPETENCY 2: MAKE RECOMMENDATIONS ON ALL PUBLIC HEALTH ISSUES RELATED TO ENVIRONMENTAL IMPACTS, INCLUDING POLICIES, LARGE-SCALE ENVIRONMENTAL PROJECTS, STATUTES, REGULATIONS, STANDARDS, PROGRAMS AND LAND-USE PLANS			
	Internal Resources		
Professional situation	**Knowledge** **Declarative Knowledge**	**Know-How** **Procedural Knowledge**	**Soft Skills** **Attitudes**
Participate in the process of reviewing land-use plans and interim control bylaws. Participate in the process of reviewing land-use plans of the Montreal Metropolitan Community and the Québec Metropolitan Community.	• General knowledge of environmental health* • Knowledge of communities and their specific characteristics (e.g., Aboriginal communities) • Departmental directions on land use and occupancy • Review process for land-use plans • Urban planning and development • Community development • Transportation • Waste management • Safety and trauma prevention • Roles and responsibilities of public health workers consistent with the legal mandate* • Roles and responsibilities of main partners consistent with the legal mandate** • Health promotion and prevention strategies* • Public health protection strategies	• Prepare a public health advisory. • Write clearly and concisely. • Assess the scientific value of the available literature.** • Take an intersectoral approach to work.** • Take an interdisciplinary approach to work.**	• Ethics • Professionalism • Scientific rigour • Leadership • Analytical skills and ability to synthesize • Collaborative spirit • Open-mindedness • Listening skills • Tact • Self-control • Independence • Initiative • Empathy

*   Common declarative knowledge.

**   Common procedural knowledge.

Table 5   Competency Framework (cont'd)

Professional situation	Internal Resources		
	Knowledge Declarative Knowledge	Know-How Procedural Knowledge	Soft Skills Attitudes
Participate in the environmental assessment process • Evaluate the impacts of development projects by identifying psychosocial and health issues whether or not the projects are subject to the impact procedure. • Follow up on impact studies and other recommendations. • Answer questions posed by the BAPE (on behalf of the MSSS or the DSP). • Participate in public hearings held by the BAPE in keeping with own mandate.	• Assessment and review of the environmental impact (MDDEP) during the project planning, design and execution phases, including the definition of roles and responsibilities • MSSS procedure (administrative) • Assessment process in northern and Aboriginal communities • Criteria and procedures • Federal assessment process • Knowledge of different types of assessment • Risk perception • Social acceptability • Theoretical foundation of the population-based approach*	• Document the health impacts. • Document the social factors affecting risk management. • Review the eligibility of the proponent's impact study and make any modifications required. • Evaluate the acceptability of a project from a public health perspective and suggest any modifications required. • Present arguments from a public health perspective. • Draft a submission. • Use communication strategies tailored to various audiences.** • Communicate risk. • Make recommendations. • Assess the scientific value of the available literature.**	
Validate the reference values, standards and criteria for various chemical, physical, microbiological and radiological contaminants.	• General epidemiology* • Biostatistics*		

*   Common declarative knowledge.

** Common procedural knowledge.

Table 5   Competency Framework (cont'd)

COMPETENCY 2: MAKE RECOMMENDATIONS ON ALL PUBLIC HEALTH ISSUES RELATED TO ENVIRONMENTAL IMPACTS, INCLUDING POLICIES, LARGE-SCALE ENVIRONMENTAL PROJECTS, ACTS, REGULATIONS, STANDARDS, PROGRAMS AND LAND-USE PLANS			
	Internal Resources		
Professional situation	**Knowledge** **Declarative Knowledge**	**Know-How** **Procedural Knowledge**	**Soft Skills** **Attitudes**
Establish reference values, standards and criteria for various chemical, physical, microbiological and radiological contaminants.	• Reference values, guide values, standards and criteria • Toxicology • Microbiology • Pharmacokinetics • Types of environmental exposure and effects on health • Methodologies for building reference values, standards and criteria • Risk analysis principles • Bibliographical research • Provincial, national and international agencies that develop reference values, standards and criteria	• Write clearly and concisely. • Make recommendations. • Analyze data. • Characterize risks.	
Draft or collaborate in drafting a scientific advisory in connection with the application of section 54, an environmental health bill or the amendment process for a set of regulations.	• Process of enacting a law • Knowledge of the context and political, economic, social and health issues	• Assess the scientific value of the available literature.** • Write clearly and concisely. • Make recommendations. • Use the results of a public health economic assessment.	

*   Common declarative knowledge.

**   Common procedural knowledge.

Table 5   Competency Framework (cont'd)

COMPETENCY 2: MAKE RECOMMENDATIONS ON ALL PUBLIC HEALTH ISSUES RELATED TO ENVIRONMENTAL IMPACTS, INCLUDING POLICIES, LARGE-SCALE ENVIRONMENTAL PROJECTS, ACTS, REGULATIONS, STANDARDS, PROGRAMS AND LAND-USE PLANS

External resources

Environmental statutes and regulations
- An Act Respecting Land Use Planning and Development
- Sustainable Development Act
- Act to Amend the Environment Quality Act and Other Legislative Provisions with Regard to Land Protection and Rehabilitation (Bill 72)

Guidelines, directions, agreements and policies
- Orientations gouvernementales en matière d'aménagement du territoire [Government directions on land use]
- Position gouvernementale en occupation et vitalité du territoire [Government position on land occupancy and vitality]
- Directions of the MSSS
- Directives sectorielles du MDDEP par types de projets [Québec Department of Sustainable Development, Environment, Wildlife and Parks sectoral directives by project type]
- Lignes directrices pour la réalisation des évaluations du risque toxicologique pour la santé humaine [Guidelines for conducting toxicological risk assessments for human health]
- Principes directeurs d'évaluation du risque toxicologique pour la santé humaine de nature environnementale [Guiding principles for assessing environmental toxicological risk assessments for human health]

Tools and databases
- Methodology guides
- Toxicology databases (IRIS, HSDB)
- Template for drafting submissions
- Fiches-outils [Tool worksheets]
- Directory of impact assessments
- Guide on technology risks
- Toxicology databases
- Scientific watch and documentation tools
- Drinking water sheets (INSPQ)
- Data analysis software

Bibliographical references
- André, P., Delisle, C. E. and J.-P. Revéret (2010). L'évaluation des impacts sur l'environnement. Processus, acteurs et pratique pour un développement durable, 3rd edition, Montreal, Presses internationales Polytechnique, 398 p.
- Portraits de santé de la population produits par l'Institut national de santé publique du Québec [Population health profiles produced by the INSPQ]
- Tools, guides and other resources on health impact assessments of the National Collaborating Centre for Healthy Public Policy Portal
- Guide méthodologique pour l'élaboration des rapports sur les politiques publiques et la santé [Methodological guide for the development of reports on public policy and health]
- Method for Synthesizing Knowledge About Public Policies (NCCHPP and INSPQ)

* Common declarative knowledge.

** Common procedural knowledge.

Table 5   Competency Framework (cont'd)

COMPETENCY 2: MAKE RECOMMENDATIONS ON ALL PUBLIC HEALTH ISSUES RELATED TO ENVIRONMENTAL IMPACTS, INCLUDING POLICIES, LARGE-SCALE ENVIRONMENTAL PROJECTS, ACTS, REGULATIONS, STANDARDS, PROGRAMS AND LAND-USE PLANS
External resources
Professional network environment   • TNCSE [Québec environmental health liaison table]: thematic committees, decision support tools, protocols, presentations, etc.   • Rapid, sustained access to experts during hearings   • Networks of colleagues and experts

*   Common declarative knowledge.

**   Common procedural knowledge.

Table 5 Competency Framework (cont'd)

COMPETENCY 3: SUPPORT THE ENVIRONMENTAL HEALTH NETWORK AND ITS INTERSECTORAL PARTNERS DURING THE DECISION-MAKING PROCESS IN A CONSTANTLY EVOLVING CONTEXT			
	Internal Resources		
Professional situation	**Knowledge** **Declarative Knowledge**	**Know-How** **Procedural Knowledge**	**Soft Skills** **Attitudes**
Raise the awareness of partners, decision-makers and the general public regarding environmental health risks and encourage the creation of healthy environments.	• Knowledge of communities and their specific characteristics • Social marketing	• Assess the scientific value of the available literature. ** • Chair meetings using various means. • Use communication strategies tailored to various audiences.** • Write clearly and concisely. • Apply health promotion principles.	• Ethics • Professionalism • Scientific rigour • Leadership • Analytical skills and ability to synthesize • Collaborative spirit • Open-mindedness • Listening skills • Tact • Self-control • Independence • Initiative • Empathy
Influence decision-makers and partners involved in the development of public policy related to environmental health.	• Theories of change • Negotiating strategies • Roles and responsibilities of public health workers in relation to the mandate* • Roles and responsibilities of the key partners in relation to the legal mandate * • Collaborative practices • Assessment strategies	• Create networks of partners. • Create an intersectoral committee. • Support own arguments with evidence-based data or the best available data. • Develop change strategies. • Manage and promote change. • Take an intersectoral approach to work.** • Take an interdisciplinary approach to work.** • Communicate persuasively. • Carry out training need analyses. • Design in-person training. • Design online training (pedagogical design)..	
Develop the professional competencies of the environmental health network and its intersectoral partners.	• Knowledge of communities and their specific characteristics • Analysis of training needs • Teaching strategies and competency-based approach		

* Common declarative knowledge.

** Common procedural knowledge.

Table 5   Competency Framework (cont'd)

COMPETENCY 3: SUPPORT THE ENVIRONMENTAL HEALTH NETWORK AND ITS INTERSECTORAL PARTNERS DURING THE DECISION-MAKING PROCESS IN A CONSTANTLY EVOLVING CONTEXT			
	Internal Resources		
Professional situation	**Knowledge** **Declarative Knowledge**	**Know-How** **Procedural Knowledge**	**Soft Skills** **Attitudes**
Develop decision support, risk management, information and communication tools. .	• Assessment strategies • Techniques for facilitating small groups in person and online • Design of online training • Knowledge of online training tools (discussion forums, blogs, wikis, etc.) • Knowledge of the quality assurance program in professional development	• Design online teaching materials. • Use coaching strategies, such as mentoring and supervision. • Develop evaluation tools. • Use online collaboration tools. • Use strategies to communicate with various audiences.** • Use presentation and graphics software.	
External resources			
Guidelines, directions, agreements, policies • Politique de l'enseignement et de la formation continue [Teaching and continuing education policy], INSPQ • Terms of Reference for Training Needs Analysis, INSPQ 2008 • Quality assurance program (INSPQ) *Tools and databases* • Guide Animer un processus de transfert des connaissances [Facilitating a knowledge translation process], INSPQ 2009 • Guide de développement d'une formation [Guide for developing training] (INSPQ intranet) • Scientific watch and documentation tools • Media watch *Bibliographical references* • Lafortune, L. (2008). Guide pour l'accompagnement professionnel d'un changement. [Guide to professional support for change]. Sainte-Foy, Presses de l'Université du Québec • Evidence-Informed Decision-Making in Environmental Health (2009) • À la frontière des responsabilités des ministères et des organismes publics : l'application de l'article 54 de la Loi sur la santé publique [At the forefront of departmental and public agency responsibilities: applying section 54 of the Public Health Act] (2008)			

*   Common declarative knowledge.

** Common procedural knowledge.

Table 5   Competency Framework (cont'd)

COMPETENCY 3: SUPPORT THE ENVIRONMENTAL HEALTH NETWORK AND ITS INTERSECTORAL PARTNERS DURING THE DECISION-MAKING PROCESS IN A CONSTANTLY EVOLVING CONTEXT
External resources
Training • Methodological workshops offered (e.g., strategic influence, pedagogical design and e-learning, persuasive communication, social marketing, clear and concise writing). For information: http://www.inspq.qc.ca *Professional network environment* • Access to a pedagogical design resource • Training adviser • Educational adviser • Networks of experts

*   Common declarative knowledge.

** Common procedural knowledge.

Table 5   Competency Framework (cont'd)

COMPETENCY 4: RESPOND TO ENVIRONMENTAL EMERGENCIES OR DISASTERS WITH A VIEW TO PROTECTING PUBLIC HEALTH			
THIS COMPETENCY REQUIRES THE MOBILISATION OF THE INTERNAL AND EXTERNAL RESOURCES ASSOCIATED WITH THE THREE OTHER COMPETENCIES. THIS COMPETENCY IS DEVELOPED IN ACCORDANCE WITH THE FOUR RECOGNIZED COMPONENTS OF EMERGENCY MANAGEMENT.			
	Internal Resources		
Professional situation	**Knowledge** **Declarative Knowledge**	**Know-How** **Procedural Knowledge**	**Soft Skills** **Attitudes**
Basic knowledge **PREVENTION** Collaborate in identifying, eliminating or reducing risks that can result in a biological, chemical or physical emergency or disaster that is likely to adversely affect public health.	• General epidemiology* • Biostatistics* • Field epidemiology • Biological, chemical and physical risks and their health effects • Theoretical foundation of the population-based approach* • Prevention and health promotion strategies* • Public health protection • Ethics in public health • Roles and responsibilities of provincial and federal public health workers in emergencies and disasters • Communication during emergencies and disasters • Coordination of emergency management responses in Québec and Canada, including those on site • Types of environmental health emergencies • Types of accident scenarios • Strategic influence • Collaborative practices • Mobilization strategies	• Implement negotiation and coordination strategies with partners. • Assess public health risks. • Assess the scientific value of the literature and available data.** • Make recommendations.	• Ethics • Professionalism • Scientific rigour • Leadership • Analytical skills and ability to synthesize • Collaborative spirit • Open-mindedness • Listening skills • Tact • Self-control • Autonomy • Initiative • Empathy

*   Common declarative knowledge.

**   Common procedural knowledge.

Table 5   Competency Framework (cont'd)

COMPETENCY 4: RESPOND TO ENVIRONMENTAL EMERGENCIES OR DISASTERS WITH A VIEW TO PROTECTING PUBLIC HEALTH			
THIS COMPETENCY REQUIRES THE MOBILISATION OF THE INTERNAL AND EXTERNAL RESOURCES ASSOCIATED WITH THE THREE OTHER COMPETENCIES. THIS COMPETENCY IS DEVELOPED IN ACCORDANCE WITH THE FOUR RECOGNIZED COMPONENTS OF EMERGENCY MANAGEMENT.			
	Internal Resources		
Professional situation	**Knowledge** **Declarative Knowledge**	**Know-How** **Procedural Knowledge**	**Soft Skills** **Attitudes**
Monitor the emergence of new health threats that can potentially lead to an emergency or disaster that could affect public health.	• Sources of relevant data and information – watch and monitoring tools.	• Identify sources of relevant data. • Analyze and interpret health and environmental data. • Assess the scientific value and relevance of data.** • Identify emerging, real and perceived threats. • Document an emerging, real or perceived threat.	
PREPAREDNESS Prepare the public health response to emergencies and disasters depending on potential health threats and in collaboration with partner organizations: • Develop or update environmental health activities in the public health component of the DSP or Agency emergency response plan, the resource mobilization plan for the public health and the organization's communication plan.	NB *All of the preceding knowledge is valid for these situations.* • Development of emergency plans • Communication during emergencies and disasters • Main challenges and issues of emergency response • Analysis of training needs • Pedagogical design • Teaching strategies, including simulation exercises • Group facilitation techniques	• Implement collaborative practice, negotiation and co-operative strategies with partners. • Draft emergency plans. • Use communication strategies tailored to various audiences.** • Implement a simulation exercise. • Participate in the organization of a simulation exercise. • Conduct an analysis of training needs.	

*   Common declarative knowledge.

** Common procedural knowledge.

Table 5 Competency Framework (cont'd)

COMPETENCY 4: RESPOND TO ENVIRONMENTAL EMERGENCIES OR DISASTERS WITH A VIEW TO PROTECTING PUBLIC HEALTH			
THIS COMPETENCY REQUIRES THE MOBILISATION OF THE INTERNAL AND EXTERNAL RESOURCES ASSOCIATED WITH THE THREE OTHER COMPETENCIES. THIS COMPETENCY IS DEVELOPED IN ACCORDANCE WITH THE FOUR RECOGNIZED COMPONENTS OF EMERGENCY MANAGEMENT.			
	Internal Resources		
Professional situation	**Knowledge** **Declarative Knowledge**	**Know-How** **Procedural Knowledge**	**Soft Skills** **Attitudes**
• Assist with the development, testing and updating of emergency response plans, mobilization plans and communication plans; • Develop tools to support emergency response; • Develop and see to the implementation of a continuing education plan (including simulation exercises) for environmental health personnel and, if applicable, for partners; • Participate in activities aimed at mitigating the health impacts of emergencies or disasters; • Provide support for the public health and emergency management network (ORSC, OSCQ) and partners involved in emergency management with a focus on environmental emergencies and disasters.	• Strategic influence • Collaborative practices • Mobilization strategies	• Develop a continuing education plan. • Give training sessions. • Take an interdisciplinary approach to work.** • Take an intersectoral approach to work.**	

* Common declarative knowledge.

** Common procedural knowledge.

Table 5 Competency Framework (cont'd)

COMPETENCY 4: RESPOND TO ENVIRONMENTAL EMERGENCIES OR DISASTERS WITH A VIEW TO PROTECTING PUBLIC HEALTH			
THIS COMPETENCY REQUIRES THE MOBILISATION OF THE INTERNAL AND EXTERNAL RESOURCES ASSOCIATED WITH THE THREE OTHER COMPETENCIES. THIS COMPETENCY IS DEVELOPED IN ACCORDANCE WITH THE FOUR RECOGNIZED COMPONENTS OF EMERGENCY MANAGEMENT.			
	Internal Resources		
Professional situation	**Knowledge** **Declarative Knowledge**	**Know-How** **Procedural Knowledge**	**Soft Skills** **Attitudes**
RESPONSE Be ready to respond to environmental emergencies or disasters in keeping with the public health mandate : • Conduct an epidemiological investigation, relevant health monitoring activities and an analysis of real or perceived health risks; • Ensure that health protection measures are in place and, if applicable, call on partners to exercise their authority; • Inform the public, stakeholders and decision-makers about health risks and the measures to be taken to protect themselves, in collaboration with partners. • Interpret the response context in order to link public health responses with partners' responses during emergencies or disasters in an emergency management context.	*NB All of the preceding knowledge is valid for these situations.* • Methodology for conducting an epidemiological investigation within the meaning of the Public Health Act • Basic principles in field epidemiology • Response strategies with respect to natural, anthropogenic or malicious CBRNE agents • Health monitoring, epidemiological surveillance and environmental monitoring • Concepts related to the establishment of public health priorities and their application in emergencies and disasters • Toxicology, biological and physical risks and effects on human health • Reference values for evaluating population health risks during acute exposure to chemical, physical and biological agents	• Document health threats. • Detect the presence of an outbreak, emergency or disaster. • Assess health risks in real time. • Draft public health recommendations, advisories or orders. • Monitor the implementation of health protection measures. • Use communication strategies tailored to various audiences (health risks and public health protection measures). • Put in place the monitoring activities required. • Determine when protection measures can be lifted. • Draft a response report. • Implement collaborative practice, negotiation and coordination strategies with partners. • Continually analyze the response context.	

* Common declarative knowledge.

** Common procedural knowledge.

Table 5　　　Competency Framework (cont'd)

COMPETENCY 4: RESPOND TO ENVIRONMENTAL EMERGENCIES OR DISASTERS WITH A VIEW TO PROTECTING PUBLIC HEALTH			
THIS COMPETENCY REQUIRES THE MOBILISATION OF THE INTERNAL AND EXTERNAL RESOURCES ASSOCIATED WITH THE THREE OTHER COMPETENCIES. THIS COMPETENCY IS DEVELOPED IN ACCORDANCE WITH THE FOUR RECOGNIZED COMPONENTS OF EMERGENCY MANAGEMENT.			
	Internal Resources		
Professional situation	**Knowledge** **Declarative Knowledge**	**Know-How** **Procedural Knowledge**	**Soft Skills** **Attitudes**
RECOVERY Implement monitoring activities deemed necessary following an emergency or disaster: • Monitor the long-term health effects, if necessary; • Collaborate, depending on the situation, on activities aimed at preventing the health impacts associated with living conditions or environmental conditions affected by the disaster; Implement public health programs, as appropriate.	• Environmental monitoring and environmental detection methods during emergencies • Population protection methods • Principles of decontaminating people exposed to chemical, physical and biological agents • Collaborative practices • Health Mission of the PNSC/PRCS and other health-related missions • Criteria for monitoring health effects	• Develop and apply monitoring activities in the affected human environment. • Develop and apply a specific public health program after the event.	

*　Common declarative knowledge.

**　Common procedural knowledge.

Table 5   Competency Framework (cont'd)

COMPETENCY 4: RESPOND TO ENVIRONMENTAL EMERGENCIES OR DISASTERS WITH A VIEW TO PROTECTING PUBLIC HEALTH

THIS COMPETENCY REQUIRES THE MOBILISATION OF THE INTERNAL AND EXTERNAL RESOURCES ASSOCIATED WITH THE THREE OTHER COMPETENCIES. THIS COMPETENCY IS DEVELOPED IN ACCORDANCE WITH THE FOUR RECOGNIZED COMPONENTS OF EMERGENCY MANAGEMENT.

Professional situation	Internal Resources		
	Knowledge Declarative Knowledge	Know-How Procedural Knowledge	Soft Skills Attitudes
Carry out feedback activities aimed at improving emergency response planning: • Conduct an evaluation of public health responses; • Participate in an evaluation of the response with the partners involved.		• Communicate persuasively. • Chair meetings using various means. • Write an evaluation report on the public health response (on our response).	

External resources

Statutes and regulations related to public health emergencies
Provincial
- Public Health Act and its regulations
- Act Respecting the INSPQ (section 20)
- Act Respecting Health Services and Social Services (section 375)
- Civil Protection Act
- Act Respecting Occupational Health and Safety and, depending on the context, the corresponding regulations

Federal
- Emergency Preparedness Act
- Emergencies Act
- Quarantine Act

Environmental statutes and regulations
Provincial
- Environment Quality Act and Regulation respecting its application
- Regulation Respecting the Quality of Drinking Water, etc.

Federal
- Environmental Emergency Regulations
- Canadian Environmental Protection Act

*   Common declarative knowledge.

** Common procedural knowledge.

Table 5   Competency Framework (cont'd)

COMPETENCY 4: RESPOND TO ENVIRONMENTAL EMERGENCIES OR DISASTERS WITH A VIEW TO PROTECTING PUBLIC HEALTH
THIS COMPETENCY REQUIRES THE MOBILISATION OF THE INTERNAL AND EXTERNAL RESOURCES ASSOCIATED WITH THE THREE OTHER COMPETENCIES. THIS COMPETENCY IS DEVELOPED IN ACCORDANCE WITH THE FOUR RECOGNIZED COMPONENTS OF EMERGENCY MANAGEMENT.
External resources
Guidelines, directions, agreements, policies   • Québec public health program (PNSP) and its regional adaptation (PAR – regional action plan)   • [Lignes directrices pour la réalisation des évaluations de conséquences sur la santé des accidents industriels majeurs et leur communication au public](#) [Guidelines for conducting assessments of the consequences of major industrial accidents for human health and releasing them to the public   • Québec emergency management plan (PNSC) and its regional adaptation, the Plan régional de sécurité civile – Mission santé (PRSC-MS) [Regional emergency management plan – Health Mission]   *Tools and databases*   • Organization emergency plans   • Resource mobilization plan (DSP, agency)   • Response and communication support tools recommended by the SECOURS committee and the INSPQ scientific team   • Information on the Web about public health and environmental health emergency management (e.g., bookmarks suggested by the INSPQ scientific team on environmental health emergencies)   • Publications and Web sites of recognized public health agencies on preparing for and responding to emergencies and disasters (e.g., sites of universities, CDC, HPA, WHO)   • Case studies, simulation tools, investigation reports (e.g., US Chemical Safety Board)   • Databases on chemical and radiological substances and products (Wiser, CANUTEC Emergency Response Guidebook, CHEMM, REMM, Chemknowledge, etc.)   • Databases on facilities using hazardous materials (e.g., Environment Canada)   • Scientific watch and documentation tools   • Media watch

*   Common declarative knowledge.

** Common procedural knowledge.
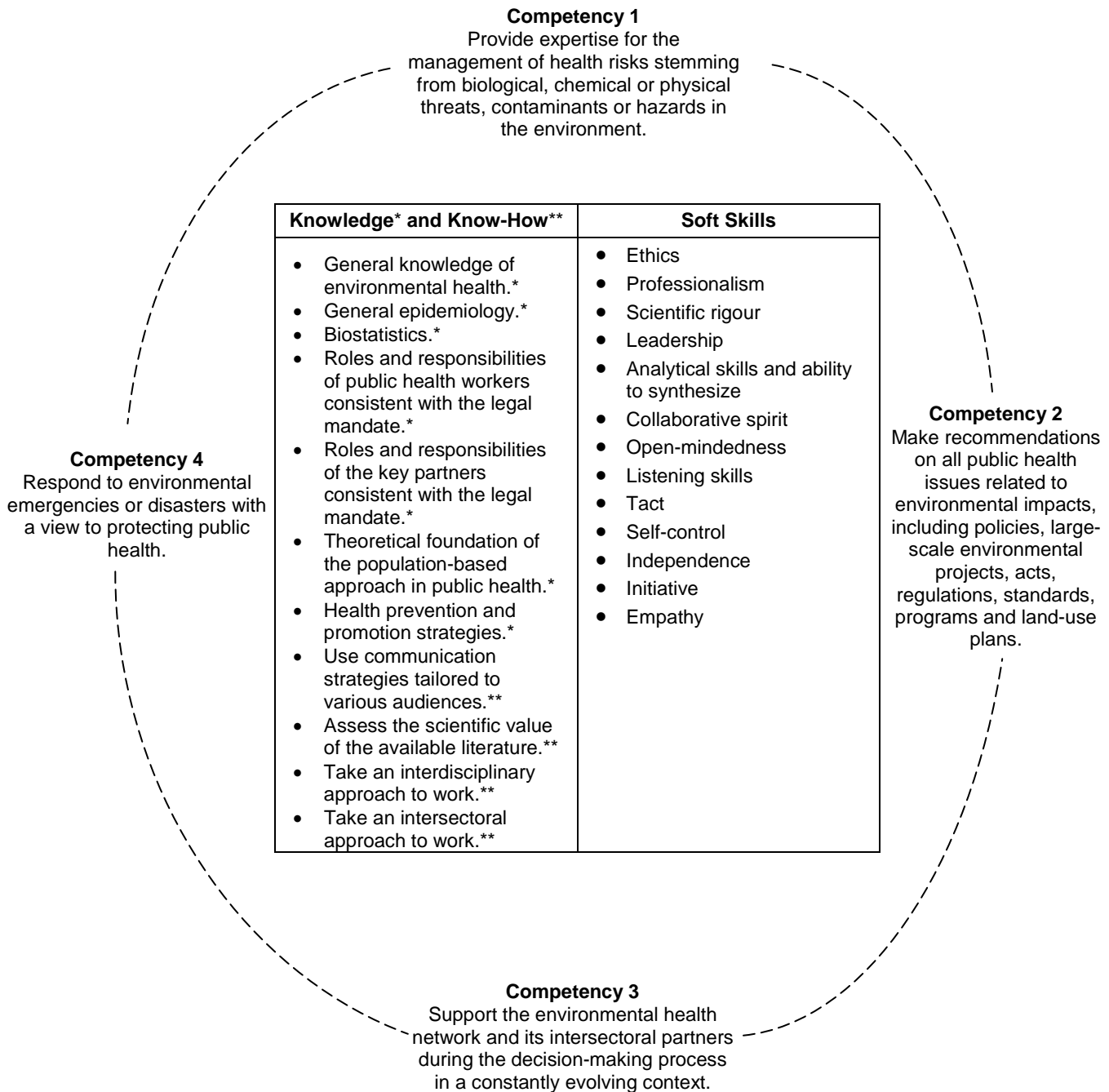
Table 5   Competency Framework (cont'd)

COMPETENCY 4: RESPOND TO ENVIRONMENTAL EMERGENCIES OR DISASTERS WITH A VIEW TO PROTECTING PUBLIC HEALTH
THIS COMPETENCY REQUIRES THE MOBILISATION OF THE INTERNAL AND EXTERNAL RESOURCES ASSOCIATED WITH THE THREE OTHER COMPETENCIES. THIS COMPETENCY IS DEVELOPED IN ACCORDANCE WITH THE FOUR RECOGNIZED COMPONENTS OF EMERGENCY MANAGEMENT.
External resources
Bibliographical references • Reference works on chemical, physical and biological risk management, including the *Cadre de référence en gestion des risques pour la santé dans le réseau québécois de la santé publique* [Health risk management framework in the Québec public health system] and the *Guide toxicologique pour les urgences en santé environnementale* [Toxicology guide for environmental health emergencies] • Emergency management reference works, including the *Cadre de coordination de site de sinistre au Québec* [Framework for coordinating disaster sites in Québec] and the *Encart sur la concertation des mandats d'enquête* [Insert on the coordination of investigation mandates] • Surveillance des maladies à déclaration obligatoire au Québec – Définitions nosologiques – Maladies d'origine chimique ou physique [Surveillance of notifiable diseases in Québec – Case definitions – Chemical and physical diseases] (MSSS) • Guide de gestion des risques d'accidents industriels majeurs [Major industrial accident risk management guide] (CRAIM) • La détermination des priorités [Establishing priorities] in *Planification de la santé : concepts, méthodes, stratégies* [Health planning: concepts, methods, strategies] (Pineault and Daveluy, 1986) • Reference works on the federal emergency response system/structure   *Training* Lectures, seminars, Webinars and workshops tailored to the needs of public health officials

*   Common declarative knowledge.

**   Common procedural knowledge.

3.6   OVERLAPPING RESOURCES

In an earlier section, we mentioned the cross-cutting nature of some internal and external resources. The diagram below illustrates this situation and shows that all the resources are exploited in each of the four competencies. Knowledge is identified by the symbol * and know-how by **.

Competency 1
Provide expertise for the management of health risks stemming from biological, chemical or physical threats, contaminants or hazards in the environment.

Knowledge* and Know-How**	Soft Skills
• General knowledge of environmental health.* • General epidemiology.* • Biostatistics.* • Roles and responsibilities of public health workers consistent with the legal mandate.* • Roles and responsibilities of the key partners consistent with the legal mandate.* • Theoretical foundation of the population-based approach in public health.* • Health prevention and promotion strategies.* • Use communication strategies tailored to various audiences.** • Assess the scientific value of the available literature.** • Take an interdisciplinary approach to work.** • Take an intersectoral approach to work.**	• Ethics • Professionalism • Scientific rigour • Leadership • Analytical skills and ability to synthesize • Collaborative spirit • Open-mindedness • Listening skills • Tact • Self-control • Independence • Initiative • Empathy

Competency 4
Respond to environmental emergencies or disasters with a view to protecting public health.

Competency 2
Make recommendations on all public health issues related to environmental impacts, including policies, large-scale environmental projects, acts, regulations, standards, programs and land-use plans.

Competency 3
Support the environmental health network and its intersectoral partners during the decision-making process in a constantly evolving context.

Figure 3   Diagram of the internal resources common to the four competencies (overlapping resources)

CONCLUSION

This environmental health competency framework, which was developed by reviewing professional situations encountered in the field and input received from practitioners, provides an up-to-date portrait of environmental health practices in Québec.

An effective methodological approach was employed that takes into account actual conditions in the field and the interactions between the professionals and stakeholders involved. All the activities, from group meetings through the validations involving various experts, managers and stakeholders, helped to ensure the relevance of the data collected and the quality of the work done. The ideas that emerged from the discussion groups are the result of an intersubjective construction in that the participants sometimes had to call into question their existing mental models. This reframing process encourages openness to change and, consequently, promotes the appropriation of a new paradigm.

The framework describes four competencies and a variety of internal and external resources that are mobilized in response to situations encountered in the field. It supports understanding of current professional practices, in all their complexity, as well as the conditions in which the work is done. The framework highlights the need for information and knowledge sharing, teamwork, interdisciplinary work and an intersectoral approach. This tool encompasses the development of collective competencies as well as individual competencies. It does not focus on a specific profession, but instead serves as an interdisciplinary framework for environmental health.

As you may recall, the ultimate purpose of the framework is to prepare a competency development plan (including a continuing education plan) that will address the learning needs of all persons involved, as well as the organization's needs. In view of the changing context of environmental health, it is essential for professionals to keep updating their competencies. In addition to supporting continuing education, the framework is a valuable tool that can be used in personnel recruitment, succession training, etc. Note, however, that it cannot ensure the quality of competency development activities, because each trainer is responsible for employing dynamic pedagogical strategies and using the tool intelligently. In addition, managers need to create a culture of continuous learning by taking into account the training needs that are identified and the prevailing context.

In the course of developing public health competency frameworks, we expected that a number of the associated internal resources would be common to different areas of public health. The initiative "adaptation of professional practices and management to the new context created by the Québec Public Health Plan" facilitates and supports the development of such frameworks. Based on the results obtained, the initiative may also support the optimization of training courses offered in the different areas through a comprehensive analysis of the common resources that are identified.

REFERENCES

BRAHIMI, C. 2011. *L'approche par compétences. Un levier de changement des pratiques en santé publique au Québec*, Institut national de santé publique du Québec.

CANADIAN INSTITUTE OF PUBLIC HEALTH INSPECTORS (CIPHI) 2010. *Continuing Professional Competencies (CPC) Program Reference Guide Release 1.1*.

ÉDITEUR OFFICIEL DU QUÉBEC 2011. *Public Health Act*.

GÉRIN, M., GOSSELIN, P., CORDIER, S., VIAU, C., QUÉNEL, P., DEWAILLY, É. 2003. *Environnement et santé publique, Fondements et pratiques.* Éditions Tec&Doc (Paris).

JOANNERT, P. 2009. *Compétences et socioconstructivisme : un cadre théorique.* Perspective en éducation et formation, De boeck, Brussels.

JOUVENOT, C. ET PARLIER, M. 2003. *Élaborer des référentiels de compétences : principes et méthodes,* Éditions Réseau Anact, Lyon.

LAPAIGE, V. A. 2010. Le Québec face au défi croisé de l'application des savoirs en santé publique. *Global Health Promotion*, 17(4): 72–88.

LE BOTERF, G. 2006. *Construire les compétences individuelles et collectives,* Éditions d'Organisation, Paris.

MEDICAL OFFICERS OF HEALTH COMPETENCIES WORKING GROUP, NATIONAL SPECIALTY SOCIETY FOR COMMUNITY MEDICINE 2010 UPDATE. *A Set of Minimum Competencies for Medical Officers of Health in Canada (version 3.0).*

MINISTÈRE DE LA SANTÉ ET DES SERVICES SOCIAUX 2008. *Programme national de santé publique du Québec, mise à jour 2008.*

NATIONAL CENTER FOR ENVIRONMENTAL HEALTH, CENTERS FOR DISEASE CONTROL & AMERICAN PUBLIC HEALTH ASSOCIATION (NCEH) 2001. Environmental Health Competency Project.

PUBLIC HEALTH AGENCY OF CANADA 2007. *Core Competencies for Public Health in Canada*, Release 1.0, Ottawa.

TARDIF, J. 2006. *L'évaluation des compétences. Documenter le parcours de développement*, Chenelière Éducation, Montreal.

WORLD HEALTH ORGANIZATION, DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT. Web site http://www.who.int/phe/about_us/en/index.html, page consulted on November 15, 2011.

ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA 2001. CanMeds available at http://www.royalcollege.ca/public/resources/aboutcanmeds.

U.S. COUNCIL ON LINKAGES BETWEEN ACADEMIA AND PUBLIC HEALTH PRACTICE 2010. Core Competencies for Public Health Professionals.

APPENDIX 1

PARTICIPANTS — GROUP AND ONE-ON-ONE INTERVIEWS

PARTICIPANTS — GROUP AND ONE-ON-ONE INTERVIEWS

DSPs

Simon Arbour

Jean-François Duchesne

Benoît Gingras

Gabriel Hakizimana

Nolwenn Noisel

Pierre Pelletier

Slavko Sebez

Ann St-Jacques

Jacques Normandeau

Stéphane Perron

Bernard Pouliot

Claude Prévost

Michel Savard

Sylvie St-Onge

Fassiatou Tairou

Institut national de santé publique du Québec

Geneviève Brisson

Denis Gauvin

Marie-Christine Gervais

Vicky Huppé

Germain Lebel

Benoît Lévesque

Denise Phaneuf

Onil Samuel

Ministère de la Santé et des Services sociaux du Québec

Lucie Laflamme

APPENDIX 2

**LIST OF PERSONS CONSULTED DURING
THE VALIDATION PROCESS FOR THE FRAMEWORK**

LIST OF PERSONS CONSULTED DURING THE VALIDATION PROCESS FOR THE FRAMEWORK

Competency 1:

- Denis Gauvin, Gabriel Hakizimana, Germain Lebel, Onil Samuel, Slavko Sebez, Marion Schnebelen

Competency 2:

- Céline Campagna, Marion Schnebelen

Competency 3:

- Céline Campagna, Marie-Christine Gervais

Competency 4:

- INSPQ science team in charge of environmental health emergency response:
  - Lise Laplante, Rollande Allard, Gaétan Carrier, Leylâ Deger, Jean-Claude Dessau, Michel Savard
- SECOURS committee:
  - Christine Blanchette, Leylâ Deger, Lise Laplante, Bernard Pouliot Slavko Sebez, Michel Savard

EXPERTISE
CONSEIL

INFORMATION

FORMATION

www.**inspq**.qc.ca

RECHERCHE
ÉVALUATION
ET INNOVATION

COLLABORATION
INTERNATIONALE

LABORATOIRES
ET DÉPISTAGE

Institut national
de santé publique
Québec