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Short Communication

Development of a tiered framework for public health capacity in Canada



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Introduction

In the early 2000s, successive Canadian public health crises revealed that public health systems were ill-equipped to meet unexpected, increased population health demands. In 2003, the Severe Acute Respiratory Syndrome (SARS) pandemic created a panicked state of preparation in anticipation of a high mortality rate and broad geographical spread. Although this was not realized, large gaps in capacity to meet potential emergency health demands were revealed.¹

After SARS, the first and only comprehensive and objective review of the Canadian and Ontario public health systems was conducted. It strongly emphasized the need for enhanced public health capacity and a strong public health workforce to prevent the occurrence of future crises. Over time, these efforts have been hampered by a muddled understanding of what public health capacity actually means.^{2–4} The objective of this study was to regain a clear understanding of the components of public health capacity, and how they relate to a stronger public health system.

In this study, twelve publicly available Canadian or Ontario SARS reports published between 2003 and 2006 were identified using a key informant (Executive Director of the Association of Local Public Health Agencies (1998–2004)), and were accessed from Internet websites between October 2012 and January 2014 ($n = 12$) using the names of the reports, or the reports' commissioners or committee chairs as key words. For a complete listing of these reports, see [Supplementary data in Appendix A](#). Manifest content analysis was used to analyze the use of the terms “capacity” and “capacities” related to public health.⁵ Tables of contents, chapter headings, executive summaries, recommendations and terms that were unrelated to public health (e.g. bed capacity) were excluded. The remaining terms were coded by report name and type of capacity by LEW. For example, epidemiological capacity was coded as “epidemiological”. All coding was independently reviewed by SEG. Disagreements between reviewers related to the addition, deletion and naming of codings ($n = 90$) were discussed and consensus was achieved. Similar codes were deductively organized by LEW into families that represented separate components of public health capacity. Families and their codes were reviewed by SEG and consensus was achieved through critical discussion. These families were then organized by LEW and AP into a tiered public health capacity framework where capacity within each tier builds upon the capacities within the preceding tiers, and moves from the individual to the systems level. Here, we present this framework of public health capacity that identifies individual components and suggests how they relate to and support one another for the purpose of enhancing overall capacity in public health systems.

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Tiered public health capacity framework

Seventeen components of public health capacity were identified and organized into five tiers, namely: human resources; foundation components; program components; integrative components; and enhanced public health (Fig. 1). This framework arranges the components of public health capacity from the individual to the systems level.

Human resources form the bottom tier of the capacity framework as they provide the necessary manpower, skills and competencies to support the succeeding tiers, and ultimately maintain and improve population health and well-being. Their critical importance was discussed by all of the reviewed reports. As the National Advisory Committee on SARS and Public Health noted, “No attempt to improve public health will succeed that does not recognize the fundamental importance of providing and maintaining in every local health agency across Canada an adequate staff of highly skilled and motivated public health professionals.”⁶

The foundation components of public health capacity provide the necessary underlying infrastructure by supporting one another to effectively fulfill the programmatic and integrative public health functions, and maintain the smooth functioning of the public health system. For example, research and K* capacity is supported by partnerships and collaboration between various public health stakeholders on the same tier level. This tier also supports succeeding tiers. For example, epidemiology and surveillance capacity is supported by timely access to quality data and information, collaborative linkages, investigative research, common reporting structures, and modern disease information systems.

The program components of public health capacity represent more traditional public health functions that support the integrative capacity components which combine these functions. For example, emergency management is supported by public health laboratories that are equipped to handle high volumes of testing, field epidemiologists, surveillance systems and networks, infection control standards, and training of front line workers.

The integrative components of public health capacity include systems-level, complex, and inter-connected public health functions that require the integration of human resources, foundation and program capacity components in order to be effective. Emergency management refers to planning and preparedness, detection and response, and control and mitigation of outbreaks, emerging and resurgent public health threats, unforeseen events, epidemics, and health crises. Population health management refers to meeting community needs and responding to public health issues and challenges within the local and provincial public health systems. Delivery of programs and services is primarily discussed in relation to Ontario's public health units although the need for human, physical and financial resources applies to public health organizations as well. Governance is related to policy and planning procedures, strategic capacity, leadership and management, performance management, and risk assessment and planning. These complex capacity components require the integration of the lower-tiered capacity components to impact local, provincial and federal public health capacity.

As the Standing Senate Committee on Social Affairs, Science and Technology noted, “Capacity enhancement is a broad term which encompasses a number of areas: surveillance systems;

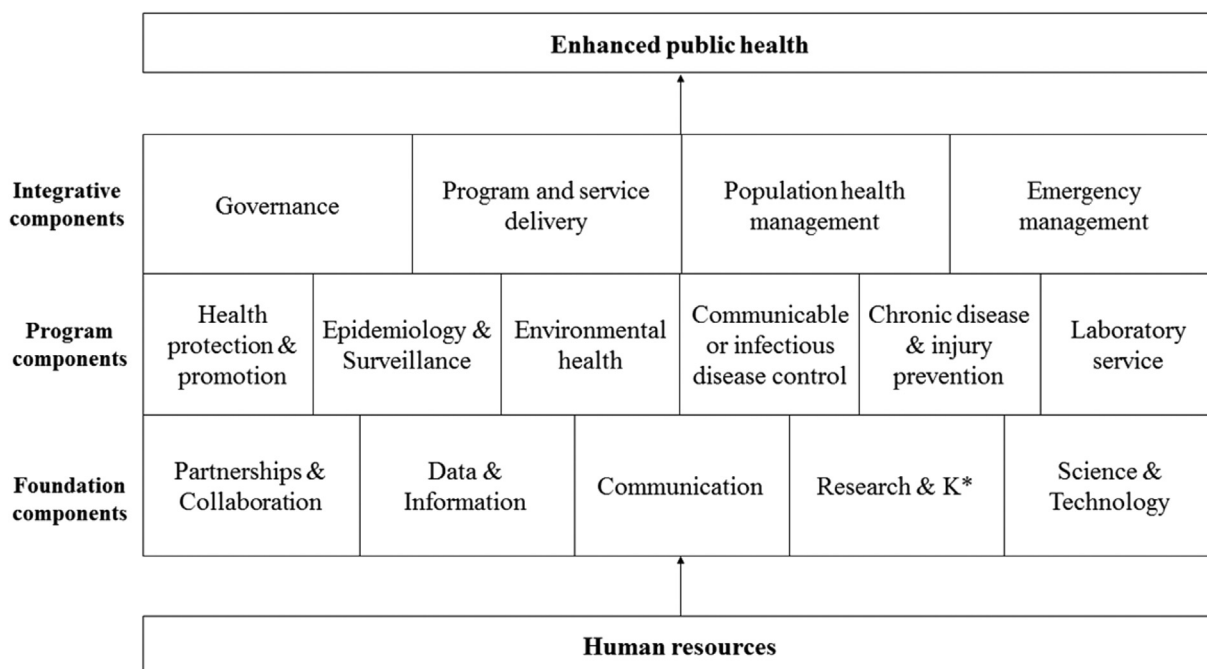


Fig. 1 – Tiered framework of public health capacity and its components.

The components of public health capacity were identified through analysis of the usage of public health-related “capacity” or “capacities” in post-SARS reports. These components were organized into five tiers from the individual to the systems level. K* indicates knowledge exchange, management and transfer. Bold font indicates the five tiers.

emergency preparedness and response; human resources; public health laboratories; information technology; communications and research.”⁷ Public health capacity exists at all societal levels, and is supported by human resources, and foundation, program and integrative components. As each component is enhanced, public health systems are able to more effectively meet public health needs.

Application of this framework

This study presents a cumulative conceptual framework of public health capacity where each capacity tier builds upon the capacities of the underlying tiers from the individual to the systems level. This organization is consistent with the United Nations Development Programme's capacity assessment and development framework and LaFond, Brown and Macintyre's health sector capacity framework.^{2,8} By organizing public health capacity components in this way, it emphasizes how individual capacity components relate to and support one another. This is in contrast to other discussions of capacity in public health that have a more singular focus on specific capacities such as epidemiology or health promotion.^{9,10} Based on this framework, capacity-building efforts are predicted to be potentially more impactful when directed at the lower tiers (human resources, foundation) as these tiers support capacity within the above tiers.

This framework is intended for a diverse audience including public health professionals, organizations, academia, government, and professional associations who are interested or engaged in assessing and enhancing the types of public health capacities that are present and/or absent within their respective units. We suggest that this framework can be applied by each actor using an iterative, developmental approach according to the following steps: 1) Identify the capacity components that individuals, agencies, and systems should possess given their particular mandate; 2) Identify the capacity components that individuals, agencies, and systems possess, and examine how these components relate to the other capacity components in the framework; 3) Identify the components that individuals, agencies, and systems do not currently possess in relation to the ideal state; and 4) Examine the potential for building these capacities internally or externally via strategic partnerships with other actors who already possess these desired capacities. This conceptual framework provides a common structure of public health capacity components that can be utilized by any actor to better coordinate and target capacity-building efforts to specific components identified using the framework.

This framework has some limitations. It is descriptive in nature rather than prescriptive with respect to how each component should be enhanced in current public health systems. It is incumbent on each user of this framework to decide how best to modify and apply it to meet their particular needs. The framework is based on government and government-commissioned SARS reports that reviewed the Canadian and Ontario public health systems with an emphasis on community public health outbreaks and emergencies. Certain

components such as maternal and child health were not addressed in these reports and are therefore not included in this framework. Lastly, this framework has not been validated using any real-world applications or scenarios. As this framework is implemented, it will be important to collect and receive feedback on its utility and applicability.

As public health continues to meet new and existing challenges, enhancing public health capacity with a renewed focus on where individual capacity components exist within the system, and how these can be effectively leveraged through strategic partnerships will strengthen the ability of public health systems to maintain and improve population health into the future.

Author statements

Ethical approval

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Competing interests

None declared.

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Appendix A. Supplementary data

Supplementary data related to this article can be found at [doi:10.1016/j.puhe.2016.03.009](https://doi.org/10.1016/j.puhe.2016.03.009).