

# **Public Health Data and Information Management Capacity Survey Tool User's Guide**

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## Background to the Public Health Data and Information Management Capacity Survey Tool

**Data management** is the process of understanding the data needs of an organization and making the data available to support the operations of the organization (ed. Thuraisingham, B. (1998). *Data Management Handbook*). Data and information management is a vital component of performance management and professional practice in public health. Health surveillance and population health assessment, two of the five public health functions identified by the Advisory Committee on Population Health (2005), are directly related to data and information use (*Improving public health system infrastructure in Canada: Report of the Strengthening Public Health System Infrastructure Task Group*). Additionally, the concepts of data and information management are incorporated throughout the Ontario Public Health Standards (OPHS) (2008), specifically in the Foundational Standard and the Population Health Assessment and Surveillance Protocol.

Effective program management goes hand-in-hand with effective use of data and information to guide decisions. Many decisions are informed by evidence, but the process by which this happens is often not explicit. The self-administered survey tool and this User's Guide are designed to help make your data and information management resources and processes explicit.

### Purpose of the Survey Tool

This self-administered tool is designed to help local public health units assess data and information management processes and capacities within the health unit. Currently, health units may differ in their capacity and their processes to manage data and information, but little is known about the range of capacities and processes. The results of the survey are designed to be used by local health units to assess current practices and to use as a planning tool for improvements.

The survey includes questions about the Board of Health's processes and procedures, culture, and capacity to effectively manage data and information. The tool is designed to look at the entire health unit (including branch or satellite offices). Some questions are organized by the program standards included in the OPHS and include administration data (HR and financial) as a 'program'; some questions consider the Board of Health as a whole. Where applicable, the program questions are intended to include all programs, 100% funded and cost-shared.

## Question-Specific Resources for Completing the Tool

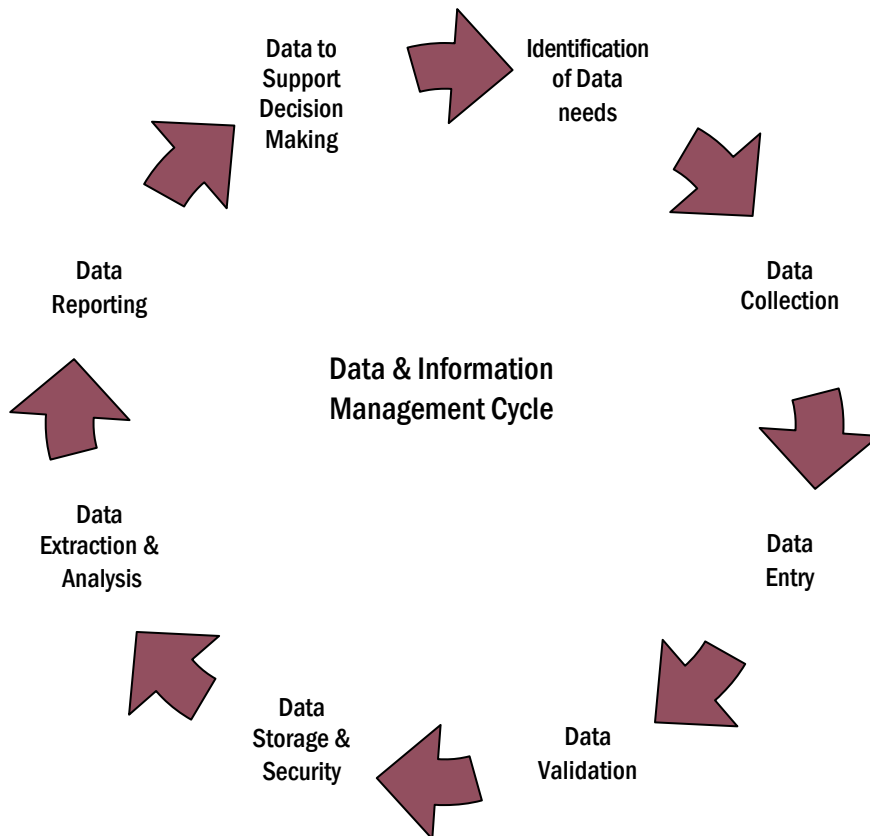
Here are some issues and ideas to consider when answering the survey. The User's Guide is for your reference; your answers to any of the questions here are not to be returned with the survey.

### Issues to Consider When Answering Question 1

Question 1 (and questions 2 and 5) ask for responses broken down by OPHS program areas. Also included as a 'program' is *administration*, which in these questions is meant to include data about human resources, such as FTEs, and financial data, such as budget allocations. Administrative data from "administrative databases for which the primary purpose is not health assessment and surveillance" (Population Health Assessment & Surveillance Protocol, 2008, p. 7), are like other types of data in that they are collected, entered, validated, stored, analyzed, reported and used for decision making.

Similar to the population health assessment and surveillance cycle presented in the Population Health Assessment and Surveillance protocol, the diagram below illustrates the connectedness of the steps in data and information management. While each step consists of distinct tasks, the validity of each step is dependent on the previous steps. Here are some things to consider in assessing your health unit's processes and capacity in each of these steps.

### Data and Information Management Cycle:



**Data Collection:** Data collection refers to gathering data and information. In public health, data can be collected through:

- Surveys, needs assessments or focus groups to gather information from clients or the community
- Surveillance
- Financial and accounting processes
- Human resource data, such as full-time equivalents (FTEs)
- Contact tracing of communicable diseases
- Client records
- Reviewing the research and best practice literature (peer-reviewed and/or other “grey” literature) on a particular topic
- Policy and program documentation, including program evaluations
- Team meetings to discuss program-related lessons learned

**Data Entry:** Data entry includes putting data into databases and may also include creating databases for data to be entered into. A key aspect of data entry is timeliness. Timeliness can refer to the amount of time it takes for the data to be incorporated into a database or other useable form. For information that is not included in a database, such as journal articles or reports, this could refer to the amount of time it takes for those journal articles or reports to be passed to those who could incorporate them into their practice or program.

**Data Validation:** Is the process of ensuring that a program operates on clean, correct and useful data. It uses routines that check for correctness or meaningfulness of data that are input to the system. [http://en.wikipedia.org/wiki/Data\\_validation](http://en.wikipedia.org/wiki/Data_validation)

**Data Storage and Security:** A vital component of information and data management is the ability to ensure information and data are kept secure. In considering this question, it may be useful to consider the following questions first.

- What are your current practices in terms of ensuring security and back-up of information and data?
  - Networks are backed up everyday
  - Staff are required to back-up files as needed
  - Data are stored in a server off-site
  - Files are encrypted
  - The building is secured with alarm system
- Would important information be secure in the following situations?
  - Health unit building is damaged in a fire or flood
  - Computers are stolen; memory sticks are lost
  - A major virus gets into the network system
  - A disgruntled employee tries to hack into the system
- How are data and information disposed of, or destroyed?

**Data Extraction and Analysis:** Once data are in a database or tracking system, they need to be pulled out (“extracted”) and analyzed in order to make the data usable and to apply them to build understanding and guide decisions. In some cases, data extraction and analysis will be performed by someone who has special skills and training in research or the topic area. In the public health setting this is often the role of epidemiologists or program evaluation specialists. In other cases, data are extracted from databases by administrative or program staff, who may use automated reports or existing report templates.

Although much of the data that are collected, analyzed and reported in public health are quantitative, it is important also to consider the use of qualitative data when completing this question.

Part of analysis involves putting the data and information in context—is it meaningful, will it be useful, for whom and for what purpose? These types of questions will guide the format and the context of the next step, data reporting.

**Data Reporting and Dissemination:** Is primarily concerned with putting the data and the analysis of the data and information into a form that can be used by those who need it. Those who need the information could be public health staff, managers or members of the Board of Health, or they could be external partners such as government ministries, community organizations, local media or the general public. Data and information can be ‘reported’ in the form of an email, a presentation, a report, a graph, etc.

## **Issues to Consider When Answering Question 2**

**Communication** among all parties involved in steps in the cycle is important to ensure that any issues with the data at one step are recognized, documented, and remedied before data are used in other steps. Many people involved in a program will use the data and information collected for a variety of purposes. It is important that all staff have access and the ability to use the data and information to inform their practice. Additionally, being aware of how data and information will be used influences how they are collected. Therefore, in answering this question you may want to consider the following:

- Do those collecting and accessing the data and information know the purpose of the data and information?
- Do all those who enter, analyze and/or use the data have an opportunity to influence modifications to the data management system?
- Are there aspects of the data and information process that management and other data users are not aware of, but should be? (problems, inconsistencies, data entry delays or gaps, etc.)
- What methods are used in your setting to ensure that this kind of communication takes place and data issues are addressed effectively as part of a quality improvement approach?

**Understanding a Program** can be achieved through uses of data to describe program activities, outputs or outcomes. How are data used to understand programs in your Board of Health? Do front-line staff and management have access to data that would help them understand their programs?

**Program Planning** can rely on many types of data, including *surveillance* data, such as would be included in a health status report or extracted from a surveillance database. *Program evaluation* data can also be used to improve programs during future cycles of program planning.

**Data to Support Decision Making:** A key component in the data and information management cycle is making use of the data and information. Data can be used in different ways to support decisions. How thoroughly are data used for all of these possible purposes: to record trends, or improve the program, or highlight the need for new programs?

**Identification of Data Needs to Guide Future Data Collection Processes:** Given that data management is a cycle, does feedback from the decision-making process guide what new data should be collected?

### **Issues to Consider When Answering Question 3**

In considering your human resource capacity, here are a couple of aspects to keep in mind:

- How sustainable are your human resources?
  - Are you relying on one individual who is responsible for multiple aspects of the data management process?
  - Are there processes in place to manage knowledge transfer when staff retire or leave the health unit?
- Are professional development opportunities made available to staff in the area of data and information management?
  - Are there specific skills sets that could be enhanced across the health unit or within specific programs or functions?
- Do staff have opportunities to consult with colleagues about data and information uses? These could be internal or external colleagues.

### **Issues to Consider When Answering Question 4**

Information technology is increasingly becoming an integral part of public health practice. There is great variability across Boards of Health in how information technology is managed. In some cases IT services are contracted out; in others they are shared with other municipal programs; and in other situations there is a dedicated IT department for the Board of Health. Regardless of the specific organization of your Board of Health's IT services and functions, please consider the extent to which access to IT services facilitates or limits your organization's ability to manage data and information.

### **Issues to Consider When Answering Question 5**

**Accuracy:** The degree to which data values are correct. (*Data Quality Management Framework: Orientation Guide*. (2007). Ministry of Health and Long-Term Care.)

**Relevance:** The degree to which the data/information meet the defined needs of the user groups. (*Data Quality Management Framework: Orientation Guide*. (2007). Ministry of Health and Long-Term Care.)

**Time and Resources:** Part of ensuring effective data management is placing an emphasis on data quality and the application of data to support decision-making. The amount of time and resources dedicated to these activities may be one indication of the organizational value attached to data management.

## Making Use of Your Results

Take a moment to review the priority areas you have listed in your scoring summary. Are there any patterns or issues that arise in more than one question? Are they program specific priorities, or issues that would best be addressed at the organizational level? Who is in the best position to provide leadership to address the priority areas identified in the tool?

Identifying any priority areas can be the start of an action plan to enhance your Board of Health's capacity to manage data and information more effectively. Additionally, identifying questions that you have about data and information management can be another means to developing an action plan.

### Some strategies to consider:

- Engage in a discussion of your results within your health unit. This could be done at the health unit level, within individual programs or both. The involvement of everyone who is involved with data is recommended, including administrative staff who enter data, program and research staff who extract findings from databases, and management who use data to guide decisions.
- Consult colleagues to determine data management processes that work in their programs, and contact other health units to examine their policies and practices for certain areas.
- Encourage and support staff to complete the Public Health Agency of Canada's Skills Enhancement courses.
- Build on your strengths. Although the tool specifically highlighted priority areas for improvement, you could also look at your scores to identify areas of strength. These are areas on which to build as you address other aspects of data and information management.
- Consult the next section on resources if there are particular issues you would like to investigate.

## Additional References and Resources

If you are interested in learning more about some of the topics discussed in the User's Guide or in the survey, here are some resources that may be useful.

### Surveillance Systems

- **Framework and Tools for Evaluating Health Surveillance Systems.** [http://www.phac-aspc.gc.ca/php-ppsp/hssef\\_e.html](http://www.phac-aspc.gc.ca/php-ppsp/hssef_e.html)
- **CDC Framework for Evaluating Public Health Surveillance Systems for Early Detections of Outbreaks.** <http://www.cdc.gov/mmwr/PDF/rr/rr5305.pdf>

## Using Evidence

- **CHSRF self assessment tool—is research working for you?**  
[http://www.chsrf.ca/other\\_documents/working\\_e.php](http://www.chsrf.ca/other_documents/working_e.php)
- **“The Art and Science of Evidence-Based Decision-Making ... Epidemiology Can Help!”**- This article explores how epidemiological skills and approaches can improve decision-making in public health and describes how the "Skills Enhancement" program can help public health organizations and practitioners improve their skills in epidemiology, surveillance and information management. This document was published as a special insert in the January/February 2002 issue of *The Canadian Journal of Public Health*. [http://www.phac-aspc.gc.ca/csc-ccs/pdf/epidemiology\\_e.pdf](http://www.phac-aspc.gc.ca/csc-ccs/pdf/epidemiology_e.pdf)

## Evaluation

- **Public Health Research Education and Development (PHRED) Program Evaluation Toolkit. Email: [toolkit@ottawa.ca](mailto:toolkit@ottawa.ca)**
- **Evaluating Health Promotion Programs** (Version 3.5). (2006). Produced by The Health Communication Unit. [http://www.thcu.ca/resource\\_db/pubs/107465116.pdf](http://www.thcu.ca/resource_db/pubs/107465116.pdf)
- **Canadian Evaluation Society.** <http://www.evaluationcanada.ca/site.cgi?s=1>

## Education

- **Public Health Agency of Canada—Skills Enhancement.** The Skills Enhancement for Public Health modules are offered through the Internet to public health practitioners across Canada. The program is an adult learning environment for public health practitioners who want to strengthen their public health knowledge and skills and make better-informed public health decisions. Of special interest is a module in development: **Introduction to Information Management:** This forthcoming module provides an overview of information management activities relevant to public health, and identifies the electronic/computer systems that support them. Learners are given the opportunity to search for, retrieve, appraise, format and present information that can contribute to effective public health practice. <http://www.phac-aspc.gc.ca/sehs-acss/index.html>

## Change Management

- Golden, B. (2006). **Transforming Healthcare Organizations.** *Healthcare Quarterly*, 10(Sp). 10–19. <http://www.longwoods.com/product.php?productid=18490>

## Terms and Definitions

**Activity Tracking:** Documenting the things staff in a program do or the services provided by the program to work towards the desired outcomes (adapted from the PHRED Program Evaluation Toolkit)

**Capacity Building:** Development of health systems [...] it includes activities directed at upgrading technical and professional skills and establishing and /or strengthen infrastructure [...] (Last, J. (2007). *A Dictionary of Public Health*. New York: Oxford University Press.)

**Data:** A set of facts or items of information. (Last, J. (2007). *A Dictionary of Public Health*. New York: Oxford University Press.) Data regarding program activities and program outcomes are included in this definition, as are administrative, surveillance and assessment data.

In public health, data can be collected through:

- Surveys, needs assessments or focus groups to gather information from clients or the community
- Surveillance
- Financial and accounting processes
- Human resource data, such as full-time equivalents (FTEs)
- Contact tracing of communicable diseases
- Client records
- Reviewing the research and best practice literature (peer-reviewed and/or other “grey” literature) on a particular topic
- Program evaluations
- Team meetings to discuss program-related lessons learned

**Database:** An organized set of data or collection of files that can be used for a specified purpose (Last, J. (2001). *A Dictionary of Epidemiology*. New York: Oxford University Press.)

**Data Management:** Method of recoding, organizing, and storing information, (Last, J. (2007). *A Dictionary of Public Health*. New York: Oxford University Press.)

**Data Storage and Security:** Procedures and mechanisms adopted to ensure that the confidentiality of data and information is protected. (Adapted from Last, J. (2007). *A Dictionary of Public Health*. New York: Oxford University Press.)

**Data Quality:** Completeness and validity of the data in the system. (Owston, R. (2002). *Evaluation plan for i-PHIS implementation*. Health Canada, Centre for Surveillance Coordination. Ottawa: ON. Author.)

**Data Quality Assurance:** The process of profiling the data to discover inconsistencies, and other anomalies in the data and performing data cleaning activities to improve the data quality. [http:// en.wikipedia.org/wiki/Data\\_quality\\_assurance](http://en.wikipedia.org/wiki/Data_quality_assurance)

**Evidence:** The assembled information and facts on which rational, logical decisions are based in the diverse forums of human discourse, including courts of law and the practice of evidence-based medicine, among many others. (Last, J. (2007). *A Dictionary of Public Health*. New York: Oxford University Press.)

**Evidence-based Decision Making:** Logical, consistent use of the best available evidence from proven basic scientific sources, preferably augmented as necessary by facts from current, verified peer-reviewed research, to inform policy decisions and routine practice. (Last, J. (2007). *A Dictionary of Public Health*. New York: Oxford University Press.)

**Information:** Facts (data) that have been arranged and/or transformed in order to provide the basis for analysis and interpretation and (ideally) transformation into knowledge. Information on public health is summarized in many ways for transmission to and use by public health officials to ensure that policies, programs and day-to-day decisions are rationally based. (Last, J. (2007). *A Dictionary of Public Health*. New York: Oxford University Press.)

**Monitoring:** The intermittent performance and analysis of routine measurements, aimed at detecting changes in the environment or health status of populations. (Last, J. (2007). *A Dictionary of Public Health*. New York: Oxford University Press.)

**Output:** The immediate result of professional or institutional health care activities, usually expressed as units of service, e.g., patient hospital days, outpatient visits, laboratory tests performed (Last, J. (2001). *A Dictionary of Epidemiology*. New York: Oxford University Press.)

**Outcomes:** All possible consequences of exposure to a risk, use of a therapeutic intervention, or the manner in which a health problem has been managed. (Last, J. (2007). *A Dictionary of Public Health*. New York: Oxford University Press.)

**Outcome Measurement:** Quantifiable consequences of an action, or set of actions, or procedure. In the health field, many outcome measures are used to assess and evaluate aspects of health care. (Last, J. (2001). *A Dictionary of Epidemiology*. New York: Oxford University Press.)

**Quality Assurance:** The procedures, methods such as audits, and corrective actions taken to ensure that preventive and therapeutic practices are conducted in conformity with best practices and standard operating procedures aimed at achieving the highest attainable level of outcomes in institutional and community-based health care. (Last, J. (2007). *A Dictionary of Public Health*. New York: Oxford University Press.)

**Surveillance:** The ongoing systematic collection, analysis, and interpretation of health data, essential to the planning, implementation, and evaluation of public health practice, closely integrated with the timely dissemination of these data to those who need to know. The final link in the surveillance chain is the application of these data to prevention and control. A surveillance system includes a functional capacity for data collection, analysis, and dissemination linked to public health programs. (Ministry of Health and Long-Term Care (2008). *Population Health Assessment and Surveillance Protocol*. Toronto: ON. Author.)

**Validity:** The extent to which a measurement actually measures what it purports to measure or an entity actually is what it purports to be. (Last, J. (2007). *A Dictionary of Public Health*. New York: Oxford University Press.)